Important: **Read and save these instructions. This guide to be left with equipment.**

SE Series

Installation and Operation Manual

Includes installation, operation, maintenance, and troubleshooting information for your indoor/outdoor SETC B+ steam exchange humidifier

condair

2573312-A | 16 APR 2014

Thank you for choosing Condair.

INSTALLATION DATE (MM/DD/YYYY)

MODEL #

SERIAL #

EC

Konformitätserklärung	Declaration of conformity	Déclaration de conformité
Wir, Nortec Humidity Limited 2740 Fenton Road Ottawa, Ontario, Canada K1T 3T7 erklären in alleiniger Verantwortung, dass das Produkt	We, Nortec Humidity Limited 2740 Fenton Road Ottawa, Ontario, Canada K1T 3T7 declare under our sole responsibility, that the product	Nous, Nortec Humidity Limited 2740 Fenton Road Ottawa, Ontario, Canada K1T 3T7 déclarons sous notre seule responsabilité, que le produit

Condair SETC Series Steam Exchange Humidifiers

Models: SETC CE 050, SETC CE 100, SETC CE 175, SETC CE 250, SETC CE 375, SETC CE 575, SETC CE 750, SETC CE 1050

auf das sich diese Erklärung bezieht, mit den folgenden Normen oder normativen Dokumenten übereinstimmt	to which this declaration relates is in conformity with the following standards or other normative standards	auquel se réfère cette déclaration est conforme aux normes ou autres documents normatifs

Machinery	LVD	EMC
EN ISO 12100	BS EN 60204-1: 2006	BS EN61000-6-4 (2007)
		BS EN61000-6-2 (2005)
		BS EN61000-3-2 (2006)
		BS EN61000-3-3 (1995, A1:2001, A2:2005)

und den Bestimmungen der folgenden Richtlinien entspricht	and is corresponding to the following provisions of directives	et est conforme aux dispositions des directives suivantes

Machinery Directive 2006/42/EC
EMC Directive 2004/108/EC
LVD Directive 2006/95/EC

Ottawa, April 14, 2013

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Contents

Introduction

CAUTION: Servicing

- Disconnect main power before any servicing.
- Shut off pressurized steam supply and ensure steam pressure is safely relieved before any servicing of pressurized steam components.
- The electrical compartment contains high voltage components and wiring. Access should be limited to authorized personnel only.
- During and following operation of the humidifier, the steam and components in contact with the steam such as the tank, blower pack, steam lines, steam distributors, and condensate lines can become hot and can burn if touched.
- Walter Meier does not accept any liability for installations of humidity equipment installed by unqualified personnel or the use of parts/components/equipment that are not authorized or approved by Condair.

CAUTION: Electrical

- All electrical work should be done according to local electrical code.
- Electrical connection to be performed by a licensed electrician.

CAUTION: Plumbing / Steam Lines

- Plumbing to be performed by a licensed plumber.
- Pressurized steam line installation to be performed by a qualified installer.
- Drain water from humidifier can be very hot. Do not drain to public sink.
- All plumbing and pressurized steam supply line work should be done according to local plumbing code.

CAUTION: Installation

- Do not mount on hot surfaces.
- Do not mount in area where freezing can occur.
- Do not mount on vibrating surfaces.
- The SETC produces steam at atmospheric pressure, no devices which could block steam output should be connected to the steam outlet.
- Atmospheric steam output must be installed so that no restriction can produce backpressure in the humidifier.
- Regardless of selecting On/Off or modulating control method, Condair humidifiers must have a closed circuit across the On/Off security loop control terminal to operate. Condair highly recommends the use of a high limit humidistat and an air proving switch in series for this function.
- Unit damage caused by water quality outside of the specified ranges is not covered under warranty.

Receiving and Unpacking

1. Check packing slip to ensure ALL material has been delivered.
2. All material shortages are to be reported to Condair within 48 hours from receipt of goods. Condair assumes no responsibility for any material shortages beyond this period.

Note: A steam valve, actuator, and wye strainer are shipped along with the SETC humidifier under the front panel against the front clean-out port.

3. Inspect shipment for damage and note damages on shipping waybill accordingly.
4. After unpacking, inspect equipment for damage and if damage is found notify the shipper promptly.
5. All Condair products are shipped on an Free-On-Board (FOB) factory basis. Any and all damage, breakage, or loss claims are to be made directly to the shipping company.

Before Installation

1. Ensure that available voltage and phase corresponds with humidifier voltage and phase as indicated on humidifier's specification label.
2. If steam supply is from a Medium or High Pressure boiler ensure supply steam line includes a relief valve to prevent supply pressure from exceeding 15 psig (1.034 Bar).
3. Ensure means for returning boiler steam condensate to boiler at atmospheric pressure is available.
4. Ensure sufficient clearances will be available as described in Location on page 13.
5. Ensure steam lines can be routed to distributor SAM-e manifold or blower pack as described in Steam Lines and Condensate Returns on page 18.
6. Report any discrepancy immediately to the site engineer.

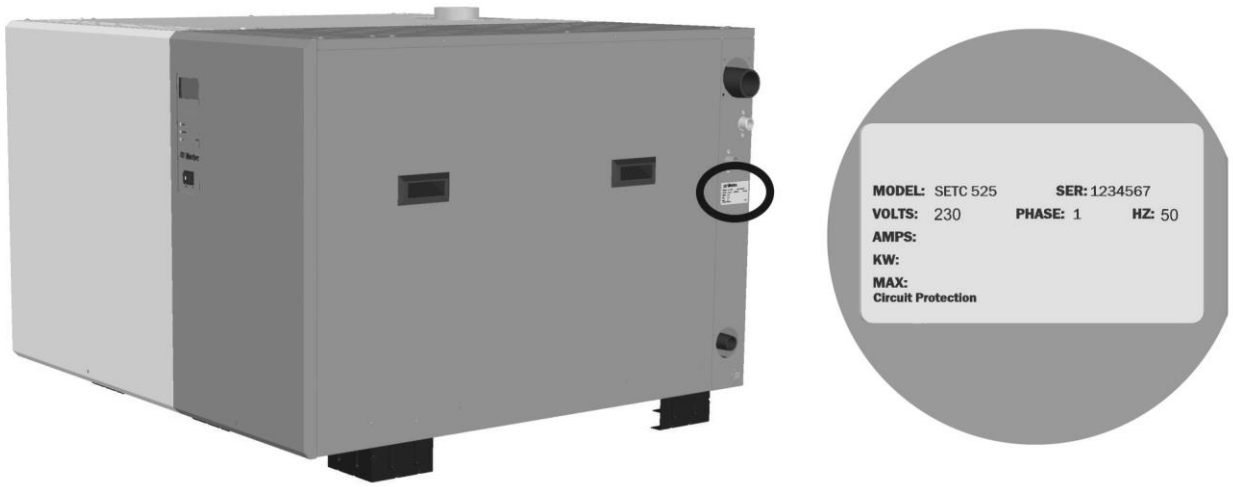


Figure 1: Specification Label Location

Humidifier Components

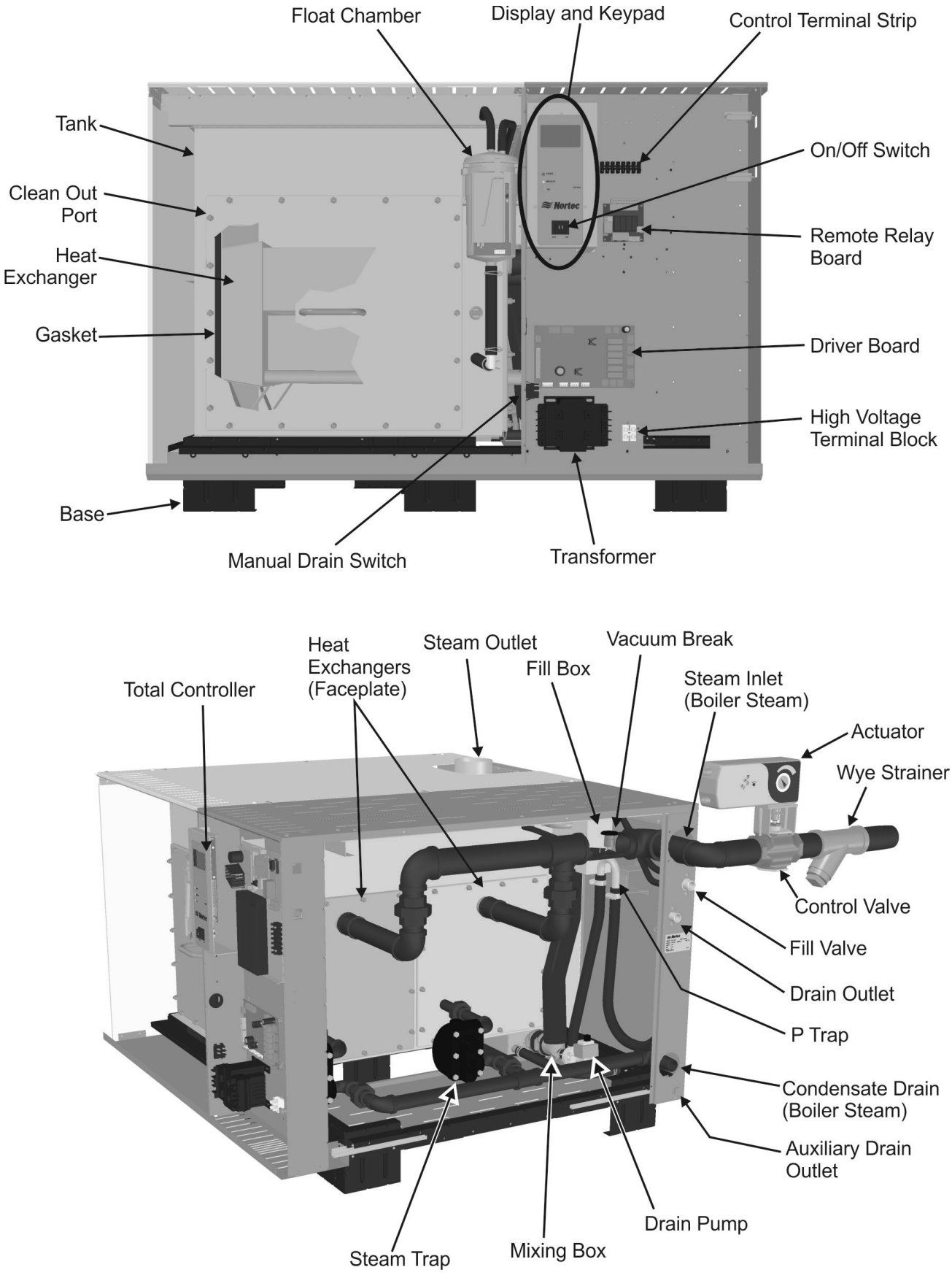


Figure 2: SETC Humidifier Components

Description of Components

Table 1: Humidifier Components

Component	Function of Component
Actuator	Opens and closes the control valve in proportion to demand for steam.
Auxiliary Drain Outlet	Drains water from tank in case of pump failure.
Base	Provides an integrated floor support for the humidifier.
Clean Out Port	Provides access to remove scale from the tank and heat exchanger.
Condensate Drain	Drains condensate formed from boiler steam in the heat exchanger(s).
Control Terminal Strip	Terminal strip for connecting external controls, blower pack, and actuator to the humidifier.
Control Valve	Controls the amount of steam allowed into the heat exchanger, thereby controlling the output of the humidifier.
Display and Keypad	User interface for configuring the humidifier.
Drain Outlet	Drain port is connected to the drain pump.
Drain Pump	Pumps water from humidifier tank.
Driver Board	Provides input and output connections to humidifier components.
Fill Box	Provides an air gap for backflow prevention.
Fill Valve	Controls flow of water into humidifier.
Float Chamber	Measures water level in the humidifier tank.
Gasket	Seals heat exchanger face plate and clean out port cover to tank.
Heat Exchanger(s)	Exchanges thermal energy from boiler steam to the tank water to produce atmospheric steam for humidification.
High Voltage Terminal Block	Primary power connection from remote disconnect to humidifier.
Manual Drain Switch	Directly activates the drain pump to drain water from the tank.
Mixing Box	Blends hot tank water with cool fill water to provide drain water cooling.
On/Off Switch	Turns power On/Off to humidifier controller. Note: Turn off humidifier disconnect to shut off primary power to the humidifier.
P Trap	Prevents steam from flowing out the drain outlet.
Remote Relay Board	Provides a terminal strip to dry contacts which open/close to indicate the humidifier is on, humidifying, needs service, or is in a fault condition.
Steam Inlet	Connection for boiler steam to the heat exchangers.
Steam Outlet	Exhausts atmospheric steam. Connect to atmospheric distribution system.
Steam Trap	Drains condensate from the heat exchanger without letting boiler steam escape to drain.
Tank	Holds the water used to generate clean steam for humidification.
Total Controller	Controls all functions of the humidifier's operation and provides user interface for configuration of the humidifier.
Transformer	Steps primary voltage down to 24 VAC for the controller and internal components such as the fill valve and drain valve.
Vacuum Break	Prevents a siphon from occurring when the drain pump is stopped.
Wye Strainer	Protects control valve and other system components from dirt and rust in the piping system.

SETC Model

The SETC with its Total Controller and state-of-the-art features and options is the most advanced steam exchange humidifier available. The SETC provides steady and reliable humidification using the proven heat exchanger technology. The SETC is available in capacities ranging from 50 lb/hr (23 kg/hr) to 1050 lb/hr (475 kg/hr). SETC humidifiers are packaged in five different cabinets depending on their capacity. Figure 3: SETC Models shows the configuration and relative size of the five different cabinets. Table 3 provides specifications for the SETC product line.

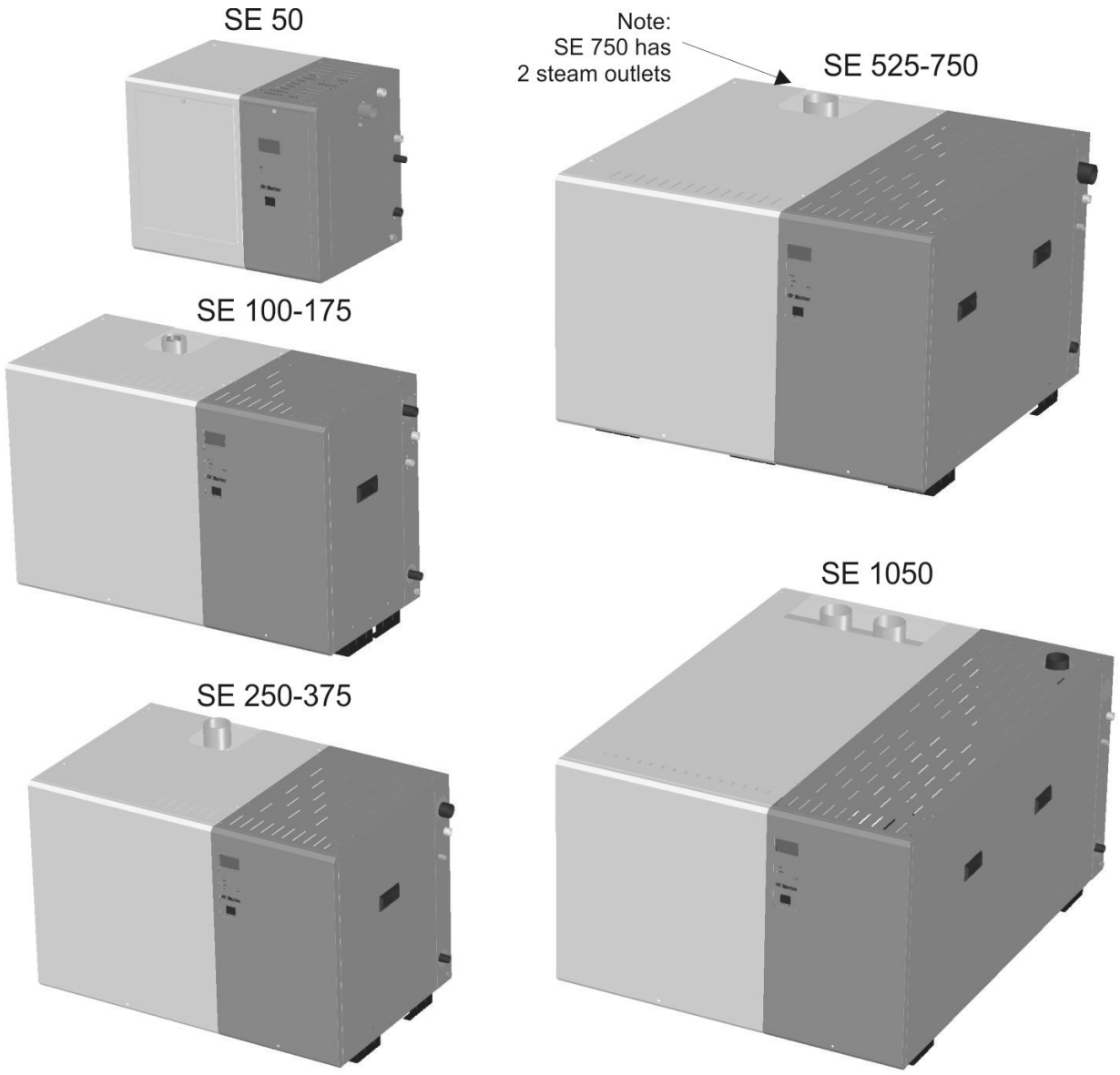


Figure 3: SETC Models

The SE 50, 100, 175, 250, and 375 all have a single heat exchanger. The SE 525 and 750 have two heat exchangers. The SE 1050 has three heat exchangers. All models have a single pressurized steam inlet and condensate drain with internal manifold connecting separate heat exchangers if they are present.

Outdoor Model

The outdoor model of the SETC provides a weatherproof enclosure that allows the SETC to be installed on rooftops in moderately cool climates. Refer to the supplemental SETC installation manual that proceeds these installation and operation instructions (see table of contents for page information).

Options and Accessories

Condair provides a complete line of options and accessories for every humidification application. The following options and accessories are available and may have been delivered with your SETC humidifier. Refer to the installation instructions that came with the accessories for proper installation and operation.

Table 2: Options and Accessories

Option / Accessory	Used For
Freeze Protection Package (SETC Only)	Emptying the tank in case of fault or power failure to prevent freezing. (Factory installed)
Floor Stand	Supporting the humidifier 27 inches (0.7 m) above the floor (height can be reduced by cutting legs of floor stand)(field assembled).
Ceiling Mounting Kit (SE50 Only)	Providing a drain pan and support brackets for mounting an SE50 unit from the ceiling.
Steam Distributors	Adding steam into ventilation ducts feeding the conditioned environment.
Remote Blower Pack	Adding steam directly into a conditioned environment.
SAM-e Steam Distribution Manifold	Adding steam into air ducts where short absorption is required.
Digital or Analog Control Humidistats	Controlling the output of the humidifier based on sensed RH (can be mounted in the space being humidified or in the duct).
Digital RH Transducers	Communicating RH in a space or duct to the humidifier or controller.
Digital or Analog High Limit Humidistats	Preventing over humidification in a duct by shutting down or throttling down the humidifier when duct RH gets high.
Air Proving Switches	Ensuring humidification only occurs when air is moving in a duct.
LINKS 2 / LINKS XPS / e-Links	Connecting the humidifier to a building management system. Allows digital control of the humidifier via BACnet, Lonworks, or Johnson N2.

Table 3: SETC Specifications

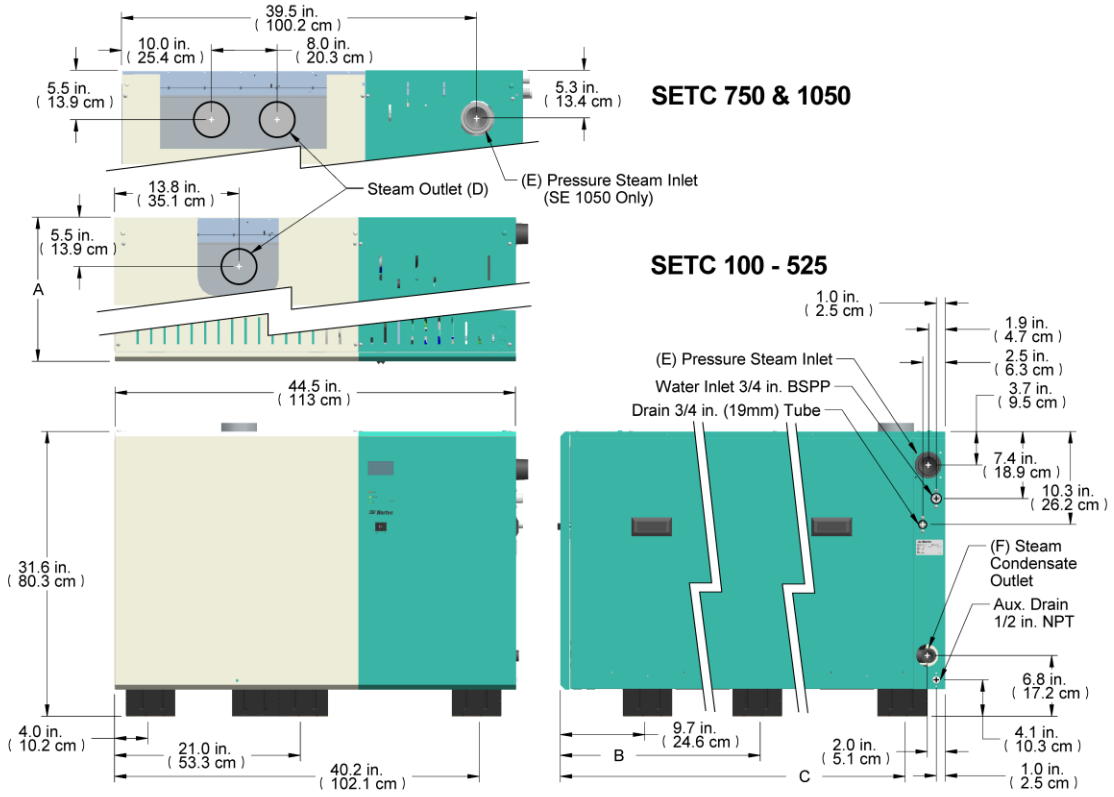
Model	Control Valve kV (CV)	Control Valve, Steam Inlet, Wye Port (BSP)	Cond-ensate Port (BSP)	Net/Full Weight lb (kg)	Required fill line flow gal (l) /min	Required Drain capacity gal (l) /min	Electrical
50	2.51 (2.9)	1/2	3/4	125/180 (57/82)	2.6 (10)	5.2 (20)	Voltage 230 Phase 1 Amps 0.65 A Power 0.15 KW Max Disconnect 10 A
100	4.76 (5.5)	3/4	3/4	267/423 (121/192)			
175	8.65 (10)	1	3/4				
250	10.38 (12)	1	3/4	355/599 (161/272)			
375	17.3 (20)	1 1/4	3/4				
525	24.22 (28)	1 1/2	1	529/992 (240/450)			
750	34.6 (40)	2	1		4.5 (17)	8 (29)	
1050	56.22 (65)	2 1/2	1 1/4	703/1384 (318/628)			

Table 4: SETC Capacities and Water Consumption

Model	*Supply Steam Pressure BAR (psig)	*Max Output lb/hr (kg/hr)	Approximate Boiler Steam Consumption lb/hr (kg/hr)	**Water Consumption gal (l) /hr	**Drain Volume gal (l) /hr
50	0.3447 (5)	13 (6)	15 (7)	2.3 (9)	0.8 (3)
	0.6895 (10)	32 (14)	36 (16)	5.7 (21)	1.9 (7)
	1.0342 (15)	50 (23)	58 (26)	9.0 (34)	3.0 (11)
100	0.3447 (5)	26 (12)	30 (14)	4.7 (18)	1.6 (6)
	0.6895 (10)	63 (29)	72 (33)	11.3 (43)	3.8 (14)
	1.0342 (15)	100 (45)	115 (52)	18.0 (68)	6.0 (23)
175	0.3447 (5)	46 (21)	52 (24)	8.2 (31)	2.7 (10)
	0.6895 (10)	110 (50)	127 (58)	19.8 (75)	6.6 (25)
	1.0342 (15)	175 (80)	201 (91)	31.5 (119)	10.5 (40)
250	0.3447 (5)	65 (30)	75 (34)	11.7 (44)	3.9 (15)
	0.6895 (10)	158 (72)	181 (82)	28.3 (107)	9.4 (36)
	1.0342 (15)	250 (114)	288 (131)	44.9 (170)	15.0 (57)
375	0.3447 (5)	98 (44)	112 (51)	17.5 (66)	5.8 (22)
	0.6895 (10)	236 (107)	272 (123)	42.5 (161)	14.2 (54)
	1.0342 (15)	375 (170)	431 (196)	67.4 (255)	22.5 (85)
525	0.3447 (5)	137 (62)	157 (71)	24.5 (93)	8.2 (31)
	0.6895 (10)	331 (150)	380 (173)	59.5 (225)	19.8 (75)
	1.0342 (15)	525 (239)	604 (274)	94.4 (357)	31.5 (119)
750	0.3447 (5)	195 (89)	224 (102)	35.1 (133)	11.7 (44)
	0.6895 (10)	473 (215)	543 (247)	84.9 (321)	28.3 (107)
	1.0342 (15)	750 (341)	863 (392)	134.8 (510)	44.9 (170)
1050	0.3447 (5)	273 (124)	314 (143)	49.1 (186)	16.4 (62)
	0.6895 (10)	662 (301)	761 (346)	118.9 (450)	39.6 (150)
	1.0342 (15)	1050 (477)	1208 (549)	188.7 (714)	62.9 (238)

* Supply steam pressure must be present at the control valve to achieve rated output

** At maximum output , 25% blow down, and with drain water cooling activated.



Model	A in. (cm)	B in. (cm)	C in. (cm)	D in. (mm)	E BSP	F BSP
100	20.8 (53)	N/A	16.1 (40.8)	1 3/4 (44)	3/4	3/4
175				3 (76)	1	3/4
250	27.2 (69)	N/A	22.4 (56.8)	3 (76)	1	3/4
375				4 (102)	1 1/4	3/4
525	42.7 (108.6)	21.9 (55.5)	38.0 (96.4)	4 (102)	1 1/2	1
750				2 X 4 (102)	2	1
1050	58.3 (148.2)	29.7 (75.3)	53.6 (136.1)	2 X 4 (102)	2 1/2	1 1/4

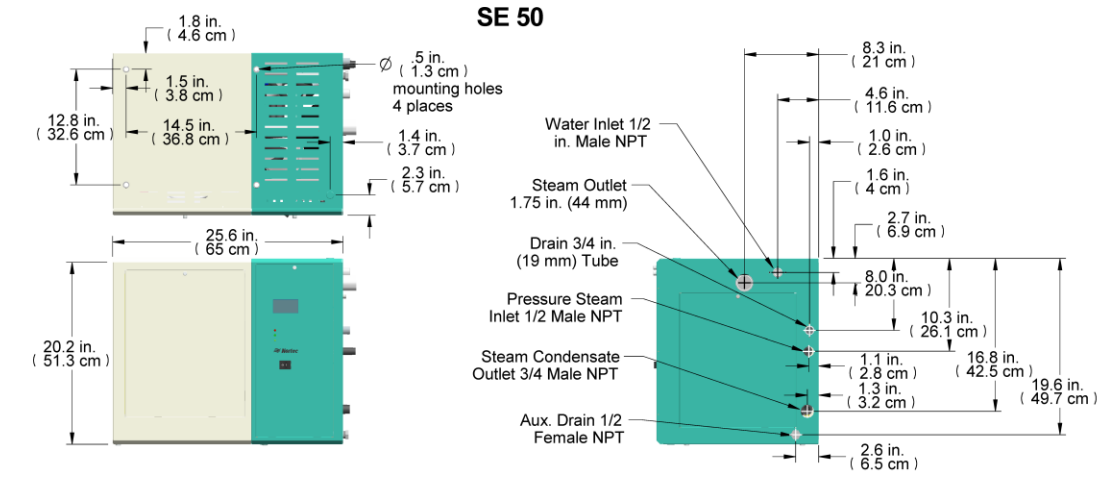


Figure 4: SE Dimensions

Installation

Typical Humidifier Installation

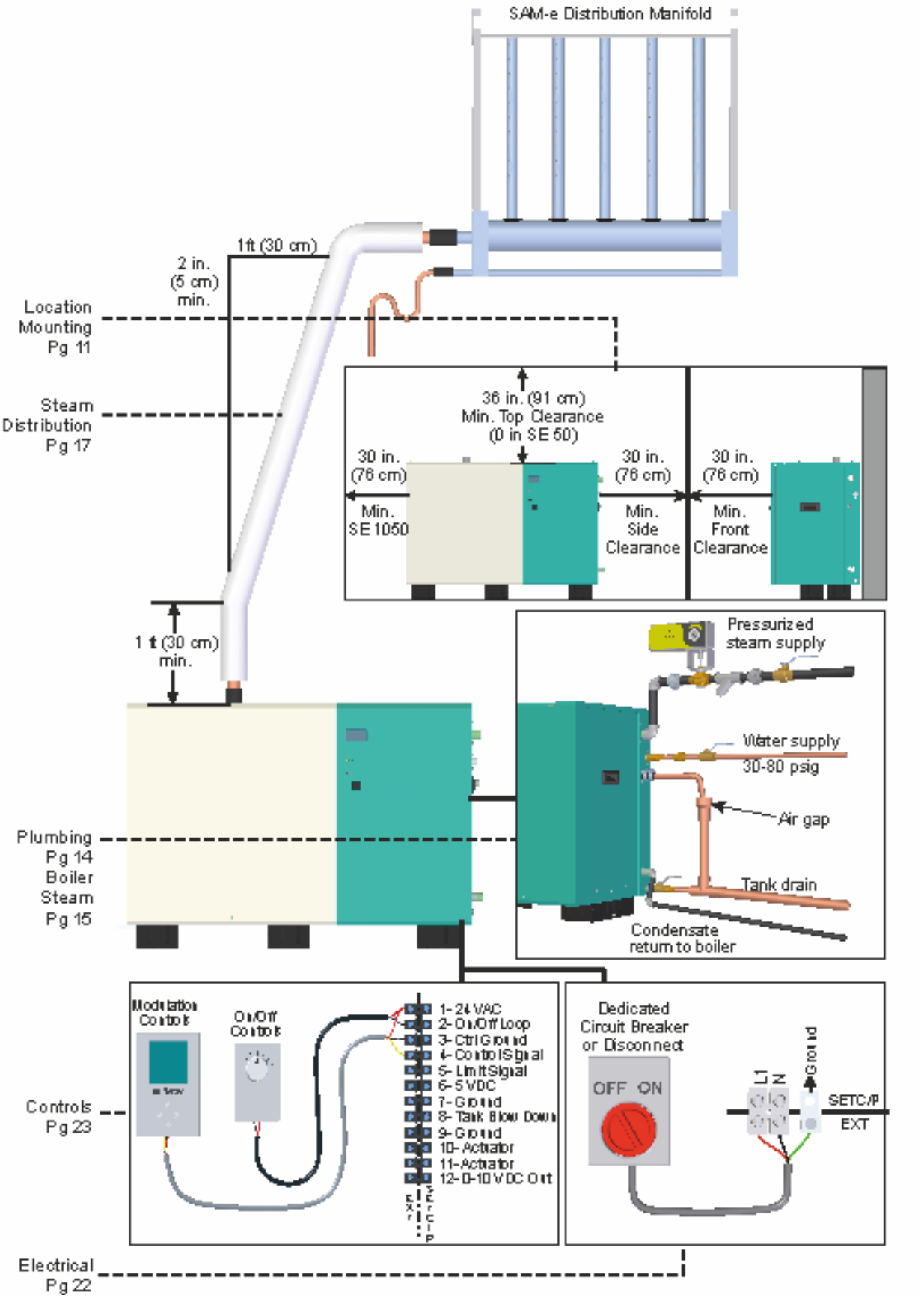


Figure 5: Typical Humidifier Installation

Location

The SE series humidifiers are designed to be either floor mounted or stand mounted (stand optional). SE 50 models can also be ceiling mounted.

