THIS FORM MUST BE PRINTED TO A STATIC PDF FOR DISTRIBUTION

Yellow highlighted text will not appear in the printed document.

SUBMITTAL REVIEW

CLIENT NAME: Vails Gate Fire Department

PROJECT TITLE: Vails Gate FD - New Firehouse

SUBMITTAL No.: 235216-1 **H2M PROJECT No.:** VGFD2001

SUBMITTAL NAME: Condensing Boilers (Phase 2) PD

SUBMITTAL REVIEW

REVIEW IS FOR GENERAL COMPLIANCE WITH CONTRACT DOCUMENTS.
NO RESPONSIBILITY IS ASSUMED FOR CORRECTNESS
OF DIMENSIONS OR DETAILS

- [x] NO EXCEPTIONS TAKEN
- [ ] SUBMIT SPECIFIED ITEM
- [ ] MAKE CORRECTIONS NOTED (RESUBMISSION NOT REQUIRED)
- [ ] NO ACTION TAKEN (REVIEW IS THE RESPONSIBILITY OF ANOTHER PARTY)
- [ ] REVISE & RESUBMIT
- [ ] NO ACTION TAKEN (THIS SUBMITTAL IS NOT REQUIRED BY THE CONTRACT)
- [ ] REJECTED - SEE REMARKS
- [ ] RECEIVED FOR RECORD

Corrections or comments made on the shop drawings during this review do not relieve contractor from compliance with requirements of the drawings and specifications. This check is only for review of general conformance with the design concept of the project and general compliance with the information given in the contract documents. The contractor is responsible for: confirming and correlating all quantities and dimensions; selecting fabrication processes and techniques of construction; coordinating their work with that of all other trades; and performing the work in a safe and satisfactory manner.

H2M architects + engineers

Date: 04/25/2023 By: MJV

Rev.: 2020-05-20

Comments:

Provide condensate trap neutralizer

Set relief valve to 50 psi

CONTRACTOR'S COMPANY NAME
ADDRESS

SUBMISSION TRANSMITTAL FORM
CLIENT NAME: Vails Gate Fire District
PROJECT TITLE: VGFD2001-New Firehouse

H2M PROJECT NO.: VGFD2001

Product, Item, or System Submitted:	Condensing Boilers (Phase 2) Product Data		
Submission Date:	4/10/23	Submission Log No.:	235216-1
Specification Section:	235216	Paragraph Reference:	1.04.A
Contract Drawing Reference(s):			
Manufacturer's Name:	Joseph Lombardo Plumbing & Heating		
Manufacturer's Mailing Address:			
Manufacturer's Contact Information:	*Name*	( ) *Tel. no.*	*Email*
Supplier's Name:			
Supplier's Mailing Address:			
Supplier's Contact Information:	*Name*	( ) *Tel. no.*	*Email*
This item is a substitution for the specified item:		☑ No	☐ Yes

KEY CONSTRUCTION SERVICES, LLC

Project No: VGFD2001

Reviewed for General Acceptance Only. This review does not relieve the Subcontractors or Suppliers of responsibility for making the work conform to the requirements of the contract. The Subcontractor and Suppliers are responsible for all dimensions, correct fabrication and accurate fit with the work of other trades.

SUBJECT TO ARCHITECT AND OR ENGINEER APPROVAL

Signed *Joseph Manfredi*(PM) **Date: 4/10/23**

Contractor's Approval Stamp with Signature & Date

Contractor's Brief Comments or Remarks (attach separate letter as needed):

By making this submission, we represent that we have determined and verified all field measurements and dimensions, field construction criteria, site and building constraints in terms of limitations in moving the item into the enclosed space, materials, catalog and model numbers and similar data and that we have checked and coordinated this submission with other work at or adjacent to the installed location in accordance with the requirements contained in the Contract Documents.

END OF SECTION 013300

Joe Lombardo

Plumbing & Heating of Rockland, Inc.

LETTER OF TRANSMITTAL

321 Spook Rock Road
Suffern, NY 10901
Ph. 845-357-6537 Fx 845-357-8529
E: info@josephlombardo.com
Website: www.josephlombardo.com

Rockland Cty. Plumbing #1000 *Rockland Cty. Cooling # 1468*
Westchester Cty. Plumbing #460 *New Jersey State Plumbing #12702*

DATE:	JOB NO.
4-6-23	
ATTENTION: Joe Manfredi	
RE: Vails Gate Firehouse	

TO: Key Construction
4246 Albany Post Rd. Suite 1
Hyde Park, NY 12538

WE ARE SENDING YOU ☐ Attached ☐ Under separate cover via _____ the following items:

☐ Shop Drawings ☐ Prints ☐ Plans ☐ Samples ☐ Specifications
☐ Copy of letter ☐ Change order ☐ _____

EMAIL	DATE	NO.	DESCRIPTION
1	4-6-23	235216	CONDENSING BOILERS PHASE 2

THESE ARE TRANSMITTED as checked below:

☐ For approval ☐ No Exceptions Taken ☐ Resubmit _____ copies for review
☐ For your use ☐ Make Corrections Noted ☐ Submit _____ copies for distribution
☐ As requested ☐ Rejected ☐ Return _____ corrected prints
☐ For review and comment ☐ _____
☐ FOR BIDS DUE _____ 20___ ☐ PRINTS RETURNED AFTER LOAN TO US

COPY TO: Joe Manfredi

SIGNED: Ronald J. Lombardo

Submittal

Date:	3/23/2023	Engineer:	H2M Engineering
Submitted To:	General Plumbing Supply	Job Name:	Vails Gate FD Phase 2
WD Quote #:	80932	Job Address:	872 Blooming Grove Turnpike
WD Job #:	2208239		New Windsor, NY 12553

Tag	Qty	Manufacturer	Model Number	Description
BL-1&2	2	Riello	AR800	Condensing Boilers
	2	Riello	20122480	Metraflex Strainer
	2	Skidmore	58765-12	Condensate Neutralizers
	2	Riello	20192112	Maintanance Kits
	2	Taco	LTRM0243T-1	Low Water CutOff
	1	Riello	20141213	BACnet MSTP/IP Gateway

Submitted for (Select one): X Approval ____ Re-Submission _____ Record Purposes

WD Submitted/Reviewed By: Greg Zimmerman

New York
2910 Express Dr S, Islandia, NY 11749
Tel: 631.585.6800
Email: infony@walesdarby.com

Pennsylvania
1650 Market St #3600, Philadelphia, PA 19103
Tel: 267.370.5204
Email: infopa@walesdarby.com

New Jersey
5B Powder Horn Dr, Warren, NJ 07059
Tel: 732.560.1001
Email: infonj@walesdarby.com

NEW RANGE MODEL

TAG: BL-1&2

RIELLO ARRAY V2.5

High Efficiency Condensing Boiler 800-4000 MBH

A Carrier Company

RIELLO
Energy For Life

THE ULTIMATE IN EFFICIENCY, REDUNDANCY & RELIABILITY

The Riello Array is a **pre-packaged boiler plant**, the new standard in boiler efficiency, redundancy and reliability.

Each Array boiler utilizes multiple **heat exchanger** modules, providing high turndown and multiple boiler redundancy in one packaged unit.

A single Array boiler provides **superior uptime reliability** that is only found in **larger boiler plants and multi boiler systems**.

** IMAGE OF AN ARRAY AR-4000 MODEL

NEW ENHANCED BENEFITS

- Reduced head loss provides for greater design flexibility
- Increased vent lengths
- Improved serviceability
- Enhanced software capabilities

KEY FEATURES

- One platform, multiple capacities
- Built in redundancy. Each module (400 MBH for ARRAY 800 and 500 MBH for ARRAY 1000÷4000) is independent and "stand-alone" ensuring continued boiler operation if an adjacent module is turned off or even removed
- Extremely simple plug & play installation, service & maintenance
- Dedicated pump for each module eliminates need for boiler circulating pump
- Standard integrated boiler cascade capability for up to 8 boilers
- Factory installed flue exhaust damper on each module allows common venting capability of Array boilers in cascade and eliminates off cycle heat loss
- Heat Exchanger Protection: Control monitors supply and return temperature and prevents heat exchanger from excessive temperature rise
- Standard integrated boiler freeze protection

HIGH PERFORMANCE

- High quality AISI 316L stainless steel heat exchanger
- True counterflow 4-pass design
- Efficiency up to 99%
- NOx emissions less than 9 PPM at 3% O_2
- Turndown ratio up to 40:1 per boiler; up to 320:1 per system
- ASME Design Pressure 80 PSI
- Low noise operation (each module <48 dBa)
- Low pressure gas capability

FLEXIBLE INSTALLATION

- Single point connections for hydronic, electrical, fuel and venting
- Small footprint, fits through standard doorway
- Venting flexibility including sidewall, through the roof and direct vent options up to 100 equivalent feet exhaust vent length
- Venting Materials: CPVC, Polypropylene or AL29-4C stainless steel

RIELLO
Energy For Life

ARRAY
CONDENSING BOILER

H

ANSI Z21.13

Project Details	
Date:	3/23/2023
Project Name:	VAILS GATE FD PHASE 2
Project Location:	NEW WINDSOR, NY
Installing Contractor:	JOSEPH LOMBARDO P&H
Engineering Firm:	H2M ENGINEERING
Riello Representative:	WALES DARBY

Boiler Supply	
AR 800 Qty.	2
AR 1000 Qty.	
AR 1500 Qty.	
AR 2000 Qty.	
AR 3000 Qty.	
AR 4000 Qty.	

Project Notes:

General Boiler Data	
BOILER TYPE	CONDENSING HYDRONIC HEATING BOILER
AHRI CERTIFIED EFFICIENCY	96.1% (AHRI STANDARD 1500)
MAX. TEMPERATURE	210°F (203± 5.5°F HIGH LIMIT)
MAX. OPERATING TEMPERATURE	194°F
VESSLE DESIGN	80 PSIG MAWP (ASME SECTION IV)
PRESSURE RELIEF VALVES SETTING	75 PSIG (PER HEAT MODULE)
FUEL TYPE: AS SHIPPED	NATURAL GAS, 1004 BTU/SCF HHV
FUEL TYPE: ALTERNATE	PROPANE (REQUIRES CONVERSION KIT)
MIN. GAS SUPPLY PRESSURE	4.0" W.C. Natural Gas / 8.0" W.C. Propane
MAX. GAS SUPPLY PRESSURE	13.5" W.C.
FLAME SAFEGUARD CONTROLLER	EBM PAPST 905MN, ASME CSD-1
FLAME DETECTION	IONIZATION PROBE CURRENT
APPROVALS	ASME, AHRI, ETL, SCAQMD[Where applicable]

Optional Accessories	
INLET FLANGED WATER STRAINER(S)	2
MOTORIZED INTAKE AIR DAMPER(S)	
CONDENSATE NEUTRALIZER KIT(S)	2
FLUE ADAPTER(S), TO STAINLESS	
FLUE ADAPTER(S), TO CPVC	
BOILER CLEANING KIT(S)	
PROPANE CONVERSION KIT(S)	
GATEWAY TO BACNET RS485 (MODBUS PROVIDED AS STANDARD)	
LONWORKS GATEWAY RS232	
DHW TEMP. SENSOR &WELL	
SYSTEM TEMP. SENSOR &WELL (Std.)	•
OUTDOOR AIR TEMP. SENSOR (Std.)	•
EXTERNAL SPOOL & RELIEF-VALVE: *(VALVE SETTING: PSIG)*	

Factory Integrated Components

- Primary boiler pumps
- Main circuit breaker
- Sequencing controller
- Factory piped and wired;
  - Water-supply manifold
  - Water-return manifold
  - Exhaust manifold
  - Gas trains
  - Condensate drain manifold (no need for external traps)
  - Relief drain manifold
  - Pumps

Redundancy

- Multiple module design
- Controls for each module
- Isolation valves for each module
- Drain valves for each module

Performance Features

- 316L stainless heat exchanger
- High turndown with low excess air
- Air-cooled housing
- Variable speed fans
- Variable water flow (staged pumps)
- Low NOx (30, 20, or 9 ppm)

Operation

- Password protected control levels
- Identified fault circuitry
- Vortex flow meters to each module
- Dynamic operating limits
- 7" color touch screen
- Chart displays
- Adjustable sequencing control and firing rate parameters
- Indirect DHW function and priority
- Hinged front door
- Identical spare parts
- Modbus communication to BMS (other gateways available)

Boiler Data Chart

	UNITS	**AR 800**	**AR 1000**	**AR 1500**	**AR 2000**	**AR 3000**	**AR 4000**
Riello Product Code		20164509	20177312	20177313	20177314	20177315	20177316
I&O Manual Code		TBA	0092303	0092303	0092303	0092302	0092302
			Redundancy				
Nº of Heating Modules	Qty.	2	2	3	4	6	8
			Combustion				
Maximum Input (<2,000 ft. alt., 30ppm NO_x)	BTU/hr (kW)	798,000 (234)	1,000,000 (293)	1,500,000 (440)	2,000,000 (586)	3,000,000 (879)	4,000,000 (1172)
Minimum Input	BTU/hr (kW)	39,900 (11.7)	100,000 (29)	100,000 (29)	100,000 (29)	100,000 (29)	100,000 (29)
Boiler Turndown	Ratio	20:1	10:1	15:1	20:1	30:1	40:1
Exhaust O_2 Range (NG)	%	4.4 – 5.8 (dry basis)					
Exhaust NOx (NG)	ppm	<30 ppm standard (<20 ppm & 9 ppm with fuel-air ratio / max. input adjustment)					
			Hydronic				
Water Volume (Total Boiler)	US Gal. (Liter)	14 53	17 (64)	24 (91)	35 (132)	55 (208)	69 (261)
			Electrical				
Single-Point Electrical Voltage	V/ph/Hz	120/1/60	120/1/60	120/1/60	230-240/**1**/60	208-230/3/60	208-230/3/60
Electrical Supply Terminals		L1, N, GND	L1, N, GND	L1, N, GND	L1, L2, N, GND	L1, L2, L3, N, GND	L1, L2, L3, N, GND
Electrical – FLA	Amps	10A	15A	23A	15A	20-19A	23-21A
Electrical – MOCP	Amps	15A	25A	30A	25A	25A	30A
Electrical – MCA	Amps	12A	20A	25A	16A	20A	24A
			Connections				
Gas Inlet [NPT Female]	NPS Inch (DN mm)	1.5 (40)	1.5 (40)	1.5 (40)	1.5 (40)	2.0 (50)	2.0 (50)
Water Return / Supply [ANSI #150 Flange – Raised]	NPS Inch (DN mm)	2.5 **NPT** (65)	3 (80)	3 (80)	4 (100)	4 (100)	4 (100)
Relief Drain Connection [NPT Female]	NPS Inch (DN mm)	2.5 (65)	2.5 (65)	2.5 (65)	2.5 (65)	2.5 (65)	2.5 (65)
Condensate Drain Connection [PVC Male]	NPS Inch (DN mm)	1.5 (40)	1.5 (40)	1.5 (40)	1.5 (40)	1.5 (40)	1.5 (40)
Flue Outlet [Controtherm InnoFlue®]	NPS Inch (DN mm)	6 (150)	6 (150)		8 (200)	8-10 (200-250)	
Available Adapters & Suitable Vent Material		CPVC, PP, Stainless Steel, AL29-4C					
Air Inlet [Circular Sheet-Metal Opening]	Ø Inch (Ø mm)	5.91” (150)	5.91” (150)		7.87” (200)	9.84” (250)	
System Sensor		NTC Type-4 Sensor: 45mm, 6mmØ (shipped loose)					
System Sensor Thermowell		304 Stainless, ½” NPT x 4” (shipped loose)					
			Misc.				
Ambient Storage Temperature	°F (°C)	5 to 158 (-15 to 70)					
Ambient Functioning Temperature	°F (°C)	32 to 120 (0 to 49)					
Heat Exchanger Surface Area (Per Module)	ft^2 (m^2)	27 (2.5)	43 (4)				

Major Components Distribution

	Common to Boiler	On Each Independent Heat Module
Electrical Compartment	• 7" Color touch screen (non-controlling) • LCD service display and touchpad • Electrical feed landing terminals • Main boiler circuit breaker • System input/output terminals	• Burner, sequencing, and flame safeguard controller • Module on/off rocker switch • Overload fuse

Water-Side	• Internally Piped Manifolds:
	  • Supply water
	  • Return water
	  • Relief drain
	  • Condensate drain
	• Low water-pressure switch
	• Low water-level cut-off
	• Boiler drain valve
	• Boiler supply temperature sensor
	• System supply temperature sensor and thermowell
	• Outdoor air temperature sensor
		• Safety relief valve: ASME rated 75 psig (517 kPa) setting.
		• Hydronic Pump
		• Temperature and pressure gauge (supply side)
		• Supply manual isolation valve
		• Return manual isolation valve
		• Check valve
		• Drain valve
		• Module return temperature sensor
		• Module supply temperature sensor
		• Module high temperature limit control
		• Module low water cut-off
		• Automatic air vent
		• Water flow meter

Gas-Side	• Single connection to gas supply line • Low gas pressure switch (manual reset) • High gas pressure switch (manual reset) • Blocked cabin air inlet switch	• Gas burner with variable speed blower • Self-compensating zero governing gas valve with dual safety shut off function • Manual gas shutoff valve upstream of the zero governing gas valve • Manual gas shutoff valve before the burner • Combination flame supervision & ignition electrode • Flue gas temperature sensor • Module exhaust backflow check valve (clapper)

Available Head Pressure

The Array boiler includes a dedicated internal primary pump for each heat engine. The Table below shows the head available for the system at the boiler outlet. The near boiler primary loop piping must be sized to accommodate the required boiler maximum flow with pressure drop at or below the available head pressure from the boiler. Primary loop to be connected to the distribution piping using closely spaced Tees or low-loss header configuration (see Installation Manual).

		Available Waterside Head Pressure					
		AR 800	**AR 1000**	**AR 1500**	**AR 2000**	**AR 3000**	**AR 4000**
ΔT 36°F Across Boiler	**Water Flowrate (USgpm)** *(Est., No Glycol, Full Firing)*	42	53	80	107	160	213
	Available Head (ft. W.C.) **Water Only**	16.0	7.5	7.0	8.0	4.5	4.0
	Available Head (ft. W.C.) **50% Glycol**	14.4	7.0	6.0	7.0	4.0	3.0
ΔT 45°F Across Boiler	**Water Flowrate (USgpm)** *(Est., No Glycol, Full Firing)*	34	43	64	85	128	171
	Available Head (ft. W.C.) **Water Only**	20.0	16.5	16.0	16.5	14.5	14.0
	Available Head (ft. W.C.) **50% Glycol**	18.0	16.0	15.5	15.5	14.0	13.5

General Dimensions & Weight

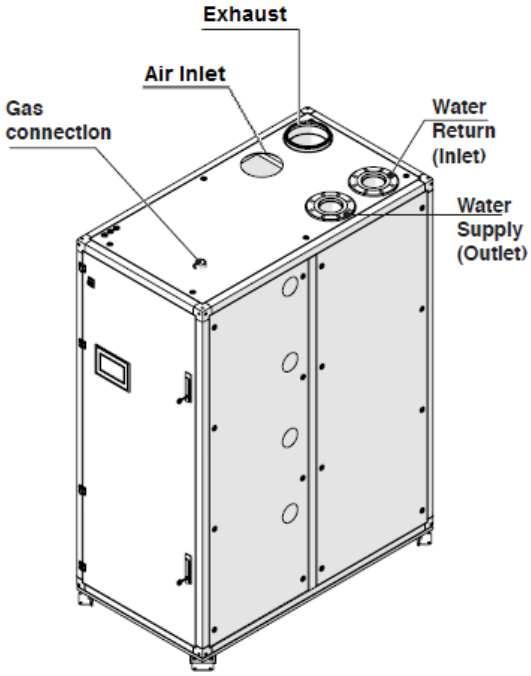
		AR 800	AR 1000	AR 1500	AR 2000	AR 3000	AR 4000
Width	Inches (mm)	28.9 (734)	33.3 (846)	33.3 (846)	33.3 (846)	35.4 (900)	35.4 (900)
Height*	Inches (mm)	53.2 (1,351)	67.2 (1,707)	67.2 (1,707)	83.0 (2,108)	83.0 (2,108)	83.0 (2,108)
Depth	Inches (mm)	60.8 (1,544)	60.8 (1,544)	60.8 (1,544)	60.8 (1,544)	72.8 (1,850)	72.8 (1,850)
Dry Weight	lbs. (kg)	770 (350)	1,058 (480)	1,323 (600)	1,676 (760)	2,315 (1,050)	2,998 (1,310)
Operating Weight	lbs. (kg)	889 (403)	1,200 (544)	1,523 (691)	1,968 (892)	2,774 (1,258)	3,574 (1,621)

*Overall height reducible by a further two (2) inches during delivery as boiler feet can be temporarily removed.

