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:

Product Name: BMS CONTROLS VALVES BY SIEMANS

Manufacturer: B&G

Subcontractor/ Supplier: D&B ENGINEERING

References:

Spec. Section No.: 230923.2

Drawing No(s): _____

Paragraph: _____

Rm. or Detail No(s): _____

Architect's/ Engineer's Review Stamp

SAGE ENGINEERING ASSOCIATES, LLP

[x] Reviewed [ ] Furnish as Corrected
[ ] Rejected [ ] Revise and Resubmit
[ ] Submit Specified Item

This review is only for general conformance with the design concept and the information given in the Construction Documents. Corrections or comments made on the shop drawings during this review do not relieve the contractor from compliance with the requirements of the plans and specifications. Review of a specific item shall not include review of an assembly of which the item is a component. The Contractor is responsible for dimensions to be confirmed and correlated at the jobsite; information that pertains solely to the fabrication processes or to the means, methods, techniques, sequences and procedures of construction; coordination of the Work with that of all other trades and performing all Work in a safe and satisfactory manner.

SAGE LOG NO. M-44

Date: 12/19/2023 By: J. Venditte

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 12.18.23

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: 12/15/2023	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
- ☐ APPROVED SUBMITTALS
- ☐ SUBMITTALS FOR YOUR USE
- ☐ MARKED PLANS & SPECIFICATIONS
- ☒ VALVE SCHEDULE
- ☐ ENGINEERING COMMENTS
- ☐ ORIGINAL DRAWINGS
- ☐ SHOP DRAWINGS
- ☐ CHANGE ORDER(S)
- ☐

THESE ARE SUBMITTED

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

DESCRIPTION

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

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

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

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.
MORRISTOWN, NJ. 07960
USA

PHONE: (973) 575-6300
FAX: (973) 575-7968

12/15/23

FOR INFORMATION CONTACT
OLIVER WRIGHT (PROJECT MANAGER)

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

Valve Submittal Notes
12/15/2023

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. Globe 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 INDUSTRY, INC. **Valve Submittal - Water**

SMART INFRASTRUCTURE

LOCATION:	NANUET, NY	**PROJECT NAME:**	NANUET BOND PHASE3 HIGH SCHC	**DATE:**	12/15/23
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. **Valve Submittal - Water**

SMART INFRASTRUCTURE

LOCATION:	NANUET, NY	**PROJECT NAME:**	NANUET BOND PHASE3 HIGH SCHC	**DATE:**	12/15/23
JOB NO:	44OP-366733			**PAGE:**	2
ENGR:	VB			**REV:**	0

GENERAL NOTES:

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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. **Valve Submittal - Water**

SMART INFRASTRUCTURE

LOCATION:	NANUET, NY	**PROJECT NAME:**	NANUET BOND PHASE3 HIGH SCHC	**DATE:**	12/15/23
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.
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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.

SIEMENS INDUSTRY, INC. **Valve Submittal - Steam**

SMART INFRASTRUCTURE

LOCATION:	NANUET, NY	**PROJECT NAME:**	NANUET BOND PHASE3 HIGH SCHC	**DATE:**	12/15/23
JOB NO:	44OP-366733			**PAGE:**	4
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. **Valve Submittal - Water**

SMART INFRASTRUCTURE

LOCATION: NANUET, NY **PROJECT NAME:** NANUET BOND PHASE3 HIGH SCHC **DATE:** 12/15/23
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: 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. **Valve Submittal - Water**

SMART INFRASTRUCTURE

LOCATION: NANUET, NY **PROJECT NAME:** NANUET BOND PHASE3 HIGH SCHC **DATE:** 12/15/23
JOB NO: 44OP-366733 **PAGE:** 6
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: 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. **Valve Submittal - Water**

SMART INFRASTRUCTURE

LOCATION:	NANUET, NY	**PROJECT NAME:**	NANUET BOND PHASE3 HIGH SCHC	**DATE:**	12/15/23
JOB NO:	44OP-366733			**PAGE:**	7
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: 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. **Valve Submittal - Water**

SMART INFRASTRUCTURE

LOCATION:	NANUET, NY	**PROJECT NAME:**	NANUET BOND PHASE3 HIGH SCHC	**DATE:**	12/15/23
JOB NO:	44OP-366733			**PAGE:**	8
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

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

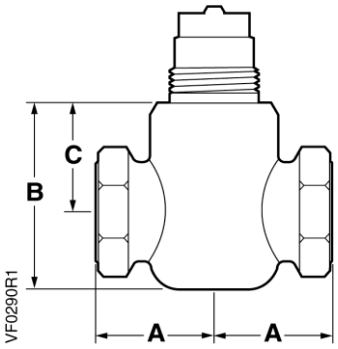
Leakage Rate Class IV (0.01% of Cv)

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.

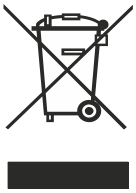
All two-way valves shall be provided with equal-percentage contoured throttling plugs.

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.

SIEMENS

Technical Bulletin

Document No. 155-772

TB 255

June 1, 2023

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).

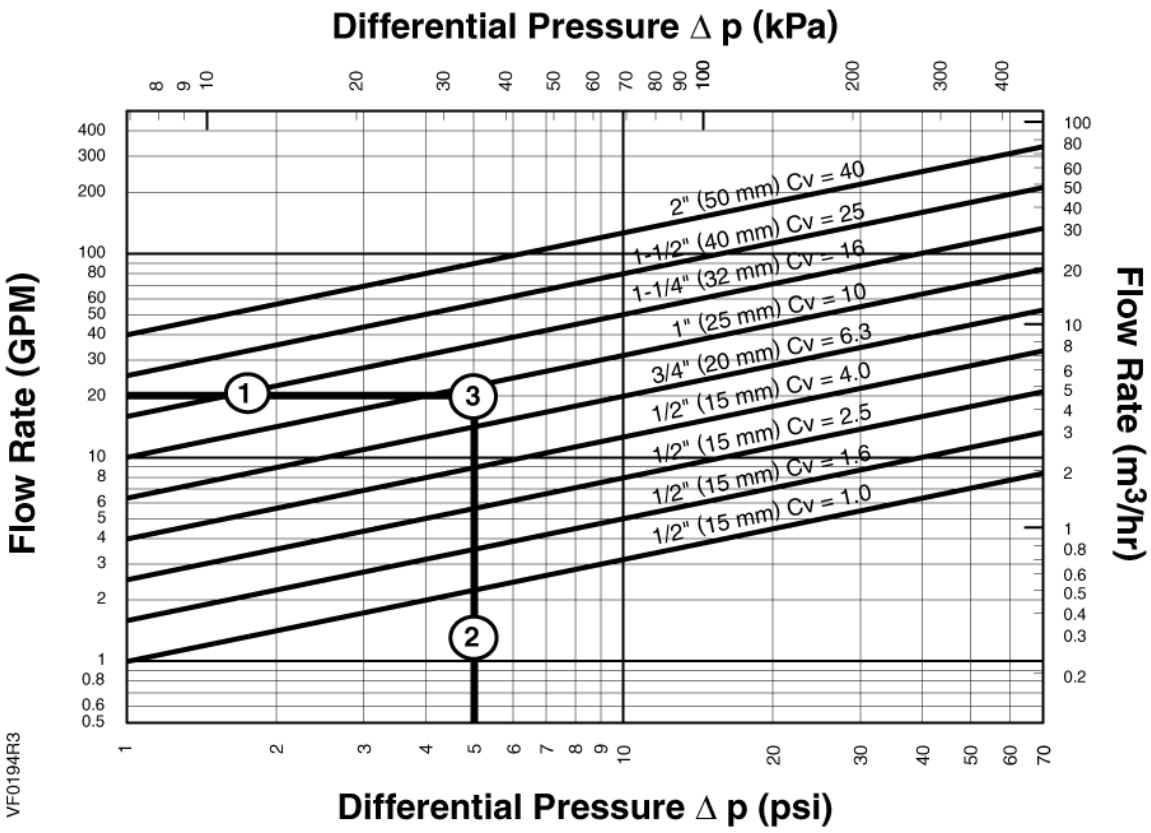


Figure 1. Water Capacity Graph.

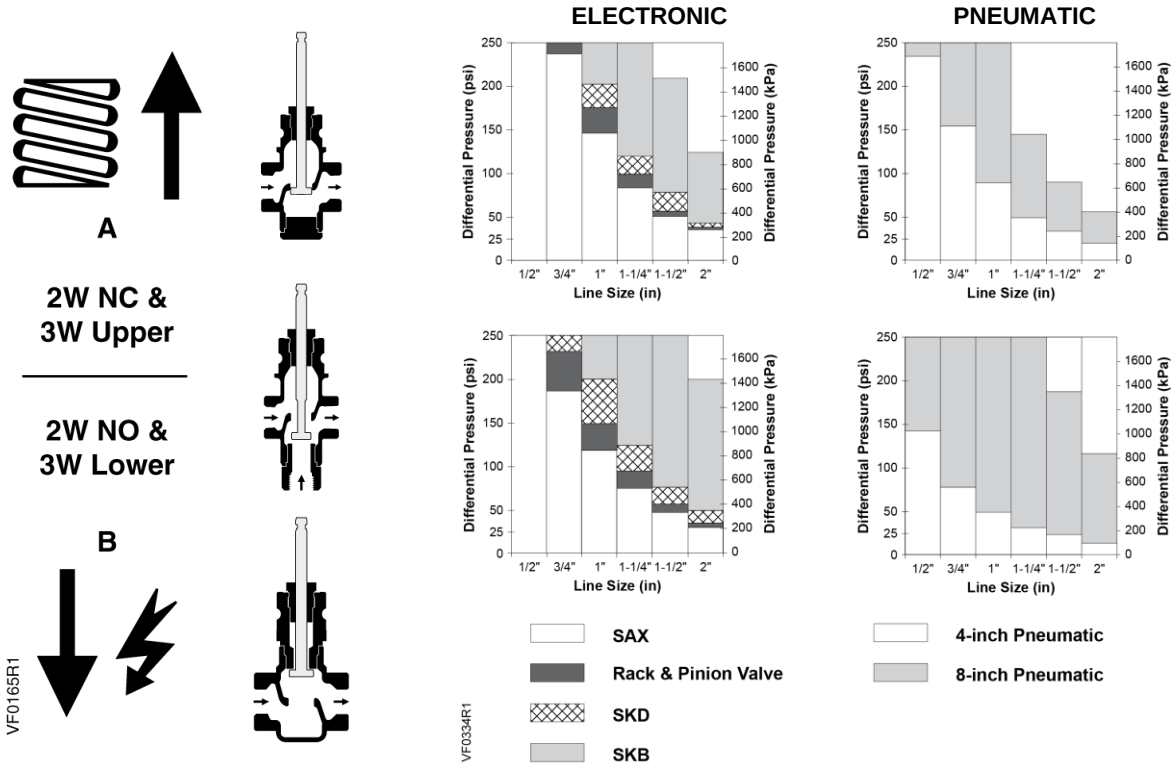


Figure 2. Close-off Pressures.

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
						Actuator P/N	155-183P25	155-161P25	
							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	Electro-Hydraulic – 24 Vac					
						Description	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 With Positioner
							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 Floating	Non-Spring Return 0 to 10 Vdc, 4 to 20 mA	Spring Return 2-Position	Spring Return 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

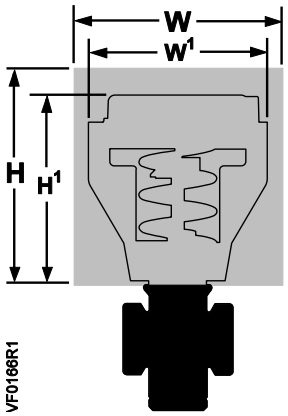


Figure 3. Actuator Dimensions. See Table 19.

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)

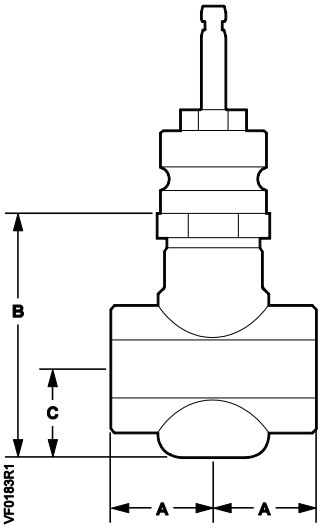


Figure 4. Two-Way Internal Thread NPT × Internal Thread NPT (IT×IT) Valves.