- Install only in areas with ambient temperature 41-104 °F (5 – 40 °C) relative humidity 5 - 95% (non condensing).
- Ensure mounting surface is strong enough to support the full weight of the humidifier and accessories (see Table 3: SETC Specifications).
- Install in location where electrical power, boiler steam, and drain can be connected to the humidifier.
- When possible install below the steam distributor. Always take care to provide proper steam line routing and proper condensate traps.
- DO NOT locate the humidifier any further then absolutely necessary from the steam distributor location as net output will be reduced as a result of heat loss through the steam line.
- Condensate drain is located close to the bottom of the humidifier. Locate the unit so that condensate line slopes down to boiler or use pump (by others) to lift to boiler. Use stand if necessary.
- Avoid mounting humidifier on combustible surfaces including (but not limited to) carpet, tile, or certain insulating materials.
- Clearance dimensions shown are for reference only and are the minimum required for maintenance of the humidifier. Consult local and national codes before final location and installation. Condair does not accept responsibility for installation code violations.

Note:. Condensate drain line must be sloped downward to boiler condensate return. Use pump (by others) or stand (optional) if necessary.

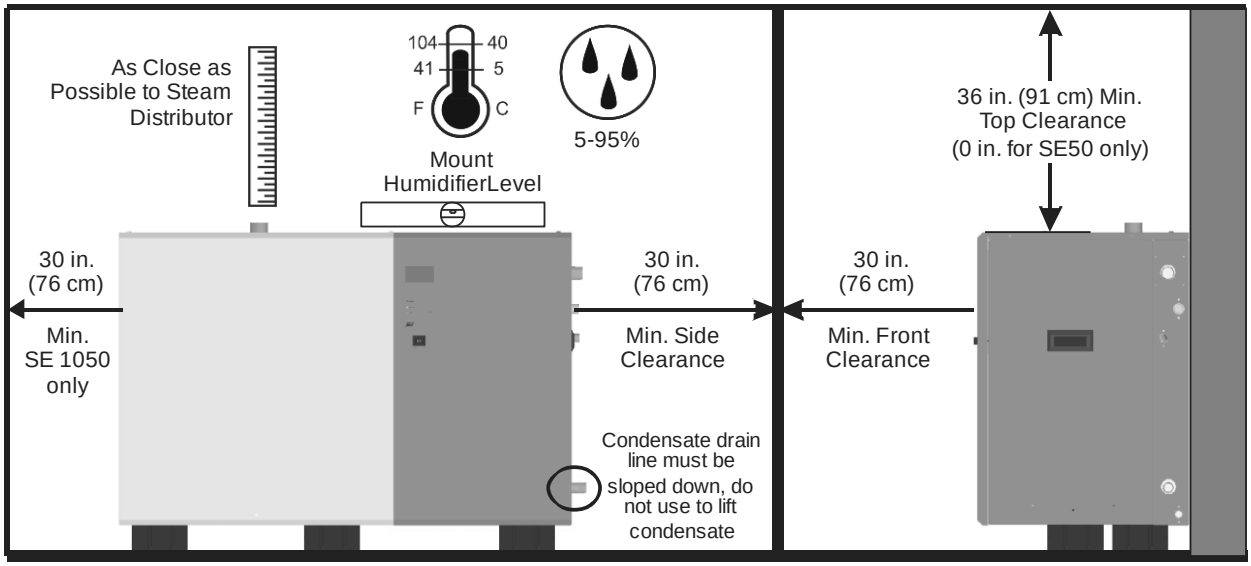


Figure 6: Installation Location / Clearance

Lifting the Humidifier

Lifting of the humidifier, after is has been unpacked, should be performed with a forklifting device. The illustrations below depict the proper positions for the fork beams. Forks should not protrude through when possible. For SE 100 – 575 models, lifting is from the front of the humidifier. For SE 750 and 1050 models, lifting is from the side of the humidifier. DO NOT lift the humidifier by any other surface. DO NOT rest the humidifier on any side other than its base.

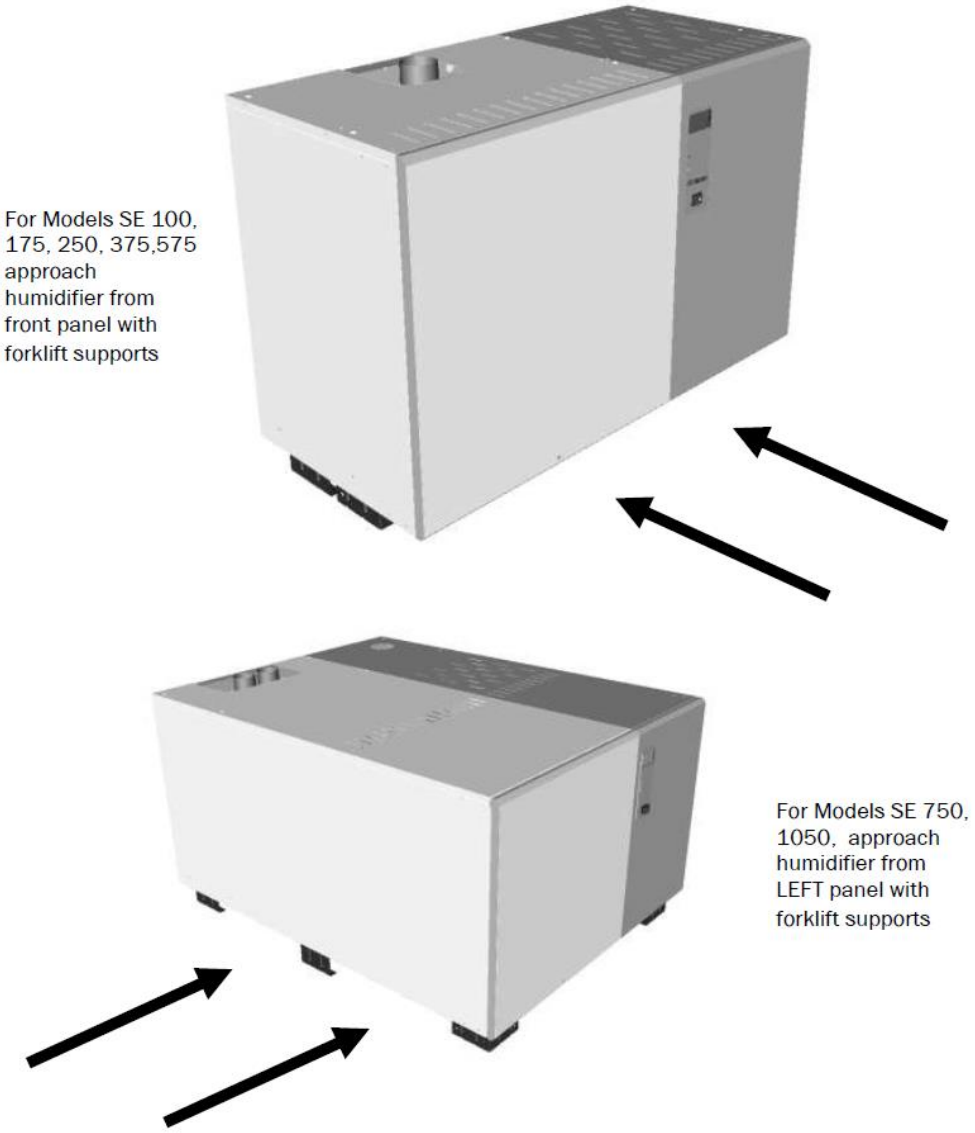


Figure 7: Forklifting Positions

Mounting on Floor Stand

The SE floor stand positions the SE humidifier at a convenient working height and provides additional clearances for sloping drains. The stand must be assembled at site.

- Assemble the stand according to the instructions that are provided with it.
- Ensure the stand and humidifier are installed on a level surface
- Permanently secure the stand to the floor via the holes in the leg support plates following any local codes or regulations.

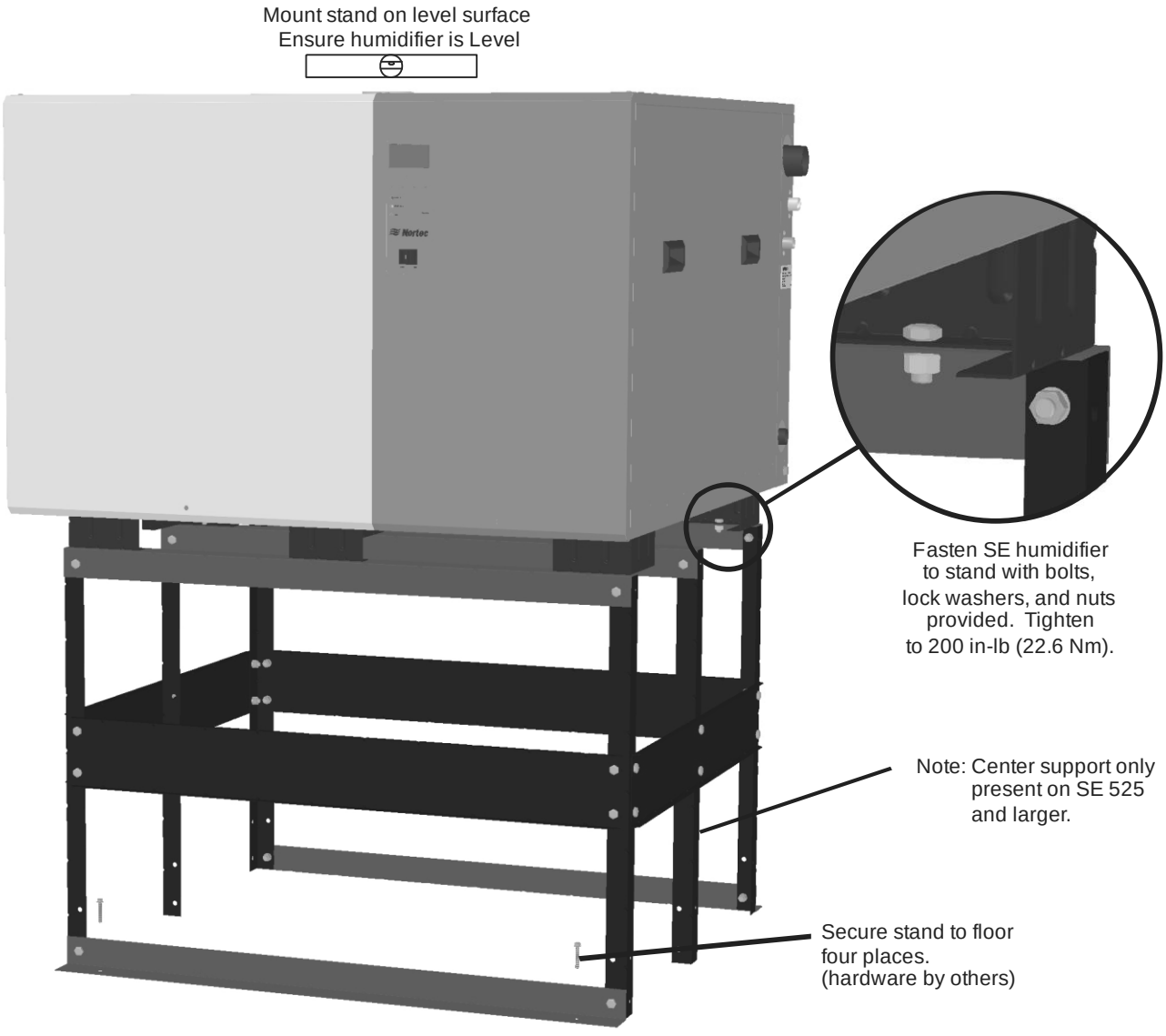


Figure 8: Mounting on Floor Stand

Note: The humidifier must be secured to the stand (hardware provided) and the stand must be secured to the floor (hardware by others).

Ceiling Mounting (SE50 Only)

Note:. *The* SE50 requires regular maintenance including removal of scale from the heat exchanger and tank. Make sure it is installed in a location where the maintenance can be performed.

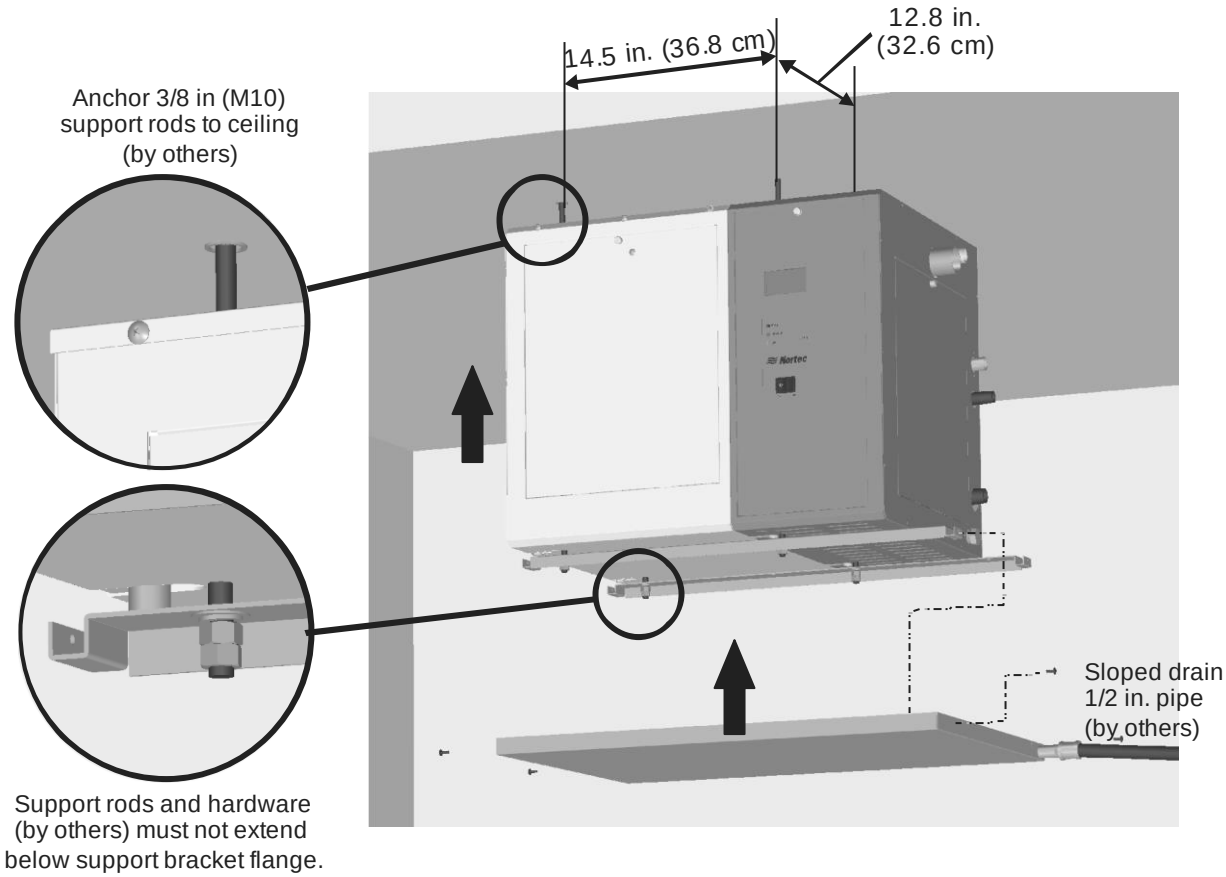


Figure 9: Ceiling Mounting the SE50

Condair offers a ceiling mounting kit which allows the SE50 to be ceiling mounted with zero clearance to the ceiling.

Follow these guidelines for installation:

- Follow the instructions provided with the ceiling mounting kit.
- Install in a location where regular maintenance can be performed. Provide clearance as shown in Figure 6: Installation Location / Clearance.
- The SE50 weighs 180 lb (82 kg) when filled with water and without any accessories or piping. It is the installer's responsibility to calculate the total weight which must be supported, to ensure the ceiling structure is adequate, to install support rods, and to connect drain pan per local codes and regulations.
- The humidifier cannot be used as a structural member. All piping connected to the unit must be supported independently.
- A drain line emptying into an open drain must be connected to the ceiling kit drain pan. Condair recommends a 1/2 in (12.7 mm) pipe with sufficient slope to ensure any water collected in the pan will drain.

Plumbing

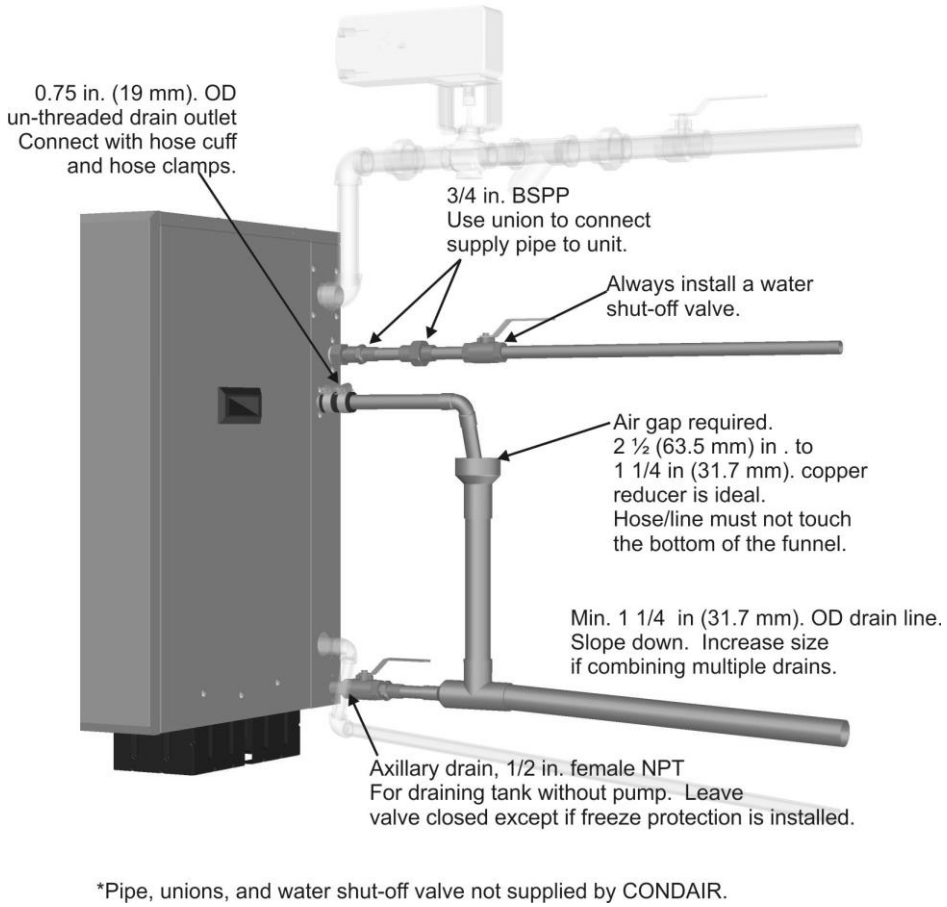


Figure 10: Water Supply and Drain Connection

Drain Water is very hot, do not use plastic pipe for drain or condensate lines, do not drain to public sink. Route to floor drain or equivalent.
Supply cold potable water, deionized water or reverse osmosis water at 30 - 80 PSIG.
Hardness 5-7 grain or 90 – 120 mg/l (as Ca^{+2} as $CaCO_3$)
Total Dissolved Solvents (TDS) 0.5-3 mg/l or **Conductivity** 1 to 70 mho/cm
Chlorides 0 - 40 ppm **PH** 7.2-8.5 **Alkalinity** 30 - 130 mg/l (as $CaCO_3$)

- All water supply and drain line connections must be installed in accordance with local plumbing codes.
- See Table 3 and Table 4 on page 7 for supply water flow requirements.
- Install water shut off valve and union before humidifier to facilitate servicing.
- Ensure drain line is adequately sized to provide free and easy draining and that an air gap is installed as shown. See Table 3 and Table 4 on page 7 for flow requirements.
- Auxiliary drain connection with manual shut off valve is recommended for all units. Valve to be left closed on units without freeze protection option installed. Valve to be left open on units with freeze protection option installed except during servicing.
- High hardness or silica content supply water may require increased maintenance.
- Unit damage caused by water quality outside of the specified ranges is not covered under warranty.

Boiler Steam and Boiler Condensate Return

- Pressurized steam line installation to be performed by a qualified installer.
- Damage to SE heat exchanger will occur if it is exposed to pressure above 20 psi (1.38 Bar). A safety relief valve must be installed to prevent the SE from being exposed to pressure in excess of 15 psi (1.034 Bar) when the SE is connected to a medium or high pressure boiler via a pressure reducing valve.
- The steam supply line must be designed to provide design pressure at the control valve when there is 100 % demand (control valve completely open). Pressure losses in the steam supply line will reduce SE output.
- Condensate must be drained to a non-pressurized boiler condensate return line.

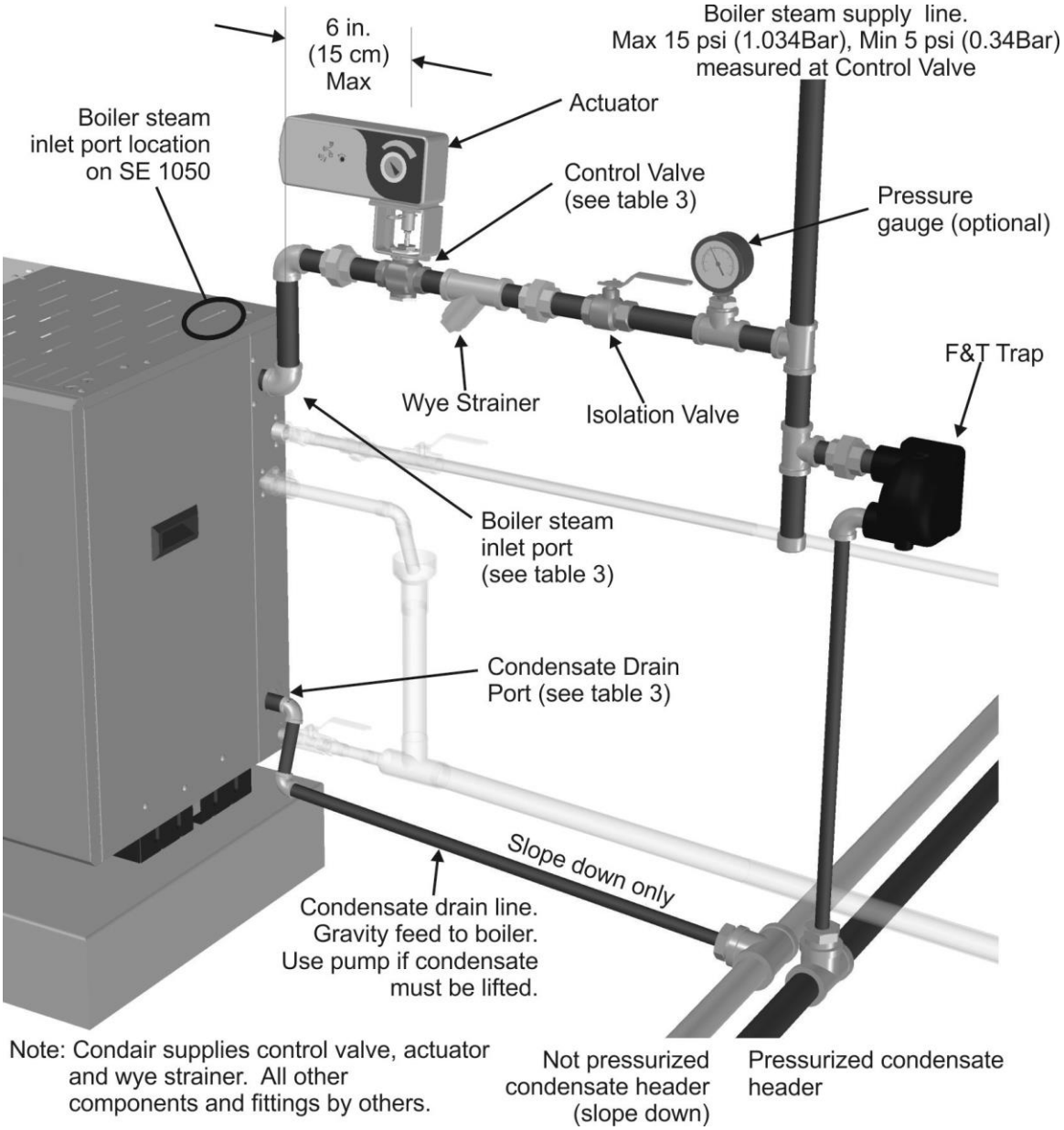


Figure 11: SE Boiler Steam and Condensate Connection

Condair supplies a control valve, actuator and wye strainer with each SE humidifier. The port sizes of the control valve, boiler steam inlet port, and condensate drain port are given in Table 3: SETC Specifications on page 7. Follow these guidelines for installation:

- All steam line connections must be installed in accordance with local codes.
- Install the control valve actuator following the procedure in Figure 12: Control Valve Actuator Installation after the control valve is installed on the steam line. Wire the actuator as described in Actuator Wiring on page 28.
- Boiler steam supply line design is the responsibility of the installer. The boiler steam supply line must be designed so that that design pressure is present at the control valve when the control valve is completely open (100% demand). The diameter of the supply line up to the wye strainer may have to be oversized to ensure proper steam pressure.
- The SE will operate on supply steam pressures between 0.3447 BAR (5 psi) and 1.0342 BAR (15 psi) measured at the control valve. Lower steam supply pressures will result in lower output. See Table 4: SETC Capacities and Water Consumption on page 7 for capacities at different supply pressures.
- If condensate cannot be gravity fed to the boiler then a pump must be used to lift the condensate. See Spirax Sarco (www.spiraxsarco.com) and others for pumps and additional information on condensate management.

Caution: Condensate leaves the steam traps inside the SE under slight pressure. Steam flash could occur in the condensate drain line.

- The boiler steam and condensate connections are independent. Boiler steam condensate should be returned to the boiler and should not be mixed with water from the tank drain.
- The steam supply pressure can be entered into the SETC control software to provide display of unit output. See Pressure Based on page 54.

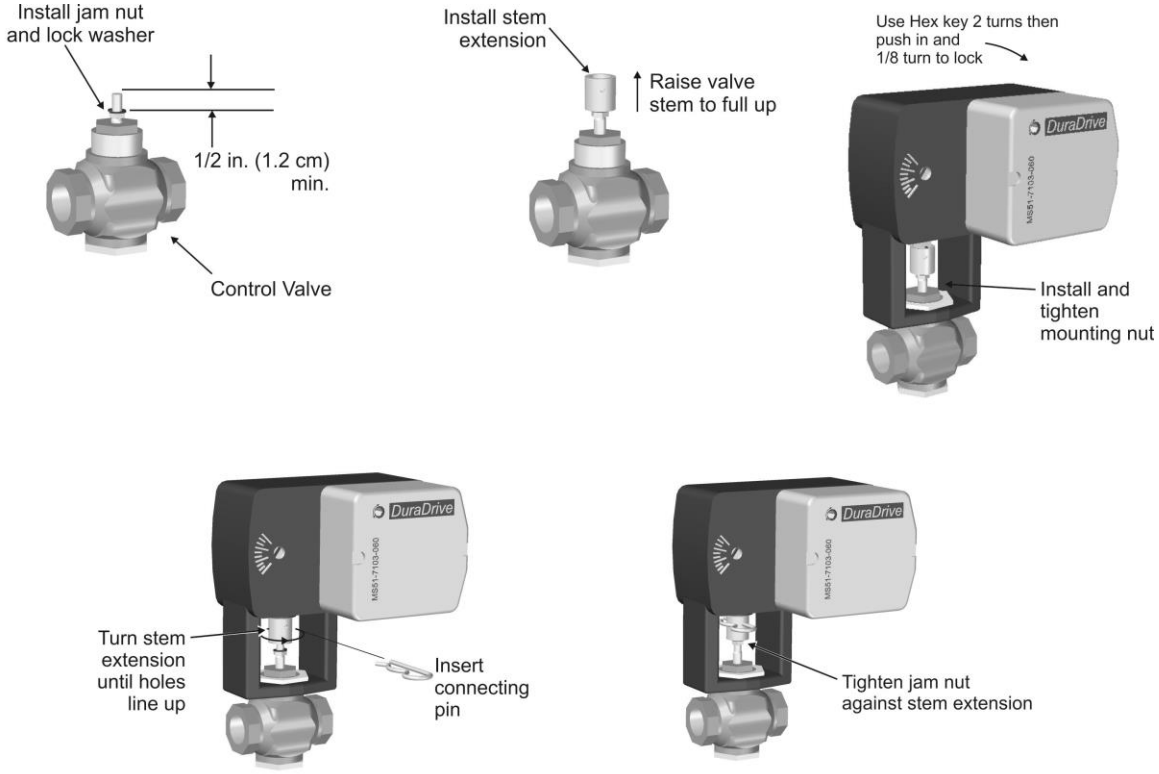


Figure 12: Control Valve Actuator Installation

Steam Lines and Condensate Returns

MAIN RULES FOR ATMOSPHERIC STEAM LINES

- Slope the steam lines.
- Trap condensate (Use full size 'T' for Traps).
- Steam lines must not have any restrictions which could cause back pressure.
- Insulate with 1.0 in. (2.5 cm) pipe insulation.
- Follow recommended materials, size and length, see tables 4,6,7.

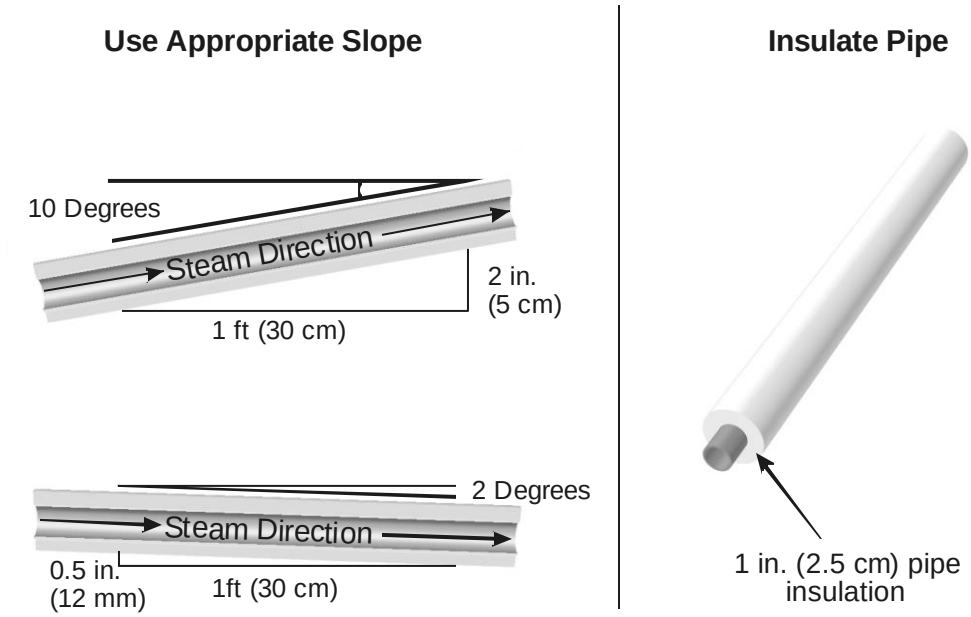


Figure 13: Main Steam Line Requirements

Table 5: Recommended Steam Line Material

Steam Line Material	Lb/hr (kg/hr)	Steam Line Length ft	Steam Line Length m	Steam Line Description
Copper Tube	0-100 (0-45)	0-90	0-27	1 1/2 in. MED-L Tubing (1.625 in. OD)
	101-250 (46-113)	0-180	0-54	3 in. MED-L Tubing (3.125 in. OD)
	251-650 (114-295)	0-260	0-79	**4 in. MED-L Tubing (4.125 in. OD)
*Stainless Steel Tube	0-100 (0-45)	0-90	0-27	1.75 inch Tube x 0.065 inch thick wall
	101-250 (46-113)	0-180	0-54	3 inch Tube x 0.065 inch thick wall
	251-650 (114-295)	0-260	0-79	**4 inch Tube x 0.065 inch thick wall
Condair Hose	31-100 (14-45)**	<15	<4.5	***Part Number 1328820 (1 3/4")

Note: * Use only stainless steel tube for reverse osmosis and deionized water applications.

