No: MC-01

SUBMITTAL COVERSHEET
Nanuet UFSD –Phase 3 Projects

Architect:
KSQ Architects
215 W 40th Street,15th Floor
New York, NY 10018

Owner:
Nanuet Union Free School District
101 Church Street
Nanuet, NY 10954

Construction Manager:
Jacobs
One Penn Plaza, 54th floor
New York, NY 10019

Contractor: Joe Lombardo Plumbing & Heating of Rockland Inc

Contract: Ron Lombardo

Address: 321 Spook Rock Road Suite 109A
Suffern, New York 10901

Telephone: 845-357-6537

Fax: 845-357-8529

School Name: Nanuet Union Free School District Phase 3 Bond Projects @ Barr Middle School & Nanuet High School

Type of Submittal:

Re-submittal: [ ] No [ ] Yes

[ ] Shop Drawings [ ] Product Data [ ] Schedule [ ] Sample [ ] _____
[ ] Test Report [ ] Certificate [ ] Color Sample [ ] Warranty [ ] _____

Submittal Description:
DIRECT-DIGITAL CONTROL SYSTEM FOR HVAC

Product Name:

Manufacturer:

Subcontractor/ Supplier: SIEMENS

References:

Spec. Section No.: 230923

Drawing No(s):

Paragraph:

Rm. or Detail No(s):

Architect's/ Engineer's Review Stamp	Contractor Review Statement:
	These documents have been checked for accuracy and coordinated with job conditions and Contract requirements by this office and have been found to comply with the provisions of the Contract Documents. Ronald J. Lombardo 3-06-24 Name: Date: Company Name: Joe Lombardo Plumbing & Heating of Rockland Inc.

Remarks:

SIEMENS Smart Infrastructure

Transmittal

To: JOE LOMBARDO PLUMBING & HEATING OF ROCKLAND INC 321 SPOOK ROCK RD SUFFERN, NY- 10901-5319 US. PHONE: (845) 357-6537	Date: 3/5/2024	Our Job No. 44OP-366733
	Job Name NANUET BOND PHASE 3 HIGH SCHOOL	
	Your Order No.	

WE ARE SENDING YOU

- ☒ HEREWITH
- ☐ UNDER SEPARATE COVER THE FOLLOWING ITEMS:

☒ SUBMITTALS FOR REVIEW/APPROVAL	☐ ENGINEERING COMMENTS
☐ APPROVED SUBMITTALS	☐ ORIGINAL DRAWINGS
☐ SUBMITTALS FOR YOUR USE	☐ SHOP DRAWINGS
☐ MARKED PLANS & SPECIFICATIONS	☐ CHANGE ORDER(S)
☒ VALVE SCHEDULE	☒ THERMOSTAT LOCATION SUBMITTAL

THESE ARE SUBMITTED

☒ FOR APPROVAL	☐ FOR YOUR USE
☐ FOR CORRECTION	☒ PLEASE RETURN __1__ APPROVED COPY(S) FOR OUR USE
☐ FOR COMMENTS	

DESCRIPTION

ONE ELECTRONIC COPY OF ATC SUBMITTAL FOR THE ABOVE MENTIONED PROJECT.

IN ORDER TO PREPARE THE SUBMITTAL, WE HAVE FOLLOWED THE INFORMATION AS CHECKED BELOW

☐ ARCHITECTURAL PLANS	☐ ELECTRICAL HEATING COIL WIRING
☒ MECHANICAL PLANS	☐ CHILLER WIRING
☐ ELECTRICAL PLANS	☐ TERMINAL UNIT CUT SHEETS
☒ MECHANICAL SPECIFICATIONS	☐ HUMIDIFIER CUT SHEETS
☐ ELECTRICAL SPECIFICATIONS	☐ DX COIL WIRING
☐ EXISTING AS BUILTS	☐ COMPLETE SET(S) OF PLANS & SPECS.
☒ CUTSHEETS	☐

PLEASE BE ADVISED THAT WE MUST HAVE THIS INFORMATION BEFORE WORK CAN BEGIN ON YOUR SUBMITTAL

REMARKS

PLEASE ADDRESS YOUR REMARKS TO: **SIEMENS INDUSTRY, INC.** SMART INFRASTRUCTURE 412 MT KEMBLE AVE. MORRISTOWN, NJ 07960, USA	ATTENTION: OLIVER WRIGHT (PROJECT MANAGER) TELEPHONE NO: (973) 575-6300

SIEMENS

SIEMENS INDUSTRY, INC.
SMART INFRASTRUCTURE

412 MT KEMBLE AVE.
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3/5/24

FOR INFORMATION CONTACT
OLIVER WRIGHT (PROJECT MANAGER)

ATC SUBMITTAL FOR
NANUET BOND PHASE3 HIGH SCHOOL

103 CHURCH ST
NANUET, NY 10954-3030
USA

44OP-366733

KSQ DESIGN
ARCHITECT

SAGE ENGINEERING ASSOCIATES, LLP
ENGINEER

JOE LOMBARDO PLUMBING & HEATING,ROCKLAND
CONTRACTOR

SIEMENS

Job Name: BNJ2 BAU Nanuet Bond Phase 3 High School
JOB #: 44OP-366733
Siemens Industry Inc – Smart Infrastructure
ATC Submittal

Submittal Notes
2/16/2023

1. At the time of submission, Siemens has based our design from Bid Set Issuance drawings dated 06/06/2023, section 23 09 23 Direct-Digital Control System for HVAC dated 06/08/2023 and addendum #1 dated 06/22/2023, addendum #3 dated 06/29/2023 addendum #6 dated 07/12/2023.

2. At the time of submission, Siemens has followed the following reviewed cut sheets.
    a. Indoor AHU - Unit Vents and Heat Pumps Rev-02.
    b. RTU, AHU, CCU, BC & MC Rev-02.
    c. Heat Exchanger.
    d. Hydronic Pumps.
    e. Variable Frequency Drivers for Pumps.
    f. Steam And Cond Specialties Rev-01.
    g. Power Ventilators Rev-01.
    h. Centrifugal Fans Rev-02.

3. At the time of submission, following cut sheets were not available. Design may change upon receiving the cut sheets.
    a. Unit heaters.
    b. Heating coils cut sheets for existing AHU's.
    c. Radiation panels.
    d. Fin tube radiators.
    e. Heating water radiation.

4. BACnet thermostats are proposed for controlling the existing & new FTR's, Heating Radiation & Convector Units.

A. Barr Middle School building:

1. At the time of submission, Siemens has designed the Unit Ventilators by providing field mounted Siemens controller, current switch, space thermostats & condensate overflow switch for all UV units as per email received from D&B Building Solutions LLC dated 12/13/2023 and as per RFI response 2 in addendum #3. Siemens will wire the required control points to Siemens controller from UV terminal strip as shown in UV units wiring diagram file - 910413999 REV. 00. Siemens has included only one BACnet IP integration from Daikin Master Controller to BAS. As per new UV scope per above details, the sequence of operations given in specification section 230923 3.11/B/3 are not aligned with the designed system because of changed mechanical design. Siemens will update the new sequences once received.

D&B Building Solutions LLC will wire Expansion Valve Kit, Z-Control kit, Navigator (required t-stat for the VRV UV system).

2. At the time of submission, sequence of operation for Unit Heaters were not available on the specification section 230923. Siemens has proposed same sequence of operations of Cabinet Unit Heater for Unit Heaters.

3. At the time of submission, damper actuator type (modulating/On/off) was not mentioned for the replacement AHU & Unit Heaters damper actuators as per notes in mechanical drawings. Siemens has requested for the existing controller and termination details to which these devices will relate to. However, the requested information's are still not received. Siemens has proposed modulating type damper actuators for the AHU's and On/Off damper actuator for Face and bypass damper actuator for existing UHs. Siemens will update the BOM once relevant information's are received.

4. At the time of submission, existing controller & terminal details for existing AHU's (S-1 to S-4, S-6 to S-9), Hot Water Systems was not available. Siemens has added a table in Barr School submittal in drawing 500A which shows the equipment and type of sensors/field devices replaced. Siemens has proposed the replacement sensors/field devices for these systems, however wiring details are not provided due to insufficient existing terminal details. Siemens will provide the wiring diagram once the required information's are received.

B. High School building:

1. At the time of submission, Siemens has connected the IO points of Hot Water Coils, for existing AHU-1, 2 & AC-1 shown in detail D18 in drawing HS-M603 to existing panel HIGHSPXM05 & HIGHSPXM03. Siemens will add the new IO points to spare IO points in controller and will replace the existing points as required.

2. At the time of submission, for RTU-HS-4 & RTU-Hs-5, Siemens has included only BACnet IP connection to BAS from Microtech III BACnet communication module as per RTU cutsheets and only includes supply of 5 qty AFMS for these units.

3. At the time of submission, sequence of operations and cutsheets for existing Unit Ventilators were not available. Siemens has requested for existing unit sequences, cutsheets and wiring diagram, however, was not received. Siemens proposes the same sequence of operations which was provided for the Unit Ventilators in specification section 230923 clause 3.11/3 Unit Ventilators. Siemens has designed this unit based on the control schematics provided in detail A9 in drawing HS-M602 and will update the submittal as required once all requested information's are available.

4. At the time of submission, Siemens has connected the new IO points of the Heat Exchanger (HX-HS-2) and pumps (P-HS-4, 5) to the spare point terminals in existing HIGHSPXC22.

5. At the time of submission, Siemens has designed Blower coil unit's controller to be placed inside the Blower control unit control enclosure. Separate panel is not provided.

SIEMENS

Job Name: Nanuet Bond Phase 3 High School
JOB #: 44OP-366733
Siemens Industry Inc – Smart Infrastructure
Valve Schedule Submittal

Valve Submittal Notes
2/16/2024

1. At the time of submission Siemens has followed the following reviewed cut sheets.
    a. Indoor AHU - Unit Vents and Heat Pumps Rev-02.
    b. RTU, AHU, CCU, BC & MC Rev-02.
    c. Heat Exchanger.

2. At the time of submission, following cut sheets are not available. Valve for these units are sized based on GPM ratings given in Nanuet Bond Phase 3 HS Mech-Elec Drawings under mechanical schedule BM-M002, HS-M002 dated:06/06/23. Design may change upon receiving the cut sheets.
    a. Unit heaters.
    b. Heating coils cut sheets for existing AHU's.
    c. Radiation panels.
    d. Fin tube radiators.
    e. Heating water radiation.

3. At the time of submission, all modulating valves are proposed based on specification details provided in the 230923/(2.10/C) dated: 06/08/23 and sequence of operations mentioned in specification section 23 09 23/(3.11/A) & (3.11/B).

A. Barr Middle School building:

1. At the time of submission, for Barr Middle School, existing pneumatic valves are replaced with new electric valves based on GPM data given in notes in drawings dated 06/06/2023. Coil data and pressure drops were not available at the time of design and to be confirmed on site.

2. Clarification: At the time of submission, 2-way modulating valves are proposed for existing Fin Tube Radiators as per control drawing detail-A10 in dwg BM-M602 dated 06/06/2023 and sequence of operations for Fin Tube Radiators mentioned in specification section 23 09 23/(3.11/B/5). As, tags are not available for existing FTR's, room numbers associated with existing FTR's are added in valve submittal comments for identification purpose.

3. Clarification: At the time of submission, as per note 17 & 18 in dwg BM-M110 the type of valves is not mentioned for Hot Water Storage Tank valve & Hot Water Booster Heater Heat Exchanger valve. Simens has proposed 2-way modulating valves for these units.

4. Unit Ventilator heating coil control valve have been selected with the following characteristics:
    a. Globe Valve, Stainless Steel trim
    b. 2-Way Modulating Valve, Spring return, Normally Open.

c. ANSI 250
d. Close-off pressure: 120 psi.

5. Existing AHU valves have been selected with the following characteristics:
    a. Globe Valve, Stainless Steel trim
    b. 3-Way Modulating Valve, Spring return.
    c. ANSI 250
    d. Selected minimum Close-off pressure: 73 psi.

6. Existing Hot Water System valves for main building heating loop have been selected with the following characteristics:
    a. Butterfly Valve, Stainless Steel trim
    b. 3-Way Modulating Valve, Spring return.
    c. ANSI 250
    d. Selected minimum Close-off pressure: 175 psi.

7. Existing Hot Water System valves for hot water storage tank have been selected with the following characteristics:
    a. Globe Valve, Stainless Steel trim
    b. 2-Way Modulating Valve, Spring return, Normally Closed.
    c. ANSI 250
    d. Selected minimum Close-off pressure: 200 psi.

8. Existing Hot Water System valves for Hot Water Booster Heat Exchanger have been selected with the following characteristics:
    a. Globe Valve, Stainless Steel trim
    b. 2-Way Modulating Valve, Spring return, Normally Open.
    c. ANSI 250
    d. Selected minimum Close-off pressure: 201 psi.

9. Existing Fin Tube Radiator control valves have been selected with the following characteristics:
    a. Globe Valve, Stainless Steel trim
    b. 2-Way Modulating Valve, Spring return, Normally Open.
    c. ANSI 250
    d. Selected minimum Close-off pressure: 55 psi.

10. New Fin Tube Radiator control valves have been selected with the following characteristics:
    a. Globe Valve, Stainless Steel trim
    b. 2-Way Modulating Valve, Spring return, Normally Open.
    c. ANSI 250
    d. Selected minimum Close-off pressure: 120 psi.

11. Heating Water Radiator control valves have been selected with the following characteristics:
    a. Globe Valve, Stainless Steel trim
    b. 2-Way Modulating Valve, Spring return, Normally Open.
    c. ANSI 250

d. Selected minimum Close-off pressure: 65 psi.

B. High School building:

1. Clarification: As per unit heater schedule in HS-M002 drawing and layout drawing given in HS-M107, these units are connecting to HW line. However, there is no specification related to valve control in SOO, hence Siemens has followed the specification given for cabinet unit heaters.

2. Existing heat exchanger 1/3 & 2/3 steam valves have been selected with the following characteristics:
   a. Globe Valve, Stainless Steel trim
   b. 2-Way Modulating Valve, Spring return, Normally Closed.
   c. ANSI 125
   d. Selected minimum Close-off pressure: 34 & 39 psi.

3. Clarification: Building steam pressure has been identified at 7psi. Heat exchanger manufacturer has requested an operating pressure of 15 psi. Siemens has provided 1/3 & 2/3 steam valves with total pressure drop of 1.2 psi as a system. Individual pressure drops for each valve listed in table. Siemens is expecting to deliver 5 psi to the HX, please confirm this is acceptable.

4. Existing hot water valve return bypass valve in crawl space have been selected with the following characteristics:
   a. 50% of line GPM and 10 psi pressure drop is considered.
   b. Globe Valve, Stainless Steel trim
   c. 2-Way Modulating Valve, Spring return, Normally Closed.
   d. ANSI 125
   e. Selected minimum Close-off pressure: 200 psi.

4. Blower coil unit hot water valves have been selected with the following characteristics:
   a. Globe Valve, Stainless Steel trim
   b. 2-Way Modulating Valve, Spring return, Normally Open.
   c. ANSI 250
   d. Selected minimum Close-off pressure: 65 psi.

5. Convector hot water valves have been selected with the following characteristics:
   a. Globe Valve, Stainless Steel trim
   b. 2-Way Modulating Valve, Spring return, Normally Open.
   c. ANSI 250
   d. Selected minimum Close-off pressure: 120 psi.

6. Radiator hot water valves have been selected with the following characteristics:
   a. Globe Valve, Stainless Steel trim
   b. 2-Way Modulating Valve, Spring return, Normally Open.
   c. ANSI 250
   d. Selected minimum Close-off pressure: 120 psi.

7. Existing AHU hot water coil HC-HS-2 & HC-HS-4 valves for AHU-1 & AHU-2, have been selected with the following characteristics:
    a. Globe Valve, Stainless Steel trim
    b. 3-Way Modulating Valve, Spring return.
    c. ANSI 250
    d. Selected minimum Close-off pressure: 117 psi.

8. Existing AHU hot water coil HC-HS-3 valve for AC-1, have been selected with the following characteristics:
    a. Globe Valve, Stainless Steel trim
    b. 2-Way Modulating Valve, Spring return, Normally Open.
    c. ANSI 250
    d. Selected minimum Close-off pressure: 201 psi.

9. AHU-HS-3 hot water valve, have been selected with the following characteristics:
    a. Globe Valve, Stainless Steel trim
    b. 2-Way Modulating Valve, Spring return, Normally Closed.
    c. ANSI 250
    d. Selected minimum Close-off pressure: 73 psi.

10. Cabinet unit heater & unit heater hot water valve, have been selected with the following characteristics:
    a. Ball Valve, Stainless Steel trim
    b. 2-Way 2 Pos Valve, Spring return, Normally Open.
    c. ANSI 250
    d. Selected minimum Close-off pressure: 200 psi.

11. Existing control valves for existing unit ventilators shall be reused, siemens need to consider wiring from controller to control valve actuator.

SIEMENS

Job Name: Nanuet Bond Phase 3 High School
JOB #: 44OP-366733
Siemens Industry Inc – Smart Infrastructure
Thermostat Location Submittal

Submittal Notes
2/16/2024

1. BACnet thermostats are proposed for controlling the existing & new FTR's, Heating Radiation & Convector Units.

2. At the time of submission, as per DWG BM-M112, note-4 thermostat is connected to EX S-2. However, as per note-28 the same thermostat is mentioned as it will be controlling the 2-way valve for EX FTR. Thereby new BACnet thermostat will be provided for EX FTR and temperature reading will be shared with EX S-2.

3. At the time of submission, as per DWG BM-M111, UV-MS-3 and FT-MS-1 serving classroom 102A are sharing a single thermostat. Siemens proposes a new BACnet thermostat which will be controlling the FTR valve. Space temperature reading from this thermostat will be shared with UV-MS-3. New separate thermostat is not considered for UV units.

4. At the time of submission, as per DWG HS-M109, RTU-HS-5, R-2-3 and R-2-4 serving cafeteria are sharing a single thermostat. Siemens proposes a new BACnet thermostat (1 qty) for heating floor radiation units (R-2-3, R-2-4) which will be controlling radiation units' valves. RTU-HS-5 will be provided with manufacturer supplied thermostat.

5. At the time of submission, as per DWG HS-M109, RTU-HS-4, R-2-1 and R-2-2 serving dining room 2 are sharing a single thermostat. Siemens proposes a new BACnet thermostat (1 qty) for heating floor radiation units (R-2-1, R-2-2) which will be controlling radiation units' valves. RTU-HS-4 will be provided with manufacturer supplied thermostat.

6. At the time of submission, as per DWG HS-M109, thermostats are not shown for Convector units. Siemens is proposing new BACnet thermostat for these units to control the valves and to monitor space temperature. CV-HS-1 & CV-HS-2, CV-HS-4 & CV-HS-5 are serving same areas so single thermostat for each pair is considered.

BARR MIDDLE SCHOOL

DWG	DESCRIPTION
	GENERAL
ABAC	ANIXTER BUILDING AUTO. CABLES
ALN	ALN COMMUNICATION
DWIR1	DXR WIRING SPECIFICATION
DWIR2	DXR WIRING SPECIFICATION2
FLN	FLN COMMUNICATION
PPMT1	PPM TERMINATION SPEC.
PPMT2	PPM TERMINATION SPEC. SHEET 2
PTRM1	PXCC TERMINATION SPECIFICATION
PTRM2	PXCC TERMINATION SPEC. SHEET 2
PWIR	PXCC WIRING SPECIFICATION
TTRM1	TX-I/O TERMINATION SPEC.
TTRM2	TX-I/O TERMINATION SPEC. 2
TTRM3	TX-I/O TERMINATION SPEC. 3
TWIR	PXCM TX-I/O WIRING SPEC.
	CONTROL DRAWINGS
	FLN SCHEDULE
	VALVE SCHEDULE
	CONTROL DRAWINGS
001	BM_RISER
001A	BM_RISER
100	BM_UNIT VENTILATOR & HP (BOM/SOO)
100A	BM_UNIT VENTILATOR & HP (SOO)
100B	BM_UNIT VENTILATOR & HP (MECH)
100C	BM_UNIT VENTILATOR & HP (RISER)
100D	BM_UNIT VENTILATOR & HP (RISER)
101	BM_EF-MS-8,10,21 (BOM)
101A	BM_EF-MS-8,10,21 (MECH)
101B	BM_EF-MS-8,10,21 (ELEC)
102	BM_EXHAUST FAN (EF-MS-23) (BOM)
102A	BM_EXHAUST FAN (EF-MS-23) (MECH)
102B	BM_EXHAUST FAN (EF-MS-23) (ELEC)
103	BM_EX EF-5,6,7,11,15,16 (BOM)

DWG	DESCRIPTION
	CONTROL DRAWINGS
103A	BM_EX EF-5,6,7,11,15,16 (MECH)
103B	BM_EX EF-5,6,7,11,15,16 (ELEC)
103C	BM_EX EF-5,6,7,11,15,16 (ELEC)
400	BM_FIN TUBE RADIATORS (BOM/SOO)
400A	BM_FIN TUBE RADIATORS (MECH/ELEC)
401	BM_RADIATOR COILS (BOM/SOO)
401A	BM_RADIATOR COILS (MECH/ELEC)
500	BM_MISC EXISTING EQUIP (BOM)
500A	BM_MISC EXISTING EQUIP (TABLE)
	DDC PANEL LAYOUTS & INSTALLATION DRAWINGS
N01	NAN.BM.FLR1.PXCM1 (BOM)
N01A	NAN.BM.FLR1.PXCM1 (LAYOUT)
N01B	NAN.BM.FLR1.PXCM1 (INSTALLATION)
N02	NAN.BM.FLR2.PXCM2 (BOM)
N02A	NAN.BM.FLR2.PXCM2 (LAYOUT)
N02B	PPM.EF.MS.10 (LAYOUT)
N02C	PPM.EF.MS.21 (LAYOUT)
N02D	PPM.EF.MS.23 (LAYOUT)
N02E	PPM.EF.MS.8 (LAYOUT)
N02F	PPM.EX.EF.11 (LAYOUT)
N02G	PPM.EX.EF.15 (LAYOUT)
N02H	PPM.EX.EF.16 (LAYOUT)
N02I	PPM.EX.EF.5 (LAYOUT)
N02J	PPM.EX.EF.6 (LAYOUT)
N02K	PPM.EX.EF.7 (LAYOUT)
N02L	NAN.BM.FLR2.PXCM2 (INSTALLATION)
	THERMOSTAT LOCATION SUBMITTAL

REVISION HISTORY

R0	2/16/2024	VB	ISSUED FOR APPROVAL

SIEMENS

SIEMENS INDUSTRY, INC.
SMART INFRASTRUCTURE

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NANUET BOND PHASE3 MID SCHOOL
NANUET, NY

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
VB	VB	NSK	02/16/24	02/16/24

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TOCA

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C:\USERS\Z004PB8F\ONEDRIVE - SIEMENS AG\BNJ2 BAU NANUET BOND PHASE 3 HIGH SCHOOL_44OP-366733\DT\MDT_BARR MIDDLE SCHOOL\TOC-000.DWG

Anixter Building Automation Cables

Non-Plenum

SBT Part Number	Description	Print Legend
H-TP20-CM	20AWG,STR,1TP,CM,BLUE JACKET	NORTHFLEX ® H-TP20-CM “DI, DO, AI, AO” (Mfg E#) 20AWG 1P 75°C CM (UL) C(UL)
H-3C20-CM	20AWG,STR,3COND,CM,BLUE JACKET	NORTHFLEX ® H-3C20-CM “TEC V/D” (Mfg E#) 20 AWG 3C 75°C CM (UL) C(UL)
H-TP18-CMR	18AWG,STR,1TP,CMR,BLUE JACKET	NORTHFLEX ® H-TP18-CMR “DI, DO, AI, AO” (Mfg E#) 18AWG 1P 75°C CMR (UL) C(UL)
H-3C18-CMR	18AWG,STR,3COND,CMR,BLUE JACKET	NORTHFLEX ® H-3C18-CMR “TEC V/D” (Mfg E#) 18 AWG 3C 75°C CMR (UL) C(UL)
H-2C14-CL3R	14AWG,STR,2COND,CL3R,DARK BLUE JACKET	H-2C14-CL3R “LV POWER” (Mfg E#) 14 AWG 2C 75°C CL3R (UL) C(UL)
H-B-TSP24LC-CM	BLN24AWG,STR,TSP,LOCAP,CM,ORANGE JACKET	H-B-TSP24LC-CM “BLN” (Mfg E#) 24 AWG 1P 75°C CM (UL) C(UL)
H-F-TSP24LC-CM	FLN24AWG,STR,TSP,LOCAP,CM,ORANGE JACKET W/ BLUE STRIPE	NORTHFLEX ® H-F-TSP24LC-CM “FLN” (Mfg E#) 24 AWG 1P 75°C CM (UL) C(UL)
H-3P24-CMR	24AWG,SOL,3P,CMR,BLUE JACKET	NORTHFLEX ® H-3P24-CMR “TEC STAT” (Mfg E#) 24 AWG 3P 75°C CMR (UL) C(UL)
LON-1P22-CM	22AWG,STR,1PAIR,CM,ORANGE JACKET W/ WHITE STRIPE	NORTHFLEX ® LON-1P22-CM “LON FLN” (Mfg E#) 22AWG 1P 75O C CM (UL) C(UL)
LON-2P22-CM	22AWG,STR,2PAIR,CM,ORANGE JACKET W/ WHITE STRIPE	NORTHFLEX ® LON-2P22-CM “LON FLN” (Mfg E#) 22AWG 2P 75O C CM (UL) C(UL)
LON-1PS22-CM	22AWG,STR,1PAIR,OAS,CM,ORANGE JACKET W/ WHITE STRIPE	NORTHFLEX ® LON-1PS22-CM “LON FLN” (Mfg E#) 22AWG 1P 75O C CM (UL) C(UL)
LON-2PS22-CM	22AWG,STR,2PAIR,OAS,CM,ORANGE JACKET W/ WHITE STRIPE	NORTHFLEX ® LON-2PS22-CM “LON FLN” (Mfg E#) 22AWG 2P 75O C CM (UL) C(UL)
E-4TP24CAT5-CM	24AWG,SOL,4TP,CAT5,CM	NORTHFLEX ® E-4TP24CAT5-CM “ETHERNET” (Mfg E#) 24AWG 4P 75O C CM (UL C(UL)
H-A-1.5TSP24LC-CM	ALN485, 24AWG, STR, TP+1C, OAS, LOCAP, CM	NORTHFLEX ® H-A-1.5TSP24LC-CM "ALN485" 24 AWG 1P+1C 75°C CM (UL) C(UL) (Mfg E#)
H-F-1.5TSP24LC-CM	FLN485, 24AWG, STR, TP+1C, OAS, LOCAP, CM	NORTHFLEX ® H-A-1.5TSP24LC-CM "FLN485" 24 AWG 1P+1C 75°C CM (UL) C(UL) (Mfg E#)

Plenum

SBT Part Number	Description	Print Legend
H-TP20-CMP	20AWG,STR,1TP,CMP,BLUE JACKET	NORTHFLEX ® H-TP20-CMP “DI, DO, AI, AO” (Mfg E#) 20 AWG 2C 75°C CMP (UL) C(UL)
H-3C20-CMP	20AWG,STR,3COND,CMP,BLUE JACKET	NORTHFLEX ® H-3C20-CMP “TEC V/D” (Mfg E#) 20 AWG 3C 75°C CMP (UL) C(UL)
H-TP18-CMP	18AWG,STR,1TP,CMP,BLUE JACKET	NORTHFLEX ® H-TP18-CMP “DI, DO, AI, AO” (Mfg E#) 18 AWG 2C 75°C CMP (UL) C(UL)
H-3C18-CMP	18AWG,STR,3COND,CMP,BLUE JACKET	NORTHFLEX ® H-3C18-CMP “TEC V/D” (Mfg E#) 18 AWG 3C 75°C CMP (UL) C(UL)
H-2C14-CL3P	14AWG,STR,2COND,CL3P,DARK BLUE JACKET	NORTHFLEX ® H-2C14-CL3P “LV POWER” (Mfg E#) 14 AWG 2C 75°C CL3P (UL) C(UL)
H-B-TSP24LC-CMP	BLN24AWG,STR,TSP,LOCAP,CMP,ORANGE JACKET	NORTHFLEX ® H-B-TSP24LC-CMP “BLN” (Mfg E#) 24 AWG TSP 75°C CMP (UL) C(UL)
H-F-TSP24LC-CMP	FLN24AWG,STR,TSP,LOCAP,CMP,ORANGE JACKET W/ BLUE STRIPE	NORTHFLEX ® H-F-TSP24LC-CMP “FLN” (Mfg E#) 24 AWG TSP 75°C CMP (UL) C(UL)
H-3P24-CMP	24AWG,SOL,3PAIR,CMP,BLUE JACKET	NORTHFLEX ® H-3P24-CMP “TEC STAT” (Mfg E#) 24 AWG 3P 75°C CMP (UL) C(UL)
LON-1P22-CMP	22AWG,STR,1PAIR,CMP,ORANGE JACKET W/ WHITE STRIPE	NORTHFLEX ® LON-1P22-CMP “LON FLN” (Mfg E#) 22AWG 1P 75O C CMP (UL) C(UL)
LON-2P22-CMP	22AWG,STR,2PAIR,CMP,ORANGE JACKET W/ WHITE STRIPE	NORTHFLEX ® LON-2P22-CMP “LON FLN” (Mfg E#) 22AWG 2P 75O C CMP (UL) C(UL)
LON-1PS22-CMP	22AWG,STR,1PAIR,OAS,CMP,ORANGE JACKET W/ WHITE STRIPE	NORTHFLEX ® LON-1PS22-CMP “LON FLN” (Mfg E#) 22AWG 1P 75O C CMP (UL) C(UL)
LON-2PS22-CMP	22AWG,STR,2PAIR,OAS,CMP,ORANGE JACKET W/ WHITE STRIPE	NORTHFLEX ® LON-2PS22-CMP “LON FLN” (Mfg E#) 22AWG 2P 75O C CMP (UL) C(UL)
E-4TP24CAT5-CMP	24AWG,SOL,4TP,CAT5,CMP	NORTHFLEX ® E-4TP24CAT5-CMP “ETHERNET” (Mfg E#) 24AWG 4P 75O C CMP (UL
H-A-1.5TSP24LC-CMP	ALN485, 24AWG, STR, TP+1C, OAS, LOCAP, CMP	NORTHFLEX ® H-A-1.5TSP24LC-CM "ALN485" 24 AWG 1P+1C 75°C CM (UL) C(UL) (Mfg E#)
H-F-1.5TSP24LC-CMP	FLN485, 24AWG, STR, TP+1C, OAS, LOCAP, CMP	NORTHFLEX ® H-A-1.5TSP24LC-CM "FLN485" 24 AWG 1P+1C 75°C CM (UL) C(UL) (Mfg E#)

Assemblies

Part Number	Description	Print Legend
550-827	CABLE ASSEMBLY TEC TO SSB 3 POS 10 FT	N
550-828	CABLE ASSEMBLY TEC TO SSC 3 POS 10 FT	N
B6320FE	18AWG, SOL, 2COND,CMP, WHITE JACKET	BELDEN 6330FE CMP 75C 2C18 Shielded (UL) E108998-M C(UL) 2801 2608 158 ROHS (UL)

REVISION HISTORY

R0	2/16/2024	VB	ISSUED FOR APPROVAL

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NANUET BOND PHASE3 MID SCHOOL
NANUET, NY

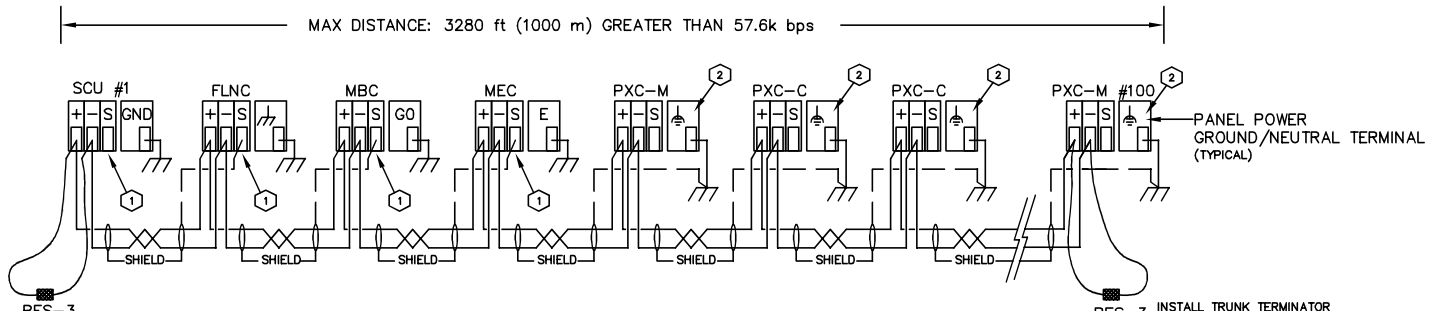
ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
VB	VB	NSK	02/16/24	02/16/24

ANIXTER BUILDING AUTO. CABLES

440P-366733
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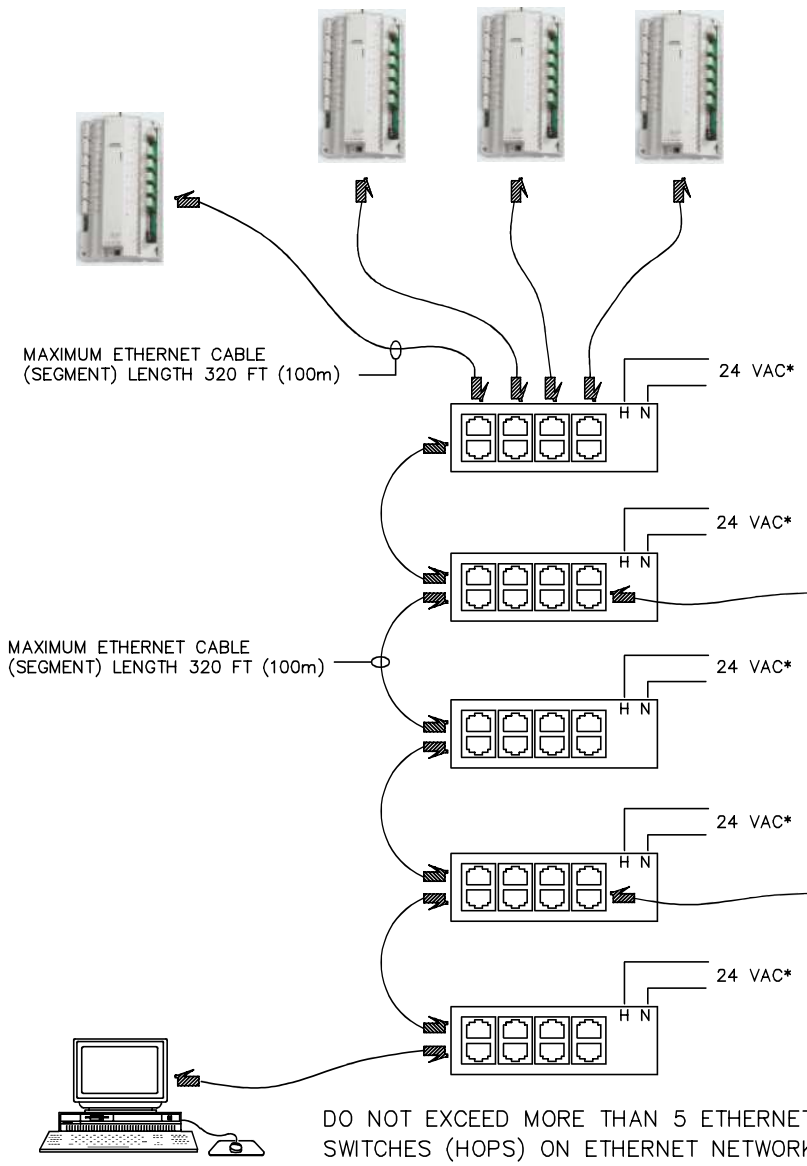
ABAC

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RES−3
538−664
BLN TRUNK TERMINATOR

1 ALN SIEMENS P2 ALN (BLN) NETWORK
SIEMENS P2 AUTOMATED LEVEL NETWORK (ALN)
COMMUNICATION PROTOCOL: RS−485

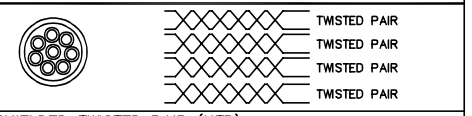


DO NOT EXCEED MORE THAN 5 ETHERNET SWITCHES (HOPS) ON ETHERNET NETWORK

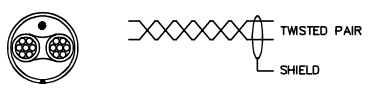
2 ALN SIEMENS ETHERNET NETWORK
10Base−T/100Base−TX
COMMUNICATION PROTOCOL: ETHERNET TCP/IP

APPLICABLE TO:
MLN (WORKSTATION TO ETHERNET)
ALNs (ETHERNET, BACnet/IP, AEM)
HUBS, SWITCHES, ROUTERS
NETWORK INTERFACE CARD

NOTE: −
* CERTAIN MODELS MAY REQUIRE 24 VDC OR 120 VAC..

ALN ETHERNET CABLE SPECIFICATIONS

4 UNSHIELDED TWISTED PAIR (UTP) 24 AWG (SOLID) 17 PICOFARAD/FT CAPACITANCE AT 1KHz, 1MHz IEEE802.3 CATEGORY 5 CERTIFIED OR BETTER
SHIELD NONE

PART NUMBERS
PLEASE REFER TO CERCO AND ANIXTER CABLE PART NUMBERS (SEE DRAWINGS 6A & 6B).

ALN TSP CABLE SPECIFICATIONS

TWISTED PAIR 24 AWG (STRANDED) 12 PICOFARAD/FT CAPACITANCE OR LESS 4 TWISTS PER FOOT.
SHIELD 100% OVERALL FOIL

PART NUMBERS
PLEASE REFER TO CERCO AND ANIXTER CABLE PART NUMBERS (SEE DRAWINGS 6A & 6B).

NOTES:

NEVER RUN NETWORK CABLING CLOSER THAN 5 FEET TO A VARIABLE FREQUENCY DRIVE (VFD) EXCEPT AT THE POINT WHERE THE NETWORK MUST CONNECT TO THE VFD. NETWORK ENTRY INTO A VFD MUST BE THROUGH A SEPERATE CONDUIT AND ALL NETWORK WIRING MUST BE KEPT AS FAR AS POSSIBLE FROM HIGH POWER CABLING IN THE DRIVE.

NEVER RUN NETWORK CABLE CLOSER THAN 5 FEET FROM CONDUITS CARRYING 100KVA OR GREATER. ALWAYS CROSS HIGH POWER CABLES (AT A DISTANCE OF 5 FEET) AT A 90° ANGLE.

NETWORK RUN IN OPEN CABLE TRAYS WITH CIRCUITS CARRYING 20 AMPS SHOULD BE NO CLOSER THAN 26 INCHES TO THE HIGHER POWER CABLES.

NETWORK RUN IN ENCLOSED TRAYS WITH CONDUITS CARRYING OVER 20 AMPS SHOULD BE NO CLOSER THAN 18 INCHES TO THE HIGHER POWER CABLES.

REVISION HISTORY

R0	2/16/2024	VB	ISSUED FOR APPROVAL

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ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
VB	VB	NSK	02/16/24	02/16/24

ALN COMMUNICATION

440P-366733
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ALN

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C:\USERS\Z004PB8F\ONEDRIVE − SIEMENS AG\BNJ2 BAU NANUET BOND PHASE 3 HIGH SCHOOL_440P−366733\DT\MDT_BARR MIDDLE SCHOOL\UCWIRE.DWG

Important Safety Information
System–specific:
The electrical safety for building automation and control systems by Siemens Building Technologies is essentially based on safely separating low voltage from mains voltage.
Application as per SELV or PELV pursuant to HD 384 "Electrical installation of buildings" depending on the grounding (24V AC) of the low voltage:
Ungrounded = Safety Extra–Low Voltage (SELV).
Grounded = Protection by Extra Low Voltage (PELV).
Device–related safety is guaranteed, among others, by:
1. Low–voltage power supply 24V AC per SELV or PELV
2. Comply with specific regulations for electrical wiring per the following sections.
3. Observe the following points when grounding 24V AC (system neutral):
4. Operating voltage of 24V AC is permitted in principle for both grounded as well as non–grounded system neutral. Local regulations and customers apply accordingly.
5. Grounding may be required or not allowed for functional reasons.
6. 24V AC systems are generally grounded unless disadvised by the manufacturer.
7. In order to avoid ground loops, connect systems with PELV to the ground at one location only (especially for transformers), if no other indication exists.

Mains and operating voltage:

Operating voltage 24V AC:
1. It must meet requirements for SELV or PELV. Permitted deviation for nominal voltage 24V AC on the device: –10 +/– 20%.

Transformer specification 24V AC:
1. Use safety insulating transformers as per EN 61558 with double insulation designed for 100% duty to supply SELV or PELV circuits..
2. Power taken from the transformer should be at least 50% of nominal load for efficiency reasons (effectiveness).
3. Transformer nominal power should be at least 25VA. For smaller transformers, the ratio of open circuit voltage to full load is unfavorable (> + 20%).

Operational voltage fuse 24V AC:
Transformers on the secondary side correspond to the actual load of all connected devices as per transformer sizing:
1. 24V AC line (system potential) must always be fused.
2. There required, also line (system neutral).

Mains filter:

Spikes and high–frequency interference may occur in areas with high levels of interference. The disturbances not only impact the transformer on the primary side, but may also influence secondary connected components.
A mains filter should be attached on the primary transformer if such interference is anticipated.
Mains filters should be installed as close to the network transformer as possible and grounded.

Device–specific :

Devices using different power circuits:
Devices must have the required insulation of the power circuits from each other to be able to connect them directly without additional insulation.

Interfaces for different voltage circuits :
Connections via interfaces increase the risk of distributing dangerous voltage through the building. Ensure that the required insulation is available at all times and installed per applicable regulations.

DXR2 with 24V AC supply:
1. A class 2 transformer or an external T4 A fuse is compulsory.
2. Max. 100VA per transformer / per fuse circuit.

Installation:

Mounting position:
Recommended:
1. Wall, horizontal from left to right or from right to left.
2. Wall, vertical from bottom to top.
3. Ambient temperature 23 to 122°F (–5 to 50 °C)

AC 24V power lines:

1. DXR2 room automation stations with 24V AC supply are limited to a consumption of 4A/100VA.
2. Supply: Class 2 transformer OR external 4A fuse OR transformer >100VA for more than one DXR2. (In this case a separate 4A fuse is required for every 100VA).
3. DXR2 room automation stations with 24V AC supply can only be wired in star topology.
4. An external power supply of field devices should be fused separately for secure operation.

24V AC Transformer :

Operating voltage :
1. The operating voltage is 24V AC. It must comply with SELV or PELV to HD 60364–4–41 (2007–01–01) requirements.
2. The acceptable deviation of the 24V AC nominal voltage connected to the transformer is +20%/–10%. This means that after taking account of the cable and contact resistances, a tolerance of +/–20% for the field device supply can be guaranteed in the field devices.

Specification for 24V AC transformers:
1. Double–insulated safety transformers to EN 61558, designed for continuous operation, to supply SELV or PELV circuits.
2. The rated transformer output must be at least 50VA. In smaller transformers the ratio of no–load voltage to full–load voltage is unfavorable (> +20%).
3. For reasons of power efficiency the rated transformer output should not exceed 200 % of the maximum load.

Wiring DXR2:
The 24V AC can only be wired in star distribution for the DXR2 room automation stations. 24V AC must be fused with max. 4A (or Class 2 transformer).

Power consumption DXR2 24V AC:
Max. permissible input current 24V AC (through terminals 5 and 6) = Total max. 4A.

Base load (without loading by field devices)
DXR2.M11, DXR2.x12P 9VA
DXR2.M18 11VA
DXR2.E18 13VA
KNX PL–Link supply 5VA/3W
29V DC / Max. 50 mA
The bus supply can be switched off manually via tool if not used. Transit power 24V AC
Field supply 24V AC Max. 6VA
Field supply 24V DC (DXR2.E18 only)Max. 2.4W
Digital output (triac active) 6VA (250mA)
Note: Certain applications ensure that only one triac at a time is active: No simultaneous heating and cooling. Two heating outputs are alternatively on 50% of the time, the same with two cooling outputs. This can be considered in the transformer sizing.
Unconfigured triac 6VA (250mA)

Cable lengths 24V AC

The permissible voltage drop of 0.6 V on the power wire between the transformer and the most distant power point (room automation station, power module, bus interface module) is the basis for calculations.

Permissible load [VA]

	Cable length for 24V AC (SI)				
Cable X–section	2.5m	5.0m	10m	20m	50m
AWG16	200VA	100VA	50VA	25VA	10VA
AWG14	320VA	160VA	80VA	40VA	16VA
	Cable length for 24V AC (US)				
Cable X–section	8.2ft	16.4ft	32.8ft	65.6ft	164ft
AWG16	200VA	100VA	50VA	25VA	10VA
AWG14	320VA	160VA	80VA	40VA	16VA

Notes :
1. The supply wire (24V AC) and return lines can each have the indicated lengths.
2. Power is added together for multiple back–to–back looped PXC3 or DXR2 ("daisy chain") which reduces the cable length accordingly.
3. Each supply point (room automation stations/power module/bus interface module) is either connected separately to the transformer's terminal block (star wiring) or looped via the room automation station.
4. Cables may be wired in parallel to increase the cross section.

Wiring of field devices (without bus)
As a rule, comply with local regulations for electrical installations. These take precedence over any notes in this document.

Wiring for Triac outputs 24V AC.
The following applies for wiring to actuating devices such as valves, damper actuators or protection connected to the Triac outputs:
1. Use stranded, 2 or multiple core round cables, screened (standard off–the–shelf installation cable).
2. Single wires may not be used.
3. Wiring may be laid together with power lines (230V AC). They must be isolated from the power lines per regulations. Isolation must meet PELV requirements.
4. Wiring can not be led in the same cable as the power lines.
5. See table below for maximum single cable lengths. However, the length must not exceed 984ft (300m) (EM interference). DXR2: 262ft (80m).

DXR2 room automation stations with 24V AC supply:

Use cable cross section suited for 4A according to local regulations (T 4A fuse external / Class 2 transformer). Cable cross section >= AWG18. Triacs are not protected and are destroyed if overloaded.
2. Cable length <= 262ft (80m)

Signal wiring
The following applies in common for signal wiring of field devices such as temperature sensors, window switches, presence detectors, dew point sensors or electrical buttons:

1. Use stranded, 2 or multiple core round cables, without screen (standard off–the–shelf installation cable).
2. Single wires or ribbon cables may not be used.
3. Signal wiring may be laid together with power lines (230V AC). They must be isolated from the power lines per regulations. Isolation must meet PELV requirements.
4. Signal wiring can not be led in the same cable as the power lines.
5. The length must not exceed the following value (measuring errors, EM interference): DXR2: 262ft (80m).
6. All system neutral terminals of a device are interconnected. TX–I/O: The connection is not in the terminal base but in the plug–in module. When this unit is unplugged there is no connection.
7. The system neutral of a digital input can be connected to any signal neutral terminal of the device.
8. It is also permissible to combine the system neutral conductors of several digital inputs in order to save wire. TX–I/O: However, system ground must be connected at least once per module.
9. With analog inputs and outputs, the measuring neutral must always be connected to the terminal associated with that specific I/O point to avoid possible measurement errors.
10. 0 to 10V DC actuators with 0 to 10V DC feedback: System neutral of output and feedback may be in the same conductor due to the small current of the U10 and Y10 signals. However, output and feedback must be on the same device and there is no 24V DC supply current admissible on the system neutral conductor.

Relay outputs

1. External fuse of max. 10A for protection of the PCB tracks.
2. Relays have volt–free relay contacts. The mains voltage / switching voltage (230V AC / 24V AC/DC) must be supplied as an external voltage to the terminals.
3. The maximum load of the relay contracts must be observed (see data sheets for the corresponding devices)
4. The sizing and fusing of the power lines are oriented to overall connected load and local regulations.
5. The fused electrical values must therefore be reviewed in the data sheets for the corresponding devices.
6. The lines must be secured on the device with strain relief.
7. Cable length: as per load and local regulations.
8. The maximum current of the relays is limited to 4 (3)A.

Inputs and Outputs

Digital inputs

Cable length
The permissible length of the cables connected to the status contacts, regardless of the thickness of the wire (min. diameter 0.024in / 0.6mm) is restricted to 262ft (80m).

Common conductor with multiple contacts:
When several status or counter contacts are to be connected, a common conductor may be used. This saves wiring. However, system ground must be connected at least once per module. Digital inputs are not electrically isolated from the system electronics. Mechanical contacts must be volt–free. Electronic switches must comply with SELV or PELV standards.

Analog inputs

Cable length:
The maximum permissible cable length for passive resistance sensors and transmitters depends on the permissible measuring error due to the line resistance. The maximum cable length for DXR2 is 262ft (80m).

Active sensors 0 – 10V DC

Cable length:
The maximum cable length for DXR2 is 262ft (80m). The permissible length of 10V DC cables for measured signals, and of the cables to supply the sensors from the TRA device, have to be calculated on the following basis for each active sensor.
1. Max. 7% voltage drop (1.68V) on the cables due to the sensor supply current. Reason: to ensure sufficient voltage for the sensor supply.
2. Measuring error of max. 0.5% of the measuring range due to line resistance on the measuring conductor (not critical, as the measuring current is only 0.1mA)
3. Longer cables are permissible provided larger measuring errors are acceptable.
4. If the active sensor is supplied locally from a transformer, the sensor cable can be up to 984ft (300m) long (DXR2: 262ft (80m)) with a wire diameter of greater than or equil to 0.024in (0.6mm). The local transformer MUST NOT be earthed (earth loop)!
5. In case of active sensors with 24V AC supply, use cable cross section suited for 10A according to local regulations .
6.

Digital outputs (relays, triacs)

Cable length:
The cable between the switching outputs and the equipment to be switched may be up to 262ft (80m) for DXR2.
The permissible lengths of the cables between the relay outputs / triacs and the actuators depend on the type of actuator in use and are calculated as follows:
Relays: Voltage drop of max. 7% (1.68V) on the 24V AC operating voltage for the actuator.
Triacs: Voltage drop of max. 3% (0.72V) on the 24V AC operating voltage for the actuator (the triac itself has already 4% voltage drop).

Analog outputs

Cable length
The permissible cable lengths for 0 – 10V DC control signals and for the 24V AC operating voltage are given in the data sheets of the individual actuators.
Where the actuators are supplied locally with 24V AC, the control signal cable may be up to 984ft (300m) long (DXR2: 262ft (80m)) with a diameter of greater than or equil to 0.024in (0.6mm).
The local transformer MUST NOT be earthed (earth loop)!
0 – 10V DC actuators with 0 – 10V DC feedback: System neutral of output and feedback may be in the same conductor due to the small current. However, output and feedback must be on the same device.

REVISION HISTORY

R0	2/16/2024	VB	ISSUED FOR APPROVAL

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NANUET, NY

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
VB	VB	NSK	02/16/24	02/16/24

DXR WIRING SPECIFICATION

440P-366733
0
DWIR1

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Ethernet network:

Network topologies
1. Star topology (general).
2. Line topology (for room automation).
3. DXR2 and PXC3 can be mixed.
4. The number of room automation stations is limited to 20 for a line topology (daisy chain).
5. The next device has no 24V AC power when a room automation station is removed. The connection exists only on the board, but not on the terminal block.
6. The Ethernet switch is inactive when a room automation station has no 24V AC power. The next devices, if in line topology, are disconnected from the network. For secure operation of the system it is recommended to supply each room automation station separately with 24V AC.

Cables – Room automation stations are connected to one another via switches and Ethernet cables with RJ45 connectors. The following conditions must be met:
1. Standard Ethernet cable min. category 5
2. Shielded or unshielded STP (Shielded Twisted Pair) or UTP (Unshielded Twisted Pair).
3. Length between switch and Room automation station max. 328ft (100m).
4. Length between Room automation stations Max. 328ft (100m).
5. Number of devices under a line topology max. 20.
6. Standard IT product at 100MB or 1GB.

Power over Ethernet (PoE) – Power over Ethernet (PoE) is a simple solution to supply power to room operator units consuming only little power. This saves a power cable and associated installation costs. PoE allows for installing Ethernet devices also in hard–to–access locations or areas where too many cables are an issue. In PoE, power sourcing equipment (PSE) supplies power to powered devices (PD, here: end devices). Voltage is supplied via the RJ45 plugs and a twisted–pair cable (TP) to the devices either:
1. Via data transmission lines
2. Or via unused lines of the RJ45 connection.

PoE requires a star topology. Standard PoE switches have between 4 and 16 outputs. In large plants (e.g. different rooms in a hotel) require use of multiple switches in a line topology.

Specifications:

Standard Ethernet cable	min category 5
Screened or unscreened STP (Shielded Twisted Pair) or UTP (Unshielded Twisted Pair)	STP / UTP

Distance between switch and station = max 328ft (100m).
Distance between switch and end unit = max 328ft (100m).

MS/TP networks:

Network topologies – MS/TP networks for Desigo TRA can only be wired in line topology. The network distance for a fully or partially loaded network is 4000ft (1220m) at a maximum network speed of 76,800 bps. Lower speeds do not mean longer network sections are possible. DXR2 controller support up to 115,200 bps. Network repeaters can be used to extend this distance.
To determine how many devices can be on a network section, add up all the loading numbers and do not exceed 32. Many third–party devices have full load interfaces. Check the manufacturer's literature for network loading information. The RS–485 specification allows 32 full load devices on a section of network cable before a repeater is required. Desigo TRA devices are 1/8 load devices, so, in theory, you could place 256 on a network section.

Response times normally limit the maximum number of devices on a network to lower values of around 96 devices.
1. Two 1200ohm ½W resistors between + and – at BOTH ends of the network section.
2. OneSpecial PTC thermistor between Reference () and earth at ONE end of the network section. This prevents the cable from being damaged by high ground currents that may occur if the reference wire is accidentally grounded to earth ground at a second location.

Technical data BACnet MS/TP – Inter–node protocol communications on BACnet MS/TP networks take place over RS–485 physical media.
Desigo TRA devices use the 3–wire interface.
1. By providing the RS–485 ground signal of the interface to the network termination plug, all node communication ports can be referenced together providing a high degree of noise immunity.
2. The RS–485 common reference wire is terminated at one point (and only one point) to earth ground.
3. An overall foil shield and drain wire provide additional noise protection.
4. The decision to use the orange jacket cable or orange jacket with blue stripe cable is up to the user/customer. The only difference in the cables is the addition of the blue stripe, which can be useful to indicate a different protocol usage (e.g. Automatic level vs. floor level network).



Cable Specifications

Transmission medium (bus cable)	1.5–Pair (1 TP & 1 conductor) with overall Shield and drain wire
Gauge (pair)	24 AWG (0.25 mm2) stranded
Capacitance	
conductor to conductor	12.5 pF/foot (41 pF/m)
conductor to shield	24 pF/foot (79 pF/m)
Impedance	120 Ohm
Twists	min. 4 per foot (13 per m)
Reference wire	24 AWG (0.25 mm2) stranded, 3 inch lay with twisted pair
Shield	100% overall foil with drain wire
NEC class	UL listed, CM, CMP (167°F (75°C or higher)
CEC class	FT4, FT6 (167°F (75°C) or higher)

KNX PL–Link room bus:

1. The KNX PL–Link bus must be conducted inside the building. The cables must never leave the building.
2. The KNX PL–Link bus facilities communications from the PXC3 room automation station to a maximum 64 devices on the KNX bus devices for various manufacturers.
3. Note: The number of devices is also limited by the number of data points and the available bus power. Data points and bus power are incremented during engineering with the ABT tool.
4. The KNX PL–Link bus basic version comprises one cable and two stranded bus wires.
5. The PXC3 has one internal bus power supply of 160mA.
6. The DXR2 has one internal bus power supply of 50mA.
7. The PXC3 also includes an 24V AC / 2A output for devices with increased power consumption that is supplied via 24V AC rather than via the KNX PL–Link bus.
8. The KNX PL–Link is physically based on the KNX bus (Konnex).
9. In KNX networks area/line couplers and IP routers are not admitted.
10. Interconnection of room automation stations via KNX PL–Link is not admissible; the connection is done exclusively via Ethernet switches (Section 9).
11. The polarity of the KNX PL–Link bus conductors must be respected (KNX terminals + and –).

Bus power supply – A bus power supply is required for bus communications. Throttled voltage 29V DC is used.

Internal KNX PL–Link Power Supply:
The room automation stations have an internal bus power supply. which is switched on by default. If an external supply is used, the internal supply must be switched off manually in the ABT (KNX PL–Link rail properties), as parallel operation is not permitted.
Bus power and the KNX bus are electrically isolated from device electronics for devices with bus power.
Parallel operation of the internal KNX PL–Link bus supply with an external bus power supply is not permitted.
The internal bus power supply must be switched off in the tool when an external bus power supply is used.

External bus supply:
An external bus power supply unit (PSU) is required when the 160mA of the PXC3 / the 50mA of the DXR2 is insufficient to cover the power demand of the connected devices.
Power supply units for 160, 320 and 640mA available in specialty stores. The total power supply for the devices must be calculated to determine the appropriate size. Comply with the corresponding details in the datasheet.
A 640mA power supply unit suffices for a line featuring 64 devices on the KNX bus with an average power demand of 10mA each.

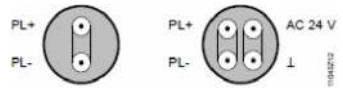
(Parallel operation)
5. In principle, parallel operation of external bus supplies among themselves is possible. However, check if the specific PSU is allowed to be operated in parallel with other PSUs. Refer to the technical specifications. The below mentioned Siemens devices are not submitted to this restriction.
6. A minimum cable distance is required between two PSU.

Bus topologies – Up to 64 devices with KNX PL–Link can be installed on one line (main line as well). No restrictions apply to the type mix.

Note:
1. There is no need to calculate the bus load number E for up to 64 devices.
2. A maximum of 64 devices may be installed even if devices requiring less power are used.

Permissible bus topologies are: Tree, line, and star topologies. These topologies can be mixed as needed. However, ring topologies are not allowed. The tree topology is advantageous if a large network must be created.

Cables
The bus lines (= wired pair) are connected via PL+ (red) and PL– (black).



24V AC can be provided in the same (2 x 2 stands) or in a separate cable.

Bus cable screening : In TRA plants, bus cables without screen are permitted. The screens available for bus cables do not need to be connected. If interference is expected on the KNX bus, use a cable with screen. Connect the screen as per standard installation rules.

Network with internal power supply: Comply with the following distances for a KNX network with the internal power supply from the room automation station:

1. Distance between device and internal supply, max 262ft (80m).
2. Distance between devices, max 262ft (80m).
3. Total length of all lines on one line, max 262ft (80m).

Network with external power supply: Comply with the following distances for a KNX network with external bus power supply (PSU)

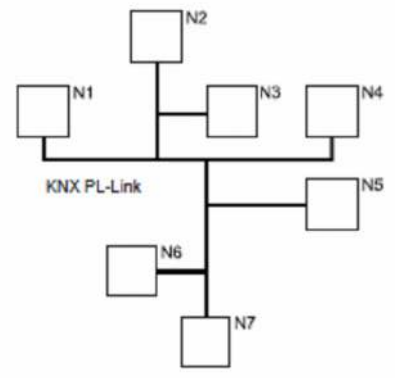
1. Distance PSU to PXC3 with switched off internal supply, Min. 0ft (0m).
2. Distance device to next PSU, Max. 1148ft (350m).
3. Distance between two PSU operated in parallel Min. 656ft (200m), (Min. 0ft (0m) for the new Siemens power supply modules.).
4. Distance between devices, Max. 2297ft (700m).
5. Total length of all lines on one line, Max. 3281ft (1000m).

Polarity: Important – The bus conductors must NOT be inverted. (KNX terminals + and –).

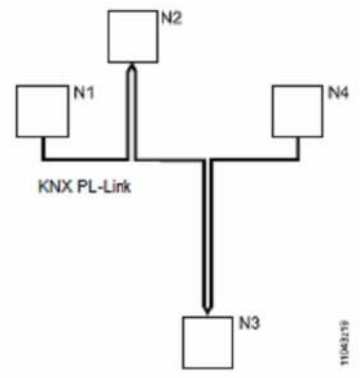
Permissible load [VA] :

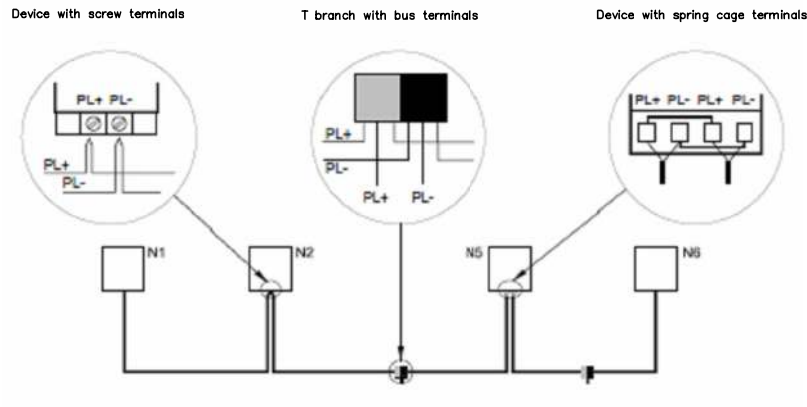
	Cable length for 24V AC				
AWG	32.8ft	65.6ft	164ft	328ft	656ft
AWG20	48VA	30VA	12VA	6VA	3VA
AWG18	48VA	48VA	20VA	10VA	5VA
AWG16	48VA	48VA	32VA	16VA	8VA
AWG14	48VA	48VA	48VA	24VA	12VA

Tree Topology(with stub lines)



Line Topology (with loops)





Permissible load [VA] (SI):

	Cable length for AC 24V				
AWG	10m	20m	50m	100m	200m
AWG20	48VA	30VA	12VA	6VA	3VA
AWG18	48VA	48VA	20VA	10VA	5VA
AWG16	48VA	48VA	32VA	16VA	8VA
AWG14	48VA	48VA	48VA	24VA	12VA

KNX PL–Link Technical data
KNX bus :
1. Transmission medium (bus cable),TP (twisted pair)
2. Baud rate, 9.6 kbps (fixed for TP)
3. Bus line polarity, PL+, PL– (not interchangeable)
4. Bus terminating resistor, Not required.

KNX bus cable:
1. Cable type, 18AWG two conductor, solid, communication cable (Belden 6320FE877 or similar).
2. Wire diameter, Min. 0.8 mm (AWG20), Max. 1.0 mm (AWG18).
3. Line resistance, 20 to 75 Ω/km.
4. Specific capacity, 10 to 100 nF/km at 10 kHz.
5. Specific inductivity, 450 to 850 µH/km at 10 kHz.
6. Screens, Not required.

Bus power supply: DXR2 is 30V DC, 50mA for max. 5 KNX devices with 10mA each .

Max. number of devices: 64 devices in a KNX PL–Link network.

REVISION HISTORY

R0	2/16/2024	VB	ISSUED FOR APPROVAL

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NANUET BOND PHASE3 MID SCHOOL
NANUET, NY

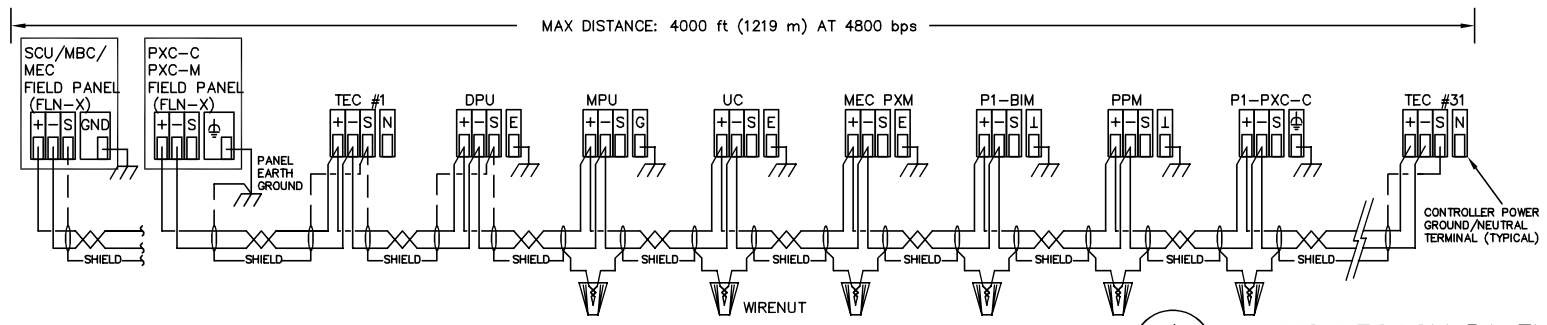
ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
VB	VB	NSK	02/16/24	02/16/24

DXR WIRING SPECIFICATION2

440P-366733
0
DWIR2

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C:\USERS\Z004PB8F\ONEDRIVE – SIEMENS AG\BNJ2 BAU NANUET BOND PHASE 3 HIGH SCHOOL_440P–366733\DT\MDT_BARR MIDDLE SCHOOL\DXRWIRE2.DWG



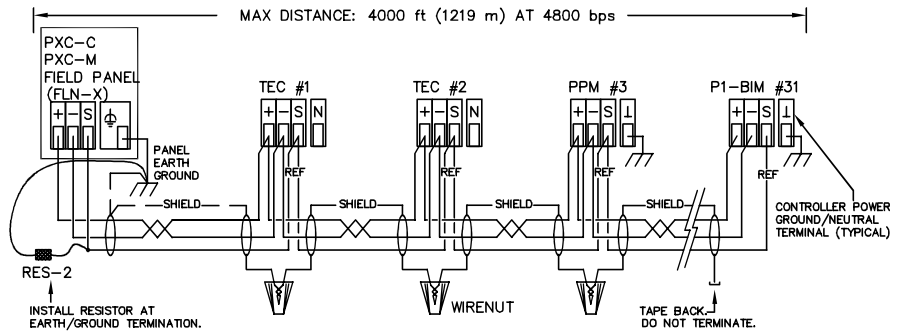
1 FLN — SIEMENS LEGACY P1 FLN NETWORK

SIEMENS P1 FLOOR LEVEL NETWORK (FLN)
COMMUNICATION PROTOCOL: RS-485
WIRING FOR 1 PAIR (2 CONDUCTOR TSP)

FLN TSP CABLE SPECIFICATIONS

TWISTED PAIR 24 AWG (STRANDED) 12 PICOFARAD/FT CAPACITANCE OR LESS 4 TWISTS PER FOOT.
SHIELD 100% OVERALL FOIL

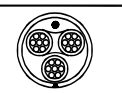
PART NUMBERS
ANNIXTER PART NUMBER: H-AF-TSP24LC-CMPBX-P DESCRIPTION: ALN/FLN24AWG,STR,TSP,LOCAP,CMP (FT-6)



RES-2
550-974P10
EARTH TERMINATOR RESISTOR

2 FLN — SIEMENS P1 FLN NETWORK

SIEMENS P1 FLOOR LEVEL NETWORK (FLN)
COMMUNICATION PROTOCOL: RS-485
WIRING FOR 1.5 PAIR (2 CONDUCTOR TSP, & 1 CONDUCTOR)

FLN 1.5 PAIR CABLE SPECIFICATIONS

TWISTED PAIR 24 AWG (STRANDED) 11 PICOFARAD/FT CAPACITANCE CONDUCTOR TO CONDUCTOR. 24 PICOFARAD/FT CAPACITANCE CONDUCTOR TO SHIELD. 4 TWISTS PER FOOT.
REFERENCE WIRE 24 AWG (STRANDED), 3 INCH LAY WITH TWISTED PAIR
SHIELD 100% OVERALL FOIL WITH DRAIN WIRE

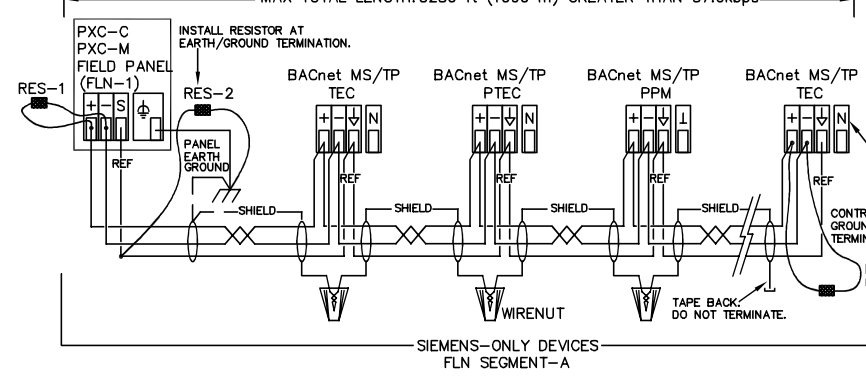
PART NUMBERS
ANNIXTER PART NUMBER: H-A-1.5TSP24LC-CMP-Y DESCRIPTION: 24-1.5PR STR TC FFEP FT6 SHD YEL (FT-6)
CERCO PART NUMBER: 8304R DESCRIPTION: 22AWG 3C STR FT6 ORG (FT-6)

NOTES:

1) FLN WIRING MUST BE CONNECTED IN A DAISY-CHAIN.
2) FOR SIEMENS-ONLY FLN NETWORK, WIRE AS SHOWN FOR FLN SEGMENT-A. INSTALL END-OF-LINE RESISTOR RES-1 AT FIELD PANEL AND ON LAST TEC.
3) FOR FLN NETWORK WITH SIEMENS & THIRD-PART DEVICES, WIRE AS SHOWN WITH FLN SEGMENT-A AND SEGMENT-B. INSTALL END-OF-LINE RESISTOR RES-1 ON LAST TEC AND ON LAST THIRD-PARTY DEVICE. DO NOT INSTALL E-O-L RESISTOR ON FIELD PANEL.

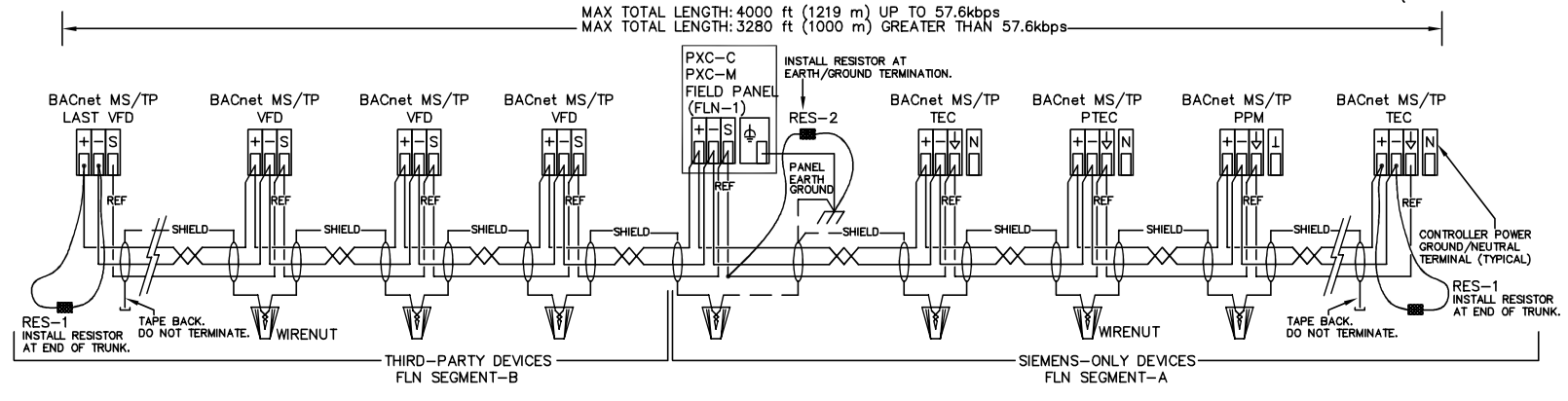
RES-1
550-975P100
120 OHM 1/2W RESISTOR

RES-2
550-974P10
EARTH TERMINATOR RESISTOR



3 FLN — BACnet MS/TP FLN NETWORK

BACnet MASTER/SLAVE TOKEN PASSING NETWORK
COMMUNICATION PROTOCOL: RS-485
WIRING FOR 1.5 PAIR (2 CONDUCTOR TSP, & 1 CONDUCTOR)



NOTES:

NEVER RUN NETWORK CABLING CLOSER THAN 5 FEET TO A VARIABLE FREQUENCY DRIVE (VFD) EXCEPT AT THE POINT WHERE THE NETWORK MUST CONNECT TO THE VFD. NETWORK ENTRY INTO A VFD MUST BE THROUGH A SEPERATE CONDUIT AND ALL NETWORK WIRING MUST BE KEPT AS FAR AS POSSIBLE FROM HIGH POWER CABLING IN THE DRIVE.

NEVER RUN NETWORK CABLE CLOSER THAN 5 FEET FROM CONDUITS CARRYING 100KVA OR GREATER. ALWAYS CROSS HIGH POWER CABLES (AT A DISTANCE OF 5 FEET) AT A 90° ANGLE.

NETWORK RUN IN OPEN CABLE TRAYS WITH CIRCUITS CARRYING 20 AMPS SHOULD BE NO CLOSER THAN 26 INCHES TO THE HIGHER POWER CABLES.

NETWORK RUN IN ENCLOSED TRAYS WITH CONDUITS CARRYING OVER 20 AMPS SHOULD BE NO CLOSER THAN 18 INCHES TO THE HIGHER POWER CABLES.

REVISION HISTORY

R0	2/16/2024	VB	ISSUED FOR APPROVAL

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NANUET BOND PHASE3 MID SCHOOL
NANUET, NY

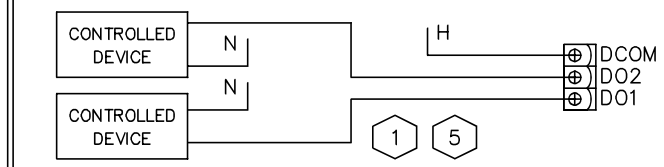
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VB	VB	NSK	02/16/24	02/16/24

FLN COMMUNICATION

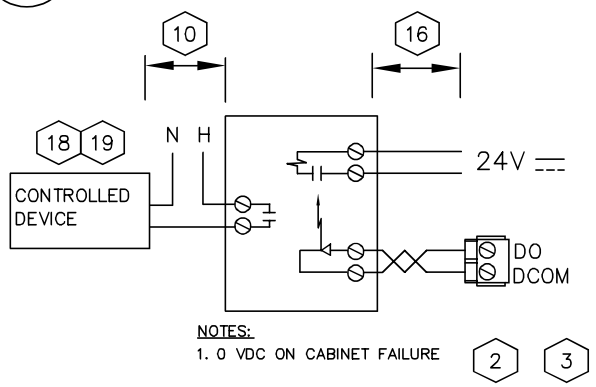
440P-366733
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FLN

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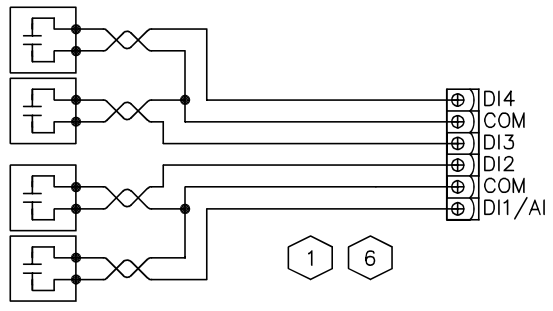
C:\USERS\Z004PB8F\ONEDRIVE - SIEMENS AG\BNJ2 BAU NANUET BOND PHASE 3 HIGH SCHOOL_440P-366733\DT\MDT_BARR MIDDLE SCHOOL\FLNTERM.DWG



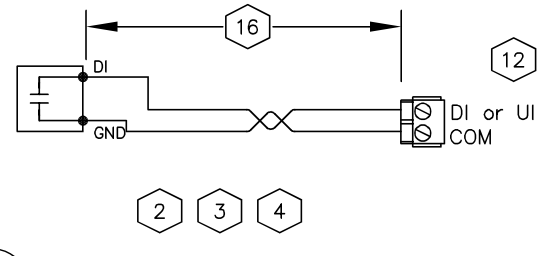
B 00 DIGITAL OUTPUT (DO) LATCHED



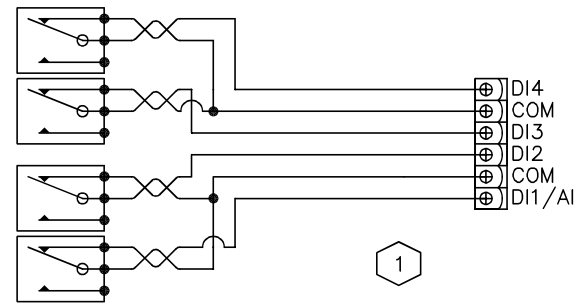
C 00 DIGITAL OUTPUT (DO) LATCHED
VOLTAGE TO SOLID STATE RELAY



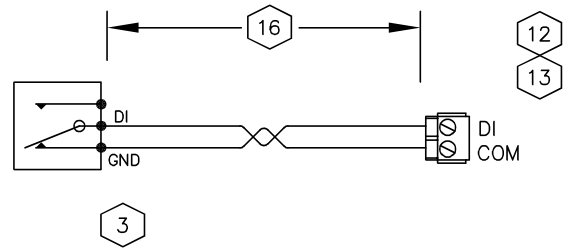
E 00 DIGITAL INPUT (DI) DRY CONTACT



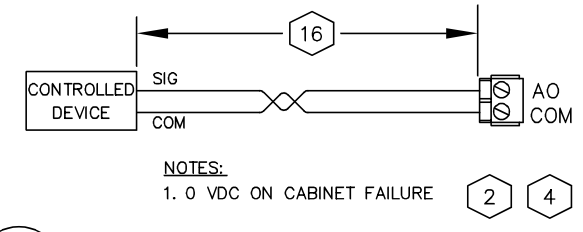
E 00 DIGITAL INPUT (DI,UI)
DRY CONTACT



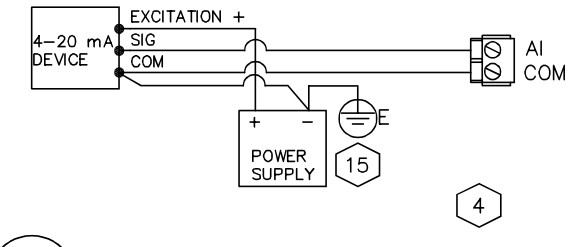
F 00 DIGITAL INPUT (DI) PULSE ACCUM



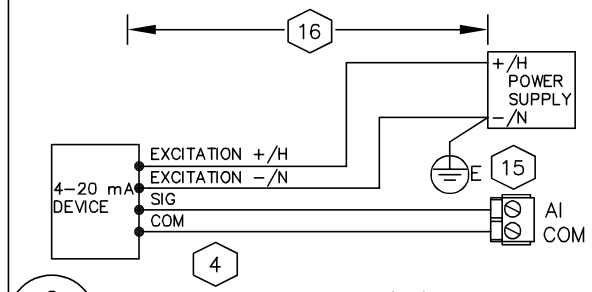
F 00 DIGITAL INPUT (DI)
PULSE ACCUMULATOR



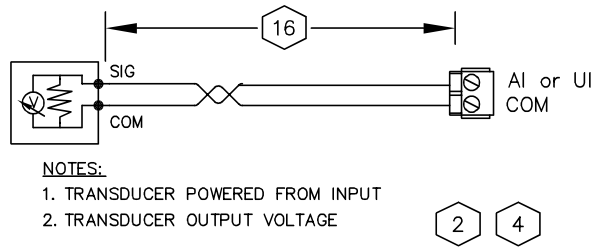
I 00 ANALOG OUTPUT (AO) 0–10 VDC



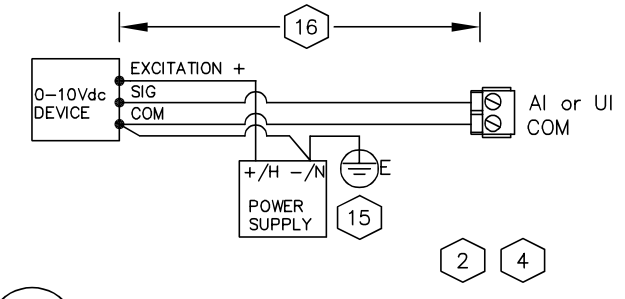
O 00 ANALOG INPUT (AI) 4–20mA
3–WIRE EXTERNAL POWERED



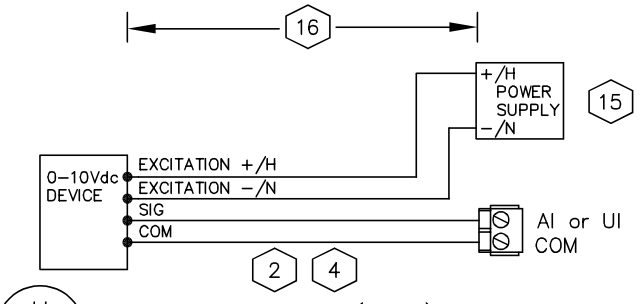
Q 00 ANALOG INPUT (AI) 4–20mA
4–WIRE EXTERNAL POWERED



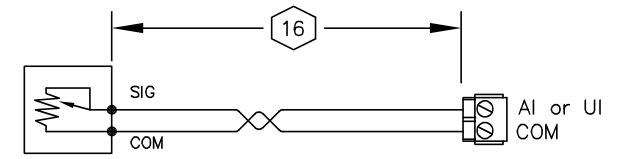
R 00 ANALOG INPUT (AI,UI) 0–10 Vdc
SELF POWERED TRANSDUCER



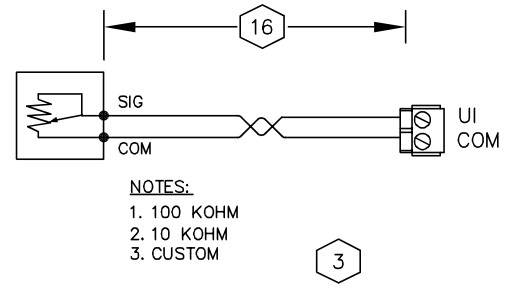
T 00 ANALOG INPUT (AI,UI) 0–10VDC
3–WIRE EXTERNAL POWERED



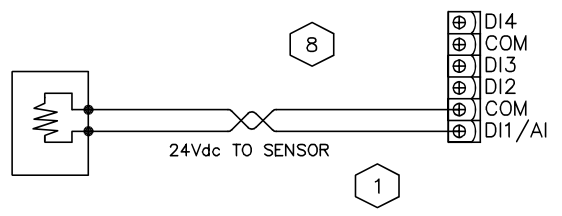
U 00 ANALOG INPUT (AI,UI) 0–10VDC
4–WIRE EXTERNAL POWERED



V 00 ANALOG INPUT (AI,UI) RTD



W 00 ANALOG INPUT (UI) THERMISTOR



W 00 ANALOG INPUT (AI) THERMISTOR
10K OHM Type 2 NTC Thermistor

NOTES:

1. Applies to Parts: PPM-1U32.PPF and PPM-1U32.PPR
2. Applies to Parts: PPM-2U3322.BPF and PPM-2U3322.BPR
3. Applies to Parts: PPM-1U32.BPF and PPM-1U32.BPR
4. Applies to Parts: PPM-2U22.BPF and PPM-2U22.BPR
5. DO Type: Two Form A NO (Normally Open) Relays with a shared common. 24 to 250 Vac, 3A resistive, 2A General Purpose.

REVISION HISTORY

R0	2/16/2024	VB	ISSUED FOR APPROVAL

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NANUET BOND PHASE3 MID SCHOOL
NANUET, NY

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
VB	VB	NSK	02/16/24	02/16/24

PPM TERMINATION SPEC.

440P-366733
0
PPMT1

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NOTES (Cont.):

6. DI Excitation: Open Circuit Voltage: 24 Vdc . Short Circuit Current: 20 mA . Maximum Load Current: 8 mA .

7. Pulse Accumulator Sensing: Same Excitation as DI. Maximum Input Frequency: 20 Hz . Minimum Pulse Duration: 20 ms, 50% DC/50ms pulse width.

8. 10K Type II NTC Thermistor: Switch selectable. 24Vdc Supplied to Sensor. Temperature range 55°F to 95°F.

9. Input Power Range: 19.2 Vac to 28.8 Vac (50 or 60 Hz) 4 VA

10. MAXIMUM WIRE RUN LENGTHS ARE BASED ON THE CURRENT DRAW AND WIRE GAGE. SEE DRAWING TWIR.

11. SEE CONTROL DRAWINGS FOR NORMAL DE–ENERGIZED CONTACT STATE

12. MAXIMUM CONTACT CLOSURE RATE IS 10 PER SECOND
DI EXCITATION = 24VDC, 10mA
UI, U EXCITATION = 24VDC, 6mA, 150ms, 1mA

13. MAXIMUM PULSE RATE = 20HZ (25ms PER STATE, 50ms PRE PULSE.

14. PPM DO CONTACT RATINGS
AC OPERATION:
4A @ 240VAC (RESISTIVE)
3A @ 240VAC (INDUCTIVE)
SIZE 4 MOTOR STARTER
DC OPERATION:
40W @ < 50VDC
20W @ > 50VDC

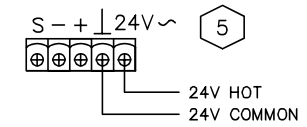
15. EXTERNAL POWER SUPPLY CAN EITHER BE A 24VDC POWER SUPPLY OR A 24VAC TRANSFORMER DEPENDING ON THE SENSOR SELECTED. IF NOT AN ISOLATED NC CLASS 2 CIRCUIT THEN POWER SOURCE, NEUTRAL AND PPM COMMON MUST BE BOTH CONNECTED TO THE SAME OR BONDED BUILDING APPROVED EARTH GROUND. FOR FURTHER DETAILS SEE EARTH GROUNDING RULES (125–3002) APOGEE WIRING GUIDELINES FOR FIELD PANELS AND EQUIPMENT CONTROLLERS.

16. 50mA OR LESS – 750ft/230m
50mA TO 100mA – 375ft/115m

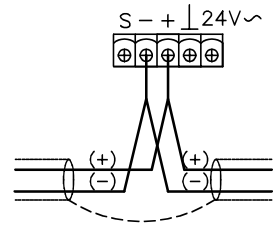
17. 100mA TO 150mA – 250ft/76m
150mA TO 200mA – 187ft/57m
200mA TO 250mA – 150ft/46m

18. WHERE H TERMINAL IS NOT A NEC CLASS 2 CIRCUIT, RELAY COMMON TERMINAL BRANCH CURRENT MUST BE EXTERNALLY LIMITED TO 10A MAXIMUM BY A NEC APPROVED MEANS. NOT A FUSE.

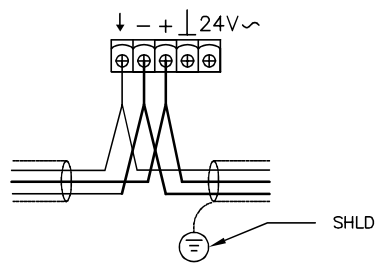
19. WHERE REQUIRED, NEUTRAL TERMINAL BRANCH CURRENT MUST BE EXTERNALLY LIMITED BY A NEC APPROVED MEANS.



PPM POWER WIRING



2–WIRE FLN TRUNK WIRING



3–WIRE FLN TRUNK WIRING

REVISION HISTORY

R0	2/16/2024	VB	ISSUED FOR APPROVAL

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NANUET BOND PHASE3 MID SCHOOL
NANUET, NY

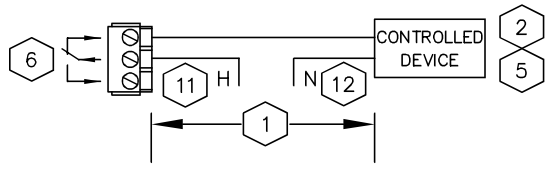
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VB	VB	NSK	02/16/24	02/16/24

PPM TERMINATION SPEC. SHEET 2

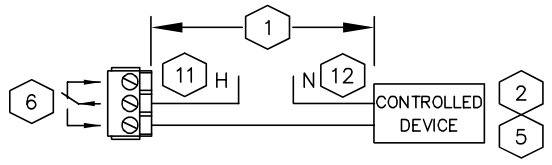
440P-366733
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PPMT2

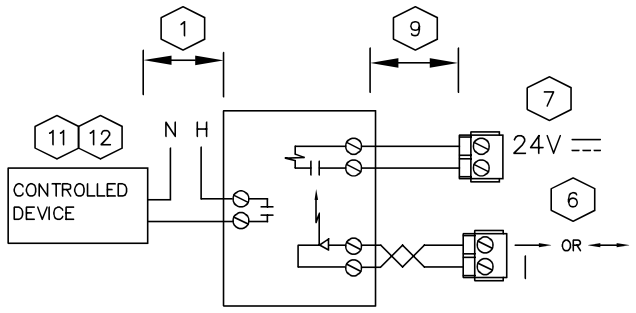
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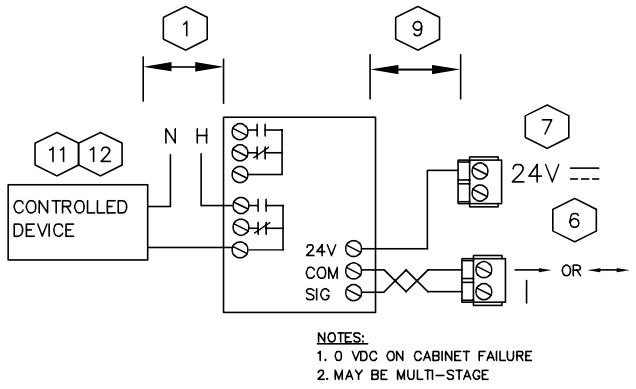
A 00 DIGITAL OUTPUT (DO) NC
PULSED OR LATCHED



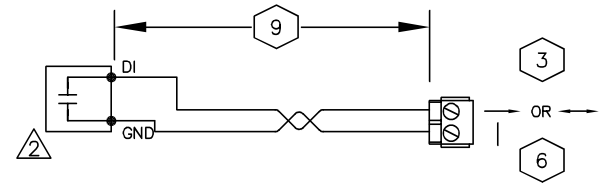
B 00 DIGITAL OUTPUT (DO) NO
PULSED OR LATCHED



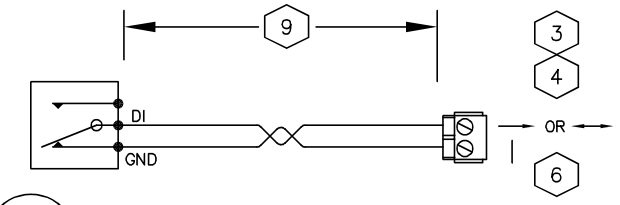
C 00 DIGITAL OUTPUT (AO,U,X) LATCHED
VOLTAGE TO SOLID STATE RELAY



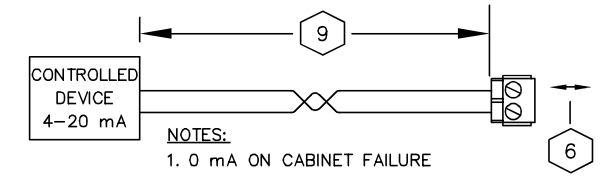
D 00 DIGITAL OUTPUT (AO,U,X) SEQUENCED
VOLTAGE TO SEQUENCING MODULE



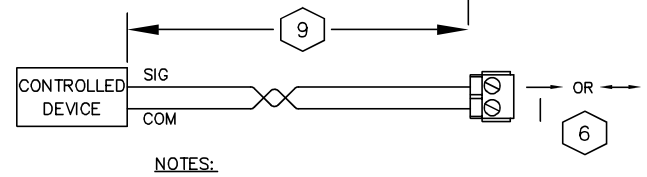
E 00 DIGITAL INPUT (DI,UI,U,X)
DRY CONTACT



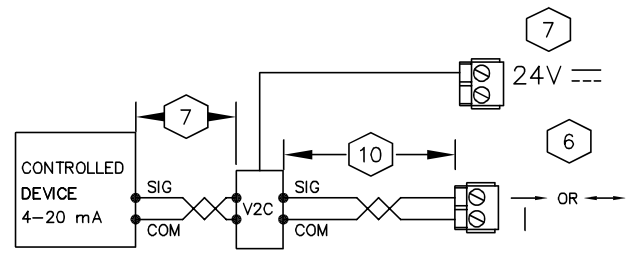
F 00 DIGITAL INPUT (UI,U,X)
PULSE ACCUMULATOR



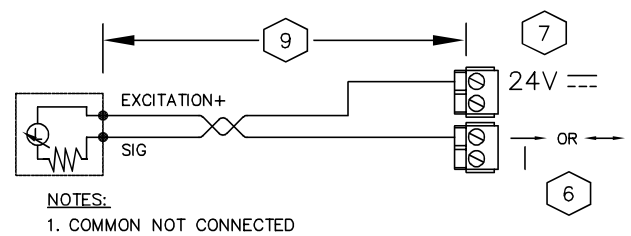
H 00 ANALOG OUTPUT (X) 4-20 mA



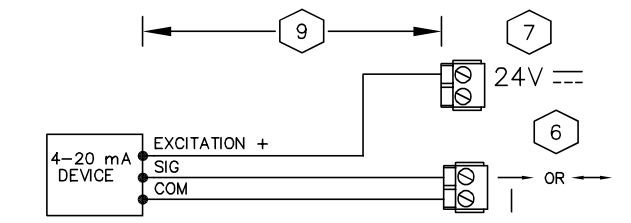
I 00 ANALOG OUTPUT (AO,U,X) 0-10VDC



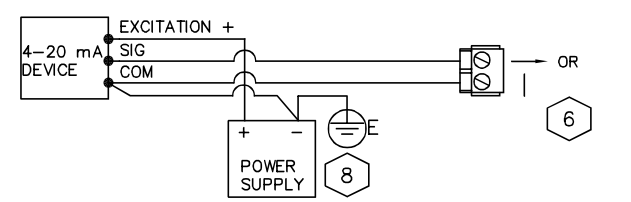
J 00 ANALOG OUTPUT (AO,U,X) 0-10VDC
VOLTAGE TO CURRENT CONVERTER



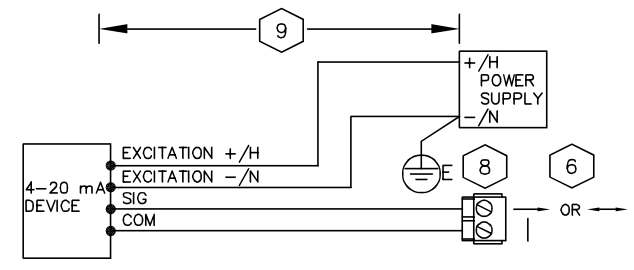
M 00 ANALOG INPUT (UI,U,X) 4-20 mA
2-WIRE INTERNAL POWERED



N 00 ANALOG INPUT (UI,U,X) 4-20mA
3-WIRE INTERNAL POWERED



O 00 ANALOG INPUT (UI,U,X) 4-20mA
3-WIRE EXTERNAL POWERED



Q 00 ANALOG INPUT (UI,U,X) 4-20mA
4-WIRE EXTERNAL POWERED

NOTES:

1. MAXIMUM WIRE RUN LENGTHS ARE BASED ON THE CURRENT DRAW AND WIRE GAGE. SEE DRAWING PWIR.
2. SEE CONTROL DRAWINGS FOR NORMAL DE-ENERGIZED CONTACT STATE
3. MAXIMUM CONTACT CLOSURE RATE IS 10 PER SECOND
   DI EXCITATION = 24VDC, 10mA
   UI, U EXCITATION = 24VDC, 6mA, 150ms, 1mA
4. DI CANNOT BE USED FOR PULSE ACCUMULATION.
   UI, U, X MAXIMUM PULSE RATE = 20HZ (25ms PER STATE, 50ms PRE PULSE.
5. PXCC DO CONTACT RATINGS
   AC OPERATION:
   4A @ 240VAC (RESISTIVE)
   3A @ 240VAC (INDUCTIVE)
   SIZE 4 MOTOR STARTER
   DC OPERATION:
   40W @ < 50VDC
   20W @ > 50VDC
6. REFER TO PXCC TERMINATION TABLES FOR ACTUAL POINT ADDRESSES. COMMON TERMINAL MAY BE SHARED BY 2 POINTS. AND ORDER MAY BE REVERSED ON ADJACENT POINTS.
7. REFER TO DRAWING P2 ON PWIR FOR MAXIMUM CURRENT PROVIDED BY THE PXCC 24VDC SENSOR SUPPLY.
8. EXTERNAL POWER SUPPLY CAN EITHER BE A 24VDC POWER SUPPLY OR A 24VAC TRANSFORMER DEPENDING ON THE SENSOR SELECTED. IF NOT AN ISOLATED NC CLASS 2 CIRCUIT THEN POWER SOURCE, NEUTRAL AND PXC COMPACT COMMON MUST BE BOTH CONNECTED TO THE SAME OR BONDED BUILDING APPROVED EARTH GROUND. FOR FURTHER DETAILS SEE EARTH GROUNDING RULES (125-3002) APOGEE WIRING GUIDELINES FOR FIELD PANELS AND EQUIPMENT CONTROLLERS.
9. 50mA OR LESS – 750ft/230m
   50mA TO 100mA – 375ft/115m
10. 100mA TO 150mA – 250ft/76m
    150mA TO 200mA – 187ft/57m
    200mA TO 250mA – 150ft/46m
11. WHERE H TERMINAL IS NOT A NEC CLASS 2 CIRCUIT, RELAY COMMON TERMINAL BRANCH CURRENT MUST BE EXTERNALLY LIMITED TO 10A MAXIMUM BY A NEC APPROVED MEANS. NOT A FUSE.
12. WHERE REQUIRED, NEUTRAL TERMINAL BRANCH CURRENT MUST BE EXTERNALLY LIMITED BA A NEC APPROVED MEANS.

REVISION HISTORY

R0	2/16/2024	VB	ISSUED FOR APPROVAL

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NANUET BOND PHASE3 MID SCHOOL
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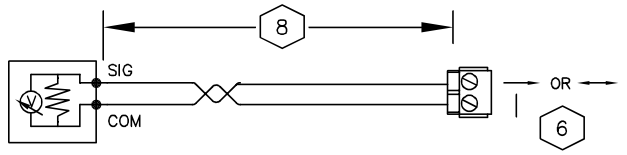
ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
VB	VB	NSK	02/16/24	02/16/24

PXCC TERMINATION SPECIFICATION

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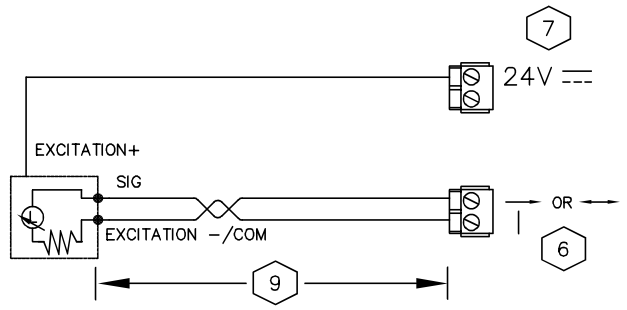
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C:\USERS\Z004PB8F\ONEDRIVE – SIEMENS AG\BNJ2 BAU NANUET BOND PHASE 3 HIGH SCHOOL_440P-366733\DT\MDT_BARR MIDDLE SCHOOL\PXCCTERM.DWG

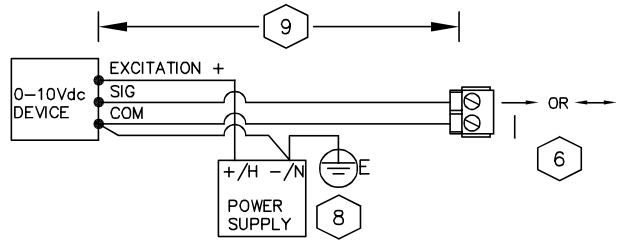


NOTES:
1. TRANSDUCER POWERED FROM INPUT
2. TRANSDUCER OUTPUT VOLTAGE

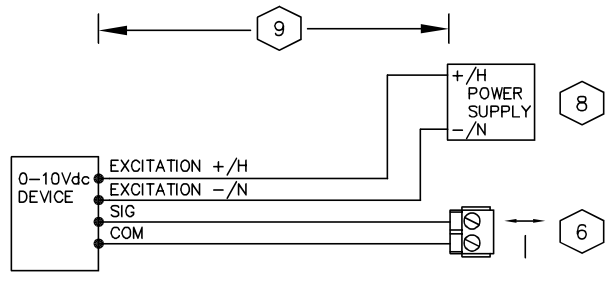
R 00 ANALOG INPUT (UI,U,X) 0–10 Vdc
SELF POWERED TRANSDUCER



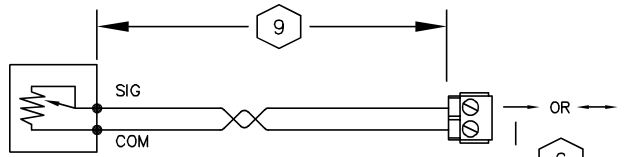
S 00 ANALOG INPUT (UI,U,X) 0–10VDC
3–WIRE INTERNAL POWERED



T 00 ANALOG INPUT (UI,U,X) 0–10VDC
3–WIRE EXTERNAL POWERED

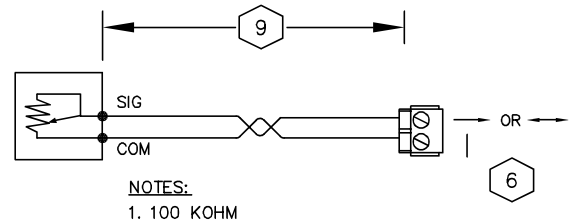


U 00 ANALOG INPUT (UI,U,X) 0–10VDC
4–WIRE EXTERNAL POWERED



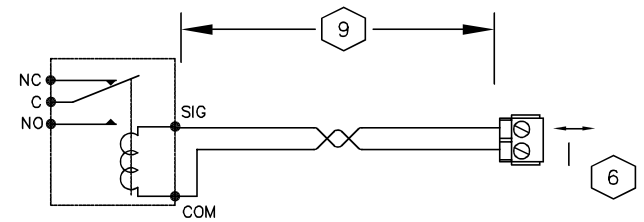
NOTES:
1. 1000 OHM PLATINUM (375)
2. 1000 OHM PLATINUM (385)
3. 1000 OHM NICKEL
4. CUSTOM

V 00 ANALOG INPUT (UI,U,X) RTD



NOTES:
1. 100 KOHM
2. 10 KOHM
3. CUSTOM

W 00 ANALOG INPUT (UI,U,X) THERMISTOR



AB 00 DIGITAL OUTPUT (X) 24 VDC
RELAY DRIVE 22 mA MAX.

Point Address Table for the PXC16.

Point Type	Point Type Number	Terminals Signal[2]	Terminals Common	PXC Point Address
Universal Input (UI) -►	UI1	25	26	1
	UI2	27	26	2
	UI3	28	29	3
Universal Input/Output (U) ◄-►	U4	30	29	4
	U5	31	32	5
	U6	33	32	6
	U7	34	35	7
	U8	36	35	8
Analog Output (AO) ◄-	A09	53	54	9
	A010	55	56	10
	A011	57	56	11
Digital Input (DI) -►	DI12	58	59	12
	DI13	60	59	13
Digital Output (DO)	DO14	4, 5, 6		14
	DO15	7, 8, 9		15
	DO16	10, 11, 12		16

Point Address Table for the PXC24.

Point Type	Point Type Number	Terminals Signal[2]	Terminals Common	PXC Point Address
Universal Input (UI) -►	UI1	25	26	1
	UI2	27	26	2
	UI3	28	29	3
Universal Input/Output (U) ◄-►	U4	30	29	4
	U5	31	32	5
	U6	33	32	6
	U7	34	35	7
	U8	36	35	8
	U9	41	42	9
	U10	43	42	10
	U11	44	45	11
	U12	46	45	12
Super Universal Input/Output (X)[1] ◄-►	X13 (U13)[1]	47	48	13
	X14 (U14)[1]	49	48	14
	X15 (U15)[1]	50	51	15
	X16 (U16)[1]	52	51	16
Analog Output (AO) ◄-	A017	53	54	17
	A018	55	56	18
	A019	57	56	19
Digital Output (DO)	DO20	4, 5, 6		20
	DO21	7, 8, 9		21
	DO22	10, 11, 12		22
	DO23	13, 14, 15		23
	DO24	16, 17, 18		24

Point Address Table for the PXC36.

Point Type	Point Type Number	Terminals Signal[2]	Terminals Common	PXC Point Address
Super Universal Input/Output (X)[1] ◄-►	X1	30	31	1
	X2	32	31	2
	X3	33	34	3
	X4	35	34	4
	X5	36	37	5
	X6	38	37	6
	X7	39	40	7
	X8	41	40	8
Universal Input/Output (U) ◄-►	U9	50	51	9
	U10	52	51	10
	U11	53	54	11
	U12	55	54	12
	U13	56	57	13
	U14	58	57	14
	U15	59	60	15
	U16	61	60	16
	U17	62	63	17
	U18	64	63	18
	U19	65	66	19
	U20	67	66	20
	U21	68	69	21
	U22	70	69	22
	U23	71	72	23
	U24	73	72	24
Digital Input (DI) -►	DI25	74	75	25
	DI26	76	75	26
	DI27	77	78	27
	DI28	79	78	28
Digital Output (DO)	DO29	4,5,6		29
	DO30	7,8,9		30
	DO31	10,11,12		31
	DO32	13,14,15		32
	DO33	16,17,18		33
	DO34	19,20,21		34
	DO35	22,23,24		35
	DO36	25,26,27		36

Notes:
1. FOR PRE–PXC24.2 CONTROLLERS, POINTS 13–16 WERE UNIVERSAL I/O POINTS INSTEAD OF THE CURRENT SUPER UNIVERSAL I/O POINTS.

2. FOR THE APPROPRIATE TERMINAL SYMBOL, PLEASE REFER TO THE RESPECTIVE POINT TYPE COLUMN.

3. THE Common TERMNAL IS ALWAYS THE FOLLOWING SYMBOL: |

4. SEE BELOW FOR DIGITAL OUTPUT SYMBOL:



REVISION HISTORY

R0	2/16/2024	VB	ISSUED FOR APPROVAL

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NANUET, NY

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
VB	VB	NSK	02/16/24	02/16/24

PXCC TERMINATION SPEC. SHEET 2

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PXCC WIRING TYPE AND GAUGE REQUIREMENTS

TABLE 1

CIRCUIT TYPE	CLASS	WIRE TYPE	MAX. DISTANCE	CONDUIT SHARING [2]
AC LINE POWER [1]	POWER	#12–14 THHN	REFER TO NEC	CHECK LOCAL CODES
DIGITAL OUTPUT	1 & 2	TP not required, check job specs & local codes #18 to #24 AWG	SEE TABLE 3	CHECK LOCAL CODES
DIGITAL INPUT	2	TP not required, check job specs & local codes #18 to #24 AWG	750ft (230 m)	CHECK LOCAL CODES
ANALOG INPUT [4] 100K/10K Thermistor	2	#18–#24 TP [3,6] or TSP [5] CM(FT4) or CMP(FT6)	750ft (230 m)	CHECK LOCAL CODES
ANALOG INPUT [4] 1K Ni OR RTD	2	#18–#24 TP [3,6] or TSP [5] CM(FT4) or CMP(FT6)	750ft (230 m)	CHECK LOCAL CODES
ANALOG INPUT 0–10 V	2	#18–#24 TP [3,6] or TSP [5] CM(FT4) or CMP(FT6)	750ft (230 m)	CHECK LOCAL CODES
ANALOG INPUT 4–20 mA	2	#18–#24 TP [3,6] or TSP [5] CM(FT4) or CMP(FT6)	750ft (230 m)	CHECK LOCAL CODES
ANALOG OUTPUT 0–10 V	2	#18–#24 TP [3,6] or TSP [5] CM(FT4) or CMP(FT6)	750ft (230 m)	CHECK LOCAL CODES
ANALOG OUTPUT 4–20 mA	2	#18–#24 TP [3,6] or TSP [5] CM(FT4) or CMP(FT6)	750ft (230 m)	CHECK LOCAL CODES
ETHERNET ALN	2	#24 (4) TP [6] CAT5 OR BETTER	295ft (90 m)	CHECK LOCAL CODES
ALN TRUNK	2	#24 TSP	SEE TABLE 4	CHECK LOCAL CODES

1. WHEN DAISY–CHAINING 24VAC POWER TO CONTROLLERS USE #14 WIRE.

2. CONDUIT SHARING RULES: ONLY WHERE LOCAL CODES PERMIT. BOTH CLASS1 AND CLASS 2 WIRING CAN BE RUN TO THE PXCC PROVIDED THE CLASS 2 WIRE IS UL LISTED 300V 75°C(167°F) OR HIGHER OR THE CLASS 2 WIRE IS NEC TYPE CM (FT4) (75°C OR HIGHER) OR CMP(FT6) (75°C OR HIGHER). NEC TYPE CL2 AND CL2P IS NOT ACCEPTABLE UNLESS ALSO UL LISTED AND MARKED 300V 75°C (167°F) OR HIGHER

3. TWISTED PAIR, NON–JACKETED UL LISTED 75°C(167°F) AND 300V, CABLE CAN BE USED IN PLACE OF CM(FT4) OR CMP(FT6)(BOTH MUST BE RATED 75°C OR HIGHER) CABLE WHEN CONTAINED IN CONDUIT PER LOCAL CODES. SEE THE FIELD PURCHASING GUIDE FOR WIRE.

4. WIRE LENGTH AFFECTS POINT INTERCEPT ENTRY. ADJUST INTERCEPT ACCORDINGLY FOR EACH WIRE GAUGE AND SENSOR TYPE.

5. SHIELDED TWISETED PAIR (TSP) IS NOT REQUIRED FOR ELECTRICAL NOISE LEVELS UPTO 10 V/M. AT HIGHER LEVELS TSP MAY BE NEEDED.TERMINATE SHIELD ON ENCLOSURE AND TAPE BACK ON POINT END.

6. FOR 24AWG INSTALL CATEGORY5 OR BETTER CABLE PER ANSI/TIA/EIA–568–B.1 OR HIGHER. USE SOLID COPPER BETWEEN JACK BOXES. USE STRANDED COPPER PATCH CABLES 13ft (4m) TO CONNECT PXCC AND 20ft (6m) TO CONNECT SWITCH OR HUB.

PXCC WIRE SPECIFICATIONS

TABLE 2

	LOW–VOLTAGE POINT APPLICATIONS	POINT USAGE	ALN TRUNK	EALN
CABLE CONFIGURATION	TWISTED PAIR OR TSP	TWISTED PAIR (UNJACKETED) OR TSP	TWISTED SHIELDED PAIR	(4) TWISTED PAIR
GAUGE	#18 TO #22 AWG (STRANDED)	#18 TO #22 AWG (STRANDED)	24 AWG (STRANDED)	24AWG(STRANDED)
CAPACITANCE	n.a.	n.a.	12.5 pf/ft OR LESS	13 pf/ft OR LESS
TWISTS PER FOOT	6 MINIMUM	6 MINIMUM	6 MINIMUM	CATEGORY 5 Min
SHIELDS	NOT REQUIRED (IN CASE OF TSP, 100% FOIL W/ DRAIN WIRE)	NOT REQUIRED (IN CASE OF TSP, 100% FOIL W/ DRAIN WIRE)	100% FOIL W/ DRAIN WIRE	NOT REQUIRED
NEC CLASS	CM, CMP (75°C OR HIGHER)	NOT SPECIFIED	CM, CMP (75°C OR HIGHER)	MM, MMP
CEC CLASS	FT4, FT6 (75°C OR HIGHER)	NOT SPECIFIED	FT4, FT6 (75°C OR HIGHER)	NOT SPECIFIED
UL VOLTAGE RATING	NOT SPECIFIED	300 VAC [2]	NOT SPECIFIED	NOT SPECIFIED
UL TEMP. RATING	NOT SPECIFIED	75°C (167°F)	NOT SPECIFIED	NOT SPECIFIED

1. UL RECOGNIZED WIRE (LABELED WITH A BACKWARDS 'RU') IS NOT FIELD INSTALLABLE. USE ONLY UL–LISTED WIRE.
2. 300 VAC WIRE CAN BE USED IN FIELD PANELS CONTAINING VOLTAGES BELOW 150 VAC.

MAXIMUM DO WIRE RUN LENGHTS

TABLE 3

NOMINAL INRUSH	STARTER SIZE	WIRE SIZE		
		#18	#16	#14
200 VA	0 1	500ft (152m)	900ft (274m)	1400ft (427m)
550 VA	2	200ft (61m)	300ft (91m)	500ft (152m)
1150 VA	3	100ft (30m)	150ft (46m)	250ft (76m)
1500 VA	4	70ft (21m)	100ft (30m)	200ft (61m)

TABLE 3 NOTES:

1. DISTANCES SHOWN ASSURE LESS THAN 10% VOLTAGE DROP ACROSS THE WIRE FOR A TYPICAL STARTER.
2. PXCC DO CONTACT RATINGS
   4A @ 250VAC & 30VDC
   SIZE 4 MOTOR STARTER
3. WIRING LENGTHS SHOWN ARE FOR 120VOLTS.

MAXIMUM NUMBER HSTIE IN SERIES ON ALN TRUNK [6]

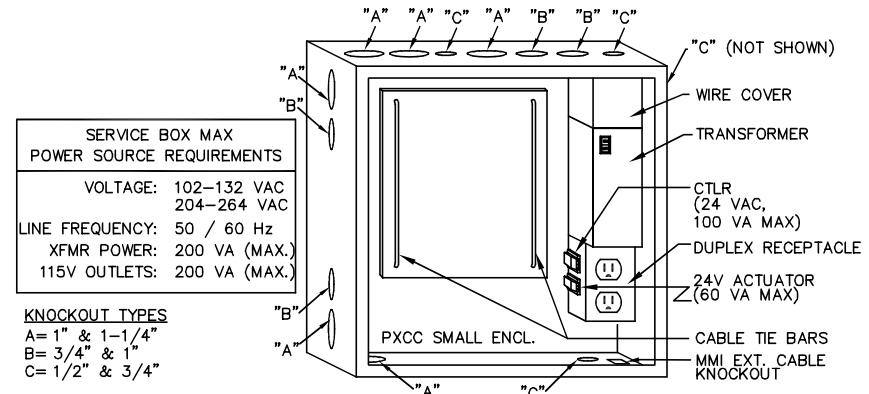
TABLE 4

SPEED	1200 BAUD	4800 BAUD	9600 – 38.4K BAUD	57.6K – 115.2K BAUD
SERIES TIE'S	10	7	6	
ALN TRUNK DISTANCE	4000ft (1.2km)	4000ft (1.2km)	4000ft (1.2km)	3280ft (1km)

- TIE MUST BE USED TO ISOLATE ALN BETWEEN PXCC CONNECTED TO DIFFERENT SERVICE GROUNDS OR ON BOTH SIDES OF THE ALN CABLE THAT EXITS BUILDING.
- THE MAX ALN DISTANCE APPLIES TO EACH SIDE OF THE TIE.

GENERAL NOTES:

- COMPLY WITH LOCAL BUILDING CODES
- SIZE WIRE FOR LOAD, CURRENT, AND VOLTAGE.
- ALL WIRE TO BE APPROVED OR LISTED FOR THE INTENDED APPLICATION BY AGENCIES SUCH AS UL, NEC, CSA.
- ALWAYS REFER TO LOCAL CODES FOR CONDUIT SHARING.
- WIRING MUST HAVE INSULATION RATED FOR HIGHEST VOLTAGE CIRCUIT IN CONDUIT.
- THE ALN TRUNK MUST BE AN UNINTERRUPTED RUN BETWEEN CABINETS. NO SPLICES ALLOWED.
- CM/CMP/MM/MMP WIRE IS NOT USABLE FOR CLASS 1 CIRCUITS.
- FOR EXTENDED TEMPERATURE INSTALLATIONS USE ONLY COPPER WIRE LISTED FOR 90°C OR HIGHER



SERVICE BOX MAX POWER SOURCE REQUIREMENTS	
VOLTAGE:	102–132 VAC 204–264 VAC
LINE FREQUENCY:	50 / 60 Hz
XFMR POWER:	200 VA (MAX.)
115V OUTLETS:	200 VA (MAX.)

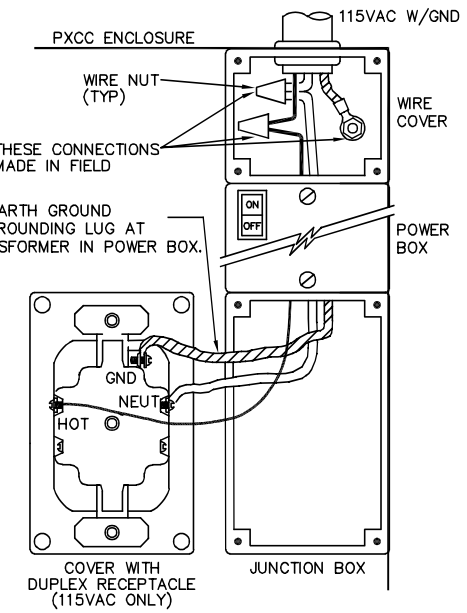
KNOCKOUT TYPES
A= 1" & 1–1/4"
B= 3/4" & 1"
C= 1/2" & 3/4"

P1 00 PXCC CONDUIT PENETRATIONS

PXCC FAMILY VA RATINGS & SENSOR SUPPLY		
PRODUCT	24VAC VA RATING	24VDC mA
PX COMPACT 16	18	100
PX COMPACT 24	20	100
PX COMPACT 36	35	200

NOTES:

1. NO MORE THAN SEVEN (7) FULLY LOADED PXCC CABINETS ALLOWED ON A SINGLE 3–WIRE CIRCUIT.
2. RECEPTACLE IS PRE–WIRED AND MOUNTED IN FACTORY, FOR 115VAC SERVICE BOX ONLY.

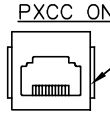


P2 00 PXCC POWER WIRING

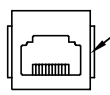
NOTES:

1. COMMUNICATION CONNECTORS PLUG INTO PXCC.
2. ALN MUST BE DAISEY–CHAINED WHEN RUNNING 19.2 k BAUD OR FASTER AND TRUNK TERMINATORS USED AT BOTH ENDS OF LINE P3C.
3. TERMINATE SHIELD AT LEAVING END OF ALN TRUNK ONLY.
4. USE ALN SHIELD TERMINATION P3A WHEN 24VAC E TERMINAL IS EARTH GROUNDED.
5. USE ALN SHIELD TERMINATION P3B WHEN 24VAC E TERMINAL IS OPEN.

PXCC ON ETHERNET CONNECTOR

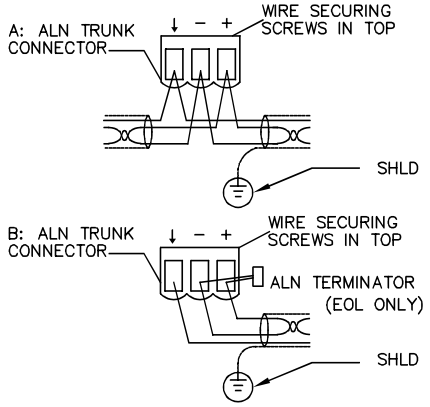


E: EALN ETHERNET CONNECTOR
RJ–45 SHIELDED JACK
FOR ETHERNET PATCH CABLE



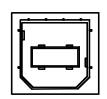
H: PXCC – HMI [7]
RJ45 JACK FOR RS232 SERVICE MODE SERIAL PRINTER OR PXCC

7. DO NOT INSERT RJ–11 6 PIN PLUG WITHOUT PIN 1 AND 8 VOIDS



NOTE:
REFER TO "APOGEE WIRING GUIDELINES FOR FIELD PANELS AND EQUIPMENT CONTROLLERS (125–3002)" FOR FLN WIRING CONFIG'S.

G: USB DEVICE CONNECTOR



FOR LAPTOP

P3 00 PXCC COMMN TERMINATIONS

REVISION HISTORY

R0	2/16/2024	VB	ISSUED FOR APPROVAL

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NANUET, NY

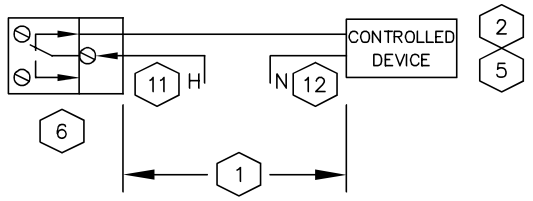
ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
VB	VB	NSK	02/16/24	02/16/24

PXCC WIRING SPECIFICATION

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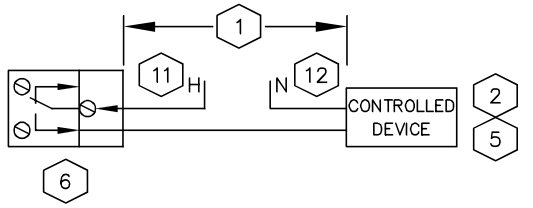
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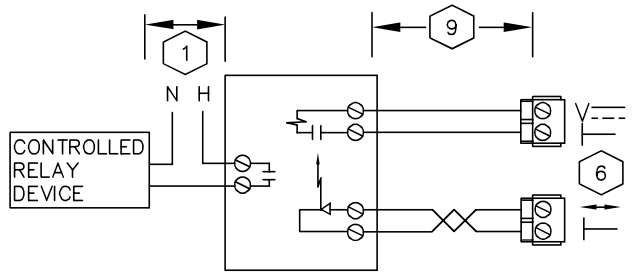
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DIGITAL OUTPUT (6R) NC
PULSED OR LATCHED



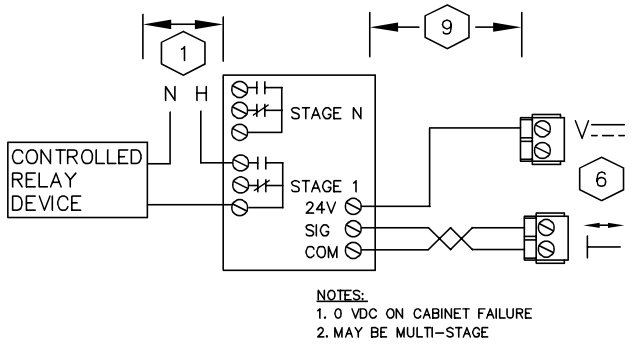
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DIGITAL OUTPUT (6R) NO
PULSED OR LATCHED



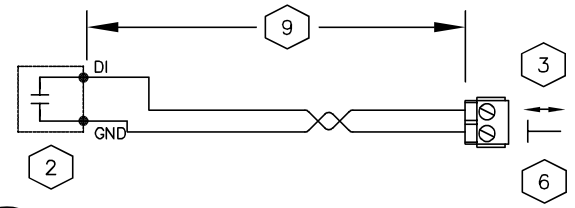
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DIGITAL OUTPUT (8U,8X) Latched
VOLTAGE TO SOLID STATE RELAY



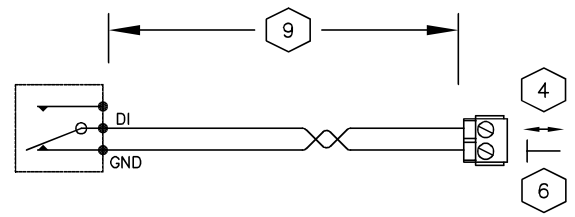
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DIGITAL OUTPUT (8U,8X) Sequenced
VOLTAGE TO SEQUENCING MODULE



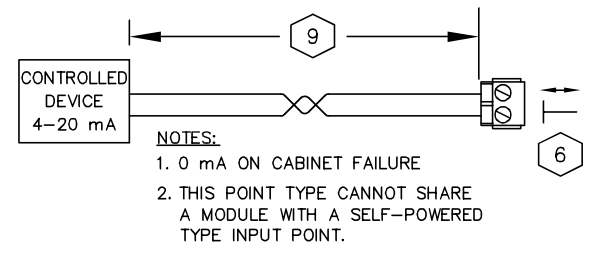
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DIGITAL INPUT (8D,16D,8U,8x)
DRY CONTACT



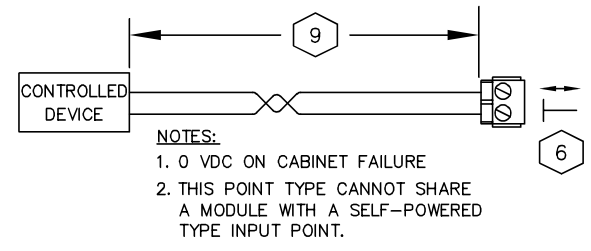
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DIGITAL INPUT (8D,16D,8U,8X)
PULSE ACCUMULATOR



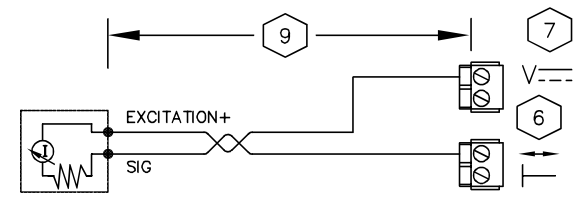
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ANALOG OUTPUT (8X) 4-20 mA



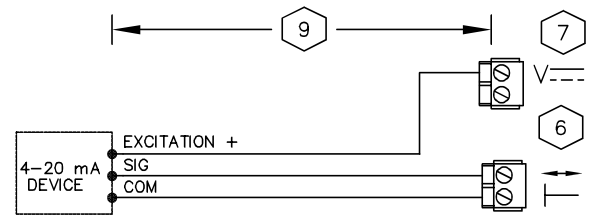
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ANALOG OUTPUT (8U,8X) 0-10VDC



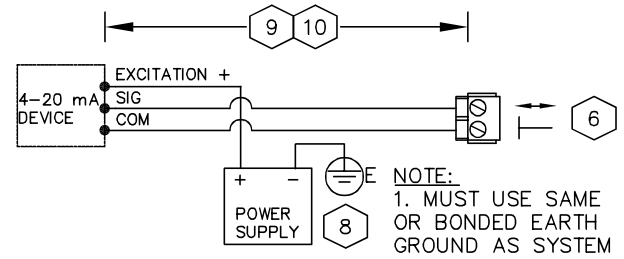
M
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ANALOG INPUT (8X) 4-20 mA
2-WIRE INTERNAL POWERED



N
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ANALOG INPUT (8X) 4-20mA
3-WIRE INTERNAL POWERED



O
00

ANALOG INPUT (8X) 4-20mA
3-WIRE EXTERNAL POWERED

NOTES:

1. MAXIMUM WIRE RUN LENGTHS ARE BASED ON THE CURRENT DRAW AND WIRE GAGE. SEE DRAWING TWIR.
2. SEE CONTROL DRAWINGS FOR NORMAL DE-ENERGIZED CONTACT STATE
3. MAXIMUM CONTACT CLOSURE RATE IS 10 PER SECOND
   8D, 16d EXCITATION = 24VDC, 8mA
   8U, 8X EXCITATION = 24VDC, 8mA, 20ms, 100mA
4. 8D, 16D MAXIMUM PULSE RATE = 10Hz (50ms PER STATE, 100ms PER PULSE)
   8U, 8X MAXIMUM PULSE RATE = 20Hz (25ms PER STATE, 50ms PER PULSE)
5. PXC MODULAR DO CONTACT RATINGS
   AC OPERATION:
   4A @ 240VAC (RESISTIVE)
   3A @ 240VAC (INDUCTIVE)
   SIZE 4 MOTOR STARTER
   DC OPERATION:
   40W @ < 50VDC
   20W @ > 50VDC
6. REFER TO PXC MODULAR PANEL FOR ACTUAL POINT ADDRESSES. REFER TO TXMI TERMINATION TABLES FOR ACTUAL TERMINALS FOR EACH PANEL ADDRESS. COMMON TERMINAL MAY BE SHARED BY 2 POINTS.
7. REFER TO DRAWING P1 ON TWIR FOR MAXIMUM CURRENT PROVIDED BY THE 24VDC SENSOR SUPPLY ON P1 BIM OR BUS POWER SUPPLY
8. EXTERNAL POWER SUPPLY CAN EITHER BE A 24VDC POWER SUPPLY OR A 24VAC TRANSFORMER DEPENDING ON THE SENSOR SELECTED. IF NOT AN ISOLATED NC CLASS 2 CIRCUIT THEN POWER SOURCE, NEUTRAL AND PXC MODULAR COMMON MUST BE BOTH CONNECTED TO THE SAME OR BONDED BUILDING APPROVED EARTH GROUND. FOR FURTHER DETAILS SEE EARTH GROUNDING RULES (125-3002) APOGEE WIRING GUIDELINES FOR FIELD PANELS AND EQUIPMENT CONTROLLERS.
9. 50mA OR LESS – 750ft/230m
   50mA TO 100mA – 375ft/115m
10. 100mA TO 150mA – 250ft/76m
    150mA TO 200mA – 187ft/57m
    200mA TO 250mA – 150ft/46m
11. WHERE H TERMINAL IS NOT A NEC CLASS 2 CIRCUIT, RELAY COMMON TERMINAL BRANCH CURRENT MUST BE EXTERNALLY LIMITED TO 10A MAXIMUM BY AN NEC APPROVED MEANS. NOT A FUSE.
12. WHERE REQUIRED, N TERMINAL BRANCH CURRENT MUST BE EXTERNALLY LIMITED BY AN NEC APPROVED MEANS.

REVISION HISTORY

R0	2/16/2024	VB	ISSUED FOR APPROVAL

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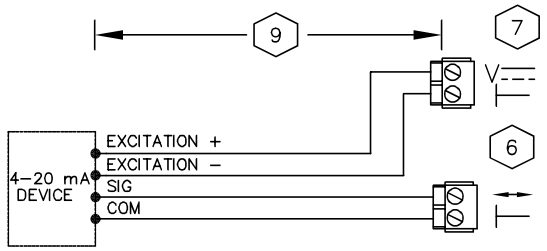
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VB	VB	NSK	02/16/24	02/16/24

TX-I/O TERMINATION SPEC.

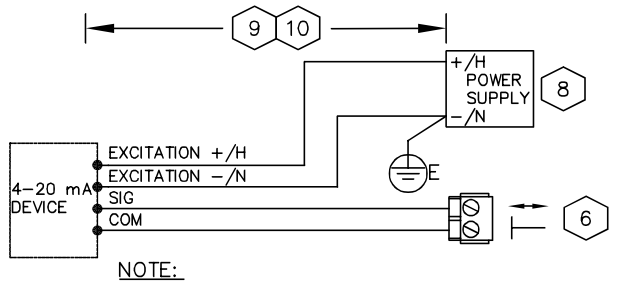
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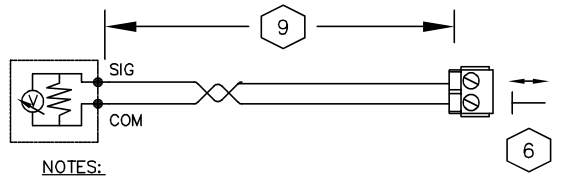


P 00 ANALOG INPUT (8X) 4–20mA
4–WIRE INTERNAL POWERED



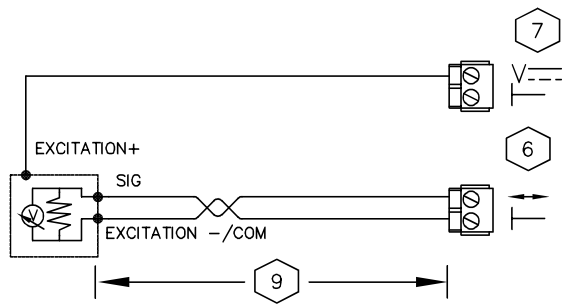
NOTE:
1. MUST USE SAME OR BONDED EARTH GROUND AS SYSTEM NEUTRAL

Q 00 ANALOG INPUT (8X) 4–20mA
4–WIRE EXTERNAL POWERED

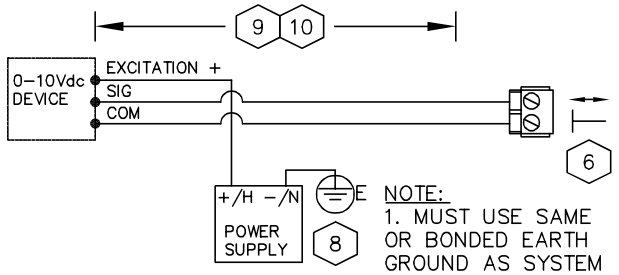


NOTES:
1. TRANSDUCER POWERED FROM ISOLATED INPUT
2. TRANSDUCER OUTPUT VOLTAGE

R 00 ANALOG INPUT (8U,8X) 0–10 Vdc
SELF POWERED TRANSDUCER

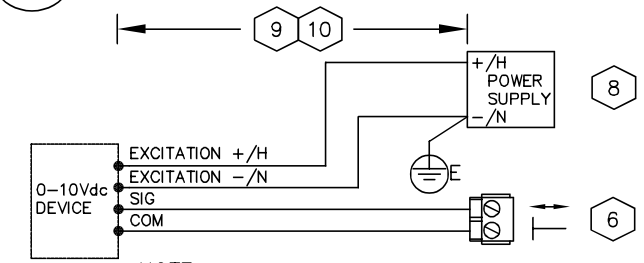


S 00 ANALOG INPUT (8U,8X) 0–10VDC
3–WIRE INTERNAL POWERED



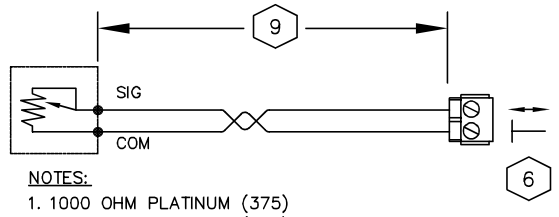
NOTE:
1. MUST USE SAME OR BONDED EARTH GROUND AS SYSTEM NEUTRAL

T 00 ANALOG INPUT (8U,8X) 0–10VDC
3–WIRE EXTERNAL POWERED



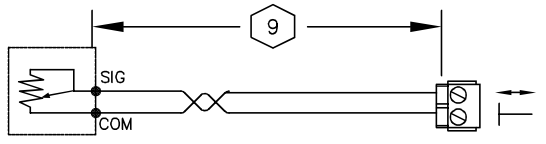
NOTE:
1. MUST USE SAME OR BONDED EARTH GROUND AS SYSTEM NEUTRAL

U 00 ANALOG INPUT (8U,8X) 0–10VDC
4–WIRE EXTERNAL POWERED



NOTES:
1. 1000 OHM PLATINUM (375)
2. 1000 OHM PLATINUM (385)
3. 1000 OHM NICKEL
4. CUSTOM

V 00 ANALOG INPUT (8X,8U) RTD



NOTES:
1. 100 KOHM
2. 10 KOHM
3. CUSTOM

W 00 ANALOG INPUT (8X,8U) THERMISTOR

TXM1 TERMINATION TABLES

1. ALL TXM1 TERMINALS (MEASURING, NEUTRAL, RELAY, SUPPLY) ARE CONNECTED IN THE PLUG–IN I/O MODULE, NOT IN THE TERMINAL BUS.

	TXM1.8D, TXM1.16D							
I/O POINT	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
SYSTEM NEUTRAL[1] ⊥ (–)	1	3	5	7	9	11	13	15
DIGITAL INPUT ⏐ (+)	2	4	6	8	10	12	14	16

1. NEUTRAL CAN BE CONNECTED TO ANY NEUTRAL TERMINAL ON SAME MODULE AND SEVERAL CAN SHARE SAME NEUTRAL TERMINAL.

	TXM1.16D							
I/O POINT	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
SYSTEM NEUTRAL ⊥ (–)	18	20	22	24	26	28	30	32
DIGITAL INPUT[1] ⏐ (+)	19	21	23	25	27	29	31	33

1. NO PULSE ACCUMULATOR

	TXM1.8U, TXM1.8U–ML							
I/O POINT	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
SYSTEM NEUTRAL ⊥ (–)	2	6	10	14	19	23	27	31
UNIVERSAL I/O ⏐ (+)	4	8	12	16	21	25	29	33
24V AC/DC ACTUATOR SUPPLY[1] ≂		7		15		24		32

1. 24V DC ONLY AVAILABLE WITH BUS CONNECTOR MODULE (BCM) POWERED EXTERNALLY BY DC SUPPLY.

	TXM1.8X, TXM1.8X–ML							
I/O POINT	(1)	(2)	(3)	(4)	(5)[1]	(6)[1]	(7)[1]	(8)[1]
SYSTEM NEUTRAL ⊥ (–)	2	6	10	14	19	23	27	31
UNIVERSAL I/O ⏐ (+)	4	8	12	16	21	25	29	33
24V AC/DC ACTUATOR SUPPLY[2] ≂		7		15		24		32
24V DC SENSOR SUPPLY[3] ⎓	3		11		20		28	

1. 4–20 mA OUTPUT AVAILABLE ON POINTS 5–8 ONLY.

2. 24V DC ONLY AVAILABLE WITH BUS CONNECTOR MODULE (BCM) POWERED EXTERNALLY BY DC SUPPLY.

3. MAY POWER EXTERNAL SENSORS 0.6w (25mA) OR 1.2w (50mA) PER TERMINATION UP TO 2.4w (100mA) MAXIMUM FOR ALL TERMINATIONS.

	TXM1.6R, TXM1.6R–M					
I/O POINT	(1)	(2)	(3)	(4)	(5)	(6)
COMMON [1] ⏐ (C)	3	9	15	20	26	32
NORMALLY CLOSED ⏋ (NC)	4	10	16	19	25	31
NORMALLY OPEN ⏐ (NO)	2	8	14	21	27	33

1. COMMONS ARE NOT INTERNALLY CONNECTED.

NOTE: REFER TO TERMINATION SHEET #1 FOR INSTALLATION DETAILS.

REVISION HISTORY

R0	2/16/2024	VB	ISSUED FOR APPROVAL

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NANUET BOND PHASE3 MID SCHOOL
NANUET, NY

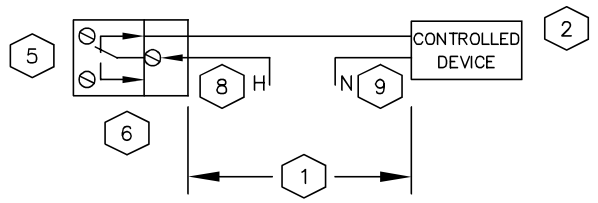
ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
VB	VB	NSK	02/16/24	02/16/24

TX-I/O TERMINATION SPEC. 2

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TTRM2

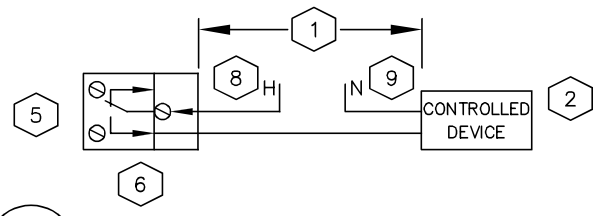
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C:\USERS\Z004PB8F\ONEDRIVE – SIEMENS AG\BNJ2 BAU NANUET BOND PHASE 3 HIGH SCHOOL_440P-366733\DT\MDT_BARR MIDDLE SCHOOL\TXIOTERM2.DWG



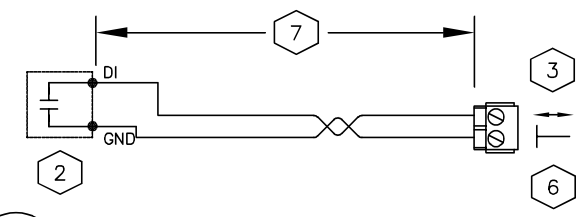
A
00

DIGITAL OUTPUT (1.4D3R, 1.8T) NC
PULSED OR LATCHED



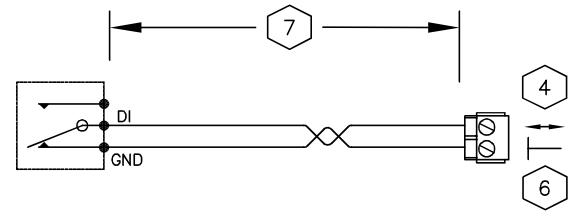
B
00

DIGITAL OUTPUT (1.4D3R, 1.8T) NO
PULSED OR LATCHED



E
00

DIGITAL INPUT (1.4D3R)
DRY CONTACT



F
00

DIGITAL INPUT (1.4D3R)
PULSE ACCUMULATOR

NOTES:

1. MAXIMUM WIRE RUN LENGTHS ARE BASED ON THE CURRENT DRAW AND WIRE GAUGE. SEE DRAWING P7WIR.
2. SEE CONTROL DRAWINGS FOR NORMAL DE–ENERGIZED CONTACT STATE
3. MAXIMUM CONTACT CLOSURE RATE IS 10 PER SECOND
4. 1.4D3R MAXIMUM PULSE RATE UP TO 10Hz
5. DO CONTACT RATINGS
   AC OPERATION:
   4A @ 250VAC (RESISTIVE)
   3A @ 250VAC (INDUCTIVE)

   DC OPERATION:
   4A @ 30VDC (RESISTIVE), UL APPLICATIONS
   3A @ 30VDC GENERAL PURPOSE
   3A @ 30VDC (RESISTIVE)
6. REFER TO PXC7 PANEL FOR ACTUAL POINT ADDRESSES. REFER TO TXM TERMINATION TABLES FOR ACTUAL TERMINALS FOR EACH PANEL ADDRESS. COMMON TERMINAL MAY BE SHARED BY 2 POINTS.
7. 50mA OR LESS – 750ft/230m
   50mA TO 100mA – 375ft/115m
8. WHERE H TERMINAL IS NOT A NEC CLASS 2 CIRCUIT, RELAY COMMON TERMINAL BRANCH CURRENT MUST BE EXTERNALLY LIMITED TO 10A MAXIMUM BY AN NEC APPROVED MEANS. NOT A FUSE.
9. WHERE REQUIRED, N TERMINAL BRANCH CURRENT MUST BE EXTERNALLY LIMITED BY AN NEC APPROVED MEANS.

		TXM1.4D3R		
I/O POINT		(1)	(2)	(3)
SUPPLY		3	9	15
NORMALLY OPEN	⏐ (NO)	2	8	14
NORMALLY CLOSED	⌐ (NC)	4	10	16

		TXM1.4D3R			
I/O POINT		(5)	(6)	(7)	(8)
SYSTEM NEUTRAL[1]	⊥ (–)	26	28	30	32
DIGITAL INPUT	⏐ (+)	27	29	31	33

1. TERMINALS 26, 28, 30, 32 ARE SYSTEM NEUTRAL TERMINALS.

THEY ARE INTERCONNECTED, NOT IN THE TERMINAL BASE BUT IN THE PLUG–IN I/O MODULE. WHEN I/O MODULE IS REMOVED, THERE IS NO CONNECTION.

THE SYSTEM NEUTRAL OF A DIGITAL INPUT CAN BE CONNECTED TO ANY SYSTEM NEUTRAL TERMINAL.

		TXM1.8T							
I/O POINT		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
SUPPLY[1]	~	2	6	10	14	19	23	27	31
DIGITAL OUTPUT[2]	⏐ (+)	4	8	12	16	21	25	29	33

1.THE LOAD CAN BE CONNECTED DIRECTLY TO THE CORRESPONDING OUTPUT TERMINALS. NO SEPARATE 24VAC SUPPLY IS REQUIRED.

2. THE TRIAC CLOSES THE CONTACT TO ⊥ (SYSTEM NEUTRAL).

REVISION HISTORY

R0	2/16/2024	VB	ISSUED FOR APPROVAL

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NANUET BOND PHASE3 MID SCHOOL
NANUET, NY

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
VB	VB	NSK	02/16/24	02/16/24

TX-I/O TERMINATION SPEC. 3

440P-366733
0
TTRM3

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PXC MODULAR WIRING TYPE AND GAUGE REQUIREMENTS

TABLE 1

CIRCUIT TYPE	CLASS	WIRE TYPE	MAX. DISTANCE	CONDUIT SHARING [2]
AC LINE POWER [1]	POWER	#12–14 THHN	REFER TO NEC	CHECK LOCAL CODES
DIGITAL OUTPUT	1 & 2	TP not required, check job specs & local codes #18 to #24 AWG	SEE TABLE 3	CHECK LOCAL CODES
DIGITAL INPUT	2	TP not required, check job specs & local codes #18 to #24 AWG	750ft (230 m)	CHECK LOCAL CODES
ANALOG INPUT [4] 100K/10K Thermistor	2	#18–#24 TP[3&6] or TSP[5] CM(FT4) or CMP(FT6)	750ft (230 m)	CHECK LOCAL CODES
ANALOG INPUT [4] 1K Ni OR RTD	2	#18–#24 TP[3&6] or TSP[5] CM(FT4) or CMP(FT6)	750ft (230 m)	CHECK LOCAL CODES
ANALOG INPUT 0–10 V	2	#18–#24 TP[3&6] or TSP[5] CM(FT4) or CMP(FT6)	750ft (230 m)	CHECK LOCAL CODES
ANALOG INPUT 4–20 mA	2	#18–#24 TP[3&6] or TSP[5] CM(FT4) or CMP(FT6)	750ft (230 m)	CHECK LOCAL CODES
ANALOG OUTPUT 0–10 V	2	#18–#24 TP[3&6] or TSP[5] CM(FT4) or CMP(FT6)	750ft (230 m)	CHECK LOCAL CODES
ANALOG OUTPUT 4–20 mA	2	#18–#24 TP[3&6] or TSP[5] CM(FT4) or CMP(FT6)	750ft (230 m)	CHECK LOCAL CODES
ETHERNET ALN	2	#24 (4) TP[6] CAT5 OR BETTER	295ft (90 m)	CHECK LOCAL CODES
ALN TRUNK	2	#24 TSP	SEE TABLE 4	CHECK LOCAL CODES

1. WHEN DAISY–CHAINING 24VAC POWER TO CONTROLLERS USE #14 WIRE.

2. CONDUIT SHARING RULES: ONLY WHERE LOCAL CODES PERMIT. BOTH CLASS1 AND CLASS 2 WIRING CAN BE RUN TO THE PXCC PROVIDED THE CLASS 2 WIRE IS UL LISTED 300V 75°C(167°F) OR HIGHER OR THE CLASS 2 WIRE IS NEC TYPE CM (FT4) (75°C OR HIGHER) OR CMP(FT6) (75°C OR HIGHER). NEC TYPE CL2 AND CL2P IS NOT ACCEPTABLE UNLESS ALSO UL LISTED AND MARKED 300V 75°C (167°F) OR HIGHER

3. TWISTED PAIR, NON–JACKETED UL LISTED 75°C(167°F) AND 300V, CABLE CAN BE USED IN PLACE OF CM(FT4) OR CMP(FT6)(BOTH MUST BE RATED 75°C OR HIGHER) CABLE WHEN CONTAINED IN CONDUIT PER LOCAL CODES. SEE THE FIELD PURCHASING GUIDE FOR WIRE.

4. WIRE LENGTH AFFECTS POINT INTERCEPT ENTRY. ADJUST INTERCEPT ACCORDINGLY FOR EACH WIRE GAUGE AND SENSOR TYPE.

5. SHIELDED TWISETED PAIR (TSP) IS NOT REQUIRED FOR ELECTRICAL NOISE LEVELS UPTO 10 V/M. AT HIGHER LEVELS TSP MAY BE NEEDED.TERMINATE SHIELD ON ENCLOSURE AND TAPE BACK ON POINT END.

6. FOR 24AWG INSTALL CATEGORY5 OR BETTER CABLE PER ANSI/TIA/EIA–568–B.1 OR HIGHER. USE SOLID COPPER BETWEEN JACK BOXES. USE STRANDED COPPER PATCH CABLES 13ft (4m) TO CONNECT PXCC AND 20ft (6m) TO CONNECT SWITCH OR HUB.

MAXIMUM DO WIRE RUN LENGHTS

TABLE 3

NOMINAL INRUSH	STARTER SIZE	WIRE SIZE		
		#18	#16	#14
200 VA	0 1	500ft (152m)	900ft (274m)	1400ft (427m)
550 VA	2	200ft (61m)	300ft (91m)	500ft (152m)
1150 VA	3	100ft (30m)	150ft (46m)	250ft (76m)
1500 VA	4	70ft (21m)	100ft (30m)	200ft (61m)

TABLE 3 NOTES:

1. DISTANCES SHOWN ASSURE LESS THAN 10% VOLTAGE DROP ACROSS THE WIRE FOR A TYPICAL STARTER.
2. PXCM DO CONTACT RATINGS
   4A @ 250VAC & 30VDC
   SIZE 4 MOTOR STARTER

MAXIMUM NUMBER HSTIE IN SERIES ON ALN TRUNK

TABLE 4

SPEED	1200 BAUD	4800 BAUD	9600 – 38.4K BAUD	57.6K – 115.2K BAUD
SERIES TIE'S	10	7	6	6
ALN TRUNK DISTANCE	4000ft (1.2km)	4000ft (1.2km)	4000ft (1.2km)	3280ft (1km)

- TIE MUST BE USED TO ISOLATE ALN BETWEEN PXCM CONNECTED TO DIFFERENT SERVICE GROUNDS OR ON BOTH SIDES OF THE ALN CABLE THAT EXITS BUILDING.
- THE MAX ALN DISTANCE APPLIES TO EACH SIDE OF THE TIE.

GENERAL NOTES:

- COMPLY WITH LOCAL BUILDING CODES
- SIZE WIRE FOR LOAD, CURRENT, AND VOLTAGE.
- ALL WIRE TO BE APPROVED OR LISTED FOR THE INTENDED APPLICATION BY AGENCIES SUCH AS UL, NEC, CSA.
- ALWAYS REFER TO LOCAL CODES FOR CONDUIT SHARING.
- WIRING MUST HAVE INSULATION RATED FOR HIGHEST VOLTAGE CIRCUIT IN CONDUIT.
- THE ALN TRUNK MUST BE AN UNINTERRUPTED RUN BETWEEN CABINETS. NO SPLICES ALLOWED.
- CM/CMP/MM/MMP WIRE IS NOT USABLE FOR CLASS 1 CIRCUITS.
- FOR EXTENDED TEMPERATURE INSTALLATIONS USE ONLY COPPER WIRE LISTED FOR 90°C OR HIGHER

PXCM WIRE SPECIFICATIONS

TABLE 2

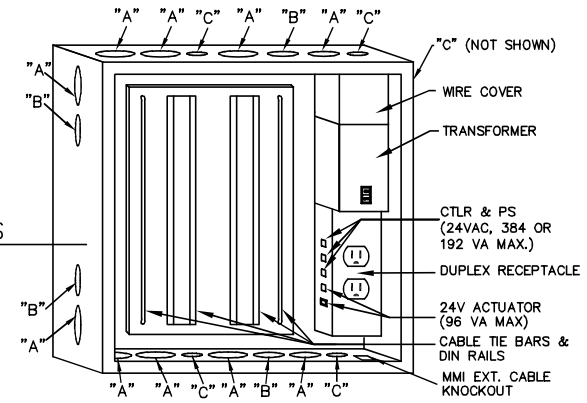
	LOW–VOLTAGE POINT APPLICATIONS	POINT USAGE	ALN TRUNK	EALN
CABLE CONFIGURATION	TWISTED PAIR OR TSP	TWISTED PAIR (UNJACKETED) OR TSP	TWISTED SHIELDED PAIR	(4) TWISTED PAIR
GAUGE	#18 TO #22 AWG (STRANDED)	#18 TO #22 AWG (STRANDED)	24 AWG (STRANDED)	24AWG(STRANDED)
CAPACITANCE	n.a.	n.a.	12.5 pf/ft OR LESS	13 pf/ft OR LESS
TWISTS PER FOOT	6 MINIMUM	6 MINIMUM	6 MINIMUM	CATEGORY 5 Min
SHIELDS	NOT REQUIRED (IN CASE OF TSP, 100% FOIL W/ DRAIN WIRE)	NOT REQUIRED (IN CASE OF TSP, 100% FOIL W/ DRAIN WIRE)	100% FOIL W/ DRAIN WIRE	NOT REQUIRED
NEC CLASS	CM, CMP (75°C OR HIGHER)	NOT SPECIFIED	CM, CMP (75°C OR HIGHER)	MM, MMP
CEC CLASS	FT4, FT6 (75°C OR HIGHER)	NOT SPECIFIED	FT4, FT6 (75°C OR HIGHER)	NOT SPECIFIED
UL VOLTAGE RATING	NOT SPECIFIED	300 VAC [2]	NOT SPECIFIED	NOT SPECIFIED
UL TEMP. RATING	NOT SPECIFIED	75°C (167°F)	NOT SPECIFIED	NOT SPECIFIED

1. UL RECOGNIZED WIRE (LABELED WITH A BACKWARDS 'RU') IS NOT FIELD INSTALLABLE. USE ONLY UL–LISTED WIRE.
2. 300 VAC WIRE CAN BE USED IN FIELD PANELS CONTAINING VOLTAGES BELOW 150 VAC.

ENCLOSURE H x W x D (IN)
PXA–ENC–19 19 x 22 x 5 3\4
PXA–ENC–34 34 x 22 x 5 3\4
PXA–ENC–18 18 x 22 x 6

KNOCKOUT TYPES
A= 1" & 1–1/4"
B= 3/4" & 1"
C= 1/2" & 3/4"

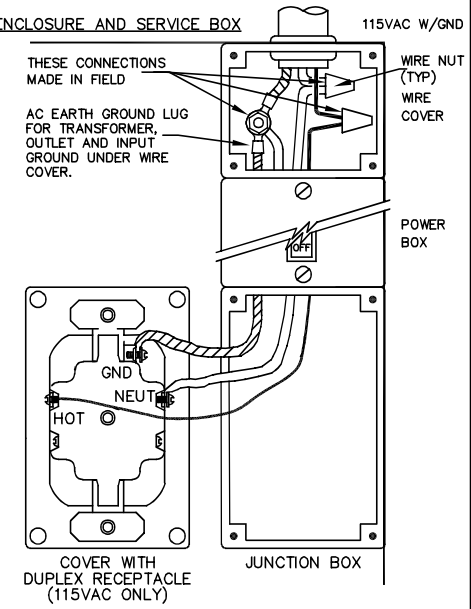
T1 00 PXCM CONDUIT PENETRATIONS



PXA–ENC19 ENCLOSURE & PXA–SB115V384VA SERVICE BOX

SERVICE BOX MAX POWER SOURCE REQUIREMENTS	
VOLTAGE:	102–132 VAC 204–264 VAC
LINE FREQUENCY:	50 / 60 Hz
115V OUTLETS:	200 VA (MAX.)
PXA–SB115V384VA [2]	440 VA (MAX.)
PXA–SB115V192VA [2]	220 VA (MAX.)
PXA–SB230V384VA	440 VA (MAX.)
PXA–SB230V192VA	220 VA (MAX.)

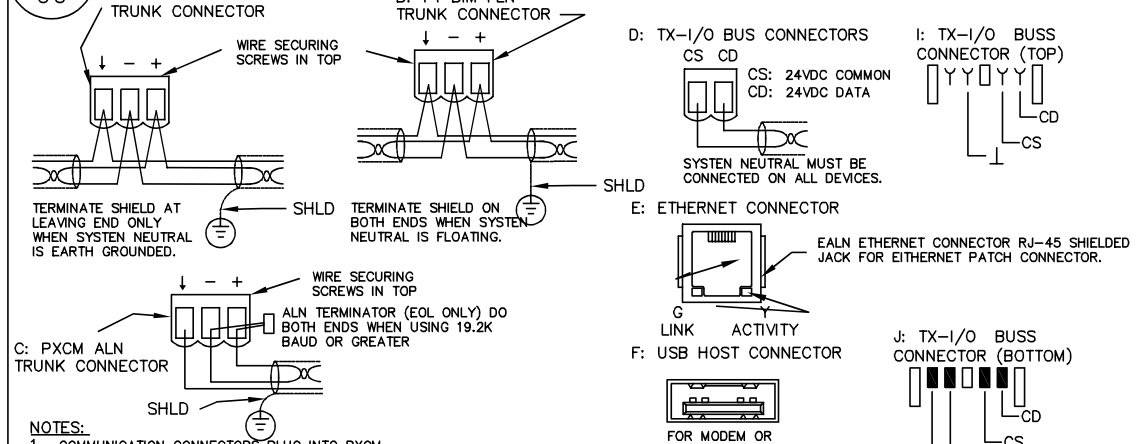
PXA ENCLOSURE AND SERVICE BOX



PXCM FAMILY VA RATINGS & SENSOR SUPPLY			
PRODUCT	24VDC (W)	24VAC INPUT VA	24VAC OUTPUT VA
PXC00–X	0	24	0
PXC100–X	0	24	0
TXB1.P1	14.4	125	96
TXS1.12F4	28.8	150	96
TXS1.EF4	0	96	96
TX–I/O MODULE	24VDC LOAD (W) MAX.		
TXM1.8D	1.1		
TXM1.16D	1.4		
TXM1.8U	1.5		
TXM1.8U–ML	1.8		
TXM1.8X	2.2		
TXM1.8X–ML	2.3		
TXM1.6R	1.7		
TXM1.6R–M	1.9		

NOTES:
1. NO MORE THAN THREE (3) 384VA OR FIVE (5) 192VA FULLY LOADED PXA CABINETS ALLOWED ON A SINGLE 3–WIRE 115V, 15A CIRCUIT.
2. RECEPTACLE IS PREWIRED AND MOUNTED IN FACTORY, FOR 115VAC SERVICE BOX ONLY.
3. DC INPUT/OUTPUT ONLY AVALABLE ON BUSS CONNECTION MODULES.

T2 00 PXCM POWER WIRING



NOTES:
1. COMMUNICATION CONNECTORS PLUG INTO PXCM.
2. ALN MUST BE DAISY–CHAINED WHEN RUNNING 19.2K BAUD OR FASTERAND TRUNK TERMINATORS USED AT BOTH ENDS OF LINE T3C. 3. TERMINATE SHIELD A LEAVING END OF ALN TRUNK ONLY T3A.
4. USE ALN SHIELD TERMINATION T3A WHEN 24VAC E TERMINAL IS EARTH GROUNDED.
5. USE ALN SHIELD TERMINATION T3B WHEN 24VAC E TERMINAL IS OPEN.

T3 00 PXCM & P1 BIM COMMUNICATION TERMINATIONS
FOR PXC MODULAR, SERIES CONTROLLERS AND SUPPLY MODULES

REVISION HISTORY

R0	2/16/2024	VB	ISSUED FOR APPROVAL

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NANUET BOND PHASE3 MID SCHOOL
NANUET, NY

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
VB	VB	NSK	02/16/24	02/16/24

PXCM TX-I/O WIRING SPEC.

440P-366733
0
TWIR

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SIEMENS
Siemens Industry, Inc.
Smart Infrastructure

Field-Level Network Device Schedule

NANUET BOND PHASE 3-MIDDLE SCHOOL

Installation Status Key

N: new installation
E: existing, to remain
M: existing, to be modified
R: existing, to be removed

Network Type Key

BAC-IP: BACnet IP FLN device
BAC-M1: BACnet MSTP FLN device - FLN 1
BAC-M2: BACnet MSTP FLN device- FLN 2
KNX: KNX device
P1-1: P1 FLN device - FLN 1
P1-2: P1 FLN device - FLN 2
P1-3: P1 FLN device - FLN 3
MB-RTU: Modbus RTU device
MB-TCP: Modbus TCP device

Installation Checklist

- Device mounted?
- Power connected?
- Network connected?
- Actuator(s) wired?
- Sensor(s) wired?
- Flow tubes connected?

Pressurization Mode Key

+ : Positive pressure
- : Negative pressure
Ø : Neutral pressure

GENERAL NOTES

1. IP ADDRESS, INSTANCE NUMBER, MAC ADDRESS, FLN NO TO BE FIELD CO-ORDINATED.

REVISION HISTORY

REV	DATE	DWN	CHK	DESCRIPTION
0	2/16/2024	VB	NSK	ISSUED FOR APPROVAL

System										Network					Device / Equipment									Grouping	Room Airflow						Supply VAV Terminal												Extract / Exhaust VAV Terminal									Room Operator Unit				Comments
																									Minimum Airflow (CFM)				Pressurization		Airflow (CFM)							Duct Size (in)			Airflow (CFM)				Duct Size (in)											
Item	Device Name	Floor	Room No	Room / Device Description	Equipment ID	Siemens Dwg. No.	Match Dwg No	Served By (Airside)	Installation Status	FLN Network No	Network Type	IP Line / Loop Tag	MAC / Device Address	Instance No.	IP Address	Type	Equipment Controlled	Coil Type	Radiation Type	Rad Valve / Relay Qty	Field Power Source	Device Load (VA)	XFMR Load (VA)	Install Check (Initial)	Group Master	Comfort / Occ	Pre-comfort / Occ Sstby	Economy / Unocc	Protection / Vacant	Pressurization Mode	Transferred / Offset Airflow	SAV Clg Min	SAV Clg Max	SAV Htg Min	SAV Htg Max	SAV Vent Min	SAV Vent Max	SAV Smoke Flow	SAV Shape	SAV H/D	SAV W	EAV Vent Min	EAV Vent Max	Smoke (General EAV) Purge (Fume Hood)	EAV Shape	EAV H/D	EAV W	Temperature	Humidity	CO2	User Interface	Lighting Pushbuttons	
1	MS.1F.UV.MS.6	1st Floor	125A	Classroom	UV-MS-6	100B	BM-M112	NA	N	NOTE 1	BAC-M1		NOTE 1			DXR	UV W/ HP	-	-		UV-XFMR	11.5	11.5 / 9999		Master																							X			X		
2	MS.1F.UV.MS.40	1st Floor	110	Fabrication Classroom	UV-MS-40	100B	BM-M112	NA	N	NOTE 1	BAC-M1		NOTE 1			DXR	UV W/ HP	-	-		UV-XFMR	11.5	11.5 / 9999		Master																							X			X		
3	MS.1F.UV.MS.39	1st Floor	110	Fabrication Classroom	UV-MS-39	100B	BM-M112	NA	N	NOTE 1	BAC-M1		NOTE 1			DXR	UV W/ HP	-	-		UV-XFMR	11.5	11.5 / 9999		Master																							X			X		
4	MS.1F.UV.MS.41	1st Floor	108	Tech Classroom	UV-MS-41	100B	BM-M111	NA	N	NOTE 1	BAC-M1		NOTE 1			DXR	UV W/ HP	-	-		UV-XFMR	11.5	11.5 / 9999		Master																							X			X		
5	MS.1F.UV.MS.38	1st Floor	107	Facility Lounge	UV-MS-38	100B	BM-M111	NA	N	NOTE 1	BAC-M1		NOTE 1			DXR	UV W/ HP	-	-		UV-XFMR	11.5	11.5 / 9999		Master																							X			X		
6	MS.1F.EX.FTR	1st Floor	106A	Stor	EX FTR	400A	BM-M111	NA	N	NOTE 1	BAC-M1		NOTE 1			BACnet T'stat					XFMR-1-OCT-1	6	54 / 80																							X			X		
7	MS.1F.UV.MS.5	1st Floor	106	Classroom	UV-MS-5	100B	BM-M111	NA	N	NOTE 1	BAC-M1		NOTE 1			DXR	UV W/ HP	-	-		UV-XFMR	11.5	11.5 / 9999		Master																							X			X		
8	MS.1F.UV.MS.4	1st Floor	104	Classroom	UV-MS-4	100B	BM-M111	NA	N	NOTE 1	BAC-M1		NOTE 1			DXR	UV W/ HP	-	-		UV-XFMR	11.5	11.5 / 9999		Master																							X			X		
9	MS.1F.FT.MS.1	1st Floor	102A	Classroom	FT-MS-1	400A	BM-M111	NA	N	NOTE 1	BAC-M1		NOTE 1			BACnet T'stat					XFMR-1-OCT-1	6	54 / 80																							X			X		
10	MS.1F.UV.MS.3	1st Floor	102A	Classroom	UV-MS-3	100B	BM-M111	NA	N	NOTE 1	BAC-M1		NOTE 1			DXR	UV W/ HP	-	-		UV-XFMR	11.5	11.5 / 9999		Master																													Thermostat shared with FT-MS-1.
11	MS.1F.UV.MS.1	1st Floor	100B	Classroom	UV-MS-1	100B	BM-M111	NA	N	NOTE 1	BAC-M1		NOTE 1			DXR	UV W/ HP	-	-		UV-XFMR	11.5	11.5 / 9999		Master																							X			X		
12	MS.1F.UV.MS.2	1st Floor	100A	Classroom	UV-MS-2	100B	BM-M111	NA	N	NOTE 1	BAC-M1		NOTE 1			DXR	UV W/ HP	-	-		UV-XFMR	11.5	11.5 / 9999		Master																							X			X		
13	MS.1F.EX.FTR	1st Floor	116.38	Office	EX FTR	400A	BM-M113	NA	N	NOTE 1	BAC-M1		NOTE 1			BACnet T'stat					XFMR-1-OCT-1	6	54 / 80																							X			X		
14	MS.1F.EX.FTR	1st Floor	116.36	Stor	EX FTR	400A	BM-M113	NA	N	NOTE 1	BAC-M1		NOTE 1			BACnet T'stat					XFMR-1-OCT-1	6	54 / 80																							X			X		
15	MS.1F.EX.FTR	1st Floor	116.3	Office	EX FTR	400A	BM-M113	NA	N	NOTE 1	BAC-M1		NOTE 1			BACnet T'stat					XFMR-1-OCT-1	6	54 / 80																							X			X		
16	MS.1F.EX.FTR	1st Floor	C115	Health	EX FTR	400A	BM-M111	NA	N	NOTE 1	BAC-M1		NOTE 1			BACnet T'stat					XFMR-1-OCT-1	6	54 / 80																							X			X		
17	MS.1F.UV.MS.12	1st Floor	120	Classroom	UV-MS-12	100B	BM-M111	NA	N	NOTE 1	BAC-M1		NOTE 1			DXR	UV W/ HP	-	-		UV-XFMR	11.5	11.5 / 9999		Master																							X			X		
18	MS.1F.UV.MS.11	1st Floor	118	Classroom	UV-MS-11	100B	BM-M111	NA	N	NOTE 1	BAC-M1		NOTE 1			DXR	UV W/ HP	-	-		UV-XFMR	11.5	11.5 / 9999		Master																							X			X		
19	MS.1F.EX.FTR	1st Floor	108	Multipurpose/Cafeteria	EX FTR	400A	BM-M111	NA	N	NOTE 1	BAC-M1		NOTE 1			BACnet T'stat					XFMR-1-OCT-1	6	54 / 80																							X			X		
20	MS.1F.EX.FTR	1st Floor	C138	Office	EX FTR	400A	BM-M111	NA	N	NOTE 1	BAC-M1		NOTE 1			BACnet T'stat					XFMR-1-OCT-1	6	54 / 80																							X			X		
21	MS.1F.EX.FTR	1st Floor	C128	Principal Office	EX FTR	400A	BM-M111	NA	N	NOTE 1	BAC-M1		NOTE 1			BACnet T'stat					XFMR-1-OCT-1	6	54 / 80																							X			X		
22	MS.1F.EX.FTR	1st Floor	C129	Asst. Principal Office	EX FTR	400A	BM-M111	NA	N	NOTE 1	BAC-M1		NOTE 1			BACnet T'stat					XFMR-1-OCT-2	6	24 / 80																							X			X		
23	MS.1F.EX.FTR	1st Floor	C132	Administration	EX FTR	400A	BM-M111	NA	N	NOTE 1	BAC-M1		NOTE 1			BACnet T'stat					XFMR-1-OCT-2	6	24 / 80																							X			X		
24	MS.1F.EX.FTR	1st Floor	C133	Guidance	EX FTR	400A	BM-M111	NA	N	NOTE 1	BAC-M1		NOTE 1			BACnet T'stat					XFMR-1-OCT-2	6	24 / 80																							X			X		
25	MS.1F.UV.MS.10	1st Floor	116	Classroom	UV-MS-10	100B	BM-M112	NA	N	NOTE 1	BAC-M1		NOTE 1			DXR	UV W/ HP	-	-		UV-XFMR	11.5	11.5 / 9999		Master																							X			X		
26	MS.1F.UV.MS.9	1st Floor	116.5	Classroom	UV-MS-9	100B	BM-M112	NA	N	NOTE 1	BAC-M1		NOTE 1			DXR	UV W/ HP	-	-		UV-XFMR	11.5	11.5 / 9999		Master																							X			X		
27	MS.1F.UV.MS.8	1st Floor	114.5	Classroom	UV-MS-8	100B	BM-M112	NA	N	NOTE 1	BAC-M1		NOTE 1			DXR	UV W/ HP	-	-		UV-XFMR	11.5	11.5 / 9999		Master																							X			X		
28	MS.1F.UV.MS.7	1st Floor	114	Classroom	UV-MS-7	100B	BM-M112	NA	N	NOTE 1	BAC-M1		NOTE 1			DXR	UV W/ HP	-	-		UV-XFMR	11.5	11.5 / 9999		Master																							X			X		

SIEMENS
Siemens Industry, Inc.
Smart Infrastructure

Field-Level Network Device Schedule

NANUET BOND PHASE 3-MIDDLE SCHOOL

Installation Status Key
N: new installation
E: existing, to remain
M: existing, to be modified
R: existing, to be removed

Network Type Key
BAC-IP: BACnet IP FLN device
BAC-M1: BACnet MSTP FLN device - FLN 1
BAC-M2: BACnet MSTP FLN device- FLN 2
KNX: KNX device
P1-1: P1 FLN device - FLN 1
P1-2: P1 FLN device - FLN 2
P1-3: P1 FLN device - FLN 3
MB-RTU: Modbus RTU device
MB-TCP: Modbus TCP device

Installation Checklist
- Device mounted?
- Power connected?
- Network connected?
- Actuator(s) wired?
- Sensor(s) wired?
- Flow tubes connected?

Pressurization Mode Key
+ : Positive pressure
- : Negative pressure
Ø : Neutral pressure

GENERAL NOTES
1. IP ADDRESS, INSTANCE NUMBER, MAC ADDRESS, FLN NO TO BE FIELD CO-ORDINATED.