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)

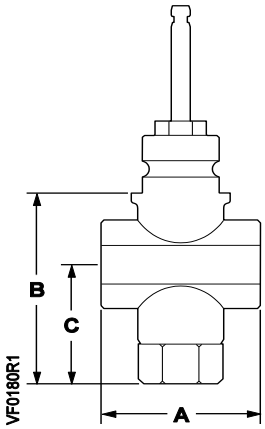


Figure 5. Three-Way Internal Thread NPT × Internal Thread NPT (IT×IT) Valves.

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)

SIEMENS

Technical Bulletin
Document No. 155-776
TB 256
December 26, 2017

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)

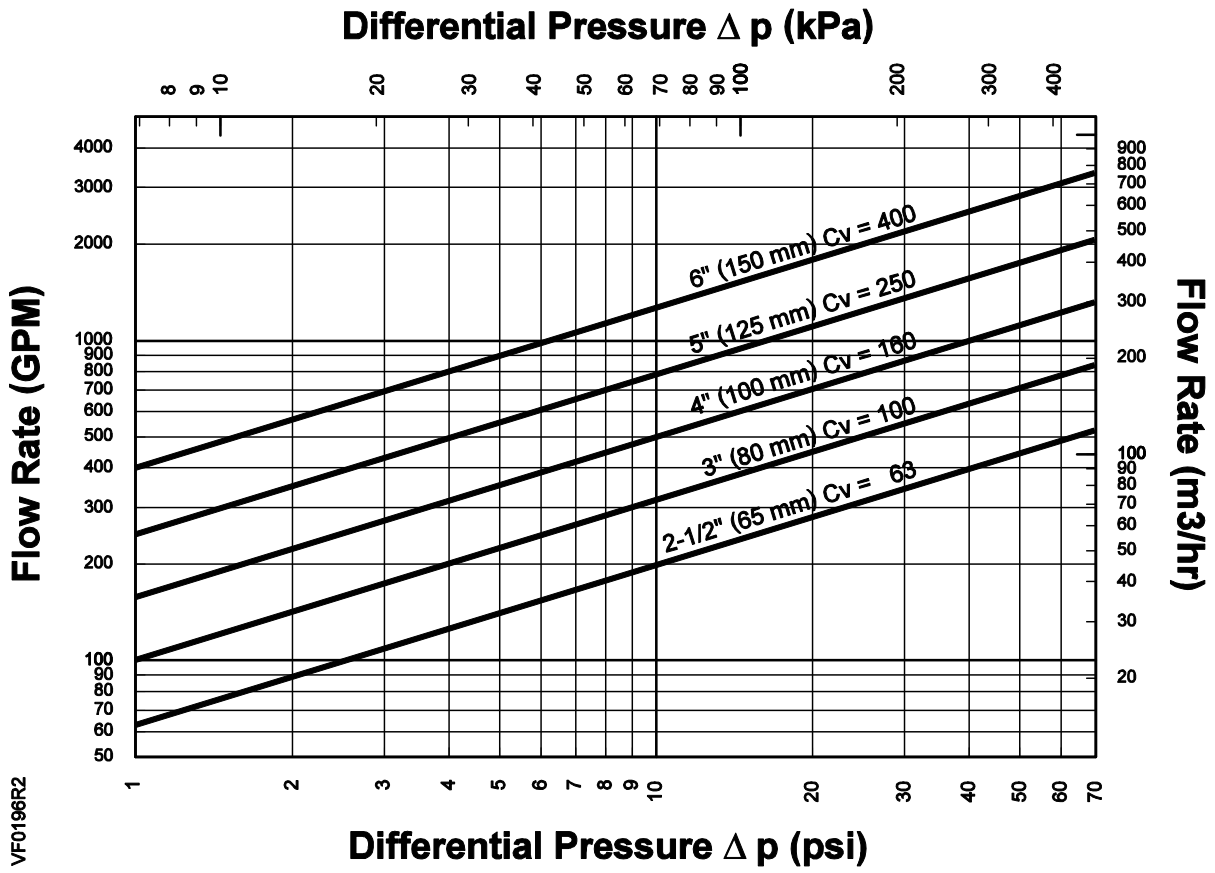


Figure 1. Water Capacity Graph.

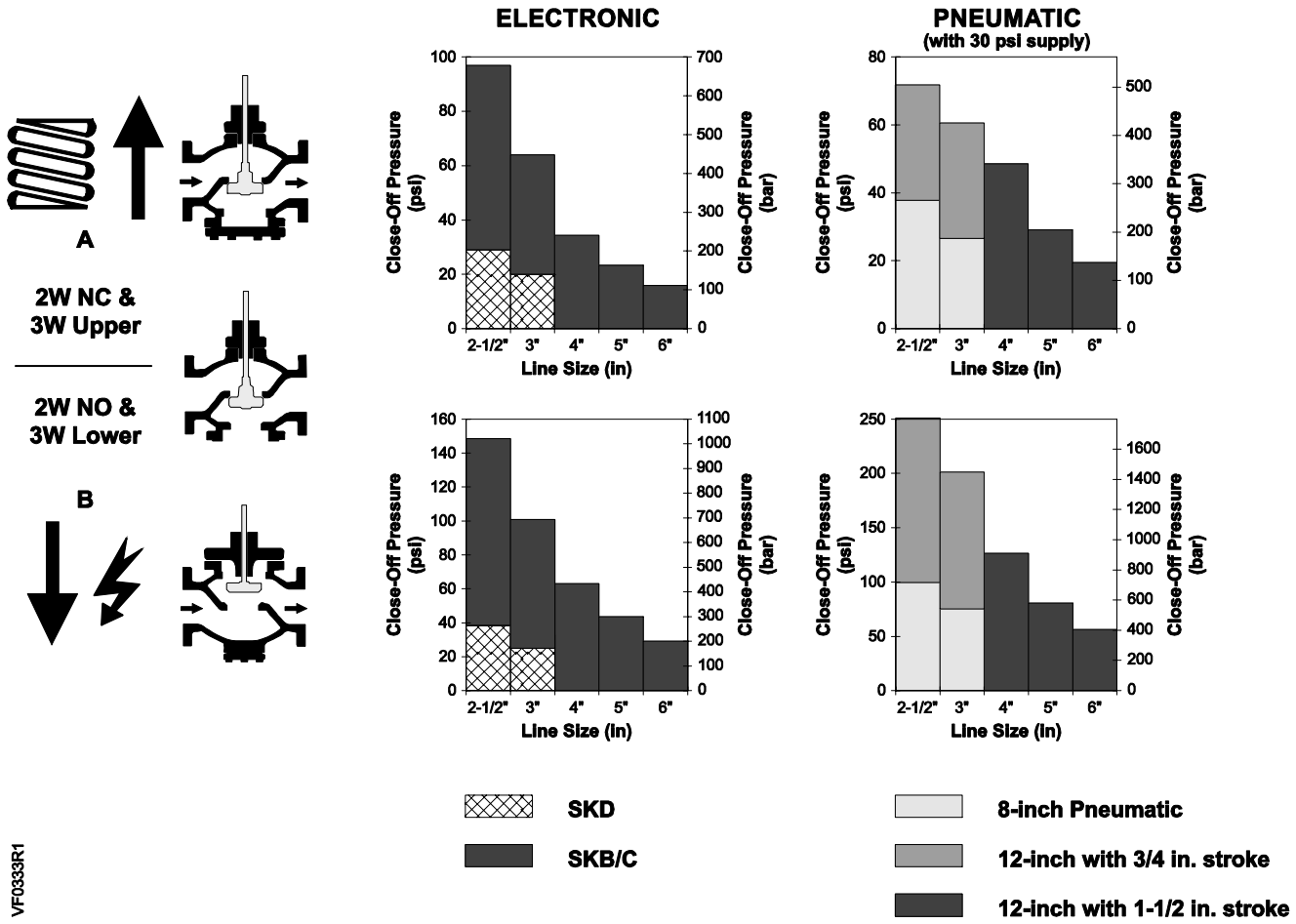


Figure 2. Close-off Pressures for 2-1/2 through 6-Inch Valves.

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		Valve Size		Stroke	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	599-05980	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	Valve P/N	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
										Actuator Code									
									Valve P/N	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).

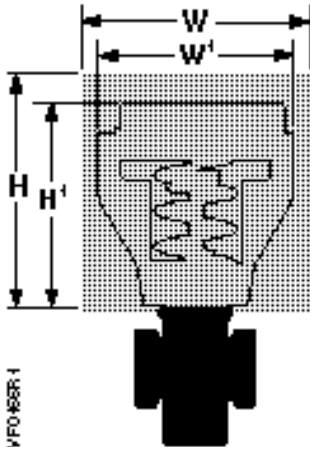


Figure 3. Actuator Dimensions.

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)

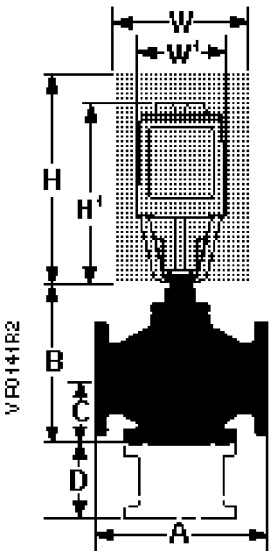


Figure 4. Dimensions.

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

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.

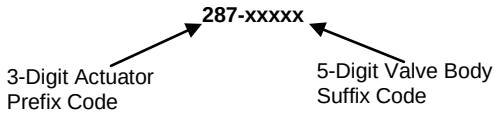
Typical applications include control of hot or chilled water; or 50% water-glycol solution.

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 Actuator Codes SKD62U 274	Spring Return 0 to 10 Vdc Actuator Codes SKC62U 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

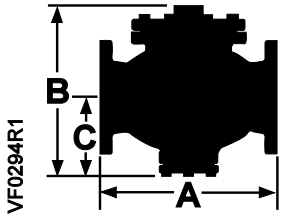


Table 5. Flanged 2-Way Valve Dimensions.

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)

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)

SIEMENS

Technical Specification Sheet
Document No. A6V11858963
October 18, 2023

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)

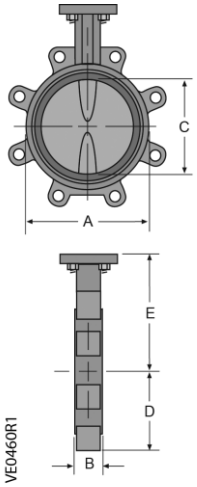
End Switches:
1 = No switches
6 = Switches

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)

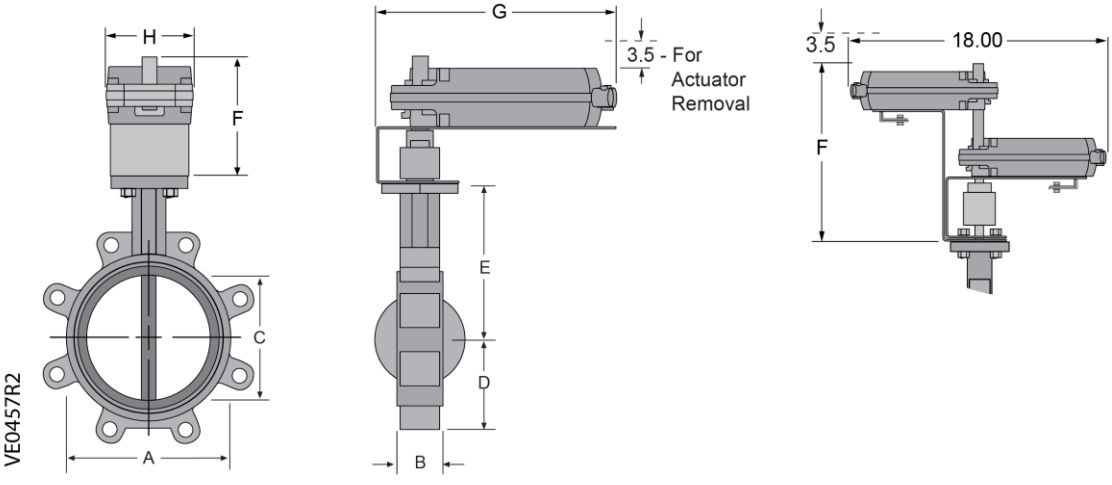
Dimensions – 2-Way, OpenAir Commercial Electric Actuators