** Use 2 x 4 in. steam lines for steam capacities higher than 750 lb/hr (307 kg/hr)

*** Use one steam hose per 100 lb/hr (45 kg/hr) of output.

Steam Hose Odour: Condair hose may generate a slight odour during initial use. This odour is temporary and will disappear after a short period of time.

Table 6: Maximum Recommended Length of Steam Line

Unit Size	Steam Output		Steam Outlet and Line Size		Maximum Length		Possible Loss		Possible Loss at Max. length	
	lb/hr	(kg/hr)	Copper	(SST)	ft	(m)	lb/hr/ft	(kg/hr/m)	lb/hr	(kg/hr)
50	50	(23)	1 1/2	(1 3/4)	37	(11)	0.11	(0.16)	4	(2)
100	100	(45)	1 1/2	(1 3/4)	90	(27)	0.11	(0.16)	10	(4.5)
175	175	(80)	3	(3)	90	(27)	0.16	(0.24)	14	(6.5)
250	250	(114)	3	(3)	180	(55)	0.16	(0.24)	28	(13)
375	375	(170)	4	(4)	180	(55)	0.22	(0.33)	39	(18)
525	525	(239)	4	(4)	220	(67)	0.22	(0.33)	48	(22)
750	750	(341)	2X 4	(4)	260	(79)	0.44	(0.66)	114	(52)
1050	1050	(477)	2X 4	(4)	260	(79)	0.44	0.66)	114	(52)

NOTE: See Table 7 for equivalent length of common fittings.

Table 7: Equivalent Length of Some Common Fittings

Tube Diameter in.	90 Degree Elbow ft (m)		45 Degree Elbow ft (m)		Side Outlet Tee ft (m)		Gate Valve ft (m)		Control Valve ft (m)	
1 1/2 or 1 3/4	3.5	(1)	1.75	(0.5)	7	(2.1)	0.8	(2.4)	34	(10)
3	5	(1.5)	2.5	(0.75)	11	(3.3)	1.1	(3.1)	54	(16)
4	8	(2.4)	4	(1.2)	15	(4.5)	1.6	(0.5)	80	(24)

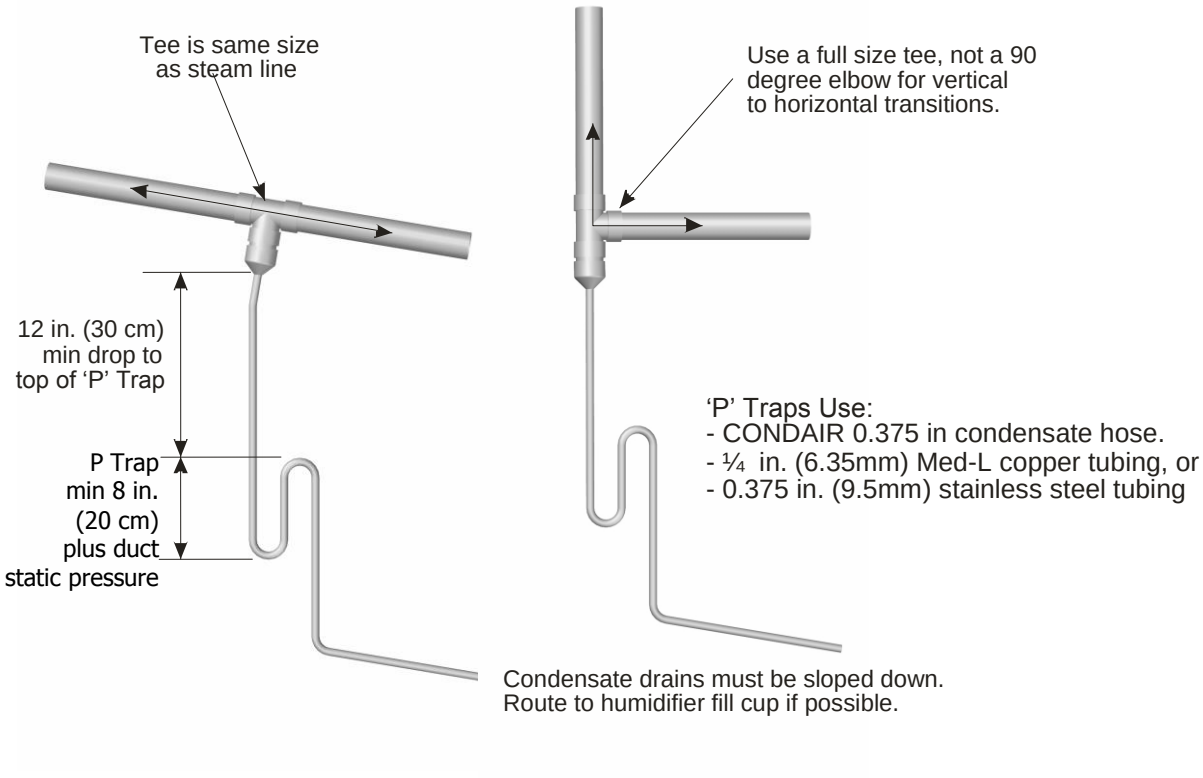


Figure 14: Condensate Traps

Note: Condensate should not be routed to a sink used frequently by personnel. Route to a floor drain or equivalent. Condensate normally cools in traps but is still hot. A SAM-e or larger steam line generates more condensate and water may not cool in the trap. A drain water cooler option may be installed if required by code.

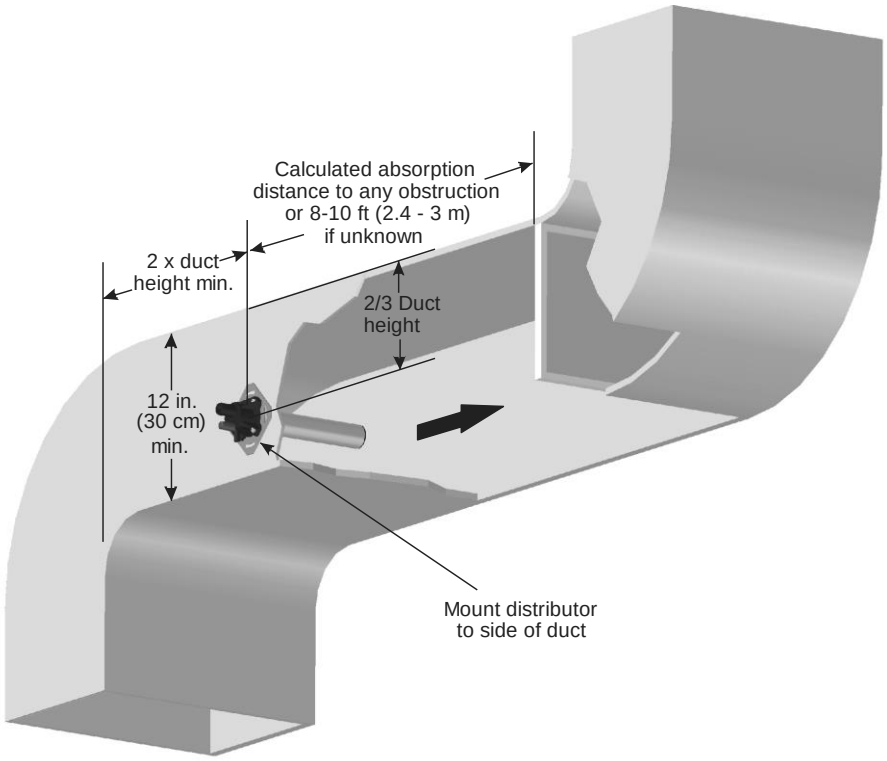


Figure 15: Distributor Location in Duct

Note:

Refer to distributor installation manuals for detailed installation instructions.

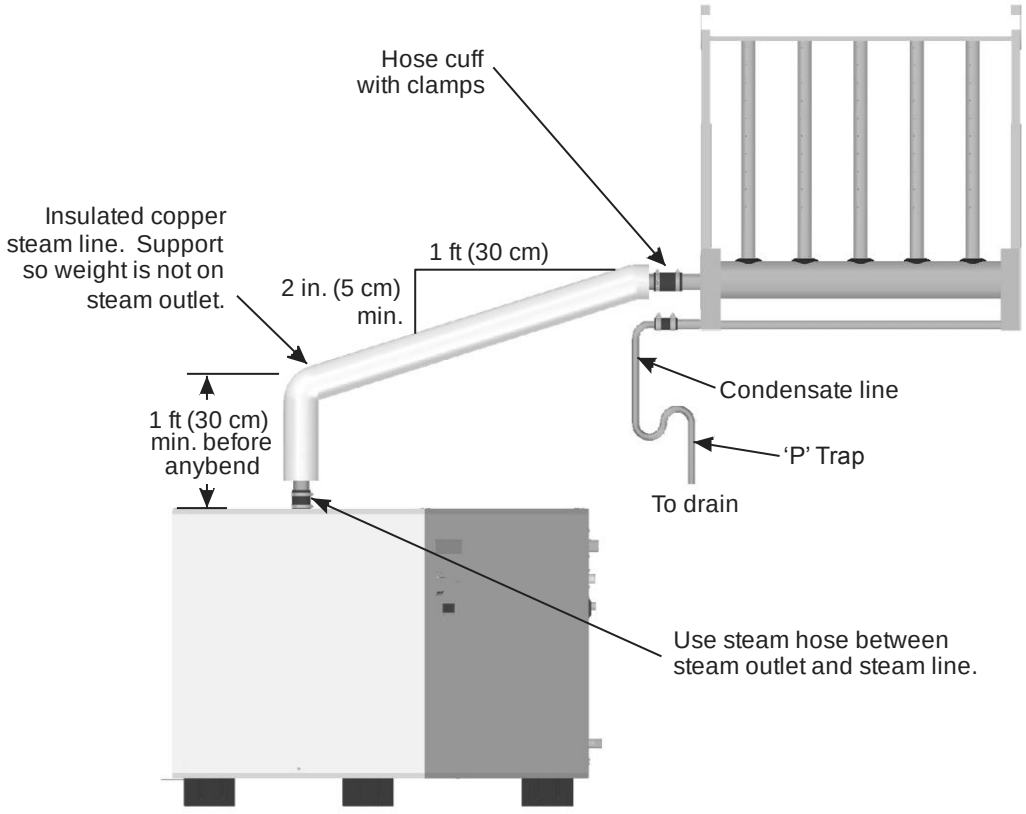


Figure 16: SAM-e/Steam Distributor Above Humidifier (Copper Steam Line Shown)

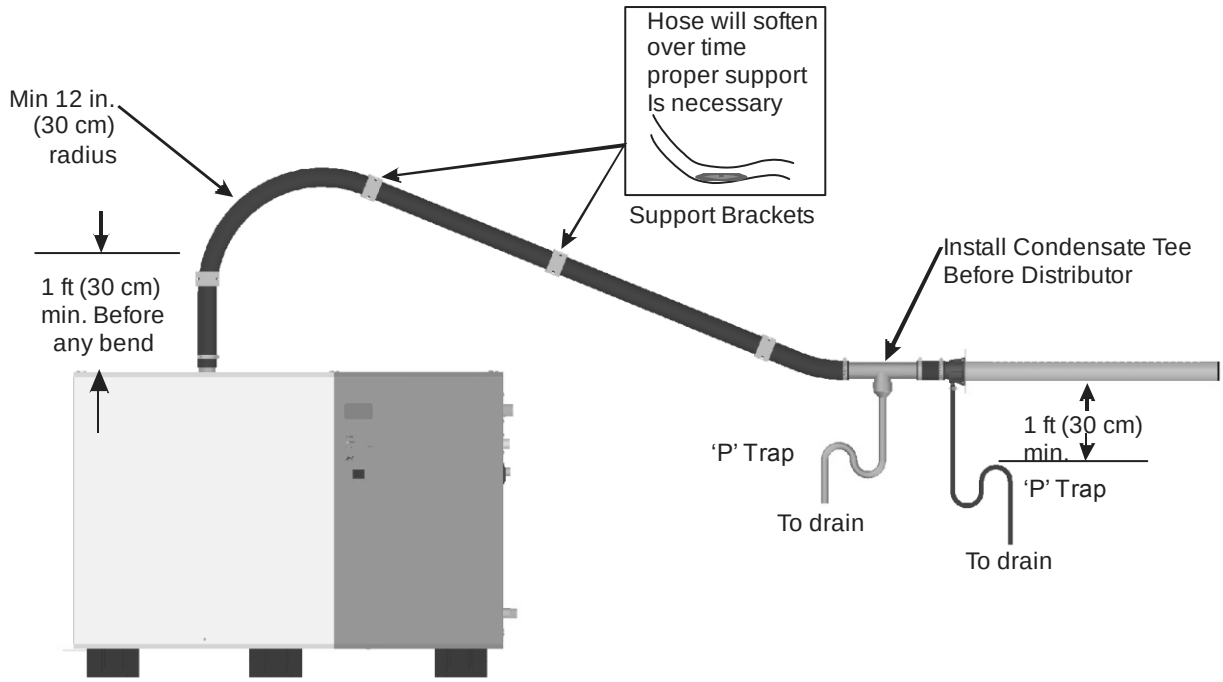


Figure 17: Steam Distributor Below Humidifier (Hose Shown)

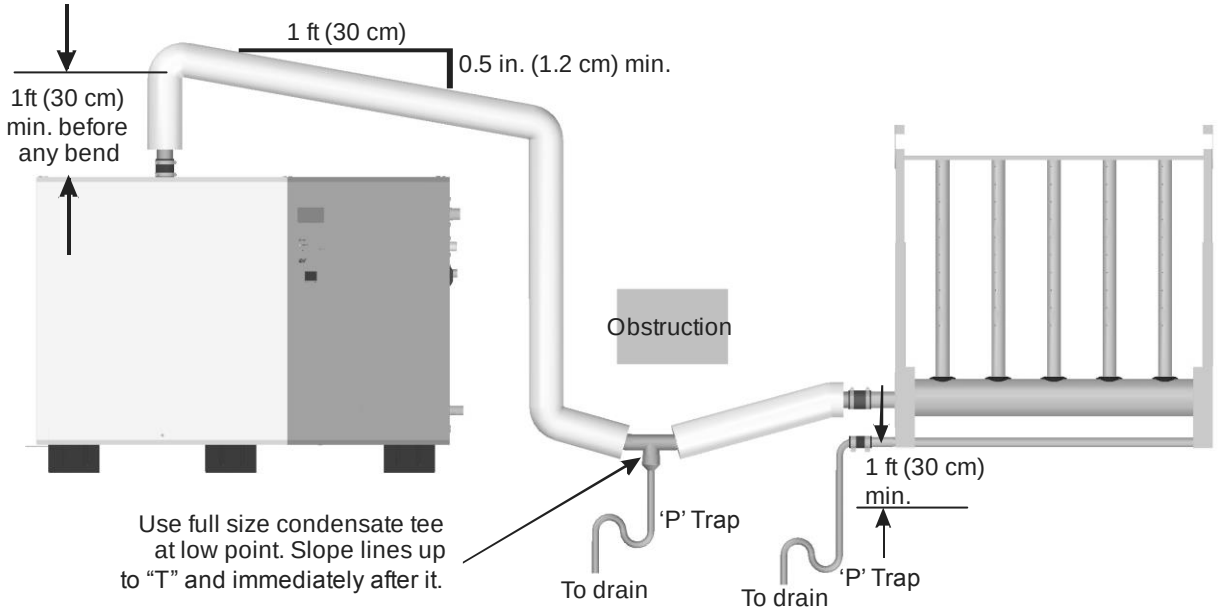


Figure 18: Steam Under Obstruction (Copper Steam Line Shown)

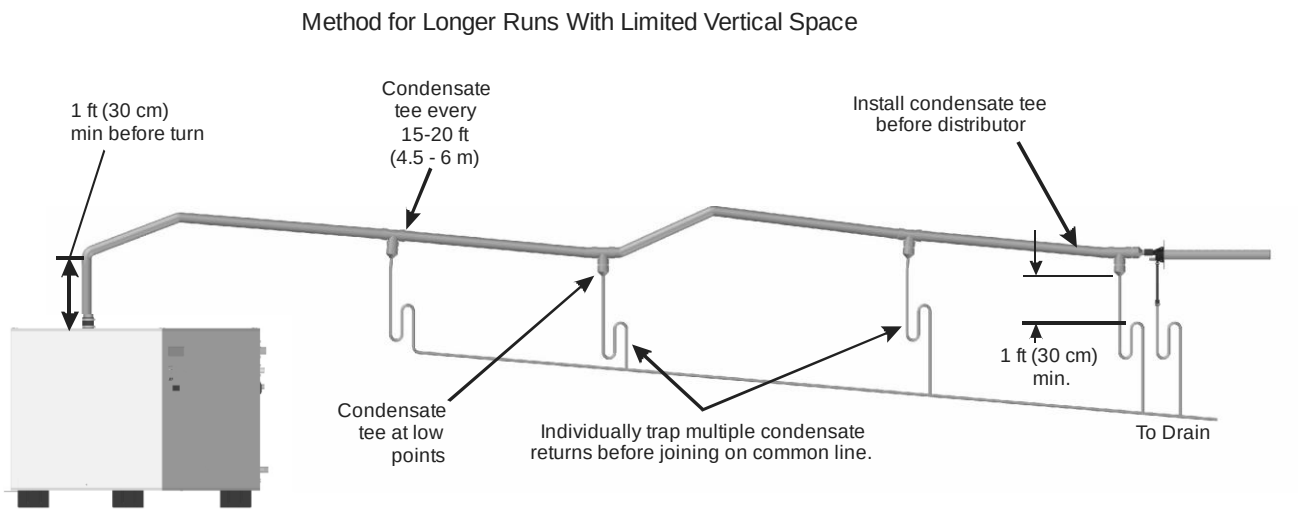
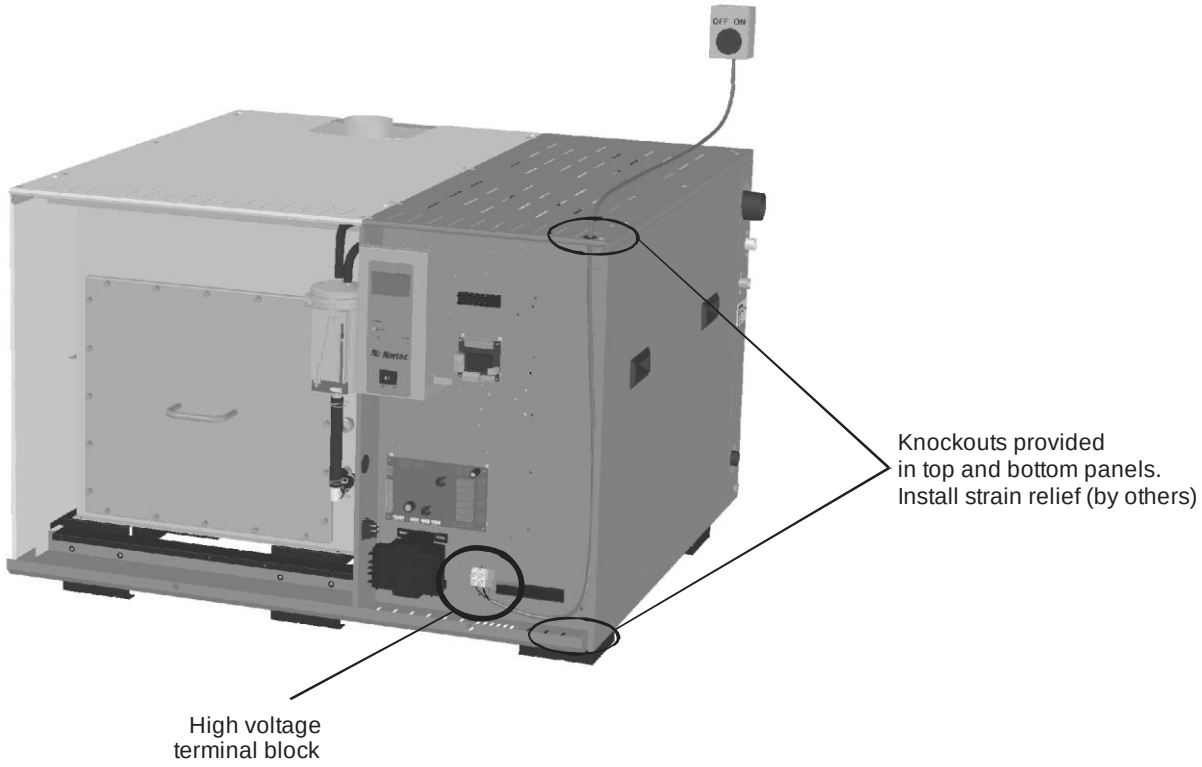


Figure 19: Long Steam Run

Electrical

Caution
Wiring to be performed by a licensed Electrician. All SE humidifiers operate on 230 VAC, single phase, 50 HZ power. Refer to specification label for power requirements.



Note:

1. Dedicated external fused disconnect must be installed. Fusing must not exceed max circuit protection as indicated on the specification label.
2. Ensure that adequate power is available to carry full humidifier amp draw as indicated on the specification label.
3. All wiring to be in accordance with national and local electrical codes.

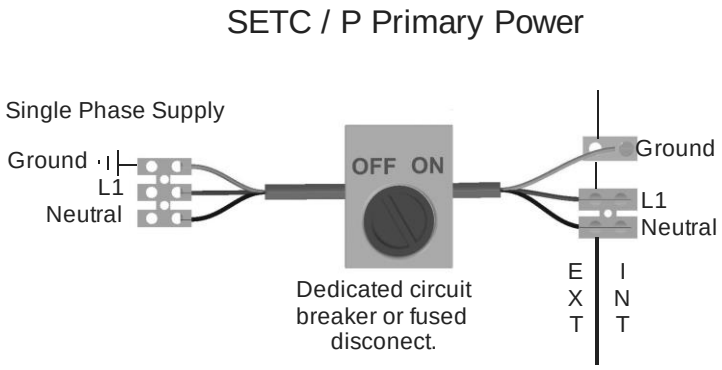


Figure 20: Primary Power Connection

External Controls

Control Wiring

Controls are available from Condair as accessories. If controls were not ordered with humidifier they must be supplied by others. The following information is relevant to all controls, factory supplied or otherwise. For wiring use minimum of 18 AWG and keep as short as possible.

The SETC humidifier can be operated with two modulating inputs. The SETC can be operated as On/Off. See Control Setting on page 51 for SETC configuration and .

Caution: Failure to wire the humidifier in accordance with the wiring instructions could cause permanent damage. Such errors will void the warranty.

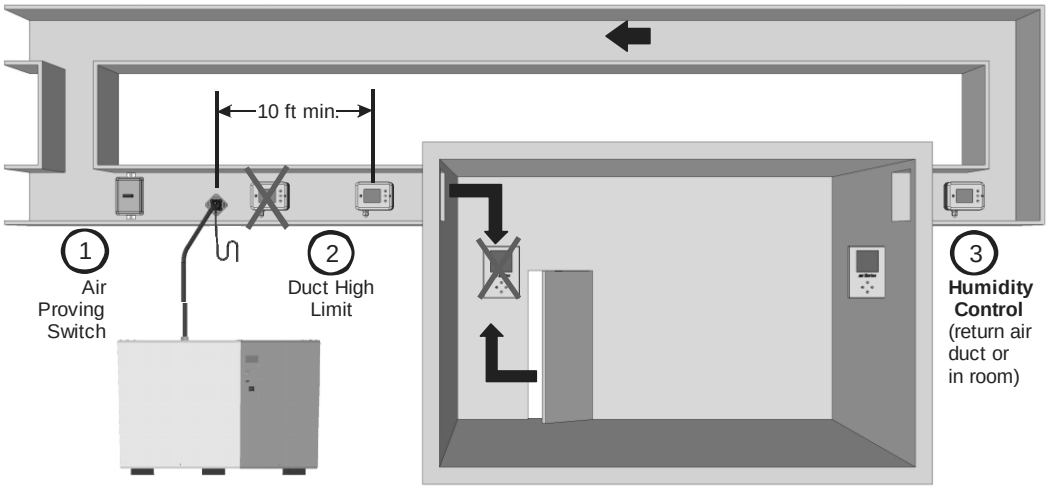
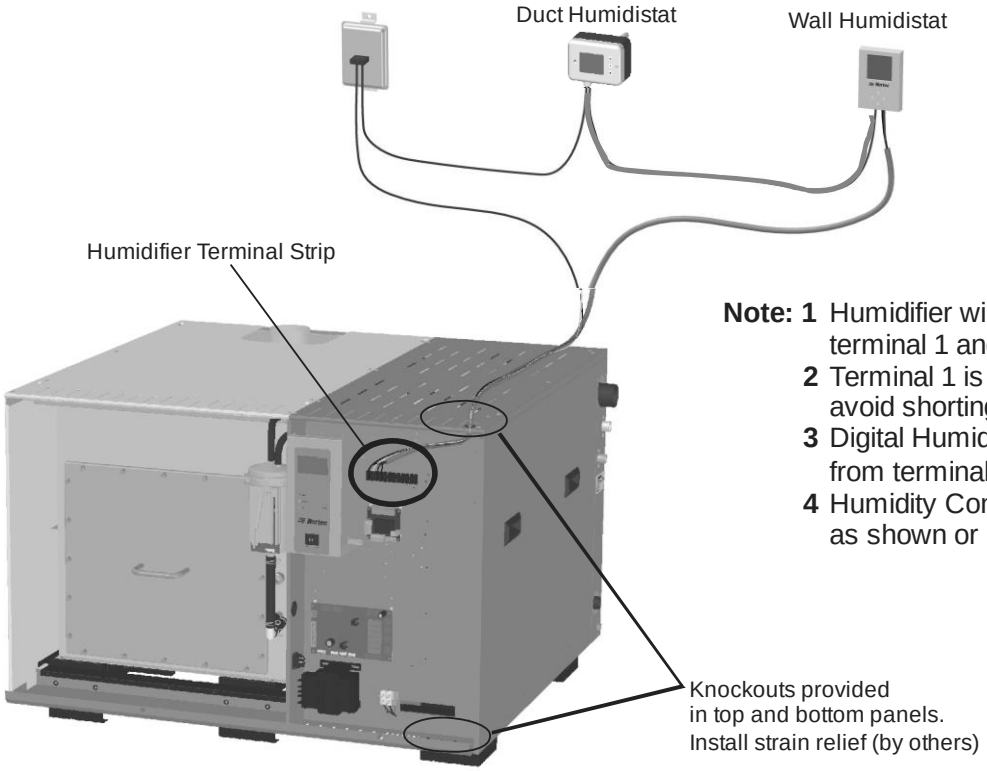


Figure 21: Control Location

1. Air Proving Switch
   a. Locate so that it can sense air flow or lack of it.
2. Duct High Limit
   a. SETC can regulated by modulating or On/Off controls, or humidity transducers. Locate at least 10 feet downstream from distributor or far enough that under normal conditions steam is fully absorbed.
3. Humidity Control
   a. SETC can regulated by modulating or On/Off controls, or humidity transducers. Can be located either in return air duct (preferred) or in the conditioned environment.
   b. Mount in area representative of room humidity (draft, doorways, sunlight, or overhang such as a shelf can affect reading). Avoid placing near discharge diffuser of humidified air.

Note: Regardless of selecting on/off or modulating control method, Condair humidifiers must have a closed circuit across the on/off security loop control terminal to operate. Condair highly recommends the use of a high limit humidistat and an air proving switch in series for this function.

On/Off Control Wiring



Note: 1 Humidifier will run when circuit between terminal 1 and 2 on humidifier is closed.
2 Terminal 1 is 24VAC Hot, turn unit off to avoid shorting while wiring.
3 Digital Humidistats require 24 VAC power from terminals 1 and 3 of humidifier.
4 Humidity Control can be wall mounted as shown or return air duct mounted.

Figure 22: On/Off Controls

Modulating Control Wiring

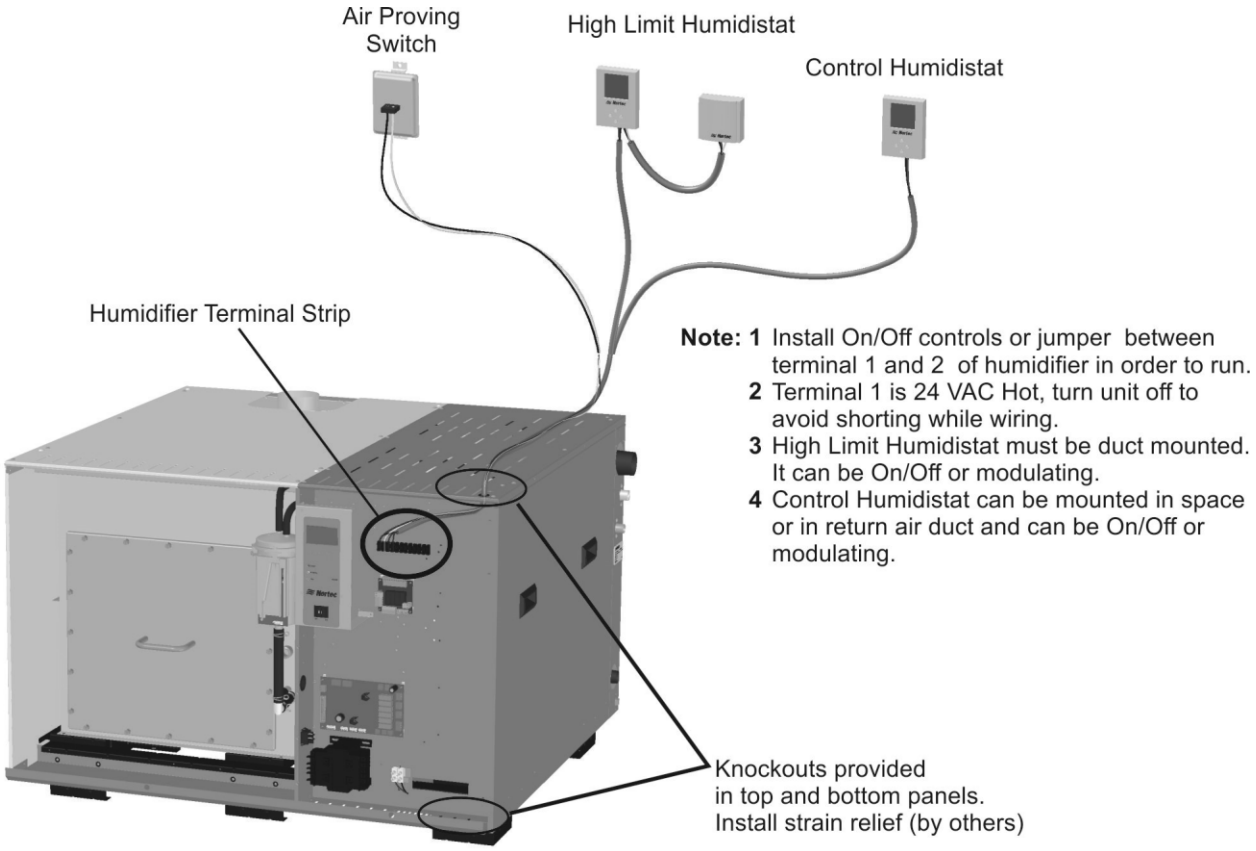
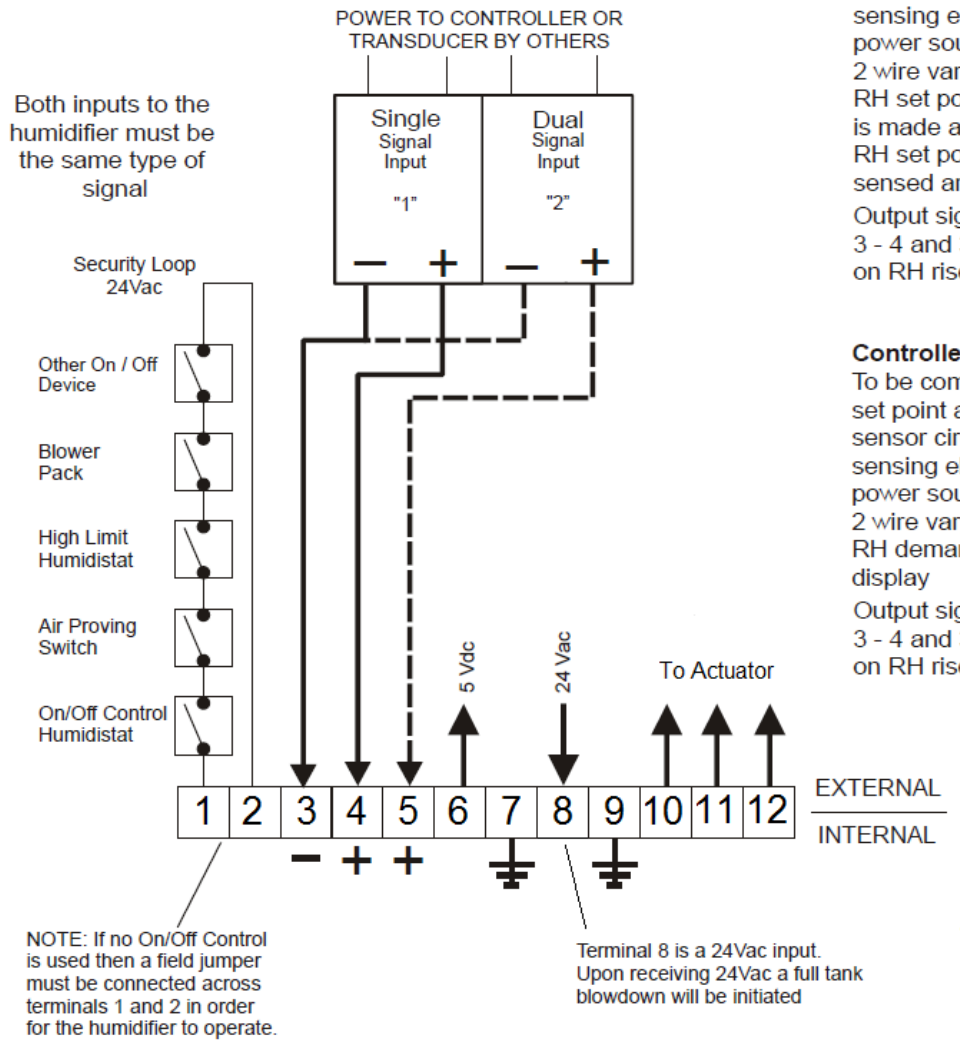


Figure 23: Dual Modulating Controls

EXTERNAL CONTROLS WIRING CONNECTIONS
LOW VOLTAGE TERMINAL STRIP

For all controller and transducer signals by others

WARNING: Failure to wire the controller in accordance with the wiring diagram supplied with the unit could permanently damage the electronics. Such errors will void the unit warranty.