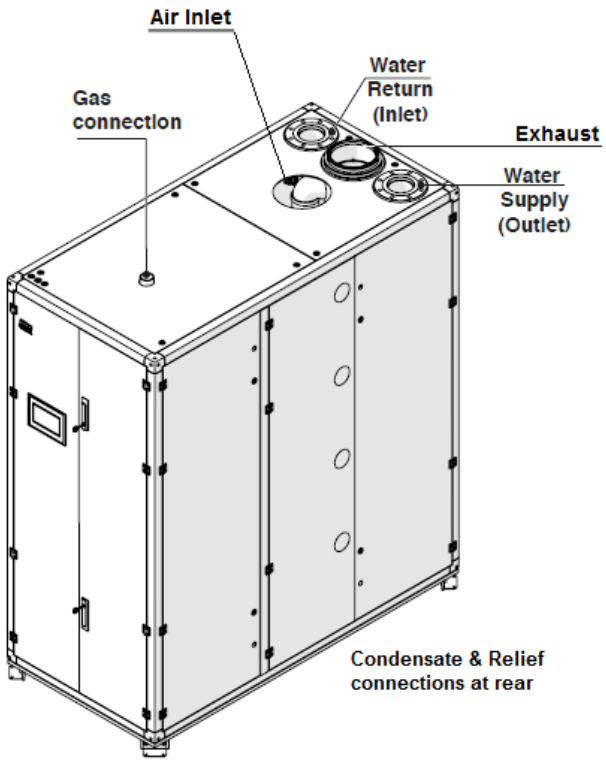
Recommended Clearance for Maintenance

Sides	24”
Front	32”
Rear	24”
Top	24”

Installation to provide at least the minimum distances to obstructions for proper service access. These clearances apply the all ARRAY boiler sizes from AR 800 to AR 4000.



AR 800 | AR 1000 | AR 1500 | AR 2000



AR 3000 | AR 4000

RIELLO NORTH AMERICA
Corporate Headquarters
2165 Meadowpine Blvd
Mississauga, ON L5N 6H6, Canada

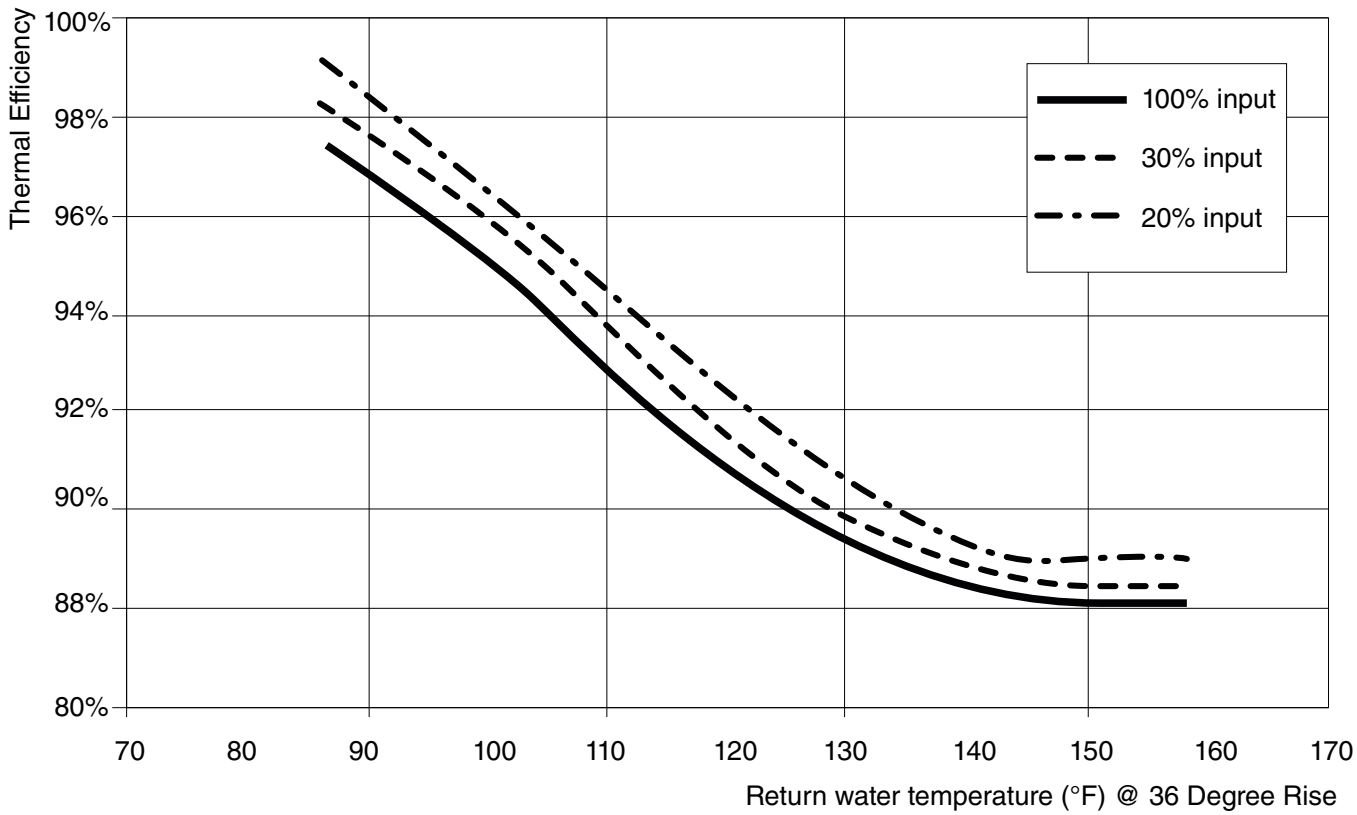
USA OFFICE
35 Pond Park Rd.
Hingham, MA 02043,USA

Phone: 905-542-0303
Fax: 905-542-1525

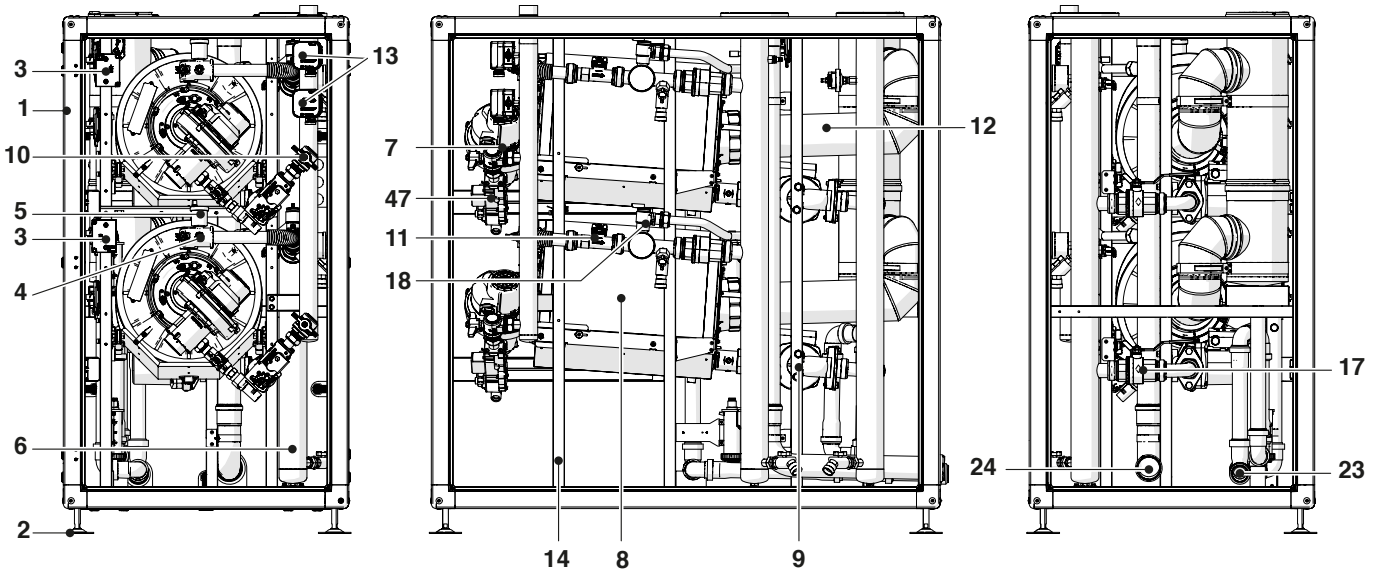
RIELLO
Energy For Life

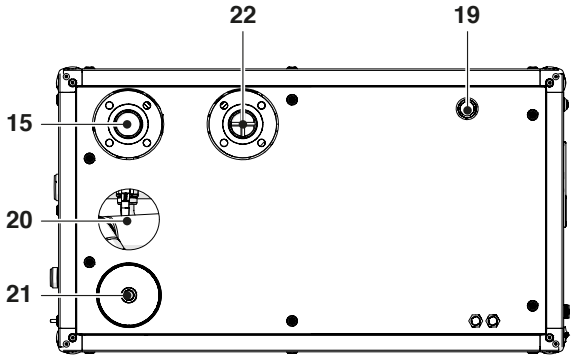
ARRAY BOILERS EFFICIENCY CURVES

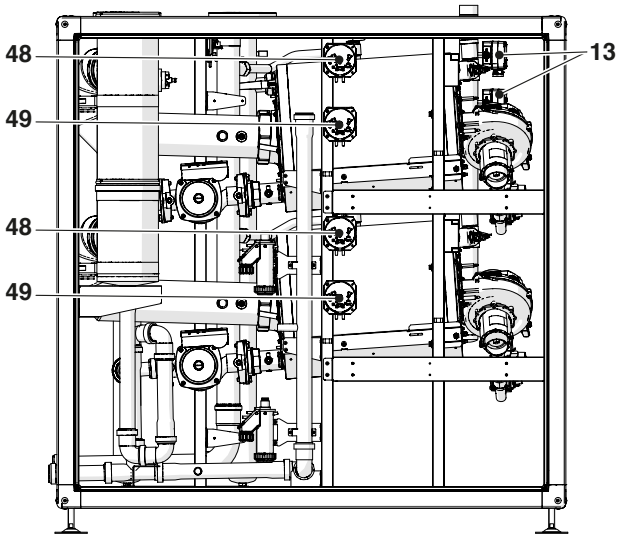
ARRAY AR 800, AR 1000, AR 1500, AR 2000

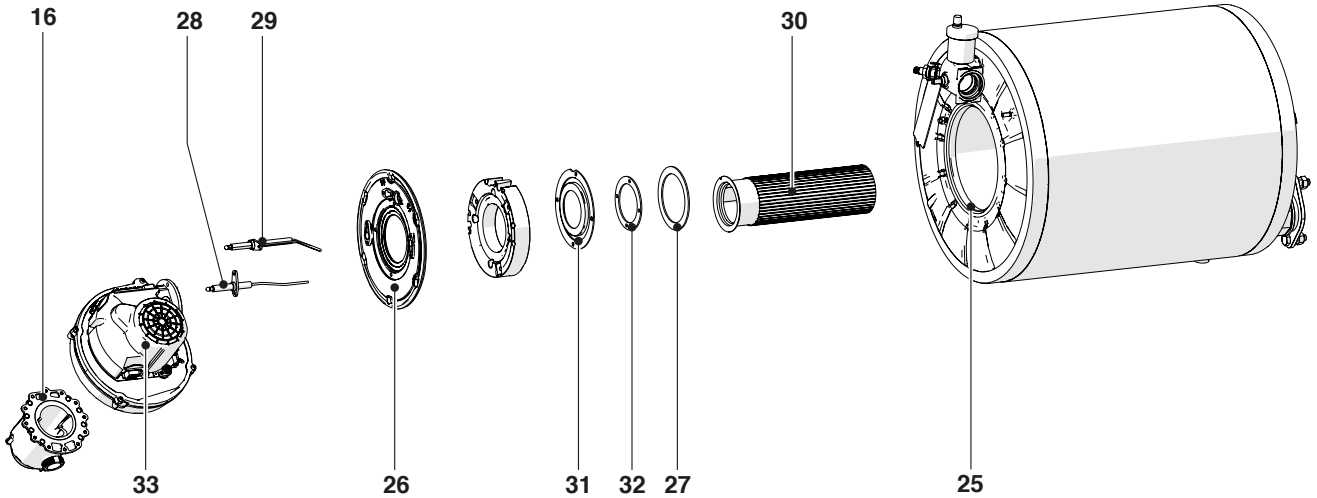


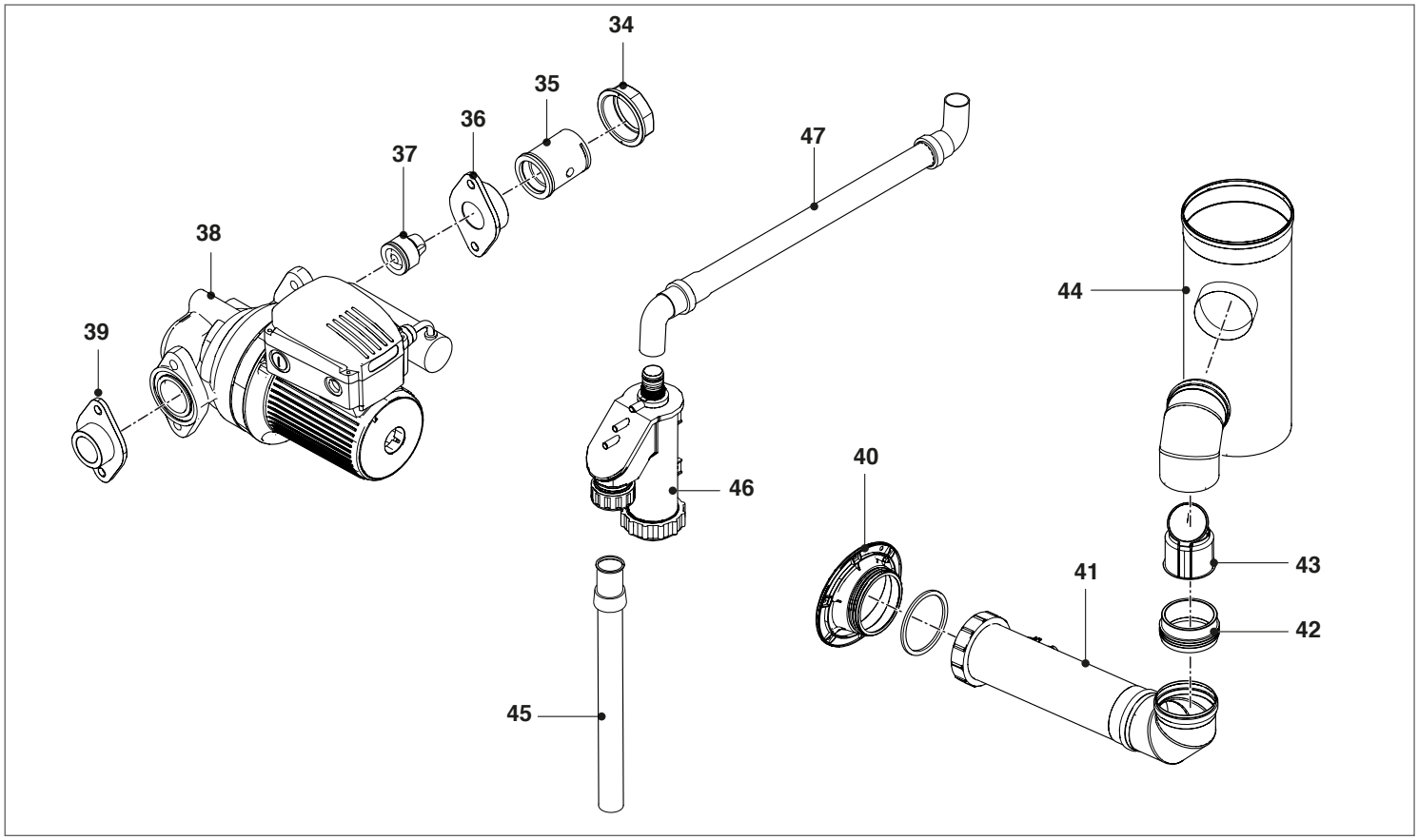
2.9 AR 800 Structure







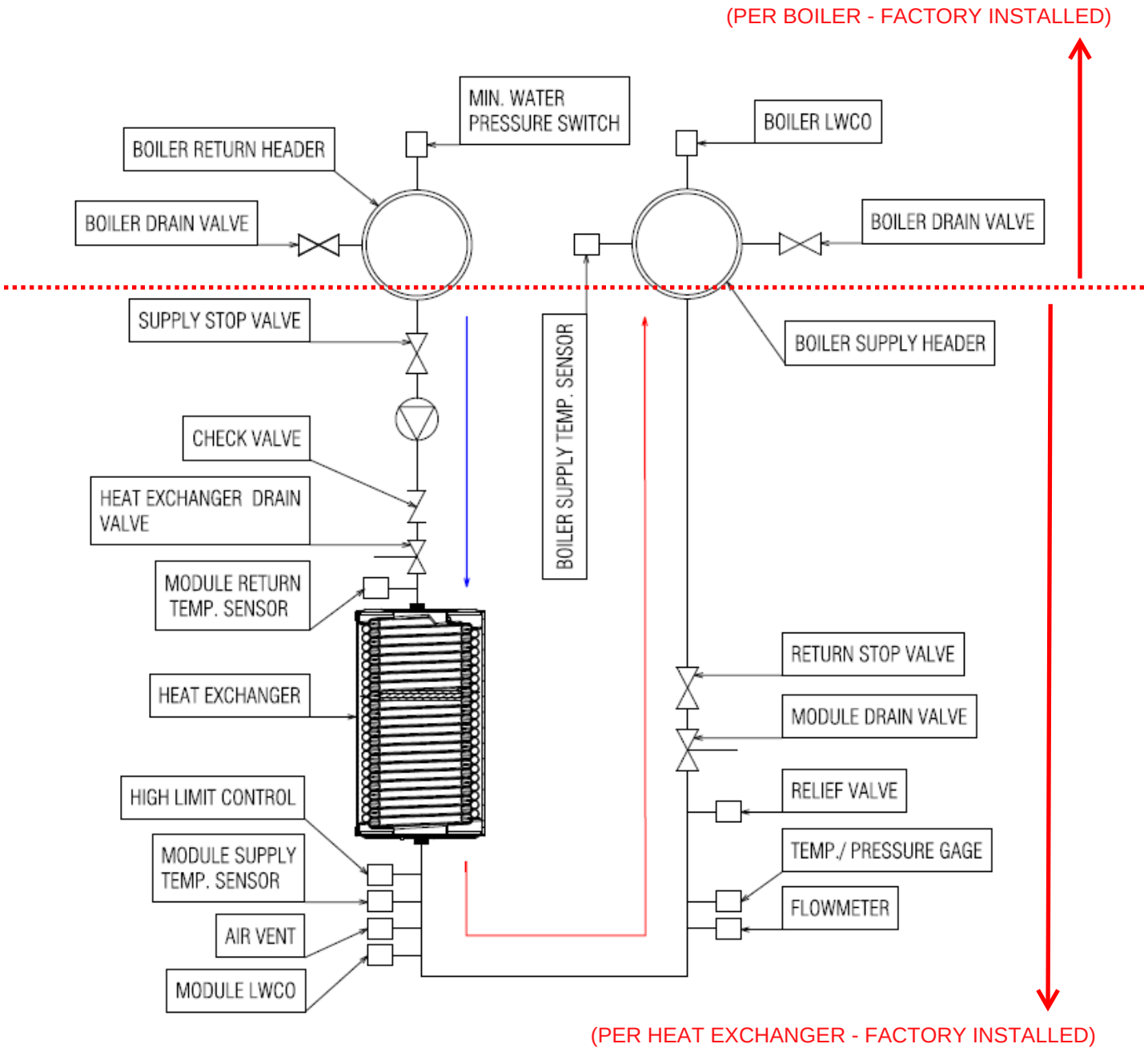




Item	Description
1	0uter frame
2	Leg
3	Ignition transformer
4	Supply pipe
5	Purge valve
6	Gas pipe
7	Gas valve
8	Heat exchanger
9	Pump
10	Water shutoff valve
11	Flow meter
12	Flue pipe
13	Gas shutoff valve
14	Inner frame
15	Vertical return manifold
16	Venturi tubes
17	Horizontal return manifold
18	Relief valve
19	Gas connection
20	Air intake
21	Venting connection
22	Vertical supply manifold
23	Condensate drain
24	Relief valve drain
25	Burner head 0-ring