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

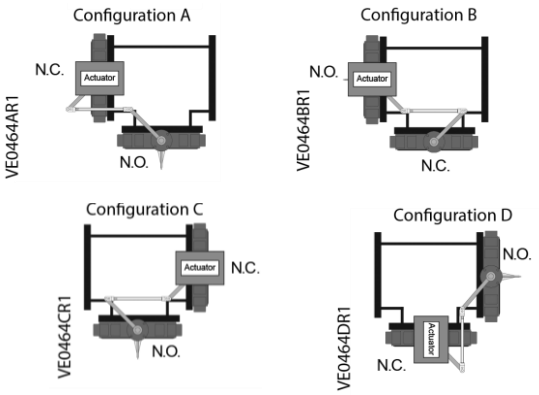
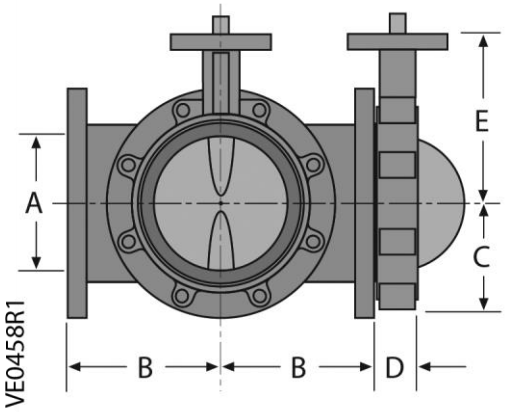


Figure 1. 3-Way Valve Configurations.

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

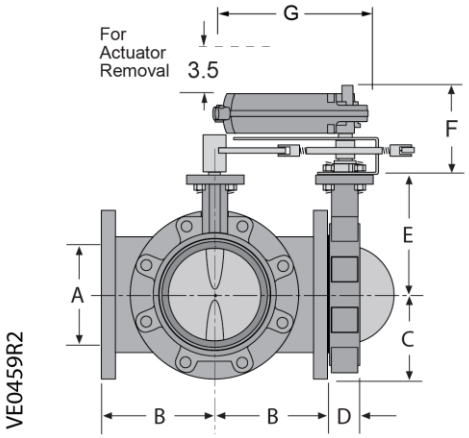


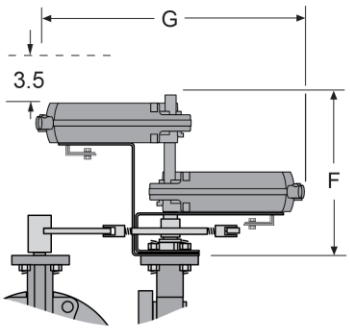
Dimensions – 3-Way, OpenAir Commercial Electric Actuators, Continued

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

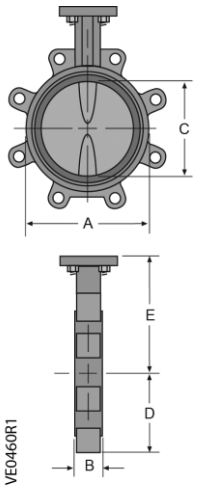
Model Number	F	G	Weight[1]	
			lbs	kg
GIB	7.43	10.96	4.4	2.0
GCA	7.43	10.96	4.9	2.2
Dual Actuator	11.75	18.00	12.8	5.8
Largest actuator dimension shown				



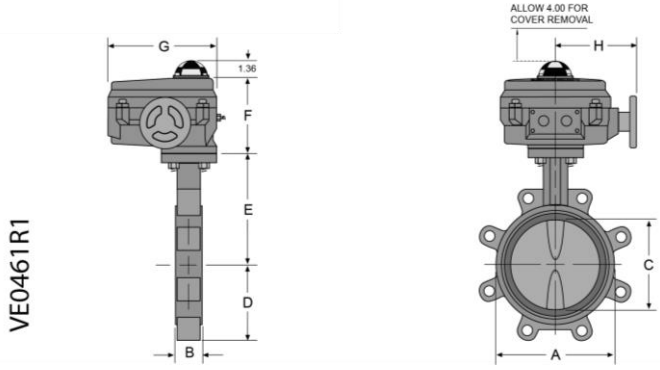


Dimensions – Industrial Actuators

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.													

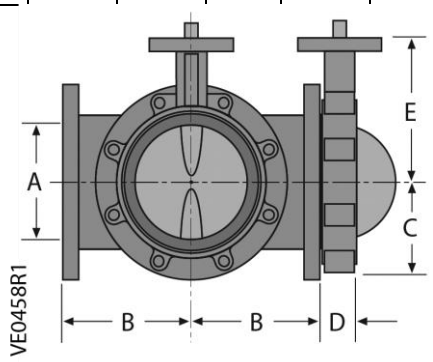


A-Series Actuators				
Model Number	F	G	H	Weight (lbs)
Axxx.530	6.4	4.8	6.5	10
Axxx.600	5.6	7.5	5.8	13
Axxx.1K/Axxx.2K	6.6	10.1	7.8	28
Axxx.3K/Axxx.5K/ Axxx.6K	7.2	12.1	9.5	48
Axxx.13K/Axxx.18K	12.1	18.8	9.5	118
Axxx.21K	12.3	32.1	28.9	195
Axxx.41K	12.3	32.1	28.9	195

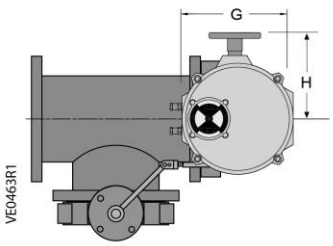


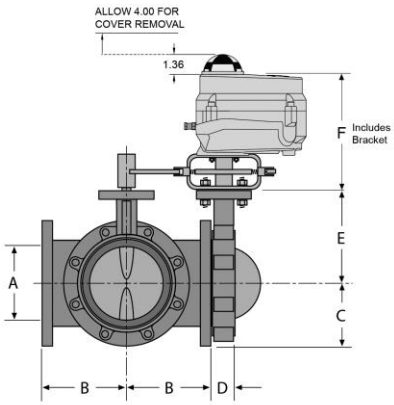
Dimensions – Industrial Actuators

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





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SIEMENS

Technical Specification Sheet
Document No. A6V11775657
March 4, 2020

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:

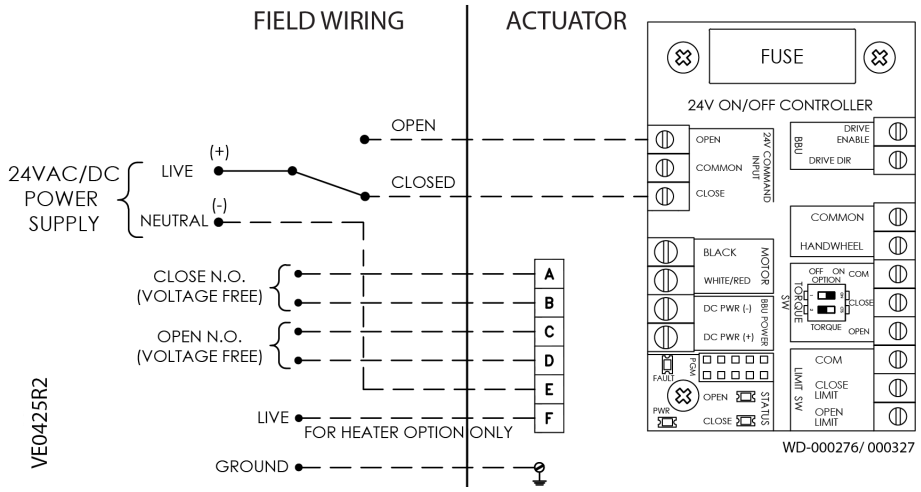
Do not install or use the A-Series Industrial Electric Actuator in or near environments where corrosive substances or vapors could be present. Exposure of the electric actuator to corrosive environments may damage the internal components of the device and will void the warranty.

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



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 1. 24 Vac/dc On/Off Wiring 600 and 2000 lb.-in. Models.

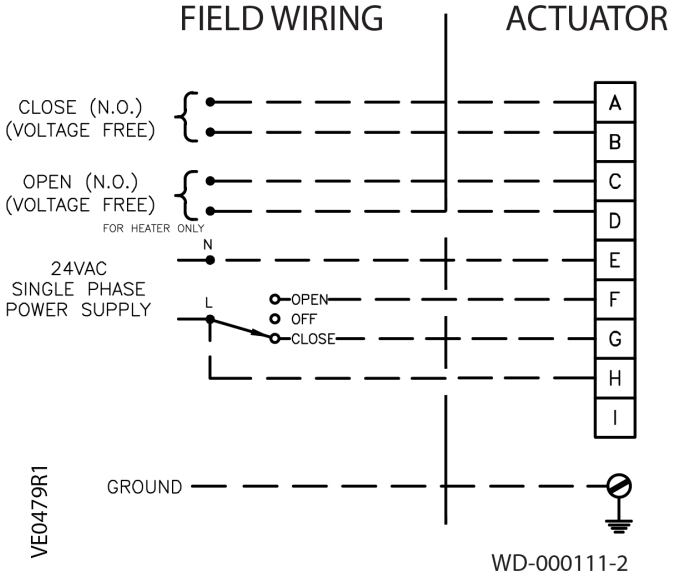


Figure 2. 24 Vac Wiring 5000 lb.-in. Models.

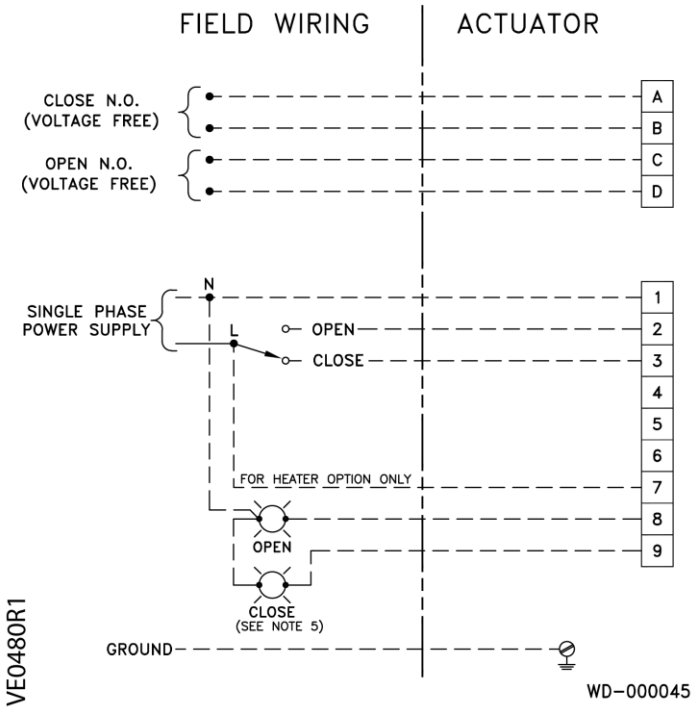


Figure 3. 120 Vac Wiring, All Models.