REVISION HISTORY

REV	DATE	DWN	CHK	DESCRIPTION
0	2/16/2024	VB	NSK	ISSUED FOR APPROVAL

System										Network						Device / Equipment											Grouping	Room Airflow						Supply VAV Terminal														Extract / Exhaust VAV Terminal								Room Operator Unit				Comments
																												Minimum Airflow (CFM)				Pressurization		Airflow (CFM)							Duct Size (in)						Airflow (CFM)				Duct Size (in)							
Item	Device Name	Floor	Room No	Room / Device Description	Equipment ID	Siemens Dwg. No.	Match Dwg No	Serviced By (Airside)	Installation Status	FLN Network No	Network Type	IP Line / Loop Tag	MAC / Device Address	Instance No.	IP Address	Type	Equipment Controlled	Coil Type	Radiation Type	Rad Valve / Relay Qty	Field Power Source	Device Load (VA)	XFMR Load (VA)	Install Check (Initial)	Group Master	Comfort / Occ	Pre-comfort / Occ-Setp	Economy / Unocc	Protection / Vacant	Pressurization Mode	Transferred / Offset Airflow	SAV Clg Min	SAV Clg Max	SAV Htg Min	SAV Htg Max	SAV Vent Min	SAV Vent Max	SAV Smoke Flow	SAV Shape	SAV H/D	SAV W	EAV Vent Min	EAV Vent Max	Smoke (General EAV) Purge (Flame Hood)	EAV Shape	EAV H/D	EAV W	Temperature	Humidity	CO2	User Interface	Lighting Pushbuttons	
29	MS.1F.EX.FTR	1st Floor	123	Storage	EX FTR	400A	BM-M112	NA	N	NOTE 1	BAC-M1		NOTE 1			BACnet T'stat					XFMR-1-CKT-2	6	24 / 80																												X			X		
30	MS.1F.UV.MASTER.PNL	1st Floor	119	Receiving Custodial	UV MASTER PNL	100B	BM-M112	NA	N	NOTE 1	BAC-IP	LOOP 1		NOTE 1	NOTE 1	DXR	UV W/ HP	-	-						Master																															
31	MS.2F.UV.MS.29	2nd Floor	224	Science Lab	UV-MS-29	100B	BM-M115	NA	N	NOTE 1	BAC-M1		NOTE 1			DXR	UV W/ HP	-	-		UV-XFMR	11.5	11.5 / 9999		Master																												X			X		
32	MS.2F.UV.MS.28	2nd Floor	222	Classroom	UV-MS-28	100B	BM-M115	NA	N	NOTE 1	BAC-M1		NOTE 1			DXR	UV W/ HP	-	-		UV-XFMR	11.5	11.5 / 9999		Master																												X			X		
33	MS.2F.UV.MS.27	2nd Floor	220	Classroom	UV-MS-27	100B	BM-M115	NA	N	NOTE 1	BAC-M1		NOTE 1			DXR	UV W/ HP	-	-		UV-XFMR	11.5	11.5 / 9999		Master																												X			X		
34	MS.2F.UV.MS.26	2nd Floor	218	Classroom	UV-MS-26	100B	BM-M115	NA	N	NOTE 1	BAC-M1		NOTE 1			DXR	UV W/ HP	-	-		UV-XFMR	11.5	11.5 / 9999		Master																												X			X		
35	MS.2F.UV.MS.25	2nd Floor	216	Classroom	UV-MS-25	100B	BM-M114	NA	N	NOTE 1	BAC-M1		NOTE 1			DXR	UV W/ HP	-	-		UV-XFMR	11.5	11.5 / 9999		Master																												X			X		
36	MS.2F.UV.MS.24	2nd Floor	214	Classroom	UV-MS-24	100B	BM-M114	NA	N	NOTE 1	BAC-M1		NOTE 1			DXR	UV W/ HP	-	-		UV-XFMR	11.5	11.5 / 9999		Master																												X			X		
37	MS.2F.UV.MS.23	2nd Floor	212	Classroom	UV-MS-23	100B	BM-M114	NA	N	NOTE 1	BAC-M1		NOTE 1			DXR	UV W/ HP	-	-		UV-XFMR	11.5	11.5 / 9999		Master																												X			X		
38	MS.2F.EX.FTR	2nd Floor	210A	Storage	EX FTR	400A	BM-M114	NA	N	NOTE 1	BAC-M1		NOTE 1			BACnet T'stat					XFMR-1-CKT-3	6	18 / 80																												X			X		
39	MS.2F.UV.MS.22	2nd Floor	210	Classroom	UV-MS-22	100B	BM-M114	NA	N	NOTE 1	BAC-M1		NOTE 1			DXR	UV W/ HP	-	-		UV-XFMR	11.5	11.5 / 9999		Master																												X			X		
40	MS.2F.UV.MS.21	2nd Floor	208	Classroom	UV-MS-21	100B	BM-M114	NA	N	NOTE 1	BAC-M1		NOTE 1			DXR	UV W/ HP	-	-		UV-XFMR	11.5	11.5 / 9999		Master																												X			X		
41	MS.2F.UV.MS.19	2nd Floor	206	Classroom	UV-MS-19	100B	BM-M114	NA	N	NOTE 1	BAC-M1		NOTE 1			DXR	UV W/ HP	-	-		UV-XFMR	11.5	11.5 / 9999		Master																												X			X		
42	MS.2F.UV.MS.16	2nd Floor	204	Classroom	UV-MS-16	100B	BM-M114	NA	N	NOTE 1	BAC-M1		NOTE 1			DXR	UV W/ HP	-	-		UV-XFMR	11.5	11.5 / 9999		Master																												X			X		
43	MS.2F.UV.MS.14	2nd Floor	202	Classroom	UV-MS-14	100B	BM-M114	NA	N	NOTE 1	BAC-M1		NOTE 1			DXR	UV W/ HP	-	-		UV-XFMR	11.5	11.5 / 9999		Master																												X			X		
44	MS.2F.UV.MS.13	2nd Floor	200	Classroom	UV-MS-13	100B	BM-M114	NA	N	NOTE 1	BAC-M1		NOTE 1			DXR	UV W/ HP	-	-		UV-XFMR	11.5	11.5 / 9999		Master																												X			X		
45	MS.2F.UV.MS.37	2nd Floor	240	Classroom	UV-MS-37	100B	BM-M114	NA	N	NOTE 1	BAC-M1		NOTE 1			DXR	UV W/ HP	-	-		UV-XFMR	11.5	11.5 / 9999		Master																												X			X		
46	MS.2F.UV.MS.36	2nd Floor	238	Classroom	UV-MS-36	100B	BM-M114	NA	N	NOTE 1	BAC-M1		NOTE 1			DXR	UV W/ HP	-	-		UV-XFMR	11.5	11.5 / 9999		Master																												X			X		
47	MS.2F.UV.MS.35	2nd Floor	236	Classroom	UV-MS-35	100B	BM-M114	NA	N	NOTE 1	BAC-M1		NOTE 1			DXR	UV W/ HP	-	-		UV-XFMR	11.5	11.5 / 9999		Master																												X			X		
48	MS.2F.UV.MS.15	2nd Floor	203	Classroom	UV-MS-15	100B	BM-M114	NA	N	NOTE 1	BAC-M1		NOTE 1			DXR	UV W/ HP	-	-		UV-XFMR	11.5	11.5 / 9999		Master																												X			X		
49	MS.2F.UV.MS.17	2nd Floor	205	Classroom	UV-MS-17	100B	BM-M114	NA	N	NOTE 1	BAC-M1		NOTE 1			DXR	UV W/ HP	-	-		UV-XFMR	11.5	11.5 / 9999		Master																												X			X		
50	MS.2F.UV.MS.20	2nd Floor	207	Classroom	UV-MS-20	100B	BM-M114	NA	N	NOTE 1	BAC-M1		NOTE 1			DXR	UV W/ HP	-	-		UV-XFMR	11.5	11.5 / 9999		Master																												X			X		
51	MS.2F.R.MS.1.2	2nd Floor	241	Library	R-MS-1,2	401A	BM-M114	NA	N	NOTE 1	BAC-M1		NOTE 1			DXR	RADIATOR COILS	-	-		XFMR-1-CKT-3	6	18 / 80		Master																												X			X		
52	MS.2F.UV.MS.34	2nd Floor	234	Classroom	UV-MS-34	100B	BM-M115	NA	N	NOTE 1	BAC-M1		NOTE 1			DXR	UV W/ HP	-	-		UV-XFMR	11.5	11.5 / 9999		Master																												X			X		
53	MS.2F.UV.MS.33	2nd Floor	232	Classroom	UV-MS-33	100B	BM-M115	NA	N	NOTE 1	BAC-M1		NOTE 1			DXR	UV W/ HP	-	-		UV-XFMR	11.5	11.5 / 9999		Master																												X			X		
54	MS.2F.EX.FTR	2nd Floor	230A	Storage	EX FTR	400A	BM-M115	NA	N	NOTE 1	BAC-M1		NOTE 1			BACnet T'stat					XFMR-1-CKT-3	6	18 / 80																												X			X		
55	MS.2F.UV.MS.32	2nd Floor	230	Science Lab	UV-MS-32	100B	BM-M115	NA	N	NOTE 1	BAC-M1		NOTE 1			DXR	UV W/ HP	-	-		UV-XFMR	11.5	11.5 / 9999		Master																												X			X		
56	MS.2F.UV.MS.31	2nd Floor	228	Science Lab	UV-MS-31	100B	BM-M115	NA	N	NOTE 1	BAC-M1		NOTE 1			DXR	UV W/ HP	-	-		UV-XFMR	11.5	11.5 / 9999		Master																												X			X		
57	MS.2F.UV.MS.30	2nd Floor	Computer Classroom	226	UV-MS-30	100B	BM-M115	NA	N	NOTE 1	BAC-M1		NOTE 1			DXR	UV W/ HP	-	-		UV-XFMR	11.5	11.5 / 9999		Master																												X			X		
58	MS.RF.EF.MS.10	Roof	SCIENCE LABS	228/230	EF-MS-10	101A	BM-M103	NA	N	NOTE 1	BAC-M1		NOTE 1			PPM					XFMR-1-CKT-4	13	52 / 80																																		

SIEMENS
Siemens Industry, Inc.
Smart Infrastructure

Field-Level Network Device Schedule

NANUET BOND PHASE 3-MIDDLE SCHOOL

Installation Status Key

N: new installation
E: existing, to remain
M: existing, to be modified
R: existing, to be removed

Network Type Key

BAC-IP: BACnet IP FLN device
BAC-M1: BACnet MSTP FLN device - FLN 1
BAC-M2: BACnet MSTP FLN device- FLN 2
KNX: KNX device
P1-1: P1 FLN device - FLN 1
P1-2: P1 FLN device - FLN 2
P1-3: P1 FLN device - FLN 3
MB-RTU: Modbus RTU device
MB-TCP: Modbus TCP device

Installation Checklist

- Device mounted?
- Power connected?
- Network connected?
- Actuator(s) wired?
- Sensor(s) wired?
- Flow tubes connected?

Pressurization Mode Key

+ : Positive pressure
- : Negative pressure
Ø : Neutral pressure

GENERAL NOTES

1. IP ADDRESS, INSTANCE NUMBER, MAC ADDRESS, FLN NO TO BE FIELD CO-ORDINATED.

REVISION HISTORY

REV	DATE	DWN	CHK	DESCRIPTION
0	2/16/2024	VB	NSK	ISSUED FOR APPROVAL

System										Network						Device / Equipment											Grouping	Room Airflow						Supply VAV Terminal													Extract / Exhaust VAV Terminal						Room Operator Unit					Comments
																												Minimum Airflow (CFM)				Pressurization		Airflow (CFM)							Duct Size (in)				Airflow (CFM)			Duct Size (in)										
Item	Device Name	Floor	Room No	Room / Device Description	Equipment ID	Siemens Dwg. No.	Match Dwg No	Served By (Airside)	Installation Status	FLN Network No	Network Type	IP Line / Loop Tag	MAC / Device Address	Instance No.	IP Address	Type	Equipment Controlled	Coil Type	Radiation Type	Rad Valve / Relay Qty	Field Power Source	Device Load (VA)	XFMR Load (VA)	Install Check (Initial)	Group Master	Comfort / Occ	Pre-comfort / Occ-Sbby	Economy / Unocc	Protection / Vacant	Pressurization Mode	Transferred / Offset Airflow	SAV Clg Min	SAV Clg Max	SAV Htg Min	SAV Htg Max	SAV Vent Min	SAV Vent Max	SAV Smoke Flow	SAV Shape	SAV H/D	SAV W	EAV Vent Min	EAV Vent Max	Smoke (General EAV) Purge (Flame Hood)	EAV Shape	EAV H/D	EAV W	Temperature	Humidity	CO2	User Interface	Lighting Pushbuttons	
59	MS.RF.EF.MS.21	Roof	BOYS LOCKER ROOM	116.41	EF-MS-21	101A	BM-M103	NA	N	NOTE 1	BAC-M1		NOTE 1			PPM					XFMR-1-CKT-4	13	52 / 80																																			
60	MS.RF.EF.MS.23	Roof	CAFETERIA	108	EF-MS-23	102A	BM-M103	NA	N	NOTE 1	BAC-M1		NOTE 1			PPM					XFMR-1-CKT-4	13	52 / 80																																			
61	MS.RF.EF.MS.8	Roof	SCIENCE LABS	222/224	EF-MS-8	101A	BM-M103	NA	N	NOTE 1	BAC-M1		NOTE 1			PPM					XFMR-1-CKT-4	13	52 / 80																																			
62	MS.RF.EX.EF.11	Roof	STORAGE	230A	EX-EF-11	103A	BM-M103	NA	N	NOTE 1	BAC-M1		NOTE 1			PPM					XFMR-1-CKT-5	13	78 / 80																																			
63	MS.RF.EX.EF.15	Roof	CORRIDOR	-	EX-EF-15	103A	BM-M103	NA	N	NOTE 1	BAC-M1		NOTE 1			PPM					XFMR-1-CKT-5	13	78 / 80																																			
64	MS.RF.EX.EF.16	Roof	CORRIDOR	-	EX-EF-16	103A	BM-M103	NA	N	NOTE 1	BAC-M1		NOTE 1			PPM					XFMR-1-CKT-5	13	78 / 80																																			
65	MS.RF.EX.EF.5	Roof	WASHROOM	-	EX-EF-5	103A	BM-M103	NA	N	NOTE 1	BAC-M1		NOTE 1			PPM					XFMR-1-CKT-5	13	78 / 80																																			
66	MS.RF.EX.EF.6	Roof	WASHROOM	-	EX-EF-6	103A	BM-M103	NA	N	NOTE 1	BAC-M1		NOTE 1			PPM					XFMR-1-CKT-5	13	78 / 80																																			
67	MS.RF.EX.EF.7	Roof	CORRIDOR	-	EX-EF-7	103A	BM-M103	NA	N	NOTE 1	BAC-M1		NOTE 1			PPM					XFMR-1-CKT-5	13	78 / 80																																			

SIEMENS INDUSTRY, INC.
SMART INFRASTRUCTURE

Valve Submittal - Water

LOCATION:	NANUET, NY	**PROJECT NAME:**	NANUET BOND PHASE3 HIGH SCHC	**DATE:**	2/16/24
JOB NO:	44OP-366733			**PAGE:**	1
ENGR:	VB			**REV:**	0

GENERAL NOTES:
1. All valves 2-1/2" and larger have flanged ends, 2" and smaller have screwed ends.
2. All control valves and wells shall be installed by the mechanical contractor.
3. Standard abbreviations used on control valves are:

BODY TYPES: 3W - Three way; 2W - Two way; A - Angle; N.C. - Normally Closed; N.O. - Normally Open; NOC - Ball Valve can be N.O. or N.C.; BF - Butterfly Valve; DS - Double Seated;

UNITS:
Steam inlet pressure, actual pressure drop, and shut off pressure indicated in PSIG.

ACTUATOR TYPES: SR - Spring Return; NSR - No Spring Return CR - Capacitor Driven Return; DA - Double Acting

Valve ID/ Location	Qty	Product Number	Valve Size	Body Type	Body Style	Actual Cv	Actuator Type	Design P. Drop (psi)	Required Flow (gpm)	Min (gpm)	Max (gpm)	Preset (gpm)	Steam Inlet	Press Drop (psi)	Valve Spec Sheet	Shut Off	ANSI Class	Comment
Mechanical System: 100_BM_UNIT VENTILATOR & HP								**BM_UNIT VENTILATOR & HP**										
V-1	40	262-02053	0.50	2W	Globe	1.60	NO-SR	3.00	2.00	N/A	N/A	N/A	--	1.56	155 306	120	250	UV-MS-1 TO 40 VLV
Mechanical System: 104_BM_AHU								**BM_AHU's**										
V-2	1	274-03146	0.50	3W	Globe	2.50	SR	5.00	4.90	N/A	N/A	N/A	--	3.84	155 304	250	250	EX AHU S-9
V-3	1	274-03148	0.75	3W	Globe	6.30	SR	5.00	9.60	N/A	N/A	N/A	--	2.32	155 304	250	250	EX AHU S-8
V-4	1	274-03150	1.25	3W	Globe	16.00	SR	5.00	28.50	N/A	N/A	N/A	--	3.17	155 304	117	250	EX AHU S-6
V-5	1	274-03146	0.50	3W	Globe	2.50	SR	5.00	4.00	N/A	N/A	N/A	--	2.56	155 304	250	250	EX AHU S-4
V-6	1	274-03147	0.50	3W	Globe	4.00	SR	5.00	6.20	N/A	N/A	N/A	--	2.40	155 304	250	250	EX AHU S-3
V-7	1	274-03151	1.50	3W	Globe	25.00	SR	5.00	39.00	N/A	N/A	N/A	--	2.43	155 304	73	250	EX AHU S-1
V-8	1	274-03151	1.50	3W	Globe	25.00	SR	5.00	39.00	N/A	N/A	N/A	--	2.43	155 304	73	250	EX AHU S-2
V-9	1	274-03146	0.50	3W	Globe	2.50	SR	5.00	4.90	N/A	N/A	N/A	--	3.84	155 304	250	250	EX AHU S-9
Mechanical System: 300_BM_HWS VALVES								**BM_HWS VALVES**										
V-10	1	B304FB-HA266.600	4.00	3W	BF	841.00	NSR	0.00	0.00	0	1176	N/A	--	0.00	A6V11858963	175	250	MB HTG LOOP MXG
V-11	1	274-06626	3.00	2W	Globe	100.00	NC-SR	5.00	160.00	N/A	N/A	N/A	--	2.56	154067	200	250	HW STORG TNK

NOTES: All control valves and wells shall be installed by the heating contractor.

SIEMENS INDUSTRY, INC.
SMART INFRASTRUCTURE

Valve Submittal - Water

LOCATION: NANUET, NY
JOB NO: 44OP-366733
ENGR: VB

PROJECT NAME: NANUET BOND PHASE3 HIGH SCHC

DATE: 2/16/24
PAGE: 2
REV: 0

GENERAL NOTES:
1. All valves 2-1/2" and larger have flanged ends, 2" and smaller have screwed ends.
2. All control valves and wells shall be installed by the mechanical contractor.
3. Standard abbreviations used on control valves are:

BODY TYPES: 3W - Three way; 2W - Two way; A - Angle; N.C. - Normally Closed; N.O. - Normally Open; NOC - Ball Valve can be N.O. or N.C.; BF - Butterfly Valve; DS - Double Seated;

UNITS:
Steam inlet pressure, actual pressure drop, and shut off pressure indicated in PSIG.

ACTUATOR TYPES: SR - Spring Return; NSR - No Spring Return CR - Capacitor Driven Return; DA - Double Acting

Valve ID/ Location	Qty	Product Number	Valve Size	Body Type	Body Style	Actual Cv	Actuator Type	Design P. Drop (psi)	Required Flow (gpm)	Min (gpm)	Max (gpm)	Preset (gpm)	Steam Inlet	Press Drop (psi)	Valve Spec Sheet	Shut Off	ANSI Class	Comment
Mechanical System: 300_BM_HWS VALVES									**BM_HWS VALVES**									
V-12	1	274-03113	1.00	2W	Globe	10.00	NO-SR	5.00	20.00	N/A	N/A	N/A	--	4.00	155 304	201	250	HW BSTR H.EX
Mechanical System: 400_BM_FIN TUBE RADIATORS									**BM_NEW FIN TUBE RADIATOR (MECH)**									
V-13	1	262-02053	0.50	2W	Globe	1.60	NO-SR	3.00	2.30	N/A	N/A	N/A	--	2.07	155 306	120	250	FT-MS-1
Mechanical System: 401_BM_RADIATOR COILS									**BM_RADIATOR COILS (MECH)**									
V-14	1	262-02055	0.50	2W	Globe	2.50	NO-SR	3.00	3.50	N/A	N/A	N/A	--	1.96	155 306	65	250	R-MS-1&2
Mechanical System: 402_BM_FIN TUBE RAIDATORS									**BM_FIN TUBE RAIDATORS (MECH)**									
V-15	1	262-02047	0.50	2W	Globe	0.40	NO-SR	3.00	0.40	N/A	N/A	N/A	--	1.00	155 306	120	250	RM-STOR 116 36
V-16	1	262-02051	0.50	2W	Globe	1.00	NO-SR	3.00	1.50	N/A	N/A	N/A	--	2.25	155 306	120	250	RM-106A
V-17	1	262-02051	0.50	2W	Globe	1.00	NO-SR	3.00	1.50	N/A	N/A	N/A	--	2.25	155 306	120	250	RM-123
V-18	1	262-02047	0.50	2W	Globe	0.40	NO-SR	3.00	0.50	N/A	N/A	N/A	--	1.56	155 306	120	250	RM-1ST OFC NW
V-19	1	262-02047	0.50	2W	Globe	0.40	NO-SR	3.00	0.50	N/A	N/A	N/A	--	1.56	155 306	120	250	RM-1ST OFC NW
V-20	1	262-02051	0.50	2W	Globe	1.00	NO-SR	3.00	1.50	N/A	N/A	N/A	--	2.25	155 306	120	250	RM-230A
V-21	1	262-02061	0.75	2W	Globe	6.30	NO-SR	3.00	8.70	N/A	N/A	N/A	--	1.91	155 306	55	250	RM-C108

NOTES: All control valves and wells shall be installed by the heating contractor.

SIEMENS INDUSTRY, INC.
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Valve Submittal - Water

LOCATION:	NANUET, NY	**PROJECT NAME:**	NANUET BOND PHASE3 HIGH SCHC	**DATE:**	2/16/24
JOB NO:	44OP-366733			**PAGE:**	3
ENGR:	VB			**REV:**	0

GENERAL NOTES:
1. All valves 2-1/2" and larger have flanged ends, 2" and smaller have screwed ends.
2. All control valves and wells shall be installed by the mechanical contractor.
3. Standard abbreviations used on control valves are:

BODY TYPES: 3W - Three way; 2W - Two way; A - Angle; N.C. - Normally Closed; N.O. - Normally Open; NOC - Ball Valve can be N.O. or N.C.; BF - Butterfly Valve; DS - Double Seated;

UNITS:
Steam inlet pressure, actual pressure drop, and shut off pressure indicated in PSIG.

ACTUATOR TYPES: SR - Spring Return; NSR - No Spring Return CR - Capacitor Driven Return; DA - Double Acting

Valve ID/ Location	Qty	Product Number	Valve Size	Body Type	Body Style	Actual Cv	Actuator Type	Design P. Drop (psi)	Required Flow (gpm)	Min (gpm)	Max (gpm)	Preset (gpm)	Steam Inlet	Press Drop (psi)	Valve Spec Sheet	Shut Off	ANSI Class	Comment
Mechanical System: 402_BM_FIN TUBE RAIDATORS													**BM_FIN TUBE RAIDATORS (MECH)**					
V-22	1	262-02053	0.50	2W	Globe	1.60	NO-SR	3.00	2.00	N/A	N/A	N/A	--	1.56	155 306	120	250	RM-C115
V-23	1	262-02053	0.50	2W	Globe	1.60	NO-SR	3.00	2.40	N/A	N/A	N/A	--	2.25	155 306	120	250	RM-C128
V-24	1	262-02053	0.50	2W	Globe	1.60	NO-SR	3.00	2.40	N/A	N/A	N/A	--	2.25	155 306	120	250	RM-C129
V-25	1	262-02053	0.50	2W	Globe	1.60	NO-SR	3.00	2.40	N/A	N/A	N/A	--	2.25	155 306	120	250	RM-C132
V-26	1	262-02053	0.50	2W	Globe	1.60	NO-SR	3.00	2.40	N/A	N/A	N/A	--	2.25	155 306	120	250	RM-C137
V-27	1	262-02053	0.50	2W	Globe	1.60	NO-SR	3.00	2.40	N/A	N/A	N/A	--	2.25	155 306	120	250	RM-C138
V-28	1	262-02051	0.50	2W	Globe	1.00	NO-SR	3.00	1.50	N/A	N/A	N/A	--	2.25	155 306	120	250	RM-2ND FL STAIRS

NOTES: All control valves and wells shall be installed by the heating contractor.

BMS RISER

INSTALLATION NOTES:

1. CAT 6 DROP BY OTHERS AND CONNECTED TO EXISTING NETWORK SWITCH.
2. 120VAC BY OTHERS.
3. PANEL IP ADDRESS TO BE FIELD COORDINATED & LOCATION TO BE CONFIRMED ON FIELD.
4. RS-485 EOL & EGR RESISTORS TO BE INSTALLED AS SHOWN.

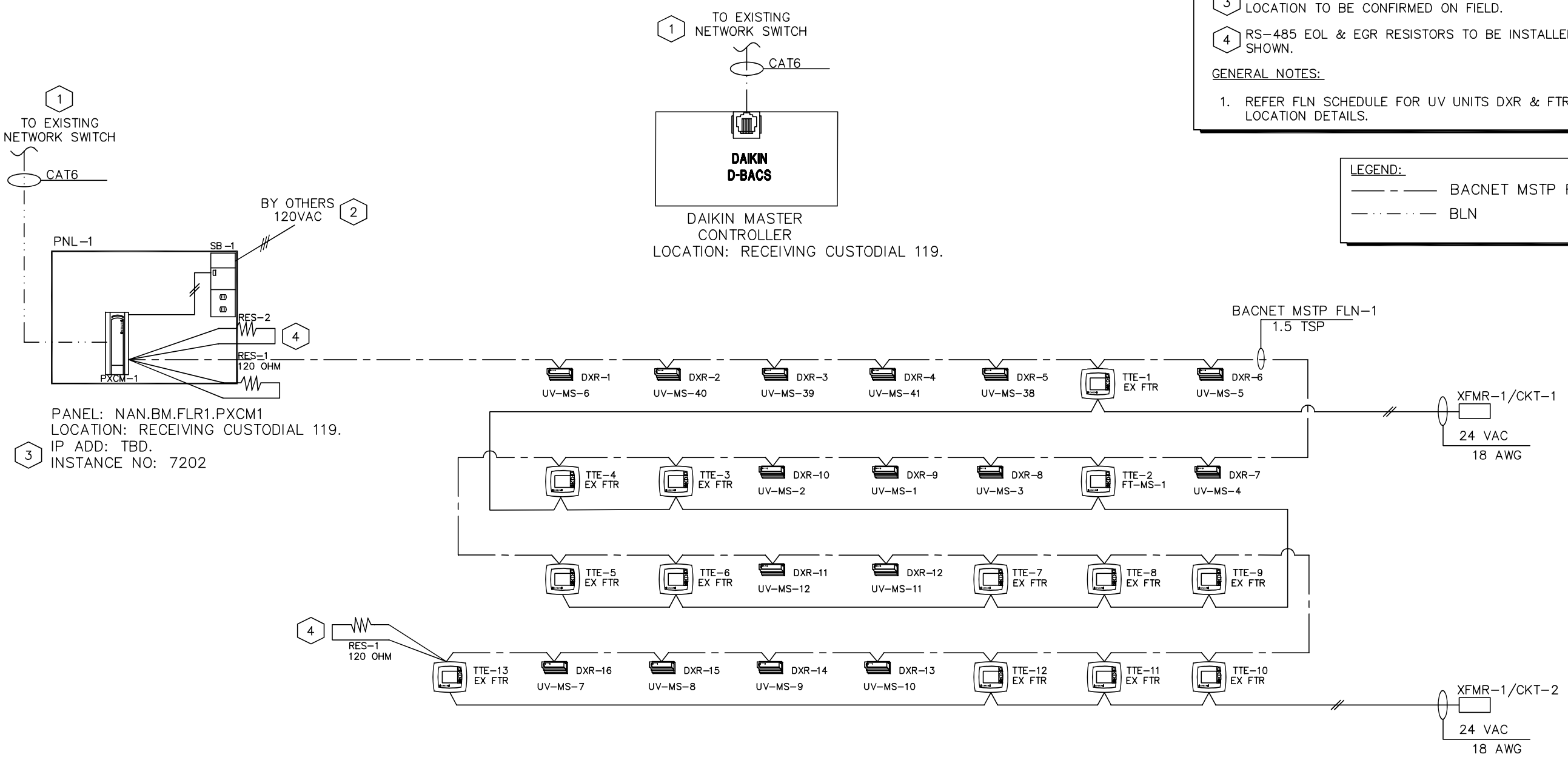
GENERAL NOTES:

1. REFER FLN SCHEDULE FOR UV UNITS DXR & FTR LOCATION DETAILS.

LEGEND:

——— - ——— BACNET MSTP FLN-1

— · · — · · — BLN



1ST FLOOR

1/001 BMS RISER

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NANUET BOND PHASE3 MID SCHOOL
NANUET, NY

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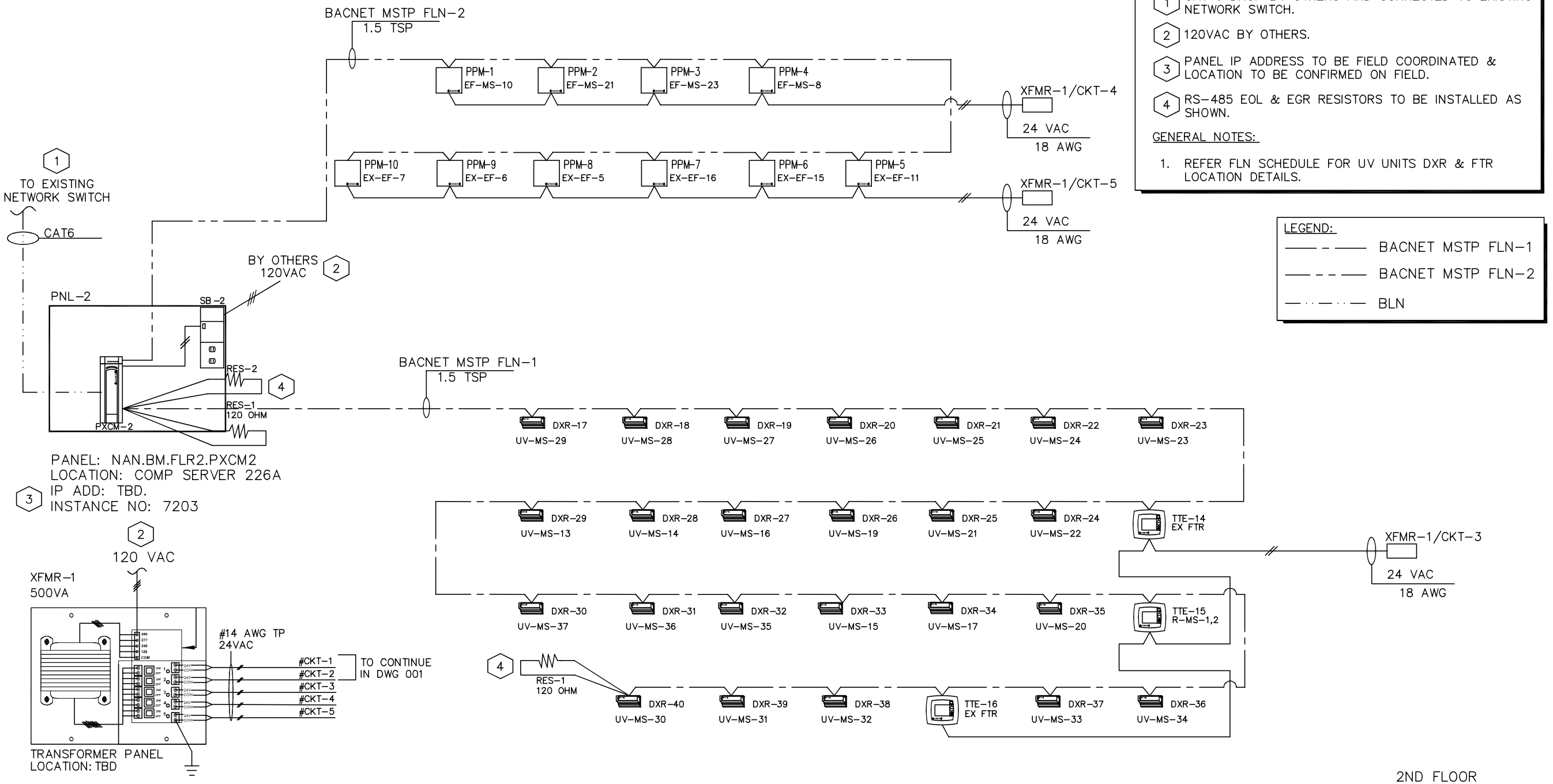
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BMS RISER



INSTALLATION NOTES:

1. CAT 6 DROP BY OTHERS AND CONNECTED TO EXISTING NETWORK SWITCH.
2. 120VAC BY OTHERS.
3. PANEL IP ADDRESS TO BE FIELD COORDINATED & LOCATION TO BE CONFIRMED ON FIELD.
4. RS-485 EOL & EGR RESISTORS TO BE INSTALLED AS SHOWN.

GENERAL NOTES:

1. REFER FLN SCHEDULE FOR UV UNITS DXR & FTR LOCATION DETAILS.

LEGEND:

- BACNET MSTP FLN-1
- BACNET MSTP FLN-2
- BLN

1 / 001A BMS RISER

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NANUET BOND PHASE3 MID SCHOOL
NANUET, NY

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Control Device	Qty	Product Number	Manufacturer	Document Number	Description
Field Mounted Devices					
CS 1	40	H608	VERIS	1006cut016	CUR SW SPLTCOR-ADJ SETPT W/LED
DXR 1	40	DXR2.M18-101B	SIEMENS	A6V10502840	DXR2.M18 Room Automation Station
ENC 1	40	550-002	SIEMENS	N/A	ENCLOSURE ASSY,TEC
FS 1	40	SS3	N/A	N/A	CONDENSATE FLOW SWITCH
TTE 1	39	S55624-H105-A	SIEMENS	N/A	QMX3.P34 Temp. Sensor and Room Unit
V					SEE VALVE SUBMITTAL

PROPOSED SEQUENCE OF OPERATION

UNIT VENTILATORS & HEAT PUMP

1. RUN CONDITIONS – SCHEDULED:
   1) THE UNIT SHALL RUN ACCORDING TO A USER DEFINABLE TIME SCHEDULE IN THE FOLLOWING MODES:
   a) OCCUPIED MODE: THE UNIT SHALL MAINTAIN
      1) A 76°F (ADJ.) COOLING SETPOINT
      2) A 70°F (ADJ.) HEATING SETPOINT.
   b) UNOCCUPIED MODE (NIGHT SETBACK): THE UNIT SHALL MAINTAIN
      1) A 85°F (ADJ.) COOLING SETPOINT.
      2) A 64°F (ADJ.) HEATING SETPOINT.
   2) UNIT VENTILATOR SENSORS SHALL INCLUDE LOCAL TEMPERATURE BUT SHALL NOT ALLOW USER TEMPERATURE SENSOR OVERRIDE CAPABILITY FROM THE SENSOR, THAT SHALL OCCUR AT THE DDC FRONT END.
   3) ALARMS SHALL BE PROVIDED AS FOLLOWS:
   a. HIGH ZONE TEMP: IF THE ZONE TEMPERATURE IS GREATER THAN THE COOLING SETPOINT BY A USER DEFINABLE AMOUNT (ADJ.).
   b. LOW ZONE TEMP: IF THE ZONE TEMPERATURE IS LESS THAN THE HEATING SETPOINT BY A USER DEFINABLE AMOUNT (ADJ.).
   c. ZONE UNOCCUPIED OVERRIDE:
      a) A TIMED LOCAL OVERRIDE CONTROL SHALL ALLOW AN OCCUPANT TO OVERRIDE THE SCHEDULE AND PLACE THE UNIT INTO AN OCCUPIED MODE FOR AN ADJUSTABLE PERIOD OF TIME. AT THE EXPIRATION OF THIS TIME, CONTROL OF THE UNIT SHALL AUTOMATICALLY RETURN TO THE SCHEDULE.
   d. FREEZE PROTECTION:
      a) THE UNIT SHALL SHUT DOWN AND GENERATE AN ALARM UPON RECEIVING A LOW TEMPERATURE THERMOSTAT STATUS WHILE THE OUTSIDE/RETURN AIR DAMPER SHALL CLOSE THE OUTSIDE AIR DAMPER AND OPEN THE FACE AND BYPASS DAMPER FULLY OPEN TO THE BYPASS POSITION.
   e. FAN:
      a) THE FAN SHALL RUN ANYTIME THE UNIT IS COMMANDED TO RUN, UNLESS SHUTDOWN ON SAFETIES.
   f. FACE AND BYPASS DAMPERS CONTROL:
      a) THE UNIT SHALL MAINTAIN ZONE HEATING AND COOLING SETPOINTS BY MODULATING THE FACE AND BYPASS DAMPERS THROUGH ONE OF THE FOLLOWING:
      1) HEATING:
      a) WHEN THE ZONE TEMPERATURE IS LESS THAN THE HEATING SETPOINT, THE FACE AND BYPASS DAMPERS SHALL MODULATE OPEN TO FACE POSITION (CLOSED TO BYPASS POSITION) TO MAINTAIN SETPOINT BY MODULATING THE AIR PASSING OVER THE HEATING COIL.
      b) WHEN THE ZONE TEMPERATURE IS GREATER THAN THE HEATING SETPOINT, THE FACE AND BYPASS DAMPERS SHALL CLOSE TO FACE POSITION (OPEN TO BYPASS POSITION).
      c) HEATING COIL VALVE:
      1) THE CONTROLLER SHALL MEASURE THE ZONE TEMPERATURE AND MODULATE THE HEATING COIL VALVE TO MAINTAIN ITS HEATING SETPOINT WITH THE FACE AND BYPASS DAMPER FULLY OPEN TO THE FACE (COIL) POSITION.
      d) THE HEATING SHALL BE ENABLED WHENEVER:
      1) OUTSIDE AIR TEMPERATURE IS LESS THAN 65°F (ADJ.).
      2) AND THE ZONE TEMPERATURE IS BELOW HEATING SETPOINT.
      3) AND THE FAN IS ON.
      4) THE HEATING COIL VALVE SHALL OPEN WHENEVER THE LOW TEMPERATURE THERMOSTAT IS ON.
   g. ECONOMIZER:
      a) THE CONTROLLER SHALL MEASURE THE ZONE TEMPERATURE AND MODULATE THE MIXED AIR DAMPERS IN SEQUENCE TO MAINTAIN THE ZONE COOLING SETPOINT. THE OUTSIDE AIR DAMPERS SHALL MAINTAIN A MINIMUM ADJUSTABLE POSITION OPEN BASED ON THE VENTILATION RATES DURING HEATING AND VENTILATION WHENEVER IN OCCUPIED AND NON-ECONOMIZER MODE.
      b) THE ECONOMIZER SHALL BE ENABLED WHENEVER:
      1) OUTSIDE AIR TEMPERATURE IS AT LEAST 2°F (ADJ.) LESS THAN THE ZONE TEMPERATURE.
      2) AND THE OUTSIDE AIR TEMPERATURE IS LESS THAN 64°F (ADJ.)
      3) THE OUTSIDE AIR DAMPER SHALL BE 100% OPEN AND THE RETURN DAMPER CLOSED WHEN IN ECONOMIZER MODE.
      c) THE ECONOMIZER SHALL CLOSE WHENEVER THE LOW TEMPERATURE THERMOSTAT IS ON.
      d) THE OUTSIDE AIR DAMPERS SHALL CLOSE AND THE RETURN AIR DAMPER SHALL OPEN WHEN THE UNIT IS OFF. IF OPTIMAL START UP IS AVAILABLE THE MIXED AIR DAMPER SHALL OPERATE AS DESCRIBED IN THE OCCUPIED MODE EXCEPT THAT THE OUTSIDE AIR DAMPER SHALL MODULATE TO FULLY CLOSED.
      e) THE CONTROLLER SHALL MONITOR THE DISCHARGE AIR TEMPERATURE. SHOULD DISCHARGE TEMPERATURE DROP BELOW A USER DEFINABLE TEMPERATURE (ADJ.), THE CONTROLLER SHALL ENABLE THE HEATING, CLOSE THE OUTSIDE DAMPER AND OPEN THE RETURN DAMPER.
2. MECHANICAL COOLING VIA VARIABLE REFRIGERANT VOLUME (VRV) HEAT PUMP SYSTEM:
   a) THE DDC SHALL INTEGRATE INTO THE BACNET CONTROLLER ON THE VRV HEAT PUMP SYSTEM TO PROVIDE START AND STOP OPERATION OF THE HEAT PUMP UNITS.
   b) WHEN ECONOMIZER OPERATION IS AVAILABLE THROUGH THE DDC SYSTEM, THE HEAT PUMP SHALL BE LOCKED OFF FROM MECHANICAL COOLING OPERATION. WHEN THE OUTSIDE AIR TEMPERATURE IS ABOVE 64 DEGREES F(ADJUSTABLE) AND ANY UNIT VENTILATOR IS CALLING FOR COOLING, THE HEAT PUMPS SHALL BE ENABLED TO OPERATE.
   c) WHEN AN INDIVIDUAL UNIT VENTILATOR IS CALLING FOR COOLING TO MEET THE SPACE TEMPERATURE SETPOINT, THE FOLLOWING SHALL OCCUR:
      1) THE DDC SYSTEM SHALL SEND A DRY CONTACT TO THE UNIT VENTILATOR VRV CONTROL KIT TO ENABLE COOLING VIA THE VRV EXPANSION VALVE KIT AND A SEPARATE DRY CONTACT SENT TO THE VRV CONTROL KIT TO ENABLE THE UNIT VENTILATOR SUPPLY FAN.
      2) THE DDC SYSTEM SHALL SEND A 0-10 VDC INPUT TO THE VRV EXPANSION VALVE KIT TO PROVIDE COOLING AS REQUIRED TO MEET THE SPACE SETPOINT.
3. MINIMUM OUTSIDE AIR VENTILATION – FIXED PERCENTAGE:
   a) THE OUTSIDE AIR DAMPERS SHALL MAINTAIN A MINIMUM POSITION (ADJ.) AS DETERMINED BY THE BALANCING OPERATIONS DURING BUILDING OCCUPIED HOURS WHEN IN NON-ECONOMIZER MODE AND BE CLOSED DURING UNOCCUPIED HOURS.
4. DISCHARGE AIR TEMPERATURE:
   a) THE CONTROLLER SHALL MONITOR THE DISCHARGE AIR TEMPERATURE.
   b) ALARMS SHALL BE PROVIDED AS FOLLOWS:
   1) HIGH DISCHARGE AIR TEMP: IF THE DISCHARGE AIR TEMPERATURE IS GREATER THAN 110°F (ADJ.).
   2) LOW DISCHARGE AIR TEMP: IF THE DISCHARGE AIR TEMPERATURE IS LESS THAN 40°F (ADJ.).
5. FAN STATUS:

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NANUET BOND PHASE3 MID SCHOOL
NANUET, NY

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
VB	VB	NSK	02/16/24	02/16/24

BM_UNIT VENTILATOR & HP (BOM/SOO)

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a) THE CONTROLLER SHALL MONITOR THE FAN STATUS.
b) ALARMS SHALL BE PROVIDED AS FOLLOWS:
c) FAN FAILURE: COMMANDED ON, BUT THE STATUS IS OFF.
d) FAN IN HAND: COMMANDED OFF, BUT THE STATUS IS ON.

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BM_UNIT VENTILATOR & HP (SOO)

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UNIT VENTILATORS (UV-MS-XX)

TYPICAL OF 40 QTY

LOCATION: 1ST/2ND FLOOR

SERVES: CLASSROOMS

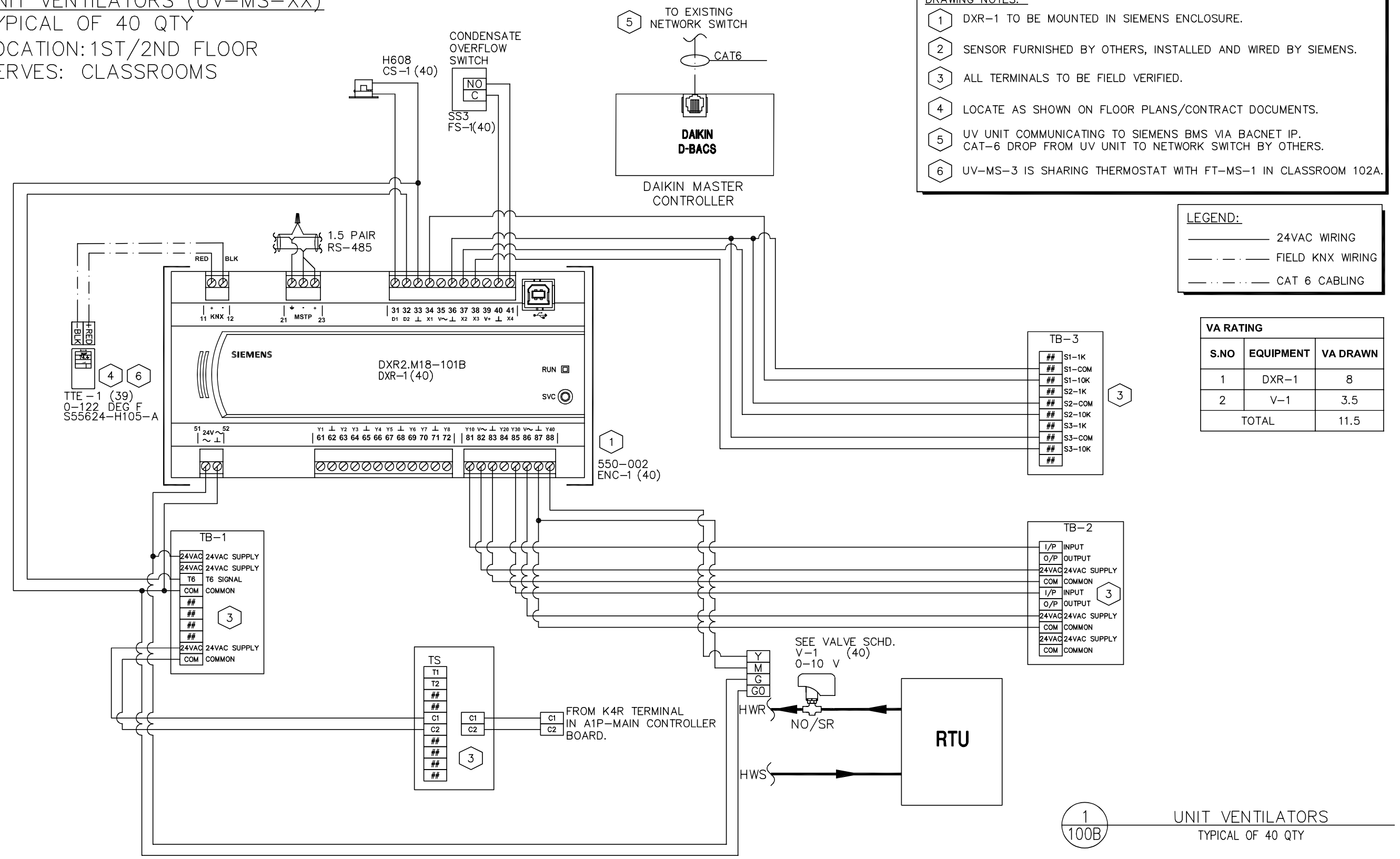
DRAWING NOTES:

1. DXR-1 TO BE MOUNTED IN SIEMENS ENCLOSURE.
2. SENSOR FURNISHED BY OTHERS, INSTALLED AND WIRED BY SIEMENS.
3. ALL TERMINALS TO BE FIELD VERIFIED.
4. LOCATE AS SHOWN ON FLOOR PLANS/CONTRACT DOCUMENTS.
5. UV UNIT COMMUNICATING TO SIEMENS BMS VIA BACNET IP. CAT-6 DROP FROM UV UNIT TO NETWORK SWITCH BY OTHERS.
6. UV-MS-3 IS SHARING THERMOSTAT WITH FT-MS-1 IN CLASSROOM 102A.

LEGEND:

- 24VAC WIRING
- FIELD KNX WIRING
- CAT 6 CABLING

VA RATING		
S.NO	EQUIPMENT	VA DRAWN
1	DXR-1	8
2	V-1	3.5
TOTAL		11.5



1 / 100B UNIT VENTILATORS

TYPICAL OF 40 QTY

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NANUET BOND PHASE3 MID SCHOOL
NANUET, NY

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
VB	VB	NSK	02/16/24	02/16/24

BM_UNIT VENTILATOR & HP (MECH)

440P-366733
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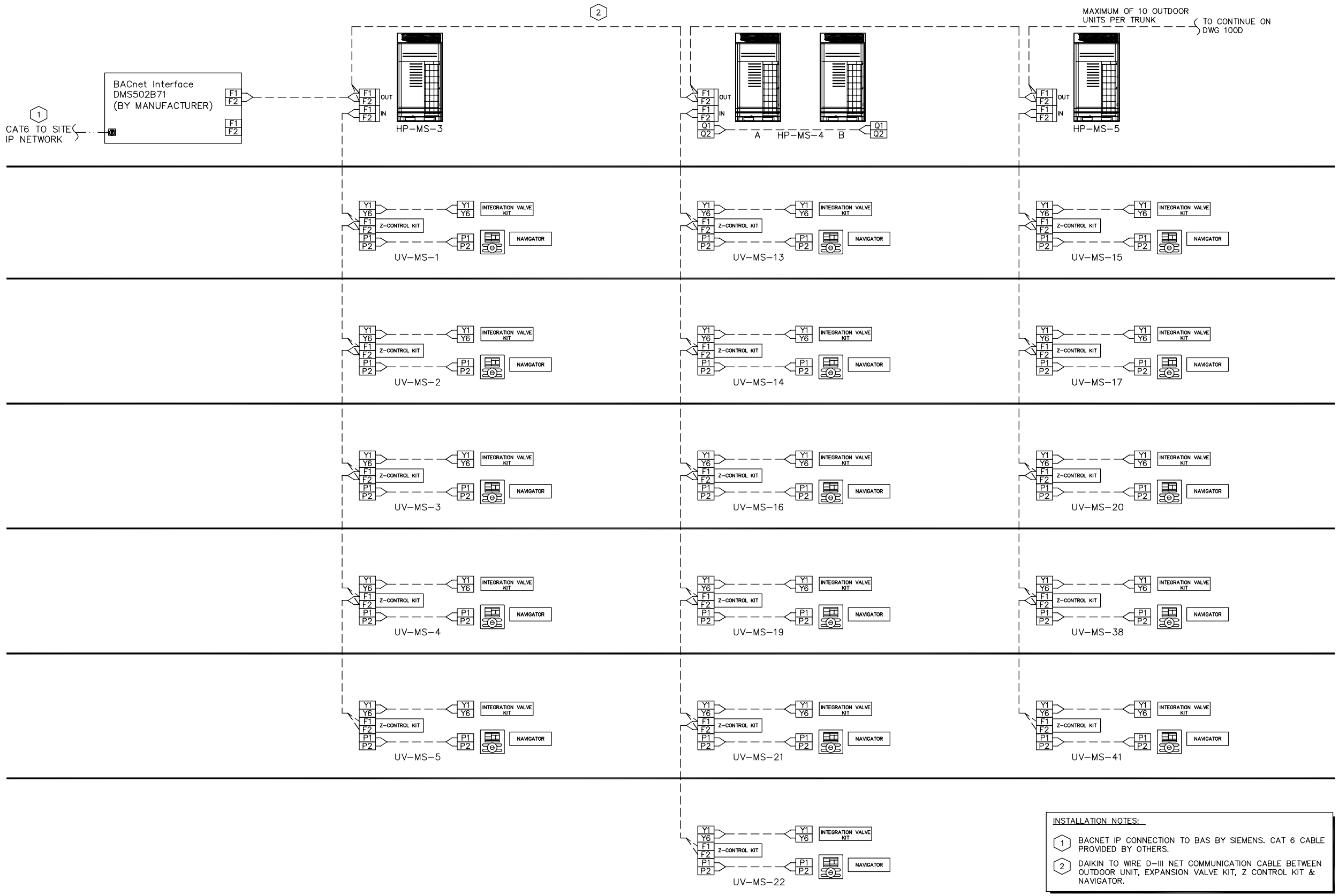
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COMMUNICATION WIRING:

— · · — · · — BLN: CAT-6 ETHERNET CABLE

– – – – – DIII-Net: DAIKIN PROPRIETARY COMM.



INSTALLATION NOTES:

1. BACNET IP CONNECTION TO BAS BY SIEMENS. CAT 6 CABLE PROVIDED BY OTHERS.
2. DAIKIN TO WIRE D-III NET COMMUNICATION CABLE BETWEEN OUTDOOR UNIT, EXPANSION VALVE KIT, Z CONTROL KIT & NAVIGATOR.

REVISION HISTORY

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NANUET BOND PHASE3 MID SCHOOL
NANUET, NY

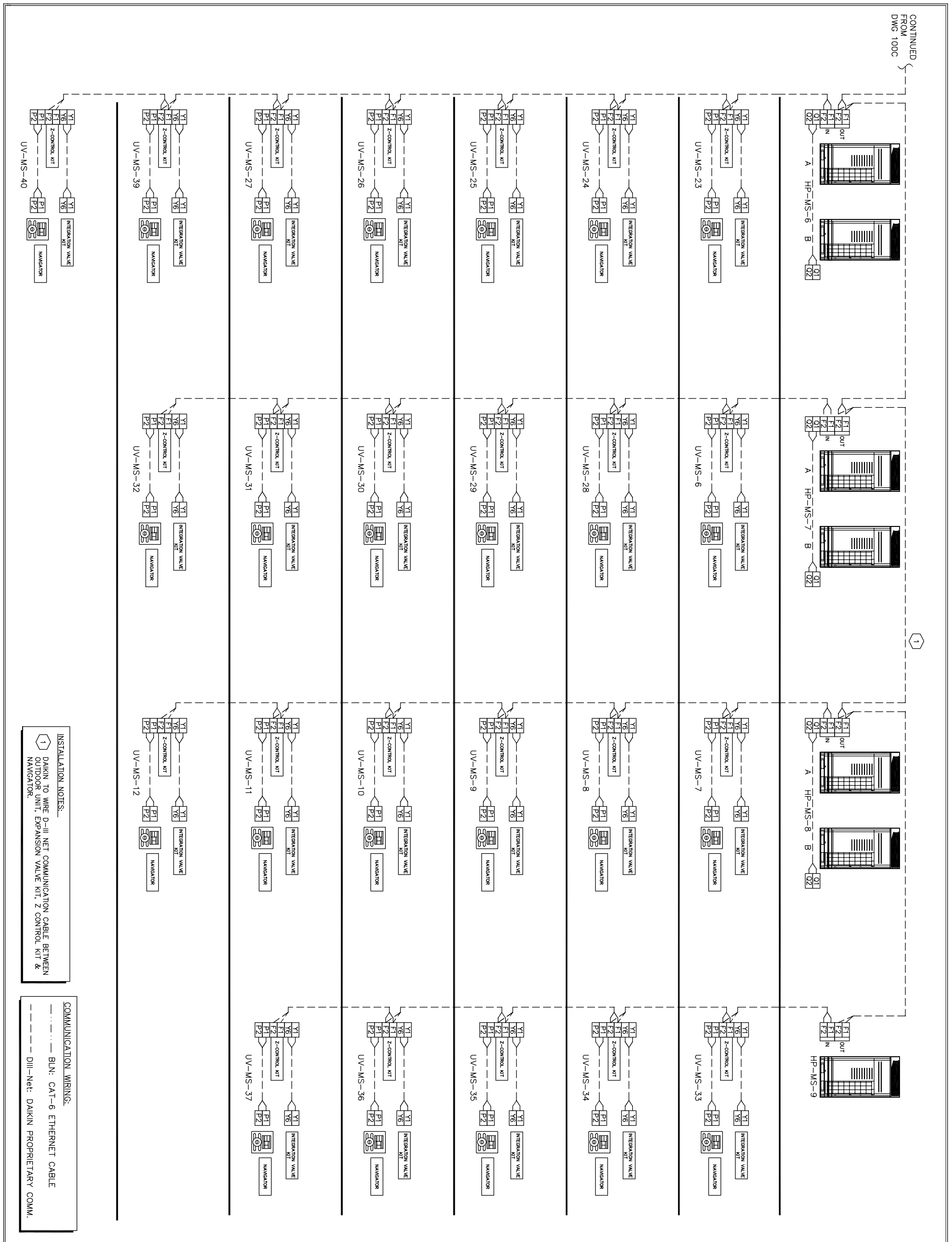
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BM_UNIT VENTILATOR & HP (RISER)

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INSTALLATION NOTES:

1. DAIKIN TO WIRE D-III NET COMMUNICATION CABLE BETWEEN OUTDOOR UNIT, EXPANSION VALVE KIT, Z CONTROL KIT & NAVIGATOR.

COMMUNICATION WIRING:

— · — · — BLN: CAT-6 ETHERNET CABLE

— — — — DIII-Net: DAIKIN PROPRIETARY COMM.

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NANUET BOND PHASE3 MID SCHOOL
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BM_UNIT VENTILATOR & HP (RISER)

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Control Device		Qty	Product Number	Manufacturer	Document Number	Description
Field Mounted Devices						
AE	1-3	3	GMA121.1P	SIEMENS	154004	2PT SR 24V,62LBIN,PLM
CS	1-3	3	H608	VERIS	1006cut016	CUR SW SPLTCOR-ADJ SETPT W/LED
RE	1-3	3	RIBU1C	FUNCTIONAL DEVICES	1208cut013	RIB 120VAC 24VAC/DC SPDT

SEQUENCE OF OPERATION

SCIENCE CLASSROOM EXHAUST FANS EF-MS-8/EF-MS-10:

A. WHEN THE DDC SYSTEM DETERMINES THE BUILDING TO BE IN OCCUPED MODE, ROOFTOP EXHAUST FANS EF-MS-8 AND EF-MS-10 SHALL OPERATE, AND THE ASSOCIATED MOTORIZED DAMPER OPENED.

B. EF-MS-8: FAN SPEED SHALL BE BASED ON VENTILATION CONDITIONS OF UV-MS-28 AND UV-MS-29. WHEN BOTH UVS ARE IN ECONOMIZER MODE, FAN SPEED SHALL BE SET TO EXHAUST 1,980 CFM. WHEN BOTH UVS ARE IN NON-ECONOMIZER, OCCUPIED VENTILATION MODE, FAN SPEED SHALL BE SET TO EXHAUST 1,075 CFM. THE TESTING AND BALANCING AGENCY SHALL NOTIFY THE DDC SYSTEM PROGRAMMER OF THE FAN SPEED AND 0-10 VDC INPUT VALUE REQUIRED TO EXHAUST EACH AIR RATE LISTED AND THE DDC PROGRAMMING SHALL ADJUST THE FAN SPEED TO THE REQUIRED RATE UNDER EACH CONDITION. WHEN THE UV OUTSIDE AIR DAMPERS ARE CLOSED THE EXHAUST FAN SHALL BE OFF.

C. EF-MS-10: FAN SPEED SHALL BE BASED ON VENTILATION CONDITIONS OF UV-MS-31 AND UV-MS-32. WHEN BOTH UVS ARE IN ECONOMIZER MODE, FAN SPEED SHALL BE SET TO EXHAUST 2,050 CFM. WHEN BOTH UVS ARE IN NON-ECONOMIZER, OCCUPIED VENTILATION MODE, FAN SPEED SHALL BE SET TO EXHAUST 1,065 CFM. THE TESTING AND BALANCING AGENCY SHALL NOTIFY THE DDC SYSTEM PROGRAMMER OF THE FAN SPEED AND 0-10 VDC INPUT VALUE REQUIRED TO EXHAUST EACH AIR RATE LISTED AND THE DDC PROGRAMMING SHALL ADJUST THE FAN SPEED TO THE REQUIRED RATE UNDER EACH CONDITION. WHEN THE UV OUTSIDE AIR DAMPERS ARE CLOSED THE EXHAUST FAN SHALL BE OFF.

BOYS LOCKER ROOM EXHAUST FAN EF-MS-21:

A. WHEN THE DDC SYSTEM DETERMINES THE BUILDING TO BE IN OCCUPED MODE, ROOFTOP EXHAUST FANS EF-MS-21 SHALL OPERATE, AND THE ASSOCIATED MOTORIZED DAMPER OPENED.

REVISION HISTORY

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SMART INFRASTRUCTURE

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MORRISTOWN
NJ. 07960 USA
Phone: (973) 575-6300
Fax: (973) 575-7968

NANUET BOND PHASE3 MID SCHOOL
NANUET, NY

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
VB	VB	NSK	02/16/24	02/16/24

BM_EF-MS-8,10,21 (BOM)

440P-366733
0
101

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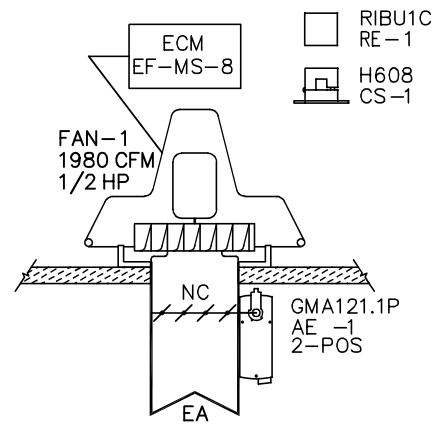
EXHAUST FAN (EF-MS-8)
LOCATION: ROOF
SERVICE: SCIENCE LABS 222/224
RELIEF AIR

EXHAUST FAN (EF-MS-10)
LOCATION: ROOF
SERVICE: SCIENCE LABS 228/230,
PREP 228A RELIEF AIR

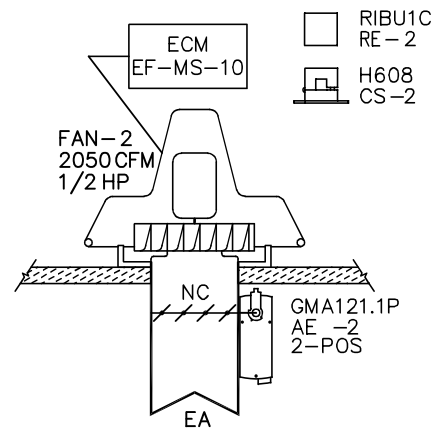
EXHAUST FAN (EF-MS-21)
LOCATION: ROOF
SERVICE: BOYS LOCKER ROOM

GENERAL NOTES:

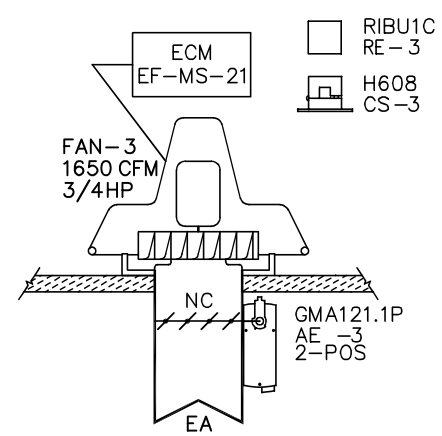
1. SEE WIRING DETAIL ON ELECTRICAL DRAWING 101B.



1 / 101A EXHAUST FAN (EF-MS-8)
LOCATION: ROOF
SERVES: SCIENCE LABS 222/224 RELIEF AIR



2 / 101A EXHAUST FAN (EF-MS-10)
LOCATION: ROOF
SERVES: SCIENCE LABS 228/230, PREP 228A RELIEF AIR



3 / 101A EXHAUST FAN (EF-MS-21)
LOCATION: ROOF
SERVES: BOYS LOCKER ROOM

REVISION HISTORY

R0	2/16/2024	VB	ISSUED FOR APPROVAL

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NANUET BOND PHASE3 MID SCHOOL
NANUET, NY

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
VB	VB	NSK	02/16/24	02/16/24

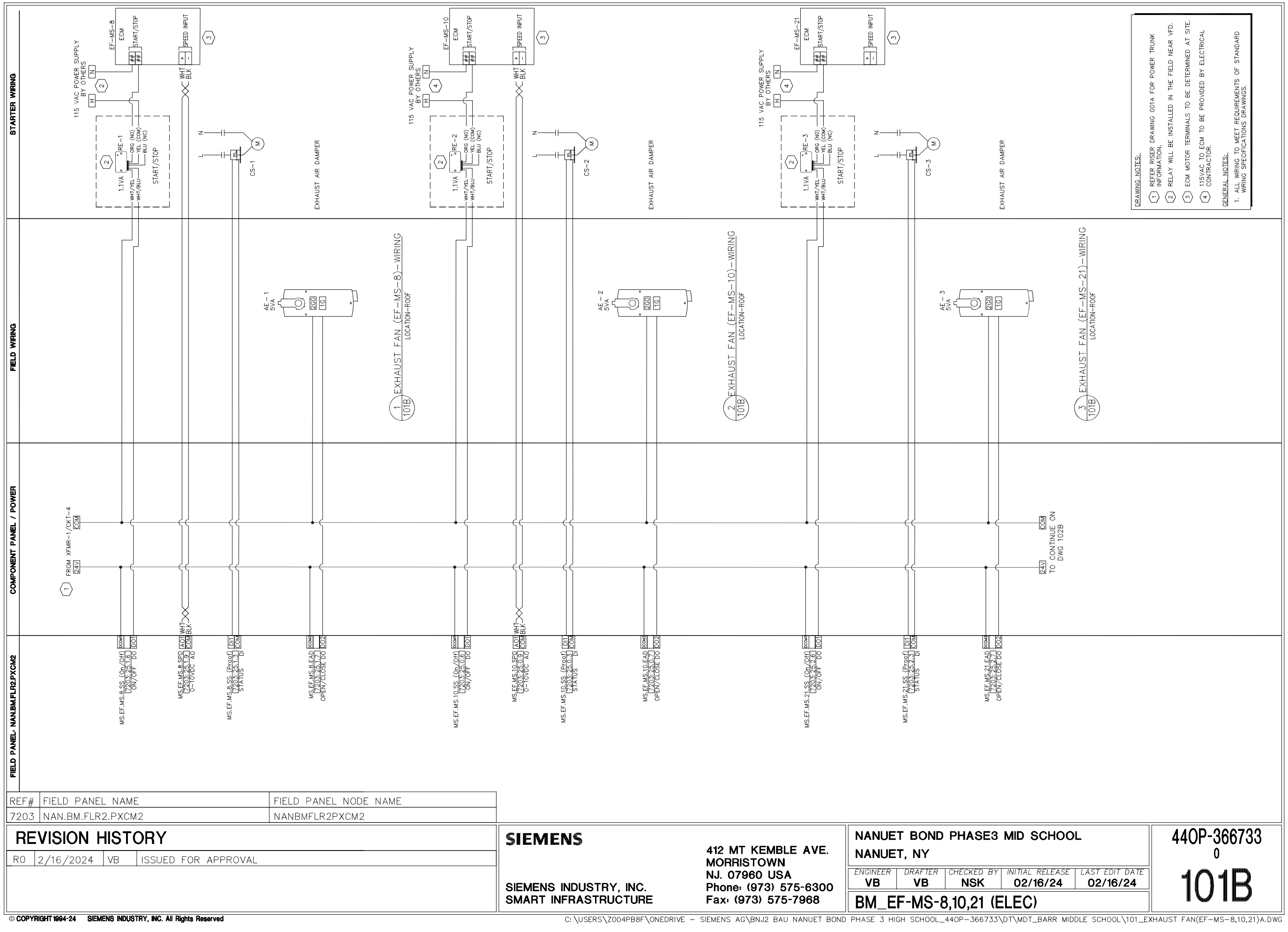
BM_EF-MS-8,10,21 (MECH)

440P-366733
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C:\USERS\Z004PB8F\ONEDRIVE - SIEMENS AG\BNJ2 BAU NANUET BOND PHASE 3 HIGH SCHOOL_440P-366733\DT\MDT_BARR MIDDLE SCHOOL\101_EXHAUST FAN(EF-MS-8,10,21).DWG



REF#	FIELD PANEL NAME	FIELD PANEL NODE NAME
7203	NAN.BM.FLR2.PXCM2	NANBMFLR2PXCM2

REVISION HISTORY

R0	2/16/2024	VB	ISSUED FOR APPROVAL

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NANUET BOND PHASE3 MID SCHOOL
NANUET, NY

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
VB	VB	NSK	02/16/24	02/16/24

BM_EF-MS-8,10,21 (ELEC)

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Control Device	Qty	Product Number	Manufacturer	Document Number	Description
Field Mounted Devices					
AE 1	1	GMA121.1P	SIEMENS	154004	2PT SR 24V,62LBIN,PLM
CS 1	1	H608	VERIS	1006cut016	CUR SW SPLTCOR-ADJ SETPT W/LED
RE 1	1	RIBU1C	FUNCTIONAL DEVICES	1208cut013	RIB 120VAC 24VAC/DC SPDT

SEQUENCE OF OPERATION

CAFETERIA RELIEF AIR FAN EF-MS-23:

A. THE STATUS OF EXISTING AIR HANDLING UNIT SUPPLY FAN SYSTEM S-1 SHALL BE MONITORED AND WHENEVER THE SUPPLY FAN STATUS IS ON, EF-MS-23 SHALL OPERATE WITH THE MOTORIZED DAMPER OPEN. THE DDC SYSTEM SHALL MONITOR THE EF-MS-23 FAN SPEED THROUGH THE VARIABLE FREQUENCY DRIVE.

REVISION HISTORY

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NANUET, NY

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
VB	VB	NSK	02/16/24	02/16/24

BM_EXHAUST FAN (EF-MS-23) (BOM)

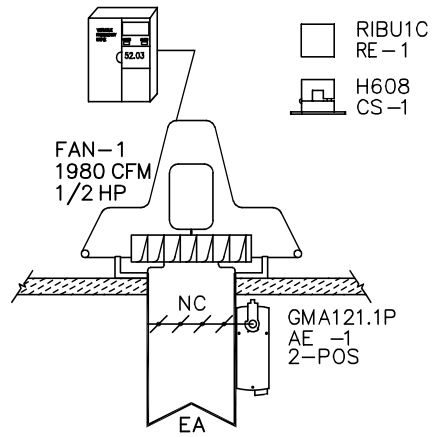
44OP-366733
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102

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EXHAUST FAN (EF-MS-23)
LOCATION: ROOF
SERVICE: CAFETERIA 108 RELIEF AIR

GENERAL NOTES:

1. SEE WIRING DETAIL ON ELECTRICAL DRAWING 102B.



1 / 102A EXHAUST FAN (EF-MS-23)
LOCATION: ROOF
SERVES: CAFETERIA 108 RELIEF AIR

REVISION HISTORY

R0	2/16/2024	VB	ISSUED FOR APPROVAL

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NANUET BOND PHASE3 MID SCHOOL
NANUET, NY

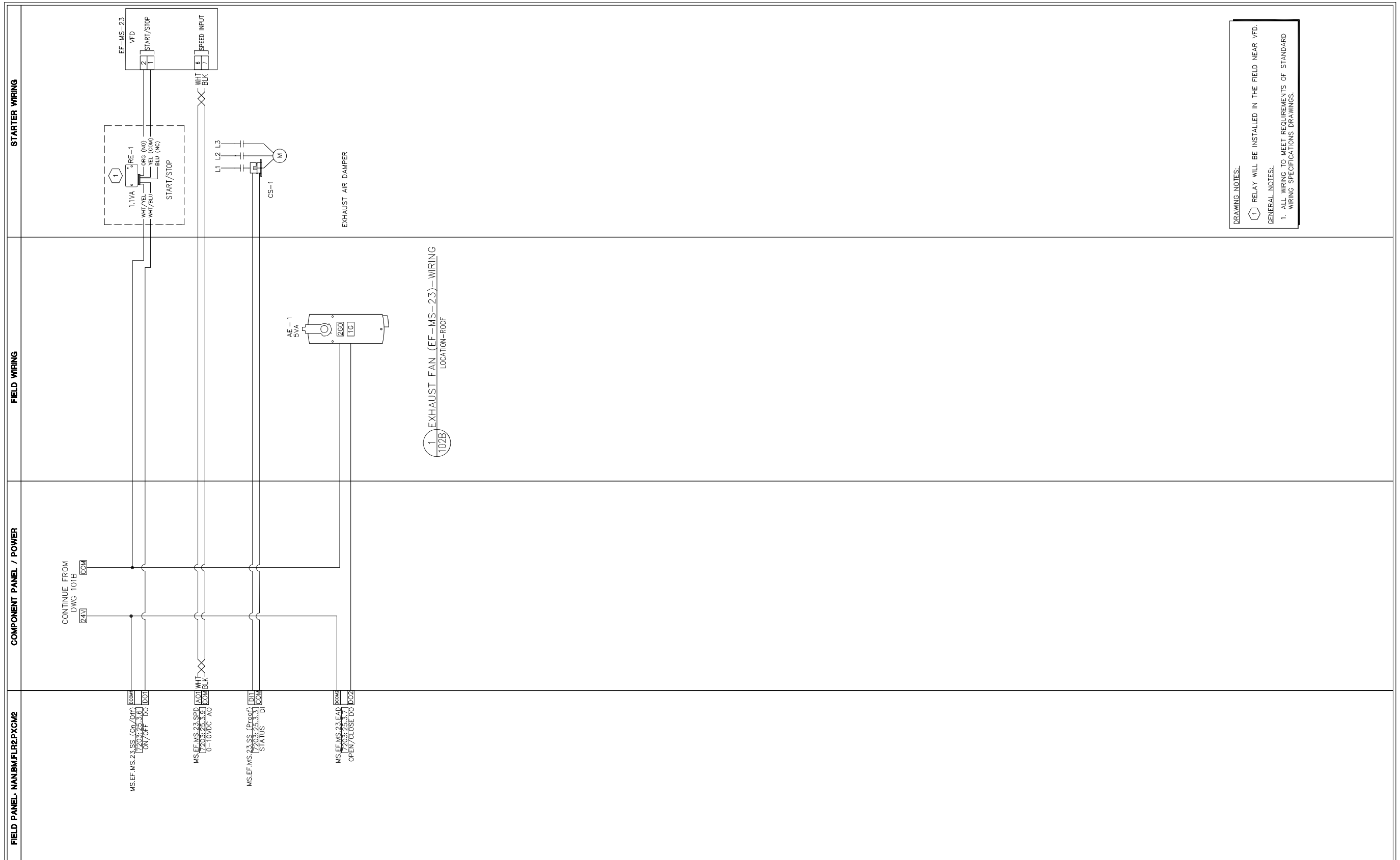
ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
VB	VB	NSK	02/16/24	02/16/24

BM_EXHAUST FAN (EF-MS-23) (MECH)

440P-366733
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102A

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REF#	FIELD PANEL NAME	FIELD PANEL NODE NAME
7203	NAN.BM.FLR2.PXCM2	NANBMFLR2PXCM2

REVISION HISTORY

R0	2/16/2024	VB	ISSUED FOR APPROVAL

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NANUET BOND PHASE3 MID SCHOOL
NANUET, NY

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
VB	VB	NSK	02/16/24	02/16/24

BM_EXHAUST FAN (EF-MS-23) (ELEC)

440P-366733
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102B

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Control Device		Qty	Product Number	Manufacturer	Document Number	Description
Field Mounted Devices						
AE	1-6	6	GMA121.1P	SIEMENS	154004	2PT SR 24V,62LBIN,PLM
CS	1-6	6	H608	VERIS	1006cut016	CUR SW SPLTCOR-ADJ SETPT W/LED
RE	1-6	6	RIBU1C	FUNCTIONAL DEVICES	1208cut013	RIB 120VAC 24VAC/DC SPDT

SEQUENCE OF OPERATION

EXISTING EXHAUST FANS:

A. EF-11, 15, 16: FANS SHALL OPERATE WHEN BUILDING IS IN OCCUPIED MODE AND BE OFF IN UNOCCUPIED MODE. DAMPER SHALL OPEN WHEN FAN IS CALLED TO RUN AND BE CLOSED WHEN FAN IS OFF.

B. EF-5, 6, 7: FANS SHALL OPERATE WHEN BUILDING IS IN OCCUPIED MODE AND BE OFF IN UNOCCUPIED MODE. DAMPER SHALL OPEN WHEN FAN IS CALLED TO RUN AND BE CLOSED WHEN FAN IS OFF.

REVISION HISTORY

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NANUET, NY

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
VB	VB	NSK	02/16/24	02/16/24

BM_ EX EF-5,6,7,11,15,16 (BOM)

44OP-366733
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103

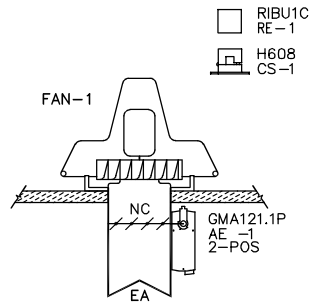
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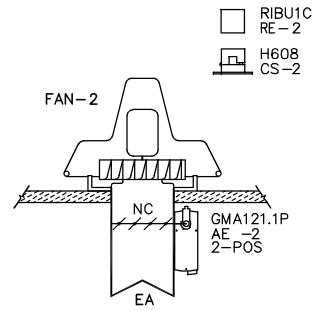
EXISTING EXHAUST FAN (EF-5,6,7,11,15,16)
LOCATION: ROOF

GENERAL NOTES:

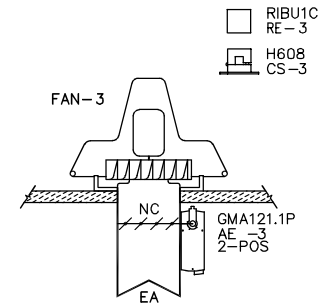
1. SEE WIRING DETAIL ON ELECTRICAL DRAWING 103B.



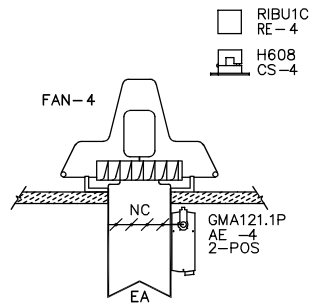
1 / 103A EXISTING EXHAUST FAN (EF-16)
LOCATION: ROOF



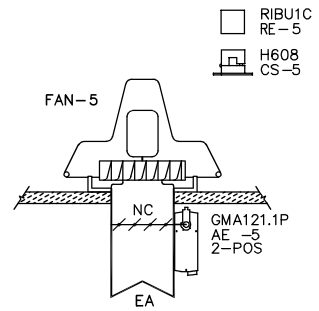
2 / 103A EXISTING EXHAUST FAN (EF-15)
LOCATION: ROOF



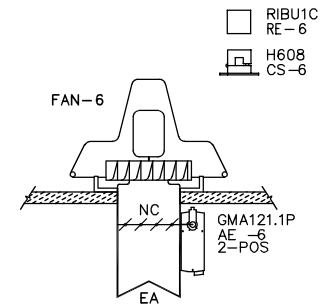
3 / 103A EXISTING EXHAUST FAN (EF-11)
LOCATION: ROOF



4 / 103A EXISTING EXHAUST FAN (EF-7)
LOCATION: ROOF



5 / 103A EXISTING EXHAUST FAN (EF-5)
LOCATION: ROOF



6 / 103A EXISTING EXHAUST FAN (EF-6)
LOCATION: ROOF

REVISION HISTORY

R0	2/16/2024	VB	ISSUED FOR APPROVAL

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NANUET BOND PHASE3 MID SCHOOL
NANUET, NY

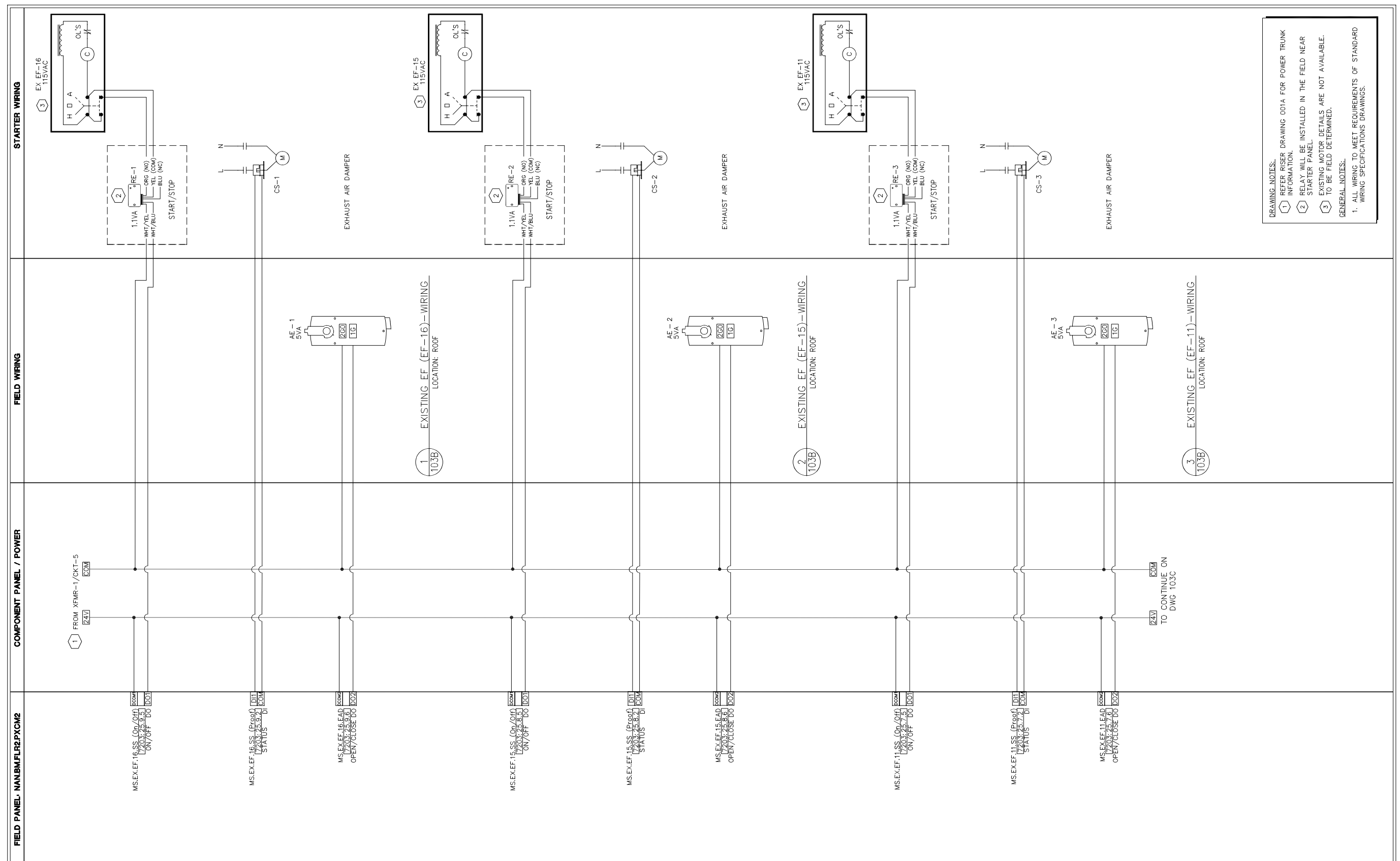
ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
VB	VB	NSK	02/16/24	02/16/24

BM_EX EF-5,6,7,11,15,16 (MECH)

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REF#	FIELD PANEL NAME	FIELD PANEL NODE NAME
7203	NAN.BM.FLR2.PXCM2	NANBMFLR2PXCM2

REVISION HISTORY

R0	2/16/2024	VB	ISSUED FOR APPROVAL

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NANUET, NY

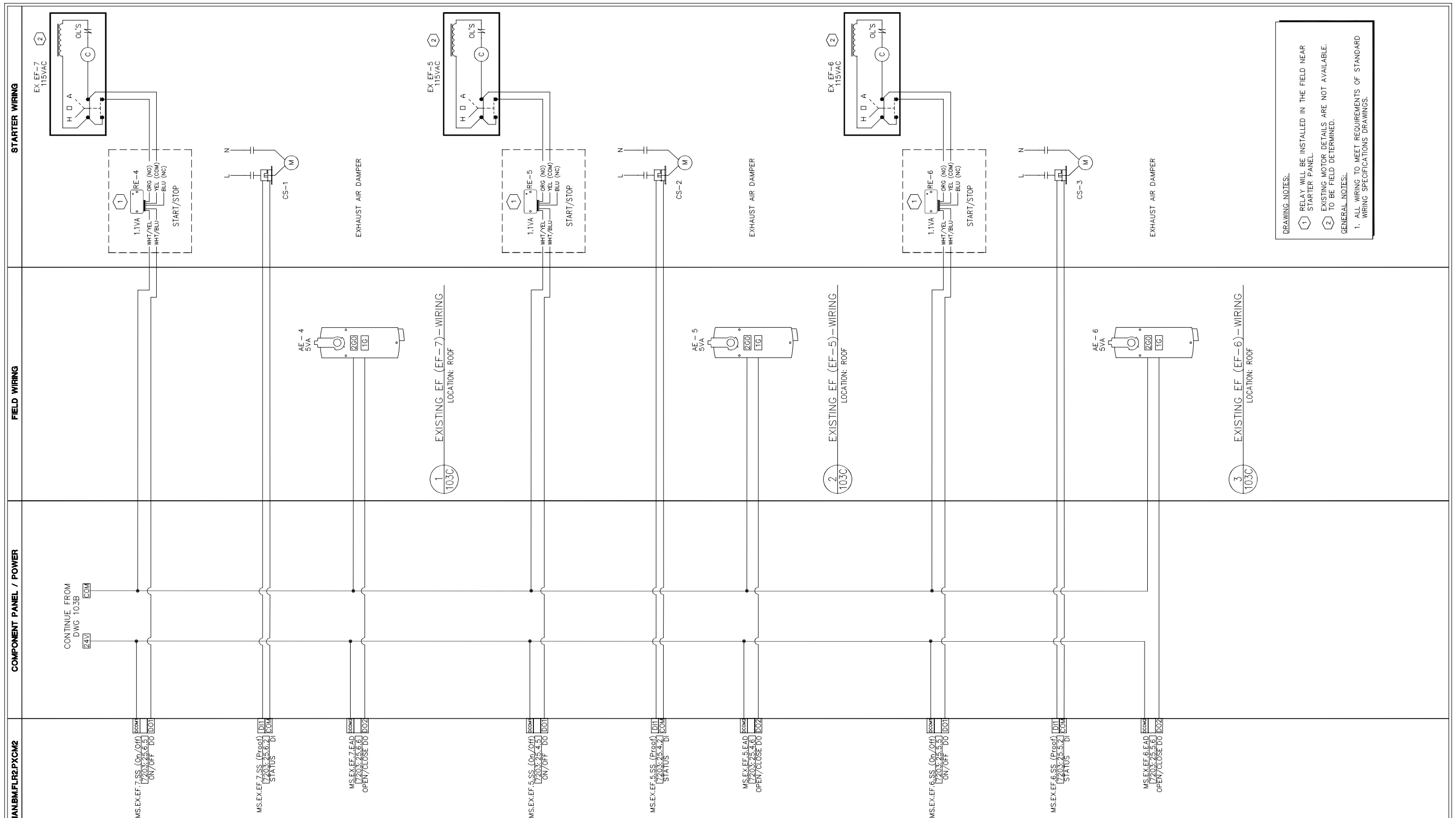
ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
VB	VB	NSK	02/16/24	02/16/24

BM_ EX EF-5,6,7,11,15,16 (ELEC)

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REF#	FIELD PANEL NAME	FIELD PANEL NODE NAME
7203	NAN.BM.FLR2.PXCM2	NANBMFLR2PXCM2

REVISION HISTORY

R0	2/16/2024	VB	ISSUED FOR APPROVAL

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NANUET BOND PHASE3 MID SCHOOL
NANUET, NY

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
VB	VB	NSK	02/16/24	02/16/24

BM_ EX EF-5,6,7,11,15,16 (ELEC)

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Control Device	Qty	Product Number	Manufacturer	Document Number	Description
Field Mounted Devices					
TTE 1	15	RDB160BNU	SIEMENS	N/A	Room Thermostat with BACnet MS/TP Comm
V					SEE VALVE SUBMITTAL

SEQUENCE OF OPERATION

FIN TUBE RADIATION:

A. MODULATE NORMALLY OPEN 2-WAY MODULATING CONTROL VALVE TO MAINTAIN ROOM AT SETPOINT IN OCCUPIED MODE OF 70 DEGREES F (ADJUSTABLE) AS WELL AS UNOCCUPIED REDUCED TEMPERATURE SETPOINT CONDITIONS OF 62 DEGREES F (ADJUSTABLE).

B. FOR SPACES SERVED BY HEATING COILS WITHIN AIR HANDLING UNITS OR ROOFTOP UNITS, THE FLOOR RADIATION SHALL BE THE FIRST STAGE OF HEATING AND THE AIR SYSTEM THE SECOND STAGE OF HEATING, INCLUDING THE EXISTING LIBRARY 241 RTU-1 AND EXISTING CAFETERIA 108 AIR HANDLING UNIT SYSTEM S-1.

REVISION HISTORY

R0	2/16/2024	VB	ISSUED FOR APPROVAL

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NANUET, NY

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
VB	VB	NSK	02/16/24	02/16/24

BM_FIN TUBE RADIATORS (BOM/SOO)

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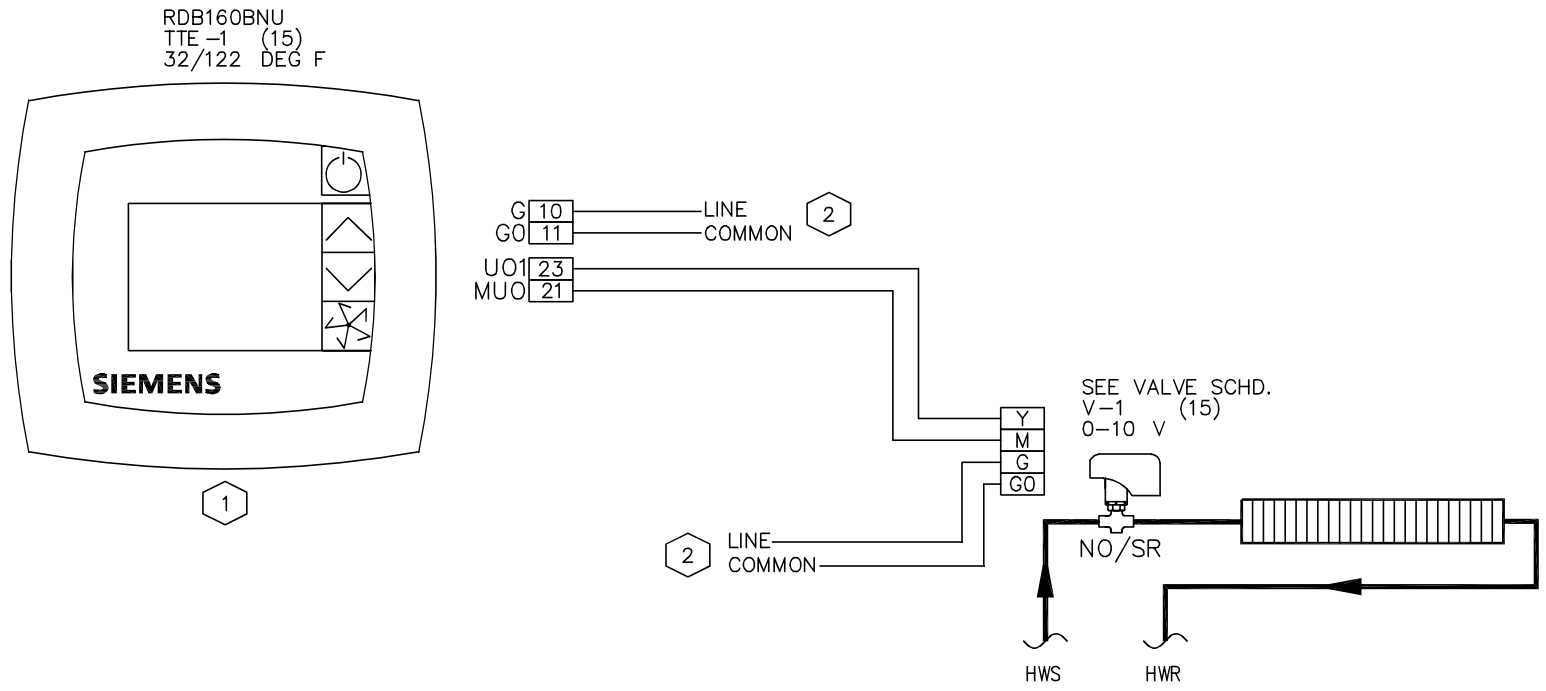
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NEW FIN TUBE RADIATOR (FT-MS-1)
EXISTING FIN TUBE RADIATOR (EX FTR)
TYPICAL OF 14 QTY
LOCATION: 1ST & 2ND FLOOR

DRAWING NOTES:

1. THERMOSTAT TO BE MOUNTED AS PER LOCATION SHOWN ON FLOOR PLAN DRAWINGS.
2. REFER TO BUILDING POWER TRUNK DRAWING FOR 24 VAC POWER.

VA RATING		
S.NO	EQUIPMENT	VA DRAWN
1	TTE-1	2.5
2	V-1	3.5
TOTAL		6



1 / 400A FIN TUBE RADIATORS
LOCATION: SEE FLN SCHEDULE

REVISION HISTORY			
R0	2/16/2024	VB	ISSUED FOR APPROVAL

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NANUET BOND PHASE3 MID SCHOOL
NANUET, NY

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
VB	VB	NSK	02/16/24	02/16/24

BM_FIN TUBE RADIATORS (MECH/ELEC)

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Control Device	Qty	Product Number	Manufacturer	Document Number	Description
Field Mounted Devices					
TTE 1	1	RDB160BNU	SIEMENS	N/A	FCU ROOM THERMOSTAT WITH BACNET MS/TP
V					SEE VALVE SUBMITTAL

SEQUENCE OF OPERATION

RADIATOR COILS/FLOOR RADIATION:

A. MODULATE NORMALLY OPEN 2-WAY MODULATING CONTROL VALVE TO MAINTAIN ROOM AT SETPOINT IN OCCUPIED MODE OF 70 DEGREES F (ADJUSTABLE) AS WELL AS UNOCCUPIED REDUCED TEMPERATURE SETPOINT CONDITIONS OF 62 DEGREES F (ADJUSTABLE).

B. FOR SPACES SERVED BY HEATING COILS WITHIN AIR HANDLING UNITS OR ROOFTOP UNITS, THE FLOOR RADIATION SHALL BE THE FIRST STAGE OF HEATING AND THE AIR SYSTEM THE SECOND STAGE OF HEATING, INCLUDING THE EXISTING LIBRARY 241 RTU-1 AND EXISTING CAFETERIA 108 AIR HANDLING UNIT SYSTEM S-1.

REVISION HISTORY

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NANUET, NY

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
VB	VB	NSK	02/16/24	02/16/24

BM_RADIATOR COILS (BOM/SOO)

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401

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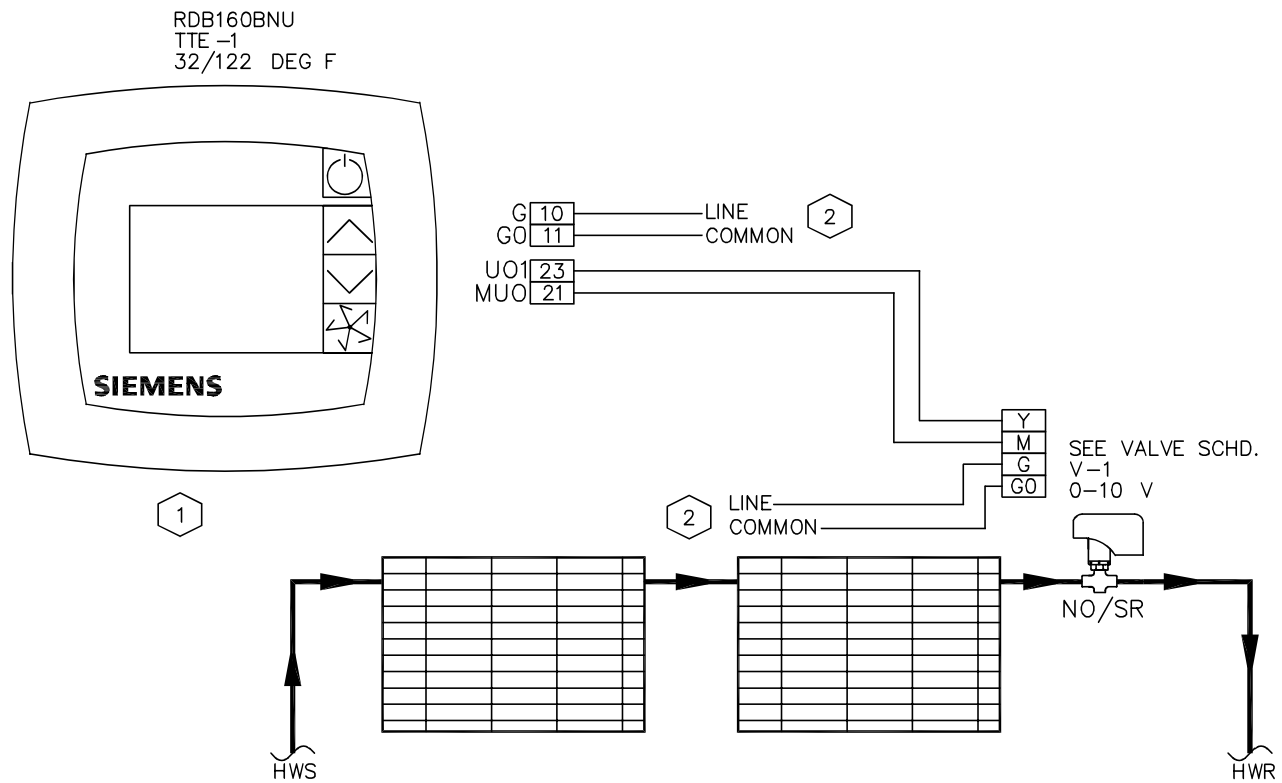
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HEATING WATER RADIATION (R-MS-1,2)
LOCATION: 2ND FLOOR

DRAWING NOTES:

1. THERMOSTAT TO BE MOUNTED AS PER LOCATION SHOWN ON FLOOR PLAN DRAWINGS.
2. REFER TO BUILDING POWER TRUNK DRAWING FOR 24 VAC POWER.

VA RATING		
S.NO	EQUIPMENT	VA DRAWN
1	TTE-1	2.5
2	V-1	3.5
TOTAL		6



1 / 401A HEATING WATER RADIATION
LOCATION: SEE FLN SCHEDULE

REVISION HISTORY

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NANUET BOND PHASE3 MID SCHOOL
NANUET, NY

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
VB	VB	NSK	02/16/24	02/16/24

BM_RADIATOR COILS (MECH/ELEC)

440P-366733
0
401A

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Control Device	Qty	Product Number	Manufacturer	Document Number	Description
Field Mounted Devices					
AE 1	1	GMA121.1P	SIEMENS	154004	2PT SR 24V,62LBIN,PLM
AE 2	10	GCA161.1P	SIEMENS	154001	MOD(V) SR,24V, MED. PLNM
TTE 1	5	QAA2212.EWSN	SIEMENS	149708	RTS, 1K OHM PT (385), BLANK FRONT
Panel Mounted Devices					
RE 1	3	RIBU1C	FUNCTIONAL DEVICES	1208cut013	RIB 120VAC 24VAC/DC SPDT

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NANUET, NY

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
VB	VB	NSK	02/16/24	02/16/24

BM_MISC EXISTING EQUIP (BOM)

44OP-366733
0
500

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GENERAL NOTES:

1. BELOW TABLE SHOWS REPLACEMENT SENSORS/FIELD DEVICES FOR EACH SYSTEMS MENTIONED IN MECHANICAL DRAWING NOTES. TERMINAL DETAILS WAS NOT AVAILABLE AND ARE TO BE FIELD DETERMINED.
2. SIEMENS HAS FURNISHED REPLACEMENT SENSORS AS PER BELOW TABLE. SIEMENS WILL UPDATE THE WIRING DRAWINGS ONCE EXISTING TERMINAL DETAILS ARE RECEIVED.

Si No	Existing Equipment	Equipment Tag	Location	Floor Plan DWG	Controller Name	Replacement Sensors/Field Devices							Comments
						Valve	Terminal Details on Existing CTRL	Damper Actuator	Terminal Details on Existing CTRL	Thermostat	Terminal Details on Existing CTRL	Relay	
Barr Middle School													
1	AHU	S-1	1st Flr-SE	BM-M112	NA	3-Way	NA	OAD	NA	-	NA	-	Existing controller type and terminal details are not available.
2	AHU	S-2	1st Flr-SE	BM-M112	NA	3-Way	NA	OAD, RAD	NA	Yes	NA	-	Existing controller type and terminal details are not available.
3	AHU	S-3	1st Flr-NE	BM-M111	NA	3-Way	NA	OAD, RAD	NA	-	NA	-	Existing controller type and terminal details are not available.
4	AHU	S-4	1st Flr-NE	BM-M111	NA	3-Way	NA	OAD	NA	Yes	NA	-	Existing controller type and terminal details are not available.
5	AHU	S-6	Basement	BM-M110	NA	3-Way	NA	OAD, RAD	NA	Yes	NA	Yes	Existing controller type and terminal details are not available.
6	AHU	S-7	Basement	BM-M110	NA	3-Way	NA	OAD	NA	Yes	NA	Yes	Existing controller type and terminal details are not available.
7	AHU	S-8	Basement	BM-M110	NA	3-Way	NA	OAD	NA	Yes	NA	Yes	Existing controller type and terminal details are not available.
8	AHU	S-9	Basement	BM-M110	NA	3-Way	NA	-	NA	-	NA	-	Existing controller type and terminal details are not available.
9	Hot Water System	EX-B-1, EX-B-2	Basement	BM-M110	BARRMSPXM10	3-Way	0.1.5	-	NA	-	NA	-	Existing controller type and terminal details are not available.
10	Hot Water Storage Tank	EX-HWST	Basement	BM-M110	NA	2-Way	NA	-	NA	-	NA	-	Existing controller type and terminal details are not available.
11	Heat Exchanger	Ex-HEX	Basement	BM-M110	NA	2-Way	NA	-	NA	-	NA	-	Existing controller type and terminal details are not available.

1 / 500A REPLACEMENT SENSORS TABLE

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NANUET BOND PHASE3 MID SCHOOL
NANUET, NY

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
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BM_MISC EXISTING EQUIP (TABLE)

440P-366733
0
500A

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C:\Users\z004pb8f\OneDrive – Siemens AG\BNJ2 BAU Nanuet Bond Phase 3 High School_440P-366733\DT\MDT_BARR MIDDLE SCHOOL\500_MISC EXISTING EQUIP.dwg

Control Device	Qty	Product Number	Manufacturer	Document Number	Description
Field Mounted Devices					
ENC 1	1	PXA-ENC19	SIEMENS	149475	ENCLOSURE ASSY 19"
Panel Mounted Devices					
PXCM 1	1	PXC00-E96.A	SIEMENS	149478	PXC MOD, BACNET, 96 NODE, APOGEE
SB 1	1	PXA-SB115V192VA	SIEMENS	588783	SERVICE BOX 115V, 24VAC, 192VA

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NAN.BM.FLR1.PXCM1 (BOM)

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PXCM -00000 PXC00-E96.A

PXC MODULAR

Module: 1 / Rail: 1

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NANUET, NY

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
VB	VB	NSK	02/16/24	02/16/24

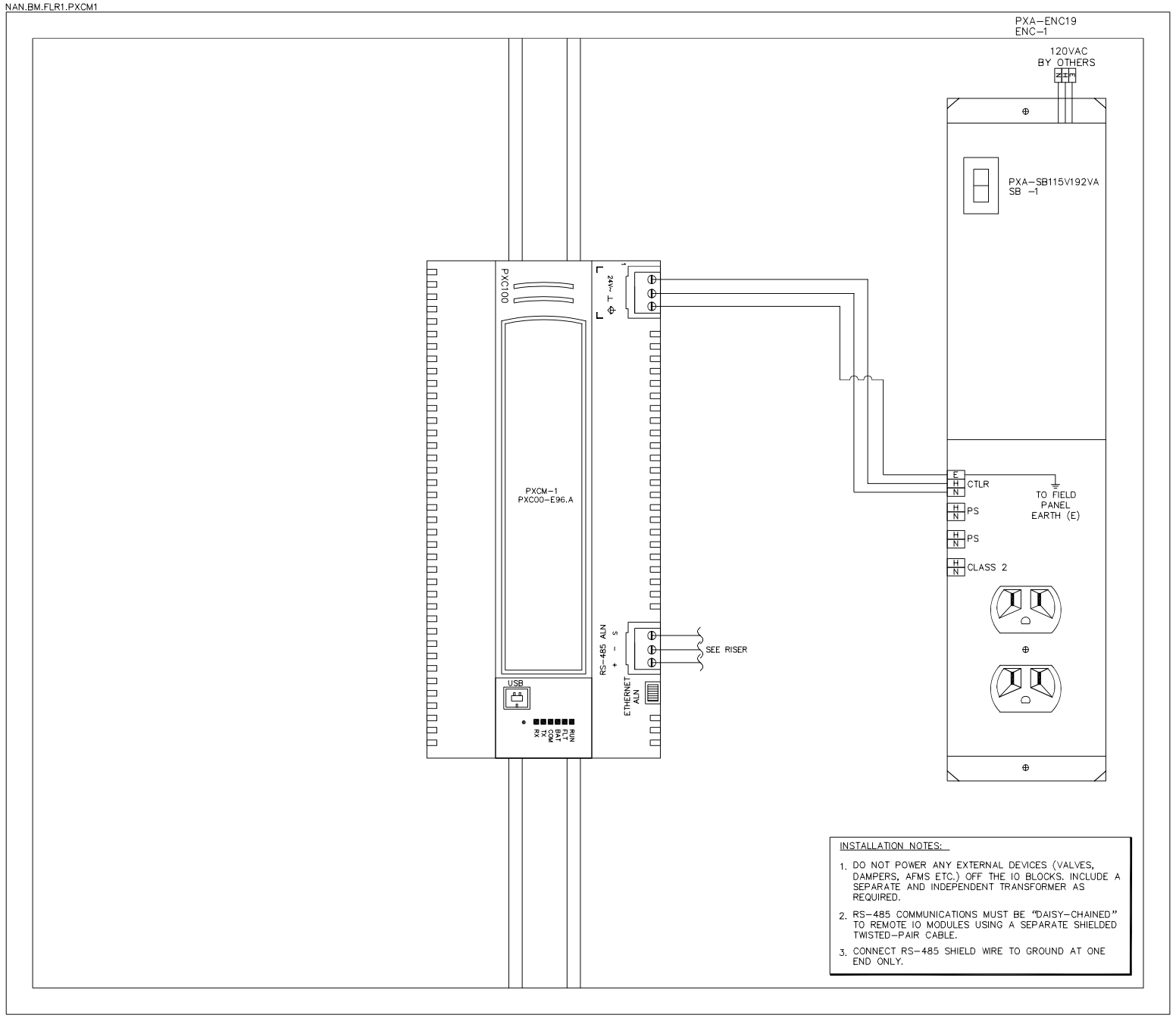
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440P-366733
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NAN.BM.FLR1.PXCM1



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NANUET, NY

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
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NAN.BM.FLR1.PXCM1 (INSTALLATION)

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Control Device	Qty	Product Number	Manufacturer	Document Number	Description
Field Mounted Devices					
ENC 2	1	PXA-ENC19	SIEMENS	149475	ENCLOSURE ASSY 19"
Panel Mounted Devices					
PPM 1	1	PPM-2U3322.BPR	SIEMENS	149220	MSTP PPM, 2UI 3DI 3DO 2AO 2AI,REMOVABLE
PPM 2	1	PPM-2U3322.BPR	SIEMENS	149220	MSTP PPM, 2UI 3DI 3DO 2AO 2AI,REMOVABLE
PPM 3	1	PPM-2U3322.BPR	SIEMENS	149220	MSTP PPM, 2UI 3DI 3DO 2AO 2AI,REMOVABLE
PPM 4	1	PPM-2U3322.BPR	SIEMENS	149220	MSTP PPM, 2UI 3DI 3DO 2AO 2AI,REMOVABLE
PPM 5	1	PPM-1U32.BPR	SIEMENS	149220	MSTP PPM, 1UI 3DI 2DO (U.S)
PPM 6	1	PPM-1U32.BPR	SIEMENS	149220	MSTP PPM, 1UI 3DI 2DO (U.S)
PPM 7	1	PPM-1U32.BPR	SIEMENS	149220	MSTP PPM, 1UI 3DI 2DO (U.S)
PPM 8	1	PPM-1U32.BPR	SIEMENS	149220	MSTP PPM, 1UI 3DI 2DO (U.S)
PPM 9	1	PPM-1U32.BPR	SIEMENS	149220	MSTP PPM, 1UI 3DI 2DO (U.S)
PPM 10	1	PPM-1U32.BPR	SIEMENS	149220	MSTP PPM, 1UI 3DI 2DO (U.S)
PXCM 2	1	PXC00-E96.A	SIEMENS	149478	PXC MOD, BACNET, 96 NODE, APOGEE
	1	PXX-485.3	SIEMENS	149478	PXC MOD EXPANSION MODULE, 3 RS-485
SB 2	1	PXA-SB115V192VA	SIEMENS	588783	SERVICE BOX 115V, 24VAC, 192VA

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NANUET BOND PHASE3 MID SCHOOL
NANUET, NY

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NAN.BM.FLR2.PXCM2 (BOM)

440P-366733
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N02

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PXCM -00000 PXC00-E96.A

PXC MODULAR

Module: 1 / Rail: 1

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NANUET BOND PHASE3 MID SCHOOL
NANUET, NY

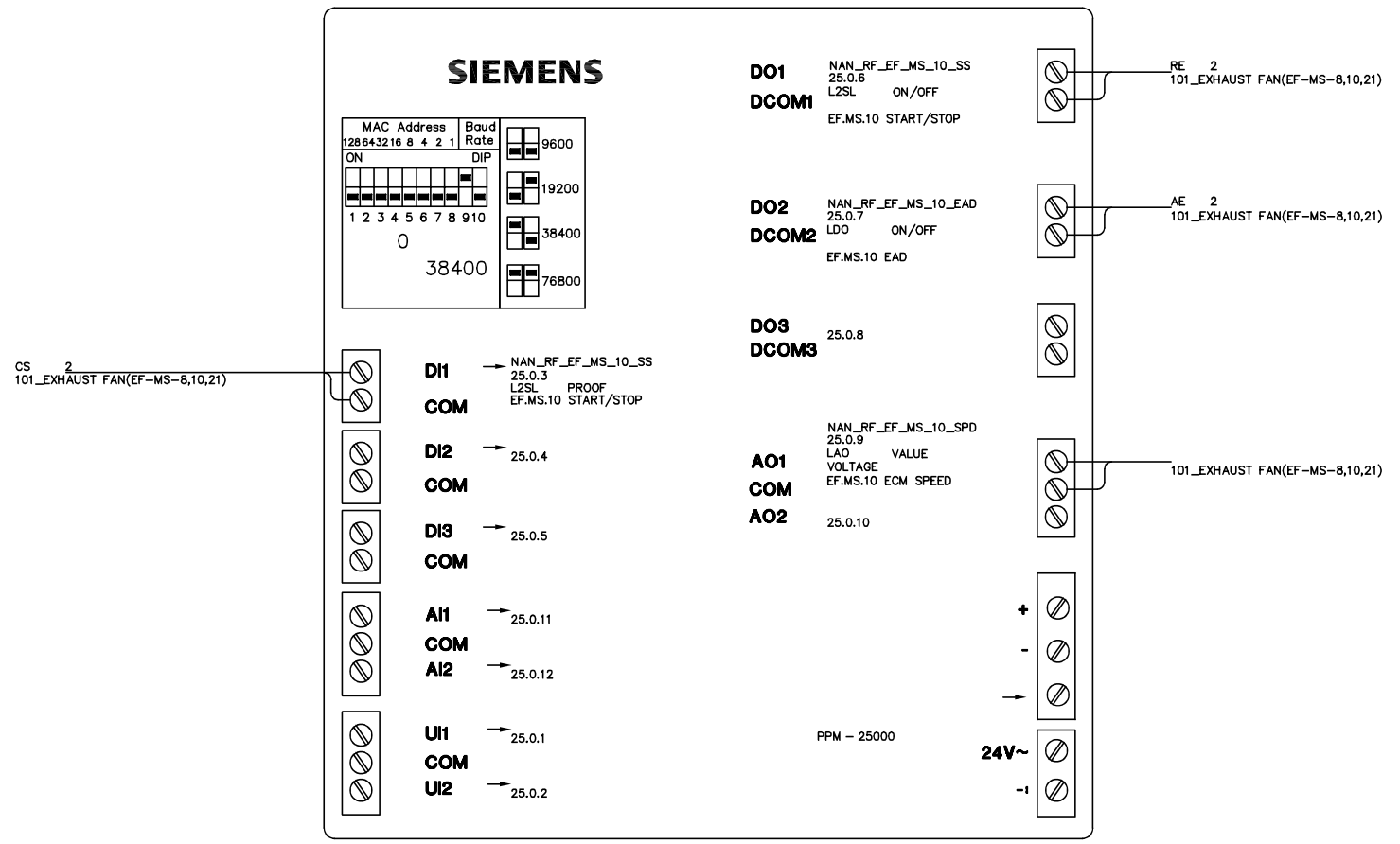
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0
N02A

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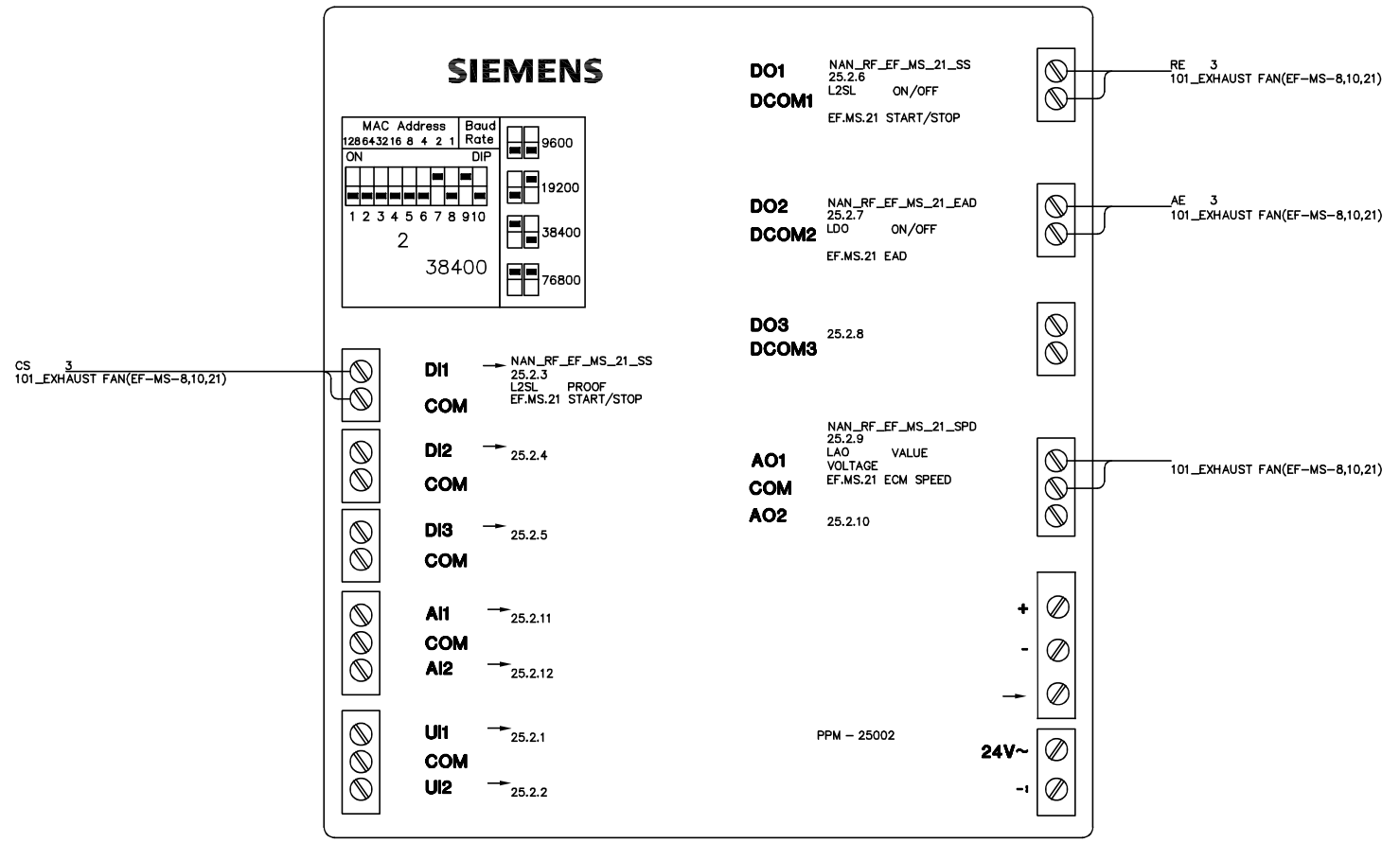
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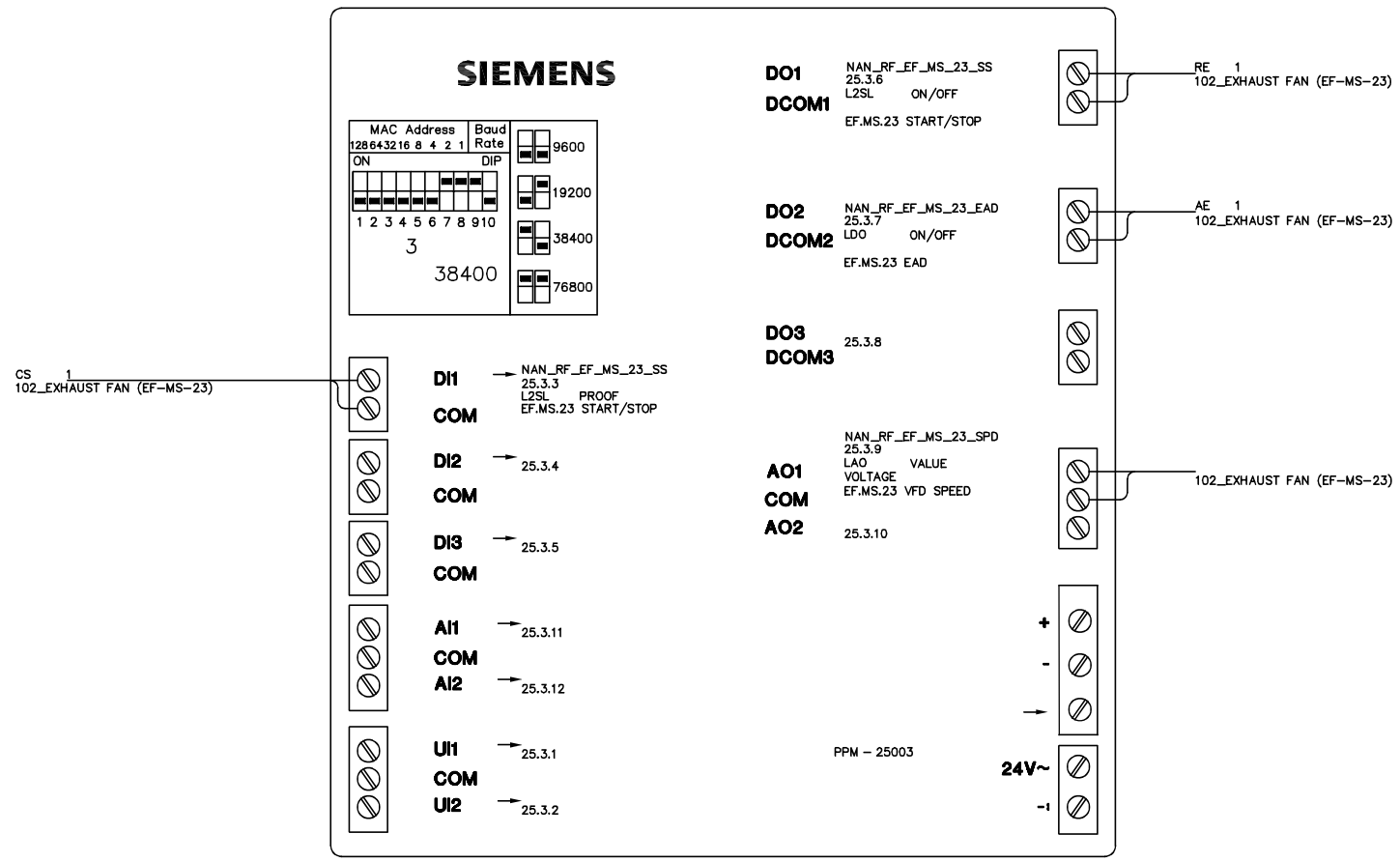
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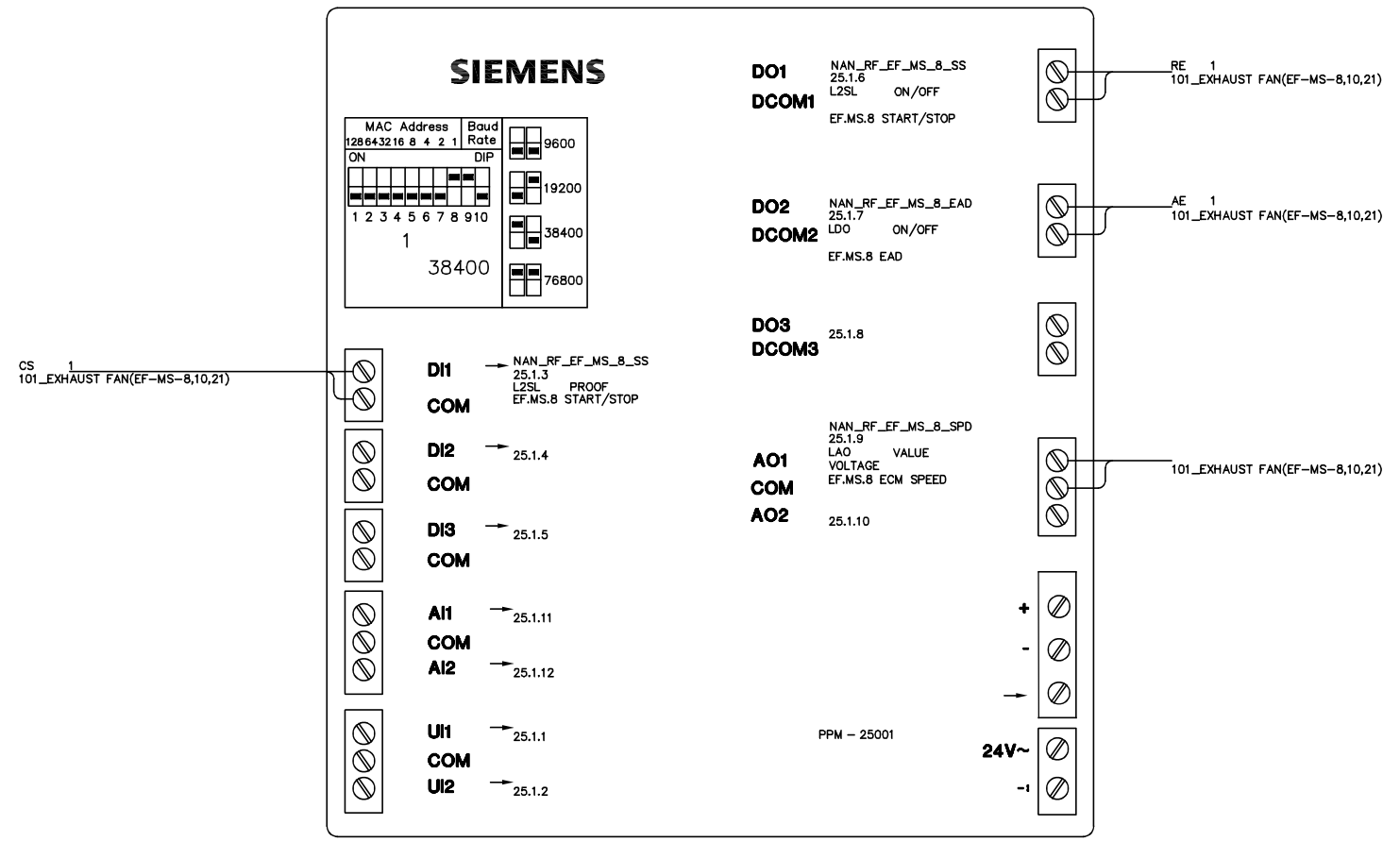
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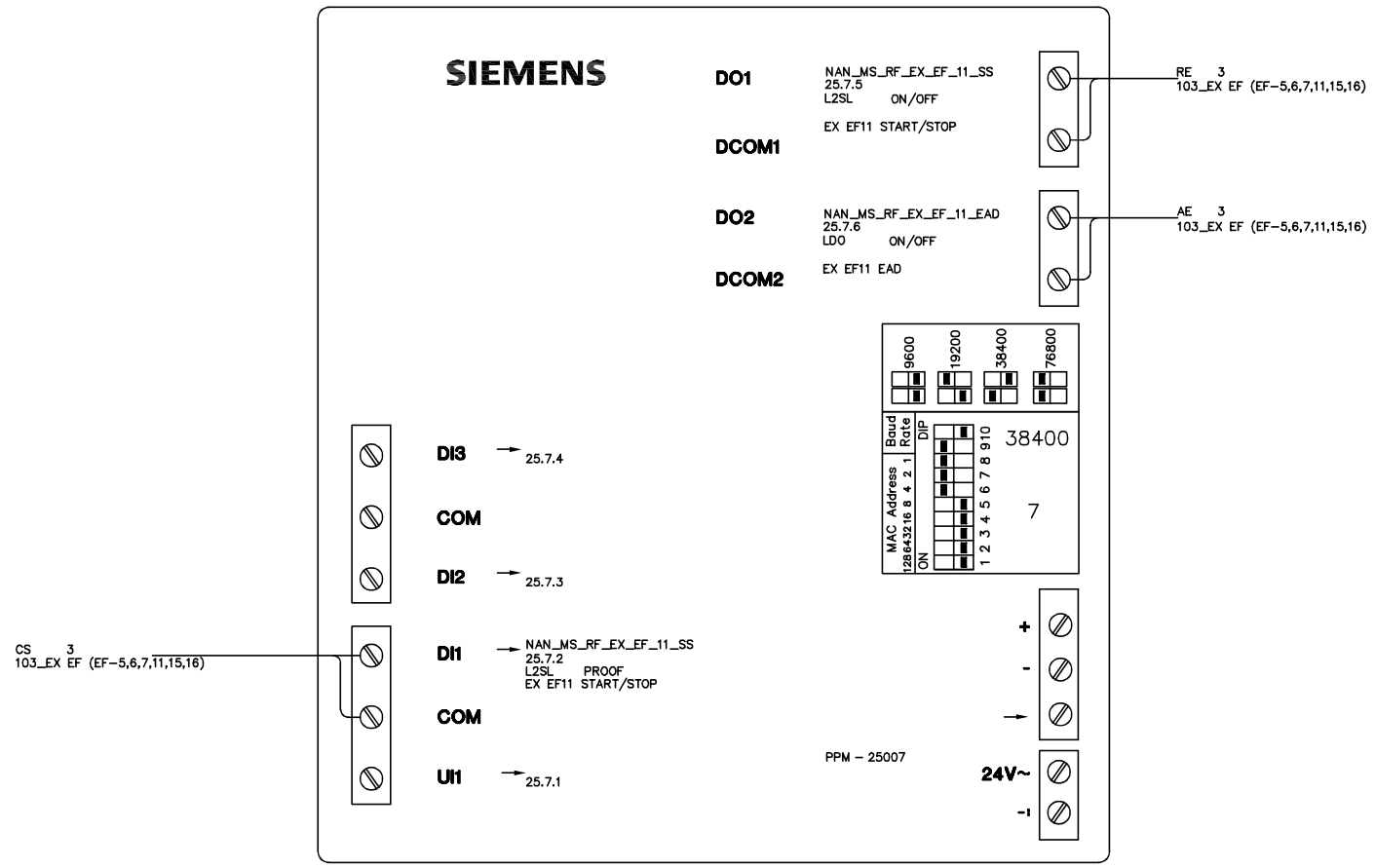
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PPM.EF.MS.8 (LAYOUT)

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NANUET, NY

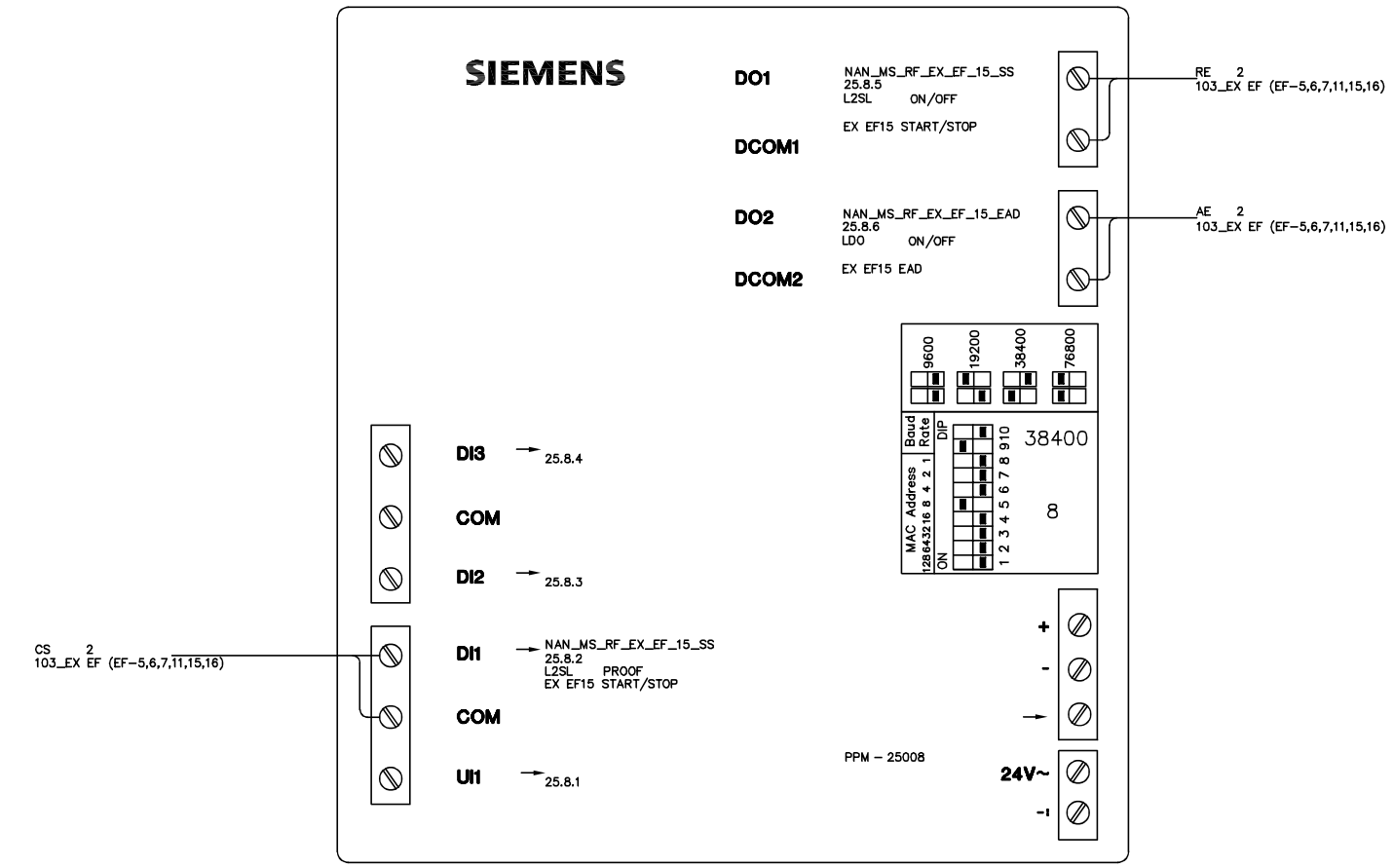
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PPM.EX.EF.11 (LAYOUT)

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N02F

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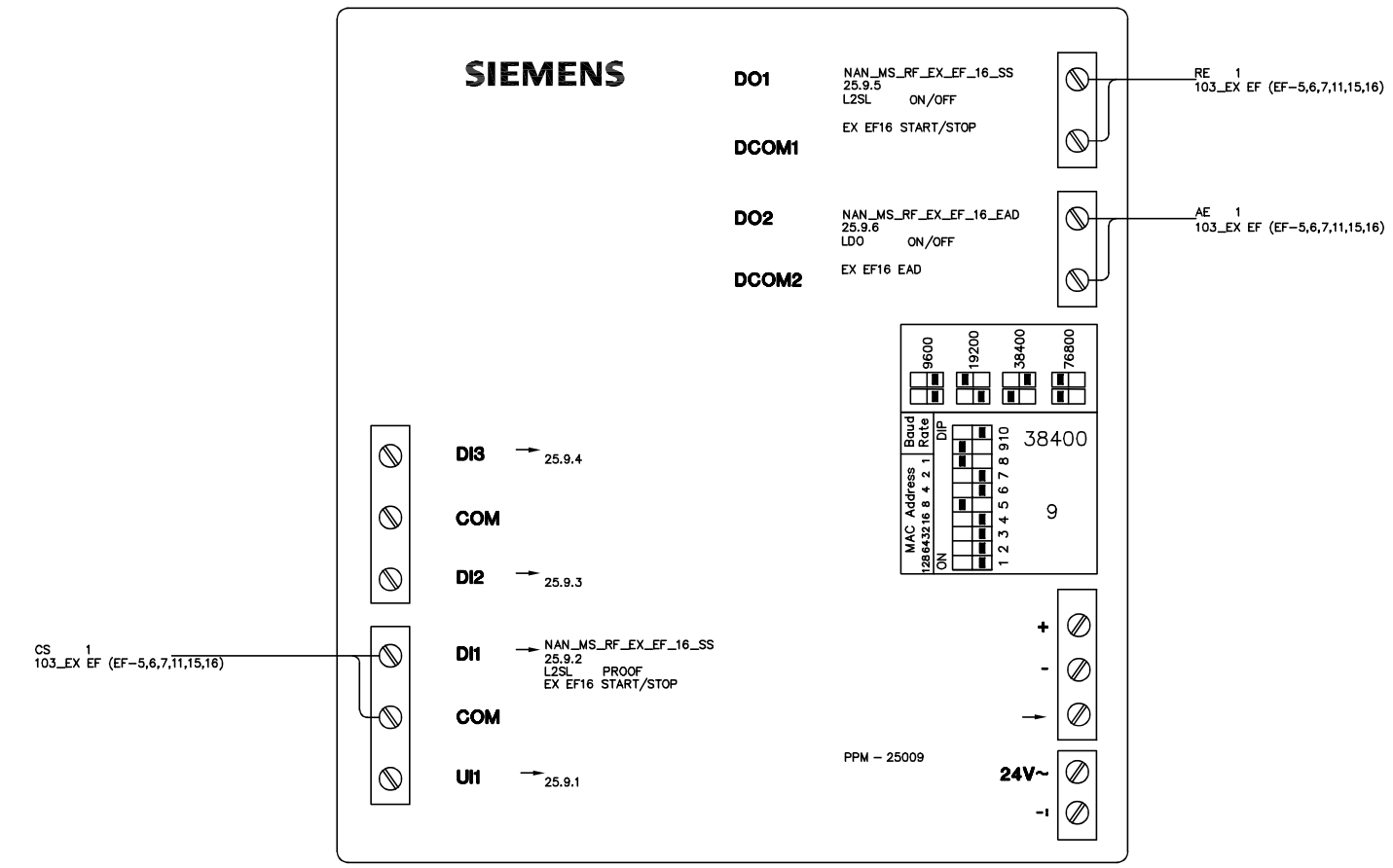
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PPM.EX.EF.15 (LAYOUT)

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NANUET BOND PHASE3 MID SCHOOL
NANUET, NY

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
VB	VB	NSK	02/16/24	02/16/24

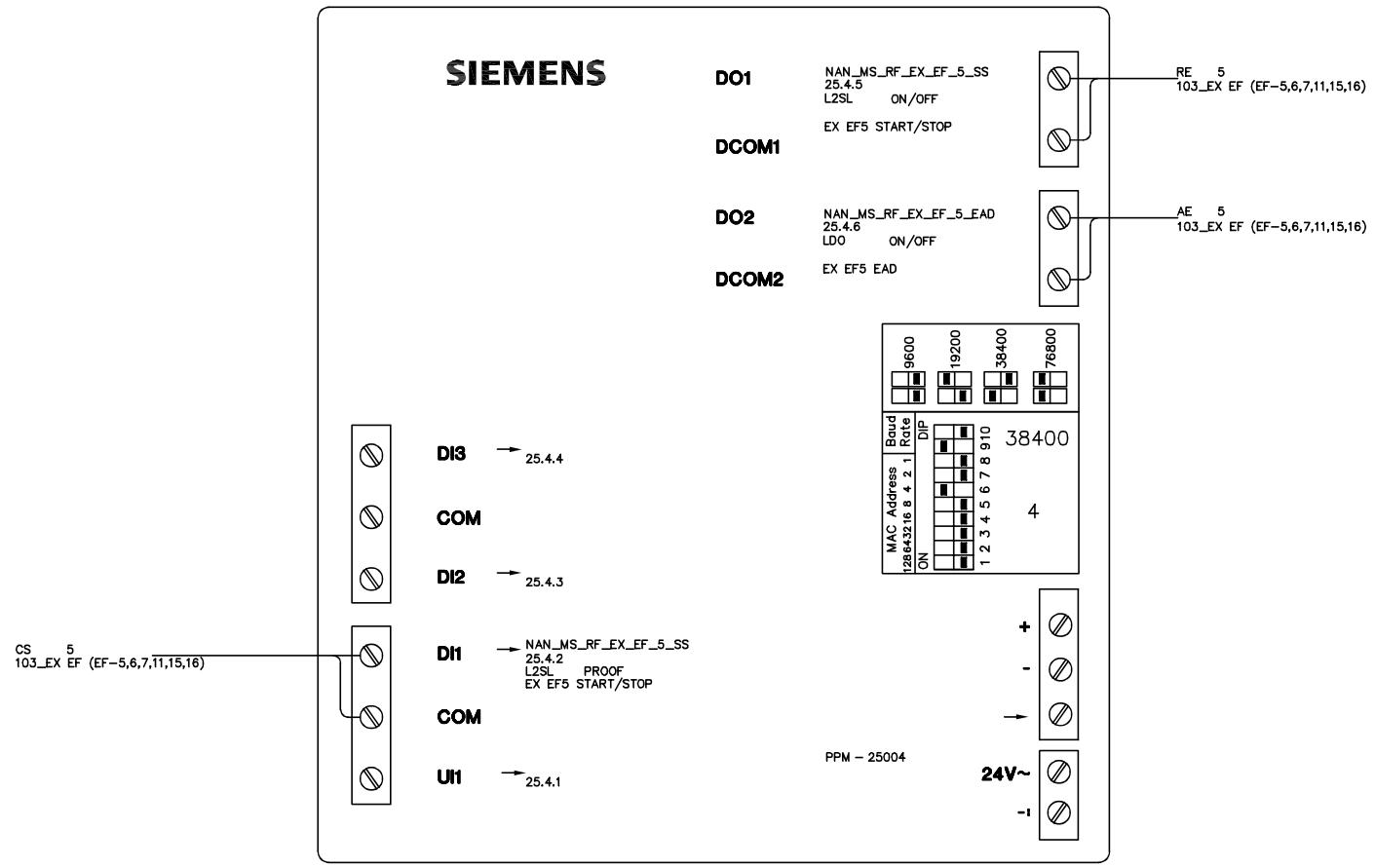
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NANUET BOND PHASE3 MID SCHOOL
NANUET, NY

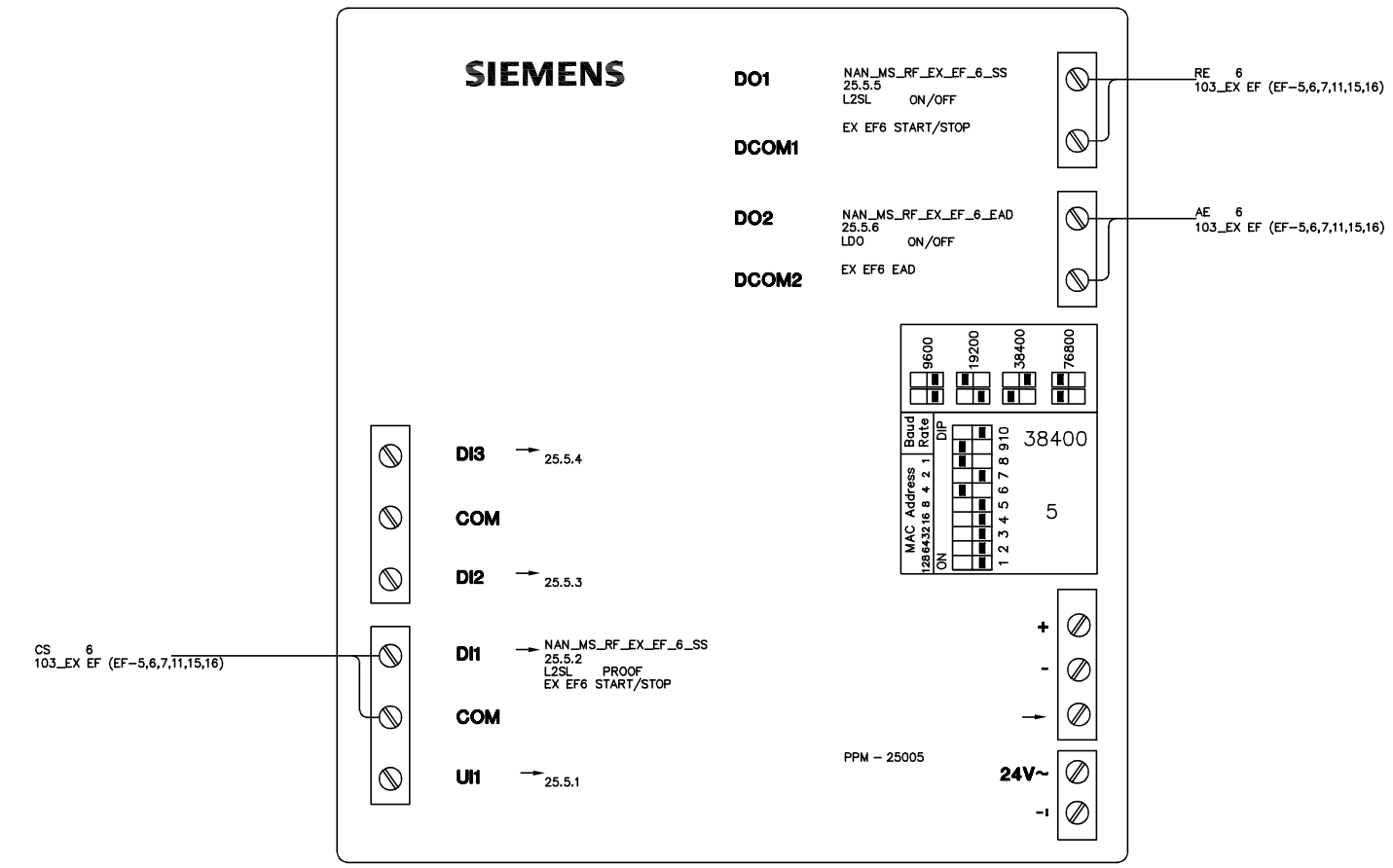
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PPM.EX.EF.5 (LAYOUT)

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REVISION HISTORY

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NANUET BOND PHASE3 MID SCHOOL
NANUET, NY

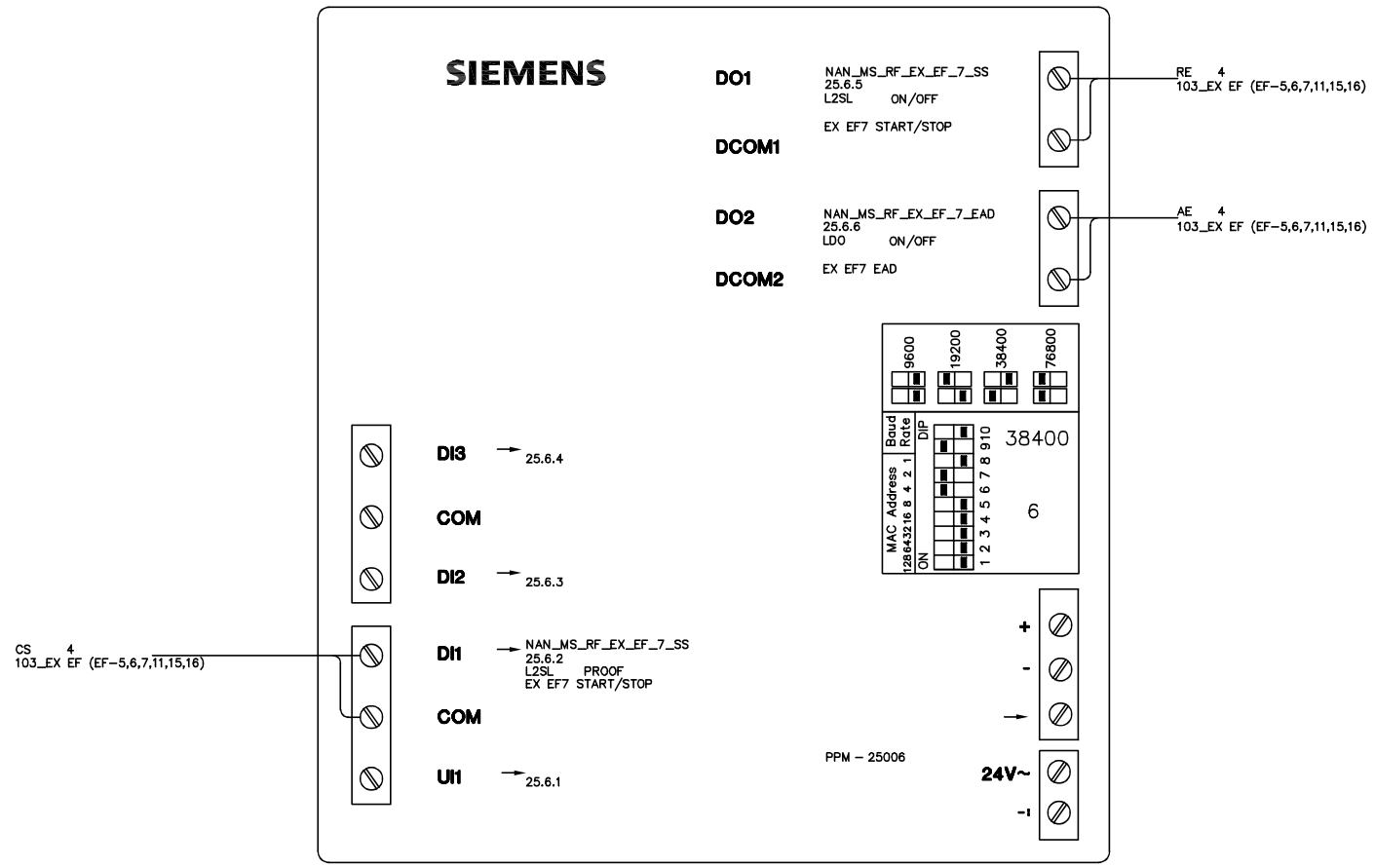
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REVISION HISTORY

R0	2/16/2024	VB	ISSUED FOR APPROVAL

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SIEMENS INDUSTRY, INC.
SMART INFRASTRUCTURE

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NANUET BOND PHASE3 MID SCHOOL
NANUET, NY

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
VB	VB	NSK	02/16/24	02/16/24

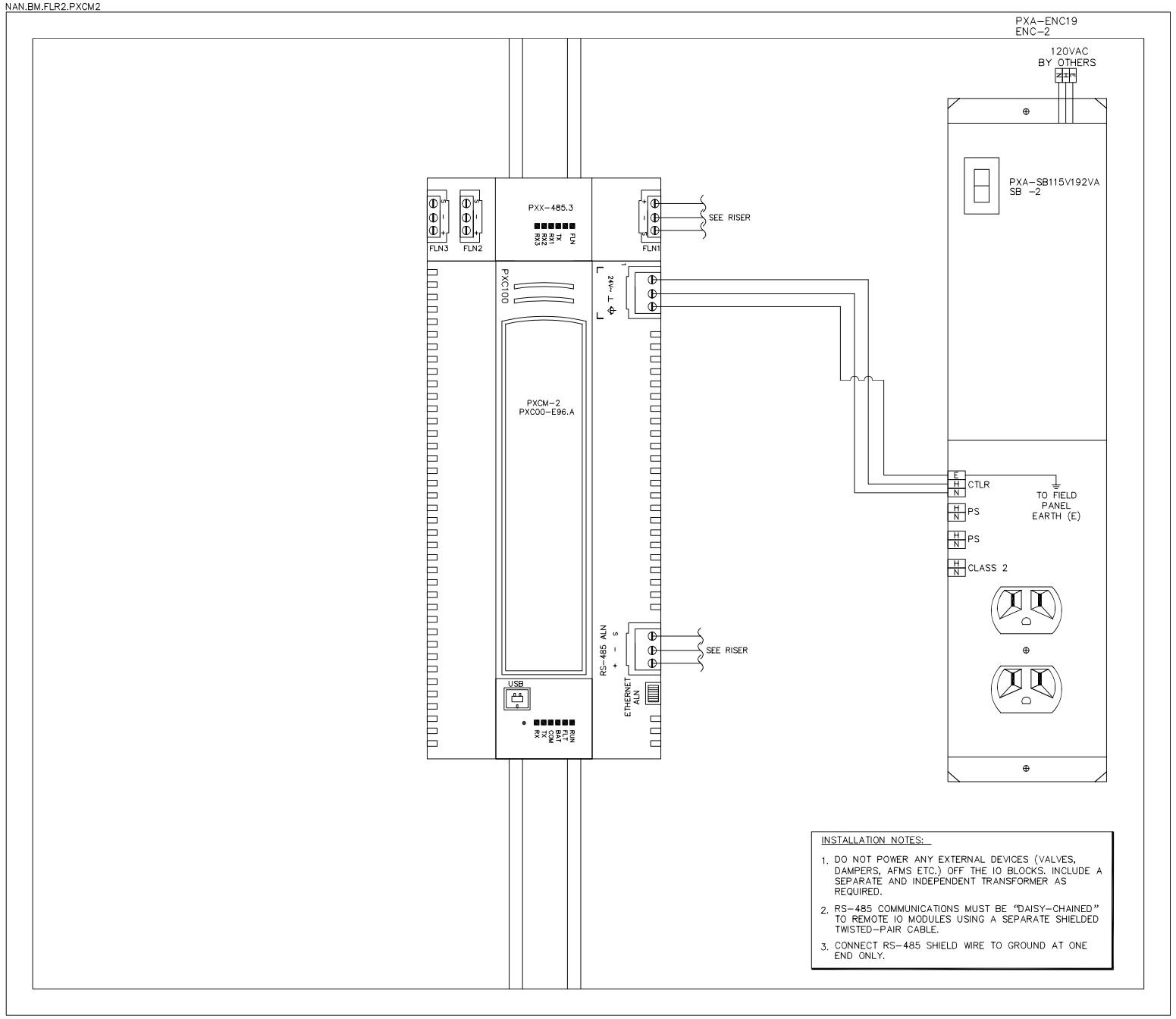
PPM.EX.EF.7 (LAYOUT)

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NAN.BM.FLR2.PXCM2



REVISION HISTORY

R0	2/16/2024	VB	ISSUED FOR APPROVAL

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NANUET BOND PHASE3 MID SCHOOL
NANUET, NY

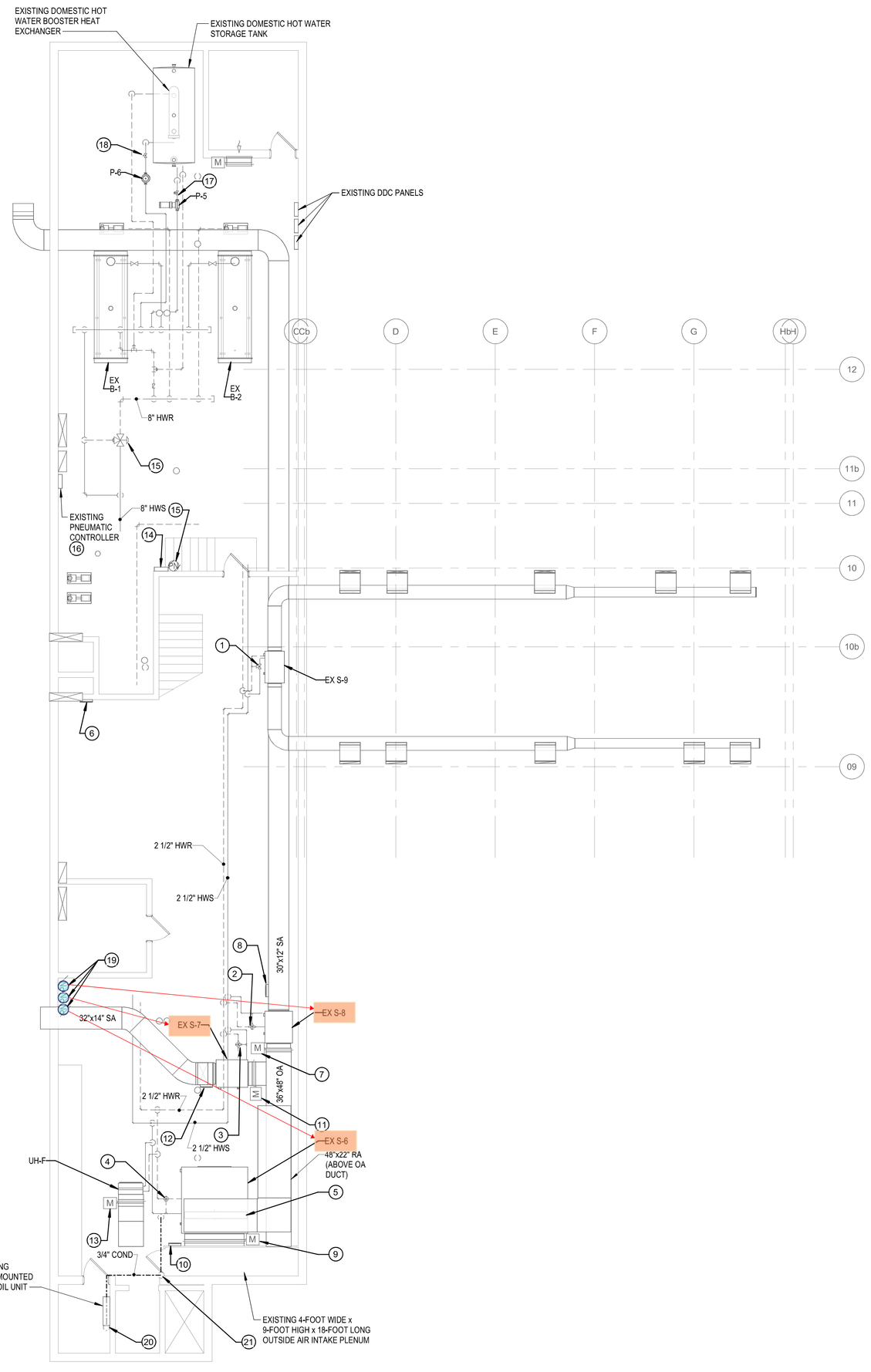
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NAN.BM.FLR2.PXCM2 (INSTALLATION)

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A18 OVERALL BASEMENT PLAN

1/8" = 1'-0"

KEYED NOTES:

1. DISCONNECT AND REMOVE EXISTING AIR HANDLING UNIT S-9 3-WAY PNEUMATIC CONTROL VALVE, DISCONNECT AND REMOVE ALL PNEUMATIC TUBING BACK TO PNEUMATIC MAIN. PROVIDE ELECTRONIC 3-WAY CONTROL VALVE RATED AT 4.9 GPM. DISCONNECT AND REMOVE ALL S-9 PNEUMATIC SENSORS AND CONTROL DEVICES AND CONVERT TO ELECTRONIC. TIE ALL ELECTRONIC SENSORS FROM S-9 INTO THE EXISTING S-9 DDC SYSTEM CONTROLLER OUTLINED IN KEYED NOTE 6.
2. DISCONNECT AND REMOVE EXISTING AIR HANDLING UNIT S-8 3-WAY PNEUMATIC CONTROL VALVE. DISCONNECT AND REMOVE ALL PNEUMATIC TUBING BACK TO PNEUMATIC MAIN. PROVIDE ELECTRONIC 3-WAY CONTROL VALVE RATED AT 9.6 GPM. DISCONNECT AND REMOVE ALL S-8 PNEUMATIC SENSORS AND CONTROL DEVICES AND CONVERT TO ELECTRONIC. TIE ALL ELECTRONIC SENSORS FROM S-8 INTO THE EXISTING S-9 DDC SYSTEM CONTROLLER OUTLINED IN KEYED NOTE 8.
3. DISCONNECT AND REMOVE EXISTING AIR HANDLING UNIT S-7 3-WAY PNEUMATIC CONTROL VALVE, DISCONNECT AND REMOVE ALL PNEUMATIC TUBING BACK TO PNEUMATIC MAIN, PROVIDE ELECTRONIC 3-WAY CONTROL VALVE RATED AT 9.6 GPM, DISCONNECT AND REMOVE ALL S-7 PNEUMATIC SENSORS AND CONTROL DEVICES AND CONVERT TO ELECTRONIC. TIE ALL ELECTRONIC SENSORS FROM S-7 INTO THE EXISTING S-9 DDC SYSTEM CONTROLLER OUTLINED IN KEYED NOTE 12.
4. DISCONNECT AND REMOVE EXISTING AIR HANDLING UNIT S-6 3-WAY PNEUMATIC CONTROL VALVE. DISCONNECT AND REMOVE ALL PNEUMATIC TUBING BACK TO PNEUMATIC MAIN. PROVIDE ELECTRONIC 3-WAY CONTROL VALVE RATED AT 28.5 GPM. DISCONNECT AND REMOVE ALL S-6 PNEUMATIC SENSORS AND CONTROL DEVICES AND CONVERT TO ELECTRONIC. TIE ALL ELECTRONIC SENSORS FROM S-6 INTO THE EXISTING S-6 DDC SYSTEM CONTROLLER OUTLINED IN KEYED NOTE 10.
5. DISCONNECT AND REMOVE EXISTING AIR HANDLING UNIT S-6 PNEUMATIC MOTORIZED RETURN AIR DAMPER ACTUATOR AT LOCATION SHOWN AND REPLACE WITH ELECTRONIC MOTORIZED DAMPER ACTUATOR. TIE CONTROL OF DAMPER INTO EXISTING DDC SYSTEM CONTROLLER SERVING S-3. REMOVE PNEUMATIC TUBING FROM REMOVED DAMPER BACK TO PNEUMATIC PIPING MAIN.
6. LOCATION OF EXISTING AIR HANDLING UNIT S-9 DDC SYSTEM CONTROLLER. DISCONNECT AND REMOVE 3-WAY CONTROL VALVE ELECTRIC-TO-PNEUMATIC TRANSDUCER INCLUDING ASSOCIATED PNEUMATIC TUBING AND PNEUMATIC DIAL OPERATOR. REMOVE PNEUMATIC TUBING BACK TO PNEUMATIC PIPING MAIN AND CAP. TIE ELECTRONIC CONTROL VALVE OUTLINED IN KEYED NOTE 1 INTO THE S-9 DDC CONTROLLER AS REQUIRED.
7. DISCONNECT AND REMOVE EXISTING AIR HANDLING UNIT S-8 PNEUMATIC MOTORIZED OUTSIDE AIR DAMPER ACTUATOR AT LOCATION SHOWN AND REPLACE WITH ELECTRONIC MOTORIZED DAMPER ACTUATOR. TIE CONTROL OF DAMPER INTO EXISTING DDC SYSTEM CONTROLLER SERVING S-8. REMOVE PNEUMATIC TUBING FROM REMOVED DAMPER BACK TO PNEUMATIC PIPING MAIN.
8. LOCATION OF EXISTING AIR HANDLING UNIT S-8 DDC SYSTEM CONTROLLER. DISCONNECT AND REMOVE DAMPER ELECTRIC-TO-PNEUMATIC TRANSDUCER AND 3-WAY CONTROL VALVE ELECTRIC-TO-PNEUMATIC TRANSDUCER INCLUDING ASSOCIATED PNEUMATIC TUBING AND PNEUMATIC DIAL OPERATORS. REMOVE PNEUMATIC TUBING BACK TO PNEUMATIC PIPING MAIN AND CAP. TIE ELECTRONIC CONTROL VALVE AND ELECTRONIC MOTORIZED DAMPER OUTLINED IN KEYED NOTES 2 AND 7 INTO THE S-8 DDC CONTROLLER AS REQUIRED.
9. DISCONNECT AND REMOVE EXISTING AIR HANDLING UNIT S-6 PNEUMATIC MOTORIZED OUTSIDE AIR DAMPER ACTUATOR AT LOCATION SHOWN AND REPLACE WITH ELECTRONIC MOTORIZED DAMPER ACTUATOR . TIE CONTROL OF DAMPER INTO EXISTING DDC SYSTEM CONTROLLER SERVING S-6. REMOVE PNEUMATIC TUBING FROM REMOVED DAMPER BACK TO PNEUMATIC PIPING MAIN.
10. LOCATION OF EXISTING AIR HANDLING UNIT S-6 DDC SYSTEM CONTROLLER. DISCONNECT AND REMOVE DAMPER ELECTRIC-TO-PNEUMATIC TRANSDUCER AND 3-WAY CONTROL VALVE ELECTRIC-TO-PNEUMATIC TRANSDUCER INCLUDING ASSOCIATED PNEUMATIC TUBING AND PNEUMATIC DIAL OPERATORS. REMOVE PNEUMATIC TUBING BACK TO PNEUMATIC PIPING MAIN AND CAP. TIE ELECTRONIC CONTROL VALVE AND ELECTRONIC MOTORIZED DAMPERS OUTLINED IN KEYED NOTES 4, 5 AND 9 INTO THE S-6 DDC CONTROLLER AS REQUIRED.
11. DISCONNECT AND REMOVE EXISTING AIR HANDLING UNIT S-7 PNEUMATIC MOTORIZED OUTSIDE AIR DAMPER ACTUATOR AT LOCATION SHOWN AND REPLACE WITH ELECTRONIC MOTORIZED DAMPER ACTUATOR . TIE CONTROL OF DAMPER INTO EXISTING DDC SYSTEM CONTROLLER SERVING S-7. REMOVE PNEUMATIC TUBING FROM REMOVED DAMPER BACK TO PNEUMATIC PIPING MAIN.
12. LOCATION OF EXISTING AIR HANDLING UNIT S-7 DDC SYSTEM CONTROLLER. DISCONNECT AND REMOVE DAMPER ELECTRIC-TO-PNEUMATIC TRANSDUCER AND 3-WAY CONTROL VALVE ELECTRIC-TO-PNEUMATIC TRANSDUCER INCLUDING ASSOCIATED PNEUMATIC TUBING AND PNEUMATIC DIAL OPERATORS. REMOVE PNEUMATIC TUBING BACK TO PNEUMATIC PIPING MAIN AND CAP. TIE ELECTRONIC CONTROL VALVE AND ELECTRONIC MOTORIZED DAMPER OUTLINED IN KEYED NOTES 3 AND 11 INTO THE S-8 DDC CONTROLLER AS REQUIRED.
13. DISCONNECT AND REMOVE EXISTING HYDRONIC UNIT HEATER UH-F DUAL PNEUMATIC FACE AND BAYPASS DAMPER AT LOCATION SHOWN AND REPLACE WITH MANUAL DAMPER OPERATOR LOCKED IN OPEN POSITION. REMOVE PNEUMATIC TUBING FROM REMOVED DAMPER BACK TO PNEUMATIC PIPING MAIN.
14. LOCATION OF EXISTING BUILDING HEATING PLANT DDC SYSTEM CONTROLLER.
15. DISCONNECT AND REMOVE MAIN BUILDING HEATING LOOP 3-WAY PNEUMATIC MIXING CONTROL VALVE. DISCONNECT AND REMOVE ALL PNEUMATIC TUBING BACK TO PNEUMATIC MAIN. DISCONNECT AND REMOVE 3 -WAY CONTROL VALVE ELECTRIC-TO-PNEUMATIC TRANSDUCER INCLUDING ASSOCIATED PNEUMATIC TUBING AND PNEUMATIC DIAL OPERATOR LOCATED ADJACENT TO BUILDING HEATING PLANT DDC SYSTEM CONTROLLER. REMOVE ASSOCIATED WIRING BACK TO CONTROL PANEL AS REQUIRED. AT LOCATIONG OF REMOVED PNEUMATIC 3-WAY MIXING VALVE PROVIDE AN ELECTRONIC 3-WAY MIXING CONTROL VALVE RATED AT 550 GPM. TIE OPERATION OF MIXING VALVE INTO EXISTING BUILDING HEATING PLANT DDC SYSTEM CONTROLLER OUTLINED IN KEYED NOTE 14.
16. DISCONNECT AND REMOVE PNEUMATIC PIPING AND ASSOCIATED PRESSURE DIAL WITHIN THE PNEUMATIC CONTROL PANEL RELATED TO THE CONTROL PRESSURE ON THE MAIN HOT WATER SUPPLY 3-WAY VALVE OUTLINED IN KEYED NOTE 15. REMOVE PNEUMATIC PIPING BACK TO ASSOCIATED PIPING MAIN AND CAP.
17. DISCONNECT AND REMOVE EXISTING DOMESTIC HOT WATER STORAGE TANK 2-WAY PNEUMATIC CONTROL VALVE. DISCONNECT AND REMOVE ALL PNEUMATIC TUBING BACK TO PNEUMATIC MAIN. PROVIDE ELECTRONIC 2-WAY CONTROL VALVE RATED AT 160 GPM. DISCONNECT AND REMOVE ALL STORAGE TANK PNEUMATIC SENSORS AND CONTROL DEVICES AND CONVERT TO ELECTRONIC. TIE ALL ELECTRONIC SENSORS FROM THE STORAGE TANK INTO THE EXISTING DDC SYSTEM CONTROLLER OUTLINED IN KEYED NOTE 14.
18. DISCONNECT AND REMOVE EXISTING DOMESTIC HOT WATER BOOSTER HEATER HEAT EXCHANGER 2-WAY PNEUMATIC CONTROL VALVE. DISCONNECT AND REMOVE ALL PNEUMATIC TUBING BACK TO PNEUMATIC MAIN. PROVIDE ELECTRONIC 2-WAY CONTROL VALVE RATED AT 20 GPM. DISCONNECT AND REMOVE ALL HEAT EXCHANGER PNEUMATIC SENSORS AND CONTROL DEVICES AND CONVERT TO ELECTRONIC. TIE ALL ELECTRONIC SENSORS FROM THE HEAT EXCHANGER INTO THE EXISTING DDC SYSTEM CONTROLLER OUTLINED IN KEYED NOTE 14.
19. DISCONNECT AND REMOVE ALL EXISTING AIR HANDLING UNITS S-6, S-7 AND S-8 PNEUMATIC CONTROL FAN OPERATORS, SENSORS AND RELAY DEVICES. DISCONNECT AND REMOVE ALL PNEUMATIC TUBING BACK TO PNEUMATIC PIPING MAIN AND CAP. CONVERT ALL PNEUMATIC CONTROL DEVICES SERVING S-6, S-7 AND S-8 TO ELECTRONIC AND PROVIDE RELAYS FROM FAN START/STOP MOTOR STARTER TO EXISTING DDC CONTROL PANELS SERVING EACH UNIT TO ALLOW FOR ELECTRONIC FAN DIGITAL START/STOP OPERATION. DISCONNECT AND REMOVE PNEUMATIC TUBING BETWEEN PNEUMATIC CONTROL DEVICES AND EXISTING S-6, S-7 AND S-8 SPACE SENSORS. PROVIDE RELAYS FROM EXISTING S-6, S-7 AND S-8 SPACE SENSORS TO EXISTING DDC CONTROL PANELS SERVING EACH UNIT TO ALLOW FOR ELECTRONIC ANALOG INPUT OF EACH SPACE TEMPERATURE TO THE DDC SYSTEM.
20. DISCONNECT AND REMOVE OPEN-ENDED PVC HOSE FROM CONDENSATE DRAIN OUTLET CONNECTION ON EXISTING ELEVATOR MACHINE ROOM FAN COIL UNIT AND PROVIDE A 3/4" HARD PIPED CONNECTION TO THE CONDENSATE OUTLET. PROVIDE A P-TRAP BELOW FAN COIL UNIT, THEN ROUTE 3/4" CONDENSATE PIPING THROUGH ELEVATOR MACHINE ROOM TO MECHANICAL AREA OF BASEMENT AS SHOWN.
21. PROVIDE 3/4" CONDENSATE DROP DOWN AT LOCATION SHOWN TO FLOOR LEVEL, THEN ROUTE 3/4" CONDENSATE PIPING BELOW BOTTOM OF DOOR OPENING TO OA INTAKE PLENUM, THEN ROUTE 3/4" CONDENSATE PIPING ALONG FLOOR LEVEL TO NEW FLOOR DRAIN BEING PROVIDED ON PLUMBING DRAWINGS. TERMINATE CONDENSATE PIPING OPEN-ENDED ABOVE NEW FLOOR DRAIN.