Transducers:
To be complete with sensing element, power source and 2 wire varying output signal. RH set point adjustment is made at unit keypad. RH set point and % RH sensed are viewed on display
Output signal across 3 - 4 and 3 - 5 increase on RH rise

Controllers (Humidistat):
To be complete with RH set point adjustment, sensor circuit, sensing element, power source and 2 wire varying output signal. RH demand are viewed on display
Output signal across 3 - 4 and 3 - 5 decrease on RH rise

Actuator Wiring (SETC)

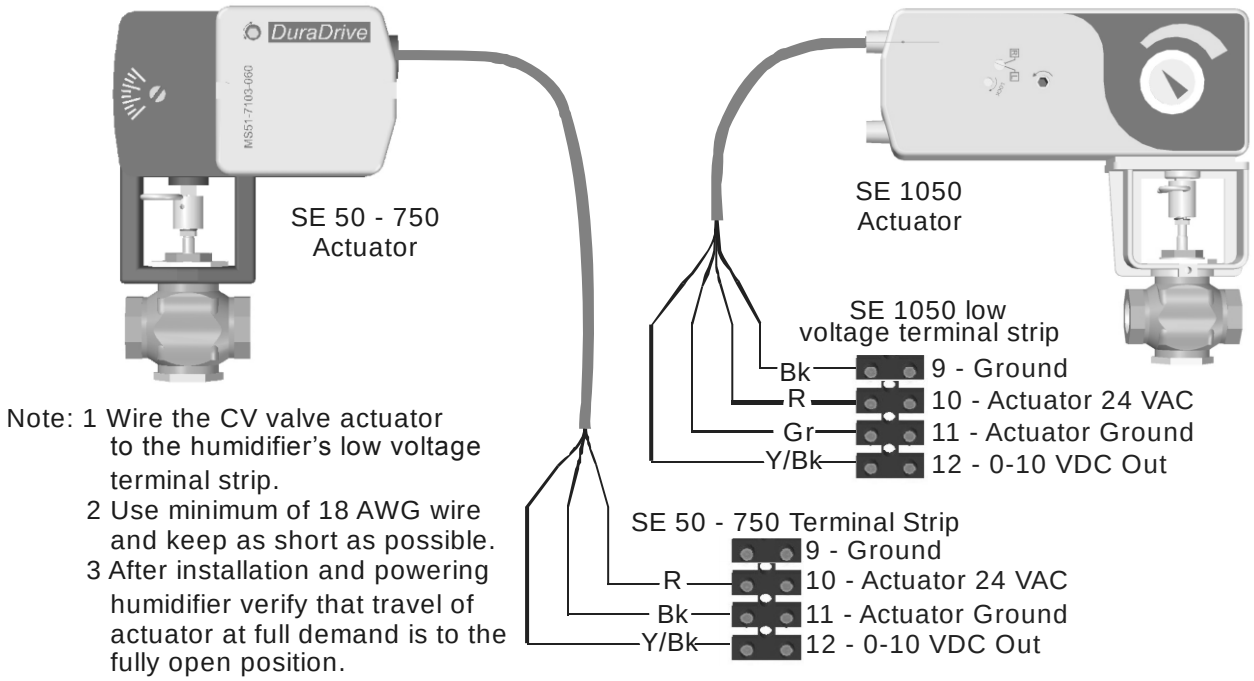


Figure 24: Control Valve Actuator Wiring

Remote Relay Board Wiring

The SETC remote relay board provides the output signal for the actuator and includes 4 relays that can provide remote status indication. The remote relay board is located as shown in Figure 25: Remote Relay Board Wiring. The PCB with the relays includes markings which indicate the function of each terminal on the board. The relays indicate the following status:

1. *Unit On* – The normally open relay is closed when the humidifier has power and the On/Off switch is set to on.
2. *Steam* – The normally open relay is closed when the control board sends a signal to the actuator to open the control valve and steam is being produced.
3. *Service* – The relay can be wired to open (NC) or close (NO) when a warning is displayed on the humidifier display and the yellow service LED is illuminated.
4. *Error* – The relay can be wired to open (NC) or close (NO) when a fault is detected by the humidifier controls.

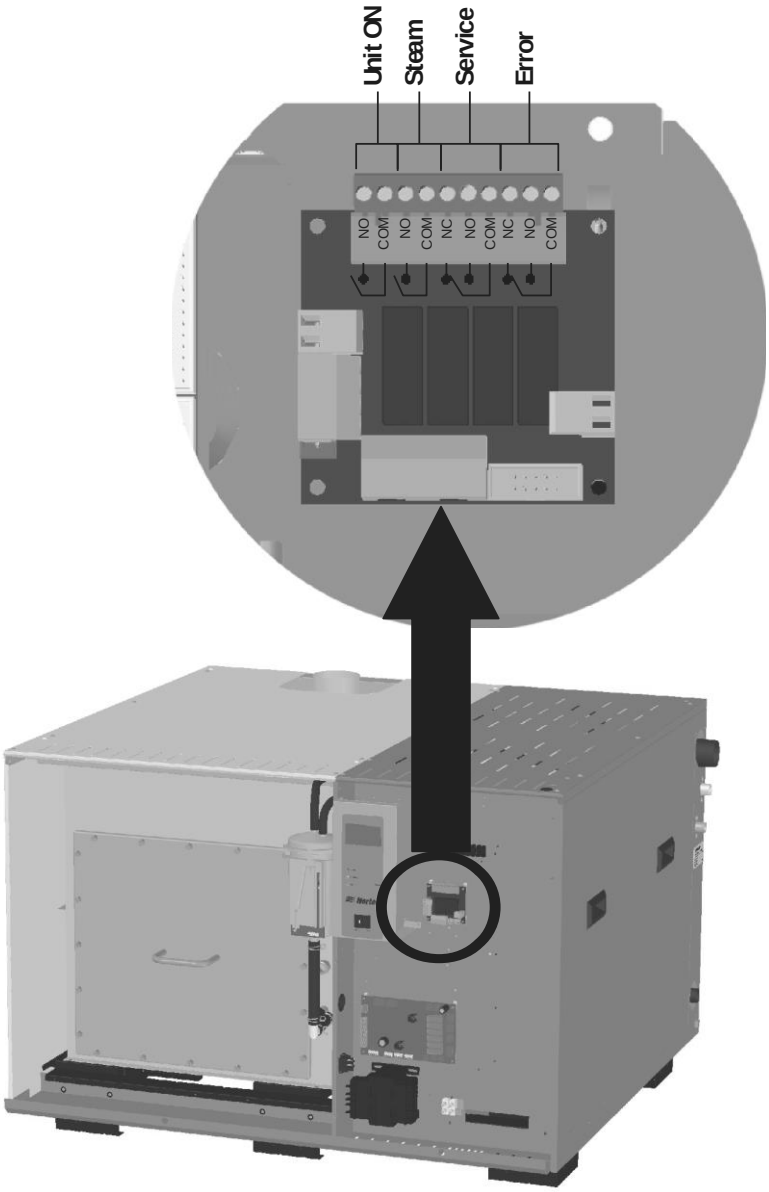


Figure 25: Remote Relay Board Wiring

Staged Modulation Wiring

- Connect up to 10 units (equivalent of 10,500 lb/hr or 4,770 kg/hr) using 18-24 AWG multi-strand, twisted pair, shielded cable.
- Connect humidistats/transducers and On/Off safety loop to master unit only.
- See Multi Mode on page 52 and Multi Unit Op. Range on page 54 for software configuration.

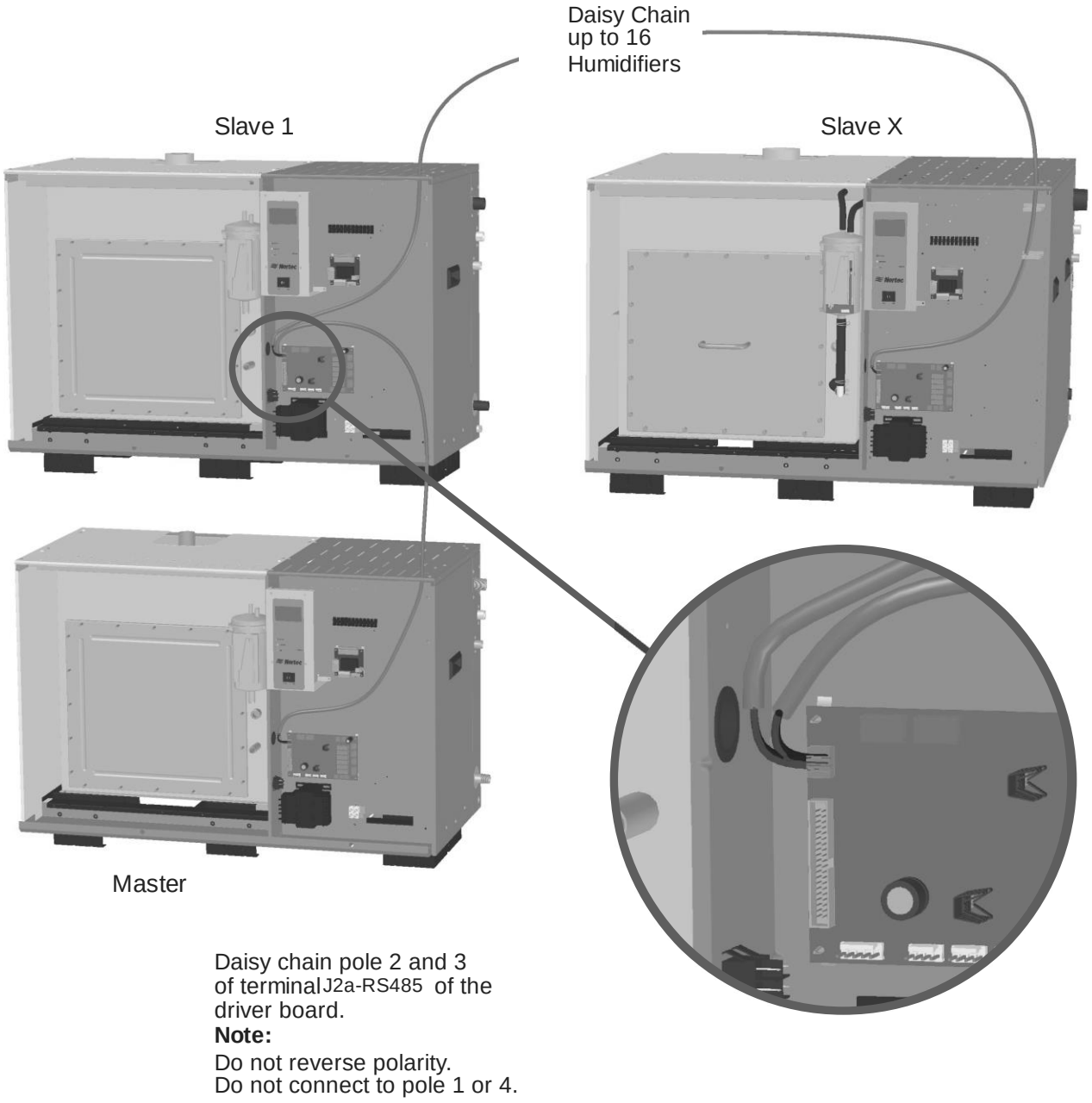


Figure 26: Staged Modulation Wiring

Options and Accessories

Note:
For installation of options and accessories follow the instructions that are provided with them.

Remote Blower Pack

Remote blower packs are available for the SETC for applications where steam for humidification must be introduced directly into the space being humidified. For instructions on installing the remote blower pack refer to the installation instructions supplied with it. The steam line and condensate return instructions provided in this manual are also applicable to remote mounted blower packs.

The blower packs include a safety relay which should be used to prevent the humidifier from operating if the blower packs do not have power. Wire humidifier security loop in series through all blower packs and other On/Off controls.

Drain Water Cooling (External)

Pneumatic and electric drain water coolers are available from Condair for installation outside the humidifier or on condensate drains from steam traps, distributors, and distribution manifold headers. An external drain water cooler may be required to meet regulations restricting the temperature of hot water that can be fed to drain below the humidifiers drain temperature of 140°F/60°C. The external drain water cooler is only available for field installation.

Start Up

Installation Check

Before turning on power to the SE, inspect the installation to ensure that it was carried out correctly. Refer to Figure 27: Installation Check, to the SETC Pre-Start Up Checklist on page 39, and to the chapter on Installation that starts on page 8.

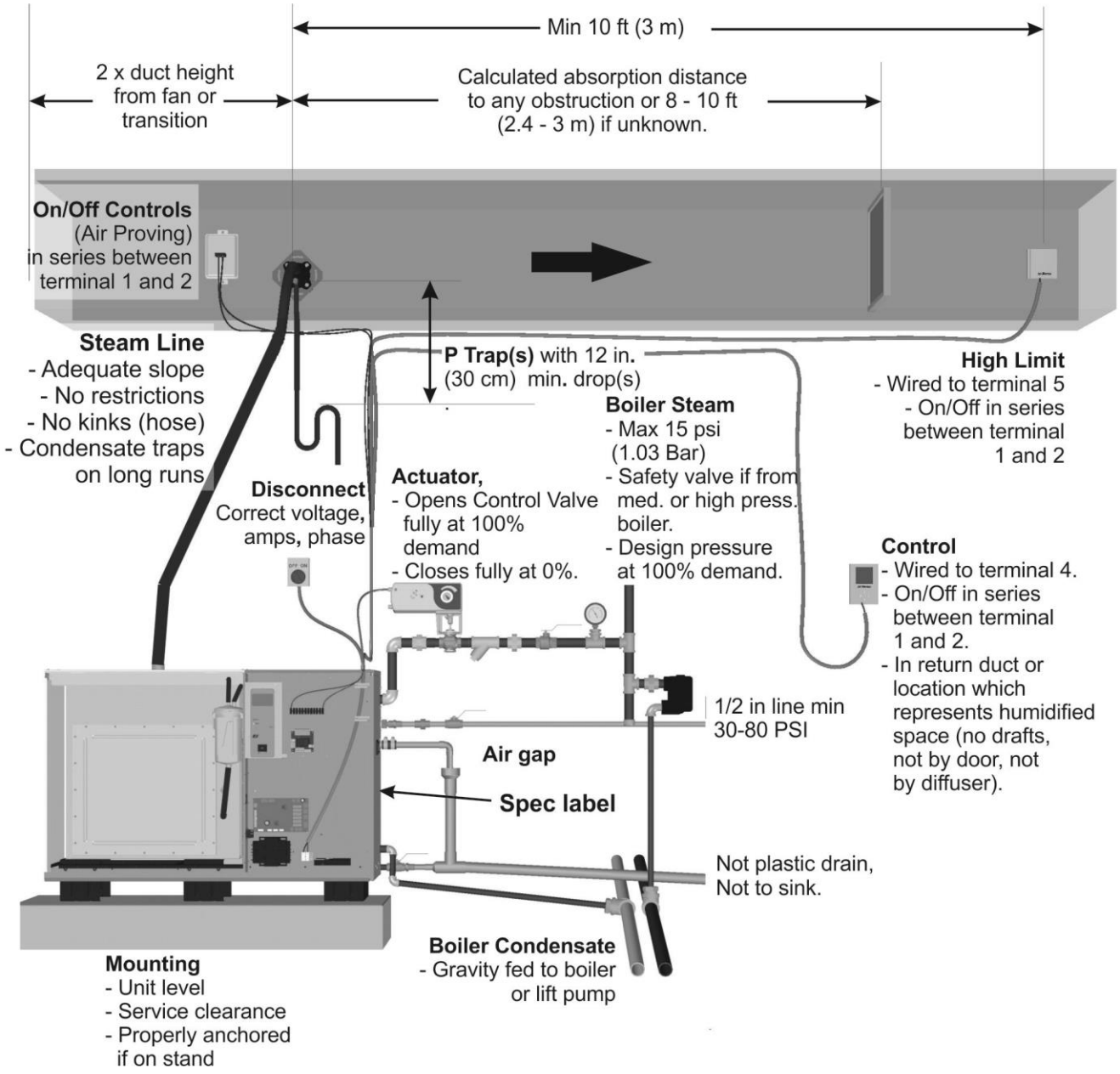


Figure 27: Installation Check

SETC User Interface

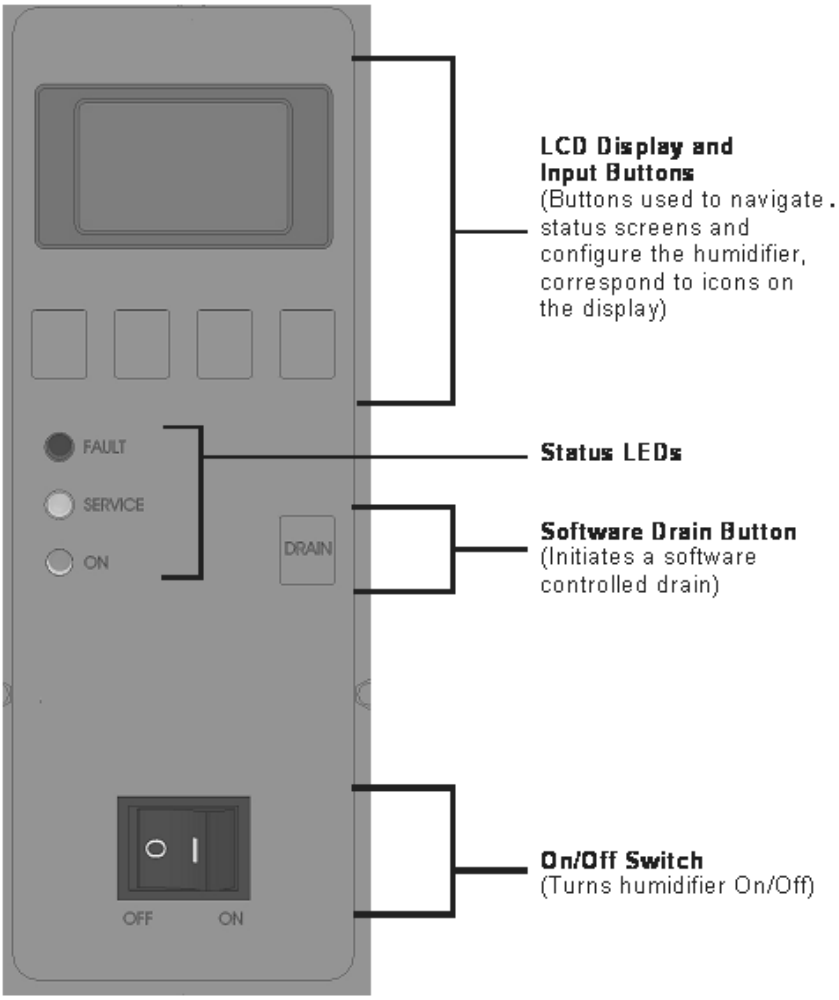


Figure 28: SETC User Interface

Manual Drain Switch

The SETC has a manual drain switch that can drain the tank even if software is not functioning. To drain the tank put the switch into the drain position. For normal operation the switch should be in the off position.

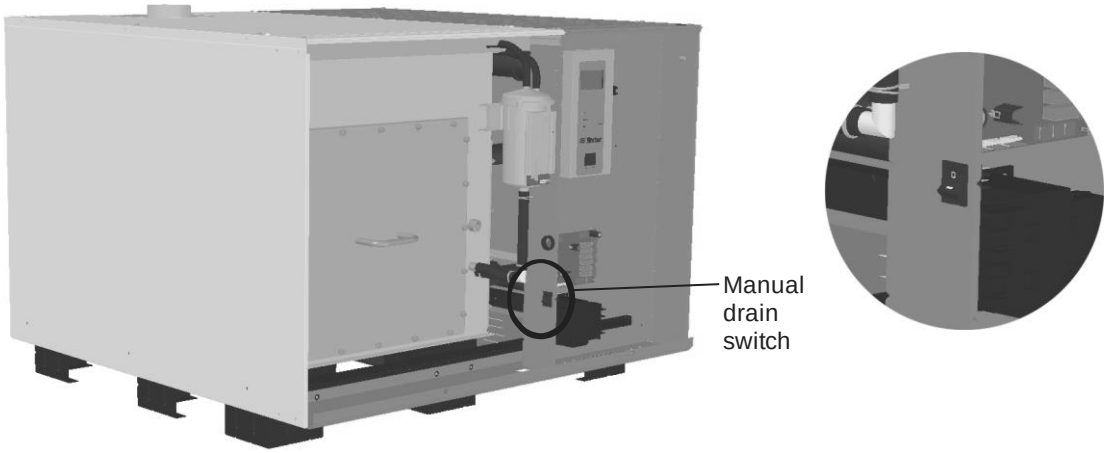


Figure 29: Manual Drain Switch

Start Up Procedure

1 Examine the humidifier and installation for damage and/or improper installation.

Warning: Damaged units or improperly installed units must not be operated. Damaged or improperly installed units may present a danger to persons and property.

2 Open the supply water shut off valve. If the auxiliary drain valve is installed ensure it is closed.

3 Slowly open boiler steam isolation valve to allow boiler steam into the steam supply line up to the control valve.

4 Turn on the main power using the installed disconnect then turn the On/Off switch on the front of the humidifier to On.

The LCD display will illuminate and the humidifier will perform a self-diagnostic sequence during which the LED's and internal components will be momentarily activated. The SE will then begin filling with water. The fill time is between 10 and 30 minutes depending on the size of the unit.

5 Once the water level is close to the top of the tank the LED lights on the SE's float chamber will light up and indicate the water level. On start up the SE will perform a float and drain pump test by first filling until just the green LED is lit and then draining until just the red LED is lit. After the float and drain test the humidifier is in normal operation mode.

Note:

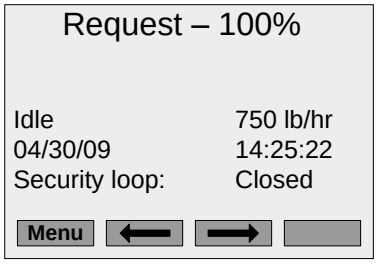
- Pressing the ESC key on the keypad will interrupt the float and drain test and the humidifier will go straight to normal operating mode.
- If an error is detected during the self-diagnostic sequence a Fault will be displayed. See troubleshooting section for information on diagnosing and correcting faults.
- The information on the SETC's LCD depends on the SETC's configuration and actual operating conditions. It may vary from display shown.

6 If On/Off or control humidistats have been installed, check and adjust the control setpoint on the control and high limit humidistat (see Condair Digital Controls on page 38). If transducer controls have been installed then adjust the humidity setpoint using the keypad and display (see Transducer Control on page 38).

7 When either the external humidistat or internal controller generate a demand for humidity higher than 15%, the security loop is closed, and the float chamber indicates the tank is full the SE will transmit a signal to the control valve to open. Steam will flow into the SE's heat exchanger(s) and the SE will heat the water in its tank.

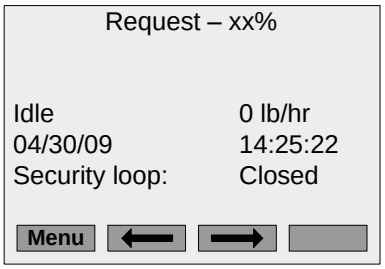
Note: on initial startup with cold water in the SE's tank it may take 5 to 15 minutes (depending on unit size) for the SE to reach a full boil and produce its rated steam.

8 The green humidifying LED on the front of the humidifier will light up and the display will indicated “Humidifying” and the amount of steam being produced (SETC only).

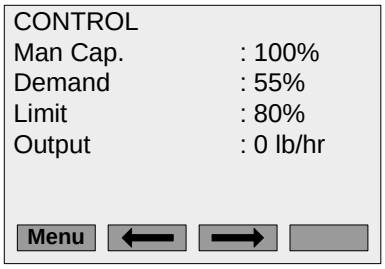


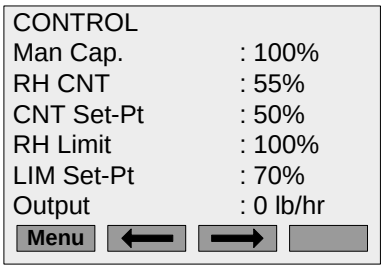
Status Screens

In addition to the main status screen the SETC includes several status screens which provide additional information about the humidifier. The additional screens can be reached by pressing the buttons corresponding to the left and right arrow key on the LCD display.



Main Status Screen
This screen reports the current request for humidity, status, output, date and time, and security loop status. If status is not idle or humidifying the left arrow key becomes a “?”. If the button corresponding to the arrow key is pressed the display will give additional information on the status of the humidifier.

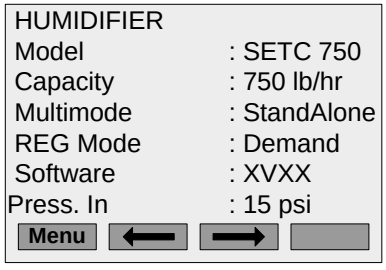




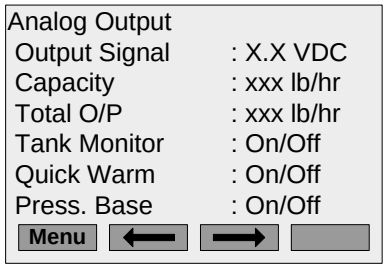
Control Information Screen
Output is the steam output of the unit in lb/hr (kg/hr). Man Cap is the user configured capacity limitation. Depending on the control configuration the screen also reports the current inputs of channel 1 and 2. If the unit is configured for internal control it also provides the current humidity and setpoints.

Caution:

- Improper control configuration can result in over humidifying which can result in damage to property.
- See Advanced Control Configuration if the controls displayed in the control information screen do not match those connected to the humidifier.

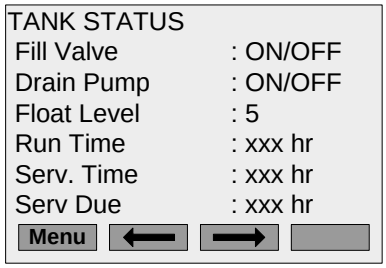


Humidifier Information Screen
Model is the humidifier model type. Capacity is maximum output if the unit is supplied 15 psi (1.034 bar) steam.
Multimode indicates if the humidifier is operating as part of a group controlled by a single control signal
REG Mode is the configured control method.
Software is the installed software version.
Press. In is the boiler steam supply pressure.



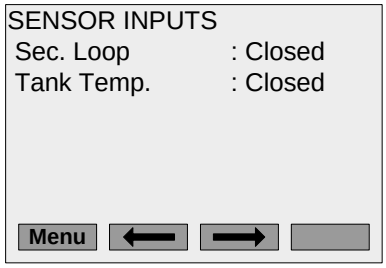
Analog Output Information

Output Signal is the signal currently being output to the actuator.
Capacity is maximum output based on actual boiler steam press.
Total O/P is the current steam production of the humidifier.
Tank Monitor de/activates the TCW warning and TCF fault.
Quick Warm boosts valve throughput until the tank is up to operating temperature. Press Base indicates if output is based on actual steam pressure.



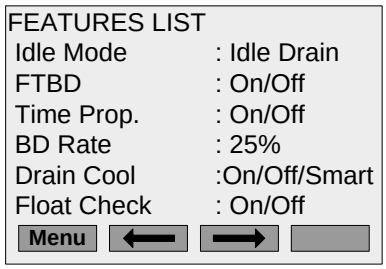
Tank Status

Fill Valve indicates if the fill valve is open or closed.
Drain pump indicates if the drain is on or off.
Float level indicates the current float level.
Run Time is total weighted operating hours since last service.
Serv Time is the service interval set for the humidifier
Serv Due is the time remaining before service is required.



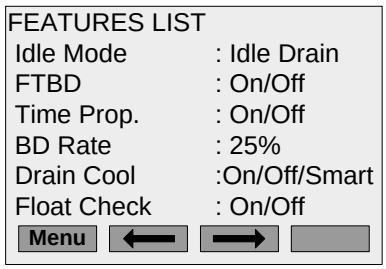
Sensor Inputs

Sec. Loop indicates if the security loop is open or closed.
Tank Temp indicates if the tank temperature sensor is cold (open) or hot (closed).



Features List

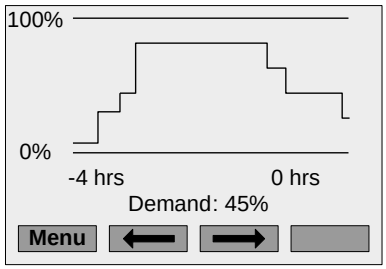
Idle Mode indicates what the humidifier is configured to do when there is no demand.
FTBD indicates if full tank blow down is enabled.
BD Rate indicates water drained for scale control as % of output.
Drain Cool indicates configuration of drain water cooling feature.
Float Check indicates if the humidifier will perform float checks.



Operational Hours

Total indicates the number of hours the humidifier has been producing steam.

Weighted indicates the total amount of steam the humidifier has produced expressed as number of hours running at 100% output.