Wiring, Continued

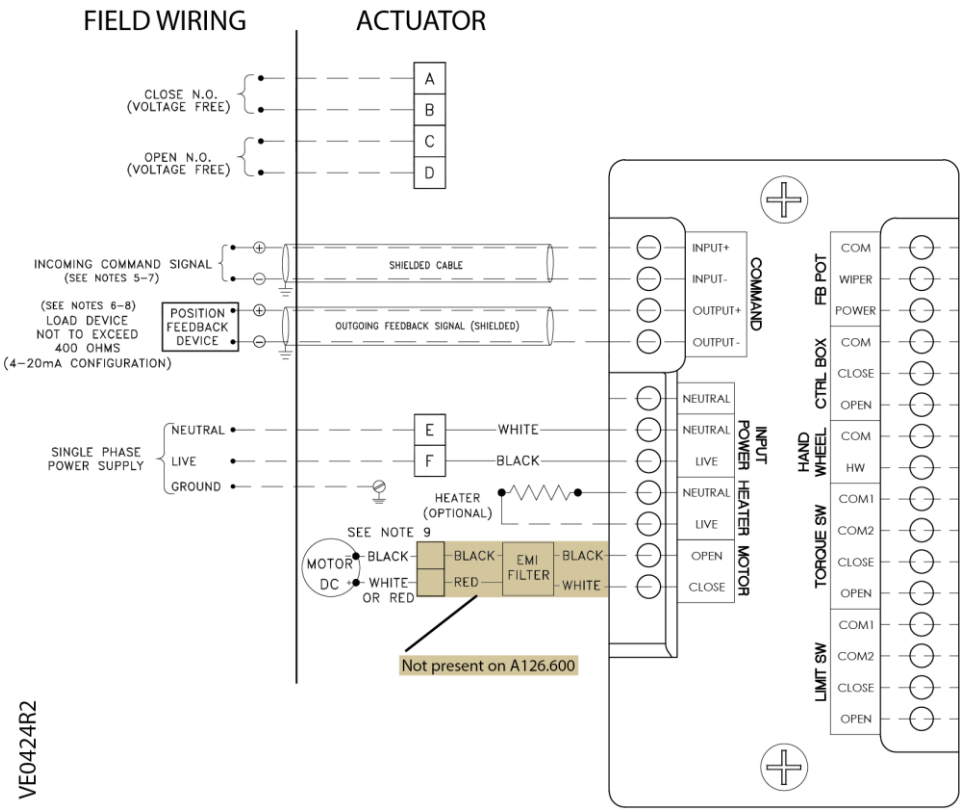


Figure 4. 24 Vac Modulating.

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.

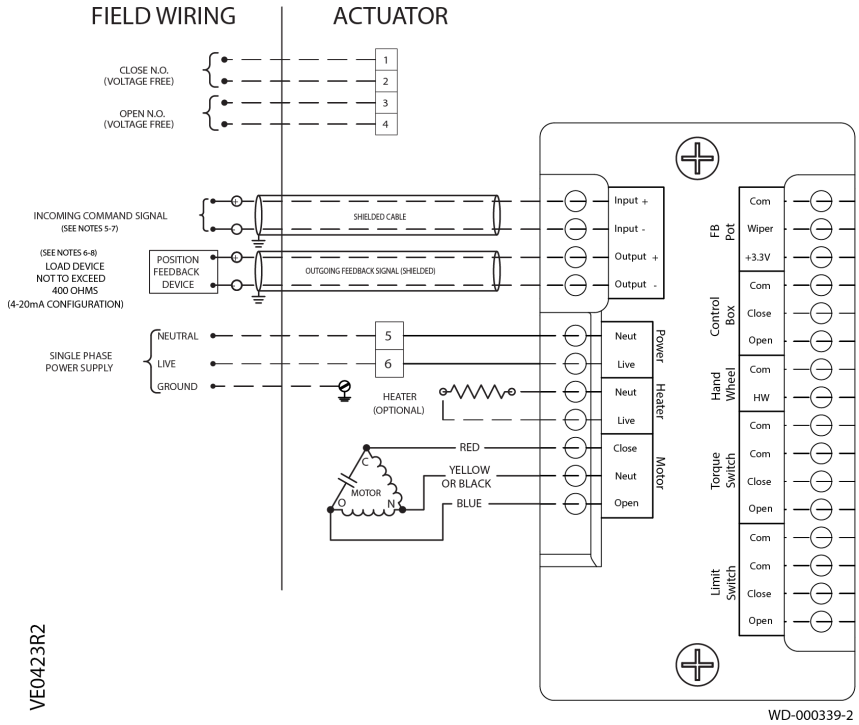


Figure 5. 120 Vac Modulating.

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)

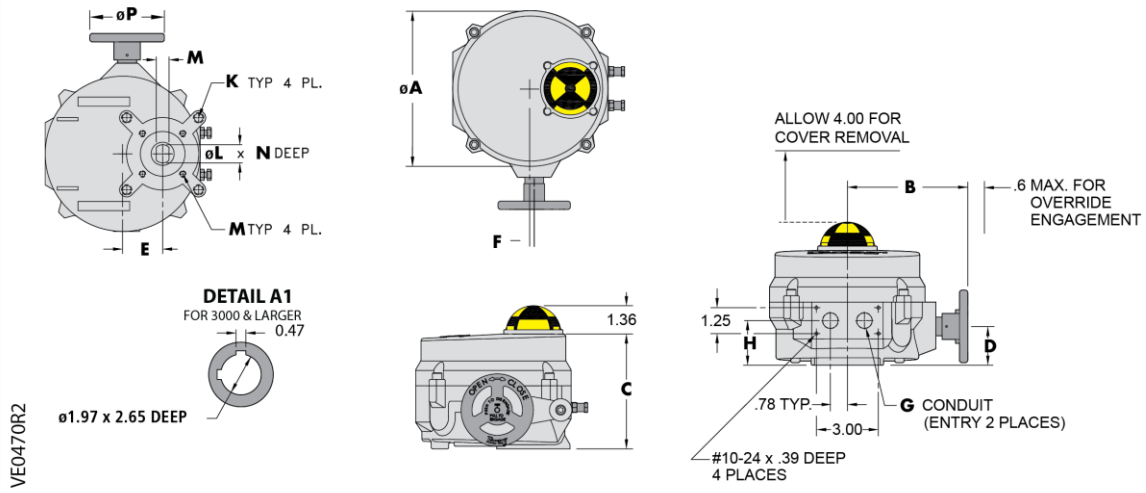
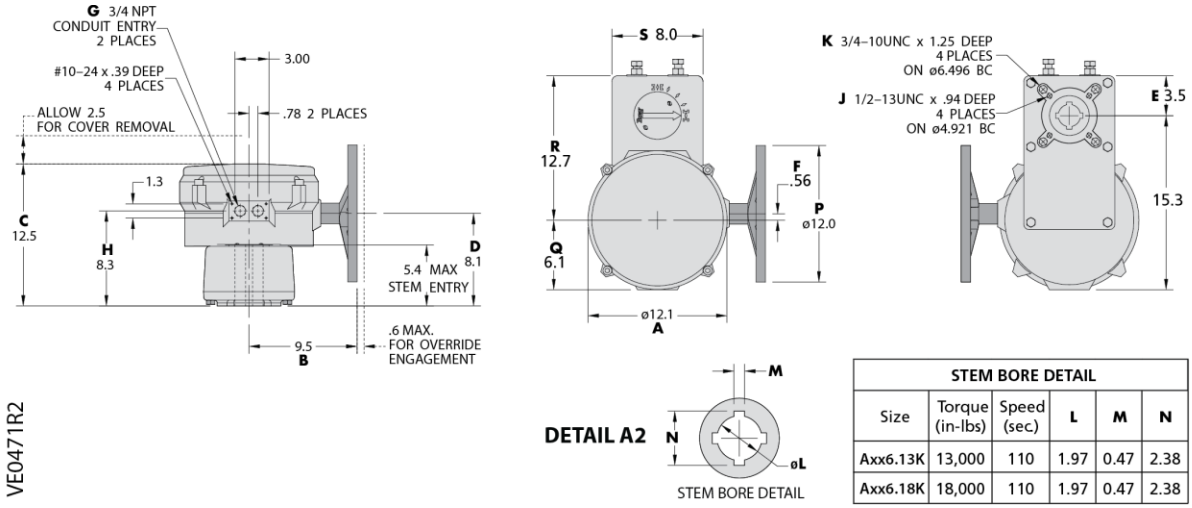


Figure 6. Models Axx6.600 to Axx6.6K.



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.

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Document No. A6V11775657
Printed in the USA

SIEMENS

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

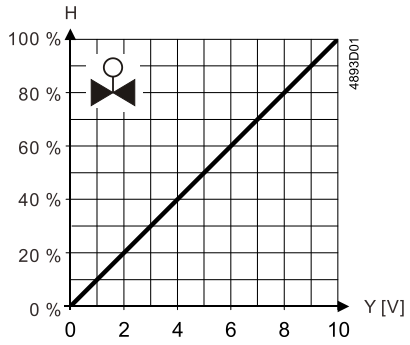
When the actuator is driven by DC 0…10 V positioning signal, it produces a stroke, which is transmitted to the valve stem.

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	–

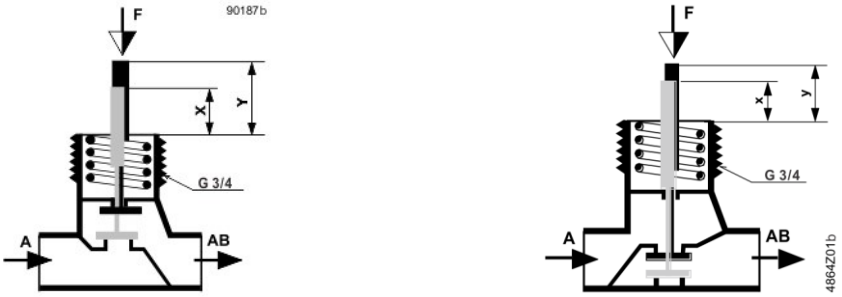
Action	Nominal Line Size		Flow Rate		Connection		
	Inch	mm	Cv	Kvs	FxF	FxUM	AFxUM
	0.5	15	1.0	(0.85)	599-02004	599-02005	–
	0.5	15	1.6	(1.37)	599-02006	599-02007	–
	0.5	15	2.5	(2.15)	599-02008	599-02009	–
	0.5	15	4	(3.44)	599-02010	599-02011	–
	0.75	20	6.3	(5.43)	599-02012	599-02013	–
	1	25	10	(8.6)	599-02014	–	–
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

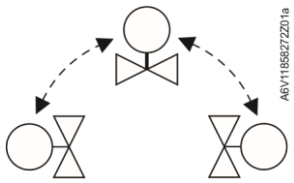
Mounting

⚠ 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

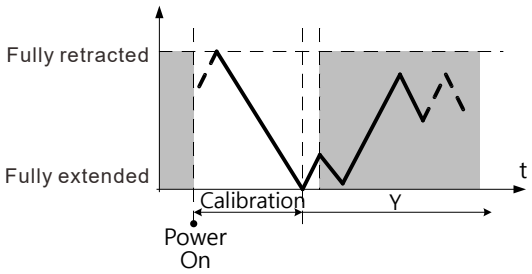
When commissioning, check both wiring and functioning of the actuator.

- 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).



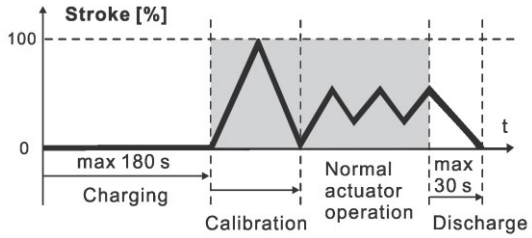
⚠ CAUTION	
	Never intervene manually during self-calibration.

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.

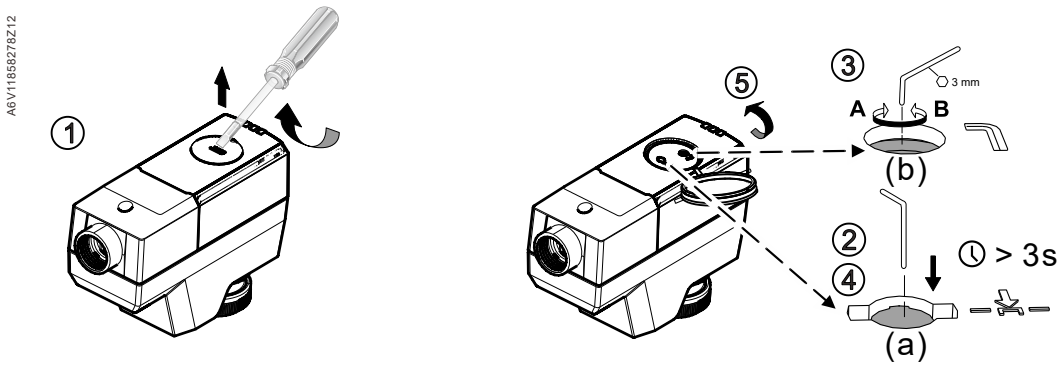
In the event of a power failure of more than 5 seconds, the actuator will return to its fail-safe position within 30 seconds.