LEGEND:

EX S-X	EXISTING AIR HANDLING UNIT
(T)	EX AHU-WALL SENSOR

SIEMENS WALL SENSOR LOCATION DRAWING

ARCHITECT

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REGISTRATION EXPIRES: 11/30/2023

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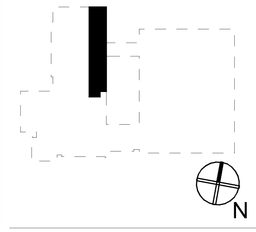
NUFSD BOND PROJECTS PH3

☐ SED#50-01-08-03-0-003-035 (HIGH SCHOOL)
■ SED#50-01-08-03-0-004-020 (BARR MIDDLE SCHOOL)

High School
103 Church St.
Nanuet, NY 10954

Barr Middle School
50 Blauvelt Rd #1
Nanuet, NY 10954

KEY PLAN



REVISIONS

No.	Description	Date

ISSUED: BID SET ISSUANCE

DATE: 06/06/2023

SCALE: 1/8" = 1'-0"

SHEET NAME:
BASEMENT PLANS

SHEET NUMBER:
BM-M110

ISSUE FOR BID SET

PROJECT NUMBER: 2111002.00 COPYRIGHT © 2014 KSQ ARCHITECTS, PC

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KEYED NOTES:

1. DISCONNECT AND REMOVE EXISTING AIR HANDLING UNIT S-4 3-WAY PNEUMATIC CONTROL VALVE. DISCONNECT AND REMOVE ALL PNEUMATIC TUBING BACK TO PNEUMATIC MAIN. PROVIDE ELECTRONIC 3-WAY CONTROL VALVE RATED AT 4 GPM. DISCONNECT AND REMOVE ALL S-4 PNEUMATIC SENSORS AND CONTROL DEVICES AND CONVERT TO ELECTRONIC. TIE ALL ELECTRONIC SENSORS FROM S-4 INTO THE EXISTING SIEMENS DDC SYSTEM.
2. DISCONNECT AND REMOVE EXISTING AIR HANDLING UNIT S-3 3-WAY PNEUMATIC CONTROL VALVE. DISCONNECT AND REMOVE ALL PNEUMATIC TUBING BACK TO PNEUMATIC MAIN. PROVIDE ELECTRONIC 3-WAY CONTROL VALVE RATED AT 6.2 GPM. DISCONNECT AND REMOVE ALL S-3 PNEUMATIC SENSORS AND CONTROL DEVICES AND CONVERT TO ELECTRONIC. TIE ALL ELECTRONIC SENSORS FROM S-3 INTO THE EXISTING SIEMENS DDC CONTROLLER SERVING S-3.
3. DISCONNECT AND REMOVE EXISTING AIR HANDLING UNIT S-3 PNEUMATIC MOTORIZED RETURN AIR DAMPER ACTUATOR AT LOCATION SHOWN AND REPLACE WITH ELECTRONIC MOTORIZED DAMPER ACTUATOR. TIE CONTROL OF DAMPER INTO EXISTING DDC SYSTEM CONTROLLER SERVING S-3. REMOVE PNEUMATIC TUBING FROM REMOVED DAMPER BACK TO PNEUMATIC PIPING MAIN.
4. DISCONNECT AND REMOVE EXISTING AIR HANDLING UNIT S-3 PNEUMATIC MOTORIZED OUTSIDE AIR DAMPER ACTUATOR AT LOCATION SHOWN AND REPLACE WITH ELECTRONIC MOTORIZED DAMPER ACTUATOR. TIE CONTROL OF DAMPER INTO EXISTING DDC SYSTEM CONTROLLER SERVING S-3. REMOVE PNEUMATIC TUBING FROM REMOVED DAMPER BACK TO PNEUMATIC PIPING MAIN.
5. LOCATION OF EXISTING AIR HANDLING UNIT S-3 DDC SYSTEM CONTROLLER. DISCONNECT AND REMOVE DAMPER ELECTRIC-TO-PNEUMATIC TRANSDUCER AND 3-WAY CONTROL VALVE ELECTRIC-TO-PNEUMATIC TRANSDUCER INCLUDING ASSOCIATED PNEUMATIC TUBING AND PNEUMATIC DIAL OPERATORS. REMOVE PNEUMATIC TUBING BACK TO PNEUMATIC PIPING MAIN AND CAP. TIE ELECTRONIC CONTROL VALVE AND ELECTRONIC MOTORIZED DAMPERS OUTLINED IN KEYED NOTES 2, 3 AND 4 INTO THE S-3 DDC CONTROLLER AS REQUIRED.
6. PROVIDE FLOOR MOUNTED UNIT VENTILATOR AT LOCATION SHOWN. PROVIDE UNIT VENTILATOR WITH FULLY CLOSED ADAPTER-BACK WITH REAR OUTDOOR AIR OPENING TO BE CUT IN FIELD TO MATCH EXISTING WALL OUTDOOR AIR OPENING SIZE. CONNECT TO EXISTING OA DUCT SLEEVE AS REQUIRED AND EXTEND INTO REAR OUTDOOR AIR OPENING ON THE UNIT VENTILATOR. CONNECT TO HWS/HWR PIPING ROUTED WITHIN UNIT VENTILATOR SHELVING SYSTEM PIPING TUNNEL AND PROVIDE 1" HWS/HWR BRANCH CONNECTIONS TO UV HEATING COIL CONNECTIONS AS REQUIRED.
7. PROVIDE REPLACEMENT TEMPERATURE SENSOR AT LOCATION SHOWN AND UTILIZE FOR SPACE TEMPERATURE CONTROL OF UNIT VENTILATOR LOCATED WITHIN SAME SPACE AS SENSOR AS REQUIRED. PROVIDE CONTROL WIRING BETWEEN SENSOR AND UNIT VENTILATOR DDC CONTROLLER AS REQUIRED.
8. PROVIDE 24" WIDE x 21-7/8" DEEP UTILITY COMPARTMENT AT LOCATION SHOWN FOR HOUSING DDC SYSTEM CONTROLLER AND VARIABLE REFRIGERANT VOLUME CONTROL COMPONENTS. THE UTILITY COMPARTMENT SHALL HOUSE THE FOLLOWING VARIABLE REFRIGERANT VOLUME CONTROL COMPONENTS: 1. WIRED NAVIGATION REMOTE CONTROLLER 2. VARIABLE REFRIGERANT VOLUME CONTROL BOX AND 3. VARIABLE REFRIGERANT VOLUME EXPANSION VALVE KIT.
9. AT LOCATIONS CALLED OUT, PROVIDE 21-7/8" DEEP PERIMETER SHELVING CABINETS. THE CABINETS SHALL BE 30" HIGH THAT INCLUDE A BASE CABINET, ONE SHELF, A STEEL TOP WITH LOUVER OUTLET, A FRONT SKIRT WITH LOUVER INLET AND A BACK WALL ANGLE. THE SHELVING CABINETS SHALL INCLUDE A 5-7/8" DEEP PIPE SPACING CAVITY AT THE REAR OF THE CABINET SYSTEM. THE SHELF SHALL BE 10-1/2" DEEP AND THE SYSTEM SHALL INCLUDE A 3" HIGH OPENING AT THE BOTTOM (COVERED BY THE LOUVERED INLET FRONT SKIRT) THAT ALLOWS AIR MOVEMENT THROUGH THE BOTTOM-FRONT OF THE SYSTEM AND OUT THE TOP-REAR OF THE SYSTEM. PROVIDE PERIMETER SHELVING CABINET SYSTEM FILLER SECTIONS WHERE REQUIRED TO TERMINATE SHELVING SYSTEMS AT END POINTS SHOWN. THE FILLER SECTION SHALL BE FIELD CUT TO FIT BETWEEN THE END PANEL AND THE LAST SHELVING CABINET SYSTEM. THE FILLER SECTION SHALL INCLUDE A FLOOR ANGLE, FRONT PANEL, STEEL TOP, BACK WALL ANGLE. THE SYSTEM SHALL BE MANUFACTURED BY HVAC CUSTOM ENCLOSURE CO., LLC DRAWING NUMBER SC164-0028 OR EQUAL.
10. PROVIDE 12" WIDE x 8" DEEP VERTICAL PIPE ENCLOSURE UNIT AT CORNER OF CLASSROOM TO CONCEAL REFRIGERANT LIQUID-SUCTION PIPING DROPS AND THE 3/4" CONDENSATE RISER DROP FROM THE SECOND FLOOR UV DRAIN PAN. ROUTE VERTICAL SUCTION/LIQUID PIPING DOWN THROUGH TOP OF UNIT VENTILATOR SHELVING CABINET TOP AND CONNECT TO UV DX COIL CONNECTION AND UV EXPANSION VALVE KIT AS REQUIRED. ROUTE CONDENSATE DRAIN PIPING TO PIPING TUNNEL AND CONNECT TO HORIZONTAL CONDENSATE DRAIN PIPING FROM FIRST FLOOR UV DRAIN PAN OUTLET PRIOR TO EXITING THROUGH EXTERIOR WALL. HEIGHT OF VERTICAL PIPING ENCLOSURE SHALL EXTEND FROM TOP OF SHELVING CABINET SYSTEM TO UNDERSIDE OF SUSPENDED CEILING SYSTEM.

KEYED NOTES (CONTINUED):

11. CONNECT TO EXISTING 1-1/4" HWR RISER AT FLOOR LEVEL AND ROUTE 1-1/4" HWR PIPING MAIN WITHIN SHELVING CABINET PIPING TUNNEL AS SHOWN.
12. ROUTE 1-1/4" COMBINED CONDENSATE DRAIN PIPING FROM FIRST FLOOR UV DRAIN PAN OUTLET AND CONDENSATE FROM SECOND FLOOR UV DRAIN PAN(S) OUT THROUGH EXTERIOR WALL. TERMINATE PIPING WITH MITER CUT ELBOW FACING GRADE LEVEL AND PITCH PIPING TOWARDS THE EXTERIOR WALL PENETRATION AS REQUIRED.
13. TYPICAL REFRIGERANT LIQUID BRANCH CONNECTOR 'Y' FITTING JOINT.
14. TYPICAL REFRIGERANT SUCTION BRANCH CONNECTOR 'Y' FITTING JOINT.
15. 3/4" CONDENSATE DRAIN RISER UP THROUGH FLOOR. ROUTE TO VERTICAL PIPING ENCLOSURE AND DROP DOWN INTO SHELVING SYSTEM PIPING TUNNEL.
16. PROVIDE UNIT VENTILATOR SYSTEM SHELVING/CABINET FILLER PIECE BETWEEN END OF UNIT VENTILATOR AND WALL AT LOCATIONS SHOWN.
17. PROVIDE 24" WIDE x 21-7/8" DEEP UTILITY COMPARTMENT AT LOCATION SHOWN FOR HOUSING DDC SYSTEM CONTROLLER AND VARIABLE REFRIGERANT VOLUME CONTROL COMPONENTS. THE UTILITY COMPARTMENT SHALL HOUSE THE FOLLOWING VARIABLE REFRIGERANT VOLUME CONTROL COMPONENTS: 1. WIRED NAVIGATION REMOTE CONTROLLER 2. VARIABLE REFRIGERANT VOLUME CONTROL BOX AND 3. VARIABLE REFRIGERANT VOLUME EXPANSION VALVE KIT. PROVIDE UNIT VENTILATOR SYSTEM SHELVING/CABINET FILLER PIECE BETWEEN END OF UTILITY COMPARTMENT AND WALL TO FILL GAP BETWEEN UTILITY COMPARTMENT END AND WALL.
18. ROUTE HWS/HWR PIPING MAINS WITHIN PIPING TUNNELS AT REAR OF UNIT VENTILATORS AND UNIT VENTILATOR SHELVING CABINET SYSTEMS.
19. PROVIDE 1-1/4" EXPANSION COMPENSATORS ON THE HWS/HWR PIPING MAINS ROUTED WITHIN THE UNIT VENTILATOR PIPING TUNNEL AT LOCATION SHOWN. THE COMPENSATORS SHALL BE 13,812" LONG. PROVIDE ANCHORS ON EACH END OF BOTH THE HWS/R RUNS AND PROVIDE PIPE GUIDES WITHIN 14 PIPE DIAMETERS OF THE COMPENSATORS ON BOTH THE HWS AND HWR COMPENSATORS.
20. CONNECT TO BOTTOM OF EXISTING 1-1/2" HWS RISER AT CONNECTION POINT SHOWN AND ROUTE 1-1/2" HWS WITHIN UV-MS-38 AND ASSOCIATED SHELVING CABINET SYSTEM PIPING TUNNEL. RECONNECT HORIZONTAL 1-1/2" HWS PIPING TO EXISTING HWS AT CONNECTION POINT SHOWN AT WALL PENETRATION TO TECH CLASSROOM 108 AND ROUTE 1" HWR PIPING FROM UV-MS-38 HEATING COIL WITHIN PIPING TUNNEL SYSTEM AND RECONNECT TO HWR MAIN AT WALL PENETRATION AS SHOWN.
21. ROUTE 5/8" REFRIGERANT SUCTION-3/8" REFRIGERANT LIQUID DOWN TO UV UTILITY COMPARTMENT WITHIN VERTICAL CHASE WALL SYSTEM.
22. PROVIDE HORIZONTAL PIPING ENCLOSURE UNIT BETWEEN END OF UV-MS-41 AND END OF EXISTING PIPING ENCLOSURE AT LOCATION SHOWN. THE SIZE OF THE HORIZONTAL PIPING ENCLOSURE UNIT SHALL MATCH THE SIZE OF THE EXISTING ENCLOSURE INSTALLED ADJACENT TO THE NEW UNIT.
23. DISCONNECT AND REMOVE EXISTING AIR HANDLING UNIT S-4 PNEUMATIC MOTORIZED OUTSIDE AIR DAMPER ACTUATOR AT LOCATION SHOWN AND REPLACE WITH ELECTRONIC MOTORIZED DAMPER ACTUATOR . TIE CONTROL OF DAMPER INTO EXISTING DDC SYSTEM. REMOVE PNEUMATIC TUBING FROM REMOVED DAMPER BACK TO PNEUMATIC PIPING MAIN.
24. DISCONNECT AND REMOVE EXISTING 2-WAY PNEUMATIC CONTROL VALVE WITHIN EXISTING FIN TUBE ENLCOSURE SYSTEM. DISCONNECT AND REMOVE ALL PNEUMATIC TUBING BACK TO PNEUMATIC MAIN. PROVIDE ELECTRONIC 2-WAY CONTROL VALVE RATED AT 1.5 GPM AT LOCATION OF REMOVED PNEUMATIC CONTROL VALVE. MODIFY HWS BRANCH PIPING AS REQUIRED FOR INSTALLATION OF ELECTRONIC CONTROL VALVE. PROVIDE SPACE TEMPERATURE SENSOR AT LOCATION SHOWN AND TIE OPERATION OF CONTROL VALVE/SENSOR INTO EXISTING SIEMENS DDC SYSTEM. PROVIDE CONTROL WIRING BETWEEN CONTROL VALVE AND REPLACEMENT SENSOR AS REQUIRED.
25. DISCONNECT AND REMOVE EXISTING 2-WAY PNEUMATIC CONTROL VALVE WITHIN EXISTING FIN TUBE ENCLOSURE SYSTEM. DISCONNECT AND REMOVE ALL PNEUMATIC TUBING BACK TO PNEUMATIC MAIN. PROVIDE ELECTRONIC 2-WAY CONTROL VALVE RATED AT 2.0 GPM AT LOCATION OF REMOVED PNEUMATIC CONTROL VALVE. MODIFY HWS BRANCH PIPING AS REQUIRED FOR INSTALLATION OF ELECTRONIC CONTROL VALVE. DISCONNECT AND REMOVE EXISTING SPACE TEMPERATURE SENSOR INCLUDING ASSOCIATED PNEUMATIC TUBING AND PROVIDE REPLACEMENT SPACE TEMPERATURE SENSOR AT LOCATION SHOWN AND TIE OPERATION OF CONTROL VALVE/SENSOR INTO EXISTING SIEMENS DDC SYSTEM. PROVIDE CONTROL WIRING BETWEEN CONTROL VALVE AND REPLACEMENT SENSOR AS REQUIRED.
26. DISCONNECT AND REMOVE EXISTING 2-WAY PNEUMATIC CONTROL VALVE WITHIN EXISTING FIN TUBE ENCLOSURE SYSTEM. DISCONNECT AND REMOVE ALL PNEUMATIC TUBING BACK TO PNEUMATIC MAIN. PROVIDE ELECTRONIC 2-WAY CONTROL VALVE RATED AT 2.4 GPM AT LOCATION OF REMOVED PNEUMATIC CONTROL VALVE. MODIFY HWS BRANCH PIPING AS REQUIRED FOR INSTALLATION OF ELECTRONIC CONTROL VALVE. DISCONNECT AND REMOVE EXISTING SPACE TEMPERATURE SENSOR INCLUDING ASSOCIATED PNEUMATIC TUBING AND PROVIDE REPLACEMENT SPACE TEMPERATURE SENSOR AT LOCATION SHOWN AND TIE OPERATION OF CONTROL VALVE/SENSOR INTO EXISTING SIEMENS DDC SYSTEM. PROVIDE CONTROL WIRING BETWEEN CONTROL VALVE AND REPLACEMENT SENSOR AS REQUIRED.

KEYED NOTES (CONTINUED):

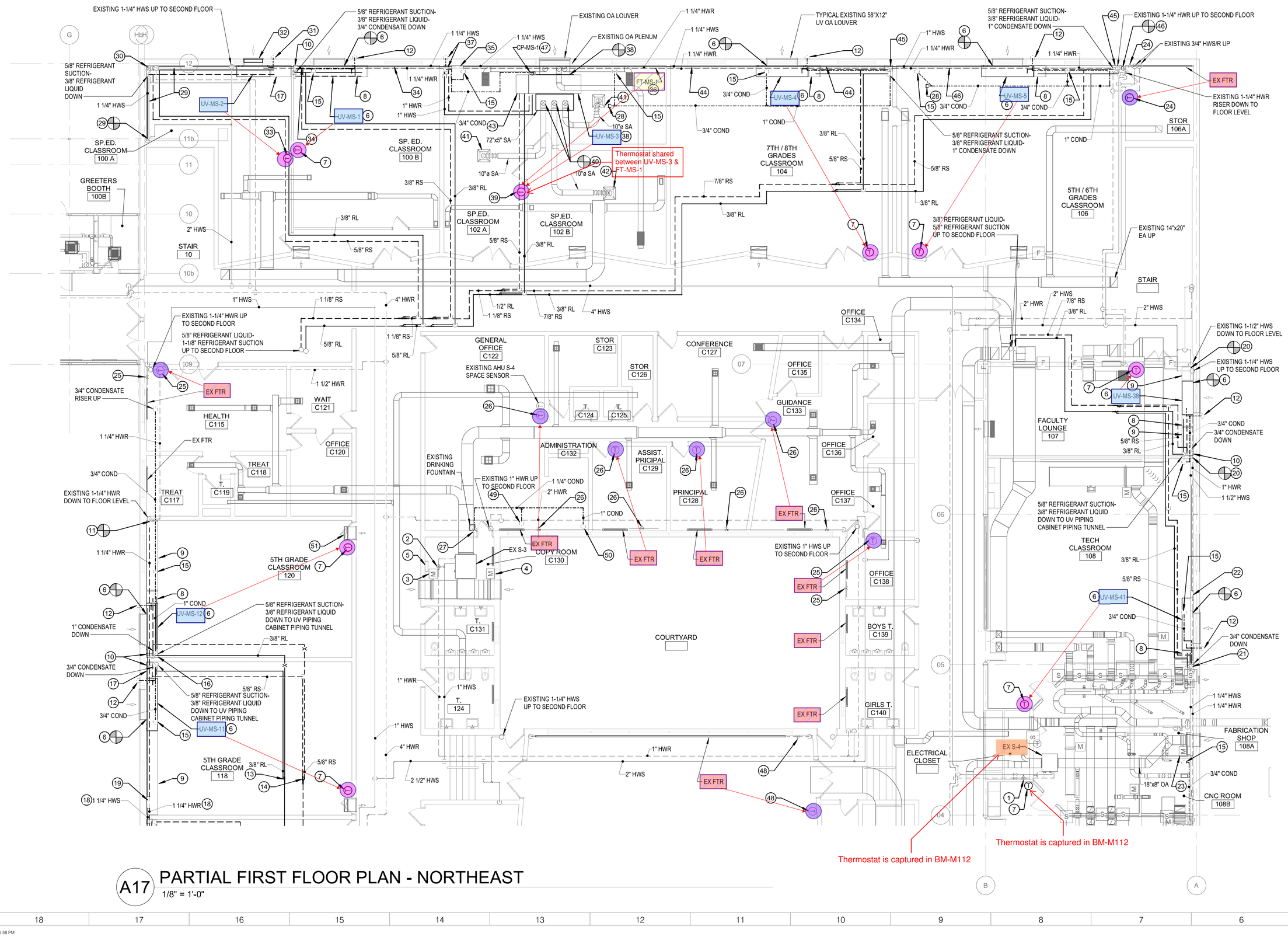
27. ROUTE 1-1/4" CONDENSATE DRAIN PIPING DOWN THROUGH CEILING ALONG WALL AND TERMINATE ABOVE FLOOD RIM OF EXISTING DRINKING FOUNTAIN AT LOCATION SHOWN WITH MITER CUT OPEN-ENDED OUTLET.
28. PROVIDE CLEANOUT PLUG AT LOCATION SHOWN WITHIN CONDENSATE DRAIN PIPING.
29. CONNECT TO EXISTING 1-1/4" HWS RISER AT BASE OF RISER AND ROUTE 1-1/4" HWS PIPING MAIN THROUGH 24" HIGH x 5" DEEP HORIZONTAL PIPING ENCLOSURE. PROVIDE PIPE ENCLOSURE UNITS AROUND PERIMETER OF SPACE AS SHOWN. TERMINATE HORIZONTAL ENCLOSURE AT SIDE OF UV-MS-2. MOUNT TOP OF ENCLOSURE EVEN WITH TOP OF UNIT VENTILATOR UV-MS-2. PROVIDE A 1" HWS BRANCH TO UV-MS-2 AND A 1" HWR CONNECTION TO UV-MS-2 HEATING COIL. CONTINUE 1-1/4" HWS AND 1" HWR THROUGH UV PIPING TUNNEL TO CLASSROOM 100B.
30. PROVIDE 8" WIDE x 8" DEEP VERTICAL PIPE ENCLOSURE UNIT AT CORNER OF CLASSROOM TO CONCEAL REFRIGERANT LIQUID-SUCTION PIPING DROPS. ROUTE VERTICAL SUCTION/LIQUID PIPING DOWN THROUGH TOP OF HORIZONTAL PIPING ENCLOSURE UNIT AND CONNECT TO UV-MS-2 DX COIL CONNECTION AND UV EXPANSION VALVE KIT AS REQUIRED. HEIGHT OF VERTICAL PIPING ENCLOSURE SHALL EXTEND FROM TOP OF HORIZONTAL PIPING ENCLOSURE UNIT TO UNDERSIDE OF SUSPENDED CEILING SYSTEM.
31. ROUTE 3/4" CONDENSATE DRAIN PIPING FROM UV DRAIN PAN OUTLET OUT THROUGH EXTERIOR WALL. TERMINATE PIPING WITH MITER CUT ELBOW FACING GRADE LEVEL AND PITCH PIPING TOWARDS THE EXTERIOR WALL PENETRATION AS REQUIRED.
32. PROVIDE 36" WIDE x 10-3/8" HIGH OUTSIDE AIR LOUVER FURNISHED WITH UNIT VENTILATOR AT LOCATION SHOWN. PROVIDE A 36"x10" OUTSIDE AIR DUCT SLEEVE FROM THE INTERIOR OF THE LOUVER CONNECTION TO THE REAR OF UV-MS-2. PROVIDE AN OPENING IN THE REAR OF THE UV OUTSIDE AIR DUCT PLENUM THE SIZE OF THE DUCT SLEEVE.
33. PROVIDE WALL MOUNTED SPACE TEMPERATURE SENSOR AT LOCATION SHOWN SERVING UV-MS-2. PROVIDE CONTROL WIRING FROM NEAREST DDC CONTROLLER TO SENSOR AND UV DDC CONTROLLER AS REQUIRED.
34. PROVIDE 24" HIGH x 5" DEEP HORIZONTAL PIPING ENCLOSURE ON EITHER SIDE OF UV-MS-1. MOUNT TOP OF ENCLOSURE EVEN WITH TOP OF UNIT VENTILATOR UV-MS-1. PROVIDE 1" HWS/R BRANCHES TO UV-MS-1 HEATING COIL AND ROUTE 1-1/4" HWS/R MAINS THROUGH UV PIPING TUNNEL TO CLASSROOM 102A.
35. PROVIDE 1-1/4" EXPANSION COMPENSATORS ON THE HWS/HWR PIPING MAINS ROUTED WITHIN THE FIN TUBE ENCLOSURE SYSTEM AT LOCATION SHOWN. THE COMPENSATORS SHALL BE 13,812" LONG. PROVIDE ANCHORS ON EACH END OF BOTH THE HWS/R RUNS AND PROVIDE PIPE GUIDES WITHIN 14 PIPE DIAMETERS OF THE COMPENSATORS ON BOTH THE HWS AND HWR COMPENSATORS.
36. PROVIDE WALL-TO-WALL, 24" HIGH x 5-5/16" DEEP FIN TUBE ENCLOSURE WITHIN WITHIN CLASSROOM 102A. PROVIDE 20-FEET OF ACTIVE FIN TUBE FT-MS-1 WITHIN THE ENCLOSURE CENTERED IN THE CLASSROOM. PROVIDE 1" HWS/R BRANCH CONNECTIONS FROM THE 1-1/4" HWS/R MAINS TO THE ACTIVE FIN TUBE. ROUTE THE 1-1/4" HWS MAIN BELOW THE ACTIVE FIN TUBE AND THE 1-1/4" HWR MAIN ABOVE THE ACTIVE FIN TUBE AS REQUIRED, BALANCE FLOW THROUGH 20-FEET OF ACTIVE FIN TUBE TO 2.3 GPM.
37. PROVIDE A 16" DEEP x 8" WIDE VERTICAL PIPE ENCLOSURE UNIT AT CORNER OF CLASSROOM 102A TO CONCEAL 3/4" CONDENSATE DRAIN RISER AND 1" HWS/R RISERS. ROUTE 3/4" CONDENSATE FROM UV-MS-3 DRAIN PAN. COMBINE WITH 3/4" DRAIN RISER ROUTED UP THROUGH FLOOR TO A 1" CONDENSATE MAIN. DROP 1" CONDENSATE RISER DOWN THROUGH VERTICAL ENCLOSURE. THEN ROUTE 1" CONDENSATE DRAIN PIPING FROM UV DRAIN PAN OUTLET OUT THROUGH EXTERIOR WALL. TERMINATE PIPING WITH MITER CUT ELBOW FACING GRADE LEVEL AND PITCH PIPING TOWARDS THE EXTERIOR WALL PENETRATION AS REQUIRED. CONNECT TO 1-1/4" HWS/R MAINS WITHIN 18" HIGH HORIZONTAL PIPE ENCLOSURE WITHIN CLASSROOM 102A AND PROVIDE 1" HWS/R BRANCHES TO HORIZONTAL, SEMI-RECESSED UV-MS-3 HEATING COIL. ROUTE HWS/R RISERS TO ABOVE CEILING WITH VERTICAL PIPE ENCLOSURE. HEIGHT OF VERTICAL PIPING ENCLOSURE SHALL EXTEND FROM TOP OF HORIZONTAL PIPING ENCLOSURE UNIT TO UNDERSIDE OF SUSPENDED CEILING SYSTEM.

GENERAL NOTES:

1. REFRIGERANT PIPING NOTE: 90 DEGREE ELBOWS SHALL BE KEPT A MINIMUM OF 20" FROM CEILING UV DX COILS AND 20" FROM BRANCH CONNECTOR 'Y' JOINTS, IN ADDITION, BRANCH CONNECTOR 'Y' JOINTS SHALL BE A MINIMUM OF 40" FROM ANOTHER BRANCH 'Y' CONNECTOR JOINT.
2. REFRIGERANT PIPING NOTE: THE HEAT PUMP SYSTEM MANUFACTURER SHALL INSPECT ALL FIELD INSTALLED REFRIGERANT PIPING PRIOR TO INSULATION INSTALLATION.
3. THE EXISTING SUSPENDED CEILING SYSTEMS LOCATED WITHIN THE SCOPE OF WORK AREA OUTSIDE OF AREAS BEING RENOVATED BY THE GENERAL CONTRACTOR SHALL BE DISCONNECTED AND REMOVED TO ALLOW FOR THE INSTALLATION WORK AND REINSTALLED FOLLOWING COMPLETION OF THE WORK BY THE MECHANICAL CONTRACTOR. THE SUSPENDED CEILING GRID SYSTEMS SHALL BE REMOVED AND MODIFIED TO COMPLETE THE WORK AND REINSTALLED FOLLOWING THE COMPLETION OF WORK. THE CEILING TILES SHALL BE REMOVED AS REQUIRED TO COMPLETE THE WORK AND REINSTALLED FOLLOWING THE COMPLETION OF THE INSTALLATION WORK. ANY CEILING TILES DAMAGED DURING THE INSTALLATION WORK SHALL BE REPLACED BY THE MECHANICAL CONTRACTOR TO MATCH THE EXISTING CEILING TILES.
4. ALL CUTTING, PATCHING, AND FIREPROOFING ASSOCIATED WITH THE INSTALLATION WORK SHALL BE COMPLETED BY THE MECHANICAL CONTRACTOR. PATCHED AREAS SHALL MATCH EXISTING CONDITIONS. ALL REFRIGERANT PIPING AND CONDENSATE PIPING PENETRATIONS THROUGH CORRIDOR WALLS SHALL BE FIREPROOFED PER SPECIFICATION SECTION 078400.
5. ROUTE REFRIGERANT SUCTION AND LIQUID PIPING FROM THE UNIT VENTILATOR DX COIL CONNECTIONS TO THE HEAT PUMP UNITS. SIZE PIPING AND PROVIDE BRANCH CONNECTOR 'Y' JOINTS PER THE DRAWING. CONFIRM PIPING SIZES AND BRANCH CONNECTOR 'Y' JOINT LOCATIONS REQUIRED WITH HEAT PUMP SYSTEM MANUFACTURER.
6. THE SMALLEST VOLUME ROOM THAT THE REFRIGERANT PIPING SYSTEMS ROUTE THROUGH FOR EACH OF THE HEAT PUMP SYSTEMS IS BELOW THE ASHRAE STANDARD 15 REFRIGERANT CONCENTRATION LIMIT OF 26 POUNDS PER 1,000 CUBIC FEET OF ROOM VOLUME FOR OCCUPIED SPACES.
7. PROVIDE FIRESTOPPING PER SPECIFICATION SECTION 078400 AT ALL PIPING PENETRATIONS THROUGH CORRIDOR WALLS AND STORAGE ROOM WALLS.
8. THE UV UTILITY COMPARTMENT SHALL INCLUDE A REMOVABLE FRONT PANEL, STANDARD #1/4-20 HEX FASTENER, STEEL TOP AND BACK WALL F-CHANNEL.
9. ROUTE REFRIGERANT SUCTION-LIQUID PIPING WITHIN UNIT VENTILATOR PIPING TUNNELS AND UNIT VENTILATOR SHELVING SYSTEM TUNNELS TO DX COOLING COIL CONNECTIONS AND UV EXPANSION VALVE KITS PER THE MANUFACTURER'S RECOMMENDATIONS.

KEYED NOTES (CONTINUED):

39. PROVIDE SEMI-RECESSED HORIZONTAL UNIT VENTILATOR UV-MS-3 AT LOCATION SHOWN. PROVIDE UV WITH BOTTOM RETURN AIR INLET STAMPED REGISTER, REAR DUCTED OUTSIDE AIR INLET AND FRONT DISCHARGE DUCTED SA OUTLET. EXTEND EXISTING OA PLENUM TO REAR OUTSIDE AIR INLET ON UV AS REQUIRED.
40. PROVIDE WALL MOUNTED SPACE TEMPERATURE SENSOR AT LOCATION SHOWN SERVING UV-MS-3 AND FIN TUBE RADIATION FT-MS-1 CONTROL VALVE. PROVIDE CONTROL WIRING FROM NEAREST DDC CONTROLLER TO SENSOR AND UV DDC CONTROLLER AS REQUIRED.
41. PROVIDE 72"x5" SA PLENUM CONNECTED TO FRONT DISCHARGE OUTLET ON UV-MS-3. INSULATE THE SA PLENUM WITH 2" THICK FLEXIBLE GLASS FIBER DUCT WRAP INSULATION. CONNECT THE EXISTING, THREE 10" ROUND SA BRANCHES TO THE TOP OF THE 72"x5" SA PLENUM AS REQUIRED. INSTALL UV-MS-3 SO THAT THE THE BOTTOM OF THE SA PLENUM, WITH INSULATION, IS ABOVE THE TOP OF THE EXISTING SUSPENDED CEILING SYSTEM.
42. REBALANCE SUPPLY AIRFLOW THROUGH EXISTING LAY-IN SA DIFFUSERS UTILIZING EXISTING IN-DUCT VOLUME DAMPERS ON EACH SA BRANCH TO 430 CFM WITH UV-MS-3 OPERATING AT DESIGN SUPPLY AIRFLOW.
43. REBALANCE SUPPLY AIRFLOW THROUGH EXISTING LAY-IN SA DIFFUSER UTILIZING EXISTING IN-DUCT VOLUME DAMPERS ON EACH SA BRANCH TO 480 CFM WITH UV-MS-3 OPERATING AT DESIGN SUPPLY AIRFLOW.
44. PROVIDE EXTERNALLY MOUNTED WIRED NAVIGATION REMOTE CONTROLLER. VARIABLE REFRIGERANT VOLUME CONTROL BOX AND VARIABLE REFRIGERANT VOLUME EXPANSION VALVE KIT SERVING HORIZONTAL UNIT VENTILATOR UV-MS-3 AT LOCATION SHOWN ABOVE EXISTING SUSPENDED CEILING SYSTEM. ROUTE LIQUID/SUCTION REFRIGERANT PIPING TO EXPANSION VALVE KIT AND UV DX COIL AS REQUIRED.
45. PROVIDE 24" HIGH x 5" DEEP HORIZONTAL PIPING ENCLOSURE ON EITHER SIDE OF UV-MS-4. MOUNT TOP OF ENCLOSURE EVEN WITH TOP OF UNIT VENTILATOR UV-MS-4. PROVIDE 1" HWS/R BRANCHES TO UV-MS-4 HEATING COIL AND ROUTE HWS/R MAINS THROUGH UV PIPING TUNNEL TO CLASSROOM 106.
46. PROVIDE 16" WIDE x 8" DEEP VERTICAL PIPE ENCLOSURE UNIT AT CORNER OF CLASSROOM TO CONCEAL REFRIGERANT LIQUID-SUCTION PIPING DROPS AND THE 3/4" CONDENSATE RISER DROP FROM THE TWO SECOND FLOOR CONDENSATE RISERS DROPS. ROUTE VERTICAL SUCTION/LIQUID PIPING DOWN THROUGH TOP OF HORIZONTAL PIPING ENCLOSURE AND CONNECT TO UV DX COIL CONNECTION AND UV EXPANSION VALVE KIT AS REQUIRED. ROUTE CONDENSATE DRAIN PIPING FROM VERTICAL DROP THROUGH HORIZONTAL PIPING ENCLOSURE AND CONNECT TO HORIZONTAL CONDENSATE DRAIN PIPING FROM FIRST FLOOR UV DRAIN PAN OUTLET PRIOR TO EXITING THROUGH EXTERIOR WALL. HEIGHT OF VERTICAL PIPING ENCLOSURE SHALL EXTEND FROM TOP OF HORIZONTAL PIPING ENCLOSURE UNIT TO UNDERSIDE OF EXISTING SUSPENDED CEILING SYSTEM.
47. PROVIDE 24" HIGH x 5" DEEP HORIZONTAL PIPING ENCLOSURE ON EITHER SIDE OF UV-MS-5, MOUNT TOP OF ENCLOSURE EVEN WITH TOP OF UNIT VENTILATOR UV-MS-5. PROVIDE 1" HWS/R BRANCHES TO UV-MS-5 HEATING COIL AND ROUTE 1-1/4" HWR MAIN THROUGH UV PIPING TUNNEL PAST UV-MS-5, THROUGH THE HORIZONTAL PIPING ENCLOSURE AND CONNECT TO THE EXISTING 1-1/4" HWR RISER AT THE CONNECTION POINT SHOWN AT BOTTOM RISER.
48. PROVIDE MINI-CONDENSATE REMOVAL PUMP AT LOCATION SHOWN ATTACHED TO UV-MS-3, ROUTE CONDENSATE FROM HORIZONTAL UV DRAIN PAN OUTLET TO INLET OF PUMP, THEN ROUTE CONDENSATE DRAIN PIPING FROM OUTLET OF PUMP TO 3/4" CONDENSATE DRAIN PIPING LINE AS SHOWN.
49. DISCONNECT AND REMOVE EXISTING 2-WAY PNEUMATIC CONTROL VALVE WITHIN EXISTING FIN TUBE ENLCOSURE SYSTEM. DISCONNECT AND REMOVE ALL PNEUMATIC TUBING BACK TO PNEUMATIC MAIN. PROVIDE ELECTRONIC 2-WAY CONTROL VALVE RATED AT 8.7 GPM AT LOCATION OF REMOVED PNEUMATIC CONTROL VALVE. MODIFY HWS BRANCH PIPING AS REQUIRED FOR INSTALLATION OF ELECTRONIC CONTROL VALVE. DISCONNECT AND REMOVE EXISTING SPACE TEMPERATURE SENSOR INCLUDING ASSOCIATED PNEUMATIC TUBING AND PROVIDE REPLACEMENT SPACE TEMPERATURE SENSOR AT LOCATION SHOWN AND TIE OPERATION OF CONTROL VALVE/SENSOR INTO EXISTING SIEMENS DDC SYSTEM. PROVIDE CONTROL WIRING BETWEEN CONTROL VALVE AND REPLACEMENT SENSOR AS REQUIRED.
50. 3/4" CONDENSATE DRAIN RISER UP THROUGH FLOOR. ROUTE CONDENSATE PIPING TO DRINKING FOUNTAIN TERMINATION OUTLET AS OUTLINED IN KEYED NOTE 27.
51. PROVIDE 1" CONDENSATE DRAIN RISER UP THROUGH FLOOR AT LOCATION SHOWN.
52. LOCATION OF TYPICAL CEILING MOUNTED RELIEF AIR REGISTER DUCTED THROUGH CORRIDOR WALL TO CORRIDOR CEILING PLENUM. TERMINATED OPEN-ENDED ABOVE CEILING PLENUM FOR RELIEF AIR OF CLASSROOMS.



A17 PARTIAL FIRST FLOOR PLAN - NORTHEAST
1/8" = 1'-0"

LEGEND:

- UV-MS-XX — UNIT VENTILATOR
- FT-MS-1 — NEW FIN TUBE RADIATOR
- T — UV/NEW FTR-WALL SENSOR
- EX FTR — EXISTING FIN TUBE RADIATOR
- T — EX FTR-WALL SENSOR
- EX S-X — EXISTING AIR HANDLING UNIT
- T — EX AHU-WALL SENSOR

SIEMENS WALL SENSOR LOCATION DRAWING

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KEYED NOTES:

1. DISCONNECT AND REMOVE EXISTING AIR HANDLING UNIT S-1 3-WAY PNEUMATIC CONTROL VALVE. DISCONNECT AND REMOVE ALL PNEUMATIC TUBING BACK TO PNEUMATIC MAIN. PROVIDE ELECTRONIC 3-WAY CONTROL VALVE RATED AT 39 GPM. DISCONNECT AND REMOVE ALL S-1 PNEUMATIC SENSORS AND CONTROL DEVICES AND CONVERT TO ELECTRONIC. TIE ALL ELECTRONIC SENSORS FROM S-1 INTO THE EXISTING SIEMENS DDC SYSTEM.
2. DISCONNECT AND REMOVE EXISTING AIR HANDLING UNIT S-4 PNEUMATIC THERMOSTAT. CAP PNEUMATIC TUBING ABOVE CEILING SYSTEM. PROVIDE DDC SYSTEM SPACE SENSOR AT LOCATION OF REMOVED PNEUMATIC THERMOSTAT CONNECTED TO S-4 OPERATION.
3. DISCONNECT AND REMOVE EXISTING AIR HANDLING UNIT S-2 3-WAY PNEUMATIC CONTROL VALVE. DISCONNECT AND REMOVE ALL PNEUMATIC TUBING BACK TO PNEUMATIC MAIN. PROVIDE ELECTRONIC 3-WAY CONTROL VALVE RATED AT 39 GPM. DISCONNECT AND REMOVE ALL S-2 PNEUMATIC SENSORS AND CONTROL DEVICES AND CONVERT TO ELECTRONIC. TIE ALL ELECTRONIC SENSORS FROM S-2 INTO THE EXISTING SIEMENS DDC SYSTEM.
4. PROVIDE DDC SYSTEM SPACE SENSOR AT LOCATION OF REMOVED PNEUMATIC THERMOSTAT CONNECTED TO EXISTING AHU S-2 OPERATION IN CONJUNCTION WITH REPLACEMENT 2-WAY CONTROL VALVE OUTLINED IN KEYED NOTE 28.
5. DISCONNECT AND REMOVE EXISTING AIR HANDLING UNIT S-2 PNEUMATIC MOTORIZED RETURN AIR DAMPER AT LOCATION SHOWN AND REPLACE WITH ELECTRONIC MOTORIZED DAMPER. TIE CONTROL OF DAMPER INTO DDC SYSTEM. REMOVE PNEUMATIC TUBING FROM REMOVED DAMPER BACK TO PNEUMATIC PIPING MAIN.
6. DISCONNECT AND REMOVE EXISTING AIR HANDLING UNIT S-2 PNEUMATIC MOTORIZED OUTSIDE AIR DAMPER AT LOCATION SHOWN AND REPLACE WITH ELECTRONIC MOTORIZED DAMPER. TIE CONTROL OF DAMPER INTO DDC SYSTEM. REMOVE PNEUMATIC TUBING FROM REMOVED DAMPER BACK TO PNEUMATIC PIPING MAIN.
7. PROVIDE FLOOR MOUNTED UNIT VENTILATOR AT LOCATION SHOWN. PROVIDE UNIT VENTILATOR WITH FULLY CLOSED ADAPTER-BACK WITH REAR OUTDOOR AIR OPENING TO BE CUT IN FIELD TO MATCH EXISTING WALL OUTDOOR AIR OPENING SIZE. CONNECT TO EXISTING OA DUCT SLEEVE AS REQUIRED AND EXTEND INTO REAR OUTDOOR AIR OPENING ON THE UNIT VENTILATOR. CONNECT TO HWS/HWR PIPING ROUTED WITHIN UNIT VENTILATOR SHELVING SYSTEM PIPING TUNNEL AND PROVIDE 1" HWS/HWR BRANCH CONNECTIONS TO UV HEATING COIL CONNECTIONS AS REQUIRED.
8. PROVIDE REPLACEMENT TEMPERATURE SENSOR AT LOCATION SHOWN AND UTILIZE FOR SPACE TEMPERATURE CONTROL OF UNIT VENTILATOR LOCATED WITHIN SAME SPACE AS SENSOR AS REQUIRED. PROVIDE CONTROL WIRING BETWEEN SENSOR AND UNIT VENTILATOR DDC CONTROLLER AS REQUIRED.
9. PROVIDE 24" WIDE x 21-7/8" DEEP UTILITY COMPARTMENT AT LOCATION SHOWN FOR HOUSING DDC SYSTEM CONTROLLER AND VARIABLE REFRIGERANT VOLUME CONTROL COMPONENTS. THE UTILITY COMPARTMENT SHALL HOUSE THE FOLLOWING VARIABLE REFRIGERANT VOLUME CONTROL COMPONENTS: 1. WIRED NAVIGATION REMOTE CONTROLLER 2. VARIABLE REFRIGERANT VOLUME CONTROL BOX AND 3. VARIABLE REFRIGERANT VOLUME EXPANSION VALVE KIT.
10. AT LOCATIONS CALLED OUT, PROVIDE 21-7/8" DEEP PERIMETER SHELVING CABINETS. THE CABINETS SHALL BE 30" HIGH THAT INCLUDE A BASE CABINET, ONE SHELF, A STEEL TOP WITH LOUVER OUTLET, A FRONT SKIRT WITH LOUVER INLET AND A BACK WALL ANGLE. THE SHELVING CABINETS SHALL INCLUDE A 5-7/8" DEEP PIPE SPACING CAVITY AT THE REAR OF THE CABINET SYSTEM. THE SHELF SHALL BE 10-1/2" DEEP AND THE SYSTEM SHALL INCLUDE A 3" HIGH OPENING AT THE BOTTOM (COVERED BY THE LOUVERED INLET FRONT SKIRT) THAT ALLOWS AIR MOVEMENT THROUGH THE BOTTOM-FRONT OF THE SYSTEM AND OUT THE TOP-REAR OF THE SYSTEM. PROVIDE PERIMETER SHELVING CABINET SYSTEM FILLER SECTIONS WHERE REQUIRED TO TERMINATE SHELVING SYSTEMS AT END POINTS SHOWN. THE FILLER SECTION SHALL BE FIELD CUT TO FIT BETWEEN THE END PANEL AND THE LAST SHELVING CABINET SYSTEM. THE FILLER SECTION SHALL INCLUDE A FLOOR ANGLE. FRONT PANEL, STEEL TOP, BACK WALL ANGLE. THE SYSTEM SHALL BE MANUFACTURED BY HVAC CUSTOM ENCLOSURE CO., LLC DRAWING NUMBER SC164-0028 OR EQUAL.
11. PROVIDE 12" WIDE x 8" DEEP VERTICAL PIPE ENCLOSURE UNIT AT CORNER OF CLASSROOM TO CONCEAL REFRIGERANT LIQUID-SUCTION PIPING DROPS AND THE 3/4" CONDENSATE RISER DROP FROM THE SECOND FLOOR UV DRAIN PAN. ROUTE VERTICAL SUCTION/LIQUID PIPING DOWN THROUGH TOP OF UNIT VENTILATOR SHELVING CABINET TOP AND CONNECT TO UV DX COIL CONNECTION AND UV EXPANSION VALVE KIT AS REQUIRED. ROUTE CONDENSATE DRAIN PIPING FROM TO PIPING TUNNEL AND CONNECT TO HORIZONTAL CONDENSATE DRAIN PIPING FROM FIRST FLOOR UV DRAIN PAN OUTLET PRIOR TO EXITING THROUGH EXTERIOR WALL. HEIGHT OF VERTICAL PIPING ENCLOSURE SHALL EXTEND FROM TOP OF SHELVING CABINET SYSTEM TO UNDERSIDE OF SUSPENDED CEILING SYSTEM.
12. CONNECT TO EXISTING 1-1/4" HWS RISER AT FLOOR LEVEL AND ROUTE 1-1/4" HWS PIPING MAIN WITHIN SHELVING CABINET PIPING TUNNEL AS SHOWN.
13. ROUTE 1" HWR FROM UV-MS-9 HEATING COIL WITHIN SHELVING CABINET PIPING TUNNEL TO CLASSROOM 116 PIPING TUNNEL.
14. ROUTE 1-1/4" COMBINED CONDENSATE DRAIN PIPING FROM FIRST FLOOR UV DRAIN PAN OUTLET AND CONDENSATE FROM SECOND FLOOR UV DRAIN PAN OUT THROUGH EXTERIOR WALL. TERMINATE PIPING WITH MITER CUT ELBOW FACING GRADE LEVEL AND PITCH PIPING TOWARDS THE EXTERIOR WALL PENETRATION AS REQUIRED.
15. TYPICAL REFRIGERANT LIQUID BRANCH CONNECTOR 'Y' FITTING JOINT.
16. TYPICAL REFRIGERANT SUCTION BRANCH CONNECTOR 'Y' FITTING JOINT.
17. 3/4" CONDENSATE DRAIN RISER UP THROUGH FLOOR. ROUTE TO VERTICAL PIPING ENCLOSURE AND DROP DOWN INTO SHELVING SYSTEM PIPING TUNNEL.
18. PROVIDE UNIT VENTILATOR SYSTEM SHELVING/CABINET FILLER PIECE BETWEEN END OF UNIT VENTILATOR AND WALL AT LOCATIONS SHOWN.

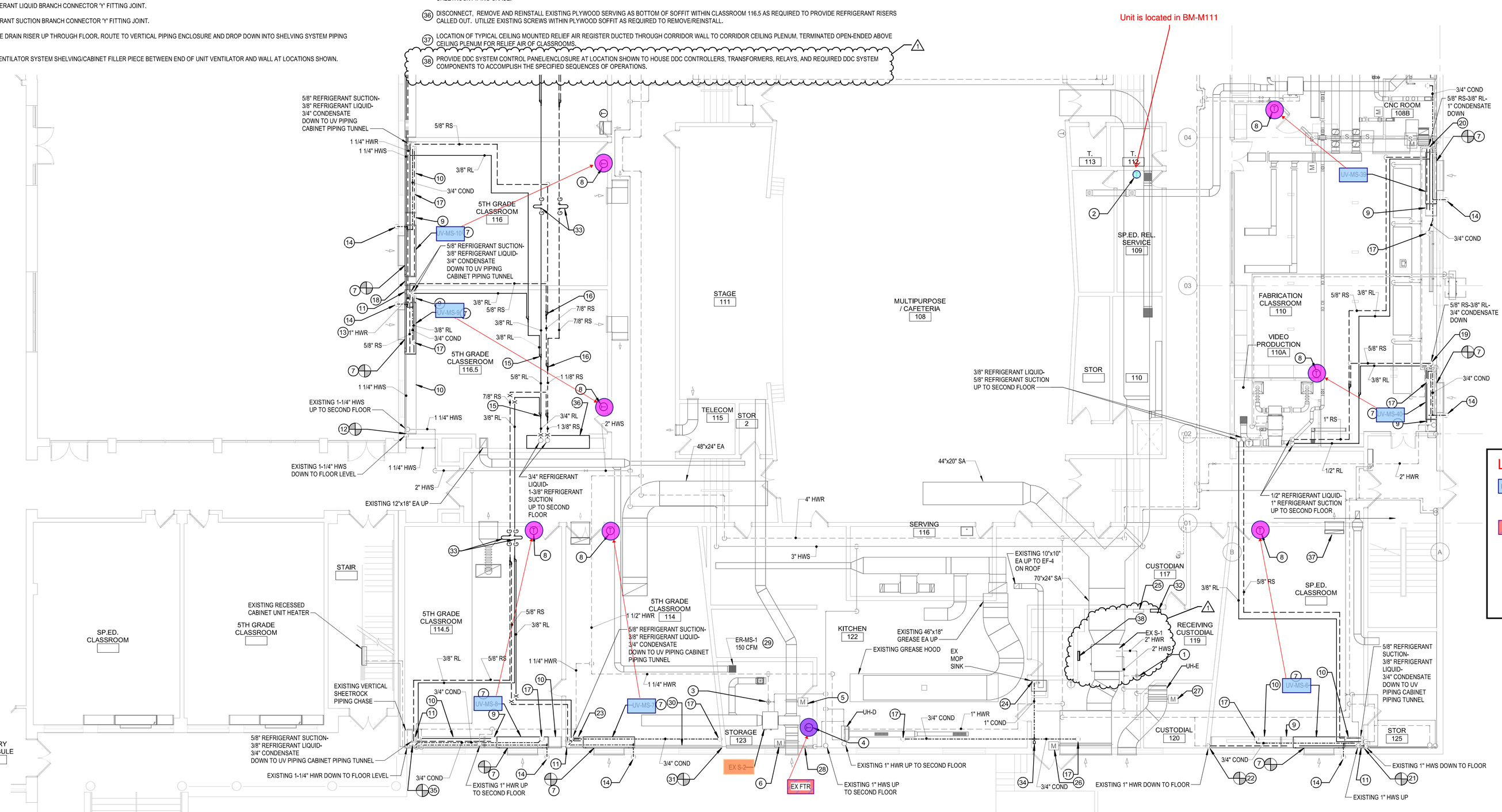
KEYED NOTES (CONTINUED):

19. ROUTE 3/4" CONDENSATE DRAIN FROM RISER UP THROUGH FLOOR AND THE 3/8" LIQUID-5/8" SUCTION PIPING DROPS DOWN THROUGH VERTICAL CHASE TO WITHIN UNIT VENTILATOR PIPING TUNNEL. ROUTE SUCTION/LIQUID PIPING TO EXPANSION VALVE KIT WITHIN UTILITY COMPARTMENT AND UV DX COIL AS REQUIRED. ROUTE CONDENSATE DRAIN PIPING TO UV-MS-40 CONDENSATE DRAIN LINE AS REQUIRED.
20. COMBINE TWO 3/4" CONDENSATE DRAINS FROM TWO RISER LOCATIONS UP THROUGH FLOOR TO ONE 1" CONDENSATE RISER DROP. AND THE 3/8" LIQUID-5/8" SUCTION PIPING DROPS DOWN THROUGH VERTICAL CHASE TO WITHIN UNIT VENTILATOR PIPING TUNNEL. ROUTE SUCTION/LIQUID PIPING TO EXPANSION VALVE KIT WITHIN UTILITY COMPARTMENT AND UV DX COIL AS REQUIRED. ROUTE 1" CONDENSATE DRAIN PIPING TO UV-MS-39 CONDENSATE DRAIN LINE AS REQUIRED.
21. CONNECT TO EXISTING 1" HWS DROP AT BASE OF RISER AND ROUTE 1" HWS TO UV-MS-6 HEATING COIL.
22. CONNECT TO EXISTING 1" HWR DROP AT BASE OF RISER AND ROUTE 1" HWR TO UV-MS-6 HEATING COIL.
23. PROVIDE 24" WIDE x 21-7/8" DEEP UTILITY COMPARTMENT AT LOCATION SHOWN FOR HOUSING DDC SYSTEM CONTROLLER AND VARIABLE REFRIGERANT VOLUME CONTROL COMPONENTS. THE UTILITY COMPARTMENT SHALL HOUSE THE FOLLOWING VARIABLE REFRIGERANT VOLUME CONTROL COMPONENTS: 1. WIRED NAVIGATION REMOTE CONTROLLER 2. VARIABLE REFRIGERANT VOLUME CONTROL BOX AND 3. VARIABLE REFRIGERANT VOLUME EXPANSION VALVE KIT. PROVIDE UNIT VENTILATOR SYSTEM SHELVING/CABINET FILLER PIECE BETWEEN END OF UTILITY COMPARTMENT AND WALL TO FILL GAP BETWEEN UTILITY COMPARTMENT END AND WALL.
24. ROUTE 1" CONDENSATE DRAIN PIPING TO 6" ABOVE EXISTING SLOP SINK FLOOD RIM. TERMINATE OPEN-ENDED WITH MITER CUT OUTLET.
25. LOCATION OF EXISTING AIR HANDLING UNIT S-1 DDC SYSTEM CONTROLLER. DISCONNECT AND REMOVE DAMPER ELECTRIC-TO-PNEUMATIC TRANSDUCER AND 3-WAY CONTROL VALVE ELECTRIC-TO-PNEUMATIC TRANSDUCER INCLUDING ASSOCIATED PNEUMATIC TUBING AND PNEUMATIC DIAL OPERATORS. REMOVE PNEUMATIC TUBING BACK TO PNEUMATIC PIPING MAIN AND CAP. TIE ELECTRONIC CONTROL VALVE AND ELECTRONIC MOTORIZED DAMPER OUTLINED IN KEYED NOTES 1 AND 26 INTO THE S-1 DDC CONTROLLER AS REQUIRED.
26. DISCONNECT AND REMOVE EXISTING AIR HANDLING UNIT S-1 PNEUMATIC MOTORIZED OUTSIDE AIR DAMPER AT LOCATION SHOWN AND REPLACE WITH ELECTRONIC MOTORIZED DAMPER. TIE CONTROL OF DAMPER INTO EXISTING DDC SYSTEM. REMOVE PNEUMATIC TUBING FROM REMOVED DAMPER BACK TO PNEUMATIC PIPING MAIN.
27. DISCONNECT AND REMOVE EXISTING HYDRONIC UNIT HEATER UH-E DUAL PNEUMATIC FACE AND BAYPASS DAMPER ACTUATORS AT LOCATION SHOWN AND REPLACE WITH ELECTRONIC MOTORIZED DAMPER ACTUATORS. TIE CONTROL OF DAMPERS INTO EXISTING DDC SYSTEM. REMOVE PNEUMATIC TUBING FROM REMOVED DAMPER BACK TO PNEUMATIC PIPING MAIN.
28. DISCONNECT AND REMOVE EXISTING 2-WAY PNEUMATIC CONTROL VALVE WITHIN EXISTING FIN TUBE ENLCOSURE SYSTEM. DISCONNECT AND REMOVE ALL PNEUMATIC TUBING BACK TO PNEUMATIC MAIN. PROVIDE ELECTRONIC 2-WAY CONTROL VALVE RATED AT 1.5 GPM AT LOCATION OF REMOVED PNEUMATIC CONTROL VALVE. MODIFY HWS BRANCH PIPING AS REQUIRED FOR INSTALLATION OF ELECTRONIC CONTROL VALVE. PROVIDE SPACE TEMPERATURE SENSOR AT LOCATION SHOWN OUTLINED IN KEYED NOTE 4 AND TIE OPERATION OF CONTROL VALVE/SENSOR INTO EXISTING SIEMENS DDC SYSTEM.
29. PROVIDE EXHAUST REGISTER ER-MS-1 AT LOCATION SHOWN AT LOCATION OF MISSING REGISTER. CONNECT EXISTING 12"x12" EA DROP TO REGISTER AS REQUIRED. BALANCE AIRFLOW THROUGH REGISTER TO 150 CFM WITH EXISTING EXHAUST FAN EF-11 OPERATING.
30. PROVIDE 24" HIGH x 5" DEEP HORIZONTAL PIPING ENCLOSURE BETWEEN END OF UV-MS-7 AND WALL BETWEEN STORAGE 123 AND CLASSROOM 114. ROUTE HWS/R BRANCH PIPING ROUTED FROM STORAGE 123 INTO THE PIPING ENCLOSURE.
31. CONNECT TO EXISTING HWS/R ROUTED THROUGH STORAGE ROOM 123 WALL INTO CLASSROOM 114. ROUTE HWS/R THROUGH HORIZONTAL PIPE ENCLOSURE. PROVIDE 1" HWS/R BRANCHES TO UV-MS-7 HEATING COIL. THEN ROUTE 1" HWS TO UV-MS-8 WITHIN CLASSROOM 114.5 THROUGH THE UV PIPING TUNNELS. AND ROUTE 1-1/4" HWS THROUGH THE UV PIPING TUNNELS TO THE SECOND CONNECTION POINT SHOWN UPSTREAM OF THE HWR PENETRATION THROUGH THE EXISTING VERTICAL CHASE. PROVIDE A 1" HWR CONNECTION TO THE UV-MS-8 HEATING COIL AS REQUIRED.
32. PROVIDE DAIKIN MODEL DCM014A51 BACNET INTERFACE AT LOCATION SHOWN CAPABLE OF INTEGRATION WITH THE BUILDING'S EXISTING DIRECT DIGITAL CONTROL (DDC) SYSTEM. THE DDC SHALL PROVIDE A LOW VOLTAGE CONNECTION FROM THE NEAREST DDC CONTROL PANEL TO THE BACNET INTERFACE AS REQUIRED. THE BACNET INTERFACE DEVICE SHALL ALLOW THE DDC SYSTEM TO MONITOR AND CONTROL THE VARIABLE REFRIGERANT VOLUME INDOOR AND OUTDOOR UNITS INSTALLED. TWISTED PAIR COMMUNICATION WIRING SHALL BE PROVIDED FROM EACH ROOFTOP HEAT PUMP UNIT TO THE BACNET INTERFACE DEVICE, AND TWISTED PAIR COMMUNICATION WIRING SHALL BE PROVIDED FROM EACH HEAT PUMP UNIT TO EACH CONTROLLER KIT LOCATED WITHIN THE UTILITY COMPARTMENT OF EACH NEW UNIT VENTILATOR.
33. PROVIDE UL-207 LISTED EXPANSION LOOP FOR THE 3/8" REFRIGERANT LIQUID AND 7/8" REFRIGERANT SUCTION LINES AT LOCATION SHOWN. THE 3/8" LOOP SHALL BE 28-1/2" LONG x 17-1/2" HIGH. THE 7/8" LOOP SHALL BE 28-1/2" LONG x 19-3/4" WIDE. PROVIDE PIPE GUIDES ON EITHER SIDE OF LOOP AND PIPE ANCHORS AT END OF PIPING RUNS PER MANUFACTURER'S RECOMMENDATIONS. INSTALL REFRIGERANT MAINS AT DIFFERENT ELEVATIONS TO ALLOW LOOPS TO AVOID CONFLICT WITHIN CEILING PLENUM.
34. PROVIDE CLEANOUT PLUG AT LOCATION SHOWN WITHIN CONDENSATE DRAIN PIPING.
35. CONNECT TO EXISTING 3/4" HWS AND 1-1/4" HWR PIPING LINES AT CONNECTION POINT SHOWN UPSTREAM OF PIPING PENETRATIONS THROUGH EXISTING VERTICAL SHEETROCK PIPING CHASE.
36. DISCONNECT, REMOVE AND REINSTALL EXISTING PLYWOOD SERVING AS BOTTOM OF SOFFIT WITHIN CLASSROOM 116.5 AS REQUIRED TO PROVIDE REFRIGERANT RISERS CALLED OUT. UTILIZE EXISTING SCREWS WITHIN PLYWOOD SOFFIT AS REQUIRED TO REMOVE/REINSTALL.
37. LOCATION OF TYPICAL CEILING MOUNTED RELIEF AIR REGISTER DUCTED THROUGH CORRIDOR WALL TO CORRIDOR CEILING PLENUM, TERMINATED OPEN-ENDED ABOVE CEILING PLENUM FOR RELIEF AIR OF CLASSROOMS.
38. PROVIDE DDC SYSTEM CONTROL PANEL/ENCLOSURE AT LOCATION SHOWN TO HOUSE DDC CONTROLLERS, TRANSFORMERS, RELAYS, AND REQUIRED DDC SYSTEM COMPONENTS TO ACCOMPLISH THE SPECIFIED SEQUENCES OF OPERATIONS.

GENERAL NOTES:

1. REFRIGERANT PIPING NOTE: 90 DEGREE ELBOWS SHALL BE KEPT A MINIMUM OF 20" FROM BRANCH CONNECTOR 'Y' JOINTS. IN ADDITION, BRANCH CONNECTOR 'Y' JOINTS SHALL BE A MINIMUM OF 40" FROM ANOTHER BRANCH 'Y' CONNECTOR JOINT.
2. REFRIGERANT PIPING NOTE: THE HEAT PUMP SYSTEM MANUFACTURER SHALL INSPECT ALL FIELD INSTALLED REFRIGERANT PIPING PRIOR TO INSULATION INSTALLATION.
3. THE EXISTING SUSPENDED CEILING SYSTEMS LOCATED WITHIN THE SCOPE OF WORK AREA OUTSIDE OF AREAS BEING RENOVATED BY THE GENERAL CONTRACTOR SHALL BE DISCONNECTED AND REMOVED TO ALLOW FOR THE INSTALLATION WORK AND REINSTALLED FOLLOWING COMPLETION OF THE WORK BY THE MECHANICAL CONTRACTOR. THE SUSPENDED CEILING GRID SYSTEMS SHALL BE REMOVED AND MODIFIED TO COMPLETE THE WORK AND REINSTALLED FOLLOWING THE COMPLETION OF WORK. THE CEILING TILES SHALL BE REMOVED AS REQUIRED TO COMPLETE THE WORK AND REINSTALLED FOLLOWING THE COMPLETION OF THE INSTALLATION WORK. ANY CEILING TILES DAMAGED DURING THE INSTALLATION WORK SHALL BE REPLACED BY THE MECHANICAL CONTRACTOR TO MATCH THE EXISTING CEILING TILES.
4. ALL CUTTING, PATCHING, AND FIREPROOFING ASSOCIATED WITH THE INSTALLATION WORK SHALL BE COMPLETED BY THE MECHANICAL CONTRACTOR. PATCHED AREAS SHALL MATCH EXISTING CONDITIONS. ALL REFRIGERANT PIPING AND CONDENSATE PIPING PENETRATIONS THROUGH CORRIDOR WALLS SHALL BE FIREPROOFED PER SPECIFICATION SECTION 078400.
5. ROUTE REFRIGERANT SUCTION AND LIQUID PIPING FROM THE UNIT VENTILATOR DX COIL CONNECTIONS TO THE HEAT PUMP UNITS. SIZE PIPING AND PROVIDE BRANCH CONNECTOR 'Y' JOINTS PER THE DRAWING. CONFIRM PIPING SIZES AND BRANCH CONNECTOR 'Y' JOINT LOCATIONS REQUIRED WITH HEAT PUMP SYSTEM MANUFACTURER.
6. THE SMALLEST VOLUME ROOM THAT THE REFRIGERANT PIPING SYSTEMS ROUTE THROUGH FOR EACH OF THE HEAT PUMP SYSTEMS IS BELOW THE ASHRAE STANDARD 15 REFRIGERANT CONCENTRATION LIMIT OF 26 POUNDS PER 1,000 CUBIC FEET OF ROOM VOLUME FOR OCCUPIED SPACES.
7. PROVIDE FIRESTOPPING PER SPECIFICATION SECTION 078400 AT ALL PIPING PENETRATIONS THROUGH CORRIDOR WALLS AND STORAGE ROOM WALLS.
8. THE UV UTILITY COMPARTMENT SHALL INCLUDE A REMOVABLE FRONT PANEL, STANDARD #1/4-20 HEX FASTENER, STEEL TOP AND BACK WALL F-CHANNEL.
9. ROUTE REFRIGERANT SUCTION-LIQUID PIPING WITHIN UNIT VENTILATOR PIPING TUNNELS AND UNIT VENTILATOR SHELVING SYSTEM TUNNELS TO DX COOLING COIL CONNECTIONS AND UV EXPANSION VALVE KITS PER THE MANUFACTURER'S RECOMMENDATIONS.

Unit is located in BM-M111



LEGEND:

- UV-MS-XX — UNIT VENTILATOR
- T — UV-WALL SENSOR
- EX FTR — EXISTING FIN TUBE RADIATOR
- T — EX FTR-WALL SENSOR
- EX S-X — EXISTING AIR HANDLING UNIT
- T — EX AHU-WALL SENSOR

SIEMENS WALL SENSOR LOCATION DRAWING

A18 PARTIAL FIRST FLOOR PLAN - SOUTHEAST
1/8" = 1'-0"

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REGISTRATION EXPIRES: 11/30/2023

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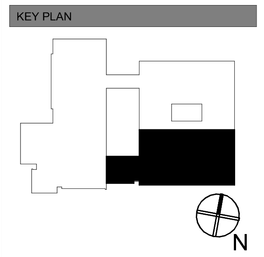
NUFSD
BOND PROJECTS
PH3

☐ SED#50-01-08-03-0-003-035 (HIGH SCHOOL)
■ SED#50-01-08-03-0-004-020 (BARR MIDDLE SCHOOL)

High School
103 Church St.
Nanuet, NY 10954

Barr Middle School
50 Blauvelt Rd #1
Nanuet, NY 10954

KEY PLAN



REVISIONS

No.	Description	Date
1	BID ADDENDUM #6	07/12/23

ISSUED: BID SET ISSUANCE
DATE: 06/06/2023
SCALE: 1/8" = 1'-0"
SHEET NAME: PARTIAL FIRST FLOOR PLAN - SOUTHEAST
SHEET NUMBER: BM-M112

ISSUE FOR BID SET

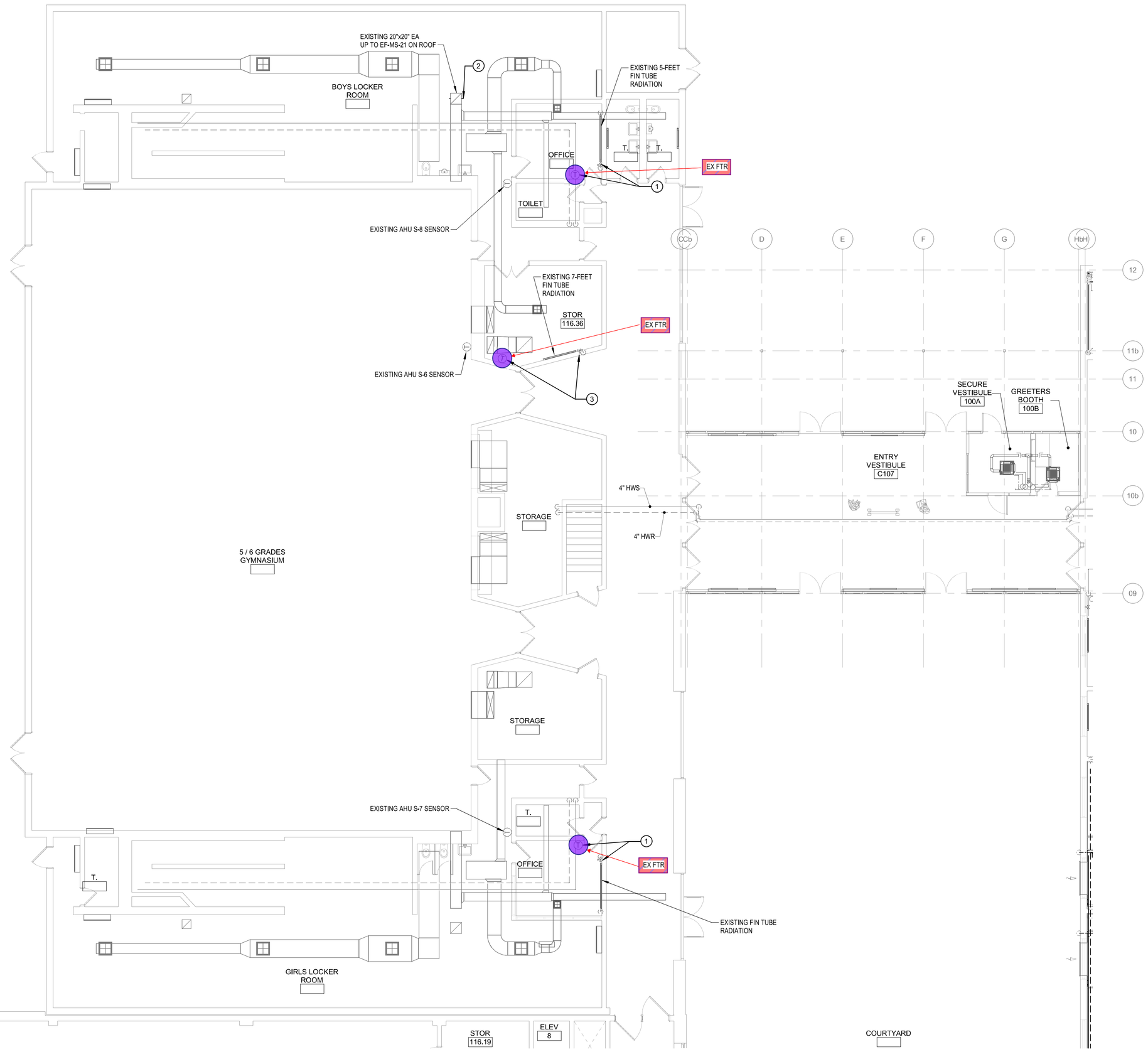
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PROJECT NUMBER: 2111002.00
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KEYED NOTES:

1. DISCONNECT AND REMOVE EXISTING 2-WAY PNEUMATIC CONTROL VALVE WITHIN EXISTING FIN TUBE ENLCOSURE SYSTEM. DISCONNECT AND REMOVE ALL PNEUMATIC TUBING BACK TO PNEUMATIC MAIN. PROVIDE ELECTRONIC 2-WAY CONTROL VALVE RATED AT 0.5 GPM AT LOCATION OF REMOVED PNEUMATIC CONTROL VALVE. MODIFY HWS BRANCH PIPING AS REQUIRED FOR INSTALLATION OF ELECTRONIC CONTROL VALVE. DISCONNECT AND REMOVE EXISTING SPACE TEMPERATURE SENSOR INLCUDING ASSOCIATED PNEUMATIC TUBING AND PROVIDE REPLACEMENT SPACE TEMPERATURE SENSOR AT LOCATION SHOWN AND TIE OPERATION OF CONTROL VALVE/SENSOR INTO EXISTING SIEMENS DDC SYSTEM. PROVIDE CONTROL WIRING BETWEEN CONTROL VALVE AND REPLACEMENT SENSOR AS REQUIRED.

2. DISCONNECT AND REMOVE EXISTING GRAVITY ACTUATED DAMPER WITHIN EXISTING 20"x20" EA RISER AND PROVIDE A MOTORIZED DAMPER TO REPLACE THE GRAVITY ACTUATED DAMPER TIED TO THE OPERATION OF REPLACEMENT ROOFTOP EXHAUST FAN EF-MS-21. DISCONNECT, REMOVE AND REINSTALL EXISTING SUSPENDED CEILING SYSTEM AS REQUIRED TO REPLACE THE DAMPER.

3. DISCONNECT AND REMOVE EXISTING 2-WAY PNEUMATIC CONTROL VALVE WITHIN EXISTING FIN TUBE ENLCOSURE SYSTEM. DISCONNECT AND REMOVE ALL PNEUMATIC TUBING BACK TO PNEUMATIC MAIN. PROVIDE ELECTRONIC 2-WAY CONTROL VALVE RATED AT 0.4 GPM AT LOCATION OF REMOVED PNEUMATIC CONTROL VALVE. MODIFY HWS BRANCH PIPING AS REQUIRED FOR INSTALLATION OF ELECTRONIC CONTROL VALVE. DISCONNECT AND REMOVE EXISTING SPACE TEMPERATURE SENSOR INLCUDING ASSOCIATED PNEUMATIC TUBING AND PROVIDE REPLACEMENT SPACE TEMPERATURE SENSOR AT LOCATION SHOWN AND TIE OPERATION OF CONTROL VALVE/SENSOR INTO EXISTING SIEMENS DDC SYSTEM. PROVIDE CONTROL WIRING BETWEEN CONTROL VALVE AND REPLACEMENT SENSOR AS REQUIRED.



LEGEND:

EX FTR	EXISTING FIN TUBE RADIATOR
T	EX FTR-WALL SENSOR

SIEMENS WALL SENSOR LOCATION DRAWING

A18 PARTIAL FIRST FLOOR PLAN - NORTHWEST
1/8" = 1'-0"

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REGISTRATION EXPIRES: 11/30/2023

NANUET

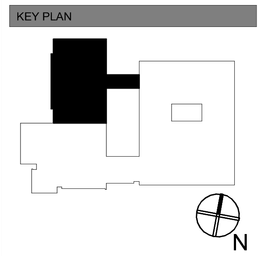
NUFSD BOND PROJECTS PH3

☐ SED#50-01-08-03-0-003-035 (HIGH SCHOOL)
☐ SED#50-01-08-03-0-004-020 (BARR MIDDLE SCHOOL)

High School
103 Church St.
Nanuet, NY 10954

Barr Middle School
50 Blauvelt Rd #1
Nanuet, NY 10954

KEY PLAN



REVISIONS

No.	Description	Date

ISSUED: BID SET ISSUANCE
DATE: 06/06/2023
SCALE: 1/8" = 1'-0"
SHEET NAME: PARTIAL FIRST FLOOR PLAN - NORTHWEST
SHEET NUMBER: BM-M113

ISSUE FOR BID SET

PROJECT NUMBER: 2111002.00 COPYRIGHT © 2014 KSQ ARCHITECTS, PC

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KEYED NOTES:

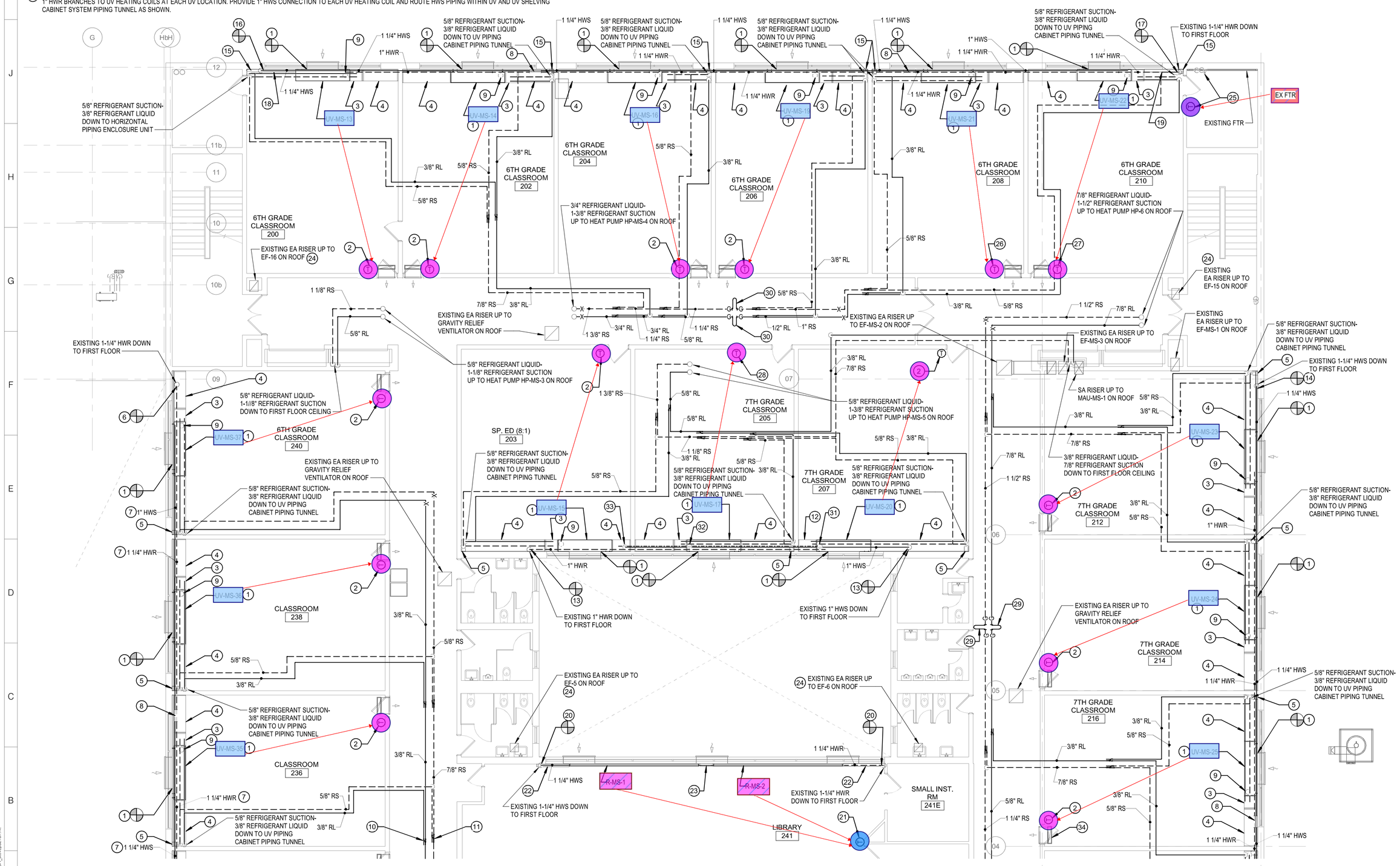
1. PROVIDE FLOOR MOUNTED UNIT VENTILATOR AT LOCATION SHOWN. PROVIDE UNIT VENTILATOR WITH FULLY CLOSED ADAPTER-BACK WITH REAR OUTDOOR AIR OPENING TO BE CUT IN FIELD TO MATCH EXISTING WALL OUTDOOR AIR OPENING SIZE. CONNECT TO EXISTING OA DUCT SLEEVE AS REQUIRED AND EXTEND INTO REAR OUTDOOR AIR OPENING ON THE UNIT VENTILATOR. CONNECT TO HWS/HWR PIPING ROUTED WITHIN UNIT VENTILATOR SHELVING SYSTEM PIPING TUNNEL AND PROVIDE 1" HWS/HWR BRANCH CONNECTIONS TO UV HEATING COIL CONNECTIONS AS REQUIRED.
2. PROVIDE REPLACEMENT TEMPERATURE SENSOR AT LOCATION SHOWN AND UTILIZE FOR SPACE TEMPERATURE CONTROL OF UNIT VENTILATOR AS REQUIRED. PROVIDE CONTROL WIRING BETWEEN SENSOR AND UNIT VENTILATOR DDC CONTROLLER AS REQUIRED.
3. PROVIDE 24" WIDE x 21-7/8" DEEP UTILITY COMPARTMENT AT LOCATION SHOWN FOR HOUSING DDC SYSTEM CONTROLLER AND VARIABLE REFRIGERANT VOLUME CONTROL COMPONENTS. THE UTILITY COMPARTMENT SHALL HOUSE THE FOLLOWING VARIABLE REFRIGERANT VOLUME CONTROL COMPONENTS: 1. WIRED NAVIGATION REMOTE CONTROLLER 2. VARIABLE REFRIGERANT VOLUME CONTROL BOX AND 3. VARIABLE REFRIGERANT VOLUME EXPANSION VALVE KIT.
4. AT LOCATIONS CALLED OUT, PROVIDE 21-7/8" DEEP PERIMETER SHELVING CABINETS. THE CABINETS SHALL BE 30" HIGH THAT INCLUDE A BASE CABINET, ONE SHELF, A STEEL TOP WITH LOUVER OUTLET, A FRONT SKIRT WITH LOUVER INLET AND A BACK WALL ANGLE. THE SHELVING CABINETS SHALL INCLUDE A 5-7/8" DEEP PIPE SPACING CAVITY AT THE REAR OF THE CABINET SYSTEM. THE SHELF SHALL BE 10-1/2" DEEP AND THE SYSTEM SHALL INCLUDE A 3" HIGH OPENING AT THE BOTTOM (COVERED BY THE LOUVERED INLET FRONT SKIRT) THAT ALLOWS AIR MOVEMENT THROUGH THE BOTTOM-FRONT OF THE SYSTEM AND OUT THE TOP-REAR OF THE SYSTEM. PROVIDE PERIMETER SHELVING CABINET SYSTEM FILLER SECTIONS WHERE REQUIRED TO TERMINATE SHELVING SYSTEMS AT END POINTS SHOWN. THE FILLER SECTION SHALL BE FIELD CUT TO FIT BETWEEN THE END PANEL AND THE LAST SHELVING CABINET SYSTEM. THE FILLER SECTION SHALL INCLUDE A FLOOR ANGLE, FRONT PANEL, STEEL TOP, BACK WALL ANGLE. THE SYSTEM SHALL BE MANUFACTURED BY HVAC CUSTOM ENCLOSURE CO.; LLC DRAWING NUMBER SC164-0028 OR EQUAL.
5. PROVIDE 12" WIDE x 8" DEEP VERTICAL PIPE ENCLOSURE UNIT AT CORNER OF CLASSROOM TO CONCEAL REFRIGERANT LIQUID-SUCTION PIPING DROPS. ROUTE VERTICAL PIPING DOWN THROUGH TOP OF UNIT VENTILATOR SHELVING CABINET TOP AND CONNECT TO UV DX COIL CONNECTION AND UV EXPANSION VALVE KIT AS REQUIRED. HEIGHT OF VERTICAL PIPING ENCLOSURE SHALL EXTEND FROM TOP OF SHELVING CABINET SYSTEM TO UNDERSIDE OF SUSPENDED CEILING SYSTEM.
6. CONNECT TO EXISTING 1-1/4" HWR RISER ABOVE FLOOR PENETRATION LOCATION AND ROUTE 1-1/4" HWR PIPING MAIN WITHIN SHELVING CABINET PIPING TUNNEL AS SHOWN.
7. ROUTE HWS/HWR PIPING MAINS WITHIN PIPING TUNNELS AT REAR OF UNIT VENTILATORS AND UNIT VENTILATOR SHELVING CABINET SYSTEMS.
8. PROVIDE 1-1/4" EXPANSION COMPENSATORS ON THE HWS/HWR PIPING MAINS ROUTED WITHIN THE UNIT VENTILATOR PIPING TUNNEL AT LOCATION SHOWN. THE COMPENSATORS SHALL BE 13.812" LONG. PROVIDE ANCHORS ON EACH END OF BOTH THE HWS/R RUNS AND PROVIDE PIPE GUIDES WITHIN 14 PIPE DIAMETERS OF THE COMPENSATORS ON BOTH THE HWS AND HWR COMPENSATORS.
9. ROUTE 3/4" CONDENSATE DRAIN PIPING FROM UV DRAIN PAN OUTLET DOWN THROUGH FLOOR TO FIRST FLOOR CEILING PLENUM.
10. TYPICAL REFRIGERANT LIQUID BRANCH CONNECTOR 'Y' FITTING JOINT.
11. TYPICAL RERIGERANT SUCTION BRANCH CONNECTOR 'Y' FITTING JOINT.
12. PROVIDE 24" WIDE x 21-7/8" DEEP UTILITY COMPARTMENT AT LOCATION SHOWN FOR HOUSING DDC SYSTEM CONTROLLER AND VARIABLE REFRIGERANT VOLUME CONTROL COMPONENTS. THE UTILITY COMPARTMENT SHALL HOUSE THE FOLLOWING VARIABLE REFRIGERANT VOLUME CONTROL COMPONENTS: 1. WIRED NAVIGATION REMOTE CONTROLLER 2. VARIABLE REFRIGERANT VOLUME CONTROL BOX AND 3. VARIABLE REFRIGERANT VOLUME EXPANSION VALVE KIT. PROVIDE UNIT VENTILATOR SYSTEM SHELVING/CABINET FILLER PIECE BETWEEN END OF UTILITY COMPARTMENT AND WALL TO FILL GAP BETWEEN UTILITY COMPARTMENT AND WALL.
13. CONNECT TO EXISTING 1" HWS/HWR RISERS JUST ABOVE FLOOR PENETRATION AT CONNECTION POINT SHOWN AND ROUTE 1" HWS/R PIPING WITHIN UV AND SHELVING CABINET SYSTEM PIPING TUNNELS TO UV HEATING COILS AS REQUIRED.
14. CONNECT TO EXISTING 1-1/4" HWS RISER ABOVE FLOOR PENETRATION AND ROUTE 1-1/4" HWS PIPING WITHIN UV AND UV SHELVING CABINET SYSTEM PIPING TUNNEL. PROVIDE 1" HWS BRANCHES TO UV HEATING COILS AT EACH UV LOCATION. PROVIDE 1" HWR CONNECTION TO UV-MS-23 HEATING COIL AND ROUTE HWR PIPING WITHIN UV AND UV SHELVING CABINET SYSTEM PIPING TUNNEL AS SHOWN.
15. PROVIDE 8" WIDE x 8" DEEP VERTICAL PIPE ENCLOSURE UNIT AT CORNER OF CLASSROOM TO CONCEAL REFRIGERANT LIQUID-SUCTION PIPING DROPS. ROUTE VERTICAL PIPING DOWN THROUGH TOP OF UNIT VENTILATOR SHELVING CABINET TOP AND CONNECT TO UV DX COIL CONNECTION AND UV EXPANSION VALVE KIT AS REQUIRED. HEIGHT OF VERTICAL PIPING ENCLOSURE SHALL EXTEND FROM TOP OF SHELVING CABINET SYSTEM TO UNDERSIDE OF SUSPENDED CEILING SYSTEM.
16. CONNECT TO EXISTING 1-1/4" HWS RISER ABOVE FLOOR PENETRATION AND ROUTE 1-1/4" HWS PIPING WITHIN UV AND UV SHELVING CABINET SYSTEM PIPING TUNNEL. PROVIDE 1" HWS BRANCHES TO UV HEATING COILS AT EACH UV LOCATION. PROVIDE 1" HWR CONNECTION TO UV-MS-13 HEATING COIL AND ROUTE HWR PIPING WITHIN UV AND UV SHELVING CABINET SYSTEM PIPING TUNNEL AS SHOWN.
17. CONNECT TO EXISTING 1-1/4" HWR RISER ABOVE FLOOR PENETRATION AND ROUTE 1-1/4" HWR PIPING WITHIN UV AND UV SHELVING CABINET SYSTEM PIPING TUNNELS. PROVIDE 1" HWR BRANCHES TO UV HEATING COILS AT EACH UV LOCATION. PROVIDE 1" HWS CONNECTION TO EACH UV HEATING COIL AND ROUTE HWS PIPING WITHIN UV AND UV SHELVING CABINET SYSTEM PIPING TUNNEL AS SHOWN.

KEYED NOTES (CONTINUED):

18. PROVIDE 18" HIGH x 5" DEEP HORIZONTAL PIPING ENCLOSURE UNIT BETWEEN WALL AND END OF UNIT VENTILATOR AT LOCATION SHOWN. ROUTE HWS PIPING AND SUCTION/LIQUID REFRIGERANT PIPING WITHIN HORIZONTAL ENCLOSURE TO UV PIPING TUNNEL.
19. PROVIDE 18" HIGH x 5" DEEP HORIZONTAL PIPING ENCLOSURE UNIT BETWEEN WALL AND END OF UV UTILITY COMPARTMENT AT LOCATION SHOWN. ROUTE HWR PIPING AND SUCTION/LIQUID REFRIGERANT PIPING WITHIN HORIZONTAL ENCLOSURE TO UV PIPING TUNNEL.
20. CONNECT TO EXISTING 1-1/4" HWS/R RISERS ABOVE FLOOR PENETRATIONS AT CONNECTION POINTS SHOWN AND ROUTE HWS/R TO RADIATOR UNITS AS REQUIRED.
21. PROVIDE SPACE TEMPERATURE SENSOR AT LOCATION SHOWN. PROVIDE CONTROL WIRING FROM SENSOR TO CONTROL VALVE SERVING RADIATOR UNITS R-MS-1/R-MS-2 AS REQUIRED.
22. PROVIDE HORIZONTAL AND VERTICAL TRIM COVERS AT LOCATIONS SHOWN TO CONCEAL THE HWS/HWR PIPNG SERVING R-MS-1/R-MS-2 FURNISHED BY THE RADIATOR MANUFACTURER, WITH HEIGHT AND DEPTH OF TRIM COVER TO MATCH THE RADIATOR HEIGHT AND DEPTH.
23. PROVIDE 3/4" EXPANSION COMPENSATOR FLEXIBLE CONNECTOR AT LOCATION SHOWN BETWEEN TWO RADIATOR UNITS R-MS-1 AND R-MS-2. INSTALL THE FLEXIBLE CONNECTOR IN A U-BEND FORMAT WITH THE U FACING DOWN. CONNECT THE OUTLET PIPING FROM R-MS-1 TO THE INLET OF R-MS-2. PROVIDE A HORIZONTAL WALL TRIM COVER OVER THE PIPING AND FLEXIBLE CONNECTOR BETWEEN THE TWO RADIATOR UNITS FURNISHED BY THE RADIATOR MANUFACTURER, WITH HEIGHT AND DEPTH OF TRIM COVER TO MATCH THE RADIATOR HEIGHT AND DEPTH.
24. PROVIDE MOTORIZED DAMPER WITHIN EXISTING EA DUCT RISER. MODIFY EA RISER AS REQUIRED FOR DAMPER INSTALLATION. TIE CONTROL OF DAMPER TO OPERATION OF ROOFTOP EXHAUST FAN CONNECTED TO EA RISER. PROVIDE CONTROL RELAY TO EXISTING EXHAUST FAN AND TIE OPERATION OF EXHAUST FAN TO DDC SYSTEM.
25. DISCONNECT AND REMOVE EXISTING 2-WAY PNEUMATIC CONTROL VALVE WITHIN EXISTING FIN TUBE ENLCOSURE SYSTEM. DISCONNECT AND REMOVE ALL PNEUMATIC TUBING BACK TO PNEUMATIC MAIN. PROVIDE ELECTRONIC 2-WAY CONTROL VALVE RATED AT 1.5 GPM AT LOCATION OF REMOVED PNEUMATIC CONTROL VALVE. MODIFY HWS BRANCH PIPING AS REQUIRED FOR INSTALLATION OF ELECTRONIC CONTROL VALVE. PROVIDE SPACE TEMPERATURE SENSOR AT LOCATION SHOWN AND TIE OPERATION OF CONTROL VALVE/SENSOR INTO EXISTING SIEMENS DDC SYSTEM.
26. DISCONNECT AND REMOVE DAMAGED SPACE TEMPERATURE SENSOR AT LOCATION SHOWN AND PROVIDE REPLACEMENT SPACE TEMPERATURE SENSOR TIED TO UV-MS-21 DDC CONTROLLER. PROVIDE CONTROL WIRING FROM REPLACEMENT SENSOR TO UV CONTROLLER AS REQUIRED.
27. PROVIDE REPLACEMENT SPACE TEMPERATURE SENSOR TIED TO UV-MS-22 DDC CONTROLLER. PROVIDE CONTROL WIRING FROM REPLACEMENT SENSOR TO UV CONTROLLER AS REQUIRED.
28. PROVIDE REPLACEMENT TEMPERATURE SENSOR AT LOCATION SHOWN AND UTILIZE FOR SPACE TEMPERATURE CONTROL OF UNIT VENTILATOR AS REQUIRED. PROVIDE CONTROL WIRING BETWEEN SENSOR AND UNIT VENTILATOR UV-MS-17 DDC CONTROLLER AS REQUIRED.
29. PROVIDE UL-207 LISTED EXPANSION LOOP FOR THE 7/8" REFRIGERANT LIQUID AND 1-1/2" REFRIGERANT SUCTION LINES AT LOCATION SHOWN. THE 7/8" LOOP SHALL BE 28-3/4" LONG x 21" HIGH. THE 1-1/2" LOOP SHALL BE 31" LONG x 25" WIDE. PROVIDE PIPE GUIDES ON EITHER SIDE OF LOOP AND PIPE ANCHORS AT END OF PIPING RUNS PER MANUFACTURER'S RECOMMENDATIONS.
30. PROVIDE UL-207 LISTED EXPANSION LOOP FOR THE 5/8" REFRIGERANT LIQUID AND 1-1/4" REFRIGERANT SUCTION LINES AT LOCATION SHOWN. THE 5/8" LOOP SHALL BE 28-1/2" LONG x 193/4" HIGH. THE 1-1/4" LOOP SHALL BE 30" LONG x 23" WIDE. PROVIDE PIPE GUIDES ON EITHER SIDE OF LOOP AND PIPE ANCHORS AT END OF PIPING RUNS PER MANUFACTURER'S RECOMMENDATIONS.
31. ROUTE 3/4" CONDENSATE DRAIN PIPING FROM DRAIN PAN OUTLET OF UV-MS-20 WITHIN UV PIPING TUNNEL SYSTEM AND CONNECT TO HORIZONTAL DRAIN PIPING WITHIN PIPING TUNNEL SYSTEM OF UV-MS-17.
32. ROUTE 3/4" CONDENSATE DRAIN PIPING FROM DRAIN PAN OUTLET OF UV-MS-17 WITHIN UV PIPING TUNNEL SYSTEM AND CONNECT TO 3/4" HORIZONTAL DRAIN PIPING ROUTED FROM UV-MS-17. AT POINT OF COMBINING TWO UV CONDENSATE DRAINS, INCREASE HORIZONTAL CONDENSATE DRAIN PIPING TO 1", THEN ROUTE THROUGH UV PIPING TUNNEL SYSTEMS TO POINT OF DROP DOWN TO FIRST FLOOR AS OUTLINED ON KEYED NOTE 33.
33. PROVIDE 1" CONDENSATE DRAIN PIPING DROP DOWN TO FIRST FLOOR AT LOCATION SHOWN FROM WITHIN UV PIPING TUNNEL SYSTEM.
34. LOCATION OF TYPICAL CEILING MOUNTED RELIEF AIR REGISTER DUCTED THROUGH CORRIDOR WALL TO CORRIDOR CEILING PLENUM, TERMINATED OPEN-ENDED ABOVE CEILING PLENUM FOR RELIEF AIR OF CLASSROOMS.

GENERAL NOTES:

1. REFRIGERANT PIPING NOTE: 90 DEGREE ELBOWS SHALL BE KEPT A MINIMUM OF 20" FROM BRANCH CONNECTOR 'Y' JOINTS. IN ADDITION, BRANCH CONNECTOR 'Y' JOINTS SHALL BE A MINIMUM OF 40" FROM ANOTHER BRANCH 'Y' CONNECTOR JOINT.
2. REFRIGERANT PIPING NOTE: THE HEAT PUMP SYSTEM MANUFACTURER SHALL INSPECT ALL FIELD INSTALLED REFRIGERANT PIPING PRIOR TO INSULATION INSTALLATION.
3. THE EXISTING SUSPENDED CEILING SYSTEMS LOCATED WITHIN THE SCOPE OF WORK AREA OUTSIDE OF AREAS BEING RENOVATED BY THE GENERAL CONTRACTOR SHALL BE DISCONNECTED AND REMOVED TO ALLOW FOR THE INSTALLATION WORK AND REINSTALLED FOLLOWING COMPLETION OF THE WORK BY THE MECHANICAL CONTRACTOR. THE SUSPENDED CEILING GRID SYSTEMS SHALL BE REMOVED AND MODIFIED TO COMPLETE THE WORK AND REINSTALLED FOLLOWING THE COMPLETION OF WORK. THE CEILING TILES SHALL BE REMOVED AS REQUIRED TO COMPLETE THE WORK AND REINSTALLED FOLLOWING THE COMPLETION OF THE INSTALLATION WORK. ANY CEILING TILES DAMAGED DURING THE INSTALLATION WORK SHALL BE REPLACED BY THE MECHANICAL CONTRACTOR TO MATCH THE EXISTING CEILING TILES.
4. ALL CUTTING, PATCHING, AND FIREPROOFING ASSOCIATED WITH THE INSTALLATION WORK SHALL BE COMPLETED BY THE MECHANICAL CONTRACTOR. PATCHED AREAS SHALL MATCH EXISTING CONDITIONS. ALL REFRIGERANT PIPING AND CONDENSATE PIPING PENETRATIONS THROUGH CORRIDOR WALLS SHALL BE FIREPROOFED PER SPECIFICATION SECTION 078400.
5. ROUTE REFRIGERANT SUCTION AND LIQUID PIPING FROM THE UNIT VENTILATOR DX COIL CONNECTIONS TO THE HEAT PUMP UNITS. SIZE PIPING AND PROVIDE BRANCH CONNECTOR 'Y' JOINTS PER THE DRAWING. CONFIRM PIPING SIZES AND BRANCH CONNECTOR 'Y' JOINT LOCATIONS REQUIRED WITH HEAT PUMP SYSTEM MANUFACTURER.
6. ROUTE REFRIGERANT PIPING THROUGH THE ROOF TO THE ROOF MOUNTED HEAT PUMP SYSTEMS. PROVIDE A PIPE CURB AND SIDE REFRIGERANT PIPIPING OUTLET PORTAL AT THE ROOF PENETRATION OF EACH HEAT PUMP SYSTEM.
7. THE SMALLEST VOLUME ROOM THAT THE REFRIGERANT PIPING SYSTEMS ROUTE THROUGH FOR EACH OF THE HEAT PUMP SYSTEMS IS BELOW THE ASHRAE STANDARD 15 REFRIGERANT CONCENTRATION LIMIT OF 26 POUNDS PER 1,000 CUBIC FEET OF ROOM VOLUME FOR OCCUPIED SPACES.
8. PROVIDE FIRESTOPPING PER SPECIFICATION SECTION 078400 AT ALL PIPING PENETRATIONS THROUGH CORRIDOR WALLS AND STORAGE ROOM WALLS.
9. THE UV UTILITY COMPARTMENT SHALL INCLUDE A REMOVABLE FRONT PANEL, STANDARD #1/4-20 HEX FASTENER, STEEL TOP AND BACK WALL F-CHANNEL.
10. ROUTE REFRIGERANT SUCTION-LIQUID PIPING WITHIN UNIT VENTILATOR PIPING TUNNELS AND UNIT VENTILATOR SHELVING SYSTEM TUNNELS TO DX COOLING COIL CONNECTIONS AND UV EXPANSION VALVE KITS PER THE MANUFACTURER'S RECOMMENDATIONS.



A18 PARTIAL SECOND FLOOR PLAN - NORTHEAST
1/8" = 1'-0"

LEGEND:

UV-MS-XX	UNIT VENTILATOR
T	UV-WALL SENSOR
EX FTR	EXISTING FIN TUBE RADIATOR
T	EX FTR-WALL SENSOR
R-MS-X	HEATING WATER RADIATION
T	RAD-WALL SENSOR

SIEMENS WALL SENSOR LOCATION DRAWING

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REGISTRATION EXPIRES: 11/30/2023

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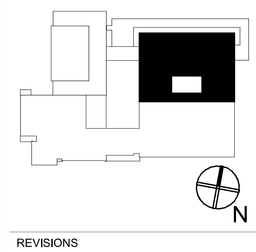
NUFSD BOND PROJECTS PH3

SED#50-01-08-03-0-003-035 (HIGH SCHOOL)
SED#50-01-08-03-0-004-020 (BARR MIDDLE SCHOOL)

High School
103 Church St.
Nanuet, NY 10954

Barr Middle School
50 Blauvelt Rd #1
Nanuet, NY 10954

KEY PLAN



REVISIONS

No.	Description	Date

ISSUED: BID SET ISSUANCE
DATE: 06/06/2023
SCALE: 1/8" = 1'-0"
SHEET NAME: PARTIAL SECOND FLOOR PLAN - NORTHEAST
SHEET NUMBER: BM-M114

ISSUE FOR BID SET

DRAWN BY: Author
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6/5/2023 3:16:11 PM

PROJECT NUMBER: 2111002.00

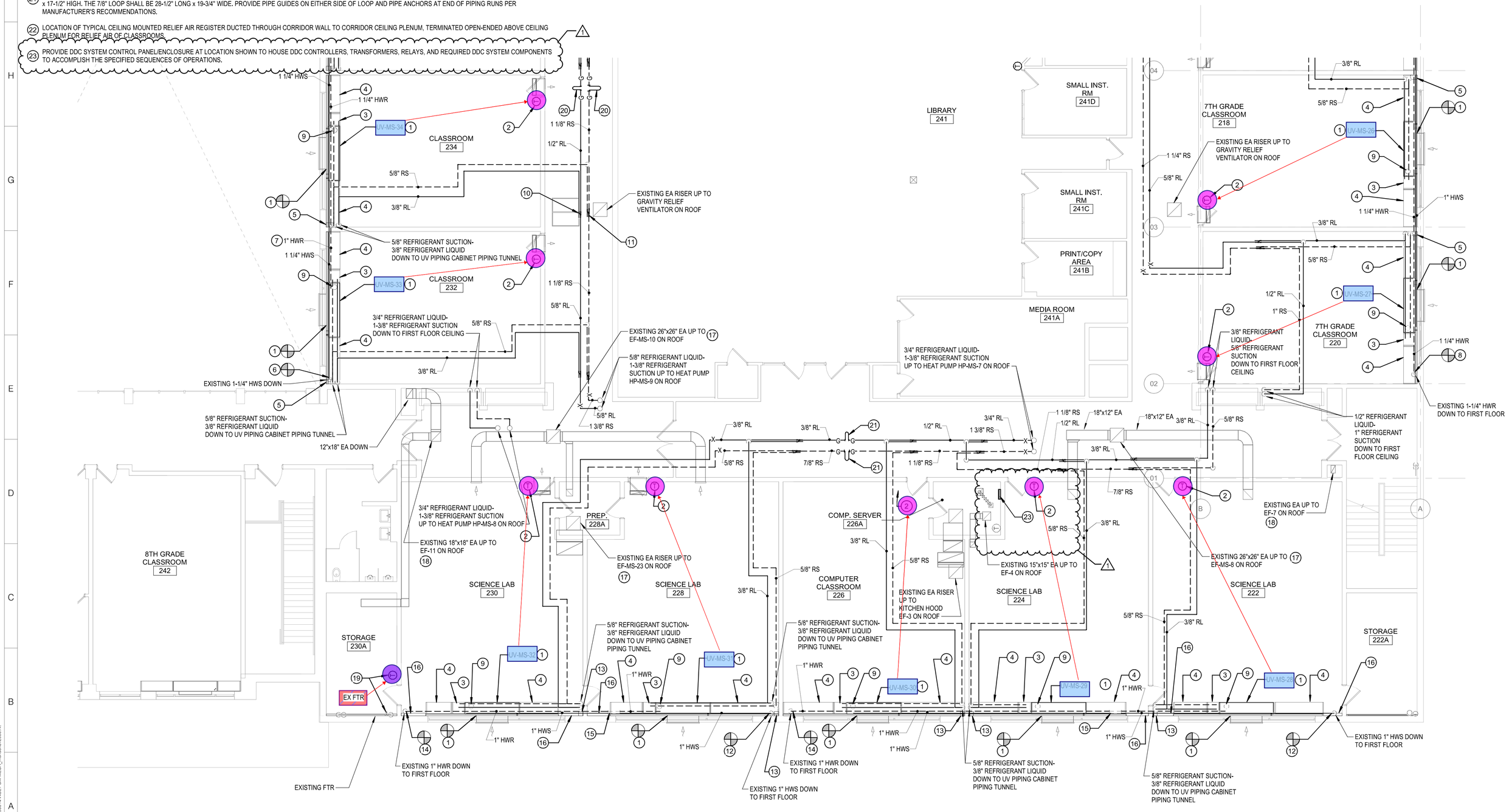
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KEYED NOTES:

1. PROVIDE FLOOR MOUNTED UNIT VENTILATOR AT LOCATION SHOWN. PROVIDE UNIT VENTILATOR WITH FULLY CLOSED ADAPTER-BACK WITH REAR OUTDOOR AIR OPENING TO BE CUT IN FIELD TO MATCH EXISTING WALL OUTDOOR AIR OPENING SIZE. CONNECT TO EXISTING OA DUCT SLEEVE AS REQUIRED AND EXTEND INTO REAR OUTDOOR AIR OPENING ON THE UNIT VENTILATOR. CONNECT TO HWS/HWR PIPING ROUTED WITHIN UNIT VENTILATOR SHELVING SYSTEM PIPING TUNNEL AND PROVIDE 1" HWS/HWR BRANCH CONNECTIONS TO UV HEATING COIL CONNECTIONS AS REQUIRED.
2. PROVIDE REPLACEMENT TEMPERATURE SENSOR AT LOCATION SHOWN AND UTILIZE FOR SPACE TEMPERATURE CONTROL OF UNIT VENTILATOR AS REQUIRED. PROVIDE CONTROL WIRING BETWEEN SENSOR AND UNIT VENTILATOR DDC CONTROLLER AS REQUIRED.
3. PROVIDE 24" WIDE x 21-7/8" DEEP UTILITY COMPARTMENT AT LOCATION SHOWN FOR HOUSING DDC SYSTEM CONTROLLER AND VARIABLE REFRIGERANT VOLUME CONTROL COMPONENTS. THE UTILITY COMPARTMENT SHALL HOUSE THE FOLLOWING VARIABLE REFRIGERANT VOLUME CONTROL COMPONENTS: 1. WIRED NAVIGATION REMOTE CONTROLLER 2. VARIABLE REFRIGERANT VOLUME CONTROL BOX AND 3. VARIABLE REFRIGERANT VOLUME EXPANSION VALVE KIT.
4. AT LOCATIONS CALLED OUT, PROVIDE 21-7/8" DEEP PERIMETER SHELVING CABINETS. THE CABINETS SHALL BE 30" HIGH THAT INCLUDE A BASE CABINET, ONE SHELF, A STEEL TOP WITH LOUVER OUTLET, A FRONT SKIRT WITH LOUVER INLET AND A BACK WALL ANGLE. THE SHELVING CABINETS SHALL INCLUDE A 5-7/8" DEEP PIPE SPACING CAVITY AT THE REAR OF THE CABINET SYSTEM. THE SHELF SHALL BE 10-1/2" DEEP AND THE SYSTEM SHALL INCLUDE A 3" HIGH OPENING AT THE BOTTOM (COVERED BY THE LOUVERED INLET FRONT SKIRT) THAT ALLOWS AIR MOVEMENT THROUGH THE BOTTOM-FRONT OF THE SYSTEM AND OUT THE TOP-REAR OF THE SYSTEM. PROVIDE PERIMETER SHELVING CABINET SYSTEM FILLER SECTIONS WHERE REQUIRED TO TERMINATE SHELVING SYSTEMS AT END POINTS SHOWN. THE FILLER SECTION SHALL BE FIELD CUT TO FIT BETWEEN THE END PANEL AND THE LAST SHELVING CABINET SYSTEM. THE FILLER SECTION SHALL INCLUDE A FLOOR ANGLE, FRONT PANEL, STEEL TOP, BACK WALL ANGLE, THE SYSTEM SHALL BE MANUFACTURED BY HVAC CUSTOM ENCLOSURE CO., LLC DRAWING NUMBER SC164-0028 OR EQUAL. PROVIDE END CAPS ON SHELVING CABINETS WHERE SYSTEMS TERMINATE SHORT OF A WALL SYSTEM AND CONNECT TO A HORIZONTAL PIPING ENCLOSURE SYSTEM.
5. PROVIDE 12" WIDE x 8" DEEP VERTICAL PIPE ENCLOSURE UNIT AT CORNER OF CLASSROOM TO CONCEAL REFRIGERANT LIQUID-SUCTION PIPING DROPS. ROUTE VERTICAL PIPING DOWN THROUGH TOP OF UNIT VENTILATOR SHELVING CABINET TOP AND CONNECT TO UV DX COIL CONNECTION AND UV EXPANSION VALVE KIT AS REQUIRED. HEIGHT OF VERTICAL PIPING ENCLOSURE SHALL EXTEND FROM TOP OF SHELVING CABINET SYSTEM TO UNDERSIDE OF SUSPENDED CEILING SYSTEM.
6. CONNECT TO EXISTING 1-1/4" HWS RISER ABOVE FLOOR PENETRATION LOCATION AND ROUTE 1-1/4" HWS PIPING MAIN WITHIN SHELVING CABINET PIPING TUNNEL AS SHOWN.
7. ROUTE 1" HWR FROM UV-MS-33 HEATING COIL WITHIN SHELVING CABINET PIPING TUNNEL TO CLASSROOM 234 PIPING TUNNEL.
8. CONNECT TO EXISTING 1-1/4" HWR RISER ABOVE FLOOR PENETRATION AND ROUTE 1-1/4" HWR PIPING WITHIN UV AND UV SHELVING CABINET SYSTEM PIPING TUNNELS. PROVIDE 1" HWR BRANCHES TO UV HEATING COILS AT EACH UV LOCATION. PROVIDE 1" HWS CONNECTION TO EACH UV HEATING COIL AND ROUTE HWS PIPING WITHIN UV AND UV SHELVING CABINET SYSTEM PIPING TUNNEL AS SHOWN.
9. ROUTE 3/4" CONDENSATE DRAIN PIPING FROM UV DRAIN PAN OUTLET DOWN THROUGH FLOOR TO FIRST FLOOR CEILING PLENUM.
10. TYPICAL REFRIGERANT LIQUID BRANCH CONNECTOR 'Y' FITTING JOINT.
11. TYPICAL RERIGERANT SUCTION BRANCH CONNECTOR 'Y' FITTING JOINT.
12. CONNECT TO EXISTING 1" HWS RISER ABOVE FLOOR PENETRATION LOCATION AND ROUTE 1" HWS PIPING MAIN WITHIN SHELVING CABINET PIPING TUNNEL AS SHOWN.
13. PROVIDE 8" WIDE x 8" DEEP VERTICAL PIPE ENCLOSURE UNIT AT CORNER OF CLASSROOM TO CONCEAL REFRIGERANT LIQUID-SUCTION PIPING DROPS. ROUTE VERTICAL PIPING DOWN THROUGH TOP OF UNIT VENTILATOR SHELVING CABINET TOP AND CONNECT TO UV DX COIL CONNECTION AND UV EXPANSION VALVE KIT AS REQUIRED. HEIGHT OF VERTICAL PIPING ENCLOSURE SHALL EXTEND FROM TOP OF SHELVING CABINET SYSTEM TO UNDERSIDE OF SUSPENDED CEILING SYSTEM.
14. CONNECT TO EXISTING 1" HWR RISER ABOVE FLOOR PENETRATION AND ROUTE 1" HWR PIPING WITHIN UV AND UV SHELVING CABINET SYSTEM PIPING TUNNELS. PROVIDE 1" HWR BRANCHES TO UV HEATING COILS AT EACH UV LOCATION. PROVIDE 1" HWS CONNECTION TO EACH UV HEATING COIL AND ROUTE HWS PIPING WITHIN UV AND UV SHELVING CABINET SYSTEM PIPING TUNNEL AS SHOWN.
15. PROVIDE 1" EXPANSION COMPENSATORS ON THE HWS/HWR PIPING MAINS ROUTED WITHIN THE UNIT VENTILATOR PIPING TUNNEL AT LOCATION SHOWN. THE COMPENSATORS SHALL BE 12.5" LONG. PROVIDE ANCHORS ON EACH END OF BOTH THE HWS/R RUNS AND PROVIDE PIPE GUIDES WITHIN 14 PIPE DIAMETERS OF THE COMPENSATORS ON BOTH THE HWS AND HWR COMPENSATORS.
16. PROVIDE 5" DEEP x 24" HIGH HORIZONTAL PIPING ENCLOSURE UNITS AT LOCATIONS SHOWN TO CONCEAL PIPING ROUTED TO UNIT VENTILATORS. ALIGN TOP OF ENCLOSURE UNITS WITH TOP OF UNIT VENTILATOR CABINETS.
17. PROVIDE MOTORIZED DAMPER WITHIN EXISTING EA DUCT RISER. MODIFY EA RISER AS REQUIRED FOR DAMPER INSTALLATION. TIE CONTROL OF DAMPER TO OPERATION OF REPLACEMENT ROOFTOP EXHAUST FAN CONNECTED TO EA RISER.
18. PROVIDE MOTORIZED DAMPER WITHIN EXISTING EA DUCT RISER. MODIFY EA RISER AS REQUIRED FOR DAMPER INSTALLATION. TIE CONTROL OF DAMPER TO OPERATION OF ROOFTOP EXHAUST FAN CONNECTED TO EA RISER. PROVIDE CONTROL RELAY TO EXISTING EXHAUST FAN AND TIE OPERATION OF EXHAUST FAN TO DDC SYSTEM.
19. DISCONNECT AND REMOVE EXISTING 2-WAY PNEUMATIC CONTROL VALVE WITHIN EXISTING FIN TUBE ENLCOSURE SYSTEM. DISCONNECT AND REMOVE ALL PNEUMATIC TUBING BACK TO PNEUMATIC MAIN. PROVIDE ELECTRONIC 2-WAY CONTROL VALVE RATED AT 1.5 GPM AT LOCATION OF REMOVED PNEUMATIC CONTROL VALVE. MODIFY HWS BRANCH PIPING AS REQUIRED FOR INSTALLATION OF ELECTRONIC CONTROL VALVE. PROVIDE SPACE TEMPERATURE SENSOR AT LOCATION SHOWN AND TIE OPERATION OF CONTROL VALVE/SENSOR INTO EXISTING SIEMENS DDC SYSTEM.
20. PROVIDE UL-207 LISTED EXPANSION LOOP FOR THE 1/2" REFRIGERANT LIQUID AND 1-1/8" REFRIGERANT SUCTION LINES AT LOCATION SHOWN. THE 1/2" LOOP SHALL BE 28-1/2" LONG x 17-1/2" HIGH. THE 1-1/8" LOOP SHALL BE 30" LONG x 23" WIDE. PROVIDE PIPE GUIDES ON EITHER SIDE OF LOOP AND PIPE ANCHORS AT END OF PIPING RUNS PER MANUFACTURER'S RECOMMENDATIONS.
21. PROVIDE UL-207 LISTED EXPANSION LOOP FOR THE 3/8" REFRIGERANT LIQUID AND 7/8" REFRIGERANT SUCTION LINES AT LOCATION SHOWN. THE 3/8" LOOP SHALL BE 28-1/2" LONG x 17-1/2" HIGH. THE 7/8" LOOP SHALL BE 28-1/2" LONG x 19-3/4" WIDE. PROVIDE PIPE GUIDES ON EITHER SIDE OF LOOP AND PIPE ANCHORS AT END OF PIPING RUNS PER MANUFACTURER'S RECOMMENDATIONS.
22. LOCATION OF TYPICAL CEILING MOUNTED RELIEF AIR REGISTER DUCTED THROUGH CORRIDOR WALL TO CORRIDOR CEILING PLENUM, TERMINATED OPEN-ENDED ABOVE CEILING PLENUM FOR RELIEF AIR OF CLASSROOMS.
23. PROVIDE DDC SYSTEM CONTROL PANEL/ENCLOSURE AT LOCATION SHOWN TO HOUSE DDC CONTROLLERS, TRANSFORMERS, RELAYS, AND REQUIRED DDC SYSTEM COMPONENTS TO ACCOMPLISH THE SPECIFIED SEQUENCES OF OPERATIONS.

GENERAL NOTES:

1. REFRIGERANT PIPING NOTE: 90 DEGREE ELBOWS SHALL BE KEPT A MINIMUM OF 20" FROM BRANCH CONNECTOR 'Y' JOINTS. IN ADDITION, BRANCH CONNECTOR 'Y' JOINTS SHALL BE A MINIMUM OF 40" FROM ANOTHER BRANCH 'Y' CONNECTOR JOINT.
2. REFRIGERANT PIPING NOTE: THE HEAT PUMP SYSTEM MANUFACTURER SHALL INSPECT ALL FIELD INSTALLED REFRIGERANT PIPING PRIOR TO INSULATION INSTALLATION.
3. THE EXISTING SUSPENDED CEILING SYSTEMS LOCATED WITHIN THE SCOPE OF WORK AREA OUTSIDE OF AREAS BEING RENOVATED BY THE GENERAL CONTRACTOR SHALL BE DISCONNECTED AND REMOVED TO ALLOW FOR THE INSTALLATION WORK AND REINSTALLED FOLLOWING COMPLETION OF THE WORK BY THE MECHANICAL CONTRACTOR. THE SUSPENDED CEILING GRID SYSTEMS SHALL BE REMOVED AND MODIFIED TO COMPLETE THE WORK AND REINSTALLED FOLLOWING THE COMPLETION OF WORK. THE CEILING TILES SHALL BE REMOVED AS REQUIRED TO COMPLETE THE WORK AND REINSTALLED FOLLOWING THE COMPLETION OF THE INSTALLATION WORK. ANY CEILING TILES DAMAGED DURING THE INSTALLATION WORK SHALL BE REPLACED BY THE MECHANICAL CONTRACTOR TO MATCH THE EXISTING CEILING TILES.
4. ALL CUTTING, PATCHING, AND FIREPROOFING ASSOCIATED WITH THE INSTALLATION WORK SHALL BE COMPLETED BY THE MECHANICAL CONTRACTOR. PATCHED AREAS SHALL MATCH EXISTING CONDITIONS. ALL REFRIGERANT PIPING AND CONDENSATE PIPING PENETRATIONS THROUGH CORRIDOR WALLS SHALL BE FIREPROOFED PER SPECIFICATION SECTION 078400.
5. ROUTE REFRIGERANT SUCTION AND LIQUID PIPING FROM THE UNIT VENTILATOR DX COIL CONNECTIONS TO THE HEAT PUMP UNITS. SIZE PIPING AND PROVIDE BRANCH CONNECTOR 'Y' JOINTS PER THE DRAWING. CONFIRM PIPING SIZES AND BRANCH CONNECTOR 'Y' JOINT LOCATIONS REQUIRED WITH HEAT PUMP SYSTEM MANUFACTURER.
6. ROUTE REFRIGERANT PIPING THROUGH THE ROOF TO THE ROOF MOUNTED HEAT PUMP SYSTEMS. PROVIDE A PIPE CURB AND SIDE REFRIGERANT PIPIPNG OUTLET PORTAL AT THE ROOF PENETRATION OF EACH HEAT PUMP SYSTEM.
7. THE SMALLEST VOLUME ROOM THAT THE REFRIGERANT PIPING SYSTEMS ROUTE THROUGH FOR EACH OF THE HEAT PUMP SYSTEMS IS BELOW THE ASHRAE STANDARD 15 REFRIGERANT CONCENTRATION LIMIT OF 26 POUNDS PER 1,000 CUBIC FEET OF ROOM VOLUME FOR OCCUPIED SPACES.
8. PROVIDE FIRESTOPPING PER SPECIFICATION SECTION 078400 AT ALL PIPING PENETRATIONS THROUGH CORRIDOR WALLS AND STORAGE ROOM WALLS.
9. THE UV UTILITY COMPARTMENT SHALL INCLUDE A REMOVABLE FRONT PANEL. STANDARD #1/4-20 HEX FASTENER, STEEL TOP AND BACK WALL F-CHANNEL.
10. ROUTE REFRIGERANT SUCTION-LIQUID PIPING WITHIN UNIT VENTILATOR PIPING TUNNELS AND UNIT VENTILATOR SHELVING SYSTEM TUNNELS TO DX COOLING COIL CONNECTIONS AND UV EXPANSION VALVE KITS PER THE MANUFACTURER'S RECOMMENDATIONS.



A18 PARTIAL SECOND FLOOR PLAN - SOUTHEAST
1/8" = 1'-0"

LEGEND:

UV-MS-XX	UNIT VENTILATOR
T	UV-WALL SENSOR
EX FTR	EXISTING FIN TUBE RADIATOR
T	EX FTR-WALL SENSOR

SIEMENS WALL SENSOR LOCATION DRAWING

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REGISTRATION EXPIRES: 11/30/2023

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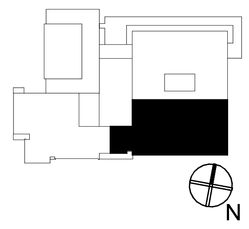
NUFSD BOND PROJECTS PH3

SED#50-01-08-03-0-003-035 (HIGH SCHOOL)
SED#50-01-08-03-0-004-020 (BARR MIDDLE SCHOOL)

High School
103 Church St.
Nanuet, NY 10954

Barr Middle School
50 Blauvelt Rd #1
Nanuet, NY 10954

KEY PLAN



REVISIONS

No.	Description	Date
1	BID ADDENDUM #6	07/12/23

ISSUED: BID SET ISSUANCE
DATE: 06/06/2023
SCALE: 1/8" = 1'-0"
SHEET NAME: PARTIAL SECOND FLOOR PLAN - SOUTHEAST
SHEET NUMBER: BM-M115

ISSUE FOR BID SET

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7/11/2023 3:23:18 PM
PROJECT NUMBER: 2111002.00
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HIGH SCHOOL

DWG	DESCRIPTION
	SCHEDULES
	FLN SCHEDULE
	VALVE SCHEDULE
	AFMS SCHEDULE
	CONTROL DRAWINGS
001	RISER
001A	RISER
110	HS-BC-HS-01 (BOM/SOO)
110A	HS-BC-HS-01 (MECH)
110B	HS-BC-HS-01 (ELEC)
111	HS-BC-HS-02 (BOM/SOO)
111A	HS-BC-HS-02 (MECH)
111B	HS-BC-HS-02 (ELEC)
112	HS-AHU-HS-03 (BOM/SOO)
112A	HS-AHU-HS-03 (BOM/SOO)
112B	HS-AHU-HS-03 (MECH)
112C	HS-AHU-HS-03 (ELEC)
113	HS-AHU HW COIL (BOM/SOO)
113A	HS-AHU HW COIL (MECH)
113B	HS-AHU HW COIL (ELEC)
113C	HS-AHU HW COIL (ELEC)
114	HS-RTU (RTU-HS-4,5) (BOM/SOO)
114A	HS-RTU (RTU-HS-4,5) (BOM/SOO)
114B	HS-RTU (RTU-HS-4,5) (MECH)
114C	HS-RTU (RTU-HS-4,5) (ELEC)
115	HS-EXHAUST FANS (BOM/SOO)
115A	HS-EXHAUST FANS (MECH)
115B	HS-EXHAUST FANS (ELEC)
116	HS-UNIT VENTILATOR (BOM/SOO)
116A	HS-UNIT VENTILATOR (SOO)
116B	HS-UNIT VENTILATOR (MECH/ELEC)
210	HS-HEAT EXCHANGER (BOM/SOO)
210A	HS-HEAT EXCHANGER (MECH)
210B	HS-HEAT EXCHANGER (ELEC)
410	HS-CONVECTOR (BOM/SOO)

DWG	DESCRIPTION
	CONTROL DRAWINGS
410A	HS-CONVECTOR (MECH/ELEC)
411	HS-RADIATOR COIL (BOM/SOO)
411A	HS-RADIATOR COIL (MECH/ELEC)
412	HS-CABINET UNIT HEATER (BOM/SOO)
412A	HS-CABINET UNIT HEATER (MECH/ELEC)
413	HS-UNIT HEATER (BOM/SOO)
413A	HS-UNIT HEATER (MECH/ELEC)
	DDC PANEL LAYOUTS & INSTALLATION DRAWINGS
E01	HIGHPXC22 (BOM)
E01A	HIGHPXC22 (LAYOUT)
E02	HIGHPXM03 (BOM)
E02A	HIGHPXM03 (LAYOUT)
E02B	HIGHPXM03 (LAYOUT)
E03	HIGHPXM05 (BOM)
E03A	HIGHPXM05 (LAYOUT)
E03B	HIGHPXM05 (LAYOUT)
N01	NAN.HS.BAS.PXCM1 (BOM)
N01A	NAN.HS.BAS.PXCM1 (LAYOUT)
N01B	NAN.HS.BAS.PXCM1 (LAYOUT)
N01C	NAN.HS.BAS.PXCC.BC1 (LAYOUT)
N01D	NAN.HS.BAS.PXCC.BC2 (LAYOUT)
N01E	NAN.HS.BAS.PXCM1 (INSTALLATION)
N02	NAN.HS.FLR1.PXCM2 (BOM)
N02A	NAN.HS.FLR1.PXCM2 (LAYOUT)
N02B	NAN.HS.FLR1.PXCM2 (LAYOUT)
N02C	NAN.HS.FLR1.PXCM2 (LAYOUT)
N02D	NAN.HS.FLR1.PXCM2 (INSTALLATION)
	THERMOSTAT LOCATION SUBMITTAL
	TECHNICAL LITERATURE

REVISION HISTORY

R0	2/16/2024	VB	ISSUED FOR APPROVAL

SIEMENS

SIEMENS INDUSTRY, INC.
SMART INFRASTRUCTURE

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NANUET BOND PHASE3 HIGH SCHOOL
NANUET, NY

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
VB	VB	NSK	02/16/24	02/16/24

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44OP-366733
0

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C:\USERS\Z004PB8F\ONEDRIVE - SIEMENS AG\BNJ2 BAU NANUET BOND PHASE 3 HIGH SCHOOL_44OP-366733\DT\MDT_HIGH SCHOOL\TOC-000.DWG

SIEMENS
Siemens Industry, Inc.
Smart Infrastructure

Field-Level Network Device Schedule

NANUET BOND PHASE 3-HIGH SCHOOL

Installation Status Key

N: new installation
E: existing, to remain
M: existing, to be modified
R: existing, to be removed

Network Type Key

BAC-IP: BACnet IP FLN device
BAC-M1: BACnet MSTP FLN device - FLN 1
BAC-M2: BACnet MSTP FLN device- FLN 2
KNX: KNX device
P1-1: P1 FLN device - FLN 1
P1-2: P1 FLN device - FLN 2
P1-3: P1 FLN device - FLN 3
MB-RTU: Modbus RTU device
MB-TCP: Modbus TCP device

Installation Checklist

- Device mounted?
- Power connected?
- Network connected?
- Actuator(s) wired?
- Sensor(s) wired?
- Flow tubes connected?

Pressurization Mode Key

+ : Positive pressure
- : Negative pressure
Ø : Neutral pressure

GENERAL NOTES

1. IP ADDRESS, INSTANCE NUMBER, MAC ADDRESS, FLN NO TO BE FIELD CO-ORDINATED.

REVISION HISTORY

REV	DATE	DWN	CHK	DESCRIPTION
0	2/16/2024	VB	NSK	ISSUED FOR APPROVAL

System										Network						Device / Equipment												Grouping	Room Airflow						Supply VAV Terminal														Extract / Exhaust VAV Terminal								Room Operator Unit				Comments
																													Minimum Airflow (CFM)				Pressurization		Airflow (CFM)							Duct Size (in)				Airflow (CFM)				Duct Size (in)								
Item	Device Name	Floor	Room No	Room / Device Description	Equipment ID	Siemens Dwg. No.	Match Dwg No	Served By (Airside)	Installation Status	FLN Network No	Network Type	IP Line / Loop Tag	MAC / Device Address	Instance No.	IP Address	Type	Equipment Controlled	Coil Type	Radiation Type	Rad Valve / Relay Qty	Field Power Source	Device Load (VA)	XFMR Load (VA)	Install Check (Initial)	Group Master	Comfort / Occ	Pre-comfort / Occ-Setp	Economy / Unocc	Protection / Vacant	Pressurization Mode	Transferred / Offset Airflow	SAV Clg Min	SAV Clg Max	SAV Htg Min	SAV Htg Max	SAV Vent Min	SAV Vent Max	SAV Smoke Flow	SAV Shape	SAV H/D	SAV W	EAV Vent Min	EAV Vent Max	Smoke (General EAV) Purge (Flame Hood)	EAV Shape	EAV H/D	EAV W	Temperature	Humidity	CO2	User Interface	Lighting Partitions	
1	HS.1F.EX.UV.1	1st Floor	NA	Classroom	EX UV-1	116B	HS-M106	NA	N	NOTE 1	BAC-M1		NOTE 1			DXR	EXISTING UV	-	-		UV-XFMR	20.5	20.5 / 9999		Master																							X			X		
2	HS.1F.EX.UV.2	1st Floor	NA	Classroom	EX UV-1	116B	HS-M106	NA	N	NOTE 1	BAC-M1		NOTE 1			DXR	EXISTING UV	-	-		UV-XFMR	20.5	20.5 / 9999		Master																							X			X		
3	HS.1F.EX.UV.3	1st Floor	NA	Classroom	EX UV-1	116B	HS-M106	NA	N	NOTE 1	BAC-M1		NOTE 1			DXR	EXISTING UV	-	-		UV-XFMR	20.5	20.5 / 9999		Master																							X			X		
4	HS.1F.EX.UV.4	1st Floor	NA	Classroom	EX UV-1	116B	HS-M106	NA	N	NOTE 1	BAC-M1		NOTE 1			DXR	EXISTING UV	-	-		UV-XFMR	20.5	20.5 / 9999		Master																							X			X		
5	HS.1F.EX.UV.5	1st Floor	NA	Classroom	EX UV-1	116B	HS-M106	NA	N	NOTE 1	BAC-M1		NOTE 1			DXR	EXISTING UV	-	-		UV-XFMR	20.5	20.5 / 9999		Master																							X			X		
6	HS.1F.EX.UV.6	1st Floor	NA	Classroom	EX UV-1	116B	HS-M106	NA	N	NOTE 1	BAC-M1		NOTE 1			DXR	EXISTING UV		-		UV-XFMR	20.5	20.5 / 9999		Master																							X			X		
7	HS.1F.EX.UV.7	1st Floor	NA	Classroom	EX UV-1	116B	HS-M106	NA	N	NOTE 1	BAC-M1		NOTE 1			DXR	EXISTING UV	-	-		UV-XFMR	20.5	20.5 / 9999		Master																							X			X		
8	HS.1F.EX.UV.8	1st Floor	NA	Classroom	EX UV-1	116B	HS-M106	NA	N	NOTE 1	BAC-M1		NOTE 1			DXR	EXISTING UV	-	-		UV-XFMR	20.5	20.5 / 9999		Master																							X			X		
9	HS.1F.CV.HS.1	1st Floor	126	Cafeteria	CV-HS-1	410A	HS-M109	NA	N	NOTE 1	BAC-M1		NOTE 1			BACnet T'stat					XFMR-1-CKT-1	6	72 / 80																							X			X		
10	HS.1F.CV.HS.2	1st Floor	126	Cafeteria	CV-HS-2	410A	HS-M109	NA	N	NOTE 1	BAC-M1		NOTE 1			BACnet T'stat					XFMR-1-CKT-1	6	72 / 80																												CV-HS-1 & CV-HS-2 shares same thermostat.
11	HS.1F.CV.HS.3	1st Floor	50	Corridor	CV-HS-3	410A	HS-M109	NA	N	NOTE 1	BAC-M1		NOTE 1			BACnet T'stat					XFMR-1-CKT-1	6	72 / 80																							X			X		
12	HS.1F.CV.HS.4	1st Floor	50	Corridor	CV-HS-4	410A	HS-M109	NA	N	NOTE 1	BAC-M1		NOTE 1			BACnet T'stat					XFMR-1-CKT-1	6	72 / 80																							X			X		
13	HS.1F.CV.HS.5	1st Floor	50	Corridor	CV-HS-5	410A	HS-M109	NA	N	NOTE 1	BAC-M1		NOTE 1			BACnet T'stat					XFMR-1-CKT-1	6	72 / 80																												CV-HS-4 & CV-HS-5 shares same thermostat.
14	HS.1F.CV.HS.7	1st Floor	NA	Stor	CV-HS-7	410A	HS-M109	NA	N	NOTE 1	BAC-M1		NOTE 1			BACnet T'stat					XFMR-1-CKT-1	6	72 / 80																							X			X		
15	HS.1F.CV.HS.8	1st Floor	NA	Storage	CV-HS-8	410A	HS-M109	NA	N	NOTE 1	BAC-M1		NOTE 1			BACnet T'stat					XFMR-1-CKT-1	6	72 / 80																							X			X		
16	HS.1F.CV.HS.9	1st Floor	NA	Storage	CV-HS-9	410A	HS-M109	NA	N	NOTE 1	BAC-M1		NOTE 1			BACnet T'stat					XFMR-1-CKT-1	6	72 / 80																							X			X		
17	HS.1F.CV.HS.10	1st Floor	3	Toilet	CV-HS-10	410A	HS-M109	NA	N	NOTE 1	BAC-M1		NOTE 1			BACnet T'stat					XFMR-1-CKT-1	6	72 / 80																							X			X		
18	HS.1F.CV.HS.11	1st Floor	1	Kitchen Storage 1	CV-HS-11	410A	HS-M109	NA	N	NOTE 1	BAC-M1		NOTE 1			BACnet T'stat					XFMR-1-CKT-1	6	72 / 80																							X			X		
19	HS.1F.CUH.HS.3	1st Floor	-	Kitchen	CUH-HS-3	413A	HS-M109	NA	N	NOTE 1	BAC-M1		NOTE 1			DXR	CABINET UNIT HEATER	-	-		XFMR-1-CKT-2	16.4	16.4 / 80		Master																							X			X		
20	HS.1F.R.2.3.R.2.4	1st Floor	126	Cafeteria	R-2-3 R-2-4	411A	HS-M109	NA	N	NOTE 1	BAC-M1		NOTE 1			BACnet T'stat					XFMR-1-CKT-1	6	72 / 80																							X			X		R-2-3,4 shares same thermostat.
21	HS.1F.R.2.1.R.2.2	1st Floor	5	Dining 2	R-2-1 R-2-2	411A	HS-M109	NA	N	NOTE 1	BAC-M1		NOTE 1			BACnet T'stat					XFMR-1-CKT-1	6	72 / 80																							X			X		R-2-1,2 shares same thermostat.
22	HS.1F.RTU.HS.4	1st Floor	5	Dining 2	RTU-HS-4	114B	HS-M109	NA	N	NOTE 1	BAC-IP	LOOP 1		NOTE 1	NOTE 1	Third-Party																																X			X		Manufacturer supplied thermostat
23	HS.1F.RTU.HS.5	1st Floor	126	Cafeteria	RTU-HS-5	114B	HS-M109	NA	N	NOTE 1	BAC-IP	LOOP 2		NOTE 1	NOTE 1	Third-Party																																X			X		Manufacturer supplied thermostat
24	HS.BAS.R.3.1	Basement	237	Office	R-3-1	411A	HS-M107	NA	N	NOTE 1	BAC-M1		NOTE 1			BACnet T'stat					XFMR-1-CKT-3	6	64.4 / 80																							X			X		
25	HS.BAS.R.1.4	Basement	244	Trainer	R-1-4	411A	HS-M107	NA	N	NOTE 1	BAC-M1		NOTE 1			BACnet T'stat					XFMR-1-CKT-3	6	64.4 / 80																							X			X		
26	HS.BAS.R.1.5	Basement	243	Office	R-1-5	411A	HS-M107	NA	N	NOTE 1	BAC-M1		NOTE 1			BACnet T'stat					XFMR-1-CKT-3	6	64.4 / 80																							X			X		
27	HS.BAS.R.1.7	Basement	226	Office	R-1-7	411A	HS-M107	NA	N	NOTE 1	BAC-M1		NOTE 1			BACnet T'stat					XFMR-1-CKT-3	6	64.4 / 80																							X			X		
28	HS.BAS.R.1.1	Basement	229	Locker	R-1-1	411A	HS-M107	NA	N	NOTE 1	BAC-M1		NOTE 1			BACnet T'stat					XFMR-1-CKT-3	6	64.4 / 80																							X			X		
29	HS.BAS.R.1.2	Basement	228	W Toilet	R-1-2	411A	HS-M107	NA	N	NOTE 1	BAC-M1		NOTE 1			BACnet T'stat					XFMR-1-CKT-3	6	64.4 / 80																							X			X		
30	HS.BAS.R.1.3	Basement	227	M Toilet	R-1-3	411A	HS-M107	NA	N	NOTE 1	BAC-M1		NOTE 1			BACnet T'stat					XFMR-1-CKT-3	6	64.4 / 80																							X			X		

SIEMENS
Siemens Industry, Inc.
Smart Infrastructure

Field-Level Network Device Schedule

NANUET BOND PHASE 3-HIGH SCHOOL

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P1-2: P1 FLN device - FLN 2
P1-3: P1 FLN device - FLN 3
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MB-TCP: Modbus TCP device

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+ : Positive pressure
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GENERAL NOTES

1. IP ADDRESS, INSTANCE NUMBER, MAC ADDRESS, FLN NO TO BE FIELD CO-ORDINATED.

REVISION HISTORY

REV	DATE	DWN	CHK	DESCRIPTION
0	2/16/2024	VB	NSK	ISSUED FOR APPROVAL

System										Network						Device / Equipment											Grouping	Room Airflow						Supply VAV Terminal													Extract / Exhaust VAV Terminal								Room Operator Unit					Comments
																												Minimum Airflow (CFM)				Pressurization		Airflow (CFM)							Duct Size (in)				Airflow (CFM)				Duct Size (in)										
Item	Device Name	Floor	Room No	Room / Device Description	Equipment ID	Siemens Dwg. No.	Match Dwg No	Served By (Airside)	Installation Status	FLN Network No	Network Type	IP Line / Loop Tag	MAC / Device Address	Instance No.	IP Address	Type	Equipment Controlled	Coil Type	Radiation Type	Rad Valve / Relay Qty	Field Power Source	Device Load (VA)	XFMR Load (VA)	Install Check (Initial)	Group Master	Comfort / Occ	Pre-comfort / Occ-Setp	Economy / Unocc	Protection / Vacant	Pressurization Mode	Transferred / Offset Airflow	SAV Clg Min	SAV Clg Max	SAV Htg Min	SAV Htg Max	SAV Vent Min	SAV Vent Max	SAV Smoke Flow	SAV Shape	SAV H/D	SAV W	EAV Vent Min	EAV Vent Max	Smoke (General EAV) Purge (Flame Hood)	EAV Shape	EAV H/D	EAV W	Temperature	Humidity	CO2	User Interface	Lighting Pushbuttons	
31	HS.BAS.R.1.6	Basement	48	Locker	R-1-6	411A	HS-M107	NA	N	NOTE 1	BAC-M1		NOTE 1			BACnet T'stat					XFMR-1-CKT-3	6	64.4 / 80																												X			X		
32	HS.BAS.UH.HS.1	Basement	240	Mechanical Room	UH-HS-1	414A	HS-M107	NA	N	NOTE 1	BAC-M1		NOTE 1			DXR	UNIT HEATER	-	-		XFMR-1-CKT-3	16.4	64.4 / 80		Master																										X			X		
33	HS.BAS.BC.HS.1	Basement	45	Art Room	BC-HS-1	110A	HS-M107	NA	N	NOTE 1	BAC-M1		NOTE 1			PXCC					XFMR-1-CKT-3	-	64.4 / 80																												X			X		
34	HS.BAS.BC.HS.2	Basement	43	Computer Room	BC-HS-2	110A	HS-M107	NA	N	NOTE 1	BAC-M1		NOTE 1			PXCC					XFMR-1-CKT-3	-	64.4 / 80																												X			X		
35	HS.BAS.CUH.HS.1	Basement	-	-	CUH-HS-1	413A	HS-M107	NA	N	NOTE 1	BAC-M1		NOTE 1			DXR	CABINET UNIT HEATER	-	-		XFMR-1-CKT-4	16.4	32.8 / 80		Master																										X			X		
36	HS.BAS.CUH.HS.2	Basement	-	Basement Storage Room	CUH-HS-2	413A	HS-M107	NA	N	NOTE 1	BAC-M1		NOTE 1			DXR	CABINET UNIT HEATER	-	-		XFMR-1-CKT-4	16.4	32.8 / 80		Master																										X			X		

SIEMENS INDUSTRY, INC.
SMART INFRASTRUCTURE

Valve Submittal - Steam

LOCATION:	NANUET, NY	**PROJECT NAME:**	NANUET BOND PHASE3 HIGH SCHC	**DATE:**	2/16/24
JOB NO:	44OP-366733			**PAGE:**	1
ENGR:	SN			**REV:**	0

GENERAL NOTES:
1. All valves 2-1/2" and larger have flanged ends, 2" and smaller have screwed ends.
2. All control valves and wells shall be installed by the mechanical contractor.
3. Standard abbreviations used on control valves are:

BODY TYPES: 3W - Three way; 2W - Two way; A - Angle; N.C. - Normally Closed; N.O. - Normally Open; NOC - Ball Valve can be N.O. or N.C.; BF - Butterfly Valve; DS - Double Seated;

UNITS:
Steam inlet pressure, actual pressure drop, and shut off pressure indicated in PSIG.

ACTUATOR TYPES: SR - Spring Return; NSR - No Spring Return CR - Capacitor Driven Return; DA - Double Acting

Valve ID/ Location	Qty	Product Number	Valve Size	Body Type	Body Style	Actual Cv	Actuator Type	Design P. Drop (psi)	Required Flow (lb/hr)	Min (gpm)	Max (gpm)	Preset (gpm)	Steam Inlet	Press Drop (psi)	Valve Spec Sheet	Shut Off	ANSI Class	Comment
Mechanical System: 210_HS-HEAT EXCHANGER														**HS-HEAT EXCHANGER (MECH)**				
V-1	1	294-06052	4.00	2W	Globe	160.00	NC-SR	5.00	3,430.00	N/A	N/A	N/A	7.00	2.55	155 304	39	125	2/3 V-HX-HS-2
V-2	1	291-06051	3.00	2W	Globe	100.00	NC-SR	2.00	1,715.00	N/A	N/A	N/A	7.00	1.60	155 304	63	125	1/3 V-HX-HS-2

NOTES: All control valves and wells shall be installed by the heating contractor.

SIEMENS INDUSTRY, INC.
SMART INFRASTRUCTURE

Valve Submittal - Water

LOCATION: NANUET, NY
JOB NO: 44OP-366733
ENGR: SN

PROJECT NAME: NANUET BOND PHASE3 HIGH SCHC
DATE: 2/16/24
PAGE: 2
REV: 0

GENERAL NOTES:
1. All valves 2-1/2" and larger have flanged ends, 2" and smaller have screwed ends.
2. All control valves and wells shall be installed by the mechanical contractor.
3. Standard abbreviations used on control valves are:

BODY TYPES: 3W - Three way; 2W - Two way; A - Angle; N.C. - Normally Closed; N.O. - Normally Open; NOC - Ball Valve can be N.O. or N.C.; BF - Butterfly Valve; DS - Double Seated;

UNITS:
Steam inlet pressure, actual pressure drop, and shut off pressure indicated in PSIG.

ACTUATOR TYPES: SR - Spring Return; NSR - No Spring Return CR - Capacitor Driven Return; DA - Double Acting

Valve ID/ Location	Qty	Product Number	Valve Size	Body Type	Body Style	Actual Cv	Actuator Type	Design P. Drop (psi)	Required Flow (gpm)	Min (gpm)	Max (gpm)	Preset (gpm)	Steam Inlet	Press Drop (psi)	Valve Spec Sheet	Shut Off	ANSI Class	Comment
Mechanical System: 110_HS-BLOWER COIL UNIT								**HS-BC-HS-1 (MECH)**										
V-1	1	262-02058	0.50	2W	Globe	4.00	NO-SR	5.00	8.00	N/A	N/A	N/A	--	4.00	155 306	65	250	BC-HS-01
Mechanical System: 111_HS-BLOWER COIL UNIT								**HS-BC-HS-02 (MECH)**										
V-2	1	262-02055	0.50	2W	Globe	2.50	NO-SR	5.00	5.00	N/A	N/A	N/A	--	4.00	155 306	65	250	BC-HS-02
Mechanical System: 112_HS-AHU-03 UNIT								**HS-AHU-HS-03 (MECH)**										
V-3	1	274-03133	1.50	2W	Globe	25.00	NC-SR	5.00	45.90	N/A	N/A	N/A	--	3.37	155 304	73	250	HWV AHU-HS-3
Mechanical System: 113_HS-AHU HW COIL								**HS-AHU HW COIL (MECH)**										
V-4	1	274-03150	1.25	3W	Globe	16.00	SR	5.00	28.50	N/A	N/A	N/A	--	3.17	155 304	117	250	HWV FX-AHU-2
V-5	1	274-03113	1.00	2W	Globe	10.00	NO-SR	5.00	20.23	N/A	N/A	N/A	--	4.09	155 304	201	250	HWV AC-1
V-6	1	274-03150	1.25	3W	Globe	16.00	SR	5.00	26.66	N/A	N/A	N/A	--	2.78	155 304	117	250	HWV FX-AHU-1
Mechanical System: 210_HS-HEAT EXCHANGER								**HS-HEAT EXCHANGER (MECH)**										
V-7	1	274-06616	3.00	2W	Globe	100.00	NC-SR	10.00	250.00	N/A	N/A	N/A	--	6.25	154067	200	125	CRAWL SPACE
Mechanical System: 410_HS-CONVECTOR (MECH)								**HS-CONVECTOR (MECH)**										
V-8	1	262-02047	0.50	2W	Globe	0.40	NO-SR	3.00	0.38	N/A	N/A	N/A	--	0.92	155 306	120	250	CV-HS-9

NOTES: All control valves and wells shall be installed by the heating contractor.

SIEMENS INDUSTRY, INC.
SMART INFRASTRUCTURE

Valve Submittal - Water

LOCATION: NANUET, NY
JOB NO: 44OP-366733
ENGR: SN

PROJECT NAME: NANUET BOND PHASE3 HIGH SCHC
DATE: 2/16/24
PAGE: 3
REV: 0

GENERAL NOTES:
1. All valves 2-1/2" and larger have flanged ends, 2" and smaller have screwed ends.
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UNITS:
Steam inlet pressure, actual pressure drop, and shut off pressure indicated in PSIG.

ACTUATOR TYPES: SR - Spring Return; NSR - No Spring Return CR - Capacitor Driven Return; DA - Double Acting

Valve ID/ Location	Qty	Product Number	Valve Size	Body Type	Body Style	Actual Cv	Actuator Type	Design P. Drop (psi)	Required Flow (gpm)	Min (gpm)	Max (gpm)	Preset (gpm)	Steam Inlet	Press Drop (psi)	Valve Spec Sheet	Shut Off	ANSI Class	Comment
Mechanical System: 410_HS-CONVECTOR (MECH)									**HS-CONVECTOR (MECH)**									
V-9	1	262-02047	0.50	2W	Globe	0.40	NO-SR	3.00	0.31	N/A	N/A	N/A	--	0.59	155 306	120	250	CV-HS-10
V-10	1	262-02047	0.50	2W	Globe	0.40	NO-SR	3.00	0.38	N/A	N/A	N/A	--	0.92	155 306	120	250	CV-HS-11
V-11	1	262-02047	0.50	2W	Globe	0.40	NO-SR	3.00	0.67	N/A	N/A	N/A	--	2.81	155 306	120	250	CV-HS-1
V-12	1	262-02047	0.50	2W	Globe	0.40	NO-SR	3.00	0.67	N/A	N/A	N/A	--	2.81	155 306	120	250	CV-HS-2
V-13	1	262-02047	0.50	2W	Globe	0.40	NO-SR	3.00	0.67	N/A	N/A	N/A	--	2.81	155 306	120	250	CV-HS-3
V-14	1	262-02047	0.50	2W	Globe	0.40	NO-SR	3.00	0.67	N/A	N/A	N/A	--	2.81	155 306	120	250	CV-HS-4
V-15	1	262-02047	0.50	2W	Globe	0.40	NO-SR	3.00	0.67	N/A	N/A	N/A	--	2.81	155 306	120	250	CV-HS-5
V-16	1	262-02047	0.50	2W	Globe	0.40	NO-SR	3.00	0.38	N/A	N/A	N/A	--	0.92	155 306	120	250	CV-HS-7
V-17	1	262-02047	0.50	2W	Globe	0.40	NO-SR	3.00	0.38	N/A	N/A	N/A	--	0.92	155 306	120	250	CV-HS-8
Mechanical System: 411_HS-RADIATOR									**HS-RADIATOR COIL (MECH)**									
V-18	1	262-02047	0.50	2W	Globe	0.40	NO-SR	3.00	0.48	N/A	N/A	N/A	--	1.44	155 306	120	250	R1-1
V-19	1	262-02047	0.50	2W	Globe	0.40	NO-SR	3.00	0.48	N/A	N/A	N/A	--	1.44	155 306	120	250	R1-2
V-20	1	262-02047	0.50	2W	Globe	0.40	NO-SR	3.00	0.48	N/A	N/A	N/A	--	1.44	155 306	120	250	R1-3

NOTES: All control valves and wells shall be installed by the heating contractor.

SIEMENS INDUSTRY, INC.
SMART INFRASTRUCTURE

Valve Submittal - Water

LOCATION: NANUET, NY
JOB NO: 44OP-366733
ENGR: SN

PROJECT NAME: NANUET BOND PHASE3 HIGH SCHC
DATE: 2/16/24
PAGE: 4
REV: 0

GENERAL NOTES:
1. All valves 2-1/2" and larger have flanged ends, 2" and smaller have screwed ends.
2. All control valves and wells shall be installed by the mechanical contractor.
3. Standard abbreviations used on control valves are:

BODY TYPES: 3W - Three way; 2W - Two way; A - Angle; N.C. - Normally Closed; N.O. - Normally Open; NOC - Ball Valve can be N.O. or N.C.; BF - Butterfly Valve; DS - Double Seated;

UNITS:
Steam inlet pressure, actual pressure drop, and shut off pressure indicated in PSIG.

ACTUATOR TYPES: SR - Spring Return; NSR - No Spring Return CR - Capacitor Driven Return; DA - Double Acting

Valve ID/ Location	Qty	Product Number	Valve Size	Body Type	Body Style	Actual Cv	Actuator Type	Design P. Drop (psi)	Required Flow (gpm)	Min (gpm)	Max (gpm)	Preset (gpm)	Steam Inlet	Press Drop (psi)	Valve Spec Sheet	Shut Off	ANSI Class	Comment
Mechanical System: 411_HS-RADIATOR									**HS-RADIATOR COIL (MECH)**									
V-21	1	262-02047	0.50	2W	Globe	0.40	NO-SR	3.00	0.48	N/A	N/A	N/A	--	1.44	155 306	120	250	R1-4
V-22	1	262-02047	0.50	2W	Globe	0.40	NO-SR	3.00	0.48	N/A	N/A	N/A	--	1.44	155 306	120	250	R1-5
V-23	1	262-02047	0.50	2W	Globe	0.40	NO-SR	3.00	0.48	N/A	N/A	N/A	--	1.44	155 306	120	250	R1-6
V-24	1	262-02047	0.50	2W	Globe	0.40	NO-SR	3.00	0.48	N/A	N/A	N/A	--	1.44	155 306	120	250	R1-7
V-25	1	262-02055	0.50	2W	Globe	2.50	NO-SR	3.00	2.96	N/A	N/A	N/A	--	1.40	155 306	65	250	R2-1
V-26	1	262-02055	0.50	2W	Globe	2.50	NO-SR	3.00	2.96	N/A	N/A	N/A	--	1.40	155 306	65	250	R2-2
V-27	1	262-02055	0.50	2W	Globe	2.50	NO-SR	3.00	2.96	N/A	N/A	N/A	--	1.40	155 306	65	250	R2-3
V-28	1	262-02055	0.50	2W	Globe	2.50	NO-SR	3.00	2.96	N/A	N/A	N/A	--	1.40	155 306	65	250	R2-4
V-29	1	262-02047	0.50	2W	Globe	0.40	NO-SR	3.00	0.50	N/A	N/A	N/A	--	1.56	155 306	120	250	R3-1
Mechanical System: 413_HS-CABINET UNIT HEATER									**HS-CABINET UNIT HEATER (MECH)**									
V-30	1	171H-10302S	0.50	2W	Ball	1.00	NO-SR	3.00	1.41	N/A	N/A	N/A	--	1.99	154038	200	250	CUH-HS-1
V-31	1	171H-10302S	0.50	2W	Ball	1.00	NO-SR	3.00	1.64	N/A	N/A	N/A	--	2.69	154038	200	250	CUH-HS-2
V-32	1	171H-10304S	0.50	2W	Ball	2.50	NO-SR	3.00	3.27	N/A	N/A	N/A	--	1.71	154038	200	250	CUH-HS-3

NOTES: All control valves and wells shall be installed by the heating contractor.

SIEMENS INDUSTRY, INC.
SMART INFRASTRUCTURE

Valve Submittal - Water

LOCATION:	NANUET, NY	**PROJECT NAME:**	NANUET BOND PHASE3 HIGH SCHC	**DATE:**	2/16/24
JOB NO:	44OP-366733			**PAGE:**	5
ENGR:	SN			**REV:**	0

GENERAL NOTES:
1. All valves 2-1/2" and larger have flanged ends, 2" and smaller have screwed ends.
2. All control valves and wells shall be installed by the mechanical contractor.
3. Standard abbreviations used on control valves are:

BODY TYPES: 3W - Three way; 2W - Two way; A - Angle; N.C. - Normally Closed; N.O. - Normally Open; NOC - Ball Valve can be N.O. or N.C.; BF - Butterfly Valve; DS - Double Seated;

UNITS:
Steam inlet pressure, actual pressure drop, and shut off pressure indicated in PSIG.

ACTUATOR TYPES: SR - Spring Return; NSR - No Spring Return CR - Capacitor Driven Return; DA - Double Acting

Valve ID/ Location	Qty	Product Number	Valve Size	Body Type	Body Style	Actual Cv	Actuator Type	Design P. Drop (psi)	Required Flow (gpm)	Min (gpm)	Max (gpm)	Preset (gpm)	Steam Inlet	Press Drop (psi)	Valve Spec Sheet	Shut Off	ANSI Class	Comment
Mechanical System: 414_UNIT HEATER										**HS-UNIT HEATER (MECH)**								
V-33	1	171H-10301S	0.50	2W	Ball	0.63	NO-SR	3.00	0.80	N/A	N/A	N/A	--	1.61	154038	200	250	UH-HS-01

NOTES: All control valves and wells shall be installed by the heating contractor.

SIEMENS

Siemens Smart Infrastructure
Building Automation Division

AIR FLOW STATION SCHEDULE

Siemens Job Number:	**44OP-366733**	Date:	**2/16/2024**		
Project Name:	**BNJ2 BAU NANUET BOND PHASE 3_HIGH SCHOOL**	DR: **VB**	CH: **NSK**	Revision:	**REV 0**

SYSTEM					TRANSMITTER			SENSOR									
REF **MECH** DWG	REF **CONTROL** DWG	**MECHANICAL SYSTEM**	**SERVICE** (SA/RA/ODA)	**MAX DESIGN AIR FLOW**	**TAG**	**MODEL**	**MFGR**	**TAG**	**TYPE** Duct / Fan Inlet	**RANGE**	**QTY** (Probes x Sensors/probe)	**DUCT SIZE** W	H	**BELL DIAMETER**	**MODEL**	**MFGR**	**COMMENTS**
HS-M111	114B	RTU-HS-4	SA	5000 CFM	AFMS-1	GTC108e	EBTRON	AFMS-1	Fan Inlet	0-5000 FPM	2 x 1/1	-	-	20	GTC108e-F/SI	EBTRON	
HS-M111	114B	RTU-HS-4	RA	5000 CFM	AFMS-2	GTC108e	EBTRON	AFMS-2	Fan Inlet	0-5000 FPM	2 x 1/1	-	-	20	GTC108e-F/SI	EBTRON	
HS-M111	114B	RTU-HS-5	OA	5000 CFM	AFMS-3	GTC116e	EBTRON	AFMS-3	Duct	0-5000 FPM	-	NA	NA	NA	GTx116E-P+	EBTRON	RTU OA duct size is not available. Need to be field determined.
HS-M111	114B	RTU-HS-5	SA	5000 CFM	AFMS-4	GTC108e	EBTRON	AFMS-4	Fan Inlet	0-5000 FPM	2 x 1/1	-	-	20	GTC108e-F/SI	EBTRON	
HS-M111	114B	RTU-HS-5	RA	5000 CFM	AFMS-5	GTC108e	EBTRON	AFMS-5	Fan Inlet	0-5000 FPM	2 x 1/1	-	-	20	GTC108e-F/SI	EBTRON	

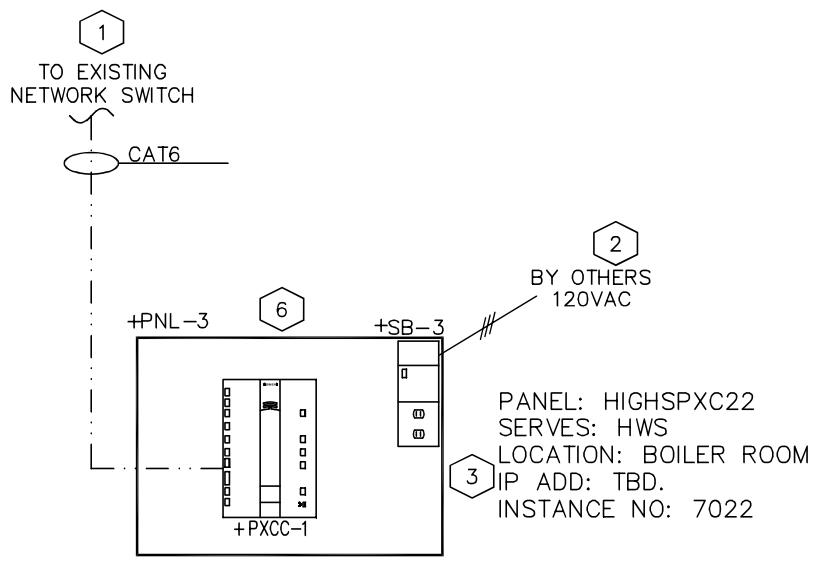
NOTE:

1 Bell diameter to be finalized before placing the order.

2 Probes and sensor qty to be finalized before placing the order.

3 Sensor part number need to be finalized before placing the order.

BMS RISER



INSTALLATION NOTES:

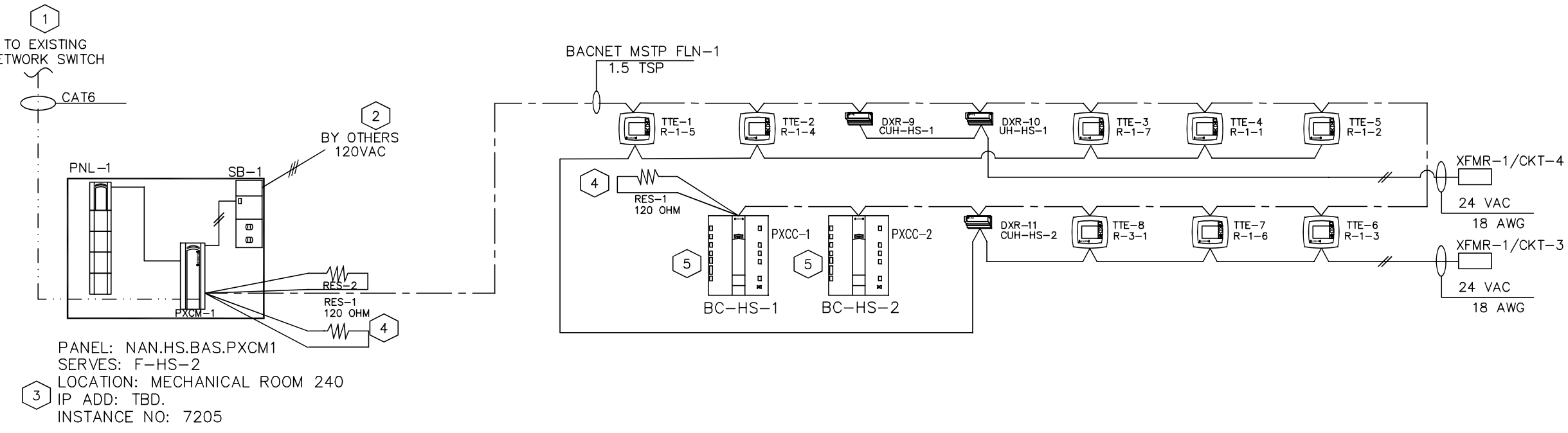
1. CAT 6 DROP BY OTHERS AND CONNECTED TO EXISTING NETWORK SWITCH.
2. 120VAC BY OTHERS.
3. PANEL IP ADDRESS, DEVICE TO BE FIELD COORDINATED & LOCATION TO BE CONFIRMED ON FIELD.
4. RS-485 EOL & EGR RESISTORS TO BE INSTALLED AS SHOWN.
5. SIEMENS TO INSTALL AND WIRE NEW PXCC CONTROLLER IN BLOWER COIL UNIT CONTROL ENCLOSURE.
6. EXISTING PANEL DETAILS TO BE FIELD COORDINATED.

GENERAL NOTES:

1. REFER FLN SCHEDULE FOR LOCATION DETAILS.

LEGEND:

- BACNET MSTP FLN-1
- BLN



BASEMENT

1
001
BMS RISER

REVISION HISTORY

R0	2/16/2024	VB	ISSUED FOR APPROVAL

SIEMENS

SIEMENS INDUSTRY, INC.
SMART INFRASTRUCTURE

412 MT KEMBLE AVE.
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NANUET BOND PHASE3 HIGH SCHOOL
NANUET, NY

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
VB	VB	NSK	02/16/24	02/16/24

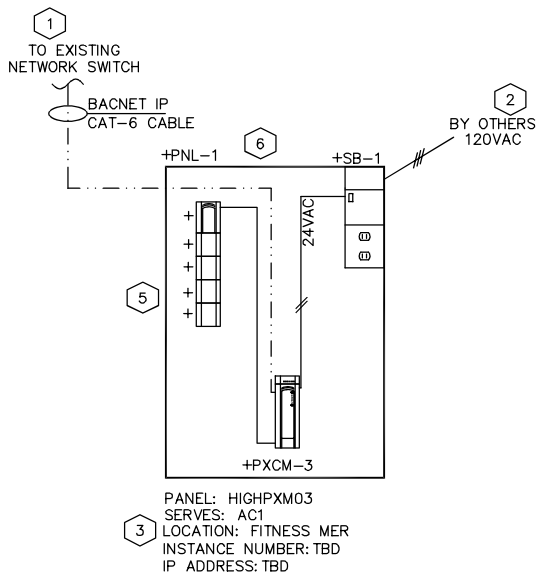
RISER

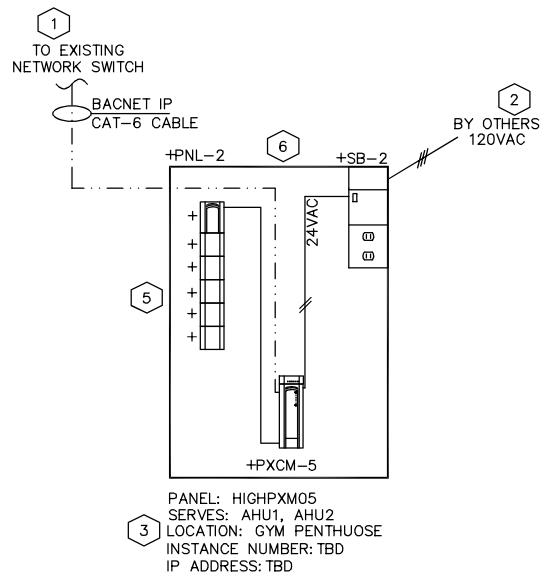
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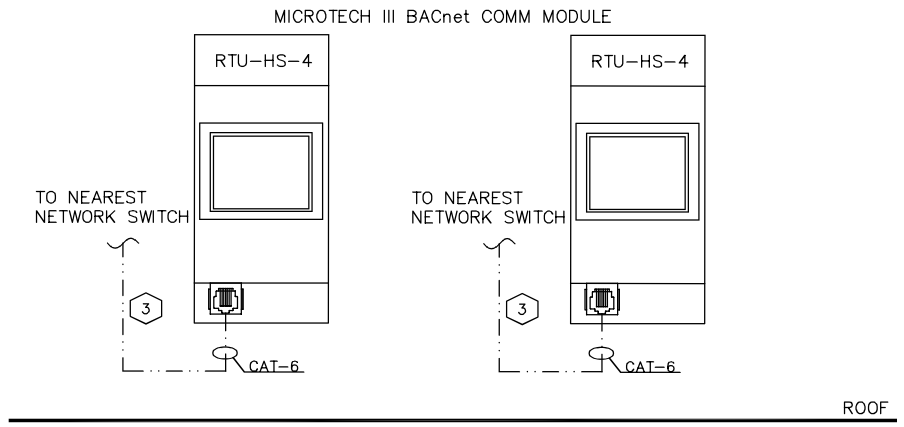
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C:\USERS\Z004PB8F\ONEDRIVE - SIEMENS AG\BNJ2 BAU NANUET BOND PHASE 3 HIGH SCHOOL_440P-366733\DT\MDT_HIGH SCHOOL\001_RISER.DWG

BMS RISER







INSTALLATION NOTES:

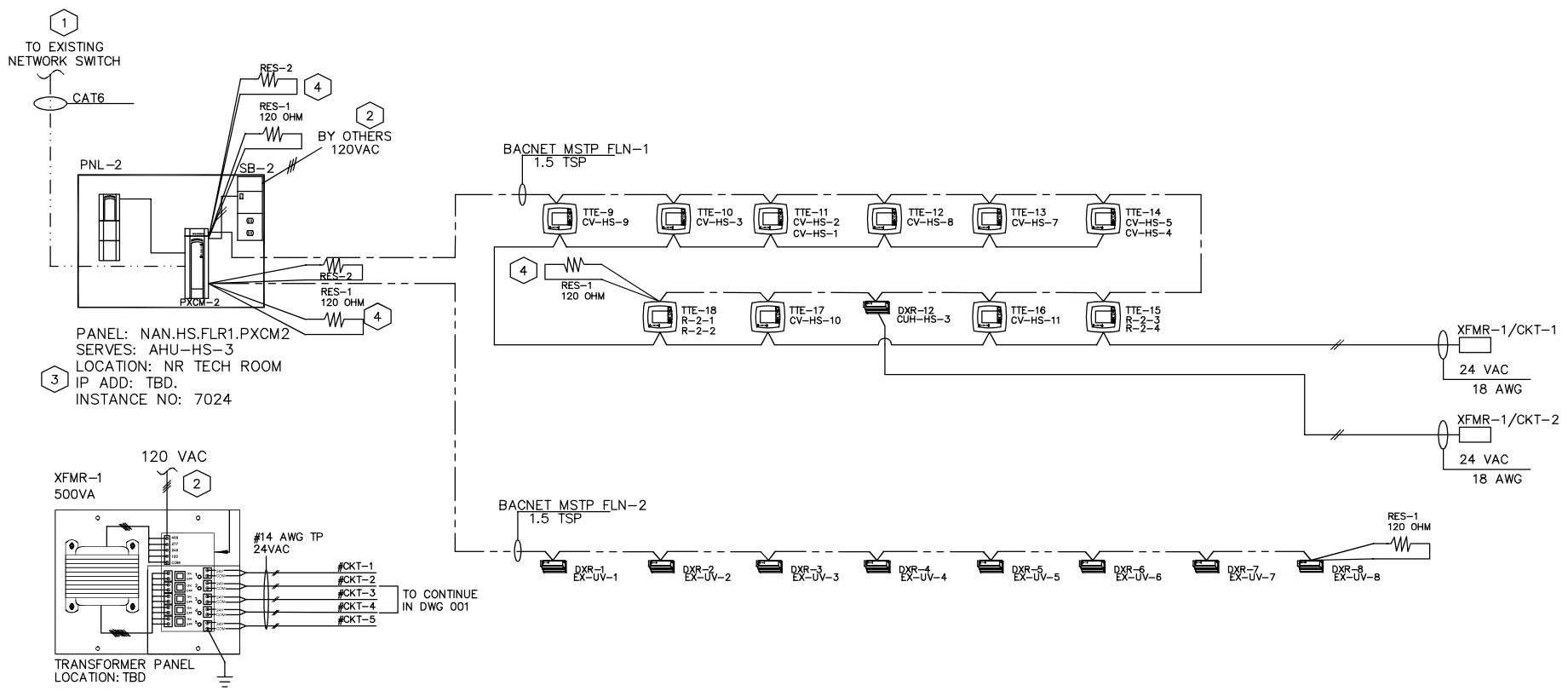
1. CAT 6 DROP BY OTHERS AND CONNECTED TO EXISTING NETWORK SWITCH.
2. 120VAC BY OTHERS.
3. IP ADDRESS, DEVICE INSTANCE TO BE FIELD COORDINATED & LOCATION TO BE CONFIRMED ON FIELD.
4. RS-485 EOL & EGR RESISTORS TO BE INSTALLED AS SHOWN.
5. EXISTING UNIT VENTILATOR TAG TO BE FIELD VERIFIED AS IN DWG HS-M106 IT WAS ONLY SHOWING AS EX UV-1 FOR ALL 8 QTY.
6. EXISTING PANEL DETAILS TO BE FIELD COORDINATED.

GENERAL NOTES:

1. REFER FLN SCHEDULE FOR LOCATION DETAILS.

LEGEND:

- BACNET MSTP FLN-1
- BACNET MSTP FLN-2
- BLN



1/001A BMS RISER

REVISION HISTORY

R0	2/16/2024	VB	ISSUED FOR APPROVAL

SIEMENS

SIEMENS INDUSTRY, INC.
SMART INFRASTRUCTURE

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Phone: (973) 575-6300
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NANUET BOND PHASE3 HIGH SCHOOL
NANUET, NY

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
VB	VB	NSK	02/16/24	02/16/24

RISER

440P-366733
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001A

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Control Device	Qty	Product Number	Manufacturer	Document Number	Description
Field Mounted Devices					
AE 1-2	2	FBO	N/A	N/A	DAMPER ACTUATORS
CS 1	1	C-2320-L ECM	SENVA	N/A	ADJ. CURRENT SWITCH FOR ECM MOTORS 0.25-
D					SEE DAMPER SUBMITTAL
DPTE 1	1	2641001WD11A1C	SETRA	0608cut003	DP TRAN AIR,1%,1" ENC
LTDE 1	1	FBO	N/A	N/A	LOW TEMP DETECTOR
RE 1	1	RIBU1C	FUNCTIONAL DEVICES	1208cut013	RIB 120VAC 24VAC/DC SPDT
RE 2-4	3	RH2B-UL-AC24VKIT	IDEC	1202cut016	RELAY&SOC,GP DPDT AC24V W/LED
SD 1	1	FBO	N/A	N/A	SMOKE DETECTOR
SPP 1-2	2	269-062	SIEMENS	N/A	PR269 ACCESSORY, SENSING TUBE
TTE 1	1	544-339-8	SIEMENS	149261	DCT POINT TEMP, PT 1K OHM (375), 8"
TTE 2	1	544-342-8	SIEMENS	149261	DUCT AVG. TMP, 1K OHM, PT(375), 8', FLEX
TTE 3	1	544-339-8	SIEMENS	149261	DCT POINT TEMP, PT 1K OHM (375), 8"
TTE 4	1	QAD2030U	SIEMENS	149918	SURFACE TMP SNSR, 10K OHM TYPE 2, METAL
TTE 5	1	544-339-8	SIEMENS	149261	DCT POINT TEMP, PT 1K OHM (375), 8"
TTE 6	1	QAA2212.EWSN	SIEMENS	149708	RTS, 1K OHM PT (385), BLANK FRONT
V					SEE VALVE SUBMITTAL
Panel Mounted Devices					
XFMR 1	1	FBO	N/A	N/A	TRANSFORMER

SEQUENCE OF OPERATIONS

BLOWER COIL UNITS

A. FAN OPERATION: GENERAL: START BLOWER COIL UNIT FAN WHEN THE BMS SCHEDULE DETERMINES EQUIPMENT TO START. START FAN FOLLOWING CONTACT CLOSURE FOR FIRE ALARM SHUTDOWN, LOW TEMPERATURE THERMOSTAT, AND RETURN DUCT SMOKE DETECTOR (WHERE APPLICABLE). PROVE FAN FLOW FOR SUPPLY FAN INDIVIDUALLY THROUGH CURRENT SENSORS.

1) OPTIMAL START: THE SUPPLY FAN SHALL START PRIOR TO SCHEDULED OCCUPANCY BASED ON THE TIME NECESSARY FOR THE ZONES TO REACH THEIR OCCUPIED SETPOINTS. THE START TIME SHALL AUTOMATICALLY ADJUST BASED ON HANGES IN OUTSIDE AIR TEMPERATURE AND ZONE TEMPERATURES. THE INITIAL OPTIMAL START TIME SHALL BE 1 HOUR PRIOR TO OCCUPIED MODE STARTING (ADJUSTABLE).

2) UNOCCUPIED MODE: BLOWER COILS SHALL BE NORMALLY OFF IN UNOCCUPIED MODE AS DETERMINED BY THE BMS.