Trend Graph

This graph provides a history of the humidifiers output for the past 4 hours. It displays a percentage of full output which corresponds to the demand signal. The current demand signal is displayed at the bottom of the screen.

Condair Digital Controls

Condair provides optional On/Off, Modulating Control, or Transducer digital controls.

Modulating Control
The modulating controls use a Proportional/Integral (PI) control algorithm to transmit a 0-10V control signal to the humidifier. Adjust the setpoint to the desired setting by using the up/down arrow buttons on the controller.

On/Off Control
The On/Off controls use a PI control algorithm to open and close a relay that opens and closes the humidifier's On/Off Security loop. Adjust the setpoint to the desired setting by using the up/down arrow buttons on the controller.

Transducer Control
The transducer controls transmit a 2-10V control signal proportional to the sensed relative humidity to the humidifier. Humidity setpoint is not set at the transducer. The setpoint is set on the SETC's display and keypad.

Note: It is possible to field calibrate Condair Digital controls if the displayed humidity is found to be different than a known trusted source. See Digital Humidistat on page 80.

Staged Modulation

Start-up of each humidifier configured and installed for Staged Modulation is the same as starting up standalone humidifiers with the exception that for the humidifier to fill and produce steam the demand to the master unit must be greater than the Multi Unit Op. Range setting of the unit being started. (Example for a slave unit configured to operate between 20 and 30% the demand to the master must be greater than 22%)

Each unit connected in a staged modulation system will display its demand as a percentage of the range for which it is configured. Example, a slave unit configured to operate between 20 and 30% demand will display a demand of 50% when demand to the master is 25%.

Note: See Multi Mode on page 52 and Multi Unit Op. Range on page 54 for software configuration. See Staged Modulation Wiring on page 30 for control wiring of humidifiers in a Staged Modulation system.

Links

Condair LINKS is an option that can be integrated with the SETC. It allows a Building Management System to monitor and / or control the humidifier. If the humidifier was equipped with this option, refer to the supplementary Links manual provided with the humidifier for more information.

SETC Pre-Start Up Checklist

Unit Serial #: _____ Tag: _____

Unit type: _____ _____ Voltage: 230 V/1 ph Steam output: _____kg/hr

Customer/Job:_____Address: _____

Water Quality:

- Potable (0 - 12 grains/gal, 0 - 14 ppm Silica, 0 - 40 ppm Chlorides) ☐ RO ☐ DI ☐

Humidifier Mounting: (Clearances around the unit Acceptable Obstruction):

- Level ☐ Front/Side Clearance ☐ Anchored (if on stand) ☐

Steam Line(s):

- Slope up (min 2 in/ft) (165mm/m). ☐ Slope down (min 0.5 in/ft) (40mm/m)☐
- Diameter / Size _____ Material _____
- Low point condensate traps ☐ No Hose Kinks / Restrictions ☐
- Insulated ☐ Type of Insulation _____

Condensate Line(s):

- P Trap min 8 in. (20 cm) plus duct static pressure ☐ P Trap min 12 in (30 cm) below ☐

Water Line:

- Can provide required flow ☐ Water pressure: 30-80 psig (2 – 5.5 Bar) ☐

Drain Line:

- Air gap within 3 ft (90cm) of the unit ☐ Diameter / Size _____
- Auxiliary drain connected with shut off valve ☐

Boiler Steam

- Boiler Pressure _____ psi / Bar Pressure to humidifier _____ psi / Bar
- 15 psi (1.034 Bar) relief valve if med/high press boiler ☐
- Actuator closes and opens control valve fully ☐
- Design pressure at control valve ☐
- Condensate return Gravity feed ☐ or pump ☐

Wiring:

- Wiring connections and connectors secured yes ☐ no ☐

Controls:

- Modulating Control Location _____ Control to Terminal 4 ☐
- Modulating High Limit Location _____ High Limit to terminal 5 ☐

Power:

- Voltage, amp, fuse per Spec Label: yes ☐ no ☐
- Disconnect switch located close to humidifier yes ☐ no ☐

Inspected by:_____ Date of inspection: _____/_____/_____

Company:_____

SETC Start Up Checklist

Unit Serial #: _____ Tag: _____

Unit type: _____ _____ Voltage: 230 V/1ph Steam output: _____kg/hr

Customer/Job: _____ Address: _____

Preliminary:

- Pre-start-up checklist completed? yes ☐ no ☐
  If no, perform Pre-Start-up Checklist before starting humidifier.

Start-Up Procedure:

The prerequisites for the humidifier activating the control valve actuator to make steam are as follows:

- Water supply valve opened yes ☐ no ☐
- Boiler steam isolation valve open yes ☐ no ☐
- Mains disconnect switched on yes ☐ no ☐
- Turn On/Off switch on yes ☐ no ☐
- On/Off Security loop (Terminal 1 and 2) closed. yes ☐ no ☐
- Demand greater than 15% yes ☐ no ☐

Controls:

- Installed Controls Match Configuration yes ☐ no ☐
- Control Setpoint: _____ High Limit Setpoint: _____
- Demand (Modulating Humidistat) yes ☐ no ☐
  or
- Sensed RH < Setpoint (Transducer) yes ☐ no ☐

The Humidifier will undergo a self-test when the power is turned on activating the LED's and other internal components followed by a float test.
If the above listed prerequisites are fulfilled the humidifier will fill the tank, open the control valve and begin normal operation.

Note: 1) It can take 10 to 30 minutes for the tank to fill depending on humidifier size.

2) Once filled it can take 5 to 15 minutes (depending on humidifier size) for a cold tank to come to a full boil.

Remarks:

_____

_____

_____

_____

Started by:_____ Date of Start Up: _____/_____/_____

Company:_____

Operation

SETC LED Status Lights

The keypad and display panel includes 3 LED's which provide information about the humidifier's current status.

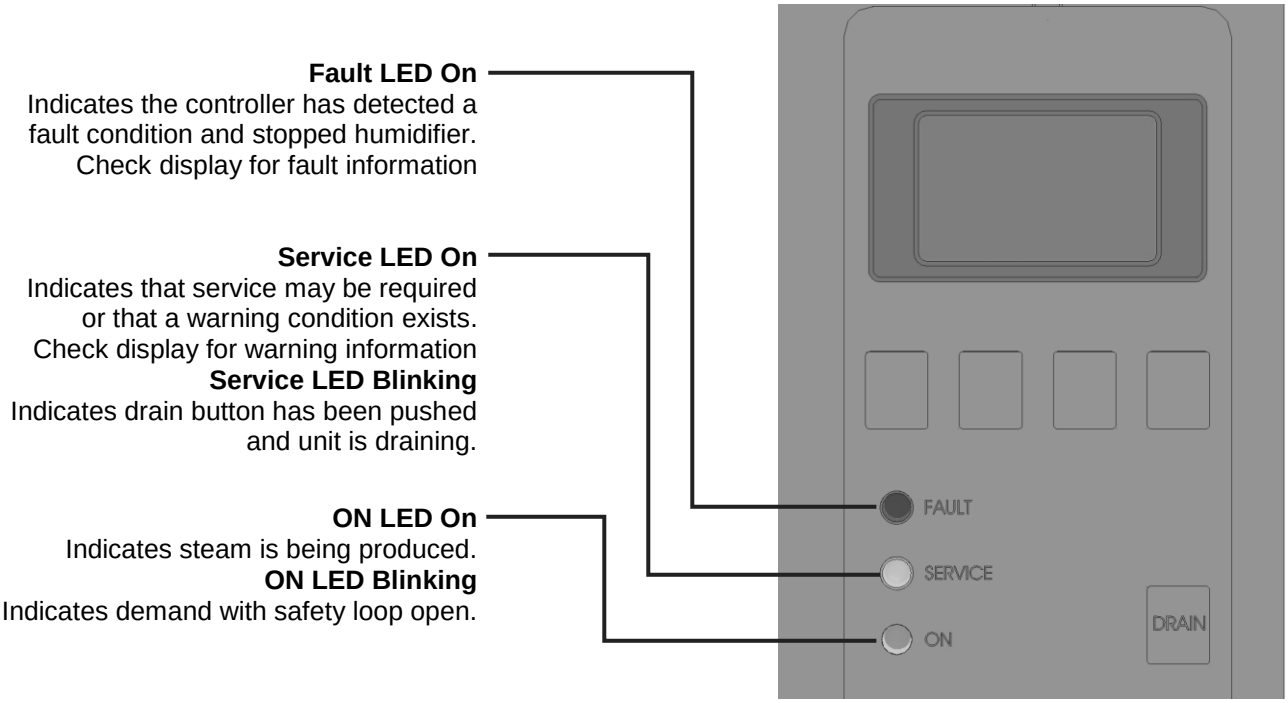


Figure 30: SETC LED Status Lights

Humidifier Schematic

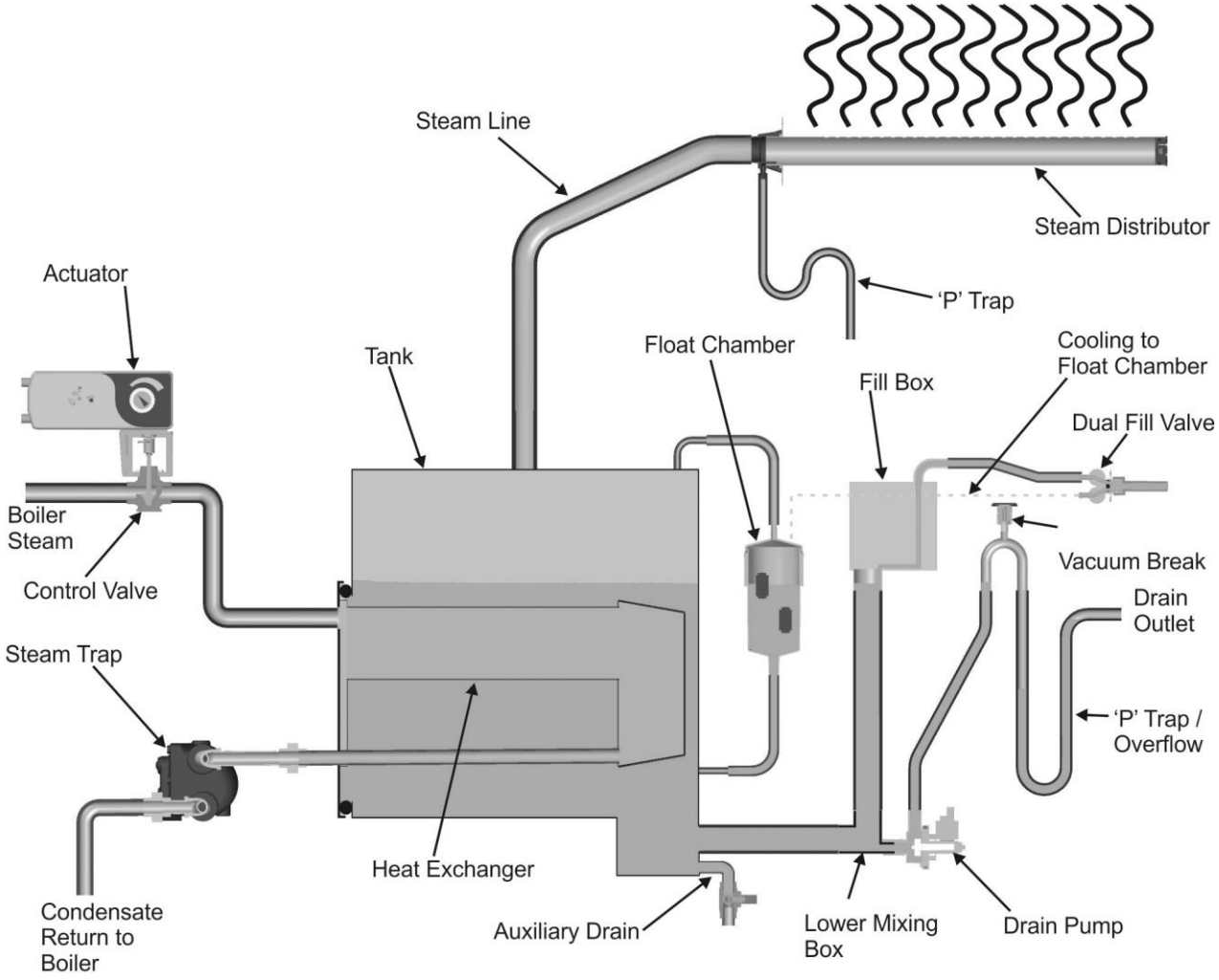


Figure 31: Humidifier Schematic

How the Humidifier Works

The SETC is an atmospheric steam generator that uses energy from pressurized steam flowing through a heat exchanger submerged in water to generate steam. The SETC is designed for air humidification via steam distributor, blower pack, or steam manifold.

Steam Generation

- After initial start-up and tank filling, the humidifier will sit in standby mode awaiting a call for humidity.
- When a call is received, the humidifier will send a signal to the electric actuator. The actuator will open as required and the flow of boiler steam will begin.
- Energy from the boiler steam is transferred to the fresh water tank through a heat exchanger inside of the unit. This causes the water to boil. Full boil from a cold tank can take up to 15 minutes. On SETC models, the Keepwarm feature can be activated to reduce boil time, see Idle Mode on page 50.

- The humidifier will modulate the actuator, controlling the flow of steam into the unit. This will allow the unit to reduce its output level as the humidity levels in the conditioned environment are satisfied.
- During the boiling process minerals are left behind from the water. The unit will occasionally activate the drain pump to flush out some of the minerals in the water and reduce the concentration in the tank. The fill valve will also be activated periodically to replace water that is boiled off during normal operation.
- When the demand to the unit ceases, the unit will close the steam valve and steam production will stop. The unit will enter standby mode and await a call for humidity. If Keepwarm is activated (SETC only), the control valve will be opened periodically to heat the tank.

Drains

- As steam is produced minerals are left behind in the SE's tank. The SE performs periodic drains to reduce the amount of minerals that will precipitate as scale.
- In general more frequent drains result in less maintenance. The amount of water drained to control mineral concentration in the tank can be configured in the SETC's software.
- To cool drain water the SE activates the fill valve whenever the drain pump is activated. Cool fill water flows down from the fill box and blends with hot tank water in the lower mixing box before being drawn into the drain pump. The drain cooling feature can be deactivated via software (see Drain Cool on page 49).

Steam Distribution

Steam generated by the humidifier may be introduced into the air in several different ways. The most common method for adding the steam into the air is to mount a steam distributor tube in a supply air duct as shown in Figure 31: Humidifier Schematic. For larger ducts or larger loads it is also common to use a steam manifold with a single steam line connection and multiple tubes for distributing the steam. For introducing steam directly into a room, remote mounted blower packs are used see Figure 312: Remote Blower Pack.

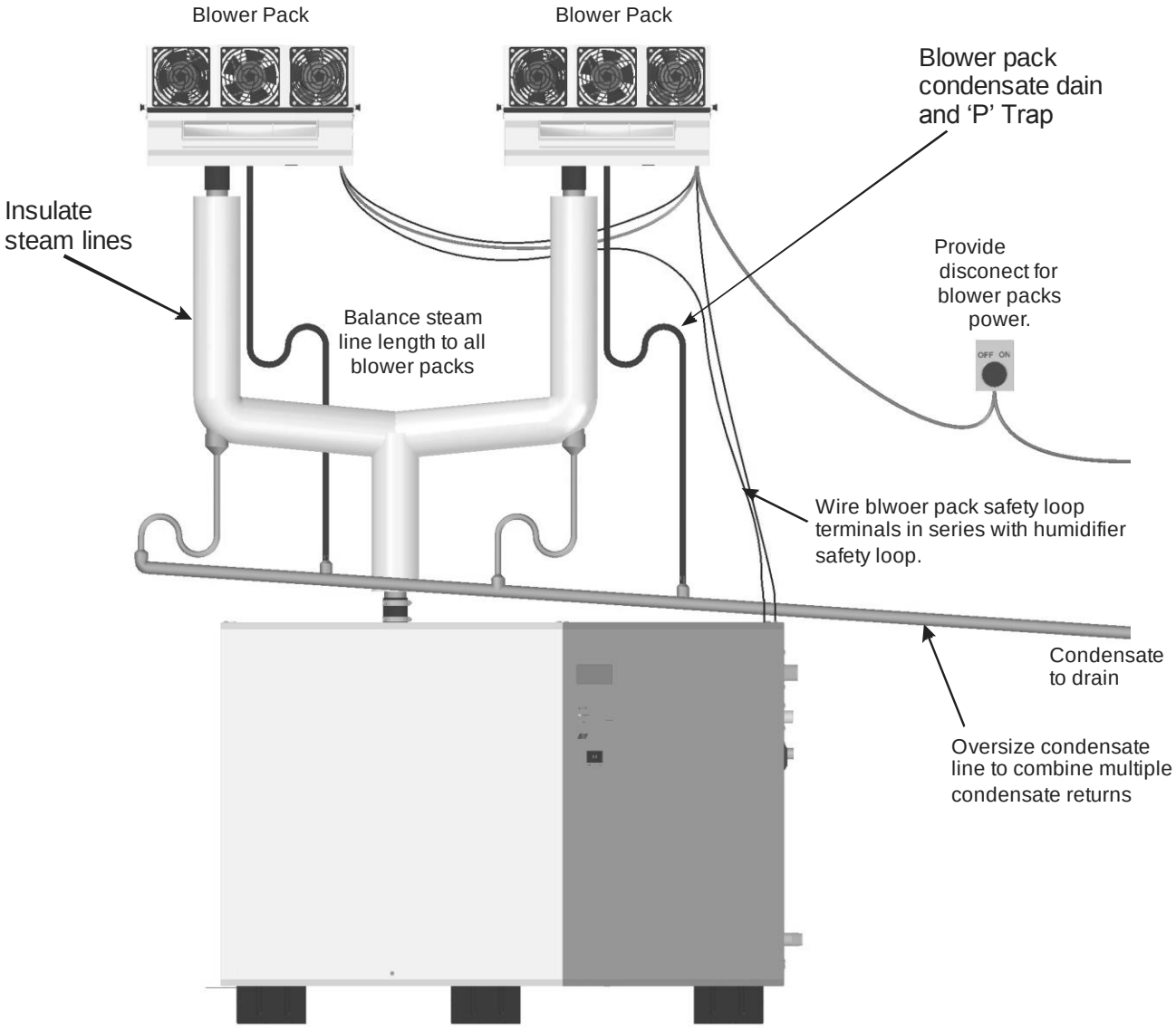


Figure 312: Remote Blower Pack

Steam Line

The steam line between the tank steam outlet and the distributor may be Condair steam hose, copper pipe, or stainless steel pipe or tube. The SETC is an atmospheric steam generator so it is very important no restrictions are present in the steam line and that the steam line is sized properly to carry the full output capacity of the humidifier. It is also important to minimize the length of steam lines. See Steam Lines and Condensate Returns on page 18 for information on selecting steam lines and maximum recommended lengths.

Whenever steam is distributed condensate is formed in the distribution system and steam distributor, manifold, or blower pack. Insulating steam lines is one important way to reduce the amount of condensate formed. Steam lines must be sloped so that condensate does not collect in the lines and create a restriction to steam flow.

Condensate Return

The condensate must be collected and removed from the system so that it does not build up and leak into the duct (or room if blower pack is used). Condensate must be collected and fed to drain.

Selecting an RH Setpoint

The optimum humidity setpoint depends on the reasons that a space is being humidified. The "ASHRAE Handbook – HVAC Applications" recommends specific design relative humidity levels for specific applications.

Health and Comfort - The benefit of humidity is most pronounced for health and comfort in the 40-60% range. A humidity setting of 40-50 % is recommended for this purpose to prevent excessive humidifying.

Note: The project designer may have defined a setpoint chosen specifically for the building. Refer to site documentation and where possible use setpoints specifically determined for the site.

Temperature Setback - In cold climates it is often necessary to reduce the humidity level in a space to prevent build-up of condensation on the inside of exterior walls, windows, and trim. It is highly recommended that the temperature setback function of the Condair digital controls be used under these conditions to prevent damage from condensation.

Duct High Limit – The duct high limit is intended to prevent saturation and wetting in duct work at high load conditions. Condair recommends a setting of 85% for the duct high limit. It may be necessary to reduce this setting If the duct work is very cold or in contact with exterior cold surfaces.

SETC Humidifier Configuration

Navigating the SETC Software

The four input buttons below the digital display are used to navigate in the SETC's software and to enter values. The function of the four buttons changes depending on what is being displayed on the screen. In all cases, four icons representing the functions of the buttons will be shown at the bottom of the screen.

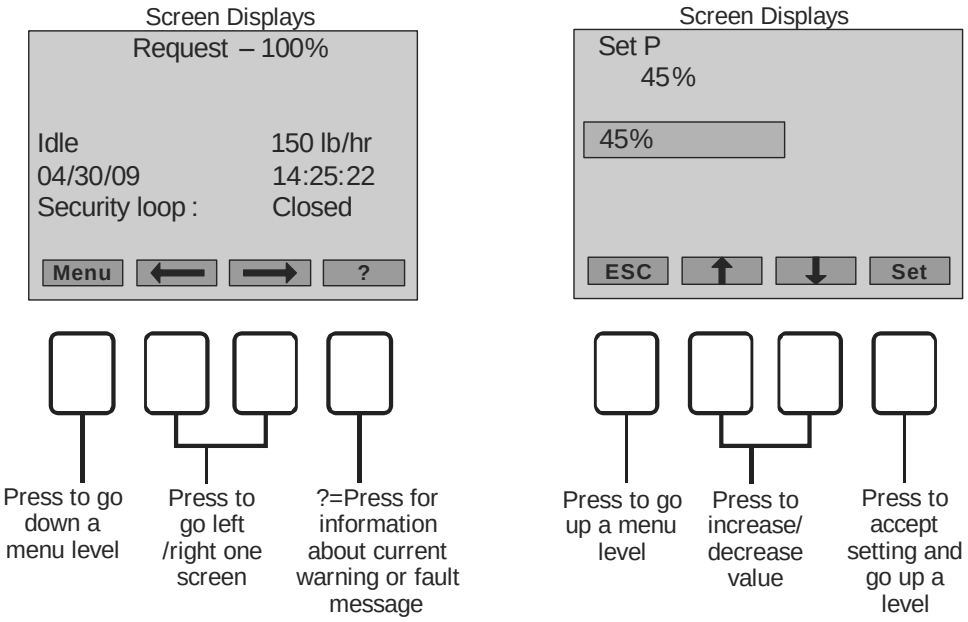
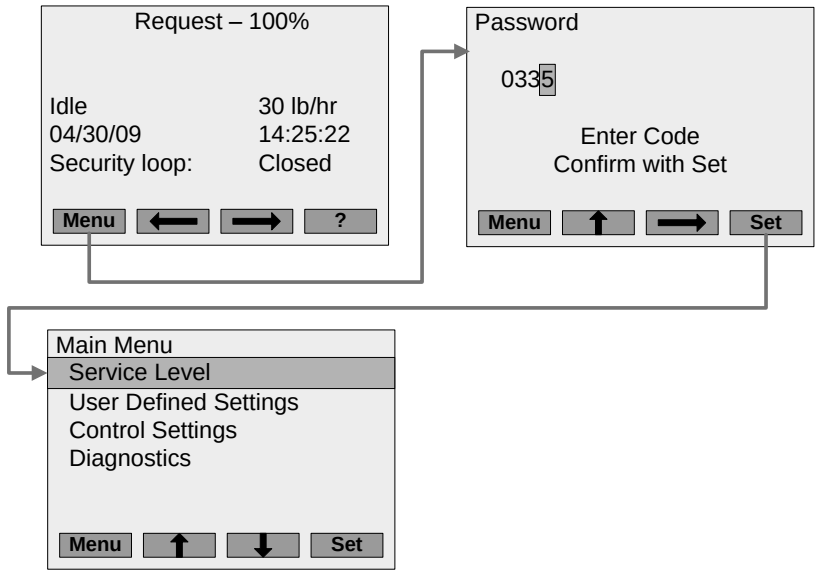


Figure 33: Navigating the SETC Software

Main Menu (SETC Password)

The menu levels of the SETC are password protected to prevent configuration changes by unauthorized persons. In order to access the menu level press the button corresponding to the Menu icon and when prompted enter the password 0335.

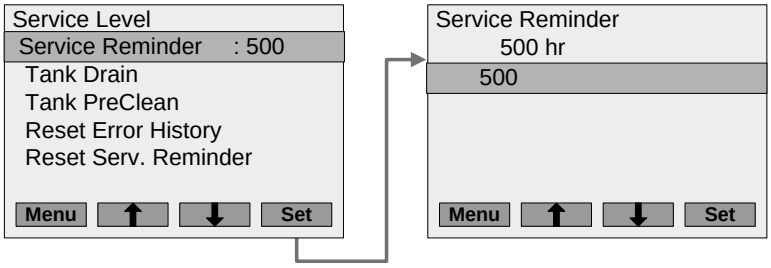


Enter Password
Press the **Menu** button from any status screen. Enter the user level code **0335** using the up arrow to change the value of each digit and the right arrow to move to the next digit. Press the **Set** button.

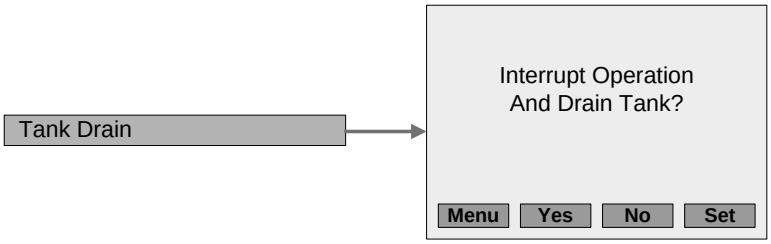
Main Menu
From here you can access all user configurable settings. Select any sub-menu by using the **up/down** arrow buttons and pressing **Set** when the desired one is highlighted.
Note: Do not make changes unless you are familiar with the software.

Service Level

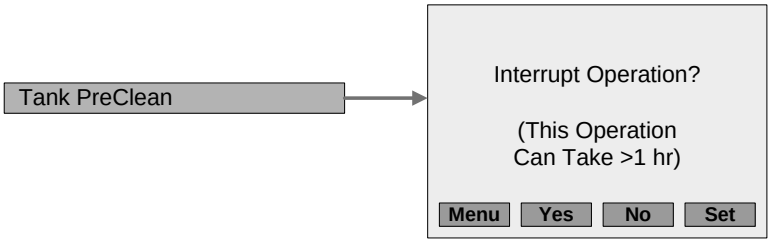
The selections in the **Service Level** allow you to reset service reminders and the fault history. Press **Set** while highlighting **Service Level** in the **Main Menu**.



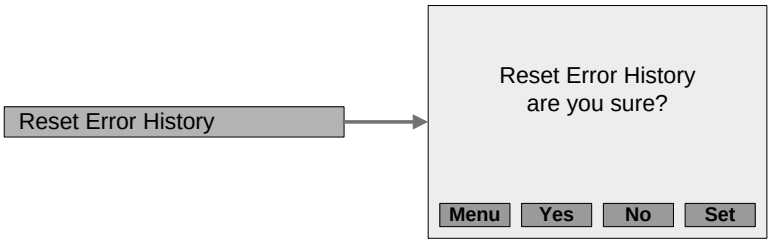
Service Reminder
Sets the maintenance time interval for the humidifier based on run time at 100% output. The controller will display a warning when the time expires. (Default = 500 hr)



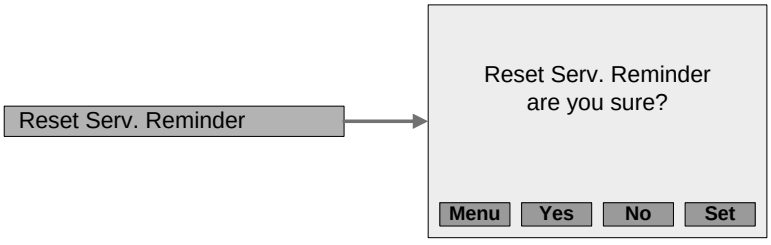
Tank Drain
If the yes button is pressed the controller activates the drain pump and empties the tank.



Tank Pre Clean
Performs a series of tank flushes in preparation for regular maintenance to remove loose scale that may be present in the tank.



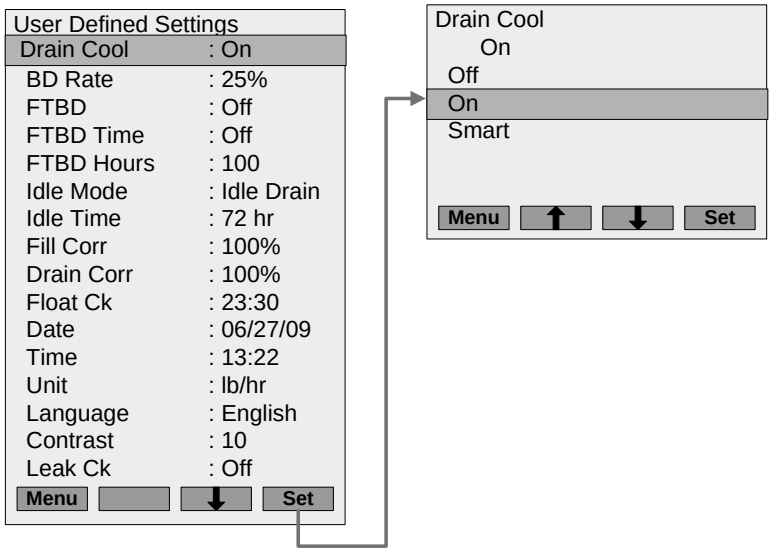
Reset Error History
Deletes the list of errors stored in the error history. The **Error History** is located in the **Diagnostics Menu**. Resetting the error history is not normally required, but can be done after repairs to remove faults that are no longer needed.



Reset Service Reminder
Resets the service reminder after the humidifier has been serviced.

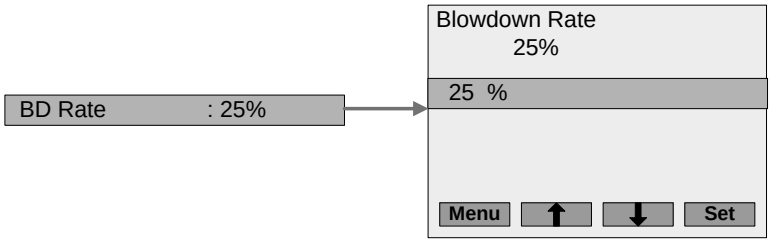
User Defined Settings

The selections in **User Defined Settings** allow you to configure most user configurable features available with the SETC. Press **Set** while highlighting **User Defined Settings** in the **Main Menu**.