A 3-mm Allen wrench can be used to move the actuator to any position.

To move the actuator stem manually

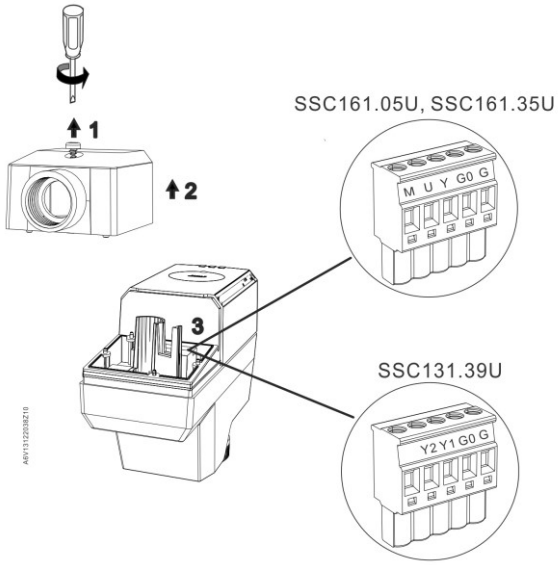
1. Open the cover using a proper screwdriver.
2. Press and hold down button (a) illustrated below for at least three seconds.
   – The actuator ignores any control signal from the controller.
3. Adjust the position of the actuator stem by rotating Allen wrench (b) illustrated below clockwise or counter-clockwise.
   – 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	-	-

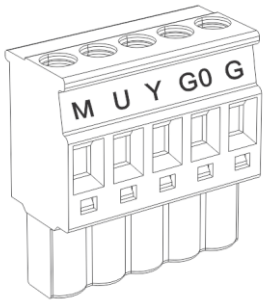
Material	
Cover/base	PC + ABS
Connecting nut	Brass

Weight	
SSC161.05U	9.7 ounces (276 g)
SSC161.35U	10.5 ounces (298 g)
SSC131.39U	10.5 ounces (298 g)

Diagrams

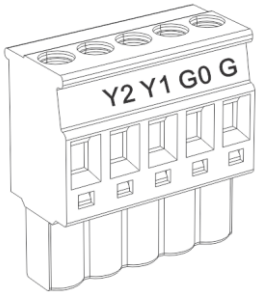
Connection terminals

Connection terminals for SSC161.05U, SSC161.35U



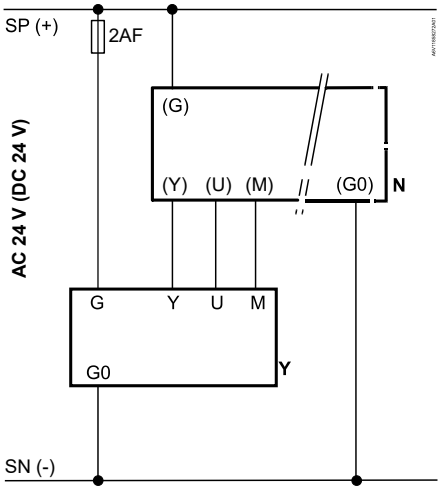
G	System potential (AC/DC 24 V)
G0	System neutral
Y	Control signal DC 0...10 V
U	Feedback signal
M	Measurement reference

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

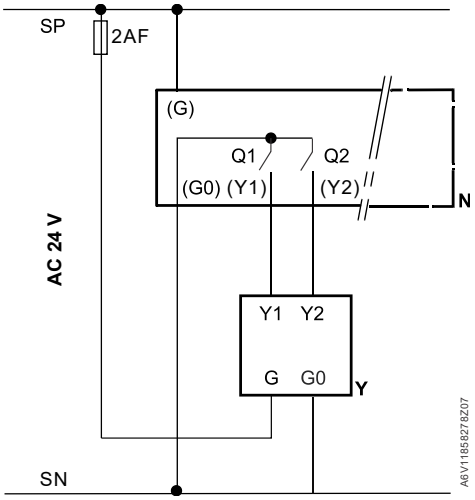
Y = Control signal

U = Feedback signal

M = Measurement reference

Connection diagrams for SSC131.39U

Neutral switch



N = Controller

Y = Actuator

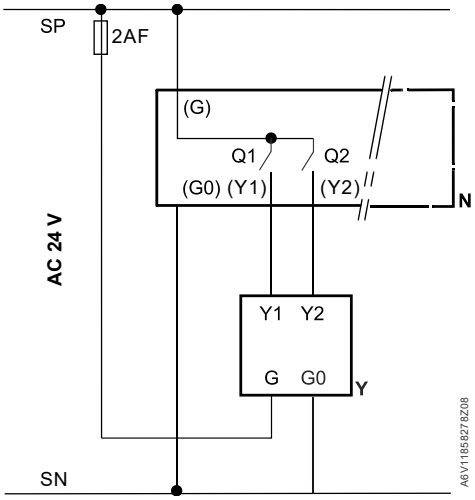
SP, G = System potential AC 24 V

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

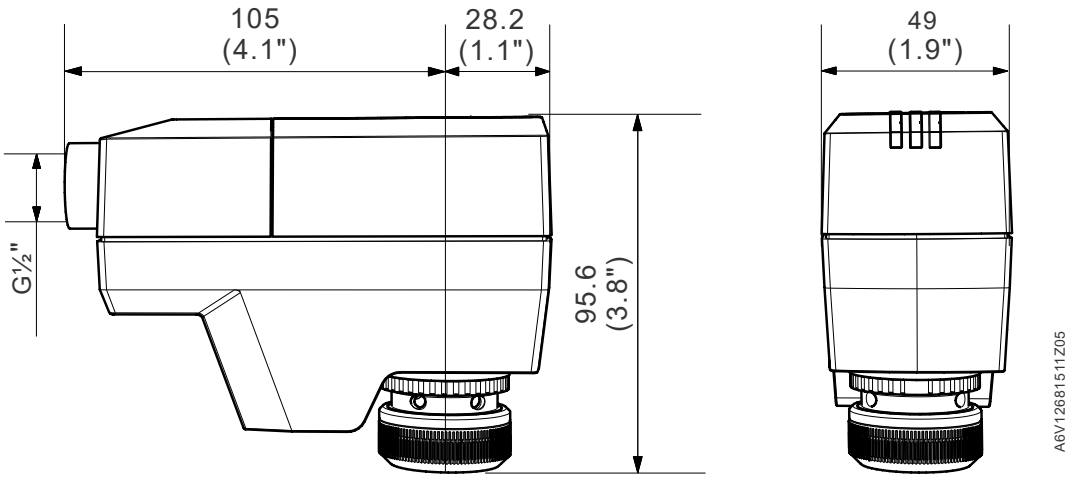
Y1, Y2 = Control signal OPEN, CLOSE

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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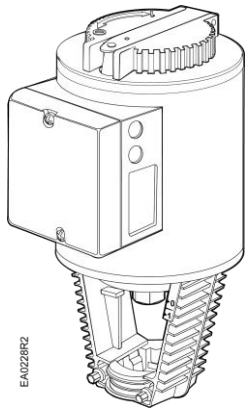
Document ID	A6V12681517_enUS_b
Edition	09/21/2023

SIEMENS

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.

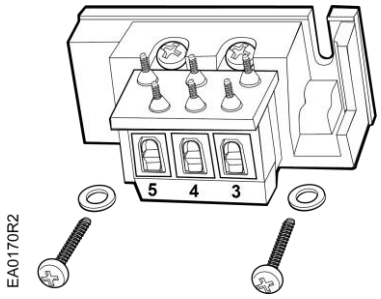


Figure 1. Auxiliary Switch.

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

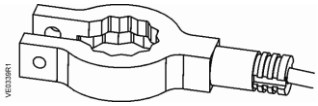


Figure 2. Stem Heating Element.

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

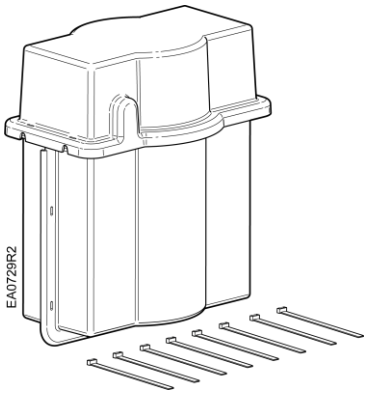


Figure 3. Weather Shield.

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.

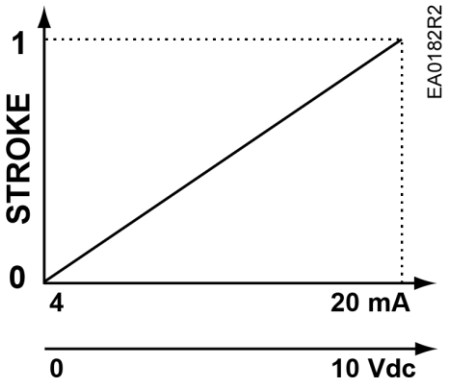


Figure 4. Input Signal.

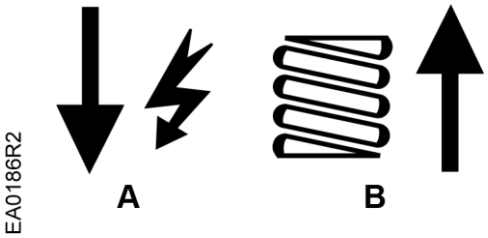


Figure 5. Spring Return.

SKB/C Details

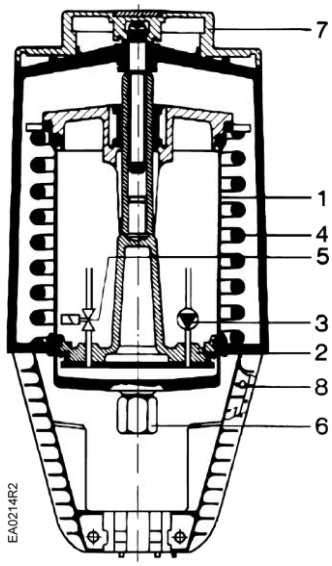


Figure 6. Actuator Design.

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.

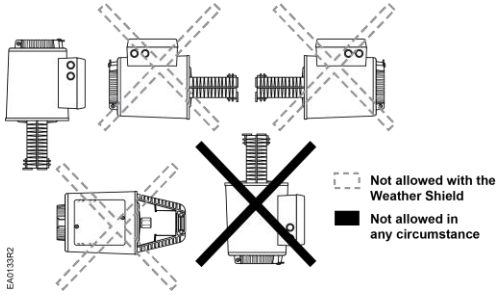


Figure 7. Acceptable Mounting Positions.

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.

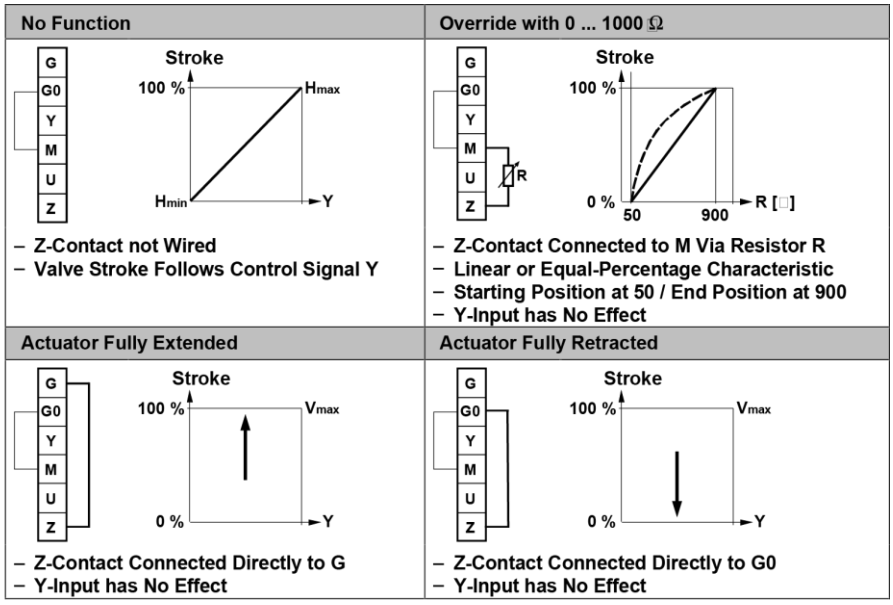
Start up

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.