B. DISCHARGE AIR SETPOINT CONTROL: DISCHARGE AIR TEMPERATURE SETPOINT SHALL BE RESET ACCORDING TO THE SPACE TEMPERATURE SENSOR SERVED BY THE BLOWER COILS. AS THE SPACE TEMPERATURE RISES ABOVE A SETPOINT OF 74 DEGREES F (FIELD ADJUSTABLE THROUGH BMS), THE DISCHARGE AIR SETPOINT SHALL BE REDUCED. AS SPACE TEMPERATURE DECREASES, THE DISCHARGE AIR SETPOINT SHALL BE INCREASED. THE MINIMUM DISCHARGE AIR TEMPERATURE SHALL BE 55 DEGREES F (FIELD ADJUSTABLE THROUGH BMS), AND THE MAXIMUM DISCHARGE AIR TEMPERATURE SHALL BE 90 DEGREES F (FIELD ADJUSTABLE THROUGH BMS).

C. MINIMUM OUTSIDE AIR VENTILATION: NORMALLY CLOSED, OPPOSED BLADE OUTSIDE AIR DAMPER SHALL MOVE TO THE OPEN POSITION WHEN THE BLOWER COIL IS IN OPERATION, IN OCCUPIED MODE.

D. ECONOMIZER COOLING:

1) WHEN THE DISCHARGE AIR TEMPERATURE SETPOINT AND THE SPACE TEMPERATURE SENSOR ARE CALLING FOR COOLING AND RETURN AIR TEMPERATURE IS HIGHER THAN THE OUTSIDE AIR TEMPERATURE, THE OUTSIDE AIR AND RETURN AIR DAMPERS SHALL MODULATE TO MEET THE DISCHARGE AIR TEMPERATURE TO COOL THE SPACE.

E. HEATING CONTROL– OCCUPIED MODE: IF THE OUTSIDE AIR TEMPERATURE IS 65 DEGREES F (ADJUSTABLE) OR BELOW AND THE DISCHARGE AIR TEMPERATURE SETPOINT IS CALLING FOR HEATING, THE HOT WATER VALVE SHALL MODULATE TO MAINTAIN THE SUPPLY AIR TEMPERATURE AT THE SUPPLY AIR SETPOINT AS DETERMINED BY THE RESET SCHEDULE.

1) UNOCCUPIED MODE HEATING: THE BLOWER COIL SHALL BE NORMALLY OFF WHEN THE BMS DETERMINES THE BUILDING TO BE IN UNOCCUPIED MODE. WHEN THE SPACE TEMPERATURE SENSOR SERVED BY THE BLOWER COIL FALLS BELOW THE UNOCCUPIED SETPOINT OF 62 DEGREES F (ADJUSTABLE), THE BLOWER COIL SHALL OPERATE WITH OUTSIDE AIR DAMPER CLOSED, RETURN DAMPER 100% OPEN, HEATING CONTROL VALVE MODULATING TO PROVIDE 95 DEGREE AIR TO THE SPACE UNTIL THE UNOCCUPIED SETPOINT IS REACHED.

F. LOW TEMPERATURE PROTECTION:

1) WHEN THE MIXED AIR TEMPERATURE DOWNSTREAM OF THE HEATING COIL IS BELOW 35 DEGREES F (ADJUSTABLE) IN ANY 12-INCH-LONG SECTION OF THE LOW TEMPERATURE THERMOSTAT CAPILLARY THE FOLLOWING SHALL OCCUR:
2) SEND AN ALARM TO THE BMS.
3) OPEN THE CONTROL VALVE TO 100% OPEN.
4) THE LOW TEMPERATURE THERMOSTAT SHALL BE OF THE MANUAL RESET TYPE.

G. FILTER DIFFERENTIAL: PROVIDE ANALOG INPUT TO MEASURE STATIC PRESSURE DIFFERENTIAL ACROSS FILTER AND ALARM THROUGH THE BMS WHEN DIFFERENTIAL STATIC PRESSURE EXCEEDS FIELD ADJUSTABLE SETPOINT.

H. FIRE ALARM SHUTDOWN: WHEN THE FIRE ALARM SYSTEM IS IN AN ALARM CONDITION AS NOTED THROUGH CONTACTS IN THE FIRE ALARM PANEL, THE UNIT SHALL BE SHUT DOWN AND ALL DAMPERS AND VALVE ACTUATORS SHALL BE PLACED IN THEIR NORMAL POSITIONS.

I. THE OUTSIDE AIR DAMPERS SHALL CLOSE WHENEVER THE UNIT IS OFF.

REVISION HISTORY

R0	2/16/2024	VB	ISSUED FOR APPROVAL

SIEMENS

SIEMENS INDUSTRY, INC.
SMART INFRASTRUCTURE

412 MT KEMBLE AVE.
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Phone: (973) 575-6300
Fax: (973) 575-7968

NANUET BOND PHASE3 HIGH SCHOOL
NANUET, NY

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
VB	VB	NSK	02/16/24	02/16/24

HS-BC-HS-01 (BOM/SOO)

440P-366733
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110

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BLOWER COIL UNIT (BC-HS-1)

LOCATION: ART ROOM 45

SERVES: ART ROOM

DRAWING NOTES:

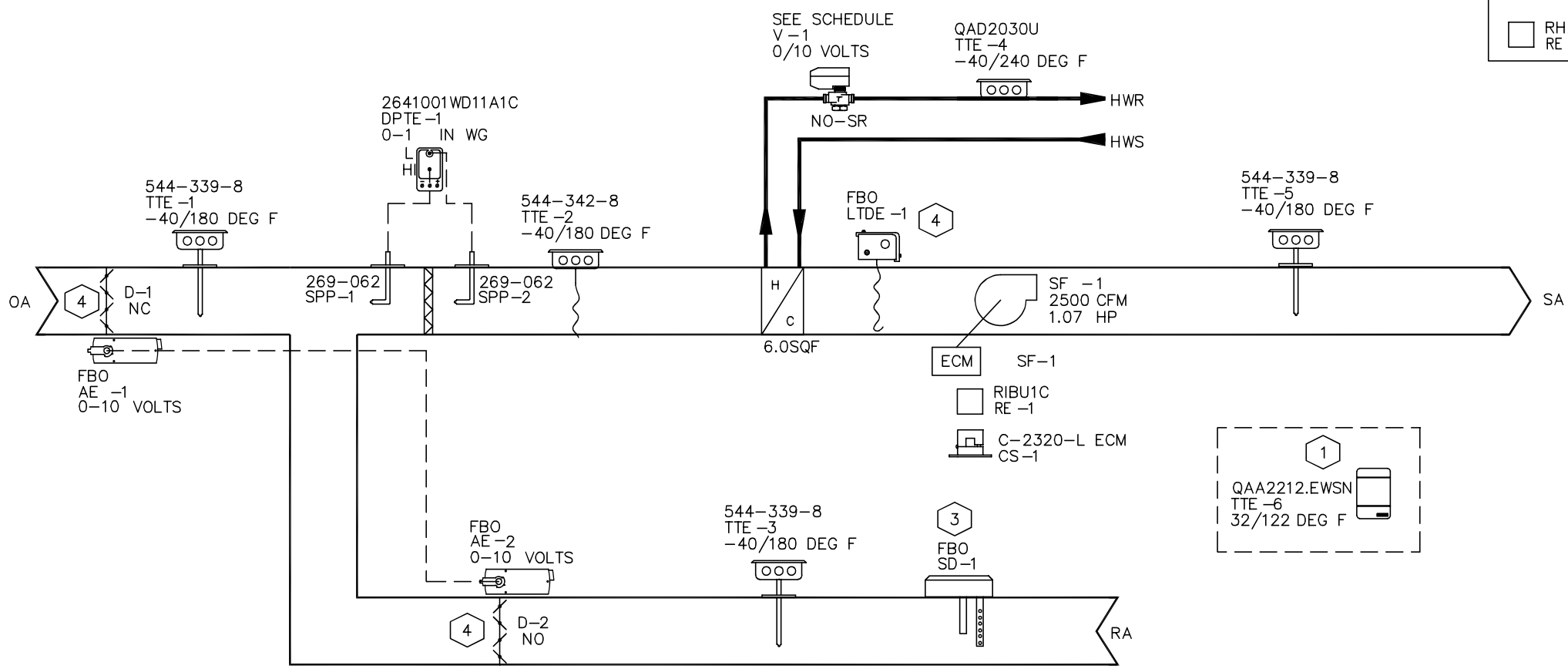
1. SENSOR LOCATION TO BE FIELD DETERMINED.
2. SAFETY RELAYS MOUNTED IN PANEL.
3. SMOKE DETECTOR PROVIDED BY OTHERS.
4. PROVIDED BY OTHERS.

GENERAL NOTES:

1. SEE WIRING DETAIL ON ELECTRICAL DRAWING 110B.

NAN.HS.BST.PXCM1

FB0 XFMR -1 | 2 | RH2B-UL-AC24VKIT RE -2 | RH2B-UL-AC24VKIT RE -3 | RH2B-UL-AC24VKIT RE -4



1 / 110A BLOWER COIL UNIT-1

LOCATION: ART ROOM:45
SERVES: ART ROOM

REVISION HISTORY

R0	2/16/2024	VB	ISSUED FOR APPROVAL

SIEMENS

SIEMENS INDUSTRY, INC.
SMART INFRASTRUCTURE

412 MT KEMBLE AVE.
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Fax: (973) 575-7968

NANUET BOND PHASE3 HIGH SCHOOL
NANUET, NY

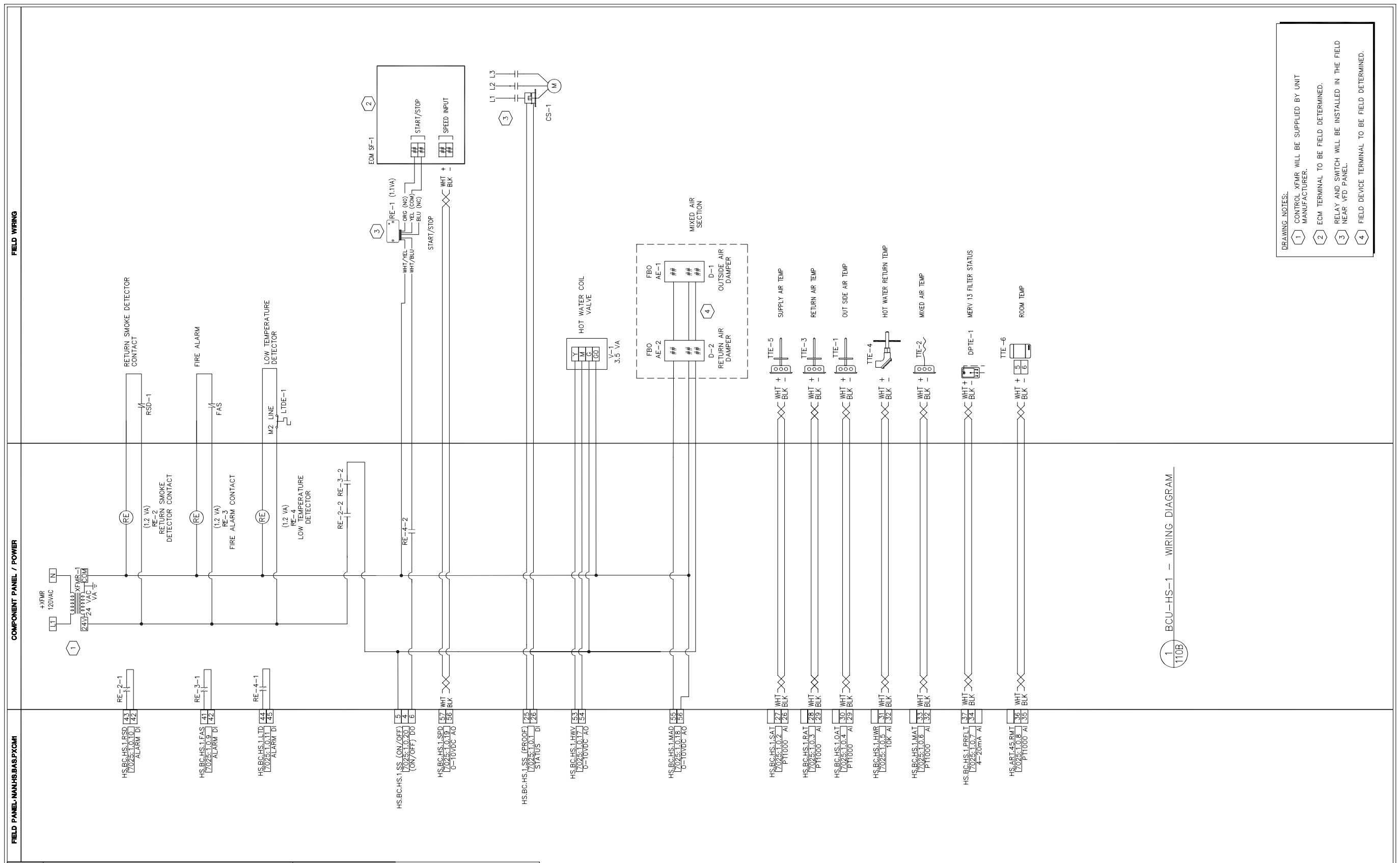
ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
VB	VB	NSK	02/16/24	02/16/24

HS-BC-HS-01 (MECH)

440P-366733
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110A

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REF#	FIELD PANEL NAME	FIELD PANEL NODE NAME
7025	NAN.HS.BAS.PXCM1	NANHSBASPXCM1

REVISION HISTORY

R0	2/16/2024	VB	ISSUED FOR APPROVAL

SIEMENS

SIEMENS INDUSTRY, INC.
SMART INFRASTRUCTURE

5095 RITTER ROAD,
412 MT KEMBLE AVE.
MORRISTOWN
NJ. 07960 USA
Phone: (973) 575-6300
Fax: (973) 575-7968

NANUET BOND PHASE3 HIGH SCHOOL
NANUET, NY

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
VB	VB	NSK	02/16/24	02/16/24

HS-BC-HS-01 (ELEC)

440P-366733
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110B

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C:\USERS\Z004PB8F\ONEDRIVE - SIEMENS AG\BNJ2 BAU NANUET BOND PHASE 3 HIGH SCHOOL_440P-366733\DT\MDT_HIGH SCHOOL\110_HS-BLOWER COIL UNITA.DWG

Control Device	Qty	Product Number	Manufacturer	Document Number	Description
Field Mounted Devices					
AE 1-2	2	FBO	N/A	N/A	DAMPER ACTUATORS
CS 1	1	C-2320-L ECM	SENVA	N/A	ADJ. CURRENT SWITCH FOR ECM MOTORS 0.25-
D					SEE DAMPER SUBMITTAL
DPTE 1	1	2641001WD11A1C	SETRA	0608cut003	DP TRAN AIR,1%,1" ENC
LTDE 1	1	FBO	N/A	N/A	LOW TEMP DETECTOR
RE 1	1	RIBU1C	FUNCTIONAL DEVICES	1208cut013	RIB 120VAC 24VAC/DC SPDT
RE 2-4	3	RH2B-UL-AC24VKIT	IDEC	1202cut016	RELAY&SOC,GP DPDT AC24V W/LED
SD 1	1	FBO	N/A	N/A	SMOKE DETECTOR
SPP 1-2	2	269-062	SIEMENS	N/A	PR269 ACCESSORY, SENSING TUBE
TTE 1	1	544-339-8	SIEMENS	149261	DCT POINT TEMP, PT 1K OHM (375), 8"
TTE 2	1	544-342-8	SIEMENS	149261	DUCT AVG. TMP, 1K OHM, PT(375), 8', FLEX
TTE 3	1	544-339-8	SIEMENS	149261	DCT POINT TEMP, PT 1K OHM (375), 8"
TTE 4	1	QAD2030U	SIEMENS	149918	SURFACE TMP SNSR, 10K OHM TYPE 2, METAL
TTE 5	1	544-339-8	SIEMENS	149261	DCT POINT TEMP, PT 1K OHM (375), 8"
TTE 6	1	QAA2212.EWSN	SIEMENS	149708	RTS, 1K OHM PT (385), BLANK FRONT
V					SEE VALVE SUBMITTAL
Panel Mounted Devices					
XFMR 1	1	FBO	N/A	N/A	TRANSFORMER

SEQUENCE OF OPERATIONS

BLOWER COIL UNITS

A. **FAN OPERATION:** GENERAL: START BLOWER COIL UNIT FAN WHEN THE BMS SCHEDULE DETERMINES EQUIPMENT TO START. START FAN FOLLOWING CONTACT CLOSURE FOR FIRE ALARM SHUTDOWN, LOW TEMPERATURE THERMOSTAT, AND RETURN DUCT SMOKE DETECTOR (WHERE APPLICABLE). PROVE FAN FLOW FOR SUPPLY FAN INDIVIDUALLY THROUGH CURRENT SENSORS.

1) **OPTIMAL START:** THE SUPPLY FAN SHALL START PRIOR TO SCHEDULED OCCUPANCY BASED ON THE TIME NECESSARY FOR THE ZONES TO REACH THEIR OCCUPIED SETPOINTS. THE START TIME SHALL AUTOMATICALLY ADJUST BASED ON HANGES IN OUTSIDE AIR TEMPERATURE AND ZONE TEMPERATURES. THE INITIAL OPTIMAL START TIME SHALL BE 1 HOUR PRIOR TO OCCUPIED MODE STARTING (ADJUSTABLE).

2) **UNOCCUPIED MODE:** BLOWER COILS SHALL BE NORMALLY OFF IN UNOCCUPIED MODE AS DETERMINED BY THE BMS.

B. **DISCHARGE AIR SETPOINT CONTROL:** DISCHARGE AIR TEMPERATURE SETPOINT SHALL BE RESET ACCORDING TO THE SPACE TEMPERATURE SENSOR SERVED BY THE BLOWER COILS. AS THE SPACE TEMPERATURE RISES ABOVE A SETPOINT OF 74 DEGREES F (FIELD ADJUSTABLE THROUGH BMS), THE DISCHARGE AIR SETPOINT SHALL BE REDUCED. AS SPACE TEMPERATURE DECREASES, THE DISCHARGE AIR SETPOINT SHALL BE INCREASED. THE MINIMUM DISCHARGE AIR TEMPERATURE SHALL BE 55 DEGREES F (FIELD ADJUSTABLE THROUGH BMS), AND THE MAXIMUM DISCHARGE AIR TEMPERATURE SHALL BE 90 DEGREES F (FIELD ADJUSTABLE THROUGH BMS).

C. **MINIMUM OUTSIDE AIR VENTILATION:** NORMALLY CLOSED, OPPOSED BLADE OUTSIDE AIR DAMPER SHALL MOVE TO THE OPEN POSITION WHEN THE BLOWER COIL IS IN OPERATION, IN OCCUPIED MODE.

D. **ECONOMIZER COOLING:**

1) WHEN THE DISCHARGE AIR TEMPERATURE SETPOINT AND THE SPACE TEMPERATURE SENSOR ARE CALLING FOR COOLING AND RETURN AIR TEMPERATURE IS HIGHER THAN THE OUTSIDE AIR TEMPERATURE, THE OUTSIDE AIR AND RETURN AIR DAMPERS SHALL MODULATE TO MEET THE DISCHARGE AIR TEMPERATURE TO COOL THE SPACE.

E. **HEATING CONTROL- OCCUPIED MODE:** IF THE OUTSIDE AIR TEMPERATURE IS 65 DEGREES F (ADJUSTABLE) OR BELOW AND THE DISCHARGE AIR TEMPERATURE SETPOINT IS CALLING FOR HEATING, THE HOT WATER VALVE SHALL MODULATE TO MAINTAIN THE SUPPLY AIR TEMPERATURE AT THE SUPPLY AIR SETPOINT AS DETERMINED BY THE RESET SCHEDULE.

1) **UNOCCUPIED MODE HEATING:** THE BLOWER COIL SHALL BE NORMALLY OFF WHEN THE BMS DETERMINES THE BUILDING TO BE IN UNOCCUPIED MODE. WHEN THE SPACE TEMPERATURE SENSOR SERVED BY THE BLOWER COIL FALLS BELOW THE UNOCCUPIED SETPOINT OF 62 DEGREES F (ADJUSTABLE), THE BLOWER COIL SHALL OPERATE WITH OUTSIDE AIR DAMPER CLOSED, RETURN DAMPER 100% OPEN, HEATING CONTROL VALVE MODULATING TO PROVIDE 95 DEGREE AIR TO THE SPACE UNTIL THE UNOCCUPIED SETPOINT IS REACHED.

F. **LOW TEMPERATURE PROTECTION:**

1) WHEN THE MIXED AIR TEMPERATURE DOWNSTREAM OF THE HEATING COIL IS BELOW 35 DEGREES F (ADJUSTABLE) IN ANY 12-INCH-LONG SECTION OF THE LOW TEMPERATURE THERMOSTAT CAPILLARY THE FOLLOWING SHALL OCCUR:
2) SEND AN ALARM TO THE BMS.
3) OPEN THE CONTROL VALVE TO 100% OPEN.
4) THE LOW TEMPERATURE THERMOSTAT SHALL BE OF THE MANUAL RESET TYPE.

G. **FILTER DIFFERENTIAL:** PROVIDE ANALOG INPUT TO MEASURE STATIC PRESSURE DIFFERENTIAL ACROSS FILTER AND ALARM THROUGH THE BMS WHEN DIFFERENTIAL STATIC PRESSURE EXCEEDS FIELD ADJUSTABLE SETPOINT.

H. **FIRE ALARM SHUTDOWN:** WHEN THE FIRE ALARM SYSTEM IS IN AN ALARM CONDITION AS NOTED THROUGH CONTACTS IN THE FIRE ALARM PANEL, THE UNIT SHALL BE SHUT DOWN AND ALL DAMPERS AND VALVE ACTUATORS SHALL BE PLACED IN THEIR NORMAL POSITIONS.

I. THE OUTSIDE AIR DAMPERS SHALL CLOSE WHENEVER THE UNIT IS OFF.

REVISION HISTORY

R0	2/16/2024	VB	ISSUED FOR APPROVAL

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NANUET BOND PHASE3 HIGH SCHOOL
NANUET, NY

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
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HS-BC-HS-02 (BOM/SOO)

440P-366733
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C:\USERS\Z004PB8F\ONEDRIVE - SIEMENS AG\BNJ2 BAU NANUET BOND PHASE 3 HIGH SCHOOL_440P-366733\DT\MDT_HIGH SCHOOL\111_HS-BLOWER COIL UNIT-K00.DWG

BLOWER COIL UNIT (BC-HS-2)
LOCATION: COMPUTER ROOM 43
SERVES: COMPUTER ROOM

DRAWING NOTES:

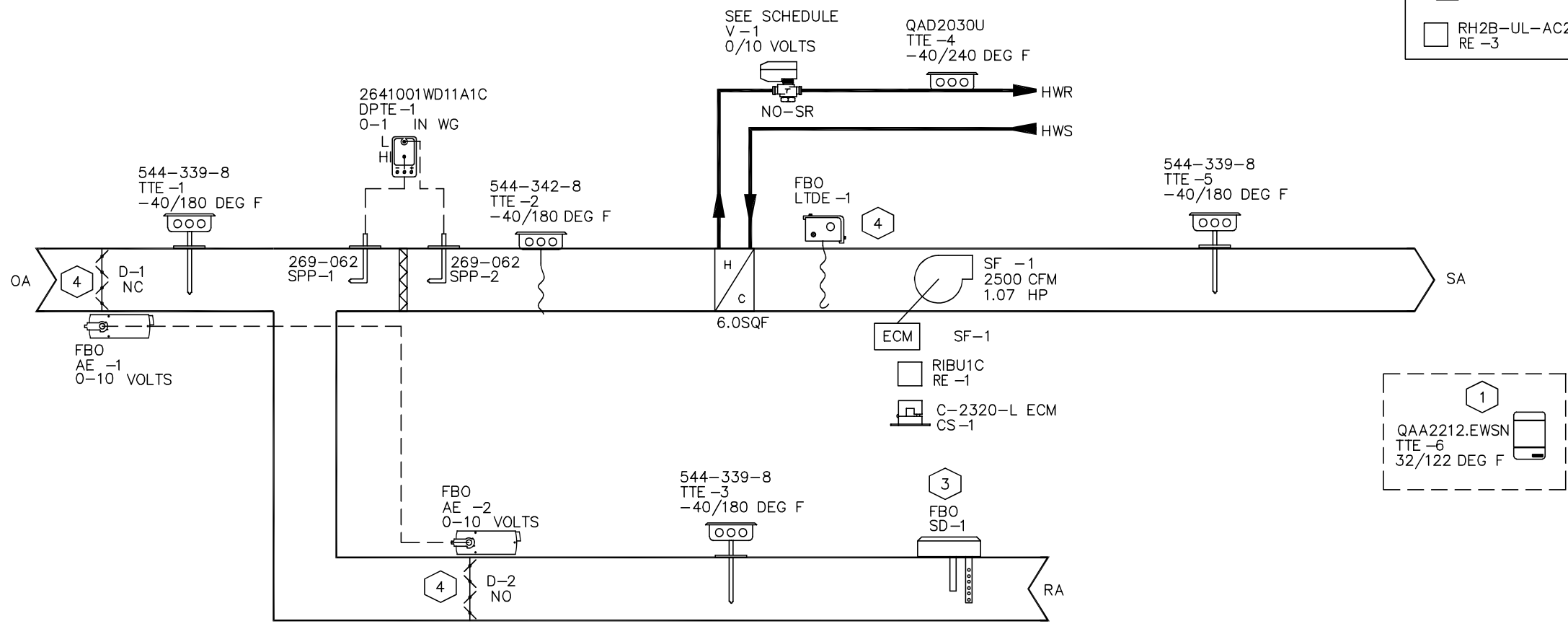
1. SENSOR LOCATION TO BE FIELD DETERMINED.
2. SAFETY RELAYS MOUNTED IN PANEL.
3. SMOKE DETECTOR PROVIDED BY OTHERS.
4. PROVIDED BY OTHERS

GENERAL NOTES:

1. SEE WIRING DETAIL ON ELECTRICAL DRAWING 111B.

NAN.HS.BST.PXCM1

FBO XFMR -1
2
RH2B-UL-AC24VKIT RE -2
RH2B-UL-AC24VKIT RE -3
RH2B-UL-AC24VKIT RE -4



1
QAA2212.EWSN
TTE -6
32/122 DEG F

1
111A
BLOWER COIL UNIT-2
LOCATION: COMPUTER ROOM :43
SERVES: COMPUTER ROOM

REVISION HISTORY

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NANUET BOND PHASE3 HIGH SCHOOL
NANUET, NY

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
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HS-BC-HS-02 (MECH)

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FIELD WIRING

COMPONENT PANEL / POWER

FIELD PANEL: NAN.HS.BAS.PXCM1

DRAWING NOTES:

1. CONTROL XFMR WILL BE SUPPLIED BY UNIT MANUFACTURER.
2. ECM TERMINAL TO BE FIELD DETERMINED.
3. RELAY AND SWITCH WILL BE INSTALLED IN THE FIELD NEAR VFD PANEL.
4. FIELD DEVICE TERMINAL TO BE FIELD DETERMINED.

BCU-HS-2 - WIRING DIAGRAM

1 / 111B

REF#	FIELD PANEL NAME	FIELD PANEL NODE NAME
7025	NAN.HS.BAS.PXCM1	NANHSBASPXCM1

REVISION HISTORY

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Control Device	Qty	Product Number	Manufacturer	Document Number	Description
Field Mounted Devices					
AE 1-3	3	GCA161.1P	SIEMENS	154001	MOD(V) SR,24V, MED. PLNM
CS 1	1	C-2320-L ECM	SENVA	N/A	ADJ. CURRENT SWITCH FOR ECM MOTORS 0.25-
CS 2	1	H614	VERIS	N/A	Current Switch, 1.5-150A, Split Core,VFD
D					SEE DAMPER SUBMITTAL
DPTE 1	1	26410R5WD11A1C	SETRA	0608cut003	DP TRAN AIR,1%,0.5" ENC
ES 2	1	FBO	N/A	N/A	END SWITCH
LTDE 1	2	134-1504	SIEMENS	155 016	T'STAT, LOW TEMP,15/55,MANUAL
RE 1-2	2	RIBU1C	FUNCTIONAL DEVICES	1208cut013	RIB 120VAC 24VAC/DC SPDT
SD 1	1	FBO	N/A	N/A	SMOKE DETECTOR
SPP 1-2	2	269-062	SIEMENS	N/A	PR269 ACCESSORY, SENSING TUBE
TTE 1	1	544-339-18	SIEMENS	149261	DCT PT TEMP, PT 1K OHM (375), 18" RIGID
TTE 2	2	544-342-16	SIEMENS	149261	DUCT AV. TMP, 1K OHM, PT(375), 16', FLEX
TTE 3-4	2	544-339-18	SIEMENS	149261	DCT PT TEMP, PT 1K OHM (375), 18" RIGID
TTE 5	1	544-577-25	SIEMENS	149261	IMMERSION TMP SNSR, PT 1K OHM(375) 2.5"
TTE 6	1	QAA2212.EWSN	SIEMENS	149708	RTS, 1K OHM PT (385), BLANK FRONT
V					SEE VALVE SUBMITTAL
Panel Mounted Devices					
RE 3-4	2	RH3B-ULAC24V-KIT	LECTRO COM	1202cut016	(1) RH3B-ULAC24V and (1) SH3B-05 socket
XFMR 1	1	TR100VA002	KELE INC	TR100VA002	Xfrmr 100VA,120-24V,dual hub,ClassII UL

SEQUENCE OF OPERATIONS

GYM AIR HANDLING UNIT AHU-HS-3

A. FAN OPERATION: GENERAL: START AHU THROUGH 0-10 VDC INPUT SIGNAL ON THE AHU CONTROL BOX. IN AUTO POSITION, START UNIT OPERATION WHEN THE BMS SCHEDULE DETERMINES THE BUILDING IS IN OCCUPIED MODE. START FAN FOLLOWING CONTACT CLOSURE FOR LOW TEMPERATURE THERMOSTAT. WHEN AHU SUPPLY FAN STARTS, INTERLOCK ASSOCIATED LOCKER RETURN FAN F-HS-3 THROUGH THE FAN'S VFD. PROVE FAN FLOW FOR SUPPLY FAN AND RETURN FAN INDIVIDUALLY THROUGH CURRENT SENSORS.

1) OPTIMAL START: THE SUPPLY FAN SHALL START PRIOR TO SCHEDULED OCCUPANCY BASED ON THE TIME NECESSARY FOR THE ZONE TO REACH ITS OCCUPIED SETPOINTS. THE START TIME SHALL AUTOMATICALLY ADJUST BASED ON CHANGES IN OUTSIDE AIR TEMPERATURE AND ZONE TEMPERATURES.

B. DISCHARGE AIR SETPOINT CONTROL: DISCHARGE AIR TEMPERATURE SETPOINT SHALL BE RESET ACCORDING TO THE SPACE TEMPERATURE SENSOR. AS THE SPACE TEMPERATURE SENSOR IN THE SELECTED SPACE INCREASES ABOVE A COOLING SETPOINT OF 75 DEGREES F (FIELD ADJUSTABLE THROUGH EMCS), THE DISCHARGE AIR SETPOINT SHALL BE REDUCED. AS SPACE TEMPERATURE DECREASES BELOW A HEATING SETPOINT OF 70 DEGREES F (FIELD ADJUSTABLE), THE DISCHARGE AIR SETPOINT SHALL BE INCREASED.

C. THE MINIMUM DISCHARGE AIR TEMPERATURE SHALL BE 57 DEGREES F (FIELD ADJUSTABLE THROUGH EMCS), AND THE MAXIMUM DISCHARGE AIR TEMPERATURE SHALL BE 100 DEGREES F (FIELD ADJUSTABLE THROUGH EMCS).

D. MINIMUM OUTSIDE AIR VENTILATION: NORMALLY CLOSED OUTSIDE AIR DAMPER SHALL MOVE TO THE OPEN POSITION WHEN AHU IS IN OPERATION. THE OUTSIDE AIR DAMPER POSITION SHALL BE SET TO PROVIDE 3,200 CFM (BASED ON POSITION SET UP BY TESTING AND BALANCING AGENCY) WHEN BUILDING IS IN OCCUPIED MODE AND THE AIR HANDLING UNIT FAN ARRAY SUPPLY FANS ARE OPERATING.

E. ECONOMIZER OPERATION: WHEN OUTSIDE AIR DRY BULB TEMPERATURE IS LESS THAN 64 DEGREES F (FIELD ADJUSTABLE THROUGH BAS) AND THE OUTSIDE AIR DRY BULB TEMPERATURE IS 2 DEGREES F LESS THEN THE RETURN AIR TEMPERATURE AND THE DISCHARGE AIR TEMPERATURE SETPOINT IS LESS THAN THE OUTSIDE AIR TEMPERATURE, MODULATE THE OUTSIDE AIR DAMPER TO MAINTAIN A MIXED AIR TEMPERATURE SETTINGCORRESPONDING TO THE DISCHARGE AIR TEMPERATURE SETPOINT.

1) THE RETURN AIR DAMPER SHALL MODULATE CLOSED IN CONJUCTION WITH THE OUTSIDE AIR DAMPER OPENING IN ECONOMIZER MODE WITH THE EXHAUST DAMPER OPENING IN CONJUCTION WITH THE RETURN DAMPER CLOSING.

F. HEATING:

1) WHEN THE ZONE TEMPERATURE IS LESS THAN THE HEATING SETPOINT, THE 2-WAY MODULATING CONTROL VALVE SHALL MODULATE OPEN AS REQUIRED TO MEET THE DISCHARGE AIR TEMPERATURE SETPOINT.
2) UNOCCUPIED MODE HEATING: AHU SHALL BE NORMALLY OFF WHEN THE EMCS DETERMINES THE BUILDING TO BE IN UNOCCUPIED MODE. WHEN THE SPACE TEMPERATURE SENSOR IN UNOCCUPIED MODE FALLS BELOW THE HEATING SETPOINT, THE AHU AND RETURN FAN F-HS-3 SHALL TURN ON WITH THE OUTSIDEAIR DAMPER CLOSED, THE EXHAUST AIR DAMPER CLOSED AND THE RETURN AIR DAMPER 100% OPEN (RUNNING THE UNIT IN 100% RECIRCULATION MODE). THE AHU SUPPLY FAN SHALL RUN TO AT 75% SUPPLY FAN SPEED WITH A DISCHARGE AIR SETPOINT OF 90 DEGREES F TO MEET THE UNOCCUPIED SETPOINT OF 60 DEGREES F.
3) WHEN HEATING COIL DISCHARGE AIR TEMPERATURE IS BELOW 40 DEGREES F (ADJUSTABLE) IN ANY 12 INCH LONG SECTION OF THE LOW TEMPERATURE THERMOSTAT CAPILLARY THE FOLLOWING SHALL OCCUR:
   a) SEND AN ALARM TO THE BAS.
   b) THE LOW TEMPERATURE THERMOSTAT SHALL BE MANUALLY RESET.
   c) MODULATE THE HEATING COIL CONTROL VALVE SERVED BY AHU TO 100% OPEN TO HEAT.

G. DX COOLING:

1) IF THE CONDITIONS FOR ECONOMIZER COOLING ARE UNAVAILABLE AND THE DISCHARGE AIR TEMPERATURE SETPOINT IS CALLING FOR COOLING, THE DDC SYSTEM SHALL SEND A 0-10 VDC SIGNAL TO THE AHUS AIR COOLED CONDENSING UNIT REFRIGERATION CONTROLS TO STAGE THE COMPRESSORS AS REQUIRED TO MAINTAIN THE DISCHARGE AIR TEMPERATURE SETPOINT WHILE MAINTAINING A MINIMUM DISCHARGE AIR TEMPERATURE OF 57 DEGREES F AND A MAXIMUM DISCHARGE AIR TEMPERATURE OF 72 DEGREES F IN COOLING MODE.
2) UNOCCUPIED COOLING: IN UNOCCUPIED MODE, SHOULD THE SPACE TEMPERATURE EXCEED 80 DEGREES F (ADJUSTABLE), THE AHU SHALL OPERATE IN 100% RETURN AIR MODE/0% OUTSIDE AIR, WITH THE SUPPLY FAN OPERATING AT 100% SUPPLY AIRFLOW, EXHAUST DAMPER CLOSED, RETURN FAN ON AND A DISCHARGE AIR SETPOINT OF 57 DEGREES F UNTIL THE SPACE REACHES 78 DEGREES F.

H. FILTER DIFFERENTIAL: PROVIDE ANALOG INPUT TO MEASURE STATIC PRESSURE DIFFERENTIAL ACROSS FILTER AND ALARM THROUGH THE EMCS WHEN DIFFERENTIAL STATIC PRESSURE EXCEEDS FIELD ADJUSTABLE SETPOINT.

REVISION HISTORY

R0	2/16/2024	VB	ISSUED FOR APPROVAL

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NANUET BOND PHASE3 HIGH SCHOOL
NANUET, NY

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
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HS-AHU-HS-03 (BOM/SOO)

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I. SMOKE DETECTION: WHEN THE PRESENCE OF SMOKE IS DETECTED AT A DUCT SMOKE DETECTOR LOCATED IN THE RETURN DUCT, THEN THE FAN STARTER CIRCUIT SHALL BE DE–ENERGIZED AND THE EMCS SHALL BE ALARMED.

J. THE OUTSIDE AIR DAMPER SHALL CLOSE AND THE RETURN AIR DAMPER SHALL OPEN WHENEVER THE UNIT IS OFF.

REVISION HISTORY

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HS-AHU-HS-03 (BOM/SOO)

440P-366733
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112A

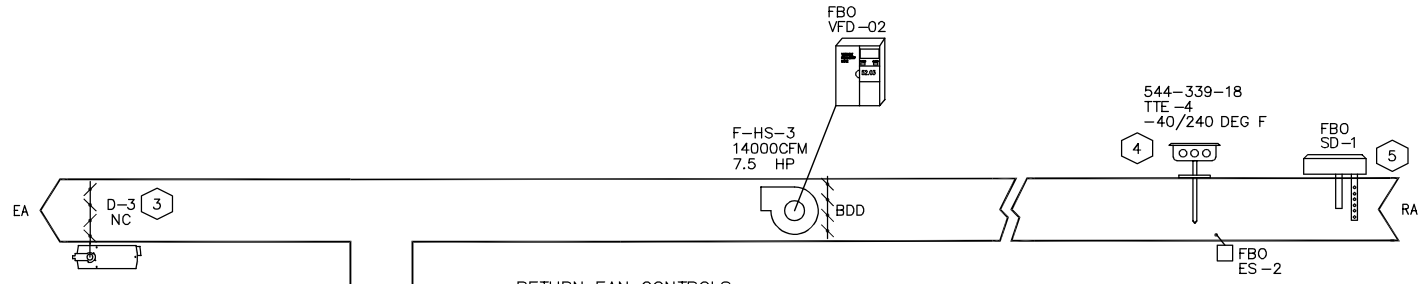
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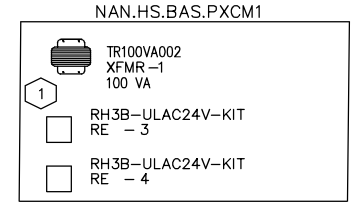
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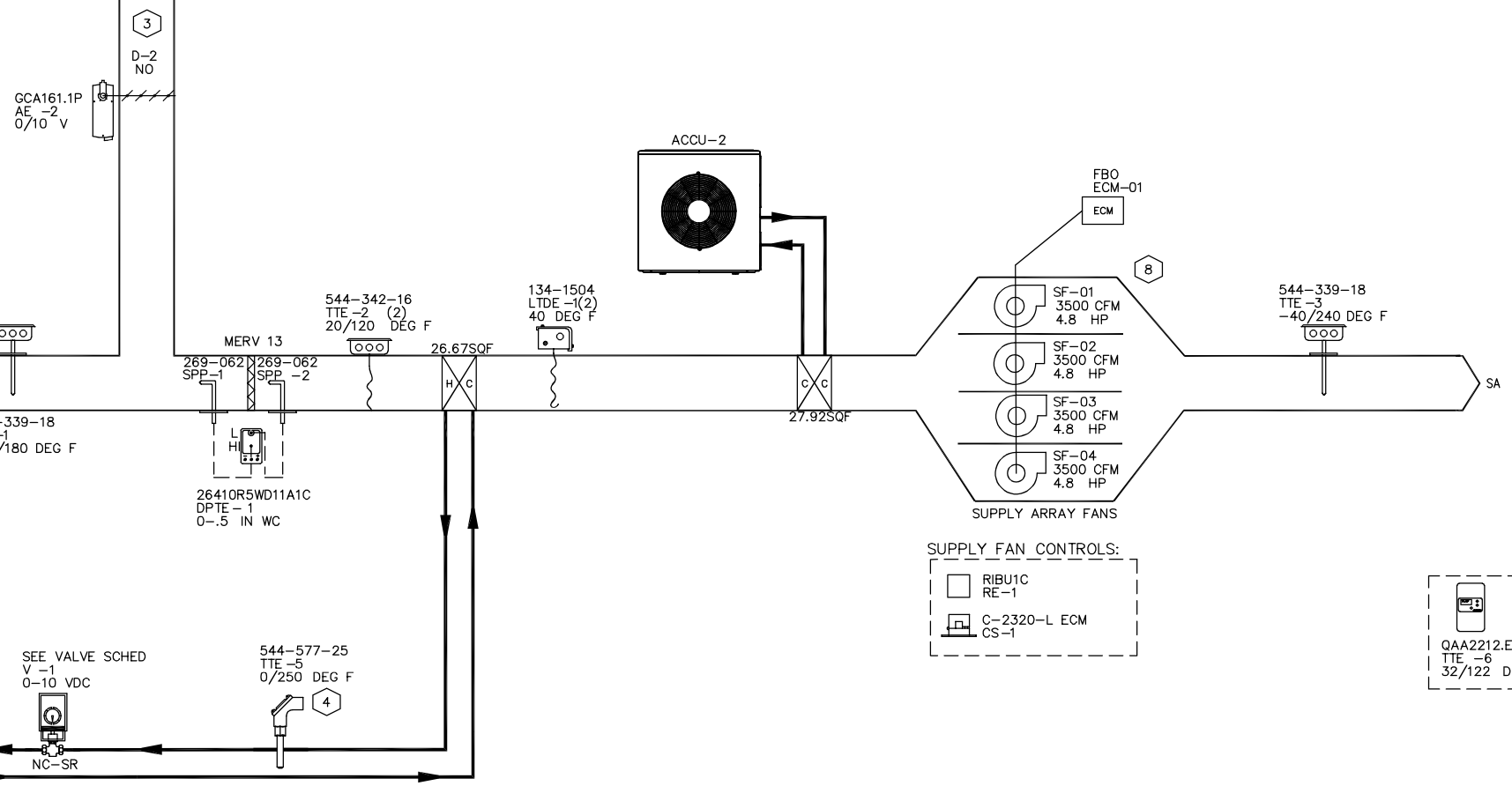
AIR HANDLING UNIT (AHU-HS-3)
LOCATION: GYM MEZZANINE
SERVES: GYMNASIUM

DRAWING NOTES:
1. CONTROL TRANSFORMERS AND RELAY MOUNTED IN PANEL.
2. ROOM SENSOR LOCATION TO BE FIELD COORDINATED.
3. DAMPER PROVIDED BY OTHERS.
4. LOCATION TO BE FIELD COORDINATED.
5. SMOKE DETECTORS BY OTHERS.

GENERAL NOTES:
1. SEE WIRING DETAIL ON ELECTRICAL DRAWING 112C.







1 / 112B INDOOR AIR HANDLING UNIT (AHU-HS-03)

REVISION HISTORY

R0	2/16/2024	VB	ISSUED FOR APPROVAL

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NANUET, NY

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HS-AHU-HS-03 (MECH)

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FIELD WIRING | **STARTER WIRING**

COMPONENT PANEL / POWER

PANEL: NAN.HS.FLR1.PXCM2

DRAWING NOTES:

1. 120VAC POWER TO XFMR AND SERVICE BOX FROM SAME CIRCUIT AS FIELD PANEL.
2. TERMINAL DETAILS TO BE FIELD DETERMINED.
3. RELAY AND SWITCH WILL BE INSTALLED IN THE FIELD NEAR VFD/STARTER PANEL.

HS-AHU-03 CONTROL BOX — START /STOP, SPEED (0/10V) — RE-1 (1.1VA) ORG (NO) YEL (COM) BLU (NC) WHT/YEL WHT/BLU — WHT BLK

F-HS-03 VFD — START /STOP, BACnet MS/TP GND B A, SPEED (0/10V) — RE-2 (1.1VA) ORG (NO) YEL (COM) BLU (NC) WHT/YEL WHT/BLU — WHT BLK

ACCU-HS-2 PANEL — DX COOLING — WHT BLK — DX COOLING CONTROL

L1 L2 L3 — M — CS-1

L1 L2 L3 — M — CS-2

V-1 17VA — Y M G0 G — WHT BLK — HEATING COIL VALVE

AE-1 OA DAMPER 7VA — 8Y 2G0 TG

AE-2 RA DAMPER 7VA — 8Y 2G0 TG

AE-3 RELIEF AIR DAMPER 7VA — 8Y 2G0 TG

TTE-2 MIXED AIR TEMP — WHT + BLK −

TTE-3 SUPPLY AIR TEMP — WHT + BLK −

TTE-1 OA TEMP — WHT + BLK −

TTE-4 RA TEMP — WHT + BLK −

TTE-5 HOT WATER RET TEMP — WHT + BLK −

DPTE-1 MERV 13 FILTER STATUS — WHT + BLK −

TTE-6 ROOM TEMP — WHT + BLK −

120VAC — H N — XFMR-1 (T1T2) 24 VAC 100 VA — 24H 24N

(1,2 VA) RE-3 LOW TEMPERATURE DETECTOR — RE-3-1 — RE-3-2 RE-4-2 — RE-3-3 RE-4-3

(1,2 VA) RE-4 RETURN SMOKE DETECTOR CONTACT — RE-4-1

TO CONTINUE ON DWG 115B

1 / 112C AHU-HS-3 – WIRING DIAGRAM

HS.HS.AHU3.LTD (7024.0.2.3) ALARM DI	6	5	WHT BLK		
HS.HS.AHU3.RSD (7024.0.2.4) ALARM DI	8	7			
HS.HS.AHU3.SAF.SS (ON/OFF) (7024.0.1.2) ON/OFF DO	9	10	8		
HS.HS.AHU3.SAF.SPD (7024.0.4.1) 0–10VDC AO	4	2	WHT BLK		
HS.HS.AHU3.SAF.SS (PROOF) (7024.0.2.2) STATUS DI	4	3			
HS.F.HS3.SS (ON/OFF) (7024.0.1.1) ON/OFF DO	3	4	2		
HS.F.HS3.SPD (7024.0.4.2) 0–10VDC AO	8	6	WHT BLK		
HS.F.HS3.SS (PROOF) (7024.0.2.1) STATUS DI	2	1			
HS.HS.AHU3.HCV (7024.0.4.3) 0–10VDC AO	12	10	WHT BLK		
HS.HS.ACCU-HS2.CCTL (7024.0.4.4) 0–10VDC AO	16	14	WHT BLK		
HS.HS.AHU3.OAD (7024.0.4.5) 0–10VDC AO	21	19	WHT BLK		
HS.HS.AHU3.RAD (7024.0.4.6) 0–10VDC AO	25	23	WHT BLK		
HS.HS.AHU3.RLAD (7024.0.4.7) 0–10VDC AO	29	27	WHT BLK		
HS.HS.AHU3.MAT (7024.0.3.2) PT1000 AI	8	6	WHT BLK		
HS.HS.AHU3.SAT (7024.0.3.5) PT1000 AI	12	10	WHT BLK		
HS.HS.AHU3.OAT (7024.0.3.4) PT1000 AI	16	14	WHT BLK		
HS.HS.AHU3.RAT (7024.0.3.1) PT1000 AI	4	2	WHT BLK		
HS.HS.AHU3.HWR (7024.0.3.6) PT1000 AI	27	19	WHT BLK		
HS.HS.AHU3.PFL (7024.0.3.6) 4–20mA AI	20	25	WHT BLK		
HS.HS.AHU3.RMT (7024.0.3.3) PT1000 AI	29	27	WHT BLK		

REF#	FIELD PANEL NAME	FIELD PANEL NODE NAME
7024	NAN.HS.FLR1.PXCM2	AHU–HS–3

REVISION HISTORY

R0	2/16/2024	VB	ISSUED FOR APPROVAL

SIEMENS

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NANUET BOND PHASE3 HIGH SCHOOL
NANUET, NY

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
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HS-AHU-HS-03 (ELEC)

440P-366733
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112C

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Control Device	Qty	Product Number	Manufacturer	Document Number	Description
Field Mounted Devices					
CS 1-2	2	H608	VERIS	1006cut016	CUR SW SPLTCOR-ADJ SETPT W/LED
LTDE 1-3	3	134-1510	SIEMENS	155 115	LOW TEMP DET STATAUTO RESET
RE 1-2	2	RIBU1C	FUNCTIONAL DEVICES	1208cut013	RIB 120VAC 24VAC/DC SPDT
RE 3-5	3	RH2B-UL-AC24VKIT	IDEC	1202cut016	RELAY&SOC,GP DPDT AC24V W/LED
TTE 1	1	544-339-18	SIEMENS	149261	DCT PT TEMP, PT 1K OHM (375), 18" RIGID
TTE 2	1	544-577-25	SIEMENS	149261	IMMERSION TMP SNSR, PT 1K OHM(375) 2.5"
TTE 3	1	544-339-18	SIEMENS	149261	DCT PT TEMP, PT 1K OHM (375), 18" RIGID
TTE 4	1	544-577-25	SIEMENS	149261	IMMERSION TMP SNSR, PT 1K OHM(375) 2.5"
TTE 5	1	544-339-18	SIEMENS	149261	DCT PT TEMP, PT 1K OHM (375), 18" RIGID
V					SEE VALVE SUBMITTAL

SEQUENCE OF OPERATION

HEATING COILS HC-HS-2/HC-HS-4:

A. THE DDC SYSTEM SHALL INTEGRATE THE HEATING COILS INTO THE EXISTING DDC PROGRAMMING SERVING EXISTING LOCKER ROOM AIR HANDLING UNITS AHU-1 AND AHU-2.

B. HEATING CONTROL- OCCUPIED MODE: IF THE OUTSIDE AIR TEMPERATURE IS 65 DEGREES F (ADJUSTABLE) OR BELOW AND THE DISCHARGE AIR TEMPERATURE SETPOINT IS CALLING FOR HEATING, THE HEATING OPERATION SHALL BE STAGED TO MAINTAIN DISCHARGE AIR AT SETPOINT.
1) THE HEATING WATER 3-WAY CONTROL VALVE SHALL MODULATE OPEN TO MAINTAIN THE HEATING DISCHARGE AIR SETPOINT.
2) THE CONTROLLER SHALL MEASURE THE SUPPLY AIR TEMPERATURE AND MODULATE THE HEATING COIL VALVE OPEN TO HOT WATER FLOW TO MAINTAIN ITS HEATING SETPOINT.
3) THE HEATING COIL'S SSOCIATED HEATING COIL CIRCULATION PUMP SHALL OPERATE WHENEVER THE HEATING COIL VALVE IS CALLED TO OPEN FOR HEATING.
   a. WHEN OUTSIDE AIR CONDITIONS ARE BELOW 40 DEGREES F (ADJUSTABLE) THE HEATING COIL CIRCULATION PUMP SHALL RUN REGARDLESS OF VALVE POSITION.
4) UNOCCUPIED MODE HEATING: AHU SHALL BE NORMALLY OFF WHEN THE EMCS DETERMINES THE BUILDING TO BE IN UNOCCUPIED MODE. WHEN A SPACE SENSOR CONNECTED TO THE AHU FALLS BELOW THE UNOCCUPIED SETPOINT OF 62 DEGREES F (ADJUSTABLE), THE AHU SHALL TURN ON AND THE DISCHARGE AIR TEMPERATURE SETPOINT SHALL BE 90 DEGREES F.
5) LOW TEMPERATURE PROTECTION:
   a. WHEN THE MIXED AIR TEMPERATURE DOWNSTREAM OF THE HEATING COIL IS BELOW 35 DEGREES F (ADJUSTABLE) IN ANY 12-INCH-LONG SECTION OF THE LOW TEMPERATURE THERMOSTAT CAPILLARY THE FOLLOWING SHALL OCCUR:
      1) SEND AN ALARM TO THE BAS.
      2) MODULATE THE HEATING WATER CONTROL VALVE TO 100% OPEN AND OPERATE THE HEATING COIL CIRCULATION PUMP.
      3) THE LOW TEMPERATURE THERMOSTAT SHALL BE AUTOMATICALLY RESET ONCE THE SENSOR TEMPERATURE INCREASES ABOVE 40 DEGREES F.

HEATING COIL HC-HS-3:

A. THE DDC SYSTEM SHALL INTEGRATE THE HEATING COIL INTO THE EXISTING DDC PROGRAMMING SERVING EXISTING WEIGHT ROOM AIR HANDLING UNIT AC-1.

B. HEATING CONTROL- OCCUPIED MODE: IF THE OUTSIDE AIR TEMPERATURE IS 65 DEGREES F (ADJUSTABLE) OR BELOW AND THE DISCHARGE AIR TEMPERATURE SETPOINT IS CALLING FOR HEATING, THE HEATING OPERATION SHALL BE STAGED TO MAINTAIN DISCHARGE AIR AT SETPOINT.
1) THE HEATING WATER 2-WAY CONTROL VALVE SHALL MODULATE OPEN TO MAINTAIN THE HEATING DISCHARGE AIR SETPOINT.
2) THE CONTROLLER SHALL MEASURE THE SUPPLY AIR TEMPERATURE AND MODULATE THE HEATING COIL VALVE OPEN TO HOT WATER FLOW TO MAINTAIN ITS HEATING SETPOINT.
3) UNOCCUPIED MODE HEATING: AHU SHALL BE NORMALLY OFF WHEN THE EMCS DETERMINES THE BUILDING TO BE IN UNOCCUPIED MODE. WHEN A SPACE SENSOR CONNECTED TO THE AHU FALLS BELOW THE UNOCCUPIED SETPOINT OF 62 DEGREES F (ADJUSTABLE), THE AHU SHALL TURN ON AND THE DISCHARGE AIR TEMPERATURE SETPOINT SHALL BE 90 DEGREES F.
4) LOW TEMPERATURE PROTECTION:
   a. WHEN THE MIXED AIR TEMPERATURE DOWNSTREAM OF THE HEATING COIL IS BELOW 35 DEGREES F (ADJUSTABLE) IN ANY 12-INCH-LONG SECTION OF THE LOW TEMPERATURE THERMOSTAT CAPILLARY THE FOLLOWING SHALL OCCUR:
      1) SEND AN ALARM TO THE BAS.
      2) MODULATE THE HEATING WATER CONTROL VALVE TO 100% OPEN.
      3) THE LOW TEMPERATURE THERMOSTAT SHALL BE AUTOMATICALLY RESET
      4) ONCE THE SENSOR TEMPERATURE INCREASES ABOVE 40 DEGREES F.

REVISION HISTORY

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NANUET BOND PHASE3 HIGH SCHOOL
NANUET, NY

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
VB	VB	NSK	02/16/24	02/16/24

HS-AHU HW COIL (BOM/SOO)

440P-366733
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113

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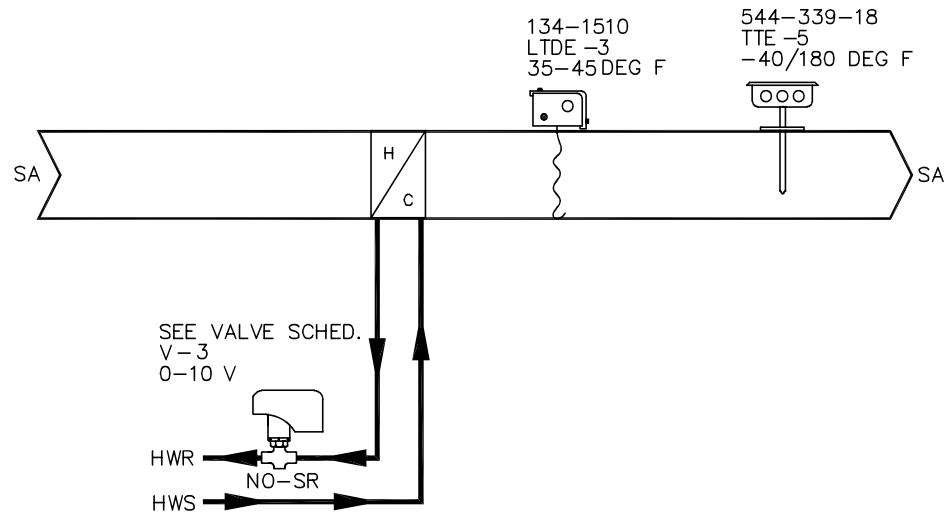
HEATING COILS
LOCATION: BASEMENT AND 2ND FLOOR
SERVES: AHU-1,2, AC-1

GENERAL NOTES:

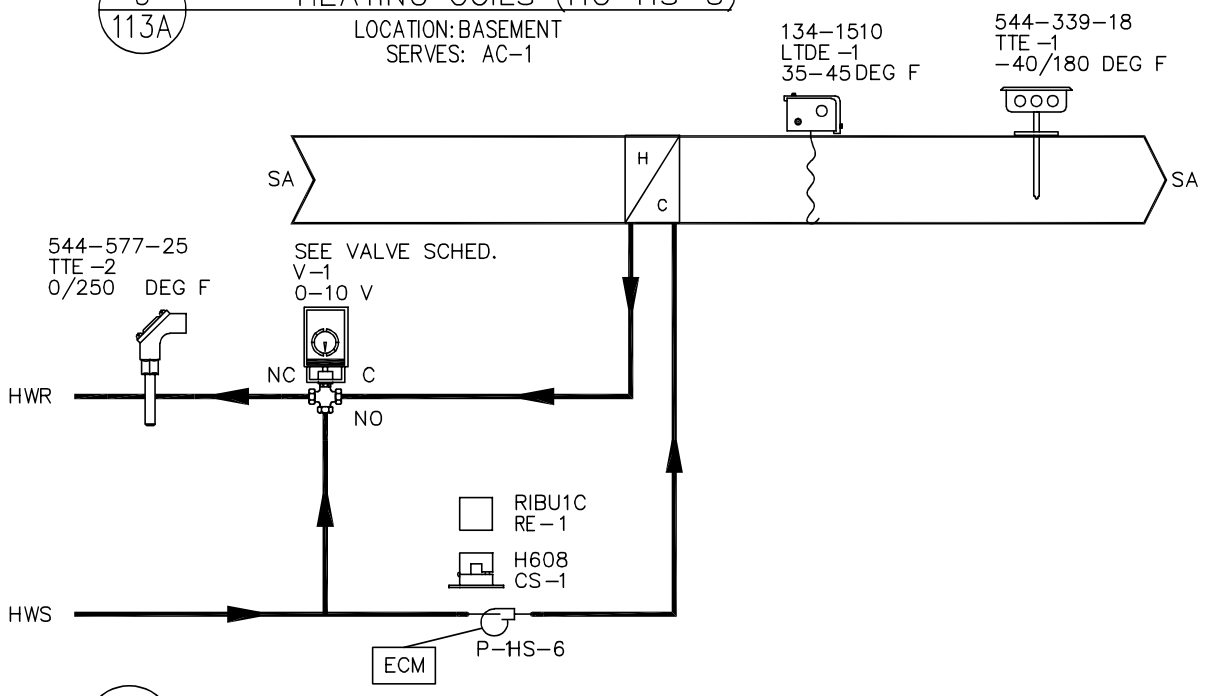
1. SEE WIRING DETAILS IN DWG 113B & 113C.
2. IO POINTS ARE CONNECTED TO EXISTING SIEMENS DDC CONTROLLER.

HIGHSPXM05
- ☐ RH2B-UL-AC24VKIT RE-3
- ☐ RH2B-UL-AC24VKIT RE-4

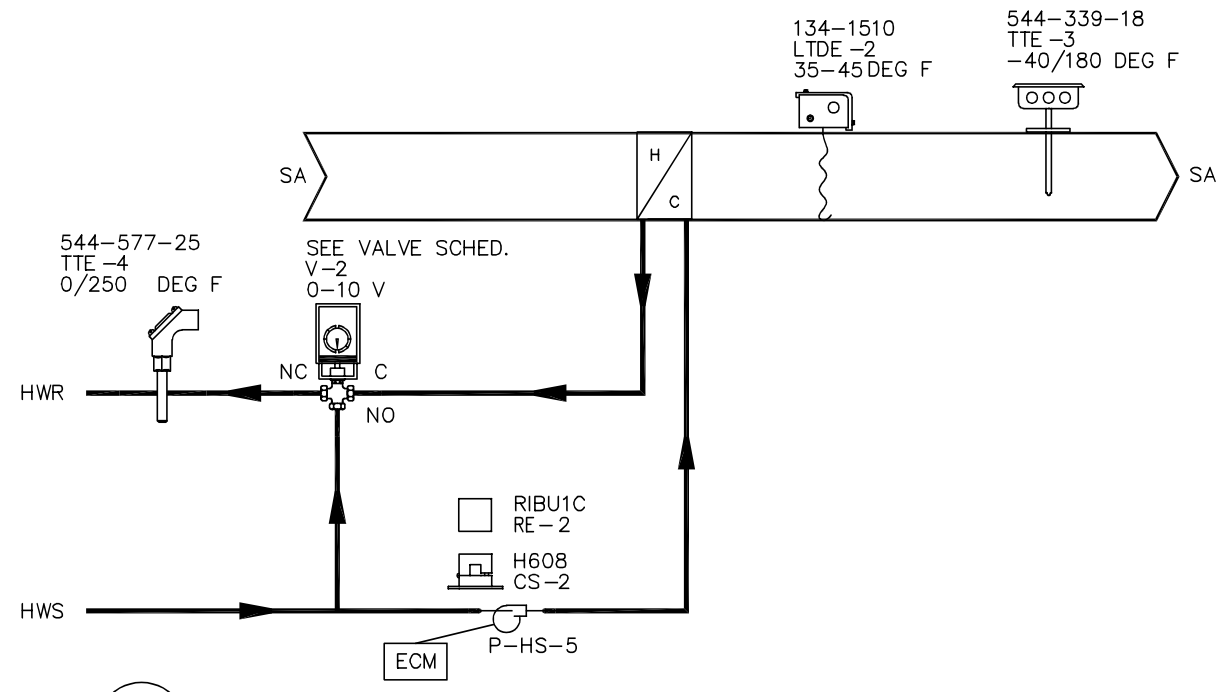
HIGHSPXM03
- ☐ RH2B-UL-AC24VKIT RE-5



3 / 113A — HEATING COILS (HC-HS-3)
LOCATION: BASEMENT
SERVES: AC-1



1 / 113A — HEATING COILS (HC-HS-2)
LOCATION: GYM FAN ROOM
SERVES: AHU-2



2 / 113A — HEATING COILS (HC-HS-4)
LOCATION: GYM FAN ROOM
SERVES: AHU-1

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NANUET, NY

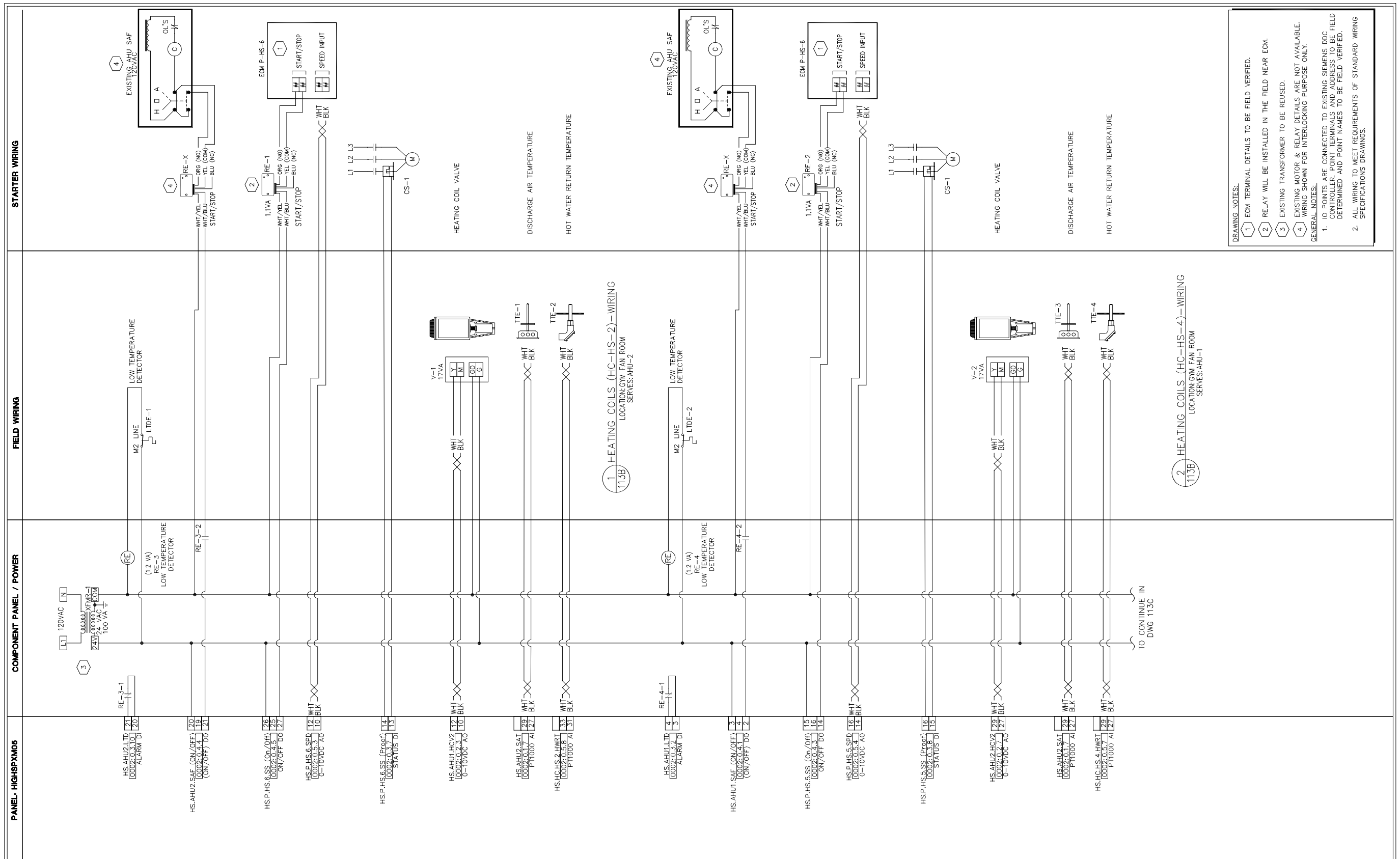
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VB	VB	NSK	02/16/24	02/16/24

HS-AHU HW COIL (MECH)

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113A

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REF#	FIELD PANEL NAME	FIELD PANEL NODE NAME
0002	HIGHSPXM05	HIGHSPXM05

REVISION HISTORY

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VB	VB	NSK	02/16/24	02/16/24

HS-AHU HW COIL (ELEC)

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113B

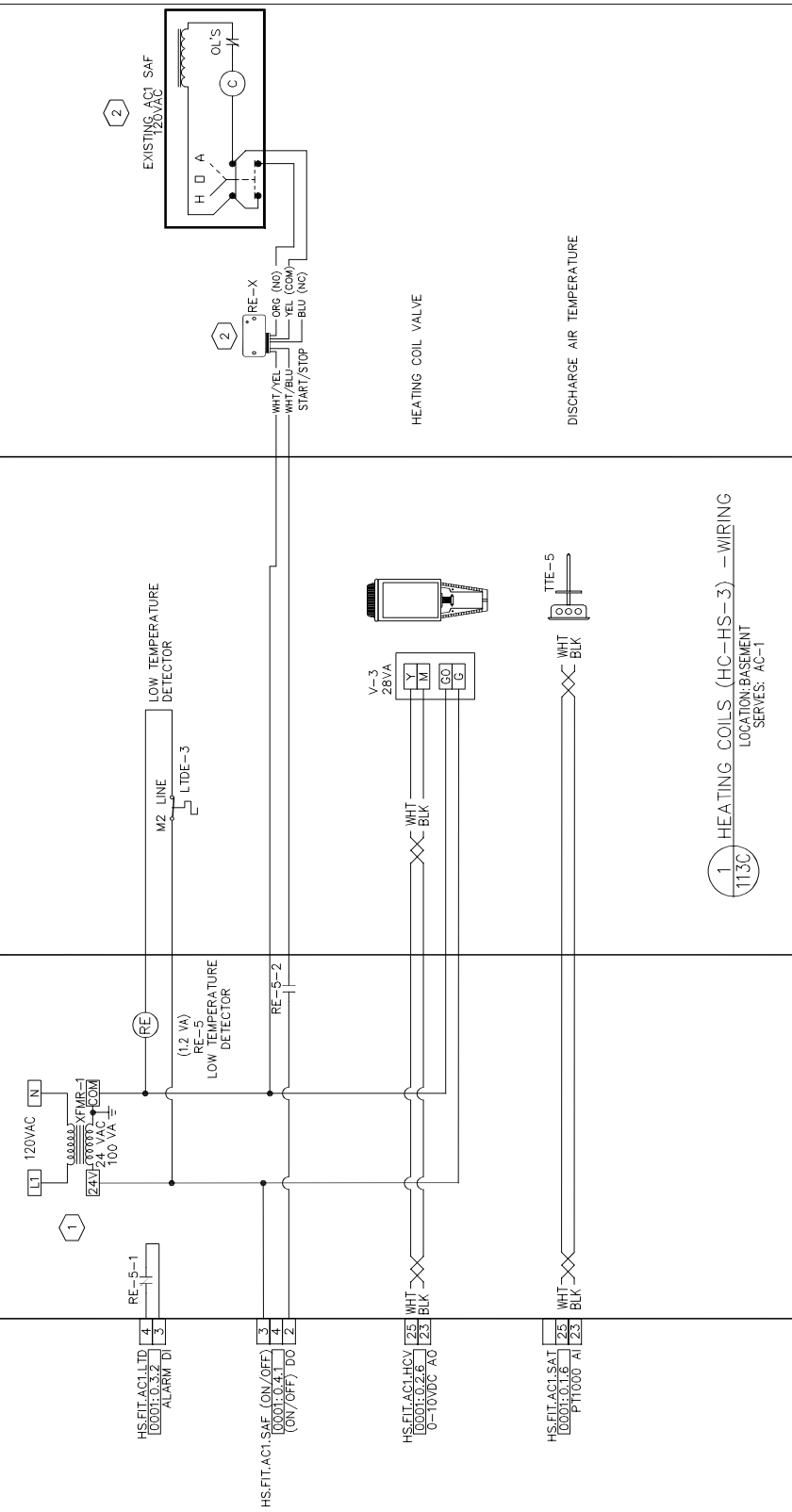
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FIELD WIRING | **STARTER WIRING**

COMPONENT PANEL / POWER

PANEL: HIGHSPXM03



DRAWING NOTES:

1. EXISTING TRANSFORMER TO BE REUSED.
2. EXISTING MOTOR & RELAY DETAILS ARE NOT AVAILABLE. WIRING SHOWN FOR INTERLOCKING PURPOSE ONLY.

GENERAL NOTES:

1. IO POINTS ARE CONNECTED TO EXISTING SIEMENS DDC CONTROLLER. POINT TERMINALS AND ADDRESS TO BE FIELD DETERMINED AND POINT NAMES TO BE FIELD VERIFIED.
2. ALL WIRING TO MEET REQUIREMENTS OF STANDARD WIRING SPECIFICATIONS DRAWINGS.

REF#	FIELD PANEL NAME	FIELD PANEL NODE NAME
0001	HIGHSPXM03	HIGHSPXM03

REVISION HISTORY

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HS-AHU HW COIL (ELEC)

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Control Device	Qty	Product Number	Manufacturer	Document Number	Description
Field Mounted Devices					
AE 1-3	5	FBO	N/A	N/A	DAMPER ACTUATOR
AFMS 1-3	6	REFER AFMS SCHD.	N/A	N/A	AIRFLOW MEASURING STATION
CS 1	2	FBO	N/A	N/A	CURRENT SWITCH
DPS 1	2	FBO	N/A	N/A	DIFFERENTIAL PRESSURE SWITCH
DPTE 1	2	FBO	N/A	N/A	ROOM PRESSURE SENSOR
EN 1-2	4	FBO	N/A	N/A	ENTHALPY SENSOR
ES 1	2	FBO	N/A	N/A	END SWITCH
HE 1	2	FBO	N/A	N/A	HUMIDITY SENSOR
LD 1	2	FBO	N/A	N/A	LEAK DETECTOR
LTDE 1	2	FBO	N/A	N/A	LOW TEMP DETECTOR
SD 1	2	FBO	N/A	N/A	SMOKE DETECTOR
SPP 1-2	4	FBO	N/A	N/A	PRESSURE PROBE
TTE 1-7	14	FBO	N/A	N/A	TEMPERATURE SENSOR
Panel Mounted Devices					
XFMR 1	1	TR100VA002	KELE INC	TR100VA002	Xfrmr 100VA,120-24V,dual hub,ClassII UL
XFMR 2	1	TR100VA002	KELE INC	TR100VA002	Xfrmr 100VA,120-24V,dual hub,ClassII UL

SEQUENCE OF OPERATION

RTU-HS-4/RTU-HS-5:

PACKAGED RTU UNIT MANUFACTURER PROVIDED CONTROLS TO BE INLINE WITH BELOW SEQUENCE OF OPERATION.

A. FAN OPERATION: GENERAL: START RTU THROUGH 0-10 VDC INPUT SIGNAL LOCATED ON RTU SUPPLY FAN VARIABLE SPEED DRIVE. IN AUTO POSITION, START UNIT OPERATION WHEN THE EMCS SCHEDULE DETERMINES EQUIPMENT TO START. START FAN FOLLOWING CONTACT CLOSURE FOR FIRE ALARM SHUTDOWN, LOW TEMPERATURE THERMOSTAT, RETURN DUCT SMOKE DETECTOR. WHEN RTU SUPPLY FAN STARTS, INTERLOCK ASSOCIATED EXHAUST FAN TO START THROUGH 0-10 VDC INPUT SIGNAL ON ELECTRICALLY COMMUTATED FAN MOTOR. PROVE FAN FLOW FOR SUPPLY FAN AND EXHAUST FAN INDIVIDUALLY THROUGH CURRENT SENSORS.

1) OPTIMAL START: THE SUPPLY FAN AND EXHAUST FAN SHALL START PRIOR TO SCHEDULED OCCUPANCY BASED ON THE TIME NECESSARY FOR THE ZONES TO REACH THEIR OCCUPIED SETPOINTS. THE START TIME SHALL AUTOMATICALLY ADJUST BASED ON CHANGES IN OUTSIDE AIR TEMPERATURE AND ZONE TEMPERATURES. THE INITIAL OPTIMAL START TIME SHALL BE 1 HOUR PRIOR TO OCCUPIED MODE STARTING (ADJUSTABLE).

B. SUPPLY FAN SPEED – MODULATE THE FAN SPEED TO MAINTAIN THE FOLLOWING:

1) OCCUPIED MODE: RTU IS A SINGLE ZONE VARIABLE AIR VOLUME AIR HANDLING SYSTEM. IN OCCUPIED MODE, THE MINIMUM FAN SPEED SHALL BE SET TO PROVIDE 5,650 CFM SUPPLY AIR.

2) EXHAUST FAN SPEED: AN AIRFLOW MEASURING STATION INSTALLED ON THE SUPPLY FAN SHALL MEASURE SUPPLY FAN AIRFLOW AND AN AIR MEASURING STATION SHALL BE INSTALLED TO MEASURE OUTSIDE AIRFLOW. A SIMILAR AIRFLOW MEASURING STATION INSTALLED ON THE EXHAUST FAN SHALL MEASURE EXHAUST FAN AIRFLOW. THE EXHAUST FAN VARIABLE SPEED DRIVE SHALL MODULATE TO MAINTAIN EXHAUST FAN AIRFLOW AS A FUNCTION OF THE OUTSIDE AIRFLOW.

C. DISCHARGE AIR SETPOINT CONTROL: DISCHARGE AIR TEMPERATURE SETPOINT SHALL BE RESET ACCORDING TO THE AVERAGE OF THE SPACE TEMPERATURE SENSORS SERVED BY RTU. AS THE AVERAGE SPACE TEMPERATURE RISES ABOVE A SETPOINT OF 74 DEGREES F (FIELD ADJUSTABLE THROUGH EMCS), THE DISCHARGE AIR SETPOINT SHALL BE REDUCED. AS SPACE TEMPERATURE DECREASES, THE DISCHARGE AIR SETPOINT SHALL BE INCREASED. THE MINIMUM DISCHARGE AIR TEMPERATURE SHALL BE 55 DEGREES F (FIELD ADJUSTABLE THROUGH EMCS), AND THE MAXIMUM DISCHARGE AIR TEMPERATURE SHALL BE 95 DEGREES F (FIELD ADJUSTABLE THROUGH EMCS) THROUGH IN-DUCT HYDRONIC HEATING COILS LOCATED DOWNSTREAM OF THE RTU SUPPLY FAN.

D. MINIMUM OUTSIDE AIR VENTILATION: NORMALLY CLOSED OUTSIDE AIR DAMPER SHALL MOVE TO THE OPEN POSITION WHEN RTU IS IN OPERATION IN OCCUPIED MODE. WHEN UNIT IS IN MINIMUM OUTSIDE AIR MODE AS DETERMINED BY THE EMCS, MODULATE DAMPER POSITION TO MAINTAIN MINIMUM SETPOINT OF 2,500 CFM. SETPOINT IN CFM SHALL BE A FIELD ADJUSTABLE SETPOINT THROUGH THE EMCS. THE UNIT DAMPER POSITION SHALL BE BALANCED TO ACHIEVE THIS AIRFLOW RATE AT THE MINIMUM LEVEL.

E. HEAT RECOVERY WHEEL – VARIABLE SPEED:

1) THE CONTROLLER SHALL MODULATE THE HEAT WHEEL FOR ENERGY RECOVERY AS FOLLOWS.

a) THE HEAT WHEEL SHALL RUN AT 100% SPEED WHENEVER THE DDC SYSTEM DETERMINES THE BUILDING TO BE IN OCCUPIED MODE AND THE RTU IS NOT OPERATING IN ECONOMIZER MODE. THE BYPASS DAMPER AROUND THE WHEEL SHALL BE CLOSED WHEN THE RTU IS NOT IN ECONOMIZER MODE.

b) FROST PROTECTION:
1) THE HEAT WHEEL SHALL RUN AT 25% SPEED (ADJUSTABLE) WHENEVER:
2) EXHAUST AIR TEMPERATURE DROPS BELOW 20°F (ADJUSTABLE).

c) ALARMS SHALL BE PROVIDED AS FOLLOWS:
1) HEAT WHEEL ROTATION FAILURE: COMMANDED ON, BUT THE STATUS IS OFF.
2) HEAT WHEEL IN HAND: COMMANDED OFF, BUT THE STATUS IS ON.
3) HEAT WHEEL VFD IN FAULT

F. ECONOMIZER

1) THE CONTROLLER SHALL TURN OFF THE HEAT RECOVERY WHEEL WHEN ECONOMIZER OPERATION IS ENGAGED AND THE OUTSIDE AIR BYPASS DAMPER AND RETURN BYPASS DAMPER SHALL OPEN TO 100% BYPASS AIR.

2) THE ECONOMIZER SHALL BE ENABLED WHENEVER:
a) OUTSIDE AIR TEMPERATURE IS LESS THAN 64°F (ADJUSTABLE).
b) AND THE OUTSIDE AIR TEMPERATURE IS LESS THAN THE RETURN AIR TEMPERATURE.
c) AND THE DISCHARGE AIR TEMPERATURE SETPOINT IS LESS THAN THE OUTSIDE AIR TEMPERATURE.
d) AND THE SUPPLY FAN STATUS IS ON.

REVISION HISTORY

R0	2/16/2024	VB	ISSUED FOR APPROVAL

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NANUET BOND PHASE3 HIGH SCHOOL
NANUET, NY

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
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HS-RTU (RTU-HS-4,5) (BOM/SOO)

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3) THE ECONOMIZER SHALL TURN OFF WHENEVER:
a) MIXED AIR TEMPERATURE DROPS FROM 45°F TO 40°F (ADJUSTABLE).
b) OR ON LOSS OF SUPPLY FAN STATUS.
c) OR LOW TEMPERATURE THERMOSTAT IS ON.

4) IN ECONOMIZER MODE THE RETURN AIR DAMPER SHALL CLOSE, THE OUTSIDE AIR DAMPER SHALL BE 100% OPEN AND THE EXHAUST FAN SHALL OPERATE TO EXHAUST AIRFLOW TO MATCH THE SUPPLY AIR.

G. HEATING CONTROL– OCCUPIED MODE: IF THE OUTSIDE AIR TEMPERATURE IS 65 DEGREES F (ADJUSTABLE) OR BELOW AND THE DISCHARGE AIR TEMPERATURE SETPOINT IS CALLING FOR HEATING, THE GAS HEATING OPERATION SHALL BE MODULATED TO MAINTAIN DISCHARGE AIR AT SETPOINT.

1) THE CONTROLLER SHALL MEASURE THE SUPPLY AIR TEMPERATURE AND MODULATE THE HEATING OPERATION VIA A 0–10 VDC SIGNAL TO MAINTAIN ITS HEATING SETPOINT. THE RTU GAS HEATING SECTION SHALL BE OPERATED IN CONJUNCTION WITH THE HYDRONIC PERIMETER RADIATORS TO MAINTAIN SPACE SENSOR SETPOINT IN HEATING MODE.

2) UNOCCUPIED MODE HEATING: RTU SHALL BE NORMALLY OFF WHEN THE EMCS DETERMINES THE BUILDING TO BE IN UNOCCUPIED MODE. WHEN THE SPACE TEMPERATURE SENSOR IN UNOCCUPIED MODE FALLS BELOW THE HEATING SETPOINT, THE RTU SHALL TURN ON WITH THE OUTSIDE AIR DAMPER CLOSED, THE EXHAUST FAN OFF AND THE RETURN AIR DAMPER 100% OPEN (RUNNING THE UNIT IN 100% RECIRCULATION MODE). THE RTU SUPPLY FAN SHALL RUN TO AT 75% SUPPLY FAN SPEED WITH A DISCHARGE AIR SETPOINT OF 95 DEGREES F OUT OF THE GAS HEATING SECTION TO MEET THE UNOCCUPIED SETPOINT OF 64 DEGREES F.

a) THE RTU SHALL NOT BE UTILIZED FOR UNOCCUPIED HEATING UNLESS THE HYDRONIC RADIATORS CANNOT MAINTAIN THE SETBACK SETPOINT FOR 30 MINUTES.

3) DX COOLING

a) IF THE CONDITIONS FOR ECONOMIZER COOLING ARE UNAVAILABLE AND THE DISCHARGE AIR TEMPERATURE SETPOINT IS CALLING FOR COOLING, THE DDC SYSTEM SHALL SEND A 0–10 VDC SIGNAL TO THE RTU REFRIGERATION CONTROLS TO STAGE THE DX COOLING COIL COMPRESSORS AS REQUIRED TO MAINTAIN THE DISCHARGE AIR TEMPERATURE SETPOINT WHILE MAINTAINING A MINIMUM DISCHARGE AIR TEMPERATURE OF 55 DEGREES F AND A MAXIMUM DISCHARGE AIR TEMPERATURE OF 72 DEGREES F IN COOLING MODE.

b) UNOCCUPIED COOLING: IN UNOCCUPIED MODE, SHOULD THE SPACE TEMPERATURE EXCEED 80 DEGREES F, THE RTU SHALL OPERATE IN 100% RETURN AIR MODE/0% OUTSIDE AIR, WITH THE SUPPLY FAN OPERATING AT 100% SUPPLY AIRFLOW, EXHAUST FAN OFF AND A DISCHARGE AIR SETPOINT OF 55 DEGREES F UNTIL THE SPACE REACHES 78 DEGREES F.

4) FILTER DIFFERENTIAL: PROVIDE ANALOG INPUT TO MEASURE STATIC PRESSURE DIFFERENTIAL ACROSS FILTER AND ALARM THROUGH THE EMCS WHEN DIFFERENTIAL STATIC PRESSURE EXCEEDS FIELD ADJUSTABLE SETPOINT.

5) SMOKE DETECTION: WHEN THE PRESENCE OF SMOKE IS DETECTED AT A DUCT SMOKE DETECTOR LOCATED IN THE RETURN DUCT, THEN THE FAN STARTER CIRCUIT SHALL BE DE–ENERGIZED AND THE EMCS SHALL BE ALARMED.

6) THE OUTSIDE AIR DAMPER SHALL CLOSE AND THE RETURN AIR DAMPER SHALL OPEN WHENEVER THE UNIT IS OFF.

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ROOF TOP UNITS (RTU–HS–4, 5)

TYPICAL OF 2 QTY

LOCATION: ROOF

SERVICE: DINING 2 & CAFETERIA

DRAWING NOTES:

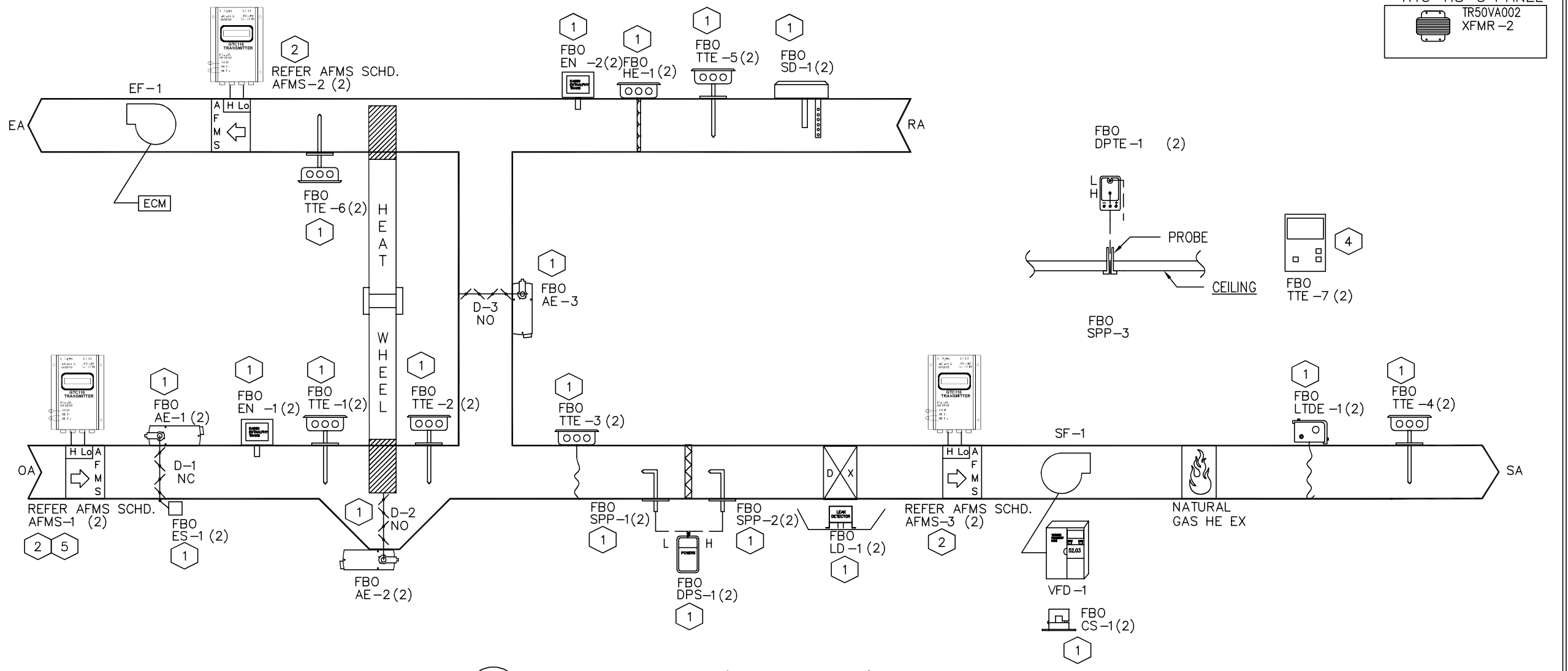
1. SENSORS/FIELD DEVICES FURNISHED, INSTALLED AND WIRED BY FACTORY.
2. SENSORS/FIELD DEVICES FURNISHED, INSTALLED AND WIRED BY SIEMENS.
3. RTU COMMUNICATING TO SIEMENS BMS VIA BACNET IP. CAT–6 DROP FROM RTU TO NETWORK SWITCH BY OTHERS.
4. SENSORS/FIELD DEVICES FURNISHED BY OTHERS, INSTALLED AND WIRED BY SIEMENS.
5. RTU–HS–4 OA AFMS FURNISHED, INSTALLED AND WIRED BY FACTORY.

RTU–HS–4 PANEL

TR50VA002
XFMR –1

RTU–HS–5 PANEL

TR50VA002
XFMR –2



1 / 114B ROOF TOP UNITS (RTU–HS–4, 5)

LOCATION: ROOF

REVISION HISTORY

R0	2/16/2024	VB	ISSUED FOR APPROVAL

SIEMENS

SIEMENS INDUSTRY, INC.
SMART INFRASTRUCTURE

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NJ. 07960 USA
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Fax: (973) 575-7968

NANUET BOND PHASE3 HIGH SCHOOL
NANUET, NY

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
VB	VB	NSK	02/16/24	02/16/24

HS-RTU (RTU-HS-4,5) (MECH)

440P-366733
0
114B

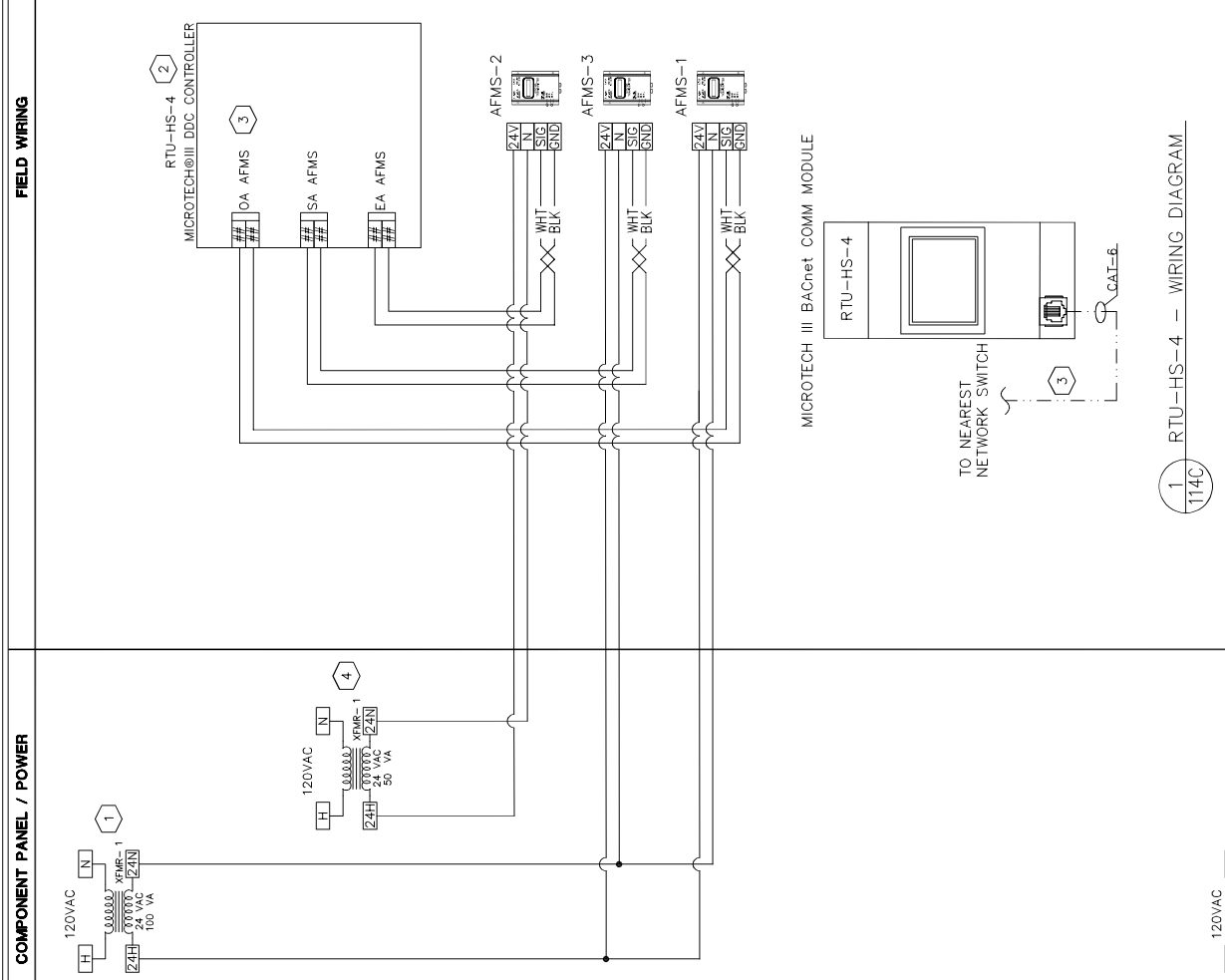
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C:\Users\z004pb8f\OneDrive – Siemens AG\BNJ2 BAU Nanuet Bond Phase 3 High School_440P–366733\DT\MDT_HIGH SCHOOL\114_HS–ROOF TOP UNITS.dwg

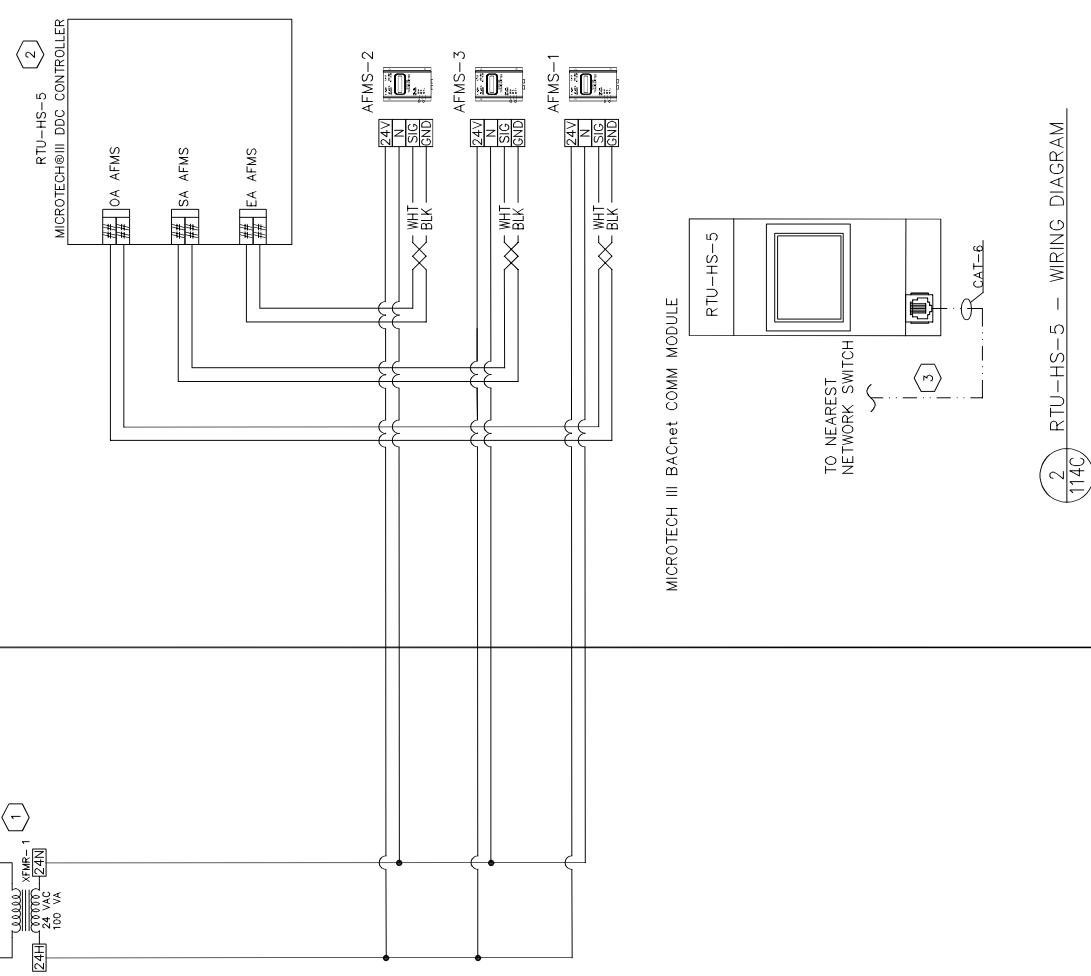
FIELD WORK

COMPONENT PANEL / POWER

PANEL



1 RTU-HS-4 – WIRING DIAGRAM
114C



2 RTU-HS-5 – WIRING DIAGRAM
114C

DRAWING NOTES:

1. TRANSFORMER FOR AFMS PROVIDED BY SIEMENS.
2. RTU MICROTECH DDC CONTROLLER AFMS TERMINALS TO BE FIELD DETERMINED.
3. OA AFMS FOR RTU-HS-4 IS FACTORY INSTALLED AND WIRED. POWER FOR OA AFMS FROM FACTORY SUPPLIED TRANSFORMER.
4. FACTORY SUPPLIED TRANSFORMER.

REVISION HISTORY

R0	2/16/2024	VB	ISSUED FOR APPROVAL

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NANUET BOND PHASE3 HIGH SCHOOL
NANUET, NY

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
VB	VB	NSK	02/16/24	02/16/24

HS-RTU (RTU-HS-4,5) (ELEC)

440P-366733
0
114C

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C:\USERS\Z004PB8F\ONEDRIVE – SIEMENS AG\BNJ2 BAU NANUET BOND PHASE 3 HIGH SCHOOL_440P-366733\DT\MDT_HIGH SCHOOL\114_HS-ROOF TOP UNITSA.DWG

Control Device	Qty	Product Number	Manufacturer	Document Number	Description
Field Mounted Devices					
AE 1	1	GMA121.1P	SIEMENS	154004	2PT SR 24V,62LBIN,PLM
CS 1	1	H614	VERIS	N/A	Current Switch, 1.5–150A, Split Core,VFD
RE 1	1	RIBU1C	FUNCTIONAL DEVICES	1208cut013	RIB 120VAC 24VAC/DC SPDT

SEQUENCE OF OPERATIONS

WOODSHOP/ART ROOM/DARK ROOM EXHAUST FAN:

A. WHEN THE DDC SYSTEM DETERMINES THAT THE BUILDING IS IN OCCUPIED MODE, EXHAUST FAN F–HS–2 SHALL BE TURNED ON AND OPERATED THROUGH THE FAN'S VFD. THE DDC SYSTEM SHALL TRACK THE FAN SPEED. WHEN THE FAN IS ON THE MOTORIZED DAMPER SHALL BE OPEN. THE DAMPER SHALL BE CLOSED WHEN THE FAN IS OFF.

REVISION HISTORY

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ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
VB	VB	NSK	02/16/24	02/16/24

HS-EXHAUST FANS (BOM/SOO)

440P-366733
0
115

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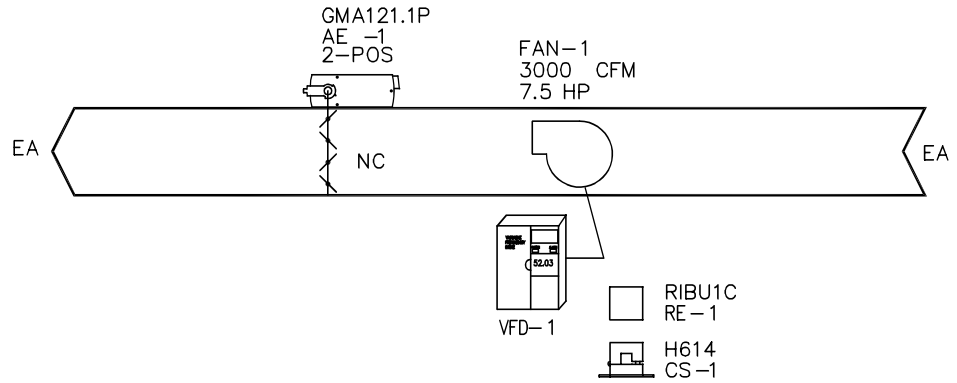
EXHAUST FAN (F-HS-2)
LOCATION: BASEMENT
SERVICE: ART/WOODSHOP/DARK ROOM/LOCKER ROOM EXHAUST

DRAWING NOTES:

(1) CONTROL TRANSFORMERS MOUNTED IN DDC ENCLOSURE.

GENERAL NOTES:

1. SEE WIRING DETAIL ON ELECTRICAL DRAWING 115B.



1 / 115A EXHAUST FAN (F-HS-2)
LOCATION: BASEMENT

REVISION HISTORY

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ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
VB	VB	NSK	02/16/24	02/16/24

HS-EXHAUST FANS (MECH)

440P-366733
0
115A

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STARTER WIRING

FIELD WIRING

COMPONENT PANEL / POWER

FIELD PANEL- NAN.HS.BAS.PXCM1

F-HS-2
VFD
2 START/STOP
1
6 SPEED INPUT
7

WHT
BLK

(1) RE-1
1.11/A
WHT/YEL
WHT/BLU
ORG (NO)
BRN (COM)
BLU (NC)
START/STOP

L1 L2 L3
M
CS-1

EXHAUST AIR DAMPER

AE-1
5/A
1
2 20
1 16

1
115B
EXHAUST FAN (F-HS-2)
LOCATION: BASEMENT

CONTINUE FROM
DWG 112C
COM
24V

WHT
BLK

3
4
2
HS.F.HS.2.SS (On/Off)
7025.0.1.1
ON/OFF DO

22
19
HS.F.HS.2.SPD
7025.0.2.5
0-10VDC AO

16
14
HS.F.HS.2.SS (Proof)
7025.0.2.4
STATUS DI

9
10
8
HS.F.HS.2.EAD
7025.0.1.2
OPN/CLS DO

DRAWING NOTES:
(1) RELAY WILL BE INSTALLED IN THE FIELD NEAR VFD.

GENERAL NOTES:
1. ALL WIRING TO MEET REQUIREMENTS OF STANDARD WIRING SPECIFICATIONS DRAWINGS.

REF#	FIELD PANEL NAME	FIELD PANEL NODE NAME
7025	NAN.HS.BAS.PXCM1	NANHSBASPXCM1

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NANUET BOND PHASE3 HIGH SCHOOL
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HS-EXHAUST FANS (ELEC)

440P-366733
0
115B

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Control Device	Qty	Product Number	Manufacturer	Document Number	Description
Field Mounted Devices					
CS 1	8	H608	VERIS	1006cut016	CUR SW SPLTCOR-ADJ SETPT W/LED
DXR 1	8	DXR2.M18-101B	SIEMENS	A6V10502840	DXR2.M18 Room Automation Station
LTDE 1	8	134-1504	SIEMENS	155 016	T'STAT, LOW TEMP,15/55,MANUAL
RE 1	8	RIBU1C	FUNCTIONAL DEVICES	1208cut013	RIB 120VAC 24VAC/DC SPDT
TTE 1	8	544-342-16	SIEMENS	149261	DUCT AV. TMP, 1K OHM, PT(375), 16', FLEX
TTE 2	8	544-339-18	SIEMENS	149261	DCT PT TEMP, PT 1K OHM (375), 18" RIGID
TTE 3	8	S55624-H105-A	SIEMENS	N/A	QMX3.P34 Temp. Sensor and Room Unit
V					SEE VALVE SUBMITTAL
Existing Equipment To Remain					
AE 1-3	24	ETR	N/A	N/A	DAMPER ACTUATORS
ENC 1	8	ETR	N/A	N/A	ENCLOSURES
RE 2	8	ETR	N/A	N/A	RELAY
XFMR 1	8	ETR	N/A	N/A	TRANSFORMER

SEQUENCE OF OPERATION

EXISTING UNIT VENTILATORS

1. RUN CONDITIONS – SCHEDULED:
   1) THE UNIT SHALL RUN ACCORDING TO A USER DEFINABLE TIME SCHEDULE IN THE FOLLOWING MODES:
   a) OCCUPIED MODE: THE UNIT SHALL MAINTAIN
      1) A 76°F (ADJ.) COOLING SETPOINT
      2) A 70°F (ADJ.) HEATING SETPOINT.
   b) UNOCCUPIED MODE (NIGHT SETBACK): THE UNIT SHALL MAINTAIN
      1) A 85°F (ADJ.) COOLING SETPOINT.
      2) A 64°F (ADJ.) HEATING SETPOINT.
   2) UNIT VENTILATOR SENSORS SHALL INCLUDE LOCAL TEMPERATURE BUT SHALL NOT ALLOW USER TEMPERATURE SENSOR OVERRIDE CAPABILITY FROM THE SENSOR, THAT SHALL OCCUR AT THE DDC FRONT END.
   3) ALARMS SHALL BE PROVIDED AS FOLLOWS:
   a. HIGH ZONE TEMP: IF THE ZONE TEMPERATURE IS GREATER THAN THE COOLING SETPOINT BY A USER DEFINABLE AMOUNT (ADJ.).
   b. LOW ZONE TEMP: IF THE ZONE TEMPERATURE IS LESS THAN THE HEATING SETPOINT BY A USER DEFINABLE AMOUNT (ADJ.).

c. ZONE UNOCCUPIED OVERRIDE:
   a) A TIMED LOCAL OVERRIDE CONTROL SHALL ALLOW AN OCCUPANT TO OVERRIDE THE SCHEDULE AND PLACE THE UNIT INTO AN OCCUPIED MODE FOR AN ADJUSTABLE PERIOD OF TIME. AT THE EXPIRATION OF THIS TIME, CONTROL OF THE UNIT SHALL AUTOMATICALLY RETURN TO THE SCHEDULE.

d. FREEZE PROTECTION:
   a) THE UNIT SHALL SHUT DOWN AND GENERATE AN ALARM UPON RECEIVING A LOW TEMPERATURE THERMOSTAT STATUS WHILE THE OUTSIDE/RETURN AIR DAMPER SHALL CLOSE THE OUTSIDE AIR DAMPER AND OPEN THE FACE AND BYPASS DAMPER FULLY OPEN TO THE BYPASS POSITION.

e. FAN:
   a) THE FAN SHALL RUN ANYTIME THE UNIT IS COMMANDED TO RUN, UNLESS SHUTDOWN ON SAFETIES.

f. FACE AND BYPASS DAMPERS CONTROL:
   a) THE UNIT SHALL MAINTAIN ZONE HEATING AND COOLING SETPOINTS BY MODULATING THE FACE AND BYPASS DAMPERS THROUGH ONE OF THE FOLLOWING:
   1) HEATING:
   a) WHEN THE ZONE TEMPERATURE IS LESS THAN THE HEATING SETPOINT, THE FACE AND BYPASS DAMPERS SHALL MODULATE OPEN TO FACE POSITION (CLOSED TO BYPASS POSITION) TO MAINTAIN SETPOINT BY MODULATING THE AIR PASSING OVER THE HEATING COIL.
   b) WHEN THE ZONE TEMPERATURE IS GREATER THAN THE HEATING SETPOINT, THE FACE AND BYPASS DAMPERS SHALL CLOSE TO FACE POSITION (OPEN TO BYPASS POSITION).
   c) HEATING COIL VALVE:
   1) THE CONTROLLER SHALL MEASURE THE ZONE TEMPERATURE AND MODULATE THE HEATING COIL VALVE TO MAINTAIN ITS HEATING SETPOINT WITH THE FACE AND BYPASS DAMPER FULLY OPEN TO THE FACE (COIL) POSITION.
   d) THE HEATING SHALL BE ENABLED WHENEVER:
   1) OUTSIDE AIR TEMPERATURE IS LESS THAN 65°F (ADJ.).
   2) AND THE ZONE TEMPERATURE IS BELOW HEATING SETPOINT.
   3) AND THE FAN IS ON.
   4) THE HEATING COIL VALVE SHALL OPEN WHENEVER THE LOW TEMPERATURE THERMOSTAT IS ON.

g. ECONOMIZER:
   a) THE CONTROLLER SHALL MEASURE THE ZONE TEMPERATURE AND MODULATE THE MIXED AIR DAMPERS IN SEQUENCE TO MAINTAIN THE ZONE COOLING SETPOINT. THE OUTSIDE AIR DAMPERS SHALL MAINTAIN A MINIMUM ADJUSTABLE POSITION OPEN BASED ON THE VENTILATION RATES DURING HEATING AND VENTILATION WHENEVER IN OCCUPIED AND NON-ECONOMIZER MODE.
   b) THE ECONOMIZER SHALL BE ENABLED WHENEVER:
   1) OUTSIDE AIR TEMPERATURE IS AT LEAST 2°F (ADJ.) LESS THAN THE ZONE TEMPERATURE.
   2) AND THE OUTSIDE AIR TEMPERATURE IS LESS THAN 64°F (ADJ.)
   3) THE OUTSIDE AIR DAMPER SHALL BE 100% OPEN AND THE RETURN DAMPER CLOSED WHEN IN ECONOMIZER MODE.
   c) THE ECONOMIZER SHALL CLOSE WHENEVER THE LOW TEMPERATURE THERMOSTAT IS ON.
   d) THE OUTSIDE AIR DAMPERS SHALL CLOSE AND THE RETURN AIR DAMPER SHALL OPEN WHEN THE UNIT IS OFF. IF OPTIMAL START UP IS AVAILABLE THE MIXED AIR DAMPER SHALL OPERATE AS DESCRIBED IN THE OCCUPIED MODE EXCEPT THAT THE OUTSIDE AIR DAMPER SHALL MODULATE TO FULLY CLOSED.
   e) THE CONTROLLER SHALL MONITOR THE DISCHARGE AIR TEMPERATURE. SHOULD DISCHARGE TEMPERATURE DROP BELOW A USER DEFINABLE TEMPERATURE (ADJ.), THE CONTROLLER SHALL ENABLE THE HEATING, CLOSE THE OUTSIDE DAMPER AND OPEN THE RETURN DAMPER.

2. MECHANICAL COOLING VIA VARIABLE REFRIGERANT VOLUME (VRV) HEAT PUMP SYSTEM:
   a) THE DDC SHALL INTEGRATE INTO THE BACNET CONTROLLER ON THE VRV HEAT PUMP SYSTEM TO PROVIDE START AND STOP OPERATION OF THE HEAT PUMP UNITS.
   b) WHEN ECONOMIZER OPERATION IS AVAILABLE THROUGH THE DDC SYSTEM, THE HEAT PUMP SHALL BE LOCKED OFF FROM MECHANICAL COOLING OPERATION. WHEN THE OUTSIDE AIR TEMPERATURE IS ABOVE 64 DEGREES F(ADJUSTABLE) AND ANY UNIT VENTILATOR IS CALLING FOR COOLING, THE HEAT PUMPS SHALL BE ENABLED TO OPERATE.
   c) WHEN AN INDIVIDUAL UNIT VENTILATOR IS CALLING FOR COOLING TO MEET THE SPACE TEMPERATURE SETPOINT, THE FOLLOWING SHALL OCCUR:
   1) THE DDC SYSTEM SHALL SEND A DRY CONTACT TO THE UNIT VENTILATOR VRV CONTROL KIT TO ENABLE

REVISION HISTORY

R0	2/16/2024	VB	ISSUED FOR APPROVAL

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NANUET BOND PHASE3 HIGH SCHOOL
NANUET, NY

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
VB	VB	NSK	02/16/24	02/16/24

HS-UNIT VENTILATOR (BOM/SOO)

440P-366733
0
116

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COOLING VIA THE VRV EXPANSION VALVE KIT AND A SEPARATE DRY CONTACT SENT TO THE VRV CONTROL KIT TO ENABLE THE UNIT VENTILATOR SUPPLY FAN.

2) THE DDC SYSTEM SHALL SEND A 0–10 VDC INPUT TO THE VRV EXPANSION VALVE KIT TO PROVIDE COOLING AS REQUIRED TO MEET THE SPACE SETPOINT.

3. MINIMUM OUTSIDE AIR VENTILATION – FIXED PERCENTAGE:

a) THE OUTSIDE AIR DAMPERS SHALL MAINTAIN A MINIMUM POSITION (ADJ.) AS DETERMINED BY THE BALANCING OPERATIONS DURING BUILDING OCCUPIED HOURS WHEN IN NON–ECONOMIZER MODE AND BE CLOSED DURING UNOCCUPIED HOURS.

4. DISCHARGE AIR TEMPERATURE:

a) THE CONTROLLER SHALL MONITOR THE DISCHARGE AIR TEMPERATURE.

b) ALARMS SHALL BE PROVIDED AS FOLLOWS:

1) HIGH DISCHARGE AIR TEMP: IF THE DISCHARGE AIR TEMPERATURE IS GREATER THAN 110°F (ADJ.).

2) LOW DISCHARGE AIR TEMP: IF THE DISCHARGE AIR TEMPERATURE IS LESS THAN 40°F (ADJ.).

5. FAN STATUS:

a) THE CONTROLLER SHALL MONITOR THE FAN STATUS.

b) ALARMS SHALL BE PROVIDED AS FOLLOWS:

c) FAN FAILURE: COMMANDED ON, BUT THE STATUS IS OFF.

d) FAN IN HAND: COMMANDED OFF, BUT THE STATUS IS ON.

REVISION HISTORY

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NANUET BOND PHASE3 HIGH SCHOOL
NANUET, NY

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
VB	VB	NSK	02/16/24	02/16/24

HS-UNIT VENTILATOR (SOO)

44OP-366733
0

116A

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UNIT VENTILATORS (EX-UV-X)
TYPICAL OF 8 QTY
LOCATION: 1ST FLOOR
SERVES: CLASSROOMS

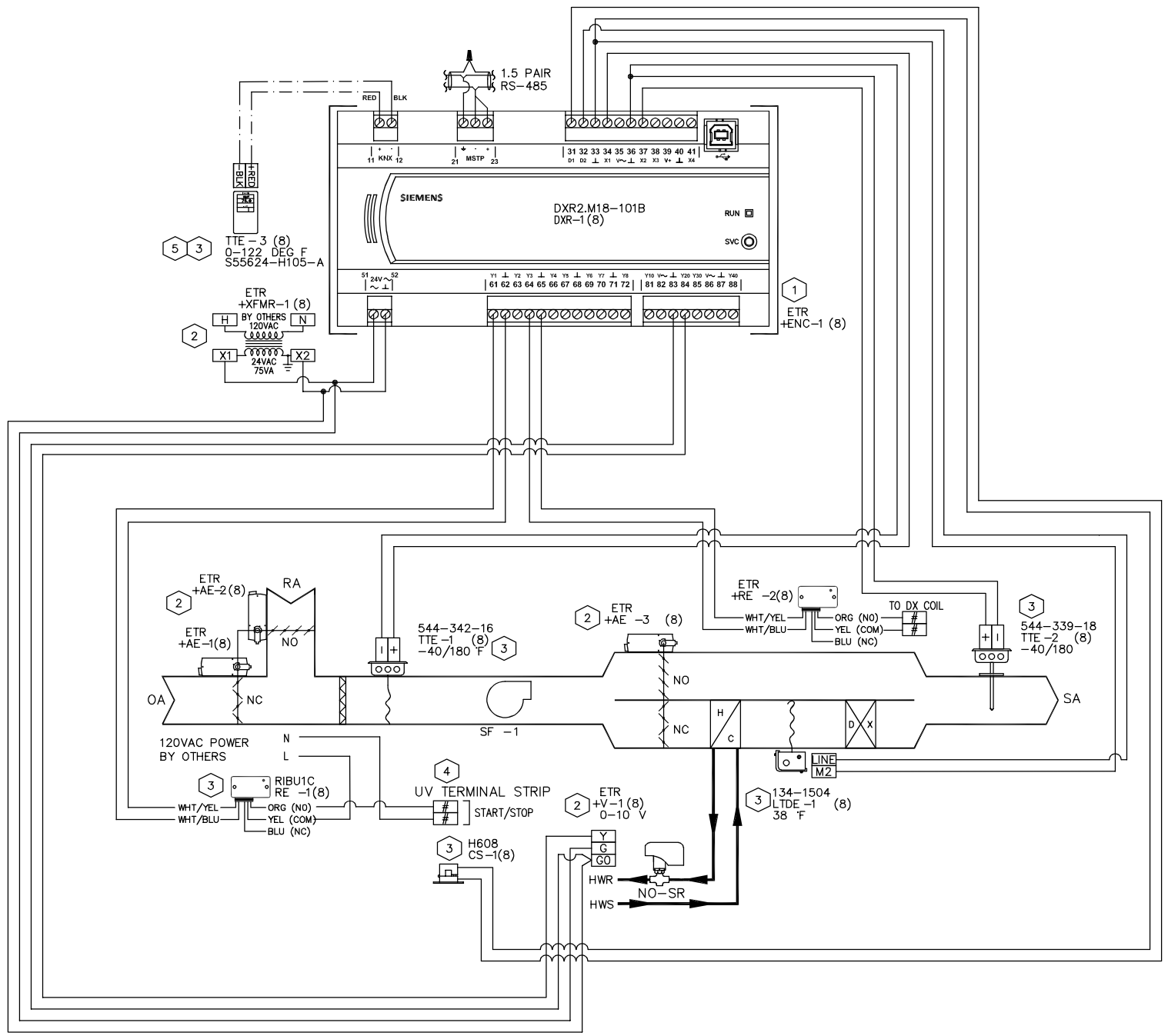
DRAWING NOTES:

1. DXR-1 TO BE MOUNTED IN EXISTING SIEMENS ENCLOSURE.
2. SENSORS/FIELD DEVICES ARE EXISTING TO REMAIN AND RE-WIRED TO NEW SIEMENS CONTROLLERS BY SIEMENS.
3. NEW SENSORS FURNISHED, INSTALLED AND WIRED BY SIEMENS.
4. ALL TERMINALS TO BE FIELD VERIFIED.
5. LOCATE AS SHOWN ON FLOOR PLANS/CONTRACT DOCUMENTS.
6. EXISTING DETAILS FOR VALVES & ACTUATORS ARE NOT AVAILABLE AND VA RATINGS FOR FIELD DEVICES TO BE FIELD DETERMINED.

LEGEND:

———— 24VAC WIRING
——·—·—— FIELD KNX WIRING

VA RATING		
S.NO	EQUIPMENT	VA DRAWN
1	DXR-1	8
2	AE-1,2,3	9
3	V-1	3.5
TOTAL		20.5



1 / 116B — UNIT VENTILATORS
TYPICAL OF 8 QTY

REVISION HISTORY

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ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
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HS-UNIT VENTILATOR (MECH/ELEC)

440P-366733
0
116B

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Control Device	Qty	Product Number	Manufacturer	Document Number	Description
Field Mounted Devices					
CS 1-2	2	H614	VERIS	N/A	Current Switch, 1.5-150A, Split Core,VFD
DPTE 1	1	2301050PD3V11B	SETRA	0608cut002	DP TRAN,WET,50PSI,4-20MA,W/MAN
RE 1-2	2	RIBU1C	FUNCTIONAL DEVICES	1208cut013	RIB 120VAC 24VAC/DC SPDT
TTE 1	1	544-577-25	SIEMENS	149261	IMMERSION TMP SNSR, PT 1K OHM(375) 2.5"
TTE 2	1	544-577-40	SIEMENS	149261	IMMERSION TMP SNSR, PT 1K OHM(375) 4"
V					SEE VALVE SUBMITTAL

SEQUENCE OF OPERATION

STEAM-TO-HOT WATER HEAT EXCHANGER HX-HS-2

A. HEAT EXCHANGER OPERATION SHALL BE ENABLED AT ALL TIMES BASED ON OUTSIDE AIR TEMPERATURE. WHEN THE OUTSIDE AIR TEMPERATURE IS BELOW 65 DEGREES F (ADJUSTABLE), THE HEAT EXCHANGER SHALL BE ENABLED.
   1) THE STEAM CONTROL VALVES SHALL MODULATE TO MAINTAIN THE LEAVING WATER TEMPERATURE SETPOINT. THE HEAT EXCHANGER 1/3 CONTROL VALVE SHALL MODULATE FIRST TO MAINTAIN THE LEAVING WATER SETPOINT. SHOULD THE 1/3 CONTROL VALVE BE 100% OPEN AND NOT ABLE TO MEET SETPOINT, THE 1/3 CONTROL VALVE SHALL CLOSE AND THE 2/3 CONTROL VALVE SHALL MODULATE TO MAINTAIN THE HEATING SETPOINT. SHOULD THE 2/3 CONTROL VALVE BE 100% OPEN AND NOT ABLE TO MEET SETPOINT, THE 1/3 CONTROL VALVE SHALL MODULATE WITH THE 2/3 CONTROL VALVE 100% OPEN TO MAINTAIN SETPOINT. SHOULD THE LEAD HEAT EXCHANGER'S CONTROL VALVES FAIL TO OPEN ON A CALL FOR HEAT, ALARM THE DDC.

B. WHENEVER THE OUTSIDE AIR TEMPERATURE IS 65 DEGREES OR BELOW (ADJUSTABLE) THE DDC SYSTEM SHALL TURN ON THE HEATING WATER LOOP PUMPS P-HS-3/P-HS-4. THE PUMP STATUS SHALL BE CONFIRMED WITH A CURRENT SENSOR. ONE OF THE TWO HEATING WATER PUMP P-HS-3/P-HS-4 SHALL BE OPERATED. ONE OF THE TWO PUMPS SHALL BE DEEMED THE LEAD PUMP, AND LEAD PUMP SHALL ROTATE WEEKLY. SHOULD THE LEAD PUMP FAIL TO START ON ALARM, THE LAG PUMP SHALL START.

C. THE HEATING WATER SYSTEM CONTROLLER SHALL MEASURE HOT WATER DIFFERENTIAL PRESSURE AND MODULATE THE SPEED OF PUMPS P-HS-3/P-HS-4 TO MAINTAIN ITS DIFFERENTIAL PRESSURE SETPOINT. THE CONTROLLER SHALL MODULATE THE SPEED TO MAINTAIN A HOT WATER DIFFERENTIAL PRESSURE OF 15 PSIG (ADJUSTABLE).

D. THE FINAL DIFFERENTIAL PRESSURE SETTING OF ALL PUMP SENSORS SHALL BE OPTIMIZED FOLLOWING INSTALLATION AND COMMISSIONING OF ALL DDC SYSTEMS BY SEQUENTIALLY LOWERING THE DIFFERENTIAL PRESSURE SETTING UNTIL THE SETPOINT CAN'T BE REACHED.
   1) SHOULD THE PUMP SPEED ON THE VFD SHALL DROP DOWN TO 25% OF MAXIMUM PUMP SPEED, THE BYPASS CONTROL VALVE SHALL MODULATE OPEN TO MAINTAIN A MINIMUM 25% PUMP SPEED AT ALL TIMES.

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FAX: (973) 575-7968

NANUET BOND PHASE3 HIGH SCHOOL
NANUET, NY

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
VB	VB	NSK	02/16/24	02/16/24

HS-HEAT EXCHANGER (BOM/SOO)

440P-366733
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210

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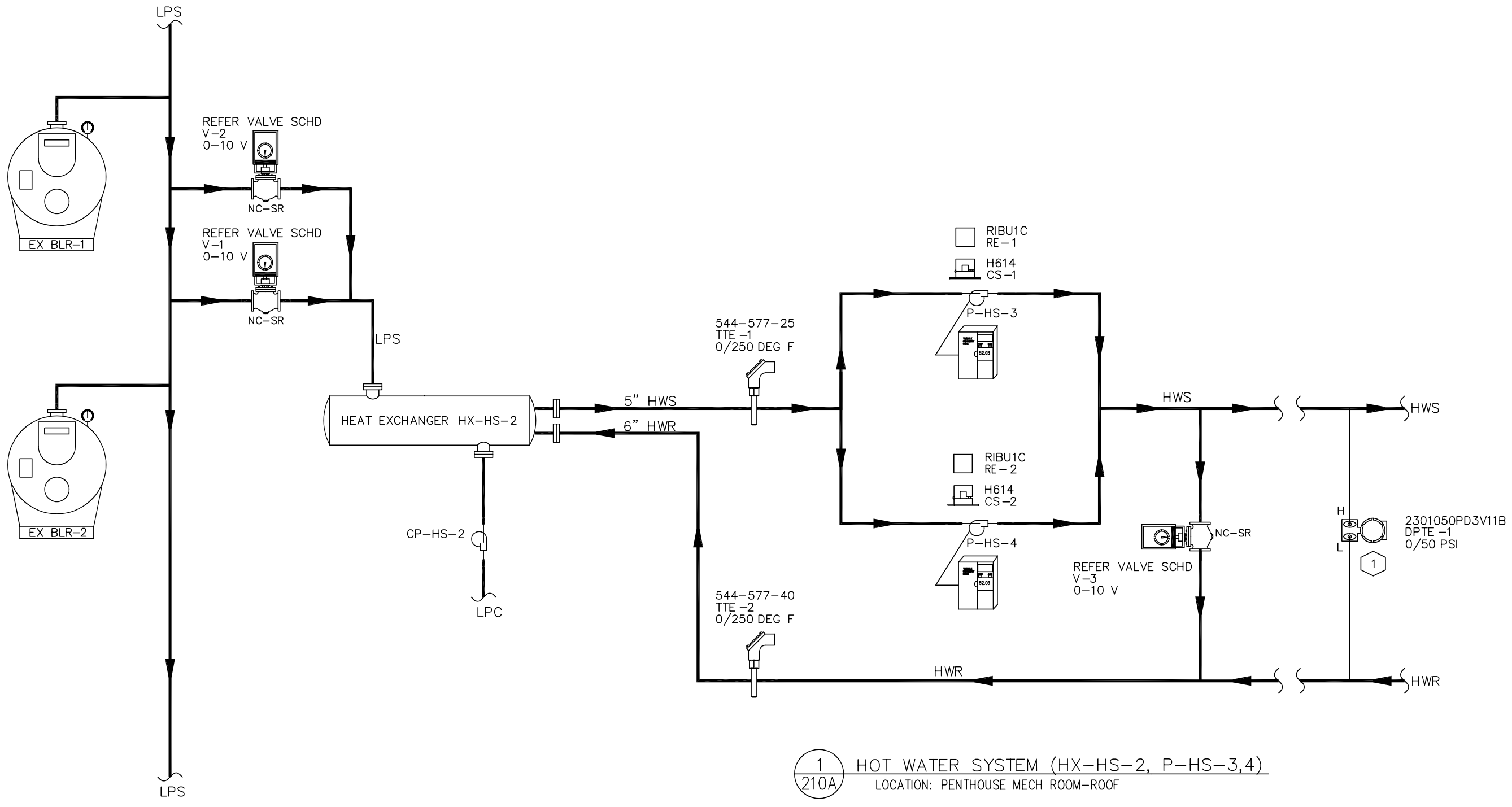
HOT WATER SYSTEM (HX-HS-2, P-HS-3,4)
LOCATION: BOILER ROOM

DRAWING NOTES:

(1) DIFF PRESSURE SENSOR LOCATION HAS TO BE FIELD COORDINATED AND INSTALLED WITH SUITABLE SUPPORTS.

GENERAL NOTES:

1. SEE WIRING DETAILS IN DWG 210B.



1 / 210A HOT WATER SYSTEM (HX-HS-2, P-HS-3,4)
LOCATION: PENTHOUSE MECH ROOM-ROOF

REVISION HISTORY

R0	2/16/2024	VB	ISSUED FOR APPROVAL

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NANUET BOND PHASE3 HIGH SCHOOL
NANUET, NY

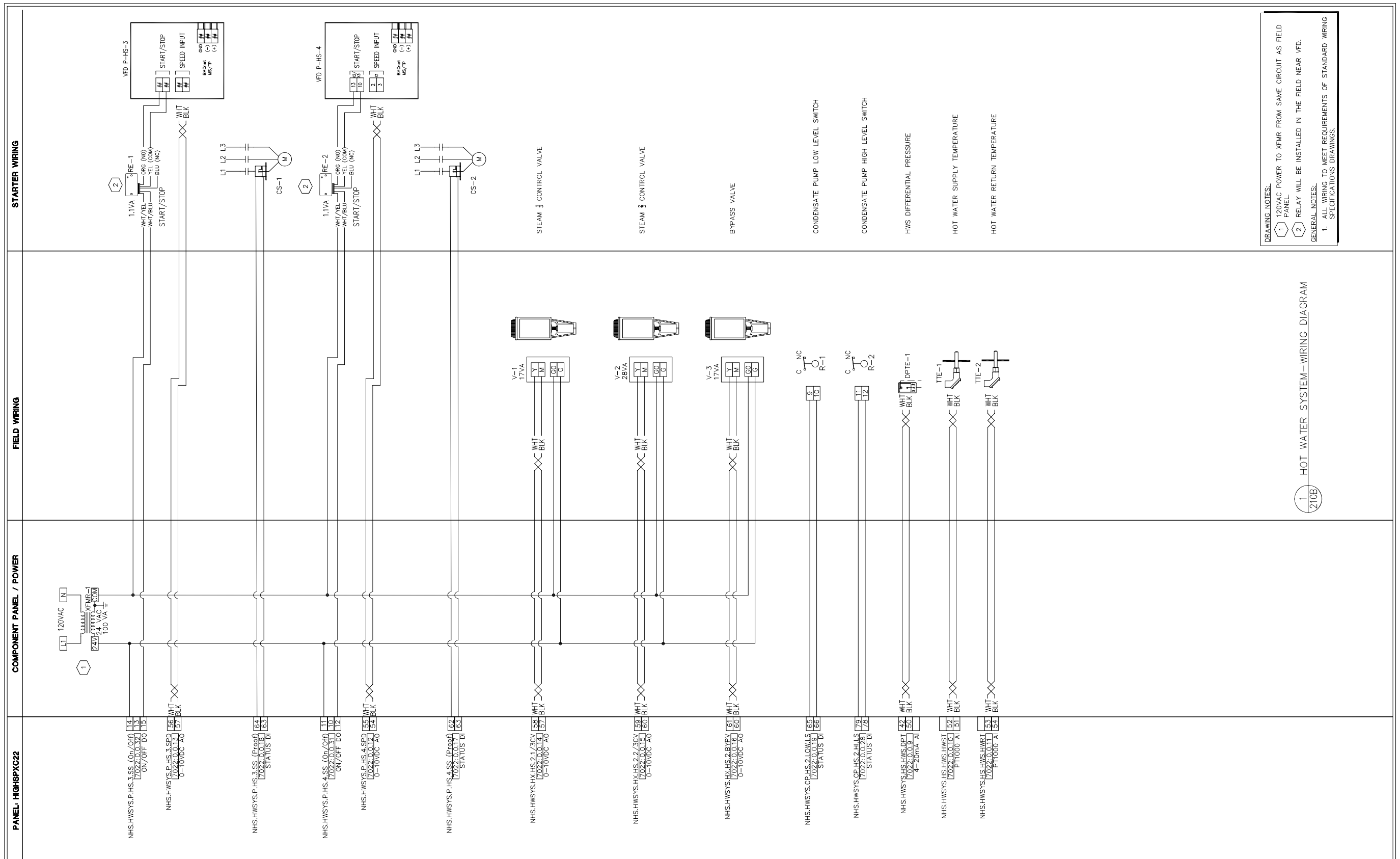
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HS-HEAT EXCHANGER (MECH)

440P-366733
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210A

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1 / 210B HOT WATER SYSTEM-WIRING DIAGRAM

REF#	FIELD PANEL NAME	FIELD PANEL NODE NAME
7022	HIGHSPXC22	HIGHSPXC22

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HS-HEAT EXCHANGER (ELEC)

440P-366733
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Control Device	Qty	Product Number	Manufacturer	Document Number	Description
Field Mounted Devices					
TTE 1	8	RDB160BNU	SIEMENS	N/A	FCU ROOM THERMOSTAT WITH BACNET MS/TP
V					SEE VALVE SUBMITTAL

SEQUENCE OF OPERATION

CONVECTORS

A. MODULATE NORMALLY OPEN 2-WAY MODULATING CONTROL VALVE TO MAINTAIN ROOM AT SETPOINT IN OCCUPIED MODE OF 70 DEGREES F (ADJUSTABLE) AS WELL AS UNOCCUPIED REDUCED TEMPERATURE SETPOINT CONDITIONS OF 62 DEGREES F (ADJUSTABLE).

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NANUET BOND PHASE3 HIGH SCHOOL
NANUET, NY

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
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HS-CONVECTOR (BOM/SOO)

440P-366733
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410

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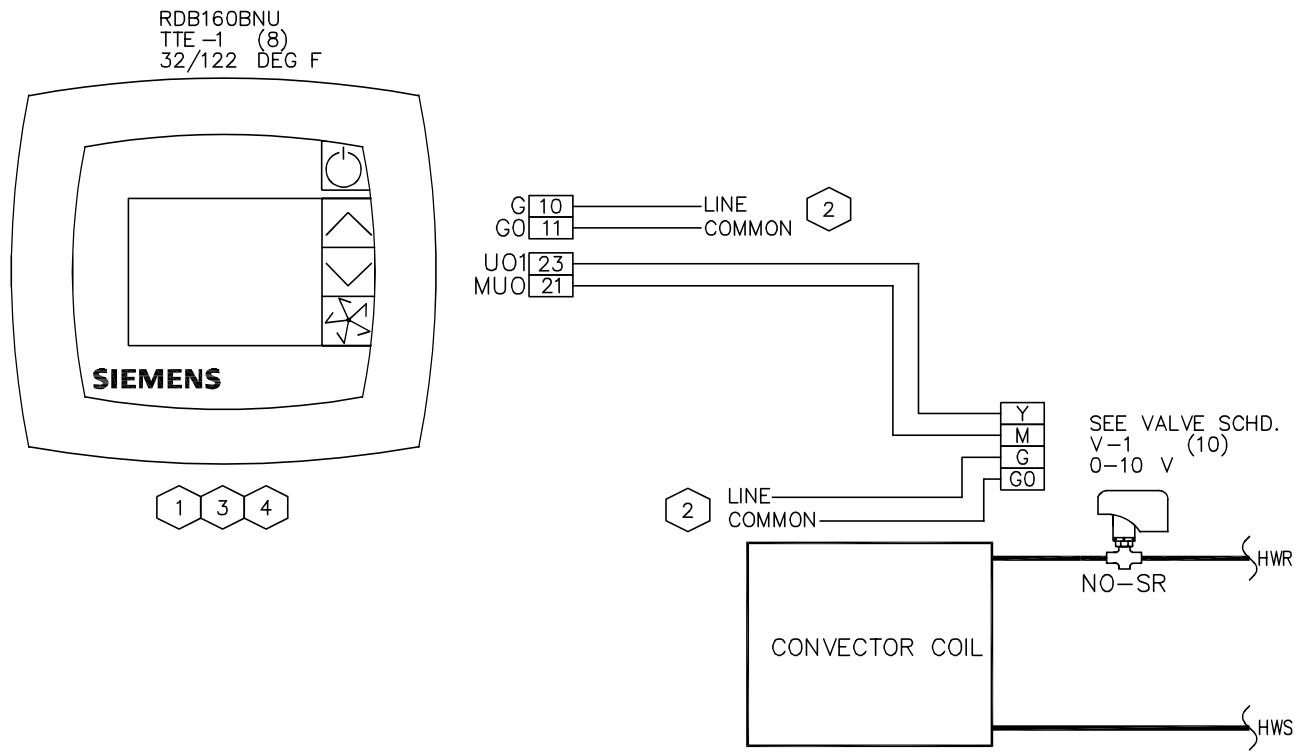
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CONVECTOR UNITS
TYPICAL OF 10 QTY
LOCATION: 1ST FLOOR
SERVES: STORAGE ROOMS
& CORRIDORS

DRAWING NOTES:

1. THERMOSTAT TO BE MOUNTED AS PER LOCATION SHOWN ON FLOOR PLAN DRAWINGS.
2. REFER TO BUILDING POWER TRUNK DRAWING FOR 24 VAC POWER.
3. CV-HS-1 & CV-HS-2, CV-HS-4 & CV-HS-5 ARE SHARING A SINGLE THERMOSTAT & ONE OUTPUT FROM U01 WILL CONTROL 2 VALVES.
4. THERMOSTAT LOCATION IS NOT SHOWN ON FLOOR PLAN DRAWINGS AND NEED TO BE FIELD DETERMINED.

VA RATING		
S.NO	EQUIPMENT	VA DRAWN
1	TTE-1	2.5
2	V-1	3.5
TOTAL		6



1 / 410A — CONVECTOR UNITS
TYPICAL OF 10 QTY
LOCATION: SEE FLN SCHEDULE

REVISION HISTORY

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NANUET BOND PHASE3 HIGH SCHOOL
NANUET, NY

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
VB	VB	NSK	02/16/24	02/16/24

HS-CONVECTOR (MECH/ELEC)

44OP-366733
0
410A

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Control Device	Qty	Product Number	Manufacturer	Document Number	Description
Field Mounted Devices					
TTE 1	10	RDB160BNU	SIEMENS	N/A	FCU ROOM THERMOSTAT WITH BACNET MS/TP
V					SEE VALVE SUBMITTAL

SEQUENCE OF OPERATION

RADIATOR COILS

A. MODULATE NORMALLY OPEN 2-WAY MODULATING CONTROL VALVE TO MAINTAIN ROOM AT SETPOINT IN OCCUPIED MODE OF 70 DEGREES F (ADJUSTABLE) AS WELL AS UNOCCUPIED REDUCED TEMPERATURE SETPOINT CONDITIONS OF 62 DEGREES F (ADJUSTABLE).

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NANUET BOND PHASE3 HIGH SCHOOL
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ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
VB	VB	NSK	02/16/24	02/16/24

HS-RADIATOR COIL (BOM/SOO)

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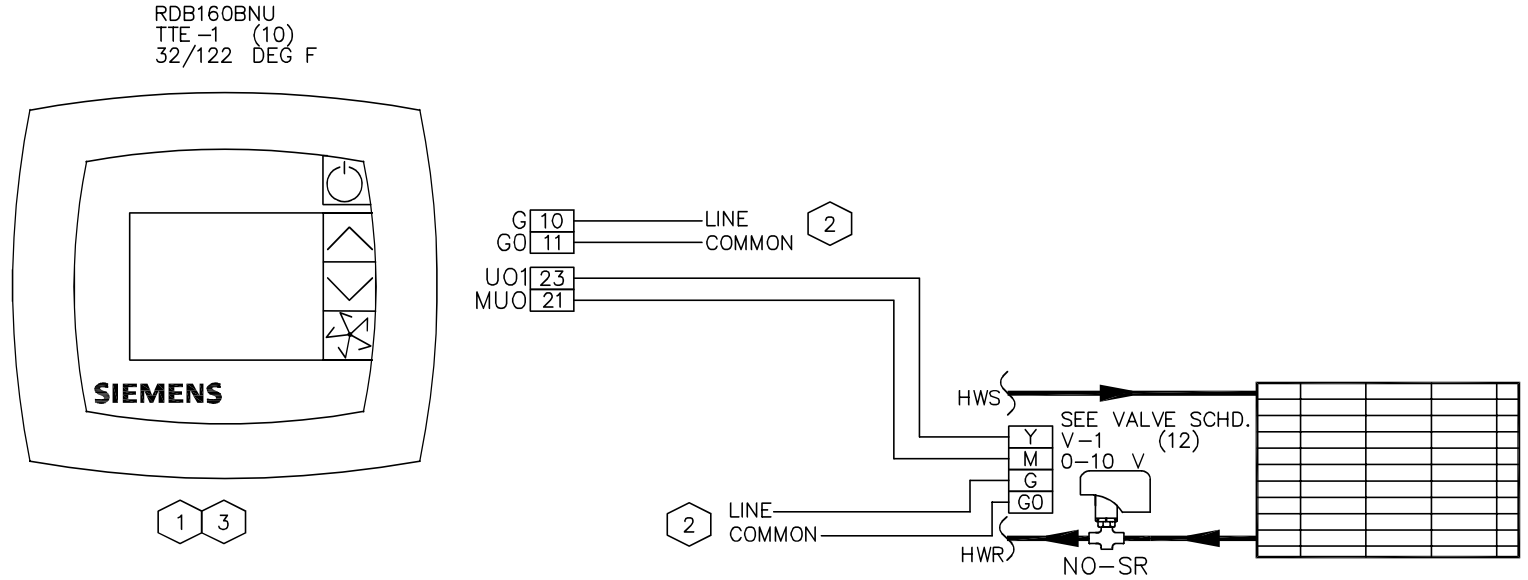
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RADIATOR COILS
TYPICAL OF 12 QTY
LOCATION: BASEMENT & 1ST FLOOR

DRAWING NOTES:

1. THERMOSTAT TO BE MOUNTED AS PER LOCATION SHOWN ON FLOOR PLAN DRAWINGS.
2. REFER TO BUILDING POWER TRUNK DRAWING FOR 24 VAC POWER.
3. R-2-1 & R-2-2, R-2-3 & R-2-4 ARE SHARING A SINGLE THERMOSTAT & ONE OUTPUT FROM U01 WILL CONTROL 2 VALVES.

VA RATING		
S.NO	EQUIPMENT	VA DRAWN
1	TTE-1	2.5
2	V-1	3.5
TOTAL		6



1/411A RADIATOR COILS
TYPICAL OF 12 QTY
LOCATION: SEE FLN SCHEDULE

REVISION HISTORY

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NANUET BOND PHASE3 HIGH SCHOOL
NANUET, NY

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
VB	VB	NSK	02/16/24	02/16/24

HS-RADIATOR COIL (MECH/ELEC)

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Control Device	Qty	Product Number	Manufacturer	Document Number	Description
Field Mounted Devices					
ENC 1	3	550-002	SIEMENS	N/A	ENCLOSURE ASSY,TEC
RE 1	3	RIBU1C	FUNCTIONAL DEVICES	1208cut013	RIB 120VAC 24VAC/DC SPDT
TTE 1	3	S55624-H105-A	SIEMENS	N/A	QMX3.P34 Temp. Sensor and Room Unit
V					SEE VALVE SUBMITTAL
Panel Mounted Devices					
DXR 1	3	DXR2.M11-101B	SIEMENS	A6V10502834	DXR2.M11 Room Automation Station

SEQUENCE OF OPERATION

CABINET UNIT HEATERS:

A. CYCLE FAN OPERATION AND VALVE POSITION TO MAINTAIN SPACE TEMPERATURE AT SETPOINT CONDITIONS THROUGH SPACE TEMPERATURE SENSOR. PROVIDE A TWO-POSITION, NORMALLY-OPEN, SPRING RETURN CONTROL VALVE ON THE HOT WATER RETURN LINE.

REVISION HISTORY

R0	2/16/2024	VB	ISSUED FOR APPROVAL

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NANUET BOND PHASE3 HIGH SCHOOL
NANUET, NY

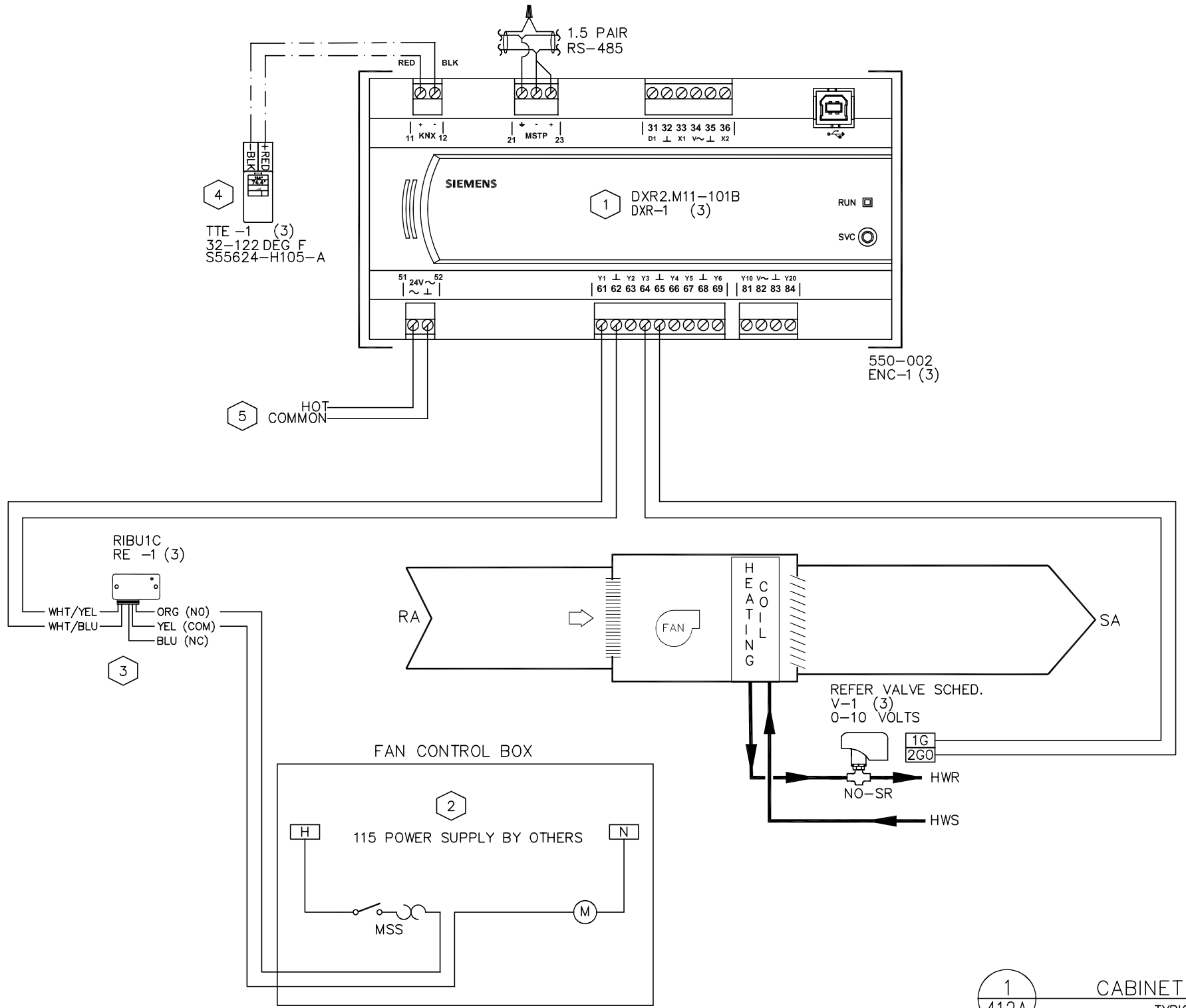
ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
VB	VB	NSK	02/16/24	02/16/24

HS-CABINET UNIT HEATER (BOM/SOO)

440P-366733
0
412

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CABINET UNIT HEATERS (CUH–HS–1, 2, 3)
LOCATION: BASEMENT & 1ST FLOOR



DRAWING NOTES:

1. DXR–1 TO BE MOUNTED IN SIEMENS ENCLOSURE.
2. 115VAC TO CUH TO BE PROVIDED BY ELECTRICAL CONTRACTOR.
3. RELAY TO BE MOUNTED NEAR TO FAN.
4. LOCATE AS SHOWN ON FLOOR PLANS/CONTRACT DOCUMENTS.
5. LOCATE REFER TO RISER FOR POWER TRUNK.

GENERAL NOTES:

1. ALL WIRING TO MEET REQUIREMENTS OF STANDARD WIRING SPECIFICATIONS DRAWINGS.

VA RATING		
S.NO	EQUIPMENT	VA DRAWN
1	DXR–1	8
2	TTE–1	0.3
3	V–1	7
4	RE–1	1.1
TOTAL		16.4

1/412A CABINET UNIT HEATER

TYPICAL OF 3 QTY
SERVES: SEE ROOM SCHEDULE

REVISION HISTORY

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NANUET BOND PHASE3 HIGH SCHOOL
NANUET, NY

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
VB	VB	NSK	02/16/24	02/16/24

HS-CABINET UNIT HEATER (MECH/ELEC)

440P-366733
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412A

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Control Device	Qty	Product Number	Manufacturer	Document Number	Description
Field Mounted Devices					
ENC 1	1	550-002	SIEMENS	N/A	ENCLOSURE ASSY,TEC
RE 1	1	RIBU1C	FUNCTIONAL DEVICES	1208cut013	RIB 120VAC 24VAC/DC SPDT
TTE 1	1	S55624-H105-A	SIEMENS	N/A	QMX3.P34 Temp. Sensor and Room Unit
V					SEE VALVE SUBMITTAL
Panel Mounted Devices					
DXR 1	1	DXR2.M11-101B	SIEMENS	A6V10502834	DXR2.M11 Room Automation Station

SEQUENCE OF OPERATION

UNIT HEATERS:

A. CYCLE FAN OPERATION AND VALVE POSITION TO MAINTAIN SPACE TEMPERATURE AT SETPOINT CONDITIONS THROUGH SPACE TEMPERATURE SENSOR. PROVIDE A TWO-POSITION, NORMALLY-OPEN, SPRING RETURN CONTROL VALVE ON THE HOT WATER RETURN LINE.

REVISION HISTORY

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NANUET BOND PHASE3 HIGH SCHOOL
NANUET, NY

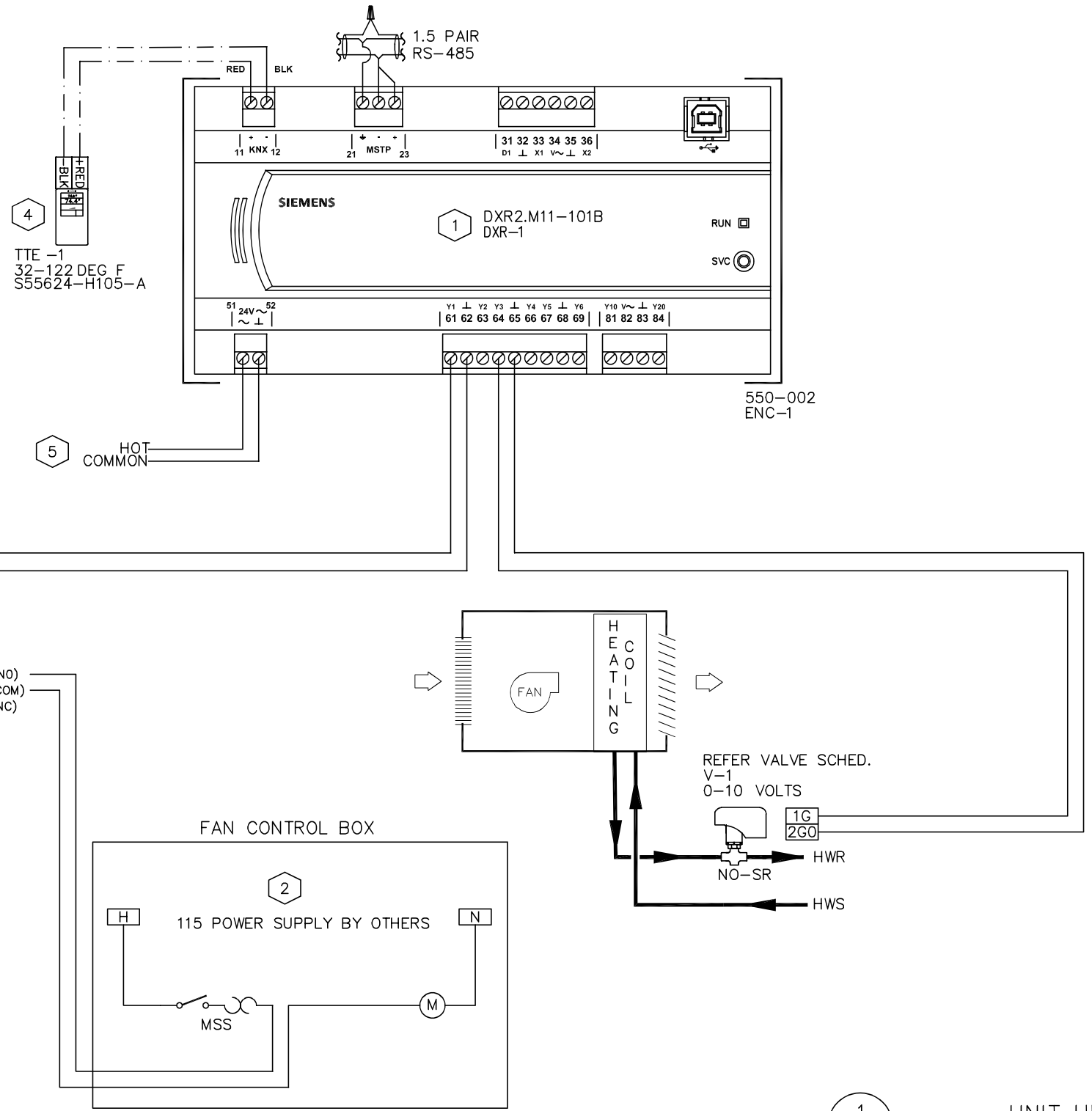
ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
VB	VB	NSK	02/16/24	02/16/24

HS-UNIT HEATER (BOM/SOO)

440P-366733
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413

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CABINET UNIT HEATERS (UH-HS-1)
LOCATION: BASEMENT



1 / 413A — UNIT HEATER
SERVES: SEE ROOM SCHEDULE

DRAWING NOTES:

1. DXR-1 TO BE MOUNTED IN SIEMENS ENCLOSURE.
2. 115VAC TO UH TO BE PROVIDED BY ELECTRICAL CONTRACTOR.
3. RELAY TO BE MOUNTED NEAR TO FAN.
4. LOCATE AS SHOWN ON FLOOR PLANS/CONTRACT DOCUMENTS.
5. LOCATE REFER TO RISER FOR POWER TRUNK.