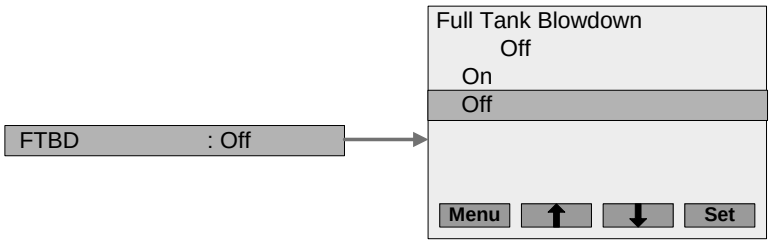
Drain Cool

Selects whether drain water cooling will be performed by adding fill water to drain water. **Off** = fill valve not activated during drain. **On** = fill valve activated whenever drain pump is on, **Smart** = fill valve only activated with drain pump when tank is hot. (Default = Smart)



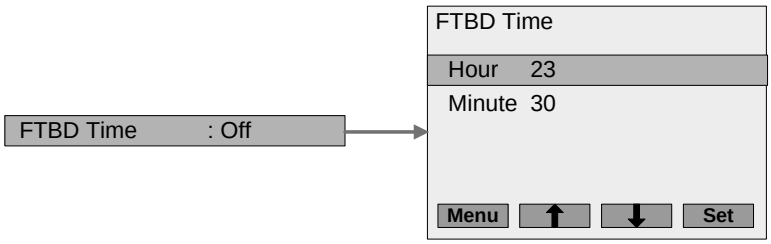
Blowdown Rate

Sets the amount of water as a percentage of steam produced that will be drained to control mineral concentration in the tank. (Default – 25%)



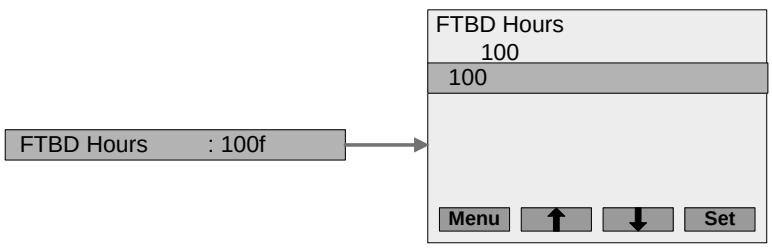
Full Tank Blowdown

Sets whether the tank will be periodically flushed to help flush minerals and scale. Blowdown frequency is controlled by the **FTBD Hours** parameter below. (Default = On)



FTBD Time

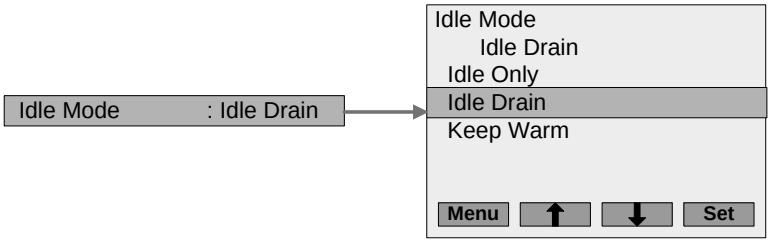
Sets the time of day when a full tank blow down will occur to avoid interrupting humidifier operation during critical times. (Default = 23:30)



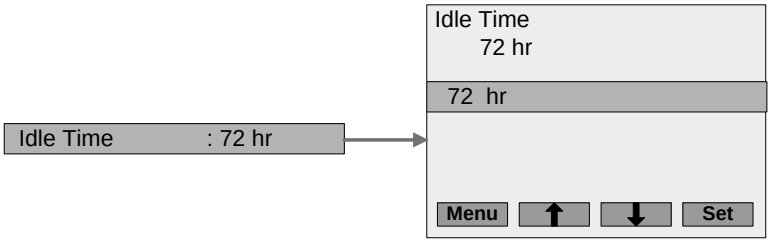
FTBD Hours

Sets the number of hours between full tank blow downs. Hours are accumulated on a weighted basis (1 hour at 50% demand = 0.5 hrs). (Default = 100 hr)

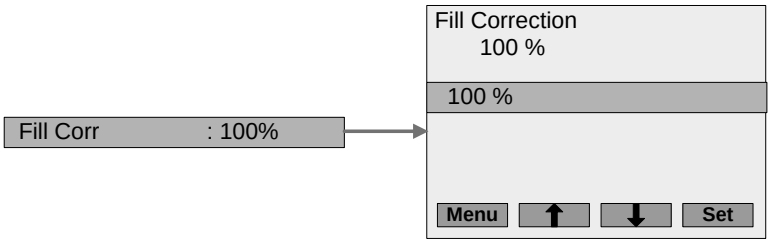
(User Defined Settings Continued)



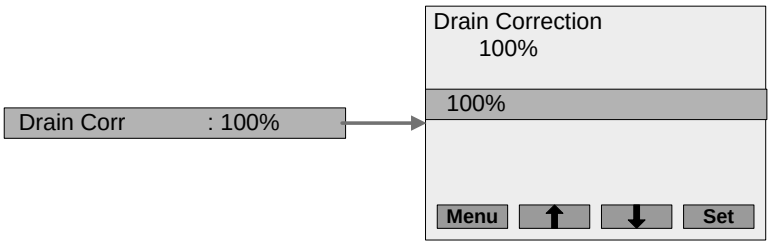
Idle Mode
Sets what the humidifier will do during periods with no demand. **Idle Only** = Do nothing. **Idle Drain** = Drain the tank if there is no demand (wait time set with idle Time parameter). **Keep Warm** = periodically opens control valve to keep tank warm. (Default = Idle Drain)



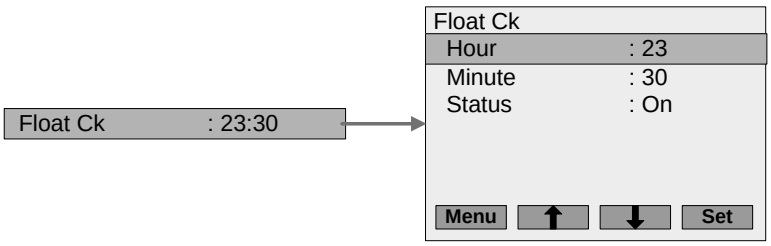
Idle Time
Sets the time without demand before the **Idle Drain** function will drain the tank (if activated) (Default = 72 hr).



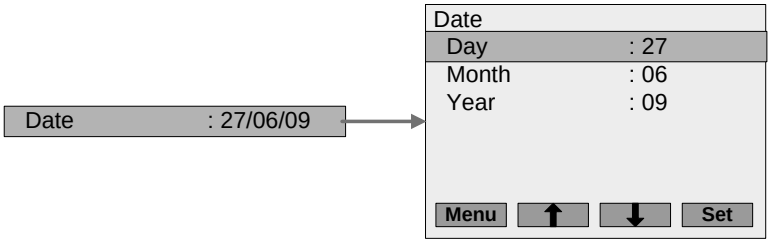
Fill Correction
Increases or decreases the length of fill valve pulses to compensate for abnormal site conditions (Default = 100%).



Drain Correction
Increases or decreases the length of drains to compensate for abnormal site conditions (Default = 100%).

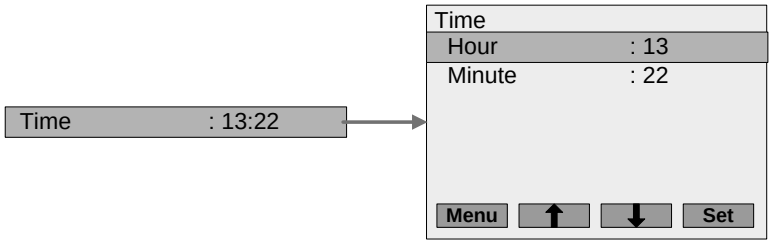


Float Check
Sets the time of day for the float check to verify drains and float operation. Can also disable the float check (Default = 23:30 and On).

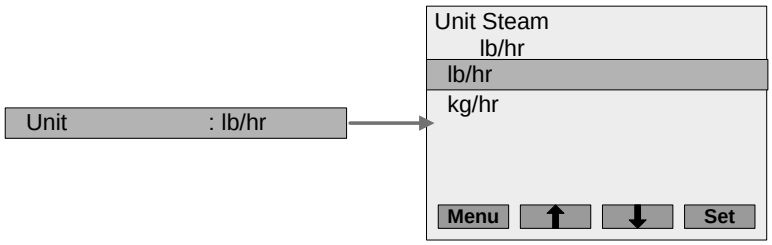


Date
Sets the date. Selecting Day, Month, or year takes the user to a submenu that allows the value to be increased or decreased by pressing up/down arrows. Set accepts the setting.

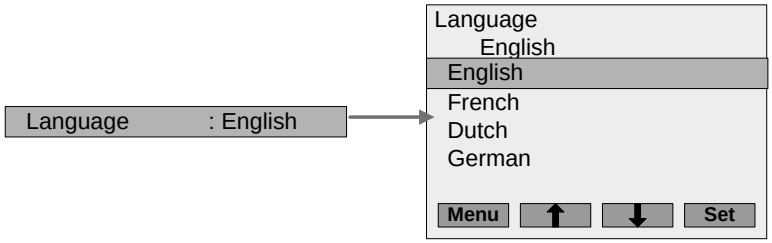
(User Defined Settings Continued)



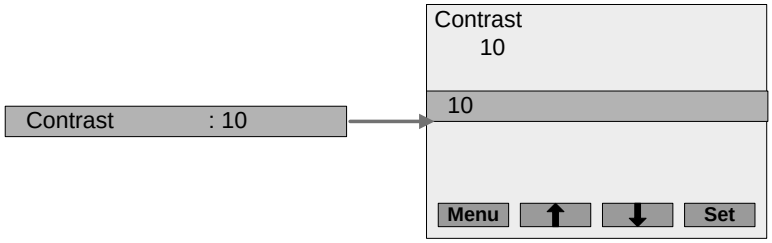
Time
Sets the time of day. Selecting Hour or Minute takes the user to a submenu that allows the value to be increased or decreased by pressing up/down arrows. Set accepts the setting.



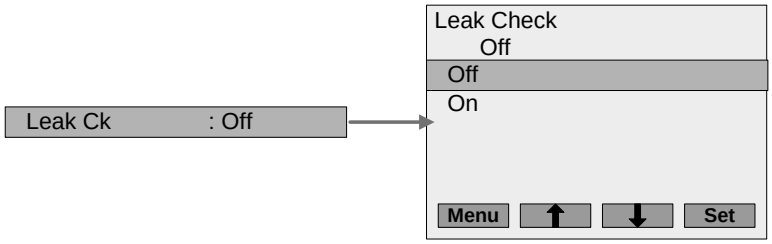
Unit
Sets the units of measure to use for display of steam output to either lb/hr or kg/hr. (Default = lb/hr)



Language
Sets the language to use for the software menu. (Default = English)



Contrast
Adjusts the contrast of the LCD display to improve visibility under different lighting conditions. (Default = 10)



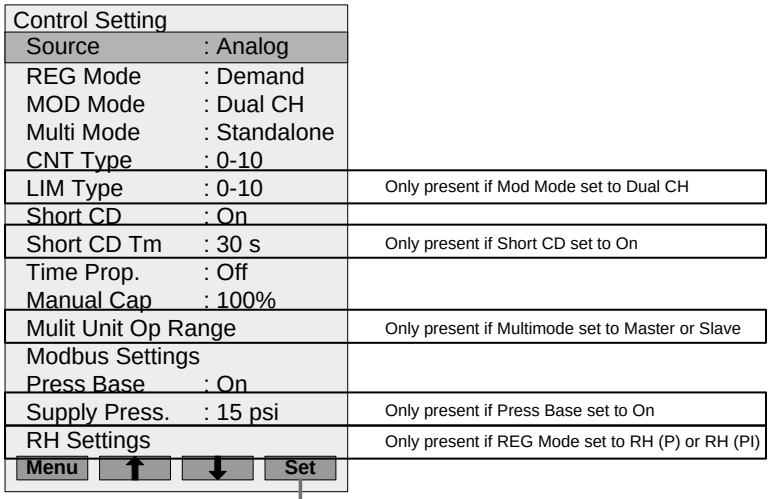
Leak check
Sets whether the controller should monitor tank level during periods of no demand. If on a fault will be generated if water level drops with no demand. (Default = Off)

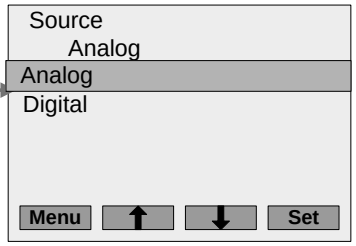
Control Setting

Control Setting allow you to set the type of external controls the humidifier is connected to. In most cases the SETC humidifier is factory configured to operate with the external controls that were specified for the site. Press **Set** while highlighting Control Setting in the Main Menu.

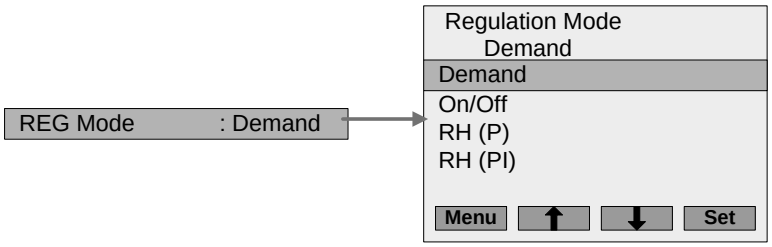
CAUTION: Improper control configuration can result in over humidifying which can result in damage to property.

(Control Settings Continued)

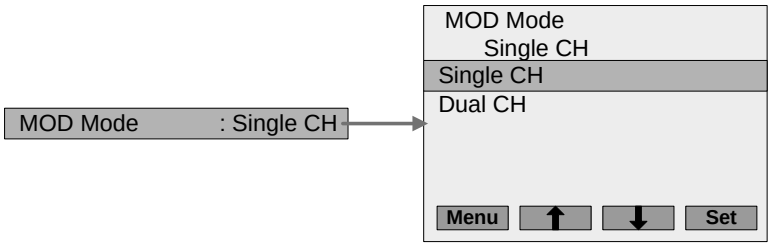




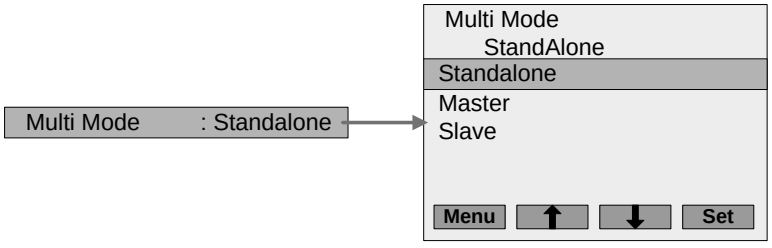
Source
Configures the humidifier to either accept analog control signals from a humidistat or digital signals from a Building Management System



REG Mode
Configures the type of control used with the humidifier. **RH (P)** is proportional only internal control based on a transducer signal. **RH (PI)** is proportional control with an integral.

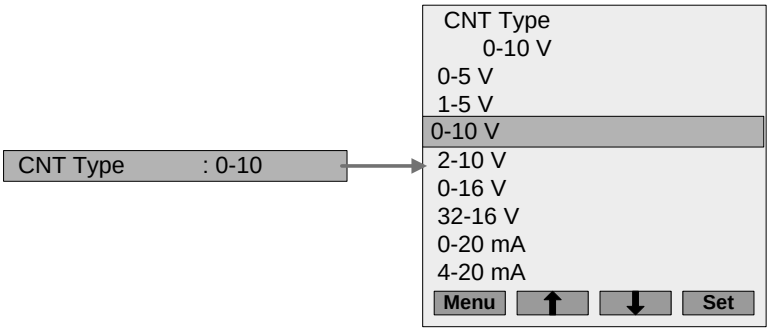


MOD Mode
Configures the humidifier to either operate with a single channel (control only) or dual channel (control and high limit). If an On/Off high limit humidistat is used set **MOD Mode** to Single CH

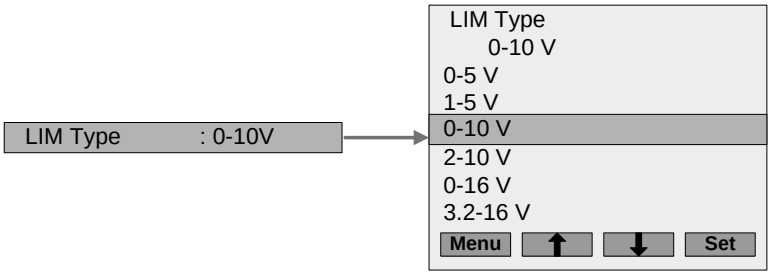


Multi Mode
Use **Multi Mode** to configure the humidifier to operate as one humidifier of a group controlled by a single control signal / transducer signal. See **Multi Unit Op. Range** later in this section. (Default = Standalone)

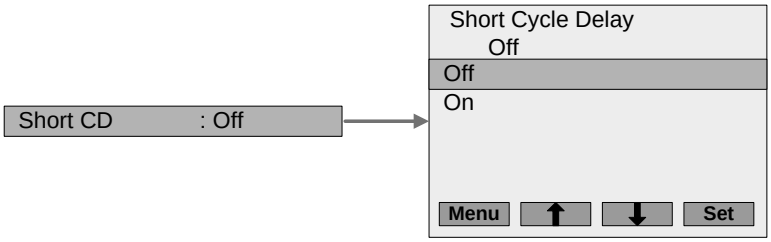
(Control Settings Continued)



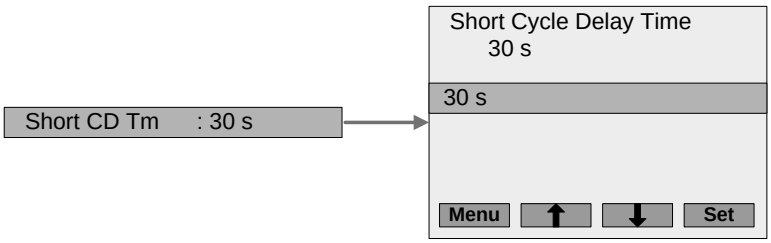
CNT Type
Configures the Volt or amp range of the control signal connected to the humidifier



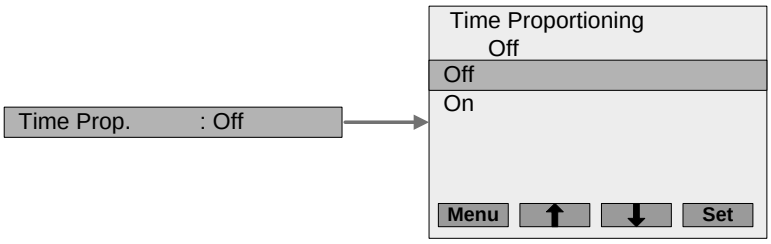
LIM Type
Configures the Volt or amp range of the high limit control signal connected to the humidifier. The type of control, VDC or mA, must be the same as that of **CNT Type.**



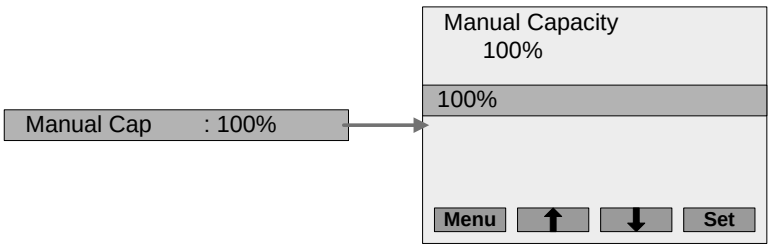
Short Cycle Delay
Sets whether the humidifier must stay off for a fixed period of time (set by the **Short CD Tim** parameter) whenever demand falls below the On threshold to prevent short cycling. (Defualt = Off).



Short CD Tim
Specifies the minimum time the humidifier must remain in idle whenever demand drops to the off condition. It is only shown if **Short CD** is set to On (Default = 30 s).



Time Prop
Sets whether the humidifier will run in time proportioning mode when demand is less than 15%. **On** results in the humidifier turning on and off for short periods of time to simulate low output. (Default = Off).



Manual Cap
Reduces the maximum capacity of the humidifier to a percentage of its full capacity. Use up/down buttons to increase/decrease and press Set to save the setting (Default = 100%).

(Control Settings Continued)

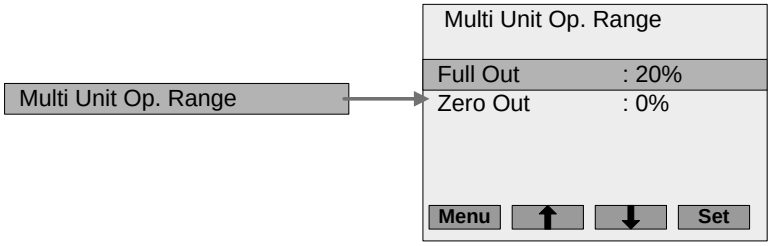
Multi Unit Op. Range

The SETC can be configured to network up to sixteen (10) humidifiers (or equivalent of 10,500 lb/hr or 4,770 kg/hr) using a master slave configuration. To operate the SETC in a staged modulation system:

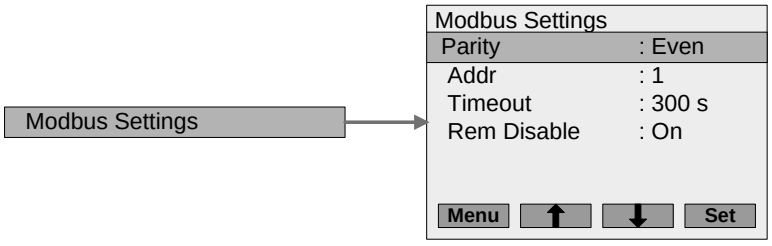
- The humidifiers must be connected in parallel (daisy chained) using the linkup terminal (J2a) on the SETC driver board (See Staged Modulation Wiring on page 30).
- One humidifier must be designated the master and all others as slave units (see Multi Mode on page 52 for software configuration). The master unit must be the unit to which external controls / transducers and safety loop are connected.
- Each humidifier in the system including the master must have the range of demand signal in which it will operate configured (see below). Example, for four humidifiers with equal capacity set the master to operate between 0% and 25%, set the first slave for 26% to 50%, set the second slave for 51% to 75%, and set the third slave for 76% to 100%.

The **Multi Unit Op. Range** submenu is used to configure the humidifier's operating range when **Multi Mode** in the **User Defined Settings** menu is set to either **Master** or **Slave**. Access the **Multi Unit Op. Range** submenu by pressing the menu button while **Multi Unit Op. Range** is highlighted in the **Control Settings** menu.

NOTE: The **Multi Unit Op. Range** submenu is only displayed if the humidifier has been configured as either a **Master** or **Slave**. It is not displayed in **Standalone** mode.

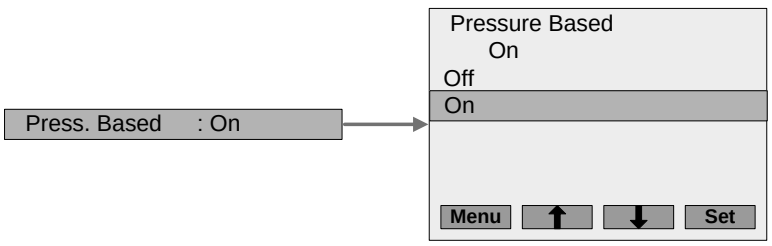


Multi Unit Op. Range
Full Out sets the system demand at which the humidifier should output its full capacity. **Zero Out** sets the system demand at which the humidifier should shut off.



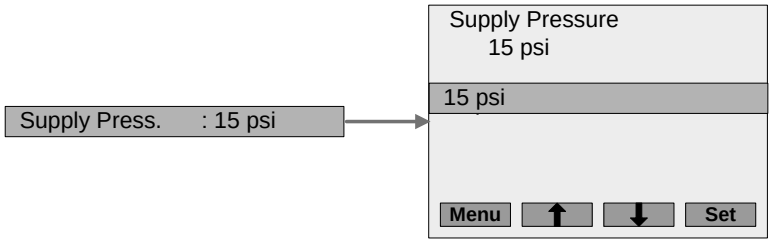
Modbus Settings

Allows configuration of communication parameters. Selecting an item brings up a screen that allows the value to be changed by using the up/down arrow keys. **Rem Disable** allows the user to turn the humidifier on if it has been remotely disabled.



Pressure Based
Configures the humidifier to use steam supply pressure to calculate system output. If set to off the output displayed is based on a supply pressure of 15 psi/1.0342 BAR.

(Control Settings Continued)

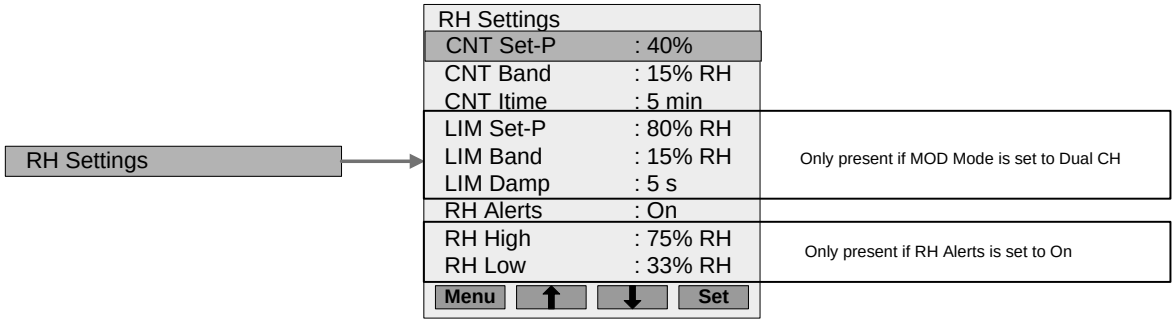


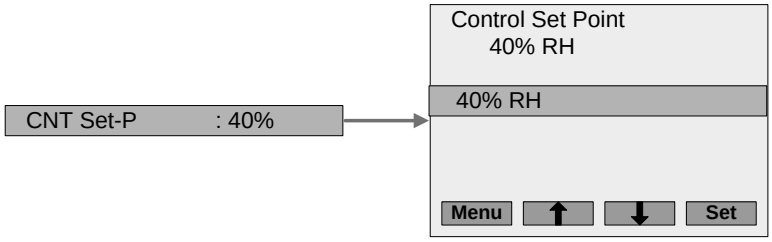
Supply Press
Sets the steam supply pressure for the humidifier to us in displaying its steam output. It is only displayed if **Press Based** is set to On. (Default = 15 psi/1.0342 BAR)

Note: The **RH Settings** menu selection will only be displayed in the **Control Settings** menu if **REG Mode** is set to **RH (P)** or **RH (PI).**

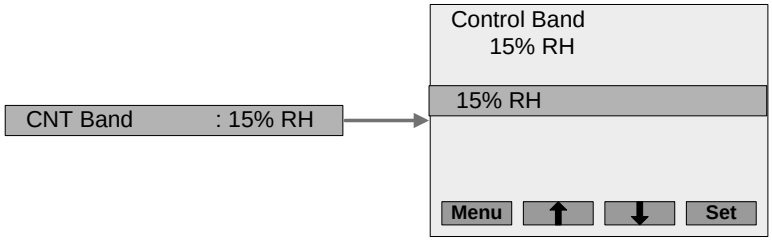
RH Settings

The **RH Settings** submenu is used to adjust set point, the proportional band, and the integral time if **REG Mode** is set to **RH (P)** or **RH (PI)** and the humidifier is connected to humidity sensors. Access the **RH Settings** submenu by pressing the menu key while **RH Settings** is highlighted in the **Control Settings** menu.

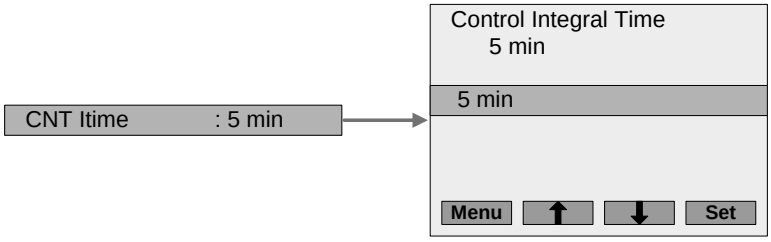




CNT Set-P
Sets the humidity set point value. The humidifier will attempt to maintain this humidity level in the space where the control transducer is installed.

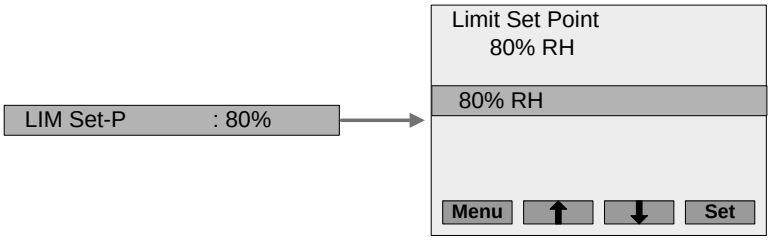


CNT Band should not normally be changed. The **CNT Band** setting adjusts the band within which the humidifier will modulate between 0 and 100% output. (Default = 15%)

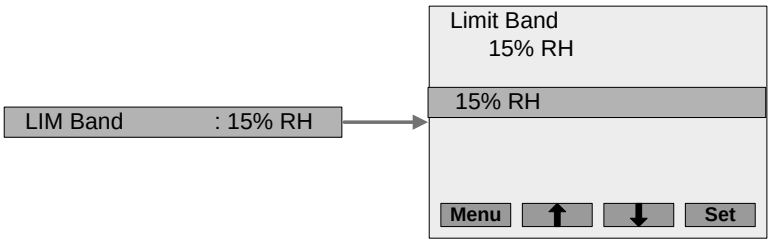


Int Time should not normally be changed. **Int Time** adjusts the frequency at which the controller corrects for proportional control error. It is only displayed if REG Mode is set to RH (PI) (Default = 5 min)

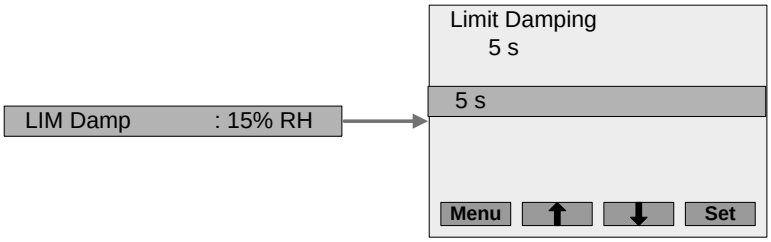
(RH Settings Continued)



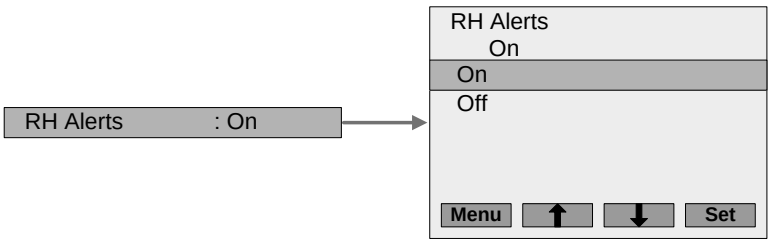
LIM Set-P
Sets the duct high limit set point value. As RH in the duct approaches the high limit the output of the humidifier will be throttled back to prevent wetting the duct. (Default = 80%)



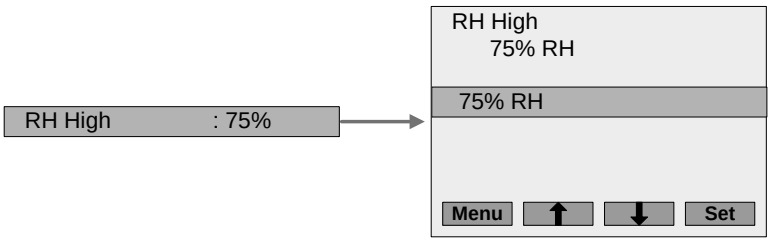
LIM Band
Should not normally be changed. The **LIM Band** setting adjusts the band within which the humidifier will throttle down the humidifier output from 100 to 0%. (Default = 15%)



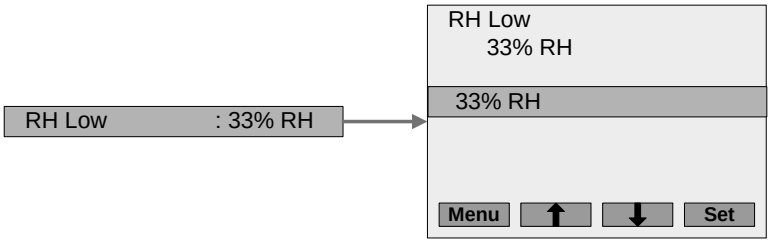
Limit Damping
Sets the number of seconds the sensed RH must exceed the limit band before output is throttled down. (Default = 5 s)



RH Alerts
Sets whether the humidifier will display warnings when humidity rises above or falls below configured limits. (Default = Off)



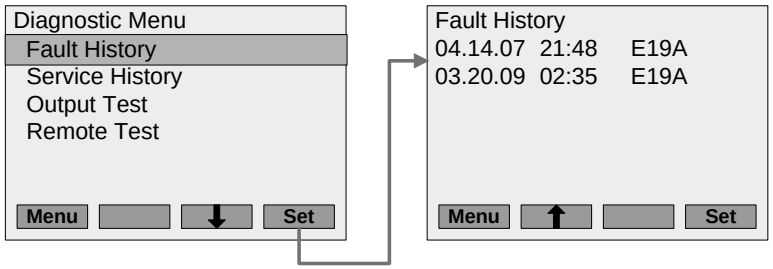
RH High
Sets the RH level above which the humidity must rise before a warning is generated. Warning is only generated if **RH Alerts** is set to on.