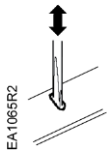


Figure 8.

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.

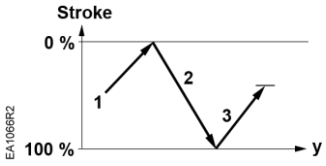


Figure 9.
Automatic Calibration

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

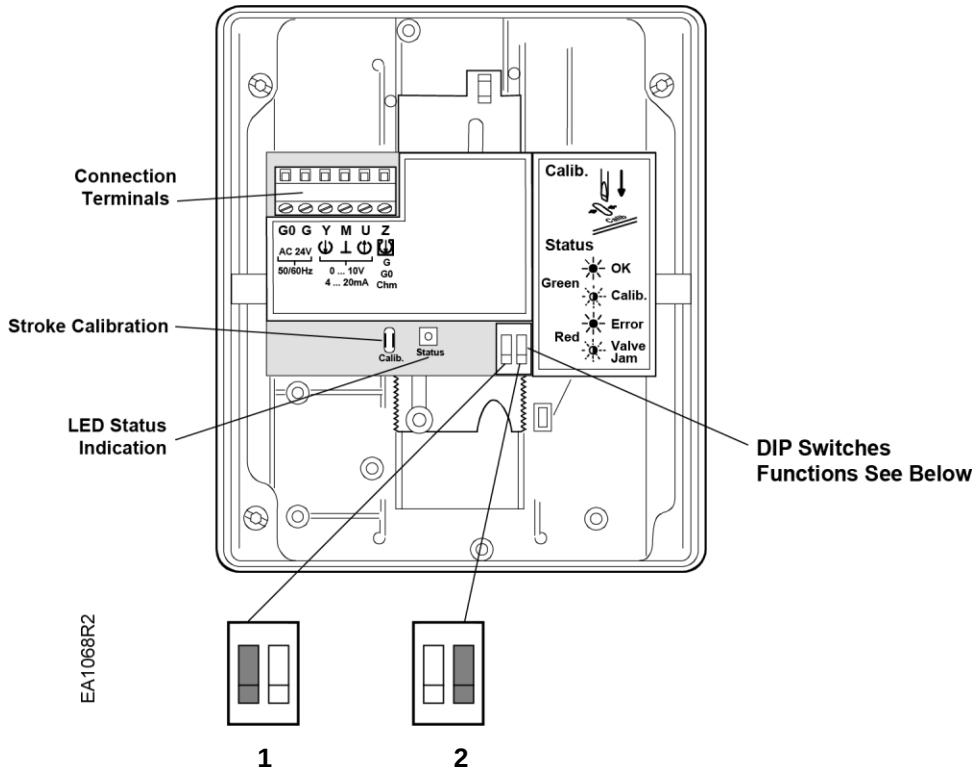


Figure 10. DIP Switches.

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.

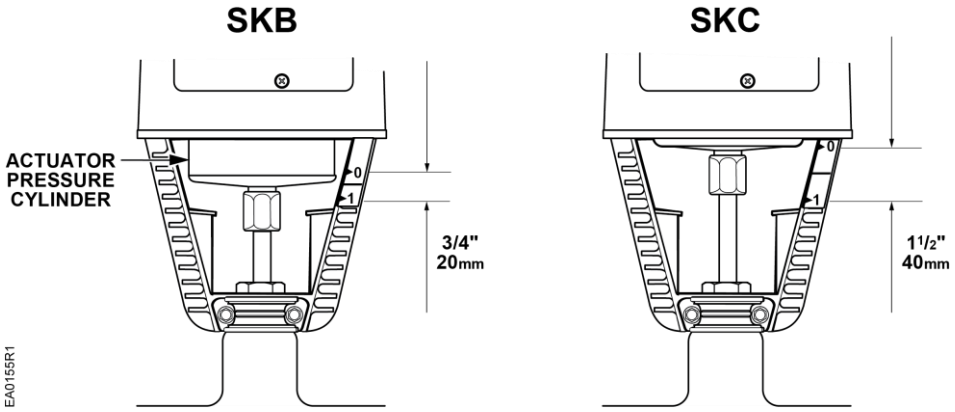


Figure 11. Valve Stem Travel Indication.

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.

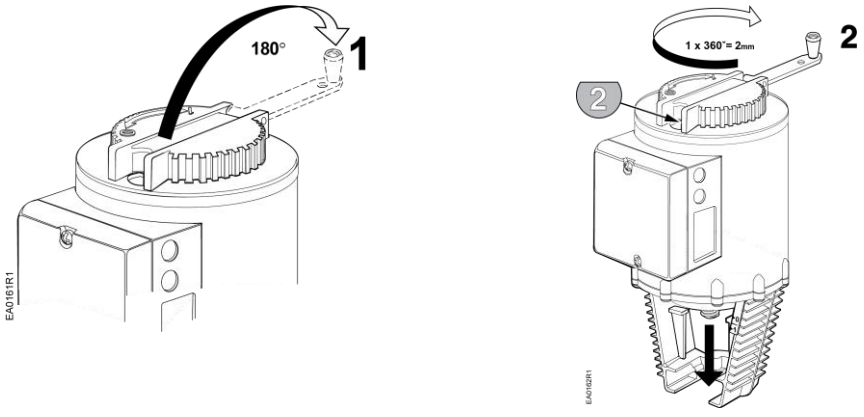


Figure 12. Manual Operation.

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.

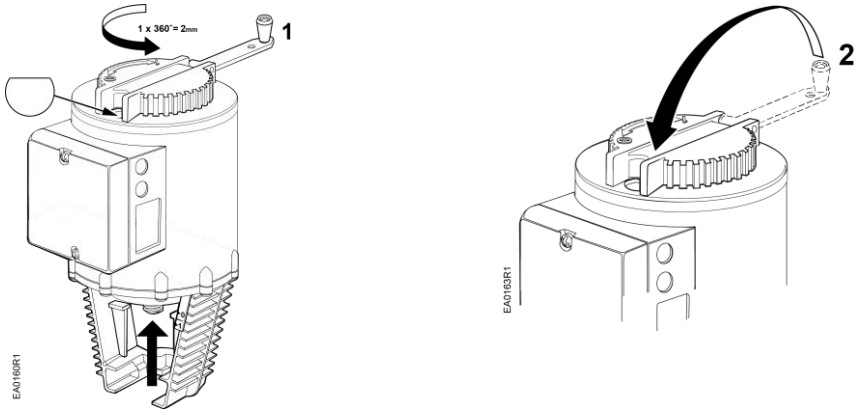


Figure 13. Automatic Operation.

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.

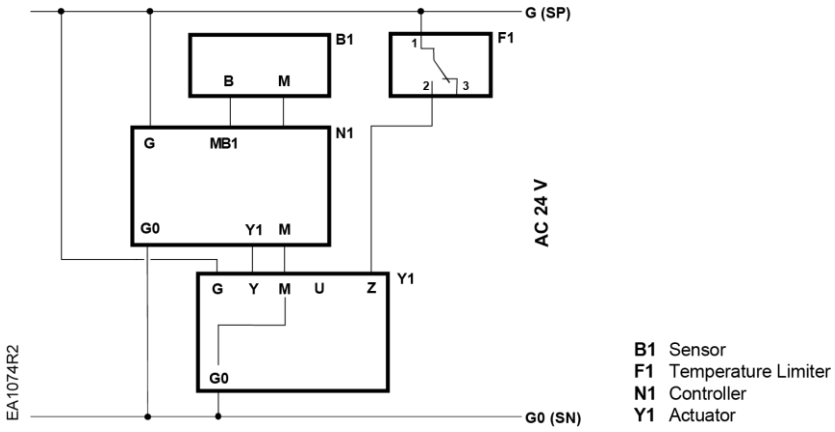


Figure 14. Connecting Terminals.

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

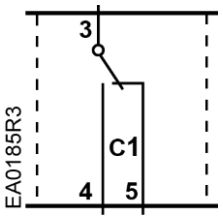


Figure 15.
Auxiliary Switch ASC1.6.

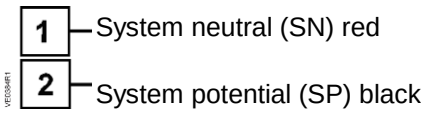


Figure 16.
Stem Heating Element ASZ6.6.

Dimensions

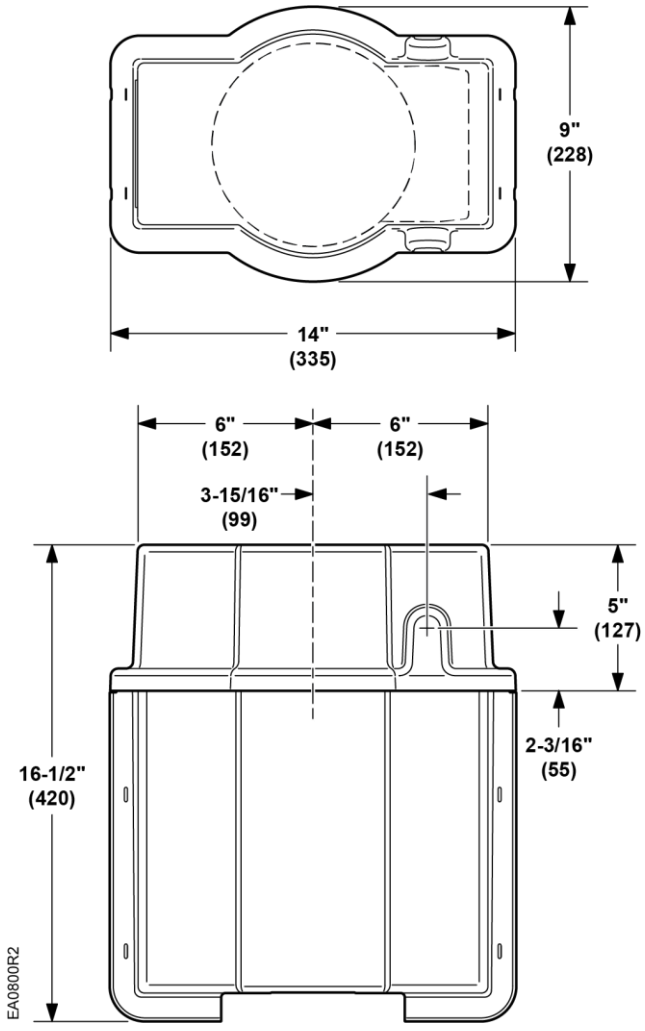


Figure 17. Dimensions of the 599-10065 Weather Shield in Inches (Millimeters).