Item	Description
26	Burner flange (outer)
27	Burner gasket
28	Sight glass combustion
29	Igniter
30	Burner tube
31	Burner flange (inner)
32	Gasket burner flange
33	Fan
34	Brass connection
35	Brass fitting
36	Flange (2")
37	Check valve
38	Pump
39	Flange (1 1/2")
40	Flue plastic flange
41	Flue pipe with 90° bend
42	Clapet seal (EPDM)
43	Clapet valve
44	Vertical flue manifold
45	Condensate pipe outlet
46	Condensate trap
47	Condensate pipe inlet
48	Flue gases pressure switch
49	Gas pressure switch

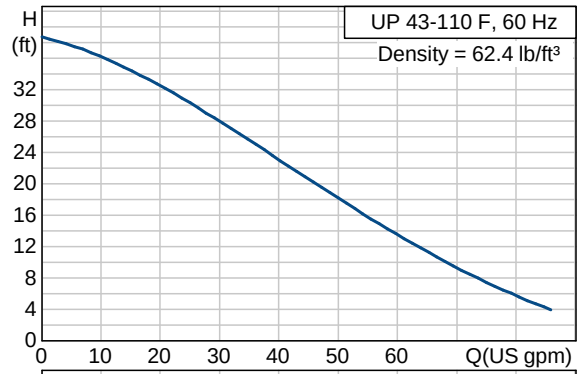
HEAT ENGINE HYDRONIC P&ID

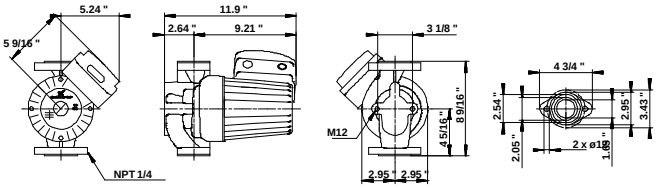


GRUNDFOS

Company name: -
Created by: -
Phone: -
Fax: -
Date: -

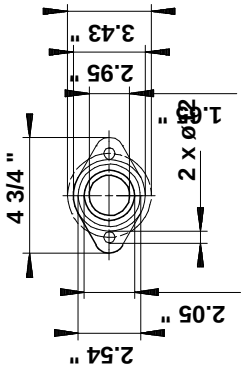
Description	Value
Product name:	UP 43-110 F
Product Number:	96439643
EAN number:	5700393918566
Technical:	
Speed Number:	1
Head max:	36.1 ft
Maximum operating pressure	125 psi
Approvals on nameplate:	UL,CUL
Model:	B
Materials:	
Pump housing:	Cast iron
	EN-JL1040
	ASTM 35 B - 40 B
Impeller:	Stainless steel
	DIN W.-Nr. 1.4301
	AISI 304
Installation:	
Maximum ambient temperature:	104 °F
Maximum operating pressure	125 psi
Flange standard:	USA
Type of connection:	F
Pipe connection:	43
Pressure stage:	125 psi
Port-to-port length:	8 9/16 in
Liquid:	
Liquid temperature range	14 .. 230 °F
Density:	62.4 lb/ft³
Electrical data:	
Max. power input:	590 W
Main frequency:	60 Hz
Rated voltage:	1 x 115/230 V
Current in speed 3	5,1/2,7 A
Cos phi:	0,98
Capacitor size - run	60 µF/240 V
Enclosure class (IEC 34-5):	X4D
Insulation class (IEC 85):	F
Motor protection:	CONTACT
Thermal protec:	internal
Controls:	
Relay	without relay
Pos term box:	1.30H
Others:	
Net weight:	33.1 lb
Gross weight:	40.6 lb
Shipping volume:	2.08 ft³
Sales region:	Namreg

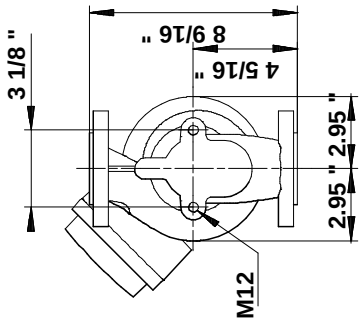


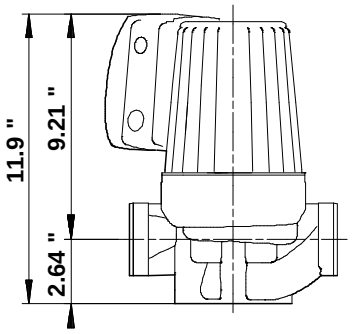


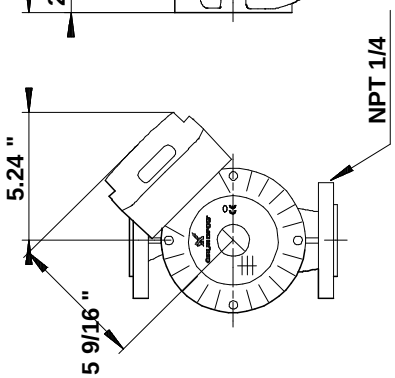
Company name: -
Created by: -
Phone: -
Fax: -
Date: -

96439643 UP 43-110 F 60 Hz









Note! All units are in [mm] unless others are stated.
Disclaimer: This simplified dimensional drawing does not show all details.

OEM Flow sensor type 200 for liquid media

Flow range
0.5 ... 150 l/min

Nominal diameters
DN 6 / 8 / 10 / 15 / 20 / 25

Temperature measurement
-40 ... +125 °C

The flow sensor type 200 is based on the Kármán vortex trail. Vortex trail principle and is available in various options with and without temperature measurement. With no moving parts the flow sensor is not sensitive to debris, has marginal pressure loss and high accuracy.

- Low cost product with high levels of accuracy
- Temperature non-sensitive measuring principle
- Excellent media resistance (measuring element not in contact with the media)
- Wide application temperature range
- Marginal loss of pressure
- Measuring element not sensitive to debris
- Direct temperature measurement in the medium with PT1000 or NTC
- Drinking water approval KTW, W270, WRAS, ACS

(PER HEAT EXCHANGER - FACTORY INSTALLED)

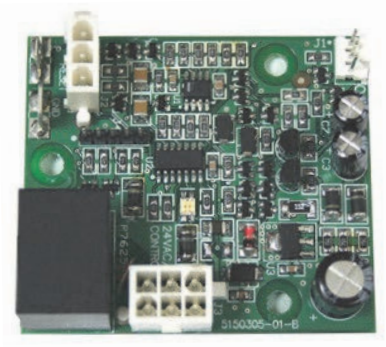
Instruction Sheet

Board Style Low Water Cutoff

102-305

SUPERSEDES: REVISION E DATED December 12, 2007 EFFECTIVE: January 6, 2009

#5401173-REV F PLANT ID 001-3902



US Patents 6,904,800, 7,243,540, and 7,317,993
Other Patents Pending

Listings/Approvals:

- UL GUIDE (MBPR2) for Limit Controls per UL Standard 353 Limit Controls - Component
- UL GUIDE (MBPR8) Controls, Limit Certified for Canada - Component per CSA Standard C22.2

Delays: 3 Second Delay on Break, (DOB)
1/2 Second Delay on Make, (DOM)

Probes: Sold Separately. All Taco probe styles are compatible with LTB

Ambient Temperature: -40°F to 150°F (-40°C to 66°C)

Probe Sensitivity: Extended operation to 40K Ohms

Open Collector Outputs: Maximum current 50 mA @ 5 VDC - 24 VDC

Enclosure: None, PCB assembly only. For indoor use only. Mounting holes to permit stand-off mounting on customer supplied plate and housing.

Reset: Configurable as automatic or manual reset style. When a normally closed switch is connected, device will be a manual reset device that looks for opening of reset switch. The LTB is fully compliant with CSD-1 requirements.

Testing: Externally supplied test switch can be wired in series with probe connection to open probe circuit simulating a low water condition.

Contact Ratings*			
Voltage	Motor Switch Rating		Pilot Rating
	Full Load	Locked Rotor	
24 VAC	-	-	50 VA
120 VAC	7.5 A	43.2 A	125 VA
240 VAC	3.75 A	21.6 A	50 or 60 Hz

* 1A resistive at 120°F to 150°F (49°C to 66°C)

** 24VAC to be supplied by an EXTERNAL Class 2 power source.

Input Voltage	Power Consumption
24 VAC**	3 VA

GENERAL

The Board Style Low Water Cutoff (LTB) is an advanced, microprocessor based low water cutoff for detecting the presence of water in a boiler. The LTB uses advanced signal processing to identify when the probe signal levels have decreased due to possible fouling. These advanced technologies permit extended operation for probe impedance up to 40K Ohms. The LTB functions longer without requiring probe cleaning, and it functions normally under non-ideal installation conditions. The LTB is designed for use with hot water boilers and hot water heating boilers. (See each boiler manufacturers' specifications for recommended minimum safe water levels).

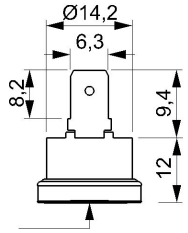
During a low water condition, the "Status" LED will illuminate RED. Under normal conditions, it will illuminate GREEN. See "Status LED States" table for details.

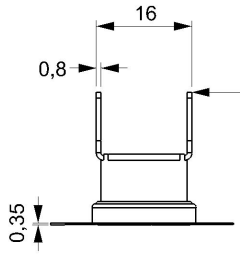
⚠ WARNING

- Installation must be performed by qualified personnel and in accordance with all national and local codes and ordinances.
- Read all instructions carefully and understand them before starting installation. Save instructions for future use.
- Instruct user how to test and operate this cutoff device as described in these instructions.
- Shock Hazard. Disconnect power source before servicing. Serious injury or death could result.
- Risk of explosion. Not for use in hazardous locations. Serious injury or death could result.
- The LWCO device must be installed in series ahead of other limit and operating controls installed on the boiler. When installations are complete, check for correct operation of ALL limit and operating controls.
- Wire insulation must be rated at 167º F (75º C) or greater, over copper conductors only. Use of other wire or insulation types could result in fire causing property damage, serious injury, and death.
- Foam in boiler or piping can cause improper operation. If the boiler is foaming, shutdown the boiler and clean it per the manufacturers recommendations to eliminate foaming. Failure to do so could result in damage to the equipment and property or could cause an explosion resulting in serious injury or death.
- For use with hot water boilers and hot water heating boilers only. Use on steam boilers could cause improper operation resulting in property damage, serious injury, and death.
- Hot or pressurized boiler systems can discharge steam and hot water. Cool boiler system to 80º F (27º C) and to 0 psi (0 bar) before servicing. Failure to do so could result in serious burns.

⚠ CAUTION

- Do not use manual reset low water cutoffs with automatic water feeders. Flooding, equipment damage, and property damage can result. Only use automatic water feeders with automatic reset low water cutoffs.

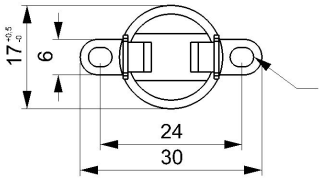




N° 2 terminali faston
6,3 x 0,8 in ottone nichelato
N°2 nickel plated brass faston
terminals 6,3 x 0,8

Marcatura/Mark
esempio/example:
KSD301-P (serie/series)
95 (temperatura nominale/rated temperature)
Z052 (data produzione/production date)

-Ultima cifra dell'anno/last number of the year
-Giorno del mese/day of the month
- Mese/month: 1-Gen/Jan
9-Set/Sep
X-Ott/Oct
Y-Nov
Z-Dic/Dec



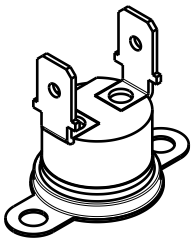
Caratteristiche meccaniche/ *mechanical characteristics*

- Range di funzionamento : -20÷150°C
- *Operating range : -20÷150°C*
- Taratura: apre a 95±3°C -- chiude a 85±3°C
- *Setting: open contact 95±3°C closed contact 85±3°C*
- Materiale capsula di contatto: alluminio
- *Disc cup material : alluminium*
- Materiale staffa di fissaggio: acciaio nichelato
- *Mounting bracket : plating Fe alloy*
- Materiale corpo : resina fenolica
- *Material body : phenolic resin*
- Materiale contatti : lega d'argento
- *Contact material: silver alloy*
- *Sigillante: resina epossidica*
- *Sealant: epoxy resin*
- *Connessione: 2 faston maschio 6,3x0,8mm (ottone nichelato)*
- *Connection: 2x 6,3x0,8mm male faston (nickel plated brass)*

Caratteristiche elettriche/ *electrical characteristics*

- Condizioni di utilizzo: 230Vac - 6A 50/60Hz
24Vdc 30÷370mA
- Use conditions : 230Vac - 6A 50/60Hz
24Vdc 30÷370mA
- Tensione nominale: 250Vac 50/60Hz
- *Rated voltage: 250Vac 50/60Hz*
- Corrente nominale: 10A
- *Rated current: 10A*
- Resistenza di isolamento : 100MOhm 500Vdc
- *Insulation resistance :100MOhm 500Vdc*
- Rigidità dielettrica : 2KVac 60sec.
- *Dielettric strenght : 2KVac 60sec.*
- Resistenza di contatto : 50mOhm MAX. misurata a 20°C
- *Contact resistance :50mOhm MAX. measured at 20°C*
- Conforme alla normativa RoHS 2011/65/CE
- *RoHS compliant 2011/65/CE*

- Conforme alla norma EN 60730-1:2000+A1+A12+A13+A14+A15 e EN 60730-2-9:2002+A1+A2+A11+A12
- *EN 60730-1:2000+A1+A12+A13+A14+A15 and EN 60730-2-9:2002+A1+A2+A11+A12 compliant*
- *Certificati: TUV 50114187 - UL / CUL E213536*
- *Certificates: TUV 50114187 - UL / CUL E213536*
- Conforme alla norma 60335-1 GWT
- *60335-1 GWT compliant*
- Conforme al Reg. CE 1907/2006 (REACH)
- *Reg. CE 1907/2006 (REACH) compliant*



Scala: 1:1

E				TOLLERANZE GENERALI DI LAVORAZIONE : UNI ISO 2768 mK			
D				DENOMINAZIONE			
C				TERMOSTATO LIMITE 95°C. ZHO *ZHO LIMIT 95°C. THERMOSTAT*			
B							
A				CODICE TLT00030	TAVOLA TLT0003000	DATA 14/12/16	
RV	DATA	MODIFICA	FIRMA	DISEGNATO S.Frigerio	CONTROLLATO M.Todeschini	PAGINA 1/1	
Technosystem s.r.l.				MATERIALE Vedere note nel disegno	SCALA 1:1		
				NOTE	FORMATO ISO A4		
				E' VIETATA QUALSIASI FORMA DI RIPRODUZIONE DEL DOCUMENTO			

DESCRIZIONE
TERMOSTATO CONTATTO SICUREZZA 95°-10°

DESCRIPTION

MATERIALE: -

MATERIAL: -

FINITURA: -

FINISHING: -

DESCRIZIONE DELLA MODIFICA: -

MODIFICATION DESCRIPTION: -

DISEGNATORE/DESIGNER	MODIFICATO DA/MODIFIED BY:	DATA/DATE	APPROVATORE/APPROVER	NUMERO/NUMBER	REV.
Claudio Devis	Claudio Devis	26/01/2017	Decarolis Andrea	20129778	-

RIELLO GROUP Energy For Life

QUOTE SENZA INDICAZIONE DI TOLLERANZA E RIFERIMENTI NORMATIVI: VEDERE PROCEDURA OPERATIVA RIELLO ST802
DIMENSIONS WITHOUT TOLLERANCES AND COMPANY STANDARDS: SEE RIELLO PROCEDURE ST802

VOLUME CALCOLATO COMPUTED VOLUME (cm3): -
SCALA/SCALE: -
Peso Netto (kg) Net Weigth (kg): 0.011

Indice Classe Funzionale/ Functional Class Index

CODICE/PART NUMBER: 20129778

20129778

A4

Model RVW40

ASME HOT WATER SAFETY RELIEF VALVE

(10410 Series)

Job Name:	Contractor:
Job Location:	P.O. Number:
Engineer:	Representative:
Tag:	Wholesale Distributor:

DESCRIPTION (PER HEAT EXCHANGER - FACTORY INSTALLED)

ASME Section IV capacity certified bronze safety relief valve for protection of hot water heating boilers, systems and similar equipment. It can be Pre-set to any pressure ranging between 20 to 80 psig (1.4 to 5.5 bar) at 250°F (121°C) max.

FEATURES

- ❒ ASME Section IV Certified Capacity
- ❒ Corrosion Resistant Construction
- ❒ Male or Female NPT inlet,
- ❒ Optional Polished or Satin Chrome Finish
- ❒ MADE IN THE USA

MATERIALS

Body: ASTM B584 Bronze
Spring: Stainless Steel
Seat: Silicone

OPTIONS

☐ 3/4" Male NPT ☐ 3/4" Female NPT
☐ B = Brass finish
☐ P = Polished chrome finish
☐ S = Satin chrome finish
☐ Set pressure (20-80 psig)

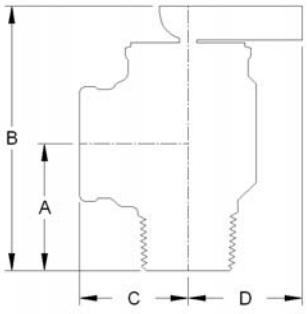
CAPACITY

Set Pressure PSIG (bar)	Capacity BTU/Hr
20 (1.38)	377,000
25 (1.72)	427,000
30 (2.07)	477,000
35 (2.41)	532,000
40 (2.76)	587,000
45 (3.10)	642,000
50 (3.45)	697,000
55 (3.79)	752,000
60 (4.14)	807,000
65 (4.48)	862,000
70 (4.83)	917,000
75 (5.17)	972,000
80 (5.52)	1,027,000

DIMENSIONS

Model	Series	Size	A	B	C	D
RVW40	10417	3/4M	1.39 (35)	2.90 (74)	1.19 (30)	1.25 (32)
RVW40F	10418	3/4F	1.23 (31)	2.74 (70)	1.19 (30)	1.25 (32)

All dims in inches (mm)



APPROVALS

HV NB

ASME Section IV Heating Boilers
Canadian Registration Number 0G8547.5C

Conbraco Industries, Inc. 701 Matthews Mint Hill Rd. Matthews NC 28105 USA ; www.Apollovalves.com ; 704-841-6000

CERTIFICATE OF COMPLIANCE

Certificate Number	20150603-E213536
Report Reference	E213536-20150529
Issue Date	2015-JUNE-03
Issued to:	GUANGDONG SHUNDE ZHONGBAO THERMOSTAT TECHNOLOGY CO LTD 4 Xingfa Rd Qixing Resident Committee Xingtan Town Shunde Foshan,Guangdong 528325 CHINA
This is to certify that representative samples of	TEMPERATURE-INDICATING AND -REGULATING EQUIPMENT Operating Control, Temperature limiter, Model- KSD301-C, f/b 0-250
	Have been investigated by UL in accordance with the Standard(s) indicated on this Certificate.
Standard(s) for Safety:	UL 60730-1 and CAN/CSA-E60730-1-Automatic Electrical Controls for Household and Similar Use, Part 1: General Requirements,UL 60730-2-9 and CAN/CSA-E60730-2-9 - Automatic Electrical Controls for Household and Similar Use, Part 2-9: Particular Requirements for Temperature Sensing Controls
Additional Information:	See the UL Online Certifications Directory at www.ul.com/database for additional information

Only those products bearing the UL Certification Mark should be considered as being covered by UL's Certification and Follow-Up Service.