GENERAL NOTES:

1. ALL WIRING TO MEET REQUIREMENTS OF STANDARD WIRING SPECIFICATIONS DRAWINGS.

VA RATING		
S.NO	EQUIPMENT	VA DRAWN
1	DXR-1	8
2	TTE-1	0.3
3	V-1	7
4	RE-1	1.1
TOTAL		16.4

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NANUET BOND PHASE3 HIGH SCHOOL
NANUET, NY

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VB	VB	NSK	02/16/24	02/16/24

HS-UNIT HEATER (MECH/ELEC)

440P-366733
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413A

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Control Device	Qty	Product Number	Manufacturer	Document Number	Description
Existing Equipment To Remain					
PXCC 1	1	PXC36-EF.A	SIEMENS	149206	APOGEE 36PT, BACNET IP/MSTP,TXIO,RS485
	1	TXA1.K24	SIEMENS	149476	@ADDRESS KEY 1-24

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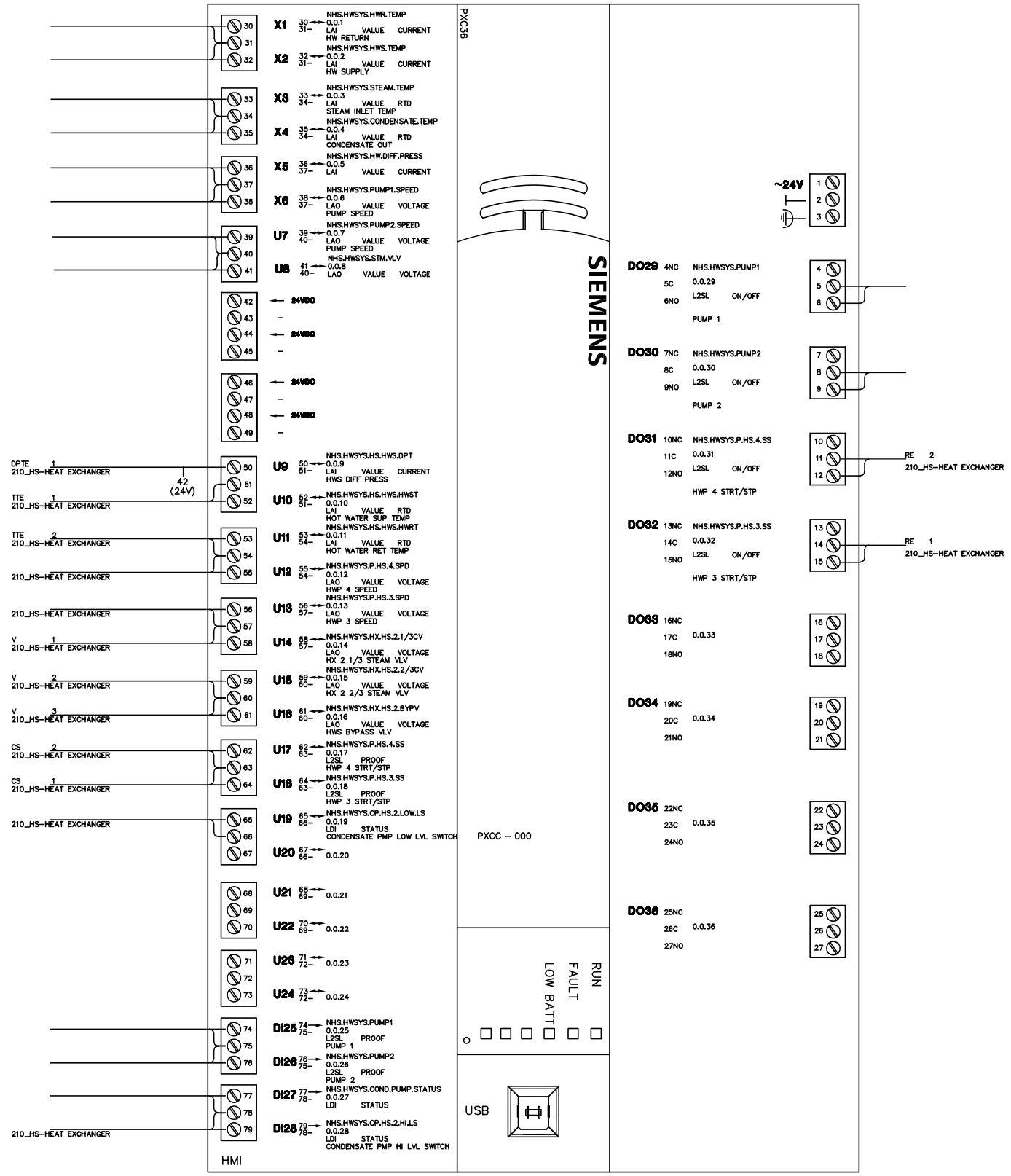
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VB	VB	NSK	02/16/24	02/16/24

HIGHPXC22 (BOM)

440P-366733
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NANUET, NY

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
VB	VB	NSK	02/16/24	02/16/24

HIGHPXC22 (LAYOUT)

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Control Device	Qty	Product Number	Manufacturer	Document Number	Description
Existing Equipment To Remain					
PXCM 3	1	PXC100-PE96.A	SIEMENS	149478	PXC MOD, P2, TX-I/O, 96 NODE, APOGEE
	1	PXX-485.3	SIEMENS	149478	PXC MOD EXPANSION MODULE, 3 RS-485
	1	TXA1.K24	SIEMENS	149476	@ADDRESS KEY 1-24
	1	TXS1.12F4	SIEMENS	149476	24VDC SUPPLY 1200MA, 4 A FUSE
	1	TXM1.8X	SIEMENS	149476	8 UNIV I/O MODULE W/ 4-20MA
	1	TXM1.8X-ML	SIEMENS	149476	8 UNIV I/O W/ 4-20MA, OVD&LCD
	1	TXM1.8D	SIEMENS	149476	8 DIGITAL INPUT MODULE
	1	TXM1.6R-M	SIEMENS	149476	6 RELAY OUTPUT MODULE W/OVD

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NANUET BOND PHASE3 HIGH SCHOOL
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HIGHPXM03 (BOM)

440P-366733
0

E02

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PXCM -00000 PXC100-PE96.A

PXC MODULAR

Module: 1 / Rail: 1

TXIO- 0000X TXS1.12F4

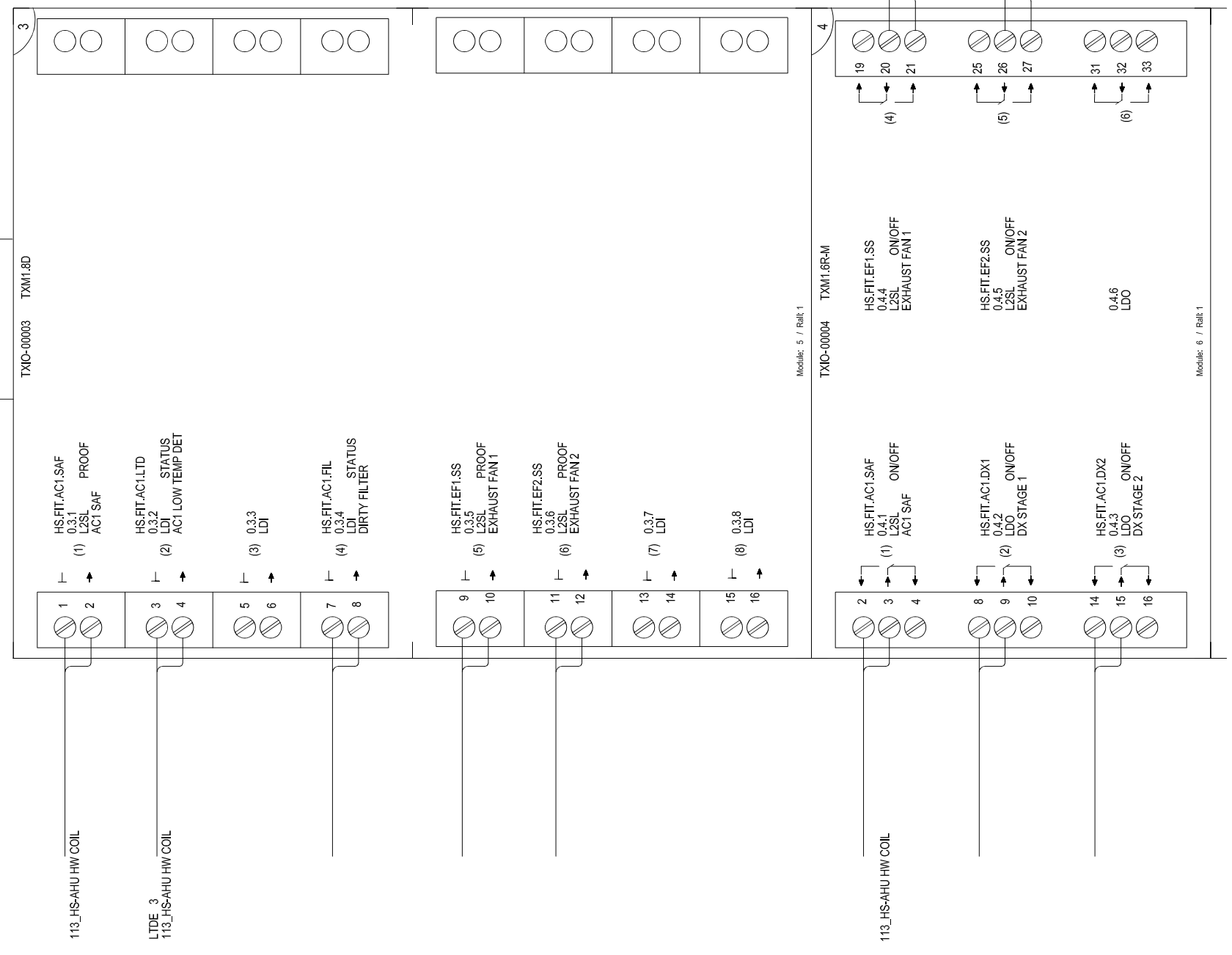
POWER SUPPLY 24 Volt 4A

Module: 2 / Rail: 1

TXIO-00001 TXM1.8X

1

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NANUET BOND PHASE3 HIGH SCHOOL
NANUET, NY

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HIGHPXM03 (LAYOUT)

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Control Device	Qty	Product Number	Manufacturer	Document Number	Description
Existing Equipment To Remain					
PXCM 5	1	PXC100-PE96.A	SIEMENS	149478	PXC MOD, P2, TX-I/O, 96 NODE, APOGEE
	1	PXX-485.3	SIEMENS	149478	PXC MOD EXPANSION MODULE, 3 RS-485
	1	TXA1.K24	SIEMENS	149476	@ADDRESS KEY 1-24
	1	TXS1.12F4	SIEMENS	149476	24VDC SUPPLY 1200MA, 4 A FUSE
	1	TXM1.8X	SIEMENS	149476	8 UNIV I/O MODULE W/ 4-20MA
	2	TXM1.8X-ML	SIEMENS	149476	8 UNIV I/O W/ 4-20MA, OVD&LCD
	1	TXM1.16D	SIEMENS	149476	16 DIGITAL INPUT MODULE
	1	TXM1.6R-M	SIEMENS	149476	6 RELAY OUTPUT MODULE W/OVD

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SIEMENS INDUSTRY, INC.
SMART INFRASTRUCTURE

412 MT KEMBLE AVE.
MORRISTOWN
NJ. 07960 USA
Phone: (973) 575-6300
Fax: (973) 575-7968

NANUET BOND PHASE3 HIGH SCHOOL
NANUET, NY

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
VB	VB	NSK	02/16/24	02/16/24

HIGHPXM05 (BOM)

440P-366733
0

E03

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PXCM -00000 PXC100-PE96.A

PXC MODULAR

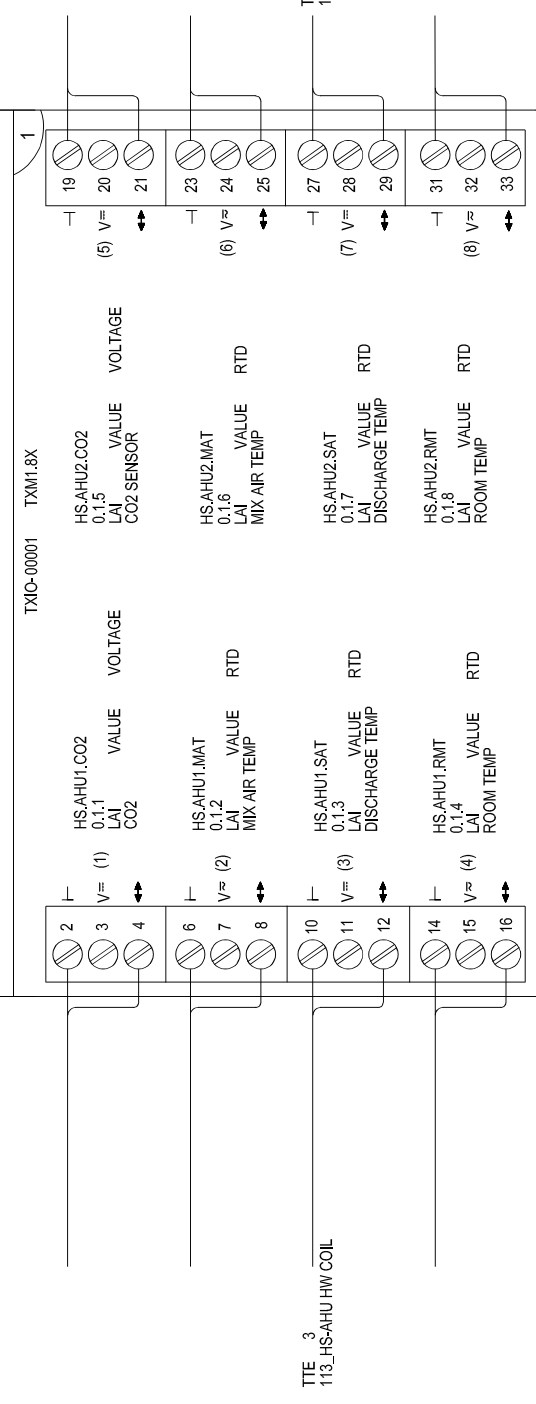
Module: 1 / Rail: 1

TXIO- 0000X TXS1.12F4

POWER SUPPLY 24 Volt 4A

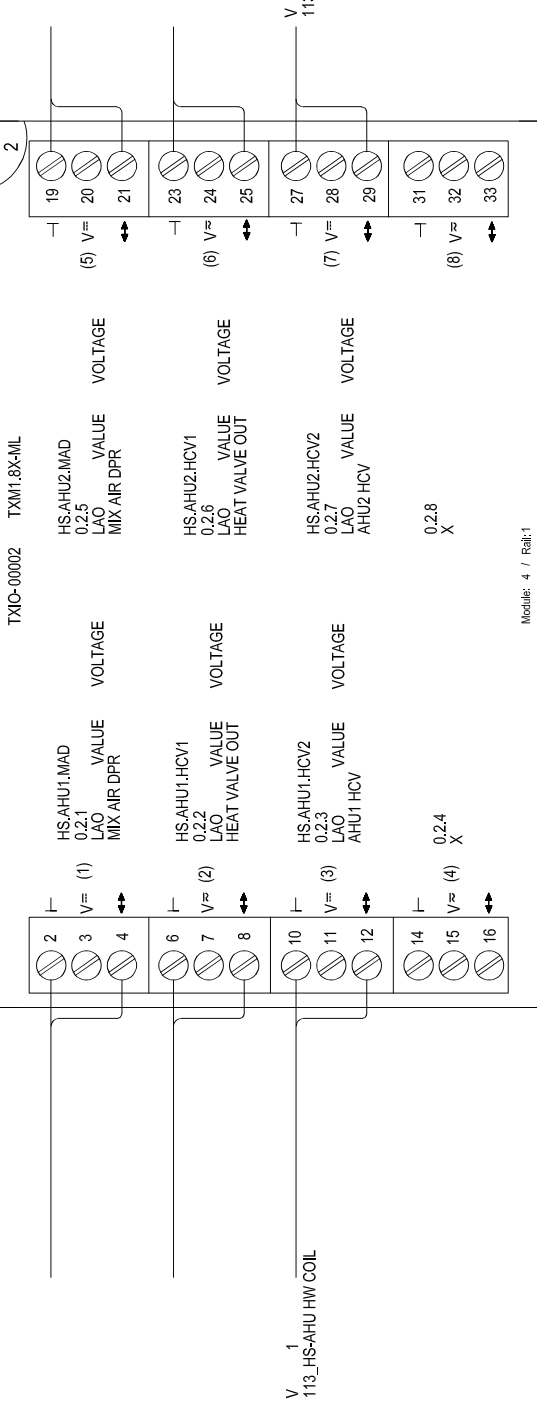
Module: 2 / Rail: 1

TXIO-00001 TXM1.8X



Module: 3 / Rail: 1

TXIO-00002 TXM1.8X-ML



Module: 4 / Rail: 1

REVISION HISTORY

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NANUET BOND PHASE3 HIGH SCHOOL
NANUET, NY

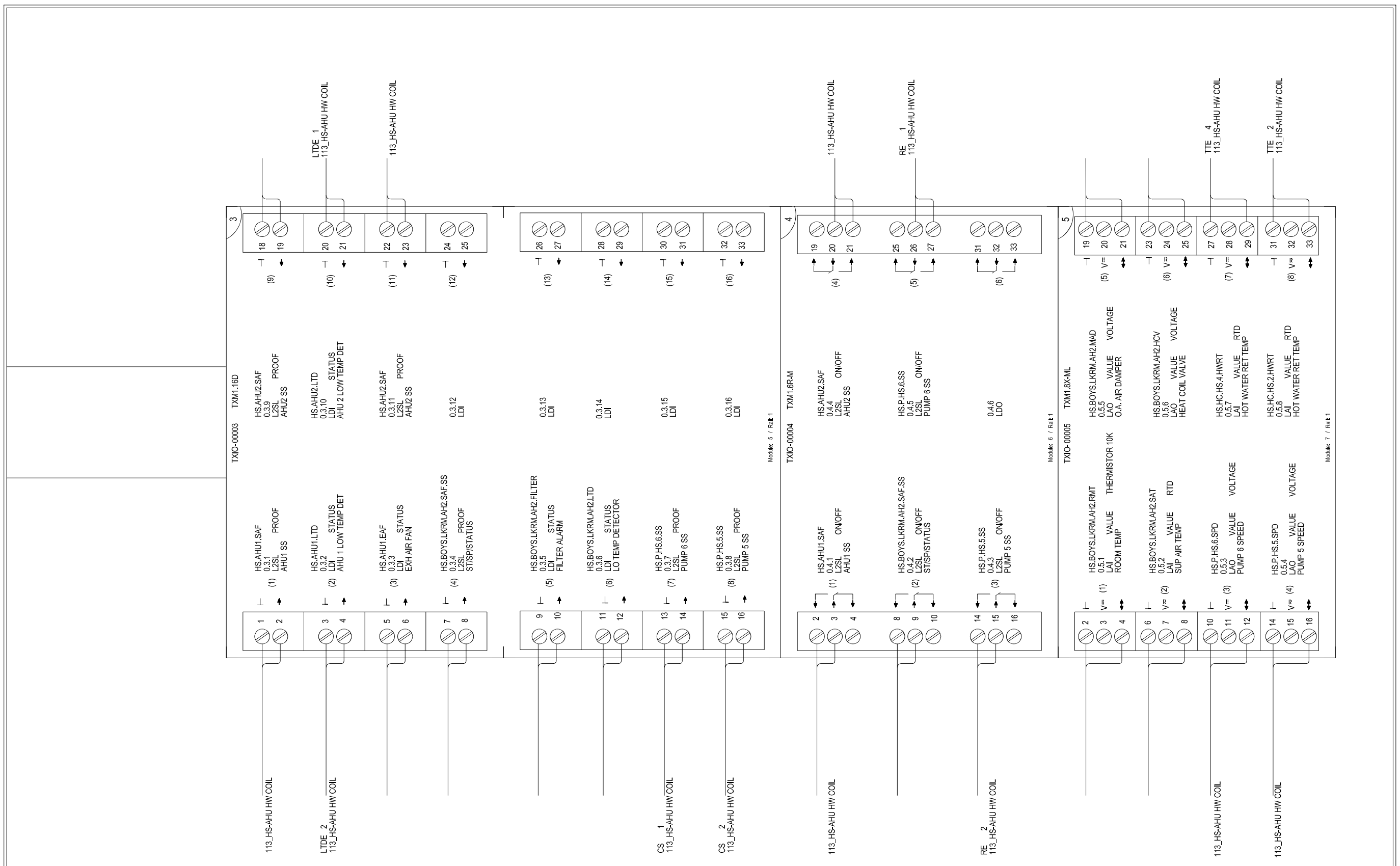
ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
VB	VB	NSK	02/16/24	02/16/24

HIGHPXM05 (LAYOUT)

440P-366733
0
E03A

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C:\USERS\Z004PB8F\ONEDRIVE - SIEMENS AG\BNJ2 BAU NANUET BOND PHASE 3 HIGH SCHOOL_440P-366733\DT\MDT_HIGH SCHOOL\HIGHSPXM05.DWG



REVISION HISTORY

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NANUET BOND PHASE3 HIGH SCHOOL
NANUET, NY

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
VB	VB	NSK	02/16/24	02/16/24

HIGHPXM05 (LAYOUT)

440P-366733
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E03B

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Control Device	Qty	Product Number	Manufacturer	Document Number	Description
Field Mounted Devices					
ENC 1	1	PXA-ENC19	SIEMENS	149475	ENCLOSURE ASSY 19"
PXCC 1	1	PXC24.3-UCM.A	SIEMENS	149837	APOGEE 24 PT, UEC BAC MSTP RS485
PXCC 2	1	PXC24.3-UCM.A	SIEMENS	149837	APOGEE 24 PT, UEC BAC MSTP RS485
Panel Mounted Devices					
PXCM 1	1	PXC100-E96.A	SIEMENS	149478	PXC MOD, BACNET, TX-I/O, 96 NODE, APOGEE
	1	TXA1.K24	SIEMENS	149476	@ADDRESS KEY 1-24
	1	TXS1.12F4	SIEMENS	149476	24VDC SUPPLY 1200MA, 4 A FUSE
	1	TXM1.6R-M	SIEMENS	149476	6 RELAY OUTPUT MODULE W/OVD
	1	TXM1.8X	SIEMENS	149476	8 UNIV I/O MODULE W/ 4-20MA
	1	TXS1.EF4	SIEMENS	149476	BUS CONNECTION MODULE, 4A FUSE
SB 1	1	PXA-SB115V192VA	SIEMENS	588783	SERVICE BOX 115V, 24VAC, 192VA

REVISION HISTORY

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NANUET BOND PHASE3 HIGH SCHOOL
NANUET, NY

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
VB	VB	NSK	02/16/24	02/16/24

NAN.HS.BAS.PXCM1 (BOM)

440P-366733
0
N01

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PXCM -00000 PXC100-E96.A

PXC MODULAR

Module: 1 / Rail: 1

REVISION HISTORY

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NANUET BOND PHASE3 HIGH SCHOOL
NANUET, NY

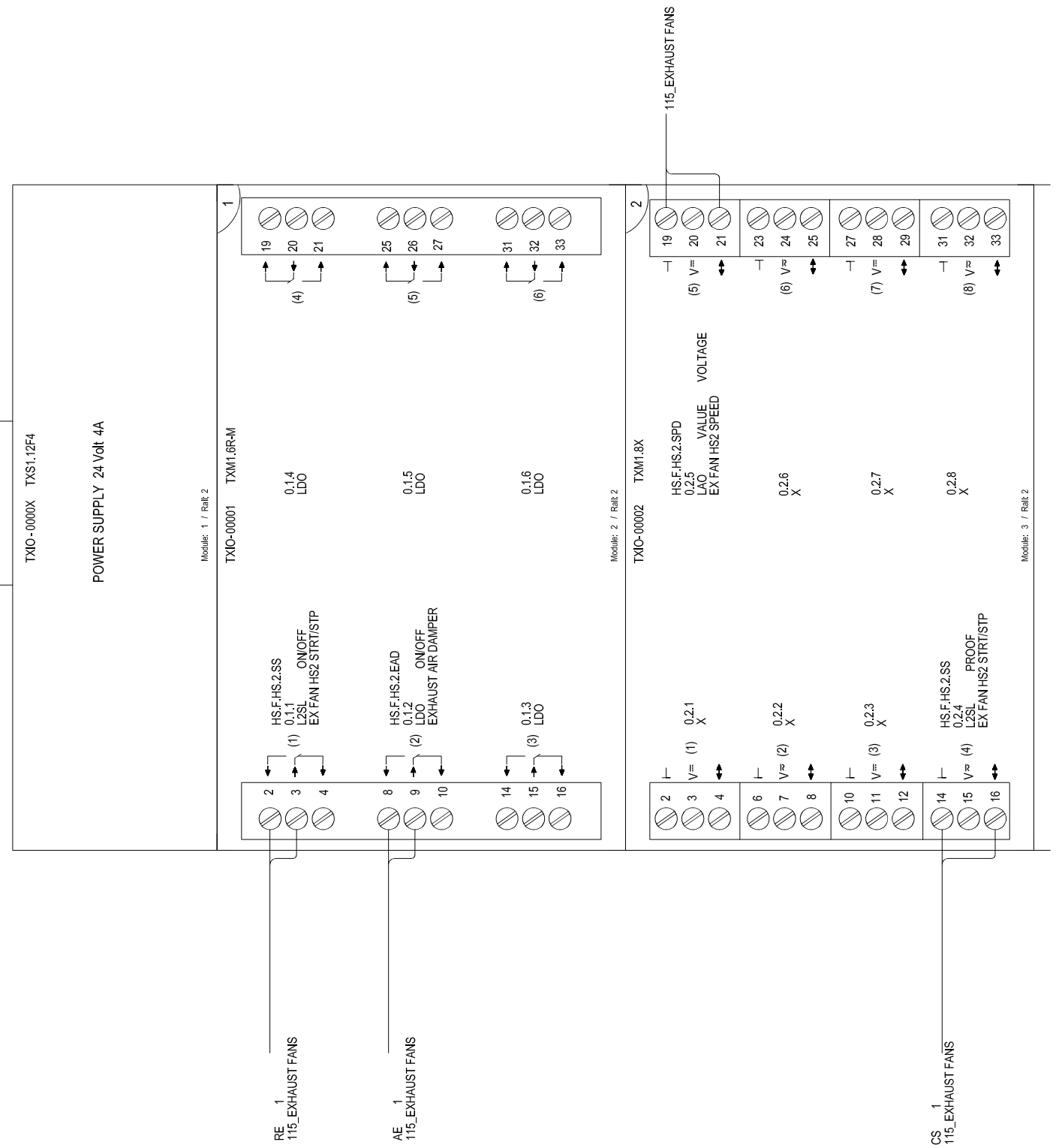
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VB	VB	NSK	02/16/24	02/16/24

NAN.HS.BAS.PXCM1 (LAYOUT)

440P-366733
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N01A

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NANUET BOND PHASE3 HIGH SCHOOL
NANUET, NY

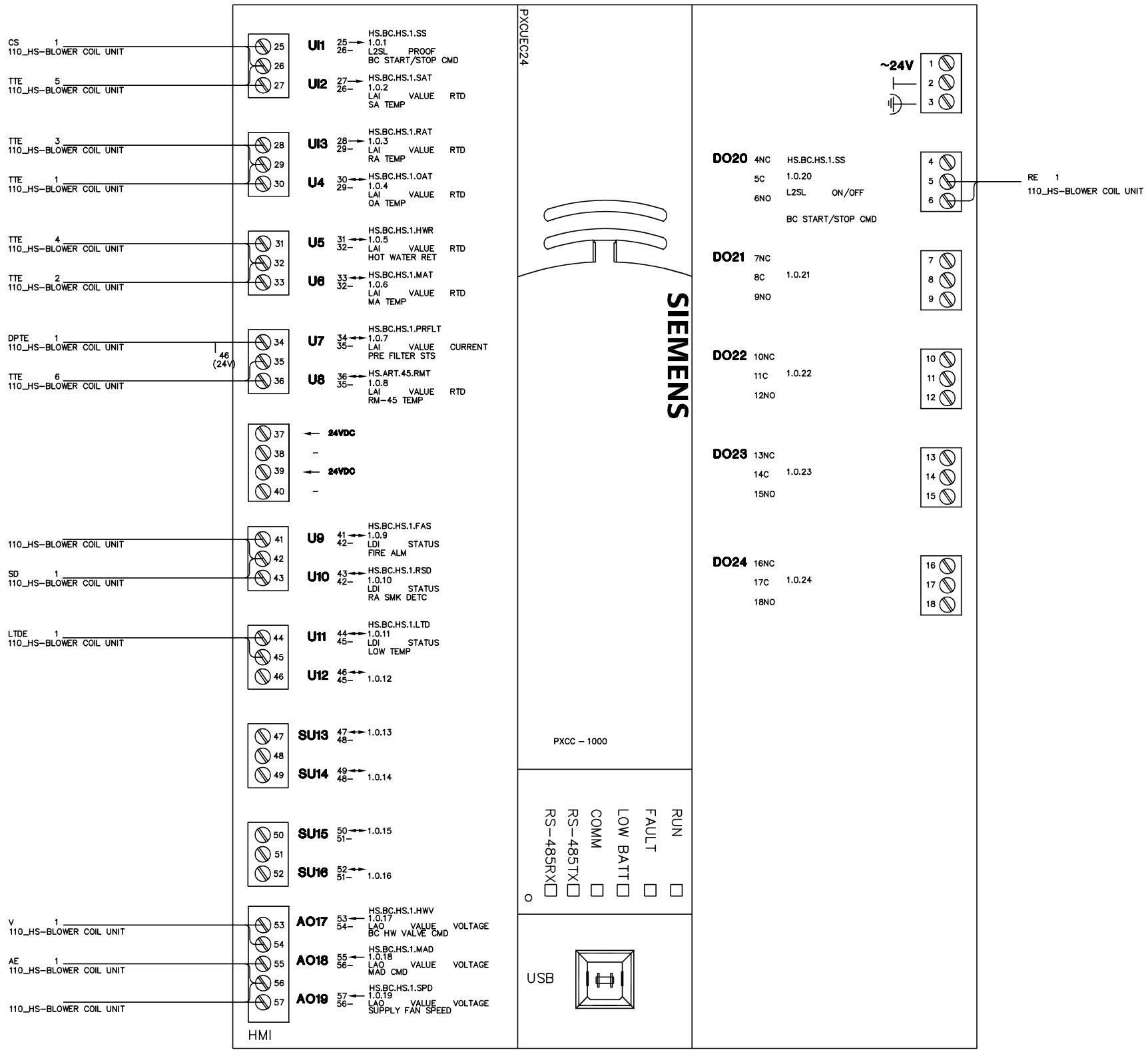
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VB	VB	NSK	02/16/24	02/16/24

NAN.HS.BAS.PXCM1 (LAYOUT)

440P-366733
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N01B

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NANUET BOND PHASE3 HIGH SCHOOL
NANUET, NY

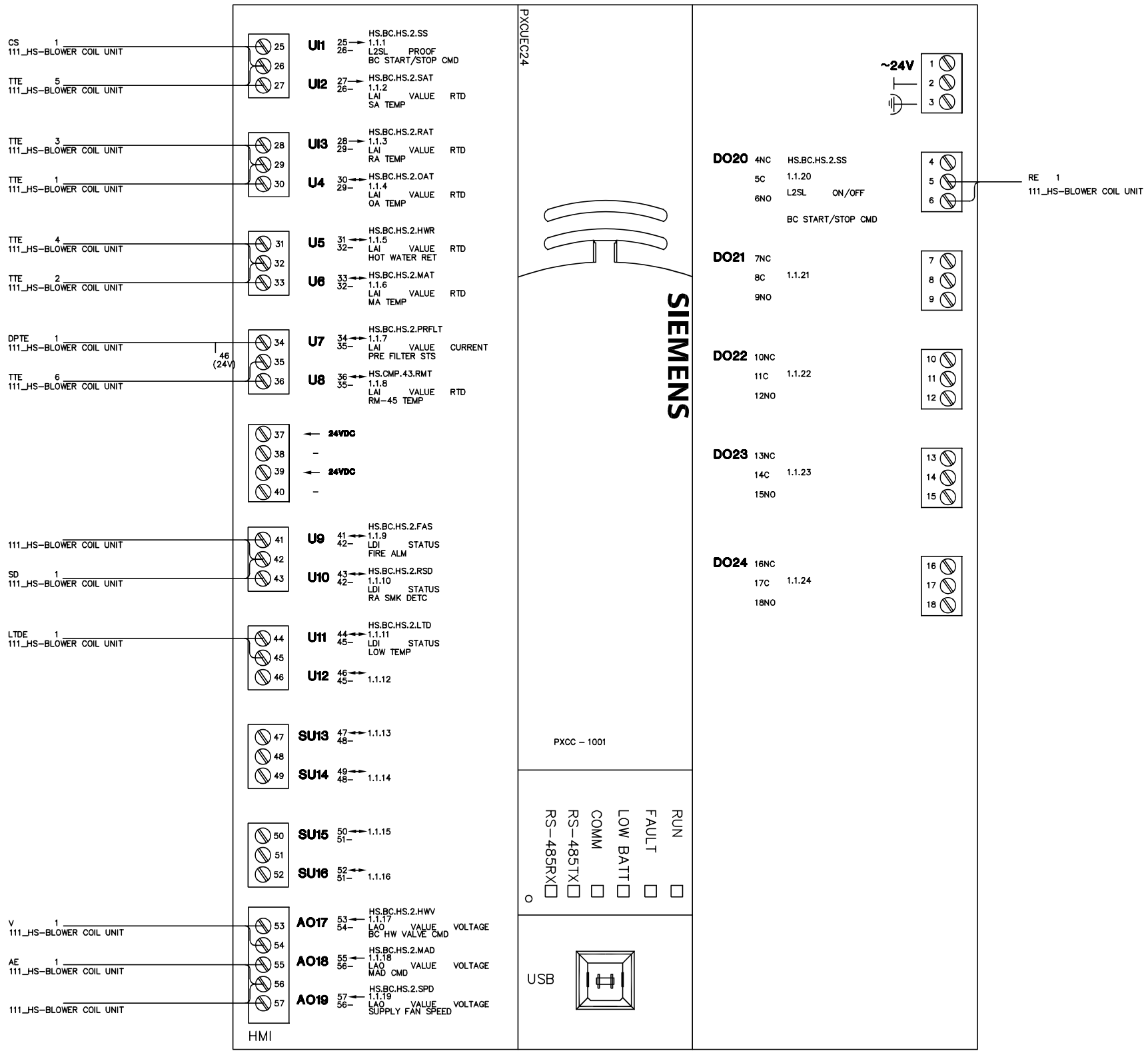
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VB	VB	NSK	02/16/24	02/16/24

NAN.HS.BAS.PXCC.BC1 (LAYOUT)

440P-366733
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N01C

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NANUET BOND PHASE3 HIGH SCHOOL
NANUET, NY

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
VB	VB	NSK	02/16/24	02/16/24

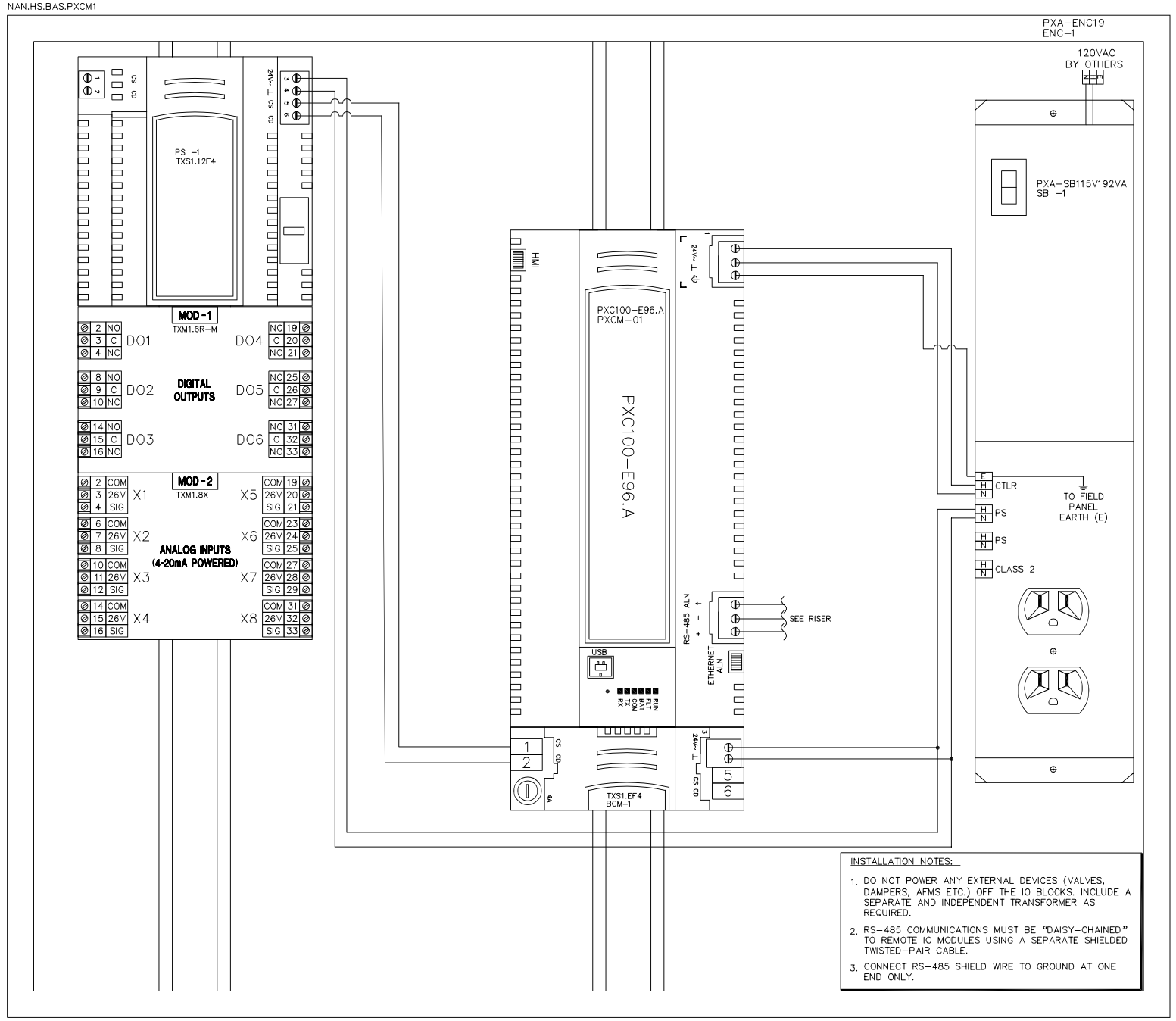
NAN.HS.BAS.PXCC.BC2 (LAYOUT)

440P-366733
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NAN.HS.BAS.PXCM1



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Fax: (973) 575-7968

NANUET BOND PHASE3 HIGH SCHOOL
NANUET, NY

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
VB	VB	NSK	02/16/24	02/16/24

NAN.HS.BAS.PXCM1 (INSTALLATION)

440P-366733
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N01E

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Control Device	Qty	Product Number	Manufacturer	Document Number	Description
Field Mounted Devices					
ENC 2	1	PXA-ENC19	SIEMENS	149475	ENCLOSURE ASSY 19"
XFMR 1	1	PSH500A	FUNCTIONAL DEVICES	1208cut143	PS FIVE 100VA C2 120-24VAC ENC
Panel Mounted Devices					
PXCM 2	1	PXC100-E96.A	SIEMENS	149478	PXC MOD, BACNET, TX-I/O, 96 NODE, APOGEE
	1	PXX-485.3	SIEMENS	149478	PXC MOD EXPANSION MODULE, 3 RS-485
	1	TXA1.K24	SIEMENS	149476	@ADDRESS KEY 1-24
	1	TXS1.12F4	SIEMENS	149476	24VDC SUPPLY 1200MA, 4 A FUSE
	1	TXM1.6R-M	SIEMENS	149476	6 RELAY OUTPUT MODULE W/OVD
	1	TXM1.8D	SIEMENS	149476	8 DIGITAL INPUT MODULE
	2	TXM1.8X	SIEMENS	149476	8 UNIV I/O MODULE W/ 4-20MA
	1	TXS1.EF4	SIEMENS	149476	BUS CONNECTION MODULE, 4A FUSE
SB 2	1	PXA-SB115V192VA	SIEMENS	588783	SERVICE BOX 115V, 24VAC, 192VA

REVISION HISTORY

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NANUET BOND PHASE3 HIGH SCHOOL
NANUET, NY

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
VB	VB	NSK	02/16/24	02/16/24

NAN.HS.FLR1.PXCM2 (BOM)

440P-366733
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N02

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PXCM -00000 PXC100-E96.A

PXC MODULAR

Module: 1 / Rail: 1

REVISION HISTORY			
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NANUET BOND PHASE3 HIGH SCHOOL
NANUET, NY

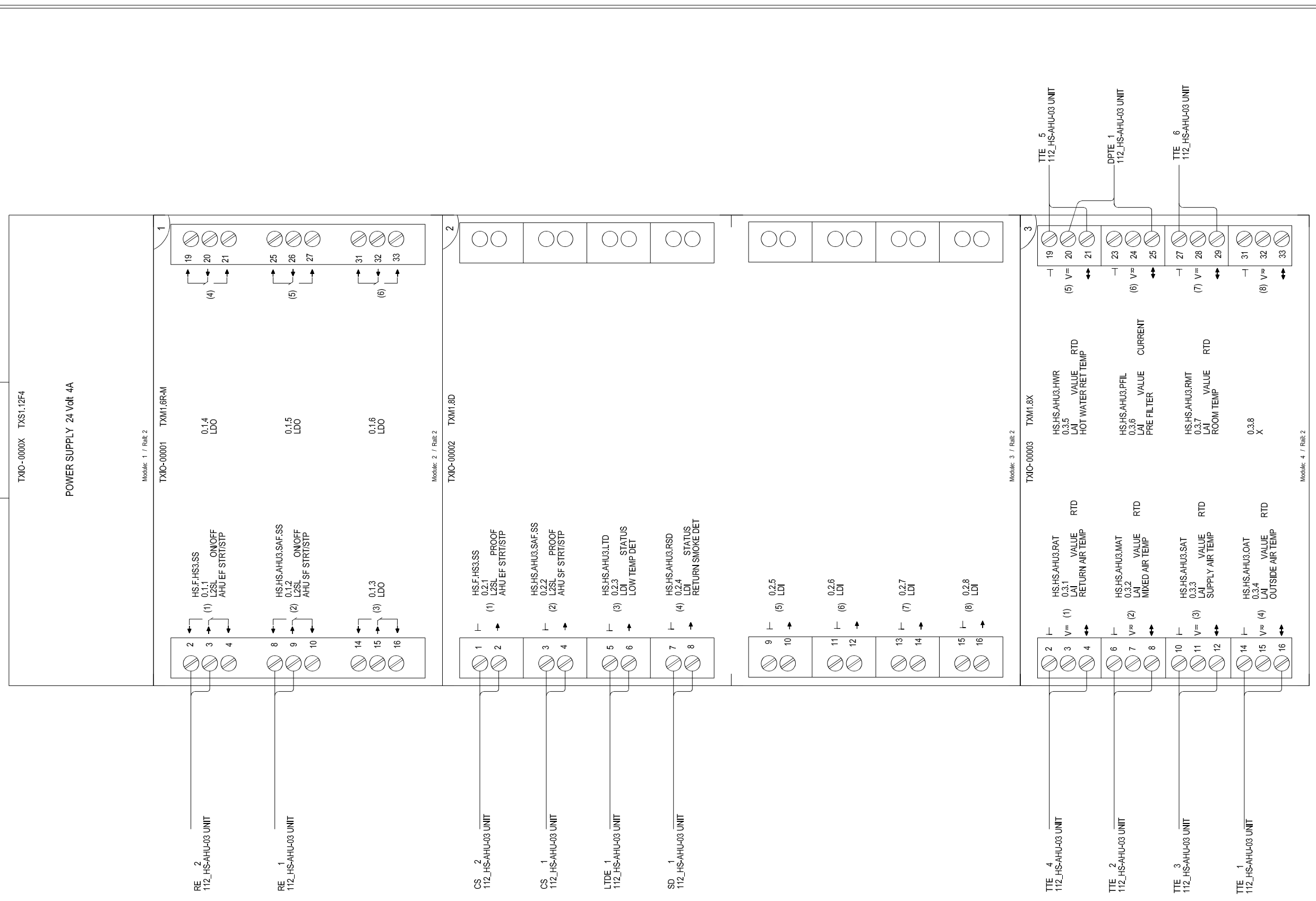
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VB	VB	NSK	02/16/24	02/16/24

NAN.HS.FLR1.PXCM2 (LAYOUT)

440P-366733
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N02A

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NANUET BOND PHASE3 HIGH SCHOOL
NANUET, NY

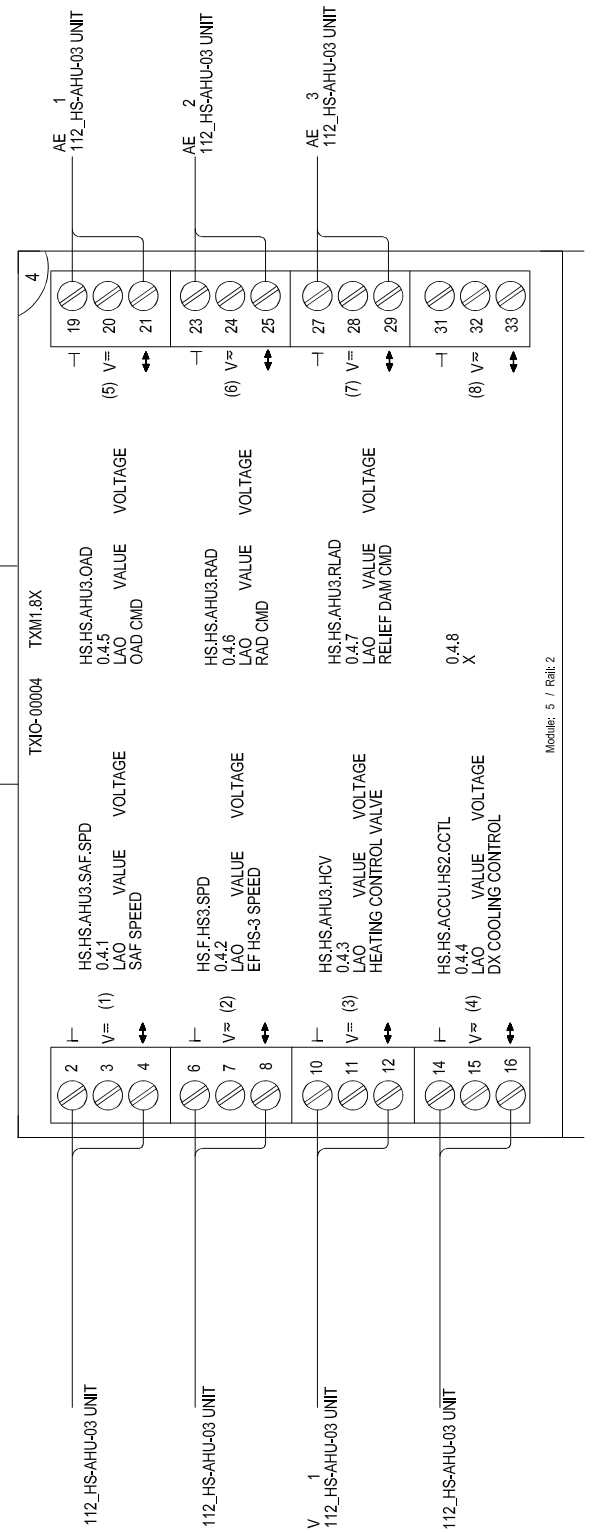
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440P-366733
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NANUET BOND PHASE3 HIGH SCHOOL
NANUET, NY

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
VB	VB	NSK	02/16/24	02/16/24

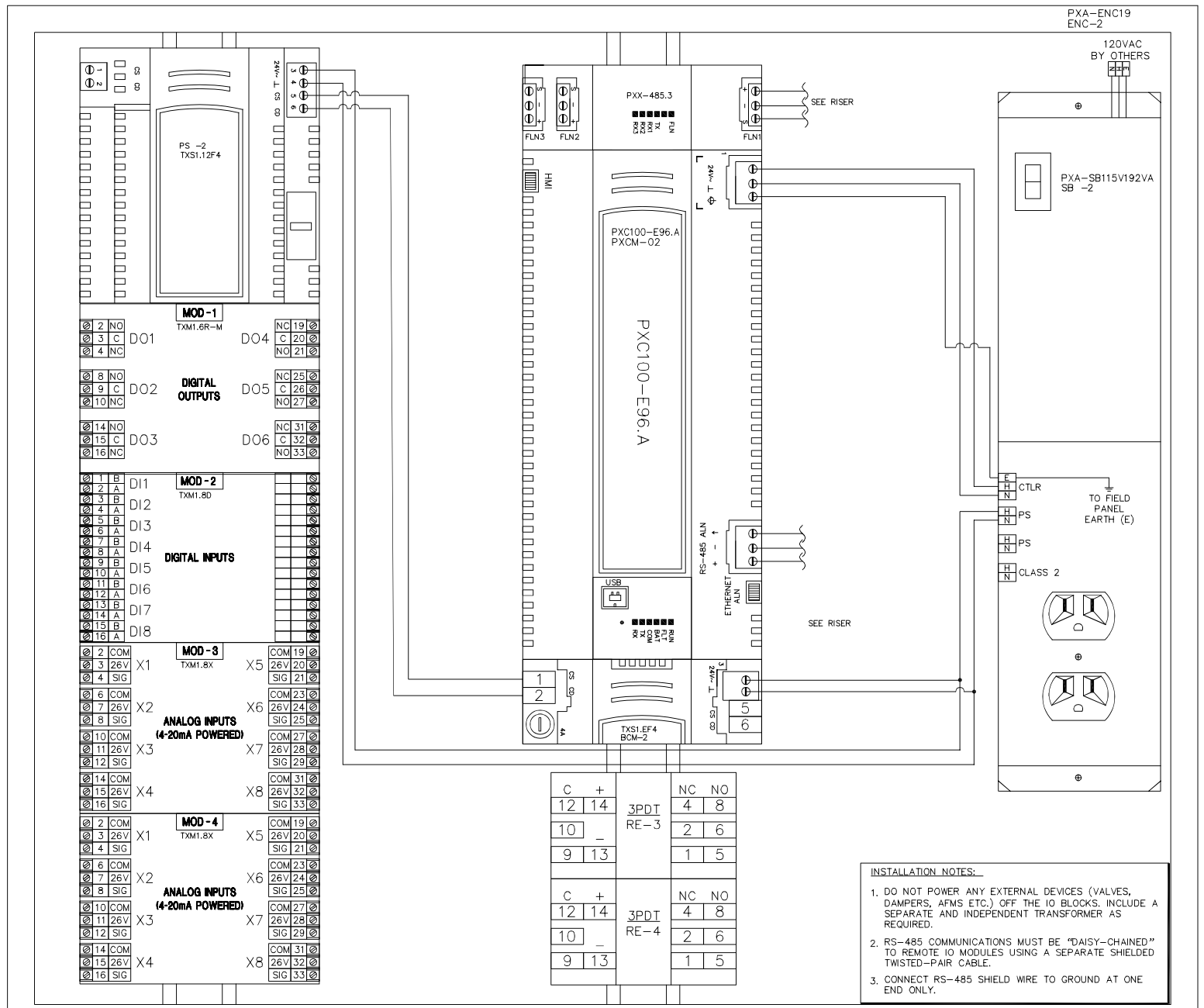
NAN.HS.FLR1.PXCM2 (LAYOUT)

440P-366733
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NAN.HS.FLR1.PXCM2



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NANUET BOND PHASE3 HIGH SCHOOL
NANUET, NY

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
VB	VB	NSK	02/16/24	02/16/24

NAN.HS.FLR1.PXCM2 (INSTALLATION)

440P-366733
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N02D

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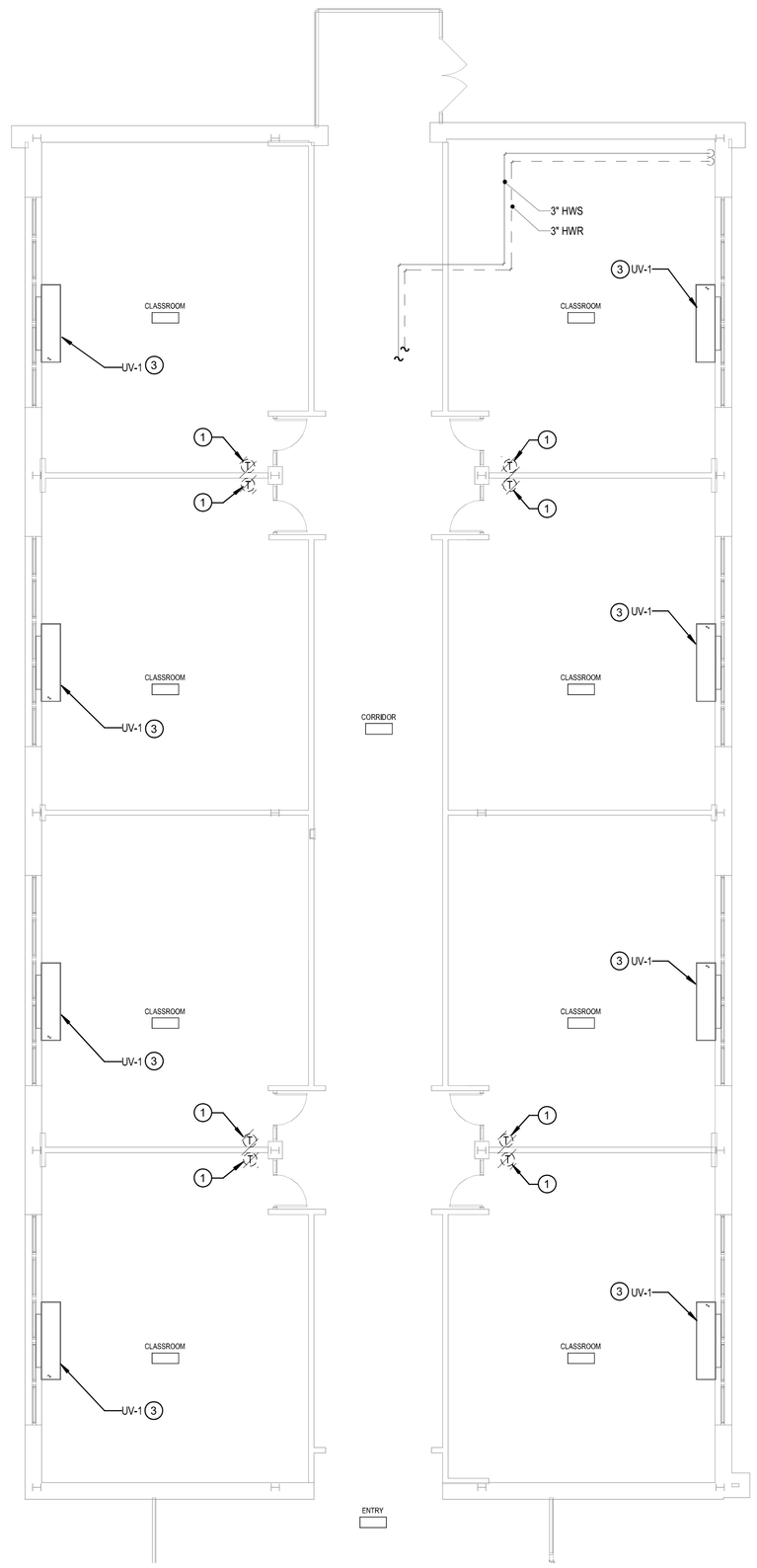
KEYED NOTES:

1. DISCONNECT AND REMOVE REMOTE SPACE TEMPERATURE SENSOR FOR THE EXISTING UNIT VENTILATOR.
2. PROVIDE REPLACEMENT SPACE TEMPERATURE SENSOR AT LOCATION SHOWN AND UTILIZE FOR SPACE TEMPERATURE CONTROL OF THE UNIT VENTILATOR AS REQUIRED. PROVIDE CONTROL WIRING BETWEEN SENSOR AND UNIT VENTILATOR DDC CONTROLLER AS REQUIRED.
3. DISCONNECT AND REMOVE FLOOR MOUNTED UNIT VENTILATOR INTREGRAL MICROTECH II CONTROLLER LOCATED WITHIN THE UNIT VENTILATOR ACCESS ENCLOSURE. DISCONNECT AND REMOVE ALL ASSOCIATED CONTROL WIRING BETWEEN CONTROLLER AND REMOVED SPACE THERMOSTAT AND BETWEEN CONTROLLER AND UNIT VENTILATOR SENSORS, RELAYS, DAMPER ACTUATORS, AND CONTROL VALVE AS REQUIRED. MAINTAIN UNIT VENTILATOR CONTROL VALVE, OA/RA DAMPER AND ACTUATOR, FACE&BYPASS DAMPER AND ACTUATOR.
4. PROVIDE DDC SYSTEM EQUIPMENT CONTROLLER WITHIN THE EXISTING ACCESS ENCLOSURE AREA OF EXISTING FLOOR MOUNTED UNIT VENTILATOR AT LOCATION SHOWN. PROVIDE DDC CONTROL POINTS PER CONTROL DRAWING LOCATED ON A10/HS-M602. PROVIDE CONTROL WIRING FROM DDC CONTROLLER TO WALL MOUNTED SPACE TEMPERATURE SENSOR. PROVIDE CONTROL WIRING BETWEEN DDC CONTROLLER AND EXISTING UNIT VENTILATOR HEATING WATER CONTROL VALVE AS REQUIRED. PROVIDE CONTROL WIRING BETWEEN DDC CONTROLLER AND EXISTING UNIT VENTILATOR OA/RA DAMPER ACTUATOR AND FACE&BYPASS DAMPER ACTUATOR. PROVIDE SENSORS AS OUTLINED AND PROVIDE CONTROL WIRING TO ALLOW START/STOP OPERATION OF EXISTING UNIT VENTILATOR MECHANICAL COOLING SYSTEM.

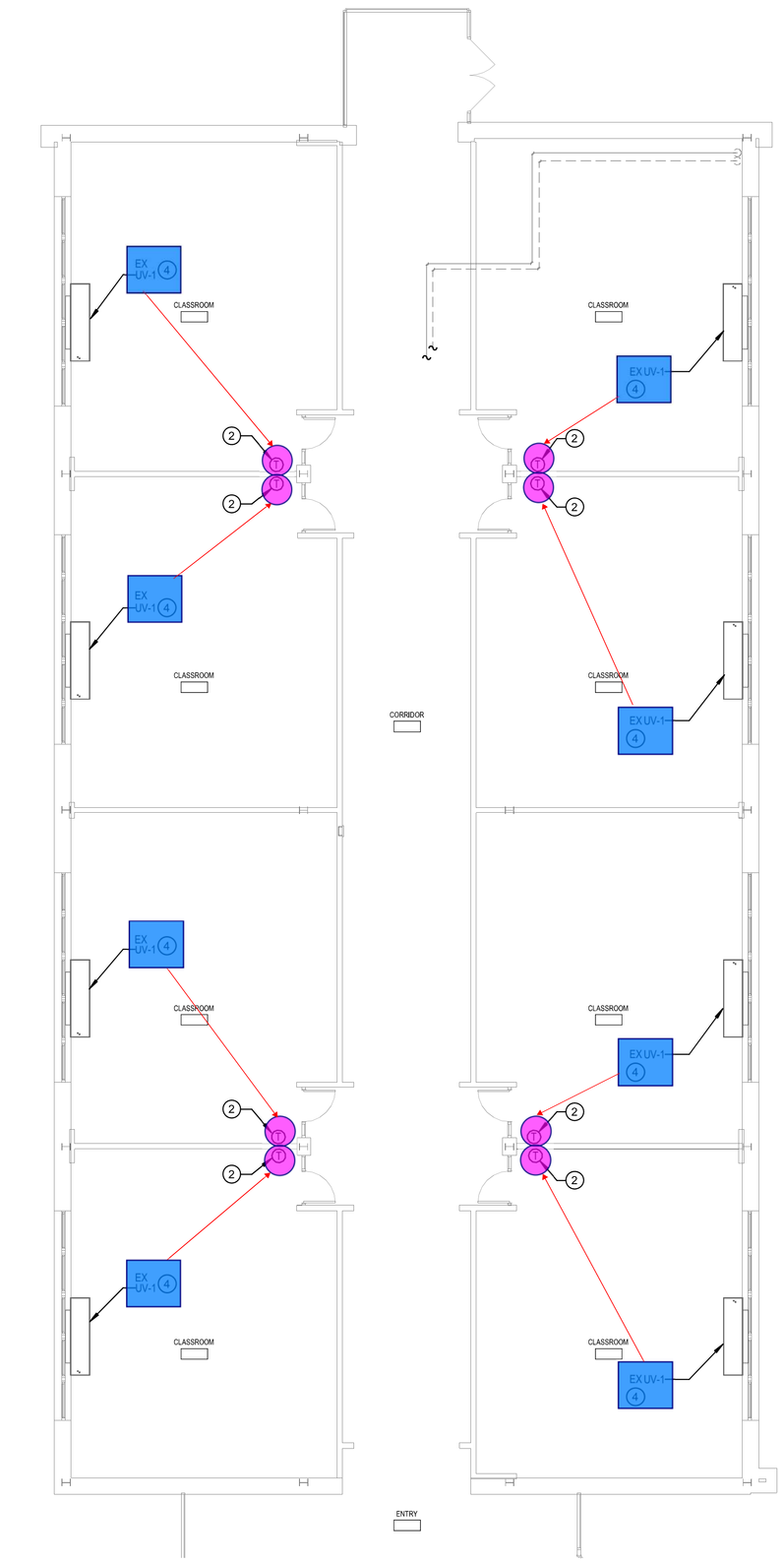
SIEMENS WALL SENSOR LOCATION DRAWING

LEGEND:

- EX UV-1 — EXISTING UNIT VENTILATOR
- T — EX UV-WALL SENSOR



A12 FIRST FLOOR REMOVALS - 2004 ADDITION
1/8" = 1'-0"



A6 FIRST FLOOR PLAN - 2004 ADDITION
1/8" = 1'-0"

ARCHITECT

ksqdesign

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New York, NY 10018
646.435.0660 office
www.ksq.design

Owner

Nanuet Union Free School District
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845.627.9880 office
http://www.nanuetsd.org/

Structural Engineer

Clapper Structural Engineering
160 Partition Street
Saugerties, NY 12477
845.943.9601
www.clapperstructural.com

MEP Engineer

Sage Engineering Associates, LLP
9 Columbia Circle
Albany NY 12203
518.453.6091 office
518.453.6092 fax
www.sagellp.com

Environmental Engineer

Quest Environmental Solutions
1376 Route 9
Wappingers Falls, NY 12590
845.298.6251
www.qualityenv.com

Construction Manager

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New York, NY 10119
646.908.6550
www.jacobs.com

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REGISTRATION EXPIRES: 11/30/2023

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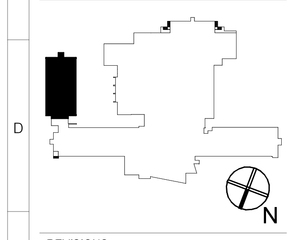
NUFSD BOND PROJECTS PH3

■ SED#50-01-08-03-0-003-035 (HIGH SCHOOL)
□ SED#50-01-08-03-0-004-020 (BARR MIDDLE SCHOOL)

High School
103 Church St.
Nanuet, NY 10954

Barr Middle School
50 Blauvelt Rd #1
Nanuet, NY 10954

KEY PLAN



REVISIONS

No.	Description	Date

ISSUED: BID SET ISSUANCE

DATE: 06/06/2023

SCALE: 1/8" = 1'-0"

SHEET NAME:
2004 ADDITION HVAC REMOVAL AND INSTALL PLANS

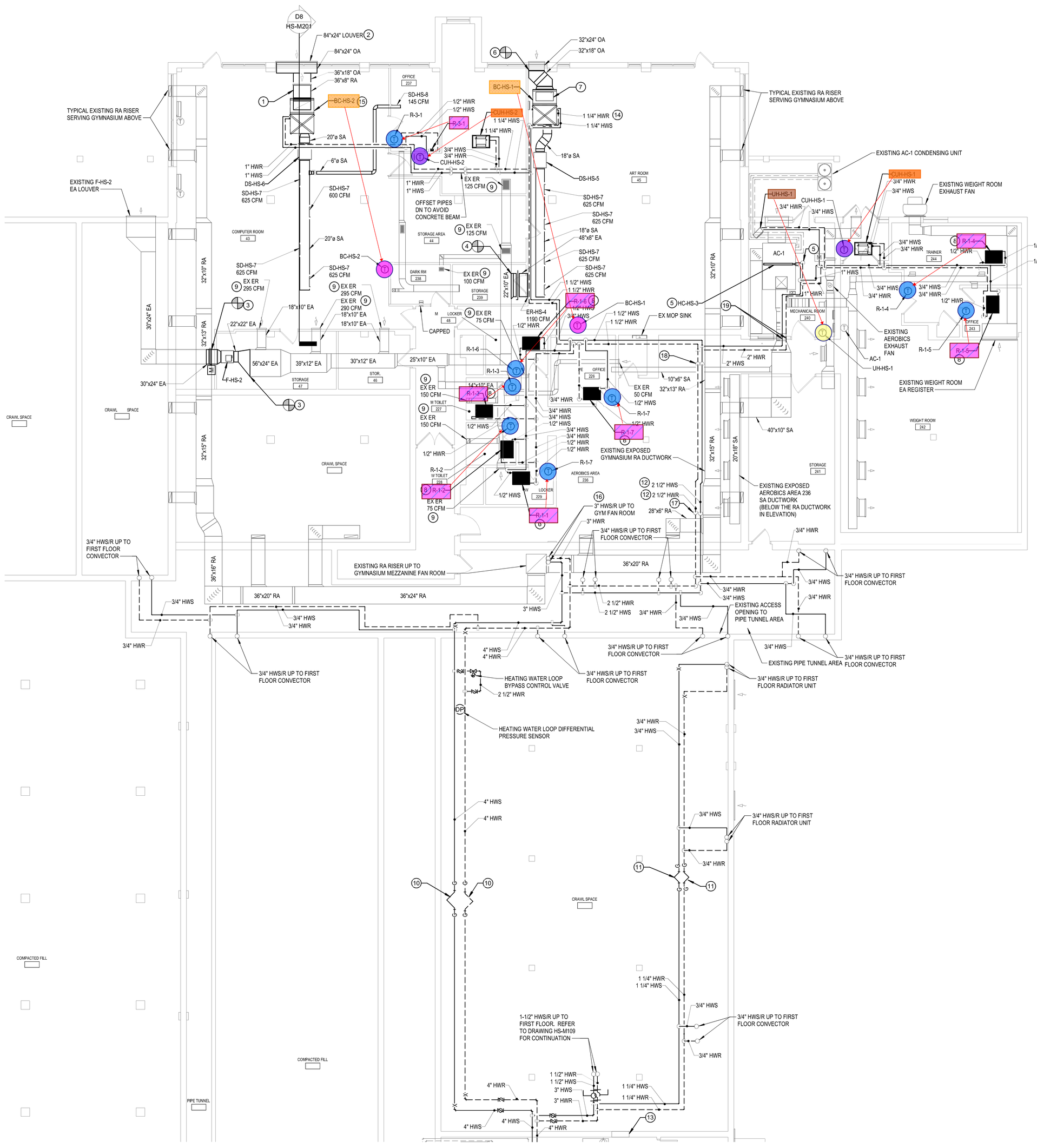
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PROJECT NUMBER: 2111002.00

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KEYED NOTES:

1. PROVIDE 36"x18" OUTSIDE AIR DUCTWORK TO REAR INLET OPENING ON BLOWER COIL BC-HS-2 MIXING BOX, PROVIDE 36"x18" RISER OUT OF TOP RA INLET ON BC-HS-2 MIXING BOX. THEN PROVIDE A TRANSITION ELBOW TO 36"x5" RA DUCTWORK. ROUTE 36"x8" RETURN AIR DUCT STACKED ABOVE 36"x18" OUTSIDE AIR DUCT AND TERMINATE OPEN-ENDED WITH 1/4" GALVANIZED WIRE MESH SCREEN.
2. PROVIDE 84"x24" OUTSIDE AIR PLENUM CONNECTED TO 84"x24" LOUVER MOUNTED IN TOP OF EXISTING GLAZING SYSTEM PANEL AS OUTLINED ON THE ARCHITECTURAL DRAWINGS. ROUTE OA DUCTWORK FROM OA PLENUM TO REAR INLET MIXING BOX ON BC-HS-2 AS REQUIRED.
3. PROVIDE INLINE FAN F-HS-2 AT LOCATION SHOWN ABOVE SUSPENDED CEILING SYSTEM IN STORAGE ROOM 47. PROVIDE TRANSITIOINS FROM EXISTING EXHAUST AIR DUCTWORK TO INLET AND OUTLET CONNECTIONS ON F-HS-2 AS REQUIRED. CONNECT 30"x24" EXHAUST AIR DUCT TO EXISTING 30"x24" EXHAUST AIR DUCT AT OUTLET OF FAN. CONNECT 22"x22" TO 56"x24" TRANSITION DUCT FITTING TO EXISTING 56"x24" EXHAUST AIR DUCT AT INLET OF FAN AS REQUIRED. PROVIDE A MOTORIZED DAMPER AT OUTLET OF FAN IN EA DUCTWORK. DISCONNECT/REMOVE/REINSTALL SUSPENDED CEILING SYSTEM IN STORAGE 47 AS REQUIRED TO INSTALL FAN AND ASSOCIATED INLET AND OUTLET EA DUCTWORK.
4. CONNECT 48"x8" EXHAUST AIR DUCT TO EXISTING 22"x10" EXHAUST AIR DUCT MAIN AT CONNECTION POINT SHOWN AND PROVIDE A WALL MOUNTED EA REGISTER WITHIN ART ROOM 45, MOUNTED ABOVE THE DOORWAY TO STORAGE ROOM 239.
5. PROVIDE A 59" WIDE x 33" HIGH HOT WATER HEATING COIL HC-HS-3 WITHIN EXISTING AIR HANDLER AC-1 HEATING COIL SECTION. AC-1 IS A TRANE MODEL LPCAC14D HORIZONTAL AIR HANDLING UNIT. COORDINATE INSTALLATION OF THE HEATING COIL WITHIN THE EXISTING AIR HANDLING UNIT HEATING COIL SECTION WITH THE LOCAL TRANE REPRESENTATIVE. PROVIDE 2" HWS/R DROPS DOWN TO THE HEATING COIL INLET AND OUTLET CONNECTION POINTS.
6. CONNECT 32"x18" OUTSIDE AIR INTAKE DUCT TO EXISTING 32"x24" OUTSIDE AIR INTAKE DUCT AT CONNECTION POINT SHOWN. ROUTE 32"x18" OUTSIDE AIR DUCT TO REAR INLET ON BLOWER COIL BC-HS-1 MIXING BOX.
7. PROVIDE TOP INLET RA OPENING ON BC-HS-1 MIXING BOX.
8. PROVIDE EXPOSED CEILING MOUNTED RADIATOR UNITS AT LOCATIONS SHOWN SUPPORTED FROM FLOOR DECK ABOVE.
9. BALANCE EXISTING EA REGISTER TO AIRFLOW AMOUNTS SHOWN WITH INLINE EXHAUST FAN F-HS-2 OPERATING AT FULL AIRFLOW CAPACITY.
10. PROVIDE 43.75" LONG x 18.875" WIDE V-TYPE, FLANGED EXPANSION LOOP AT LOCATIONS SHOWN ON THE 4" HWS/R MAINS. CAPABLE OF 3" +/- MOVEMENT. PROVIDE PIPE GUIDES AND ANCHORS AS SHOWN INSTALLED PER THE MANUFACTURER'S INSTRUCTIONS. SUPPORT THE RETURN BEND OF THE LOOP PER THE MANUFACTURER'S INSTRUCTIONS.
11. PROVIDE 26.25" LONG x 12" WIDE V-TYPE, SWEAT CONNECTION EXPANSION LOOP AT LOCATIONS SHOWN ON THE 1-1/4" HWS/R MAINS. CAPABLE OF 3" +/- MOVEMENT. PROVIDE PIPE GUIDES AND ANCHORS AS SHOWN INSTALLED PER THE MANUFACTURER'S INSTRUCTIONS. SUPPORT THE RETURN BEND OF THE LOOP PER THE MANUFACTURER'S INSTRUCTIONS.
12. ROUTE 2-1/2" HWS/R PIPING MAINS EXPOSED WITHIN AEROBICS AREA 236 PARALLEL IN HEIGHT WITH EXISTING EXPOSED RETURN DUCTWORK ROUTED NORTH-SOUTH THROUGH THE AERBOICS AREA. AND ABOVE THE EXPOSED SUPPLY AIR DUCTWORK SERVING THE AEROBICS AREA. PROVIDE PVC JACKETING OVER THE INSULATED 2-1/2" HWS/R PIPING MAINS.
13. LOCATION OF EXISTING 3-FOOT WIDE x 4-FOOT HIGH ACCESS DOOR OPENING TO CRAWLSPACE AREA FROM BOILER ROOM. ROUTE HWS/R PIPING BETWEEN BOILER ROOM AND AEROBICS AREA 236 WITHIN CRAWLSPACE AREA AS SHOWN. PROVIDE PVC JACKETING OVER THE INSULATED HWS/R PIPING LINESS WITHIN THE CRAWLSPACE.
14. ROUTE HWS/R PIPING MAINS EXPOSED WITHIN ART ROOM 45 ALONG EAST WALL OF ART ROOM. PROVIDE 1-1/4" HWS/R BRANCHES TO BLOWER COIL BC-HS-1 HEATING COIL AS REQUIRED. PROVIDE HEATING COIL ON LEFT HAND SIDE OF BLOWER COIL TO ALLOW COIL PULL TO WEST SIDE OF ART ROOM 45. PROVIDE PVC JACKETING OVER ALL EXPOSED INSULATED HWS/R PIPING. MOUNT BLOWER COIL EXPOSED IN ART ROOM 45 BELOW EXISTING NORTH-SOUTH CONCRETE BEAM. PROVIDE EXPOSED SPIRAL SA DUCTWORK OUT OF FRONT DISCHARGE OUTLET LOCATION ON BLOWER COIL.
15. MOUNT BLOWER COIL BC-HS-2 EXPOSED WITHIN WOODSHOP 43, PROVIDE EXPOSED SPIRAL SA DUCTWORK OUT OF FRONT DISCHARGE OUTLET LOCATION ON BLOWER COIL.
16. ROUTE 3" HWS/R PIPING APPROXIMATELY 22-FEET VERTICALLY FROM PIPING TUNNEL UP TO GYMNASIUM MEZZANINE FAN ROOM. ROUTE PIPING VERTICALLY THROUGH EXISTING VERTICAL CHASE OPENING.
17. ROUTE HWS/R PIPING MAINS BELOW EXISTING 28"x6" RA BRANCH AT LOCATION SHOWN, THEN PROVIDE A RISE UP AND ROUTE THE HWS/R PIPING MAINS WITH TOP OF PIPING EVEN WITH TOP OF EXISTING 32"X15" RA MAIN.
18. PROVIDE DROP IN ELEVATION ON THE HWS/R PIPING MAINS AT LOCATION SHOWN ONCE PAST THE EXISTING 10"X6" SA BRANCH.
19. ROUTE 2" HWS/R PIPING BRANCHES BELOW EXISTING SA DUCTWORK CONNECTED TO EXISTING AC-1 AND PENETRATE MECHANICAL ROOM 240 WALL BELOW AC-1 SA DUCTWORK AS SHOWN.

LEGEND:

BC-HS-X	BLOWER COIL
T	BC-WALL SENSOR
CUH-HS-X	CABINET UNIT HEATER
T	CUH-WALL SENSOR
R-1-X	HEATING WATER RADIATION
T	RAD-WALL SENSOR
	UNIT HEATER
T	UH-WALL SENSOR

SIEMENS WALL SENSOR LOCATION DRAWING

A18 BASEMENT FLOOR PLAN
1/8" = 1'-0"

ARCHITECT

ksqdesign

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845.943.9601
www.clapperstructural.com

MEP Engineer

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Albany NY 12203
518.453.6091 office
518.453.6092 fax
www.sagellp.com

Environmental Engineer

Quest Environmental Solutions
1376 Route 9
Wappingers Falls, NY 12590
845.298.6251
www.qualityenv.com

Construction Manager

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One Penn Plaza
54th Floor, Suite 5420
New York, NY 10119
646.908.6550
www.jacobs.com

STATE OF NEW YORK JOHN VENDITTI LICENSED PROFESSIONAL ENGINEER 083994
REGISTRATION EXPIRES: 11/30/2023

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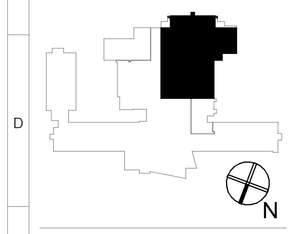
NUFSD BOND PROJECTS PH3

■ SED#50-01-08-03-0-003-035 (HIGH SCHOOL)
□ SED#50-01-08-03-0-004-020 (BARR MIDDLE SCHOOL)

High School
103 Church St.
Nanuet, NY 10954

Barr Middle School
50 Blauvelt Rd #1
Nanuet, NY 10954

KEY PLAN



REVISIONS

No.	Description	Date

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SHEET NUMBER: HS-M107

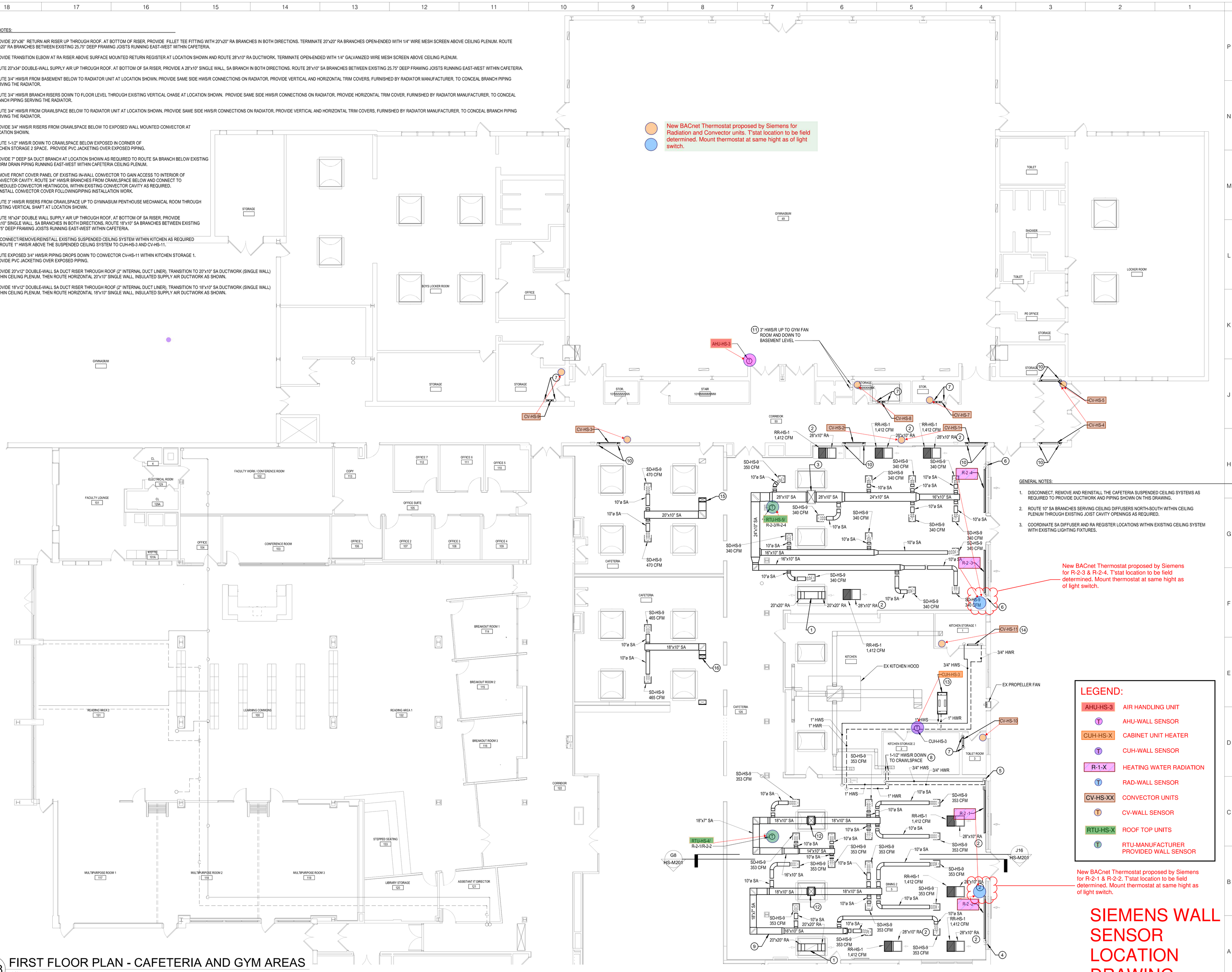
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PROJECT NUMBER: 2111002.00
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KEYED NOTES:

1. PROVIDE 20"x36" RETURN AIR RISER UP THROUGH ROOF. AT BOTTOM OF RISER, PROVIDE FILLET TEE FITTING WITH 20"x20" RA BRANCHES IN BOTH DIRECTIONS. TERMINATE 20"x20" RA BRANCHES OPEN-ENDED WITH 1/4" WIRE MESH SCREEN ABOVE CEILING PLENUM. ROUTE 20"x20" RA BRANCHES BETWEEN EXISTING 25.75" DEEP FRAMING JOISTS RUNNING EAST-WEST WITHIN CAFETERIA.
2. PROVIDE TRANSITION ELBOW AT RA RISER ABOVE SURFACE MOUNTED RETURN REGISTER AT LOCATION SHOWN AND ROUTE 28"x10" RA DUCTWORK. TERMINATE OPEN-ENDED WITH 1/4" GALVANIZED WIRE MESH SCREEN ABOVE CEILING PLENUM.
3. ROUTE 20"x34" DOUBLE-WALL SUPPLY AIR UP THROUGH ROOF. AT BOTTOM OF SA RISER, PROVIDE A 28"x10" SINGLE WALL, SA BRANCH IN BOTH DIRECTIONS. ROUTE 28"x10" SA BRANCHES BETWEEN EXISTING 25.75" DEEP FRAMING JOISTS RUNNING EAST-WEST WITHIN CAFETERIA.
4. ROUTE 3/4" HWS/R FROM BASEMENT BELOW TO RADIATOR UNIT AT LOCATION SHOWN. PROVIDE SAME SIDE HWS/R CONNECTIONS ON RADIATOR. PROVIDE VERTICAL AND HORIZONTAL TRIM COVERS, FURNISHED BY RADIATOR MANUFACTURER, TO CONCEAL BRANCH PIPING SERVING THE RADIATOR.
5. ROUTE 3/4" HWS/R BRANCH RISERS DOWN TO FLOOR LEVEL THROUGH EXISTING VERTICAL CHASE AT LOCATION SHOWN. PROVIDE SAME SIDE HWS/R CONNECTIONS ON RADIATOR, PROVIDE HORIZONTAL TRIM COVER, FURNISHED BY RADIATOR MANUFACTURER, TO CONCEAL BRANCH PIPING SERVING THE RADIATOR.
6. ROUTE 3/4" HWS/R FROM CRAWLSPACE BELOW TO RADIATOR UNIT AT LOCATION SHOWN. PROVIDE SAME SIDE HWS/R CONNECTIONS ON RADIATOR, PROVIDE VERTICAL AND HORIZONTAL TRIM COVERS, FURNISHED BY RADIATOR MANUFACTURER, TO CONCEAL BRANCH PIPING SERVING THE RADIATOR.
7. PROVIDE 3/4" HWS/R RISERS FROM CRAWLSPACE BELOW TO EXPOSED WALL MOUNTED CONVECTOR AT LOCATION SHOWN.
8. ROUTE 1-1/2" HWS/R DOWN TO CRAWLSPACE BELOW EXPOSED IN CORNER OF KITCHEN STORAGE 2 SPACE. PROVIDE PVC JACKETING OVER EXPOSED PIPING.
9. PROVIDE 7" DEEP SA DUCT BRANCH AT LOCATION SHOWN AS REQUIRED TO ROUTE SA BRANCH BELOW EXISTING STORM DRAIN PIPING RUNNING EAST-WEST WITHIN CAFETERIA CEILING PLENUM.
10. REMOVE FRONT COVER PANEL OF EXISTING IN-WALL CONVECTOR TO GAIN ACCESS TO INTERIOR OF CONVECTOR CAVITY. ROUTE 3/4" HWS/R BRANCHES FROM CRAWLSPACE BELOW AND CONNECT TO SCHEDULED CONVECTOR HEATINGCOIL WITHIN EXISTING CONVECTOR CAVITY AS REQUIRED. REINSTALL CONVECTOR COVER FOLLOWINGPIPING INSTALLATION WORK.
11. ROUTE 3" HWS/R RISERS FROM CRAWLSPACE UP TO GYMNASIUM PENTHOUSE MECHANICAL ROOM THROUGH EXISTING VERTICAL SHAFT AT LOCATION SHOWN.
12. ROUTE 16"x24" DOUBLE WALL SUPPLY AIR UP THROUGH ROOF, AT BOTTOM OF SA RISER, PROVIDE 18"x10" SINGLE WALL, SA BRANCHES IN BOTH DIRECTIONS. ROUTE 18"x10" SA BRANCHES BETWEEN EXISTING 25.75" DEEP FRAMING JOISTS RUNNING EAST-WEST WITHIN CAFETERIA.
13. DISCONNECT/REMOVE/REINSTALL EXISTING SUSPENDED CEILING SYSTEM WITHIN KITCHEN AS REQUIRED TO ROUTE 1" HWS/R ABOVE THE SUSPENDED CEILING SYSTEM TO CUH-HS-3 AND CV-HS-11.
14. ROUTE EXPOSED 3/4" HWS/R PIPING DROPS DOWN TO CONVECTOR CV-HS-11 WITHIN KITCHEN STORAGE 1. PROVIDE PVC JACKETING OVER EXPOSED PIPING.
15. PROVIDE 20"x12" DOUBLE-WALL SA DUCT RISER THROUGH ROOF (2" INTERNAL DUCT LINER), TRANSITION TO 20"x10" SA DUCTWORK (SINGLE WALL) WITHIN CEILING PLENUM, THEN ROUTE HORIZONTAL 20"x10" SINGLE WALL, INSULATED SUPPLY AIR DUCTWORK AS SHOWN.
16. PROVIDE 18"x12" DOUBLE-WALL SA DUCT RISER THROUGH ROOF (2" INTERNAL DUCT LINER), TRANSITION TO 18"x10" SA DUCTWORK (SINGLE WALL) WITHIN CEILING PLENUM, THEN ROUTE HORIZONTAL 18"x10" SINGLE WALL, INSULATED SUPPLY AIR DUCTWORK AS SHOWN.

New BACnet Thermostat proposed by Siemens for Radiation and Convector units. T'stat location to be field determined. Mount thermostat at same hight as of light switch.


STORAGE
GYMNASIUM
BOYS LOCKER ROOM
OFFICE
STORAGE
STORAGE
STOR.
STAIR
CORRIDOR
TOILET
SHOWER
TOILET
LOCKER ROOM
PE OFFICE
STORAGE
STORAGE
AHU-HS-3
11 3" HWS/R UP TO GYM FAN ROOM AND DOWN TO BASEMENT LEVEL
CV-HS-9
CV-HS-1
CV-HS-2
CV-HS-8
CV-HS-7
CV-HS-5
CV-HS-4
RR-HS-1 1,412 CFM
28"x10" RA
RR-HS-1 1,412 CFM
28"x10" RA
SD-HS-9 350 CFM
SD-HS-9 340 CFM
10"ø SA
R-2 -4
28"x10" SA
28"x10" SA
24"x10" SA
16"x10" SA
RTU-HS-5/ R-2-3/R-2-4
SD-HS-9 340 CFM
SD-HS-9 340 CFM
SD-HS-9 340 CFM

SIEMENS

PXC100-E96.A
PXC00-E96.A
PXX-485.3

Technical Specification Sheet
Document No. 149-487
April 1, 2023

PXC Modular Series for BACnet Networks



Figure 1. PXC Modular.

Description

The PXC Modular Series for BACnet networks is a high-performance modular Direct Digital Control (DDC) supervisory equipment controller, which is an integral part of the APOGEE Automation System. It is classified as a BACnet Building Controller (B-BC) and supports BACnet/IP and BACnet MS/TP protocols.

The field panel operates stand-alone or networked to perform complex control, monitoring, and energy management functions without relying on a higher level processor.

- Up to 100 PXC Modular field panels communicate on a peer-to-peer network.
- With the addition of TX-I/O modules and a TX-I/O Power Supply on a self-forming bus, the PXC Modular can directly control up to 500 points.

> See the *APOGEE Wiring Guidelines for Field Panels and Equipment Controllers (125-3002)* for information on setting up this configuration.

- With the addition of an Expansion Module, the PXC Modular also provides central monitoring and control for distributed wireless or wired Field Level Network (FLN) devices.

Features

- BACnet Testing Laboratories (BTL) certified Classified as BACnet Building Controllers (B-BC) using the BACnet/IP protocol and/or BACnet MS/TP, or BACnet Advanced Application Controllers (B-AAC) using the BACnet MS/TP protocol for specific models.
- Modular hardware components match initial control requirements while providing for future expansion.
- DIN rail mounted device with removable terminal blocks simplifies installation and servicing.
- Proven program sequences to match equipment control applications.
- Built-in energy management applications and DDC programs for complete facility management.
- Comprehensive alarm management, historical data trend collection, operator control, and monitoring functions.
- Sophisticated Adaptive Control, a closed loop control algorithm that auto-adjusts to compensate for load/seasonal changes (License required with Firmware revision 3.5.1 and higher).
- HMI RS-232 and USB ports, which provide laptop connectivity for local operation and engineering.
- Extended battery backup of Real Time Clock.
- Back-up battery protection eliminating the need for time-consuming program and database re-entry in the event of an extended power failure.
- The PXC Modular illuminates a “battery low” status LED and can send an alarm message to selected printers or terminals.
- Optional support for MS/TP or P1 FLN devices.
- Optional support for P1 Wireless FLN.
- Optional operation as a MS/TP or P1 device with default applications.

- PPCL performance during an internal database backup has been significantly improved. PPCL will consistently execute during the backup cycle.
- Unused Ethernet ports are now disabled and do not require the field panel to cold start.
- The handling of COV subscriptions for large databases has been improved.
- The HMI prompt was changed from A, N, **M** (Application/flNdevice/Mstp) to A, N, **B (Application/flNdevice/Bacnet)**; allowing the configuration of routed FLN types and clarifying that any BACnet device (MS/TP or IP) can be added to the BACnet ALN.
- The Available memory report has been extended to show installed Memory (physical memory installed in hardware), in addition to the existing metrics already provided:
  - Available RAM left
  - Number of Fragments of memory
  - Largest Contiguous memory
- Auto Save allows the database to be backed up to flash memory automatically whenever the database is changed, instead of being an operator-selected function. It does not provide any safeguard or protection against power loss.
- PXM10T and PXM10S support: Optional LCD Local user interface with HOA (Hand-off-auto) capability and point commanding and monitoring features.
- MS/TP Point Pickup Module (PPM) support: Universal Inputs can be configured for analog or digital input. Input/Output type is configured by writing to BACnet object properties.

The Simple Network Management Protocol (SNMP) Agent allows points in the field panel to communicate with an SNMP manager over Ethernet.

Hardware

PXC Modular

- The PXC Modular is a microprocessor-based multi-tasking platform for program execution and communication with other field panels. It scans field data, optimizes control parameters, and manages operator requests for data in seconds.
- The program and database information stored in the PXC Modular memory is protected with a battery backup. This eliminates the need for time-consuming program and database re-entry in the event of an extended power failure. When battery replacement is necessary, the PXC Modular illuminates a “battery low” status LED and can send an alarm message to selected printers or terminals.
- The PXC Modular firmware, including the operating system, is stored in non-volatile flash memory.
- The PXC Modular provides both an Ethernet port as well as an RS-485 port for communication on Automation Level Networks supporting either BACnet/IP or BACnet MS/TP.
- LEDs provide instant visual indication of overall operation, network communication, and battery status.
- Two self-forming buses are an integral part of the flexibility of the PXC Modular. A self-forming bus to the right of the controller (see Figure 3) supports up to 500 points through TX-I/O™ modules. Another self-forming bus to the left of the controller (see Figure 5) supports hardware connection to subsystems through Expansion Modules.

TX-I/O Modules

TX-I/O Modules are modular expansion I/O consisting of an electronics module and terminal base. The electronics modules perform A/D or D/A conversion, signal processing and point monitoring and command output through communication with the PXC Modular. The terminal bases provide for termination of field wiring and connection of a self-forming bus. For more information, see the *TX-I/O Product Range Technical Specification Sheet* (149-476).

TX-I/O Power Supply

The TX-I/O Power Supply provides power for TX-I/O modules and peripheral devices. Multiple Power Modules can be used in parallel to meet the power needs of large concentrations of I/O points (see Figure 2 and Figure 3). For more information, see the *TX I/O Product Range Technical Specification Sheet* (149-476).

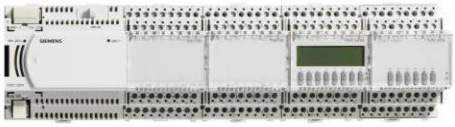


Figure 2. TX-I/O Power Supply and TX-I/O Modules.



Figure 3. PXC Modular, TX-I/O Power Supply, and TX I/O Modules.

PXC Modular Expansion Module

The PXC Modular Expansion Module (see Figure 4) provides the hardware connection for Field Level Network (FLN) devices.

Using the Triple RS-485 Expansion Module, the PXC Modular supports one RS-485 network of BACnet MS/TP devices (see Figure 5). With the Expansion Module the PXC Modular can also provide wireless FLN support.



Figure 4. RS-485 Expansion Module.



Figure 5. RS-485 Expansion Module and PXC Modular.

Modular Control Panels with Application Flexibility

The PXC Modular is a high performance controller with extensive flexibility. It can be customized with the exact hardware and program for the application. As a result, the user only purchases what is needed.

For example, in monitoring applications, the control panel can be customized with the number and type of points to match the sensor devices. For monitoring and controlling a large number of (on-off) fans or motors, more digital points can be added (see Figure 6).



Figure 6. PXC Modular, TX-I/O Power Supply, and TX I/O Modules.

Alternately, if no local point control is required, the PXC Modular can be used to monitor and control Field Level Network devices using the Expansion Module (see Figure 7).



Figure 7. RS-485 Expansion Module and PXC Modular.

Of course, the PXC Modular can be used for both direct point monitoring and control and as a system controller for Field Level Network devices (see Figure 8).



Figure 8. RS-485 Expansion Module, PXC Modular, TX-I/O Power Supply, and TX-I/O Modules.

In a stand-alone configuration, the PXC Modular can fulfill all requirements of a supervisory network coordinator by managing operation schedules and alarms and communicating for the connected devices.

The control program for each field panel is customized to exactly match the application. Proven Powers Process Control Language (PPCL), a “BASIC” type programming language, provides direct digital control and energy management sequences to precisely control equipment and optimize energy usage.

Available Options

Launch Pad

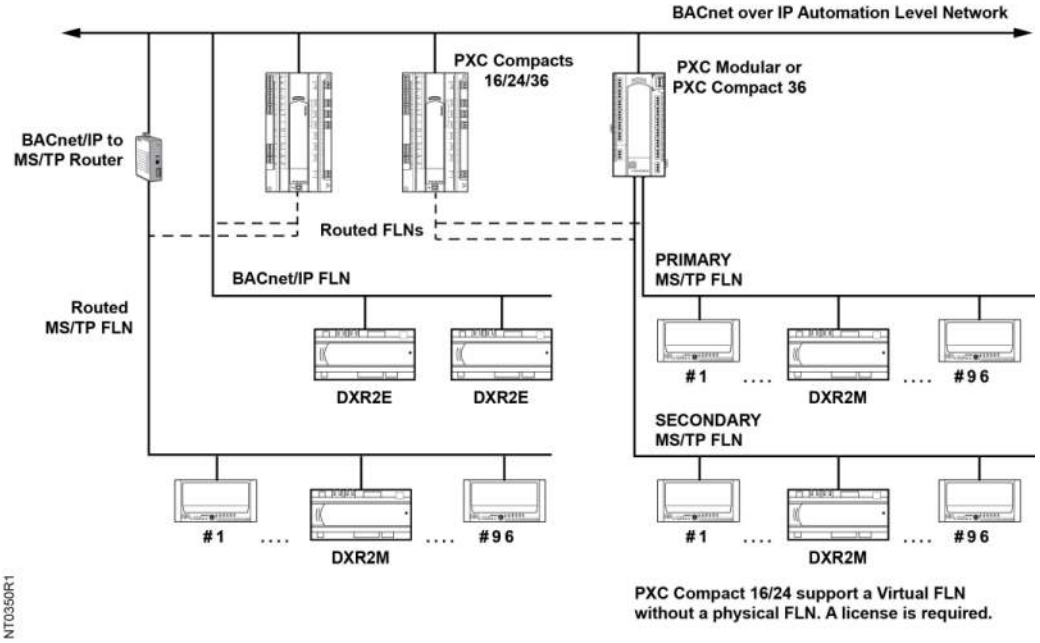
Siemens Launch Pad provides easy access to the applications required for configuring, monitoring, and controlling the Building Automation System. It allows you to deploy the Application MC tool to a field panel, load licenses, add shortcuts to other applications, and access user documentation.

The Launch Pad is an Adobe AIR-based application that allows you to do the following:

- Launch Adobe AIR-based UI that allows you to interact with Siemens Ethernet BACnet Field Panels and provides a more intuitive user interface for database interaction in comparison to line-by-line command prompts.
- Deploy browser-based Application MC to field panels.
- Deploy licenses to field panels.
- Add shortcut buttons so that other commonly-used Building Automation System applications are easily accessible and can be launched from Launch Pad.
- A shortcut button is automatically added, if WCIS has been installed along with Launch Pad.

Routed FLNs

A Routed FLN is a software configured network that allows you to group BACnet IP or MS/TP devices by network number. A network that resides in a field panel but does not have a physical connection to a piece of equipment.



Global Information Access

The HMI port supports operator devices, such as a local user interface or simple CRT terminal, and a phone modem for dial-in service capability. Devices connected to the operator terminal port gain global information access.

Multiple Operator Access

Multiple operators can access the network simultaneously. Multiple operator access ensures that alarms are reported to an alarm printer while an operator accesses information from a local terminal. When using the BACnet/IP ALN option, multiple operators may also access the controller through concurrent Telnet sessions and/or local operator terminal ports.

Menu Prompted, English Language Operator Interface

The PXC Modular includes a simple, yet powerful, menu-driven English Language Operator Interface that provides, among other things:

- Point monitoring and display
- Point commanding
- Historical trend collection and display for multiple points
- Event scheduling
- Program editing and modification via Powers Process Control Language (PPCL)
- Alarm reporting and acknowledgment
    - Continual display of dynamic information

Built-in Direct Digital Control Routines

The PXC Modular provides stand-alone Direct Digital Control (DDC) to deliver precise HVAC control and comprehensive information about system operation. It receives information from sensors in the building, processes the information, and directly controls the equipment. The following functions are available in the PXC Modular:

- Adaptive Control, an auto-adjusting closed loop control algorithm, which provides more efficient, adaptive, robust, fast, and stable control than the traditional PID control algorithm. It is superior in terms of response time and holding steady state, and at minimizing error, oscillations, and actuator repositioning.
- Closed Loop Proportional, Integral and Derivative (PID) control.
- Logical sequencing.
- Alarm detection and reporting.
    - Reset schedules.

Built-in Energy Management Applications

The following applications are programmed in the PXC Modular Series and require simple parameter input for implementation:

- Automatic Daylight Saving Time switchover
- Calendar-based scheduling
- Duty cycling
- Economizer control
- Equipment scheduling, optimization and sequencing
- Event scheduling
- Holiday scheduling
- Night setback control
- Peak Demand Limiting (PDL)
- Temperature-compensated duty cycling
    - Temporary schedule override

Modular Series Specifications

Dimensions (L × W × D)	
PXC Modular	7.56" × 3.54" × 2.76" (192 mm × 90 mm × 70 mm)
FLN Expansion Module	1.26" × 3.54" × 2.76" (32 mm × 90 mm × 70 mm)
DIN rail (EN 60715 TH 35-7.5, steel)	1.38" × 0.30" × 0.04" (35 mm × 7.5 mm × 1 mm)

Processor, Battery, and Memory	
Processor	MPC885 (PowerPC)
Processor Clock Speed	133 MHz
Memory	80 MB (64 MB SDRAM, 16 MB Flash ROM)
Serial EEPROM	4 KB
Secure Digital (SD) memory card (for future use)	Expandable or removable non-volatile memory
Battery backup of SDRAM	30 days (accumulated), AA (LR6) 1.5 Volt Alkaline (non-rechargeable)
Battery backup of Real Time Clock	12 months (accumulated), Coin cell (BR2032) 3 Volt lithium
Real Time Clock Initial Accuracy	±30 seconds/month typical @ 77°F (25°C)

Communication	
BACnet/IP Automation Level Network (ALN)	10Base-T or 100Base-TX compilant
BACnet MS/TP Automation Level Network (ALN) or Secondary BACnet MS/TP Field Level Network (FLN)	RS-485, 9600 bps to 115.2 Kbps, 1/8 Load
BACnet MS/TP Field Level Network (FLN) on PXX-485.3 Expansion Module	RS-485, 9600 bps to 115.2 Kbps, 1/8 Load
P1 Wired/Wireless Field Level Network (FLN) on PXX-485.3 Expansion Module	RS-485 x 3, 4800 bps to 38.4 Kbps, 1/8 load
TX-I/O self-forming bus connection	115.2 Kbps, 5 pin connector (middle pin is not connected)
Human-Machine Interface (HMI) Advanced User Mode	RS-232 compliant, 1200 bps to 115.2 Kbps (default)
USB Device port (for non-smoke control applications only)	Standard 1.1 and 2.0 USB device port, Type B female connector
USB Host port on selected models (for ancillary smoke control applications only).	Standard 1.1 and 2.0 USB host port, Type A female connector

Electrical Rating	
Power Requirements	24 Vac +/-20% input @ 50/60 Hz
Power Consumption (Maximum)	24 VA @ 24 Vac
AC Power	NEC Class 2
Communication	NEC Class 2

Operating Environment	
Ambient operating environment	Operate in a dry location, which is protected from exposure to salt spray or other corrosive elements. Exposure to flammable or explosive vapors must be prevented.
Ambient operating temperature	32°F to 122°F (0°C to 50°C)
Shipping and storage environment	-13°F to 158°F (-25°C to 70°C)
Relative Humidity	5% to 95% rh, non-condensing
Mounting Surface	Building wall or structural member (Do not mount on HVAC components or any other vibrating surface.) **CE Compliance** Requires installation inside a metal enclosure rated at IP30 minimum. **Smoke Control Applications** Requires installation inside a PX series enclosure
Vibration	Compliance to IEC 60721, 3M2, and 2M2
Protection to EN60529	IP 20

Agency Listings	
UL	UL 864 UUKL Smoke Control Equipment - Conforms to UL864 9th and 10th Edition. UL 864 UUKL7 Smoke Control Equipment - Conforms to UL864 9th and 10th Edition. CAN/ULC-S527-M8 UL 916 PAZX - Conforms to UL916 9th and 10th Edition. UL 916 PAZX7 - Conforms to UL916 9th and 10th Edition.
Agency Compliance	CFR47 Part 15, Class A; CFR47 Part 15, Class B - with metal enclosure, maximum opening Australian EMC Framework - with metal enclosure, maximum opening size is 34" European EMC Directive (CE) - with metal enclosure, maximum opening size is 34" RoHS Compliant UKCA - Electromagnetic Compatibility Regulations (S.I. 2016 No. 1091 / S.I. 2012 No. 3032)
OSHPD Seismic Certification	Product meets OSHPD Special Seismic Preapproval certification (OSH-0217-10) under California Building Code 2010 (CBC2010) and International Building Code 2009 (IBC2009) when installed within the following Siemens enclosure part numbers: PXA-ENC18, PXA-ENC19, or PXA-ENC34.
BTL	BACnet Testing Laboratories (BTL) Certified, Firmware Revision 3.0 and later

Electrical Disturbance Testing	
Dips and Interrupts	per EN 61000-4-11
Electrical Fast Transients (EPT)	per EN 61000-4-4, 1 kV signal, 2 kV AC power
Electrical Surge Immunity	per EN 61000-4-5 AC power: 2 kV common mode, 1 kV differential mode Signal lines: 1 kV CM, 5 kV DM
Electrostatic Discharge (ESD)	per EN 61000-4-2, 4 kV contact, 8 kV air discharge
RF Conducted Immunity	per EN 61000-4-6 @ 10V
RF Radiated Immunity	per EN 61000-4-3 @ 10V/m

Ordering Information

PXC Modular Series

Product Number	Description
PXC00-E96.A	PXC Modular, BACnet/IP or MS/TP ALN, P1 or MS/TP FLN. PXX-485.3 is a connection for FLN devices.
PXC100-E96.A	PXC Modular, BACnet/IP or MS/TP ALN, P1 or MS/TP FLN, self-forming TX-I/O Island Bus. PXX-485.3 is also required as the connection to the FLN devices.
PXX-485.3	Provides FLN support for the PXC Modular. Includes three RS-485 P1 FLN connections or one MS/TP FLN connection; maximum of 96 devices supported.

Optional Licenses

Product Number	Description
PXF-TXIO.A	License to enable the Island Bus on PXC00-E96.A and PXC00-PE96.A.
LSM-SNMP	License to enable SNMP Agent on Siemens Modular or Compact hardware with BACnet Firmware Revision 3.2.3
LSM-ADAPT	License to use the Adaptive Control added in FW 3.5.1/2.8.18 and later

*) Field Panel Web Services are no longer available for sale. Launch Pad is a free download available from X:\StdApps\APOGEE_Products_FW_SW\Integrated_Solutions.

Accessories

Product Number	Description
PXM10S	Controller mounted Operator Display module with point monitor and optional blue backlight
PXM10T	Controller mounted Operator Display module
PXA-HMI.CABLEP5	Serial cable required for PXM10T/S connection to PXC Series controllers.
PXA-MOD.CON	PXC Modular Connector Kit - Fits one PXC Modular

Service Boxes and Enclosures

Product Number	Description
PXA-SB115V192VA	PX Series Service Box—115V, 24 Vac, 50/60 Hz, 192 VA
PXA-SB115V384VA	PX Series Service Box—115V, 24 Vac, 50/60 Hz, 384 VA
PXA-SB230V192VA	PX Series Service Box—230V, 24 Vac, 50/60 Hz, 192 VA
PXA-SB230V384VA	PX Series Service Box—230V, 24 Vac, 50/60 Hz, 384 VA
PXA-ENC18	18" Enclosure (Utility Cabinet) (UL Listed NEMA Type 1 Enclosure)
PXA-ENC19	19” Enclosure (UL Listed NEMA Type 1 Enclosure)
PXA-ENC34	34” Enclosure (UL Listed NEMA Type 1 Enclosure)

Documentation

Product Number	Description
125-3582	PXC Modular Series Owner's Manual
125-1896	APOGEE Powers Process Control Language (PPCL) User's Manual

Disposal



The device is considered an electronic device for disposal in accordance with the European Guidelines and may not be disposed of as domestic garbage.

- Dispose of the device through channels provided for this purpose.
- Comply with all local and currently applicable laws and regulations.

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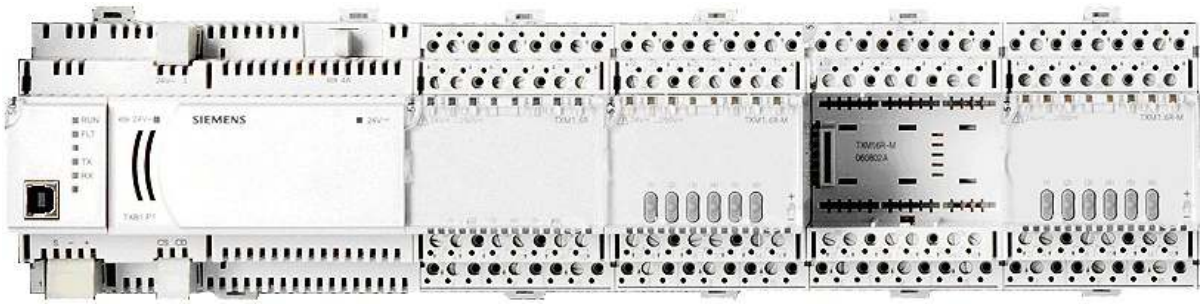
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SIEMENS

TXM1.8D
TXM1.8X
TXM1.6R-M
TXS1.12F4
TXS1.EF4
TXA1.K24

Technical Specification Sheet
Document No. 149-476
April 1, 2023

TX-I/O Product Range



Description

TX-I/O™ is a range of I/O modules, with associated power and communication modules, for use within the APOGEE Automation System. The TX-I/O product range includes the following:

- Eight types of I/O modules, which act as signal converters. The I/O modules communicate between the PXC Modular or the PXC-36 and the related devices in the building services plant.
- TX-I/O Power Supply for the TX-I/O modules.
- TX-I/O Bus Connection Module, which bridges communication and power from one DIN rail to another.
- TX-I/O Island Bus Expansion (IBE) module, which bridges communication between the primary field panel and expansion field panels.
- P1 Bus Interface Module (BIM), which connects TX-I/O modules to the P1 FLN. The P1 BIM provides power for TX-I/O modules, but it does not contain applications or perform control; the control database for the TX-I/O points resides in a field panel.

TX-I/O Modules provide I/O points for APOGEE based upon TX-I/O Technology. TX-I/O Technology provides flexibility of point types, tremendous flexibility of signal types and support for manual operation.

There are eight types of TX-I/O modules:

- 8 point DI module (TXM1.8D)
- 16 point DI module (TXM1.16D)
- 6 point DO with Relay module (TXM1.6R)
- 6 point DO with Relay and Manual Override module (TXM1.6R-M)
- 8 point Universal module (TXM1.8U)
- 8 point Universal with local override/identification device (LOID) module (TXM1.8U-ML)
- 8 point Super Universal module (TXM1.8X)
- 8 point Super Universal with LOID module (TXM1.8X-ML)

Features

- The *self-forming TX-I/O island bus* transmits power as well as communication signals.
  - The TX-I/O island bus can be extended a maximum of 164 feet (50 meters).
  - Adding an Island Bus Expansion (IBE) module expands communication data up to an additional maximum of 200 feet (61 m) in two directions.
- *Hot-swappable electronic components* allow powered electronics to be disconnected and replaced without removing terminal wiring or disturbing the self-forming bus.

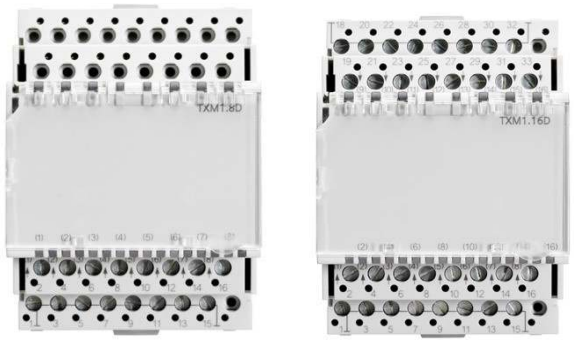
All TX-I/O modules include the following features:

- DIN rail mounting.
- High density (point count to physical dimensions).

- Hardware addressed with address keys.
- Removable label holder that allows for customized point labels.
- LEDs that provide status indication and diagnostic information for the I/O module, as well as for each point on the module.
- Separable into terminal base and plug-in I/O module electronics for:
  - Improved installation workflow, allowing field wiring to be terminated prior to installation of electronics.
  - Optimum diagnostics—connected peripheral devices can be measured without affecting or being affected by the I/O module.
  - Quick replacement of electronics for service.

Module Introduction

Digital Input Modules (TXM1.8D and TXM1.16D)

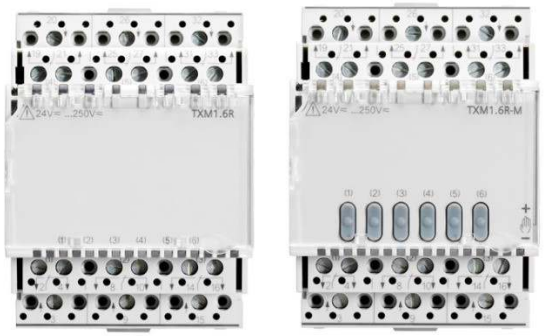


The TXM1.8D and TXM1.16D are dedicated to monitoring, respectively, 8 and 16 digital input points.

- They monitor status signals from normally open (NO) or normally closed (NC), latched voltage free/dry contacts.
- All 8 points on the TXM1.8D module, as well as 8 of the 16 points on the TXM1.16D module, may be used as pulse counters up to 10 Hz.
- Each input point has a green LED for status indication.

NOTE: No potential (dry contact) for all points.

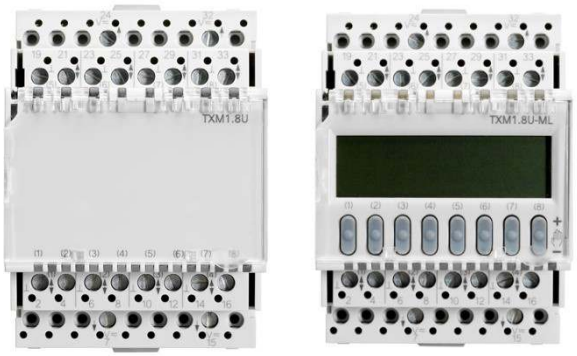
Digital Output Modules (TXM1.6R and TXM1.6R-M)



The TXM1.6R and TXM1.6R-M Digital Output Modules provide six NO or NC (form C), maintained or pulsed, voltage free/dry contacts.

- The contacts are rated for a maximum of 250 Vac at 4A.
- Each I/O point has a green LED for status indication.
- The TXM1.6R-M module is also equipped with manual override switches. An orange LED per override switch indicates override status individually per point.

Universal Modules (TXM1.8U and TXM1.8U-ML)



The TXM1.8U and TXM1.8U-ML Universal I/O modules provide 8 points, which can be individually software configured as digital input, analog input, or analog output to best meet the specific application needs.

All Universal I/O modules provide:

- Class 2 AC distribution voltage for peripheral devices, such as valves and actuators.
- Green LED status per I/O point that varies in intensity according to the voltage and current (directly proportional).

Digital input support includes:

- Voltage free/dry contacts
- Pulse counters up to 25 Hz

Analog input sensor support includes:

- 1K Nickel – Landis & Gyr curve
- 1K Platinum – 375 and 385 coefficient
- 10K and 100K Thermistor – Type II Curve

Active input and output support includes:

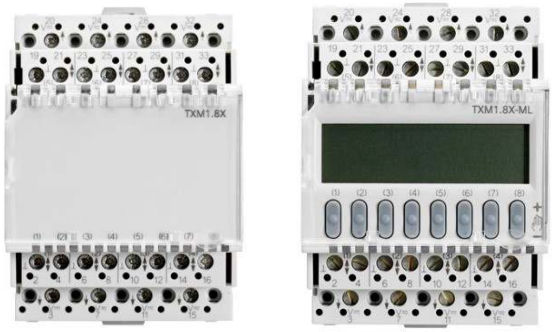
- Analog input voltage 0-10 Vdc
- Analog output voltage 0-10 Vdc

TXM1.8U-ML modules are also equipped with a local override/identification device (LOID), which includes an LCD signal display. The LCD displays the following information for each I/O point:

- Configured signal type
- Symbolic display of process value
- Notification of faulty operation, short circuit, or sensor open circuit

Orange LEDs indicate override status individually per point.

Super Universal Modules (TXM1.8X and TXM1.8X-ML)



The TXM1.8X and TXM1.8X-ML Super Universal modules share all of the Universal module features, and also provide:

- Analog input current 4-20 mA
- Analog output current 4-20 mA (four current outputs maximum per module on Points 5 through 8)
- 24 Vdc distribution from power supply for sensors at a maximum of 200 mA per module

TX-I/O Power Supply (TXS1.12F4)



The TX-I/O Power Supply generates 24 Vdc at 1.2A to power TX-I/O modules and peripheral devices.

- Up to 4 TX-I/O Power Supplies can be operated in parallel, with a maximum of two per DIN rail.
- It can be located within a row of TX-I/O modules or at the beginning of a new DIN rail.

The TX-I/O Power Supply performs the following functions:

- Transfers 24 Vac at 4A to power TX-I/O modules and peripheral devices.
- Routes CS (+24 Vdc Communication Supply) and CD (Communication Data signal) between DIN rails.
- Provides an input point for 24 Vac to power additional peripheral devices.
- Isolates the 24 Vac peripheral device supply in case of overload or short-circuit with Class 2 distribution. The replaceable AC fuse can be accessed from an installed module.
- Indicates the AC fuse status (via LED) for easy diagnostics.

TX-I/O Bus Connection Module (TXS1.EF4)



The Bus Connection Module transfers DC power for TX-I/O modules and peripheral devices and transfers AC power for peripheral devices.

- It can be located within a row of TX-I/O modules or at the beginning of a new DIN rail.

The TX-I/O Bus Connection Module performs the following functions:

- Routes CS (+24 Vdc Communication Supply) and CD (Communication Data Signal) between DIN rails.
- Provides an input point for 24 Vac to power additional peripheral devices.
- Isolates the 24 Vac peripheral device supply in case of overload or short-circuit with Class 2 distribution. The replaceable AC fuse can be accessed from an installed module.
- Indicates the AC fuse status (via LED) for easy diagnostics.

TX-I/O Island Bus Expansion Module (TXA1.IBE)



The TX-I/O Island Bus Expansion (IBE) module increases the distance between the primary field panel and expansion field panels without affecting the TX-I/O island bus maximum distance.

- An LED provides an indication of island bus communication.
- The IBE converts the TX-I/O island bus signal on the self-forming rail to an RS-485 signal level on the connector.
  - Each IBE module supports a maximum of two RS-485 segments.
  - Each segment may extend up to 200 ft (61 m) from the primary enclosure.
  - The island bus length extended from the primary field panel is added to island bus length extended from any expansion panel. RS-485 segment length between the IBEs does not add to the island bus length.
- The IBE does not transfer power over the RS-485 segment.
- Switches set the IBE as the TX-I/O island bus master (BM) or an RS-485 end-of-line terminator.
- A programming tool is not required.
- A maximum of 5 IBEs may be installed on the island bus: one IBE in the primary enclosure plus one in each expansion enclosure (maximum of 4).
- Only one Island Bus Expansion (IBE) module per enclosure is permitted.
- Expansion enclosures must be supplied using a separate TX-I/O Power Supply. Loss of this power does not affect the primary enclosure.

P1 Bus Interface Module (TXB1.P1 and TXB1.P1-4)



The P1 Bus Interface Module (P1 BIM) provides P1 FLN communication and power for TX-I/O modules. It does not contain application or control for the TX-I/O modules.

The P1 BIM provides the following features:

- Communication on the P1 FLN or MEC Expansion Bus.
- 24 Vac input.
- Generation of 24 Vdc at 600 mA to power TX-I/O modules and peripheral devices.
- Plug-in screw terminals.
- Isolates the peripheral device supply in case of overload or short-circuit with Class 2 distribution. The replaceable AC fuse can be accessed from an installed module.
- Separate LEDs for module operation, FLN communication activity, 24 Vdc present on the TX-I/O island bus, and monitoring of the 24 Vac fuse.

TXB1.P1

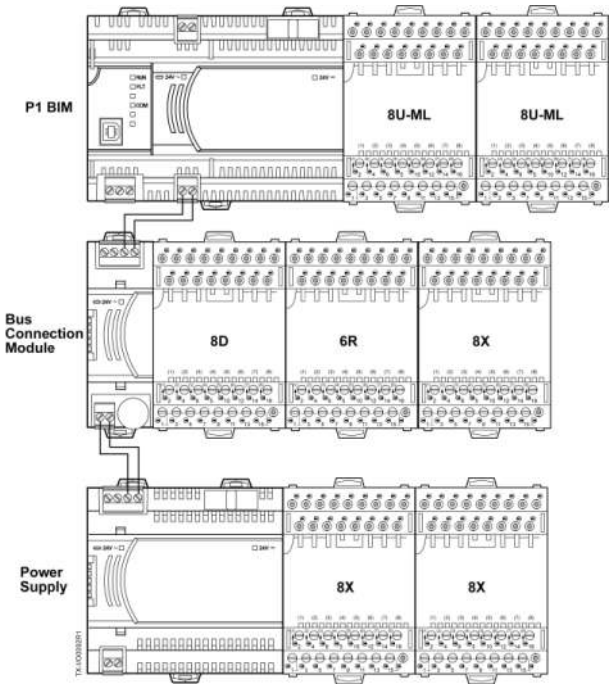
- Support for 80 TX-I/O points.
- Support for up to 10 I/O modules.
- Transfer of 24 Vac at a maximum of 4A to power peripheral devices.
- Up to three TX-I/O Power Supplies can be operated in parallel, max of 2 per DIN.

TXB1.P1-4

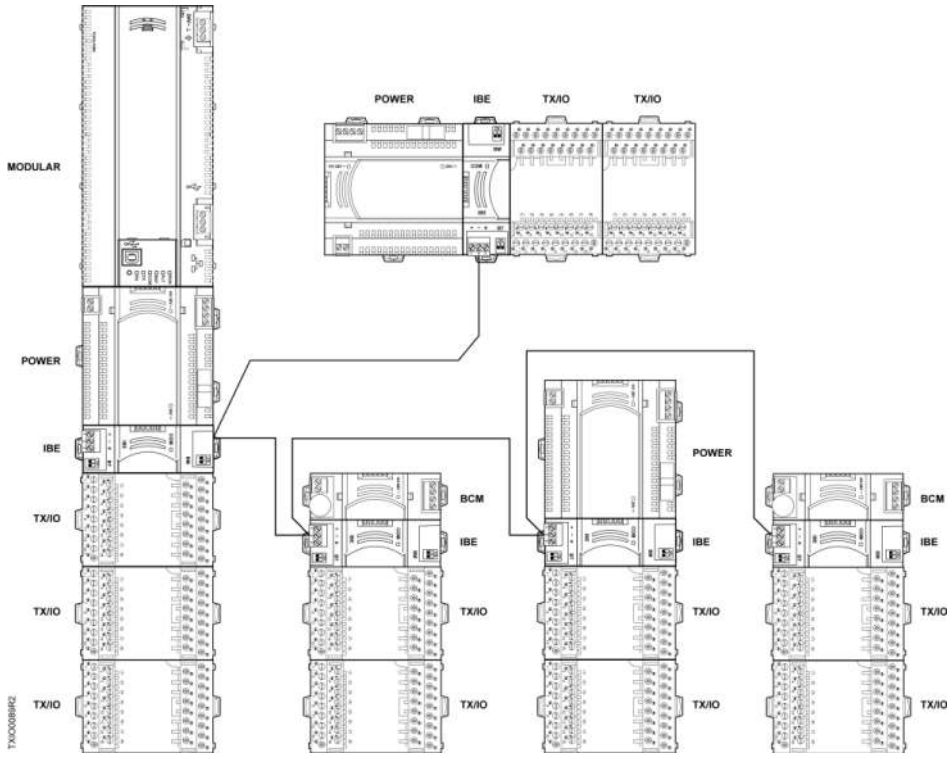
- Support for 64 TX-I/O points.
- Support for up to 4 I/O modules.

TX-I/O island bus Extension

The following picture shows the TX-I/O island bus extended using a Bus Connection Module and TX-I/O Power Supply. This configuration allows the TX-I/O island bus to extend a maximum of 164 feet (50 meters), and may extend outside an enclosure.



The following picture shows the TX-I/O island bus expanded using five Island Bus Expansion modules.



I/O Functions by Module

TX-I/O™ function	Description	Module type							
		TXM1.8D	TXM1.16D	TXM1.8U	TXM1.8U-ML	TXM1.8X	TXM1.8X-ML	TXM1.6R	TXM1.6R-M
		Maximum number of functions per module							
Digital inputs									
Binary Input	Status indication, voltage-free/dry contact	8	16	8	8	8	8		
Counter	Count/accumulator, voltage-free/dry pulse contact	8	8	8	8	8	8		
Analog Inputs									
	Temperature LG-Ni1000			8	8	8	8		
	Temperature Pt 1000 375			8	8	8	8		
	Temperature Pt 1000 385			8	8	8	8		
	Temperature (NTC) 10 K			8	8	8	8		
	Temperature (NTC) 100 K			8	8	8	8		
	Voltage, DC 0, 10V *			8	8	8	8		
	Current DC 4, 20 mA *					8	8		
Digital outputs									
BO OnOff	Latched contact, AC/DC 250V, 4A							6	6
BO Pulse	Pulse							6	6
Analog Outputs									
	DC 0..10 V *			8	8	8	8		
	DC 4 ... 20 mA *					4	4		

* Active inputs and active outputs (0-10V and 4-20 mA) must be located on different modules if sensors are externally powered.

Specifications:

Dimensions (L × W × D)	
TX-I/O Modules	2.52” × 3.54” × 2.75” (64 mm × 90 mm × 70 mm)
TX-I/O P1 BIM	5” × 3.54” × 2.75” (128 mm × 90 mm × 70 mm)
TX-I/O Power Supply	3.78” × 3.54” × 2.75” (96 mm × 90 mm × 70 mm)
TX-I/O Bus Connection Module	1.26” × 3.54” × 2.75” (32 mm × 90 mm × 70 mm)
TX-I/O Island Bus Expansion (IBE) Module	1.26” × 3.54” × 2.75” (32 mm × 90 mm × 70 mm)
Electrical	
Power Requirements	24 Vac +/-20% input @ 50 or 60 Hz
Power Consumption	
Power Supply	35 VA with 96 VA pass-thru
Bus Connection Module	0 VA with 96 VA pass-thru
TX-I/O P1 BIM	20 VA with 96 VA pass-thru
With the above power consumption, the Power Supply produces 28.8 W (1.2A at 24 Vdc) and the P1 BIM provides 14.4 W (0.6A at 24 Vdc) to be used by the following:	
TXM1.8D	1.1 W
TXM1.16D	1.4 W
TXM1.8U	1.5 W
TXM1.8U-ML	1.8 W
TXM1.8X	2.2 W
TXM1.8X-ML	2.3 W
TXM1.6R	1.7 W
TXM1.6R-M	1.9 W
Island Bus Expansion Module	1.2 W
Terminations	
I/O Terminals	20-12 AWG Solid 20-14 AWG Stranded
Power Supply, BCM, P1 BIM, and IBE	2-, 3-, or 4-position screw terminal pluggable blocks
Operating Environment	
Ambient operating environment	Operate in a dry location, which is protected from exposure to salt spray or other corrosive elements. Exposure to flammable or explosive vapors must be prevented.
Operating Temperature	32°F to +122°F (0°C to 50°C)
Shipping & Storage Environment	-13°F to 158°F (-25°C to 70°C)
Relative Humidity	5 to 93% rh, non-condensing
Agency Listings	UL 864 UUKL Smoke Control Equipment ULC/ORD-C100-1992 UUKL7 Smoke Control Equipment UL 916 PAZX CSA 22.2 No. 205 PAZX7
Agency Compliance	FCC Compliance Australian EMC Framework (C-Tick) European EMC Directive (CE) European Low Voltage Directive (LVD) RoHS Compliant UKCA - Electromagnetic Compatibility Regulations (S.I. 2016 No. 1091 / S.I. 2012 No. 3032)

Ordering Information

TX-I/O I/O Modules

Product Number	Description
TXM1.8D	TX-I/O Module, 8 DI points
TXM1.16D	TX-I/O Module, 16 DI points
TXM1.8U	TX-I/O Module, 8 Universal points
TXM1.8U-ML	TX-I/O Module, 8 Universal points with LOID
TXM1.8X	TX-I/O Module, 8 Super Universal points
TXM1.8X-ML	TX-I/O Module, 8 Super Universal points with LOID
TXM1.6R	TX-I/O Module, 6 DO with Relay points
TXM1.6R-M	TX-I/O Module, 6 DO with Relay points with manual override

TX-I/O Power Supply and Bus Modules

Product Number	Description
TXS1.12F4	TX-I/O Power Supply, 1.2 A, 4A Fuse
TXS1.EF4	TX-I/O Bus Connection Module, 4A Fuse
TXA1.IBE	TX-I/O Island Bus Expansion Module with RS-485 connection.
TXB1.P1	TX-I/O Bus Interface Module, P1, 10-module
TXB1.P1-4	TX-I/O Bus Interface Module, P1, 4-module

Accessories

Product Number	Description
TXA1.K12	One set of address keys, numbers 1-12
TXA1.K24	One set of address keys, numbers 1-24
TXA1.K-48	One set of address keys, numbers 25-48
TXA1.K-72	One set of address keys, numbers 49-72
TXA1.LLT-P100	Labels for TX-I/O 100 sheets/pack Letter format
TXA1.LH	Replacement label holders

Regions where this Product is Sold

(US, Asia Pacific, Canada, Latin America, UK)

Disposal



The devices are considered electrical and electronic equipment for disposal in terms of the applicable European Directive and may not be disposed of as domestic garbage.

- Dispose of the devices through channels provided for this purpose.
- Comply with all local and currently applicable laws and regulations.

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SIEMENS

DXR2.M18P-101B

Desigo™ Room Automation

DXR2 room automation stations, BACnet/MSTP, 24 V

DXR2.M18



Automation station with increased functionality and flexibility to support the demands for standard control of terminal HVAC equipment and Total Room Automation (TRA) applications. TRA offers the highest level of flexibility for energy-optimized solutions without sacrificing comfort.

- Compact, programmable room automation stations for HVAC, lighting, and shading.
- BACnet MS/TP Communication (BTL certified).
- KNX PL-Link bus to connect sensors, actuators, and operator units (including bus power).
- USB interface.
- Operating voltage AC 24V.
- Mounted on standard DIN rails or on the wall.
- Plug-in terminal blocks.

Features

- Total Room Automation applications combining multiple disciplines (HVAC, lighting, blinds/shading) into one comprehensive solution.
- BTL Listed as a BACnet Advanced Application Controller (B-AAC) device.
- Fully programmable using block programming.
- Proven, pre-loaded applications.
- Operational modes (Comfort, Standby, Economy, Protection, and so on).

Preconfigured applications

Fan Coil Unit (FCU)

- FAN COIL 2-Pipe CW/HW and HW Valves
- FAN COIL 4-Pipe CW and HW Valves
- FAN COIL staged DX Cooling and staged Heating
- FAN COIL with CW and staged Electric Heat
- FAN COIL–UNIT VENT with CW, HW and Outside Air Damper (OAD) control
- FAN COIL–UNIT VENT with CW, ELEC and OAD control
- FAN-COIL-UNIT VENT with DX, HW and OAD control
- FAN COIL-UNIT VENT with DX, ELEC and OAD control

Chilled Beam

- Chilled Beam Passive 2 Pipe Heating/Cooling and Radiator 1-Stage Electric

Heat Pump

- HP Variable Speed, Two Stage Elec Heat and One Stage Elec Rad with OAD
- HP Variable Speed, Water Source, HW Heat and Modulating Elec Rad with OAD
- HP Single Stage, One Stage Elec Heat and HW Rad with OAD
- HP Multi Stage, Two Stage Elec Heat and HW Rad with OAD
- HP Multi Stage, Hot Gas Reheat, One Stage Elec Heat and HW Rad with OAD
- HP Multi Stage, Ground Source, Hot Gas Reheat, One Stage Elec Heat and HW Rad with OAD

Additional Applications

- Electrical terminal heating coils, PWM, single, multi-stage or analog
- Terminal fans, single, multi-stage or analog
- Chill water, DX or hot water coils and heating/cooling coils (2-pipe or 4-pipe)
- Variable Air Volume (VAV), Dual Duct and Fan Powered VAV (FPB)
- Radiant ceiling including Chilled beams, cooling, heating and heating/cooling (2-pipe or 4-pipe) control
- Radiator/Baseboard: hot water, steam or electric
- Lighting – up to four separated or overlapping zones
  - Manual switching and dimming
  - Occupancy control and Vacancy control
  - Automatic Daylight Harvesting - step or constant level control
  - Stairwell lighting
  - Scene control

- Blinds – one or two separate zones
  - Manual control: Up, Down, Predefined positions
  - Occupancy control and Vacancy control
  - Glare Protection
  - Energy efficiency functions including solar radiation optimization
  - Slat angle
  - Scene control

Pre-loaded Application Options

Fan coil unit

- Single, multiple or variable speed fan control.
- Outside air damper control with economizer.
- Ventilation Control or Demand Control Ventilation (DCV) with separate outside air damper (OAD) setpoints for each operational mode.
- Supply (discharge) air temperature control for modulation heating or cooling coils.
- Dehumidification control.
- Terminal coils: heating (hot water or electric), cooling (chilled water or DX) and heating/cooling coil (2-pipe or 4-pipe).
- Radiant ceiling including Chilled beams and Radiator control.

Heat pump

- Heat Pump compressors: Single, multiple or variable speed.
- Air-to-air, water loop or ground water configurations.
- Single, multiple or variable speed fan control.
- Outside air damper control with economizer.
- Dehumidification control.
- Ventilation Control or Demand Control Ventilation (DCV) with separate outside air damper (OAD) setpoints for each operational mode.
- Terminal heating coil (hot water or electric) or hot gas coil.
- Radiant ceiling including Chilled beams and Radiator control.
- Greenleaf energy efficiency determination and display.
- Configurable plant operating modes (heating, cooling, warm up, cool down, flush/purge, and so on).

Functions

The selected application and its parameters as well as input and output configuration determine the room automation station's functionality.

A detailed description of functionality is available in the ABT (Automation Building Tool) online help.

Communication

- BACnet MS/TP
- USB connection for service and commissioning, firmware download, and LAN access.
- The following functions are available with the KNX PL-Link bus:
  - Communication with room operator units, switches, sensors, actuators, and luminaires.
  - Plug-and-play connection of Siemens field devices with KNX PL-Link.

Type summary

Product Number	SSN	Description	Inputs	Outputs
DXR2.M18-101B (Version with 60 data points*)	S55376-C124	DXR2.M18 Room Automation Station	2 DI, 4 UI	8 DO Triacs, 4 AO 0 to 10V
DXR2.M18-101K (Version with 60 data points)	S55376-C154	Smoke Control DXR2.M18 Room Automation Station	2 DI, 4 UI	8 DO Triacs, 4 AO 0 to 10V

Accessories

Product Number	Designation
985-124	499 ohm Resistor Kit

Product Documentation

Topic	Title	Document ID
Installation and mounting	DXR Installation Instructions	A6V10550039
Global datasheet*	DXR2 24V IP DXR2 24V MS/TP	N9205 N9207
Setup and commissioning	DXR VAV Start-up Procedures DXR FPB Start-up Procedures DXR FCU Start-up Procedures Balancing Procedures	A6V10665935 A6V10665938 A6V10665941 A6V10665943
Room Unit Datasheet	Wall mounted	A6V10394781
BTL listing	DXR PIC Statement	A6V10665948

* Please see the Global datasheets for additional information not found in this submittal sheet.

Technical data

Housing

Color	RAL 7035 (light-gray)
Dimensions	180 mm (7.09 in) x 104.5 mm (4.11 in) x 59.5 mm (2.34 in)
Weight Packaging	ca. 360 g (12.69 oz) ca. 40 g (1.41 oz)

Function data

Communication	
A/D Resolution (analog in) D/A Resolution (analog out)	14 Bits 12 Bits

Power data

Power supply	
Operating voltage	AC 24V -15%/+20%
Frequency	50/60 Hz
Internal fuse	4 A irreversible
Transformer with secondary current limitation of max. 10 A or external secondary current fuse Non-renewable fuse Circuit breakers	 Max. 10 A, slow Max. 13 A, characteristic B, C, D as per EN 60898

Apparent power (VA) for transformer design						
Base Model	**Base load**	**Max. load Triac output AC 24V~ 0.25 A each**	**Max. load all Aux. outputs AC 24V~**	**Max. load KNX PL-Link (at 50 mA)**	**Max. load DC 24V+ (2.4 W)[)]**	**Max. Allowed Power consumption including connected field devices**
DXR2.M18	6	8 x 6 = 48	18	4	6	70

Power for the Triac outputs must be reduced if the maximum load of 18 VA is required for AC 24V field supply on the DXR2.x18.

NOTE:
To calculate the total VA, add the Base Load + the number of Triacs + field supplies+ KNX PL-Link devices.
This cannot exceed the maximum power consumption. See the *Wiring Guidelines* for more information.

Inputs

Analog Inputs		
Resistance sensor	**Temperature measurement**	**Voltage measurement**
AI 1000 Ω	AI PT1K 375 (NA)*)	AI 0 to 10V
AI 2500 Ω	AI PT1K 385 (EU)*)	AI 0 to 10V (0 to 100%)
AI 10 KΩ	AI (LG-)Ni1000*)	
AI 100 KΩ	AI Ni1000 DIN*)	
	AI T1 (PTC)*)	
	AI NTC10K (Type II)**)	
	AI NTC100K**)	

* A fixed value of 1 Ω is calibrated to correct line resistance.

** Configurable default.

Digital Inputs	
Contact voltage	Universal input: 18V Digital input: 21V
Contact current	Universal input: 1.2 mA; 7.4 mA initial current Digital input: 1.6 mA; 9.4 mA initial current
Contact resistance for closed contacts	Max. 100 Ω
Contact resistance for open contacts	Min. 50 kΩ

Outputs

Analog Outputs	
0 to 10V	Max. 1 mA

Digital Outputs	
Type (Switching outputs triacs)	High side The Triac closes the contact to AC 24V
Switching voltage	AC 24V
Permissible load	250 mA/6 VA per output (cos phi 0.35) (500 mA/12 VA per output with PWM*)
Protection	Short-circuit proof

DC 24V output for field devices (1: V+)	
Output voltage	DC 24V
Permissible load	100 mA/2.4 W
Protection against overload	Short-circuit proof

Connections

Interfaces	
MSTP	Interface type: RS485 Galvanic isolation: Yes Baud rates: 9600, 19200, 38400, 76800, 115200 Protocol: BACnet over MS/TP Short-circuit proof Protection against faulty wiring at max. AC 24V
USB (2.0)	Plug: Type B Data rate: 12 Mbps
KNX PL-Link	Type: KNX TP1 PL-Link, galvanic isolation Baud rate: 9.6 kbps Bus power: 50 mA Short-circuit proof Protection against faulty wiring at max. AC 24V
Wiring connections	
Pluggable screw terminals	Copper wire or copper strands with ferrules 1 x 0.6 mm dia. to 2.5 mm2 (22 to 14 AWG) or 2 x 0.5 mm dia. to 1 mm2 (24 to 18 AWG) Copper strands without ferrules 1 x 0.6 mm dia. to 2.5 mm2 (22 to 14 AWG) or 2 x 0.5 mm dia. to 1.5 mm2 (24 to 16 AWG)
Slotted screws	Small 1/8” blade, tightening torque 0.6 Nm (0.44 lb-ft)
Wiring lengths for signals	KNX PL-Link 80 m (260 ft) with internal bus power or 300 m (990 ft) with external power supply MS/TP 1,000 m (3,290 ft) Signal lines 80 m (260 ft) For inputs AI 100 KΩ, AI NTC10K, AI NTC100K: 30 m (100 ft) or 80 m (260 ft), if shielded.

KNX/PL-Link Network and Power Wriring.*	
Cable configuration	1 or 2 twisted pair - Pair 1 red/black - Pair 2 yellow/white
Gauge	20 AWG (solid copper)
Twists per foot	4 Minimum
Capacitance	30 pF/foot or less
Shields	100% foil with drain wire
UL type	300Vrms, CMP (75 °C or higher)
CSA type	300Vrms, FT6 (75 °C or higher)

* Alternative 18 AWG STP CMP (Belden 6320FE 8771000)

Conformity

⚠ CAUTION	
	**National safety regulations** Failure to comply with national safety regulations may result in personal injury and property damage. Observe national provisions and comply with the appropriate safety regulations.

Ambient Conditions and Protection classification	
Climatic ambient conditions	
• Transport and storage	• Temperature -25 to 70°C (-13 to 158°F) Air humidity 5 to 95% rh.
• Operation	• Temperature -5 to 45°C (23 to 113°F)/ -5 to 50°C (23 to 122°F) Air humidity 5 to 95% rh.

Standards, Directives and Approvals	
UL Listing	UL 916 PAZX - Conforms to UL916 9th and 10th Edition. UL 864 UUKL Smoke Control Equipment - Conforms to UL864 9th and 10th Edition. (Smoke Control 'K' variant only)
Suitable for plenum area installation	UL1995
Federal Communications Commission	FCC CFR 47 Part 15 Class B
CSA Compliance and cUL certification	C22.2 No. 205
Environmental compatibility - RoHS Compliant	The product environmental declaration contains data on environmentally compatible product design and assessments (composition, packaging, environmental benefit, and disposal).
BACnet BTL Listing	BTL-AAC
CEC Title 24 Supported	—
ASHRAE Guideline 36 Supported	—
ASHRAE 90.1 Supported	—
Quality	ISO 9001 (Quality)

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SIEMENS

DXR2.M11-101B

Desigo™ Room Automation

DXR2 room automation stations, BACnet/MSTP, 24 V

DXR2.M11



Automation station with increased functionality and flexibility to support the demands for standard control of terminal HVAC equipment and Total Room Automation (TRA) applications. TRA offers the highest level of flexibility for energy-optimized solutions without sacrificing comfort.

- Compact, programmable room automation stations for HVAC, lighting, and shading.
- BACnet MS/TP Communication (BTL certified).
- KNX PL-Link bus to connect sensors, actuators, and operator units (including bus power).
- USB interface.
- Operating voltage AC 24V.
- Mounted on standard DIN rails or on the wall.
- Plug-in terminal blocks.

Features

- Total Room Automation applications combining multiple disciplines (HVAC, lighting, blinds/shading) into one comprehensive solution.
- BTL Listed as a BACnet Advanced Application Controller (B-AAC) device.
- Fully programmable using block programming.
- Proven, pre-loaded applications.
- Operational modes (Comfort, Standby, Economy, Protection, and so on).

Preconfigured applications

Fan Coil Unit (FCU)

- FAN COIL 2-Pipe CW/HW and HW Valves
- FAN COIL 4-Pipe CW and HW Valves
- FAN COIL staged DX Cooling and staged Heating
- FAN COIL with CW and staged Electric Heat
- FAN COIL–UNIT VENT with CW, HW and Outside Air Damper (OAD) control
- FAN COIL–UNIT VENT with CW, ELEC and OAD control
- FAN-COIL-UNIT VENT with DX, HW and OAD control
- FAN COIL-UNIT VENT with DX, ELEC and OAD control

Chilled Beam

- Chilled Beam Passive 2 Pipe Heating/Cooling and Radiator 1-Stage Electric

Heat Pump

- HP Variable Speed, Two Stage Elec Heat and One Stage Elec Rad with OAD
- HP Variable Speed, Water Source, HW Heat and Modulating Elec Rad with OAD
- HP Single Stage, One Stage Elec Heat and HW Rad with OAD
- HP Multi Stage, Two Stage Elec Heat and HW Rad with OAD
- HP Multi Stage, Hot Gas Reheat, One Stage Elec Heat and HW Rad with OAD
- HP Multi Stage, Ground Source, Hot Gas Reheat, One Stage Elec Heat and HW Rad with OAD

Additional Applications

- Electrical terminal heating coils, PWM, single, multi-stage or analog
- Terminal fans, single, multi-stage or analog
- Chill water, DX or hot water coils and heating/cooling coils (2-pipe or 4-pipe)
- Radiant ceiling including Chilled beams, cooling, heating and heating/cooling (2-pipe or 4-pipe) control
- Radiator/Baseboard: hot water, steam or electric
- Lighting – up to four separated or overlapping zones
  - Manual switching and dimming
  - Occupancy control and Vacancy control
  - Automatic Daylight Harvesting - step or constant level control
  - Stairwell lighting
  - Scene control

- Blinds – one or two separate zones
  - Manual control: Up, Down, Predefined positions
  - Occupancy control and Vacancy control
  - Glare Protection
  - Energy efficiency functions including solar radiation optimization
  - Slat angle
  - Scene control

Pre-loaded Application Options

Fan coil unit

- Single, multiple or variable speed fan control.
- Outside air damper control with economizer.
- Ventilation Control or Demand Control Ventilation (DCV) with separate outside air damper (OAD) setpoints for each operational mode.
- Supply (discharge) air temperature control for modulation heating or cooling coils.
- Dehumidification control.
- Terminal coils: heating (hot water or electric), cooling (chilled water or DX) and heating/cooling coil (2-pipe or 4-pipe).
- Radiant ceiling including Chilled beams and Radiator control.

Heat pump

- Heat Pump compressors: Single, multiple or variable speed.
- Air-to-air, water loop or ground water configurations.
- Single, multiple or variable speed fan control.
- Outside air damper control with economizer.
- Dehumidification control.
- Ventilation Control or Demand Control Ventilation (DCV) with separate outside air damper (OAD) setpoints for each operational mode.
- Terminal heating coil (hot water or electric) or hot gas coil.
- Radiant ceiling including Chilled beams and Radiator control.
- Greenleaf energy efficiency determination and display.
- Configurable plant operating modes (heating, cooling, warm up, cool down, flush/purge, and so on).

Functions

The selected application and its parameters as well as input and output configuration determine the room automation station's functionality.

A detailed description of functionality is available in the ABT (Automation Building Tool) online help.

Communication

- BACnet MS/TP
- USB connection for service and commissioning, firmware download, and LAN access.
- The following functions are available with the KNX PL-Link bus:
  - Communication with room operator units, switches, sensors, actuators, and luminaires.
  - Plug-and-play connection of Siemens field devices with KNX PL-Link.

Type summary

Product Number	SSN	Description	Inputs	Outputs
DXR2.M11-101B (Version with 30 data points)	S55376-C122	DXR2.M11 Room Automation Station	1 Di, 2 UI	6 DO Triacs, 2 AO 0 to 10V
DXR2.M11-101K (Version with 30 data points)	S55376-C151	Smoke Control DXR2.M11 Room Automation Station	1 Di, 2 UI	6 DO Triacs, 2 AO 0 to 10V

Accessories

Product Number	Designation
985-124	499 ohm Resistor Kit

Product Documentation

Topic	Title	Document ID
Installation and mounting	DXR Installation Instructions	A6V10550039
Global datasheet*	DXR2 24V IP DXR2 24V MS/TP	N9205 N9207
Setup and commissioning	DXR VAV Start-up Procedures DXR FPB Start-up Procedures DXR FCU Start-up Procedures Balancing Procedures	A6V10665935 A6V10665938 A6V10665941 A6V10665943
Room Unit Datasheet	Wall mounted	A6V10394781
BTL listing	DXR PIC Statement	A6V10665948

* Please see the Global datasheets for additional information not found in this submittal sheet.

Technical data

Housing

Color	RAL 7035 (light-gray)
Dimensions	180 mm (7.09 in) x 104.5 mm (4.11 in) x 59.5 mm (2.34 in)
Weight Packaging	ca. 330 g (11.64 oz) ca. 40 g (1.41 oz)

Function data

Communication	
A/D Resolution (analog in) D/A Resolution (analog out)	14 Bits 12 Bits

Power data

Power supply	
Operating voltage	AC 24V -15%/+20%
Frequency	50/60 Hz
Internal fuse	4 A irreversible
Transformer with secondary current limitation of max. 10 A or external secondary current fuse Non-renewable fuse Circuit breakers	 Max. 10 A, slow Max. 13 A, characteristic B, C, D as per EN 60898

Apparent power (VA) for transformer design						
Base Model	**Base load**	**Max. load Triac output AC 24V~ 0.25 A each**	**Max. load all Aux. outputs AC 24V~**	**Max. load KNX PL-Link (at 50 mA)**	**Max. load DC 24V+ (2.4 W)[)]**	**Max. Allowed Power consumption including connected field devices**
DXR2.M11	6	6 x 6 = 36	12	4	-	58

NOTE:
To calculate the total VA, add the Base Load + the number of Triacs + field supplies+ KNX PL-Link devices.
This cannot exceed the maximum power consumption. See the *Wiring Guidelines* for more information.

Inputs

Analog Inputs		
Resistance sensor	**Temperature measurement**	**Voltage measurement**
AI 1000 Ω	AI PT1K 375 (NA)*)	AI 0 to 10V
AI 2500 Ω	AI PT1K 385 (EU)*)	AI 0 to 10V (0 to 100%)
AI 10 KΩ	AI (LG-)Ni1000*)	
AI 100 KΩ	AI Ni1000 DIN*)	
	AI T1 (PTC)*)	
	AI NTC10K (Type II)**)	
	AI NTC100K**)	

* A fixed value of 1 Ω is calibrated to correct line resistance.

** Configurable default.

Digital Inputs	
Contact voltage	Universal input: 18V Digital input: 21V
Contact current	Universal input: 1.2 mA; 7.4 mA initial current Digital input: 1.6 mA; 9.4 mA initial current
Contact resistance for closed contacts	Max. 100 Ω
Contact resistance for open contacts	Min. 50 kΩ

Outputs

Analog Outputs	
0 to 10V	Max. 1 mA

Digital Outputs	
Type (Switching outputs triacs)	High side The Triac closes the contact to AC 24V
Switching voltage	AC 24V
Permissible load	250 mA/6 VA per output (cos phi 0.35) (500 mA/12 VA per output with PWM*)
Protection	Short-circuit proof

AC 24V outputs for field devices (2: V~)	
Output voltage	AC 24V
Permissible load	500 mA/12 VA overall
Protection against overload	Short-circuit proof

Connections

Interfaces	
MSTP	Interface type: RS485 Galvanic isolation: Yes Baud rates: 9600, 19200, 38400, 76800, 115200 Protocol: BACnet over MS/TP Short-circuit proof Protection against faulty wiring at max. AC 24V
USB (2.0)	Plug: Type B Data rate: 12 Mbps
KNX PL-Link	Type: KNX TP1 PL-Link, galvanic isolation Baud rate: 9.6 kbps Bus power: 50 mA Short-circuit proof Protection against faulty wiring at max. AC 24V
Wiring connections	
Pluggable screw terminals	Copper wire or copper strands with ferrules 1 x 0.6 mm dia. to 2.5 mm2 (22 to 14 AWG) or 2 x 0.5 mm dia. to 1 mm2 (24 to 18 AWG) Copper strands without ferrules 1 x 0.6 mm dia. to 2.5 mm2 (22 to 14 AWG) or 2 x 0.5 mm dia. to 1.5 mm2 (24 to 16 AWG)
Slotted screws	Small 1/8” blade, tightening torque 0.6 Nm (0.44 lb-ft)
Wiring lengths for signals	KNX PL-Link 80 m (260 ft) with internal bus power or 300 m (990 ft) with external power supply MS/TP 1,000 m (3,290 ft) Signal lines 80 m (260 ft) For inputs AI 100 KΩ, AI NTC10K, AI NTC100K: 30 m (100 ft) or 80 m (260 ft), if shielded.

KNX/PL-Link Network and Power Wriring.*	
Cable configuration	1 or 2 twisted pair - Pair 1 red/black - Pair 2 yellow/white
Gauge	20 AWG (solid copper)
Twists per foot	4 Minimum
Capacitance	30 pF/foot or less
Shields	100% foil with drain wire
UL type	300Vrms, CMP (75 °C or higher)
CSA type	300Vrms, FT6 (75 °C or higher)

* Alternative 18 AWG STP CMP (Belden 6320FE 8771000)

Conformity

⚠ CAUTION	
	**National safety regulations** Failure to comply with national safety regulations may result in personal injury and property damage. Observe national provisions and comply with the appropriate safety regulations.

Ambient Conditions and Protection classification	
Climatic ambient conditions	
• Transport and storage	• Temperature -25 to 70°C (-13 to 158°F) Air humidity 5 to 95% rh.
• Operation	• Temperature -5 to 45°C (23 to 113°F)/ -5 to 50°C (23 to 122°F) Air humidity 5 to 95% rh.

Standards, Directives and Approvals	
UL Listing	UL 916 PAZX - Conforms to UL916 9th and 10th Edition. UL 864 UUKL Smoke Control Equipment - Conforms to UL864 9th and 10th Edition. (Smoke Control 'K' variant only)
Suitable for plenum area installation	UL1995
Federal Communications Commission	FCC CFR 47 Part 15 Class B
CSA Compliance and cUL certification	C22.2 No. 205
Environmental compatibility - RoHS Compliant	The product environmental declaration contains data on environmentally compatible product design and assessments (composition, packaging, environmental benefit, and disposal).
BACnet BTL Listing	BTL-AAC
CEC Title 24 Supported	—
ASHRAE Guideline 36 Supported	—
ASHRAE 90.1 Supported	—
Quality	ISO 9001 (Quality)

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Compact Series Unitary Equipment Controller



Figure 1. PXC Compact Series Unitary Equipment Controllers (PXC UEC-16/24).

Description

The PXC Compact Series Unitary Equipment Controller (Programmable Controller–Compact) for BACnet networks is a high-performance Direct Digital Control (DDC) equipment controller, which is an integral part of the APOGEE Automation System. The controllers are classified as a BACnet Advanced Application Controller (B-AAC) with support for BACnet MS/TP protocol.

The PXC Compact UEC Series offers integrated I/O based on state-of-the-art TX-I/O™ Technology, which provides superior flexibility of point and signal types, and makes it an optimal solution for Air Handling Unit (AHU) control.

The Unitary Equipment Controller communicates with other field panels or workstations on a peer-to-peer Automation Level Network (ALN), or on the Field Level Network (FLN), and supports the following communication options:

- Native BACnet MS/TP on RS-485

Features

- BACnet Testing Laboratories (BTL) certified Classified as BACnet Advanced Application Controllers (B-AAC) using the BACnet MS/TP protocol for specific models.
- Sophisticated Adaptive Control, a closed loop control algorithm that auto-adjusts to compensate for load/seasonal changes.
- Message control for terminals, printers, pagers, and workstations.
- HMI RS-232 and USB port, which provides laptop connectivity for local operation and engineering.
- Extended battery backup of Real Time Clock.
- Auto Save and persistent database backup and restore within the controller.
- PXM10T and PXM10S support: Optional LCD Local user interface with HOA (Hand-off-auto) capability and point commanding and monitoring features.
- An extended temperature range for the control of rooftop devices.

Compact Series Unitary Equipment Controller

The PXC Unitary Equipment Controller (UEC) is an MS/TP device, that can be configured as a programmable, stand-alone device or as a networked device on the BACnet MS/TP ALN (Automation Level Network) or FLN (Field Level Network) device.

PXC UEC-16

The PXC UEC-16 provides control for 16 points, including 8 software-configurable universal points.

Point count includes: 3 Universal Input (UI), 5 Universal I/O (U), 2 Digital Input (DI), 3 Analog Output (AOV), and 3 Digital Output (DO).

PXC UEC-24

The PXC UEC-24 provides control for 24 points, including 16 software-configurable universal points.

Point count includes: 3 Universal Input (UI), 9 Universal I/O (U), 4 Super Universal I/O (X), 3 Analog Output (AOV), 5 Digital Output (DO).

Extended Temperature Operation

The PXC Compact UEC "R" models support extended temperature operation, allowing for rooftop installations.

Hardware

The PXC Compact Series consists of the following major components:

- Input/Output Points
- Power Supply
- Controller Processor

Input/Output Points

- The PXC Compact input/output points perform A/D or D/A conversion, signal processing, point command output, and communication with the controller processor. The terminal blocks are removable for easy termination of field wiring.
- The Universal and Super Universal points leverage TX-I/O™ Technology from Siemens Building Technologies to configure an extensive variety of point types.
- Universal Input (UI) and Universal Input/Output (U) points are software-selectable to be:
  - 0-10V input
  - 4-20 mA input
  - Digital Input
  - Pulse Accumulator inputs
  - 1K Ni RTD @ 32°F (Siemens, Johnson Controls, DIN Standard)
  - 1K Pt RTD (375 or 385 alpha) @ 32°F
  - 10K NTC Thermistor (Type 2 and Type 3) @ 77°F
  - 100K NTC Thermistor (Type 2) @ 77°F
  - 0-10V Analog Output (Universal Input/Output (U) points only)
- Super Universal (X) points are software-selectable to be:
  - 0-10V input
  - 4-20 mA input
  - Digital Input
  - Pulse Accumulator inputs
  - 1K Ni RTD @ 32°F (Siemens, Johnson Controls, DIN Standard)
  - 1K Pt RTD (375 or 385 alpha) @ 32°F
  - 10K NTC Thermistor (Type 2 and Type 3) @ 77°F
  - 100K NTC Thermistor (Type 2) @ 77°F
  - 0-10V Analog Output
  - 4-20 mA Analog Output
  - Digital Output (using external relay)
- Digital Output (DO) points are 110/220V 4 Amp (resistive) Form C relays; LEDs indicate the status of each point.
- All PXC Compact Series models support 0-10 Vdc Analog Output circuits.
- The Super Universal points may be defined as either 0-10 Vdc or 4-20 mA Analog Output circuits.

Power Supply

- The 24 volt DC power supply provides regulated power to the input/output points and active sensors. The power supply is internal to the PXC Compact housing, eliminating the need for external power supply and simplifying installation and troubleshooting.
- The power supply works with the processor to ensure smooth power up and power down sequences for the equipment controlled by the I/O points, even through brownout conditions.

Controller Processor

- The Unitary Equipment Controller includes a microprocessor-based multi-tasking platform for program execution and communications with the I/O points and with other UECs and field panels.

- A Human Machine Interface (HMI) port, with a quick-connect phone jack (RJ-45), uses RS-232 protocol to support operator devices (such as a local user interface or simple CRT terminal), and a phone modem for dial-in service capability.
- A USB Device port supports a generic serial interface for an HMI or Tool connection. The USB Device port does not support firmware flash upgrades.
- The program and database information stored in the UEC RAM memory is battery-backed. This eliminates the need for time-consuming program and database re-entry in the event of an extended power failure.
- The firmware, which includes the operating system, is stored in non-volatile flash ROM memory; this enables firmware upgrades in the field.
- Brownout protection and power recovery circuitry protect the controller board from power fluctuations.
- LEDs provide instant visual indication of overall operation, network communication, and low battery warning.

Programmable Control with Application Flexibility

The PXC Compact Series of high performance controllers provides complete flexibility, which allows the owner to customize each controller with the exact program for the application.

The control program for each UEC is customized to exactly match the application. Proven Powers Process Control Language (PPCL), a text-based programming structure like BASIC, provides direct digital control and energy management sequences to precisely control equipment and optimize energy usage.

Global Information Access

The HMI port supports operator devices, such as a local user interface or simple CRT terminal. Devices connected to the operator terminal port gain global information access.

Multiple Operator Access

Multiple operators can access the network simultaneously. Multiple operator access ensures that alarms are reported to an alarm printer while an operator accesses information from a local terminal. Multiple operators may also access the controller through concurrent Telnet sessions and/or local operator terminal ports.

Menu Prompted, English Language Operator Interface

The UEC includes a simple, yet powerful, menu-driven English Language Operator Interface that provides, among other things:

- Point monitoring and display
- Point commanding
- Historical trend collection and display for multiple points
- Event scheduling
- Program editing and modification via Powers Process Control Language (PPCL)
- Alarm reporting and acknowledgment
- Continual display of dynamic information

Built-in Direct Digital Control Routines

The UEC provides stand-alone Direct Digital Control (DDC) to deliver precise HVAC control and comprehensive information about system operation. It receives information from sensors in the building, processes the information, and directly controls the equipment. The following functions are available in the UEC:

- Adaptive Control, an auto-adjusting closed loop control algorithm, which provides more efficient, adaptive, robust, fast, and stable control than the traditional PID control algorithm. It is superior in terms of response time and holding steady state, and at minimizing error, oscillations, and actuator repositioning.
- Closed Loop Proportional, Integral and Derivative (PID) control.
- Logical sequencing.
- Alarm detection and reporting.
- Reset schedules.

Built-in Energy Management Applications

The following applications are programmed in the Unitary Equipment Controller and require simple parameter input for implementation:

- Automatic Daylight Saving Time switchover

- Calendar-based scheduling
- Duty cycling
- Economizer control
- Equipment scheduling, optimization and sequencing
- Event scheduling
- Holiday scheduling
- Night setback control
- Peak Demand Limiting (PDL)
- Temperature-compensated duty cycling
- Temporary schedule override

BACnet UEC Specifications

Dimensions (L × W × D)	
PXC Unitary Equipment Controller, 16 point, BACnet MS/TP	10.7" × 5.9" × 2.45" (272 mm × 150 mm × 62 mm)
PXC Unitary Equipment Controller, 24 point, BACnet MS/TP	10.7" × 5.9" × 2.45" (272 mm × 150 mm × 62 mm)

Processor, Battery, and Memory	
Processor and Clock Speed	Freescale MPC852T, 100 MHz
Memory	24 MB (16 MB SDRAM, 8 MB Flash ROM)
Battery backup of SDRAM (field replaceable)	AA (LR6) 1.5 Volt Alkaline (non-rechargeable) 180 days (accumulated)
	Rooftop (Extended Temperature) Models: 330 days (accumulated) AA (LR6) 3.6 Volt Lithium (non-rechargeable)
Battery backup of Real Time Clock	10 years (32°F to 122°F (0°C to 50°C)) Coin cell (BR2032) 3 Volt lithium
	Rooftop (Extended Temperature) Models 18 months

Communication	
A/D Resolution (analog in)	16 bits
D/A Resolution (analog out)	10 bits
BACnet MS/TP Automation Level Network (ALN)	9600 bps to 115.2 Kbps, up to 10 nodes per MS/TP ALN
BACnet MS/TP Field Level Network (FLN)	9600 bps to 115.2 Kbps
Human-Machine Interface (HMI)	RS-232 compliant, 1200 bps to 115.2 Kbps
USB Device port (for non-smoke control applications only)	USB 1.1 (12 Mbps) and 2.0 (480 Mbps), Type B female connector. Self-powered, does not use or supply USB power.
Prior to June 2013	USB 1.0 (1.5 Mbps) and 1.1 (12 Mbps)

Electrical	
Power Requirements	24 Vac ±20% input @ 50/60 Hz
Power Consumption (Maximum)	20 VA @ 24 Vac
A/D Resolution (analog in)	16 bits
D/A Resolution (analog out)	10 bits
AC Power and Digital Outputs	NEC Class 1 Power Limited
Communication and all other I/O	NEC Class 2

Electrical		
Digital Output		**Class 1 Relay, Form C (NO and NC contacts)**
Analog Outputs		**Voltage (0-10 Vdc)**
Universal Inputs (UI) and	**Analog Inputs**	**Digital Inputs**
Universal Inputs/Outputs (U)	Voltage (0-10 Vdc)	Pulse Accumulator
	Current (4-20 mA)	Contact Closure Sensing
	1K Ni RTD @ 32°F (Siemens, JCI, DIN Ni 1K)	Dry Contact/Potential Free inputs only
	1K Pt RTD (375 or 385 alpha) @ 32°F	Digital Input (10 ms settling time)
	10K NTC Type 2 or Type 3 Thermistor	Supports counter inputs up to 20 Hz, minimum pulse duration 20 ms (open or closed)
	100K NTC Type 2 Thermistor	
	Analog Outputs	
	0 to 10 Vdc @ 1 mA max	
Super Universal (X)	**Analog Inputs**	**Digital Inputs**
	Voltage (0-10 Vdc)	Pulse Accumulator
	Current (4-20 mA)	Contact Closure Sensing
	1K Ni RTD @ 32°F (Siemens, JCI, DIN Ni 1K)	Dry Contact/Potential Free inputs only
	1K Pt RTD (375 or 385 alpha) @ 32°F	Digital Input (10 ms settling time)
	10K NTC Type 2 or Type 3 Thermistor	Supports counter inputs up to 20 Hz, minimum pulse duration 20 ms (open or closed)
	100K NTC Type 2 Thermistor	
	Analog Outputs	**Digital Output**
	0 to 10 Vdc @ 1 mA max	0 to 24 Vdc, 22 mA max.
	0 to 20 mA @ 650 Ω max	(using external relay)

Ambient Conditions	
Shipping & Storage	-13°F to 158°F (-25°C to 70°C)
Operating Temperature	32°F to 122°F (0°C to 50°C)
	Operate in a dry location, which is protected from exposure to salt spray or other corrosive elements. Exposure to flammable or explosive vapors must be prevented.
Operating temperature *with rooftop (extended temperature) option*	-40°F to 158°F (-40°C to 70°C)
Relative Humidity	5 to 95% rh non-condensing
Mounting Surface	Direct equipment mount, building wall, or structural member
	CE Compliance Must be installed inside a metal enclosure rated at IP20 minimum

Agency Listings	
UL	UL916 PAZX UL916 PAZX7

Agency Listings	
Agency Compliance	FCC Compliance CFR47 Part 15, Subpart B, Class B Australian EMC Framework European EMC Directive (CE) European Low Voltage Directive (LVD) BACnet Testing Laboratories (BTL) Certified RoHS Compliant
OSHPD Seismic Certification	Product meets OSHPD Special Seismic Preapproval certification (OSH-0217-10) under California Building Code 2010 (CBC2010) and International Building Code 2009 (IBC2009) when installed within the following Siemens enclosure part numbers: PXA-ENC18, PXA-ENC19, or PXA-ENC34.

Ordering Information

PXC Compact Series

Part Number	Description
PXC16.3-UCM.A	PXC Unitary Equipment Controller, 16 point, BACnet MS/TP
PXC16.3-UCMR.A	PXC Unitary Equipment Controller, 16 point, BACnet MS/TP, Rooftop Model
PXC24.3-UCM.A	PXC Unitary Equipment Controller, 24 point, BACnet MS/TP
PXC24.3-UCMR.A	PXC Unitary Equipment Controller, 24 point, BACnet MS/TP, Rooftop Model

Accessories

Product Number	Description
PXM10S	Controller mounted Operator Display module with point monitor and optional blue backlight
PXM10T	Controller mounted Operator Display module
PXA-HMI.CABLEP5	Serial cable required for PXM10T/S connection to non-rooftop variants of the 16-point and 24-point Compact Series (pack of 5)

Service Boxes and Enclosures

Product Number	Description
PXA-SB115V192VA	PX Series Service Box—115V, 24 Vac, 50/60 Hz, 192 VA
PXA-SB115V384VA	PX Series Service Box—115V, 24 Vac, 50/60 Hz, 384 VA
PXA-SB230V192VA	PX Series Service Box—230V, 24 Vac, 50/60 Hz, 192 VA
PXA-SB230V384VA	PX Series Service Box—230V, 24 Vac, 50/60 Hz, 384 VA
PXA-ENC18	18" Enclosure (Utility Cabinet) (UL Listed NEMA Type 1 Enclosure)
PXA-ENC19	19” Enclosure (UL Listed NEMA Type 1 Enclosure)
PXA-ENC34	34” Enclosure (UL Listed NEMA Type 1 Enclosure)

Disposal



The devices are considered electrical and electronic equipment for disposal in terms of the applicable European Directive and may not be disposed of as domestic garbage.

- Dispose of the devices through channels provided for this purpose.
- Comply with all local and currently applicable laws and regulations.

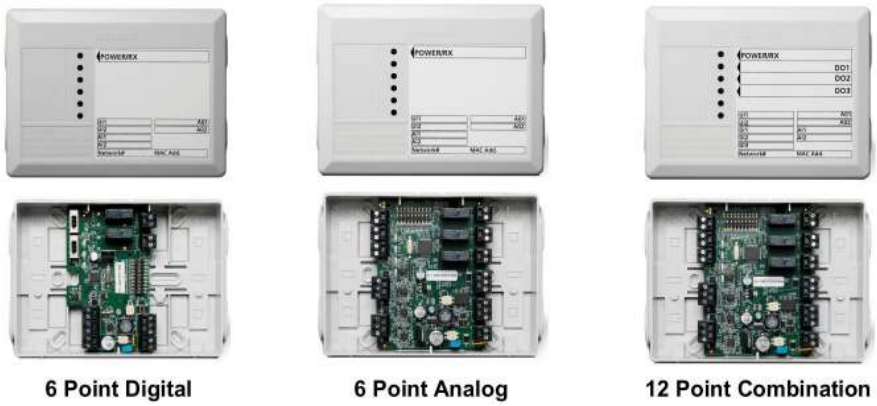
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Siemens MS/TP Point Pickup Module



6 Point Digital | 6 Point Analog | 12 Point Combination

Description

The Siemens Point Pickup Modules (PPM) are expansion I/O devices that communicate on a BACnet master-slave/token-passing (MS/TP) network, allowing for the incorporation of a cluster of remote points into the Building Automation Station over the MS/TP network.

The PPM family leverages the MS/TP network to extend the reach of any BTL-listed BACnet Building Controllers application program.

Each Universal Input can be configured for analog or digital input. Input/Output type is configured by writing to BACnet object properties.

Features

- Wide range of signal type support for flexible IO solutions.
- Device ID and Device name auto-populated for efficient start up (Device ID and Device name are also writable for customization).
- UL and cUL Listed as Enclosed Energy Management Equipment. No additional enclosure required.
- Evaluated and certified by UL[1)] as suitable for installation in plenum areas. (Building codes for plenum requirements vary by location; check with local building authority).
- LEDs, visible through the housing, indicate the power, communication, and DO status.
- Default communication at 19200 baud also supports 9600, 38400 and 76800 via DIP switch.
- 8-bit DIP switch to configure MAC address.
- Recover and resume communication on the network after a power interruption without operator intervention.
- Capable of mounting on electrical junction box without field modification or adaptors. (4 in. x 4 in. standard depth US box, 100 mm x 100 mm x 25 mm Asia/Pacific standard box.)
- DIN rail and surface mount installation also possible.
- Assembly has a cover label associated with the LEDs for easy labeling and identification.
- Supports unsolicited COVs when faster data point value updates are required.

1) The current version of PPM-3U63.BPR (for China only) is not certified by BTL or UL.

Hardware

Controller Board

The controller interfaces with, but does not provide, direct control of the following external devices:

- Digital input devices (dry contacts from motion sensors, alarm and door contacts) or Accumulator (gas, water, electrical)
- Digital output devices (fans, pumps, lighting)
- Analog input devices (temp, humidity, flow, pressure)
- Analog output (valves, actuators)

		PPM Type			
		Digital PPM	Analog PPM	Combo PPM	
				PPM-2U3322.BPF and PPM-2U3322.BPR	PPM-3U63.BPR (for China only)
I/O Function	**Description**	**Maximum number of function per module**			
Digital inputs					
Binary Inputs	Status indication, voltage-free/dry contact	4	2	5	9
Counter	Count/accumulator, voltage-free/dry pulse contact	3			
Analog inputs w/ 12-bit A/D resolution					
	Temperature Pt 1000 385		4	4	
	Temperature NTC 10K Type II	1			
	Temperature Ni1000 RTD		4	4	
	Voltage, DC 0-10V		4	4	
	Current DC 4-20 mA		2		
Universal inputs w/ 12-bit A/D resolution					
	Temperature Pt 1000 385			2	3
	Temperature Ni 1000 RTD			2	3
	Voltage, DC 0-10V			2	3
	Digital inputs			2	3
Digital outputs					
BO On/Off	NO Contact, 240 Vac, 5A Resistive/ 2 A General Purpose	2		3	3
Analog outputs					
	DC 0-10 V		2	2	

MS/TP Point Pickup Modules Specifications

Power Requirements Operating Range Power Consumption	Input power range of 19.2 Vac to 28.8 Vac (50 or 60 Hz) 4 VA to 7 VA
Universal Inputs	**6 Point Digital PPMs** (PPM-1U32.BPR and PPM-1U32.BPF) 1- 10K Ω Type II NTC Thermistor or dry contact **6 Point Analog PPMs** (PPM-2U22.BPF and PPM-2U22.BPR) 2- 1000 Nickel RTD, 1000 Pt RTD, 0-10V, or dry contact **12 Point Combination PPMs** (PPM-2U3322.BPF and PPM-2U3322.BPR) 2- 1000 Nickel RTD, 1000 Pt RTD, 0-10V, or dry contact **12 Point Combination PPM** (PPM-3U63.BPR, for China only) 3- 1000 Nickel RTD, 1000 Pt RTD, 0-10V, or dry
Digital Outputs	**6 Point Digital PPMs** (PPM-1U32.BPR and PPM-1U32.BPF) 2- Form A NO (Normally Open) Relays. 24 to 240 Vac, 5A resistive, 2A General Purpose, 5(2) **6 Point Digital PPM** (PPM-1U32.BPR) 2- Hand-Off-Auto switches provide manual operation of the relays for commissioning **12 Point Combination PPMs** (PPM-2U3322.BPF, PPM-2U3322.BPR, and PPM-3U63.BPR (for China only)) 3- Form A NO (Normally Open) Relays. 24 to 240 Vac, 5A resistive, 2A General Purpose, 5(2)
Analog Inputs	**6 Point Analog PPMs** (PPM-2U22.BPF and PPM-2U22.BPR) 2- 1000 Nickel RTD, 1000 Pt RTD, 0-10Vdc, or 4-20mA **12 Point Combination PPMs** (PPM-2U3322.BPFand PPM-2U3322.BPR) 2- 1000 Nickel RTD, 1000 Pt RTD, 0-10Vdc
Analog Outputs	**6 Point Analog PPMs** (PPM-2U22.BPF and PPM-2U22.BPR) 2- 0-10 Vdc **12 Point Combination PPMs** (PPM-2U3322.BPFand PPM-2U3322.BPR) 2- 0-10 Vdc
Digital Inputs	**6 Point Digital PPMs** (PPM-1U32.BPR and PPM-1U32.BPF) 3- Dry contact or Pulse accumulator **12 Point Digital PPM** (PPM-3U63.BPR, for China only) 6- Dry contact
Dimensions	6.1 in x 4.5 x 1.4 in (154 mm x 114.4 mm x 34.5 mm)
Weight	0.8 lb max. including box
Communications Remote Local	BACnet MS/TP master or slave 9600 to 76800 baud set using a DIP switch
Storage Temperature Operating Range Humidity Range	-40°F to 158°F (-40°C to 70°C) 32°F to 122°F (0°C to 50°C) 5% to 95% rh (non-condensing)

Ordering Information

Part Number	Description
PPM-1U32.BPF	6 Point Digital BACnet MS/TP Point Pickup Module, Fixed terminal blocks (1UI 3DI 2DO)
PPM-1U32.BPR	6 Point Digital BACnet MS/TP Point Pickup Module, Removable terminal blocks and HOA switches (1UI 3DI 2DO)
PPM-2U22.BPF	6 Point Analog BACnet MS/TP Point Pickup Module, Fixed terminal blocks (2UI 2AI 2 AO)
PPM-2U22.BPR	6 Point Analog BACnet MS/TP Point Pickup Module, Removable terminal blocks (2UI 2AI 2 AO)
PPM-2U3322.BPF	12 Point Combination BACnet MS/TP Point Pickup Module, Fixed terminal blocks (2UI 3DI 3DO 2AO 2AI)
PPM-2U3322.BPR	12 Point Combination BACnet MS/TP Point Pickup Module, Removable terminal blocks (2UI 3DI 3DO 2AO 2AI)
PPM-3U63.BPR (for China only)	12 Point Combination BACnet MS/TP Point Pickup Module, Removable terminal blocks (3UI 6DI 3DO)
PPM-DIN.RMB	BACnet MS/TP Point Pickup Module DIN rail mounting brackets (5 pair)
550-975P100	3-wire 120 Ω 1/2W carbon composition resistor/each end of line terminator (pkg. of 100)
550-974P10	3-wire RS-485 reference terminator for single earth ground termination at one end of network.

BACnet Protocol Implementation Conformance Statement

Products

Product	Model Number	Protocol Revision	Software Version	Firmware Version
6 Point Analog PPM	PPM-2U22.BPF PPM-2U22.BPR	135-2004	3.0	1.0
6 Point Digital PPM	PPM-1U32.BPF PPM-1U32.BPR	135-2004	3.0	1.0
12 Point Combo PPM	PPM-2U3322.BPF PPM-2U3322.BPR PPM-3U63.BPR (for China only)	135-2004	3.0	1.0

Vendor Information

Siemens Industry, Inc.
Building Technologies Division
1000 Deerfield Parkway
Buffalo Grove, IL 60089
www.sbt.siemens.com

Product Description

The Point Pickup Module connects to small point count, remotely located digital IO/. This controller communicates with the APOGEE® Automation System using BACnet MS/TP.

BACnet Standardized Device Profile (Annex L)

Supported	Device Profile
	BACnet Operator Workstation (B-OWS)
	BACnet Building Controller (B-BC)
	BACnet Advanced Application Controller (B-AAC)
•	BACnet Application Specific Controller (B-ASC)
	BACnet Smart Actuator (B-SA)
	BACnet Smart Sensor (B-SS)

Supported BACnet Interoperability Building Block (BIBBs)

BACnet Interoperability Building Blocks (BIBB)		Supported
Data Sharing		
DS-RP-A	Data Sharing-ReadProperty-A	
DS-RP-B	Data Sharing-ReadProperty-B	•
DS-RPM-A	Data Sharing-ReadPropertyMultiple-A	
DS-RPM-B	Data Sharing-ReadPropertyMultiple-B	•
DS-RPC-A	Data Sharing-ReadPropertyConditional-A	
DS-RPC-B	Data Sharing-ReadPropertyConditional-B	
DS-WP-A	Data Sharing-WriteProperty-A	
DS-WP-B	Data Sharing-WriteProperty-B	•
DS-WPM-A	Data Sharing-WritePropertyMultiple-A	•
DS-WPM-A	Data Sharing-WritePropertyMultiple-B	
DS-COV-A	Data Sharing-COV-A	
DS-COV-B	Data Sharing-COV-B	•
DS-COVP-A	Data Sharing-COVP-A	
DS-COVP-B	Data Sharing-COVP-B	
DS-COVU-A	Data Sharing-COV-Unsolicited-A	
DS-COVU-B	Data Sharing-COV-Unsolicited-B	•
Scheduling		
SCHED-A	Scheduling-A	
SCHED-I-B	Scheduling-Internal-B	
SCHED-E-B	Scheduling-External-B	
Alarm and Event Management		
AE-N-A	Alarm and Event-Notification-A	
AE-N-I-B	Alarm and Event-Notification Internal-B	
AE-N-E-B	Alarm and Event-Notification External-B	
AE-ACK-A	Alarm and Event-ACK-A	
AE-ACK-B	Alarm and Event-ACK-B	
AE-ASUM-A	Alarm and Event-Alarm Summary-A	
AE-ESUM-B	Alarm and Event-Alarm Summary-B	
AE-INFO-A	Alarm and Event-Information-A	
AE-INFO-B	Alarm and Event-Information-B	
AE-LS-A	Alarm and Event-LifeSafety-A	
AE-LS-B	Alarm and Event-LifeSafety-B	
Trending		
T-VMT-A	Trending-Viewing and Modifying Trends-A	

BACnet Interoperability Building Blocks (BIBB)		Supported
T-VMT-I-B	Trending-Viewing and Modifying Trends-Internal-B	
T-VMT-E-B	Trending-Viewing and Modifying Trends-External-B	
T-ATR-A	Trending-Automated Trend Retrieval-A	
T-ATR-B	Trending-Automated Trend Retrieval-B	
Network Management		
NM-CE-A	Network Management-Connection Establishment-A	
NM-CE-B	Network Management-Connection Establishment-B	
NM-RC-A	Network Management-Router Configuration-A	
NM-RC-B	Network Management-Router Configuration-B	
Device Management		
DM-DDB-A	Device Management-Dynamic Device Binding-A	
DM-DDB-B	Device Management-Dynamic Device Binding-B	•
DM-DOB-A	Device Management-Dynamic Object Binding-A	
DM-DOB-B	Device Management-Dynamic Object Binding-B	•
DM-DDC-A	Device Management-DeviceCommunicationControl-A	
DM-DDC-B	Device Management-DeviceCommunicationControl-B	•
DM-PT-A	Device Management-Private Transfer-A	
DM-PT-B	Device Management-Private Transfer-B	
DM-TM-A	Device Management-Text Message-A	
DM-TM-B	Device Management-Text Message-B	
DM-TS-A	Device Management-TimeSynchronization-A	
DM-TS-B	Device Management-TimeSynchronization-B	
DM-UTC-A	Device Management-UTCTimeSynchronization-A	
DM-UTC-B	Device Management-UTCTimeSynchronization-B	
DM-RD-A	Device Management-ReinitializeDevice-A	
DM-RD-B	Device Management-ReinitializeDevice-B	
DM-BR-A	Device Management-Backup and Restore-A	
DM-BR-B	Device Management-Backup and Restore-B	
DM-LM-A	Device Management-List Manipulation-A	
DM-LM-B	Device Management-List Manipulation-B	
DM-OCD-A	Device Management-Object Creation and Deletion-A	
DM-OCD-B	Device Management-Object Creation and Deletion-B	
DM-VT-A	Device Management-Virtual Terminal-A	
DM-VT-B	Device Management-Virtual Terminal-B	

BACnet Standard Application Services Support

Name		
ReadProperty		Execute
ReadPropertyMultiple		Execute
WriteProperty		Execute
UnconfirmedCOVNotification	Initiate	
DeviceCommunicationContro		Execute
I-Am	Initiate	
I-Have	Initiate	
Who-Has		Execute
Who-Is		Execute

Data Link Layer Options

	BACnet IP, (Annex J)
	BACnet IP, (Annex J), Foreign Device
	ISO 8802-3, Ethernet (Clause 7)
	ANSI/ATA 878.1, 2.5 Mb. ARCNET (Clause 8)
	ANSI/ATA 878.1, RS-485 ARCNET (Clause 8), baud rate(s) _____
•	MS/TP master (Clause 9), baud rate(s): 9600 bps, 19200 bps, 38400 bps, 76800 bps
•	MS/TP slave (Clause 9), baud rate(s): _____
	Point-To-Point, EIA 232 (Clause 10), baud rate(s): _____
	Point-To-Point, modem, (Clause 10), baud rate(s): _____
	LonTalk, (Clause 11), medium: _____
	Other: _____

Segmentation Capability

	Able to transmit segmented messages	Window Size: 32
	Able to receive segmented messages	Window Size: 32

Device Address Binding

Is Static Device Binding supported?	No

Networking Options

	Router, Clause 6 – List all routing configurations, e.g., ARCNET-Ethernet, Ethernet-MS/TP, etc. BACnet/IP (Annex J) to BACnet MS/TP
	Annex H.3, BACnet Tunneling Router over UDP/IP
	BACnet/IP Broadcast Management Device (BBMD)
	Does the BBMD support registrations by Foreign Devices?

Character Sets Supported

Indicating support for multiple character sets does not imply that they can all be supported simultaneously.

•	ANSI X3.4
	ISO 10646 (USC-2)
	IBM™/Microsoft™ DBCS
	ISO 10646 (ICS-4)
	ISO 8859-1
	JIS C 6226

6 Point Analog PPM

Standard Object Types Supported

Object Type	Supported	Creatable	Deletable
Accumulator		No	No
Analog Input	•	No	No
Analog Output	•	No	No
Analog Value		No	No
Averaging		No	No
Binary Input	•	No	No
Binary Output	•	No	No
Binary Value		No	No
Calendar		No	No
Command		No	No
Device	•	No	No
Event Enrollment		No	No
File		No	No
Group		No	No
Life Safety Point		No	No
Life Safety Zone		No	No
Loop		No	No
Multi-state Output		No	No
Multi-state Value		No	No
Notification Class		No	No
Program		No	No
Pulse Converter		No	No
Schedule		No	No
Trend Log		No	No

Object Attributes

Accumulator Input Object Type

This object type will not be supported in this project.

Analog Input Object Type

Analog Input Object Type			
Property_Identifier	**Supported**	**Access**	**Notes**
Object_Identifier	Yes		
Object_Name	Yes		
Object_Type	Yes		
Present_Value	Yes	W	
Description	No		
Device_Type	No		
Status_Flags	Yes		
Event_State	Yes		
Reliability	Yes		
Out_Of_Service	Yes	W	
Update_Interval	No		
Units	Yes	W	
Min_Pres_Value	No		
Max_Pres_Value	No		
Resolution	No		
COV_Increment	Yes	W	
Time_Delay	No		
Notification Class	No		
High_Limit	No		
Low_Limit	No		
Deadband	No		
Limit_Enable	No		
Event_Enable	No		
Acked_Transitions	No		
Notify_Type	No		
Event_Time_Stamps	No		
Profile_Name	No		
Analog Output Object Type			
Property_Identifier	**Supported**	**Access**	**Notes**
Object_Identifier	Yes		
Object_Name	Yes		
Object_Type	Yes		
Present_Value	Yes	W	
Description	No		
Device_Type	No		

Status_Flags	Yes		
Event_State	Yes		
Reliability	Yes		
Out_Of_Service	Yes		
Units	Yes		
Min_Pres_Value	No		
Max_Pres_Value	No		
Resolution	Yes		
Priority_Array	Yes		
Relinquish_default	Yes	W	
COV_Increment	Yes	W	
Time_Delay	No		
Notification Class	No		
High_Limit	No		
Low_Limit	No		
Deadband	No		
Limit_Enable	No		
Event_Enable	No		
Acked_Transitions	No		
Notify_Type	No		
Event_Time_Stamps	No		
Profile_Name	No		

Analog Value Object Type

This object type will not be supported in this project.

Averaging Object Type

This object type will not be supported in this project.

Binary Input Object Type

Binary Input Object Type			
Property_Identifier	**Supported**	**Access**	**Notes**
Object_Identifier	Yes		
Object_Name	Yes		
Object_Type	Yes		
Present_Value	Yes	W	
Description	No		
Device_Type	No		
Status_Flags	Yes		
Event_State	Yes		

Reliability	Yes		
Out_Of_Service	Yes	W	
Polarity	Yes		
Inactive_Text	Yes		
Active_Text	Yes		
Change_Of_State_Time	No		
Change_Of_State_Count	No		
Time_Of_State_Count_Reset	No		
Elapsed_Active_Time	No		
Time_Of_Active_Time_Reset	No		
Time_Delay	No		
Notification Class	No		
Alarm_Value	No		
Event_Enable	No		
Acked_Transitions	No		
Notify_Type	No		
Event_Time_Stamps	No		
Profile_Name	No		
Binary Output Object Type			
Property_Identifier	**Supported**	**Access**	**Notes**
Object_Identifier	Yes		
Object_Name	Yes		
Object_Type	Yes		
Present_Value	Yes	W	
Description	No		
Device_Type	No		
Status_Flags	Yes		
Event_State	Yes		
Reliability	Yes		
Out_Of_Service	Yes		
Polarity	Yes		
Inactive_Text	Yes		
Active_Text	Yes		
Change_Of_State_Time	No		
Change_Of_State_Count	No		
Time_Of_State_Count_Reset	No		
Elapsed_Active_Time	No		
Minimum_Off_time	No		
Maximum_Off_time	No		

Priority_Array	Yes		
Relinquish_default	Yes	W	
Time_Delay	No		
Notification Class	No		
Feedback_Value	No		
Event_Enable	No		
Acked_Transitions	No		
Notify_Type	No		
Event_Time_Stamps	No		
Profile_Name	No		

Binary Value Object Type

This object type will not be supported in this project.

Calendar Object Type

This object type will not be supported in this project.

Command Object Type

This object type will not be supported in this project.

Device Object Type

Device Object Type			
Property_Identifier	**Supported**	**Access**	**Notes**
Object_Identifier	Yes	W	
Object_Name	Yes	W	
Object_Type	Yes		
System_Status	Yes		
Vendor_Name	Yes		
Vendor_Identifier	Yes		
Model_Name	Yes		
Firmware_Revision	Yes		
Application_Software_Version	Yes		
Location	Yes	W	
Description	Yes	W	
Protocol_Version	Yes		
Protocol_Revision	Yes		
Protocol_Services_Support	Yes		
Protocol_Object_Types_Supported	Yes		
Object_List	Yes		
Max_APDU_Length_Accepted	Yes		

Segementation_Support	Yes		
Max_Segments_Support	No		
VT_Classes_Supported	No		
Active_VT_Sessions	No		
Local_Time	No		
Local_Date	No		
UTC_Offset	No		
Daylight_Savings_Status	No		
APDU_Segment_Timeout	No		
APDU_Timeout	Yes		
Number_Of_APDU_Retries	Yes		
List_Of_Session_Keys	No		
Time_Sync_Recipients	No		
Max_Master	Yes	W	
Max_Info_Frames	Yes	W	
Device_Address_Binding	Yes		
Database_Revsion	Yes		
Configuration_Files	No		
Last_Restore_Time	No		
Backup_Failure_Time	No		
Active_COV_Subscriptions	No		
Slave_Proxy_Table	No		
Manual_Slave_Address_Binding	No		
Auto_Slave_Discovery	No		
Slave_Address_Binding	No		
Profile_Name	No		

Event Enrollment Object Type

This object type will not be supported in this project.

File Object Type

This object type will not be supported in this project.

Group Object Type

This object type will not be supported in this project.

Life Safety Point Object Type

This object type will not be supported in this project.