Dimensions, Continued

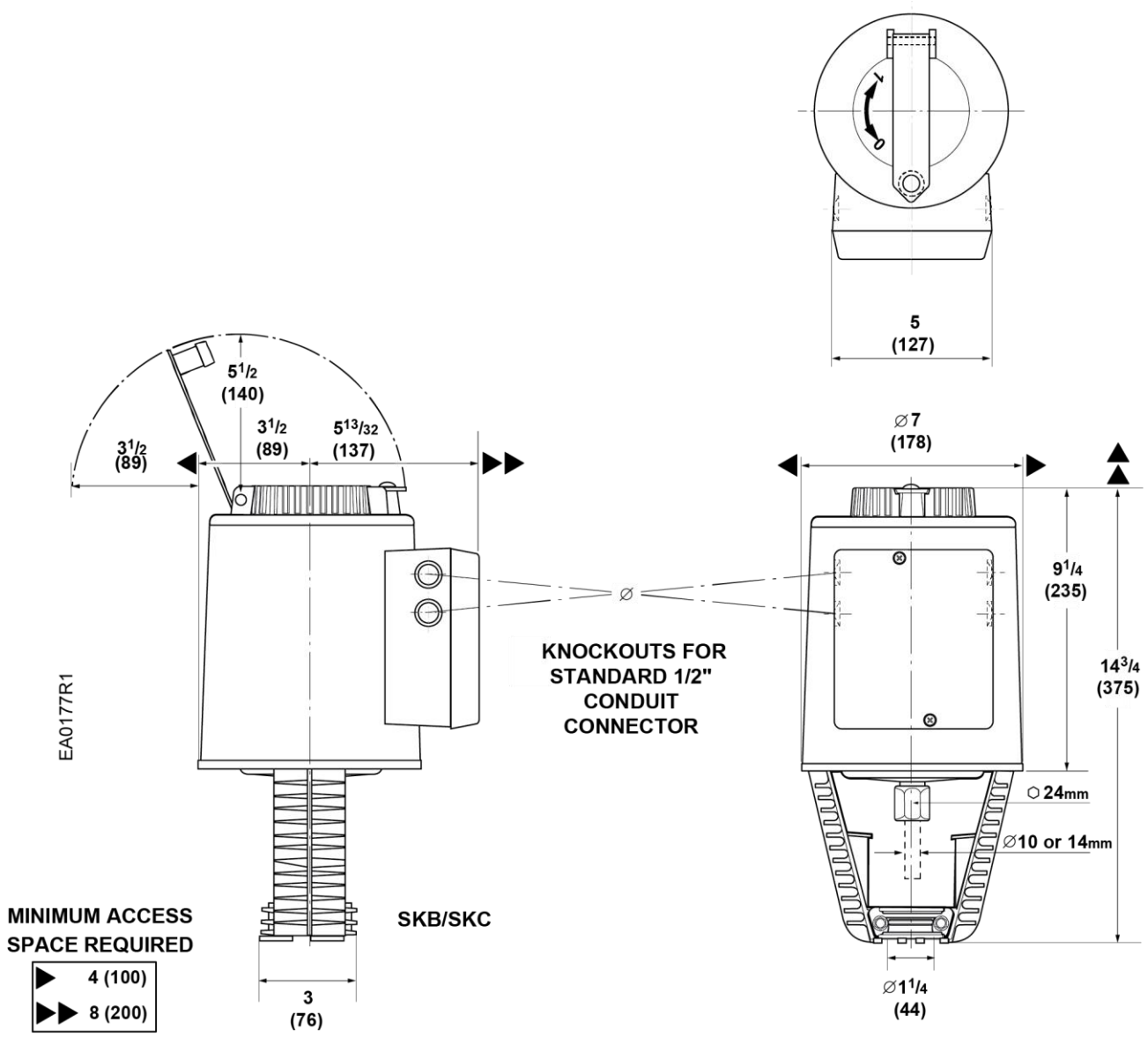


Figure 18. Dimensions of SKB/C in Inches (Millimeters).

SIEMENS

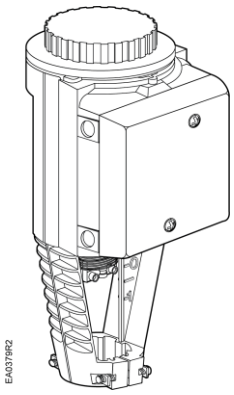
Technical Instructions

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.

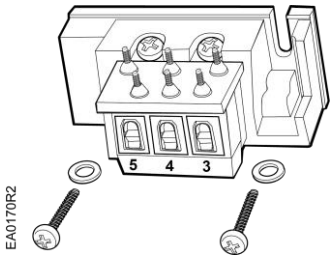


Figure 1. Auxiliary Switch.

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

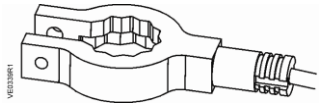


Figure 2. Stem Heating Element.

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

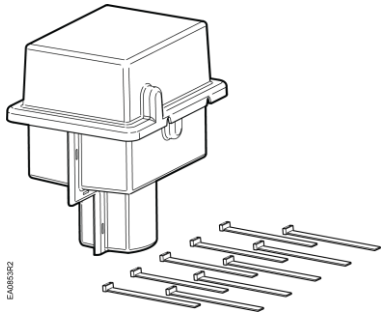


Figure 3. Weather Shield.

599-10071 Weather Shield.

See *Service Kits* for replacement ultraviolet resistant cable ties.

Service Kits

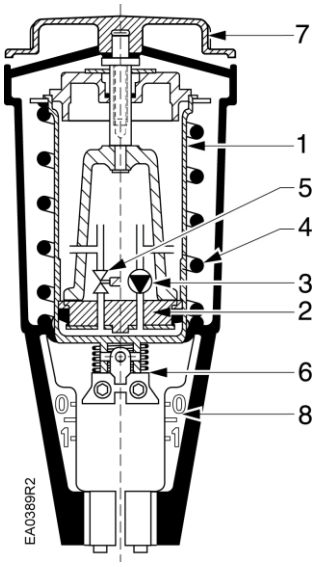
The only field serviceable part is the circuit board.

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.

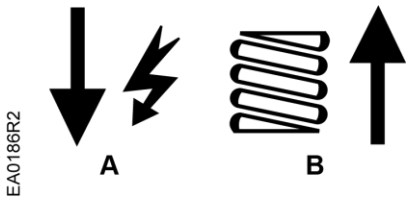


Figure 5.

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.

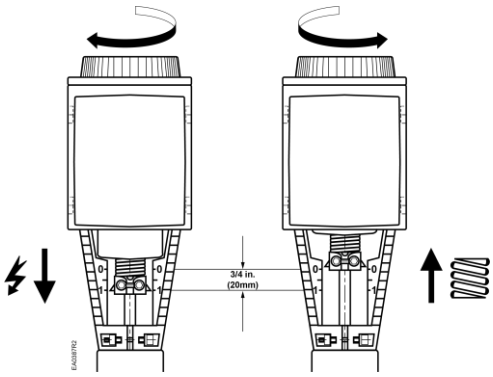


Figure 7. Valve Stem Travel Indication.

Mounting and Installation

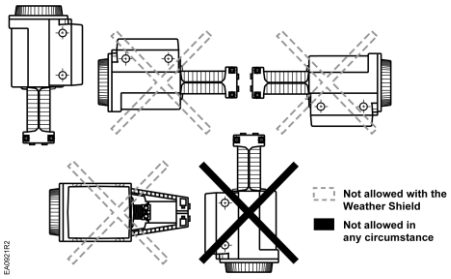


Figure 8. Acceptable Mounting Positions.

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).

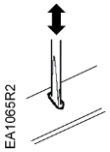


Figure 9.

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.

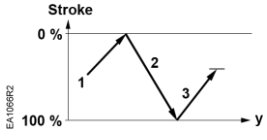


Figure 10.

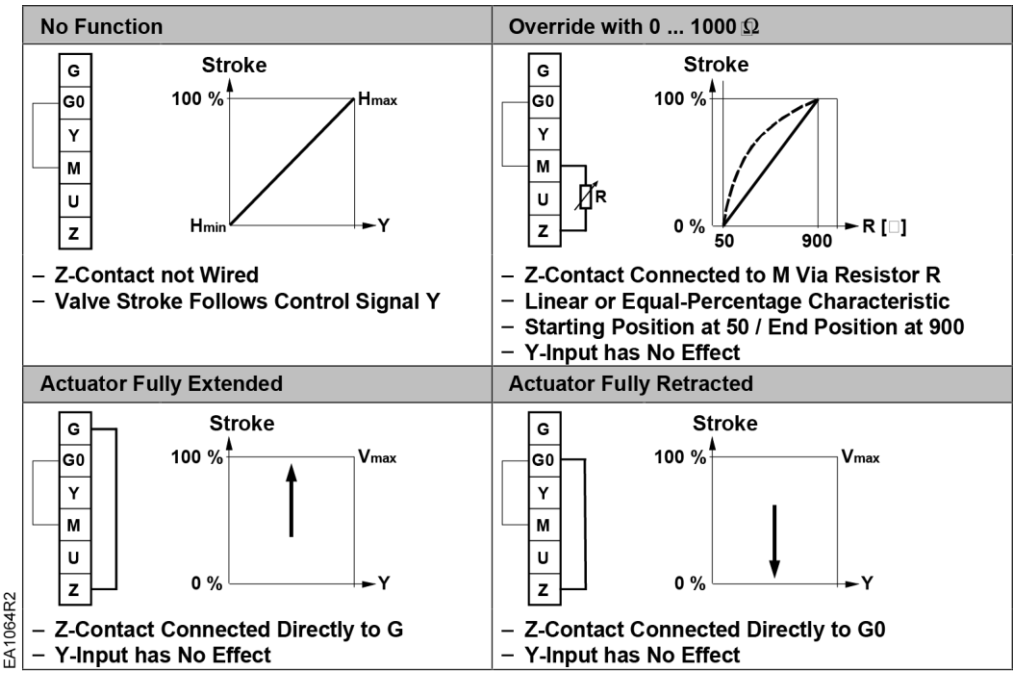
Stroke Calibration, Continued

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

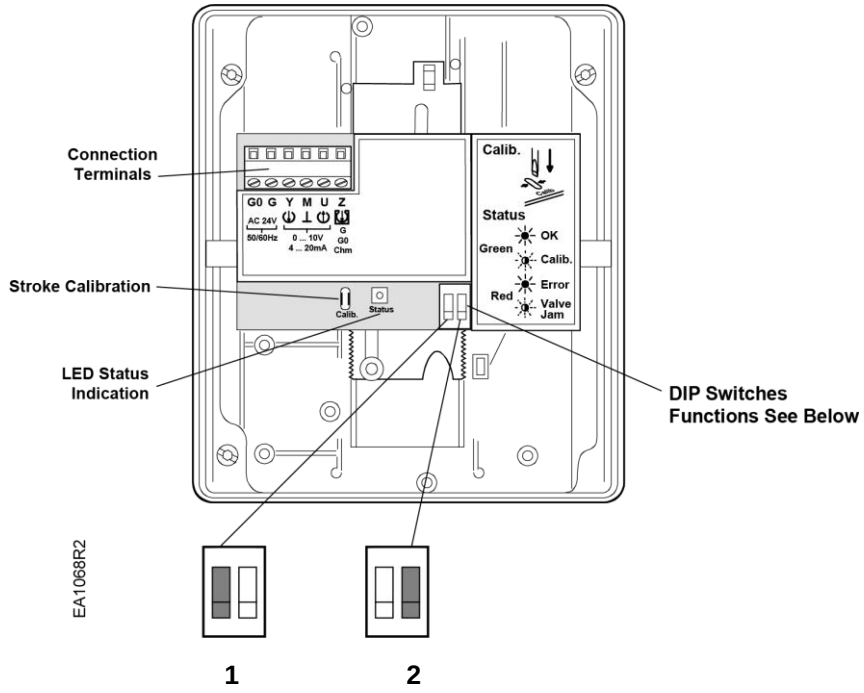


Figure 11. SKD Electronic Features.

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

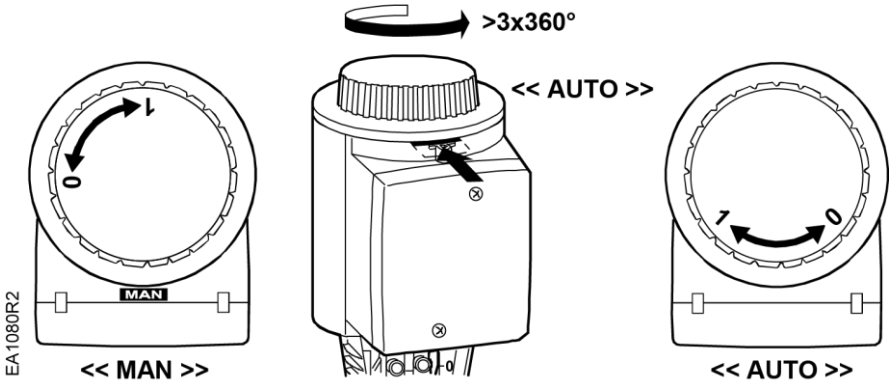


Figure 12. The Manual Setting Knob in Manual and Automatic Position.