RH Low
Sets the RH level below which the humidity must fall before a warning is generated . Warning is only generated if **RH Alerts** is set to on.

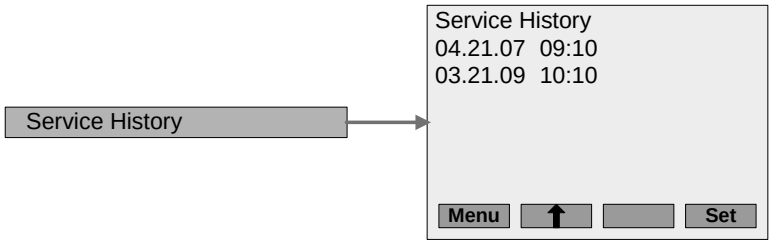
Diagnostic Menu

The **Diagnostic Menu** provides a historical list of errors and service recorded by the humidifier's software as well as providing the ability to manually activate humidifier components for troubleshooting purposes. Press **Set** while highlighting **Diagnostic Menu** in the **Main Menu**.



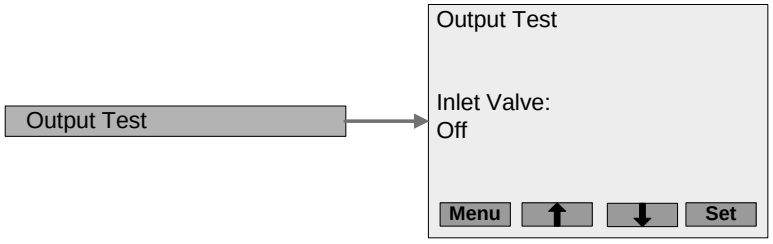
Fault History

Displays a list of faults which the controller has recorded. It shows the date and time at which the faults occurred. Refer to Table 10: Troubleshooting Warnings and Faults on page 72 for meaning of codes and suggested actions to correct faults.



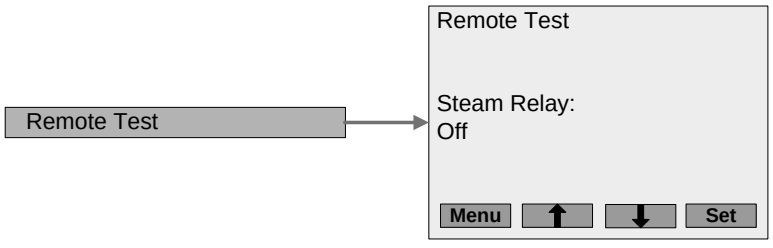
Service History

Displays a list of service that has been performed on the humidifier. It displays the date and time of service.



Output Test

Provides a means for activating all humidifier components (inlet valve, drain pump, etc.) for diagnostic purposes so long as the security loop is closed. Components can be activated one at a time. Scroll to component to be tested using **up/down** buttons, press **Set** once to activate, press again to turn off.



Remote Test

Provides a means for testing of remote fault relays to confirm they are operating correctly. Relays can be activated one at a time. Scroll between relays with **up/down** arrow buttons and press **Set** once to turn on relay, press again to turn it off.

Maintenance and Servicing

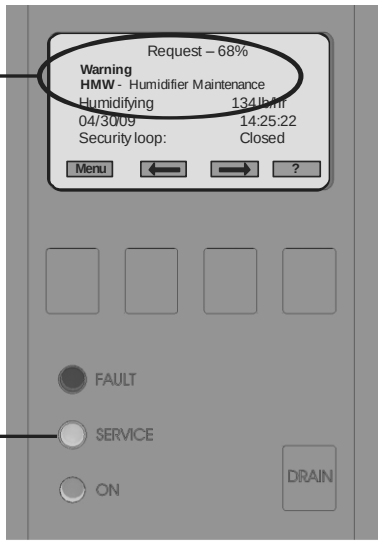
Required Maintenance

Caution: Power to the humidifier should always be turned off using the dedicated external disconnect before removing the door or side panel, or before doing any service work on the humidifier.

Service Warning / Fault

The SETC controller includes a timer that monitors the humidifier's operating hours and generates a warning when service is required. Optimal maintenance time is dependent on water supply conditions and humidifier usage. The default factory service reminder is equivalent to 500 hours of operation at 100% output. Failure to perform maintenance when the service warning is displayed will cause the unit to lock out. Condair is not responsible for any damages resulting from, or attributed to not performing required maintenance. (See Manufacturer's Warranty).

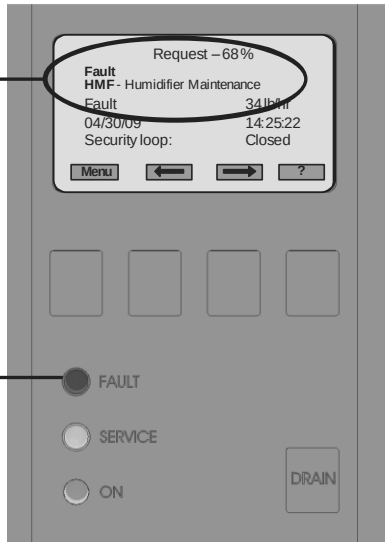
Service LED On
+
HMW - Humidifier Maintenance
=
Service timer has expired and humidifier needs maintenance



Warning
When the software determines that the service timer has elapsed it first displays a warning and turns on the yellow service LED. The humidifier will continue to operate for another 200 hours after the warning is displayed.

+ 200 Hours

Fault LED On
+
HMF - Humidifier Maintenance
=
Service timer + 200 hours has passed. Maintenance must be performed. Humidifier has shut down.



Fault
After 200 hours the humidifier will display a fault and shut down.

If maintenance is not possible the humidifier can be temporarily put back into service by turning the humidifier off and on. The humidifier will run for another 200 hours.

This reset can be repeated 4 times after which the humidifier will not run until the **Reset Service Reminder** function is entered in the software's service level.

Figure 34: Service Warning / Fault

Maintenance Schedule

Regular maintenance is required to keep the Condair SE Series humidifier operating at its peak capacity and efficiency. Follow the maintenance schedule shown in Table 8: SE Humidifier Maintenance Schedule to ensure long humidifier life and peak performance.

Table 8: SE Humidifier Maintenance Schedule

Item	30 Days After Start-up	When Service Light is Lit	End of Season	What to Do
Tank	✓	✓	✓	1. Remove service door and inspect for scale. 2. Remove scale deposits from tank walls using plastic scraper. 3. Collect scale deposits from tank bottom using wet vac or scraper and bucket.
Heat Exchanger	✓	✓	✓	1. Remove service door and inspect for scale. 2. Remove scale deposits from tank walls using plastic scraper. 3. Collect scale deposits from tank bottom using wet vac or scraper and bucket. 4. Once per season remove heat exchanger, clean, and inspect.
Gaskets	✓	✓	✓	1. Inspect for cracking or damages. 2. Remove any scale deposits before re-installing.
Float Chamber	✓	✓	✓	1. Remove float chamber, and float chamber lid. 2. Clean any scale deposits from walls and float magnets. 3. Re-install magnets.
Heater System			✓	1. Inspect for dust and dirt build-up. 2. Blow clean with compressed air.
Fill System	✓		✓	1. Inspect for leaks at float chamber and fill valve.
Drain System	✓		✓	1. Inspect for leaks at drain pump, auxiliary drain, and internal vacuum break.
Steam Trap			✓	1. Inspect for deposits and float operation. 2. Replace thermal disk if necessary. 3. Clean all ports and inside of trap body.
Wye Strainer			✓	1. Remove service plug and clean out collector screen.
Steam Valve			✓	1. Inspect actuator operation. 2. Perform leakage test to ensure that valve is closing properly.
Boiler Pressure			✓	1. Inspect Pressure Reducing Valve operation. Pressure must not exceed 15 psi/1.0342 BAR

Note: After performing the first maintenance on the SETC it is possible to increase or decrease the service period to match water conditions. If the tank, heat exchanger, and float chamber are relatively clean and free of scale consider increasing the service period. If there is a lot of scale and it is difficult to remove then reduce the service period and consider increasing the blow down setting.

Cleaning the Tank

The tank, heat exchanger, and float chamber should be cleaned at least once per season to remove scale and mineral deposits which can reduce unit efficiency. In areas with high mineral content in the water, cleaning should be more frequent.

Warning

- Disconnect main power at the external disconnect before any servicing.
- Tank and piping may be hot, take care when handling.
- Avoid using de-scaler chemicals or caustic chemical which can damage the tank or heat exchanger.

1. Follow Maintenance Shutdown and Extended Shutdown procedure on page 65. Give the unit some time to cool down to avoid injury when servicing.
2. Remove the cabinetry covers on the front (all models) and top (SE 525 – 1050 models) by removing the Phillips type screws and lifting the covers.
3. Remove the tank maintenance doors on the front (all models) and top (SE 525 – 1050 models) by applying penetrating lubricant to nuts and using 1/2 in. (12 – 13 mm) socket. Remove excess lubricant.
4. Inspect the tank door gaskets. Remove any scale from the gaskets, the tank door gasket surface, and tank gasket surface.
5. Using a plastic scraper, such as those used for car windshields, remove scale adhered to tank walls and visible portions of the heat exchanger. Remove this scale from the unit. A wet vacuum can be used for this purpose.
6. Inspect the heat exchanger. If significant scale build-up has occurred, follow the cleaning procedure in the next section.

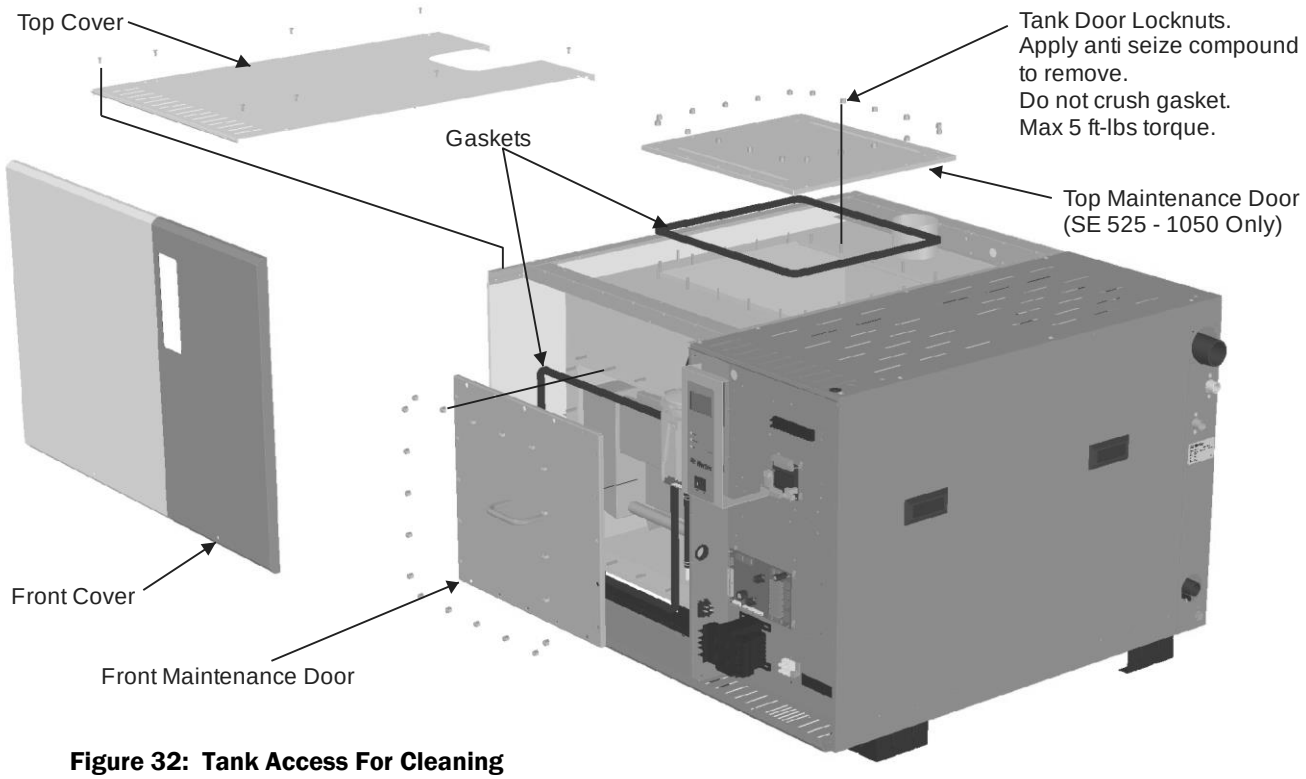


Figure 32: Tank Access For Cleaning

7 Apply anti-seize compound to the mounting nuts. Reinstall the gaskets and tank doors. When tightening the tank door nuts, take care not to over tighten. The tank door nuts should only be torqued to 5 ft-lbs (approx. 7 N-m) to prevent crushing the gasket underneath.

Cleaning the Heat Exchanger

1 Follow Maintenance Shutdown and Extended Shutdown procedure on page 65. Give the unit some time to cool down to avoid injury when servicing.

2 Remove the cabinet cover on the right side by removing the Phillips type screws and lifting the covers.

3 Disconnect the union that transports steam into the heat exchanger and remove the F&T trap by disconnecting the two unions that hold it in place.

4 Apply penetrating lubricant to heat exchanger nuts and remove with 1/2 in. (12 – 13 mm) socket. Remove excess lubricant.

5 Remove the heat exchanger(s) by pulling on the handle and sliding the heat exchanger out of the unit.

Note: Heat exchangers are heavy, use proper lifting technique when removing them. It is helpful to have an assistant help remove the heat exchanger.

6 Inspect the heat exchanger gaskets. Remove any scale from the gaskets, the heat exchanger gasket surface, and tank gasket surface.

7 Using a plastic scraper, such as those used for car windshields, remove scale adhered to the heat exchanger.

8 Reinstall heat exchanger gaskets and heat exchanger. When anti- tightening nuts, take care not to over tighten. Only torque nuts to 5 ft-lbs (approx. 7 N-m) to prevent crushing the gasket underneath.

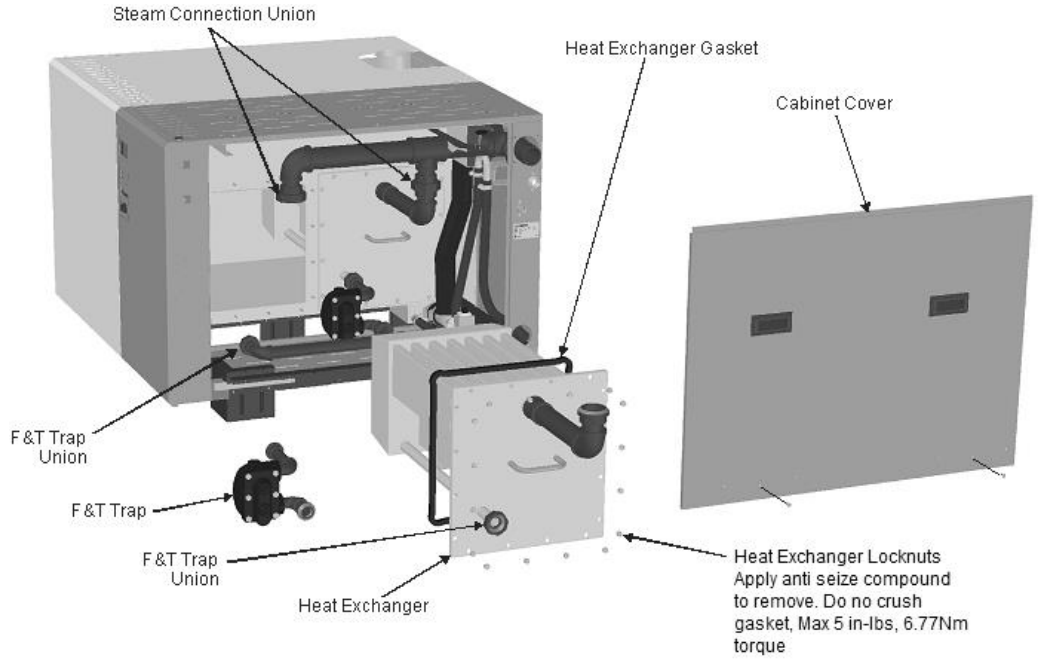


Figure 336: Heat Exchanger Removal

Cleaning the Float Chamber

1. Follow Maintenance Shutdown and Extended Shutdown procedure on page 65. Give the unit some time to cool down to avoid injury when servicing.
2. Remove the cabinet covers on the front of the unit by removing the Phillips type screws and lifting the covers.
3. Disconnect the electrical connection to the float board.
4. Remove the hose clamps and the hoses from the top and bottom of the float chamber.
5. Remove the reusable tie-wrap from the float chamber by inserting a small screw driver into the top of the buckle.
6. Squeeze both sides of the mounting bracket to release the float chamber from the slots on the support bracket.
7. Use a screw driver to remove the 3 screws from top of the float chamber and remove the lid. Using a small brush or plastic scraper remove any scale from the inside of the chamber.
8. Magnetic floats are polarity sensitive, ensure they are installed with an orientation that causes them to be attracted to one another when parallel.
9. Re-installation is the reverse of removal.

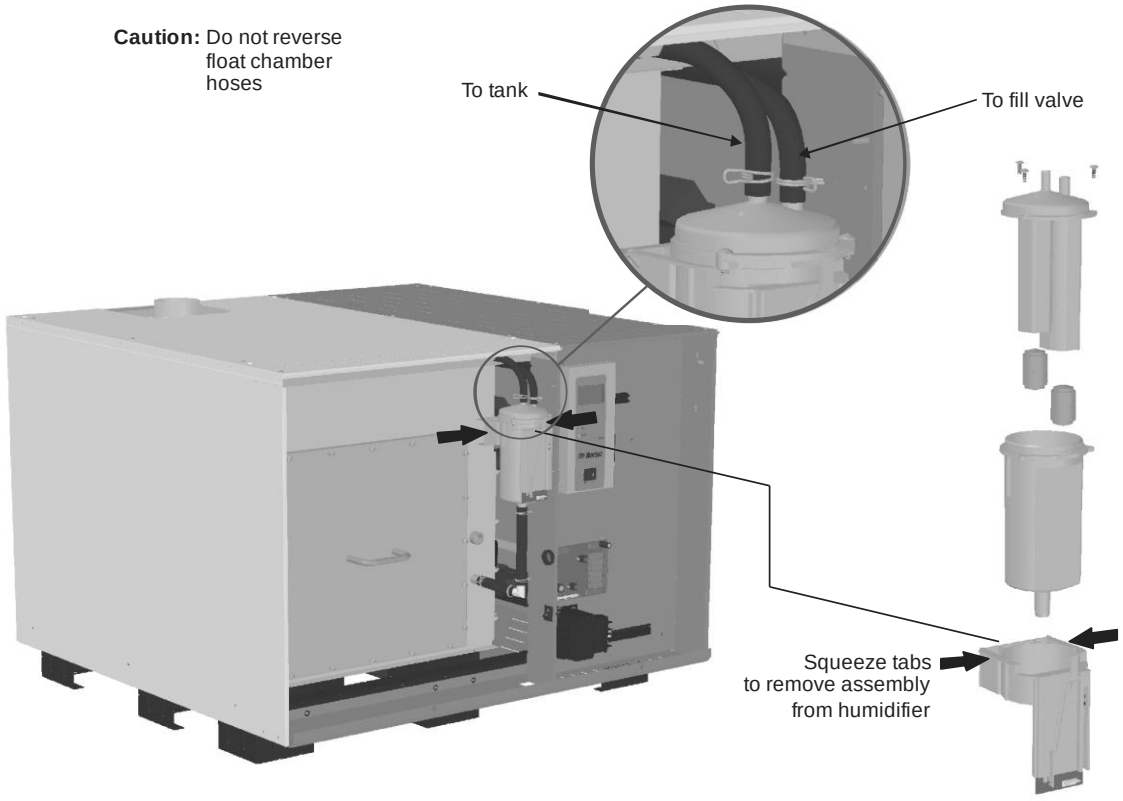


Figure 37: Float Chamber Cleaning

Resetting Service Reminder

After completing maintenance of the SETC reset the service reminder by following the procedure outlined in Reset Service Reminder on page 48.

NOTE: If the "Service Reminder" is not reset the humidifier may fault out on the Humidifier Maintenance Fault despite the fact that the maintenance has been performed.

Maintenance Shutdown and Extended Shutdown

The following procedure should be followed to shut down the humidifier for maintenance or should it be required to disconnect power to the humidifier for a period of extended shut-down.

When performing maintenance, the SETC models include a Tank Pre-Clean feature. Tank Pre-Clean will activate the drain pump to flush out some of minerals in the bottom of the tank, then refill partially with cold water to cool the tank, and finally drain the contents of the tank. This cycle will cool the tank, as well as flush out some deposits.

1. SETC - Activate Tank Pre-Clean as described in Tank Pre Clean on page 48 or press and release the drain button to simply drain the tank.
2. SETC - If preclean was activated wait until the LCD display indicates the preclean is complete otherwise wait until no water is coming out from the drain.
3. When the tank has completed draining, turn the main power switch to “Off”. Also, shut off the electrical power at the disconnect.
4. Close the manual shut-off valve on the pressurized steam supply.
5. Close the manual shut-off valve on the water supply line.
6. Briefly open the manual valve on the auxiliary drain line (if applicable) to drain any remaining water.
7. The unit can now be serviced (if maintenance is being performed), or “stored” in this state until the next humidification season. Alternatively, SETC models can be left in 3 day drain state during an “off-season”.
8. To restart the unit follow Start Up Procedure on page 35.

Note: As long as the SETC is powered, it will automatically drain the tank when there has not been a call for humidity for an extended period of time. This feature will reduce or prevent the possible accumulation of algae and bacteria growing in the tank. The tank will remain empty until there is a call for humidity at which time the fill valve will open and refill the humidifier tank. The unit will go through its normal process for optimum operation.

SETC Maintenance Checklist

Model #: _____

Serial #: _____ Tag: _____

System Check

- HMW (Maintenance Warning) ☐ HMF (Maintenance Fault) ☐
- Other warnings or Faults shown in display / LED's? No ☐ Yes ☐ _____
  (See Troubleshooting Chapter for actions to address warnings and faults if present)

Clean Tank / Heat Exchanger / Float Chamber

- Tank drained. ☐
- Disconnect open, On/Off switch to Off. ☐
- Water shut off and manual steam valve closed, cabinet covers removed. ☐
- Penetrating lubricant applied to tank maintenance door nuts. ☐
- Maintenance doors removed (front and top of 525+). ☐
- Tank maintenance door gaskets cleaned and in good condition. ☐
- Scale removed from tank. ☐
- Heat Exchanger has scale and needs cleaning? No ☐ Yes ☐

  If Yes:
  - Steam supply and condensate unions disconnected. ☐
  - Penetrating lubricant applied and heat exchanger nuts removed. ☐
  - Heat exchanger removed. ☐
  - Heat exchanger gaskets cleaned and in good condition. ☐
  - Heat exchanger cleaned with plastic scraper. ☐
  - Anti-seize compound applied and Heat exchanger reinstalled. ☐
    Nuts torque to 5 ft-lb ☐
  - Anti-seize compound applied and steam supply/condensate unions reconnected. ☐
- Tank maintenance doors reinstalled. ☐ Nuts torque to 5 ft-lb (7 N-m). ☐
- Float Chamber removed inspected and cleaned. ☐

General Inspection

- Electrical wiring not loose and in good condition. ☐
- Steam hoses and steam lines in good condition / No kinks in hose. ☐
- No Signs of water leaking around humidifier, steam line, condensate returns. ☐
- Cabinet covers replaced, water shut off valve opened, manual steam valve opened, On/Off switch to On, Disconnect Closed. ☐
- SETC only - "Reset Service Reminder" in Software, (Password 0335, Service Level). ☐

Inspected by:_____ Date of inspection: _____/_____/_____

Company:_____

Troubleshooting

Organization of Troubleshooting Chapter

The troubleshooting chapter is broken down into 2 sections.

General Troubleshooting	Deals with troubleshooting incorrect humidifier operation, steam line, and plumbing issues without any control software warnings or faults.
Humidifier Warnings and Faults	Deals with warning and error messages that are generated by the humidifier's control software.

CAUTION: Be aware, when troubleshooting, that the humidifier is powered by high voltage and pressurized steam. Familiarity with both good practices and wiring of the humidifier is recommended. Any troubleshooting that requires opening the cabinet should be done by qualified personnel.

NOTE: Most humidifier faults are not caused by faulty equipment but rather by improper installation. A complete fault diagnosis always involves a thorough examination of the entire system. Often, the steam hose connection has not been properly executed, or the fault lies with the humidity control system.

Troubleshooting Requirements

- Humidifier maintenance should be completed as per the SETC Maintenance Checklist on page 66 prior to any in depth troubleshooting of the humidifier systems operation. System problems may be resolved/prevented with proper humidifier service.
- Ensure the installation meets the installation requirements outlined in the Installation Chapter of this manual.
- Familiarize yourself with the operation of the humidifier by reading the Operation Chapter of this manual.
- Wiring diagram specific for your humidifier is installed on the inside of the humidifier door. A generic copy of the SETC wiring diagram is also included at the end of this chapter for reference purposes.
- When contacting your local representative or Condair for troubleshooting assistance, please ensure the serial number has been obtained for reference purposes.

General Troubleshooting

The following section provides general guidelines for troubleshooting the SETC humidifier and auxiliary components. For detailed troubleshooting information refer to the manuals provided with auxiliary equipment, to Table 10: Troubleshooting Warnings and Faults.

Humidifier

Table 9: General Troubleshooting

Symptom	Cause	Corrective Action(s)
Nothing happens when On/Off switch is turned on.	1 Fuse blown	1 Check inline fuse in yellow housing between transformer and driver board. Check and replace fuse on driver board.
	2 Incorrect or no Voltage	2a Check voltage against spec label and correct. 2b Check disconnect and ensure humidifier is getting power.
	3 Step Down Transformer not outputting 24VAC	3 Replace the transformer
Humidifier will not humidify or not reaching RH set point	1 Safety loop open	1a Check if green LED is flashing on the humidifier display. 1b Check if there is 24 VAC at terminal 2. 1c Check wiring and operation of On/Off devices connected to terminal 1 and 2. Ensure they are closing when they should be.
	2 High limit limiting output	2 Check if the high limit is installed too close to the humidifier and if it is operating correctly.
	3 No signal on Channel 1	3 Check voltage between terminal 3 and 4. For demand configuration 15% of full scale signal must be present for humidifier to start. For transducer configuration the signal must be lower than set point for the humidifier to start.
	4 No signal on Channel 2 (For units configured for dual channel operation).	4 Check voltage between terminal 5 and 3. For demand configuration 15% of full scale signal must be present for humidifier to operate. For transducer configuration the signal must be lower than set point for the humidifier to start..
	5 Capacity has been manually limited	5 Check Manual Capacity on status screens. Adjust “Manual Cap” in the “Control Setting” menu if necessary.
Humidifier has faulted or has a warning	1 Software has detected an abnormal condition	1 Refer to Table 10 Troubleshooting warnings and faults.

Steam Distributors

Symptom	Cause	Corrective Action(s)
Distributor spitting out water	1 Distributor not level	1 Use support at end of distributor to ensure it is level.
	2 “P” Trap too close to distributor	2 “P” Trap must be a minimum of 12 in (30 cm) below the distributor to ensure flow. Relocate if required.
	3 Condensate line not sloped sufficiently	3 Sufficient slope to ensure flow is required. Reinstall if required.
	4 Trap blocked	4 Check that water flows through trap. Clear out if blocked.
	5 Condensate line double trapped	5 Condensate lines must not have two traps in sequence. This can cause an air lock and prevent water draining.
	6 Steam line not insulated	6 If steam line is long, condensate build up could overload distributor condensate port. Insulate line to improve efficiency and install additional condensate traps as required.
Condensation in duct	1 Installation clearances not observed	1 Refer to distributor installation manual for required clearances. Relocate distributor if required.
	2 Design conditions changed	2 Check supply air temperature and humidity to determine if conditions have changed.
	3 High limit not functioning	3 Check setting and operation of high limit. Replace if defective.
	4 Air proving not installed or not working	4 Check that the humidifier will only operate when there is air moving in the duct.
	5 Improper location of high limit	5 Check that high limit is installed where it can detect high duct humidity.

Blower Pack

Symptom	Cause	Corrective Action(s)
Blower not operating **Note:** Blower pack does not come on unless the humidifier is producing steam.	1 No power to blower pack	1a Check power connection. 1b Check blower pack fuses
	2 On/Off Thermostat not closing	2 Check wiring to thermostat replace if it does not close when it is exposed to steam.

Digital Humidistat

Symptom	Cause	Corrective Action(s)
Humidistat Reading incorrectly	1 Sensor out of calibration	1 Check reading against known reliable instrument. If out of calibration follow the instructions provided with the humidistat to recalibrate.
	2 Improper sensor location	2 Check that the humidistat is positioned in a location representative of room humidity.
	3 Exposed to draft or heat source	3 Check that heat/cold fluctuations, drafts, sunlight, doors, or vents are affecting the reading.
	4 No vapour barrier	4 Ensure drafts cannot affect reading by verifying vapour barrier is in place and working.

SETC Warnings and Faults

The self-diagnostic system built into the SETC is continually monitoring the operation of the humidifier.

Warnings

- When problem symptoms are detected, the SETC will attempt to take self-corrective actions to try to correct the problem. A warning is displayed on the screen for information purposes and the humidifier continues to operate.
- If the condition which generated the warning is eliminated the warning is cleared from the display.

Faults

- If the humidifier is not able to self-correct a problem symptom it will, if necessary, respond by shutting itself down.
- When this occurs the humidifier illuminates the red "Fault" LED, shuts off the signal to the control valve actuator, and activates the "Error" relay of the remote relay board.

Clearing a Fault

- Check the fault message that the humidifier is displaying and take any necessary actions to correct the cause(s) as outlined in Table 10, Troubleshooting Warnings and Faults.
- Power cycle the humidifier with the On/Off switch waiting 3 seconds between turning it off and on.

Table 10: Troubleshooting Warnings and Faults

Code	Display Message	LED	System Detected	Cause	Corrective Action(s)
DCF	Drain Ck Fault	Red	The drain pump is activated but water level has not decreased	1 Drain blocked	1 Check water flow at air gap when drain activated. Flow should be > 5 gal (20 l) / min.
				2 Pump not working	2a Check wiring to pump. 2b Activate pump with diagnostic output test and verify pump runs and drains water.
				3 Floats stuck	3a Watch float board lights while manual drain is activated. Verify lights activate in sequence 3b Remove float chamber and check for scale

FCF	Fill Check Fault	Red	The fill valve has been active for an extended time without increasing a float level.	1 Water supply off or inadequate	1a Ensure water line is open and that adequate water supply and pressure is available.
				2 Fill valve strainer blocked	2a Disconnect water supply line and remove strainer. Clear if obstructed.
				3 Fill Valve not activating	3a Check wiring to fill valve. 3b Activate fill valve with diagnostic output test. Verify water is flowing when activated.
				4 Float board not detecting water	4a Check wiring to float board.
				5 Manual drain switch on or auxiliary drain open.	5a Check that manual drain switch is not on. 5b Check that auxiliary drain valve is closed.
FIF	Float Inconsist.	Red	The unit registers that the float levels do not increase logically from 1 to 5	1 High water flow from fill valve to float chamber cooling.	1 Check flow from fill valve hose connected to float chamber and flows at 0.35 LPM. If not check hose is connected to correct side of fill valve or if orifice is missing in fill valve.
				2. Float chamber or board not in place	2 Check that float board is properly installed in plastic support , that tie wrap is in place, and that float reservoir is in place.
				3 Float level sensor is malfunctioning.	3 Squeeze bottom hose from float chamber and activate fill valve using diagnostic output test. Watch for proper light sequence. Replace assembly if sequence is incorrect.