Life Safety Zone Object Type

This object type will not be supported in this project.

Loop Object Type
This object type will not be supported in this project.

Multistate Input Object Type
This object type will not be supported in this project.

Multistate Output Object Type
This object type will not be supported in this project.

Multistate Value Object Type
This object type will not be supported in this project.

Notification Class Object Type
This object type will not be supported in this project.

Program Object Type
This object type will not be supported in this project.

Pulse Converter Object Type
This object type will not be supported.

Schedule Object Type
This object type will not be supported in this project.

Trend Log Object Type
This object type will not be supported in this project.

6 Point Digital PPM

Standard Object Types Supported

Object Type	Supported	Creatable	Deletable
Accumulator	•	No	No
Analog Input	•	No	No
Analog Output		No	No
Analog Value		No	No
Averaging		No	No
Binary Input	•	No	No
Binary Output	•	No	No
Binary Value		No	No
Calendar		No	No
Command		No	No
Device	•	No	No
Event Enrollment		No	No
File		No	No
Group		No	No
Life Safety Point		No	No
Life Safety Zone		No	No
Loop		No	No
Multi-state Output		No	No
Multi-state Value		No	No
Notification Class		No	No
Program		No	No
Pulse Converter		No	No
Schedule		No	No
Trend Log		No	No

Object Attributes

Accumulator Input Object Type

Accumulator Input Object Type			
Property_Identifier	**Supported**	**Access**	**Notes**
Object_Identifier	Yes		
Object_Name	Yes		
Object_Type	Yes		
Present_Value	Yes	W	

Description	No		
Device_Type	No		
Status_Flags	Yes		
Event_State	Yes		
Reliability	Yes		
Out_Of_Service	Yes	W	
Scale	Yes	W	Currently we just support the floatscale.
Units	Yes	W	
Prescale	No		
Max_Pres_Value	Yes		
Value_Change_Time	Yes		
Value_Before_Change	Yes		
Value_Set	Yes	W	
Logging_Record	No		
Logging_Object	No		
Pulse_Rate	No		
High_Limit	No		
Low_Limit	No		
Limit_Monitoring_Interval	No		
Notification Class	No		
Time_Delay	No		
Limit_Enable	No		
Event_Enable	No		
Acked_Transitions	No		
Notify_Type	No		
Event_Time_Stamps	No		
Profile_Name	No		
Analog Input Object Type			
Property_Identifier	**Supported**	**Access**	**Notes**
Object_Identifier	Yes		
Object_Name	Yes		
Object_Type	Yes		
Present_Value	Yes	W	
Description	No		
Device_Type	No		
Status_Flags	Yes		
Event_State	Yes		
Reliability	Yes		

Out_Of_Service	Yes	W	
Update_Interval	No		
Units	Yes	W	
Min_Pres_Value	No		
Max_Pres_Value	No		
Resolution	No		
COV_Increment	Yes	W	
Time_Delay	No		
Notification Class	No		
High_Limit	No		
Low_Limit	No		
Deadband	No		
Limit_Enable	No		
Event_Enable	No		
Acked_Transitions	No		
Notify_Type	No		
Event_Time_Stamps	No		
Profile_Name	No		

Analog Output Object Type

This object type will not be supported in this project.

Analog Value Object Type

This object type will not be supported in this project.

Averaging Object Type

This object type will not be supported in this project.

Binary Input Object Type

Binary Input Object Type			
Property_Identifier	**Supported**	**Access**	**Notes**
Object_Identifier	Yes		
Object_Name	Yes		
Object_Type	Yes		
Present_Value	Yes	W	
Description	No		
Device_Type	No		
Status_Flags	Yes		
Event_State	Yes		
Reliability	Yes		

Out_Of_Service	Yes	W	
Polarity	Yes		
Inactive_Text	Yes	W	
Active_Text	No		
Max_Pres_Value	Yes		
Change_Of_State_Time	No		
Change_Of_State_Count	No		
Time_Of_State_Count_Reset	No		
Elapsed_Active_Time	No		
Time_Of_Actve_Time_Reset	No		
Time_Delay	No		
Notification Class	No		
Alarm_Value	No		
Event_Enable	No		
Acked_Transitions	No		
Notify_Type	No		
Event_Time_Stamps	No		
Profile_Name	No		
Binary Output Object Type			
Property_Identifier	**Supported**	**Access**	**Notes**
Object_Identifier	Yes		
Object_Name	Yes		
Object_Type	Yes		
Present_Value	Yes	W	
Description	No		
Device_Type	No		
Status_Flags	Yes		
Event_State	Yes		
Reliability	Yes		
Out_Of_Service	Yes		
Polarity	Yes		
Inactive_Text	Yes		
Active_Text	Yes		
Change_Of_State_Time	No		
Change_Of_State_Coount	No		
Time_Of_State_Count_Reset	No		
Elapsed_Active_Time	No		
Time_Of_Active_Time_Reset	No		
Minimum_Off_Time	No		

Minimum_On_Time	No		
Priority_Array	Yes		
Relinquish_default	Yes	W	
Time_Delay	No		
Notification Class	No		
Feedback_Value	No		
Event_Enable	No		
Acked_Transitions	No		
Notify_Type	No		
Event_Time_Stamps	No		
Profile_Name	No		

Binary Value Object Type

This object type will not be supported in this project.

Calendar Object Type

This object type will not be supported in this project.

Command Object Type

This object type will not be supported in this project.

Device Object Type

Device Object Type			
Property_Identifier	**Supported**	**Access**	**Notes**
Object_Identifier	Yes	W	
Object_Name	Yes	W	
Object_Type	Yes		
System_Status	Yes		
Vendor_Name	Yes		
Vendor_Identifier	Yes		
Model_Name	Yes		
Firmware_Revision	Yes		
Application_Software_Version	Yes		
Location	Yes	W	
Description	Yes	W	
Protocol_Version	Yes		
Protocol_Revision	Yes		
Protocol_Services_Supported	Yes		
Protocol_Object_Tyes_Supported	Yes		
Object_List	Yes		

Max_APDU_Length_Accepted	Yes		
Segmentation_Supported	Yes		
Max_Segments_Supported	No		
VT_Classes_Sessions	No		
Local_Time	No		
Local_Date	No		
UTC_Offset	No		
Daylight_Savings_Status	No		
APDU_Segment_Timeout	No		
APDU_Timeout	Yes		
Number_Of_APDU_Retries	Yes		
List_Of_Session_Keys	No		
Time_Sync_Recipients	No		
Max_Master	Yes	W	
Max_Info_Frames	Yes	W	
Device_Address_Binding	Yes		
Database_Revision	Yes		
Configuration_Files	No		
Last_Restore_Time	No		
Backup_FailureE_Timeout	No		
Active_COV_Subscriptions	No		
Slave_Proxy_Table	No		
Manual_Slave_Address_Binding	No		
Auto_Slave_Discovery	No		
Slave_Address_Binding	No		
Profile_Name	No		

Event Enrollment Object Type

This object type will not be supported in this project.

File Object Type

This object type will not be supported in this project.

Group Object Type

This object type will not be supported in this project.

Life Safety Point Object Type

This object type will not be supported in this project.

Life Safety Zone Object Type

This object type will not be supported in this project.

Loop Object Type

This object type will not be supported in this project.

Multistate Input Object Type

This object type will not be supported in this project.

Multistate Output Object Type

This object type will not be supported in this project.

Multistate Value Object Type

This object type will not be supported in this project.

Notification Class Object Type

This object type will not be supported in this project.

Program Object Type

This object type will not be supported in this project.

Pulse Converter Object Type

This object type will not be supported in this project.

Schedule Object Type

This object type will not be supported in this project.

Trend Log Object Type

This object type will not be supported in this project.

12 Point Combo PPM

Standard Object Types Supported

Object Type	Supported	Creatable	Deletable
Accumulator		No	No
Analog Input	•	No	No
Analog Output	•	No	No
Analog Value		No	No
Averaging		No	No
Binary Input	•	No	No
Binary Output	•	No	No
Binary Value		No	No
Calendar		No	No
Command		No	No
Device	•	No	No
Event Enrollment		No	No
File		No	No
Group		No	No
Life Safety Point		No	No
Life Safety Zone		No	No
Loop		No	No
Multi-state Input		No	No
Multi-state Output		No	No
Multi-state Value		No	No
Notification Class		No	No
Program		No	No
Pulse Converter		No	No
Schedule		No	No
Trend Log		No	No

Object Attributes

Accumulator Input Object Type

This object type will not be supported in this project.

Analog Input Object Type

Analog Input Object Type			
Property_Identifier	**Supported**	**Access**	**Notes**
Object_Identifier	Yes		
Object_Name	Yes		
Object_Type	Yes		
Present_Value	Yes	W	
Description	No		
Device_Type	No		
Status_Flags	Yes		
Event_State	Yes		
Reliability	Yes		
Out_Of_Service	Yes	W	
Update_Interval	No		
Units	Yes	W	
Min_Pres_Value	No		
Max_Pres_Value	No		
Resolution	No		
COV_Increment	Yes	W	
Time_Delay	No		
Notification Class	No		
High_Limit	No		
Low_Limit	No		
Deadband	No		
Limit_Enable	No		
Event_Enable	No		
Acked_Transitions	No		
Notify_Type	No		
Event_Time_Stamps	No		
Profile_Name	No		
Analog Output Object Type			
Property_Identifier	**Supported**	**Access**	**Notes**
Object_Identifier	Yes		
Object_Name	Yes		
Object_Type	Yes		
Present_Value	Yes	W	
Description	No		
Device_Type	No		

Status_Flags	Yes		
Event_State	Yes		
Reliability	Yes		
Out_Of_Service	Yes		
Units	Yes		
Min_Pres_Value	No		
Max_Pres_Value	No		
Resolution	No		
Priority_Array	Yes		
Relinquish_default	Yes	W	
COV_Increment	Yes	W	
Time_Delay	No		
Notification Class	No		
High_Limit	No		
Low_Limit	No		
Deadband	No		
Limit_Enable	No		
Event_Enable	No		
Acked_Transitions	No		
Notify_Type	No		
Event_Time_Stamps	No		
Profile_Name	No		

Analog Value Object Type

This object type will not be supported in this project.

Averaging Object Type

This object type will not be supported in this project.

Binary Input Object Type

Binary Input Object Type			
Property_Identifier	**Supported**	**Access**	**Notes**
Object_Identifier	Yes		
Object_Name	Yes		
Object_Type	Yes		
Present_Value	Yes	W	
Description	No		
Device_Type	No		
Status_Flags	Yes		
Event_State	Yes		

Reliability	Yes		
Out_Of_Service	Yes	W	
Polarity	Yes		
Inactive_Text	Yes		
Active_Text	Yes		
Change_Of_State_Time	No		
Change_Of_State_Count	No		
Time_Of_State_Count_Reset	No		
Elapsed_Active_Time	No		
Time_Of_Active_Time_Reset	No		
Time_Delay	No		
Notification Class	No		
Alarm_Value	No		
Event_Enable	No		
Acked_Transitions	No		
Notify_Type	No		
Event_Time_Stamps	No		
Profile_Name	No		
Binary Output Object Type			
Property_Identifier	**Supported**	**Access**	**Notes**
Object_Identifier	Yes		
Object_Name	Yes		
Object_Type	Yes		
Present_Value	Yes	W	
Description	No		
Device_Type	No		
Status_Flags	Yes		
Event_State	Yes		
Reliability	Yes		
Out_Of_Service	Yes		
Polarity	Yes		
Inactive_Texxt	Yes		
Active_Text	Yes		
Change_Of_State_Time	No		
Change_Of_State_Count	No		
Time_Of_State_Count_Reset	No		
Elapsed_Active_Time	No		
Time_Of_Active_Time_Reset	No		
Minimum_Off_Time	No		

Minimum_On_Time	No		
Priority_Array	Yes		
Relinquish_default	Yes	W	
Time_Delay	No		
Notification Class	No		
Feedback_Value	No		
Event_Enable	No		
Acked_Transitions	No		
Notify_Type	No		
Event_Time_Stamps	No		
Profile_Name	No		

Binary Value Object Type

This object type will not be supported in this project.

Calendar Object Type

This object type will not be supported in this project.

Command Object Type

This object type will not be supported in this project.

Device Object Type

Device Object Type			
Property_Identifier	**Supported**	**Access**	**Notes**
Object_Identifier	Yes	W	
Object_Name	Yes	W	
Object_Type	Yes		
System_Status	Yes		
Vendor_Name	Yes		
Vendor_Identifier	Yes		
Model_Name	Yes		
Firmware_Revision	Yes		
Application_Software_Version	Yes		
Location	Yes	W	
Description	Yes	W	
Protocol_Version	Yes		
Protocol_Revision	Yes		
Protocol_Services_Supported	Yes		
Protocol_Object_Types_Supported	Yes		
Object_list	Yes		

Max_APPDU_Length_Accepted	Yes		
Segmentation_Supported	Yes		
Max_Segments_Supported	No		
VT_Classes_Supported	No		
Active_VT_Sessions	No		
Local_Time	No		
Local_Date	No		
UT_Offset	No		
Daylight_Savings_Status	No		
APDU_Segment_Timeout	No		
APDU_Timeout	Yes		
Number_Of_APDU_Retries	Yes		
List_Of_Session_Keys	No		
Time_Sync_Recipients	No		
Max_Master	Yes	W	
Max_Info_Frames	Yes	W	
Device_Address_Binding	Yes		
Database_Revision	Yes		
Configuration_Files	No		
Last_Restore_Time	No		
Backup_Failure_Timeout	No		
Active_COV_Subscriptions	No		
Slave_Proxy_Table	No		
Manual_Slave_Address_Binding	No		
Auto_Slave_Discovery	No		
Slave_Address_Binding	No		
Profile_Name	No		

Event Enrollment Object Type

This object type will not be supported in this project.

File Object Type

This object type will not be supported in this project.

Group Object Type

This object type will not be supported.

Life Safety Point Object Type

This object type will not be supported.

Life Safety Zone Object Type

This object type will not be supported in this project.

Loop Object Type
This object type will not be supported in this project.

Multistate Input Object Type
This object type will not be supported in this project.

Multistate Output Object Type
This object type will not be supported in this project.

Multistate Value Object Type
This object type will not be supported in this project.

Notification Class Object Type
This object type will not be supported in this project.

Program Object Type
This object type will not be supported in this project.

Pulse Converter Object Type
This object type will not be supported in this project.

Schedule Object Type
This object type will not be supported in this project.

Trend Log Object Type
This object type will not be supported in this project.

SIEMENS

RDB160BNU

Fan Coil Unit Room Thermostat with BACnet MS/TP Communication

RDB160BNU



The RDB160BNU controls fan coil units with the following features:

- HVAC applications: 2-pipe, 2-pipe with electric heater, and 4-pipe
- Communication: BACnet MS/TP
- Operating voltage: AC 24 V
- Fan: 1, 2, 3-speed or DC 0...10 V (automatic or manual)
- Valve actuators: On/off, 3-position or DC...10 V
- Electric heater: On/off
- Built-in temperature sensor
- Three configurable inputs for external room/return air temperature, supply air temperature limitation, heating/cooling changeover, window contact, and occupancy sensor.
- Operating modes: Comfort, Standby (Economy), OFF, and mold protection
- Room temperature control: Based on built-in temperature sensor or room/return air temperature
- Heating/cooling changeover: manual, or automatic via water temperature sensor or digital input
- Supply air temperature limitation
- Automatic valve exercise
- Backlit LCD

Use

The RDB160BNU is suitable for commercial applications where communication to a building management system is required, such as offices, healthcare, education, retail, shopping malls or other commercial facilities.

Functions

Temperature control

- Built-in temperature sensor or
- External room/return air temperature

Operating modes

- Comfort
- Standby (Economy)
- OFF mode
- Mold protection (optional in OFF mode)

Additional functions

- Heating/cooling changeover
  - Manual: via thermostat (P02) or BACnet object
  - Automatic: via water temperature sensor or digital input
- Supply air temperature limitation function

Security functions

- Lock buttons
- Lock parameter menu access
- Block device during fire alarms
- Valve exercising feature

Energy efficiency functions

- Setpoint limitation
- Window state
- Occupancy

Fan operation

- Automatic and manual modes
- Fan operation in dead zone (fan kick)
- Fan over-run for electric heater

Fan blocking functions

- Block fan speed control in Auto mode
- Block fan speed control in Manual mode

BACnet MS/TP communication

- BACnet MS/TP MAC address: set from 0 to 127. Factory setting is 127.
- BACnet MS/TP device instance number: set from 0 to 4194302. Factory setting is 0.
- Baud rate: selectable between 9600, 19200, 38400 and 76800 (default setting) bps.

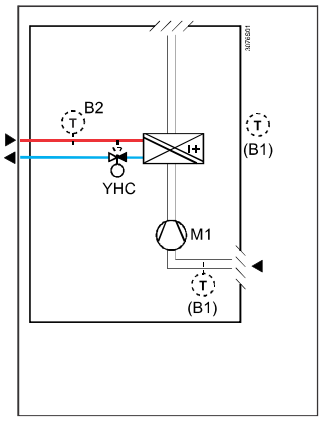
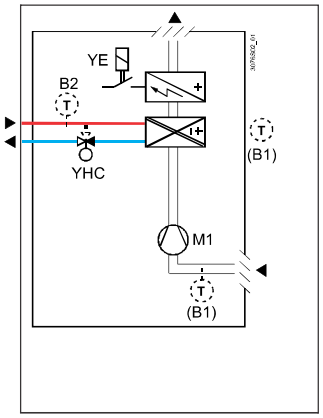
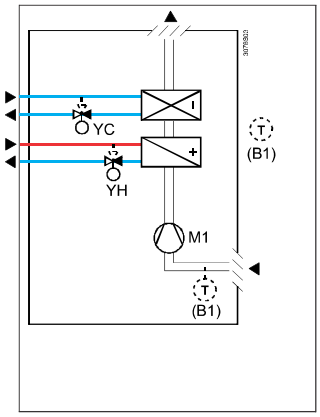
Applications

HVAC applications

The RDB160BNU can control fan coil units of the following types:

- 2-pipe system
- 2-pipe system with electric heater
- 4-pipe system

The applications can be configured using the local parameter menu or via BACnet objects:

HVAC applications		
• 2-pipe fan coil (P01 = 2)	• 2-pipe fan coil with electric heater (P01 = 4)	• 4-pipe fan coil (P01 = 3)
		

YHC	Heating/cooling valve actuator	M1	Fan
YH	Heating valve actuator	B1	Return air temperature sensor or external room temperature sensor (optional)
YC	Cooling valve actuator	B2	Changeover sensor (optional)
YE	Electric heater		

Control applications

The RDB160BNU can control 29 different FCU control applications with up to 2 DC 0…10 V control outputs i.e., the control of a DC fan, DC cooling valve, and DC heating valve is not possible.

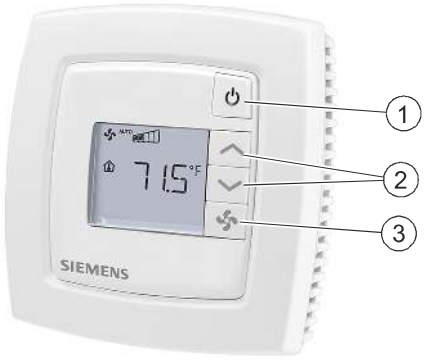
	2-pipe		2-pipe with electric heater		4-pipe		
Fan	1/2/3-speed	DC 0…10 V	1/2/3-speed	DC 0…10 V	1/2/3-speed	DC 0…10 V	
Output #1	On/Off, PWM, 3-position, DC 0…10 V		On/Off, PWM, DC 0…10 V		On/Off, PWM, DC 0…10 V	On/Off, PWM	DC 0…10 V
Output #2	N/A		On/Off			On/Off, PWM	

Mechanical design

The RDB160BNU consists of 3 parts:

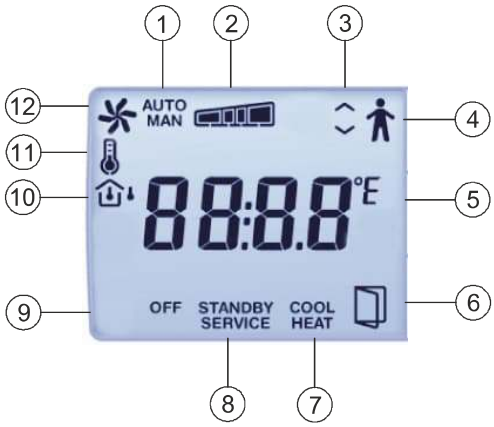
- Mounting plate with screw terminals
- Plastic housing with electronics, buttons, display, and room temperature sensor
- Frame

Buttons



1 On/Off
2 Up/down
3 Fan

Display



1 'AUTO/MAN': Automatic or manual mode indication for the fan

2 Current fan speed (Low, Medium, High)

3 Up/Down buttons to adjust setpoints and parameters

4 Occupancy indication

5 Current room temperature or setpoint in °F or °C (one decimal point)

6 Open window

7 'COOL/HEAT': Shows the current control mode

8 'STANDBY': Economy mode indication
'SERVICE': Commissioning mode (setting parameters)

9 'OFF': OFF mode

10 Indoor / outdoor temperature

11 Setpoint temperature

12 Fan status

Type summary

Type	Order number	Designation
RDB160BNU	S55770-T437	RDB160BNU BACnet FCU Room Thermostat

Equipment combinations

The thermostat can be combined with sensors and actuators with compatible signal types as listed in chapter 'Technical data'.

Product documentation

Topic	Document ID:
Installation instructions	A6V12045441
Commissioning instructions	A6V12045450

The Installation instructions document is available in English, Spanish, and French.

It is included with the thermostat in the same packaging box.

Related documents such as environmental declarations, CE declarations, etc., can also be downloaded at the following Internet address:

www.siemens.com/bt/download

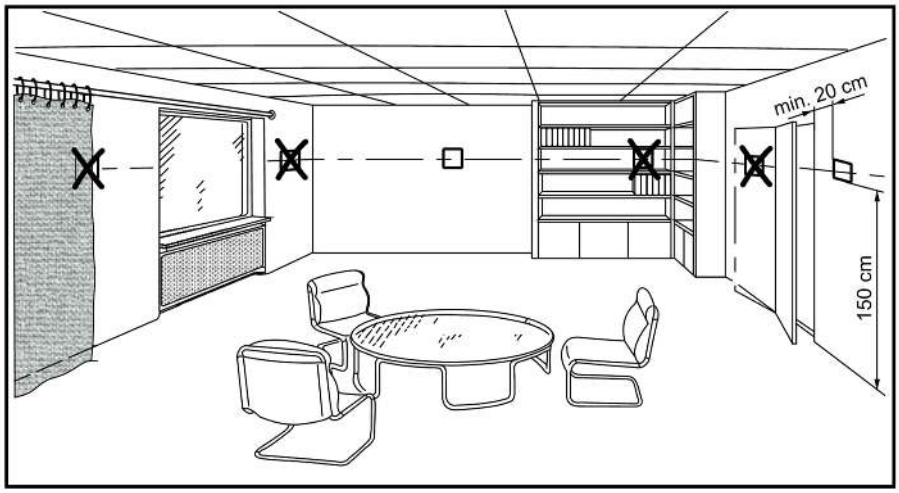
The BTL listing can be found at https://www.bacnetinternational.net/btl/.

Notes

Safety

⚠ CAUTION	
	**National safety regulations** Failure to comply with national safety regulations may result in personal injury and property damage. ● Observe national provisions and comply with the appropriate safety regulations.

Mounting



- The thermostat is suitable for mounting directly on the wall or on a 4” x 4” conduit box (using the ARG70 adapter plate).
- Recommended height: 1.5 m above the floor.
- Do not mount the devices in recesses, shelves, behind curtains or doors, or above or near heat sources.
- Avoid direct solar radiation and drafts.
- Seal the conduit box or the installation tube if any, as air currents can affect sensor readings.
- Adhere to allowed ambient conditions.

Installation

⚠ WARNING	
	**No internal line protection for supply lines to external consumers** Risk of fire and injury due to short-circuits • The AC 24 V mains supply line must have an external circuit breaker with a rated current of no more than 10 A. • Adapt the supply line cable diameters as per local regulations to the rated value of the installed over-current protection device. • Disconnect the thermostat from the power supply before removing it from the mounting plate.

⚠ WARNING	
	**Relay outputs (DO1, DO2, DO3, DO4 or UO1) connected to mains voltage** Injuries caused by electric shock when touching the device • Adapt the relay cable diameters as per local regulations to the rated value of the installed over-current protection device. • Use only valve actuators rated for AC 24 V.

Commissioning

The RDB160BNU thermostat is delivered with pre-programmed control sequences. The relevant application and its parameters can be selected using the buttons on the thermostat. This can be done through:

- Setup Wizard: Only appears the first time the thermostat is powered on. It enables rapid system configuration of the most important parameters. For a list of these parameters, please refer to the installation instructions. See chapter 'Product documentation [▶ 6]'.
- Parameter Menu: Available anytime. Used to access and change the complete parameter set. For a list of these parameters, please refer to the commissioning instructions. See chapter 'Product documentation [▶ 6]'.

Disposal



The symbol with the crossed-out waste container means that electrical and electronic products and batteries may not be disposed of in normal household waste. They must be placed in separate collection and recycling containers according to the applicable laws. Please also refer to any applicable national labelling requirements. Proper disposal helps save valuable resources and prevents potentially harmful effects to people and the environment. Spent batteries and accumulators that can be removed from old devices for disposal, must be removed and placed in the indicated disposal channels. You are responsible for deleting any personal data from old devices for disposal. The registered manufacturers or distributors of electrical and electronic devices have established a common system for returning old devices. Suppliers of electrical devices must accept the returned devices at no charge. You can return old devices to the original sales location or to recycling or collection centers for old electrical devices. Please contact your regional or municipal offices/authorities for information on recycling centers or collection centers for old electrical devices.

Warranty

Technical data on specific applications are valid only together with Siemens products listed under "Equipment combinations". Siemens rejects any and all warranties in the event that third-party products are used.

Technical data

General	
Operating voltage	AC 18…30 V
Frequency	50…60 Hz
Power consumption	2.5 VA
No internal fuse! External preliminary protection with max. C 10 circuit breaker required in all cases.	

Ambient conditions, environmental conditions	
Ambient temperature	32…122 °F (0...50 °C)
Storage temperature	-4…+158 °F (-20...+70 °C)
Ambient humidity	Max. 90%

Communication	
Communication	BACnet MS/TP
Communication speed	9600, 19200, 38400 or 76800 bps

Inputs	
Analog input (AI1)	PT1000-sensor, 32...122 °F (0…50 °C)
Universal input (UI1)	• Analog input: PT1000 sensor, 32...212 °F (0…100 °C) • Digital input: potential-free contact
Digital input (DI1)	Potential free contact
Common ('C') power output (for UI1 and DI1 only)	DC 24 V, max. 10 mA, short circuit-protected

Outputs	
Digital outputs (Dox)	AC 24 V, max. 0.5 A
Do NOT connect fans in parallel. Connect one fan directly. For additional fans, install one relay for each speed.	
Universal outputs (UOx)	• Digital output (DO): AC 24 V, max. 2.0 A • Analog output (AO): DC 0...10 V, max. 5 mA

Operational data	
Built-in temperature sensor	
Technology	NTC linearized 15 kΩ
Measuring range	32…122 °F (0…50 °C)
Accuracy	±0.9 °F (±0.5 °C) at 59...86 °F (15...30 °C)
Setpoint range	41…95 °F (5…35 °C)

Standards and directives	
UL certificates	UL916 *)
BACnet BTL Listing	BACnet Application Specific Controller (B-ASC)
EU conformity (CE)	See EU declaration of conformity *)
UK conformity (UKCA)	See UK declaration of conformity *)
The product environmental declaration contains data on environmentally compatible product design and assessments (RoHS compliance, materials composition, packaging, environmental benefit, disposal)	See product environmental declaration *)

General	
Mounting	Indoor, wall (directly, or on a 4” x 4” conduit box using the ARG70 adapter plate).
Terminal blocks	Lift type for max. cable cross-section: 2.1 mm^2
Display	Backlit LCD
Casing material	Polycarbonate, PC
Color	Signal white RAL 9003
Safety class	IP20
Net weight	3.88 ounces (110 g)

*) The documents can be downloaded at http://siemens.com/bt/download

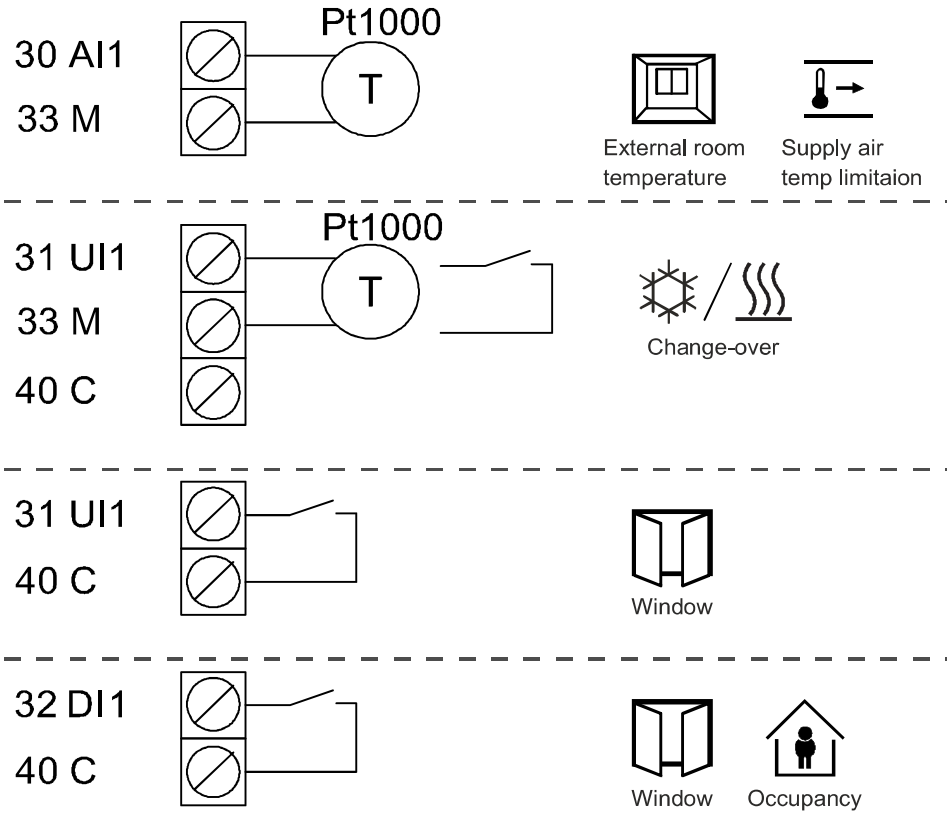
Connection terminals

No.	Label	Description
10	G	Supply voltage (AC 24 V~)
11	G0	Supply voltage (AC 24 V⊥)
12	DO1	**D**igital **O**utput 1 (AC 24 V⊥, max. 0.5 A): Fan speed low
13	DO2	**D**igital **O**utput 2 (AC 24 V⊥, max. 0.5 A): Fan speed medium
14	DO3	**D**igital **O**utput 3 (AC 24 V⊥, max. 0.5 A): Fan speed high
20	CDO	**C**ommon (AC 24 V~) for **D**igital **O**utputs: for DOs or UO1 (when configured as DO)
21	MUO	**M**easuring ground for **U**niversal **O**utputs (-DC 0…10 V): for UOs (when configured as AOs)
22	DO4	**D**igital **O**utput 4 (AC 24 V⊥, max. 0.5 A): • Electric heater (2-pipe FCU with electric heater) • Cooling valve (4-pipe FCU)
23	UO1	**U**niversal **O**utput 1 (AC 24 V⊥, max. 2.0 A or +DC 0…10 V, max. 5 mA): • Heating or cooling valve (2-pipe FCU and 2-pipe FCU with electric heater) • Heating valve (4-pipe FCU)
24	UO2	**U**niversal **O**utput 2 (+DC 0…10 V): • Fan (all applications with DC fan) • Cooling valve (4-pipe FCU with 3-speed fan)
30	AI1	**A**nalog **I**nput 1 (PT1000 sensor, 32…122 °F (0…50 °C)): • External room temperature sensor • Supply air temperature sensor
31	UI1	**U**niversal **I**nput 1 (PT1000 sensor, 32…212 °F (0…100 °C) or contact): • Change-over temperature sensor or contact • Window contact
32	DI1	**D**igital **I**nput 1 (Contact): • Presence detector • Window contact
33	M	**M**easuring ground: for AI1 or UI1 (when configured as AI)

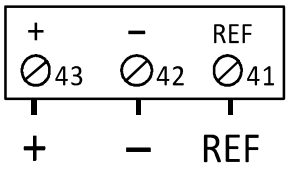
40	C	**C**ommon (DC 24 V): for DI1 and UI1 (when configured as DI)
41	REF	BACnet MS/TP Reference
42	-	BACnet MS/TP -
43	+	BACnet MS/TP +

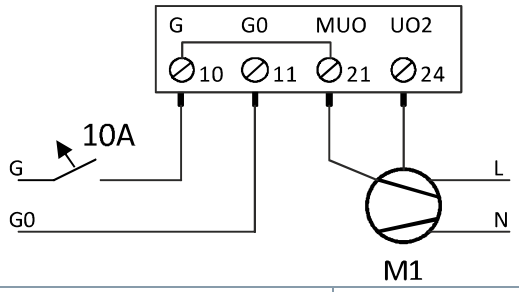
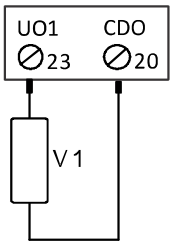
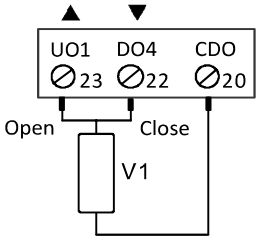
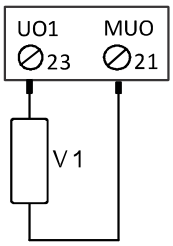
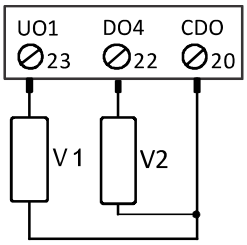
Connection diagrams

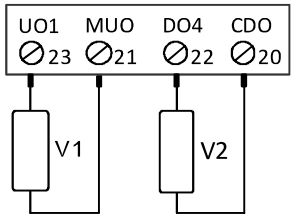
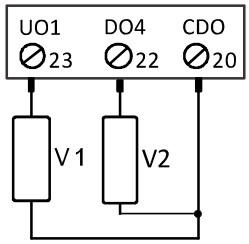
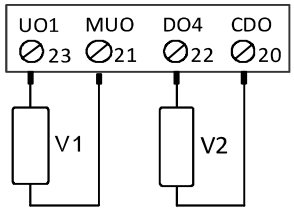
Inputs

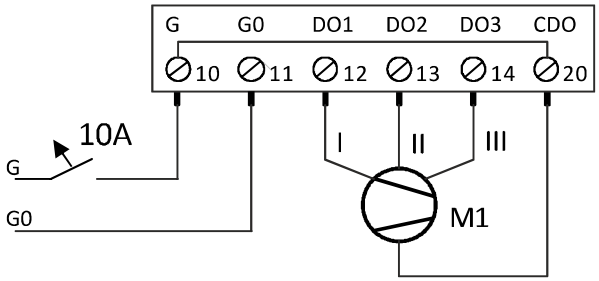
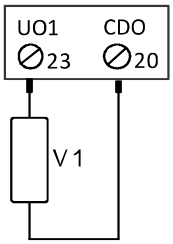
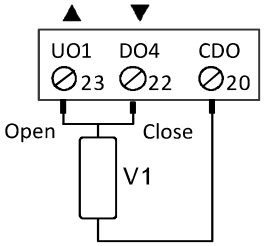
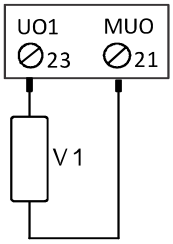
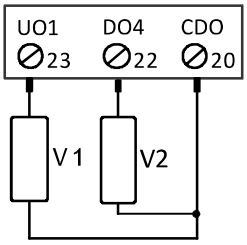
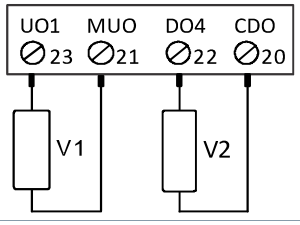


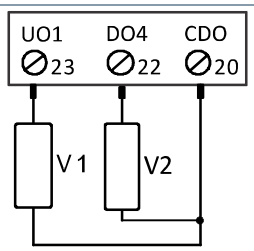
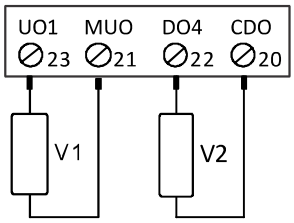
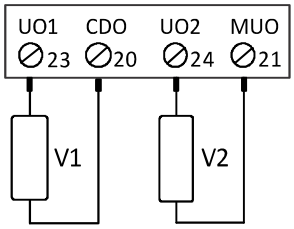
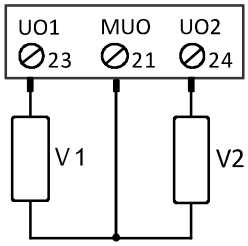
BACnet MS/TP



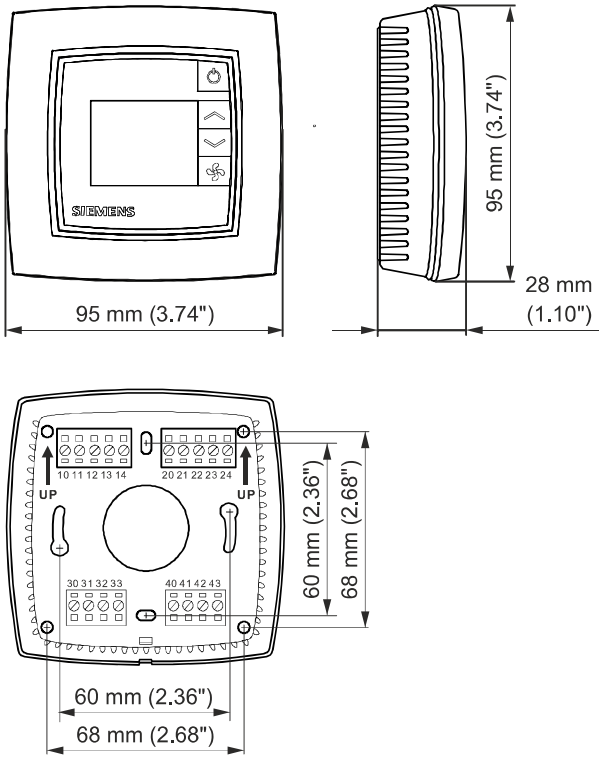
	DC 0…10 V fan	
		
HVAC application	**Control application**	**Wiring**
2-pipe	Heating/cooling valve (V1): On/Off or PWM	
2-pipe	Heating/cooling valve (V1): 3-position • UO1 = Open ▲ • DO4 = Close ▼	
2-pipe	Heating/cooling valve (V1): DC 0…10 V	
2-pipe with electric heater	Heating/cooling valve (V1): On/Off or PWM Electric heater (V2): On/Off	

2-pipe with electric heater	Heating/cooling valve (V1): DC 0…10 V Electric heater (V2): On/Off	
4-pipe	Heating valve (V1): On/Off or PWM Cooling valve (V2): On/Off or PWM	
4-pipe	Heating valve (V1): DC 0…10 V Cooling valve (V2): On/Off or PWM	

	3-/2-1-speed fan	
		
HVAC application	**Control application**	**Wiring**
2-pipe	Heating/cooling valve (V1): On/Off or PWM	
2-pipe	Heating/cooling valve (V1): 3-position • UO1 = Open ▲ • DO4 = Close ▼	
2-pipe	Heating/cooling valve (V1): DC 0…10 V	
2-pipe with electric heater	Heating/cooling valve (V1): On/Off or PWM Electric heater (V2): On/Off	
2-pipe with electric heater	Heating/cooling valve (V1): DC 0…10 V Electric heater (V2): On/Off	

4-pipe	Heating valve (V1): On/Off or PWM Cooling valve (V2): On/Off or PWM	
4-pipe	Heating valve (V1): DC 0…10 V Cooling valve (V2): On/Off or PWM	
4-pipe	Heating valve (V1): On/Off or PWM Cooling valve (V2): DC 0…10 V	
4-pipe	Heating valve (V1): DC 0…10 V Cooling valve (V2): DC 0…10 V	

Dimensions



All dimensions in mm

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SIEMENS

QMX3.P34

Technical Specification Sheet
Document No. 149-151
April 21, 2021

QMX3 Room Sensors for Siemens DXR Series Controllers



QMX3.P30/P40/P70
Sensing Only



QMX3.P02
Sensor/Room Operator



QMX3.P34/P44/P74
Sensor with Full Display



QMX3.P37
Room Sensor/Operator with Display

Description

The QMX3 Series includes sensors, switches and room operator units exclusively for use with Siemens DXR Series Controllers. The devices communicate with the controller using PL-Link protocols. All units can be installed on a standard 2" × 4" electrical box with no additional back plates required. No-logo versions are available for some units.

QMX3.P02
- Temperature sensor.
- Configurable touch keys for light and shade control.

QMX3.P30
- Temperature sensor.

QMX3.P34
- Temperature sensor.
- Backlit LCD display and touch keys for HVAC control.
- Green Leaf active energy management.

QMX3.P37
- Temperature sensor.
- Backlit LCD display and configurable touch keys for light and shade control.
- Green Leaf active energy management.

QMX3.P40
- Temperature and humidity sensor

QMX3.P44
- Temperature and humidity sensor
- Backlit LCD display and touch keys for HVAC control

QMX3.P70
- Temperature, humidity and air quality sensor.
- LED air quality indicator.

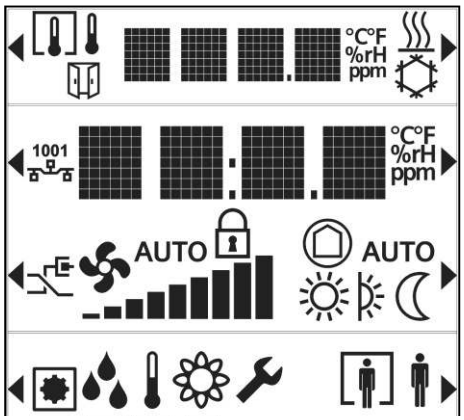
QMX3.P74
- Temperature, humidity and CO_2 sensor.
- Backlit LCD HMI and touch keys for HVAC control.
- Green Leaf active energy management.

Specifications*

Temperature	
Measuring range	32°F to 122°F (0°C to 50°C)
Accuracy	± 0.36°F @ 77°F (0.2°C @ 25°C)
Humidity (P4x and P7x)	
Measuring Range	0 to 95% rh
Accuracy	± 4% (20 to 80% rh)
CO_2 (P70 and P74)	
Measuring Range	400 to 10,000 PPM
Accuracy < 2K ppm	± (30 ppm +4% measured CO_2) @ 73°F (23°C) and 101.3 kPa
Temp. dependency	± 2 ppm/°C typical
Pressure dependency	0.14% of value/hPa
Long-term drift	± 20 ppm per year
Calibration	Not required
Operating voltage range	PL-Link DC 21 to 30V Max.
Power consumption	15 mA at 24 Vdc
Agency Listings	UL 916 FCC Part 15 CSA C22.2 #0 and #205
Color	White or black
Dimensions	5.25" × 3.5" × 0.71" (133.4 mm × 88.4 mm × 18 mm)
Shipping Weight	7.6 oz. (216 g)

*Accuracies shown are for sensing elements; actual system accuracy may vary.

Display (QMX3.P34 and QMX3.P74 Only)



NOTES:

- User-accessible values and settings will vary based on overall system configuration.
- Some values (for example, open window indicator, and outdoor air temperature) require additional

	Current Room Temperature/Humidity/Air Quality
	Indicates indoor or outdoor temperature (User-selectable).
	Indicates that a window is open.
	Heating/cooling mode indicator
	Green leaf indicates optimum settings are active. (One-touch resets to optimum setpoints.)
	Displays temperature setpoint (User-adjustable)
	Displays current fan speed (User-adjustable)
	Displays current room operating mode (User-selectable)
	Displayed value selector (RH/Temp/Air Quality) (User-selectable)
	Room occupancy indicator
	Start-up/commissioning mode indicators (See start-up and commissioning documents)
	Indicates parameters are locked

Product Ordering Information

Category	Model Number	Orderable Part Number	Temperature Sensor	Humidity Sensor	CO2 Sensor	Air Quality Indicator LED	Backlit Display and Touch Keys	Green Leaf LED	Configurable Touch Keys	Window for Labels	Color
Sensors	QMX3.P30*	S55624-H103-A*	•	–	–	–	–	–	–	–	White
	QMX3.P30-1WNB	QMX3.P30-1WNB	•	–	–	–	–	–	–	–	White (no logo)
	QMX3.P30-1BSC	S55624-H123	•	–	–	–	–	–	–	–	Black
	QMX3.P40	S55624-H116	•	•	-	-	-	-	-	-	White
	QMX3.P40-1BSC	S55624-H124	•	•	-	-	-	-	-	-	Black
	QMX3.P70	S55624-H104-A	•	•	•	•	–	–	–	–	White
	QMX3.P70-1BSC	S55624-H125	•	•	•	•	–	–	–	–	Black
Room Operator Units	QMX3.P02	QMX3.P02	•	–	–	–	–	–	•	•	White
	QMX3.P02-1BSC	S55624-H128	•	–	–	–	–	–	•	•	Black
	QMX3.P34*	S55624-H105-A*	•	–	–	–	•	•	–	–	White
	QMX3.P34-1WNB	QMX3.P34-1WNB	•	–	–	–	•	•	–	–	White (no logo)
	QMX3.P34-1BSC	S55624-H126	•	–	–	–	•	•	–	–	Black
	QMX3.P44	S55624-H143-A	•	•	–	–	•	•	–	–	White
	QMX3.P44-1BSC	S55624-H144	•	•	–	–	•	•	–	–	Black
	QMX3.P74*	S55624-H106-A*	•	•	•	–	•	•	–	–	White
	QMX3.P74-1WNB	QMX3.P74-1WNB	•	•	•	–	•	•	–	–	White (no logo)
	QMX3.P74-1BSC	S55624-H127	•	•	•	–	•	•	–	–	Black
	QMX3.P37	QMX3.P37	•	–	–	–	•	•	•	•	White
	QMX3.P37-1BSC	S55624-H129	•	–	–	–	•	•	•	•	Black
Accessories	QMX3-GSKT	QMX3-GSKT	QMX3 Insulating Gasket (10-pack). For installing sensors on a hollow wall.								
	OCI702	S55800-Y101	USB to PL-LINK Interface with Power Supply (Required for commissioning)								
	QMX3-BP	QMX3-BP	QMX3 Replacement Back Plates (12-pack)								
	5WG11938AB01	5WG11938AB01	KNX/PL-Link Bus Connector (25-pack)								

* For COO = USA, add suffix "-1WSB" to the **model** number to create the orderable part number (for example**: QMX3.P30-1WSB**).

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SIEMENS

QAA2212.EWSN

Technical Specification Sheet
Document No. 149-714
October 12, 2023

Series QAA2200 Room Temperature Sensors & Series QFA3200 Room Humidity Sensors



QxAx2xx.EWSN
Sensing Only



QxAx2xx.FWSN
Full HMI

Description

Series QAA2200 Room Temperature and Series QFA3200 Room Humidity + Temperature sensors are engineered to enable accurate and efficient control of room comfort. A wide variety of output signals is available for compatibly with nearly any control system. The patented housing design seamlessly blends into any décor and features strategically placed ventilation slots to maximize airflow and optimize accuracy.

The QFA3200 units combine a temperature sensor with a relative humidity sensor in a single housing to reduce installation time and improve overall room aesthetics.

Installation is quick and straightforward with all hardware included for mounting on a standard 2” × 4” electrical box. Screws and anchors are provided for mounting the sensor directly to a wall. Matching gaskets and trim rings are also available.

The “E” versions have a blank front to prevent unauthorized adjustments and are ideal for high traffic areas or remote spaces that are not supervised.

The “F” versions feature a full HMI that can display room conditions and temperature setpoint. The display is easily configured to limit the information that is available to the occupant. Temperature setpoint can be adjusted using soft touch plus (+) and minus (-) keys, and an override key enables the user to manually signal to the controller that the space is occupied.

Specifications

Temperature	
Measuring range	32°F to 122°F (0°C to 50°C)
Accuracy	
1K Ω Pt	± 0.54°F (0.3°C) @ 32°F (0°C)
1K Ω (32°F) Ni	± 0.72°F (0.4°C) @ 32°F (0°C)
10K Ω Type II	± 0.4°F (0.22°C) @ 77°F (25°C)
100K Ω Type II	± 0.36°F (0.2°C) @ 77°F (25°C)
4 to 20 mA/0 to 10V	± 0.9°F (0.5°C)
Humidity (QFA32xx only)	
Measuring Range	0 to 100% rh
Accuracy	± 2% between 10 to 90%
Long-Term Stability	<0.5% rh/year
Resolution	0.03% rh
Repeatability	+/-0.1% rh
Setpoint/Override (“F” versions only)	
Setpoint Signal	
QxAx2**SS**.FWSN	4 to 20 mA or 0 to 10V/0 to 5V
All others	0 to 10V/0 to 5V
Setpoint Range	55°F to 95°F (13°C to 35°C)
Override Contact	Momentary, 1A @ 24 Vac max.
Input Power	18 to 36 Vdc or 24 Vac ± 20%
VA Rating	1.5 VA, max.
Agency Listing	UL 916 CSA C22.2 No. 205
Color	White
Dimensions	4.5” × 2.75” × 1.18” (115 mm × 70 mm × 30 mm)
Shipping Weight	6 oz. (170 g)

Product Ordering Information

Part Number[1]	Temperature Output	Humidity Output	Display	Setpoint Adjustment
QAA2212.EWSN	Pt 1K Ω (385a) RTD	—	—	—
QAA2212.FWSN			•	•
QAA2220.EWSN	Ni 1K Ω @ 32°F RTD		—	—
QAA2220.FWSN			•	•
QAA2230.EWSC[2]	10K Ω Type II Thermistor		—	—
QAA2230.EWSN				
QAA2230.FWSC[2]			•	•
QAA2230.FWSN				
QAA2235.EWSN	100K Ω Type 2 Thermistor		—	—
QAA22SS.EWSN	0 to 10V/4 to 20 mA (Selectable)			
QAA22SS.FWSN			•	•
QFA3212.EWSN	Pt 1K Ω (385a) RTD	4 - 20 mA or 0 - 10V/ 0 - 5V (Selectable)	—	—
QFA3212.FWSN			•	•
QFA3230.FWSN	10K Ω Type II Thermistor			
QFA32SS.EWSN	0 to 10V/4 to 20mA		—	—
QFA32SS.FWSN			•	•

[1]For no-logo version, change "S" to "N" in Part Number position 10.

[2]For use with TALON® LON controllers.

Accessories Ordering Information

Description	Part Number
Room Unit Back Plate (10-pack)*	AQA2200-INTL
Room Unit Back Plate (Single)*	AQA2200-2X4
Room Sensor Insulating Gasket (10-pack) (Recommended for hollow wall installations.)	563-102 GSKT KIT

* For use when installing Series 2200/3200 Sensors on conduit boxes other than U.S. style 2” × 4”. Back plate measures 3-1/4” × 5” (82.55 mm × 127 mm).

Disposal



The devices are considered electrical and electronic equipment for disposal in terms of the applicable European Directive and may not be disposed of as domestic garbage.

- Dispose of the devices through channels provided for this purpose.
- Comply with all local and currently applicable laws and regulations.

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SIEMENS

QAM2030.010
544-339-18
544-339-8
544-342-16
544-342-8

Technical Specification Sheet
Document No. 149-915
March 25, 2022

Duct Temperature Sensors



Rigid Probe



Rigid Probe – Bracket Mount



Flexible Probe

Description

Siemens Duct Temperature Sensors monitor and transmit changes in duct air temperature to the HVAC control system. They provide an accurate, reliable indication of duct air temperature. The sensor resistance varies proportionally to the actual temperature being measured.

Sensors are offered with a variety of probe lengths to fit almost any size duct. Longer probes are typically flexible for easier handling and installation (see *Product Ordering Information* on the following page for details).

Multiple output signals are available to ensure compatibility with most common HVAC control systems.

Features

- Variety of sensing elements.
- Suitable for multiple duct applications.
- Responsive to temperature change.
- Accurate and reliable indication of duct temperature.
- Familiar installation process does not require special tools.

Specifications

Output Signals	100K Ω Thermistor 10K Ω Type 2 Thermistor 1K Ω @ 32°F Ni RTD 1K Ω Pt RTD (375a) 1K Ω Pt RTD (385a) 4 to 20 mA • -4°F to 122°F • 20°F to 120°F • 30°F to 250°F 10K Ω Matched Pair Thermistor • (For use with Siemens TEC only)
Probe Material	0.028 Wall SAE J526 ZTEW or Galfan steel tubing
Housing*	Standard NEC approved 2 × 4 inch (5 × 10 cm) utility box with 1/2-inch (13 mm) knockouts
Screw Head Type	Standard slotted

* Bracket-mounted units do not include housing.

Disposal



The devices are considered electrical and electronic equipment for disposal in terms of the applicable European Directive and may not be disposed of as domestic garbage.

- Dispose of the devices through channels provided for this purpose.
- Comply with all local and currently applicable laws and regulations.

Product Ordering Information

Output Signal	Type	Probe Length	Measuring Range	Accuracy	PN
100K Ω Thermistor	Point	18 inches (rigid)	-40°F to 180°F (-40°C to 82°C)	±0.50°F (±0.28°C) @ 77°F (25°C)	535-741-18
		4 inches (rigid)			535-741-4
		8 inches (rigid)			535-741-8
		4 inches (rigid), Bracket			536-811
	Averaging	18 inches (rigid)		±0.36°F (±0.2°C) @ 77°F (25°C)	540-244-18
		36 inches (flexible)			540-245-36
		72 inches (flexible)			540-246-72
10K Ω Type II Thermistor	Point	4 inches (rigid)		±0.4°F (±0.2°C) @ 77°F (25°C)	QAM2030.010
		8 inches (rigid)			QAM2030.020
		18 inches (rigid)			QAM2030.045
	Averaging	8 feet (flexible)			QAM2030.250
		16 feet (flexible)			QAM2030.500
		24 feet (flexible)			QAM2030.750
1K Ω @ 32F Ni RTD	Point	4 inches (rigid)		±0.72°F (±0.4°C) @ 32°F (0°C)	QAM2020.010
		8 inches (rigid)			QAM2020.020
		18 inches (rigid)			QAM2020.045
	Averaging	16 feet (flexible)		±0.75°F (±0.4°C) @ 75°F (24°C)	QAM2020.500
		24 feet (flexible)			QAM2020.750
1K Ω Pt RTD (375a)	Point	18 inches (rigid)		±0.54°F (±0.3°C) @ 32°F (0°C)	544-339-18
		4 inches (rigid)			544-339-4
		8 inches (rigid)			544-339-8
	Averaging	16 feet (flexible)			544-342-16
		24 feet (flexible)			544-342-24
		8 feet (flexible)			544-342-8
		18 inches (rigid)			544-343-18
		24 inches (rigid)			544-343-24
		36 inches (rigid)			544-343-36
		48 inches (rigid)			544-343-48
1K Ω Pt RTD (385a)	Point	4 inches (rigid)			QAM2012.010
		8 inches (rigid)			QAM2012.020
		18 inches (rigid)			QAM2012.045
	Averaging	8 feet (flexible)		±0.75°F (±0.4°C) @ 75°F (24°C)	QAM2012.250
		16 feet (flexible)			QAM2012.500
		24 feet (flexible)			QAM2012.750
4 to 20 mA	Point	18 inches (rigid)	-4°F to 122°F (-20°C to 50°C)	±0.54°F (±0.3°C) @ 32°F (0°C)	544-560-18
		4 inches (rigid)			544-560-4
		8 inches (rigid)			544-560-8
		18 inches (rigid)	20°F to 120°F (-7°C to 49°C)		533-376-18
		4 inches (rigid)			533-376-4
		8 inches (rigid)			533-376-8
	Averaging	16 feet (flexible)			533-380-16
		24 feet (flexible)			533-380-24
		8 feet (flexible)			533-380-8
		18 inches (rigid)			535-490-18
		24 inches (rigid)			535-490-24
		36 inches (rigid)			535-490-36
		48 inches (rigid)			535-490-48
	Point	18 inches (rigid)	30°F to 250°F (-1°C to 121°C)		533-377-18
		4 inches (rigid)			533-377-4
		8 inches (rigid)			533-377-8
For Use with Siemens TEC Only	Point	4 inches (rigid)	-40°F to 180°F (-40°C to 82°C)	± 0.50°F (± 0.28°C) @ 77°F (25°C)	538-871
		4 inches (rigid), Bracket			540-128
		18 inches (rigid)			540-739

Accessories

Flange and Gasket Kit for Variable Insertion Depth of Rigid Point Sensors	AQM2000

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SIEMENS

544-577-25

Technical Specification Sheet
Document No. 149-919
March 25, 2022

Immersion Well Temperature Sensors



Thermistor/RTD



4 to 20 mA

Description

Siemens Immersion Well Temperature Sensors monitor and transmit changes in liquid temperature to the HVAC control system. The sensor resistance varies proportionally to the actual temperature being measured.

All sensors are fully assembled with stainless steel thermowells, and are available in 2.5-inch, 4-inch and 6-inch insertion depths.

Multiple output signals are available to ensure compatibility with most common HVAC control systems.

Features

- Variety of sensing elements.
- Suitable for hot or chilled fluids.
- Responsive to temperature changes.
- Accurate and reliable indication of temperature.
- Familiar installation requires no special tools.

Specifications

Output Signals	100k Ω Thermistor 10k Ω Type 2 Thermistor 1k Ω @ 32°F Ni RTD 1k Ω Pt RTD (375a) 1k Ω Pt RTD (385a) 4 to 20 mA • 20°F to 70°F • 30°F to 250°F • 32°F to 212°F
Well Material	300 Series Stainless Steel Lead-free
External Connection Threads	1/2-inch – 14 NPT
Conduit Connection Threads	1/2-inch – 14 NPSMI

NOTE: Not for use in potable water systems.

Table 1. Product Ordering Information.

Output Signal	Insertion Depth	Measuring Range	Accuracy	Product Number
100K Ω Thermistor	2.5 inches	0°F to 250°F (-18°C to 121°C)	±0.50°F (±0.28°C) @ 77°F (25°C)	536-777-25
	4 inches			536-777-40
	6 inches			536-777-60
10K Ω Type II Thermistor	2.5 inches		±0.4°F (±0.22°C) @ 77°F (25°C)	QAE2030.005
	4 inches			QAE2030.010
	6 inches			QAE2030.015
1K Ω @ 32°F Ni RTD	2.5 inches		±0.72°F (±0.4°C) @ 32°F (0°C)	QAE2020.005
	4 inches			QAE2020.010
	6 inches			QAE2020.015
1K Ω Pt RTD (375a)	2.5 inches		±0.54°F (±0.3°C) @ 32°F (0°C)	544-577-25
	4 inches			544-577-40
	6 inches			544-577-60
1K Ω Pt RTD (385a)	2.5 inches			QAE2012.005
	4 inches			QAE2012.010
	6 inches			QAE2012.015
4 to 20 mA	2.5 inches	20°F to 70°F (-7° to 21°C)		536-774-25
	4 inches			536-774-40
	6 inches			536-774-60
	2.5 inches	30°F to 250°F (-1°C to 121°C)		536-767-25
	4 inches			536-767-40
	6 inches			536-767-60
	2.5 inches	32°F to 212°F (0°C to 100°C)		544-562-25
	4 inches			544-562-40
	6 inches			544-562-60

Table 2. Accessories Information.

Description		Part Number
Repair Kits*	Repair Kit, 4 to 20 mA, 30°F to 250°F	536-767-RK
	Repair Kit, 4 to 20m A, 20°F to 70°F	536-774-RK
	Repair Kit, 100k ohm Thermistor	536-777-RK
	Repair Kit, 4 to 20 mA, 32°F to 212°F	544-562-RK
	Repair Kit, PT 1k Ohm RTD (375)	544-577-RK
	Repair Kit, PT 1k Ohm RTD (385)	AQE2012
	Repair Kit, NI 1k Ohm @ 32°F RTD	AQE2020
	Repair Kit, 10k Ohm Type 2 Thermistor	AQE2030
Thermowells	Immersion Well, 2.5-inch	AQE2000.005
	Immersion Well, 4-inch	AQE2000.010
	Immersion Well, 6-inch	AQE2000.015

* Repair kits include replacement sensing element, temperature transmitter (4 to 20 mA models only), and related hardware.

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SIEMENS

QAD2030U

Technical Specification Sheet
Document No. 149-918
March 25, 2022

Surface Mount Temperature Sensors



With Electrical Box



Strap-on Cable Only



Self-Contained

Description

Siemens Surface Temperature Sensors monitor and transmit changes in temperature to the HVAC control system. The sensor resistance varies proportionally to the actual temperature being measured.

The self-contained sensors and units with electrical boxes are ideal for measuring pipe surface temperature as a surrogate for actual fluid temperature when it is not possible to retrofit a full immersion type sensor.

The strap-on cable style sensors can be used to acquire pipe surface temperature and can also be used to quickly acquire duct air temperature. When fitted with an appropriate protection tube, it can acquire temperature within a concrete slab.

The QAH11.1 is designed specifically for use as a changeover temperature sensor with Siemens RDG Series room thermostats.

Multiple output signals are available to ensure compatibility with most common HVAC control systems.

Features

- Variety of sensing elements.
- Suitable for hot or chilled fluids.
- Responsive to temperature change.
- Accurate and reliable indication of temperature.
- Easy installation requires no special tools.

Specifications

Output Signals	100K Ω Thermistor 10K Ω Type 2 Thermistor 1K Ω @ 32°F Ni RTD 1K Ω Pt RTD (375a) 1K Ω Pt RTD (385a) 4 to 20 mA
Accuracy	See Table 1.

Table 1. Product Ordering Information.

Configuration	Output Signal	Measuring Range	Cable Length	Accuracy	Product Number
With 2" × 4" Electrical Box	10K Ω Type II Thermistor	-40°F to 240°F (-40°C to 121°C)	26 inches	±0.4°F (±0.2°C) @ 77°F (25°C)	QAD2030U
	1K Ω @ 32°F Ni RTD		26 inches	±0.72°F (±0.4°C) @ 32°F (0°C)	QAD2020U
	1K Ω Pt RTD (375a)		26 inches	±0.54°F (±0.3°C) @ 32°F (0°C)	544-089
	1K Ω Pt RTD (385a)		26 inches		QAD2012U
	4 to 20 mA	30°F to 250°F (-1°C to 121°C)	26 inches		536-780
Strap-on Cable Only	100K Ω Thermistor	-40°F to 248°F (-40°C to 120°C)	8 inches	±0.50°F (±0.28°C) @ 77°F (25°C)	540-258
	10K Ω Type II Thermistor	-13°F to 203°F (-25°C to 95°C)	6.5 Feet	±0.81°F (±0.45°C) @ 77°F (25°C)	QAP1030.200
	1K Ω @ 32°F Ni RTD		6 Feet	±0.36°F (±0.2°C) @ 32°F (0°C)	QAP22
	1K Ω Pt RTD (385a)	-22°F to 266°F (-30° to 130°C)	5 Feet	±1°F (±0.5°C) @ 32°F (0°C)	QAP2012.150
	3K Ω Thermistor	32°F to 104°F (0°C to 40°C)	8 feet	±0.54°F (±0.3°C) @ 77°F (25°C)	QAH11.1*
Self-Contained with Plastic Housing	10K Ω Type II Thermistor	-11°F to 257°F (-30°C to 125°C)	Not Applicable	±0.81°F (±0.45°C) @ 77°F (25°C)	QAD2030
	1K Ω @ 32°F Ni RTD	0°F to 250°F (-18°C to 121°C)	Not Applicable	±0.36°F (±0.2°C) @ 32°F (0°C)	QAD22
	1K Ω Pt RTD (385a)	-11°F to 266°F (-30°C to 130°C)	Not Applicable	±0.54°F (0.3°C) @ 32°F (0°C)	QAD2012

* For use as a heating/cooling changeover sensor with Siemens RDG Series room thermostats.

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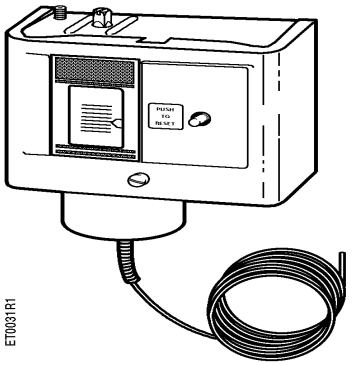
SIEMENS

134-1504

Technical Instructions
Document No. 155-016P25
ET 134-22
April 12, 2018

Powers™ Controls

Low Temperature Detection Thermostat



Description	The electric Low Temperature Detection Cut-out and Alarm Thermostat is a remote bulb instrument which opens an electrical circuit to stop the supply fan motor and/or closes an outside air damper when the temperature at the sensing element falls below the setting of the instrument. Simultaneously, it closes a circuit to indicate an alarm condition.
Features	• Manual reset • Easy temperature setting with adjusting screw on top of enclosure • Mounting bracket and two screws included • Main and separate reverse-acting auxiliary contacts
Product Number	134-1504

Warning/Caution Notations

WARNING	⚠	Personal injury or loss of life may occur if a procedure is not performed as specified.
CAUTION	⚠	Equipment damage or loss of data may occur if you do not follow a procedure as specified.

Application

This instrument should only be used on those applications where the ambient temperature to which the instrument case and bellows are exposed remains above the temperature setting of the thermostat. This thermostat should be used in areas protected from the weather.

Prerequisites

WARNING:

This low temperature detection thermostat is designed for use only as an operating control. Where an operating control failure would result in personal injury and/or loss of property, it is the installer's responsibility to add devices (safety, limit controls) or systems (alarm, supervisory systems) that protect against, or warn of control failure.

CAUTION:

The switch contact position (LINE-M2) may be in either an open or closed state upon receipt due to possible exposure to freezing temperatures during shipping. It is strongly recommended that the reset button be manually pressed down and released before initial use to restore the switch position to a normal operating state before proceeding to installation; otherwise, the unit could remain in the tripped state.

Specifications

Switch Action	Main (LINE-M2) contacts open on temperature drop, simultaneously auxiliary contacts close
Range	15 to 55°F (-9 to 13°C)
Maximum bulb temperature	400°F (204°C)
Minimum differential	5°F (2.8°C) Non-adjustable
Sensing element	Vapor filled
Bulb length	1/8-inch OD × 20 feet (6 m)
Reset action	Manual
Electrical rating	See Table 1
Weight	2.4 lb (1.1 kg)
Dimensions	See Figures 2 and 5
Approvals	UL file SA 10816 CSA file LR948

Operation

This thermostat incorporates a temperature sensing element of the vapor-filled type which actuates a heavy duty contact through a rugged link mechanism.

Any one-foot length of the element subjected to temperatures below the temperature setting of the thermostat will actuate the thermostat switch mechanism regardless of the temperature being sensed by the remainder of the element. This makes the thermostats ideal for protecting large coils where air stratification could cause freezing conditions in a localized area.

The thermostat has a main and auxiliary contact unit. The main load circuit (LINE-M2) opens on temperature drop and simultaneously, an auxiliary or alarm circuit (LINE-MI) closes on temperature drop.

NOTE: The reset button must be manually pressed down and released to resume normal fan system operation.

Electrical Ratings

Table 1.

Pole Number	Line-M2 (Main)				Line-M1 (Auxiliary)			
Motor Rating	**120V**	**208V**	**240V**	**277V**	**120V**	**208V**	**240V**	**277 V**
AC Full Load Amps	16.0	9.2	8.0	—	6.0	3.3	3.0	—
AC Locked Rotor Amps	96.0	55.2	48.0	—	36.0	19.8	18.0	—
AC Non-Ind Amps	16.0	9.2	8.0	7.2	6.0	6.0	6.0	6.0
Pilot Duty-Both Poles	125 VA, 24 to 600 Vac 57.5 VA, 120 to 300 Vdc							

Mounting and Installation

General Guidelines

- Locate the sensing element in the downstream side of the coil.
- Locate the case and bellows where the ambient temperature is always warmer than the setpoint.
- Install the thermostat so that the reset button is readily accessible and the element bellows points down.
- Install as much of the bulb as possible in a horizontal plane. If too much of the bulb is vertical, it will not operate properly.
- Avoid sharp bends or kinks in the sensing element.

Large walk-in Ducts (Figure 1)

1. Attach the mounting bracket to the thermostat with the two round head screws provided.
2. Mount the two perforated steel strap hangers inside the duct with the wide part of the hanger strap parallel to the air flow.
3. Drill a hole in the side of the duct. With the bulb still coiled, thread the bulb through the hole using a rotary movement.
4. Mount the thermostat on the outside of the duct.
5. Carefully uncoil the bulb avoiding sharp bends or kinks in the sensing element.
6. Mount the bulb in a horizontal, serpentine manner, attaching the bulb to the strap as shown in detail in Figure 1.

The installation is complete.

NOTE: For an alternate method of mounting, use coil clips (Part Number 356-115) in the fins to hold the bulb in a horizontal, serpentine pattern.

Mounting and Installation, Continued

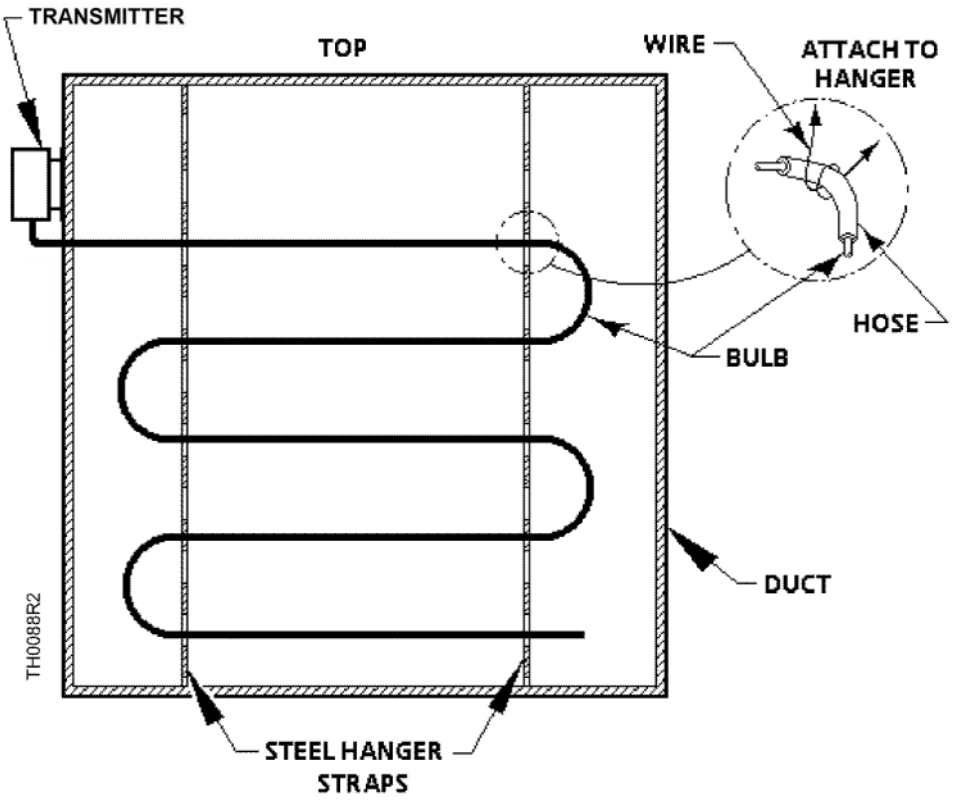


Figure 1. Typical Mounting in Walk-in Duct.

Limited Access Ducts
(Figure *2*)

1. Attach the mounting bracket to the thermostat with the two round head screws provided.
2. Attach a mounting flange (Part Number 808-412) on the opposite side of the duct (near the bottom) from where the thermostat will be mounted.
3. Mount a second flange on an 8-inch by 4-inch sheet metal plate. Cut an access opening for the bulb on the duct diagonally across from the duct-mounted flange. Drill mounting screw holes for the sheet metal plate.
4. Cut a length of copper tubing to fit diagonally across the duct. Stretch out the bulb and wrap it around the tubing. See Figure 2.
5. Insert the tubing and bulb through the access hole and into the duct-mounted flange. Fasten the 8-inch by 4-inch sheet metal plate to the duct.
6. Mount the thermostat on the outside of duct.

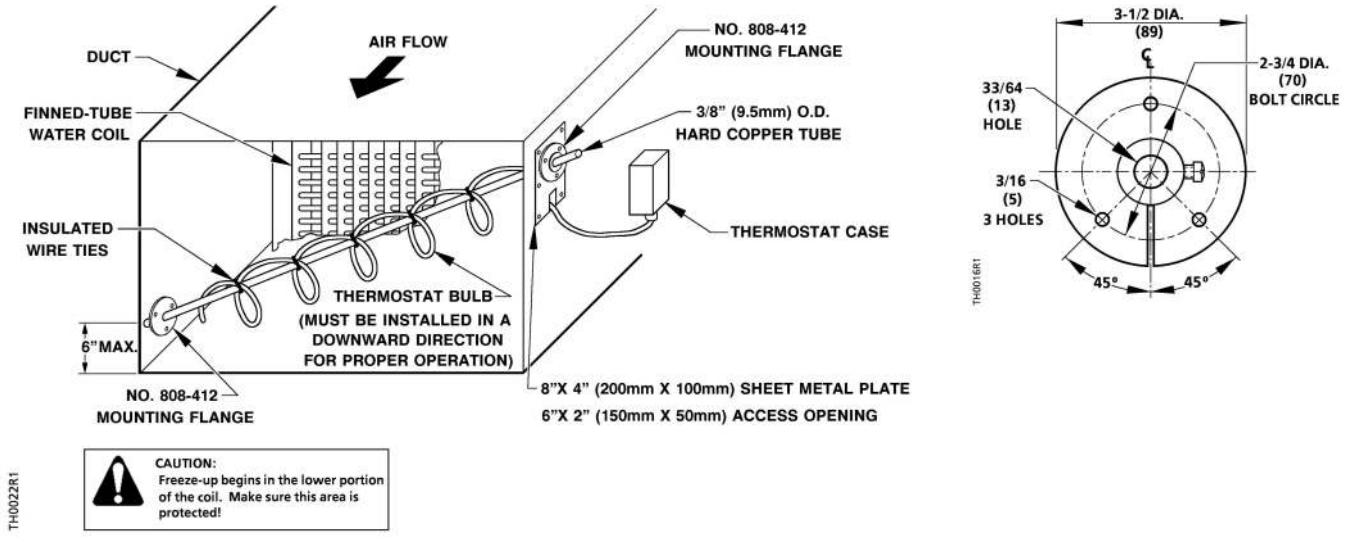


Figure 2. Bulb Mounting for Limited Access Ducts with 808-412 Mounting Flange.

Wiring

WARNING:

Disconnect the power supply before wiring connections are made to avoid possible electrical shock or damage to the equipment.

Make all wiring connections using copper conductors only and in accordance with the National Electrical Code and local regulations. Loads exceeding the rating of the thermostat should be handled by means of a relay or motor starter.

An opening for 1/2-inch conduit is provided in the bottom of the thermostat enclosure.

See Figure 3 for a typical wiring diagram.

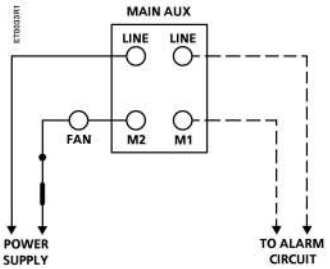


Figure 3. Typical Wiring Diagram.

CAUTION:

Use terminal screws furnished (#8-32 × 1/4-inch binder head screw). Longer terminal screws can interfere with switch mechanism and damage the switch.

Adjustment

After mounting the thermostat, adjust the temperature setting using the setpoint adjusting screw on the top of the enclosure. See Figure 4.

Observe a complete operating cycle to be sure that all components function correctly.

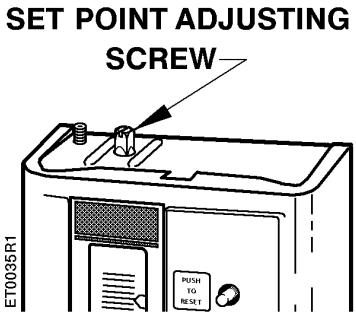


Figure 4. Setpoint Adjustment Screw.

Calibration

There is no field calibration required for the thermostat.

Troubleshooting

Observe a complete operating cycle to be sure that all components function correctly.

Service

There is no servicing of the thermostat. Replace if inoperative.

Dimensions

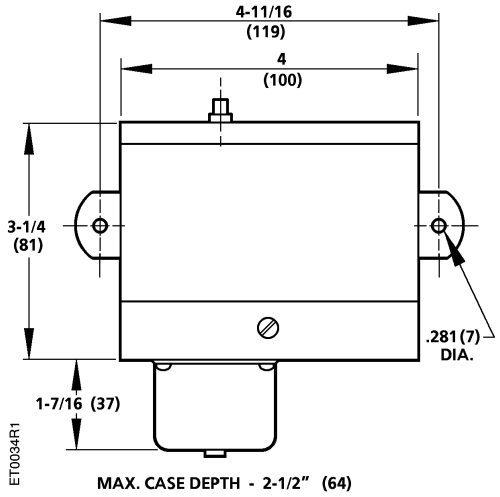


Figure 5. Dimensions in Inches (Millimeters).

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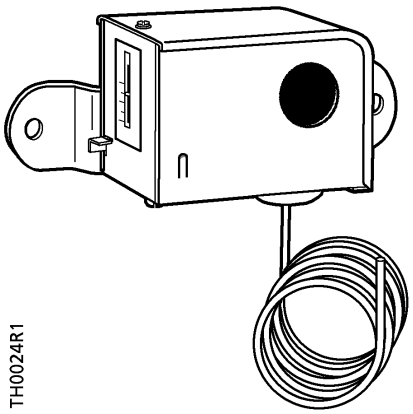
SIEMENS

134-1510

Technical Instructions
Document No. 155-115P25
ET 134-20
November 18, 2021

Powers™ Controls

ET 134 Low Temperature Detection Control



Description	The Electric Low Temperature Detection Control has a remote bulb and a Single Pole Double Throw (SPDT) switch that closes and opens a circuit in both directions.
Features	• Compact and sturdy • Adjustable range with fixed differential • Unaffected by ambient temperature at case • Manual or automatic reset available • The set point adjustment screw is accessible at the bottom of the control or at the top with the cover removed • Mounting bracket standard

Product Numbers

Description	Product Numbers
Low Temperature Detection Control Automatic reset	134-1510
Manual reset	134-1511

Warning/Caution Notations

WARNING:	⚠	Personal injury/loss of life may occur if a procedure is not performed as specified.
CAUTION:	⚠	Equipment damage or loss of data may occur if the user does not follow a procedure as specified

Siemens Industry, Inc.
Part No. 997-442 Rev. F

Application

The electric low temperature detection controls are especially suited for sensing low temperature conditions to avoid freeze-up of hydronic heating coils, cooling coils, liquid heating pipes and similar applications. Typically, the switch opens an electrical circuit to stop the supply fan motor when the temperature at the sensing element falls below the setting of the instrument.



WARNING:

The low temperature detection control is designed for use only as an operating control. Where an operating control failure would result in personal injury and/or loss of property, it is the responsibility of the installer to add devices (safety, limit controls) or systems (alarm, supervisory systems) that protect against, or warn of control failure.

Specifications

Switch action	SPDT
Control purpose	Low temperature
Control construction	Electromechanical independently mounted
Cycles	30K auto reset, 6K manual reset
Mounting method	Permanently attached through mounting bracket hole
Grounding method	Wire bound screw terminal
Type 1 or Type 2 action	Type 1.B (micro-disconnection)
Pollution solution	External - Degree 3, Internal Degree 2
Rated impulse voltage	4,000 Vac
Ball pressure temperature	Switch component 302°F (150°C)
Range	35 to 45°F (2 to 7°C)
Maximum bulb temperature	250°F (121°C)
Ambient temperature at thermostat	0 to 140°F (-18 to 60°C)
Differential	
134-1510	12°F (6.7°C)
134-1511	Temperature must be 12°F (6.7°C) above cutout point before control can be reset
Bulb	1/8-inch (3.2 mm) × 20 feet (6 m)
Capillary length	4 feet (1.2 m)
Sensing element	Vapor filled
Reset type	See *Product Number*
Electrical ratings	See *Table 1*
Enclosure	UL: Type 1 (NEMA)
Conduit opening	7/8-inch (22 mm) for 1/2-inch conduit for 1/2” trade size (or PG16) conduit
Wiring connection	3 color-coded screw terminals (SPDT only) and one ground terminal
Wiring rating	Copper conductors only, rated at least 194°F (90°C)
Finish	Galvanized steel
Weight	1.8 lbs. (0.8 kg)
Dimensions	See *Figure 4*
Approvals	
North America	cULus listed; UL60730, CSA E60730 UL File: SA10816

Operation

Any 1-foot length of the element subjected to temperatures below the temperature setting of the control will actuate the control switch mechanism regardless of the temperature being sensed by the remainder of the element. The sensing element is unaffected by the ambient temperature at the control body if it is warmer than the set point temperature.

The 134-1511 control has a manual reset feature. (See *Figure 5*.)

NOTES: 1. The reset lever must be pressed manually and released to resume normal fan system operation.

2. The manual reset may have tripped during shipping and may need to be reset prior to installation for normal operation.

Table 1. Electrical Ratings.

Volts AC 50/60Hz	cULus		
	120	208	240
Full Load Amps	16	9.2	8
Lock Rotor Amps	96	55.2	48
Resistive Amps	16	9.2	8
Pilot Duty	125 VA, 24 to 277 Vac		

Mounting and Installation

General Guidelines

- Locate the sensing element in the downstream side of the coil.
- Locate the case and bellows where the ambient temperature is always warmer than the set point.
- Install the control case so that the reset button is readily accessible and the element bellows point down.
- Avoid sharp bends or kinks in the sensing element.
- Install as much of the bulb as possible in a horizontal plane. If too much of the bulb is vertical, it will not operate properly.

Large Walk-in Ducts

(Figure 1)

1. Attach the mounting bracket to the control case with the two round head screws provided.
2. Mount the two perforated steel strap hangers inside the duct with the wide part of the hanger strap parallel to the air flow.
3. Drill a hole through the side of the duct. With the bulb still coiled, thread the bulb through the hole using a rotary movement.
4. Mount the control case on the outside of the duct.
5. Carefully uncoil the bulb avoiding sharp bends or kinks in the sensing element.
6. Mount the bulb in a horizontal serpentine manner. Attaching the bulb to the strap as shown in the detail in *Figure 1*.

The installation is now complete.

For an alternate method of mounting, use coil clips (part number 356-115) in the fins to hold the bulb in a horizontal serpentine pattern.

Mounting and Installation, continued

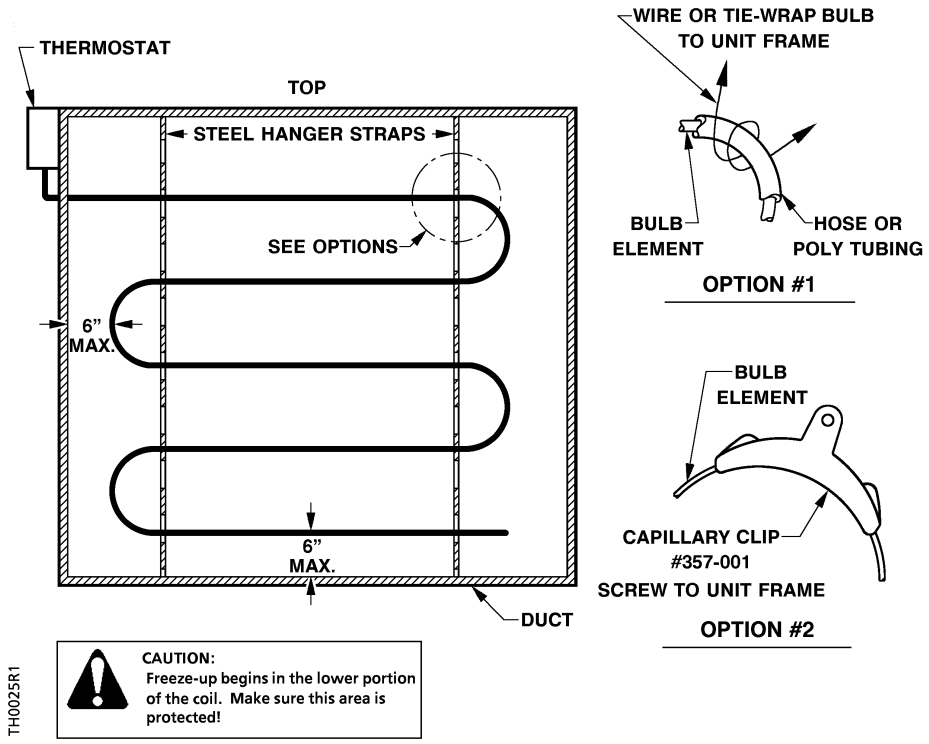


Figure 1. Typical Mounting in Walk-in Duct.

Limited Access Ducts

(Figure 2)

1. Attach the mounting bracket to the control case with the two round head screws provided.
2. Attach a mounting flange (part number 808-412) on the opposite side of the duct (near the bottom) from where the control will be mounted.
3. Mount a second flange on an 8-inch by 4-inch sheet metal plate. Cut an access opening for the bulb on the duct diagonally across from the duct mounted flange. Drill mounting screw holes for the sheet metal plate.
4. Cut a length of copper tubing to fit diagonally across the duct. Stretch out the bulb and wrap it around the tubing.
5. Insert the tubing and bulb through the access hole and into the duct-mounted flange. Fasten the 8-inch by 4-inch sheet metal plate to the duct.
6. Mount the control case on the outside of the duct.

The installation is now complete.

Mounting and Installation,

continued

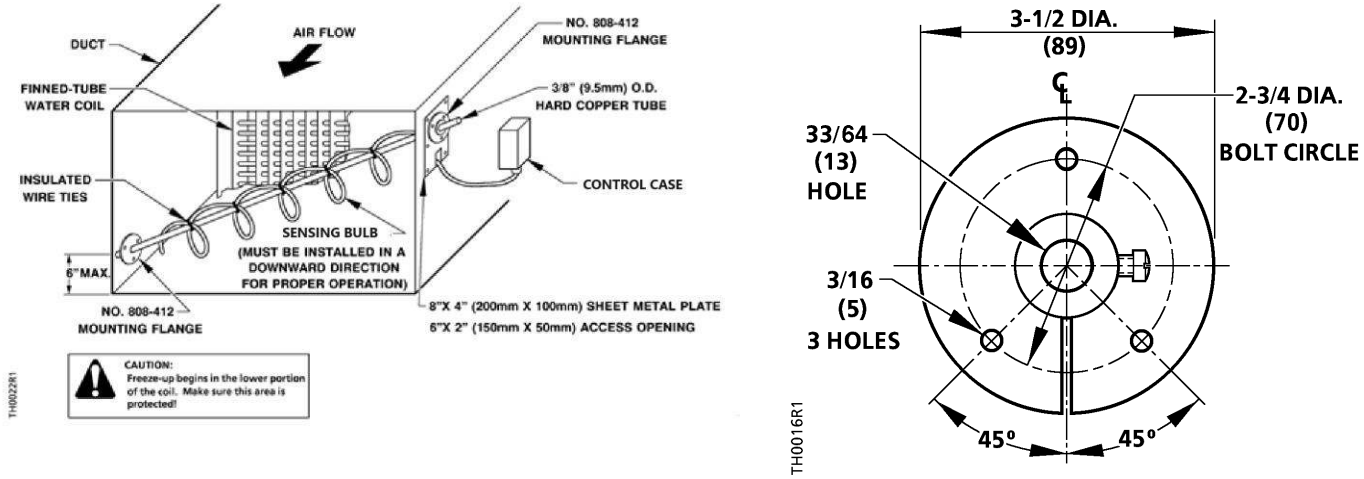


Figure 2. Bulb Mounting for Limited Access Ducts with Mounting Flange.

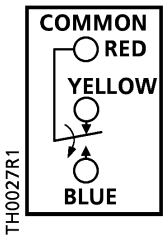
Wiring

WARNING:

Disconnect the power supply before wiring connections are made to avoid possible electrical shock or damage to the equipment.

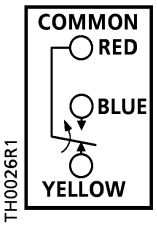
All wiring should conform to the National Electrical Code and local regulations. Loads exceeding the rating of the control should be handled by means of a relay or motor starter.

Red is common. See *Figure 3* for terminal identification.



Red to Yellow opens on temp. decrease below set point.

Red to Blue closes on temp. decrease below set point.



Red to Blue closes on temp. decrease below set point.

Red to Yellow opens on temp. decrease below set point.

Figure 3. Terminal Identification.

CAUTION:

Use terminal screws furnished (M4 x 8 mm combo binder head screw). Substitution of other screws can cause problems in making proper connections.

Dimensions

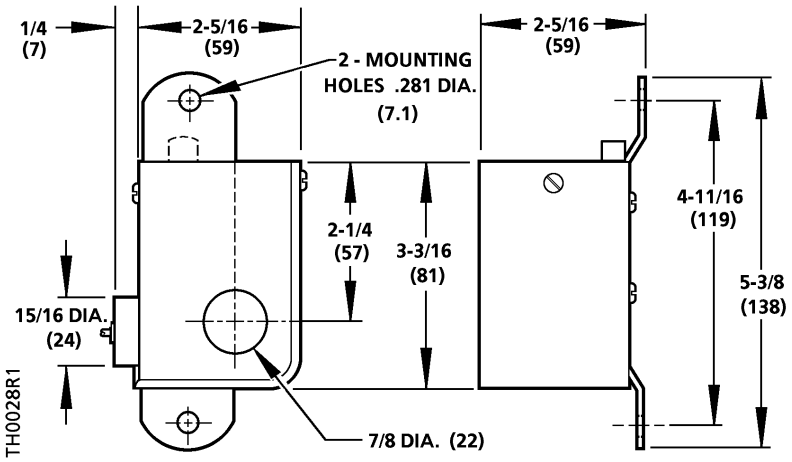


Figure 4. Dimensions of the 134-1510 and 134-1511 Control.

Adjustment

Change the set point by turning the adjusting screw until the pointer is opposite the desired cutout point.

The adjusting screw is accessible at the bottom of the control or at the top when the cover is removed. See *Figure 5* for the location of the adjusting screw.

The direct reading scale was calibrated at 800 feet (244 m) above sea level at 35°F (2°C). For critical installations in higher altitudes raise the set point by 1°F (0.56°C) for each 1,800 feet (549 m) of elevation.

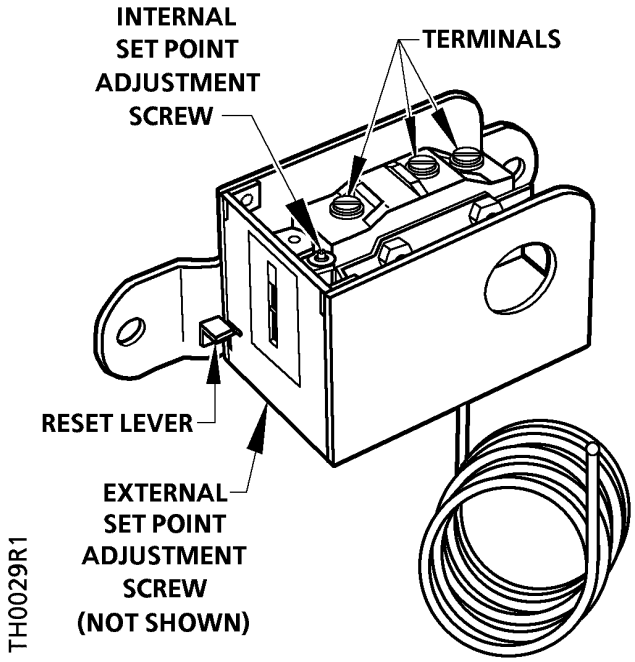


Figure 5. Internal View of Control.

Troubleshooting

Observe a complete operating cycle to be sure that all components function correctly.

Service

There is no servicing of the control. Replace if inoperative.

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SIEMENS

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262-02058
262-02061

Submittal Sheet
Document No. 154-010P25
May 30, 2023

Powermite 599, ANSI Class 250 MT Series Terminal Unit 2-Way Valves

Description

The Powermite 599 Series ANSI Class 250 MT Series 2-way valve bodies work with any MT Series pneumatic or electronic actuator with a 7/32-inch (5.5-mm) stroke. They are suitable for normally open or normally closed control. Typical applications include control of hot or chilled water, water-glycol solutions up to 50% and steam up to 15 psi (steam only with stainless steel trim). Compatible actuators deliver a minimum of 67 lbs (300 N) of force.

Features

- Direct-coupled universal bonnet
- Internal thread NPT end connections with either brass trim or stainless steel trim.
- ANSI Leakage Class IV (0.01% of Cv)

Product Numbers

Use the product numbers in the tables to order the valve and the actuator assembled together. The product number consists of a 3-digit prefix code, a hyphen, and a 5-digit suffix code. The prefix specifies an actuator. The suffix specifies the valve body.

262-02014

3-Digit Actuator Prefix Code

5-Digit Valve Body Suffix Code

Table 1. 2-Way Valve and Actuator Assemblies with Brass Trim and Internal Thread NPT Connections.

	Valve Body	Valve Size, Inch	Cv (Kvs)	2-Inch Pneumatic Actuators, Spring Return (Fail-safe *)			Electro-mechanical, 24V							
				10-15 psi (69-103 kPa)	3-8 psi (21-55 kPa)	8-13 psi (55-90 kPa)	SSC81U Floating, NSR	SSC131.39U Floating, SR	SSC161.05U 0-10V, NSR	SSC161.35U 0-10V, SR	SAS81.03U Floating, NSR	SAS81.33U Floating, SR	SAS61.03U 0-10V/ 4-20 mA NSR	SAS61.33U 0-10V/ 4-20 mA SR
														
				Actuator Prefix Code										
				256	257	258	259	260	261	262	363	366	364	365
Normally Closed	599-02000	1/2	0.4 (0.34)	256-02000	**257-02000B**	**258-02000C**	259-02000	260-02000	261-02000	262-02000	363-02000	366-02000	364-02000	365-02000
	599-02002	1/2	0.63 (0.54)	256-02002	**257-02002B**	**258-02002C**	259-02002	260-02002	261-02002	262-02002	363-02002	366-02002	364-02002	365-02002
	599-02004	1/2	1 (0.85)	256-02004	**257-02004B**	**258-02004C**	259-02004	260-02004	261-02004	262-02004	363-02004	366-02004	364-02004	365-02004
	599-02006	1/2	1.6 (1.37)	256-02006	**257-02006B**	**258-02006C**	259-02006	260-02006	261-02006	262-02006	363-02006	366-02006	364-02006	365-02006
	599-02008	1/2	2.5 (2.14)	256-02008	**257-02008B**	**258-02008C**	259-02008	260-02008	261-02008	262-02008	363-02008	366-02008	364-02008	365-02008
	599-02010	1/2	4 (3.42)	256-02010	**257-02010B**	**258-02010C**	259-02010	260-02010	261-02010	262-02010	363-02010	366-02010	364-02010	365-02010
	599-02012	3/4	6.3 (5.38)	256-02012	**257-02012B**	**258-02012C**	259-02012	260-02012	261-02012	262-02012	363-02012	366-02012	364-02012	365-02012
	599-02014	1	10 (8.55)	256-02014	**257-02014B**	**258-02014C**	259-02014	260-02014	261-02014	262-02014	363-02014	366-02014	364-02014	365-02014
Normally Open	599-02030	1/2	0.4 (0.34)	**256-02030A**	257-02030	**258-02030C**	259-02030	260-02030	261-02030	262-02030	363-02030	366-02030	364-02030	365-02030
	599-02032	1/2	0.63 (0.54)	**256-02032A**	257-02032	**258-02032C**	259-02032	260-02032	261-02032	262-02032	363-02032	366-02032	364-02032	365-02032
	599-02034	1/2	1 (0.85)	**256-02034A**	257-02034	**258-02034C**	259-02034	260-02034	261-02034	262-02034	363-02034	366-02034	364-02034	365-02034
	599-02036	1/2	1.6 (1.37)	**256-02036A**	257-02036	**258-02036C**	259-02036	260-02036	261-02036	262-02036	363-02036	366-02036	364-02036	365-02036
	599-02038	1/2	2.5 (2.14)	**256-02038A**	257-02038	**258-02038C**	259-02038	260-02038	261-02038	262-02038	363-02038	366-02038	364-02038	365-02038
	599-02041	1/2	4 (3.42)	**256-02041A**	257-02041	**258-02041C**	259-02041	260-02041	261-02041	262-02041	363-02041	366-02041	364-02041	365-02041
	599-02044	3/4	6.3 (5.38)	**256-02044A**	257-02044	**258-02044C**	259-02044	260-02044	261-02044	262-02044	363-02044	366-02044	364-02044	365-02044
	599-02046	1	10 (8.55)	**256-02046A**	257-02046	**258-02046C**	259-02046	260-02046	261-02046	262-02046	363-02046	366-02046	364-02046	365-02046

* Product numbers in gray shading are available as assemblies only.

Table 2. Two-Way Valve and Actuator Assemblies with Stainless Steel Trim and Internal Thread NPT Connections.

	Valve Body	Valve Size, Inches	Cv (Kvs)	2-Inch Pneumatic Actuators, Spring Return (Fail Safe) *			Electro-mechanical, 24 Vac							
				10-15 psi (69-103 kPa)	3-8 psi (21-55 kPa)	8-13 psi (55-90 kPa)	SSC81U Floating, NSR	SSC131.39U Floating SR	SSC161.05U 0-10V, NSR	SSC161.35U 0-10V, SR	SAS81.03U Floating, NSR	SAS81.33U Floating, SR	SAS61.03U 0-10V/ 4-20 mA NSR	SAS61.33U 0-10V/ 4-20 mA SR
				Actuator Prefix Code										
				256	257	258	259	260	261	262	363	366	364	365
Normally Closed	599-02015	1/2	0.4 (0.34)	256-02015	**257-02015B**	**258-02015C**	259-02015	260-02015	261-02015	262-02015	363-02015	366-02015	364-02015	365-02015
	599-02017	1/2	0.63 (0.54)	256-02017	**257-02017B**	**258-02017C**	259-02017	260-02017	261-02017	262-02017	363-02017	366-02017	364-02017	365-02017
	599-02019	1/2	1 (0.85)	256-02019	**257-02019B**	**258-02019C**	259-02019	260-02019	261-02019	262-02019	363-02019	366-02019	364-02019	365-02019
	599-02021	1/2	1.6 (1.37)	256-02021	**257-02021B**	**258-02021C**	259-02021	260-02021	261-02021	262-02021	363-02021	366-02021	364-02021	365-02021
	599-02023	1/2	2.5 (2.14)	256-02023	**257-02023B**	**258-02023C**	259-02023	260-02023	261-02023	262-02023	363-02023	366-02023	364-02023	365-02023
	599-02025	1/2	4 (3.42)	256-02025	**257-02025B**	**258-02025C**	259-02025	260-02025	261-02025	262-02025	363-02025	366-02025	364-02025	365-02025
	599-02027	3/4	6.3 (5.38)	256-02027	**257-02027B**	**258-02027C**	259-02027	260-02027	261-02027	262-02027	363-02027	366-02027	364-02027	365-02027
	599-02029	1	10 (8.55)	256-02029	**257-02029B**	**258-02029**	259-02029	260-02029	261-02029	262-02029	363-02029	366-02029	364-02029	365-02029
Normally Open	599-02047	1/2	0.4 (0.34)	**256-02047A**	257-02047	**258-02047C**	259-02047	260-02047	261-02047	262-02047	363-02047	366-02047	364-02047	365-02047
	599-02049	1/2	0.63 (0.54)	**256-02049A**	257-02049	**258-02049C**	259-02049	260-02049	261-02049	262-02049	363-02049	366-02049	364-02049	365-02049
	599-02051	1/2	1 (0.85)	**256-02051A**	257-02051	**258-02051C**	259-02051	260-02051	261-02051	262-02051	363-02051	366-02051	364-02051	365-02051
	599-02053	1/2	1.6 (1.37)	**256-02053A**	257-02053	**258-02053C**	259-02053	260-02053	261-02053	262-02053	363-02053	366-02053	364-02053	365-02053
	599-02055	1/2	2.5 (2.14)	**256-02055A**	257-02055	**258-02055C**	259-02055	260-02055	261-02055	262-02055	363-02055	366-02055	364-02055	365-02055
	599-02058	1/2	4 (3.42)	**256-02058A**	257-02058	**258-02058C**	259-02058	260-02058	261-02058	262-02058	363-02058	366-02058	364-02058	365-02058
	599-02061	3/4	6.3 (5.38)	**256-02061A**	257-02061	**258-02061C**	259-02061	260-02061	261-02061	262-02061	363-02061	366-02061	364-02061	365-02061
	599-02063	1	10 (8.55)	**256-02063A**	257-02063	**258-02063C**	259-02063	260-02063	261-02063	262-02063	363-02063	366-02063	364-02063	365-02063

* Product numbers in gray shading are available as assemblies only.

Technical Data

Valve Size 1/2-inch to 1-inch

Body Globe style, ANSI Class 250
1/2- and 3/4-inch C37700 Forged brass.
1-inch UNS CA 844 Bronze

Trim Brass or Stainless Steel

Stem Stainless steel
ASTM A582 Type 303,
7/32-inch (5.5-mm) stroke

Seat Metal-to-metal

Packing Ethylene propylene O-ring

Close-off Ratings According to ANSI/FCI 70-2
See Table 3.

Controlled Medium Water, water-glycol solutions to 50%, low pressure steam <15 PSI (with stainless steel trim only).

Media Temperature 35°F to 250°F (2°C to 120°C)

Maximum Differential Pressure for Modulating Service:

Media	Brass Trim	Stainless Steel Trim
Liquid	25 psi (173 kPa)	50 psi (345 kPa)
Steam	—	15 psi (103 kPa)

Rangeability Cv <1 = >50:1,
Cv >1 = >100:1

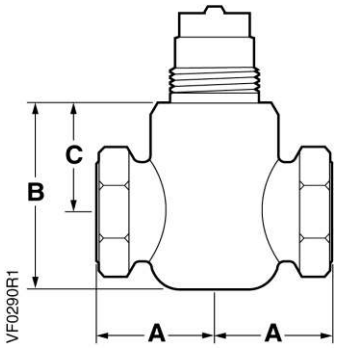
Leakage Rate Class IV (0.01% of Cv)

Flow Characteristics Modified equal percentage

Mounting NEMA 1 (interior only)

Table 3. Close-Off Ratings in psi (kPa).

Action	Valve Size Inches	Flow Rate, Cv (Kvs)	Electronic Actuator		Close-Off Ratings @ 20 psi (138 kPa)		
					2-Inch Pneumatic Actuator		
			SAS	SSC	3-8 psi (69-103 kPa)	8-13 psi (21-55 kPa)	10-15 psi (55-90 kPa)
NC	1/2	0.4 to 1.6 (0.34 to 1.37)	95 (655)	95 (655)	40 (276)	95 (655)	95 (655)
	1/2	2.5 to 4 (2.15 to 3.44)	50 (345)	50 (345)	28 (193)	50 (345)	50 (345)
	3/4 and 1	6.3 to 10 (5.43 to 8.6)	40 (276)	40 (276)	18 (124)	40 (276)	40 (276)
NO	1/2	0.4 to 1.6 (0.34 to 1.37)	160 (1103)	120 (868)	95 (655)	45 (310)	20 (138)
	1/2	2.5 to 4 (2.15 to 3.44)	85 (586)	65 (448)	45 (310)	25 (172)	15 (103)
	3/4 and 1	6.3 to 10 (5.43 to 8.6)	70 (482)	55 (379)	35 (241)	10 (69)	—



Internal Thread NPT × Internal Thread NPT

Valve Size Inches	A	B		C		Weight lbs (kg)
		NO	NC	NO	NC	
1/2	1-3/8 (35)	2-1/4 (57)		1-5/16 (33)		0.96 (.44)
3/4	1-5/8 (41)	2-3/8 (59)		1-5/16 (33)		1.13 (.51)
1	1-15/16 (49)	2-3/4 (69)		1-9/16 (39)		1.7 (.77)

Figure 1. Two-way Valve Dimensions in Inches (mm).

Typical Specifications

Automatic control valves shall have NPT threaded type fittings, 1/2 through 1-inch sizes, and shall be ANSI rated to withstand the pressures and temperatures encountered.

Valves shall have metal-to-metal seats, stainless steel stems, and Ethylene propylene O-ring packing.

Valves shall be ANSI Leakage Class IV (0.01% of Cv). Valves shall have >50:1 rangeability for Cv<1 rangeability and >100:1 for Cv>1.

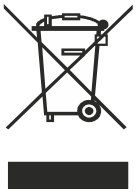
All two-way valves shall be provided with equal-percentage contoured throttling plugs.

For complete technical details on valves with stainless steel trim, or union internal thread, angle internal thread, or union external thread end connections, see *Powermite 599 Series, MT Series Terminal Unit Two-way Valves* Technical Instructions, 155-196P25.

Disposal

Do not dispose of valves as household waste.

- Special handling of individual components may be mandated by law or make ecological sense.
- Observe all local and currently applicable laws and regulations.



The actuators are considered electrical and electronic equipment for disposal in terms of the applicable European Directive and may not be disposed of as domestic garbage.

- Dispose of the actuators through channels provided for this purpose.
- Comply with all local and currently applicable laws and regulations.

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Flowrite™ 599 Series

1/2 to 2-Inch Valve (2-Way & 3-Way) and Actuator Assembly Selection

Description

This Technical Bulletin will aid in selecting a 1/2-inch to 2-inch Flowrite 599 Series valve and actuator assembly. Begin with the graph of water capacity and the chart of ANSI Class IV close-off pressures to select a valve and actuator according to specifications.

Use Tables 1 through 15 to identify two-way valve and actuator product numbers. Use Tables 16 through 18 to identify three-way valve and actuator product numbers. These tables show all the possible combinations of the 1/2-inch to 2-inch Flowrite 599 Series valves and compatible actuators that can be ordered as complete valve assemblies from the factory.

The dimensions of all 1/2-inch to 2-inch valves and the service envelope required for each actuator are included in Table 19 through Table 21.

How to Use the Selection Graphs

Use Figure 1, the Water Capacity graph, to select a valve. Locate the specified flow rate on the vertical axis. Follow across on the horizontal line to the point of intersection with the specified pressure drop. Choose the valve size from the heavy diagonal lines across the graph.

Use Figure 2, the Close-Off Pressure graph, to select an actuator. First locate the graph for the valve action and actuator power source specified. Locate the bar that represents the valve line size. The top of the bar indicates the maximum close-off pressure for tight close-off ANSI Class IV. Use the legend at the bottom of the graph to identify the actuator.

How To Use The Valve Tables

Tables have been organized to help select a valve and actuator combination using additional specifications.

Moving from left to right, identify the valve needed. Continue to the right to match the valve to a desired actuator.

A valve and actuator assembly part number is determined by combining the actuator prefix code with the suffix of the valve product number.

NOTES:

No valve will combine with all actuators.

The symbol “—” indicates a combination is not available.

Selection Example

Specification

Select a two-way normally-open valve and pneumatic actuator assembly that will deliver 20 gpm (5 m^3/h) chilled water with linear flow characteristic with no more than 5 psi (35 kPa) pressure drop across the fully-open valve. The valve must have standard packing and a internal thread-to-internal thread (IT×IT) connection.

The valve shall be operated by a standard 8-inch pneumatic actuator and must close off tightly against a pump head pressure of 50 psi (300 kPa).

Valve Sizing

Use Figure 1, the water capacity graph, to begin valve sizing.

1. Locate 20 gpm (5 m^3/h) on the vertical axis to find the required flow.
2. Read across the horizontal axis to find 5 psi (35 kPa), the maximum allowable pressure drop across the open valve.
3. Select a 1-inch (25 mm), 10 Cv (8.6 Kvs) line size valve, because the point of intersection falls between the 3/4 inch and 1-inch line sizes.

Actuator Selection

Use Figure 2, the close-off pressure graph, to choose an actuator.

1. Locate the graph for pneumatic actuators for NO valves in the lower right side of the figure.
2. Locate the bar for 1-inch valves. The gray-shaded bar represents an 8-inch pneumatic actuator.
3. Notice that the 8-inch pneumatic actuator has the sufficient force to provide tight close-off (ANSI C IV) against more than 50 psi (300 kPa) differential. For a 1-inch valve, select an 8-inch, standard pneumatic actuator, with a 20 mm stroke.

Product Number Selection

Use *Table 1, Two-Way, Normally Open (NO), Equal Percentage Valves, Bronze Trim, Standard Packing*. Begin at the left and select the specifications necessary.

1. Select a standard packed valve, with an F×F connection according to the above specifications.
2. Select the 1-inch line size determined from the sizing example above. The valve part number is 599-03167.
3. Read across table to the 8-inch Standard Pneumatic actuator.

   The actuator part number is 599-01050.
   The actuator code number is 277.
4. Read down the column to determine the valve and actuator assembly product number is 277-03167.

   NOTE: The valve and actuator can be ordered separately by using the part numbers from Steps 2 and 3.

References

Two-Way Valves, 1/2 to 2-inch Bronze Body, ANSI 250 Technical Instructions (155-184).

Three-Way Valves 1/2 to 2-inch Bronze Body Technical Instructions (155-185).

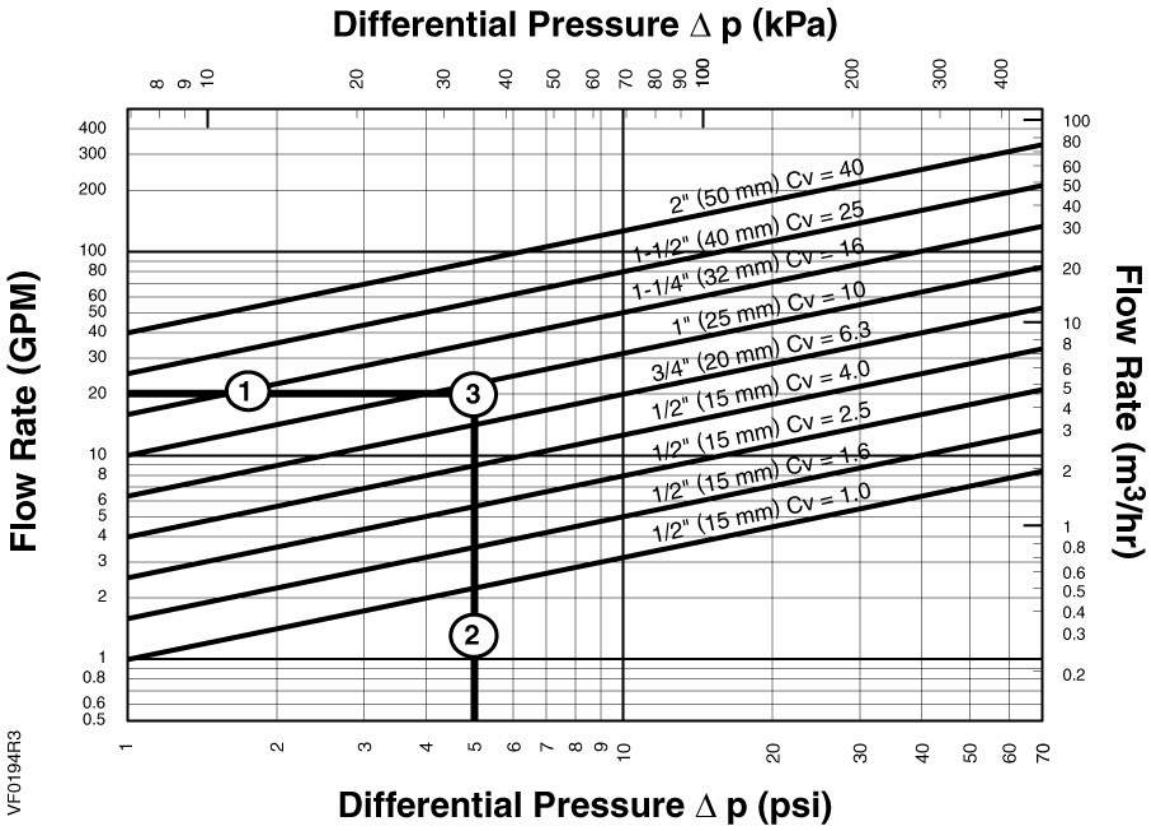


Figure 1. Water Capacity Graph.

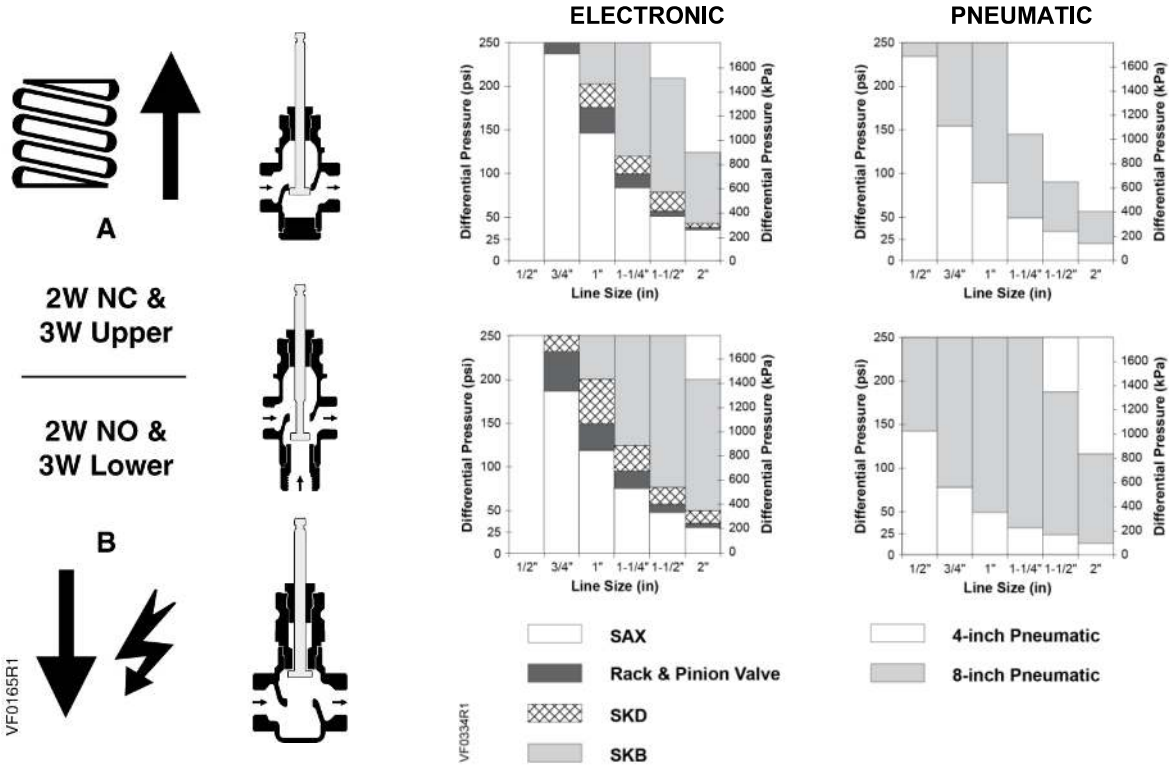


Figure 2. Close-off Pressures.

Table 1. Two-Way, Normally Open (NO), Equal Percentage Valves, Bronze Trim, Standard Packing.

Connection *	Flow Rate		Valve Size		Stroke	Pneumatic Actuators			
						Description	4-inch	8-inch Standard Temp.	
							3-8 psi (21-55 kPa)	Without Positioner	With Positioner
							155-183P25	155-161P25	
						Actuator P/N	599-01081	599-01050	599-01051 & 599-00426
	Cv	Kvs	In	mm		Valve P/N	Actuator Code		
							268	277	283
IT×IT	1	0.9	0.5	15	20	599-03162	268-03162	277-03162	283-03162
	1.6	1.4	0.5	15	20	599-03163	268-03163	277-03163	283-03163
	2.5	2.2	0.5	15	20	599-03164	268-03164	277-03164	283-03164
	4	3.4	0.5	15	20	599-03165	268-03165	277-03165	283-03165
	6.3	5.4	0.75	20	20	599-03166	268-03166	277-03166	283-03166
	10	8.6	1	25	20	599-03167	268-03167	277-03167	283-03167
	16	14	1.25	32	20	599-03168	268-03168	277-03168	283-03168
	25	22	1.5	40	20	599-03169	268-03169	277-03169	283-03169
	40	34	2	50	20	599-03170	268-03170	277-03170	283-03170

* IT = Internal Thread NPT

Table 2. Two-Way, Normally Open (NO), Equal Percentage Valves, Bronze Trim, Standard Packing.

Connection*	Flow Rate		Valve Size		Stroke	Electro-Mechanical – 24 Vac				
						Description	Non-Spring Return		Spring Return	
							Floating	0 to 10 Vdc, 4 to 20 mA	2-Position	0 to 10 Vdc
						Technical Instructions	155-507	155-506	155-541P25	
						Actuator P/N	SAX81.03U	SAX61.03U	599-03611	599-03609
	Cv	Kvs	In	mm		Valve P/N	Actuator Code			
							373	371	299	298
IT×IT	1	0.9	0.5	15	20	599-03162	373-03162	371-03162	299-03162	298-03162
	1.6	1.4	0.5	15	20	599-03163	373-03163	371-03163	299-03163	298-03163
	2.5	2.2	0.5	15	20	599-03164	373-03164	371-03164	299-03164	298-03164
	4	3.4	0.5	15	20	599-03165	373-03165	371-03165	299-03165	298-03165
	6.3	5.4	0.75	20	20	599-03166	373-03166	371-03166	299-03166	298-03166
	10	8.6	1	25	20	599-03167	373-03167	371-03167	299-03167	298-03167
	16	14	1.25	32	20	599-03168	373-03168	371-03168	299-03168	298-03168
	25	22	1.5	40	20	599-03169	373-03169	371-03169	299-03169	298-03169
	40	34	2	50	20	599-03170	373-03170	371-03170	299-03170	298-03170

* IT = Internal Thread NPT

Table 3. Two-Way, Normally Open (NO), Equal Percentage Valves, Bronze Trim, Standard Packing.

Connection *	Flow Rate		Valve Size		Stroke	Description	Electro-Hydraulic – 24 Vac				
							NSR	Spring Return	NSR	Spring Return	
						Technical Instructions	Floating		0 to 10V 4 to 20 mA		
							155-181P25		155-180P25		155-163P25
						Actuator P/N	SKD82.50U	SKD82.51U	SKD60U	SKD62U	SKB62U
	Cv	Kvs	In	mm			Actuator Code				
						Valve P/N	275	276	267	274	291
IT×IT	1	0.9	0.5	15	20	599-03162	275-03162	276-03162	267-03162	274-03162	—
	1.6	1.4	0.5	15	20	599-03163	275-03163	276-03163	267-03163	274-03163	—
	2.5	2.2	0.5	15	20	599-03164	275-03164	276-03164	267-03164	274-03164	—
	4	3.4	0.5	15	20	599-03165	275-03165	276-03165	267-03165	274-03165	—
	6.3	5.4	0.75	20	20	599-03166	275-03166	276-03166	267-03166	274-03166	—
	10	8.6	1	25	20	599-03167	275-03167	276-03167	267-03167	274-03167	291-03167
	16	14	1.25	32	20	599-03168	275-03168	276-03168	267-03168	274-03168	291-03168
	25	22	1.5	40	20	599-03169	275-03169	276-03169	267-03169	274-03169	291-03169
	40	34	2	50	20	599-03170	275-03170	276-03170	267-03170	274-03170	291-03170

* IT = Internal Thread NPT

Table 4. Two-Way, Normally Open (NO), Equal Percentage Valves, Stainless Steel Trim, Standard Packing.

Connection*	Flow Rate		Valve Size		Stroke	Description	Pneumatic Actuators		
							4-inch	8-inch- Standard Temp.	
						Technical Instructions	3-8 psi (21-55 kPa)	Without Positioner	With Positioner
							155-183P25	155-161P25	155-162P25
						Actuator P/N	599-01081	599-01050	599-01051 & 599-00426
	Cv	Kvs	In	mm		Valve P/N	Actuator Code		
							268	277	283
IT×IT	1	0.9	0.5	15	20	599-03108	268-03108	277-03108	283-03108
	1.6	1.4	0.5	15	20	599-03109	268-03109	277-03109	283-03109
	2.5	2.2	0.5	15	20	599-03110	268-03110	277-03110	283-03110
	4	3.4	0.5	15	20	599-03111	268-03111	277-03111	283-03111
	6.3	5.4	0.75	20	20	599-03112	268-03112	277-03112	283-03112
	10	8.6	1	25	20	599-03113	268-03113	277-03113	283-03113
	16	14	1.25	32	20	599-03114	268-03114	277-03114	283-03114
	25	22	1.5	40	20	599-03115	268-03115	277-03115	283-03115
	40	34	2	50	20	599-03116	268-03116	277-03116	283-03116

* IT = Internal Thread NPT

Table 5. Two-Way, Normally Open (NO), Equal Percentage Valves, Stainless Steel Trim, Standard Packing.

Connection *	Flow Rate		Valve Size		Stroke	Electro-Mechanical – 24 Vac				
						Description	Non-Spring Return		Spring Return	
							Floating	0 to 10 Vdc, 4 to 20 mA	2-Position	0 to 10 Vdc
						Technical Instructions	155-507	155-506	155-541P25	
						Actuator P/N	SAX81.03U	SAX61.03U	599-03611	599-03609
	Cv	Kvs	In	mm		Valve P/N	Actuator Code			
							373	371	299	298
IT×IT	1	0.9	0.5	15	20	599-03108	373-03108	371-03108	299-03108	298-03108
	1.6	1.4	0.5	15	20	599-03109	373-03109	371-03109	299-03109	298-03109
	2.5	2.2	0.5	15	20	599-03110	373-03110	371-03110	299-03110	298-03110
	4	3.4	0.5	15	20	599-03111	373-03111	371-03111	299-03111	298-03111
	6.3	5.4	0.75	20	20	599-03112	373-03112	371-03112	299-03112	298-03112
	10	8.6	1	25	20	599-03113	373-03113	371-03113	299-03113	298-03113
	16	14	1.25	32	20	599-03114	373-03114	371-03114	299-03114	298-03114
	25	22	1.5	40	20	599-03115	373-03115	371-03115	299-03115	298-03115
	40	34	2	50	20	599-03116	373-03116	371-03116	299-03116	298-03116

* IT = Internal Thread NPT

Table 6. Two-Way, Normally Open (NO), Equal Percentage Valves, Stainless Steel Trim, Standard Packing.

Connection *	Flow Rate		Valve Size		Stroke	Electro-Hydraulic – 24 Vac					
						Description	NSR	Spring Return	NSR	Spring Return	
							Floating		0-10V 4-20 mA		
						Technical Instructions	155-181P25		155-180P25		155-163P25
						Actuator P/N	SKD82.50U	SKD82.51U	SKD60U	SKD62U	SKB62U
	Cv	Kvs	In	mm		Valve P/N	Actuator Code				
							275	276	267	274	291
IT×IT	1	0.9	0.5	15	20	599-03108	275-03108	276-03108	267-03108	274-03108	—
	1.6	1.4	0.5	15	20	599-03109	275-03109	276-03109	267-03109	274-03109	—
	2.5	2.2	0.5	15	20	599-03110	275-03110	276-03110	267-03110	274-03110	—
	4	3.4	0.5	15	20	599-03111	275-03111	276-03111	267-03111	274-03111	—
	6.3	5.4	0.75	20	20	599-03112	275-03112	276-03112	267-03112	274-03112	—
	10	8.6	1	25	20	599-03113	275-03113	276-03113	267-03113	274-03113	291-03113
	16	14	1.25	32	20	599-03114	275-03114	276-03114	267-03114	274-03114	291-03114
	25	22	1.5	40	20	599-03115	275-03115	276-03115	267-03115	274-03115	291-03115
	40	34	2	50	20	599-03116	275-03116	276-03116	267-03116	274-03116	291-03116

* IT = Internal Thread NPT

Table 7. Two-Way, Normally Open (NO), Linear Valves, Stainless Steel Trim.

Packing	Connection *	Flow Rate		Valve Size		Stroke	Pneumatic Actuators				
							Description	4-Inch	8-Inch		
								3-8 psi (21-55 kPa)	Standard	Hi-Temp	Standard With Positioner	Hi-Temp
							Technical Instructions	155-183P25	155-161P25			
							Actuator P/N	599-01081	599-01050	599-01051	599-01050 and 599-00426	599-01051 and 599-00426
		Cv	Kvs	In	mm		Valve P/N	Actuator Code				
								268	277	278	283	284
Standard	IT×IT	1	0.9	0.5	15	20	599-03000	268-03000	277-03000	—	283-03000	—
		1.6	1.4	0.5	15	20	599-03001	268-03001	277-03001	—	283-03001	—
		2.5	2.2	0.5	15	20	599-03002	268-03002	277-03002	—	283-03002	—
		4	3.4	0.5	15	20	599-03003	268-03003	277-03003	—	283-03003	—
		6.3	5.4	0.75	20	20	599-03004	268-03004	277-03004	—	283-03004	—
		10	8.6	1	25	20	599-03005	268-03005	277-03005	—	283-03005	—
		16	14	1.25	32	20	599-03006	268-03006	277-03006	—	283-03006	—
		25	22	1.5	40	20	599-03007	268-03007	277-03007	—	283-03007	—
		40	34	2	50	20	599-03008	268-03008	277-03008	—	283-03008	—
Hi-Temp		1	0.9	0.5	15	20	599-03054	268-03054	277-03054	278-03054	283-03054	284-03054
		1.6	1.4	0.5	15	20	599-03055	268-03055	277-03055	278-03055	283-03055	284-03055
		2.5	2.2	0.5	15	20	599-03056	268-03056	277-03056	278-03056	283-03056	284-03056
		4	3.4	0.5	15	20	599-03057	268-03057	277-03057	278-03057	283-03057	284-03057
		6.3	5.4	0.75	20	20	599-03058	268-03058	277-03058	278-03058	283-03058	284-03058
		10	8.6	1	25	20	599-03059	268-03059	277-03059	278-03059	283-03059	284-03059
		16	14	1.25	32	20	599-03060	268-03060	277-03060	278-03060	283-03060	284-03060
		25	22	1.5	40	20	599-03061	268-03061	277-03061	278-03061	283-03061	284-03061
		40	34	2	50	20	599-03062	268-03062	277-03062	278-03062	283-03062	284-03062

* IT = Internal Thread NPT

Table 8. Two-Way, Normally Open (NO), Linear Valves, Stainless Steel Trim.

Packing	Connection *	Flow Rate		Valve Size		Stroke	Electro-Mechanical Actuators 24 Vac				
							Description	Non-Spring Return		Spring Return	
								Floating	0 to 10 Vdc, 4 to 20 mA	2-Position	0 to 10 Vdc
							Technical Instructions	155-507	155-506	155-541P25	
							Actuator P/N	SAX81.03U	SAX61.03U	599-03611	599-03609
		Cv	Kvs	In	mm		Valve P/N	Actuator Code			
								373	371	299	298
Standard	IT×IT	1	0.9	0.5	15	20	599-03000	373-03000	371-03000	299-03000	298-03000
		1.6	1.4	0.5	15	20	599-03001	373-03001	371-03001	299-03001	298-03001
		2.5	2.2	0.5	15	20	599-03002	373-03002	371-03002	299-03002	298-03002
		4	3.4	0.5	15	20	599-03003	373-03003	371-03003	299-03003	298-03003
		6.3	5.4	0.75	20	20	599-03004	373-03004	371-03004	299-03004	298-03004
		10	8.6	1	25	20	599-03005	373-03005	371-03005	299-03005	298-03005
		16	14	1.25	32	20	599-03006	373-03006	371-03006	299-03006	298-03006
		25	22	1.5	40	20	599-03007	373-03007	371-03007	299-03007	298-03007
		40	34	2	50	20	599-03008	373-03008	371-03008	299-03008	298-03008
Hi-Temp		1	0.9	0.5	15	20	599-03054	—	—	—	—
		1.6	1.4	0.5	15	20	599-03055	—	—	—	—
		2.5	2.2	0.5	15	20	599-03056	—	—	—	—
		4	3.4	0.5	15	20	599-03057	—	—	—	—
		6.3	5.4	0.75	20	20	599-03058	—	—	—	—
		10	8.6	1	25	20	599-03059	—	—	—	—
		16	14	1.25	32	20	599-03060	—	—	—	—
		25	22	1.5	40	20	599-03061	—	—	—	—
		40	34	2	50	20	599-03062	—	—	—	—

* IT = Internal Thread NPT

Table 9. Two-Way, Normally Open (NO), Linear Valves, Stainless Steel Trim.

Packing	Connection *	Flow Rate		Valve Size		Stroke	Electro-Hydraulic Actuators 24 Vac					
							Description	NSR	Spring Return	NSR	Spring Return	
								Floating		0-10 Vdc, 4-20 mA		
							Technical Instructions	155-181P25		155-180P25		155-163P25
							Actuator P/N	SKD82.50U	SKD82.51U	SKD60U	SKD62U	SKB62U
		Cv	Kvs	In	mm		Valve P/N	Actuator Code				
								275	276	267	274	291
Standard	IT×IT	1	0.9	0.5	15	20	599-03000	275-03000	276-03000	267-03000	274-03000	—
		1.6	1.4	0.5	15	20	599-03001	275-03001	276-03001	267-03001	274-03001	—
		2.5	2.2	0.5	15	20	599-03002	275-03002	276-03002	267-03002	274-03002	—
		4	3.4	0.5	15	20	599-03003	275-03003	27036-003	267-03003	274-03003	—
		6.3	5.4	0.75	20	20	599-03004	275-03004	276-03004	267-03004	274-03004	—
		10	8.6	1	25	20	599-03005	275-03005	276-03005	267-03005	274-03005	291-03005
		16	14	1.25	32	20	599-03006	275-03006	276-03006	267-03006	274-03006	291-03005
		25	22	1.5	40	20	599-03007	275-03007	276-03007	267-03007	274-03007	291-03007
		40	34	2	50	20	599-03008	275-03008	276-03008	267-03008	274-03008	291-03008
Hi-Temp		1	0.9	0.5	15	20	599-03054	275-03054	276-03054	267-03054	274-03054	—
		1.6	1.4	0.5	15	20	599-03055	275-03055	276-03055	267-03055	274-03055	—
		2.5	2.2	0.5	15	20	599-03056	275-03056	276-03056	267-03056	274-03056	—
		4	3.4	0.5	15	20	599-03057	275-03057	276-03057	267-03057	274-03057	—
		6.3	5.4	0.75	20	20	599-03058	275-03058	276-03058	267-03058	274-03058	—
		10	8.6	1	25	20	599-03059	275-03059	276-03059	267-03059	274-03059	291-03059
		16	14	1.25	32	20	599-03060	275-03060	276-03060	267-03060	274-03060	291-03060
		25	22	1.5	40	20	599-03061	275-03061	276-03061	267-03061	274-03061	291-03061
		40	34	2	50	20	599-03062	275-03062	276-03062	267-03062	274-03062	291-03062

* IT = Internal Thread NPT

Table 10. Two-Way, Normally Closed (NC), Equal Percentage Valves, Standard Packing.

Connection *	Flow Rate		Valve Size		Stroke	Type	Pneumatic		
						Description	4-Inch	8-Inch- Standard Temp.	
							10-15 psi	Without Positioner	With Positioner
						Technical Instructions	155-183P25	155-161P25	
						Actuator P/N	599-01083	599-01050	599-01050 & 599-00426
	Cv	Kvs	In	mm		Valve P/N	Actuator Code		
							270	277	283
Brass IT×IT	1	0.9	0.5	15	20	599-03180	270-03180	277-03180	283-03180
	1.6	1.4	0.5	15	20	599-03181	270-03181	277-03181	283-03181
	2.5	2.2	0.5	15	20	599-03182	270-03182	277-03182	283-03182
	4	3.4	0.5	15	20	599-03183	270-03183	277-03183	283-03183
	6.3	5.4	0.75	20	20	599-03184	270-03184	277-03184	283-03184
	10	8.6	1	25	20	599-03185	270-03185	277-03185	283-03185
	16	14	1.25	32	20	599-03186	270-03186	277-03186	283-03186
	25	22	1.5	40	20	599-03187	270-03187	277-03187	283-03187
	40	34	2	50	20	599-03188	270-03188	277-03188	283-03188
Stainless Steel	1	0.9	0.5	15	20	599-03126	270-03126	277-03126	283-03126
	1.6	1.4	0.5	15	20	599-03127	270-03127	277-03127	283-03127
	2.5	2.2	0.5	15	20	599-03128	270-03128	277-03128	283-03128
	4	3.4	0.5	15	20	599-03129	270-03129	277-03129	283-03129
	6.3	5.4	0.75	20	20	599-03130	270-03130	277-03130	283-03130
	10	8.6	1	25	20	599-03131	270-03131	277-03131	283-03131
	16	14	1.25	32	20	599-03132	270-03132	277-03132	283-03132
	25	22	1.5	40	20	599-03133	270-03133	277-03133	283-03133
	40	34	2	50	20	599-03134	270-03134	277-03134	283-03134

* IT = Internal Thread NPT

Table 11. Two-Way, Normally Closed (NC), Equal Percentage Valves, Standard Packing.

Connection *		Flow Rate		Valve Size		Stroke	Type	Electro-Mechanical-24 Vac			
							Description	Non-Spring Return		Spring Return	
								Floating	0 to 10 Vdc, 4 to 20 mA	2-Position	0 to 10 Vdc
							Technical Instructions	155-507	155-506	155-541P25	
							Actuator P/N	SAX81.03U	SAX61.03U	599-03611	599-03609
		Cv	Kvs	In	mm		Valve P/N	Actuator Code			
								373	371	299	298
Brass	IT×IT	1	0.9	0.5	15	20	599-03180	373-03180	371-03180	299-03180	298-03180
		1.6	1.4	0.5	15	20	599-03181	373-03181	371-03181	299-03181	298-03181
		2.5	2.2	0.5	15	20	599-03182	373-03182	371-03182	299-03182	298-03182
		4	3.4	0.5	15	20	599-03183	373-03183	371-03183	299-03183	298-03183
		6.3	5.4	0.75	20	20	599-03184	373-03184	371-03184	299-03184	298-03184
		10	8.6	1	25	20	599-03185	373-03185	371-03185	299-03185	298-03185
		16	14	1.25	32	20	599-03186	373-03186	371-03186	299-03186	298-03186
		25	22	1.5	40	20	599-03187	373-03187	371-03187	299-03187	298-03187
		40	34	2	50	20	599-03188	373-03188	371-03188	299-03188	298-03188
Stainless Steel		1	0.9	0.5	15	20	599-03126	373-03126	371-03126	299-03126	298-03126
		1.6	1.4	0.5	15	20	599-03127	373-03127	371-03127	299-03127	298-03127
		2.5	2.2	0.5	15	20	599-03128	373-03128	371-03128	299-03128	298-03128
		4	3.4	0.5	15	20	599-03129	373-03129	371-03129	299-03129	298-03129
		6.3	5.4	0.75	20	20	599-03130	373-03130	371-03130	299-03130	298-03130
		10	8.6	1	25	20	599-03131	373-03131	371-03131	299-03131	298-03131
		16	14	1.25	32	20	599-03132	373-03132	371-03132	299-03132	298-03132
		25	22	1.5	40	20	599-03133	373-03133	371-03133	299-03133	298-03133
		40	34	2	50	20	599-03134	373-03134	371-03134	299-03134	298-03134

* IT = Internal Thread NPT

Table 12. Two-Way, Normally Closed (NC), Equal Percentage Valves, Brass and Stainless Steel Trim, Standard Packing.

Connection *		Flow Rate		Valve Size		Stroke	Electro-Hydraulic Actuators – 24 Vac					
							Description	NSR	Spring Return	NSR	Spring Return	
								Floating		0 to10 Vdc, 4 to 20 mA		
							Technical Instructions	155-181P25		155-180P25		155-163P25
							Actuator P/N	SKD82.50U	SKD82.51U	SKD60U	SKD62U	SKB62U
		Cv	Kvs	In	mm		Valve P/N	Actuator Code				
								275	276	267	274	291
Brass	IT×IT	1	0.9	0.5	15	20	599-03180	275-03180	276-03180	267-03180	274-03180	—
		1.6	1.4	0.5	15	20	599-03181	275-03181	276-03181	267-03181	274-03181	—
		2.5	2.2	0.5	15	20	599-03182	275-03182	276-03182	267-03182	274-03182	—
		4	3.4	0.5	15	20	599-03183	275-03183	276-03183	267-03183	274-03183	—
		6.3	5.4	0.75	20	20	599-03184	275-03184	276-03184	267-03184	274-03184	—
		10	8.6	1	25	20	599-03185	275-03185	276-03185	267-03185	274-03185	291-03185
		16	14	1.25	32	20	599-03186	275-03186	276-03186	267-03186	274-03186	291-03186
		25	22	1.5	40	20	599-03187	275-03187	276-03187	267-03187	274-03187	291-03187
		40	34	2	50	20	599-03188	275-03188	276-03188	267-03188	274-03188	291-03188
Stainless Steel	IT×IT	1	0.9	0.5	15	20	599-03126	275-03126	276-03126	267-03126	274-03126	—
		1.6	1.4	0.5	15	20	599-03127	275-03127	276-03127	267-03127	274-03127	—
		2.5	2.2	0.5	15	20	599-03128	275-03128	276-03128	267-03128	274-03128	—
		4	3.4	0.5	15	20	599-03129	275-03129	276-03129	267-03129	274-03129	—
		6.3	5.4	0.75	20	20	599-03130	275-03130	276-03130	267-03130	274-03130	—
		10	8.6	1	25	20	599-03131	275-03131	276-03131	267-03131	274-03131	291-03131
		16	14	1.25	32	20	599-03132	275-03132	276-03132	267-03132	274-03132	291-03132
		25	22	1.5	40	20	599-03133	275-03133	276-03133	267-03133	274-03133	291-03133
		40	34	2	50	20	599-03134	275-03134	276-03134	267-03134	274-03134	291-03134

* IT = Internal Thread NPT

Table 13. Two-Way, Normally Closed (NC), Linear Valves.

Packing	Connection *	Flow Rate		Valve Size		Stroke	Type	Pneumatic Actuator				
							Description	4-Inch	8-Inch			
								10-15 psi (69-103 kPa)	Standard	Hi-Temp	Standard W/Positioner	Hi-Temp W/Positioner
							Technical Instructions	155-183P25	155-161P25			
							Actuator P/N	599-01083	599-01050	599-01051	599-01050 & 599-00426	599-01051 & 599-00426
		Cv	Kvs	In	mm		Valve P/N	Actuator Code				
								270	277	278	283	284
Standard	IT×IT	1	0.9	0.5	15	20	599-03018	270-03018	277-03018	—	283-03018	—
		1.6	1.4	0.5	15	20	599-03019	270-03019	277-03019	—	283-03019	—
		2.5	2.2	0.5	15	20	599-03020	270-03020	277-03020	—	283-03020	—
		4	3.4	0.5	15	20	599-03021	270-03021	277-03021	—	283-03021	—
		6.3	5.4	0.75	20	20	599-03022	270-03022	277-03022	—	283-03022	—
		10	8.6	1	25	20	599-03023	270-03023	277-03023	—	283-03023	—
		16	14	1.25	32	20	599-03024	270-03024	277-03024	—	283-03024	—
		25	22	1.5	40	20	599-03025	270-03025	277-03025	—	283-03025	—
		40	34	2	50	20	599-03026	270-03026	277-03026	—	283-03026	—
Hi-Temp		1	0.9	0.5	15	20	599-03072	270-03072	277-03072	278-03072	283-03072	284-03072
		1.6	1.4	0.5	15	20	599-03073	270-03073	277-03073	278-03073	283-03073	284-03073
		2.5	2.2	0.5	15	20	599-03074	270-03074	277-03074	278-03074	283-03074	284-03074
		4	3.4	0.5	15	20	599-03075	270-03075	277-03075	278-03075	283-03075	284-03075
		6.3	5.4	0.75	20	20	599-03076	270-03076	277-03076	278-03076	283-03076	283-03076
		10	8.6	1	25	20	599-03077	270-03077	277-03077	278-03077	283-03077	284-03077
		16	14	1.25	32	20	599-03078	270-03078	277-03078	278-03078	283-03078	284-03078
		25	22	1.5	40	20	599-03079	270-03079	277-03079	278-03079	283-03079	284-03079
		40	34	2	50	20	599-03080	270-03080	277-03080	278-03080	283-03080	284-03080

* IT = Internal Thread NPT

Table 14. Two-Way, Normally Closed (NC), Linear Valves, Stainless Steel Trim.

Packing	Connection *	Flow Rate		Valve Size		Stroke	Electro-Mechanical Actuators 24 Vac				
							Description	Non-Spring Return		Spring Return	
								Floating	0 to 10 Vdc, 4 to 20mA	2-Position	0 to 10 Vdc
							Technical Instructions	155-507	155-506	155-541P25	
							Actuator P/N	SAX81.03U	SAX61.03U	599-03611	599-03609
		Cv	Kvs	In	mm		Valve P/N	Actuator Code			
								373	371	299	298
Standard	IT×IT	1	0.9	0.5	15	20	599-03018	373-03018	371-03018	299-03018	298-03018
		1.6	1.4	0.5	15	20	599-03019	373-03019	371-03019	299-03019	298-03019
		2.5	2.2	0.5	15	20	599-03020	373-03020	371-03020	299-03020	298-03020
		4	3.4	0.5	15	20	599-03021	373-03021	371-03021	299-03021	298-03021
		6.3	5.4	0.75	20	20	599-03022	373-03022	371-03022	299-03022	298-03022
		10	8.6	1	25	20	599-03023	373-03023	371-03023	299-03023	298-03023
		16	14	1.25	32	20	599-03024	373-03024	371-03024	299-03024	298-03024
		25	22	1.5	40	20	599-03025	373-03025	371-03025	299-03025	298-03025
		40	34	2	50	20	599-03026	373-03026	371-03026	299-03026	298-03026
Hi-Temp		1	0.9	0.5	15	20	599-03072	—	—	—	—
		1.6	1.4	0.5	15	20	599-03073	—	—	—	—
		2.5	2.2	0.5	15	20	599-03074	—	—	—	—
		4	3.4	0.5	15	20	599-03075	—	—	—	—
		6.3	5.4	0.75	20	20	599-03076	—	—	—	—
		10	8.6	1	25	20	599-03077	—	—	—	—
		16	14	1.25	32	20	599-03078	—	—	—	—
		25	22	1.5	40	20	599-03079	—	—	—	—
		40	34	2	50	20	599-03080	—	—	—	—

* IT = Internal Thread NPT

Table 15. Two-Way, Normally Closed (NC), Linear Valves, Stainless Steel Trim.

Packing	Connection *	Flow Rate		Valve Size		Stroke	Electro-Hydraulic Actuators -24 Vac				
							Description	NSR	Spring Return	NSR	Spring Return
								Floating		0 to 10 Vdc, 4 to 20mA	
							Technical Instructions	155-181P25		155-180P25	155-163P25
							Actuator P/N	SKD82.50U	SKD82.51U	SKD60U	SKD62U	SKB62U
		Cv	Kvs	In	mm		Valve P/N	Actuator Code				
								275	276	267	274	291
Standard	IT×IT	1	0.9	0.5	15	20	599-03018	275-03018	276-03018	267-03018	274-03018	—
		1.6	1.4	0.5	15	20	599-03019	275-03019	276-03019	267-03019	274-03019	—
		2.5	2.2	0.5	15	20	599-03020	275-03020	276-03020	267-03020	274-03020	—
		4	3.4	0.5	15	20	599-03021	275-03021	276-03021	267-03021	274-03021	—
		6.3	5.4	0.75	20	20	599-03022	275-03022	276-03022	267-03022	274-03022	—
		10	8.6	1	25	20	599-03023	275-03023	276-03023	267-03023	274-03023	291-03023
		16	14	1.25	32	20	599-03024	275-03024	276-03024	267-03024	274-03024	291-03024
		25	22	1.5	40	20	599-03025	275-03025	276-03025	267-03025	274-03025	290-03025
		40	34	2	50	20	599-03026	275-03026	276-03026	267-03026	274-03026	291-03026
Hi-Temp		1	0.9	0.5	15	20	599-03072	275-03072	276-03072	267-03072	274-03072	—
		1.6	1.4	0.5	15	20	599-03073	275-03073	276-03073	267-03073	274-03073	—
		2.5	2.2	0.5	15	20	599-03074	275-03074	276-03074	267-03074	274-03074	—
		4	3.4	0.5	15	20	599-03075	275-03075	276-03075	267-03075	274-03075	—
		6.3	5.4	0.75	20	20	599-03076	275-03076	276-03076	267-03076	274-03076	—
		10	8.6	1	25	20	599-03077	275-03077	276-03077	267-03077	274-03077	291-03077
		16	14	1.25	32	20	599-03078	275-03078	276-03078	267-03078	274-03078	291-03078
		25	22	1.5	40	20	599-03079	275-03079	276-03079	267-03079	274-03079	291-03079
		40	34	2	50	20	599-03080	275-03080	276-03080	267-03080	274-03080	291-03080

* IT = Internal Thread NPT

Table 16. Three-Way, Normally Closed (NC), Equal Percentage Valves, Normally Open, Linear, Standard Packing.

Trim & Connection *	Flow Rate		Valve Size		Stroke	Pneumatic					
						Description	4-Inch			8-inch- Standard Temp.	
							3-8 psi (21-55 kPa)	5-10 psi (34-69 kPa)	10-15 psi (69-103 kPa)	Without Positioner	With Positioner
						Technical Instructions	155-183P25			155-161P25	
						Actuator P/N	599-01081	599-01082	599-01083	599-01050	599-01050 & 599-00426
	Cv	Kvs	In	mm		Valve P/N	Actuator Code				
							268	269	270	277	283
Bronze Trim - IT×IT	1	0.9	0.5	15	20	599-03198	268-03198	269-03198	270-03198	277-03198	283-03198
	1.6	1.4	0.5	15	20	599-03199	268-03199	269-03199	270-03199	277-03199	283-03199
	2.5	2.2	0.5	15	20	599-03200	268-03200	269-03200	270-03200	277-03200	283-03200
	4	3.4	0.5	15	20	599-03201	268-03201	269-03201	270-03201	277-03201	283-03201
	6.3	5.4	0.75	20	20	599-03202	268-03202	269-03202	270-03202	277-03202	283-03202
	10	8.6	1	25	20	599-03203	268-03203	269-03203	270-03203	277-03203	283-03203
	16	14	1.25	32	20	599-03204	268-03204	269-03204	270-03204	277-03204	283-03204
	25	22	1.5	40	20	599-03205	268-03205	269-03205	270-03205	277-03205	283-03205
	40	34	2	50	20	599-03206	268-03206	269-03206	270-03206	277-03206	283-03206
SS Trim - IT×IT	1	0.9	0.5	15	20	599-03144	268-03144	269-03144	270-03144	277-03144	283-03144
	1.6	1.4	0.5	15	20	599-03145	268-03145	269-03145	270-03145	277-03145	283-03145
	2.5	2.2	0.5	15	20	599-03146	268-03146	269-03146	270-03146	277-03146	283-03146
	4	3.4	0.5	15	20	599-03147	268-03147	269-03147	270-03147	277-03147	283-03147
	6.3	5.4	0.75	20	20	599-03148	268-03148	269-03148	270-03148	277-03148	283-03148
	10	8.6	1	25	20	599-03149	268-03149	269-03149	270-03149	277-03149	283-03149
	16	14	1.25	32	20	599-03150	268-03150	269-03150	270-03150	277-03150	283-03150
	25	22	1.5	40	20	599-03151	268-03151	269-03151	270-03151	277-03151	283-03151
	40	34	2	50	20	599-03152	268-03152	269-03152	270-03152	277-03152	283-03152

* IT = Internal Thread NPT

Table 17. Three-Way Normally Closed (NC), Linear Valves, Stainless Steel, Standard Packing.

Connection *	Flow Rate		Valve Size		Stroke	Electro-Mechanical Actuators 24 Vac				
						Description	Non-Spring Return		Spring Return	
							Floating	0-10 Vdc, 4-20mA	2-Position	0-10 Vdc
						Technical Instructions	155-507	155-506	155-541P25	
						Actuator P/N	SAX81.03U	SAX61.03U	599-03611	599-03609
	Cv	Kvs	In	mm		Valve P/N	Actuator Code			
							373	371	299	298
Bronze Trim IT×IT	1	0.9	0.5	15	20	599-03198	373-03198	371-03198	299-03198	298-03198
	1.6	1.4	0.5	15	20	599-03199	373-03199	371-03199	299-03199	298-03199
	2.5	2.2	0.5	15	20	599-03200	373-03200	371-03200	299-03200	298-03200
	4	3.4	0.5	15	20	599-03201	373-03201	371-03201	299-03201	298-03201
	6.3	5.4	0.75	20	20	599-03202	373-03202	371-03202	299-03202	298-03202
	10	8.6	1	25	20	599-03203	373-03203	371-03203	299-03203	298-03203
	16	14	1.25	32	20	599-03204	373-03204	371-03204	299-03204	298-03204
	25	22	1.5	40	20	599-03205	373-03205	371-03205	299-03205	298-03205
	40	34	2	50	20	599-03206	373-03206	371-03206	299-03206	298-03206
SS Trim – IT×IT	1	0.9	0.5	15	20	599-03144	373-03144	371-03144	299-03144	298-03144
	1.6	1.4	0.5	15	20	599-03145	373-03145	371-03145	299-03145	298-03145
	2.5	2.2	0.5	15	20	599-03146	373-03146	371-03146	299-03146	298-03146
	4	3.4	0.5	15	20	599-03147	373-03147	371-03147	299-03147	298-03147
	6.3	5.4	0.75	20	20	599-03148	373-03148	371-03148	299-03148	298-03148
	10	8.6	1	25	20	599-03149	373-03149	371-03149	299-03149	298-03149
	16	14	1.25	32	20	599-03150	373-03150	371-03150	299-03150	298-03150
	25	22	1.5	40	20	599-03151	373-03151	371-03151	299-03151	298-03151
	40	34	2	50	20	599-03152	373-03152	371-03152	299-03152	298-03152

* IT= Internal Thread NPT

Table 18. Three-Way, Normally Closed (NC), Equal Percentage Valves, Normally Open (NO), Linear, Standard Packing.

Trim	Connection *	Flow Rate		Valve Size		Stroke	Electro-Hydraulic Actuators				
							Description	NSR	Spring Return	NSR	Spring Return
								Floating		0 to 10 Vdc, 4 to 20 mA	
							Technical Instructions	155-181P25		155-180P25	155-163P25
							Actuator P/N	SKD82.50U	SKD82.51U	SKD60U	SKD62U	SKB62U
		Cv	Kvs	In	mm		Valve P/N	Actuator Code				
								275	276	267	274	291
Bronze	IT×IT	1	0.9	0.5	15	20	599-03198	275-03198	276-03198	267-03198	274-03198	—
		1.6	1.4	0.5	15	20	599-03199	275-03199	276-03199	267-03199	274-03199	—
		2.5	2.2	0.5	15	20	599-03200	275-03200	276-03200	267-03200	274-03200	—
		4	3.4	0.5	15	20	599-03201	275-03201	276-03201	267-03201	274-03201	—
		6.3	5.4	0.75	20	20	599-03202	275-03202	276-03202	267-03202	274-03202	—
		10	8.6	1.0	25	20	599-03203	275-03203	276-03203	267-03203	274-03203	291-03203
		16	14	1.25	32	20	599-03204	275-03204	276-03204	267-03204	274-03204	291-03204
		25	22	1.5	40	20	599-03205	275-03205	276-03205	267-03205	274-03205	291-03205
		40	34	2.0	50	20	599-03206	275-03206	276-03206	267-03206	274-03206	291-03206
Stainless Steel	IT×IT	1	0.9	0.5	15	20	599-03144	275-03144	276-03144	267-03144	274-03144	—
		1.6	1.4	0.5	15	20	599-03145	275-03145	276-03145	267-03145	274-03145	—
		2.5	2.2	0.5	15	20	599-03146	275-03146	276-03146	267-03146	274-03146	—
		4	3.4	0.5	15	20	599-03147	275-03147	276-03147	267-03147	274-03147	—
		6.3	5.4	0.75	20	20	599-03148	275-03148	276-03148	267-03148	274-03148	—
		10	8.6	1.0	25	20	599-03149	275-03149	276-03149	267-03149	274-03149	291-03149
		16	14	1.25	32	20	599-03150	275-03150	276-03150	267-03150	274-03150	291-03150
		25	22	1.5	40	20	599-03151	275-03151	276-03151	267-03151	274-03151	291-03151
		40	34	2.0	50	20	599-03152	275-03152	276-03152	267-03152	274-03152	291-03152

* IT = Internal Thread NPT

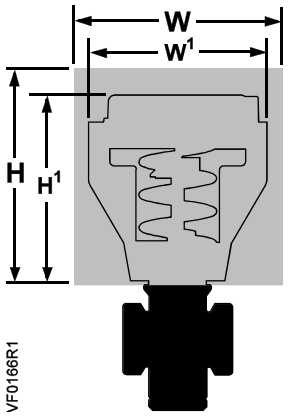


Figure 3. Actuator Dimensions. See Table 19.

Table 19. Dimensions of the Actuator and Recommended Service Envelope. Dimensions in Inches (Millimeters).

Actuator	Actuator Prefix Code	Actual Height of Actuator H1	Service Height H	Actual Width or Diameter of Actuator W1	Service Width W
4-inch Pneumatic	268, 269 270	5-3/4 (146)	14 (350)	5-1/2 (137) diameter	18 (450)
8-inch Pneumatic	277, 278, 283, 284	14-1/8 (359)	26 (660)	8-3/4 (222) diameter	21 (533)
SKB with handle closed	289, 290, 291	14-3/4 (375)	22-3/4 (578)	7 (178) width × 8-15/16 (226) depth	25 (635)
SKD	267, 274, 275, 276	11-13/16 (300)	19-3/4 (500)	5 (127) width × 6-5/8 (169) depth	14-1/2 (360)
SAX	371, 373	9-9/16 (242)	17-1/4 (442)	4-7/8 (124) width × 5-7/8 (150) depth	17-3/4 (450)
El/Mech with linkage	298, 299	14-1/2 (368)	10 (254)	5 (127) width × 5-1/8 (121) depth	8 (203)

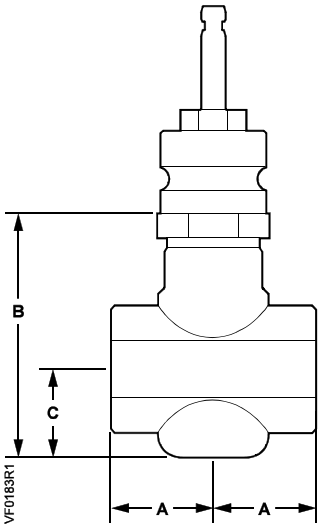


Figure 4. Two-Way Internal Thread NPT × Internal Thread NPT (IT×IT) Valves.

Table 20. Two-Way Valve Dimensions.

Valve Action	Valve Size inch (mm)	A	B	C	Weight lbs (kg)
Normally Open	1/2 (15)	1-7/16 (36)	2-15/16 (74)	1-1/4 (31)	3 (1.4)
	3/4 (20)	1-11/16 (43)	3-15/16 (99)	1-7/16 (36)	4 (1.8)
	1 (25)	2 (50)	3-3/4 (96)	1-1/4 (32)	5 (2.3)
	1-1/4 (32)	2-1/2 (62)	4-1/4 (108)	2 (51)	7 (3.2)
	1-1/2 (40)	2-9/16 (65)	4-1/4 (108)	2 (51)	9 (4.1)
	2 (50)	3-1/8 (79)	4-9/16 (116)	2-1/4 (57)	13 (5.9)
Normally Closed	1/2 (15)	1-7/16 (36)	3-13/16 (97)	2-3/16 (55)	3 (1.4)
	3/4 (20)	1-11/16 (43)	3-13/16 (97)	2-3/16 (55)	4 (1.8)
	1 (25)	2 (50)	3-13/16 (97)	2-3/16 (55)	5 (2.3)
	1-1/4 (32)	2-1/2 (62)	3-13/16 (97)	2-3/16 (55)	7 (3.2)
	1-1/2 (40)	2-9/16 (65)	3-7/8 (99)	2-1/4 (58)	8 (3.6)
	2 (50)	3-1/8 (79)	4-1/2 (114)	2-9/16 (65)	16 (7.3)

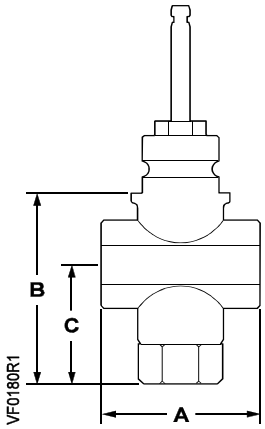


Figure 5. Three-Way Internal Thread NPT × Internal Thread NPT (IT×IT) Valves.

Table 21. Three-Way Valve Dimensions.

Valve	Valve Size Inches (mm)	Dimensions in Inches (mm)			Weight lb (kg)
		A	B	C	
3-Way	1/2 (15)	2-7/8 (72)	4-5/16 (110)	2-11/16 (68)	3 (1.4)
	3/4 (20)	3-3/8 (85)	4-5/16 (110)	2-3/4 (69)	4 (1.8)
	1 (25)	3-15/16 (100)	4-1/2 (114)	2-7/8 (72)	5 (2.3)
	1-1/4 (32)	4-15/16 (125)	4-5/8 (116)	2-15/16 (74)	7 (3.2)
	1-1/2 (40)	5-1/8 (130)	4-5/8 (117)	3 (76)	9 (4.1)
	2 (50)	6-1/4 (158)	4-3/4 (121)	3-3/16 (81)	13 (5.9)

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Flowrite™ 599 Series

2-1/2 to 6-Inch Valve, Two-Way & Three-Way, and Actuator Assembly Selection

Description

This Technical Bulletin will aid in the selection of a Flowrite 599 Series 2-1/2 inch to 6-inch valve and actuator assembly. Begin with the graph of water capacity and the chart of close-off pressures to select a valve and actuator according to specifications. Use Tables 1 through 4 to identify product numbers.

These tables show all the possible combinations of the Flowrite 599 Series valves and compatible actuators that can be ordered as complete valve assemblies from the factory.

The dimensions of all valves and the service envelope required for each actuator are included in Tables 5 through 7.

How to Use the Selection Graphs

Use Figure 1, the water capacity graph, to select a valve. Locate the specified flow rate on the vertical axis. Follow across on the horizontal line to the point of intersection with the specified pressure drop. Choose the valve size from the heavy diagonal lines across the graph.

Use Figure 2, the close-off pressure graph, to select an actuator. First locate the valve action and actuator power source specified. Locate the bar that represents the valve line size. The top of the bar indicates the maximum close-off pressure for tight close-off.

Use the legend at the bottom of the graph to identify the actuator.

How To Use The Valve Tables

Tables have been organized to help select a valve and actuator combination using additional specifications.

Moving from left to right, identify the valve by selecting the combination of parameters needed. Continue to the right to match the selected valve to a desired actuator.

A valve and actuator assembly part number is determined by combining the actuator prefix code with the suffix of the valve product number.

NOTES:

1. No valve will combine with all actuators.

2. The symbol “—” indicates a combination is not available.

Selection Example

Specification

Select a two-way normally closed valve and actuator assembly for an ANSI 125 piping system that will deliver 500 gpm (113 $m^{3/}$h) chilled water with an equal percentage flow characteristic with no more than 5 psi (35 kPa) pressure drop across the fully open valve.

The valve shall be operated by a 24 Vac powered, 0 to 10 Vdc control signal, spring return electronic actuator, and must close off tightly against a pump head pressure of 15 psi (1 bar).

Valve Sizing

Use Figure 1, the water capacity graph, to begin valve sizing.

1. Locate 500 gpm (113 m^3/h) on the vertical axis to find the required flow.
2. Read across the horizontal axis to find 5 psi (35 kPa), the maximum allowable pressure drop across the open valve.
3. Select a 5-inch (125 mm) 250 Cv (214 Kvs) line size valve because the point of intersection falls close to the 5-inch line.

Actuator selection

Use Figures 2, the close-off pressure graph, to choose an actuator.

1. Locate the graph for electronic actuators for NC valves in the upper left side of the figure.
2. Locate the bar for 5-inch valves. The black bar represents an SKB/C actuator.
3. Notice that the SKB/C has the sufficient force to provide tight close-off against more than 20 psi (1.4 bar) differential. For a 5-inch valve, select an SKC actuator with a 40 mm stroke.

Product Number Selection

Use Table 1 for ANSI Class 125 valves. Begin at the left and select the specifications necessary.

1. Select a two-way, normally closed, equal percentage flow characteristic according to the specifications.

2. Select bronze trim for the low pressure water application and standard packing for chilled water.

3. Select the 5-inch line size determined from the sizing example above. Note the 40 mm stroke of the valve. The valve part number is 599-05993.

4. Read across the top of the table to Electronic-hydraulic, 40 mm, and 24 Vac, 0-10 Vdc control signal.
   The actuator part number is SKC62U.
   The actuator code number is 294.

5. Read down the column to determine the valve and actuator assembly product number is 294-05993.

   NOTE: A valve and actuator can be ordered separately by using the part numbers from Steps 3 and 4.

References

Two-Way Valves 2-1/2 to 6-inch Flanged Iron Body Technical Instructions (155-159)

Three-Way Valves 2-1/2 to 6-inch Flanged Iron Body Technical Instructions (155-160)

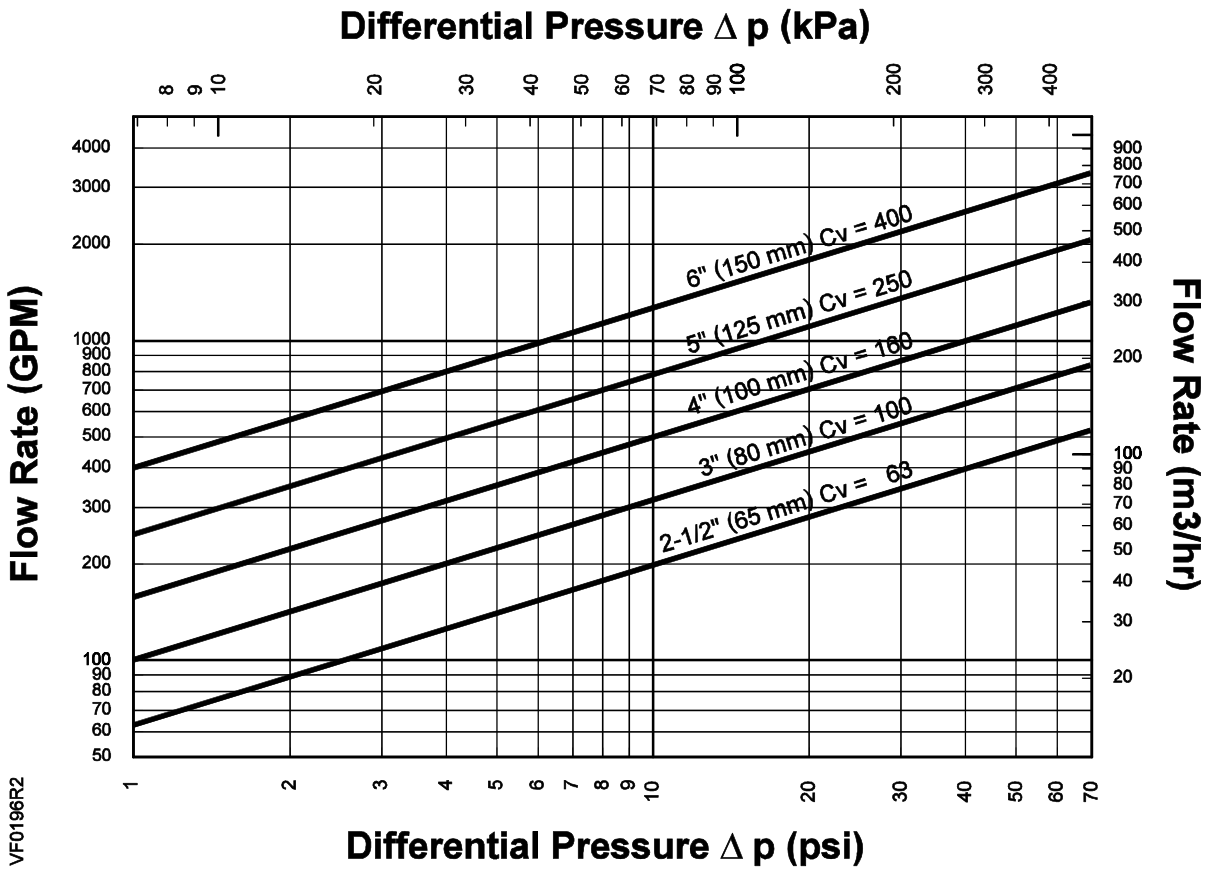


Figure 1. Water Capacity Graph.

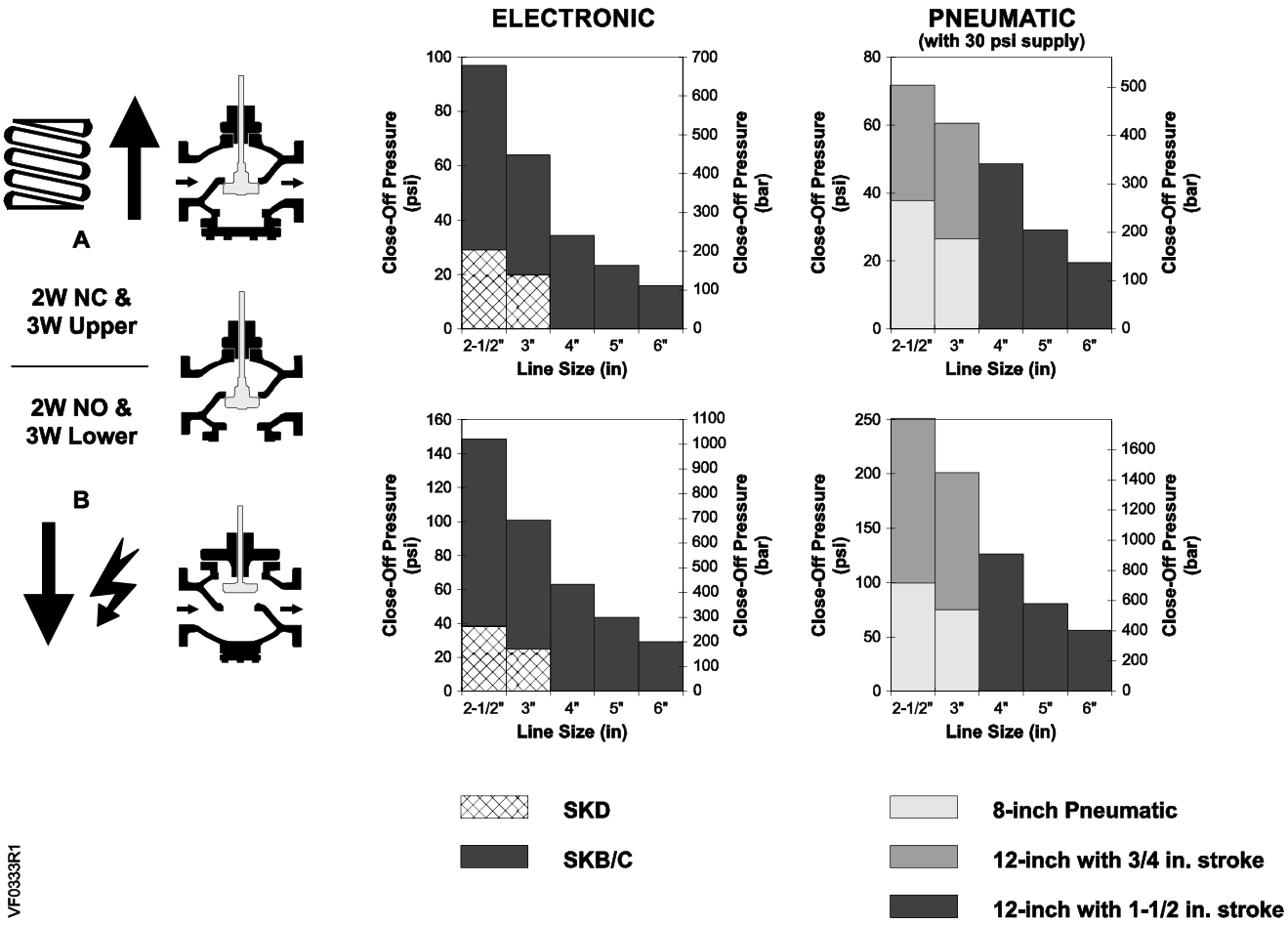


Figure 2. Close-off Pressures for 2-1/2 through 6-Inch Valves.

Table 1. Two-Way and Three-Way Flanged Valves, ANSI Class 125.