Recognized components are incomplete in certain constructional features or restricted in performance capabilities and are intended for use as components of complete equipment submitted for investigation rather than for direct separate installation in the field. The final acceptance of the component is dependent upon its installation and use in complete equipment submitted to UL LLC.

Look for the UL Certification Mark on the product.

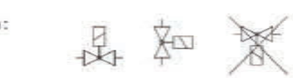
Bruce Mahrenholz, Director North American Certification Program

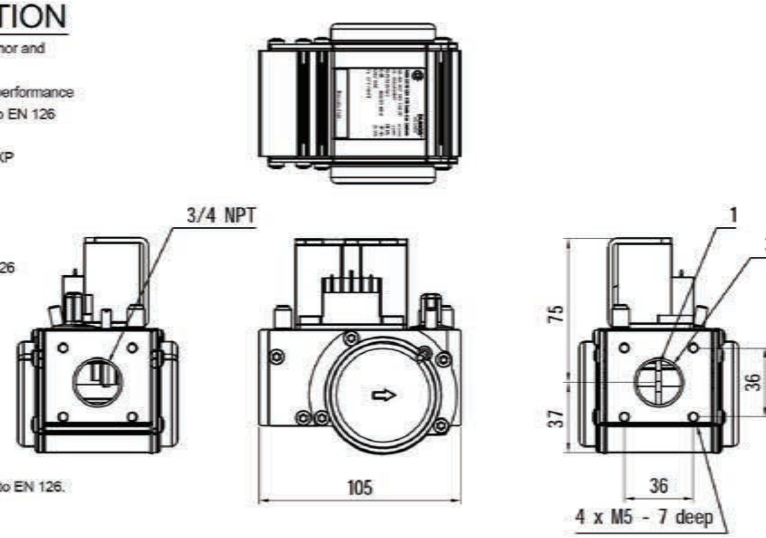
UL LLC

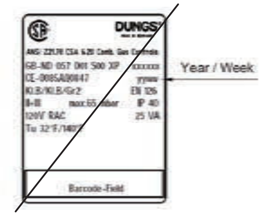
TECHNICAL SPECIFICATION

ACAD-Zeichnung, nicht manuell ändern !

Main Function	: Combined Zero governor and safety shut-off valve. Design, construction, performance and safety according to EN 126
Type specification	: GB-ND 057 D01 S00 XP
Approval	: ~~CE-0085 AQ 0847~~
	: CSA 1316948
Nominal diameter	: DN 20
Gas connection inlet and outlet	: 3/4 NPT - DIN EN 10226
Max. operating pressure	: max 65 mbar
Gas family	: II + III
Governor	: According to EN 126
Voltage	: 120 V RAC
Power consumption	: 25 VA
Degree of protection	: IP 40
Electrical connection	: System Molex
Solenoid valves	: 2 x class B according to EN 126. Operating seriel
Opening time	: < 1s, fast opening
Closing time	: < 1s, fast closing
Ambient temperature	: 0°C / 60°C (32°F/140°F)
Storage temperature	: -25°C / 70°C
Factory setting:	
Setting at min.	: Signal pressure -30 Pa, Offset 0 ± 8 Pa
Setting at max.	: Signal pressure -1000 Pa, Offset 0 ± 8 Pa
Throttle valve setting	: 3550 l/h air at -1000 Pa
Mounting position :	

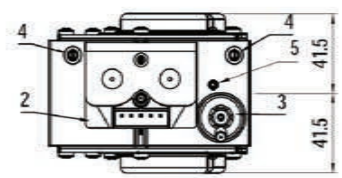






POS.

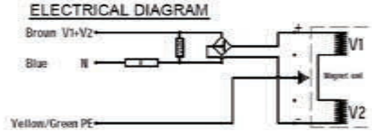
1 Fine mesh strainer
2 Solenoid valve V1 and V2
3 Pressure regulator
4 Pressure test nipple
5 Throttle valve screw



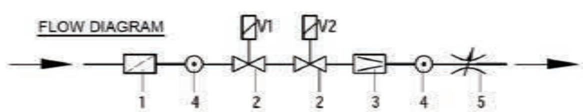
ACCESSORIES:

1 pcs. Connection box with cable Art. no. 244 333 (Ordered separately)
1 pcs. Screw M4x30 DIN ISO 1207 Art. no. 235 356 (Ordered separately)

ELECTRICAL DIAGRAM



FLOW DIAGRAM



Validation: We have tested the article stated and checked above specification and found both acceptable.
Karl Dungs A/S, Hedensted. Sample no.: ______

date signature

Please return this document to us, duly signed, if you find the specification correct.
Customer

date signature

				Dato	Navn
			Tegn.	12.04.2007	TAH
			Kontr.	16.08.2007	TAH
			Godk.	16.08.2007	EJ
A	KM3763	16.08.2007	TAH		
-	KM3718				
State	Ændring	Dato	Navn		

DUNGS® Karl Dungs A/S, Vejlevej 21, DK-8722 Hedensted

Beskrivelse: **Product specification** GB-ND 057 D01 S00 XP

Tegningsnr.:	Klasse-Nr.	Format	Index	Side
251 880	600	3	A	Sider

Erst. for: Erst. af: Version:

2D

ANSI Z21.78 CSA 6.20 Comb. Gas Controls
GB-ND 057 D01 S00 XP 251880
55299 04007
CE-0085CM0036 yyww
Kl.B/Kl.B/Gr.2 EN126
II+III max.65 mbar IP40
120V RAC 50-60Hz 25VA
Tu 32°F/140°F

Made by ebmpapst

Barcodefeld

CE-0085AQ0847
→CE-0085CM0036

Ausgabe 1:
Typenschild und CE-Nummer auf ebm-papst umgestellt.

Vers.	Änderungsnummer	Datum	Name
2	500000011636	25.02.11	erl
1	500000011603	16.02.11	mia

Fertigzustand | Zul. Abw. | Oberfläche | Maßstab 1:1 | Geom.-Schl.:

Werkstoff

Status der Zeichnung: Freigegeben
Ausgabedatum: 25.02.11 — genehmigt von: hacker

ebmpapst — ebm-papst Landshut GmbH

Kd.-Spezifikation/customer specification
Gasventil / gas valve
GB-ND 057 D01 S00 XP

Zeichnungsnummer: 55299 04007 B03
Blatt 1 / 1
Urspr. | Ers.f.: 251880 A | Ers.d.: | DIN_A3

Huba Control

FOR FINE PRESSURE AND FLOW MEASUREMENT

Relative pressure switch type 620/625

Pressure range
-4 ... -900 mbar / 2 ... 6000 mbar

Type 620 and 625 pressure switches, with 13 pressure ranges, are suitable for liquids and gases. Body materials are available in plastic, brass and aluminium, with a choice of NBR, FPM, EPDM and silicone diaphragms.
Very high precision through finely tuned measurement stages and high long term stability. Rugged design and especially suitable for use in general industrial equipment
construction, process technology and food automation.

- High accuracy by 13 ideally designed pressure range increments
- Switching differences adjustable
- High long term stability with reproducibility of switching points up to < ± 0.3 mbar
- Customer specific switching points adjustable in factory
- Rugged industrial switch with excellent Price / performance ratio

Venting

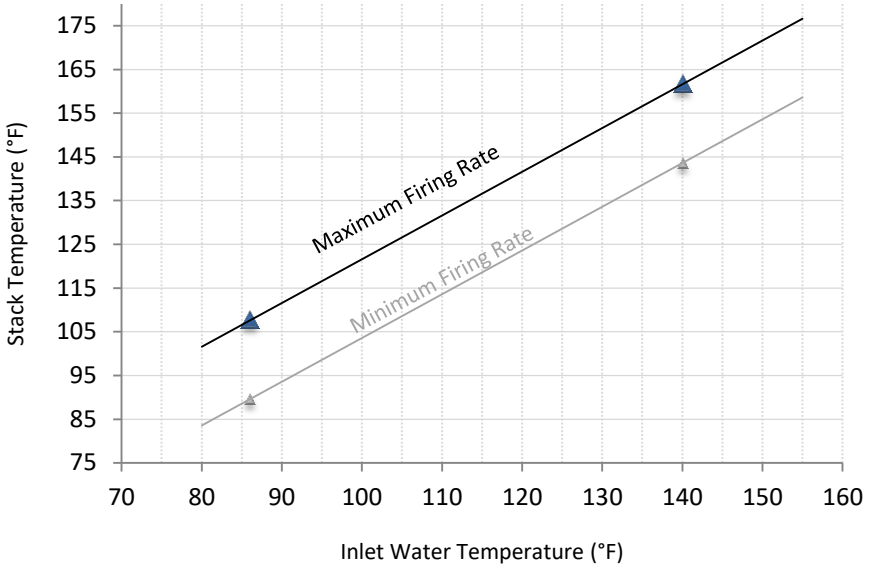
Installation must comply with local requirements and with the National Fuel Gas Code ANSI Z223.1. **Array** boilers vent and air piping can be installed through the roof or through a sidewall. Suitable, UL approved, positive pressure, watertight vent materials **MUST** be used for safety and UL certification. (CPVC, PP, Stainless Steel, AL29-4C)

	Allowable Vent Pressures			
			Max. Positive Vent Pressure at Boiler Exit [1]	
Model	**Exhaust Mass Flow Rate**	**Max. Allowable Negative Draft at Boiler Exit**	**176°F supply / 140°F return**	**104°F supply / 86°F return**
AR 800	0.21 lbs/s	-62 Pa (-0.25" WC)	180 Pa (0.72" WC)	180 Pa (0.72"WC)
AR 1000	0.26 lbs/s	-62 Pa (-0.25")	202 Pa (0.81")	224 Pa (0.90")
AR 1500	0.40 lbs/s	-62 Pa (-0.25")	174 Pa (0.70")	197 Pa (0.79")
AR 2000	0.52 lbs/s	-62 Pa (-0.25")	187 Pa (0.75")	209 Pa (0.84")
AR 3000	0.78 lbs/s	-62 Pa (-0.25")	162 Pa (0.65")	179 Pa (0.72")
AR 4000	1.04 lb/s	-62 Pa (-0.25")	149 Pa (0.60")	167 Pa (0.67")

(1) Pressure drop from ducted combustion air must be subtracted from the allowable exhaust vent pressure.

Linearized Exhaust Temperatures

(Operating at 36°F Across Boiler)



VENTING CONFIGURATIONS: The following figures show the acceptable piping installation for venting and combustion air.

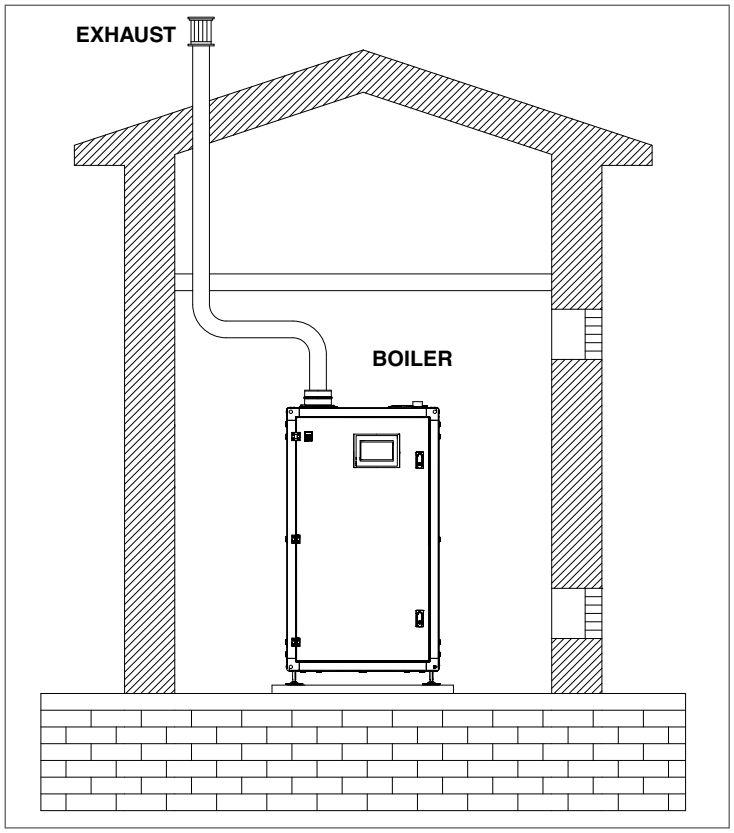


Fig. 29 *All Combustion Air from Adjacent Indoor Spaces through Indoor Combustion Air Openings*

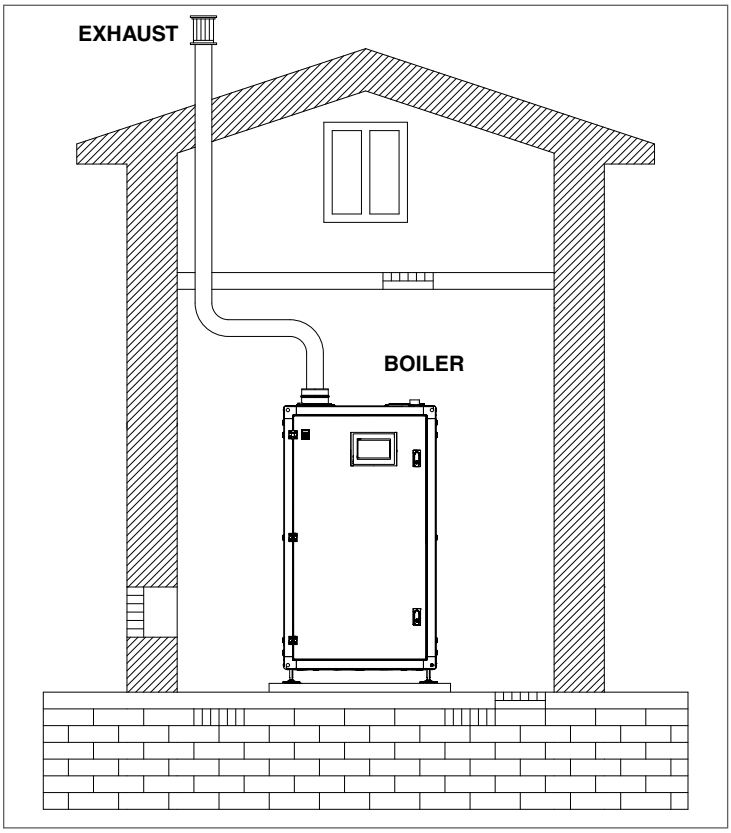


Fig. 31 *All Combustion Air From Outdoors – Inlet Air From Ventilated Crawl Space and Outlet Air to Ventilated Attic*