- 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

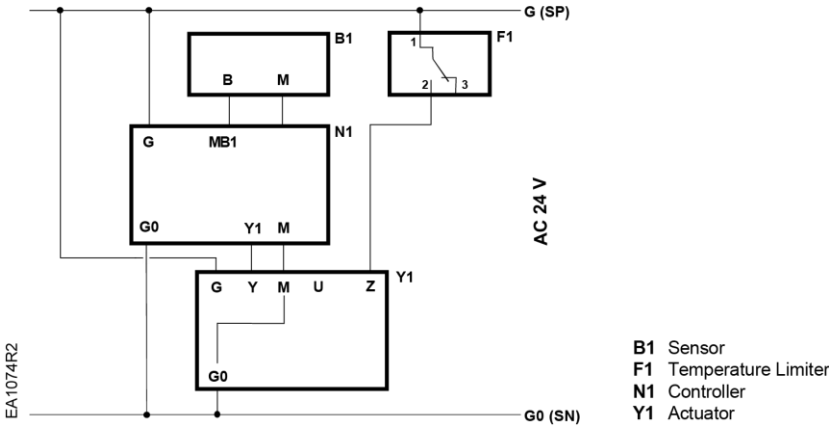


Figure 13. Connecting Terminals.

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

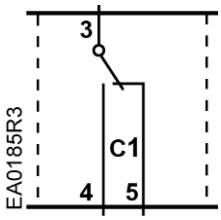
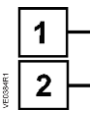


Figure 14. Auxiliary Switch ASC1.6.



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

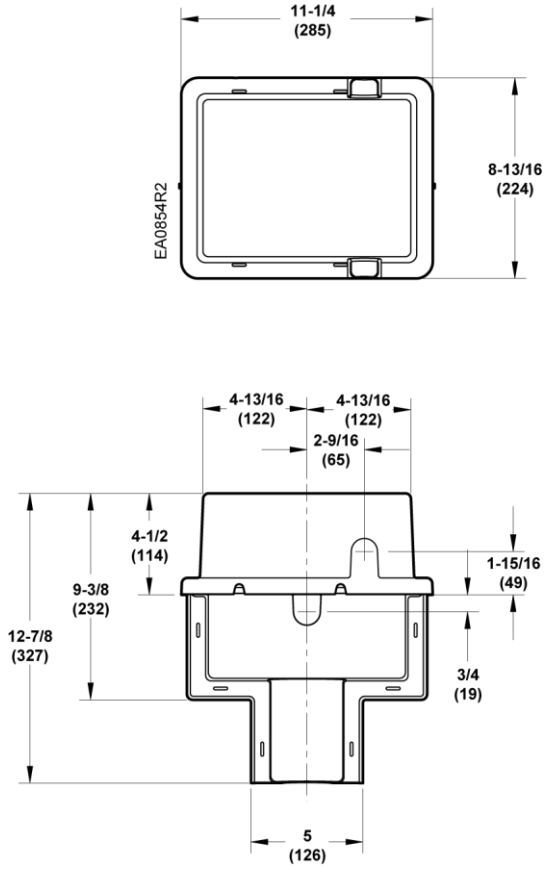


Figure 16. Dimensions of 599-10071 Weather Shield in Inches (Millimeters).

Dimensions, Continued

NOTE: The top knockout position should be used when installing the Weather Shield.

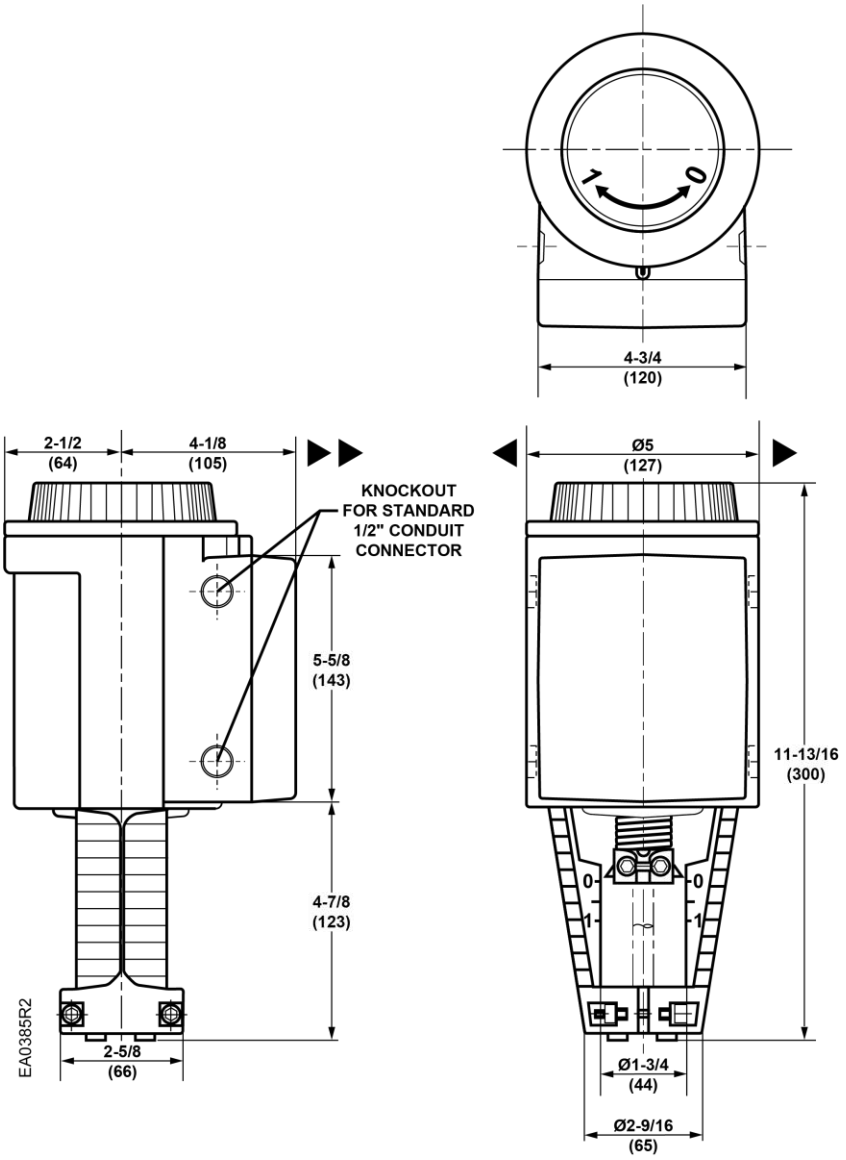


Figure 17. Dimensions of SKD6xU Actuators in Inches (Millimeters).

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SIEMENS

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.

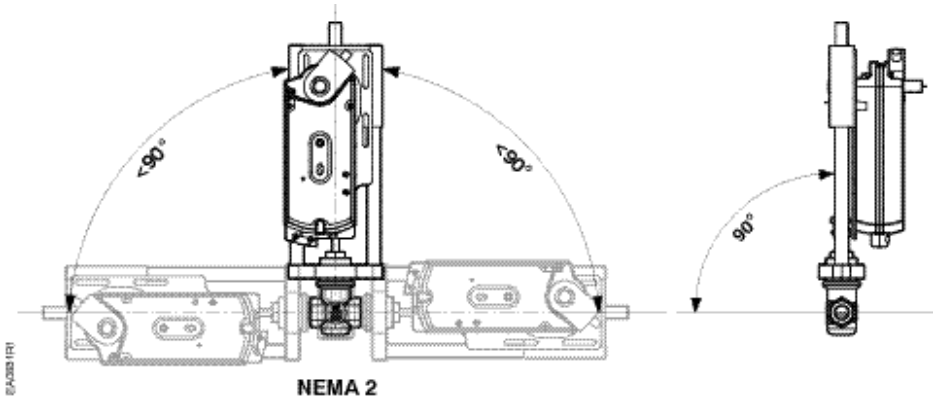

Figure 1. Acceptable NEMA 2 Mounting Positions.

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

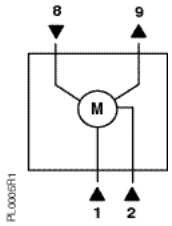

Table 3. 599-03609 Assembly (with GCA161.1U) for Modulating Control with 24 Vac or 24 Vdc Supply Voltage.

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

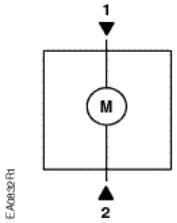

Table 4. 599-03611 Assembly (with GCA121.1U) for 24 Vac or 24 Vdc Two-Position Control.

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

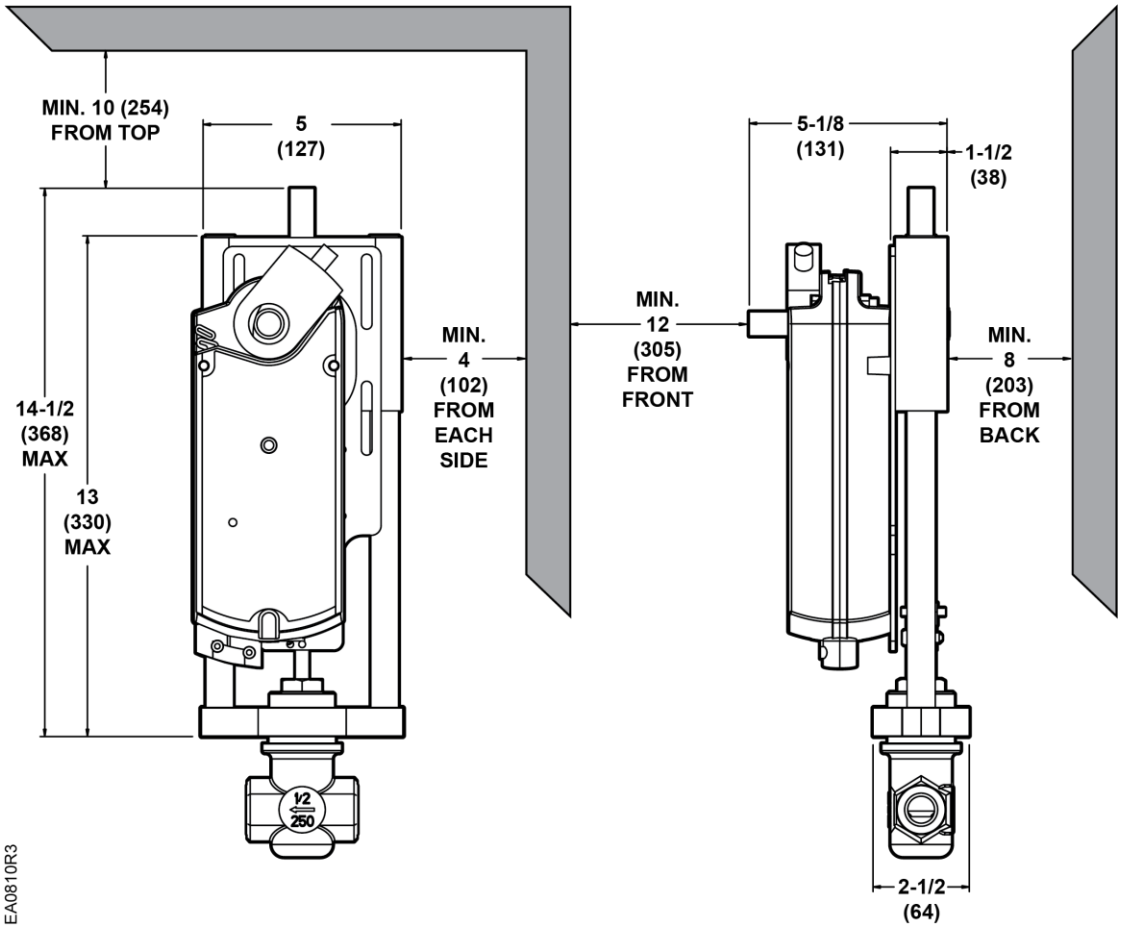

Figure 2. Dimensions of the Flowrite 599 Series Rack & Pinion Valve in Inches (Millimeters).

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)