										Electro-Hydraulic – 24 Vac									
								Stroke		20 mm Stroke							40 mm Stroke		
								Description		Non-Spring Return			Spring Return				NSR	Spring Return	
										Floating		0 to10 Vdc, 4 to20 mA	Floating		0 to10 Vdc, 4 to20 mA		Floating		0 to10 Vdc, 4 to20 mA
								Technical Instructions		155-181P25	155-171P25	155-180P25	155-181P25	155-171P25	155-180P25	155-163P25	155-171P25		155-163P25
								Actuator P/N		SKD82.50U	SKB82.50U	SKD60U	SKD82.51U	SKB82.51U	SKD62U	SKB62U	SKC82.60U	SKC82.61U	SKC62U
Action	Port & Characteristic	Trim	Packing	Flow Rate Cv	Flow Rate Kvs	Valve Size In	Valve Size mm	Stroke	Valve P/N	Actuator Code 275	290	267	276	289	274	291	293	292	294
Normally Open	2-Way Equal Percentage	Bronze	Standard	63	54	2.5	65	20	599-05980	275-05980	290-05980	267-05980	276-05980	289-05980	274-05980	291-05980	—	—	—
				100	86	3	80	20	599-05981	275-05981	290-05981	267-05981	276-05981	289-05981	274-05981	291-05981	—	—	—
				160	140	4	100	40	599-05982	—	—	—	—	—	—	—	293-05982	292-05982	294-05982
				250	215	5	125	40	599-05983	—	—	—	—	—	—	—	293-05983	292-05983	294-05983
				400	340	6	150	40	599-05984	—	—	—	—	—	—	—	293-05984	292-05984	294-05984
		Stainless Steel		63	54	2.5	65	20	599-05960	275-05960	290-05960	267-05960	276-05960	289-05960	274-05960	291-05960	—	—	—
				100	86	3	80	20	599-05961	275-05961	290-05961	267-05961	276-05961	289-05961	274-05961	291-05961	—	—	—
				160	140	4	100	40	599-05962	—	—	—	—	—	—	—	293-05962	292-05962	294-05962
				250	215	5	125	40	599-05963	—	—	—	—	—	—	—	293-05963	292-05963	294-05963
				400	340	6	150	40	599-05964	—	—	—	—	—	—	—	293-05964	292-05964	294-05964
	2-Way Linear	Stainless Steel		63	54	2.5	65	20	599-06060	275-06060	290-06060	267-06060	276-06060	289-06060	274-06060	291-06060	—	—	—
				100	86	3	80	20	599-06061	275-06061	290-06061	267-06061	276-06061	289-06061	274-06061	291-06061	—	—	—
				160	140	4	100	40	599-06062	—	—	—	—	—	—	—	293-060962	292-060962	294-060962
				250	215	5	125	40	599-06063	—	—	—	—	—	—	—	293-06063	292-06063	294-06063
				400	340	6	150	40	599-06064	—	—	—	—	—	—	—	293-06064	292-06064	294-06064
			Hi-Temp	63	54	2.5	65	20	599-06040	275-06040	290-06040	267-06040	276-06040	289-06040	274-06040	291-06040	—	—	—
				100	86	3	80	20	599-06041	275-06041	290-06041	267-06041	276-06041	289-06041	274-06041	291-06041	—	—	—
				160	140	4	100	40	599-06042	—	—	—	—	—	—	—	293-06042	292-06042	294-06042
				250	215	5	125	40	599-06043	—	—	—	—	—	—	—	293-06043	292-06043	294-06043
				400	340	6	150	40	599-06044	—	—	—	—	—	—	—	293-06044	292-06044	294-06044
Normally Closed	2-Way Equal Percentage	Bronze	Standard	63	54	2.5	65	20	599-05990	275-05990	290-05990	267-05990	276-05990	289-05990	274-05990	291-05990	—	—	—
				100	86	3	80	20	599-05991	275-05991	290-05991	267-05991	276-05991	289-05991	274-05991	291-05991	—	—	—
				160	140	4	100	40	599-05992	—	—	—	—	—	—	—	293-05992	292-05992	294-05992
				250	215	5	125	40	599-05993	—	—	—	—	—	—	—	293-05993	292-05993	294-05993
				400	340	6	150	40	599-05994	—	—	—	—	—	—	—	293-05994	292-05994	294-05994
		Stainless Steel		63	54	2.5	65	20	599-05970	275-05970	290-05970	267-05970	276-05970	289-05970	274-05970	291-05970	—	—	—
				100	86	3	80	20	599-05971	275-05971	290-05971	267-05971	276-05971	289-05971	274-05971	291-05971	—	—	—
				160	140	4	100	40	599-05972	—	—	—	—	—	—	—	293-05972	292-05972	294-05972
				250	215	5	125	40	599-05973	—	—	—	—	—	—	—	293-05973	292-05973	294-05973
				400	340	6	150	40	599-05974	—	—	—	—	—	—	—	293-05974	292-05974	294-05974
	2-Way Linear	Stainless Steel		63	54	2.5	65	20	599-06070	275-06070	290-06070	267-06070	276-06070	289-06070	274-06070	291-06070	—	—	—
				100	86	3	80	20	599-06071	275-06071	290-06071	267-06071	276-06071	289-06071	274-06071	291-06071	—	—	—
				160	140	4	100	40	599-06072	—	—	—	—	—	—	—	293-06072	292-06072	294-06072
				250	215	5	125	40	599-06073	—	—	—	—	—	—	—	293-06073	292-06073	294-06073
				400	340	6	150	40	599-06074	—	—	—	—	—	—	—	293-06074	292-06074	294-06074
			Hi-Temp	63	54	2.5	65	20	599-06050	275-06050	290-06050	267-06050	276-06050	289-06050	274-06050	291-06050	—	—	—
				100	86	3	80	20	599-06051	275-06051	290-06051	267-06051	276-06051	289-06051	274-06051	291-06051	—	—	—
				160	140	4	100	40	599-06052	—	—	—	—	—	—	—	293-06052	292-06052	294-06052
				250	215	5	125	40	599-06053	—	—	—	—	—	—	—	293-06053	292-06053	294-06053
				400	340	6	150	40	599-06054	—	—	—	—	—	—	—	293-06054	292-06054	294-06054
3-Way Mixing	Linear	Bronze	Standard	63	54	2.5	65	20	599-06160	275-06160	290-06160	267-06160	276-06160	289-06160	274-06160	291-06160	—	—	—
				100	86	3	80	20	599-06161	275-06161	290-06161	267-06161	276-06161	289-06161	274-06161	291-06161	—	—	—
				160	140	4	100	40	599-06162	—	—	—	—	—	—	—	293-06162	292-06162	294-06162
				250	215	5	125	40	599-06163	—	—	—	—	—	—	—	293-06163	292-06163	294-06163
				400	340	6	150	40	599-06164	—	—	—	—	—	—	—	293-06164	292-06164	294-06164
		Stainless Steel		63	54	2.5	65	20	599-06165	275-06165	290-06165	267-06165	276-06165	289-06165	274-06165	291-06165	—	—	—
				100	86	3	80	20	599-06166	275-06166	290-06166	267-06166	276-06166	289-06166	274-06166	291-06166	—	—	—
				160	140	4	100	40	599-06167	—	—	—	—	—	—	—	293-06167	292-06167	294-06167
				250	215	5	125	40	599-06168	—	—	—	—	—	—	—	293-06168	292-06168	294-06168
				400	340	6	150	40	599-06169	—	—	—	—	—	—	—	293-06169	292-06169	294-06169

Table 2. Two-Way and Three-Way, Flanged Valves, ANSI Class 125.

Characteristic	Trim	Packing	Flow Rate		Valve Size		Stroke	Pneumatic				Pneumatic with Factory Mounted Positioner			
								Stroke	20 mm			40 mm	20 mm			40 mm
								Description	8-inch		12-inch		8-inch		12-inch	
									Standard	Hi Temp			Standard	Hi-Temp		
								Technical Instructions	155-161P25		155-162P25		155-161P25		155-162P25	
								Actuator P/N	599-01050	599-01051	599-01010	599-01000	599-01050 & 599-00426	599-01051 & 599-00426	599-01010 & 599-00423	599-01000 & 599-00423
			Cv	Kvs	In	mm		Valve P/N	Actuator Code 277	278	279	281	283	284	285	287
2-Way Equal Percentage. NO	Bronze	Standard	63	54	2.5	65	20	599-05980	277-05980	—	279-05980	—	283-05980	—	285-05980	—
			100	86	3	80	20	599-05981	277-05981	—	279-05981	—	283-05981	—	285-05981	—
			160	140	4	100	40	599-05982	—	—	—	281-05982	—	—	—	287-05982
			250	215	5	125	40	599-05983	—	—	—	281-05983	—	—	—	287-05983
			400	340	6	150	40	599-05984	—	—	—	281-05984	—	—	—	287-05984
	Stainless Steel		63	54	2.5	65	20	599-05960	277-05960	—	279-05960	—	283-05960	—	285-05960	—
			100	86	3	80	20	599-05961	277-05961	—	279-05961	—	283-05961	—	285-05961	—
			160	140	4	100	40	599-05962	—	—	—	281-05962	—	—	—	287-05962
			250	215	5	125	40	599-05963	—	—	—	281-05963	—	—	—	287-05963
			400	340	6	150	40	599-05964	—	—	—	281-05964	—	—	—	287-05964
2-Way Linear NO	Stainless Steel		63	54	2.5	65	20	599-06060	277-06060	—	279-06060	—	283-06060	—	285-06060	—
			100	86	3	80	20	599-06061	277-06061	—	279-06061	—	283-06061	—	285-06061	—
			160	140	4	100	40	599-06062	—	—	—	281-06062	—	—	—	287-06062
			250	215	5	125	40	599-06063	—	—	—	281-06063	—	—	—	287-06063
			400	340	6	150	40	599-06064	—	—	—	281-06064	—	—	—	287-06064
		Hi-Temp	63	54	2.5	65	20	599-06040	277-06040	278-06040	279-06040	—	283-06040	284-06040	285-06040	—
			100	86	3	80	20	599-06041	277-06041	278-06041	279-06041	—	283-06041	284-06041	285-06041	—
			160	140	4	100	40	599-06042	—	—	—	281-06042	—	—	—	287-06042
			250	215	5	125	40	599-06043	—	—	—	281-06043	—	—	—	287-06043
			400	340	6	150	40	599-06044	—	—	—	281-06044	—	—	—	287-06044
2-Way Equal Percentage NC	Bronze	Standard	63	54	2.5	65	20	599-05990	277-05990	—	279-05990	—	283-05990	—	285-05990	—
			100	86	3	80	20	599-05991	277-05991	—	279-05991	—	283-05991	—	285-05991	–
			160	140	4	100	40	599-05992	—	—	—	281-05992	—	—	—	287-05992
			250	215	5	125	40	599-05993	—	—	—	281-05993	—	—	—	287-05993
			400	340	6	150	40	599-05994	—	—	—	281-05994	—	—	—	287-05994
	Stainless Steel		63	54	2.5	65	20	599-05970	277-05970	—	279-05970	—	283-05970	—	285-05970	—
			100	86	3	80	20	599-05971	277-05971	—	279-05971	—	283-05971	—	285-05971	—
			160	140	4	100	40	599-05972	—	—	—	281-05972	—	—	—	287-05972
			250	215	5	125	40	599-05973	—	—	—	281-05973	—	—	—	287-05973
			400	340	6	150	40	599-05974	—	—	—	281-05974	—	—	—	287-05974
2-Way Linear NC	Stainless Steel		63	54	2.5	65	20	599-06070	277-06070	—	279-06070	—	283-06070	—	285-06070	—
			100	86	3	80	20	599-06071	277-06017	—	279-06071	—	283-06070	—	285–06070	—
			160	140	4	100	40	599-06072	—	—	—	281-06072	—	—	—	287-06072
			250	215	5	125	40	599-06073	—	—	—	281-06073	—	—	—	287-06073
			400	340	6	150	40	599-06074	—	—	—	281-06074	—	—	—	287-06074
		Hi-Temp	63	54	2.5	65	20	599-06050	277-06050	278-06050	279-06050	—	283-06050	284-06050	285-06050	—
			100	86	3	80	20	599-06051	277-06051	278-06051	279-06051	—	283-06050	284-06051	285-06051	—
			160	140	4	100	40	599-06052	—	—	—	281-06052	—	—	—	287-06052
			250	215	5	125	40	599-06053	—	—	—	281-06053	—	—	—	287-06053
			400	340	6	150	40	599-06054	—	—	—	281-06954	—	—	—	287-06054
3-Way Mixing Linear	Bronze	Standard	63	54	2.5	65	20	599-06160	277-06160	—	279-06160	—	283-06160	—	285-06160	—
			100	86	3	80	20	599-06161	277-06161	—	279-06161	—	283-06161	—	285-06161	—
			160	140	4	100	40	599-06162	—	—	—	281-06162	—	—	—	287-06162
			250	215	5	125	40	599-06163	—	—	—	281-06163	—	—	—	287-06163
			400	340	6	150	40	599-06164	—	—	—	281-06174	—	—	—	287-06174
	Stainless Steel		63	54	2.5	65	20	599-06165	277-06165	—	279-06165	—	283-06165	—	285-06165	—
			100	86	3	80	20	599-06166	277-06166	—	279-06166	—	283-06166	—	285-06166	—
			160	140	4	100	40	599-06167	—	—	—	281-06167	—	—	—	287-06167
			250	215	5	125	40	599-06168	—	—	—	281-06168	—	—	—	287-06168
			400	340	6	150	40	599-06169	—	—	—	281-06169	—	—	—	287-06169

Table 3. Two-Way and Three-Way, Flanged Valves, ANSI Class 250.

Action	Port & Characteristic	Trim	Packing	Flow Rate Cv	Flow Rate Kvs	Valve Size In	Valve Size mm	Stroke	Electronic-Hydraulic – 24 Vac									
									Stroke	20 mm							40 mm		
									Description	Non-Spring Return			Spring Return				NSR	Spring Return	
										Floating		0 to 10 Vdc, 4 to 20 mA	Floating		0 to 10 Vdc, 4 to 20 mA		Floating		0 to 10 Vdc, 4 to 20 mA
									Technical Instructions	155-181P25	155-171P25	155-180P25	155-181P25	155-171P25	155-180P25	155-163P25	155-171P25		155-163P25
									Actuator P/N	SKD82.50U	SKB82.50U	SKD60U	SKD82.51U	SKB82.51U	SKD62U	SKB62U	SKC82.60U	SKC82.61U	SKC62U
									Valve P/N	Actuator Code									
				Cv	Kvs	In	mm			275	290	267	276	289	274	291	293	292	294
Normally Open	2-Way Equal Percentage	Bronze	Standard	63	54	2.5	65	20	599-05940	275-05940	290-05940	267-05940	276-05940	289-05940	274-05940	291-05940	—	—	—
				100	86	3	80	20	599-05941	275-05941	290-05941	267-05941	276-05941	289-05941	274-05941	291-05941	—	—	—
				160	140	4	100	40	599-05942	—	—	—	—	—	—	—	293-05942	292-05942	294-05942
				250	215	5	125	40	599-05943	—	—	—	—	—	—	—	293-05943	292-05943	294-05943
				400	340	6	150	40	599-05944	—	—	—	—	—	—	—	293-05944	292-05944	294-05944
		Stainless St		63	54	2.5	65	20	599-05920	275-05920	290-05920	267-05920	276-05920	289-05920	274-05920	291-05920	—	—	—
				100	86	3	80	20	599-05921	275-05921	290-05921	267-05921	276-05921	289-05921	274-05921	291-05921	—	—	—
				160	140	4	100	40	599-05922	—	—	—	—	—	—	—	293-05922	292-05922	294-05922
				250	215	5	125	40	599-05923	—	—	—	—	—	—	—	293-05923	292-05923	294-05923
				400	340	6	150	40	599-05924	—	—	—	—	—	—	—	293-05924	292-05924	294-05924
	2-Way Linear	Stainless St		63	54	2.5	65	20	599-06140	275-06140	290-06140	267-06140	276-06140	289-06140	274-06140	291-06140	—	—	—
				100	86	3	80	20	599-06141	275-06141	290-06141	267-06141	276-06141	289-06141	274-06141	291-06141	—	—	—
				160	140	4	100	40	599-06142	—	—	—	—	—	—	—	293-06142	292-06142	294-06142
				250	215	5	125	40	599-06143	—	—	—	—	—	—	—	293-06143	292-06143	294-06143
				400	340	6	150	40	599-06144	—	—	—	—	—	—	—	293-06144	292-06144	294-06144
			Hi- Temp	63	54	2.5	65	20	599-06120	275-06120	290-06120	267-06120	276-06120	289-06120	274-06120	291-06120	—	—	—
				100	86	3	80	20	599-06121	275-06121	290-06121	267-06121	276-06121	289-06121	274-06121	291-06121	—	—	—
				160	140	4	100	40	599-06122	—	—	—	—	—	—	—	293-06122	292-06122	294-06122
				250	215	5	125	40	599-06123	—	—	—	—	—	—	—	293-06123	292-06123	294-06123
				400	340	6	150	40	599-06124	—	—	—	—	—	—	—	293-06124	292-06124	294-06124
Normally Closed	2-Way Equal Percentage	Bronze	Standard	63	54	2.5	65	20	599-05950	275-05950	290-05950	267-05950	276-05950	289-05950	274-05950	291-05950	—	—	—
				100	86	3	80	20	599-05951	275-05951	290-05951	267-05951	276-05951	289-05951	274-05951	291-05951	—	—	—
				160	140	4	100	40	599-05952	—	—	—	—	—	—	—	293-05952	292-05952	294-05952
				250	215	5	125	40	599-05953	—	—	—	—	—	—	—	293-05953	292-05953	294-05953
				400	340	6	150	40	599-05954	—	—	—	—	—	—	—	293-05954	292-05954	294-05954
		Stainless St		63	54	2.5	65	20	599-05930	275-05930	290-05930	267-05930	276-05930	289-05930	274-05930	291-05930	—	—	—
				100	86	3	80	20	599-05931	275-05931	290-05931	267-05931	276-05931	289-05931	274-05931	291-05931	—	—	—
				160	140	4	100	40	599-05932	—	—	—	—	—	—	—	293-05932	292-05932	294-05932
				250	215	5	125	40	599-05933	—	—	—	—	—	—	—	293-05933	292-05933	294-05933
				400	340	6	150	40	599-05934	—	—	—	—	—	—	—	293-05934	292-05934	294-05934
	2-Way Linear	Stainless St		63	54	2.5	65	20	599-06150	275-06150	290-06150	267-06150	276-06150	289-06150	274-06150	291-06150	—	—	—
				100	86	3	80	20	599-06151	275-06151	290-06151	267-06151	276-06151	289-06151	274-06151	291-06151	—	—	—
				160	140	4	100	40	599-06152	—	—	—	—	—	—	—	293-06152	292-06152	294-06152
				250	215	5	125	40	599-06153	—	—	—	—	—	—	—	293-06153	292-06153	294-06153
				400	340	6	150	40	599-06154	—	—	—	—	—	—	—	293-06154	292-06154	294-06154
			Hi-Temp	63	54	2.5	65	20	599-06130	275-06130	290-06130	267-06130	276-06130	289-06130	274-06130	291-06130	—	—	—
				100	86	3	80	20	599-06131	275-06131	290-06131	267-06131	276-06131	289-06131	274-06131	291-06131	—	—	—
				160	140	4	100	40	599-06132	—	—	—	—	—	—	—	293-06132	292-06132	294-06132
				250	215	5	125	40	599-06133	—	—	—	—	—	—	—	293-06133	292-06133	294-06133
				400	340	6	150	40	599-06134	—	—	—	—	—	—	—	293-06134	292-06134	294-06134
3-Way Mixing	Linear	Bronze	Standard	63	54	2.5	65	20	599-06170	275-06170	290-06170	267-06170	276-06170	289-06170	274-06170	291-06170	—	—	—
				100	86	3	80	20	599-06171	275-06171	290-06171	267-06171	276-06171	289-06171	274-06171	291-06171	—	—	—
				160	140	4	100	40	599-06172	—	—	—	—	—	—	—	293-06172	292-06172	294-06172
				250	215	5	125	40	599-06173	—	—	—	—	—	—	—	293-06173	292-06173	294-06173
				400	340	6	150	40	599-06174	—	—	—	—	—	—	—	293-06174	292-06174	294-06174
		Stainless St		63	54	2.5	65	20	599-06175	275-06175	290-06175	267-06175	276-06175	289-06175	274-06175	291-06175	—	—	—
				100	86	3	80	20	599-06176	275-06176	290-06176	267-06176	276-06176	289-06176	274-06176	291-06176	—	—	—
				160	140	4	100	40	599-06177	—	—	—	—	—	—	—	293-06177	292-06177	294-06177
				250	215	5	125	40	599-06178	—	—	—	—	—	—	—	293-06178	292-06178	294-06178
				400	340	6	150	40	599-06179	—	—	—	—	—	—	—	293-06179	294-06179	294-06179

Table 4. Two-Way and Three-Way, Flanged Valves, ANSI Class 250.

	Characteristic	Trim	Packing	Flow Rate		Valve Size		Stroke	Pneumatic				Pneumatic with Factory Mounted Positioner			
									Stroke	20 mm			40 mm	20 mm			40 mm
									Description	8-inch		12-inch		8-inch		12-inch	
										Standard	Hi-Temp			Standard	Hi-Temp		
									Technical Instructions	155-161P25		155-162P25		155-161P25		155-162P25	
									Actuator P/N	599-01050	599-01051	599-01010	599-01000	599-01050 & 599-00426	599-01051 & 599-00426	599-01010 & 599-00423	599-01000 & 599-00423
				Cv	Kvs	In	mm		Valve P/N	Actuator Codes							
										277	278	279	281	283	284	285	287
Normally Open	2-Way Equal Percentage	Bronze	Standard	63	54	2.5	65	20	599-05940	277-05940	—	279-05940	—	283-05940	—	285-05940	—
				100	86	3	80	20	599-05941	277-05941	—	279-05941	—	283-05941	—	285-05941	—
				160	140	4	100	40	599-05942	—	—	—	281-05942	—	—	—	287-05942
				250	215	5	125	40	599-05943	—	—	—	281-05943	—	—	—	287-05943
				400	340	6	150	40	599-05944	—	—	—	281-05944	—	—	—	287-05944
		Stainless Steel		63	54	2.5	65	20	599-05920	277-05920	—	279-05920	—	283-05920	—	285-05920	—
				100	86	3	80	20	599-05921	277-05921	—	279-05921	—	283-05921	—	285-05921	—
				160	140	4	100	40	599-05922	—	—	—	281-05922	—	—	—	287-05922
				250	215	5	125	40	599-05923	—	—	—	281-05923	—	—	—	287-05923
				400	340	6	150	40	599-05924	—	—	—	281-05924	—	—	—	287-05924
	2-way Linear			63	54	2.5	65	20	599-06140	277-06140	—	279-06140	—	283-06140	—	285-06140	—
				100	86	3	80	20	599-06141	277-06141	—	279-06141	—	283-06141	—	285-06141	—
				160	140	4	100	40	599-06142	—	—	—	281-06142	—	—	—	287-06142
				250	215	5	125	40	599-06143	—	—	—	281-06143	—	—	—	287-06143
				400	340	6	150	40	599-06144	—	—	—	281-06144	—	—	—	287-06144
			Hi-Temp	63	54	2.5	65	20	599-06120	277-06120	278-06120	279-06120	—	283-06120	284-06120	285-06120	—
				100	86	3	80	20	599-06121	277-06121	278-06120	279-06121	—	283-06121	284-06121	285-06121	—
				160	140	4	100	40	599-06122	—	—	—	281-06122	—	—	—	287-06122
				250	215	5	125	40	599-06123	—	—	—	281-06123	—	—	—	287-06123
				400	340	6	150	40	599-06124	—	—	—	281-06124	—	—	—	287-06124
Normally Closed	2-Way Equal Percentage	Bronze	Standard	63	54	2.5	65	20	599-05950	277-05950	—	279-05950	—	283-05950	—	285-05950	—
				100	86	3	80	20	599-05951	277-05951	—	279-05951	—	283-05951	—	285-05951	–
				160	140	4	100	40	599-05952	—	—	—	281-05952	—	—	—	287-05952
				250	215	5	125	40	599-05953	—	—	—	281-05953	—	—	—	287-05953
				400	340	6	150	40	599-05954	—	—	—	281-05954	—	—	—	287-05954
		Stainless Steel		63	54	2.5	65	20	599-05930	277-05930	—	279-05930	—	283-05930	—	285-05930	—
				100	86	3	80	20	599-05931	277-05931	—	279-05931	—	283-05931	—	285-05931	—
				160	140	4	100	40	599-05932	—	—	—	281-05932	—	—	—	287-05932
				250	215	5	125	40	599-05933	—	—	—	281-05933	—	—	—	287-05933
				400	340	6	150	40	599-05934	—	—	—	281-05934	—	—	—	287-05934
	2-Way Linear			63	54	2.5	65	20	599-06150	277-06150	—	279-06150	—	283-06150	—	285-06150	—
				100	86	3	80	20	599-06151	277-06151	—	279-06151	—	283-06151	—	285-06151	—
				160	140	4	100	40	599-06152	—	—	—	281-06152	—	—	—	287-06152
				250	215	5	125	40	599-06153	—	—	—	281-06153	—	—	—	287-06153
				400	340	6	150	40	599-06154	—	—	—	281-06154	—	—	—	287-06154
			Hi-Temp	63	54	2.5	65	20	599-06130	277-06130	278-06130	279-06130	—	283-06130	284-06130	285-06130	—
				100	86	3	80	20	599-06131	277-06131	278-06131	279-06131	—	283-06131	284-06131	285-06131	—
				160	140	4	100	40	599-06132	—	—	—	281-06132	—	—	—	287-06132
				250	215	5	125	40	599-06133	—	—	—	281-06133	—	—	—	287-06133
				400	340	6	150	40	599-06134	—	—	—	281-06134	—	—	—	287-06134
3-Way Mixing	Linear	Bronze	Standard	63	54	2.5	65	20	599-06170	277-06170	—	279-06170	—	283-06170	—	285-06170	—
				100	86	3	80	20	599-06171	277-06171	—	279-06171	—	283-06171	—	285-06171	—
				160	140	4	100	40	599-06172	—	—	—	281-06172	—	—	—	287-06172
				250	215	5	125	40	599-06173	—	—	—	281-06173	—	—	—	287-06173
				400	340	6	150	40	599-06174	—	—	—	281-06174	—	—	—	287-06174
		Stainless St.		63	54	2.5	65	20	599-06175	277-06175	—	279-06175	—	283-06175	—	285-06175	—
				100	86	3	80	20	599-06176	277-06176	—	279-06176	—	283-06176	—	285-06176	—
				160	140	4	100	40	599-06177	—	—	—	281-06177	—	—	—	287-06177
				250	215	5	125	40	599-06178	—	—	—	281-06178	—	—	—	287-06178
				400	340	6	150	40	599-06179	—	—	—	281-06179	—	—	—	287-06179

Note: Spring start point NO = 3 to 8 psi (21 to 55 kPa), NC = 10 to 15 psi (69 to 103 kPa), 3-Way = 8 to 13 psi (55 to 90 kPa).

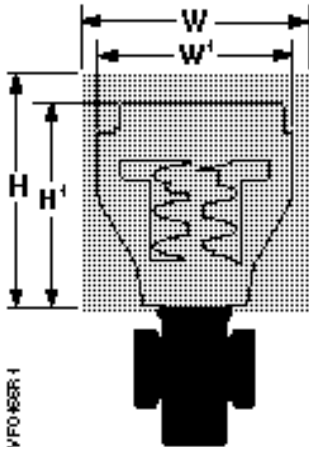


Figure 3. Actuator Dimensions.

Table 5. Dimensions of the Actuator and Recommended Service Envelope. Dimensions in Inches (Millimeters).

Actuator	Actuator Prefix Code	Actual Height of Actuator H1	Service Height H	Actual Width or Diameter of Actuator W1	Service Width W
8-inch Pneumatic	277, 278, 283, 284	14-1/8 (359)	26 (660)	8-3/4 (222) diameter	21 (533)
12-inch Pneumatic	279, 281, 285, 287	17-7/8 (454)	30 (762)	15-1/8 (384) diameter	27 (686)
SKB/C with handle closed	289, 290, 291, 292, 293, 294	14-3/4 (375)	22-3/4 (578)	7 (178) width × 8-15/16 (226) depth	25 (635)
SKD	267, 274, 275, 276	11-13/16 (300)	19-3/4 (500)	5 (127) width × 6-5/8 (169) depth	14-1/2 (360)

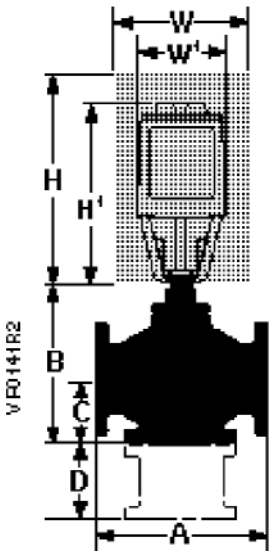


Figure 4. Dimensions.

Table 6. Three-Way Valve Dimensions.

Nominal Valve Size Inches (mm)	Dimensions in Inches (Millimeters)					Weight lb (kg)	
	A		B	C	D		
	ANSI Class 125	ANSI Class 250			Service Flange	ANSI Class 125	ANSI Class 250
2-1/2 (65)	10-7/8 (276.4)	11-1/2 (292)	9-3/8 (239.2)	3-3/4 (95)	6-1/2 (165)	104 (47)	117 (53)
3 (80)	11-3/4 (298.5)	12-1/2 (318)	10-3/4 (272)	4-3/8 (111)	7 (178)	114 (52)	132 (60)
4 (100)	13-7/8 (352.4)	14-1/2 (368)	12-1/2 (317.6)	5-1/8 (131.6)	7-1/2 (191)	146 (66)	174 (79)
5 (125)	15-3/4 (400)	16-5/8 (422)	13-3/4 (349.2)	5-3/4 (146.2)	8-1/2 (216)	170 (77)	215 (99)
6 (150)	17-3/4 (451)	18-5/8 (473)	15-1/2 (393)	6-5/8 (167)	9-1/2 (241)	199 (90)	261 (119)

Table 7. Two-Way Valve Dimensions.

Valve Action	Nominal Valve Size Inches (mm)	ANSI Class 125				ANSI Class 250			
		Dimensions in Inches (mm)			Weight lb (kg)	Dimensions in Inches (mm)			Weight lb (kg)
		A	B	C		A	B	C	
Normally Open	2-1/2 (65)	10-7/8 (276)	11 (281)	4-7/8 (123)	107 (49)	11-1/2 (292)	11 (281)	4-7/8 (123)	121 (55)
	3 (80)	11-3/4 (299)	12-1/4 (312)	5-5/16 (135)	118 (53)	12-1/2 (318)	12-1/4 (312)	5-5/16 (135)	139 (63)
	4 (100)	13-7/8 (352)	13-9/16 (345)	6-5/16 (160)	153 (70)	14-1/2 (368)	13-5/8 (344.7)	6-5/16 (160)	183 (83)
	5 (125)	15-3/4 (400)	15-3/16 (385)	7 (177)	176 (80)	16-5/8 (422)	15-3/16 (385)	7 (177)	222 (101)
	6 (150)	17-3/4 (451)	16-3/4 (426)	7-7/8 (200)	211 (96)	18-5/8 (473)	16-3/4 (426)	7-7/8 (200)	277 (126)
Normally Closed	2-1/2 (65)	10-7/8 (276)	10-5/8 (269)	4-7/8 (125)	107 (48)	11-1/2 (292)	11 (279)	5-3/8 (135)	120 (55)
	3 (80)	11-3/4 (299)	11-15/16 (303)	5-5/8 (142)	117 (53)	12-1/2 (318)	12-7/16 (315)	6 (154)	136 (62)
	4 (100)	13-7/8 (352)	13-15/16 (354)	6-5/8 (168)	154 (70)	14-1/2 (368)	14-3/8 (364)	7 (178)	184 (84)
	5 (125)	15-3/4 (400)	15-1/4 (388)	7-1/2 (185)	175 (79)	16-5/8 (422)	15-3/4 (399)	7-3/4 (196)	221 (101)
	6 (150)	17-3/4 (451)	171/16 (433)	8-3/16 (207)	210 (95)	18-5/8 (473)	17-1/2 (444)	8-5/8 (218)	275 (125)

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SIEMENS

274-06626

Submittal Sheet
Document No. 154-067
June 26, 2009

Flowrite™ 599 Series High Pressure Close-off , 2-Way Valves, 2-1/2 to 6-Inch, Flanged Iron Body, ANSI Classes 125 & 250

Description

The Flowrite 599 Series high pressure close-off, two-way flanged valve iron bodies, are designed to work with either pneumatic or electronic actuators with 3/4-inch (20 mm) or 1-1/2-inch (40 mm) stroke. They are available in both ANSI Class 125 and 250 for normally open or normally closed action.

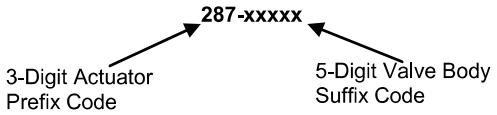
Typical applications include control of hot or chilled water; or 50% water-glycol solution.

Features

- Universal bonnet, for direct-coupled actuators
- Equal percentage flow characteristic
- Stainless steel trim
- ANSI Class IV leakage (≤ 0.01% of Cv)
- EPDM O-ring packing

Product Numbers

Use the product numbers in the tables to order the valve and the actuator assembled together. The product number consists of a 3-digit prefix code, a hyphen, and a 5-digit suffix code. The prefix specifies an actuator. The suffix specifies the valve body.



Typical Specifications

Automatic high pressure close-off control valves shall have flanged connections, 2-1/2-inch through 6-inch (65 mm through 150 mm) sizes, and shall be ANSI 125 or ANSI 250 rated to withstand the pressures and temperatures encountered.

Valves shall have metal-to-metal seats, stainless steel trim and stems, and EPDM O-ring packing.

Valve shall be ANSI Leakage Class IV (0.01% of Cv) at a close-off differential up to 200 psi. Valves shall have a 100:1 rangeability or better.

Technical Data

Valve Size	2-1/2 in. to 6-in. (65 mm to 150 mm)
Body	Cast iron ASTM A126 Class B
Trim	Stainless Steel
Stem	Stainless steel ASTM A582 Type 303
Stem Travel:	
2-1/2 and 3-inch	3/4-inch (20 mm) stroke
4, 5, and 6-inch	1-1/2-inch (40 mm) stroke
Seat	Metal-to-metal
Packing:	EPDM O-ring
Close-off Ratings	According to ANSI/FCI 70-2 See Tables 2 and 4.
Controlled Medium	Water, 50% water-glycol solution
Medium Temperature:	20°F to 250°F (-7°C to 120°C)
Maximum Recommended Differential Pressure for Modulating Service	50 psi (345 kPa)

Table 1. Flowrite Valve and Pneumatic Actuator.

NOTE: If an 8-inch or 12-inch pneumatic actuator without position relay is required, order the valve and actuator separately.

ANSI Class	Action	Valve Body	Valve Size, Inch (mm)	Cv	Stroke	8-Inch	12-Inch
							
						599-01050	599-01000
						W/Position Relay 599-00426	W/Position Relay 599-00423
						Actuator Codes	
						283	287
ANSI 125	Normally Open	599-06610	2-1/2 (65)	63	3/4 (20)	283-06610	—
		599-06611	3 (80)	100	3/4 (20)	283-06611	—
		599-06612	4 (100)	160	1-1/2 (40)	—	287-06612
		599-06613	5 (125)	250	1-1/2 (40)	—	287-06613
		599-06614	6 (150)	400	1-1/2 (40)	—	287-06614
	Normally Closed	599-06615	2-1/2 (65)	63	3/4 (20)	283-06615	—
		599-06616	3 (80)	100	3/4 (20)	283-06616	—
		599-06617	4 (100)	160	1-1/2 (40)	—	287-06617
		599-06618	5 (125)	250	1-1/2 (40)	—	287-06618
		599-06619	6 (150)	400	1-1/2 (40)	—	287-06619
ANSI 250	Normally Open	599-06620	2-1/2 (65)	63	3/4 (20)	283-06620	—
		599-06621	3 (80)	100	3/4 (20)	283-06621	—
		599-06622	4 (100)	160	1-1/2 (40)	—	287-06622
		599-06623	5 (125)	250	1-1/2 (40)	—	287-06623
		599-06624	6 (150)	400	1-1/2 (40)	—	287-06624
	Normally Closed	599-06625	2-1/2 (65)	63	3/4 (20)	283-06625	—
		599-06626	3 (80)	100	3/4 (20)	283-06626	—
		599-06627	4 (100)	160	1-1/2 (40)	—	287-06626
		599-06628	5 (125)	250	1-1/2 (40)	—	287-06628
		599-06629	6 (150)	400	1-1/2 (40)	—	287-06629

Table 2. Pneumatic Close-Off Ratings in PSI (kPa).

Action	Valve Size, Inch (mm)	Spring Return			
		8- Inch		12-Inch	
		3 to 8 psi (21 to 55 kPa)	10 to 15 psi (69 to 103 kPa)	3 to 8 psi (21 to 55 kPa)	10 to 15 psi (69 to 103 kPa)
				15 psi (103 kPa)	0 psi (0 kPa)
Normally Open	2-1/2 (65)	200 (1378)	—	—	—
	3 (80)	200 (1378)	—	—	—
	4 (100)	—	—	200 (1378)	—
	5 (125)	—	—	200 (1378)	—
	6 (150)	—	—	200 (1378)	—
Normally Closed	2-1/2 (65)	—	200 (1378)	—	—
	3 (80)	—	200 (1378)	—	—
	4 (100)	—	—	—	200 (1378)
	5 (125)	—	—	—	200 (1378)
	6 (150)	—	—	—	200 (1378)

Table 3. Flowrite Valve and 24 Vac Electro-Hydraulic Actuator Assemblies.

NOTE: If a SKD/C82…U actuator is required, order the valve and actuator separately.

Flow Characteristic	ANSI Class	Action	Valve Body	Valve Size Inch (mm)	Cv	Stroke	Spring Return 0 to 10 Vdc SKD62U Actuator Codes 274	Spring Return 0 to 10 Vdc SKC62U Actuator Codes 294
Equal Percentage	ANSI 125	Normally Open	599-06610	2-1/2 (65)	63	3/4 (20)	274-06610	—
			599-06611	3 (80)	100	3/4 (20)	274-06611	—
			599-06612	4 (100)	160	1-1/2 (40)	—	294-06612
			599-06613	5 (125)	250	1-1/2 (40)	—	294-06613
			599-06614	6 (150)	400	1-1/2 (40)	—	294-06614
		Normally Closed	599-06615	2-1/2 (65)	63	3/4 (20)	274-06615	—
			599-06616	3 (80)	100	3/4 (20)	274-06616	—
			599-06617	4 (100)	160	1-1/2 (40)	—	294-06617
			599-06618	5 (125)	250	1-1/2 (40)	—	294-06618
			599-06619	6 (150)	400	1-1/2 (40)	—	294-06619
	ANSI 250	N/O	599-06620	2-1/2 (65)	63	3/4 (20)	274-06620	—
			599-06621	3 (80)	100	3/4 (20)	274-06621	—
			599-06622	4 (100)	160	1-1/2 (40)	—	294-06622
			599-06623	5 (125)	250	1-1/2 (40)	—	294-06623
			599-06624	6 (150)	400	1-1/2 (40)	—	294-06624
		N/C	599-06625	2-1/2 (65)	63	3/4 (20)	274-06625	—
			599-06626	3 (80)	100	3/4 (20)	~~274-06626~~	—
			599-06627	4 (100)	160	1-1/2 (40)	—	294-06627
			599-06628	5 (125)	250	1-1/2 (40)	—	294-06628
			599-06629	6 (150)	400	1-1/2 (40)	—	294-06629

274-06626

Table 4. Close-Off Ratings in PSI (kPa).

Action	Valve Size In (mm)	Electro-Hydraulic 24 Vac SKD	Electro-Hydraulic 24 Vac SKC
Normally Open	2-1/2 (65)	200 (1378)	—
	3 (80)	200 (1378)	—
	4 (100)	—	200 (1378)
	5 (125)	—	200 (1378)
	6 (150)	—	200 (1378)
Normally Closed	2-1/2 (65)	200 (1378)	—
	3 (80)	200 (1378)	—
	4 (100)	—	200 (1378)
	5 (125)	—	200 (1378)
	6 (150)	—	200 (1378)

Dimensions

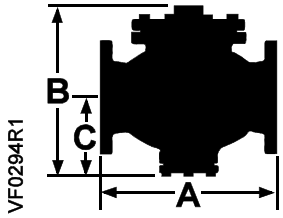


Table 5. Flanged 2-Way Valve Dimensions.

Valve Action	Valve Size inch (mm)	ANSI Class 125				ANSI Class 250			
		Inches (mm)			Weight lbs. (kg)	Inches (mm)			Weight lbs. (kg)
		A	B	C		A	B	C	
Normally Open	2-1/2 (65)	10-7/8 (276)	11 (281)	4-7/8 (123)	62 (28)	11-1/2 (292)	11 (281)	4-7/8 (123)	78 (35)
	3 (80)	11-3/4 (299)	12-1/4 (312)	5-5/16 (135)	79 (35)	12-1/2 (318)	12-1/4 (312)	5-5/16 (135)	102 (46)
	4 (100)	13-7/8 (352)	13-9/16 (345)	6-5/16 (160)	129 (58.12)	14-1/2 (368)	13-5/8 (344.7)	6-5/16 (160)	168.68 (75)
	5 (125)	15-3/4 (400)	15-3/16 (385)	7 (177)	162 (73)	16-5/8 (422)	15-3/16 (385)	7 (177)	215 (97)
	6 (150)	17-3/4 (451)	16-3/4 (426)	7-7/8 (200)	222 (101)	18-5/8 (473)	16-3/4 (426)	7-7/8 (200)	312 (142)
Normally Closed	2-1/2 (65)	10-7/8 (276)	10-5/8 (269)	4-7/8 (125)	58 (26)	11-1/2 (292)	11 (279)	5-3/8 (135)	74 (34)
	3 (80)	11-3/4 (299)	11-15/16 (303)	5-5/8 (142)	72 (35)	12-1/2 (318)	12-7/16 (315)	6 (154)	100 (45)
	4 (100)	13-7/8 (352)	13-15/16 (354)	6-5/8 (168)	128 (58)	14-1/2 (368)	14-3/8 (364)	7 (178)	16 (72)
	5 (125)	15-3/4 (400)	15-1/4 (388)	7-1/2 (185)	159 (72)	16-5/8 (422)	15-3/4 (399)	7-3/4 (196)	214 (97)
	6 (150)	17-3/4 (451)	17-1/16 (433)	8-3/16 (207)	219 (100)	18-5/8 (473)	17-1/2 (444)	8-5/8 (218)	309 (141)

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Table 11. Valve Dimensions and Weight.

Action	Valve Size inch (mm)	ANSI Class 125				ANSI Class 250			
		Dimensions Inches (mm)			Weight lbs. (kg)	Dimensions Inches (mm)			Weight lbs. (kg)
		A	B	C		A	B	C	
Normally Open	2-1/2 (65)	11 (276)	11 (281)	4-7/8 (123)	62 (28)	11-1/2 (292)	11 (281)	5 (123)	78 (35)
	3 (80)	11-3/4 (299)	12-1/4 (312)	5-5/16 (135)	79 (35)	12-1/2 (318)	12-1/4 (312)	5-5/16 (135)	102 (46)
	4 (100)	14 (352)	13-9/16 (345)	6-5/16 (160)	129 (58)	14-1/2 (368)	13-5/8 (344.7)	6-5/16 (160)	165 (75)
	5 (125)	15-3/4 (400)	15-3/16 (385)	7 (177)	162 (73)	16-5/8 (422)	15-3/16 (385)	7 (177)	215 (97)
	6 (150)	17-3/4 (451)	16-3/4 (426)	8 (200)	222 (101)	18-5/8 (473)	16-3/4 (426)	8 (200)	312 (142)
Normally Closed	2-1/2 (65)	11 (276)	10-5/8 (269)	5 (125)	60 (27)	11-1/2 (292)	11 (279)	5-3/8 (135)	76 (35)
	3 (80)	11-3/4 (299)	12 (303)	5-5/8 (142)	78 (35)	12-1/2 (318)	12-7/16 (315)	6 (154)	101 (45)
	4 (100)	14 (352)	14 (354)	6-5/8 (168)	128 (58)	14-1/2 (368)	14-3/8 (364)	7 (178)	164 (74)
	5 (125)	15-3/4 (400)	15-1/4 (388)	7-1/2 (185)	160 (72)	16-5/8 (422)	15-3/4 (399)	7-3/4 (196)	214 (97)
	6 (150)	17-3/4 (451)	17-1/16 (433)	8-3/16 (207)	219 (100)	18-5/8 (473)	17-1/2 (444)	8-5/8 (218)	309 (141)

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Technical Specification Sheet
Document No. A6V11858963
October 18, 2023

B304FB-HA266.600
A266.600

Resilient Seat Butterfly Valves



Description

Designed to last longer with minimal downtime, Siemens resilient seat butterfly valves are available in sizes from 2 to 24 inches (DN 50 to 600) built with the highest temperature and chemical resistance available in the market.

Available in 2-way and 3-way configurations, 2” through 20” butterfly valves are lug style. 24” valves are double-flanged. All have ANSI 125 rated bodies. 3-way valves can be used for mixing and diverting applications and are available in multiple configurations to match job site needs.

These valves are compatible with Siemens A-Series Industrial Electric, and OpenAir® Commercial Electric actuators. OpenAir actuators are available in in both spring return and non-spring return variants for two-position (On/Off), Floating and Modulating control. All Industrial actuators include a heater to prevent condensation.

Resilient seat butterfly valves provide bubble-tight shut off (leakage class better than ANSI Class VI) up to 175 PSI (Full Cut) and 50 PSI (Under Cut) requirements.

Application

Siemens Resilient Seat butterfly valves are suitable for standard temperature (intermittent 250°F) or high temperature applications (continuous 250°F). Standard temperature assemblies can be field upgraded to high temperature at any time by updating the actuator. There is no need to remove the valve from the piping.

These valves can be used for isolation purposes or as modulating valves. Siemens butterfly valves are optimized for use in Chilled Water, Hot Water and Open Loop Cooling Tower applications.

Features

- High purity, peroxide cured, high temperature EPDM seats to ensure continuous operation at 250°F (121°C)
- Corrosion-resistant, 316 Stainless Steel disc (2” through 12”)
- Corrosion-resistant Electroless Nickel Plated Ductile Iron (14” through 24”)
- Internal disc-to-stem connection to eliminate leakage through the stem
- Wide variety of direct mount actuators.
- Full 175 PSI and 50 PSI close-off pressure ratings available.

Specifications

Material	Body		ASTM A126 Class A Cast Iron
	Disc for sizes 2”-12”		316 Stainless Steel
	Disc for sizes 14” and above		Electroless Nickel Plated Ductile Iron
	Seat		High purity, peroxide-cured, high temperature EPDM
	Stem		416 Stainless Steel
	Stem Bearing		Heavy Duty Acetal
	Packing		Nitrile Butadiene Rubber (NBR)
	Tee		Ductile Iron (3-Way valves only)
Operating	Body cold working pressure rating		250 psi (17.2 bar)
	Media temperature		-20 to 250°F [continuous] (-28 to 121°C)
	Controlled medium		Hot water, chilled water, condenser water up to 50% Glycol
	Flow characteristic		Modified equal percentage
	Flow Coefficients		Table 1.
	Close-off (for electric actuator assemblies only)		2” to 12”, 175 PSI. full cut 14” to 24”, 150 PSI, full cut 50 PSI dead end service, full cut 50 PSI, all under cut discs
	Angle of rotation		0° to 90°
	Leakage		Bubble tight at 175 PSI close-off (better than ANSI class VI)
	Maximum fluid velocity		30 feet/second (9 m/second)
	Max recommended differential pressure with flow		29 psi (2 bar)
Size Range	2-inch through 24-inch (DN 50 to 600)		
Body Style	Lug (2” through 20”) or double flange (24”), 2-way and 3-way, ANSI 125 rated		
Miscellaneous	Dimensions, service envelope, weight		See Tables 5 through 8
	Agency Certification (for actuators)	UL	Meets UL 873 or UL 508
		cUL	Certified to Canadian Standard C22.2 No. 24.93 or C22.2 No. 14
		CE	European standard
	Agency Certification (for valves)	SIL	

NOTE:
These performance specifications are nominal and conform to acceptable industry standards. For application at conditions beyond these specifications, consult your local Siemens office. Siemens, Inc. shall not be liable for damages resulting from misapplication or misuse of its products.

Table 1. Cv at Opening Angles, Two-Way Valves.

Valve Size (Inches)	Disc Opening Angle								
	10°	20°	30°	40°	50°	60°	70°	80°	90°
2	1	7	16	27	43	61	84	114	144
2.5	1.5	11	24	43	67	107	163	223	282
3	2	15	35	61	96	154	267	364	461
4	3	27	62	109	171	274	496	701	841
5	5	43	98	170	268	428	775	1,146	1,376
6	6	56	129	225	354	567	1,025	1,542	1,850
8	12	102	241	421	680	1,081	1,862	2,842	3,316
10	19	162	382	667	1,076	1,710	2,948	4,525	5,430
12	27	353	555	1,005	1,594	2,563	4,393	6,731	8,077
14	34	299	756	1,320	2,149	3,384	5,939	9,974	10,538
16	45	397	1,001	1,749	2,847	4,483	7,867	11,761	13,966
18	58	507	1,281	2,237	3,643	5,736	10,062	14,496	17,214
20	72	632	1,595	2,786	4,536	7,144	12,535	1,812	22,339
24	259	1,028	2,387	4,244	6,962	11,040	18,235	27,186	33,154

Sizing and Selection

1. Determine the designed Cv as follows:

$$Cv = \frac{Q\sqrt{SG}}{\sqrt{\Delta P}}$$

Q = Flow in gallons per minute (GPM) required to pass through the valve
SG = Specific gravity of the fluid (water = 1)
ΔP = Designed pressure drop across the valve in PSI
Cv = Flow coefficient
NOTE: For modulating butterfly valves, size for design flow at 60° rotation.

2. Determine if the valve should be line sized or sized to match the designed pressure drop:
Option 1: On/Off Valves
Select the valve size to equal the pipe size
Option 2: Modulating Valves
Size the valve for design flow at 60° open

3. Determine actual pressure drop as follows:

$$\Delta P = \left(\frac{Q\sqrt{SG}}{Cv}\right)^2$$

Pressure drop is recommended to be no higher than 29 PSI or match the designed pressure drop. For modulating applications 3, 4, 5, and 6 PSI are commonly accepted.

4. Ensure that close-off requirements are met.

Actuator Product Numbers

Table 2. A-Series Industrial Electric Actuators, 24V.

Product Number	Operating Mode	Voltage 50/60 Hz	Torque		90° Stroke Time*	Current Draw (Amps)	
			(lb-in)	(Nm)		Full Load	Locked Rotor
A126.530	On/Off	24 Vac	530	60	31 sec. AC 40 sec. DC	1.0	1.7
A126.600			600	68	60 sec. AC 40 sec. DC	1.80	--
A126.2K			2,000	226	60 sec.	2.00	--
A126.5K			5,000	565	60 sec.	4.00	--
A166.530	Modulating	24 Vac	530	60	31 sec.	1.0	1.7
A166.600			600	68	60 sec.	1.80	--
A166.2K			2,000	226	60 sec.	2.00	--
A166.5K			5,000	565	60 sec.	4.00	--

* Operating times shown are with 60 Hz power supply. Actuators with 50 Hz power supply will be 20% slower.

Table 3. A-Series Industrial Electric Actuators, 120V.

Product Number	Operating Mode	Voltage 50/60 Hz	Torque		90° Stroke Time*	Current Draw (Amps)	
			(lb-in)	(Nm)		Full Load	Locked Rotor
A266.530	On/Off	120 Vac	530	60	31 sec.	0.20	0.34
A226.600			600	68	30 sec.	0.80	1.00
A226.1K			1,200	135	30 sec.	0.78	2.10
A226.2K			2,000	226	30 sec.	1.00	2.10
A226.3K			3,000	339	30 sec.	1.20	3.00
A226.5K			5,000	565	30 sec.	1.60	3.00
A226.6K			6,500	734	30 sec.	2.30	3.10
A226.13K			13,000	1,470	110 sec.	2.30	3.10
A226.18K			18,000	2,034	110 sec.	2.50	3.10
A226.21K			21,300	2,406	60 sec.	6.5	14
A226.41K			40,680	4,596	60 sec.	6.5	14
A266.530	Modulating	120 Vac	530	60	31 sec.	0.20	0.34
A266.600			600	68	30 sec.	0.80	1.00
A266.1K			1,200	135	30 sec.	0.78	2.10
A266.2K			2,000	226	30 sec.	1.00	2.10
A266.3K			3,000	339	30 sec.	1.20	3.00
A266.5K			5,000	565	30 sec.	1.60	3.00
A266.6K			6,500	734	30 sec.	2.30	3.10
A266.13K			13,000	1,470	110 sec.	2.30	3.10
A266.18K			18,000	2,034	110 sec.	2.50	3.10
A266.21K			21,300	2,406	60 sec.	6.5	14
A266.41K			40,680	4,496	60 sec.	6.5	14

* Operating times shown are with 60 Hz power supply. Actuators with 50 Hz power supply will be 20% slower.

Ordering a Valve/Actuator Assembly

Use the product numbers in the following table to order a valve or a valve and actuator assembly. The valve product number consists of the type, action, valve size, disc type, and valve configuration.

To order an assembly, add a (-) after the valve product number and then choose the application, actuator, voltage, control signal, end switches followed by a separator (.) and the actuator torque.

Table 4. Product Numbers.

Sample:	B	2	02	F	C	-	S	A	1	2	6	.	530

Valve Type:
Butterfly

Action:
2 = 2-Way
3 = 3-Way

Valve Size:
02=2", 25=2.5", 03=3", 04=4",
05=5", 06=6", 08=8" 10=10",
12=12", 14=14", 16=16",
18=18", 20=20", 24=24"

Disc Type:
F = Full Cut
U = Under Cut

Valve Configuration:
3-Way - A, B, C, D
2-Way
O = Normally Open
C = Normally Closed
M = Valve assembly with manual operator

Denotes Assembly

Application:
S = Standard Temp – Intermittent 250°F Operation
H = High Temperature – Continuous 250°F Operation
Blank = Siemens Commercial Actuator

Actuator:
A = Industrial Actuator
GCA = Siemens SR Commercial Actuator
GIB = Siemens NSR Commercial Actuator

Voltage:
1 = 24V
2 = 120V

Control Signal:
2 = 2-Position
3 = Floating (Commercial Actuators only)
6 = Modulating (0-10V)

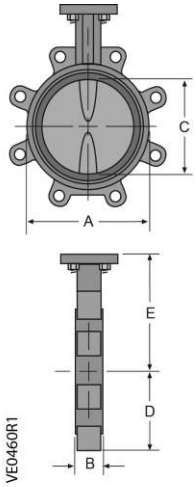
End Switches:
1 = No switches
6 = Switches

Separator

Actuator Torque (lb-in):
530=530, 600=600, 1K=1200, 2K=2000, 3K=3000, 5K=5000, 6K=6500,
13K=13000, 18K=18000, 21K=21300, 41K=40680, 3U = Shaft adapter with 3-foot cable
(Commercial Actuators only)

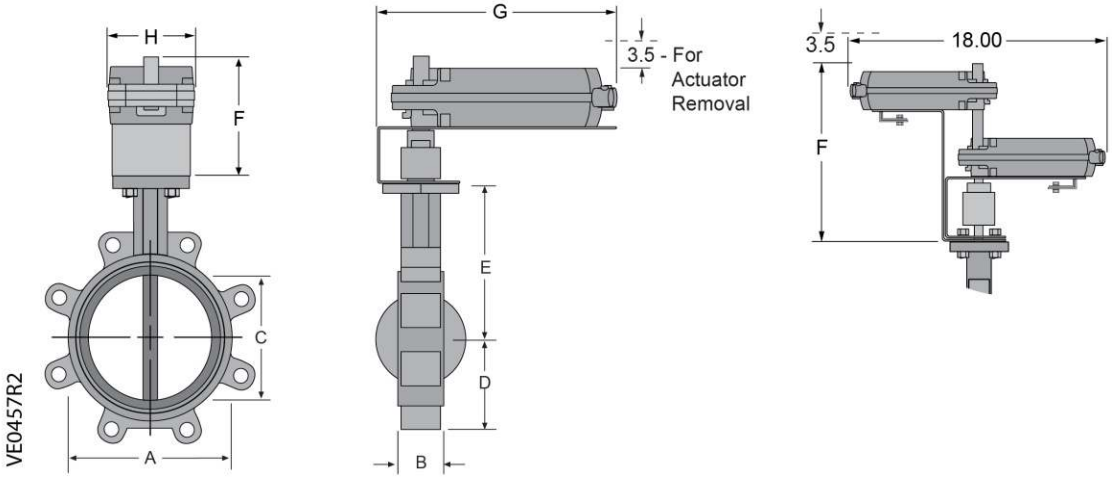
Dimensions – 2-Way, OpenAir Commercial Electric Actuators

Table 5. 2-Way, 2" to 6", Resilient Seat Butterfly Valve Bodies.													
Size		Cv		A	B	C	D	E	Lug Bolting Data			Weight[1]	
In.	mm	90°	60°						BC	Holes	Threads	lbs	kg
2	50	144	61	3.69	1.62	2.00	2.30	5.50	4.75	4	5/8-11	7.0	3.12
2.5	65	282	107	4.19	1.75	2.50	2.57	6.00	5.50	4	5/8-11	8.0	3.63
3	80	461	154	4.88	1.75	3.00	2.81	6.25	6.00	4	5/8-11	9.0	4.08
4	100	841	274	6.06	2.00	4.00	4.09	7.00	7.50	8	5/8-11	15.0	6.80
5	125	1376	428	7.06	2.12	5.00	4.61	7.50	8.50	8	3/4-10	20.0	9.07
6	150	1850	567	8.12	2.12	5.75	5.06	8.00	9.50	8	3/4-10	23.0	10.43
1- Weights are for valve bodies only.													



Commercial Actuators

Model Number	F	G	H	Weight[1]	
				lbs	kg
GIB	7.43	10.96	3.95	4.4	2.0
GCA	7.43	10.96	3.95	4.9	2.2
Dual Actuator	11.75	18.00	4.00	12.8	5.8
Largest actuator dimension shown					



Configurations – 3-Way Assemblies

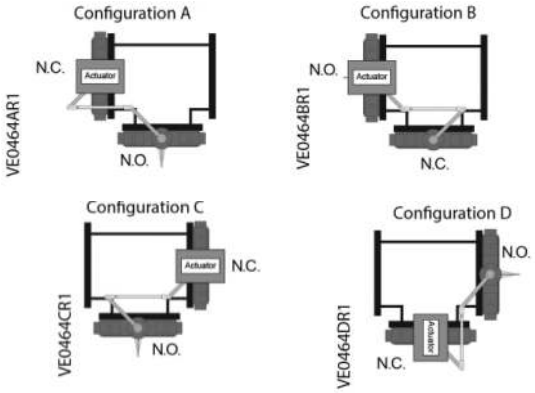
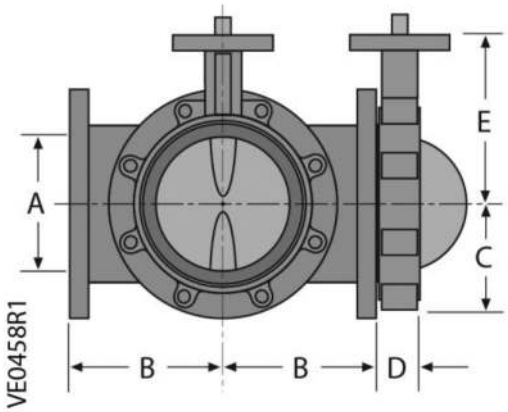


Figure 1. 3-Way Valve Configurations.

Dimensions – 3-Way, OpenAir Commercial Electric Actuators

Table 6. 3-Way, 2" to 6", Resilient Seat Butterfly Valve Bodies.

Size		Cv		A	B	C	D	E	Lug Bolting Data		
In.	mm	90°	60°						BC	Holes	Threads
2	50	144	61	2.00	4.50	2.30	1.62	5.50	4.75	4	5/8-11
2.5	65	282	107	2.50	5.00	2.57	1.80	6.00	5.50	4	5/8-11
3	80	461	154	3.00	5.50	2.81	1.80	6.25	6.00	4	5/8-11
4	100	841	274	4.00	6.50	4.09	2.00	7.00	7.50	8	5/8-11
5	125	1376	428	5.00	7.50	4.61	2.12	7.50	8.50	8	3/4-10
6	150	1850	567	6.00	8.00	5.06	2.12	8.00	9.50	8	3/4-10

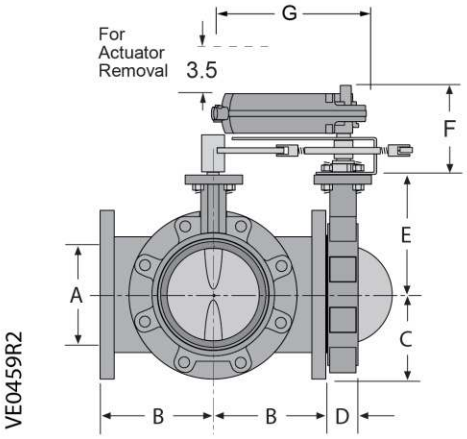


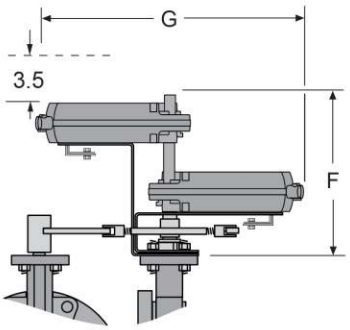
Dimensions – 3-Way, OpenAir Commercial Electric Actuators, Continued

3-Way Tee Weights			
Size		Weight	
Inches	mm	lbs	kg
2	50	19	8.6
2.5	65	27	12.2
3	80	39	17.7
4	100	62	28.1
5	125	79	35.8
6	150	96	43.5
8	200	155	70.3
10	250	270	122.5
12	300	380	172.4
14	350	435	197.3
16	400	550	249.5
18	450	665	301.6
20	500	855	387.8
24	609	1330	603.3

OpenAir Commercial Electric Actuators

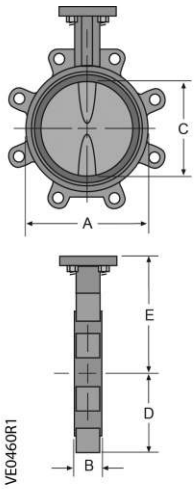
Model Number	F	G	Weight[1]	
			lbs	kg
GIB	7.43	10.96	4.4	2.0
GCA	7.43	10.96	4.9	2.2
Dual Actuator	11.75	18.00	12.8	5.8
Largest actuator dimension shown				



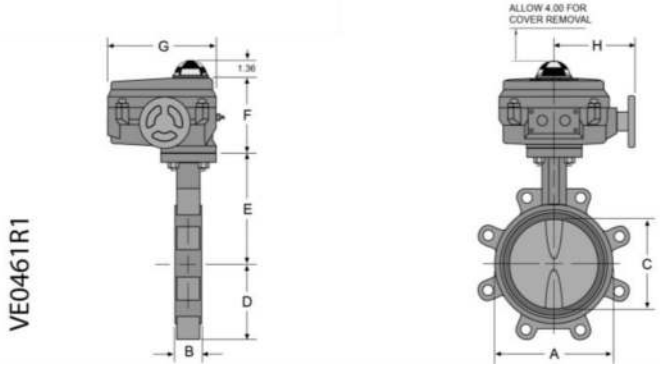


Dimensions – Industrial Actuators

Table 7. 2-Way, 2" to 24", Resilient Seat Butterfly Valve Bodies.													
Size		Cv		A	B	C	D	E	Lug Bolting Data			Weight[1]	
In.	mm	90°	60°						BC	Holes	Threads	lbs	kg
2	50	144	61	3.69	1.62	2.00	2.30	5.50	4.75	4	5/8-11	7	3.12
2.5	65	282	107	4.19	1.75	2.50	2.57	6.00	5.50	4	5/8-11	8	3.63
3	80	461	154	4.88	1.75	3.00	2.81	6.25	6.00	4	5/8-11	9	4.08
4	100	841	274	6.06	2.00	4.00	4.09	7.00	7.50	8	5/8-11	15	6.80
5	125	1376	428	7.06	2.12	5.00	4.61	7.50	8.50	8	3/4-10	20	9.07
6	150	1850	567	8.12	2.12	5.75	5.06	8.00	9.50	8	3/4-10	23	10.43
8	200	3316	1081	10.59	2.50	7.75	6.05	9.50	11.75	8	3/4-10	42	19.05
10	250	5430	1710	12.75	2.50	9.75	7.69	10.75	14.25	12	7/8-9	66	29.94
12	300	8077	2563	14.88	3.00	11.75	9.02	12.25	17.00	12	7/8-9	88	39.92
14	350	10538	3384	17.05	3.00	13.25	9.93	13.62	18.75	12	1-8	114	51.71
16	400	13966	4483	19.21	4.00	15.25	11.30	14.75	21.25	16	1-8	166	75.30
18	450	17214	5736	21.12	4.25	17.25	12.16	16.00	22.75	16	1 1/8-7	226	102.51
20	500	22339	7144	22.25	5.00	19.25	14.00	17.25	25.00	20	1 1/8-7	305	138.35
24	600	33154	11040	33.00	5.94	23.28	17.56	19.50	29.50	4	1 1/4-7	500	226.80
1- Weights are for valve bodies only.													

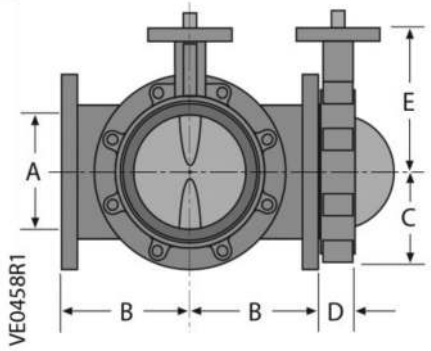


A-Series Actuators				
Model Number	F	G	H	Weight (lbs)
Axxx.530	6.4	4.8	6.5	10
Axxx.600	5.6	7.5	5.8	13
Axxx.1K/Axxx.2K	6.6	10.1	7.8	28
Axxx.3K/Axxx.5K/ Axxx.6K	7.2	12.1	9.5	48
Axxx.13K/Axxx.18K	12.1	18.8	9.5	118
Axxx.21K	12.3	32.1	28.9	195
Axxx.41K	12.3	32.1	28.9	195

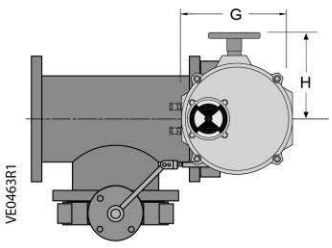


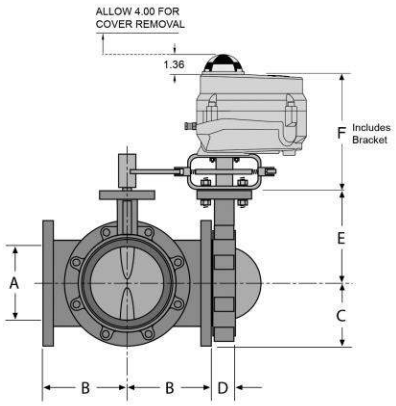
Dimensions – Industrial Actuators

Table 8. 3-Way, 2” to 24”, Resilient Seat Butterfly Valve Bodies.											
Size		Cv		A	B	C	D	E	Lug Bolting Data		
In.	mm	90°	60°						BC	Holes	Threads
2	50	144	61	2.00	4.50	2.30	1.62	5.50	4.75	4	5/8-11
2.5	65	282	107	2.50	5.00	2.57	1.80	6.00	5.50	4	5/8-11
3	80	461	154	3.00	5.50	2.81	1.80	6.25	6.00	4	5/8-11
4	100	841	274	4.00	6.50	4.09	2.00	7.00	7.50	8	5/8-11
5	125	1376	428	5.00	7.50	4.61	2.12	7.50	8.50	8	3/4-10
6	150	1850	567	6.00	8.00	5.06	2.12	8.00	9.50	8	3/4-10
8	200	3316	1081	8.00	9.00	6.05	2.50	9.50	11.75	8	3/4-10
10	250	5430	1710	10.00	11.00	7.69	2.50	10.75	14.25	12	7/8-9
12	300	8077	2563	12.00	12.00	9.02	3.00	12.25	17.00	12	7/8-9
14	350	10538	3384	14.00	14.00	9.93	3.00	13.62	18.75	12	1-8
16	400	13966	4483	16.00	15.00	11.30	4.00	14.75	21.25	16	1-8
18	450	17214	5736	18.00	16.50	12.16	4.20	16.00	22.75	16	1-1/8-7
20	500	22339	7144	20.00	18.00	14.00	5.00	17.25	25.00	18	1-1/8-7
24	610	33154	11044	24.00	22.00	16.00	5.94	19.50	29.50	20	1-1/4-7



A-Series Actuators				
Model Number	F	G	H	Weight (lbs)
Axxx.530	9.4	8.0	6.5	10
Axxx.600	8.6	7.5	5.8	12
Axxx.1K/Axxx.2K	10.73	10.1	7.8	28
Axxx.3K	11.33	12.10	3.50	48
Axxx.5K	13.2	12.10	9.50	48
Axxx.6K	13.2	12.10	9.50	118
Axxx.13K/Axxx.18K	20.5	12.10	9.50	118
Axxx.21K	22.3	32.1	28.9	195
Axxx.41K	22.3	32.1	28.9	195





Information in this publication is based on current specifications. The company reserves the right to make changes in specifications and models as design improvements are introduced. Products or company names mentioned herein may be the trademarks of their respective owners.
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A-Series Industrial Electric Actuator (600 to 18,000 lb-in)



Description

The A-Series quarter-turn industrial electric actuator features a compact, reliable design that mounts directly to Siemens resilient seat butterfly valves without the need for brackets and linkages. Available in torque outputs from 600 to 18,000 lb-in (68 to 2,033 Nm), 24V and 120 Vac, Two-position (On/Off) and Modulating units all in NEMA 4x and IP65-rated housings.

Features

- Compact, lightweight design and direct mounting
- High visibility Beacon position indicator
- Manual, declutchable override handwheel
- Terminal strip for cable terminations
- Servo NXT option for modulating control
- Travel limit cams adjustable by hand or screwdriver
- UL-approved (120 Vac only)
- On/off or modulating control
- Available in 120, 24 Vac 50/60 Hz, single-phase, 24 Vdc voltages
- Output torque 600 lb-in (68 Nm) to 18,000 lb-in (2,033 Nm)
- ISO 5211 for direct mounting
- All actuators include a heater to prevent condensation build-up
- All modulating units include a feedback potentiometer

Servo NXT Features
(for Modulating Actuators)

- Provides precise modulating control of valve position
- Single Finger Technology (SFT) menu driven, pushbutton, programming with LED confirmation of all settings:
    - Input Control – 4 to 20 mA, 0 to 10 Vdc, 0 to 5 Vdc or 2 to 10 Vdc
    - Position Feedback – 4 to 20 mA, 0 to 10 Vdc, or 0 to 5 Vdc
    - Auto Calibrating
    - Fail Position:
        - Loss of supply power - fail-in-place
        - Loss of control signal - selectable
    - Adjustable Speed Control
- Including:
    - Manual mode
    - Onboard signal generator to simplify field set-up
    - Fault display – Simplifies troubleshooting
    - Stall detection – Eliminates mechanical damage in case of obstruction or bad switch settings
- Optical isolation of all inputs/outputs
    - Provides interoperability with all controllers
    - Earth ground tolerant
    - Allows for parallel operation

Applications

These actuators are ideal for use on valves for chillers, cooling towers, boilers, heat exchangers and other outdoor applications. The actuators' advanced electronics assure reliable compatibility with virtually any analog control signal used in today's building automation and temperature control systems.

Specifications

Operating Conditions	Ambient Temperature	-20°F to 150°F (-29°C to 65°C)
	Fail Position	Loss of supply power - fail-in-place
	Motor Insulation	
	120 Vac:	Class F, 311°F (155°C) thermal trip at 275°F (135°C)
	24 Vac/dc:	Class B, Slow Blow Fuse 5A @ 250 Vac
Physical Description	Housing	ASTM B85 Pressure Die Cast Aluminum, Polyester Powder Coated
	Motor	
	120 Vac	Single-Phase, Reversible, Permanent Split Capacitor Induction Motor
	24 Vac/Vdc	Single-Phase, Permanent Magnet-Brush D.C. Motor
	Auxiliary/Limit Switches SPDT	
	120 Vac	10A- 1/3 HP
	12 Vdc	2A
	Terminal Strip	
	Switch Plate	12 to 22 AWG (2.0 to 0.65 mm)
	Servo	14 to 24 AWG (1.63 to 0.51 mm)
	Heater	5-Watt, PTC style
	Dimensions and weight	See Dimensions.
	Enclosure	Designed to meet NEMA Type 4, 4x and IP65 specifications
	Travel stops	Externally adjustable at both 0 and 90 degrees.
	Conduit entries	
	600 lb-in	Two 1/2” NPT (BSP)
	1200 lb-in and higher	Two 3/4” NPT
	Manual operation	Pull to engage, push to disengage - 30:1 drive ratio, 12 and18K lb.-in. models are 90:1
Certifications		UL508 certified (120 Vac only)

Servo Specifications (for Use with Modulating Actuators)

Power Requirements		120 Vac 50/60 Hz +/- 10% 24 Vac 50/60 Hz +/- 10% 24 Vdc -10%, +30% 5 VA average (no load) Fuse: 5A Slow Blow 5 mm × 20 mm
Input Signal	Control Signal	4 to 20 mA, 0 to 10 Vdc, 0 to 5 Vdc, 2 to 10 Vdc
	Input Impedance	>100 Meg Ohms (0 to 10V, 2 to 10V, 0 to 5V)
Output Signal	Operating Modes	4 to 20 mA, 0 to 10 Vdc, 0 to 5 Vdc
	Output Impedance	<10 Ohms (0 to 5 Vdc, output, 0 to 10 V output) 200 Ohms (4 to 20 mA output mode)
	Loop Voltage	12 Vdc (4 to 20 mA output mode)
Resolution	Absolute Position Accuracy	<1%
	Dead Band Adjustment	1% (+/- 0.5%) to 6% (+/-3%) (3% default) 1% minimum increment
Potentiometer Feedback Signal	Supply Voltage External Feedback Potentiometer	3.3 Vdc 1K to 10K Ohms
Speed Control	Open/Close Speed	0% to 100% (default). Step size: 20%. Actuator open/close speed as a percentage of full speed. (See motor speed specification for maximum 90° run times.)
Operating Mode	Normal Mode	Modulating – follow setpoint
	Loss of Control Signal	Selectable to Open, Close, or Last
	Loss of Supply Power	Fail-in-place
	Reverse Acting Mode	Configurable for inverted input signal
	Autocalibration	Automatic endpoint detection
	Manual Operation	Keypad electrical manual operation of actuator (Open, Stop, Close)
Torque Protection	Stall Detection	Motor detected stationary >2 seconds (600 to 6500 lb-in units only)
	Torque Limit	*(Optional)* externally connected Open/Close torque limit switch
	Electronic Torque Limit	*(Optional)* factory-programmable current/torque limit switch
Environmental	Ambient Temperature	-20°F to 150°F (-29°C to 65°C)
	Compliance	120V units comply with UL, cUL, and CSA. All models are CE certified.

CAUTION:

Do not install or use the A-Series Industrial Electric Actuator in or near environments where corrosive substances or vapors could be present. Exposure of the electric actuator to corrosive environments may damage the internal components of the device and will void the warranty.

Ordering Information

Product Number	Operating Mode	Voltage 50/60 Hz	Torque		90° Stroke Time*	Current Draw (Amps)	
			(lb-in)	(Nm)		Full Load	Locked Rotor
A126.600	On/Off	24 Vac/dc	600	68	60 sec. AC 40 sec. DC	1.80	–
A126.2K			2,000	226	60 sec.	2.00	–
A126.5K		24 Vac	5,000	565	60 sec.	3.00	–
A166.600	Modulating	24 Vac	600	68	60 sec.	1.80	–
A166.2K			2,000	226	60 sec.	2.00	–
A166.5K			5,000	565	60 sec.	3.00	–
A226.600	On/Off	120 Vac	600	68	30 sec.	0.80	1.00
A226.1K			1,200	135	30 sec.	0.78	2.10
A226.2K			2,000	226	30 sec.	1.00	2.10
A226.3K			3,000	339	30 sec.	1.20	3.00
A226.5K			5,000	565	30 sec.	1.60	3.00
A226.6K			6,500	734	30 sec.	2.30	3.10
A226.13K			13,000	1,470	110 sec.	2.30	3.10
A226.18K			18,000	2,034	110 sec.	2.50	3.10
A266.600	Modulating	120 Vac	600	68	30 sec.	0.80	1.00
A266.1K			1,200	135	30 sec.	0.78	2.10
A266.2K			2,000	226	30 sec.	1.00	2.10
A266.3K			3,000	339	30 sec.	1.20	3.00
A266.5K			5,000	565	30 sec.	1.60	3.00
A266.6K			6,500	734	30 sec.	2.30	3.10
A266.13K			13,000	1,470	110 sec.	2.30	3.10
A266.18K			18,000	2,034	110 sec.	2.50	3.10

* Operating times shown are with 60 Hz power supply. Actuators with 50 Hz power supply will be 20% slower.
NOTE: 13K and 18K torque models are available starting July 2020.

Wiring

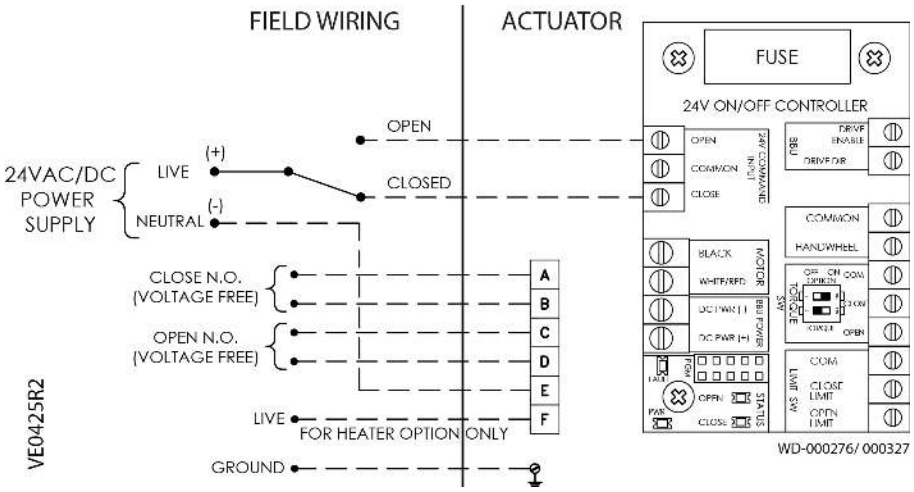


Figure 1. 24 Vac/dc On/Off Wiring 600 and 2000 lb.-in. Models.

NOTE:
Use this A-Series Industrial Electric Actuator only to control equipment under normal operating conditions. Where failure or malfunction of the electric actuator could lead to personal injury or property damage to the controlled equipment or other property, additional precautions must be designed into the control system. Incorporate and maintain other devices such as supervisory or alarm systems or safety or limit controls intended to warn of, or protect against, failure or malfunction of the electric actuator.

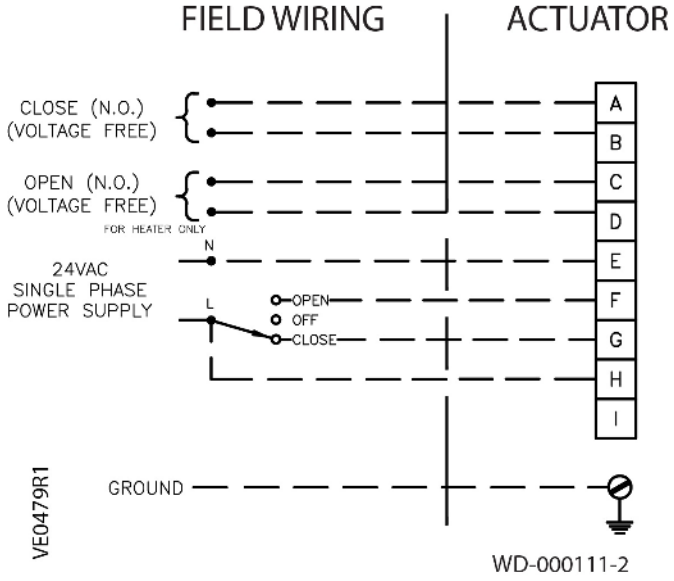


Figure 2. 24 Vac Wiring 5000 lb.-in. Models.

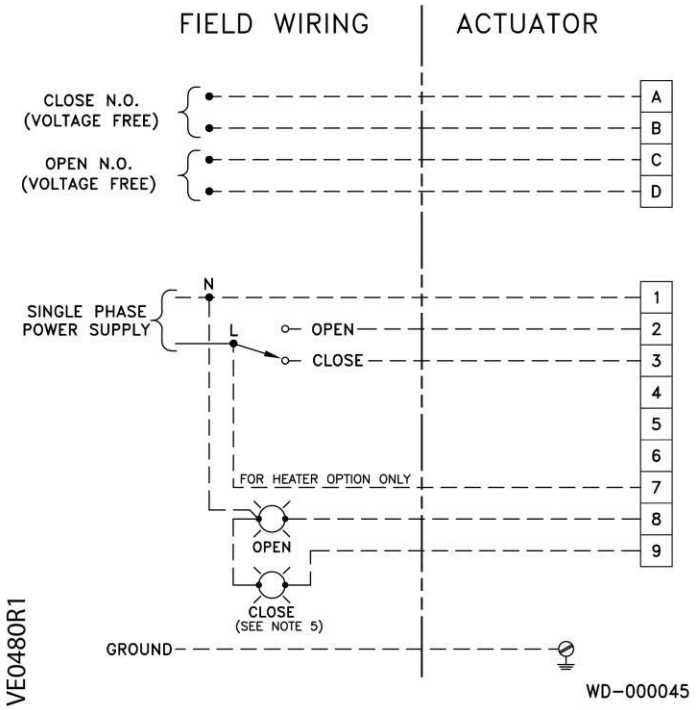


Figure 3. 120 Vac Wiring, All Models.

Wiring, Continued

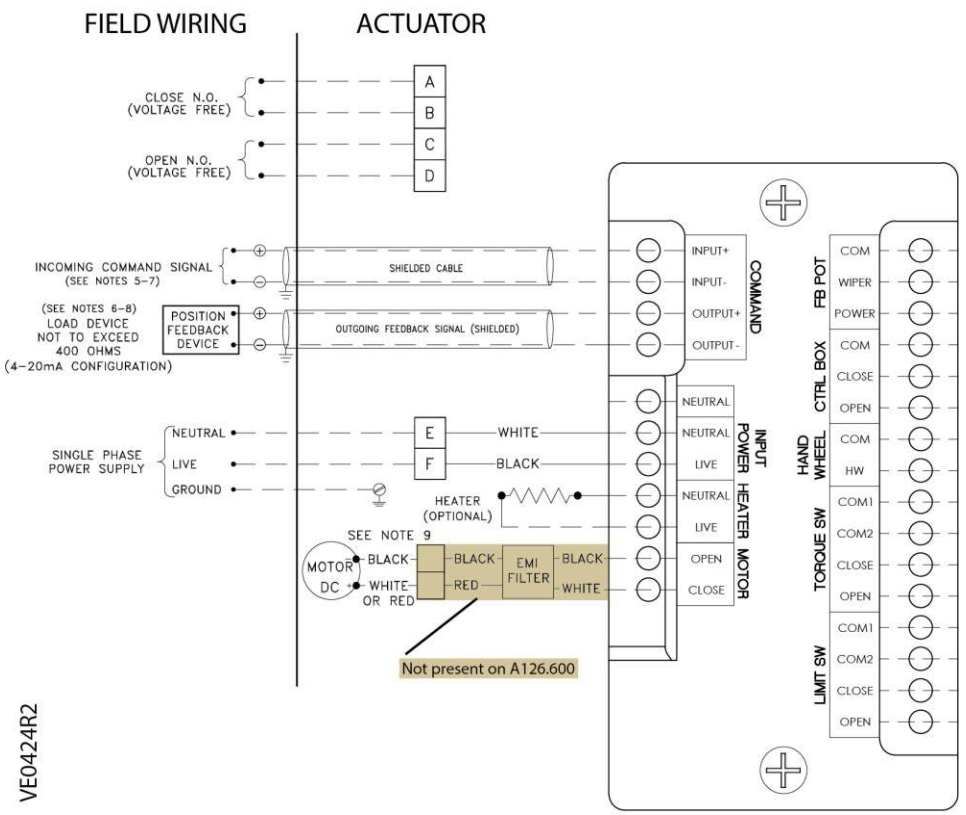


Figure 4. 24 Vac Modulating.

NOTES:

1. Command signal and feedback wires must be shielded and grounded for proper servo operation.
2. The command signal input (-) terminal is internally connected to the Servo neutral terminal. DO NOT connect the live to the neutral terminal on the servo.
3. Command signal and feedback signal must be isolated from each other and any other circuits. When using 0 to 10 Vdc, 0 to 5 Vdc, and 2 to 10 Vdc, the common of the command signal should NOT be ground/earth referenced.
4. Feedback loop is powered by the servo. Do NOT supply external power.
5. Command signal and feedback signal wires should be shielded properly, and shield should be grounded on one end only, preferably the controller end.
6. The 24V Servo (NXT) can be wired 3 or 4 wire configured.

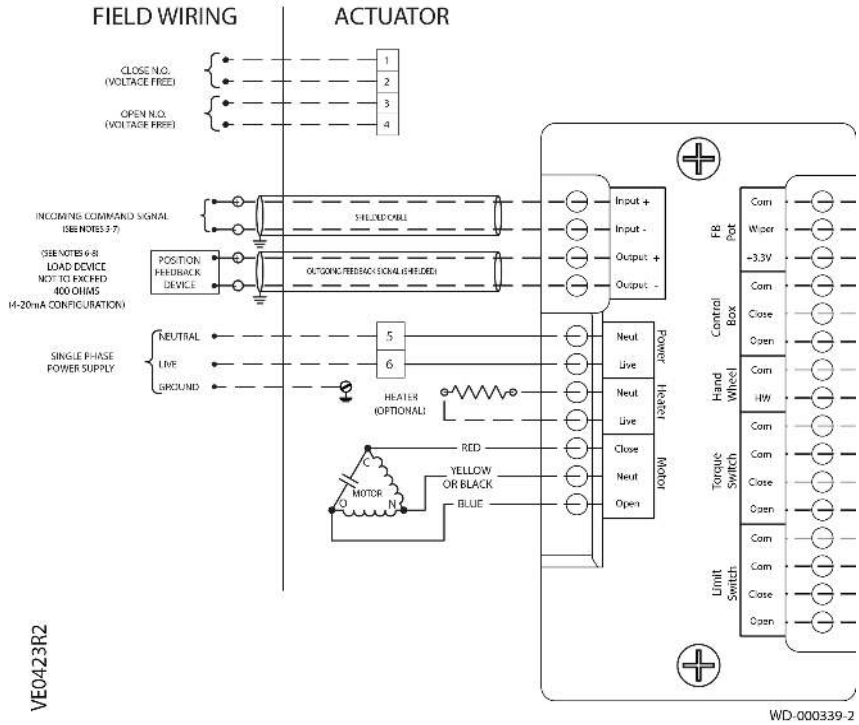


Figure 5. 120 Vac Modulating.

Dimensions

Actuator Model Number	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	Wt lbs (kgs)
Axx6.600	7.5 (191)	5.8 (147)	5.6 (141)	1 (48)	1.94 (49.2)	.19 (4.7)	1/2	2.2 (55)	5/16-18 ×Ø 2.76 (F07)	–	L75 (19)	.51 (31)	1.75 (44.5)	3.5 (89)	–	–	–	13 (6)
Axx6.1K Axx6.2K	10.1 (256)	7.8 (198)	6.6 (168)	2.4 (62)	2.69 (68.3)	.56 (14.3)	3/4	2.6 (66)	5/16-18 ×Ø 2.76 (F07)	1/2-13 x ø4.92 (F12)	1.18 (30)	.87 (22)	2.22 (56.3)	8.0 (203)	8.0	8.0	8.0	28 (13)
Axx6.3K Axx6.5K Axx6.6K	12.1 (308)	9.5 (242)	7.2 (183)	2.9 (73)	3.19 (80.9)	.56 (14.3)	3/4	3.1 (78)	1/2-13 x ø4.92 (F12)	3/4-10 x ø6.50 (F16)	See Detail A1			12 (304.8)	–	–	–	48 (22)
Axx6.13K Axx6.18K	12.1 (308)	9.5 (242)	12.5 (317)	8.1 (206)	9.2 (234)	.56 (14.2)	3/4	8.3 (211)	1/2-13 x ø4.92 (F12)	3/4-10 x ø6.50 (F16)	See Detail A1			12 (305)	6.1 (155)	12.7 (323)	8 (203)	118 (54)

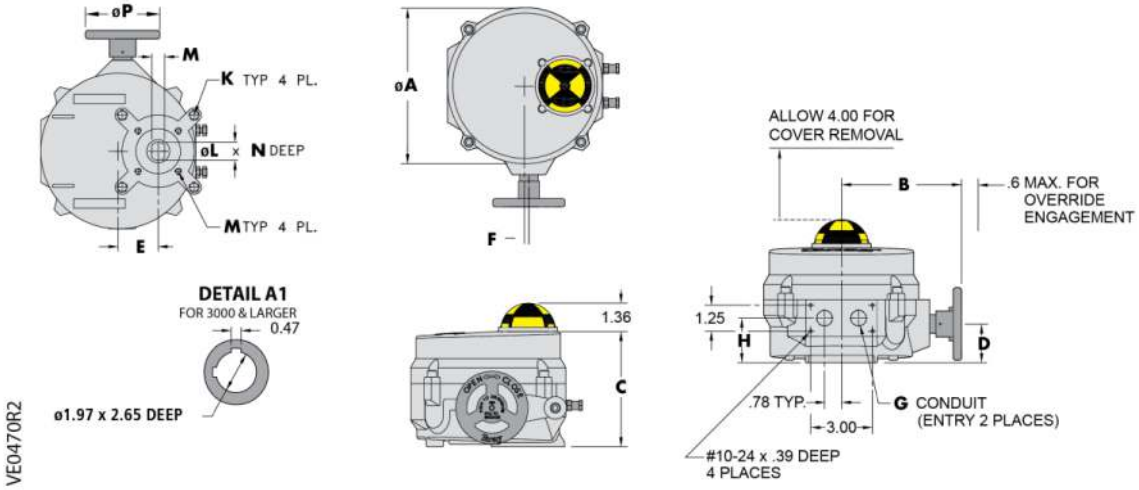
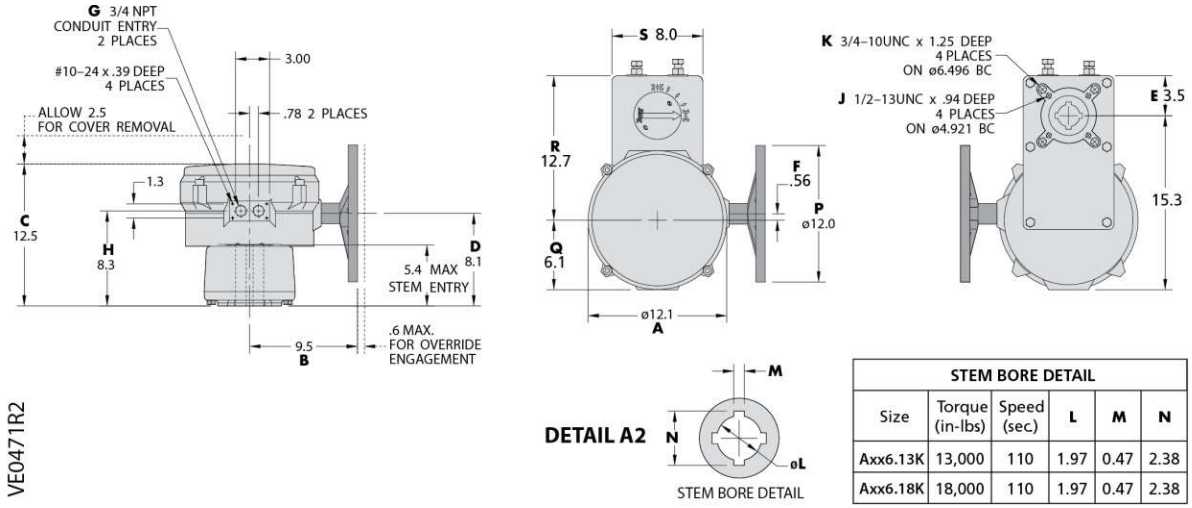


Figure 6. Models Axx6.600 to Axx6.6K.



STEM BORE DETAIL					
Size	Torque (in-lbs)	Speed (sec.)	L	M	N
Axx6.13K	13,000	110	1.97	0.47	2.38
Axx6.18K	18,000	110	1.97	0.47	2.38

Figure 7. Models Axx6.13K and Axx6.18K.

Information in this publication is based on current specifications. The company reserves the right to make changes in specifications and models as design improvements are introduced. Products or company names mentioned herein may be the trademarks of their respective owners.
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Your feedback is important to us. If you have comments about this document, please send them to sbt_technical.editor.us.sbt@siemens.com

SIEMENS

SSC161.35U

Electromotoric actuator

SSC161.05U, SSC161.35U, SSC131.39U



For Powermite MT Series 2-way and 3-way globe valves

- SSC161.05U (fail-in-place), and SSC161.35U (fail-safe): Operating voltage AC/DC 24 V, modulating control signal DC 0...10 V
- SSC131.39U (fail-safe): Operating voltage AC 24 V, 3-position (floating) control signal
- All actuators are self-calibrating to the valve stroke
- Modulating variants have position feedback signal
- Direct mounting with coupling nut, no tools required
- Manual override
- Position and actuator motion indication (LED)
- Positioning force 67 lbf (300 N)
- Parallel operation of multiple actuators possible

Use

- For 2-way and 3-way Powermite 599 MT Series, 599-02000 - 599-02079
- Typical application in chilled ceiling, VAV, unit ventilators, fan coil unit and other terminal unit applications
- Max.10 units of SSC161.05DU, SSC161S.35DU are able to operate in parallel, provided the controller output suffices.
- For 3-position actuator, SSC131.39U, 24 actuators can run in parallel.

NOTICE	
!	• SSC131.39U floating fail-safe actuators cannot be run in parallel with legacy SSC81.5U actuators. • For parallel operation of floating fail-safe SSC actuators all actuators in parallel must be the same part number.

Technical design

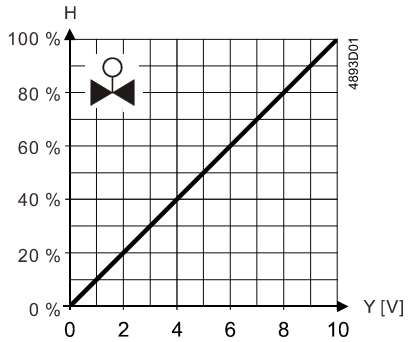
When the actuator is driven by DC 0…10 V positioning signal, it produces a stroke, which is transmitted to the valve stem.

3-position control signal (for SSC131.39U only)

• Voltage at Y1:	Stem extends	Normally open valve closes, normally closed valve opens
• Voltage at Y2:	Stem retracts	Normally open valve opens, normally closed valve closes
• No voltage at Y1 or Y2:	Actuator maintains its current position	
• Voltage applied to both Y1 and Y2 (not recommended): When no power is supplied, the SSC131.39U actuator fails with the stem fully retracted.	Stem moves to Y2	

DC 0...10 V control signal

- The valve opens / closes in proportion to the control signal at Y.
- At DC 0 V, actuator stem is retracted, the normally closed valve is fully closed and the normally open valve is fully open.
- When no power is supplied, the SSC161.05U actuator maintains its current position and the SSC161.35U actuator fails with the stem fully retracted.
- This actuator provides a DC 0…10 V position feedback signal proportional to the stroke of the actuator stem.



Y = Control signal Y [V]

H = Percentage of calibrated valve stroke

LED indication

Status	LED indication patterns
Variants	SSC161.35U, SSC161.35U, SSC131.39U 
Modulation: Stem retracting	Flashing green in sequence: LED1-->LED2-->LED3 (500 ms each)
Modulation: Stem extending	Flashing green in sequence: LED3-->LED2-->LED1 (500 ms each)
Stem position	At H0 - H40: Constant green (LED3) At H40 - H60: Constant green (LED2) At H60 - H100: Constant green (LED1)
Fail-safe*	Flashing red (LED2): 500 ms on, 500 ms off
Calibration	Flashing green (LED2): 100 ms on, 100 ms off
Error	Constant red (LED2)
Manual operation	Flashing green/red alternatively (LED2): Green 500 ms, red 500 ms
Ultra-cap initial charging*	Constant green & red simultaneously (LED2): Constant orange

* Only available for SSC161.35U, SSC161.35U, SSC131.39U.

Type summary

Type	Stock number	Operating voltage	Running speed	Running time 5.5 mm	Control signal	Actuator characteristic
SSC161.05U	S55155-A110	AC/DC 24 V	5 s/mm	27.5 s ± 25 %	DC 0...10 V	Linear
SSC161.35U	S55155-A111	AC/DC 24 V	5 s/mm	27.5 s ± 25 %	DC 0...10 V	Linear
SSC131.39U	S55155-A109	AC 24 V	16 s/mm	88 s ± 25 %	AC 24 V	-

Ordering

When ordering, specify both type and quantity.

Example:

Type	Stock number	Designation	Quantity
SSC161.05U	S55155-A110	Electromotoric actuator	2

Delivery

Valves and actuators can be ordered assembled in the factory or ordered separately. For easier valve assembly, actuators ordered separately have the actuator stem fully retracted.

Valve combinations

Valves

Combinable valves for SSC161.05U, SSC161.35U, SSC131.39U, 2-way Powermite 599 MT Series (Stainless Steel)

Action	Nominal Line Size		Flow Rate		Connection		
	Inch	mm	Cv	Kvs	FxF	FxUM	AFxUM
Normally Closed	0.5	15	0.4	(0.34)	599-02015	599-02016	–
	0.5	15	0.63	(0.54)	599-02017	599-02018	–
	0.5	15	1.0	(0.85)	599-02019	599-02020	–
	0.5	15	1.6	(1.37)	599-02021	599-02022	–
	0.5	15	2.5	(2.15)	599-02023	599-02024	–
	0.5	15	4	(3.44)	599-02025	599-02026	–
	0.75	20	6.3	(5.43)	599-02027	599-02028	–
	1	25	10	(8.6)	599-02029	–	–
Normally Open	0.5	15	0.4	(0.34)	599-02047	599-02048	–
	0.5	15	0.63	(0.54)	599-02049	599-02050	–
	0.5	15	1.0	(0.85)	599-02051	599-02052	–
	0.5	15	1.6	(1.37)	599-02053	599-02053	–
	0.5	15	2.5	(2.15)	599-02055	599-02056	599-02057
	0.5	15	4	(3.44)	599-02058	599-02059	599-02060
	0.75	20	6.3	(5.43)	599-02061	599-02062	–
	1	25	10	(8.6)	599-02063	–	–

Combinable valves for SSC161.05U, SSC161.35U, SSC131.39U, 2-way Powermite 599 MT Series (Brass)

Action	Nominal Line Size		Flow Rate		Connection		
	Inch	mm	Cv	Kvs	FxF	FxUM	AFxUM
Normally Closed	0.5	15	0.4	(0.34)	599-02000	599-02001	–
	0.5	15	0.63	(0.54)	599-02002	599-02003	–

Action	Nominal Line Size		Flow Rate		Connection		
	Inch	mm	Cv	Kvs	FxF	FxUM	AFxUM
	0.5	15	1.0	(0.85)	599-02004	599-02005	–
	0.5	15	1.6	(1.37)	599-02006	599-02007	–
	0.5	15	2.5	(2.15)	599-02008	599-02009	–
	0.5	15	4	(3.44)	599-02010	599-02011	–
	0.75	20	6.3	(5.43)	599-02012	599-02013	–
	1	25	10	(8.6)	599-02014	–	–
Normally Open	0.5	15	0.4	(0.34)	599-02030	599-02031	–
	0.5	15	0.63	(0.54)	599-02032	599-02033	–
	0.5	15	1.0	(0.85)	599-02034	599-02035	–
	0.5	15	1.6	(1.37)	599-02036	599-02037	–
	0.5	15	2.5	(2.15)	599-02038	599-02039	599-02040
	0.5	15	4	(3.44)	599-02041	599-02042	599-02043
	0.75	20	6.3	(5.43)	599-02044	599-02045	–
	1	25	10	(8.6)	599-02046	–	–

Combinable valves for SSC161.05U, SSC161.35U, SSC131.39U, 3-way Powermite 599 MT Series

Nominal Line Size		Flow Rate		Connection	
Inch	mm	Cv	Kvs	Brass Trim	Stainless Steel Trim
0.5	15	0.4	(0.34)	599-02064	599-02072
0.5	15	0.63	(0.54)	599-02065	599-02073
0.5	15	1.0	(0.85)	599-02066	599-02074
0.5	15	1.6	(1.37)	599-02067	599-02075
0.5	15	2.5	(2.15)	599-02068	599-02076
0.5	15	4	(3.44)	599-02069	599-02077
0.75	20	6.3	(5.43)	599-02070	599-02078
1	25	10	(8.6)	599-02071	599-02079

Note: To ensure trouble-free operation of third-party valves with the SSC.. actuators, the valves must satisfy the following requirements:

- Threaded connections with coupling nut ¾".
- Nominal force F > 67 lbf (300 N)
- Dimension X ≥ 0.35 in (8.8 mm)
- Dimension Y ≤ 0.56 in (14.3 mm)



Product documentation

Topic	Title	Document ID
Installation	Mounting instruction	A6V13122038
Standards and directives	CE declarations	A5W00254962A
	RCM conformity	A5W00254983A
Environmental compatibility	Environmental declarations for SSC161.05U	A5W00242127A
	Environmental declarations for SSC131.39U, SSC161.35U	A5W00244689A

Related documents such as the environmental declarations, declarations of conformity, etc., can be downloaded from the following Internet address:

www.siemens.com/bt/download

Notes

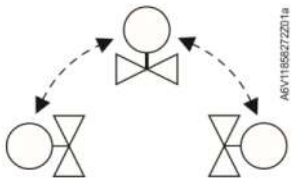
Mounting

⚠ WARNING	
	• Do not use pipe wrenches, pliers or similar tools. • Avoid lateral pressure or (cable) tension on the mounted actuator!

Valve and actuator are easy to assemble on site before commissioning:

- Remove protective cover from the valve body.
- Position the actuator and tighten the connection nut manually.
- See "Mounting instruction" for graphical instructions.

Orientation



Engineering

The actuators must be electrically connected in accordance with local regulations (see "Connection diagrams [▶ 16]").

⚠ CAUTION	
⚠	**National safety regulations** Failure to comply with national safety regulations may result in personal injury and property damage. • Observe national provisions and comply with the appropriate safety regulations.

Observe permissible temperatures (see "Technical data [▶ 12]").

Commissioning

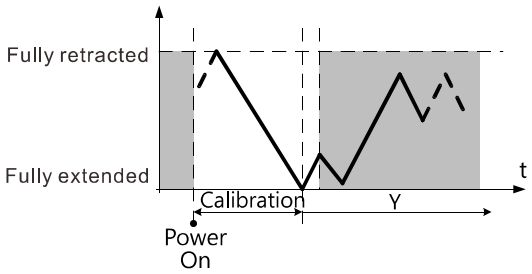
When commissioning, check both wiring and functioning of the actuator.

- Actuator stem extends Normally open valve closes, normally closed valve opens
- Actuator stem retracts Normally open valve opens, normally closed valve closes

NOTICE	
!	The actuator must be commissioned only with a correctly mounted valve in place!

Self-calibration

When operating voltage is applied, the actuator self-calibrates (fully retracted → fully extended → setpoint).



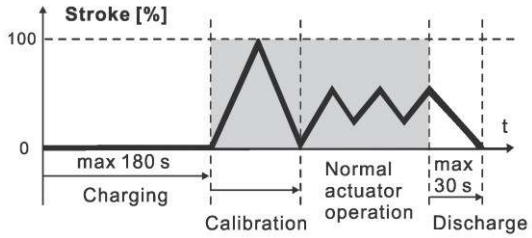
⚠ CAUTION	
⚠	Never intervene manually during self-calibration.

NOTICE	
!	• Correct calibration is only possible with valve stroke > 0.05 inch (1.2 mm). Valve stroke < 1.2 mm results in calibration failure. • If calibration fails, the actuator performs another calibration automatically after 10 seconds. • After three failed calibration attempts, the actuator stem remains in the extended position and the valves are open.

Electrical fail-safe function (for SSC161.35U, SSC131.39U only)

When first connected to power, or after a power failure, the capacitor which stores energy for the fail-safe function will be charged. This process takes up to 180 seconds. While the capacitor is being charged, the actuator cannot respond to any control signals.

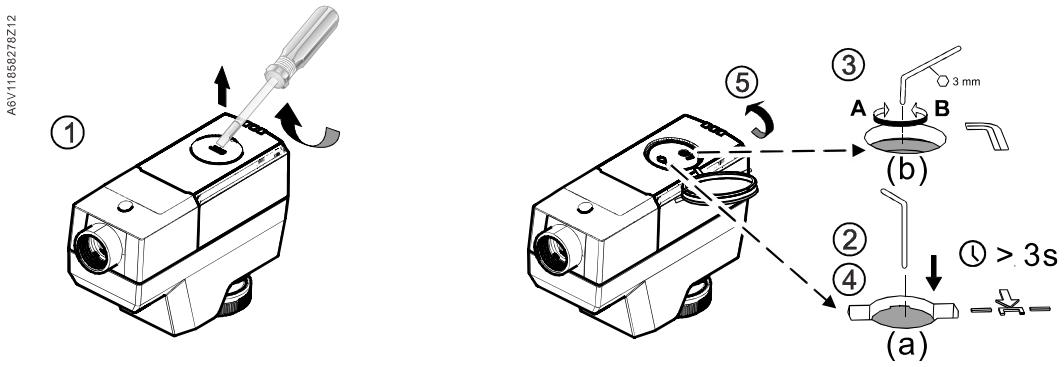
In the event of a power failure of more than 5 seconds, the actuator will return to its fail-safe position within 30 seconds.



A 3-mm Allen wrench can be used to move the actuator to any position.

To move the actuator stem manually

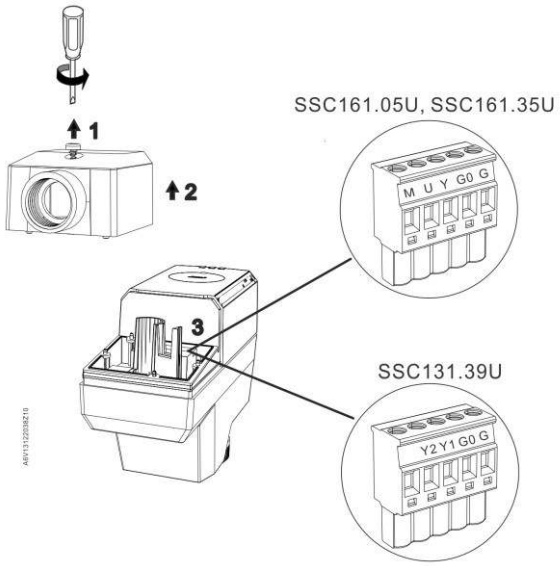
1. Open the cover using a proper screwdriver.
2. Press and hold down button (a) illustrated below for at least three seconds.
   – The actuator ignores any control signal from the controller.
3. Adjust the position of the actuator stem by rotating Allen wrench (b) illustrated below clockwise or counter-clockwise.
   – The actuator stem moves down if you rotate clockwise; it moves up if you rotate counter-clockwise. The manually set position is retained.
4. To release the actuator from manual operation mode, press and hold down button (a) illustrated below again for at least three seconds.
   – The actuator runs a self-calibration automatically. Control signal sent from the controller takes effect.
5. Close the cover.



NOTICE	
!	**If operating voltage is applied to actuator, press button (a) before and after manually adjusting the position of the actuator stem.** If no operating voltage and control signal are applied, manual operation can be done without pressing button (a).

Cabling operation

1. Unscrew cover screw
2. Remove cover
3. Remove terminal block and connect or disconnect wire terminals.
4. Re-install the terminal block
5. Install the cover
6. Screw in the cover screw



Maintenance

The actuators require no maintenance.

⚠ WARNING	
	**Operating voltage must be switched off during any maintenance!**

NOTICE	
!	When carrying out service work on the plant, note the following: ● Switch off operating voltage. ● If necessary, disconnect electrical connections from the terminals. ● The actuator must be commissioned only with a correctly mounted valve in place!

Repair

The actuators cannot be repaired; the complete unit must be replaced.

Disposal

	The device is considered an electronic device for disposal and may not be disposed of as domestic waste. • Dispose of the device through channels provided for this purpose. • Comply with all local and currently applicable laws and regulations.

Warranty

Technical data on specific applications are valid only together with Siemens products listed under "Equipment combinations". Siemens rejects any and all warranties in the event that third-party products are used.

Open Source Software (OSS)

Software license overview

These devices use Open Source Software (OSS). All Open Source Software components used in the product (to include copyrights and licensing agreement) are available at http://siemens.com/bt/download.

Firmware version	OSS document		Device
	Document ID	Title	
2.10.0 or above	A6V13503690	Readme OSS for Modulating Room Actuator 200N, 300N	All

Technical data

Power supply		
Operating voltage	SSC161.05U, SSC161.35U	AC 24 V (± 15 %) or DC 24 V (± 20 %)
	SSC131.39U	AC 24 V (± 20 %)
Frequency	50/60 Hz	
Power consumption	SSC161.05U	Normal Operation: 3.5 VA (AC); 1.5 W (DC) Peak (Ultra cap recharge): N/A
	SSC161.35U	Normal Operation: 3.5 VA (AC); 1.5 W (DC) Peak (Ultra cap recharge): 8 VA (AC); 4 W (DC)
	SSC131.39U	Normal Operation: 3 VA (AC); 1.5 W (DC) Peak (Ultra cap recharge): 6 VA (AC); 4 W (DC)
Primary fuse or breaker rating	External, 2 A quick blow	

Signal input	
Control signal	Modulating: DC 0...10 V to Y Floating: AC 24 V to Y1 or Y2
Input impedance	100 kOhm
Parallel operation (number of actuators)	Max. 10 modulating or 24 floating actuators[1)]

[1)] Provided that the controller output is sufficient.

Signal output	
Feedback signal (modulating actuators only)	DC 0...10 V
Max. output current	1 mA
Max. output voltage	-
Resolution	1:100

Operating data	
Position with de-energized contact Y	See "Technical design [▶ 2]"
Running speed (time for 5.5 mm)	SSC161.05U, SSC161.35U: 5 s/mm ± 25 % (27.5 s ± 25 %)
	SSC131.39U: 16 s/mm ± 25 % (88 s ± 25 %)
Positioning force	67 lbf (300 N)
Stroke	0.05" to 0.25" inch (1.2…6.5 mm)
Permissible temperature of medium in the connected valve	34 to 248°F (1…120℃)

Electrical connection (connecting cable integral)	
Permissible length for signal lines	65 ft (20 m)
Wire cross section	18...20 AWG (0.5...0.75 mm²)
Cable diameter	<0.22 inch （5.5 mm）

Mounting	
Connection to valve	Brass coupling nut 3/4” inch
Orientation	above horizontal

Standards	
EU conformity declaration (CE)	A5W00254962A
RCM conformity declaration	A5W00254983A
UK conformity declaration (UKCA)	A5W00257055A
Housing protection degree	NEMA 2 / IP20 (EN 60529)
Protection class according to EN 60730	III
Pollution degree	2
Overvoltage category	I
Environmental compatibility	The product environmental declaration (SSC161.05U: A5W00242127A; SSC131.39U, SSC161.35U: A5W00244689A) contains data on environmentally compatible product design and assessments (RoHS compliance, materials composition, packaging, environmental benefit, disposal).
UL Approval Federal Communications Commission	UL as per UL60730-1, UL60730-2-14 http://ul.com/database cUL as per CSA – CAN E60730-1, E730-2-14 FCC CFR 47 Part 15 Class B
ICES003	CAN ICES-3 (B)/NMB-3(B)

FCC regulations

Modification of this device to receive cellular radio telephone service signals is prohibited under FCC rules and federal law.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

Reorient or relocate the receiving antenna.

Increase the separation between the equipment and receiver.

Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

Consult the dealer or an experienced radio/TV technician for help.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Statement

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Housing color	
Cover/base	2003, Ti-Gray

General ambient conditions			
	Operation	**Transport**	**Storage**
Temperature	34 to 122°F (1...50 ℃)	-13 to 158°F (-25...70 ℃)	-13 to 158°F (-25...70 ℃)
Humidity	5...95 % r.h. non condensing	<95 % r.h. non condensing	5...95 % r.h. non condensing
Atmospheric pressure	Min. 700 hPa, corresponding to max. 3,000 m above sea level	-	-

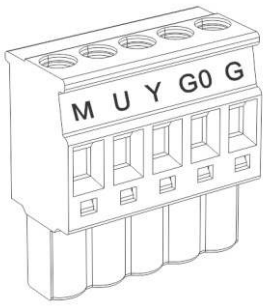
Material	
Cover/base	PC + ABS
Connecting nut	Brass

Weight	
SSC161.05U	9.7 ounces (276 g)
SSC161.35U	10.5 ounces (298 g)
SSC131.39U	10.5 ounces (298 g)

Diagrams

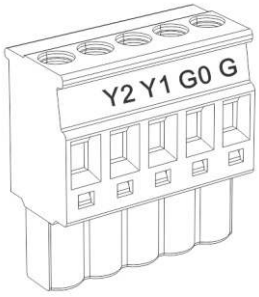
Connection terminals

Connection terminals for SSC161.05U, SSC161.35U



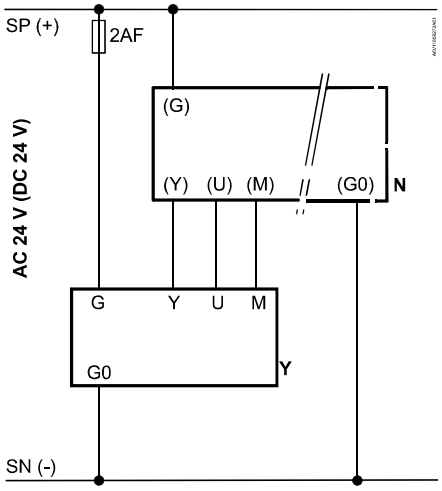
G	System potential (AC/DC 24 V)
G0	System neutral
Y	Control signal DC 0...10 V
U	Feedback signal
M	Measurement reference

Connection terminals for SSC131.39U



G	System potential (AC 24 V)
G0	System neutral
Y1	Stem extends
Y2	Stem retracts

Connection diagrams for SSC161.05U, SSC161.35U



N = Controller

Y = Actuator

SP, G = System potential AC/DC 24 V

SN, G0 = System neutral

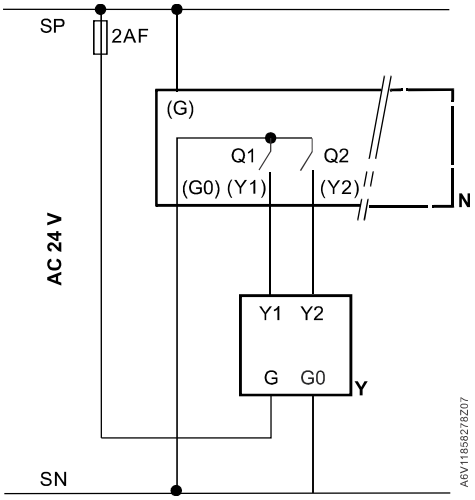
Y = Control signal

U = Feedback signal

M = Measurement reference

Connection diagrams for SSC131.39U

Neutral switch



N = Controller

Y = Actuator

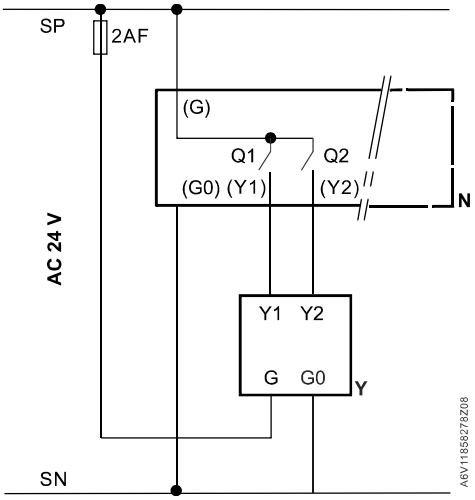
SP, G = System potential AC 24 V

SN, G0 = System neutral

Y1, Y2 = Control signal OPEN, CLOSE

Q1, Q2 = Controller contacts

Hot switch



N = Controller

Y = Actuator

SP, G = System potential AC 24 V

SN, G0 = System neutral

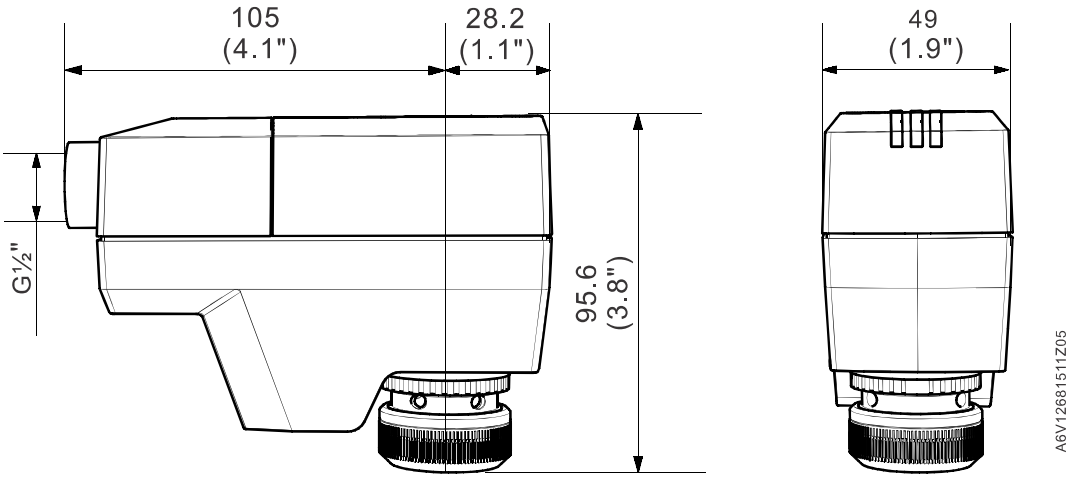
Y1, Y2 = Control signal OPEN, CLOSE

Q1, Q2 = Controller contacts

NOTICE	
!	• SSC131.39U floating fail-safe actuators cannot be run in parallel with legacy SSC81.5U actuators. • For parallel operation of floating fail-safe SSC actuators all actuators in parallel must be the same part number.

Dimensions

mm (inch)



Revision numbers

Type	Valid from rev. no.
SSC161.05U	..A
SSC161.35U	..A
SSC131.39U	..A

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Edition	09/21/2023

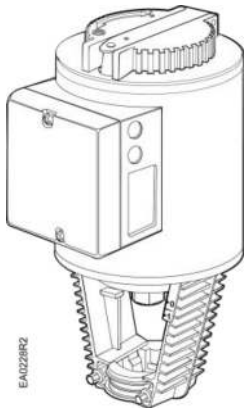
SIEMENS

SKB62U
SKC62U

Technical Instructions
Document No. 155-163P25
September 25, 2018

Flowrite™ 599 Series

SKB/C Electronic Valve Actuator Proportional Control



Description

The Flowrite 599 Series SKB/C Electronic Valve Actuator requires a 24 Vac supply and receives a 0 to 10 Vdc or a 4 to 20 mA control signal to proportionally control a valve. This actuator is designed to work with Flowrite 599 Series valves with a 3/4-inch (20 mm) or 1-1/2-inch (40 mm) stroke.

Features

- Direct-coupled installation requires no special tools or adjustments
- Visual and electronic stroke indication
- Die-cast aluminum housing
- Manual override
- Spring return to fail-safe position
- Automatic stroke calibration
- Maintenance-free

Application

These electronic actuators are designed to be used with Flowrite 599 Series valves with 3/4-inch (20 mm) stroke (SKB) and 1-1/2 inch (40 mm) stroke (SKC) in liquid and steam service applications.

Product Numbers

Actuator Stroke	Order Number	Actuator Prefix Code
3/4-inch (20 mm)	SKB62U	291
1-1/2 inch (40 mm)	SKC62U	294

Warning/Caution Notations

WARNING:	⚠	Personal injury/loss of life may occur if you do not perform a procedure as specified.
CAUTION:	⚠	Equipment damage or loss of data may occur if you do not follow a procedure as specified.

Specifications

Power Supply	Operating voltage SKB/C62U	24 Vac ±20%
	Frequency SKB/C62U	50/60 Hz
	Power consumption	
	SKB62U	18 VA/12W
	SKC62U	28 VA/20W
Control signal	Control input (Y) SKB/C62	
	Voltage	0 to 10 Vdc or 4 to 20 mA
	Maximum Impedance	0 to 10 Vdc, 100K ohms 4 to 20 mA, 250 ohms
	Control input (Z) SKB/C62U	
	Resistance	0 to 1000 ohms
	Voltage	0 to 1.6 Vdc
Feedback signal	Control output (U) SKB/C62U	
	Voltage	0 to 10 Vdc
	Load impedance	>500 ohms
	Current	4 to 20 mA
	Load impedance	<500 ohms
Equipment rating	Rating SKB/C62U	Class 2 according to UL, CSA
Function	Nominal stroke	
	SKB62U	3/4-inch (20 mm)
	SKC62U	1-1/2 inches (40 mm)

Run time with control operation (full stroke)	Open/Close	Spring Return
SKB62U	120 seconds	15 seconds
SKC62U	120 seconds	20 seconds

Nominal Force SKB/C62U	**Stroke**	**Force**
NC and 3-way upper	0%	640 lbs (2800 N)
NO and 3-way by-pass	100%	1000 lbs (4400 N)

Housing	Mounting location	NEMA 1 (interior only) NEMA TYPE 3R rated when installed with 599-10065 weather shield. See *Accessories.*
Ambient conditions	Ambient temperature (Operation)	5°F to 130°F (-15°C to 55°C)
	Media temperature	20°F to 337°F (-7°C to 170°C)
Agency certification	UL	UL873
	cUL Certified to Canadian standard	C22.2 No. 24-93
	CE Conformity as per the EMC directive	89/336/EEC
	Low voltage directive	78/23/EEC

Specifications, continued

Miscellaneous

Conduit opening	1/2-inch NPSM
Dimensions	See Figure 18
Weight	
SKB62U	18.9 lbs (8,6 kg)
SKC62U	22 lbs (10,0 kg)

Accessories

Installation instructions are included with each accessory.

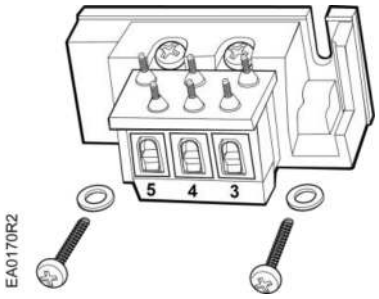


Figure 1. Auxiliary Switch.

ASC1.6 Auxiliary switch sends a signal to indicate the valve is in the 0% stroke position. Switching point is fixed at the 0% stroke position.

Switching capacity	24 Vac 4A resistive, 2A inductive
Lowest recommended current	10 mA

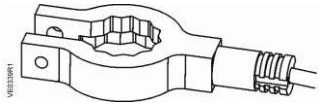


Figure 2. Stem Heating Element.

ASZ6.6 The stem heating element prevents the formation of ice on the stem when the medium temperature drops below 32°F (0°C). It is suited for universal use with valves having a stem or spindle diameter of 10 or 14 mm.

Operating voltage	24 Vac/dc ± 20%
Power consumption	≤ 40 VA/30W

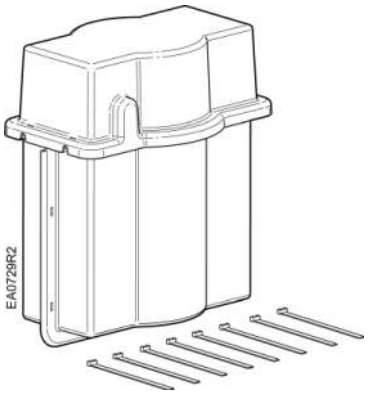


Figure 3. Weather Shield.

599-10065 The SKB/C actuator is UL listed to meet NEMA Type 3R requirements (a degree of protection against rain, sleet, and damage from external ice formation) when installed with Weather Shield and outdoor-rated conduit fittings in the vertical position. See *Service Kits* for replacement ultraviolet resistant cable ties.

Service Kits

Circuit board replacement	4 668 5748 8
Manual override kit	4268 5510 8
Plastic wiring compartment cover	4 104 5582 8
Stem retainer kit	
Contains one stem nut (Figure 7, Item 6) and one stem retainer clip.	
2-1/2 and 3-inch valves	599-10048
4, 5, and 6-inch valves	599-10049
Retainer clamp kit	599-10200
Ultraviolet (UV) resistant cable ties (pkg. of 8)	538-994

WARNING:

This product contains a spring under high compression. Do not attempt to disassemble the actuator.

Operation

A 0 to 10 Vdc or a 4 to 20 mA control signal controls the actuator. The actuator, mounted on a valve, produces a stroke proportional to the input signal. When power is turned off or in the event of a power failure, the actuator spring returns the valve to its normal position.

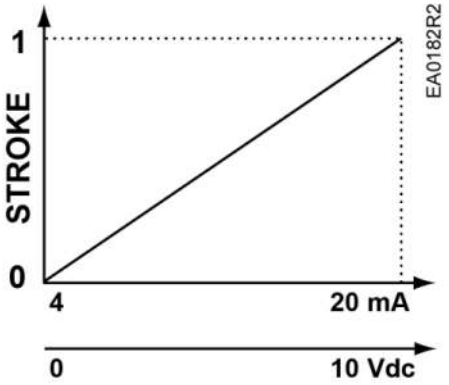


Figure 4. Input Signal.

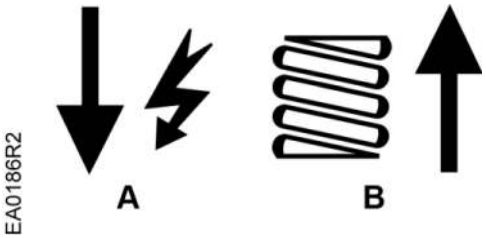


Figure 5. Spring Return.

SKB/C Details

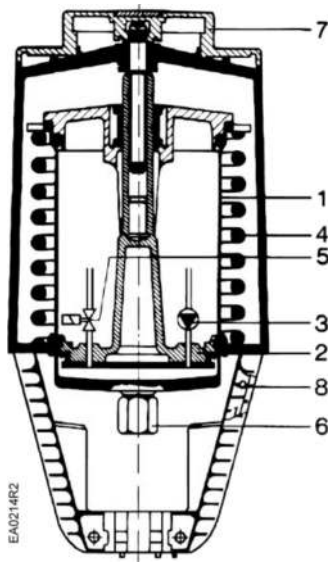


Figure 6. Actuator Design.

Legend

1. Pressure cylinder
2. Piston
3. Oscillating pump
4. Return springs
5. Bypass valve
6. Coupling piece (stem nut)
7. Manual setting knob
8. Position indicator

Mounting and Installation

The vertical position is the required position for mounting and the only position for NEMA Type 3R rating with the Weather Shield. Acceptable mounting positions are shown in Figure 7.

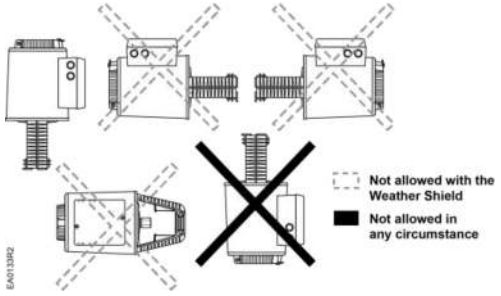


Figure 7. Acceptable Mounting Positions.

Allow four inches (100 mm) around the sides and back of the actuator and eight inches (200 mm) above and to the front of the actuator.

See dimensions in Figure 17 and Figure 18.

Detailed installation instructions for field mounting are shipped with the actuator.

CAUTION:

Use care when removing the knockout. Do not damage the circuit board. Use the top knockout position, if possible.

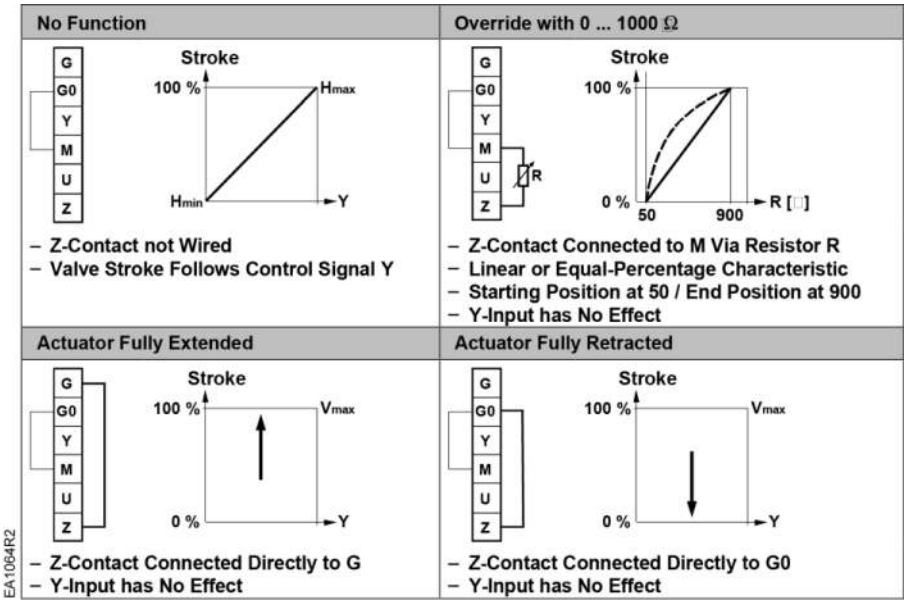
Start up

Check the wiring for proper connections.

NOTE: The valve body assembly determines the complete assembly action.

Override Control

The override control input (Z) has three modes of operation:



NOTE: The Z-modes have a direct acting factory setting.

Start-up, continued

Stroke Calibration

To determine the stroke positions 0% and 100% in the valve, calibration is required when the valve/actuator are commissioned for the first time. The actuator must be mechanically connected to a valve and must have a supply voltage of 24 Vac. Repeat the calibration procedure as often as necessary

CAUTION:

Before starting calibration, be sure that the manual adjuster is set to **Automatic** for the actual values to register.

There is a slot on the printed circuit boards for the actuators. To initiate the calibration procedure, the contacts inside this slot must be short-circuited (possibly with a screwdriver). See Figure 8.

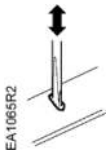


Figure 8.

Automatic calibration proceeds as follows (see Figure 9):

- Actuator runs to the 0% stroke position (1), green LED flashes.
- Actuator then runs to the 100% stroke position (2), green LED flashes.
- Measured values are stored in the EPROM.
- The actuator now moves to the position defined by control signal Y or Z (3), and the green LED now glows steady (normal operation).
- Throughout this procedure, output U is inactive, meaning the values only represent actual positions when the green LED stops flashing and remains on continuously.

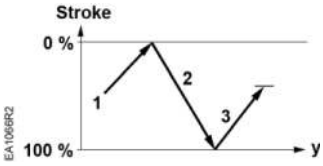


Figure 9.
Automatic Calibration

Table 1. LED Status.

LED	Display	Function	Action
Green	ON	Normal Operation	Automatic operation
	Flashing	Stroke calibration In Progress	Wait for calibration to be completed (LED stops flashing)
Red	ON	Faulty stroke calibration Internal Error	- Check mounting - Restart stroke calibration (by short-circuiting calibration slot) - Replace electronics
	Flashing	Inner valve jammed	Check the valve
	OFF	• No power supply • Faulty electronics	-Check mains -Replace electronics

Start-up, Continued

Standard Features

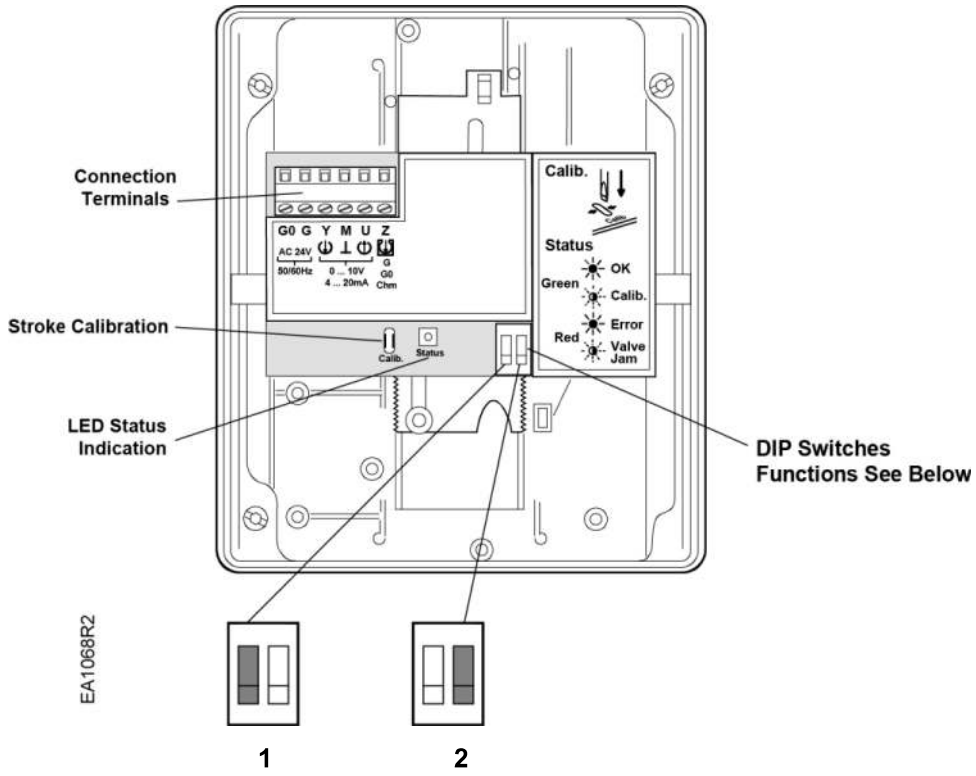


Figure 10. DIP Switches.

DIP Switches (From Left to Right)	**1 Selection of Control Signal**	**2 Selection of Flow Characteristic**
ON	4 to 20 mA	Modified*
OFF (Factory Settings)	0 to 10 Vdc	Default

* Changing the default setting will modify an equal percentage valve to a linear flow characteristic. When set to default, the flow characteristic is determined by the valve body.

Normally Closed Valve Actuator pressure cylinder moves:

- Outward (**0** to **1**): Valve opens.
- Inward (**1** to **0**): Valve closes.

Normally Open Valve Actuator pressure cylinder moves:

- Outward (**0** to **1**): Valve closes.
- Inward (**1** to **0**): Valve opens.

Start-up, continued

Three-way Valve

Actuator pressure cylinder moves:

- Outward (**0** to **1**): Valve opens between ports NC and C.
- Inward (**1** to **0**): Valve opens between ports NO and C.

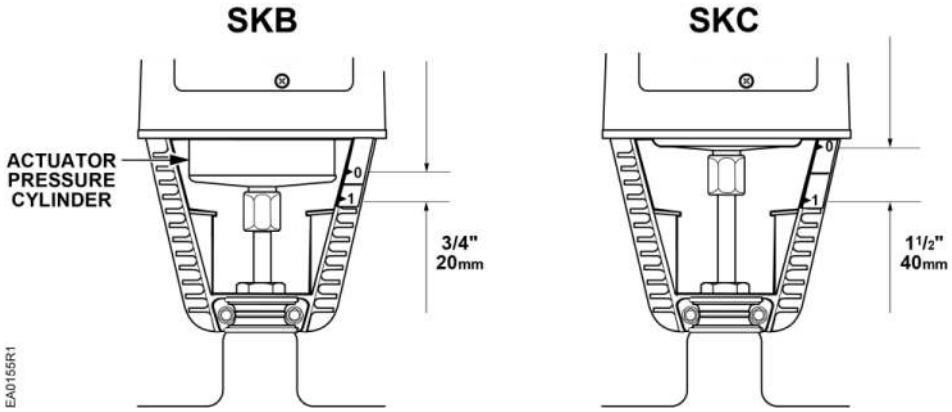


Figure 11. Valve Stem Travel Indication.

Manual operation

Release the crank arm of the manual setting knob located on the top of the actuator. See Figure 12.

A red scale appears in a window in the manual setting knob as you turn the crank clockwise, (see Figure 12). This scale indicates the effective valve stroke in millimeters.

Each complete revolution (360°) is equal to 2 mm of stroke. The numbers 2 to 20 or 2 to 40 are visible depending on the stroke of the actuator.

If a signal is sent to the actuator while it is in manual operation, the actuator will move but the control will not be accurate. The valve cannot be commanded to its 0% position while in manual operation.

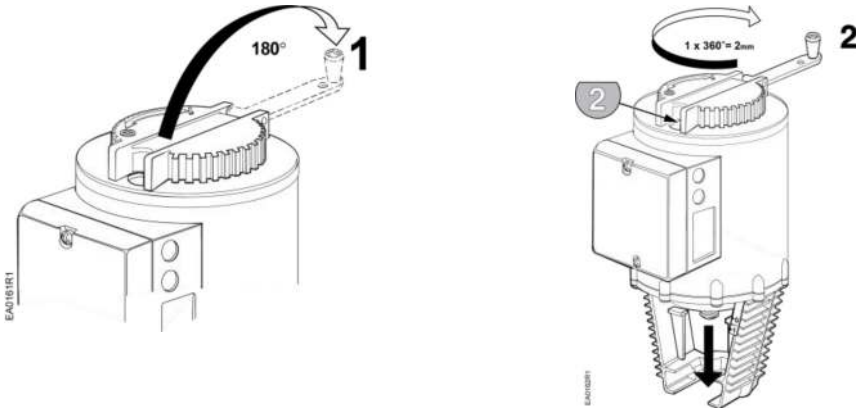


Figure 12. Manual Operation.

CAUTION:

Do not attempt automatic operation of the actuator when the red scale is visible.

Automatic operation

When returning to automatic control, turn the crank arm of the manual setting knob counterclockwise until the red numbers disappear. It is essential that the window is clear and the crank arm is snapped into position. See Figure 13.

NOTE: It is possible to secure the manual override handle in place by inserting a # 8 ×1-1/4-inch or M5 × 30 mm thread-forming screw through the handle.

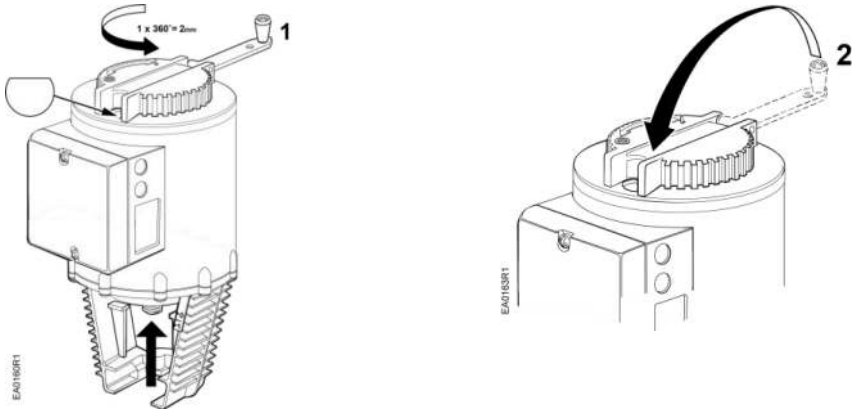


Figure 13. Automatic Operation.

Wiring

Do not use autotransformers. Use earth ground isolating step-down Class 2 transformers.

Determine supply transformer rating by summing total VA of all actuators used. The maximum rating for Class 2 step-down transformer is 100 VA.

Actuator	Power Consumption	Actuators per Class 2 Supply Circuit* (80% of transformer VA)
SKB62U	17 VA	4
SKC62U	28 VA	2

* Operating more actuators requires additional transformers or separate 100 VA power supplies.

Wiring Diagrams

The position output signal U will switch from 0 to 10 Vdc to 4 to 20 mA when a 4 to 20 mA input signal is selected and used on the Y terminal.

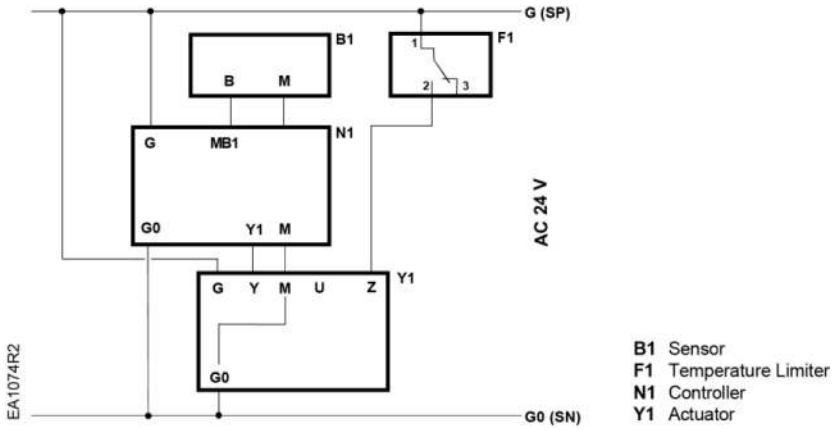


Figure 14. Connecting Terminals.

24 Vac	
G	System potential (SP)
G0	System neutral (SN)
Y	Control input 0 to 10 Vdc or 4 to 20 mA (DIP switch selectable)
Z	Override control
M	Measuring neutral
U	Output for 0 to 10 Vdc or 4 to 20 mA measuring voltage. See Table 1.

Table 1. Actuator Output Signal.

Actuator Input Signal	Receiving Impedance	
	Low (<500 ohm)	High (>10K ohm)
0 to 10 Vdc	0 to 20 mA	0 to 10 Vdc
4 to 20 mA	4 to 20 mA	2 to 10 Vdc

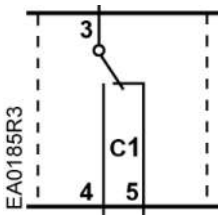


Figure 15. Auxiliary Switch ASC1.6.

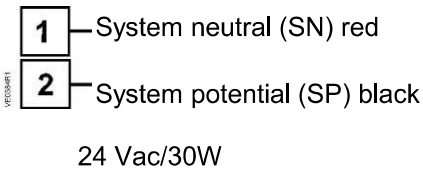


Figure 16. Stem Heating Element ASZ6.6.

Dimensions

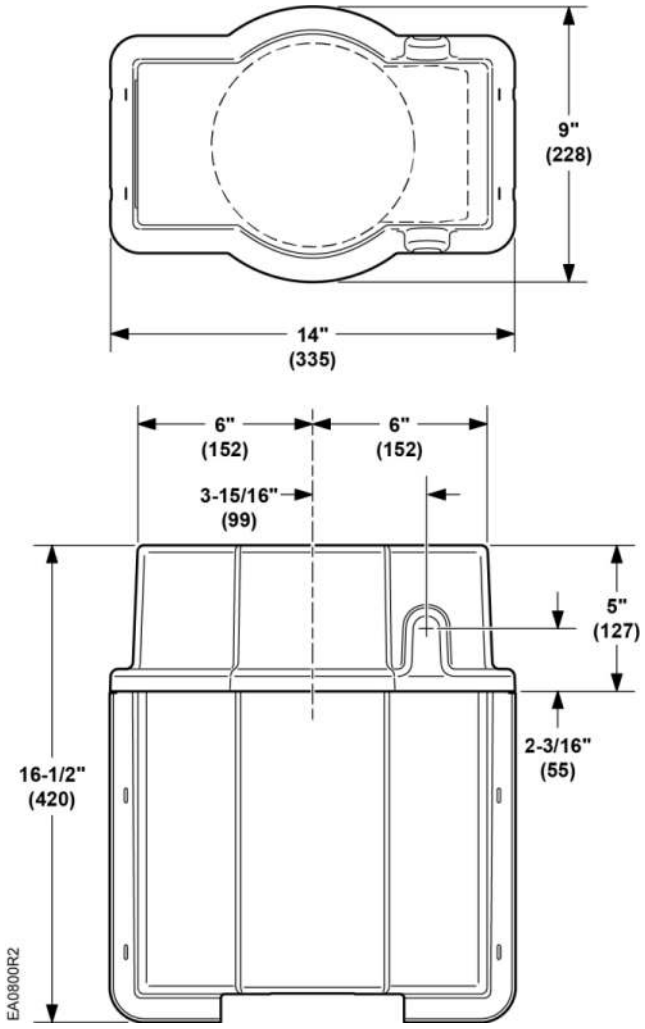


Figure 17. Dimensions of the 599-10065 Weather Shield in Inches (Millimeters).

Dimensions, Continued

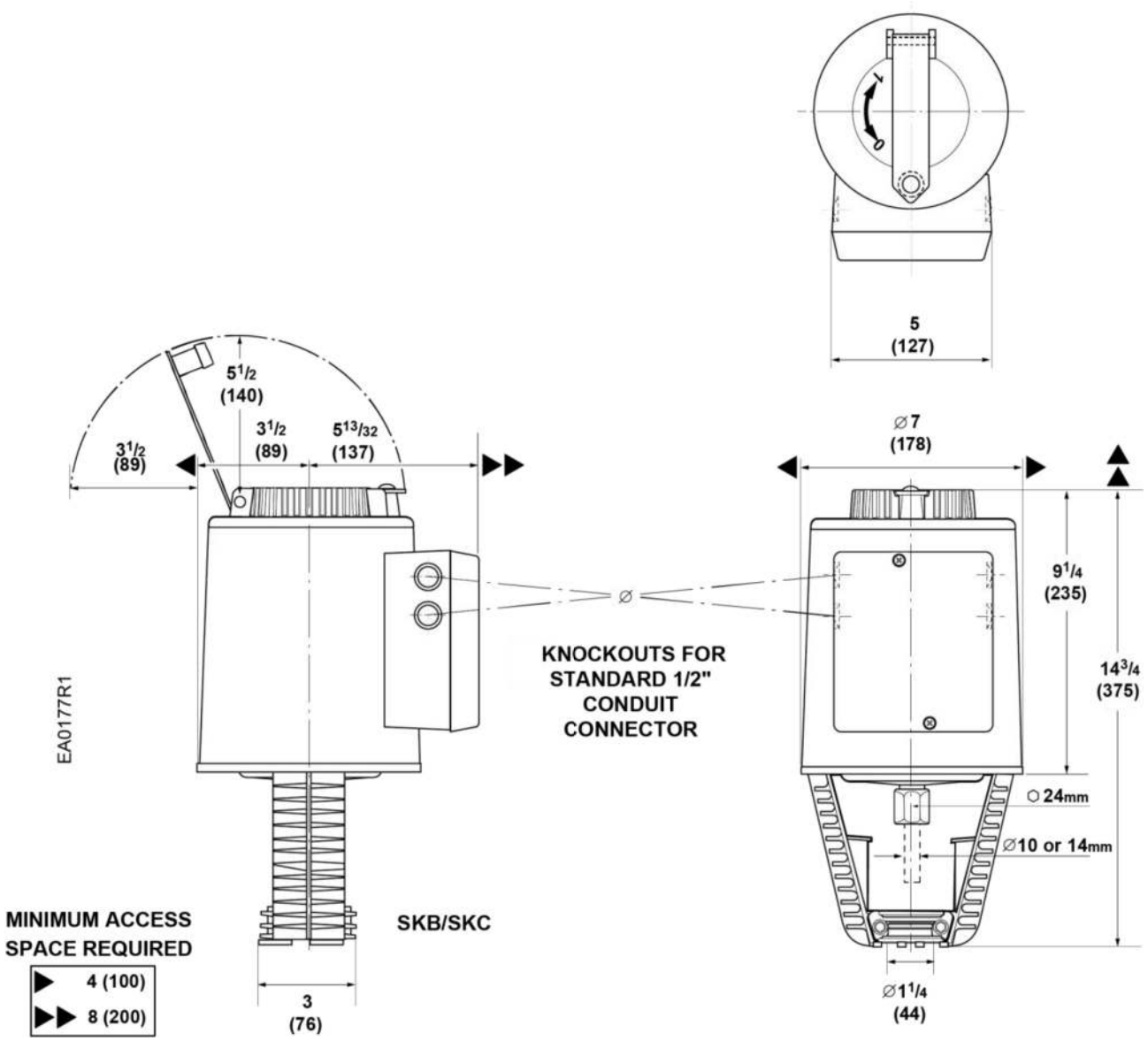


Figure 18. Dimensions of SKB/C in Inches (Millimeters).

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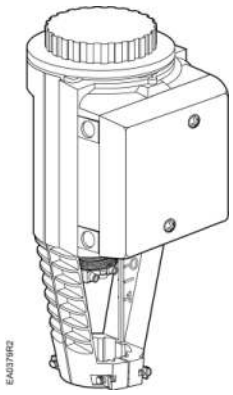
SIEMENS

SKD62U

Technical Instructions
Document No. 155-180P25
September 25, 2018

Flowrite™ 599 Series

SKD6xU Electronic Valve Actuators
24 Vac Proportional Control



c UL us LISTED

Description	The Flowrite 599 Series SKD6xU Electronic Valve Actuators require a 24 Vac supply and receive a 0 to 10 Vdc or a 4 to 20 mA control signal to proportionally control a valve. These actuators are designed to work with Flowrite 599 Series valves with a 3/4-inch (20 mm) stroke.
Features	• Direct-coupled installation requires no special tools or adjustments • Visual and electronic stroke indication • Die-cast aluminum housing • Manual override • Spring return to fail-safe position or non-spring return fail-in-place • Automatic stroke calibration • Maintenance-free
Application	These electronic actuators are designed to be used with Flowrite 599 Series valves with a 3/4-inch (20 mm) stroke in liquid and steam service applications.
Product Number	SKD62U, Spring Return (Actuator Prefix Code 274) SKD60U, Non-Spring Return (Actuator Prefix Code 267)

Warning/Caution Notations

WARNING:	⚠	Personal injury or loss of life may occur if you do not perform a procedure as specified.
CAUTION:	⚠	Equipment damage or loss of data may occur if you do not perform a procedure as specified.

Specifications

Power supply	Operating voltage	24 Vac -20%/+30%
	Frequency	50/60 Hz
	Power consumption	17 VA/12W
Control signals	Control input (Y)	
	Voltage	0 to 10 Vdc or 4 to 20 mA (DIP switch selectable)
	Maximum Impedance	0 to 10 Vdc 100K ohms 4 to 20 mA; 240 ohm
	Signal resolution	<1%
	Hysteresis	1%
	Control input (Z)	
	Resistance	0 to 1000 ohms
	Voltage	0 to 1.6V
	Control output (U) – position feedback	
	Voltage	0 to 9.8 Vdc ± 2%
	Load Impedance	>10K ohm
	Current	4 to 19.6 mA ± 2%
	Load impedance	< 500 ohms
Function	Nominal stroke	3/4-inch (20 mm)
	Run time with control operation (full stroke)	
	Pushing stroke, 0 to 100%	30 seconds
	Pulling and Spring return stroke, 100 to 0%	15 seconds
	Nominal Force	**Stroke** **Force**
	NC and 3-way upper	0% 225 lbs (1000 N)
	NO and 3-way by-pass	100% 258 lbs (1150 N)
Agency Certification	UL approval	UL873
	cUL	Certified to Canadian standard C22.2 No. 24-93
	CE conformity per the EMC directive	89/336/EEC
	Low voltage directive	73/23/EEC
Ambient conditions	Ambient temperature (Operation)	5°F to 122°F (-15°C to 50°C)
	Media temperature	-13°F to 300°F (-25°C to 150°C) <32°F (0°C) requires a Stem Heater
Housing	NEMA Rating	NEMA 1 (interior only) See *Accessories.*
Miscellaneous	Dimensions	See Figure 17
	Conduit opening	1/2-inch NPSM
	Weight	
	SKD60U	7.9 lbs (3.6 kg)
	SKD62U	8.5 lbs (3.85 kg)

Accessories

NOTE: Installation instructions are included with each accessory.

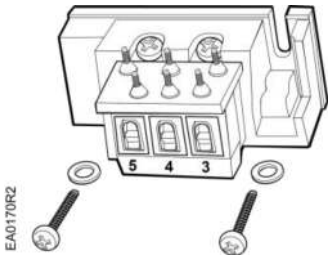


Figure 1. Auxiliary Switch.

ASC1.6 Auxiliary switch.

Sends a signal to indicate the valve is in the 0% stroke position. Switching point is fixed at the 0% stroke position.

Switching capacity	24 Vac 4A resistive 2A inductive
Lowest recommended current	10 mA

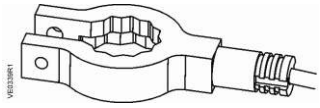


Figure 2. Stem Heating Element.

ASZ6.6 The stem heating element prevents the formation of ice on the stem when the medium temperature drops below 32°F (0°C). It is suited for universal use with valves having a stem or spindle diameter of 10 or 14 mm.

Operating voltage	24 Vac/dc ± 20%
Power consumption	≤ 40 VA/30W

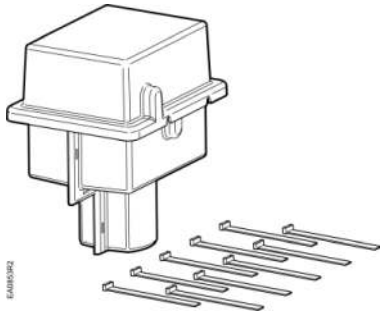


Figure 3. Weather Shield.

599-10071 Weather Shield.

See *Service Kits* for replacement ultraviolet resistant cable ties.

Service Kits

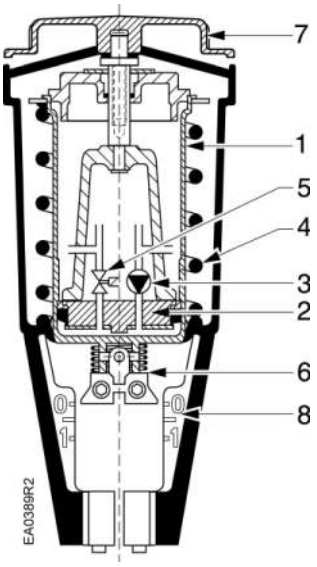
The only field serviceable part is the circuit board.

Circuit board replacement	4-668-5748-8
Plastic wiring compartment cover	4-104 5634-8
Manual Override Kit for SKD	4-268 5504-8
Ultraviolet (UV) resistant cable ties (pkg. of 10)	538-996

WARNING:

This product contains a spring under high compression. Do not attempt to disassemble the actuator.

SKD Details



Legend

1 Pressure cylinder
2 Piston
3 Oscillating pump
4 Return spring
5 Bypass valve
6 Valve stem retainer
7 Manual override knob
8 Position indicator

Figure 4. SKD6xU Details.

Operation

The actuator accepts a 0 to 10 Vdc or a 4 to 20 mA control signal. The actuator mounted on a valve, produces a stroke proportional to the input signal. When power is turned off or in the event of a power failure, the SKD62U Actuator spring returns the valve to its normal position, and the SKD60U Actuator fails in place.

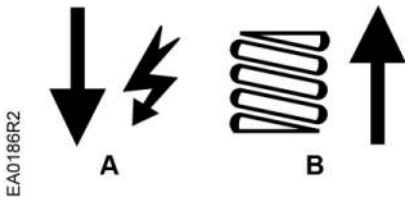


Figure 5.

Spring return: When power is turned off or in the event of a power failure, the actuator spring returns the valve to its normal position.



Figure 6.

Non-spring return: When power is turned off or in the event of a power failure, the actuator maintains its position.

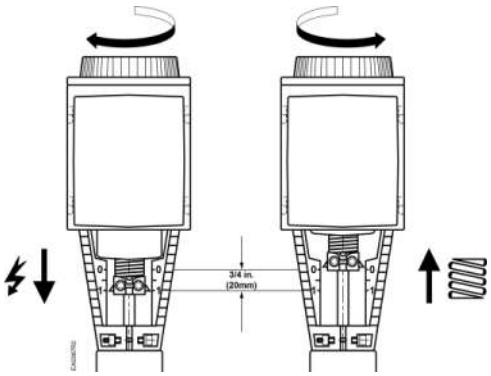


Figure 7. Valve Stem Travel Indication.

Mounting and Installation

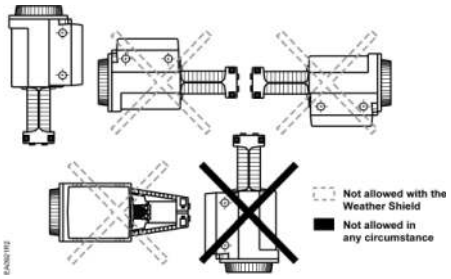


Figure 8. Acceptable Mounting Positions.

The vertical position is the recommended position for mounting. Other positions are allowed. When using the Weather Shield for NEMA 3R rating, the vertical position is required. See Weather Shield installation instructions and Figure 8.

Allow four inches (100 mm) around the sides and back of the actuator and eight inches (200 mm) above and to the front of the actuator.

See dimensions in Figure 16 and Figure 17.

Detailed installation instructions for field mounting are shipped with the actuator.

Start-up

Check the wiring for proper connections.

NOTE: The valve body assembly determines the complete assembly action.

Stroke Calibration

To determine the stroke positions 0% and 100% in the valve, calibration is required when the valve/actuator are commissioned for the first time.

The actuator must be mechanically connected to a valve and must have a 24 Vac power supply. The calibration procedure can be repeated as often as necessary.

CAUTION:
Before starting calibration, be sure the manual adjuster is set to **Automatic** to register the actual values.

There is a slot on the printed circuit boards of the actuators. To initiate the calibration procedure, the contacts inside this slot must be short-circuited, for example, with a screwdriver (see Figure 9).

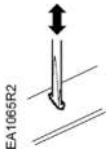


Figure 9.

Automatic calibration proceeds as follows (see Figure 10):

- Actuator runs to the 0 stroke position (1), green LED flashes.
- Actuator then runs to the 100 stroke position (2), green LED flashes.
- Measured values are stored in the EPROM.
- The actuator now moves to the position defined by control signal **Y** or **Z** (3), and the green LED now glows steadily (normal operation).
- Throughout this procedure, output **U** is inactive; meaning, the values only represent actual positions when the green LED stops flashing and remains on continuously.

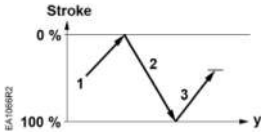


Figure 10.

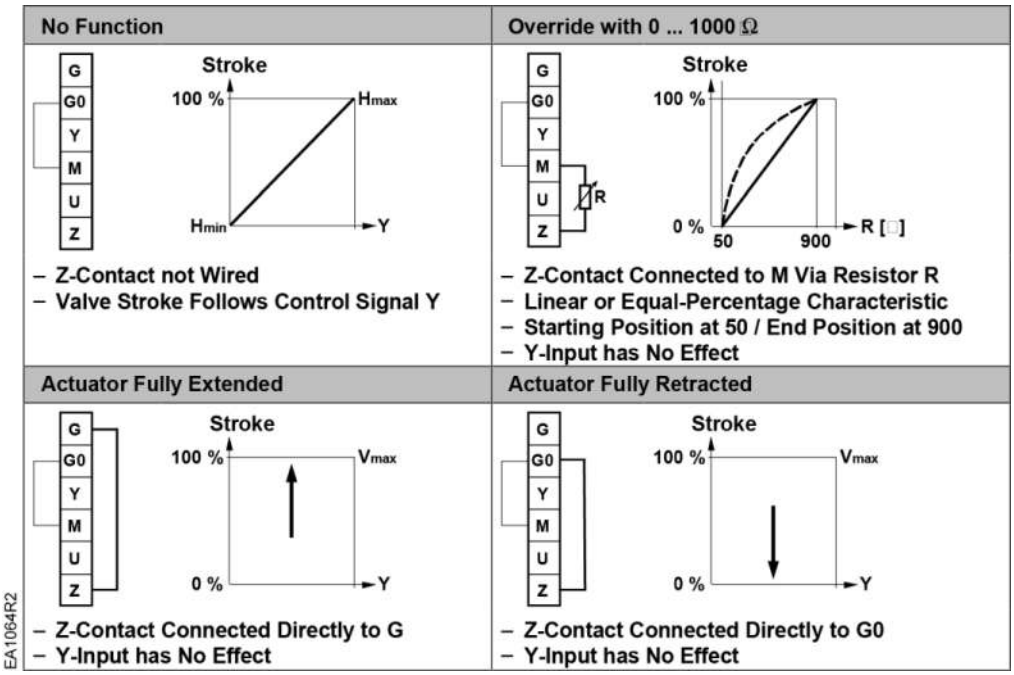
Stroke Calibration, Continued

Table 1. LED Status.

LED	Display	Function	Action
Green	ON	Normal Operation	Automatic operation
	Flashing	Stroke calibration In Progress	Wait for calibration to be completed (LED stops flashing)
Red	ON	Faulty stroke calibration Internal Error	- Check mounting - Restart stroke calibration (by short-circuiting calibration slot) - Replace electronics
	Flashing	Inner valve jammed	Check the valve
	OFF	• No power supply • Faulty electronics	-Check mains -Replace electronics

Override Control

The override control input (Z) has three modes of operation:



The Z-modes have a "direct acting" factory setting.

Start-up, Continued

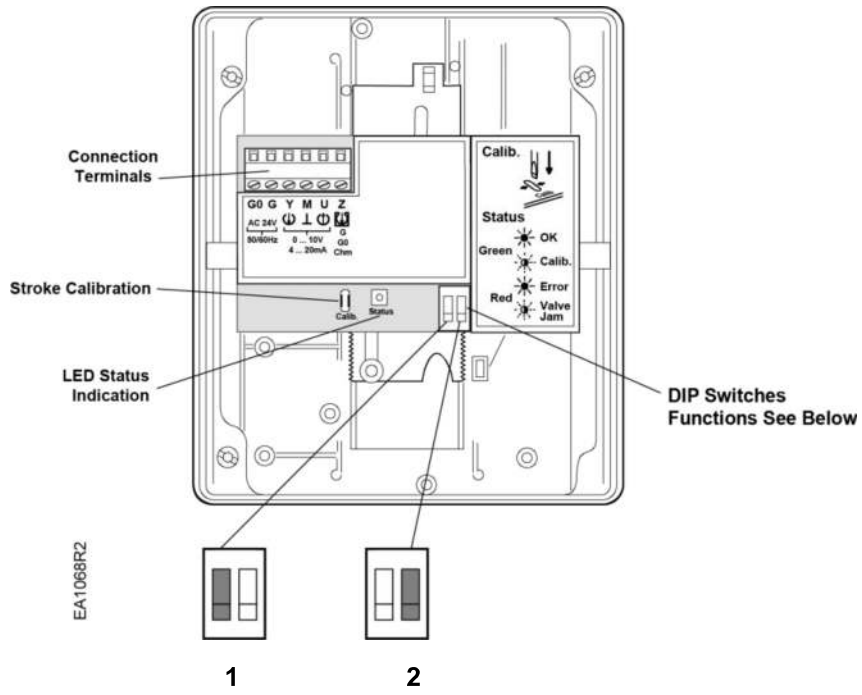


Figure 11. SKD Electronic Features.

DIP Switches (Left to right)	1 Selection of Control Signal	2 Selection of Flow Characteristic
ON	4 to 20 mA	Modified*
OFF Factory Setting	0 to 10 Vdc	Default

*Changing the default setting will modify an equal percentage valve to a linear flow characteristic. When set to default, the flow characteristic is determined by the valve body.

Normally Closed Valve

Actuator pressure cylinder moves:

- Outward (**0** to **1**): Valve opens.
- Inward (**1** to **0**): Valve closes.

Normally Open Valve

Actuator pressure cylinder moves:

- Outward (**0** to **1**): Valve closes.
- Inward (**1** to **0**): Valve opens.

Three-Way Valve

Actuator pressure cylinder moves

- Outward (**0** to **1**): Valve opens between port NC and C.
- Inward (**1** to **0**): Valve opens between ports NO and C.

The measuring voltage at terminal **U** provides valve stem position feedback to an indicating instrument or building automation system.

Manual Operation

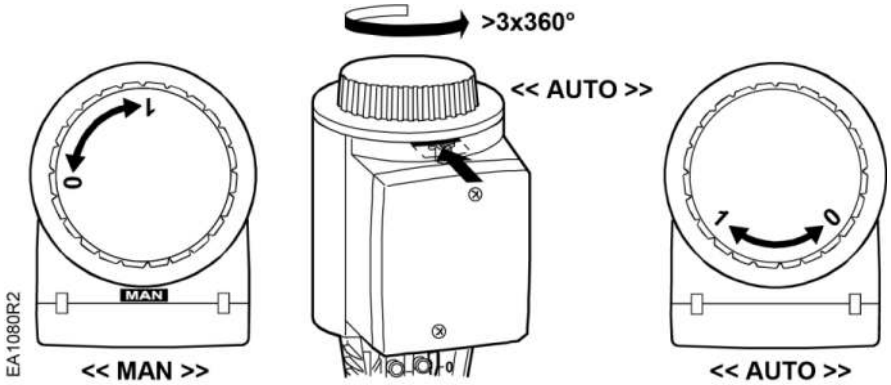


Figure 12. The Manual Setting Knob in Manual and Automatic Position.

- Turn the manual setting knob clockwise for manual operation.
- A red indicator becomes visible as you begin to crank. Each complete revolution (360°) is equal to 3/32-inch (2.5 mm) stroke.
- If a signal is sent to the actuator while it is in manual operation, the actuator will move but the control will not be accurate.
- The valve cannot be commanded to its 0% position while in manual operation.

Automatic operation

For automatic operation the manual override knob must be in the fully closed position.

Turn the manual override knob counterclockwise until the red indicator disappears.

Wiring

Do not use autotransformers. Use earth ground isolating step-down Class 2 power supplies.

Determine supply transformer rating by summing total VA of all actuators used.

The maximum rating for Class 2 step-down transformer is 100 VA.

- Since SKD6xU actuators require ≈20 VA, a maximum of four actuators can be powered by one transformer (80% of transformer VA).
- Operating more than four SKD6xU actuators requires additional transformers or separate 100 VA power supplies.
- The position output signal **U** will switch from 0 to 10 Vdc to 4 to 20 mA when a 4 to 20 mA input signal is selected and used on the Y terminal.

Wiring Diagrams

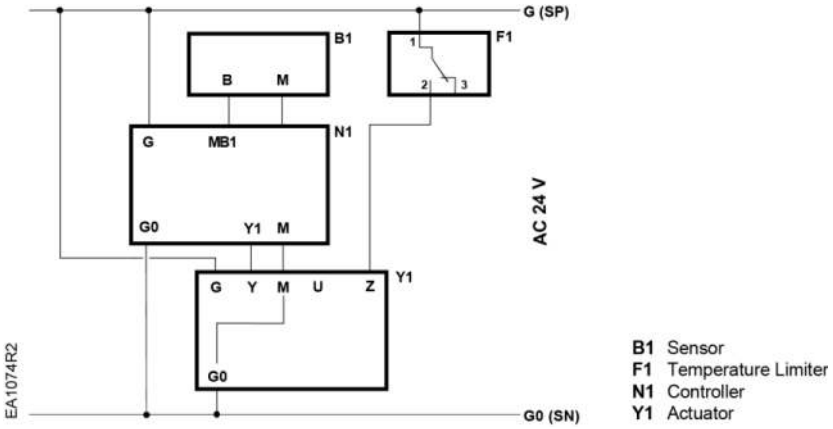


Figure 13. Connecting Terminals.

24 Vac	
G	System Potential (SP)
G0	System Neutral (SN)
Y	Control input 0 to 10 Vdc or 4 to 20 mA (DIP switch selectable)
M	Measuring neutral
U	Position indication 0 to 10 Vdc or 4 to 20 mA, (see Table 2.
Z	Override control

Table 2.

Actuator input signal	Receiving Impedance	
	Low (<500 Ohm)	High (>10K Ohm)
0 to 10 Vdc	0 to 20 mA	0 to 10 Vdc
4 to 20 mA	4 to 20 mA	2 to 10 Vdc

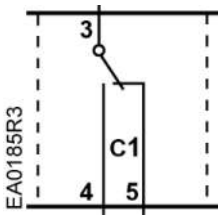
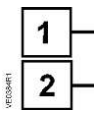


Figure 14. Auxiliary Switch ASC1.6.



System neutral (SN) red

System potential (SP) black

24 Vac/30W

Figure 15. Heating Element ASZ6.6.

Troubleshooting

- Check that the wires are connected correctly and attached securely.
- Check for adequate power supply.
- Check that the actuator is set for automatic operation. See the *Start-Up* section.

Dimensions

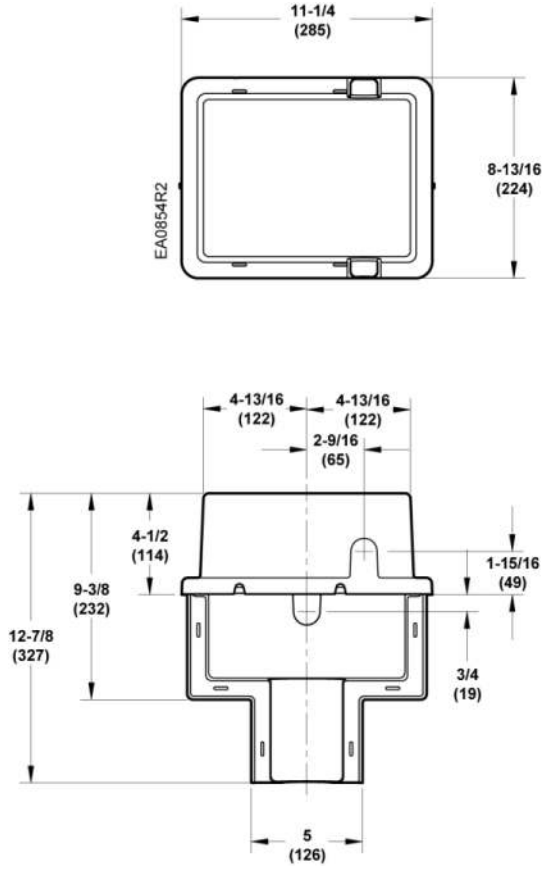


Figure 16. Dimensions of 599-10071 Weather Shield in Inches (Millimeters).

Dimensions, Continued

NOTE: The top knockout position should be used when installing the Weather Shield.

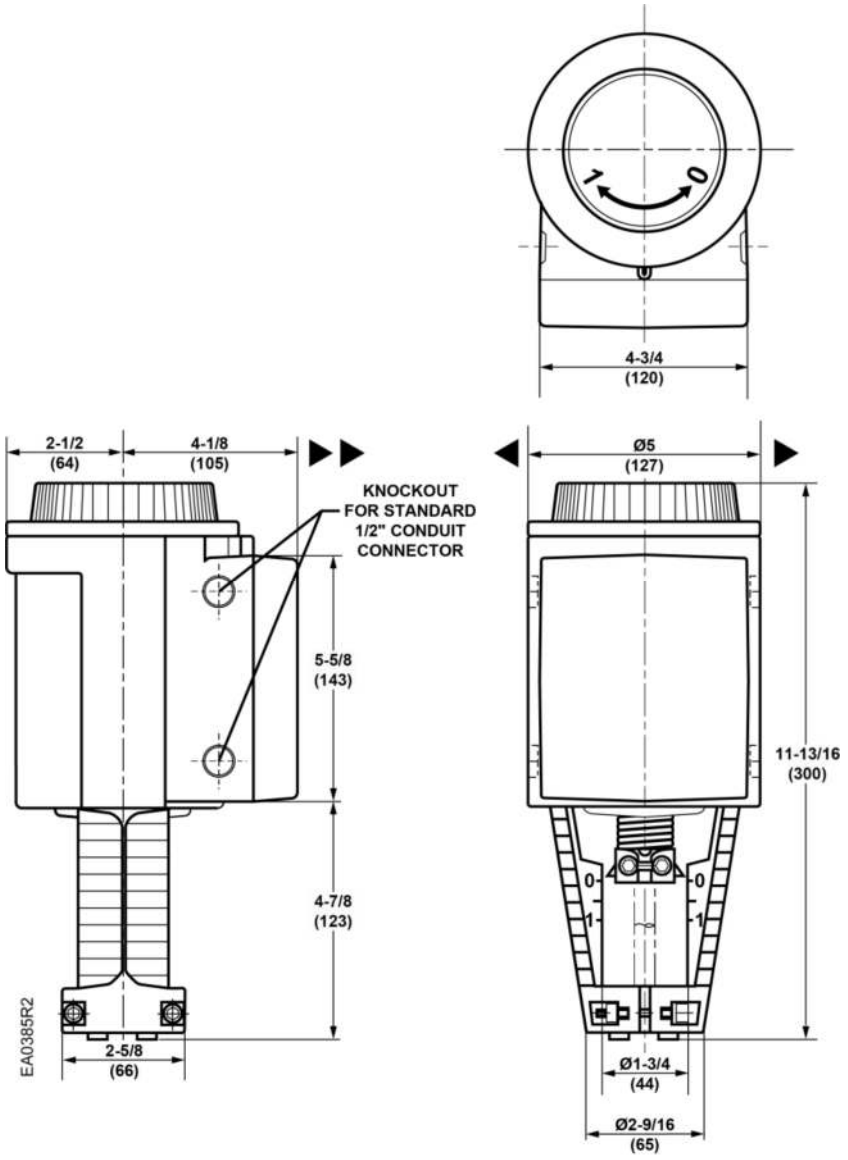


Figure 17. Dimensions of SKD6xU Actuators in Inches (Millimeters).