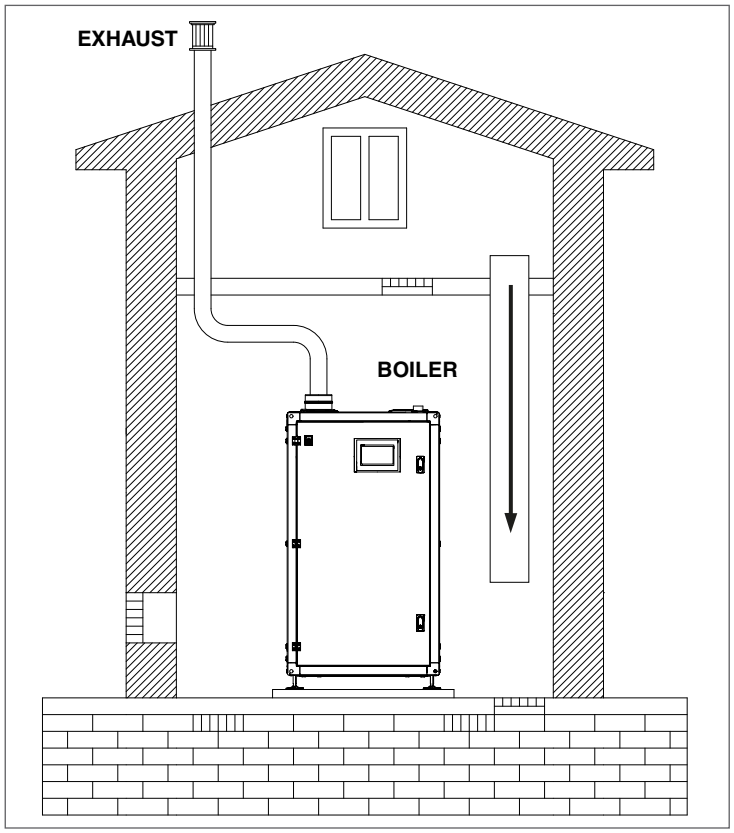


Fig. 30 *All Combustion Air from Outdoors trough Ventilated Attic*

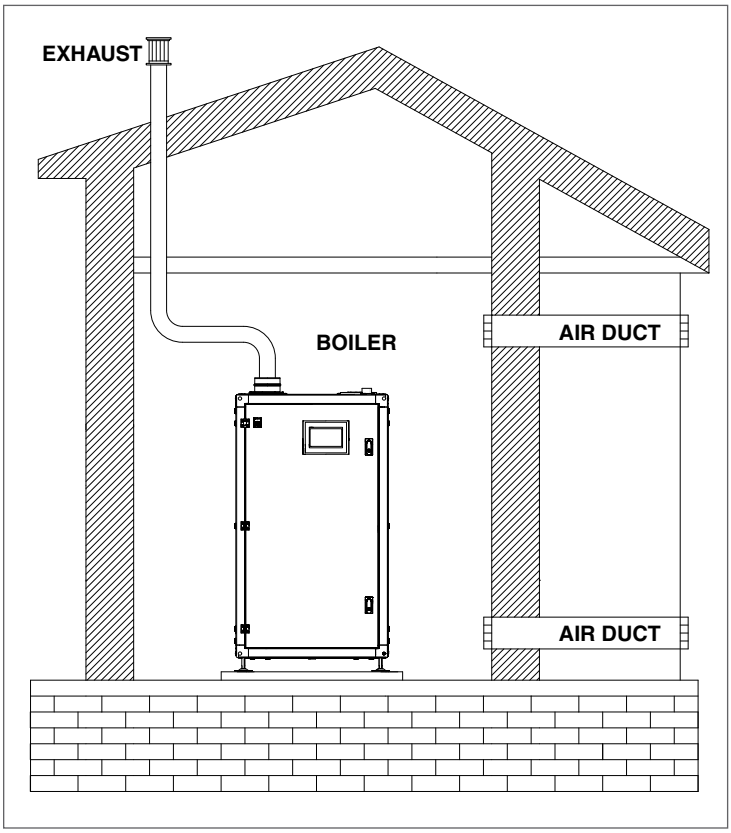


Fig. 32 *All Combustion Air from Outdoors through Horizontal Ducts*

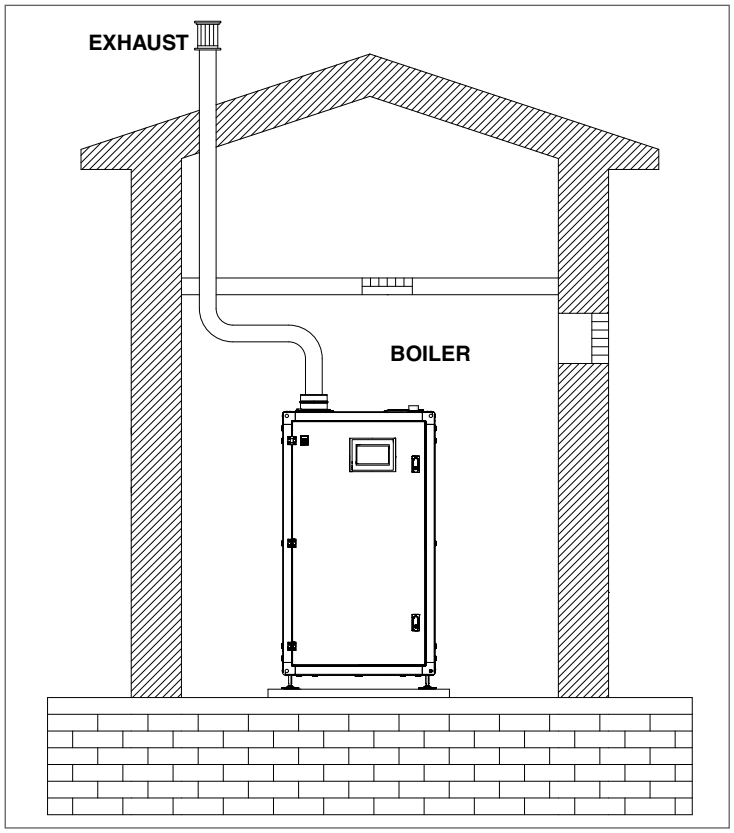


Fig. 33 *All Combustion Air from Outdoors through Single Combustion Air Opening*

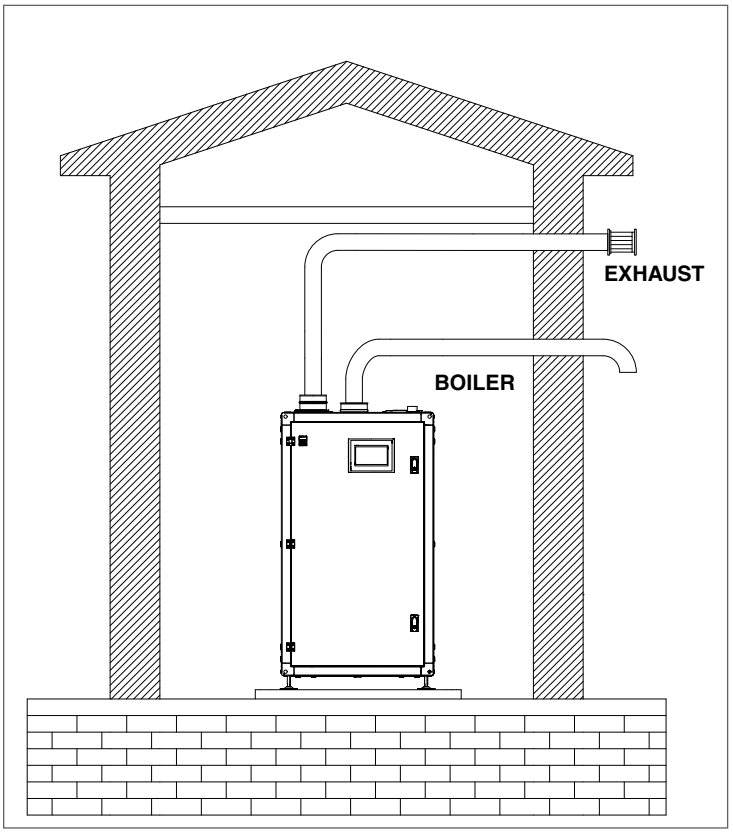


Fig. 35 *Sealed Combustion Located on Same Side with Exhaust (horizontal)*

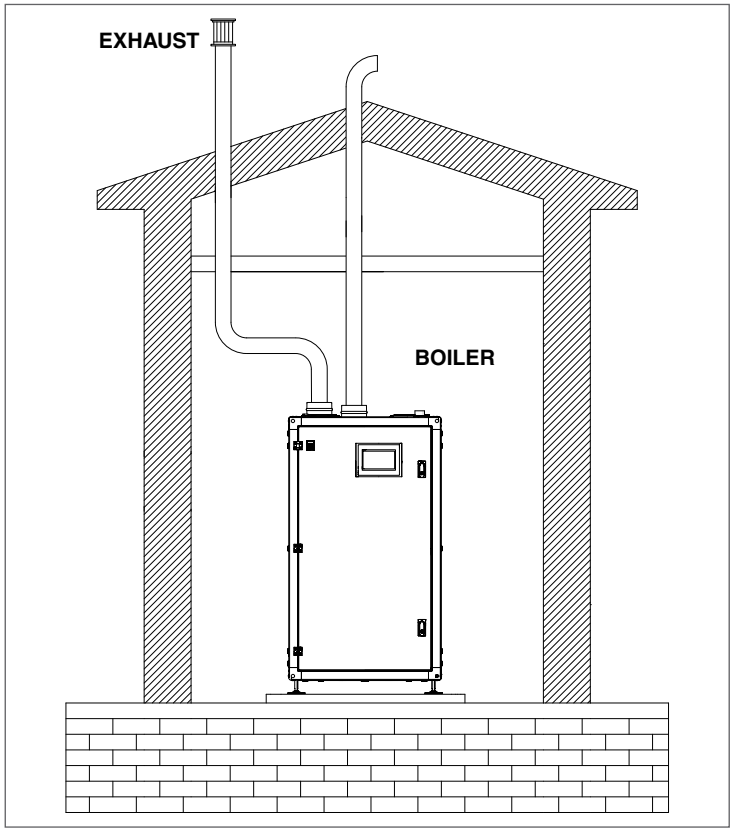


Fig. 34 *Sealed Combustion Located on Same Side with Exhaust (vertical)*

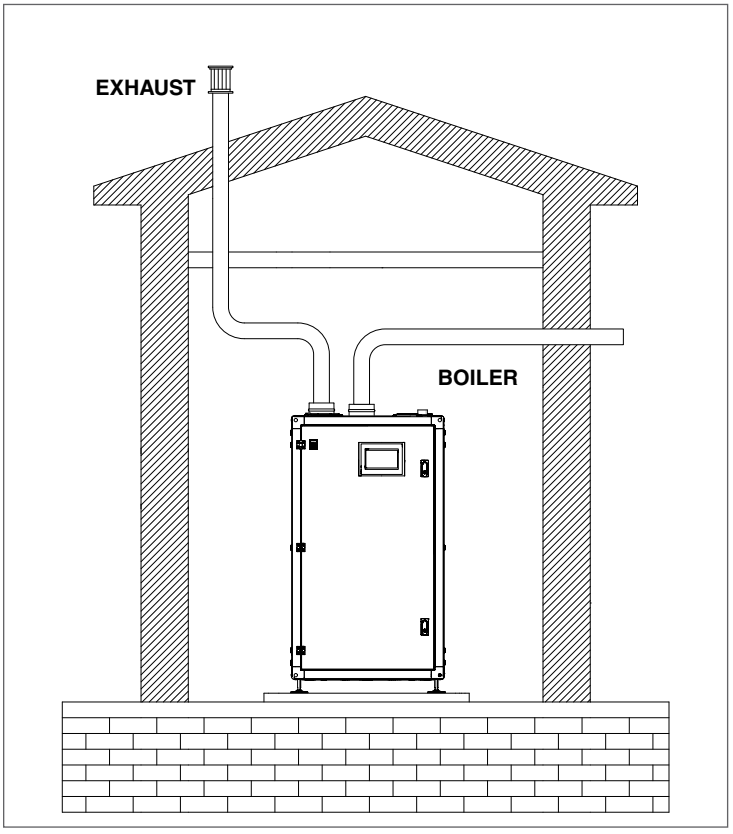


Fig. 36 *Sealed Combustion Located on Side Wall*

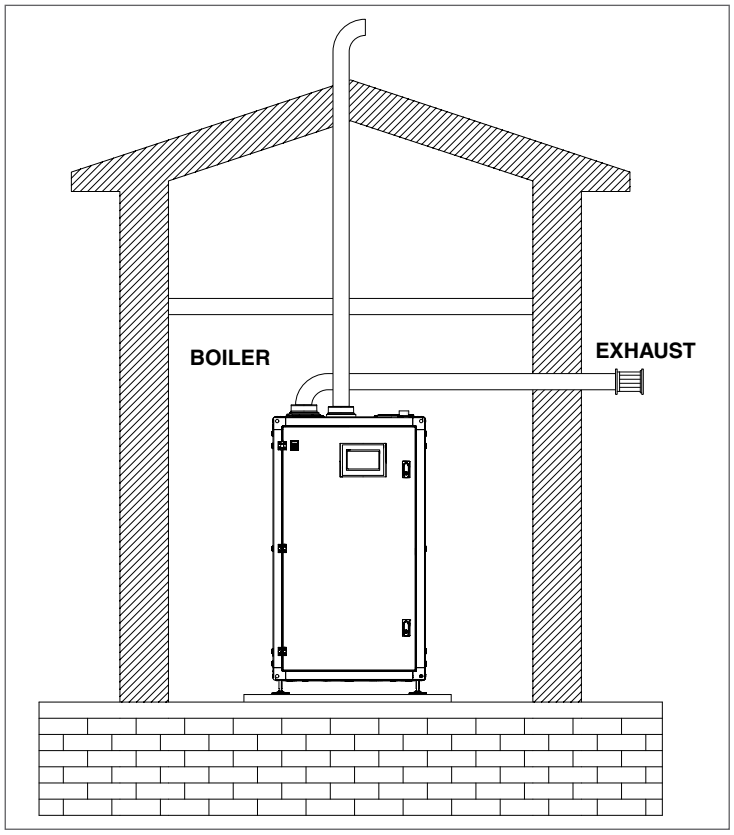


Fig. 37 *Exhaust Located on Side Wall*

- It is not recommended to terminate vent above any door or window, as condensate can freeze causing ice formations.
- Do not use chimney as a raceway if another boiler or fireplace is vented into or through chimney.
- Because the unit is capable of discharging low temperature exhaust gases, the flue must be pitched back towards the unit a minimum of 1/4" per foot to avoid any condensate pooling and to allow for proper drainage.
- While there is a positive flue pressure during operation, the combined pressure drop of vent and combustion air systems must not exceed the limits listed in "Appendix H – Venting Size Data".

Fittings as well as pipe lengths must be calculated as part of the equivalent length.

- For a natural draft installation the draft must not exceed – 0.25" w.c.
- These factors must be planned into the vent installation. If the maximum allowable equivalent lengths of piping are exceeded, the unit will not operate properly or reliably.
- For Massachusetts installations, contact companies able to provide vent systems which conform to all applicable requirements for installations within the Commonwealth of Massachusetts.
- For installation of multiple boilers, common venting shall be sized based on the data in "Appendix H – Venting Size Data".

4.16 Combustion Air

Air supply is a direct requirement of ANSI 223.1, NFPA-54, CSA B149.1 and local codes. These codes should be consulted before a permanent design is determined.
Array boilers utilize combustion air from the space in which they are installed, or utilize combustion air ducted directly to the unit.

Ventilation air must be provided in either case.

Material	Standard
ABS	ANSI/ASTM D1527
PVC Schedule 40	ANSI/ASTM D1785 or D2665
CPVC Schedule 40	ANSI/ASTM F441
Polypropylene	ULC S636
Single wall galvanised steel	26 gauge

In cold climates it is essential to provide a motorized air inlet damper to control the supply of combustion air and prevent nuisance condensation.

The combustion air must be free of:
- Permanent wave solutions;
- Chlorinated waxes/cleaners;
- Chlorine-based swimming pool chemicals;
- Calcium chloride
- Sodium chloride used for water softening;
- Refrigerant leaks;
- Paint or varnish removers;
- Hydrochloric acid/muriatic acid;
- Cements and glues;
- Antistatic fabric softeners used in clothes dryers;
- Chlorine-type bleaches, detergents, and cleaning solvents found in household laundry rooms;
- Adhesives used to fasten building products and other similar products.

To prevent contamination do not connect the combustion air inlet and exhaust near:
- Dry cleaning/laundry areas and establishments;
- Swimming pools;
- Metal fabrication plants;
- Beauty shops;
- Refrigeration repair shops;
- Photo processing plants;
- Auto body shops;
- Plastic manufacturing plants;
- Furniture refinishing areas and establishments;
- Remodeling areas;
- Garages with workshops

Whenever the environment contains these types of chemicals, combustion air MUST be supplied from a clean area outdoors for the protection and longevity of the equipment and warranty validation. The more common methods of combustion air supply are outlined in the following sections.

4.16.1 Combustion Air From Outside the Building

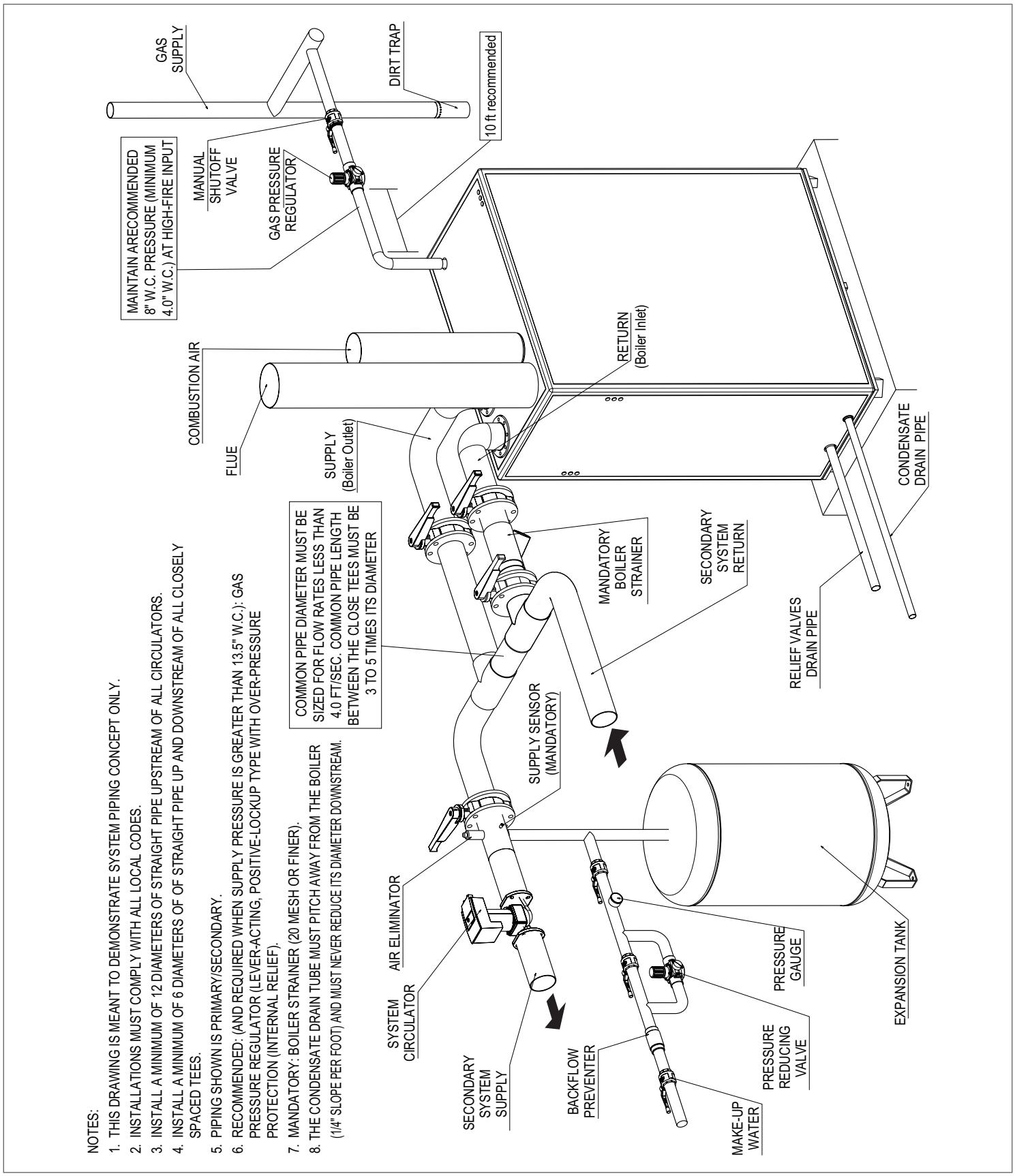
Air supplied from outside the building must be provided through two permanent openings. For each unit these two openings must have a free area in accordance with the requirements of CAN/CSA B149.1, Natural Gas and Propane Installation Code. The free area must take into account restrictions such as louvers and bird screens.

4.16.2 Combustion Air From Inside the Building

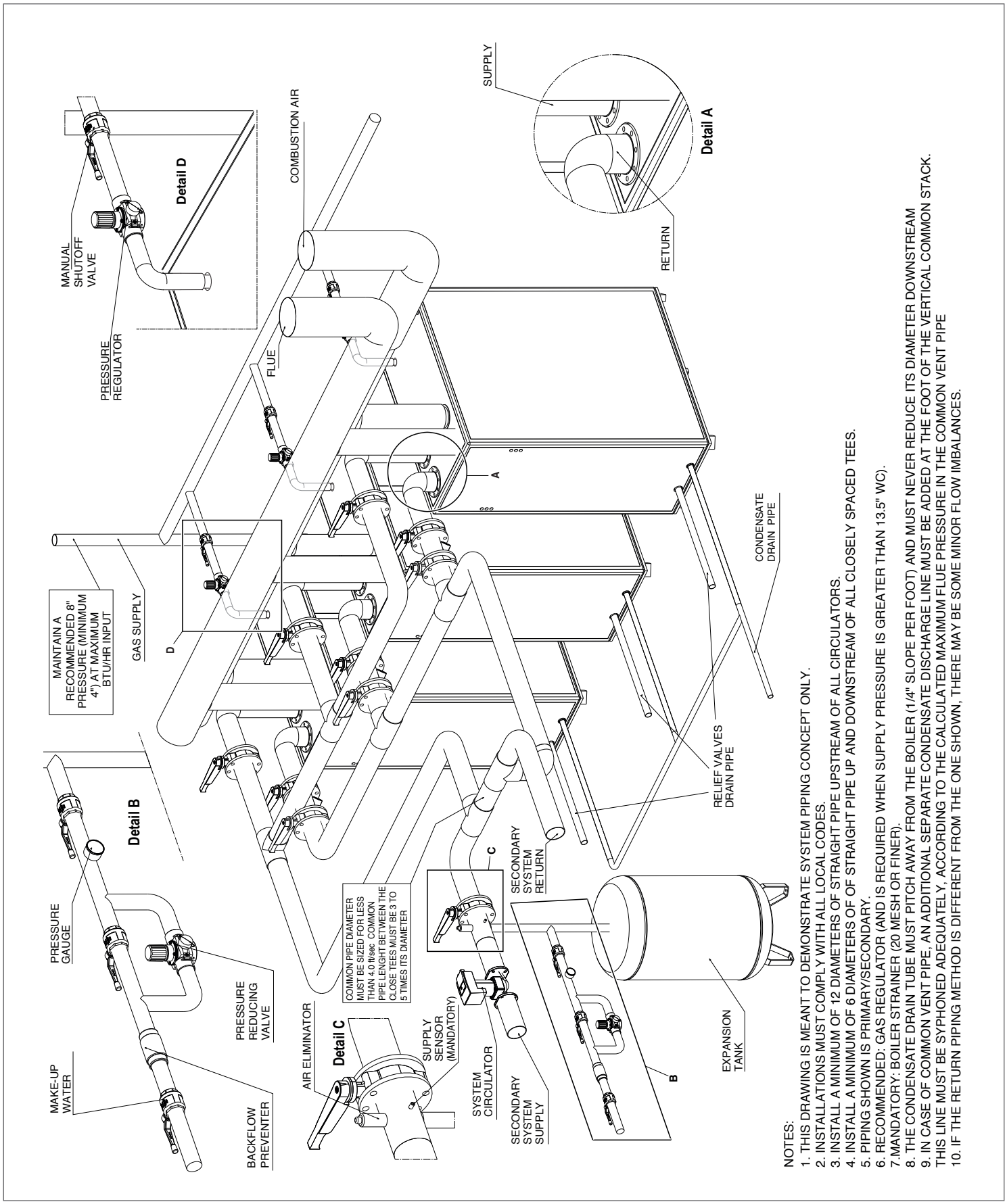
When combustion air is provided from within the building, it must be supplied through two permanent openings in an interior wall. Each opening must have a free area of not less than one square inch per 1000 BTUH of total input or 3000 square inches of free area. The free area must take into account any restrictions, such as louvers.