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SIEMENS

GCA121.1U

Technical Instructions
Document No. 155-541P25
October 15, 2018

Flowrite™

599 Series Rack & Pinion Valves



Description	The Flowrite 599 Series Rack & Pinion Valve couples the OpenAir™ Actuator to a 1/2- to 2-inch Flowrite 599 Series two- or three-way valve via a linkage. The linkage transforms the actuator rotary movement into the linear motion required to position the valve.
Features	• Brushless DC motor technology with stall protection • Bi-directional fail-safe spring return (actuator dependent) • Direct or reverse acting selectable by field installation • All metal housing
Application	The Flowrite valves are used to control water and glycol solutions to 50 percent in small to large air handling units and central plant applications.
Warning/Caution Notations	**WARNING:** Personal injury or loss of life may occur if you do not perform a procedure as specified.
	CAUTION: Equipment damage may occur if you do not perform a procedure as specified.

Product Numbers

Table 1 provides a complete description of the product numbers.

Table 1. Flowrite 599 Series Rack & Pinion Valve Product Numbers.

Product Number	Description
298-XXXXX 299-XXXXX 	Assembly consisting of: OpenAir Electronic Actuator, linkage, and 1/2-inch to 2-inch Flowrite two-way or three-way valve body. 298-XXXXX includes: OpenAir GCA161.1U Electronic Actuator for 0 to 10 Vdc modulating control with a 24 Vac or 24 Vdc supply voltage. Product number 299-XXXXX includes: OpenAir GCA121.1U Electronic Actuator for 2-position on/off control with a 24 Vac or 24 Vdc supply voltage. The XXXXX of the product number specifies a particular Flowrite two or three-way valve body. For details and complete product numbers, see TB249, *Flowrite 599 Series Valve and Actuator Assembly Selection* Technical Bulletins (155-772 or 155-776).
599-03609 	Assembly consisting of: OpenAir GCA161.1U Electronic Actuator and linkage. The assembly is ready for field installation on a 1/2- to 2-inch Flowrite two- or three-way valve. For details on the actuator, see *OpenAir GCA Series Spring Return 142 lb in Electronic Damper Actuators Technical Instructions* (155-173P25).
599-03611 	Assembly consisting of: OpenAir GCA121.1U Electronic Actuator and linkage. The assembly is ready for field installation on a 1/2- to 2-inch Flowrite two- or three-way valve. For details on the actuator, see *OpenAir GCA Series Spring Return 142 lb in Electronic Damper Actuators Technical Instructions* (155-173P25).
599-03610 	Linkage only. For mounting of an alternate OpenAir electronic actuator on the linkage and installation of that linkage/actuator assembly on 1/2-inch to 2-inch Flowrite two-way or three-way valve.

Specifications

Power supply	Operating voltage	24 Vac ±20%, 24 Vdc ±10%
	Frequency	50/60 Hz
	Power consumption 599-03609 assembly (with GCA161.1U actuator)	9 VA running, 5 VA holding
	599-03611 assembly (with GCA121.1U actuator)	8 VA running, 3 VA holding
	Equipment rating	Class 2, in accordance with UL/CSA
Control signal **(599-03609 assembly with GCA161.1U actuator)**	Input signal voltage input input resistance	 0 to 10 Vdc (max. 35 Vdc) 100K ohms
	current input input resistance	4 to 20 mA 500 ohms
	Position output feedback signal	0 to 10 Vdc, ±1 mA maximum
Ambient conditions	Ambient temperature operation storage and transport	 -25 to 130°F (-32 to 55°C) -25 to 158°F (-32 to 70°C)
	Ambient humidity (non-condensing)	95% rh
Mounting	Nominal angle of rotation	90°
	Maximum angular rotation	95°
	Noise level	<45 dBA (running)
	Enclosure	NEMA 2 in vertical to horizontal 90 degrees (see Figure 1)
Linkage	Frame	Aluminum alloy frame
	Construction	Steel rack, pinion and stem shaft pre-lubricated, bronze bushings
Physical characteristics	Pre-connected cable	18 AWG, 3 ft (0.9 m)
	Dimensions	See Figures 2 and 3.
	Weight	8.35 lb (3.79 kg)

For Valve specifications, see the following documents:

- *Flowrite™ 599 Series Two-way 1/2 to 2-inch Bronze Valves Technical Instructions* (155-184P25)
- *Flowrite 599 Series Three-Way 1/2 to 2-inch Bronze Valves Technical Instructions* (155-185P25)

For OpenAir™ Electronic Damper Actuator specifications, see the following document:

*OpenAir GCA Series Spring Return 142 lb in Electronic Damper Actuators (*155-173P25)

Operation

599-03609 assembly with GCA161.1U actuator

A continuous 0 to 10 Vdc signal from a controller to Terminal Y (8, gray) of a normally-closed, direct-acting assembly operates the actuator and the valve opens respectively. The linkage proportionally translates the rotary actuator stroke into a linear valve stem motion.

A 0 to 10 Vdc position output feedback signal at Terminal U (9, pink) is available to monitor the position of the actuator.

In the event of a power failure or when the operating voltage is absent, the actuator returns to the fail-safe (90°) position and the valve closes.

In the event of a stall, the actuator is overload protected over the full range to prevent damage.

599-03611 assembly with GCA121.1U actuator

When power is applied to a normally-closed, direct-acting assembly, the actuator moves to the full-open (-5°) position and the valve opens. The linkage translates the rotary actuator stroke into a linear valve stem motion.

In the event of a power failure or when operating voltage is absent, the actuator returns to the fail-safe (90°) position and the valve closes.

In the event of a stall, the actuator is overload protected over the full range to prevent damage.

Life expectancy

An improperly-tuned loop will cause excessive repositioning that will shorten the life of the actuator.

Installation and Mounting

Flowrite Rack & Pinion Valves are suitable for water applications where, the actuator mounts on the linkage vertically. Units are shipped from the factory in the vertical position.

Flowrite Rack & Pinion Valves can be installed on normally-closed, normally-open, and three-way Flowrite valves for direct or reverse-acting control applications. The actuator orientation and the position of the actuator shaft adapter on the linkage determine whether the linkage shaft rotates clockwise or counterclockwise for the proper control action. *Flowrite 599 Series Rack & Pinion Valves Installation Instructions* (129-292), shipped with the assembly, provides details to configure the assembly for the desired control application.

For applications using an alternate OpenAir Electronic Actuator on the linkage, the actuator preload must be reset. *Flowrite 599 Series Rack & Pinion Valves Installation Instructions* (129-292), shipped with the assembly, provides preload details.

Install the Flowrite Rack & Pinion Valve so that the flow of the medium follows the direction of the arrow cast on the valve body. For best performance, install the valve with the actuator above the valve body. Figure 1 shows acceptable NEMA 2 mounting positions. Do not mount the assembly so that the actuator is below horizontal or upside-down.

Allow sufficient space for servicing the assembly. See *Dimensions* and the recommended service envelope in Figure 2.

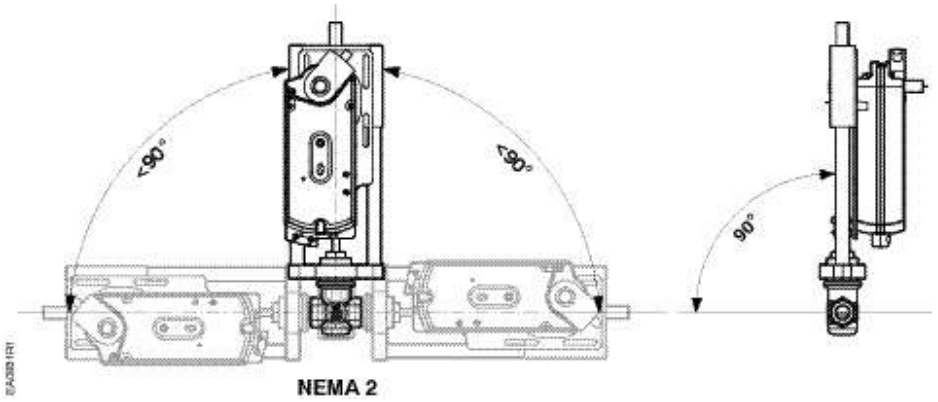


Figure 1. Acceptable NEMA 2 Mounting Positions.

Wiring

All wiring must conform to NEC, and to local codes and regulations.

Use earth ground isolating step-down Class 2 transformers. Do not use autotransformers.

Determine the supply transformer rating by summing the total VA of all actuators used. The maximum rating for a Class 2 step-down transformer is 100 VA.

Table 2 shows the recommended maximum actuators per Class 2 circuit and includes a safety factor of 80% of the transformer VA. Operating additional actuators requires additional transformers or separate 100 VA power trunks.

Table 2. Recommended Maximum Power Consumption (VA) for a Class 2 Step-Down Transformer.

Actuator	Power Consumption	Actuator per Class 2 Supply Circuit
GCA12x.	8 VA	10
GCA16x	9 VA	9

Wiring Diagrams

599-03609 assembly with GCA161.1U actuator

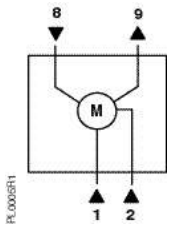


Table 3. 599-03609 Assembly (with GCA161.1U) for Modulating Control with 24 Vac or 24 Vdc Supply Voltage.

Standard Symbol	Function	Terminal Connection	Standard Color
1	Supply (SP)	G	Red
2	Neutral (SN)	G0	Black
8	0 to 10 Vdc input signal	Y	Gray
9	Output for 0 to 10 Vdc position feedback indication	U	Pink

599-03611 assembly with GCA121.1U actuator

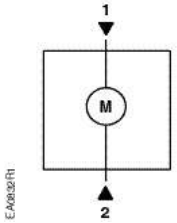


Table 4. 599-03611 Assembly (with GCA121.1U) for 24 Vac or 24 Vdc Two-Position Control.

Standard Symbol	Function	Terminal Connection	Standard Color
1	Supply (SP)	G	Red
2	Neutral (SN)	G0	Black

Start Up/ Commissioning

- Check that the wires are connected correctly.
- For additional actuator information, see *OpenAir™ GCA Series Spring Return 142 lb-in Electronic Damper Actuators* Technical Instructions (155-173P25).

Service

WARNING:
Do not open the actuator.

If the linkage or actuator is inoperative, replace the unit.

For valve service kits, see the following documents:

- *Flowrite 599 Series Two-Way 1/2 to 2-Inch Bronze Valves* Technical Instructions (155-184P25)
- *Flowrite 599 Series Three-Way 1/2 to 2-inch Bronze Valves* Technical Instructions (155-185P25)

Dimensions

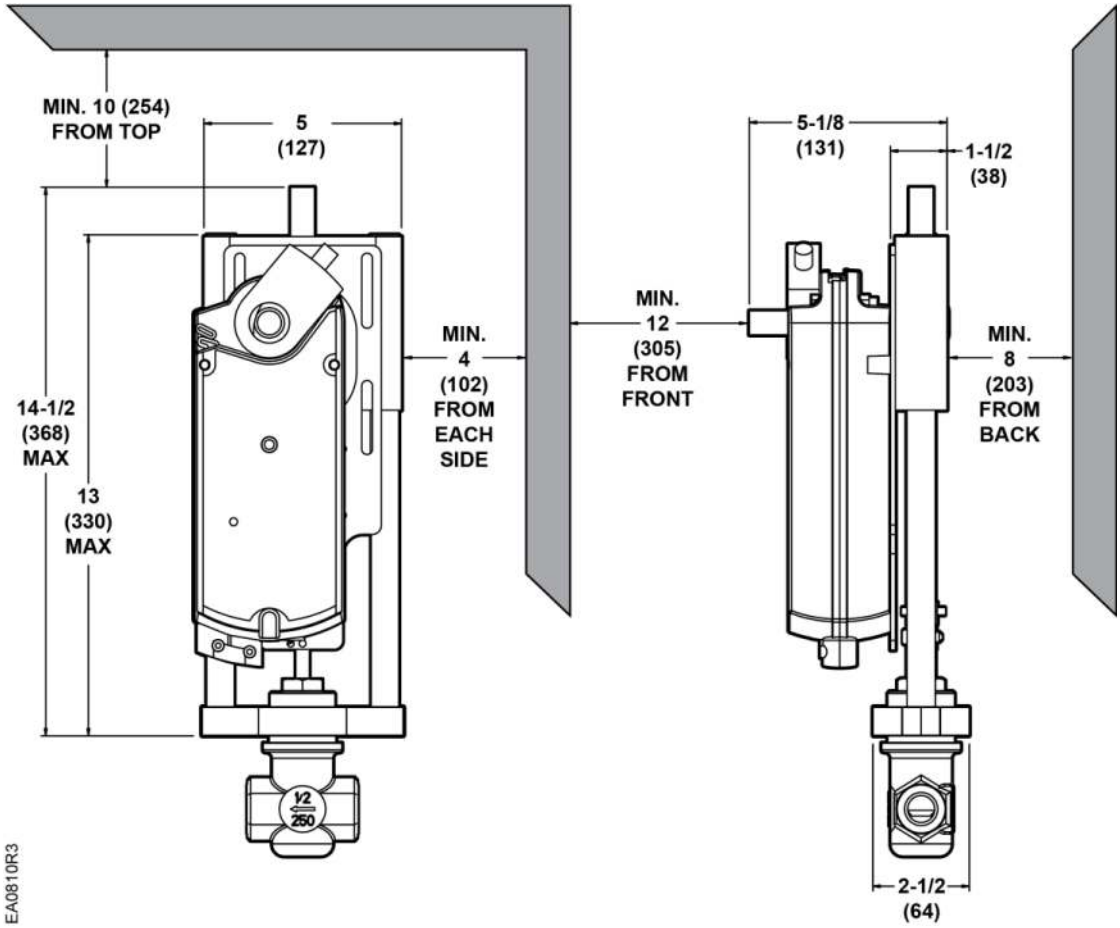


Figure 2. Dimensions of the Flowrite 599 Series Rack & Pinion Valve in Inches (Millimeters).

NOTES: For valve dimensions, see the following documents:

- *Flowrite 599 Series Two-Way 1/2- to 2-inch Bronze Valves* Technical Instructions (155-184P25)
- *Flowrite 599 Series Three-Way 1/-2 to 2-inch Bronze Valves* Technical Instructions (155-185P25)

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SIEMENS

Submittal Sheet
Document No. 154-001P25
August 28, 2012

OpenAir™ GCA Series, Spring Return,160 lb-in, Electronic Damper Actuators

Description

The OpenAir GCA Series spring return, 160 lb-in (18 Nm) electronic damper actuators provide modulating, two-position and floating control of building HVAC dampers.

Product Number	Operating Voltage			Control				Cables		Built-in Control Options			
	24 Vac ± 20%	24 Vdc ±10%	120 Vac ± 10%	0 to 10 Vdc	2 to 10 Vdc or 0 to 10 Vdc	Floating	2-position	Standard	Plenum	Position Feedback	Dual Auxiliary Switches	Signal Inversion	Offset 0 to 5 Vdc Span 2 to 30 Vdc
GCA121.1U	•	•					•	•					
GCA121.1P	•	•					•		•				
GCA126.1U	•	•					•	•			•		
GCA126.1P	•	•					•		•		•		
GCA221.1U			•				•	•					
GCA226.1U			•				•	•			•		
GCA131.1U	•	•				•		•					
GCA131.1P	•	•				•			•				
GCA132.1U	•	•				•		•		•			
GCA136.1U	•	•				•		•			•		
GCA136.1P	•	•				•			•		•		
GCA151.1U	•	•			•			•		•		•	
GCA151.1P	•	•			•				•	•		•	
GCA156.1U	•	•			•			•		•	•	•	
GCA156.1P	•	•			•				•	•	•	•	
GCA161.1U	•	•		•				•		•			
GCA161.1P	•	•		•					•	•			
GCA163.1U	•	•		•				•		•			•
GCA163.1P	•	•		•					•	•			•
GCA164.1U	•	•		•				•		•	•		•
GCA164.1P	•	•		•					•	•	•		•
GCA166.1U	•	•		•				•		•	•		
GCA166.1P	•	•		•					•	•	•		



Features

- Brushless DC motor technology with stall protection
- Bi-directional fail-safe spring return
- Patented self-centering shaft coupling
- Models available with dual independently adjustable auxiliary switches
- All modulating models offer built-in feedback
- Floating control models available with feedback potentiometer
- All metal housing
- Manual override
- 5° preload as shipped from factory
- Mechanical range adjustment capability by moving shaft coupling to desired position
- Easily visible position indicator
- Precabled
- CE, UL60730, and cUL (C22.2 No. 24-93) listed

Technical Data

24 Vac, 120 Vac Torque:	160 lb-in (18 Nm) running and spring return <360 lb-in (40 Nm) maximum

NOTE: At -25°F, spring return is 142 lb-in (16 Nm)

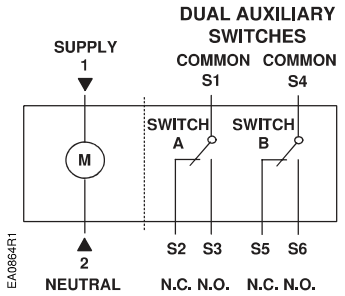
Runtime for 90°:	90 sec. operating, 15 sec. typical (30 sec. max.) closing on power loss
Frequency:	50/60 Hz
Power consumption: Running:	7 VA/5W (24 Vac/dc; GCA12x, GCA13x) 7 VA/5W (24 Vac/dc, GCA15x) 7 VA/5W (24 Vac/dc GCA16x) 8 VA (120 Vac GCA22x)
Power consumption: Holding	5 VA/3W (24 Vac/dc, GCA12x) 5 VA/3W (24 Vac/dc, GCA13x, GCA15x) 5 VA (24 Vac/dc, GCA16x) 6 VA (120 Vac, GCA22x)
Equipment rating (24V):	Class 2 per UL/CSA
Noise level:	<45 dBA (running)
Angle of rotation:	90° nominal, 95° max.
Shaft dimensions:	3/8-in to 1-in (8 to 25.6 mm) dia. 1/4-in to 3/4-in (6 to 18 mm) sq. 3/4-in (20 mm) min. length
Operating temperature:	-25°F to 130°F (-32°C to 55°C)
Storage temperature:	-40°F to 158°F (-40°C to 70°C)
Ambient humidity:	95% rh (non-condensing)
Pre-cabled connection:	18 AWG, 3 ft (0.9 m) long
Enclosure:	NEMA 2, IP54 per EN 60 529
Material:	Die cast aluminum alloy
Agency listings:	CE, UL60730, cUL C22.2 No. 24-93
Gear Lubrication:	Silicone-free
Weight:	4.85 lb (2.2 kg)
Dimensions:	11-13/16 in (300 mm) H 4-3/4 in (120 mm) W 2-7/8 in (72 mm) D

Typical Specifications

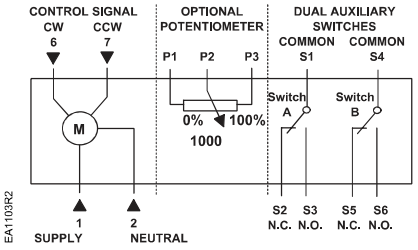
Spring return damper actuators shall be the type that requires no connecting linkages. The spring return actuators shall have a self-centering damper shaft coupling that assures concentric alignment of the actuator's output coupling with the damper shaft and be capable of direct mounting to a shaft up to a 1-inch diameter. Actuators shall use a brushless DC motor and provide stall protection throughout the full range of rotation. All spring return actuators shall be capable of both clockwise and counterclockwise spring return fail-safe operation using a continuously engaged mechanical return spring that returns the actuator to a fail-safe position in <20 seconds in response to a loss of power. All actuators shall provide a means of manually positioning the output coupling in the absence of power. Dual independently adjustable auxiliary switches must be integral to the actuator. All actuators must be precabled and provide an easily readable high contrast yellow on black position indicator. All actuators shall be UL60730 and CSA22.2 listed and manufactured under ISO 9002 and ISO 14000 procedures. Actuators shall be designed for a minimum of 60,000 full stroke cycles at the actuators rated torque and temperatures. Actuators shall be as manufactured by Siemens Industry, Inc.

Wiring Diagrams

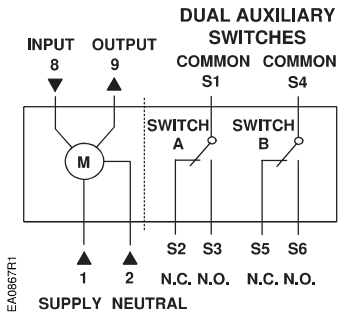
2-Position, 24 Vac/dc:



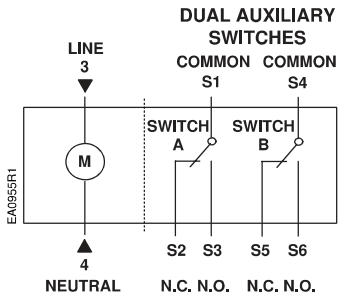
Floating, 24 Vac/dc:



0 to 10 Vdc, GCA16x, 24 Vac/dc;
2 to 10 Vdc, GCA15x, 24 Vac/dc:



2-Position, 120 Vac:



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GMA121.1P

SIEMENS

Submittal Sheet
Document No. 154-004P25
January 25, 2011

OpenAir™ GMA Series, Spring Return, 24 Vac/dc and 120 Vac, 62 lb-in, Direct-Coupled Electronic Damper Actuators

Product Number	Operating Voltage		Control				Cables		Built-In Control Options				
	24 Vac ±20% 24 Vdc ±15%	120 Vac ±10%	Modulating 0 to 10 Vdc	Modulating 2 to 10 Vdc	Floating	2-position	Standard	Plenum	Position Feedback	Dual Auxiliary Switches	Offset 0 to 5 Vdc Span 2 to 30 Vdc	Input Signal Inversion (Direct or Inverse Acting)	Feedback Signal Inversion
GMA121.1U	•					•	•						
GMA121.1P/B	•					•		•					
GMA121.1P	•					•		•					
GMA126.1U	•					•	•			•			
GMA126.1P	•					•		•		•			
GMA221.1U		•				•	•						
GMA226.1U		•				•	•			•			
GMA131.1U	•				•		•						
GMA131.1P	•				•			•					
GMA132.1U	•				•		•		•				
GMA136.1U	•				•		•			•			
GMA151.1U	•			•			•		•			•	•
GMA151.1P	•			•				•	•			•	•
GMA156.1U	•			•			•		•	•		•	•
GMA156.1P	•			•				•	•	•		•	•
GMA161.1U	•		•				•		•				
GMA161.1P	•		•					•	•				
GMA163.1U	•		•				•		•		•		
GMA163.1P	•		•					•	•		•		
GMA164.1U	•		•				•		•	•	•		
GMA166.1U	•		•				•		•	•			
GMA166.1P	•		•					•	•	•			

Technical Data

Runtime for 90°:	90 sec. operating
Spring Return:	15 sec. typical (<60 seconds max. at –25°F (–32°C))
Frequency:	50/60 Hz
Power consumption: 24 Vac/dc	
Running:	5 VA/3.5W
Holding:	4 VA/3W
Power Consumption: 120 Vac	
Running and holding:	≤7 VA/5W
Equipment rating (24V):	Class 2 per UL/CSA
Angle of rotation:	90° nominal, 95° max.
Shaft dimensions:	1/4 to 3/4-in. (6.4 to 20.5 mm) dia., 1/4 to 1/2-in. (6.4 to 13 mm) sq., 1-in. (25.4 mm) min. length
Operating temperature:	-25°F to 130°F (-32°C to 55°C)
Storage temperature:	-40°F to 158°F (-40°C to 70°C)
Ambient humidity:	95% rh (non-condensing)

Description

The OpenAir direct-coupled, spring return electronic damper actuators provide modulating, two-position and three-position control of building HVAC dampers.



Features

- Brushless motor technology
- Bi-directional fail-safe spring return
- Unique self-centering shaft coupling
- Models available with dual, independently adjustable auxiliary switches
- Floating control models available with feedback potentiometer
- All modulating control types include built-in feedback capability
- All metal housing
- Manual override
- Mechanical range adjustment capability
- Easily visible position indicator
- Precabled
- UL60730 (to replace UL873) and cUL (C22.2 No. 24-93) listed CE conformance
- Small actuator footprint with 62 lb-in of torque
- 24 Vac/dc compatible

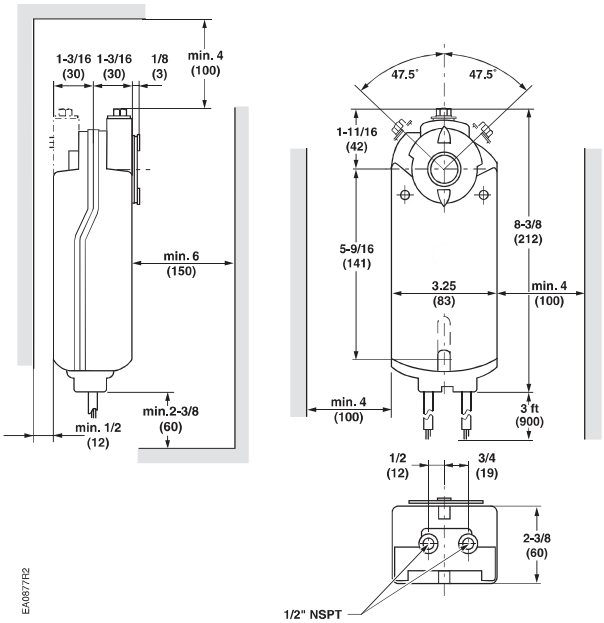
Technical Data, continued

Enclosure:	NEMA 1
Precabled connection:	18 AWG, 3 ft (0.9 m) long
Agency listings:	UL60730 (to replace UL873) C-UL C22.2 No. 24-93
Material:	Die cast aluminum alloy
Gear lubrication:	Silicone free
Dimensions:	8-3/8" H × 3-1/4" W × 2-2/3" D (212 mm H x 83 mm W x 68 mm D)
Weight:	2.9 lb (1.3 kg)
Country of Origin	USA

Typical Specifications

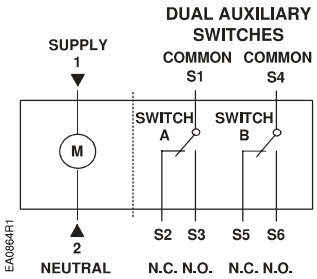
Spring-return damper actuators shall be the direct-coupled type that requires no connecting linkages. These spring return actuators shall have a self-centering damper shaft coupling that assures concentric alignment of the actuator's output coupling with the damper shaft for <60 lb-in torque and be capable of direct mounting to a shaft up to a 3/4-inch in diameter. Actuators shall provide stall protection throughout the full range of rotation. All spring return actuators shall be capable of both clockwise and counterclockwise spring return fail-safe operation using a continuously engaged mechanical return spring that returns the actuator to a fail-safe position in <15 seconds in response to a loss of power. All actuators shall provide a means of manually positioning the output coupling in the absence of power. Dual, independently adjustable auxiliary switches are available for these actuators. All actuators must be precabled and provide an easily readable high contrast yellow on black position indicator. All actuators shall be CE conforming; UL60730 (to replace UL873) and CSA22.2 listed and manufactured under ISO 9002 and ISO 14000 procedures. Actuators shall be as manufactured by Siemens Industry, Inc.

Dimensions in Inches (Millimeters)

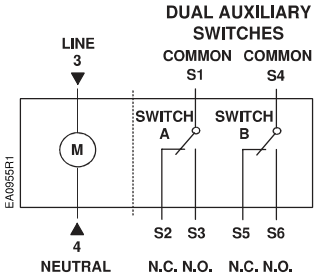


Wiring Diagrams

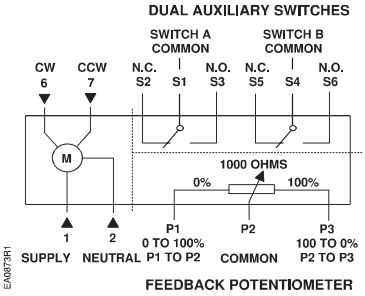
GMA12x, 2-Position, 24 Vac/dc:



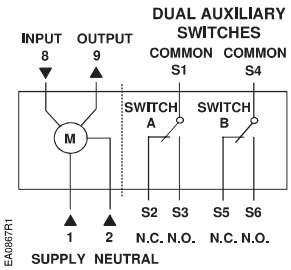
GMA22x, 2-Position, 120 Vac:



GMA13x, Floating, 24 Vac/dc:



GMA16x, GMA15x; Modulating; 24 Vac/dc:



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EBTRON a measurable difference!

Advantage IV

Gold Series

GTx116e-P+

OVERVIEW

Airflow Measurement with Temperature and Alarm Capability



- Thermal Dispersion Technology
- Supports up to 16 Sensor Nodes
- NIST-traceable Calibration
- *%-of-reading* Accuracy
- Airflow and Status Alarm
- Temperature Output Capability
- Combination Analog/Network Models
- Three Mounting Styles
- Remote Transmitter with LCD Display
- 3-year Warranty

The GTx116e-**P+** is EBTRON's top-of-the-line solution for accurate and repeatable measurement in ducts and plenums. Ideal for outdoor air delivery monitoring and airflow tracking applications. Temperature and alarm capability plus unsurpassed product features and connectivity options make this the best choice for today's high performance buildings. Bluetooth® low energy technology interface.[1]

[1] Order with the /NR option when RF devices are not permitted.

Typical Applications

- Outdoor Air Delivery Monitoring
- Differential Airflow Tracking
- Hospital Pressurization
- Laboratory Pressurization
- Air Change Verification & Monitoring
- System Performance Monitoring

Benefits

- Comply with ASHRAE Standards
- Demonstrate Code Compliance
- Satisfy LEED Prerequisites and Credits
- Provide Acceptable IAQ
- Save Energy
- Reduce Liability
- Improve Performance

Product Highlights

- Best Installed Accuracy
- Low Airflow Capability
- Volumetric or Mass Airflow Measurement
- Long-term Stability
- "Plug and Play" Operation
- Intuitive User Interface
- Waterproof Sensor Assembly
- FEP Plenum Rated Cables

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SPECIFICATIONS: GTx116e-P+

General

Probe and Sensor Node Configurations (max.)
2 probes x 8 sensor nodes/probe
4 probes x 4 sensor nodes/probe

Installed Airflow Accuracy[1]
Ducts/Plenums: ±3% of reading
Non-ducted OA Intakes: better than or equal to ±5% of reading

P+ Sensor Density: Refer to the P+ sensor density table.

Sensor Node Averaging Method
Airflow: Independent, arithmetic average
Temperature: Independent, velocity weighted average

Listings & Compliance
UL: UL-873 and CSA C22.2 No. 24
CE: Non-UK European shipments only
UKCA: UK shipments only
BACnet International: BTL Listed (GTC116e and GTM116e transmitters)
FCC: This device complies with Part 15 of the FCC rules
RoHS: This device is RoHS2 compliant

Environmental Limits
Temperature:
Probes: -20 to 160 ºF [-28.9 to 71.1 ºC]
Transmitter: -20 to 120 ºF [-28.9 to 48.9 ºC]
Humidity: (non-condensing)
Probes: 0 to 100%
Transmitter: 5 to 95%

Individual Sensing Nodes

Sensing Node Sensors
Self-heated sensor: Precision, hermetically sealed, bead-in-glass thermistor probe
Temperature sensor: Precision, hermetically sealed, bead-in-glass thermistor probe

Sensing Node Housing
Material: Glass-filled Polypropylene (Kynar® with /SS option)
Sensor Potting Materials: Waterproof marine epoxy

Sensing Node Internal Wiring
Type: Kynar® coated copper

Airflow Measurement
Accuracy: ±2% of reading to NIST-traceable airflow standards (includes transmitter uncertainty)
Calibrated Range: 0 to 5,000 fpm [25.4 m/s]
Calibration Points: 16

Temperature Measurement
Accuracy: ±0.15ºF [0.08 ºC] to NIST-traceable temperature standards (includes transmitter uncertainty)
Calibrated Range: -20 to 160 ºF [-28.9 to 71.1 ºC]
Calibration Points: 3

Sensor Probe Assembly

Tube
Material: Gold anodized 6063 aluminum (316 stainless steel with /SS option)

Mounting Brackets
Material: 304 stainless steel

Mounting Options & Size Limits[1]
Insertion: 6 to 191in. [152.4 to 4851 mm]
Stand-off: 6 to 190 in. [152.4 to 4826 mm]
Internal: 8 to 194 in. [203.2 to 4928 mm]

Probe to Transmitter Cables
Type: FEP jacket, plenum rated CMP/CL2P, UL/cUL listed, -67 to 302 ºF [-55 to 150 ºC], UV tolerant
Standard Lengths: 10, 15, 20, 25, 30, 40 and 50 ft. [3.1, 4.6, 6.1, 7.6, 9.1, 12.2, and 15.2 m]
Connecting Plug: 13/16" [20.63 mm] nominal diameter with gold-plated connector pins

Transmitter

Power Requirement: 24 VAC (22.8 to 26.4 under load) @20V-A max.
Connector Receptacle Pins and PCB Connections: Gold-plated receptacle pins, PCB interconnects, PCB edge fingers, and test points
User Interface: 2 line x16-character backlit LCD display and 4 button interface

B.A.S. Connectivity Options
All Transmitters: Three field selectable (0-5/0-10 VDC or 4-20mA), scalable and isolated analog output signals (AO1=airflow, AO2=temperature or alarm, AO3=Not Used).
GTA116e Transmitter: No additional connectivity to B.A.S.
GTC116e Transmitter: One additional field selectable (BACnet MS/TP or Modbus RTU) and isolated RS-485 network connection - Individual sensor node airflow rates and temperatures are available via the network
GTM116e Transmitter: One additional isolated Ethernet (simultaneously supported BACnet Ethernet or BACnet IP, Modbus TCP and TCP/IP) network connection - Individual sensor node airflow rates and temperatures are available via the network
GTF116e Transmitter: One additional isolated Lonworks Free Topology network connection
GTU116e Transmitter: One additional USB connection for thumb drive data-logging of sensor node airflow rates and temperatures

Airflow Alarm
Type: Low and/or high user defined setpoint alarm
Tolerance: User defined % of setpoint
Delay: User defined
Zero Disable: Alarm can be disabled when the airflow rate falls below the low limit cutoff value (unoccupied periods)
Reset Method: Manual or automatic
Visual Indication: Yes, LCD display
Analog Signal Indication: Yes, on AO2 assignment

System Status Alarm
Type: Sensor diagnostic system trouble indication
Visual Indication: Yes, LCD display
Analog Signal Indication: Yes, on AO2 assignment

***EB-Link* Bluetooth® low energy Interface for Android® and iPhone®:** Display real-time airflow, velocity-weighted temperature, individual sensor node airflow/temperature data, settings and diagnostics.[2]

[1] Installed airflow accuracy allows for additional uncertainty that results from averaging a finite number of sensors in a contorted velocity profile created from up and downstream disturbances. The specified installed accuracy is based on the P+ sensor density rules for installations that meet or exceed EBTRON minimum placement requirements. P+ sensor density rules may not be available in certain duct sizes due to sensor placement limitations.

[2] Order with the /NR option when RF devices are not permitted.

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GTC108e

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Advantage IV

Gold Series

GTx108e-F/An

OVERVIEW

Fan Array Airflow Measurement with Temperature and Alarm Capability



- Thermal Dispersion Technology
- Supports up to 8 Fans
- NIST-traceable Calibration
- *%-of-reading* Accuracy
- Individual Fan Airflow Alarms
- Temperature Output Capability
- Combination Analog/Network Models
- Four Mounting Styles
- Remote Transmitter with LCD Display
- 3-year Warranty

The GTx108e-**F**/An is EBTRON's solution for accurate and repeatable airflow measurement in fan arrays. One to eight fans are supported. Airflow, temperature and/or airflow alarming are available on all models. Individual fan airflow rates and fan alarming are available with combination analog output/network models. Does not affect fan performance. Bluetooth® low energy technology interface.[1]

[1] Order with the /NR option when RF devices are not permitted.

Typical Applications

- Fan Airflow Tracking
- Air Change Verification & Monitoring
- Individual Fan Performance Monitoring & Fault Detection

Benefits

- Monitor up to 8 Fans with a Single Transmitter
- Demonstrate Fan Performance and Operation
- Improve Fan Tracking of VAV Systems
- Comply with ASHRAE Standards
- Save Energy
- Reduce Fan Horsepower

Product Highlights

- Accurate and Repeatable
- Long-term Stability
- Streamline Design
- Individual Fan Airflow Monitoring & Alarming
- Adjustable Mounting Brackets
- "Plug and Play" Operation
- FEP Plenum Rated Cables

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SPECIFICATIONS: GTx108e-F/An

General

Probe and Sensor Node Configurations
- **Fan Arrays (less than or equal to 4 fans):** 2 probes x 1 sensor node per probe or 1 probe x 1 sensor node per probe in each fan
- **Fan Arrays (greater than 4 fans):** 1 probe x 1 sensor node per probe in each fan (8 probe maximum)

Installed Airflow Accuracy[1]
- ±(3% to 10%) of reading, depending on fan type and installation. May be improved by field adjustment using the Field Adjust Wizard (FAW) to a reliable reference.

Sensor Node Averaging Method
- **Airflow:** Independent, arithmetic average per fan
- **Temperature:** Independent, velocity weighted average

Listings and Compliance
- **UL:** UL-873 and CSA C22.2 No. 24
- **CE:** Non-UK European shipments only
- **UKCA:** UK shipments only
- **BACnet International:** BTL Listed (GTC108e and GTM108e transmitters)
- **FCC:** This device complies with Part 15 of the FCC rules
- **RoHS:** This device is RoHS2 compliant

Environmental Limits
- **Temperature:**
  - **Probes:** -20 to 160 ºF [-28.9 to 71.1 ºC]
  - **Transmitter:** -20 to 120 ºF [-28.9 to 48.9 ºC]
- **Humidity:** (non-condensing)
  - **Probes:** 0 to 100%
  - **Transmitter:** 5 to 95%

Individual Sensing Nodes

Sensing Node Sensors
- **Self-heated sensor:** Precision, hermetically sealed, bead-in-glass thermistor
- **Temperature sensor:** Precision, hermetically sealed, bead-in-glass thermistor

Sensing Node Housing
- **Material:** Glass-filled Polypropylene
- **Sensor Potting Materials:** Waterproof marine epoxy

Airflow Measurement
- **Accuracy:** ±2% of reading to NIST-traceable airflow standards (includes transmitter uncertainty)
- **Calibrated Range:** 0 to 10,000 fpm [0. to 50.8 m/s]
- **Calibration Points:** 16

Temperature Measurement
- **Accuracy:** ±0.15ºF [0.08 ºC] to NIST-traceable temperature standards (includes transmitter uncertainty)
- **Calibrated Range:** -20 to 160 ºF [-28.9 to 71.1 ºC]
- **Calibration Points:** 3

Sensor Probe Assembly

Mounting Rods
- **Material:** Zinc plated steel

Mounting Brackets (Forward, Face, Flare)
- **Material:** 304 stainless steel

Mounting Brackets (Cantilever)
- **Material:** Zinc plated steel

Mounting Options & Size Limits
- **Forward:** 6 to 64 inches [152.4 to 1625.6 mm] (diameter at inlet entrance)
- **Face:** 11 to 77 inches [279.4 to 1955.8 mm] (diameter at inlet entrance)
- **Flare:** 6 to 57 inches [152.4 to 1447.8 mm] (opening size at backdraft damper inlet)
- **Cantilever**: 11 to 82 inches [279.4 to 2082.8 mm] (diameter at inlet entrance)

Probe to Transmitter Cables
- **Type:** FEP jacket, plenum rated CMP/CL2P, UL/cUL listed, -67 to 302 ºF [-55 to 150 ºC], UV tolerant
- **Standard Lengths:** 10, 25, and 50 ft. [3.1, 7.6 and 15.2 m]
- **Connecting Plug:** 9/16" [14.29 mm] nominal diameter with gold-plated connector pins

Transmitter

Power Requirement: 24 VAC (22.8 to 26.4 under load) @16V-A

Connector Receptacle Pins and PCB Connections: Gold-plated receptacle pins, PCB interconnects, PCB edge fingers, and test points

User Interface: 2 line x16-character backlit LCD display and 4 button interface

B.A.S. Connectivity Options
- **All Transmitters:** Three field selectable (0-5/0-10 VDC or 4-20mA), scalable and isolated analog output signals (AO1=airflow, AO2=temperature or alarm, AO3=Not Used).
- **GTA108e Transmitter:** No additional connectivity to B.A.S.
- **GTC108e Transmitter:** One additional field selectable (BACnet MS/TP or Modbus RTU) and isolated RS-485 network connection - Individual sensor node airflow rates and temperatures are available via the network
- **GTM108e Transmitter:** One additional isolated Ethernet (simultaneously supported BACnet Ethernet or BACnet IP, Modbus TCP and TCP/IP) network connection - Individual sensor node airflow rates and temperatures are available via the network
- **GTF108e Transmitter:** One additional isolated Lonworks Free Topology network connection
- **GTU108e Transmitter:** One additional USB connection for thumb drive data-logging of sensor node airflow rates and temperatures

Airflow Alarm
- **Type:** Low and/or high user defined setpoint alarm
- **Tolerance:** User defined % of setpoint
- **Delay:** User defined
- **Zero Disable:** Alarm can be disabled when the airflow rate falls below the low limit cutoff value (unoccupied periods)
- **Reset Method:** Manual or automatic
- **Visual Indication:** Yes, LCD display
- **Network Indication:** Yes (GTM108e and GTC108e only)
- **Analog Signal Indication:** Yes, on AO2 assignment

Fan Alarm
- **Type:** Minimum airflow, % deviation from median airflow, or % deviation from maximum airflow stored in memory
- **Tolerance:** User defined % of setpoint
- **Delay:** User defined
- **Zero Disable:** Alarm can be disabled when the airflow rate falls below the low limit cutoff value (unoccupied periods)
- **Reset Method:** Manual or automatic
- **Visual Indication:** Yes, LCD display
- **Network Indication:** Yes (GTM108e and GTC108e only)
- **Analog Signal Indication:** Yes, on AO2 assignment

System Status Alarm
- **Type:** Sensor diagnostic system trouble indication
- **Visual Indication:** Yes, LCD display
- **Network Indication:** Yes
- **Analog Signal Indication:** Yes, on AO2 assignment

***EB-Link* Bluetooth® low energy Interface for Android® and iPhone®:** Download individual sensor node airflow/temperature data, settings and diagnostics.[2]

[1] Installed airflow accuracy is the actual system accuracy expected and includes sampling uncertainty of the sensor probes.

[2] Order with the /NR option when RF devices are not permitted.

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2641001WD11A1C



Model 264

Low Differential Pressure Transducer

Features

- Industry standard for very low differential pressure
- ±0.25%, ±0.4%, ±1% FS accuracy
- 3 year unconditional warranty
- Up to 10 PSI overpressure (range dependent)
- Installation time minimized w/ mounting options
- Reverse wiring protection
- Internal regulation permits use with unregulated DC power supplies
- Fire retardant case (UL 94 V-0 approved)
- CE & RoHS compliant

Applications

- HVAC/R systems
- Room pressurization for critical environments
- Energy management systems
- Variable air volume and fan control (VAV)
- Environmental pollution control
- Lab & fume hood control

With millions of sensors installed world wide, Setra's 264 is the "standard" for low differential pressure measurement in HVAC building automation. The 264 very low differential pressure transducer uses a dead-ended stainless steel welded capacitive sensing element that requires minimal amplification and delivers excellent accuracy and longterm stability in critical installations. The 264 has a 3 year, unconditional warranty, giving the end-user peace of mind well beyond the initial commissioning phase and guarantees performance well after the BAS warranty. The 264 utilizes a robust design that offers brass barbed fittings, and an optional conduit cover for easy and consistent installation.

The industry standard

The 264 has been a consistent and trusted HVAC sensor for over two decades. The reputation of reliability and quality with exceptional delivery time has helped the 264 remain the trusted choice for any low differential pressure applications.

Convenient installation

The 264 is available in both a wall and conduit versions providing the installer with flexible mounting options. The base mount allows the sensor to be installed anywhere, allowing for a simple installation.

The Setra sensor

The core technology of the 264 is the all stainless steel capacitive sensing element. Setra designs and manufactures all of their sensing elements resulting in full control over the process and quality of every single sensor. The welded dead-ended capacitive sensors requires minimal amplification and delivers excellent accuracy and longterm stability. Setra's technology has been used in over 8 million installations and has the highest field acceptance rate in the industry.

3 YEAR WARRANTY

USA Made

RoHS

CE

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Specifications

Performance data

Accuracy RSS[1] (at constant temp)	±1.0% FS (standard); ±0.4% FS, ±0.25% FS (optional)
Non-linearity, BFSL	±0.96% FS (standard); ±0.38% FS, ±0.22% FS (optional)
Hysteresis	0.10% FS

Thermal effects[2]

Compensated range °F (°C)	0 to +150 (-18 to +65)
Zero shift %FS/100°F(50°C)	±0.033 (±0.06)
Span shift %FS/100°F(50°C)	±0.033 (±0.06)
Max. line pressure	10 PSI
Overpressure	Up to 10 PSI (range dependent)
Long term stability	0.5% FS/YR

Environmental data

Operating temperature °F (°C)[3]	0 to +175 (-18 to +79)
Storage temperature °F (°C)	-65 to +250 (-54 to +121)

Position effect[4]

Range	Zero offset (%FS/G)
0 to 1" W.C.	2.3
0 to 0.25" W.C.	1
0 to 0.5" W.C.	0.5
0 to 1.0" W.C.	0.3
0 to 2.5" W.C.	0.2
0 to 10" W.C.	0.15

[1] RSS of Non-Linearity, Hysteresis, and Non-Repeatability.
[2] Units calibrated at nominal 70°F. Maximum thermal error computed from this datum.
[3] Operating temperature limits of the electronics only. Pressure media temperatures may be considerably higher.
[4] Unit is factory calibrated at 0g effect in the vertical position.
[5] Calibrated into a 50K ohm load, operable into a 5000 ohm load or greater.
[6] Zero output factory set to within ±50mV (±25 mV for optional accuracies).

Physical description

Case	Fire-retardant glass filled polyester (UL 94 V-O Approved)
Electrical Connection	Screw terminal strip
Mounting	4 screw holes on removable zinc plated steel base (designed for 2.75" snap track)
Pressure Fittings	3/16" O.D. barbed brass for 1/4" push on tubing
Zero and Span Adjustments	Accessible on top of case
Weight (approx.)	10 Ounces

Electrical data (voltage)

Circuit	3-Wire (Com, Out, Exc)
Excitation/output[5]	9 to 30 VDC / 0 to 5 VDC[6,7]
Output impedance	100 ohms
Bidirectional output at zero pressure	2.5 VDC[6,7]

Electrical data (current)

Circuit	2-wire
Output[8]	4 to 20 mA[9,10]
External load	0 to 800 ohms
Min. loop supply voltage (VDC)	9 + 0.02 x (resistance of receiver plus line)
Max. loop supply voltage (VDC)	30 + 0.004 x (resistance of receiver plus line)
Bidirectional output at zero pressure	12 mA[9,10]

Pressure media

Clean air or similar non-conducting gases.

[7] Span (Full Scale) output factory set to within ±50mV. (±25 mV for optional accuracies).
[8] Calibrated at factory with a 24 VDC loop supply voltage and a 250 ohm load.
[9] Zero output factory set to within ±0.16mA (±0.08 mA for optional accuracies).
[10] Span (Full Scale) output factory set to within ±0.16mA (±0.08 mA for optional accuracies).

Specifications subject to change without notice.

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Ordering information

Example part number: 26412R5WD11T1C; *Model 264, 0 to 2.5 in. W.C. Range, 4 to 20 mA Output, Terminal Strip Electrical Connection, and ±1% Accuracy:*

2	6	4	1	□	□	□	□	□	□	□	□	□	□
[1]				[2]						[3]		[4]	[5]

[1]

Model	
2641	Model 264

[2]

Unidirectional ranges	
0R1WB	0 to 0.1" W.C.
R25WD	0 to 0.25" W.C.
0R5WD	0 to 0.5" W.C.
001WD	0 to 1" W.C.
1R5WD	0 to 1.5" W.C.
2R5WD	0 to 2.5" W.C.
003WD	0 to 3" W.C.
005WD	0 to 5" W.C.
010WD	0 to 10" W.C.
015WD	0 to 15" W.C.
025WD	0 to 25" W.C.
050WD	0 to 50" W.C.
100WD	0 to 100" W.C.
025LD	0 to 25 Pa
050LD	0 to 50 Pa
100LD	0 to 100 Pa
250LD	0 to 250 Pa
500LD	0 to 500 Pa
10CLD	0 to 1000 Pa

[2]

Bidirectional ranges	
R05WB	±0.05" W.C.
0R1WB	±0.1" W.C.
R25WB	±0.25" W.C.
0R5WB	±0.5" W.C.
001WB	±1" W.C.
1R5WB	±1.5" W.C.
2R5WB	±2.5" W.C.
005WB	±5" W.C.
7R5WB	±7.5" W.C.
010WB	±10" W.C.
025WB	±25" W.C.
050WB	±50" W.C.
025LB	±25 Pa
050LB	±50 Pa
100LB	±100 Pa
250LB	±250 Pa
500LB	±500 Pa
10CLB	±1000 Pa

[3]

Output	
T1	4 to 20 mA
2D	0 to 5 VDC

[4]

Electrical termination	
T1	Terminal strip
A1	1/2" conduit enc.

[5]

Accuracy[1]	
C	±1% FS
E	±0.4% FS
F	±0.25% FS
G	±1% FS

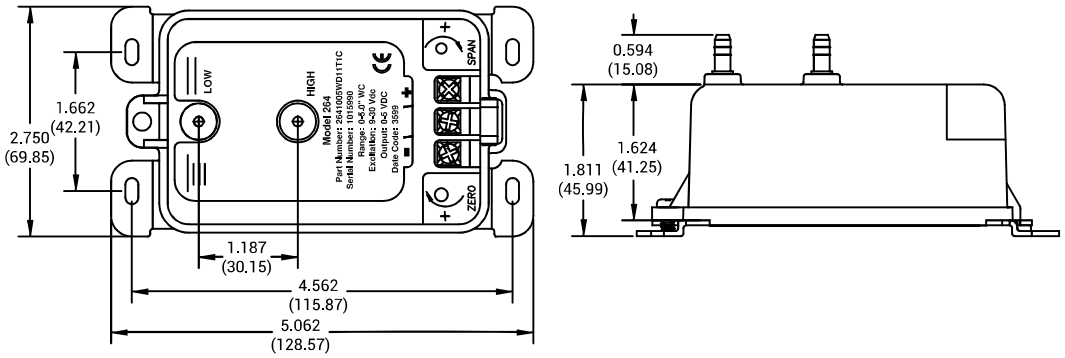
2641001WD11A1C

[1] Optional accuracy codes E, F, G, include calibration certificate.

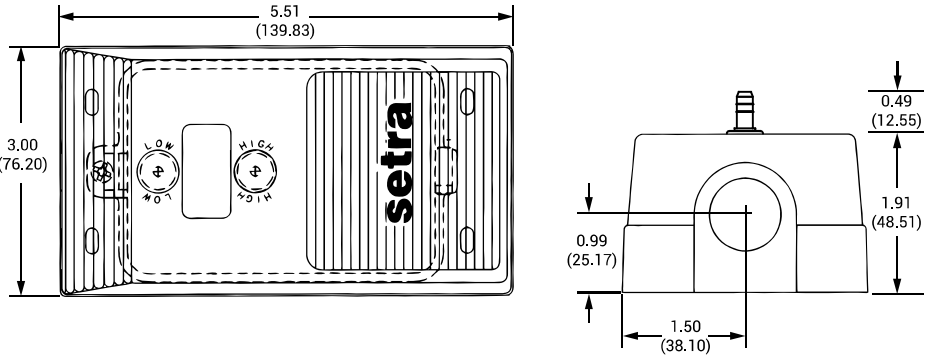
Contact Setra for versions not shown here.

Dimensions

Electrical termination "T1"



Electrical termination "A1"



inches (mm)

SSP 264 Rev. L 04/2018

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2301050PD3V11B

Model 230

True Wet-to-Wet Differential Pressure Transducer



The Model 230 is Setra's highest accuracy solution for monitoring differential pressure in wet-to-wet applications. Its single diaphragm design enables a true wet-to-wet differential pressure measurement with superior ±0.25% FS accuracy compared to competitive units which calculate differential pressure using two single point pressure sensors. The stainless steel capacitive sensor provides a highly accurate, linear analog output proportional to the pressure over a wide temperature range. The 230 is offered with an optional 3 or 5 valve machined brass manifold for ease of installation and maintenance.

Avoid Line Pressure w/ Single Diaphragm Sensor

Unlike the competition, the 230 is a true wet-to-wet sensor with a single diaphragm construction. The differential pressure range of a single diaphragm is not impacted by line pressure whereas dual differential pressure sensors require the individual sensors to measure gauge pressure, comparing the outputs to determine the differential pressure.

Increase the Sensors Response Time

The 230 utilizes an all stainless steel capacitive sensor which responds 20x faster than oil filled sensors and provides conditioned electronic circuitry with a highly accurate, linear analog output proportional to the pressure over a wide temperature range.

Save Time on Money & Installation

When time and project costs are a priority, the 230 is offered with an optional 3 or 5 valve machined brass manifold for ease of installation and maintenance. The brass body has no internal process connections, therefore eliminating the risk of internal leaks.

- **Single Diaphragm Design**
- **All Stainless Steel Capacitive Sensor**
- **3 or 5 Valve Manifold Assembly Options**

Model 230 Features:

- Only true wet-to-wet differential pressure transducer on the market
- ±0.25% FS Accuracy
- Available to 1 PSID with 350 PSI Line Pressure
- No Liquid Fill Diaphragm
- NEMA 4 Rated Housing
- Low Line Pressure Effect
- Fast Response Time
- Gas & Liquid Compatible
- CE & RoHS Compliant

Applications:

- Energy Management Systems
- Process Control Systems
- Flow Measurement of Various Gases or Liquids
- Liquid Level Measurement or Pressurized Vessels
- Pressure Drop Across Filters

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Model 230

True Wet-to-Wet Differential Pressure Transducer

PROOF PRESSURE

Unidirectional		
Pressure Range PSID	Proof Pressure High Side PSI	Proof Pressure Low Side PSI
0 to 1.0	50	2.5
0 to 2.0	50	5
0 to 5.0	100	12.5
0 to 10.0	100	25
0 to 25.0	350	62.5
0 to 30.0	350	75
0 to 50.0	350	125
0 to 100.0	350	250

Bidirectional		
Pressure Range PSID	Proof Pressure High Side PSI	Proof Pressure Low Side PSI
0 to ±0.5	50	1.25
0 to ±1.0	50	2.5
0 to ±2.5	100	6.35
0 to ±5.0	100	12.5
0 to ±10.0	200	25
0 to ±25.0	350	62.5
0 to ±50.0	350	125

GENERAL SPECIFICATIONS

Performance Data	
Accuracy RSS[1] (at constant temp)	±0.25% FS
Non-Linearity, BFSL	±0.20% FS
Hysteresis	0.10% FS
Non-Repeatability	0.05% FS
Thermal Effects[2]	
Compensated Range °F(°C)	+30 to +150 (-1 to +65)
Zero Shift %FS/100°F(%FS/50°C)	2.0 (1.8)
Span Shift %FS/100°F(%FS/50°C)	2.0 (1.8)
Line Pressure Effect	Zero shift ±0.004% FS/PSIG line pressure
Resolution	Infinite, limited only by output noise level (0.02%FS)
Static Acceleration Effect	2%FS/g (most sensitive axis)
Natural Frequency	500 Hz (gaseous media)
Warm-up Shift	±0.1% FS total
Response Time	30 to 50 milliseconds
Long Term Stability	0.5%FS/1 YR
Maximum Line Pressure	350 PSIG
Environmental Data	
Operating[3] Temperature °F (°C)	0 to +175 (-18 to +80)
Storage Temperature °F (°C)	-65 to +250 (-54 to +121)
Vibration	5 g from 5 Hz to 500 Hz
Acceleration	10g
Shock	50g
Pressure Media	
Model 230	Gases or liquids compatible with 17-4 PH Stainless Steel, 300 Series Viton O-Rings. Note: Hydrogen not recommended for use with 17-4 PH stainless steel. Optional Buna-N O'rings are recommended for hydrocarbon applications.
3 & 5 Valve Manifold	Gases or liquids compatible with 360 brass, Copper 122, Acetal plug valves and Nitrile O-rings.

Physical Description (Model 230)	
Case	Stainless Steel/Aluminum
Electrical Connection	Barrier strip terminal block with conduit enclosure & 0.875 DIA conduit opening.
Pressure Fittings	1/4"-18 NPT internal
Weight (approx.)	14.4 oz
Sensor Cavity Volume	0.27 in³ Positive Port, 0.08 in³ Negative Port
(With 1/4"NPT external fittings installed-does not include cavity volume of 1/4"NPT external fittings.)	
Physical Description (3-Valve Manifold Assembly)[4]	
Manifold Block	Brass
Valves (3)[5]	V1 for Connection to + port V2 for Connection to - port V3 for Equalizing Pressure
Valve Type	90° On/Off
Process Connections	1/4"-18 NPT Internal Thread
Dimensions	7.05"W x 6.25"H x 2.16"D
Weight	<2.5 lbs.
Physical Description (5-Valve Manifold Assembly)[6]	
Manifold Block	Brass
Valve (5)[5]	V1 for Connection to ± Port V2 for Connection to – Port V3 for Equalizing Pressure V4 & V5 for Connection to External Gauge or Alternate Plumbing Configuration
Process Connection	1/4"-18 NPT Internal Thread
Dimensions	7.05"W x 6.25"H x 2.16"D
Weight	<3.8 lbs.
Electrical Data (Voltage)	
Circuit	3-Wire (Exc, Out, Com)
Excitation	9 to 30 VDC for 0-5 VDC Output, 13 to 30 VDC for 0-10 VDC Output
Output[7]	0 to 5 VDC[8], 0 to 10 VDC[8]
Output Impedance	100 ohms
Electrical Data (Current)	
Circuit	2-Wire
Output[9]	4 to 20mA[10]
External Load	0 to 1000 ohms
Minimum supply voltage (VDC)	9+ 0.02 x (Resistance of receiver plus line).
Maximum supply voltage (VDC)	30+ 0.004 x (Resistance of receiver plus line).

[1] RSS of Non-Linearity, Hysteresis, and Non-Repeatability.
[2] Units calibrated at nominal 70°F. Maximum thermal error computed from this datum.
[3] Operating temperature limits of the electronics only. Pressure media temperatures may be considerably higher.
[4] Order assembled with the Model 230 (Code 3V) or separately as Option 891.
[5] Refer to drawings
[6] Order assembled with the Model 230 (Code 5V)
[7] Calibrated into a 50K ohm load, operable into a 5000 ohm load or greater.
[8] Zero output factory set to within ±25mV (for 5 VDC output) or ±50mV (for 10 VDC output)
Span (Full Scale) output factory set to ±25 mV (for 5 VDC output) or ± 50 mV (for 10 VDC output
[9] Calibrated at factory with a 24 VDC loop supply voltage and a 250 ohm load.
[10] Zero output factory set to within ±0.16mA. Span factory set to within ±0.16 mA

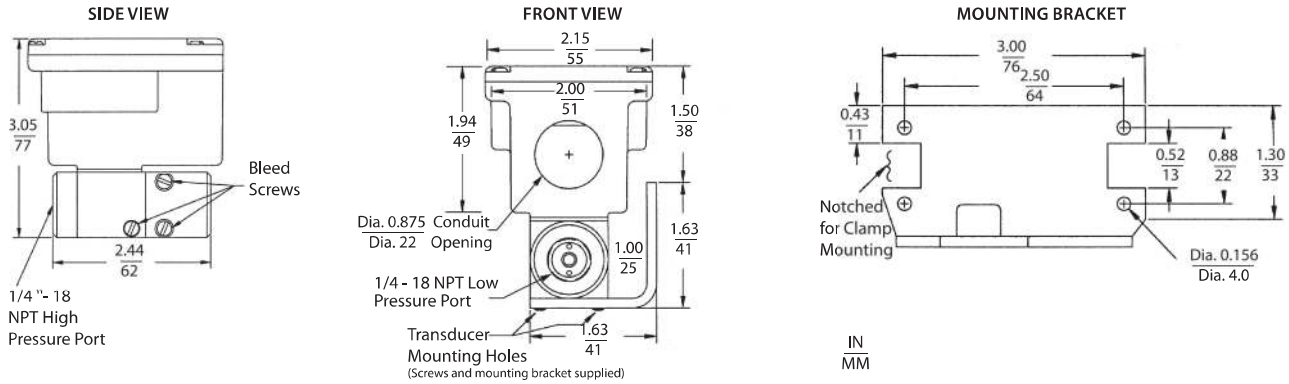
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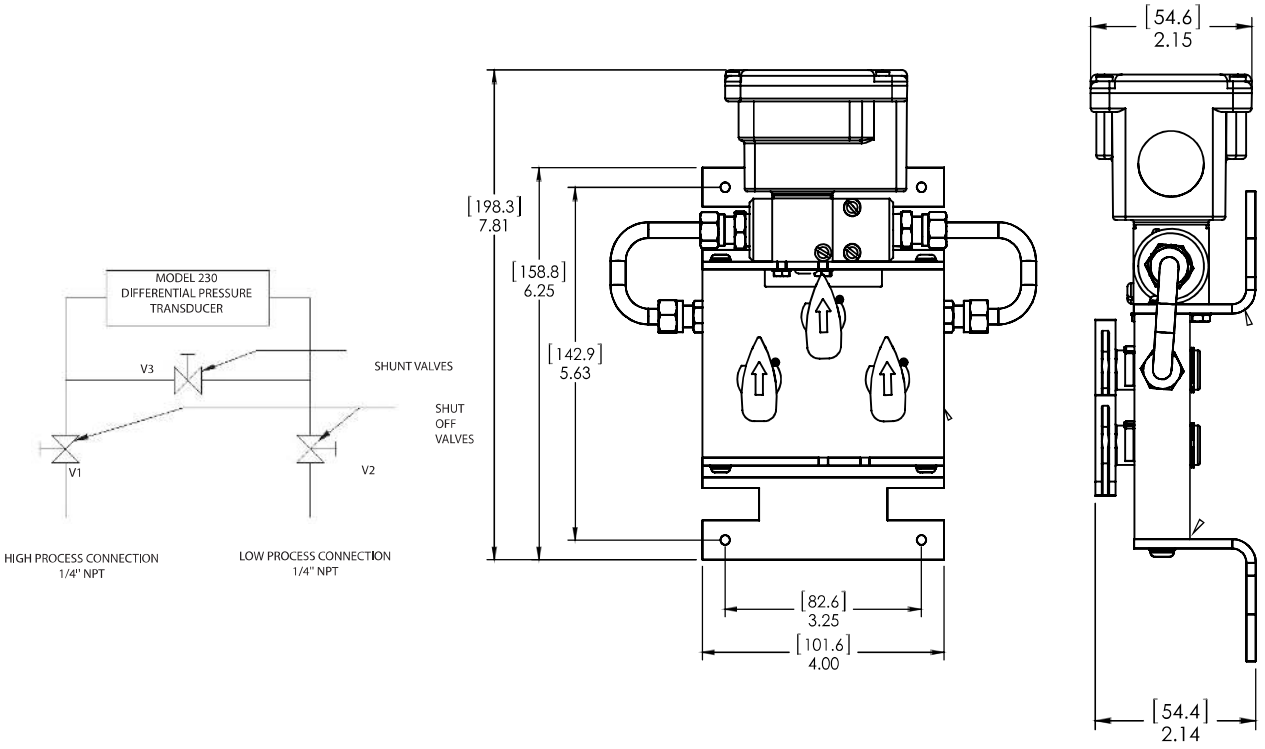
Model 230

True Wet-to-Wet Differential Pressure Transducer

MODEL 230 DIMENSIONS



DIMENSIONS W/ 3-VALVE MANIFOLD ASSEMBLY



For differential pressure measurements at high line pressure (350 PSIG max), it is recommended that the pressure sensor be installed with a valve in each line, plus a shunt valve across the high and low (reference) pressure ports as shown.

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Model 230

True Wet-to-Wet Differential Pressure Transducer

ORDERING INFORMATION

2	3	0	1	–						–			–			–		–	

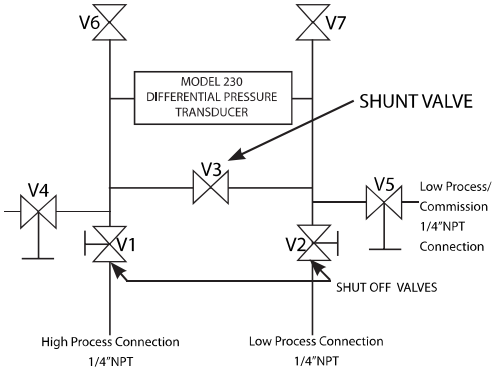
Model	Range				Pressure Fitting		Output		Bleed Screw Seals			Optional	
2301 = 230	Unidirectional		Bidirectional		2F	1/4" NPT (F)	11	4-20 mA	Std.	B	Viton	C	Calibration Certificate
	001PD	0 to 1 PSID	0R5PB	±0.5 PSID	3V	3-Valve Manifold	2D	0.05-5.05 VDC	Opt.	A	Buna-N		
	002PD	0 to 2 PSID	001PB	±1 PSID	5V	5-Valve Manifold	2E	0.05-10.05 VDC					
	005PD	0 to 5 PSID	2R5PB	±2.5 PSID									
	010PD	0 to 10 PSID	005PB	±5 PSID									
	025PD	0 to 25 PSID	010PB	±10 PSID									
	030PD	0 to 30 PSID	025PB	±25 PSID									
	050PD	0 to 50 PSID	050PB	±50 PSID									
	100PD	0 to 100 PSID											

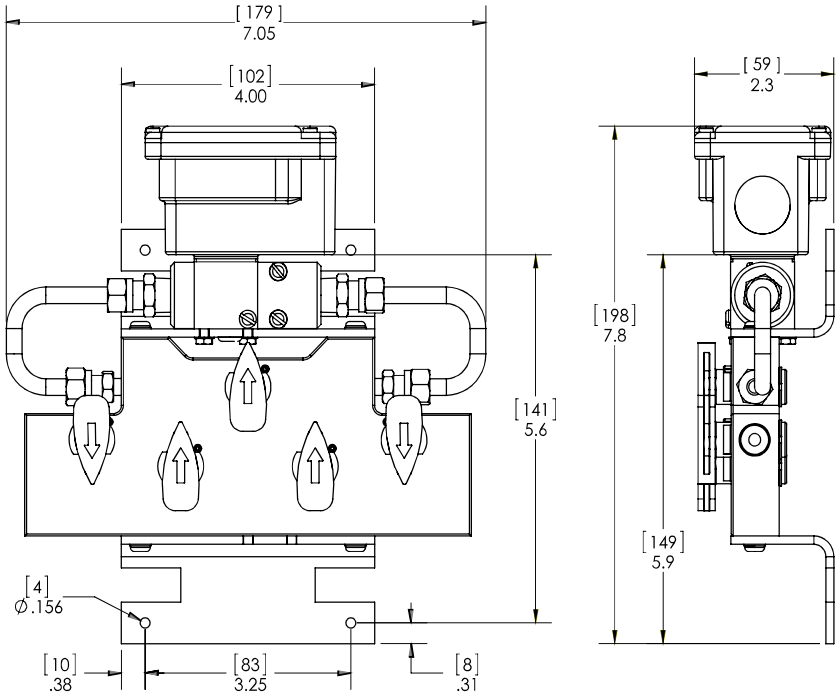
2301050PD3V11B

Please contact factory for versions not shown.

Ordering Example: 2301005PD2F11B = Model 230 0 to 5 PSID unidirectional, 1/4-18 NPT Ext. fitting, 4 to 20 mA Output, and Viton/Silicone Seals.
2301005PD3V11B = Model 230, 0 to 5 PSID unidirectional, 3-Valve Manifold, 4 to 20 mA, Output, and Viton/Silicone Seals (Assembled w/3- Valve Manifold).

DIMENSIONS W/ 5-VALVE MANIFOLD ASSEMBLY





For differential pressure measurements at high line pressure (350 PSIG max), it is recommended that the pressure sensor be installed with a valve in each line, plus a shunt valve across the high and low (reference) pressure ports as shown.
Note: V6 and V7 bleed valves are not required when used with a Setra Model 230. Use the bleed screws on Model 230 to bleed the lines of air.

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RIBU1C

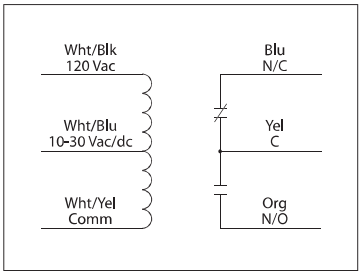
RIB Building Automation

Functional Devices, Inc. | 101 Commerce Drive, Sharpsville, IN 46068
Email: sales@functionaldevices.com | **Website:** www.functionaldevices.com
Toll Free: (800) 888-5538 | **Office:** (765) 883-5538 | **Fax:** (765) 883-7505

10 AMP PILOT CONTROL RELAYS

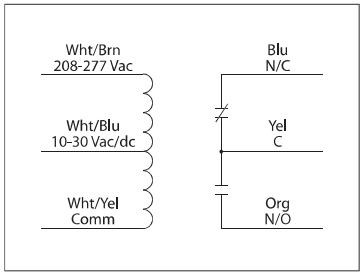
RIBU1C

Pilot Relay, 10 Amp SPDT, 10-30 Vac/dc/
120 Vac Coil, NEMA 1 Housing



RIBH1C

Pilot Relay, 10 Amp SPDT, 10-30 Vac/dc/
208-277 Vac Coil, NEMA 1 Housing









RIBU1C-RD
RIBH1C-RD
• Red housing



RIBU1C-N4
RIBH1C-N4
• NEMA 4X housing

SPECIFICATIONS

 # Relays & Contact Type: One (1) SPDT Continuous Duty Coil
Expected Relay Life: 10 million cycles minimum mechanical
Operating Temperature: -30 to 140° F
Humidity Range: 5 to 95% (noncondensing)
Operate Time: 20ms
Relay Status: LED On = Activated
Dimensions: 1.70"H x 2.80"W x 1.50"D with 0.50" NPT nipple
Housing Detail: See **Housing A** in housing guide for dimensions
Origin: Made of US and non-US parts
Wires: 16˝, 600V Rated
Approvals: UL Listed, C-UL, CE, RoHS (All models)
UL916 (RIBU1C, RIBH1C)
UL864, California State Fire Marshal (RIBU1C-RD, RIBH1C-RD)
UL508 (RIBU1C-N4, RIBH1C-N4)
Housing Rating: UL Accepted for Use in Plenum, NEMA 1
Gold Flash: Yes
Override Switch: No

Contact Ratings:
10 Amp Resistive @ 277 Vac
10 Amp Resistive @ 28 Vdc
480 VA Pilot Duty @ 240-277 Vac
480 VA Ballast @ 277 Vac
Not rated for Electronic Ballast
600 Watt Tungsten @ 120 Vac (N/O)
240 Watt Tungsten @ 120 Vac (N/C)
1/3 HP @ 120-240 Vac (N/O)
1/6 HP @ 120-240 Vac (N/C)
1/4 HP @ 277 Vac (N/O)
1/8 HP @ 277 Vac (N/C)

Note:
Order packs by adding "-5PACK", "-10PACK", "-25PACK", or "-100PACK" to end of model number.

Coil Current:
33 mA @ 10 Vac
35 mA @ 12 Vac
46 mA @ 24 Vac
55 mA @ 30 Vac
28 mA @ 120 Vac (RIBU1C)
39 mA @ 208-277 Vac (RIBH1C)
13 mA @ 10 Vdc
15 mA @ 12 Vdc
18 mA @ 24 Vdc
20 mA @ 30 Vdc

Coil Voltage Input:
10-30 Vac/dc ; 120 Vac ; 50-60 Hz (RIBU1C)
10-30 Vac/dc ; 208-277 Vac ; 50-60 Hz (RIBH1C)
Drop Out = 2.1 Vac / 2.8 Vdc
Pull In = 9 Vac / 10 Vdc

RH Series Compact Power Relays

RH2B-UL-AC24VKIT
RH3B-ULAC24V-KIT

Key features

- SPDT through 4PDT, 10A contacts
- Compact power type relays
- Miniature power relays with a large capacity
- 10A contact capacity
- Compact size saves space



Part Number Selection

Contact	Model	Part Number: Blade Terminal	Part Number: PCB Terminal	Coil Voltage Code (Standard Stock in bold)
SPDT 	Standard	RH1B-U ☐	RH1V2-U ☐	AC6V, AC12V, **AC24V**, AC110V, **AC120V**, AC220V, **AC240V** DC6V, **DC12V**, **DC24V**, DC48V, DC110V
	With Indicator	RH1B-UL ☐	—	
	With Check Button	RH1B-UC ☐	—	
	With Indicator and Check Button	RH1B-ULC ☐	—	
	Top Bracket Mounting	RH1B-UT ☐	—	
	With Diode (DC coil only)	RH1B-UD ☐	RH1V2-UD ☐	DC6V, **DC12V**, **DC24V**, DC48V, DC110V
	With Indicator and Diode (DC coil only)	RH1B-ULD ☐	—	**DC12V**, **DC24V**, DC48V, DC110V
DPDT 	Standard	RH2B-U ☐	RH2V2-U ☐	AC6V, AC12V, **AC24V**, **AC110-120V**, **AC220-240V** DC6V, **DC12V**, **DC24V**, DC48V, DC100-110V
	With Indicator	RH2B-UL ☐	RH2V2-UL ☐	
	With Check Button	RH2B-UC ☐	—	
	With Indicator and Check Button	RH2B-ULC ☐	—	
	Top Bracket Mounting	RH2B-UT ☐	—	
	With Diode (DC coil only)	RH2B-UD ☐	RH2V2-UD ☐	DC6V, **DC12V**, **DC24V**, DC48V, DC100-110V
	With Indicator and Diode (DC coil only)	RH2B-ULD ☐	RH2V2-ULD ☐	
3PDT 	Standard	RH3B-U ☐	RH3V2-U ☐	AC6V, AC12V, **AC24V**, AC110V, **AC120V**, AC220V, **AC240V** DC6V, **DC12V**, **DC24V**, DC48V, DC110V
	With Indicator	RH3B-UL ☐	RH3V2-UL ☐	
	With Check Button	RH3B-UC ☐	—	
	With Indicator and Check Button	RH3B-ULC ☐	—	
	Top Bracket Mounting	RH3B-UT ☐	—	
	With Diode (DC coil only)	RH3B-UD ☐	—	DC6V, DC12V, DC24V, DC48V, DC110V
	With Indicator and Diode (DC coil only)	RH3B-ULD ☐	—	
4PDT 	Standard	RH4B-U ☐	RH4V2-U ☐	AC6V, AC12V, **AC24V**, AC110V, **AC120V**, AC220V, **AC240V** DC6V, **DC12V**, **DC24V**, DC48V, DC110V
	With Indicator	RH4B-UL ☐	RH4V2-UL ☐	
	With Check Button	RH4B-UC ☐	—	
	With Indicator and Check Button	RH4B-ULC ☐	—	
	Top Bracket Mounting	RH4B-UT ☐	—	
	With Diode (DC coil only)	RH4B-UD ☐	RH4V2-UD ☐	DC6V, DC12V, DC24V, DC48V, DC110V
	With Indicator and Diode (DC coil only)	RH4B-ULD ☐	—	

PCB terminal relays are designed to mount directly to a circuit board without any socket.

Ordering Information
When ordering, specify the Part No. and coil voltage code:
(example) **RH3B-U** (Part No.) **AC120V** (Coil Voltage Code)

Sockets (for Blade Terminal Models)

Relays	Standard DIN Rail Mount [1]	Finger-safe DIN Rail Mount [1]	Through Panel Mount	PCB Mount
RH1B	SH1B-05	SH1B-05C	SH1B-51	SH1B-62
RH2B	SH2B-05	SH2B-05C	SH2B-51	SH2B-62
RH3B	SH3B-05	SH3B-05C	SH3B-51	SH3B-62
RH4B	SH4B-05	SH4B-05C	SH4B-51	SH4B-62
				

1. DIN Rail mount socket comes with two horseshoe clips. Do not use unless you plan to insert pullover wire spring. Replacement horseshoe clip part number is Y778-011.

Hold Down Springs & Clips

Appearance	Item	Relay	For DIN Mount Socket	For Through Panel & PCB Mount Socket
	Pullover Wire Spring	RH1B	SY2S-02F1 [2]	SY4S-51F1
		RH2B	SY4S-02F1 [2]	
		RH3B	SH3B-05F1 [2]	
		RH4B	SH4B-02F1 [2]	
	Leaf Spring (side latch)	RH1B, RH2B, RH3B, RH4B	SFA-202 [3]	SFA-302 [3]
	Leaf Spring (top latch)	RH1B, RH2B, RH3B, RH4B	SFA-101 [3]	SFA-301 [3]

2. Must use horseshoe clip when mounting in DIN mount socket. Replacement horseshoe clip part number is Y778-011.
3. Two required per relay.

AC Coil Ratings

Voltage (V)	Rated Current (mA) ±15% at 20°C								Coil Resistance (Ω) ±10% at 20°C				Operation Characteristics (against rated values at 20°C)		
	AC 50Hz				AC 60Hz										
	SPDT	DPDT	3PDT	4PDT	SPDT	DPDT	3PDT	4PDT	SPDT	DPDT	3PDT	4PDT	Max. Continuous Applied Voltage	Pickup Voltage	Dropout Voltage
6	170	240	330	387	150	200	280	330	330	9.4	6.4	5.4	110%	80% maximum	30% minimum
12	86	121	165	196	75	100	140	165	165	39.3	25.3	21.2			
24	42	60.5	81	98	37	50	70	83	83	153	103	84.5			
110	9.6	—	18.1	21.6	8.4	—	15.5	18.2	18.2	—	2,200	1,800			
110-120	—	9.4-10.8	—	—	—	8.0-9.2	—	—	—	—	—	—			
120	8.6	—	16.4	19.5	7.5	—	14.2	16.5	16.5	—	10,800	7,360			
220	4.7	—	8.8	10.7	4.1	—	7.7	9.1	9.1	—	10,800	7,360			
220-240	—	4.7-5.4	—	—	—	4.0-4.6	—		—	18,820	—	—			
240	4.9	—	8.2	9.8	4.3	—	7.1	8.3	8.3	—	12,100	9,120			

DC Coil Ratings

Voltage (V)	Rated Current (mA) ±15% at 20°C				Coil Resistance (Ω) ±10% at 20°C				Operation Characteristics (against rated values at 20°C)		
	SPDT	DPDT	3PDT	4PDT	SPDT	DPDT	3PDT	4PDT	Max. Continuous Applied Voltage	Pickup Voltage	Dropout Voltage
6	128	150	240	250	47	40	25	24	110%	80% maximum	10% minimum
12	64	75	120	125	188	160	100	96			
24	32	36.9	60	62	750	650	400	388			
48	18	18.5	30	31	2,660	2,600	1,600	1,550			
100-110	—	8.2-9.0	—	—	—	12,250	—	—			
110	8	—	12.8	15	13,800	—	8,600	7,340			

Standard coil voltages are in **BOLD**.

Contact Ratings

Model	Continuous Current	Maximum Contact Capacity: Allowable Contact Power: Resistive Load	Allowable Contact Power: Inductive Load	Rated Load: Voltage (V)	Rated Load: Res. Load	Rated Load: Ind. Load
SPDT	10A	1540VA 300W	990VA 210W	110 AC	10A	7A
				220 AC	7A	4.5A
				30 DC	10A	7A
DPDT 3PDT 4PDT	10A	1650VA 300W	1100VA 225W	110 AC	10A	7.5A
				220 AC	7.5A	5A
				30 DC	10A	7.5A

Note: Inductive load for the rated load — cos ø = 0.3, L/R = 7 ms

TÜV Ratings

Voltage	RH1	RH2	RH3	RH4
240V AC	10A	10A	7.5A	7.5A
30V DC	10A	10A	10A	10A

AC: cos ø = 1.0, DC: L/R = 0 ms

UL Ratings

Voltage	Resistive: RH1 RH2	Resistive: RH3	Resistive: RH4	General Use: RH1 RH2	General Use: RH3	General Use: RH4	Horsepower Rating: RH1 RH2	Horsepower Rating: RH3	Horsepower Rating: RH4
240V AC	10A	7.5A	7.5A	7A	6.5A	5A	1/3 HP	1/3 HP	—
120V AC	—	10A	10A	—	7.5A	7.5A	1/6 HP	1/6 HP	—
30V DC	10A	10A	—	7A	—	—	—	—	—
28V DC	—	—	10A	—	—	—	—	—	—

CSA Ratings

Voltage	Resistive: RH1	Resistive: RH2	Resistive: RH3	Resistive: RH4	General Use: RH1	General Use: RH2	General Use: RH3	General Use: RH4	Horse-power Rating: RH1, 2, 3
240V AC	10A	10A	—	7.5A	7A	7A	7A	5A	1/3 HP
120V AC	10A	10A	10A	10A	7.5A	7.5A	—	7.5A	1/6 HP
30V DC	10A	10A	10A	10A	7A	7.5A	—	—	—

Socket Specifications

	Sockets	Terminal	Electrical Rating	Wire Size	Torque
DIN Rail Mount Sockets	SH1B-05	(Coil) M3 screws (contact) M3.5 screws with captive wire clamp	250V, 10A	Maximum up to 2–#12AWG	5.5 - 9 in•lbs 9 - 11.5 in•lbs
	SH2B-05 SH3B-05 SH4B-05	M3.5 screws with captive wire clamp	300V, 10A	Maximum up to 2–#12AWG	9 - 11.5 in•lbs
Finger-safe DIN Rail Mount	SH1B-05C	(coil) M3 screws (contact) M3.5 screws with captive wire clamp, fingersafe	250V, 10A	Maximum up to 2–#12AWG	5.5 - 9 in•lbs 9 - 11.5 in•lbs
	SH2B-05C SH3B-05C SH4B-05C	M3.5 screws with captive wire clamp, fingersafe	300V, 10A	Maximum up to 2–#12AWG	9 - 11.5 in•lbs
Through Panel Mount Socket	SH1B-51 SH2B-51 SH3B-51 SH4B-51	Solder	300V, 10A	—	—
PCB Mount Socket	SH1B-62	PCB mount	250V, 10A	—	—
	SH2B-62 SH3B-62 SH4B-62	PCB mount	300V, 10A	—	—

Accessories

Item	Appearance	Use with	Part No.	Remarks
Aluminum DIN Rail (1 meter length)		All DIN rail sockets	BNDN1000	The BNDN1000 is designed to accommodate DIN mount sockets. Made of durable extruded aluminum, the BNDN1000 measures 0.413 (10.5mm) in height and 1.37 (35mm) in width (DIN standard). Standard length is 39" (1,000mm).
DIN Rail End Stop		DIN rail	BNL5	9.1 mm wide.
Replacement Hold-Down Spring Anchor		DIN mount sockets and hold down springs.	Y778-011	For use on DIN rail mount socket when using pullover wire hold down spring. 2 pieces included with each socket.

Specifications

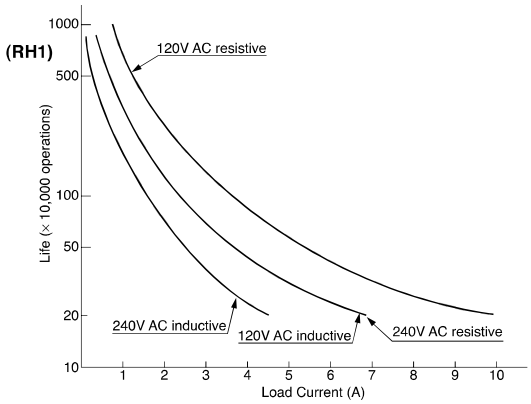
Contact Material		Silver cadmium oxide	
Contact Resistance [1]		50mΩ maximum	
Minimum Applicable Load		24V DC, 30 mA; 5V DC, 100 mA (reference value)	
Operating Time [2]	SPDT DPDT	20ms maximum	
	3PDT 4PDT	25ms maximum	
Release Time [2]	SPDT DPDT	20ms maximum	
	3PDT 4PDT	25ms maximum	
Power Consumption (approx.)	SPDT	AC: 1.1VA (50Hz), 1VA (60Hz)	DC: 0.8W
	DPDT	AC: 1.4VA (50Hz), 1.2VA (60Hz)	DC: 0.9W
	3PDT	AC: 2VA (50Hz), 1.7VA (60Hz)	DC: 1.5W
	4PDT	AC: 2.5VA (50Hz), 2VA (60Hz)	DC: 1.5W
Insulation Resistance		100MΩ minimum (500V DC megger)	
Dielectric Strength [3]	SPDT	Between live and dead parts: Between contact and coil: Between contacts of the same pole:	2,000V AC, 1 minute 2,000V AC, 1 minute 1,000V AC, 1 minute
	DPDT 3PDT 4PDT	Between live and dead parts: Between contact and coil: Between contacts of different poles: Between contacts of the same pole:	2,000V AC, 1 minute 2,000V AC, 1 minute 2,000V AC, 1 minute 1,000V AC, 1 minute
Operating Frequency		Electrical: Mechanical:	1,800 operations/hour maximum 18,000 operations/hour maximum
Vibration Resistance		Damage limits: Operating extremes:	10 to 55Hz, amplitude 0.5 mm 10 to 55Hz, amplitude 0.5 mm
Shock Resistance		Damage limits: Operating extremes:	1,000m/s² (100G) 200m/s² (20G - SPDT, DPDT) 100m/s² (10G - 3PDT, 4PDT)
Mechanical Life		50,000,000 operations minimum	
Electrical Life	DPDT	500,000 operations minimum (120V AC, 10A)	
	SPDT 3PDT 4PDT	200,000 operations minimum (120V AC, 10A)	
Operating Temperature [4]	SPDT DPDT 3PDT 4PDT	–25 to +70°C (no freezing)	
Operating Humidity		45 to 85% RH (no condensation)	
Weight (approx.)		SPDT: 24g, DPDT: 37g, 3PDT: 50g, 4PDT: 74g	

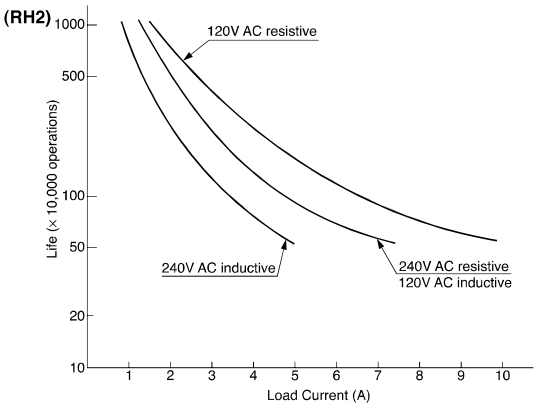
Note: Above values are initial values.
1. Measured using 5V DC, 1A voltage drop method
2. Measured at the rated voltage (at 20°C), excluding contact bouncing
   Release time of relays with diode: 40 ms maximum
3. Relays with indicator or diode: 1000V AC, 1 minute
4. For use under different temperature conditions, refer to Continuous Load Current vs. Operating Temperature Curve. The operating temperature range of relays with indicator or diode is –25 to +40°C.

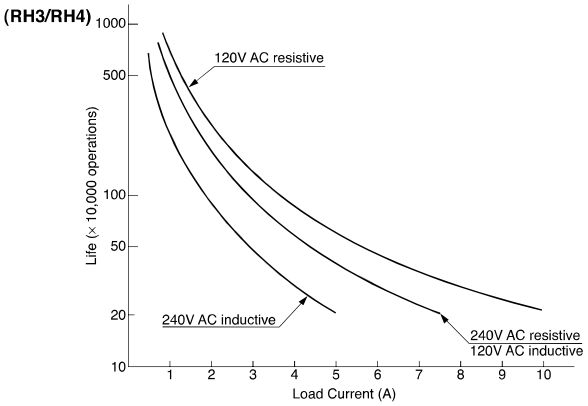
Characteristics (Reference Data)

Electrical Life Curves

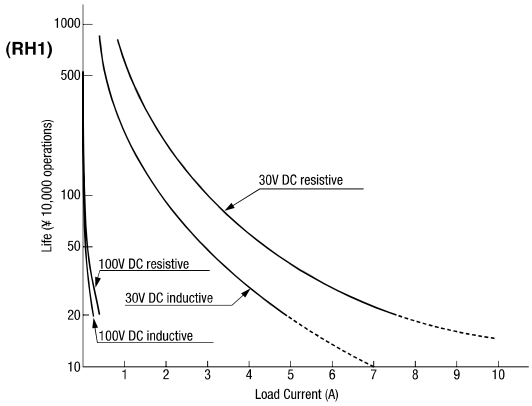
AC Load

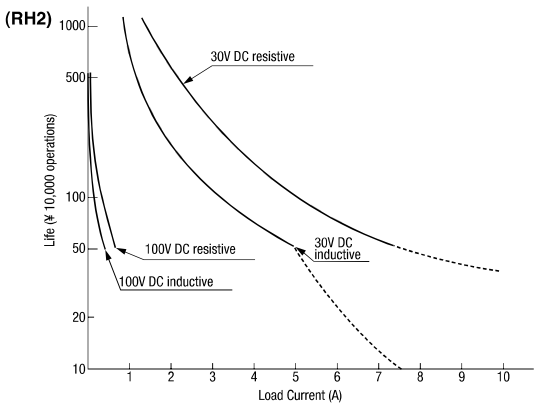


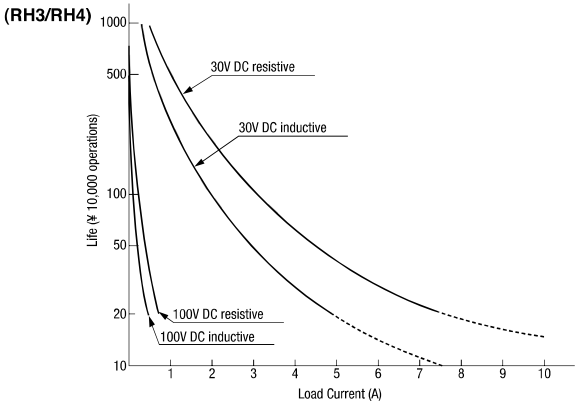




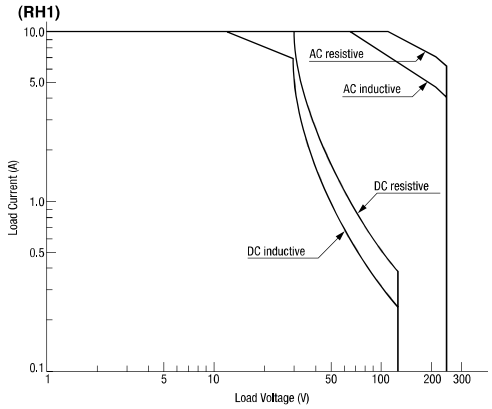
DC Load

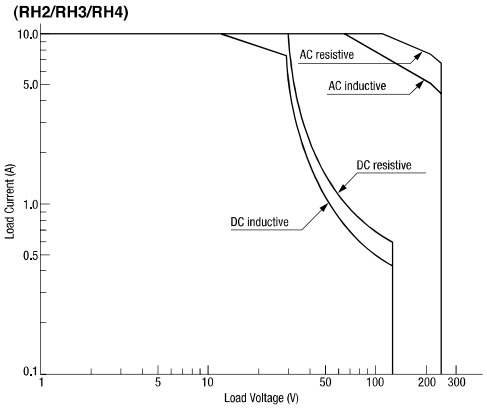






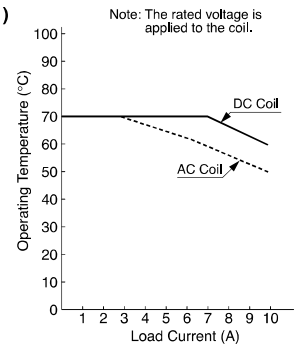
Maximum Switching Capacity



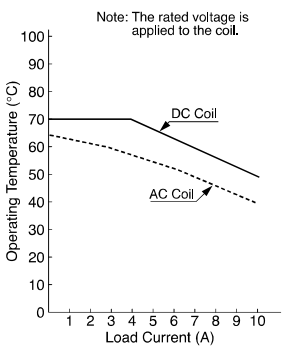


Continuous Load Current vs. Operating Temperature Curve (Basic Type, With Check Button, and Top Bracket Mounting Type)

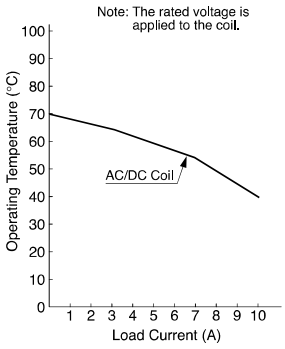
(RH1)



(RH2)

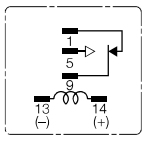
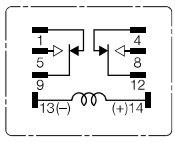
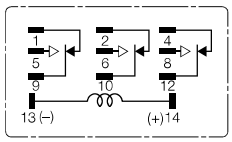
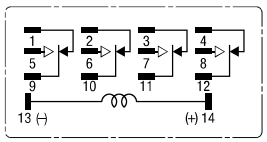
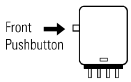


(RH3/RH4)

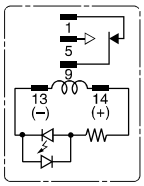
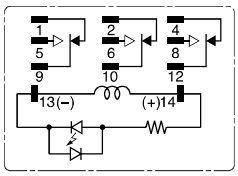
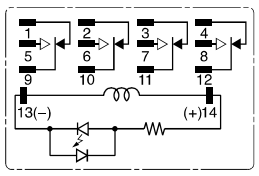
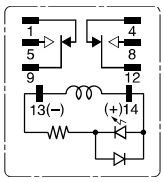
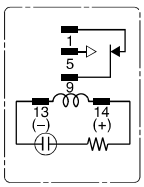
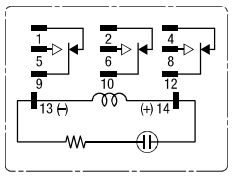
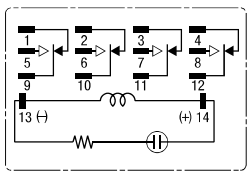
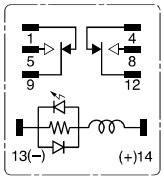


Internal Connection (View from Bottom)

Basic Type

SPDT	DPDT	3PDT	4PDT	With Check Button
				 Contacts can be operated by pressing the check button.

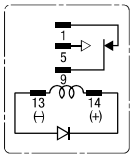
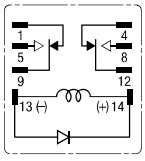
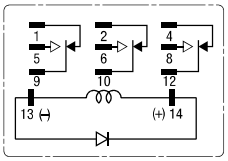
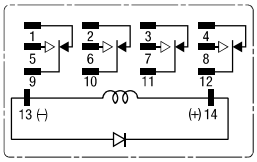
With Indicator (-L type)

	SPDT	3PDT	4PDT	DPDT
Below 100V AC/DC				
Below 24V AC/DC				
100V AC/DC and over				
24V AC/DC and over				

When the relay is energized, the indicator goes on.

- Relay coils less than 100V DC do not contain a protection diode (except DPDT).
- Relay coils below 100V use LED indicator, coils above 100V use neon lamp indicator.
- LED color of DPDT model is green

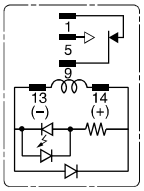
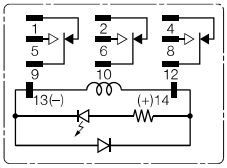
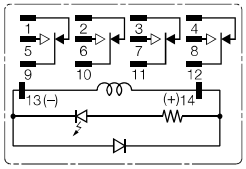
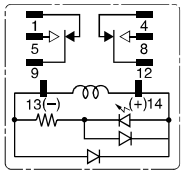
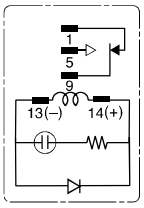
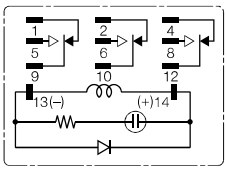
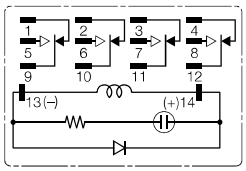
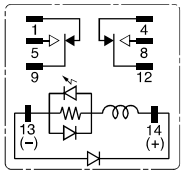
With Diode (-D type)

SPDT	DPDT	3PDT	4PDT
			

Contains a diode to absorb the back emf generated when the coil is de-energized. The release time is slightly longer. Available for DC coil only.

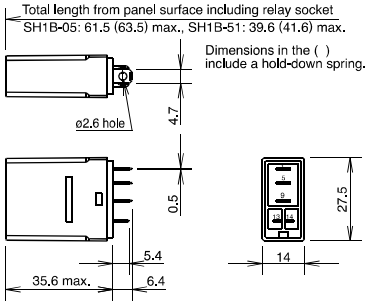
- Diode Characteristics
  Reverse withstand voltage: 1,000V
  Forward current: 1A

With Indicator LED & Diode (-LD type)

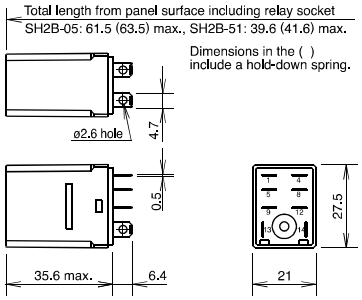
	SPDT	3PDT	4PDT		DPDT	
Below 100V DC				Below 24V AC/ DC		Contains an LED indicator and a surge absorber, and has the same height as the basic type. LED color of DPDT model is green.
100V DC and over				24V AC/ DC and over		

Dimensions (mm)

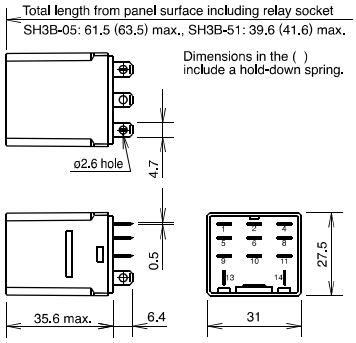
RH1B-U/RH1B-UL/RH1B-UD/RH1B-ULD



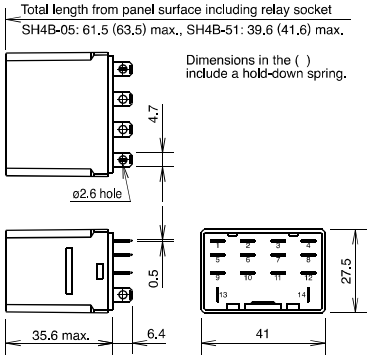
RH2B-U/RH2B-UL/RH2B-UD/RH2B-ULD



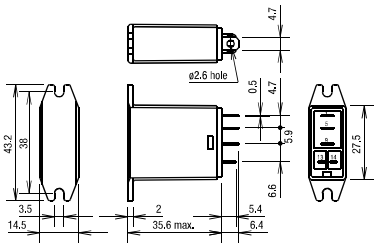
RH3B-U/RH3B-UL/RH3B-UD/RH3B-ULD



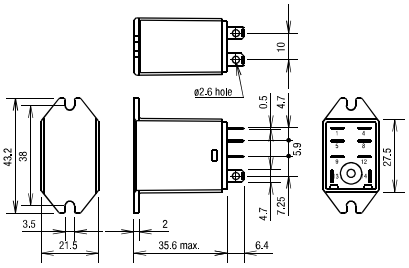
RH4B-U/RH4B-UL/RH4B-UD/RH4B-ULD



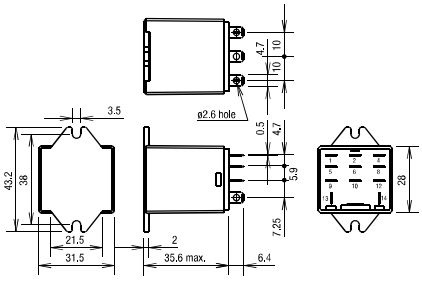
RH1B-UT



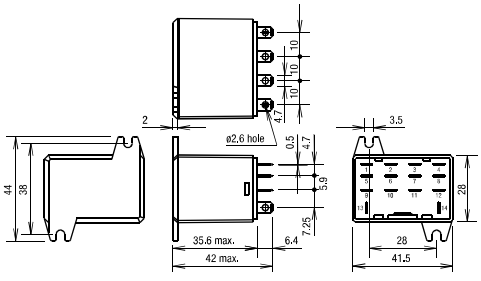
RH2B-UT



RH3B-UT

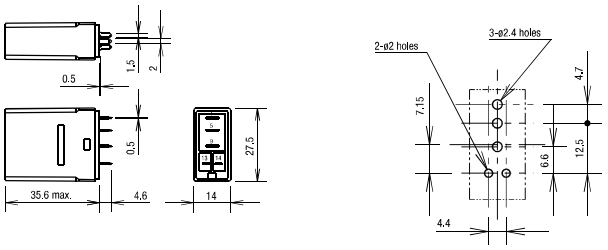


RH4B-UT

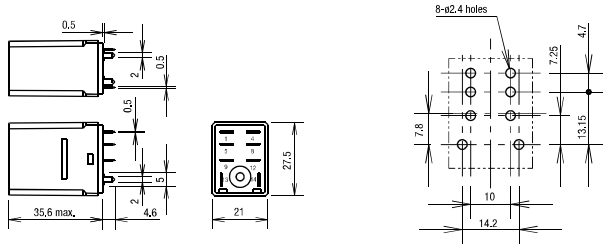


Dimensions con't (mm)

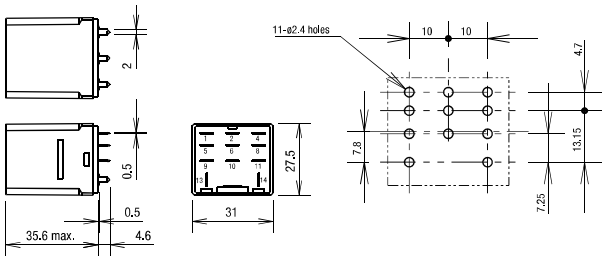
RH1V2-U/RH1V2-UD



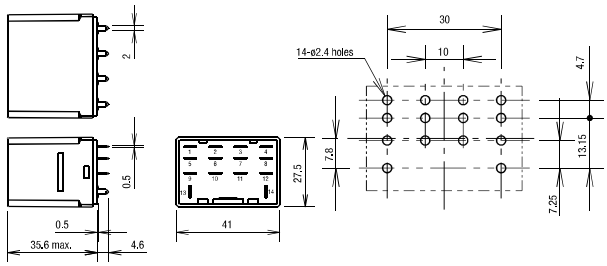
RH2V2-U/RH2V2-UL/RH2V2-UD



RH3V2-U/RH3V2-UL/RH3V2-D

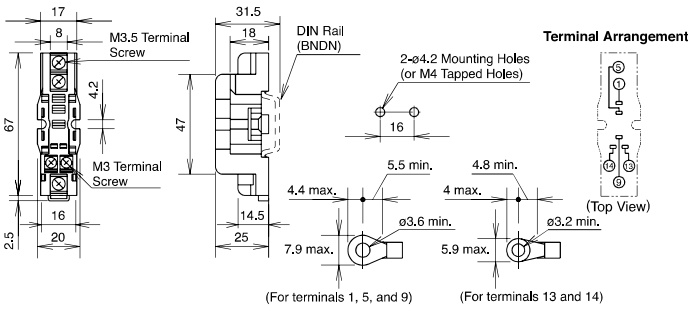


RH4V2-U/RH4V2-UL/RH4V2-UD

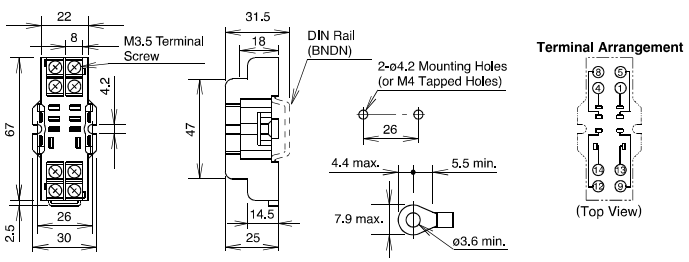


Standard DIN Rail Mount Sockets

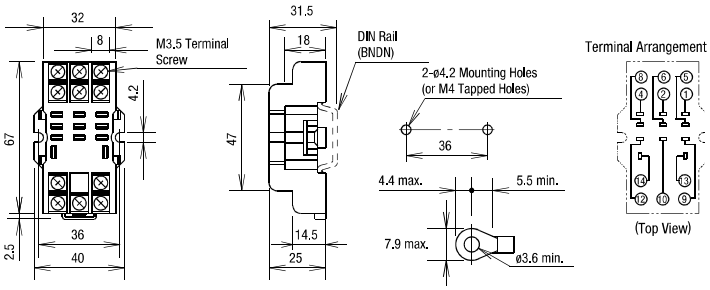
SH1B-05



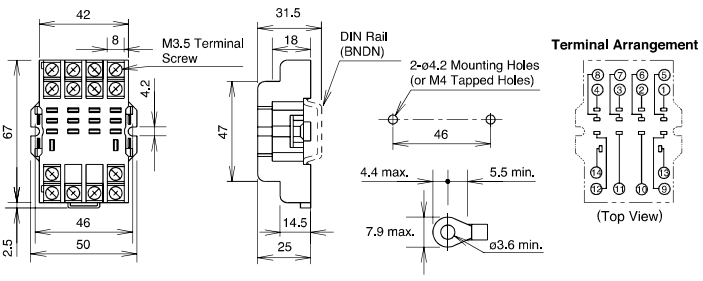
SH2B-05



SH3B-05



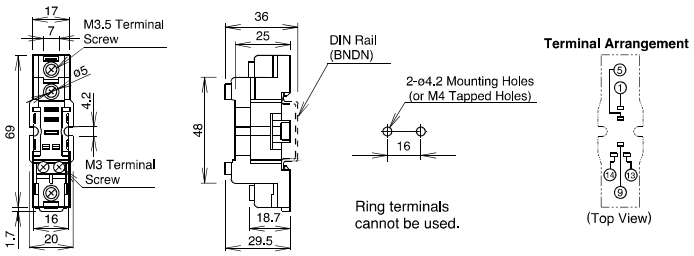
SH4B-05



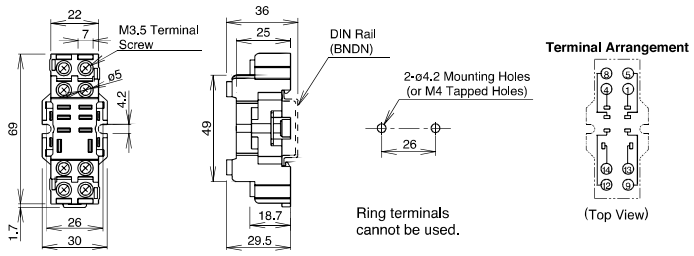
Dimensions con't (mm)

Finger-safe DIN Rail Mount Sockets

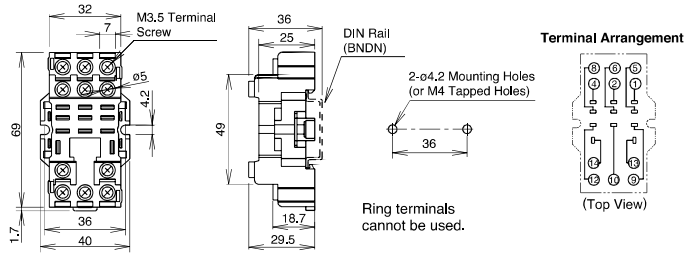
SH1B-05C



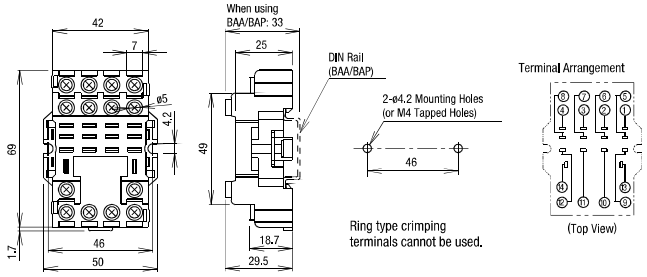
SH2B-05C



SH3B-05C

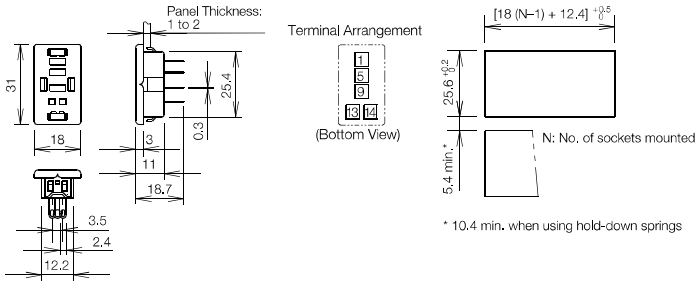


SH4B-05C

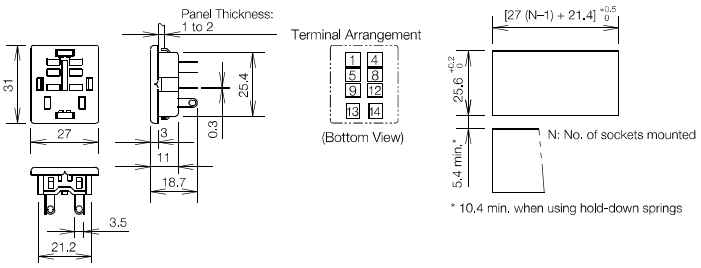


Through Panel Mount Socket

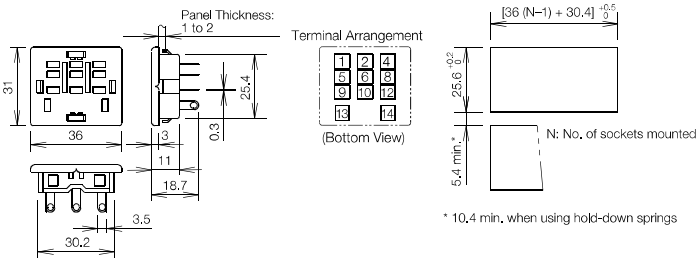
SH1B-51



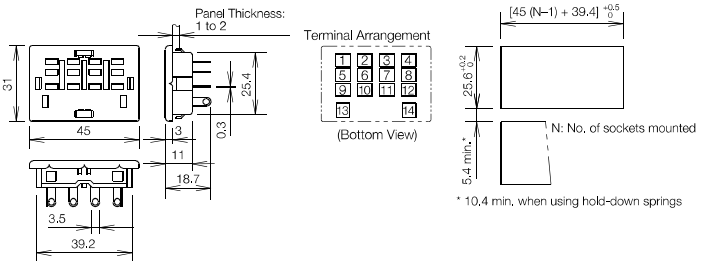
SH2B-51



SH3B-51



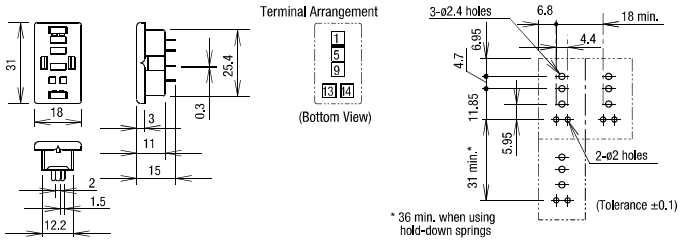
SH4B-51



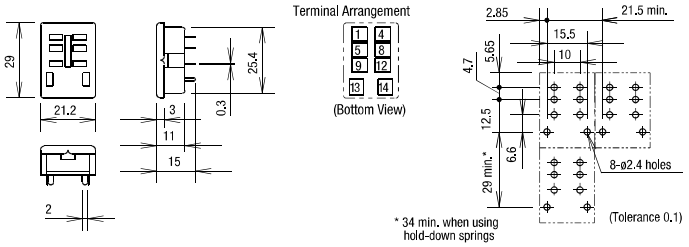
Dimensions con't (mm)

PCB Mount Sockets

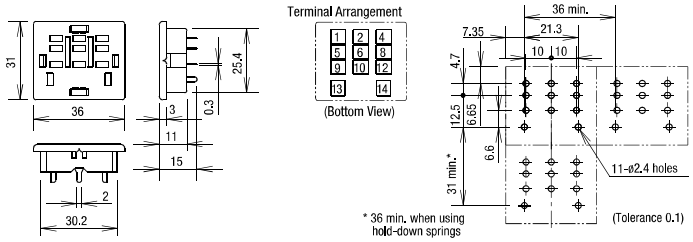
SH1B-62



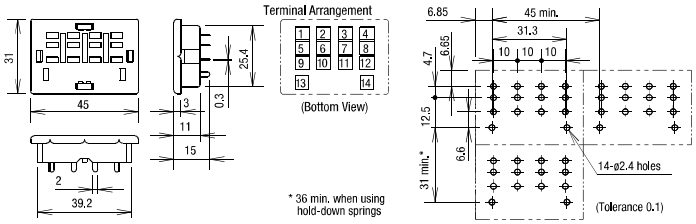
SH2B-62



SH3B-62



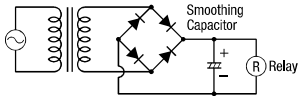
SH4B-62

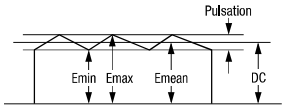


Operating Instructions

Driving Circuit for Relays

1. To ensure correct relay operation, apply rated voltage to the relay coil.
2. Input voltage for the DC coil:
   A complete DC voltage is best for the coil power to make sure of stable relay operation. When using a power supply containing a ripple voltage, suppress the ripple factor within 5%. When power is supplied through a rectification circuit, the relay operating characteristics, such as pickup voltage and dropout voltage, depend on the ripple factor. Connect a smoothing capacitor for better operating characteristics as shown below.



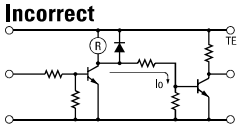


$$\text{Ripple Factor (\%)} = \frac{Emax - Emin}{Emean} \times 100\%$$

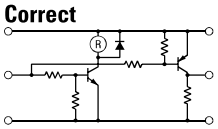
Emax = Maximum of pulsating current
Emin = Minimum of pulsating current
Emean = DC mean value

3. Leakage current while relay is off:
   When driving an element at the same time as the relay operation, special consideration is needed for the circuit design. As shown in the incorrect circuit below, leakage current (Io) flows through the relay coil while the relay is off. Leakage current causes coil release failure or adversely affects the vibration resistance and shock resistance. Design a circuit as shown in the correct example.

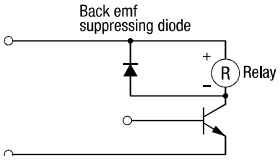
Incorrect



Correct

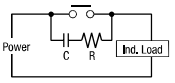
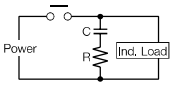
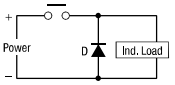
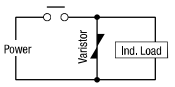


4. Surge suppression for transistor driving circuits:
   When the relay coil is turned off, a high-voltage pulse is generated, causing a transistor to deteriorate and sometimes to break. Be sure to connect a diode to suppress the back electromotive force. Then, the coil release time becomes slightly longer. To shorten the coil release time, connect a Zener diode between the collector and emitter of the transistor. Select a Zener diode with a Zener voltage slightly higher than the power voltage.

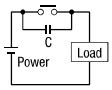
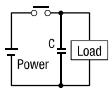


Protection for Relay Contacts

1. The contact ratings show maximum values. Make sure that these values are not exceeded. When an inrush current flows through the load, the contact may become welded. If this is the case, connect a contact protection circuit, such as a current limiting resistor.
2. Contact protection circuit:
   When switching an inductive load, arcing causes carbides to form on the contacts, resulting in increased contact resistance. In consideration of contact reliability, contact life, and noise suppression, use of a surge absorbing circuit is recommended. Note that the release time of the load becomes slightly longer. Check the operation using the actual load. Incorrect use of a contact protection circuit will adversely affect switching characteristics. Four typical examples of contact protection circuits are shown in the following table:

RC		This protection circuit can be used when the load impedance is smaller than the RC impedance in an AC load power circuit. • R: Resistor of approximately the same resistance value as the load • C:0.1 to 1 µF
		This protection circuit can be used for both AC and DC load power circuits. R: Resistor of approximately the same resistance value as the load C: 0.1 to 1 µF
Diode		This protection circuit can be used for DC load power circuits. Use a diode with the following ratings. Reverse withstand voltage: Power voltage of the load circuit x 10 Forward current: More than the load current
Varistor		This protection circuit can be used for both AC and DC load power circuits. For a best result, when using a power voltage of 24 to 48V AC/DC, connect a varistor across the load. When using a power voltage of 100 to 240V AC/DC, connect a varistor across the contacts.

3. Do not use a contact protection circuit as shown below:

	This protection circuit is very effective in arc suppression when opening the contacts. But, the capacitor is charged while the contacts are opened. When the contacts are closed, the capacitor is discharged through the contacts, increasing the possibility of contact welding.
	This protection circuit is very effective in arc suppression when opening the contacts. But, when the contacts are closed, a current flows to charge the capacitor, causing contact welding.

Generally, switching a DC inductive load is more difficult than switching a DC resistive load. Using an appropriate arc suppressor, however, will improve the switching characteristics of a DC inductive load.

Soldering

1. When soldering the relay terminals, use a soldering iron of 30 to 60W, and quickly complete soldering (within approximately 3 seconds).
2. Use a non-corrosive rosin flux.

Operating Instructions con't

Other Precautions

1. General notice:
   To maintain the initial characteristics, do not drop or shock the relay.

   The relay cover cannot be removed from the base during normal operation. To maintain the initial characteristics, do not remove the relay cover.

   Use the relay in environments free from condensation, dust, sulfur dioxide (SO_2), and hydrogen sulfide (H_2S).

   Make sure that the coil voltage does not exceed applicable coil voltage range.

2. UL and CSA ratings may differ from product rated values determined by IDEC.

3. Do not use relays in the vicinity of strong magnetic field, as this may affect relay operation.

Safety Precautions

- Turn off the power to the relay before starting installation, removal, wiring, maintenance, and inspection of the relays. Failure to turn power off may cause electrical shock or fire hazard.
- Observe specifications and rated values, otherwise electrical shock or fire hazard may be caused.
- Use wires of the proper size to meet voltage and current requirements. Tighten the terminal screws on the relay socket to the proper tightening torque.
- Surge absorbing elements on AC relays with RC or DC relays with diode are provided to absorb the back electromotive force generated by the coil. When the relay is subject to an excessive external surge voltage, the surge absorbing element may be damaged. Add another surge absorbing provision to the relay to prevent damage.

Precautions for the RU Relays

- Before operating the latching lever of the RU relay, turn off the power to the RU relay. After checking the circuit, return the latching lever to the original position.
- Do not use the latching lever as a switch. The durability of the latching lever is a minimum of 100 operations.
- When using DC loads on 4PDT relays, apply a positive voltage to terminals of neighboring poles and a negative voltage to the other terminals of neighboring poles to prevent the possibility of short circuits.
- DC relays with a diode have a polarity in the coil terminals. Apply the DC voltage to the correct terminals.

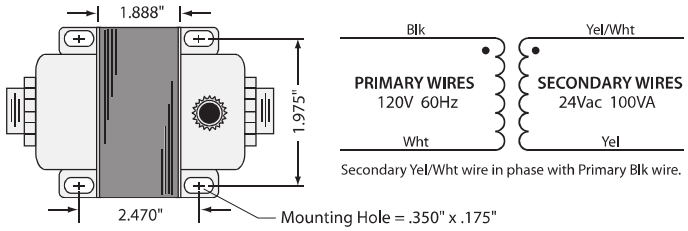
RIB Functional Devices, Inc.
(800) 888-5538 sales@functionaldevices.com www.functionaldevices.com

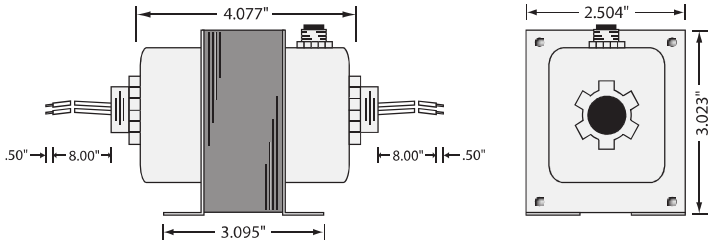
TRANSFORMER

TR100VA002

Transformer 96 VA, 120 to 24 Vac, Circuit Breaker, Foot and Dual Threaded Hub Mount

c UL us LISTED Class 2 CE RoHS







SPECIFICATIONS

VA Rating:	96
Frequency:	50/60 Hz
Mounting:	Foot & Dual Threaded Hubs
Over Current Protection:	Circuit Breaker
Dimensions:	4.077˝ x 2.504˝ x 3.023˝ (w/ .500˝ NPT Hubs)
Wire Length:	8˝ Typical w/ .5˝ Strip
Operating Temperature:	-30 to 140° F
MTBF:	100,000 Hours @ 77° F
Construction:	Split-Bobbin
Approvals:	Class 2 UL5085-3 Listed, C-UL, CE, RoHS

PSH500A

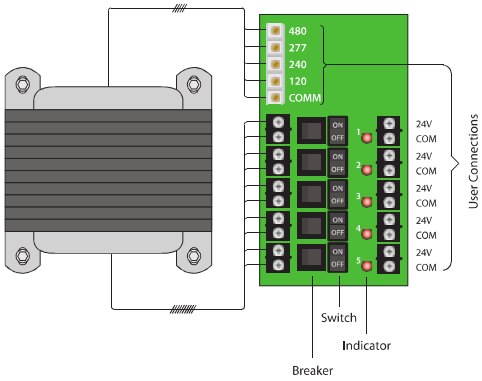
RIB Building Automation

Functional Devices, Inc. | 101 Commerce Drive, Sharpsville, IN 46068
Email: sales@functionaldevices.com | **Website:** www.functionaldevices.com
Toll Free: (800) 888-5538 | **Office:** (765) 883-5538 | **Fax:** (765) 883-7505

AC POWER SUPPLIES

PSH500A

500 VA Power Supply, Five 100 VA Class 2 Outputs,
480/277/240/120 Vac to 24 Vac, Metal Enclosure



PSMN500A

500 VA Power Supply, Five 100 VA Class 2 Outputs,
480/277/240/120 Vac to 24 Vac, Polymetal Subpanel Pre-Mounted



PSMN500A



PSH500A
Shown WithCover



PSH500A
Shown Without Cover

SPECIFICATIONS

Transformer: One (1) 500 VA
Over Current Protection: Circuit Breaker
Primary: 480/277/240/120 Vac
Frequency: 50/60 Hz
Dimensions: 12.125˝ H x 12.125˝ W x 6.000˝ D (PSH500A)
11.330˝ H x 11.400˝ W x 5.000˝ D (PSMN500A)
Origin: Made of US and non-US parts
Approvals: Class 2 (UL Approved UL5085-3),
UL916, C-UL, CE, RoHS, Special
^ Seismic Certification of Equipment and Components: OSP-0201-10
Housing: NEMA1 Metal Enclosure (PSH500A)
Sub-Panel: Plenum Rated Polymetal (PSMN500A)
Notes:
- To order UL508, add "-IC" to end of model number.
- Primary voltage terminal cover available.
- Design is in accordance with ASCE 7-05 Chapter 13: ^ https://hcai.ca.gov/wp-content/uploads/2020/10/OSP-0201.pdf
- Consult factory for OSP labeling

5 Secondaries:
24 Vac, with LED Indicators
4 Amp breaker for each output

24 Vac ON/OFF:
On / Off Switch & Breaker

Input:
480/277/240/120 Vac Finger-Safe Terminals, 8-18 AWG

Output:
5 Ungrounded, Isolated, 100 VA, Class 2, 24 Vac Outputs. Terminals accept 12-26 AWG wire.

Ambient Temperature Derating:
4A up to 40˚ C ; 3A up to 50˚ C ; 2A up to 55˚ C
(When All 5 Outputs Operated Simultaneously)

- With 240 Vac primary input voltage
- When all 5 outputs operated simultaneously, at room temperature

Standby Wattage:
48.515 W @ 120 Vac
48.699 W @ 240 Vac
49.564 W @ 277 Vac
48.255 W @ 480 Vac

Full Load Primary Current:
4.66 A @ 120 Vac
2.41 A @ 240 Vac
2.06 A @ 277 Vac
1.17 A @ 480 Vac

Secondary Output Voltage vs. Load:
24.0 V @ 1 Amp
23.0 V @ 2 Amp
21.8 V @ 3 Amp
21.1 V @ 4 Amp

C-2320-L ECM

ECMset

ECM (Brushless motor) Current Switch

Adjustable minimum turn-on
Prevents false trip due to ECM stand-by current
Split-core operation to 200A
N.O. 30VAC/DC output



DESCRIPTION

ECMSet™ is designed for no/go run detection on electronically commutated motors (ECMs) . ECMs draw a small amount of AC standby current to power their inverter, up to 1A, even when the motor isn't running. The ECMSet features a high resolution adjustable turn-on setpoint to ignore standby current, preventing false ON status indications.

APPLICATIONS

- No/go run detection for EC motors
- On set-point prevents false trips due to EC inverter stand-by current
- Great for data center current switch sensing



Turn-on setpoint minimizes false trips due to standby ECM inverter draw.



Optional CR command relay for stop/start/status in a single labor saving device.



FEATURES

- Reliable operation on ECM motors
- Set trip point with easily scaled dial to that sensor only turns on when motor is actually running
- Super low turn-on adjustment scale Maintenance-free—no call backs
- No hazardous guesswork. Multi-turn adjustments are a thing of the past
- Reduce the risk of arc flash; sensor can be set without calibration in live enclosure
- Industry leading 7 year warranty

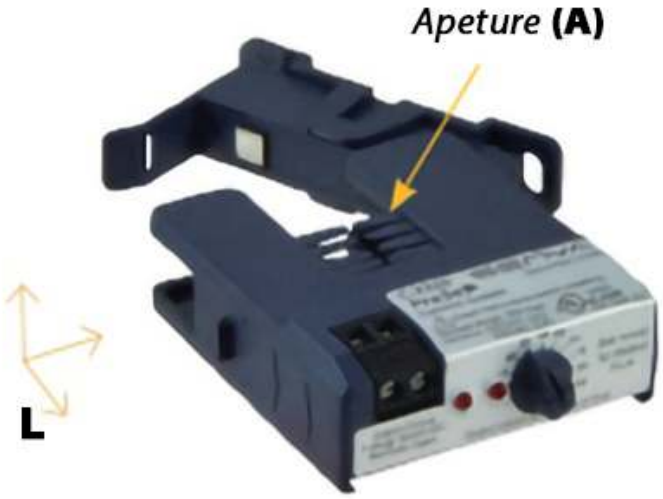
ORDERING

SPLIT CORE	Min (on)	Max Amps	N.O. Output*	Trip LED	Power LED
C-2320-L-ECM	0.25A	200A	1.0A@30VAC/DC	•	•

COMMAND RELAY - DIRECT MOUNT (MOUNTS ON ALL 2300 SERIES CURRENT DEVICES)	Contact rating	Coil
CR3-24	N.O. 10A @ 125VAC	24VAC/DC 15mA nominal
CR4-24	N.C. 10A @ 125VAC	24VAC/DC 15mA nominal
CR3-12	N.O. 10A @ 125VAC	9-12VDC 30mA nominal
CR4-12	N.C. 10A @ 125VAC	9-12VDC 30mA nominal

Other coil voltages available—consult factory

DIMENSIONS



L: 2.5″ **H:** 0.57″ **W:** 2.23″
A: 0.75″x0.75″

Warning: The datasheet is designed for reference only. Refer to installation instructions that accompany the product and heed all safety instructions. Product improvement is a continuing process at Senva. Changes may occur to products without prior notice.

SPECIFICATIONS	
Standard Output Rating	1.0A@30VAC/DC
Output Type	NO, solid-state FET
Environmental Rating	5-140 °F (-15-60 °C) 10-90% RH Non-condensing
Insulation Class	600V RMS. For use on insulated conductors only! Use minimum 75 ° C insulated conductor
Sensor Power	Induced
Frequency Range	50/60Hz
Compliance	cUL, UL, CE, RoHS

** Product improvement is a continual process at Senva and product features and specification may change without prior notice. Refer to instructions that accompany the product for installation and wiring.*

H614

Automatically Learns At Initial Power-Up



CURRENT SENSING THE ULTIMATE PROOF OF FLOW

Maximize Reliability
Minimize Installed Cost

Hawkeye™

The Hawkeye H614 is a microprocessor based, self-learning, self-calibrating current-sensitive switching device designed for use with VFD systems. At initial power-up, the H614 automatically learns the average current on the line with no action required by the installer. Once a current is learned, the switch monitors for changes in current greater than ±20% of the learned load. When calibrated for a given VFD system, the H614 is tolerant of gradual drifts in frequency due to expected conditions, such as an accumulation of debris in a filter, while still detecting a sudden drop due to a potential abnormal system condition (e.g., belt loss or other mechanical failure).

Microcontroller based learning technology

Automatically learns load upon initial power-up…minimizes calibration labor

Saves space

Small size fits easily inside small starter enclosures

Automatic trip point

Automatic trip point (1.5 to 150 Amps, 12 to 115 Hz)…detect abnormal events

100% solid state

100% solid state…no moving parts to fail

Under- and over-load

Microcontroller based learning technology…automatically learns load

Flexibility

Removable mounting bracket for installation flexibility

APPLICATIONS

- Monitoring fans, pumps, motors, and other electrical loads for proper operation
- Detecting belt loss and motor failure…ideal for fan and pump status
- Verifying lighting circuit loads
- Monitoring critical motors (compressor, fuel, etc.)
- Monitoring industrial process equipment status (OEM)

SPECIFICATIONS

Sensor Power	Induced from monitored conductor
Response Time	1 sec.
Learn Time	15 sec. learn period after frequency stabilizes
Frequency Range in Conductor	12 to 115 Hz[1]
Temperature Range	-15 to 60 °C (5 to 140 °F)
Humidity Range	10 to 90% RH non-condensing
Alarm Limits	±20% of learned current in every 5 Hz freq. band[2]
Normal-to-Alarm Status Output Delay	Approx. 7 sec.
Alarm-to-Normal Status Output Delay	1 sec. nominal[3]
Off Delay	<30 sec. nominal
Contact Ratings	30 Vac/dc, 1 A
Insulation Class	600 Vac (UL); 300 Vac RMS (CE)
Terminal Block Wire Size	24 to 14 AWG (0.2 to 2.1 mm²)
Terminal Block Torque	3.5 to 4.4 in-lbs (0.4 to 0.5 N-m)

WARRANTY	
Limited Warranty	5 years
AGENCY APPROVALS	
Agency Approvals	UL508 open device, CE: EN61010-1, CAT III, Pollution Degree 2

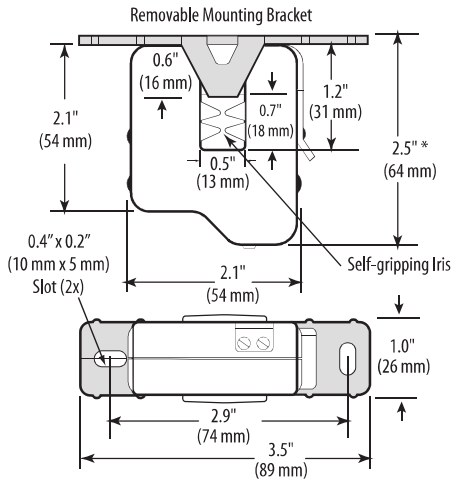
CE c UL us LISTED

1. VFD systems generate fields that can disrupt electrical devices. Ensure that these fields are minimized and are not affecting the sensor.
2. The H614 is not intended for use in applications where the current is expected to fluctuate by more than 20% due to acceptable causes other than VFD driven changes.
3. If the H614 experiences a momentary loss of power, the Alarm-to-Normal output delay may exceed 1 sec.

Specification Note: For CE compliance, conductor shall be insulated according to IEC 61010-1

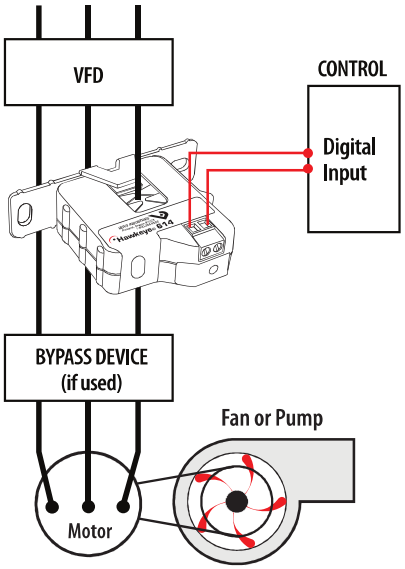
The product design provides for basic insulation only. Use wire with minimum 75°C rated insulation. Do not use the LED status indicators as evidence of applied voltage.
This sensor detects abnormal operation by looking for sudden changes in current across the entire frequency range. In Learn mode, the sensor calculates a margin 20% above and 20% below the learned frequency curve. An abnormal condition in the circuit is one that falls outside this margin.

DIMENSIONAL DRAWING



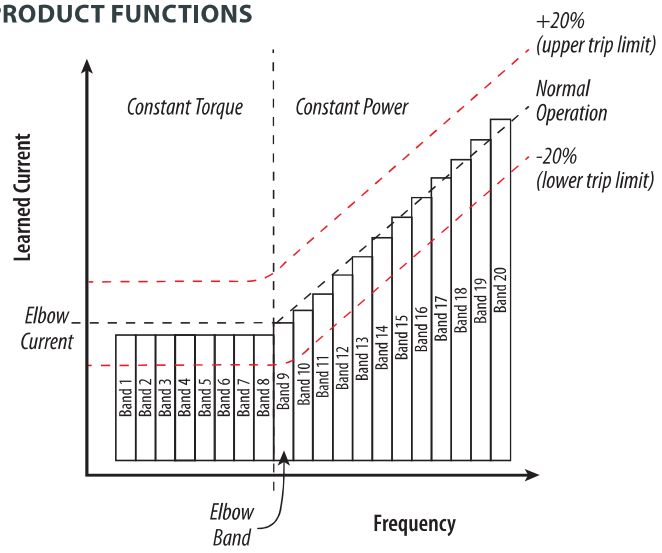
* Terminal block may extend up to 1/8" over the height dimensions shown.

WIRING DIAGRAM



NOTE: The H614 is not intended for use in staged pump, variable inlet vane, and other applications in which the amperage changes under normal operation, independent of frequency.
NOTE: (Optional) For added sensitivity in detecting amperage changes, use H614 devices on all three phases of the VFD

PRODUCT FUNCTIONS



SENSOR MODE		STATUS LED BLINK PATTERN	CONTACTS
Learning Mode (first 15 sec of operation after frequency stabilizes)		Alternating Red/Green (1 per sec.)	Closed
On/Off Status only	Learn mode incomplete. VFD system does not meet abnormal condition detection criteria	Green blink (5 times per sec. after 15 sec of stable frequency)	Closed
	Current is not adequate for the device to detect abnormal conditions	No LED	Closed
Status OK		Green blink (1 per sec.)	Closed
Alarm		Red blink (1 per sec.)	Open

HOW IT WORKS

During setup, the H614 automatically determines the normal amperage and frequency profile and stores it in memory. Then the microprocessor monitors for amperage changes greater than ±20% of this learned curve, indicating a potential system failure.

USAGE EXAMPLE

The H614 is designed for HVAC fan and blower systems, as well as some single stage pumping systems involving consistent viscosity liquids. If an H614 is installed on one phase of the VFD, it detects changes in that phase that result from the VFD compensating for changes elsewhere in the system. Alternatively, for increased sensitivity, H614s can be used on all three phases for immediate detection of phase balance changes anywhere in the system.

ORDERING INFORMATION

MODEL	AMPERAGE RANGE	FREQUENCY RANGE	STATUS OUTPUT	NOMINAL TRIP POINT TARGET RANGE	HOUSING	STATUS LED	UL	CE
H614	1.5 to 150 A[1]	12 to 115 Hz	N.O. 1.0 A @ 30 Vac/dc	±20% in each of 20 bands	Split-core	•	•[2]	•

1. If the current is above 1.5 A, but neither LED is illuminated, the H614 is considered to be in on/off status mode.
2. Listed for use on 75°C insulated conductors.

HX08 SERIES & H701

Detect Belt Loss, Coupling Shear, and Mechanical Failure













Hx08 Series and H701 adjustable current switches offer high performance, with a wide array of amperage range options. These products can accurately detect belt loss, coupling shear, or other mechanical failure on unit vents, exhaust fans, recirculation pumps, and other fixed loads down to as little as 1/5 HP.

Retrofit or new construction

High performance devices in split- and solid-core housings

Small size

Fits easily inside small enclosures

Adjustable trip point

Precise current trip point setting

Self-gripping iris

Self-gripping iris on split-core housings for easy installation

Low setpoint

Minimum trip point as low as 0.5 A (H608)…no need for multiple wraps of the conductor through the sensor, even on loads as small as 1/5 HP

Status LEDs

Status LEDs available for easy setup and local indication

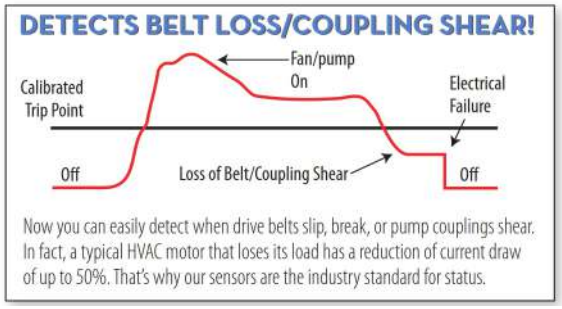
APPLICATIONS

- Detecting belt loss, coupling shear, and mechanical failure
- Verifying lighting circuit and other electrical service run times
- Monitoring status of industrial process equipment
- Monitoring status of critical motors (compressor, fuel, etc.)
- VFD output on/off status

SPECIFICATIONS

Sensor Power	Induced from monitored conductor
Insulation Class	600 Vac RMS (UL), 300VAC RMS (CE)
Frequency Range [2]	50/60 Hz, On/Off status for Variable Frequency Drive (VFD) outputs at 12 to 115 Hz
Temperature Range	-15 to 60 °C (5 to 140 °F)
Humidity Range	10 to 90% RH non-condensing
Hysteresis	10% (typical)
Terminal Block Wire Size	H308: 22-16 AWG (0.3 to 1.3 mm^2) Others: 24-14 AWG (0.2 to 2.1 mm^2)
Terminal Block Torque	H308: 3.5 to 7 in-lbs (0.8 N-m) Others: 3.5 to 4.4 in-lbs (0.4 to 0.5 N-m)
WARRANTY	
Limited Warranty	5 years
AGENCY APPROVALS	
Agency Approvals	UL 508 open device listing; CE: EN61010-1, CAT III, Pollution Degree 2, basic insulation

CE c UL us LISTED E150462

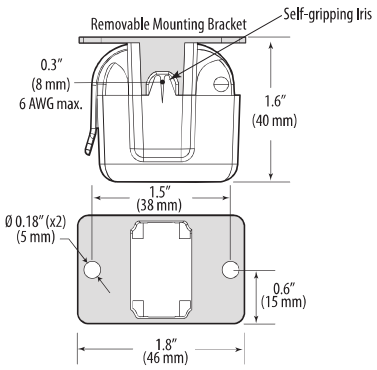


Notes: Do not use the LED status indicators as evidence of applied voltage.

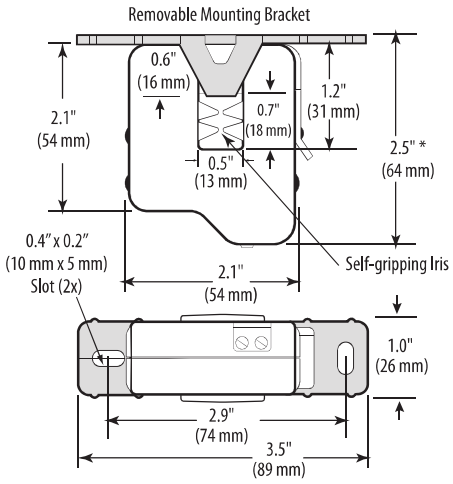
If using this switch in an application that includes an electronically commutated motor (ECM), see Veris Application Note VN61, at www.veris.com.

VFD systems generate fields that can disrupt electrical devices. Ensure that these fields are minimized and are not affecting the sensor.

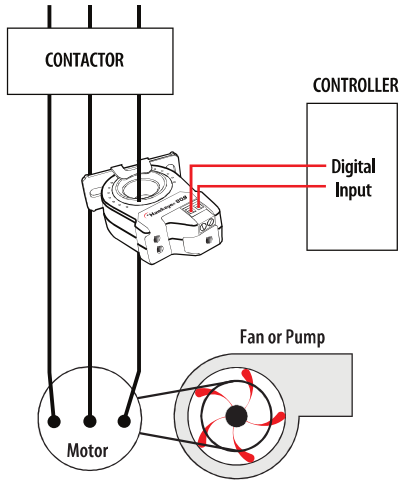
H308
Dimensional Drawing



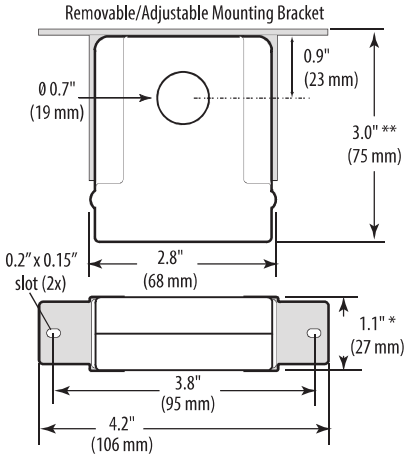
H608
Dimensional Drawing



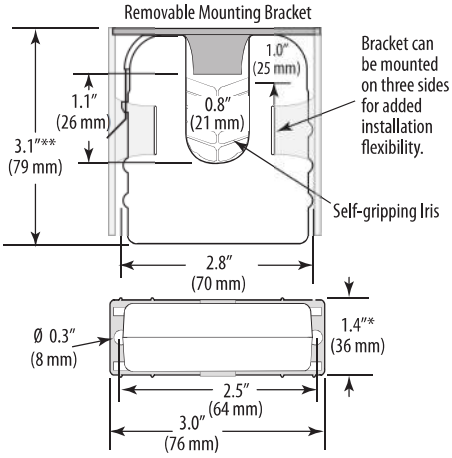
MONITORING FAN /PUMP MOTORS FOR POSITIVE PROOF OF FLOW
Wiring Diagram



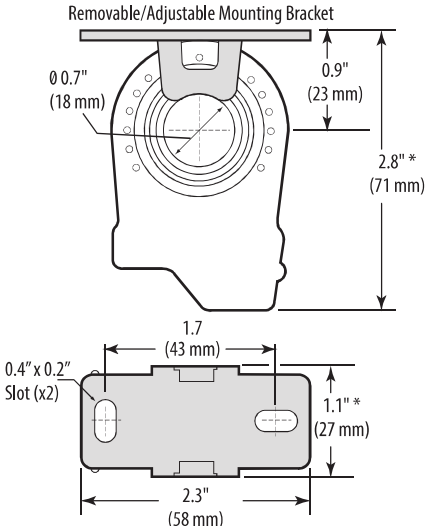
H708/701
Dimensional Drawing



H908
Dimensional Drawing



H808
Dimensional Drawing



* Terminal block may extend up to 1/8" over the height dimensions shown.
** Slide switch may extend up to 1/4" over the height dimensions shown.

ORDERING INFORMATION

MODEL	AMPERAGE RANGE @ 50/60 HZ ONLY	STATUS OUTPUT (MAX.)	MIN. TRIP POINT	HOUSING	STATUS LED	UL	CE
H308	0.75 to 50 A	N.O. 1.0 A @ 30 Vac/dc	0.75 A or less	Split-Core	•	•[2]	•
H608	0.5 to 175 A		0.5 A or less	Split-Core	•	•[1]	•
H701	1 to 135 A		1.0 A or less	Solid-Core		•	
H708	1 to 135 A		1.0 A or less	Solid-Core	•	•	
H808	0.75 to 50 A		0.75 A or less	Solid-Core	•	•	•
H908	2.5 to 135 A		2.5 A or less	Split-Core	•	•	•

1. Listed for use on 75 °C insulated conductors.
2. Product provides functional insulation only.

LEVEL & LEAK DETECTION

CONDENSATE OVERFLOW SWITCHES
SS/SP SERIES

DESCRIPTION

The **Rectorseal SS/SP Series** condensate overflow switches detect rising water in A/C condensate drain pans and shut off the system to prevent overflow and water damage. Designed for installation on auxiliary drain pan outlets or inline on primary drains, models are available with a solid state electronic probe or magnetic reed switch. Switches include mounting adapters and hardware.

Model SG1 condensate overflow alarm is wired across the normally closed contacts of the condensate switch. As the water level rises, the switch opens allowing current to flow through the alarm which sounds a buzzer and flashes an LED indicating a possible overflow condition. The SG1 works with most 24-volt overflow switches and pumps and comes pre-wired with 4-foot 18 AWG lead wires and 2-sided tape.



SS1



SS2AP



SS3



SG1

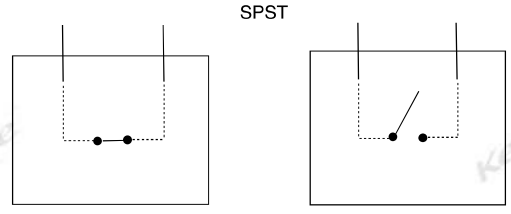
FEATURES

- ***Waterproof***
- ***Primary or auxiliary installation***
- ***Easy to install and service***
- ***Low voltage***
- ***UL 508 listed***
- ***Plenum rated models***
- ***One year warranty***

SPECIFICATIONS

Supply Voltage	24 VAC
Relay Type	Magnetic, Solid state
Switching Capability	1.25A, 2.3A
Plenum Rating	No, Yes
Mounting	3/4" adapter, NA
Mounting Orientation	Primary (inline) or auxillary, Auxillary, Drain Pan
Wire Length	6 ft (1.8m), 18 AWG, 4 ft (1.2m), 18 AWG
Weight	0.2 lb (0.09 kg), 0.09 lb (0.04 kg)
Warranty	1 year

WIRING



SPECIFICATIONS

Model	Switch Type	Supply Voltage	Switching Capability	Installation	Plenum Rated	Mounting Adapter	Lead Length	Weight
SS1	Magnetic	24 VAC	1.25A	Primary (inline) or auxillary	No	3/4" adapter	6 ft (1.8m), 18 AWG	0.2 lb (0.09 kg)
SS2AP	Magnetic	24 VAC	1.25A	Auxillary	Yes	3/4" adapter	4 ft (1.2m), 18 AWG	0.2 lb (0.09 kg)
SS3	Magnetic	24 VAC	1.25A	Drain Pan	No	NA	6 ft (1.8m), 18 AWG	0.09 lb (0.04 kg)

ORDERING INFORMATION

MODEL	DESCRIPTION
SS1	Inline magnetic reed condensate overflow switch
SS2AP	Auxiliary condensate overflow switch
SS3	Auxiliary condensate pan overflow switch
SP1P	Inline solid state condensate overflow switch

RELATED PRODUCTS

SG1	Condensate overflow alarm

SIEMENS

PXA-ENC19
PXA-SB115V192VA

Technical Specification Sheet
Document No. 149-475
February 17, 2009

PX Series Enclosures and Accessories



Figure 1. New PX Series Enclosures.

Enclosures

Description

PX series enclosures house both electronic and pneumatic components. The enclosures include a perforated backplane for mounting of the PXC series controllers, Power Modular Equipment Controllers, Point Expansion Modules or other electronic or pneumatic components.

Features

- Three sizes available to match installation needs.
- Sturdy construction accommodates secure conduit fittings and protects components against incidental contact and falling dirt.
- Multiple knockouts along top, sides and bottom.
- Perforated backplane extends wall-to-wall for mounting of additional equipment.
- DIN rail(s) for mounting of components.
- Spacious interior for easy routing and termination of wiring.
- Hinged door, key lock, wire tie bars, PXA series service boxes
- UL Smoke Control Listing is available on the 19” and 34” models.
- UL 916 rating is available on the 18’ enclosure
- 18” enclosure pull-box type, utility cabinet for low cost installations (see Figure 2).



Figure 2. Complete 18” Enclosure Assembly.

Accessories

Service Boxes

Description

PXA series service boxes include all of the parts necessary for installation inside a 19 inch or 34 inch PX Series Enclosure Assemblies. The 192VA service box can also be used within existing MEC enclosures. The 384VA service box may only be installed in the 34 inch PX Series Enclosure.



Figure 3. SB115V384VA service box .

Features

- Four service boxes are available to step-down line voltage to 24Vac for use by electronic components.
- Service boxes are sized for:
  - 115V to 24V at 192VA
  - 115V to 24V at 384VA
  - 230V to 24V at 192VA
  - 230V to 24V at 384VA
- 384VA models mount inside the 34” enclosures.
- 192VA models mount inside the 19” and 34” enclosures.
- Two sidewall kits cover exposed circuits for use in other NEMA Type 1 enclosures such as motor control cabinets.
- Each service box includes an on/off circuit breaker for the transformer, transient protection on both primary and secondary sides, two NEC Class 1 power limited terminations for components inside the enclosure and one NEC Class 2 termination for external components such as TX-I/O Bus expansion or actuators.
- The 115V models provide an un-switched duplex outlet to power peripheral devices such as modems, trunk interfaces and Portable Operator’s Terminals.
- UL864 Smoke Control rated when used in PXA Series Enclosure 19” or 34” or within existing MEC enclosures.

DIN Replacement Kit (PXA-DIN16KIT)

The DIN Replacement Kit can be used when additional 16” DIN rail is required.

This kit contains:

- Four 16” (406 mm) DIN rails for use when extra rails are needed
- Twelve Screws

Wire Tie Bar Kit (PXA-TIEBARKIT)

The Wire Tie Bar kit can be used when addition tie bars are needed to secure wiring within the enclosure.

This kit contains:

- Four 4.5” (114 mm) tie bars
- Four 9.5” (241 mm) tie bars
- Screws and cable ties

USB Modem Kit (PXA-USBMODEMKIT)

USB Modem kit contains everything needed for dial up modem connection using the USB Host port of the PXC Modular controller.

This kit contains:

- Sportsters Modem 56k BPS Dialup
- USB to RS232 Adapter
- Surge Suppressor Analog Telephone Line
- DB25M/F Right-Angle Adapter
- IBM 6’ PC Cable DB9F to DB25M

USB to RS232 Adapter (PXA-USBADAPTER)

USB to RS232 Adapter converts USB Host signals (Type A male connector) to RS232 signals (DB9 male connector).

This adapter may be used for connection to a RS232 printer. It is part of the PXA-USBMODEMKIT.

Specifications

Specifications	PXA-ENC18	PXA-ENC19	PXA-ENC34
UL Listed NEMA Type 1 Enclosure	X	X	X
Pull-box style	X		
Hinged Door with lock		X	X

Ambient Operating Environment			
+32°F to +120°F (0°C to +49°C) 93% RH (Non-condensing)	X	X	X

Agency Listing			
UL864 UUKL		X	X
ULC-C100 UUKL7		X	X
UL 916 PAZX		X	X
UL 508A	X		

Agency Compliance			
FCC Compliance	X	X	X
Australian EMC Framework	X	X	X
European EMC Directive (CE)	X	X	X
European Low Voltage Directive (LVD)	X	X	X
Dimensions	18”H × 14”W × 6”D (457.2 mm × 355.6 mm × 152.4 mm)	19”H × 22”W × 5.75”D (482.6 mm × 558.8 mm × 146.05 mm)	34”H × 22”W × 5.75”D (863.6 mm ×558.8 mm × 146.05 mm)

Mounting Surface			
Building Wall	X	X	X
Structural Member	X	X	X

Input Power Requirement	**115V Service Boxes**	**230V Service Boxes**
Voltage	115Vac +/- 15% @ 60 Hz +/- 5%, from 15 or 20A circuit breaker	230Vac +/- 15% @ 50/60 Hz +/- 5%, from 10A circuit breaker
Current	2A for 192VA, 4A for 384VA, 2A for 115Vac Service Outlets	1A for 192VA, 2A for 384VA

Ordering Information

Enclosure Range

Description	Product Number
18” PX Series Enclosure	PXA-ENC18
19” PX Series Enclosure	PXA-ENC19
34” PX Series Enclosure	PXA-ENC34

Accessories

Service Box 115V, 24 Vac, 192 VA	PXA-SB115V192VA
Service Box 230V, 24 Vac, 192 VA	PXA-SB230V192VA
Service Box 115V, 24 Vac, 384 VA	PXA-SB115V384VA
Service Box 230V, 24 Vac, 384 VA	PXA-SB230V384VA
Service Box Sidewall Kit, 192 VA	PXA-SW192VA
Service Box Sidewall Kit, 384 VA	PXA-SW384VA
Replacement door for 19” PX series enclosure	PXA-ENC19.REPL.DR
Replacement door for 34” PX series enclosure	PXA-ENC34.REPL.DR

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SIEMENS

550-002

Installation Instructions
Document No. 550-196
December 15, 2004

Terminal Equipment Controller Enclosure

Product Description

A Terminal Equipment Controller enclosure is a general-purpose metal cabinet with a removable cover that houses an electronic output Terminal Equipment Controller (TEC). It is available in two versions: one to enclose a short platform TEC, and a larger multi-purpose model designed to enclose any of the following:

- Short platform TEC with or without actuator
- Long platform TEC
- TEC Actuator Package
- TEC Plug-in Relay Module (either direct or remote mounted)

Product Number

540-155	Enclosure for short platform TEC
550-002	Multi-purpose enclosure for short or long platform TEC and/or other components listed above

Agency Approvals

- UL listed as an industrial control panel enclosure per UL 508
- cUL certified as an industrial control panel enclosure per Canadian standard C22.2 No.14–95

Required Tools

- 1/4-inch hex nut driver
- If supplied screws are not used: electric drill and appropriate size bit
- Medium flat-blade screwdriver

Prerequisites

The mounting screws provided are designed for common sheet-metal duct surfaces. Have appropriate mounting hardware on hand if another surface is used.

Instructions

1. Remove enclosure cover.

   NOTE: Enclosure 540-155 has cover screws that should be loosened but not removed. Enclosure 550-002 has no cover screws; see Figure 5 for tip on removing cover.

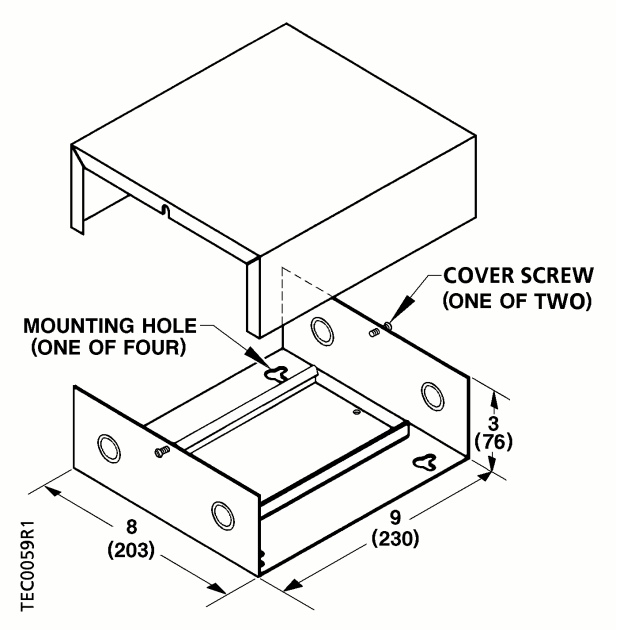
2. Remove appropriate knockouts.
3. Align the enclosure on the mounting surface and mark the position of the mounting holes (Figure 1 or Figure 2).
4. Mount the enclosure with the self-tapping screws provided or drill pilot holes and mount with other screws.
5. Do one of the following:

   - If the controller will not be installed at this time, replace the cover.
   - If the controller will be installed now, then snap it into the mounting rail and replace enclosure cover. (For enclosure 550-002, see Figure 4 for how to secure the mounting rail, and Figure 6 for how to replace the cover.)

The enclosure is installed.

Expected Installation Time

20 minutes



Dimensions in Inches (Millimeters)

Figure 1. Enclosure 540-155.

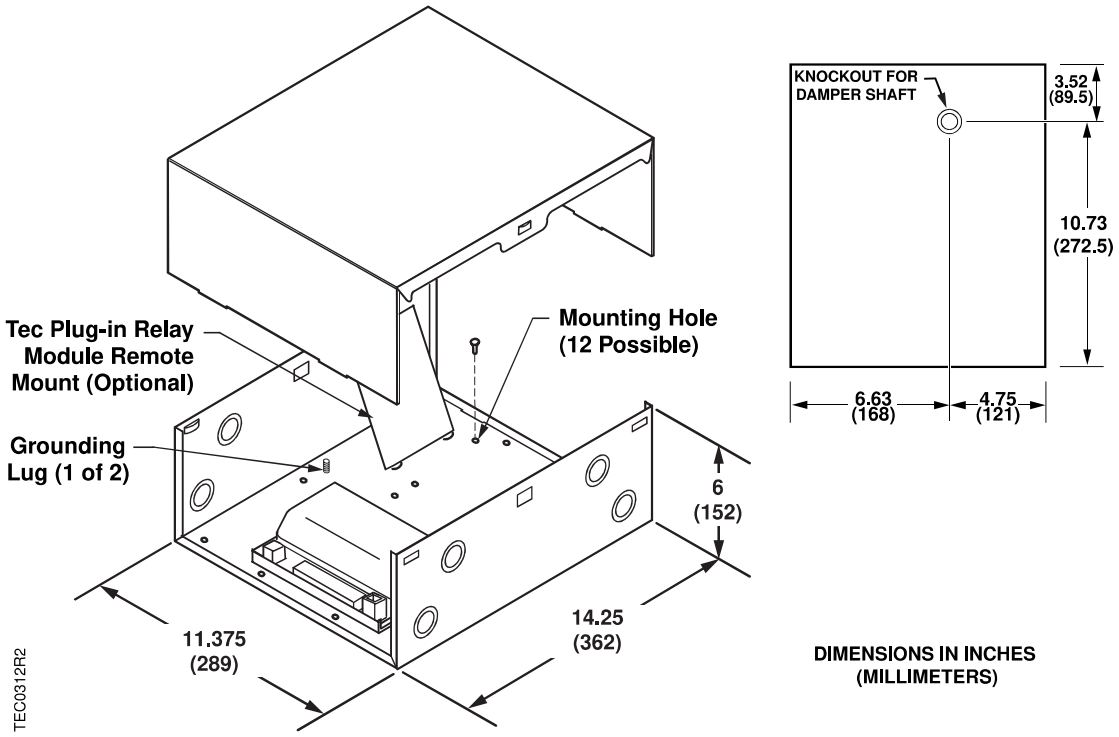
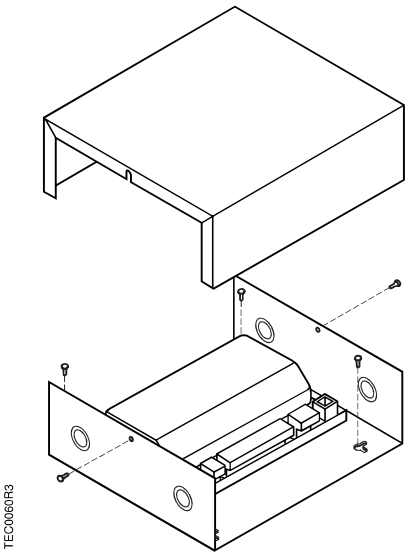
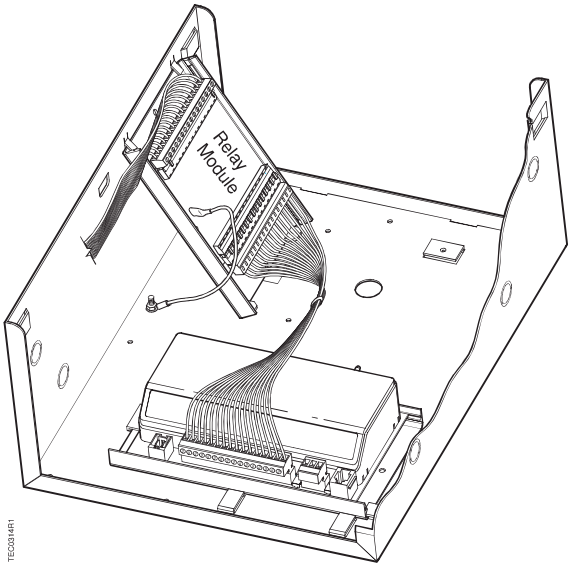


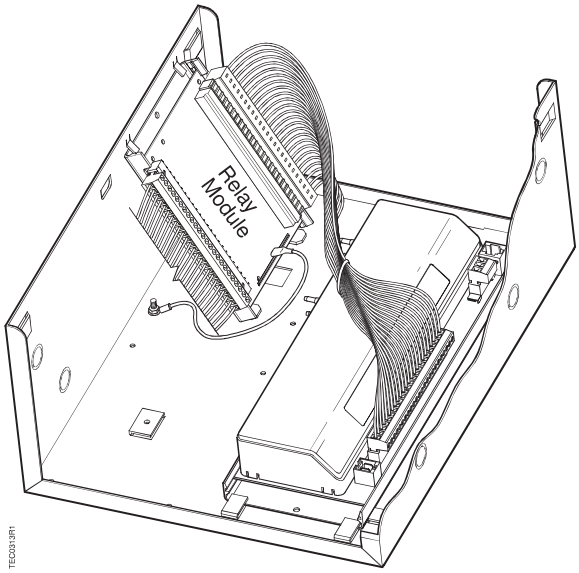
Figure 2. Enclosure 550-002.



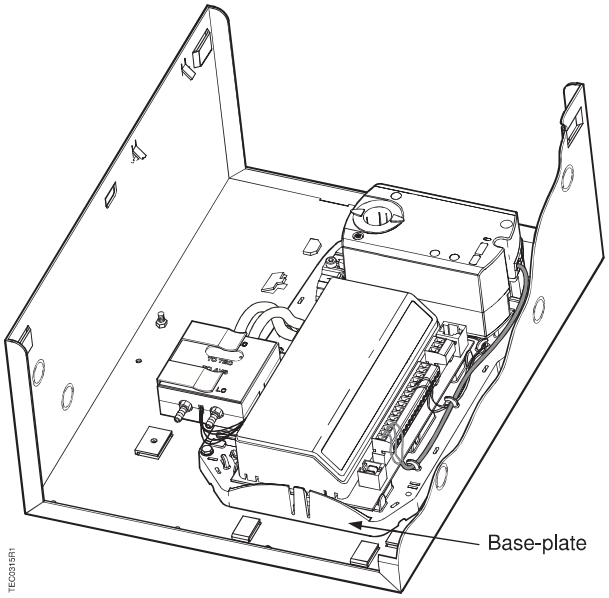
Enclosure 540-155 with Short Platform Controller



Enclosure 550-002 with Short Platform Controller and optional TEC Plug-in Relay Module (remotely mounted)



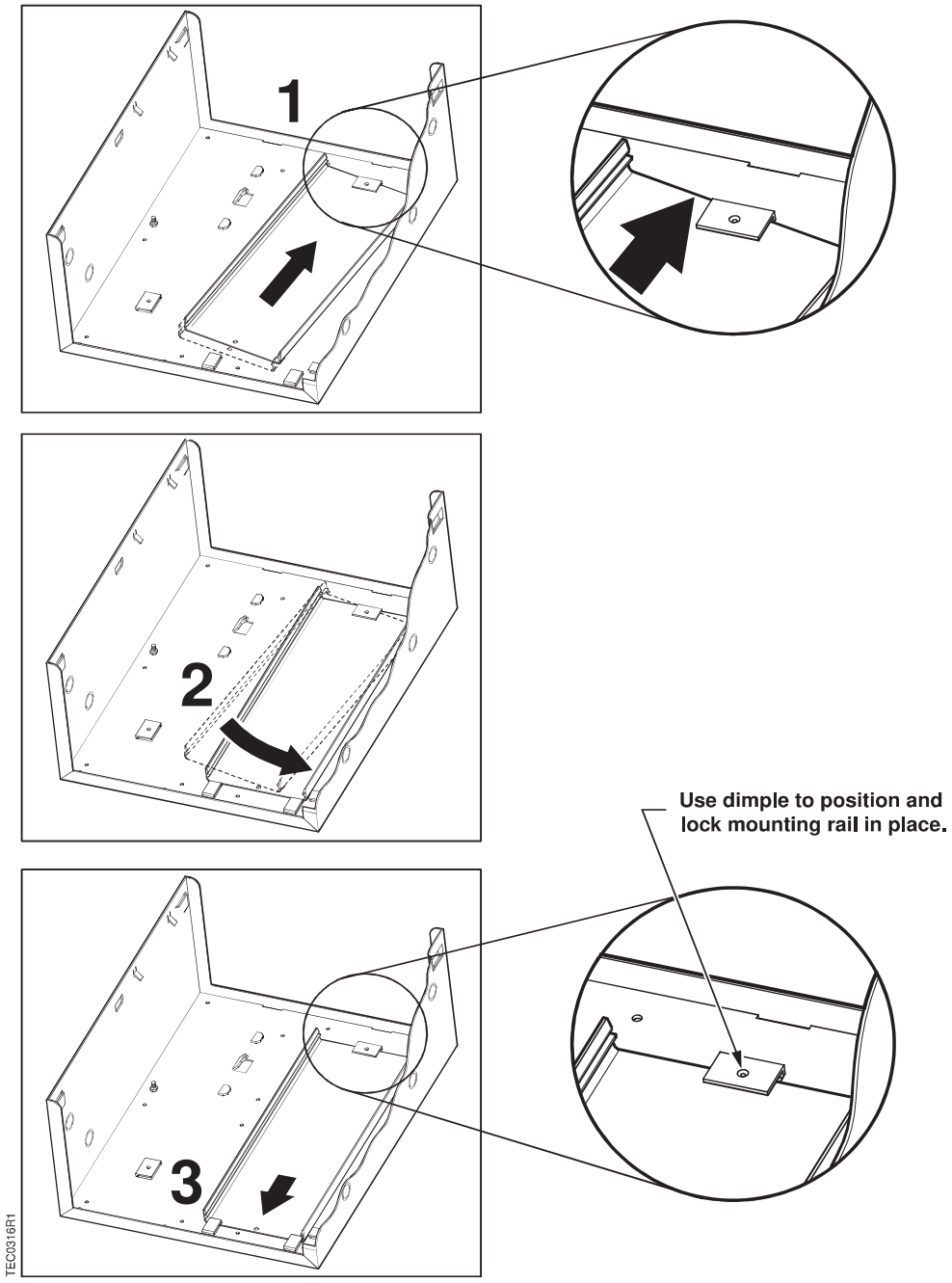
Enclosure 550-002 with Long Platform Controller and optional TEC Plug-in Relay Module (remotely mounted)



Note: TEC Plug-in Relay Module (optional) is not shown but is available with this configuration.

Enclosure 550-002 with TEC Actuator Package (shown with optional Autozero Module)

Figure 3. Enclosures with Controllers and Optional Components Installed.



With enclosure 550-002, the mounting rail does not mount with screws. Instead, it slides under and is secured by mounting flanges. **Exception:** TEC Actuator Package (P/N comes pre-assembled on a common base-plate that must be screwed in place.
Short platform mounting rail mounts in same manner as long platform mounting rail, but at right angle.

Figure 4. Enclosure 550-002, Method of Securing Mounting Rails.

NOTE: Long platform mounting rail shown above. Short platform mounting rail mounts in same manner but at right angle.

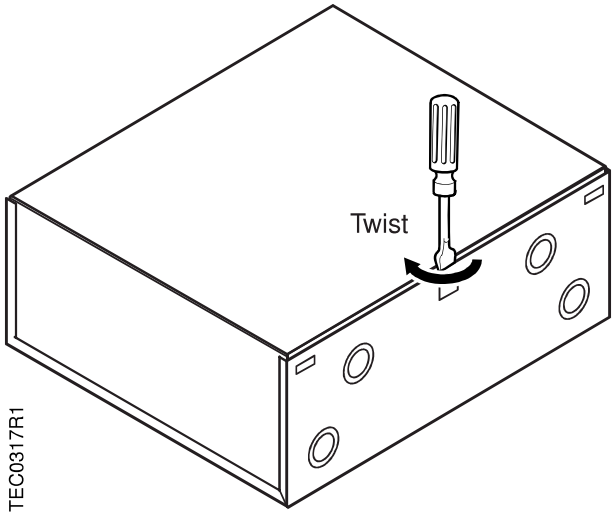


Figure 5. Enclosure 550-002 — First Step of Removing Cover (do both sides).

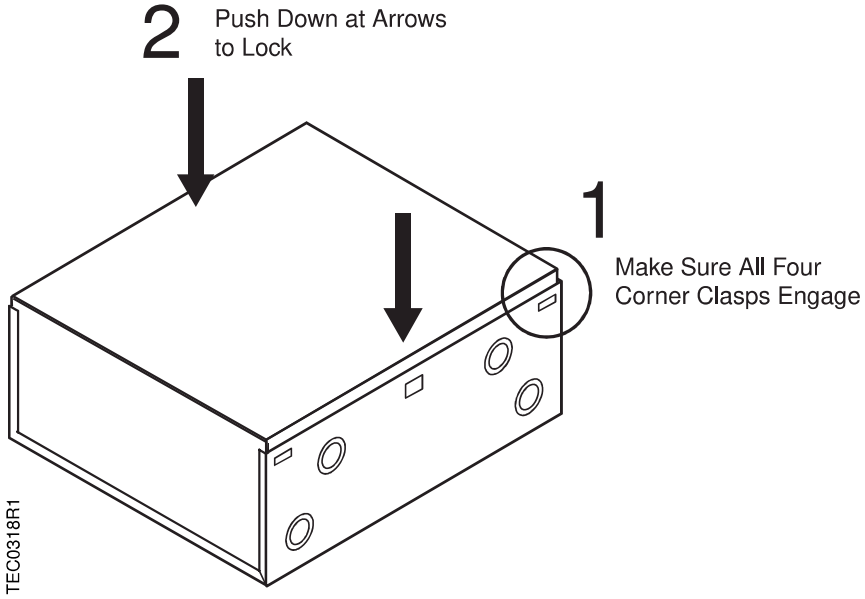


Figure 6. Enclosure 550-002 — Replacing Cover.

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