APPENDIX G – BOILER INSTALLATION (EXAMPLE DRAWINGS)

ARRAY AR 800 Single Unit Installation



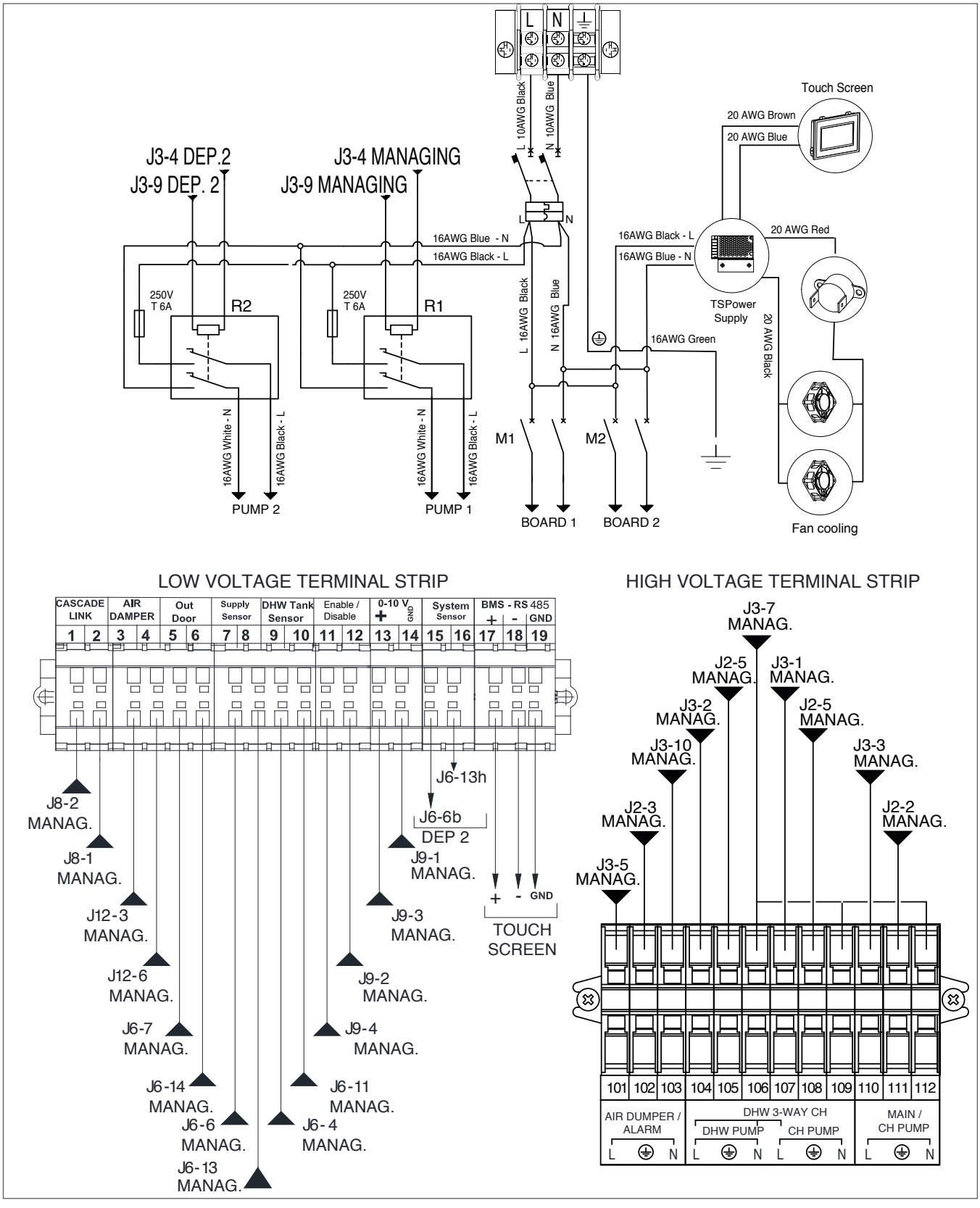
ARRAY AR 800 Multiple Boiler Installation



NOTES:
1. THIS DRAWING IS MEANT TO DEMONSTRATE SYSTEM PIPING CONCEPT ONLY.
2. INSTALLATIONS MUST COMPLY WITH ALL LOCAL CODES.
3. INSTALL A MINIMUM OF 12 DIAMETERS OF STRAIGHT PIPE UPSTREAM OF ALL CIRCULATORS.
4. INSTALL A MINIMUM OF 6 DIAMETERS OF OF STRAIGHT PIPE UP AND DOWNSTREAM OF ALL CLOSELY SPACED TEES.
5. PIPING SHOWN IS PRIMARY/SECONDARY.
6. RECOMMENDED: GAS REGULATOR (AND IS REQUIRED WHEN SUPPLY PRESSURE IS GREATER THAN 13.5" WC).
7. MANDATORY: BOILER STRAINER (20 MESH OR FINER).
8. THE CONDENSATE DRAIN TUBE MUST PITCH AWAY FROM THE BOILER (1/4" SLOPE PER FOOT) AND MUST NEVER REDUCE ITS DIAMETER DOWNSTREAM
9. IN CASE OF COMMON VENT PIPE, AN ADDITIONAL SEPARATE CONDENSATE DISCHARGE LINE MUST BE ADDED AT THE FOOT OF THE VERTICAL COMMON STACK. THIS LINE MUST BE SYPHONED ADEQUATELY, ACCORDING TO THE CALCULATED MAXIMUM FLUE PRESSURE IN THE COMMON VENT PIPE
10. IF THE RETURN PIPING METHOD IS DIFFERENT FROM THE ONE SHOWN, THERE MAY BE SOME MINOR FLOW IMBALANCES.

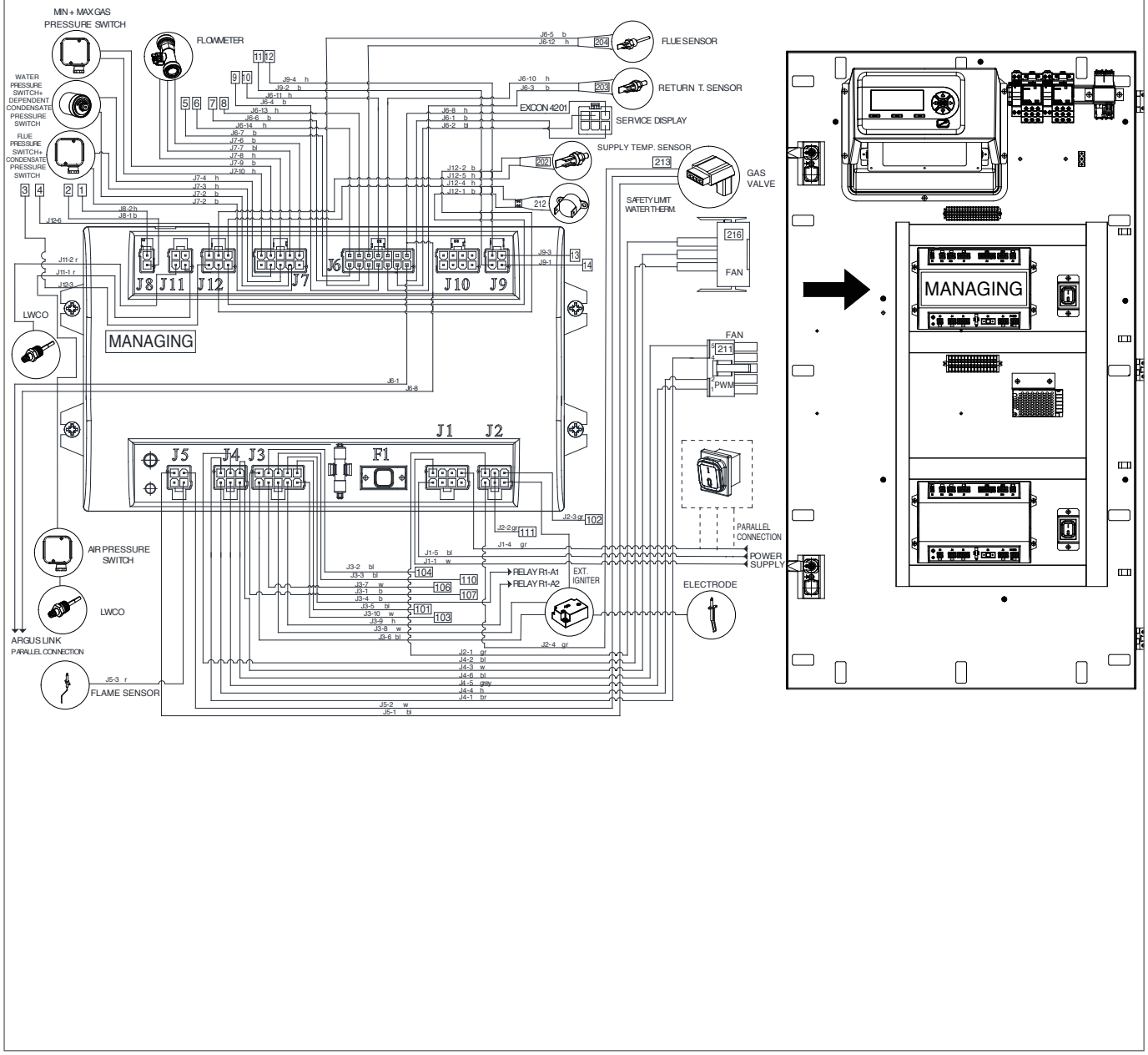
WIRING DIAGRAM ARRAY AR 800

ANNEXE A – SCHÉMA DE CÂBLAGE



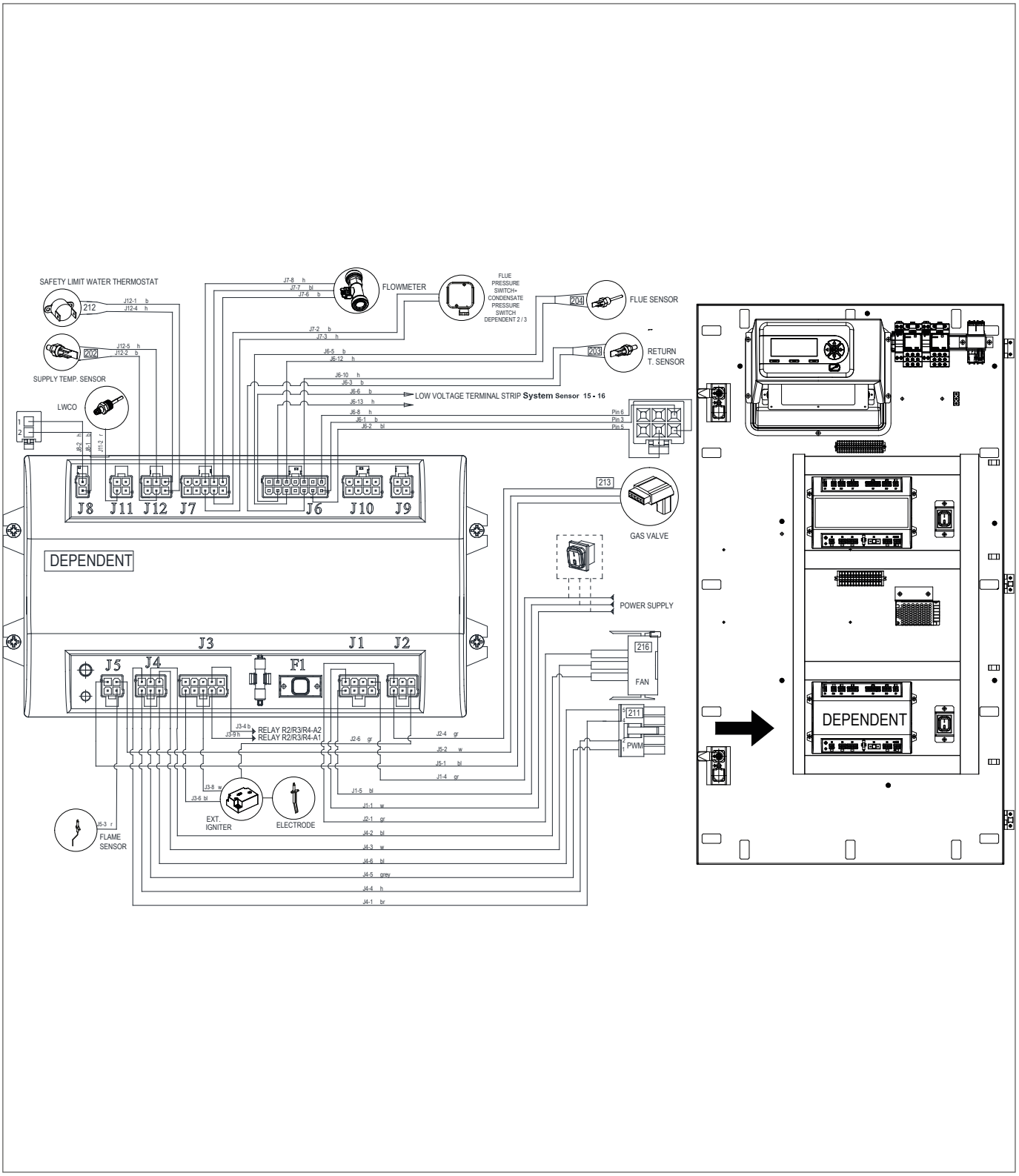
WIRING DIAGRAM ARRAY AR 800 – MANAGING

SCHÉMA DE CÂBLAGE – CHAUDIÈRE DE GESTION



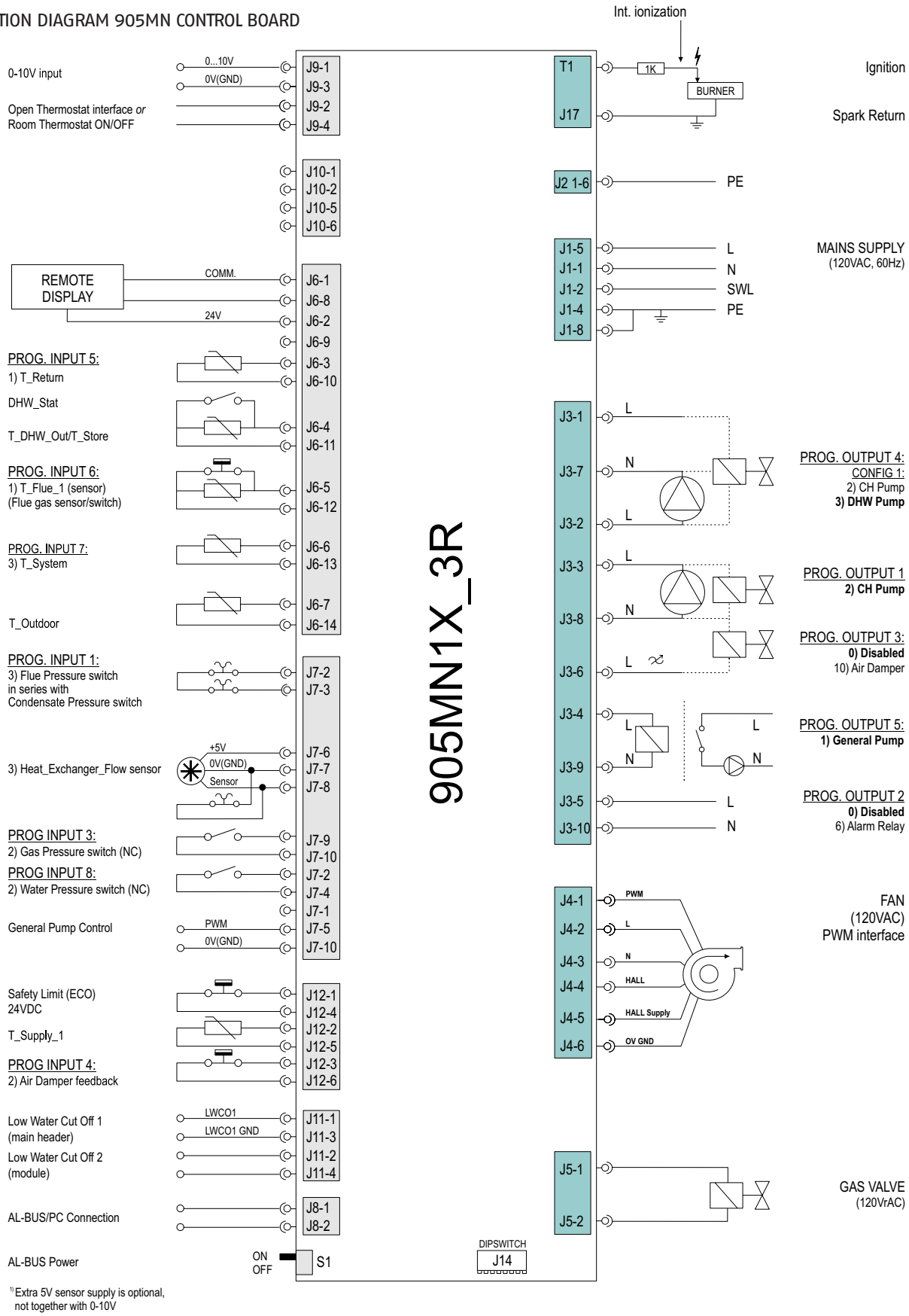
WIRING DIAGRAM ARRAY AR 800 – DEPENDENT 2 / 3

SCHÉMA DE CÂBLAGE DE LA CHAUDIÈRE – CHAUDIÈRE DÉPENDANTE 2/3



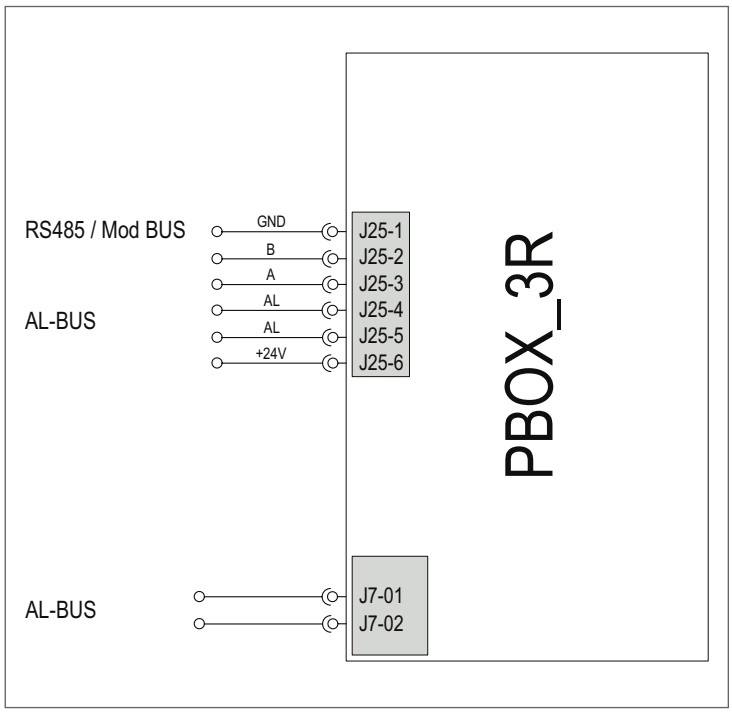
APPENDIX B – CONNECTION DIAGRAM

CONNECTION DIAGRAM 905MN CONTROL BOARD



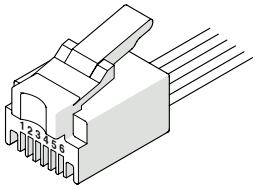
[1] Extra 5V sensor supply is optional, not together with 0-10V

CONNECTION DIAGRAM 905PB DISPLAY



905PB05_3R	
Connector	**Function**
J7	PC interface
J25	Connection to MN control/Modbus

905PB05_3R Display: RJ-11 Connector:



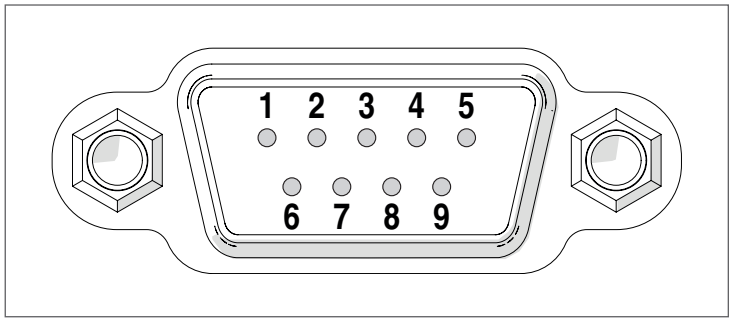
1: GND/VSS
2: ModBus_B (= Data -)
3: ModBus_A (= Data +)
3: AL_Comm
5: VSS — **To 905MN**
6: +24V

J25 Wire Colors:
J25-1: Grey
J25-2: Black
J25-3: Green
J25-4: Yellow
J25-5: Red
J25-6: Blue

CONNECTION DIAGRAM 905TS (Touchscreen) AND 905PB DISPLAY

Modbus connection diagram between the 900PB and 900TS

Pins on connector COM1 of the 900TS:



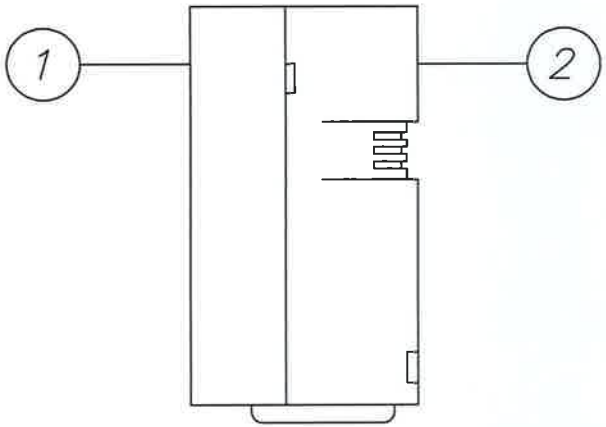
Primary connection to 900PB:

Communication	Pin	Function	Connect to	
COM2 (Master)	5	GND	900 PB (J25-1)	
	7	RS 485 +	900 PB (J25-3)	
	8	RS 485 -	900 PB (J25-2)	

Secondary connection to BMS (pre-wired):

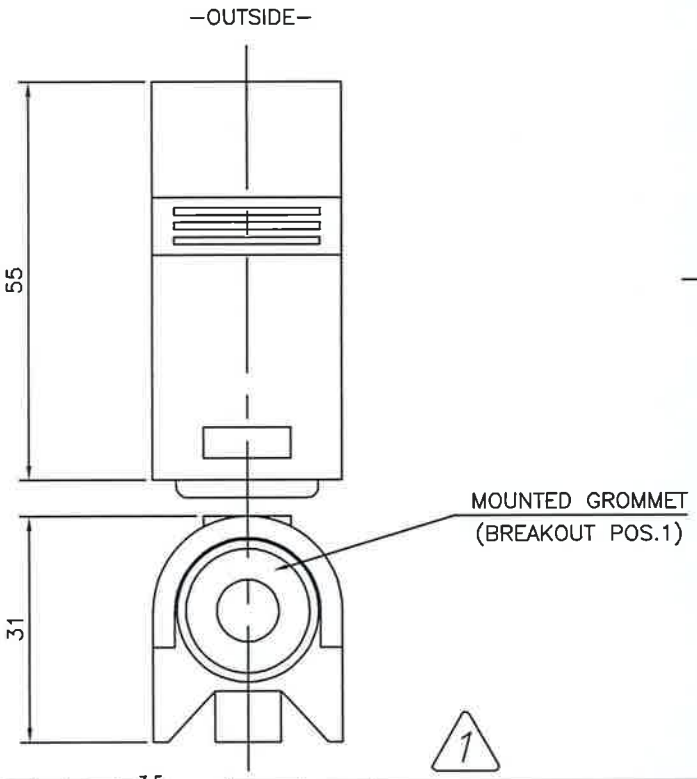
Communication	Pin	Function
COM1 (Slave)	4	RS485 +
	9	RS485 -
	5	GND

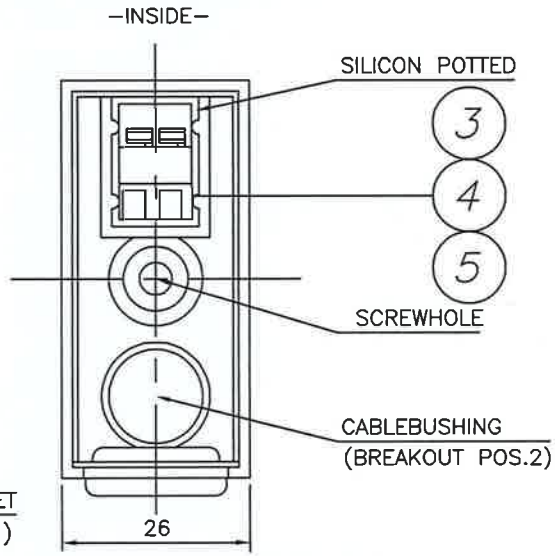
(FACTORY SUPPLIED OUTDOOR TEMPERATURE SENSOR)



NTC thermistor
type 10KOhm 3%
single 2-wire
10KOhm at 25°C
Bvalue 3435K±0.5%
Trange -40..+50°C

Electrical circuit



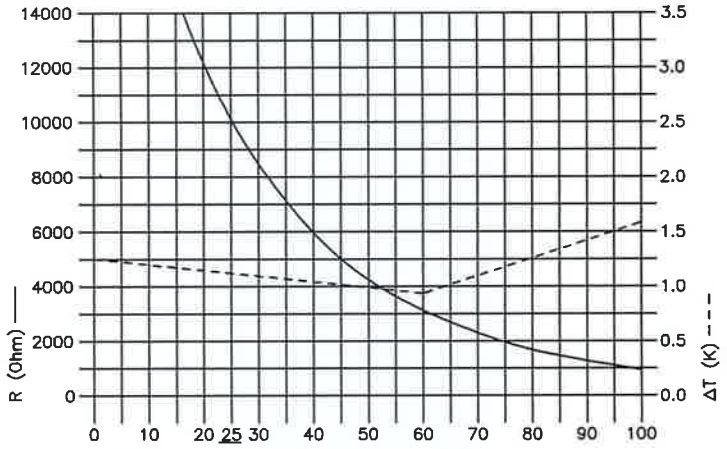


This drawing has to be approved of by the customer by a signature and sent back.
By signing this drawing the customer declares to agree the specifications. Any changes in these specifications are not accepted unless agreed by the customer and Tasseron.

APPR.:
NAME: FONTECAL SPA
DATE: UFFICIO TECNICO 03 GIU. 2015

T(°C)	Rn(Ohm)
0	27396
5	22140
10	17999
15	14716
20	12099
25	10000
30	8308
35	6936
40	5819
45	4904
50	4151
55	3529
60	3012
65	2582
70	2221
75	1918
80	1663
85	1446
90	1262
95	1105
100	970

Resistance table



Resistance diagram

1

POS.	QTY.	MATERIAL	DESCRIPTION
5	1	-	NTC (SNTC 10K3 A66)
4	1	-	PCB
3	1	PA6	2-POLE SPRING CONNECTOR
2	1	ABS, WHITE	PROTECTION CAP
1	1	ABS, BLACK	MOUNTING BACKPLATE

REV.	DESCRIPTION	DWN	APP SLS	APP PRD	DATE
1	chg material PC to ABS	JP	JB	-	02-02-15
0	----------	PL	JB	-	30-07-13

TASSERON SENSORS & CONTROLS

NTC outsidesensor 10K3%
-

DRAWING NO. TSRD110 | A4

⚠ CHANGE CAD-DRAWING ONLY WITH CAD-SYSTEM ⚠

SCALE: 1:1
DIMENSIONS: all units in mm
TOLERANCES: ±0.5mm unless otherwise noted

CSA INTERNATIONAL

Certificate of Compliance

Certificate: 2409198 **Master Contract:** 172723

Project: 2503646 **Date Issued:** April 27, 2012

Issued to: **ebm-papst Landshut GmbH**

Hofmark-Aich-Strasse 25
Landshut, 84030
Germany
Attention: Juergen Schwalme

The products listed below are eligible to bear the CSA Mark shown with adjacent indicators 'C' and 'US' for Canada and US or with adjacent indicator 'US' for US only or without either indicator for Canada only.

C US

John Kristoff-Kichka

Issued by: John Kristoff-Kichka

PRODUCTS

CLASS 3302 01 - COMBINATION CONTROLS - Part 1
CLASS 3302 81 - COMBINATION CONTROLS - Part 1 - Certified to U.S. Standards

Model Number	Inlet Size	Outlet Size
For Use With Natural, Mfd., Mixed, Liq. Pet. or Propane Gases and LP Gas-Air Mixtures		
Automatic Valves (Dual), 1/2 psig Gas Pressure Regulators and Pressure Switches		
Trade Name: ebmpapst		
GB-055 D(01, 02)S(20, 22, 40, 42)	1/2	1/2
GB-055 E(01, 02)S(20, 40)	1/2	1/2
GB-(M, MP, P, MEP, MLE, MEP) 055 D(01, 02)S(20, 22, 40, 42)	1/2	1/2
GB-(M, MP, P, MEP, MLE, MEP) 055 E(01, 02)S(20, 40)	1/2	1/2
GB-(L, LE, LEP, LEPZ, Z) 055 D(01, 02)S(20, 22, 40, 42)	1/2	1/2

Certificate: 2409198 **Master Contract:** 172723

Project: 2503646 **Date Issued:** April 27, 2012

GB-(L, LE, LEP, LEPZ, Z) 055 E(01, 02)S(20, 40)	1/2	1/2
GB-(N, ND, G, GD, WN, WND) 055 D(01, 02)S(00, 02)	1/2	1/2
GB-(N, ND, G, GD, WN, WND) 055 E(01, 02)S00	1/2	1/2
GB-057 D(01, 02)S(20, 22, 40, 42)	3/4	3/4
GB-(M, MP, P, MEP, MLE, MEP) 057 D(01, 02)S(20, 22, 40, 42)	3/4	3/4
GB-(L, LE, LEP, LEPZ, Z) 057 D(01, 02)S(20, 22, 40, 42)	3/4	3/4
GB-(N, ND, G, GD, WN, WND) 057 D(01, 02)S(00, 02)	3/4	3/4

APPLICABLE REQUIREMENTS

ANSI Z21.78-2010•CSA 6.20-2010 Combination Gas Controls For Gas Appliances

Certificate of Product Ratings

AHRI Certified Reference Number : 205652806 Date : 01-07-2021 Model Status: Active

Brand Name : RIELLO

Series Name : ARRAY

Model Number : AR 800

Material : Stainless Steel

Location : Indoor

Fuel Type : Natural Gas

Input Rating, MBH : 798

Input Rating, gph :

Gross Output (MBH) : 767

Ignition Type : Intermittent/Electronic Ignition

Heating Medium : Water

Draft Type: Forced Draft

CO2 : 10.1

Rated as follows in accordance with Department of Energy (DOE) Boiler test procedures as published in the latest edition of the Code of Federal Regulations, 10 CFR Part 431 and subject to verification of rating accuracy by AHRI-sponsored, independent, third party testing:

	At 798 MBH
Combustion Efficiency (%)	96.1
Thermal Efficiency (%) :	96.1

†"Active" Model Status are those that an AHRI Certification Program Participant is currently producing AND selling or offering for sale; OR new models that are being marketed but are not yet being produced."Production Stopped" Model Status are those that an AHRI Certification Program Participant is no longer producing BUT is still selling or offering for sale.

Ratings that are accompanied by WAS indicate an involuntary re-rate. The new published rating is shown along with the previous (i.e. WAS) rating.

AIR-CONDITIONING, HEATING, & REFRIGERATION INSTITUTE

we make life better™

CERTIFICATE NO.: 132545222387704965

RIELLO
Energy For Life

LIMITED WARRANTY
TERMS & CONDITIONS

Revision 2 - Effective November 1, 2018

ARRAY Series Boiler

GENERAL NOTE

This limited warranty is provided by Riello Canada Inc. ("Riello") and covers Riello Array Series Boilers (the "Boiler"). This warranty is provided to the original purchaser as long as the Boiler remains located at its original place of installation. This warranty is provided with respect to the Boiler heat exchanger and its insulation and casing, and approved accessories designated by Riello.

The warranty is conditional upon:

- The proper installation of the Boiler by a qualified HVAC mechanical contractor or installer trained and certified in accordance with the applicable laws and regulations of the jurisdiction in which the Boiler is installed (the "Qualified Contractor"); and
- Strict adherence to the water quality guidelines as described in the Boiler operation manual; and
- Proper operation and maintenance of the Boiler in accordance with the Boiler operation manual and service bulletins as issued by Riello from time to time, and the mandatory maintenance schedule (see Appendix D).

Installation or maintenance of the Boiler by a person other than a Qualified Contractor shall void this warranty.

This warranty is applicable only to Boilers for which payment has been made in full.

Any component of a Boiler returned to Riello in connection with this warranty agreement shall become the property of Riello and may not be returned to the customer.

WARRANTY TERMS & CONDITIONS

LIFETIME THERMAL SHOCK WARRANTY

Riello warrants that the heat exchanger of the Boiler shall not fail from thermal shock damage for the lifetime of the boiler.

TEN (10) YEAR HEAT EXCHANGER WARRANTY

Riello warrants that the heat exchanger of the Boiler shall be free from leakage, condensate corrosion, and shall be free of defects in material and workmanship for TEN (10) YEARS from the date of manufacture, which date is found within the Boiler serial number on the data plate.

The obligation of Riello under this heat exchanger warranty shall be to repair or replace those parts of the heat exchanger determined by Riello to be defective in material and/or workmanship.

FIVE (5) YEAR BURNER WARRANTY

Riello warrants the burner head against failure due to defects in materials or workmanship for a period of five years from the date of manufacture (as defined by the date code engraved on the burner head end plate). This warranty covers the burner head only, and does not include failed gaskets. This warranty does not provide coverage for damage caused by corrosion due to corrosive ambient conditions, contaminated air supply, accumulation of dust, poor combustion (i.e., improper air/fuel ratio) and overfiring or underfiring beyond the recommended input range. Upon request, the defective burner head shall be returned to Riello for inspection, and annual combustion and maintenance reports must be provided for warranty consideration.

The obligation of Riello under this burner warranty shall be to repair or replace such parts determined by Riello to be defective in material and/or workmanship.

PARTS WARRANTY

For any parts other than the heat exchanger and burner head warranted above, Riello warrants that the Boiler and approved accessories designated by Riello as standard equipment shall be free of defects in manufacture, material and workmanship for 18 months from shipment or 12 months from start-up (whichever comes first).

The obligation of Riello under this limited warranty shall be to repair or replace those parts determined by Riello to be defective in material and/or workmanship.

WARRANTY EXCLUSIONS

- Any costs of labor for the examination, removal or reinstallation of allegedly defective Boiler parts, and transportation thereof to and from Riello facilities in North America or Italy, or as determined by Riello.
- Damage to the Boiler or any of its original or authorized replacement parts or other accessories designated by Riello as standard equipment caused by excessive temperatures or pressures, unsuitable fuels, fuel impurities, improper fuel mixture, fuel or gas explosion, electrical, chemical or electrochemical reaction, water impurities, unsuitable water conditions causing unusual deposits within the combustion chamber and/or the water side of the pressure vessel, water treatment chemicals or water conditioning systems, electrical failures, flooding or acts of God, contaminated combustion air, air impurities, sulfur or sulfuric action or reaction, dust particles, corrosive vapors, oxidation, and installation of the Boiler in an unsuitable location or continued use of the Boiler after onset of a malfunction or discovery of a defect.
- Operation of the Boiler that does not comply with the conditions set out in the Appendices hereto.
- Failures or malfunctions resulting from: improper installation, operation or maintenance of the Boiler in accordance with our published Installation, Operation and Maintenance Manual or Users Information Manual provided with the product.

WARRANTY AND DAMAGE LIMITATIONS

The obligations of Riello hereunder shall also be subject to the following terms and conditions:

- Any repaired or replaced component of a Boiler and approved accessories will be warranted only for the remaining unexpired term of the warranty applicable to the original Boiler.
- Negotiations, intermediate acts, discussions, disagreements or denials concerning alleged defects or deficiencies shall not extend any warranty herein and shall not waive or be deemed to waive any requirement for notification of defect or deficiency.
- Additional costs arising out of the performance of this warranty including but not limited to transport, labor, installation, assembly, inspection, troubleshooting, testing and recommissioning of the Boiler are the responsibility of the owner.
- RIELLO IS NOT RESPONSIBLE FOR ANY INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES CAUSED BY A BOILER.
- RIELLO DOES NOT WARRANT OR GUARANTEE THE MERCHANTABILITY OR FITNESS OF ANY BOILER FOR ANY PARTICULAR PURPOSE.
- Riello does not extend this warranty to any related parts or products that are not supplied and sold by Riello.

ASSIGNABILITY

This warranty is not assignable or transferrable.

WARRANTY NOTIFICATION

The obligations of Riello under this warranty are conditional upon the customer notifying Riello in writing within FOURTEEN (14) DAYS of the alleged defect or deficiency giving rise to a claim under this warranty.

The written notification must include the following data:

a. Serial number of the affected Boiler, list of the alleged parts with a brief description of the failure and of the conditions under which the failure occurred.
b. Information about the hydraulic system, flow rate, length of the venting system, installation schematic and total heating power of the system.
c. Log file downloaded from the Boiler control system showing the list of errors and the servicing dates in chronological order.
d. Identity of the Qualified Contractor who performed the Boiler start-up.

Riello reserves the sole right to make all warranty decisions. No person may provide service under this warranty without the prior approval from Riello.

APPLICABLE LAW, JURISDICTION AND DISPUTE RESOLUTION

All disputes, claims or demands arising from or relating to this warranty shall be determined in accordance with the laws within the Province of Ontario, Canada and the Courts of Ontario shall have exclusive jurisdiction to adjudicate all such disputes, claims or demands.

If you have any questions about the coverage provided by this warranty, contact Riello at one of the addresses shown below:

Riello Burners North America – Canada

2165 Meadowpine Blvd.

L5N 6H6 Mississauga (Ontario)

Riello Burners North America – United States

35 Pond Park Road

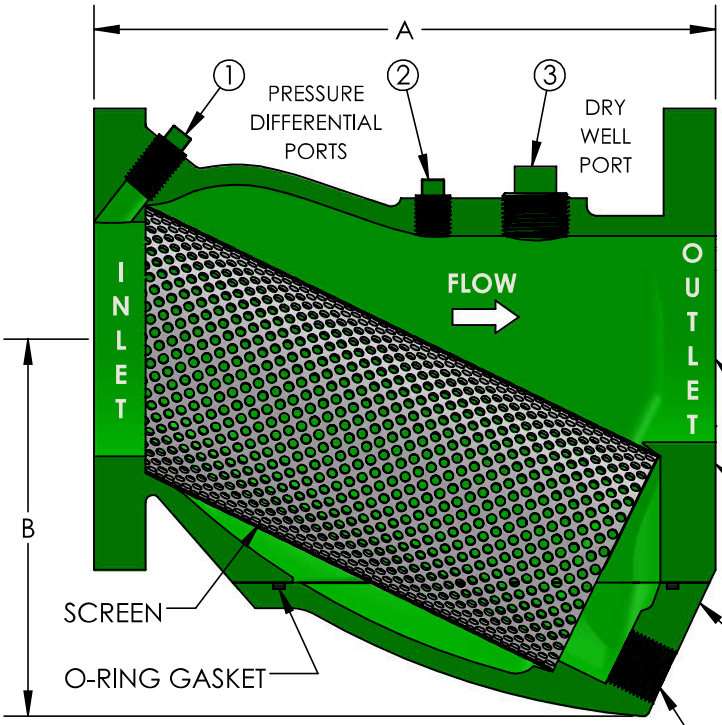
Hingham, MA 02043

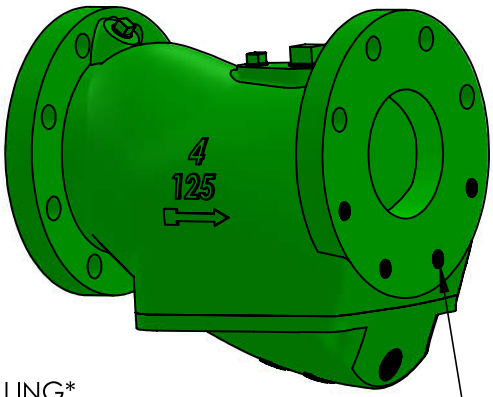
Tel : (800) 4-RIELLO / (800) 474-3556

Fax : (866) 2-RIELLO

Website: www.rielloboilers.com

MODEL LPD
LOW PRESSURE DROP
125# FLANGED STRAINER





*TAPPED BOLT HOLES
HALF OF THE BOLT HOLES ON THE OUTLET END ARE TAPPED. SEE TAP SIZE BELOW FOR SIZING.

MATERIALS OF CONSTRUCTION

BODY, FLANGES, COVER PLATE - CAST IRON
SCREEN - 304 STAINLESS STEEL
O-RING GASKET - VITON

OPERATING TEMPERATURE/PRESSURE

WATER, OIL, GAS.....175 PSI @ 150°F
STEAM.....125 PSI @ 350°F

STANDARD SCREENS

SERIVCE	SIZE	PERF
LIQUID	2" - 3"	.045"
	4" - 12"	.125"
STEAM	2" - 6"	.045"
	8" - 12"	.062"

QTY	PART NUMBER	PIPE SIZE		A	B	Cv# (GPM)	SCREEN AREA (in²)	PORT SIZE (NPT)		BLOWOFF SIZE (NPT)	TAP SIZE (UNC)	TAP DEPTH	WEIGHT (LBS)
		INCH	MM					1 & 2	3				
	LPD0200	2"	50	7-7/8"	4-5/8"	120	52.0	1/4"	1/2"	3/4"	5/8"-11	0.5"	20
	LPD0250	2-1/2"	65	10"	5-1/4"	160	84.6	1/4"	1/2"	3/4"	5/8"-11	0.5"	30
	LPD0300	3"	80	10-1/8"	6-1/4"	236	99.0	1/4"	1/2"	1"	5/8"-11	0.875"	50
	LPD0400	4"	100	12-1/8"	7-3/8"	460	147.3	3/8"	1"	1"	5/8"-11	0.875"	75
	LPD0500	5"	125	15-5/8"	8-3/8"	600	226.5	3/8"	1"	1-1/2"	3/4"-10	0.875"	115
	LPD0600	6"	150	18-1/2"	10-5/8"	952	317.6	3/8"	1"	1-1/2"	3/4"-10	0.875"	154
	LPD0800	8"	200	22-1/2"	13"	1580	515.0	3/8"	1"	1-1/2"	3/4"-10	1"	273
	LPD1000	10"	250	27"	16-5/8"	2424	745.2	3/8"	1"	2"	7/8"-9	1.125"	464
	LPD1200	12"	300	29-7/8"	19-3/4"	3200	1035.1	3/8"	1"	2"	7/8"-9	1.125"	565

#Cv IS THE FLOW RATE IN GALLONS OF 60°F WATER THAT WILL PASS THROUGH THE STRAINER IN 1 MINUTE AT A 1 PSI PRESSURE DROP.

NSF 372 - LEAD FREE
The wetted surface of this product contacted by consumable water contains less than one quarter of one percent (0.25%) of lead by weight. Material complies with state codes and standards, where applicable, requiring reduced lead content.

CUSTOMER:_____

PROJECT:_____

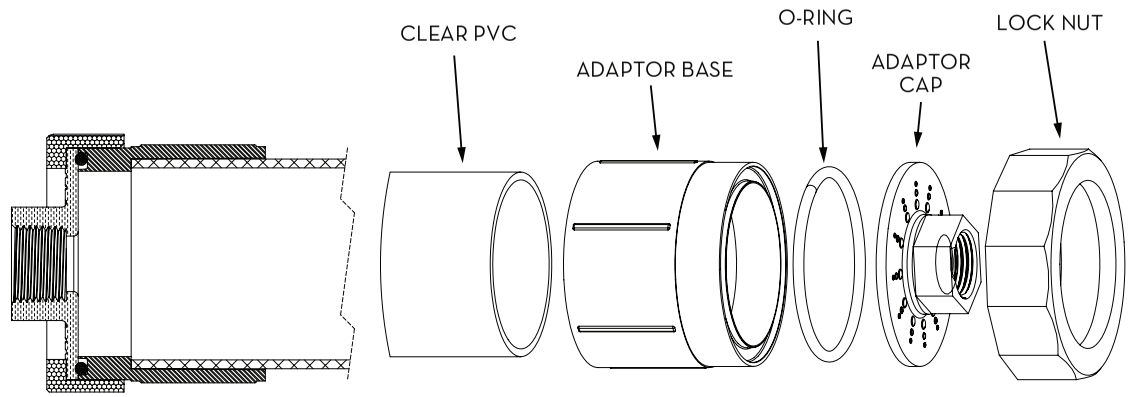
ENGINEER:_____

REV.			DATE
	7	2-1/2" BLOWOFF ADJUSTED	4/12/2018
	6	BLOWOFF ADJUSTED	12/6/2016
	5	Cv ADDED, 5" ADDED	10/12/2016

Metraflex for pipes in motion
2323 W. HUBBARD ST.
CHICAGO, IL 60612
TEL: 312-738-3800
FAX: 312-738-0415
WWW.METRAFLEX.COM

MODEL LPD
LOW PRESSURE DROP 125# FLANGED STRAINER

DRAWN BY: DKISH	DATE: 11/23/2015
APPROVED: JR	DATE: 11/23/2015
SCALE: N/A	DRAWING NUMBER: LPD-7



Description	Part #	Included
220 MBH Tube Model	SCN2-220	(2) ½" MNPT x ¾" PVC Adaptors
600 MBH Tube Model	SCN4-600	(2) ½" MNPT x ¾" PVC Adaptors
1,200 MBH Tube Model	SCN4-1200	(2) ½" MNPT x ¾" PVC Adaptors
2,000 MBH Tube Model	SCN4-2000	(2) ½" MNPT x ¾" PVC Adaptors
4,000 MBH Tank Model	SCN4T	Fitted with (2) 3/4" Bulkhead Fittings
6,000 MBH Tank Model	SCN6T	Fitted with (2) 1" Bulkhead Fittings
220 MBH Recharge Kit	S22RCK	(2) Replacement O-rings
600 MBH Recharge Kit	S60RCK	(2) Replacement O-rings
1,200 MBH Recharge Kit	S120RCK	(2) Replacement O-rings
2,000 MBH Recharge Kit	S200RCK	(2) Replacement O-rings
Recharge Media for Tank Models	STKRCK	2 Required for CN4T 3 Required for CN6T

Capacities are for guide purposes only. Performance will be affected by actual operating conditions.

Skidmore
A Swan Group Company

CONDENSATE NEUTRALIZERS

- UNIQUE – Integrated unions — easy to install, easy to service.
- CLEAR TUBE – Allows visual inspection.
- BEST VALUE – Six models, including tank style, sized to do it all.
- RECHARGE KITS – All tube models include replacement O-rings.
- SUPERIOR MEDIA – New combination of materials for improved performance.

Learn more about our products at www.skidmorepump.com

THE COMPANY

Skidmore has been a manufacturer in the Steam Industry since 1921. With the addition of Condensate Neutralization products, Skidmore now offers a complete line up of Glycol Feed Systems, Pot Feeders, and Condensate Neutralization products to support condensing boilers and closed loop hydronic systems. Skidmore's condensate neutralizers are a patent pending tube model which includes built-in unions and O-ring seals at each end, ensuring ease of replacement. Skidmore continually researches and develops ways to improve his products, always with the contractor in mind.

THE CARTRIDGE

An effective condensate neutralizer starts with the cartridge — it should be easy to install and allow easy access not just for replacing the media but for periodic visual inspection. Skidmore condensate neutralizers also incorporate the exclusive, patent pending integrated unions with O-rings. On either end of the cartridge, these lock rings are designed to allow the service technician to easily replace the media without disturbing the drain piping.

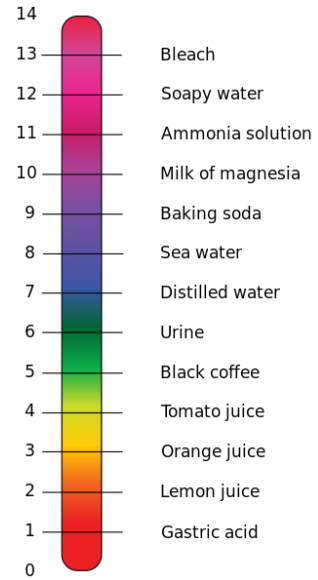
THE MEDIA

Our condensate neutralizers contain clean screened calcite and magnesium oxide. Calcite works by having the acidic aqueous solution come in contact with its surface. It raises the pH by dissolving some of the calcite (calcium carbonate) releasing carbon dioxide and various salts. Some of the salts stay entrained in the aqueous solutions and some may settle to the bottom of the neutralizer. An advantage of calcite is that it is self-limiting and does not over correct causing a high pH condition which is undesirable.

We add granular magnesium oxide (FloMag PWT) to our media for better performance. Calcite and magnesium oxide are used globally in the treatment of potable (drinking) water for raising pH. Skidmore is committed to ongoing research and development in order to provide you with the best possible solutions for your condensate needs.

WHAT IS CONDENSATE?

Condensate is produced after the transition of a gas into a liquid due to a drop in temperature or pressure. In the case of burning natural gas in a high efficiency boiler, furnace, or water heater, this condition occurs when the temperature of the flue gases starts to drop below 130°F.



This condensate is made up of several ingredients and will generally have a pH of between 2.9 and 4. As such it is considered to be acidic and can cause serious damage to piping systems, sewerage systems, treatment facilities, septic systems and other items it may come in contact with. Many communities now insist that this condensate be rendered benign before it enters the common drainage system. The easiest way to accomplish this is with the addition of a condensate neutralizer.

HOW DOES A CONDENSATE NEUTRALIZER WORK?

The acid neutralization takes place when the acidic solution comes in contact with the media. The media changes the solution into water, CO2 and various salts which tend to collect in the bottom of the neutralizer.

WHY USE A CONDENSATE NEUTRALIZER?

A fully condensing boiler will produce condensate at the rate of approximately 1 gallon per hour per 100,000 BTUs. Apart from the fact that many Plumbing Code authorities across the country require the use of condensate neutralizers, untreated condensate can cause serious damage to drainage piping and fittings. While condensing gas equipment condensate is considered to be mildly acidic, it is the amount produced that is of concern. The photos to the right show the effect of exposure to untreated condensate.

Submittal Data Information

101-081

Low Water Cutoff

Taco Comfort Solutions™ A Taco Group Company

Effective: October 1, 2008

Supersedes: December 1, 2007

Job: _____ Engineer: _____ Contractor: _____ Rep: _____

ITEM NO.	MODEL NO.	
LWCO (Sec.)	LTR -2	

Listings/Approvals

UL GUIDE (MBPR) for Limit Controls per UL Standard 353 Limit Controls

UL GUIDE (MBPR7) Controls, Limit Certified for Canada CSA Standard C22.2

UL GUIDE (MCUR2) for Electrode Assemblies – Component (remote probes)

FM Approved (LF only)

Fully compliant with CSD-1 requirements

Material of Construction

LTA-2 and LF Control Unit: NEMA Type 1 (For indoor use only). Formed sheet metal with powder coat/plated finish enclosure, knock-outs for 1/2" conduit fittings.

LTR Unit: UL 94 V0 rated engineered plastic enclosure

Remote Probe: NEMA Type 4. Drawn sheet metal with powder coat/plated finish enclosure. Opening for 1/2" conduit fitting.

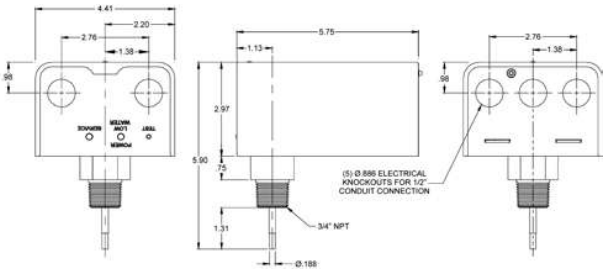
All models are not for use in hazardous locations

Performance Data

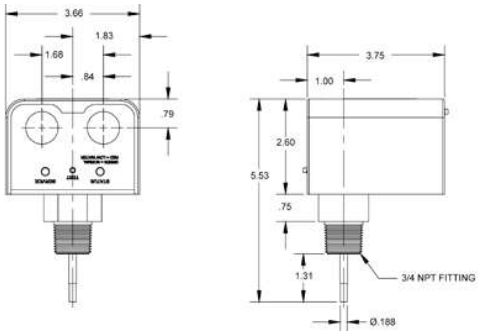
Category	LF Model	LTA-2 Model	LTR Model
Maximum Pressures Steam	250 psi (17.6 kg/cm²)	NA	N/A
Maximum Pressures Hot Water	250 psi (17.6 kg/cm²) @250°F (121°C)	250 psi (17.6 kg/cm²) @250°F (121°C)	160 psi (11.2 kg/cm²) @ 250°F (121°C)
Maximum Ambient Temp.	150°F (66°C)	150°F (66°C)	120°F (49°C)
Delays	Automatic	N/A	N/A
Probe Sensitivity	20K Ohms, extended operation to 40K Ohms	20K Ohms, extended operation to 40K Ohms	20K Ohms, extended operation to 40K Ohms
Control Power Consumption	3VA @ 120VAC, 3VA @ 24VAC	2.8VA @ 120VAC, 2.8VA @ 24VAC	1.5VA @ 24VAC
Input Supply Voltage	120VAC, 24VAC*	120VAC, 24VAC*	24VAC*

*24VAC supplied by a Class 2 power source

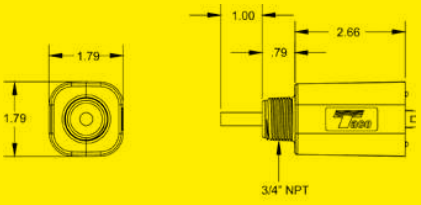
Model LF Dimensions



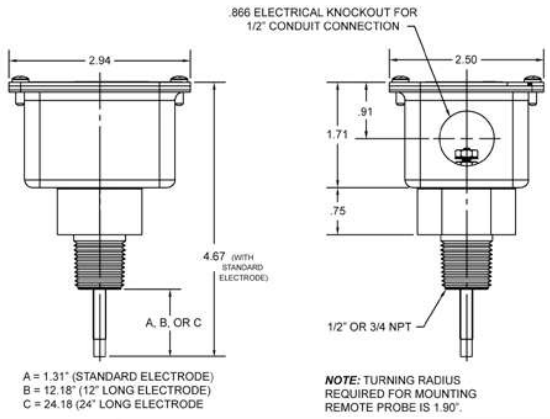
Model LTA-2 Dimensions



Model LTR Dimensions



Remote Probe Dimensions



Taco Comfort Solutions™ A Taco Group Company

Taco, Inc., 1160 Cranston Street, Cranston, RI 02920 | Tel: (401) 942-8000 | FAX: (401) 942-2360

Taco (Canada), Ltd., 8450 Lawson Road, Suite #3, Milton, Ontario L9T 0J8 | Tel: (905) 564-9422 | FAX: (905) 564-9436

Visit our web site: www.TacoComfort.com | Printed in USA |

Skidmore
Benton Harbor, MI 49022
www.skidmorepump.com

Skidmore Condensate Neutralizer
Models SCN4T and SCN6T

Installation, Operation and Maintenance Manual

⚠ WARNING

- Skidmore condensate neutralizers should only be installed by a qualified professional.
- Read all instructions before installing. Perform steps in the order given. Failure to comply could result in substantial property damage, severe personal injury, or death.
- Do not allow flue gases to vent through condensate neutralizer. Vent in cap is designed to allow proper flow through neutralizer. All condensate drain lines must have a gas trap before entering the neutralizer. Failure to comply could result in substantial property damage, severe personal injury or death.
- Skidmore neutralizers should only be connected to a condensate outlet that is installed per the appliance manufacturer's instructions. Failure to comply could result in substantial property damage, severe personal injury, or death.

IMPORTANT

- All piping should be in accordance with relevant building and mechanical codes, as well as any local, state or federal regulations.
- Neutralizer should be installed below all traps and condensate outlets.
- It is recommended that the installer maintain a pitch of ¼" per foot between the condensate neutralizer outlet and the pump or drain.
- Do not use pipe dope on threaded fittings - use only Teflon tape.
- Skidmore condensate neutralizers may **NOT** be installed in the vertical position.
- It is recommended that the neutralizer be installed before the condensate pump.
- All condensate traps should be primed before commencing operation of the appliance.
- Skidmore condensate neutralizer media should be replaced at least once a year or when pH falls below local regulations.

MOUNTING OPTIONS

- It is recommended that Skidmore condensate neutralizers be installed as close as possible to the outlet of the condensate trap.
- Condensate neutralizer may be installed on level ground or mounting brackets (not provided). Models SCN4T and SCN6T have screw inserts in their bases which can be used if needed.
- Skidmore condensate neutralizers may be installed on or above the floor so long as a pitch of ¼" per foot is maintained between the neutralizer outlet and the drain or pump.
- It is recommended that unions be installed to facilitate maintenance of the condensate neutralizer

INSTALLATION

1. Skidmore condensate neutralizers are provided with ¾" NPT tappings on SCN4T and 1" tappings on SCN6T at either end to accommodate fittings of choice.
2. If using PVC pipe, apply Teflon tape to the threads of PVC socket adaptors and attach to neutralizer. **Do not over tighten.**
3. Identify suitable location for assembled condensate neutralizer. **Observe direction of flow as indicated on neutralizer**.
4. PVC unions should be secured at either end of the neutralizer.
5. Prime and glue PVC pipe to fittings.
   Note: If using flexible tubing, be sure to use hose clamps at barb fittings.
   Note: PVC pipe is the preferred method for piping condensate drain lines.
6. Route PVC pipe or tubing to drain or pump, maintaining a pitch of ¼" per foot.
7. Fill condensate trap with water until flow is established through neutralizer.
8. Observe neutralizer during boiler operation to ensure unrestricted condensate flow.

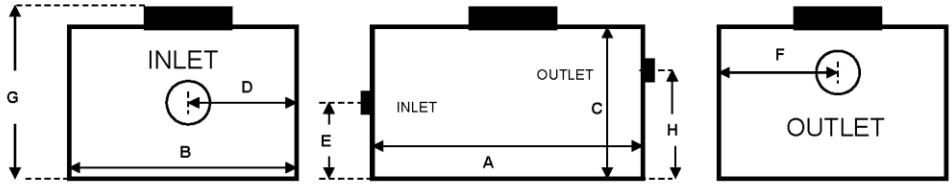
MAINTENANCE

1. All service items should be undertaken by a qualified professional.
2. Visually inspect unit for signs of leaking or damage.
3. Neutralizer media should be replaced at least once a year or when pH falls below local regulations. Neutralizer efficiency can only be determined by measuring pH level of condensate outflow.
4. Refer to chart below for appropriate refill kit.

Skidmore	
Replacement Media Kits	
Model #	Refill Kit #
SCN4T	STKRCK x 2
SCN6T	STKRCK x 3

5. Disconnect condensate line from both the inlet and the outlet of the neutralizer.
6. Unscrew cap and remove spent neutralizer media. Rinse empty neutralizer with water.
7. Add replacement media and replace cap.
8. Reattach neutralizer to condensate line and prime flue gas trap with a minimum of 1 gallon of water.
9. Observe neutralizer during boiler operation to ensure unrestricted condensate flow.

MODEL SCN4T ~ 4 Million Btuh



MODEL SCN6T ~ 6 Million Btuh