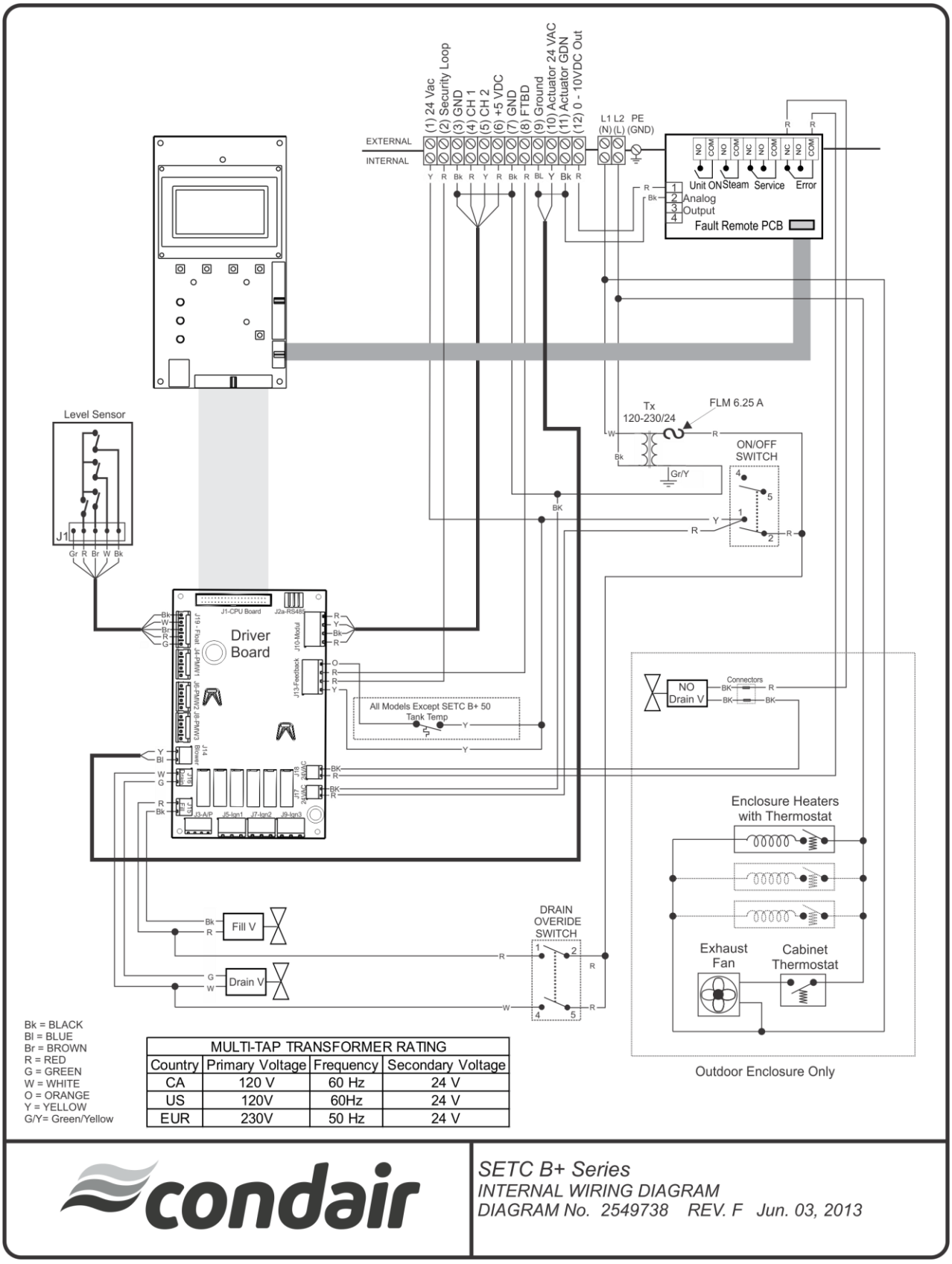
FLF	Float Level	Red	More than one Float Level is registering at the same time	1. Float chamber or board not in place	1 Check that float board is properly installed in plastic support , that tie wrap is in place, and that float reservoir is in place.
				2 Float level sensor is malfunctioning.	2 Squeeze bottom hose from float chamber and activate fill valve using diagnostic output test. Watch for proper light sequence. Replace assembly if sequence is incorrect.
FTF	Fill Fault / Warning	Red	The fill valve has been active for an extended time without reaching level 1.	1 Water supply off or inadequate	1a Ensure water line is open and that adequate water supply and pressure is available.
				2 Fill valve strainer blocked	2a Disconnect water supply line and remove strainer. Clear if obstructed.
FTW				3 Fill Valve not activating	3a Check wiring to fill valve. 3b Activate fill valve with diagnostic output test. Verify water is flowing when activated.
				4 Float board not detecting water	4a Check wiring to float board.
				5 Manual drain switch on or auxiliary drain open.	5a Check that manual drain switch is not on. 5b Check that auxiliary drain valve is closed.
HMF	Maint. Fault / Warning	Red	The Humidifier Maintenance interval and 72 hour window for cleaning has expired	1 Humidifier requires maintenance	1 Perform humidifier maintenance as described Maintenance Schedule on page 61
HMW		Yel	The preset service interval time has expired.	2 Service reminder not reset after maintenance	2 Reset service reminder as described in Reset Service Reminder on page 48
KWF	Keep Warm Fault	Red	Keep Warm activated but tank temperature has not increased within time allotted	1 Tank temperature sensor not detecting warm tank.	1a Check tank to see if hot (caution). 1b Check wiring to tank temperature sensor. 1c Check if sensor closed when tank is hot.

KWF (Cont)				2 No steam supply to humidifier.	2a Check that isolation valve is not closed. 2b Check if boiler steam is available. 2c Check if control valve opens using diagnostic output test.
				3 Condensate not draining from heat exchanger.	3a Check that F&T trap is allowing condensate to drain.
LKF	Leak Fault / Warning	Red	Float level has dropped multiple times while no steam is being produced.	1 Steam leaking through control valve	1a Valve actuator not adjusted. Follow Figure 12: Control Valve Actuator Installation on page 17. 1a Control valve defective. Replace control valve.
LKW				2. Auxiliary drain is leaking.	2a Check that auxiliary drain valve is closed and is not leaking.
				3. Tank or fittings are leaking.	3a Check for leaks from tank, tank covers, and fittings.
LMI	Limit Instable		Limit signal Is not stable.	1 High limit humidistat too close to steam distributor	1 Locate the high limit humidistat a minimum of 10 feet (3 m) from the distributor.
				2 High limit humidistat setpoint too low	2 Adjust the high limit setpoint to 85% or more.
				3 Improper Proportional and Integral settings in control	3 Adjust proportional and integral settings to reduce swings in demand signal.
				4 Defective control	4 Replace defective control
MEM	Flash R/W Fault	Red	Controller Memory failure	1 Software has detected a hardware problem with main control board	1 Restart humidifier, if error occurs within 1 minute replace main control board. If error does not occur then primary power fluctuation may be the cause.
MTW	ModBus Timeout		No Modbus signal	1 Loose connection	1 Check connections and polarity of wires.
				2 Incorrect Modbus address	2 Check that Modbus address of humidifier matches that of master.

MTW (Cont)				3 Humidifier configured for Modbus but not connected to network	3 Configure controls correctly in "Control Setting" level of software (see Operation Chapter).
				4 Improper wire used	4 Use 120 Ohm impedance shielded twisted pair cable.
				5 Noise preventing humidifier from detecting signal.	5 Eliminate source of noise causing interference.
NSW	No Signal Warning		No communication is detected from Master unit. (This unit is set up as slave)	1 Improper wiring	1 Check wiring connections, polarity, and type of wire used. (See Staged Modulation Wiring on page 30)
RDW	Remote Disabled		The unit has been remotely disabled through modbus communication or Condair Online.	1 Network signal received by humidifier to shut down.	1 Normal operation for humidifier on network control Contact network administrator to enable humidifier.
RHW	Rh High Warning		The measured RH is above the RH High alarm setting.	1 Set point higher than RH alarm setting	1 If the humidifier is still operating then check and adjust set points.
RLW	Rh Low Warning		The measured RH is below the RH Low alarm setting.	1 Humidifier not running	1 Check why humidifier is not running and put it into operation.
				2 Set point lower than RH low alarm setting	2 Check and adjust set points.
RMW	Rh Limit Warning		Operation is interrupted until an input higher than 3% is received.	1 Sensor not powered	1 Use multi-meter to check that sensor is powered.
				2 Sensor not wired correctly	2 Check wiring is secure and wired correctly per instructions in installation chapter.
				3 Defective sensor	3 Check if sensor is outputting corresponding to RH. If not replace the sensor.
				4 RH less than 5%	4 RH less than 5% are interpreted as a broken sensor. Contact Condair Representative for recommendation.
				5 Humidifier control configuration incorrect	5 Check that the humidifier control configuration matches the installed sensor output.

TCF	Tank Cold Fault	Red	The tank has not become hot with the steam valve activated.	1 Tank temperature sensor not detecting warm tank.	1b Check tank to see if hot (caution). 1a Check wiring to tank temperature sensor. 1c Check if sensor closed when tank is hot.
TCW				2 No steam supply to humidifier.	2a Check that isolation valve is not closed. 2b Check if boiler steam is available. 2c Check if control valve opens using diagnostic output test.
				3 Condensate not draining from heat exchanger.	3a Check that F&T trap is allowing condensate to drain.

SETC Wiring Diagram



MULTI-TAP TRANSFORMER RATING			
Country	Primary Voltage	Frequency	Secondary Voltage
CA	120 V	60 Hz	24 V
US	120V	60Hz	24 V
EUR	230V	50 Hz	24 V

Figure 38: SETC Wiring Diagram

Spare Parts

SETC 100 – 1050 Plumbing Parts

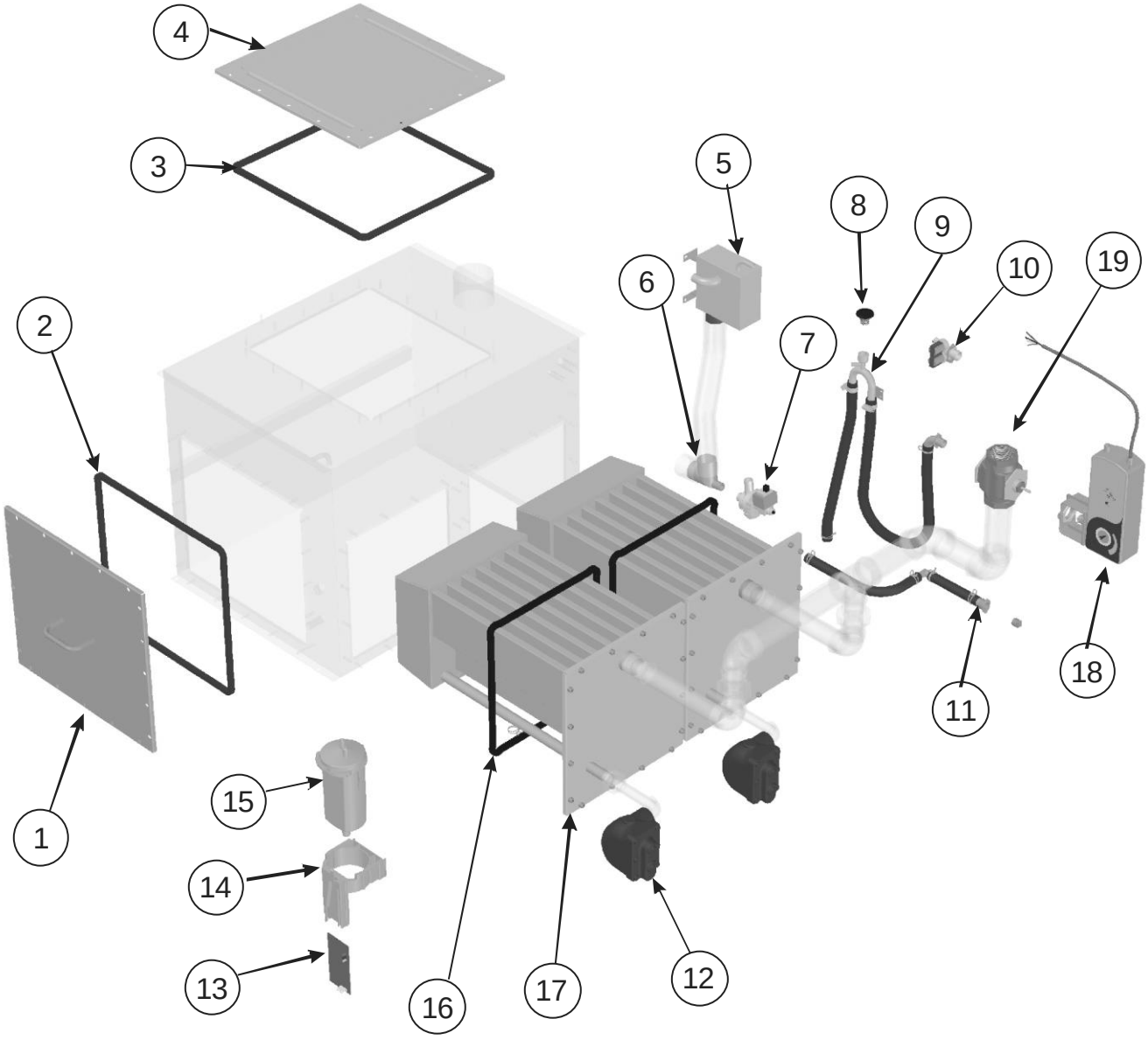


Figure 39: SETC 100-1050 Plumbing Parts

Table 9: SETC 100-1050 Plumbing Parts List

Item	Description	Part No.	100	175	250	375	525	750	1050
1	Cover Plate Assy.	2544439	1	1	1	1	1	1	1
2	O-ring, Clean Out Port	2524361	1	1	1	1	1	1	1
3	O-ring, Clean Out Port,	2524361					1	1	2
4	Cover Plate, Clean Out Port	2547539					1	1	2
5	Fill Box Assy.	2526152	1	1	1	1	1	1	1
6	Lower Mixing Box	1506749	1	1	1	1	1	1	1
7	Drain Pump 24v 50 Hz	1502644	1	1	1	1	1	1	1
8	Vacuum Break Valve 1/2" NPT	1505959	1	1	1	1	1	1	1
9	P-Trap	2553825	1	1	1	1	1	1	1
10	Dual Fill Valve 10.0 l/min & 0.35 l/min	1505759	1	1	1	1	1		
	Dual Fill Valve, 17.0L/Min & 0.35L/Min	1508581						1	1
11	Auxiliary Drain Termination	1506925	1	1	1	1	1	1	1
12	Steam Trap, 15psi	1508849	1	1	1	1	2	2	3
13	Float Board	2573846	1	1	1	1	1	1	1
14	Float Chamber Mounting Bracket	1113777	1	1	1	1	1	1	1
15	Float Chamber	1115933	1	1	1	1	1	1	1
16	O-ring, Heat Exchanger, Large	2524403			1	1	2	2	3
	O-ring, Heat Exchanger, Mini	2524405	1	1					
17	Heat Exchanger Kit, Single	2530902			1	1	2	2	3
	Heat Exchanger Kit, Mini	2530901	1	1					
18	Modulating Actuator 0-10 VDC	1507549	1	1	1	1	1	1	
	Modulating Actuator 0-10 VDC, 2.5 Val	1508472							1
19	Control Valve 3/4 in. 4.76 kV (CV 5.5)	1594322	1						
	Control Valve 1 in. 8.65kV (CV 10.0)	1594330		1					
	Control Valve 1 in. 10.38kV (CV 12.0)	1594332			1				
	Control Valve 1.25 in. 17.3kV (CV 20.0)	1594341				1			
	Control Valve 1.5 in. 24.22kV (CV 28.0)	1594350					1		
	Control Valve 2.0 in. 34.6kV (CV 40.0)	1594360						1	
	Control Valve 2.5 in. 56.22kV (CV 65.0)	1508473							1

SETC 100 – 1050 Cabinet and Electrical Parts

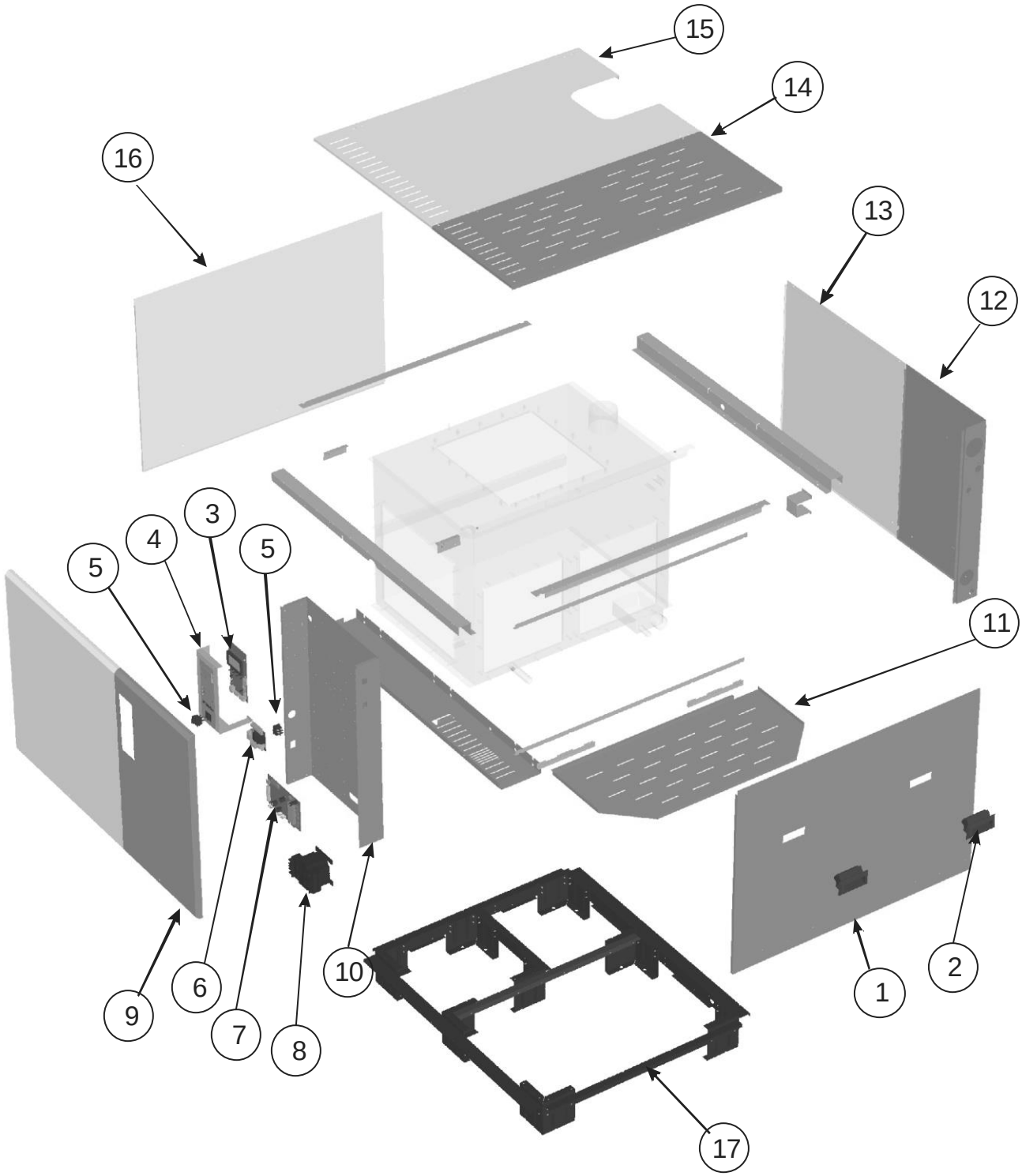


Figure 40: SETC 100-1050 Cabinet and Electrical Parts

Table 10: SETC B+ 100 – 1050 Cabinet and Electrical Parts List

Item	Description	Part No.	100	175	250	375	525	750	1050
1	Service Door, Mini	2523709	1	1					
	Service Door, Single	2524402			1	1			
	Service Door, Double	2524401					1	1	
	Service Door, Triple	2523704							1
2	Recessed Handle,	2523444	1	1	1	1	2	2	2
3	Kit Processor Board SE	2553861	1						
Not Shown	Cable , 40 Pin Ribbon	2537230	1						
4	Panel Processor Display,	2544253	1						
Not Shown	Membrane, Condair	1509735	1						
5	Switch Rocker DPST 10A-250V	2522489	1						
6	Remote Fault Indication Board SETC	2550184	1						
Not Shown	Cable, 10pin Ribbon	2522062	1						
7	PCB Driver Board	2535504	1						
8	Transformer,120/240V,24 V,150VA	2532672	1						
9	Door, Front, GS-SE	2523597	1						
10	Panel, Electrical Cabinet	Reference - Contact Factory							
11	Panel, Elec. Bottom	Reference - Contact Factory							
12	Panel, Rear Elec.	Reference - Contact Factory							
13	Panel, Tank Rear	Reference - Contact Factory							
14	Panel, Elec. Top	Reference - Contact Factory							
15	Panel, Top Tank	Reference - Contact Factory							
16	Panel, Left,	Reference - Contact Factory							
17	Base Assembly	Reference - Contact Factory							

SETC 50 Plumbing Parts

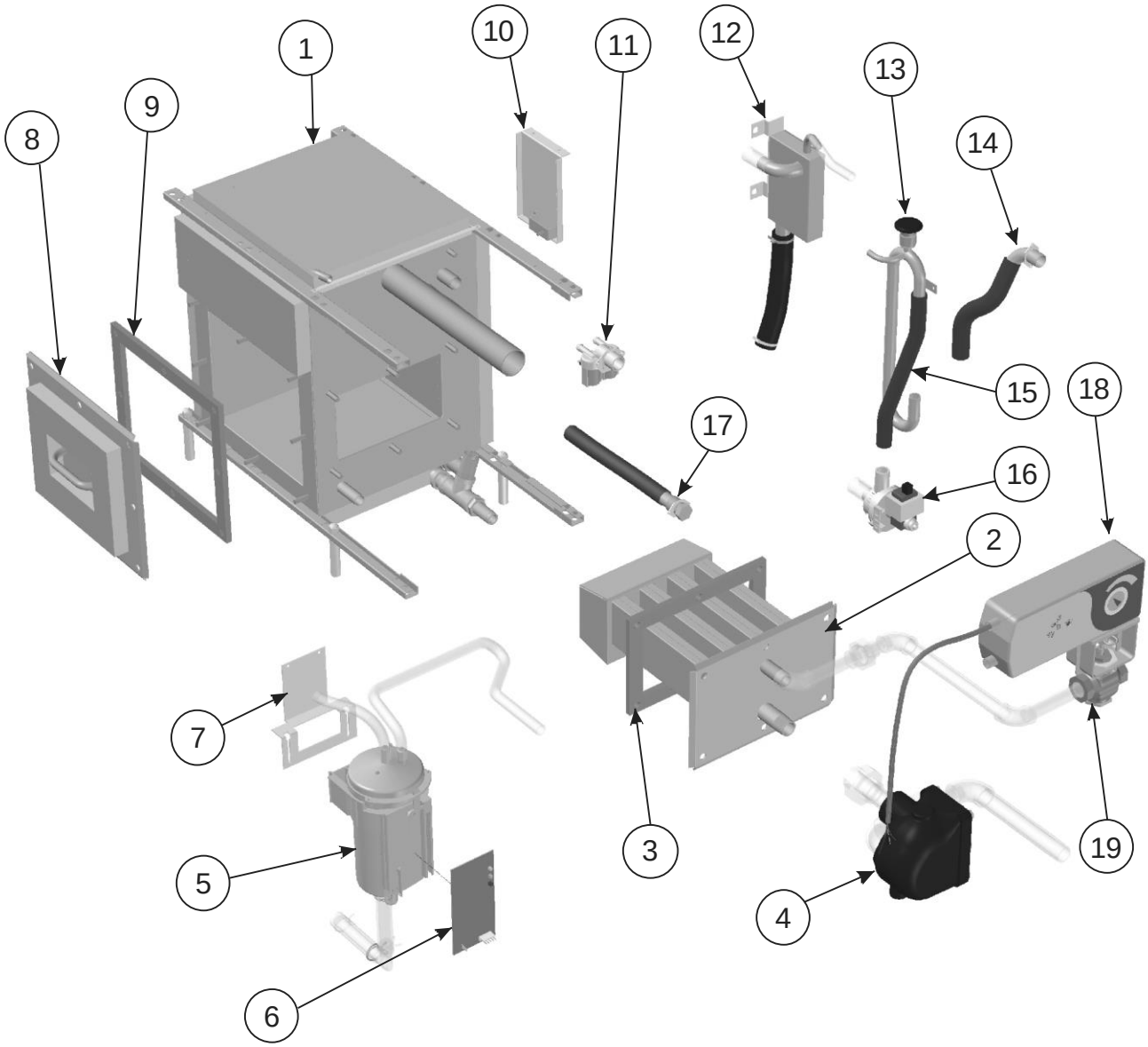


Figure 41: SETC 50 Plumbing Parts

Table 11: SETC B+ 50 Plumbing Parts

Item	Description	Part No.	Qty
1	Tank Replacement Kit, SE50	2520458	1
2	Heat Exchanger Replacement Kits, SE50	2520460	1
3	Gasket, Tank/H.E. Assembly, SE50	1510179	1
4	F&T Trap Assembly, with Plumbing, SE50	1510181	1
5	Float Chamber Assembly, with Board and Connections, SE50	2520239	1
6	Float Board	2573846	1
7	Bracket, Float Chamber Mount, SE50	2520240	1
8	Cover Plate Kit, Clean Out Port, SE50	2520461	1
9	Gasket, Clean Out Port, SE50	1510180	1
10	P Trap Mount Assembly, SE50	1510187	1
11	Dual Fill Valve, 5.5L -.35 L/Min	1704234	1
12	Fill Box Assembly with Connections, SE50	2520235	1
13	Vacuum Break Valve 1/2" NPT	1505959	1
14	Termination Assembly with Connections, SE50	2520236	1
15	P Trap Assembly, Complete, SE50	1510187	1
16	Pump Drain, 24V, 50HZ (DPS 25-119)	1502644	1
17	Auxiliary Drain Termination	1506925	1
18	Modulating Actuator 0-10 Vdc	1507549	1
19	Valve 1/2in VB72632.51kV (CV 2.90)	1594316	1

SETC 50 Electrical and Cabinet Parts

Figure 342: SETC 50 Electrical and Cabinet Parts

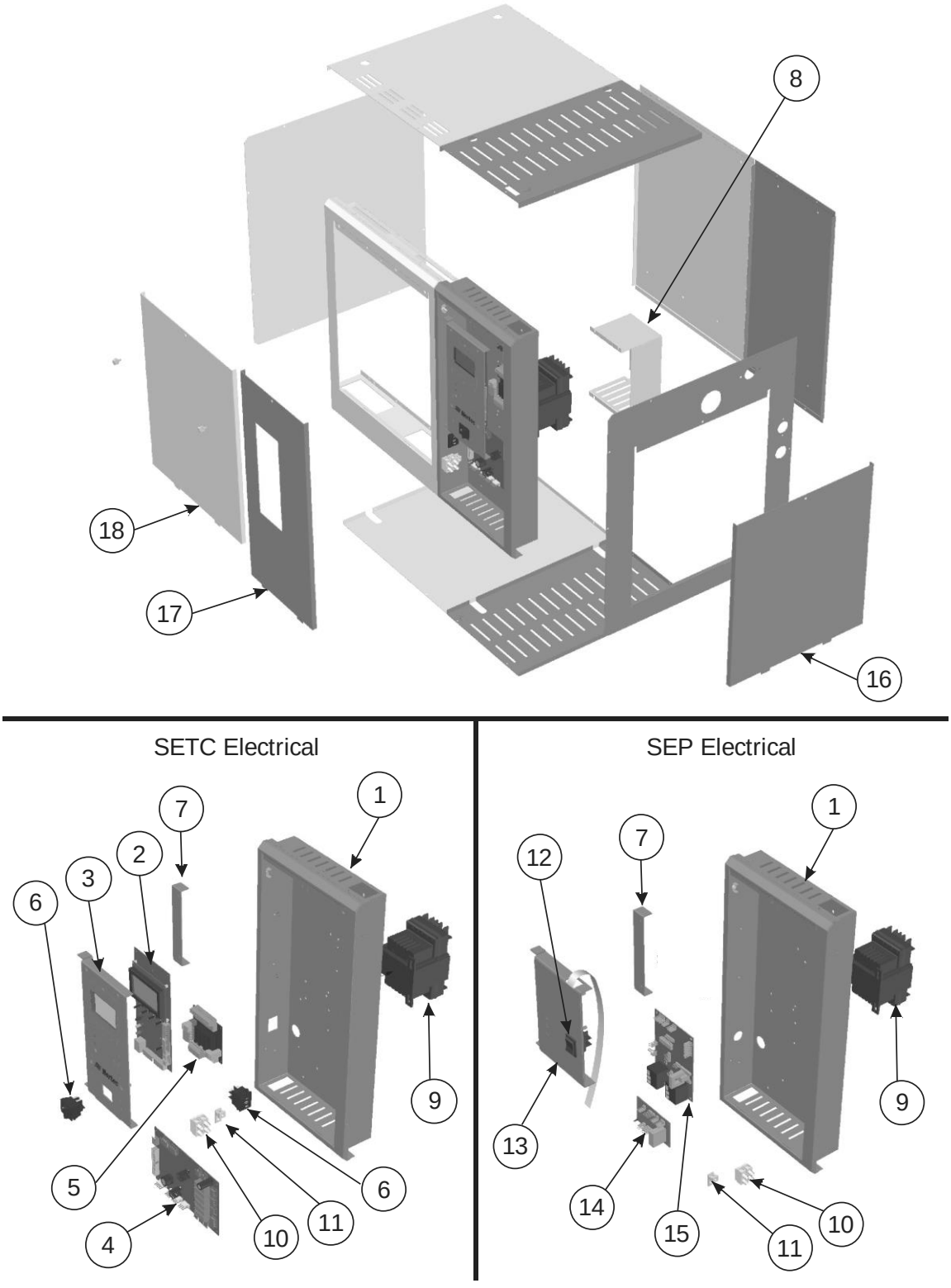


Table 12: SETC B+ 50 Electrical and Cabinet Parts

Item	Description	Part No.	Qty
1	Panel Assembly, Electrical Front, Cabinet SE50	2520268	1
2	Kit Processor Board SE	2553861	1
Not Shown	Cable, 40 Pin Ribbon	2537230	1
3	Panel Assm, Display, Cabinet, SE 50 B+	2552793	1
4	PCB Driver Board	2535504	1
5	Remote Fault Indication Board SETC	2550184	1
Not Shown	Cable, 10 pin Ribbon	2522062	1
6	Switch Rocker DPST 10A-250V	2522489	2
7	Bracket Assm, Keypad Mnt, SE50	2520272	1
8	Enclosure, Transformer, Cabinet, SE50	2549857	1
9	Transformer,120/240Vpri,24Vsec,150VA	2532672	1
10	Terminal Block 2 Pole	1473002	1
11	Ground Clamp	1323020	1
12	Switch DPDT ON/OFF/DRAIN SETC	2538961	1
13	SEP Display / Keypad Assembly, SE50	2520279	1
14	SEP, Led Board Assembly	1508619	1
15	SEP Control Board	1508577	1
16	Panel Access, Elect Right, Cabinet, SE50	2520283	1
17	Panel Access Electrical Front SE 50 B+	2552792	1
18	Panel, Access, Tank Front, Cabinet, SE50	2520267	1

Warranty

Condair AG. and/or Nortec Humidity Ltd. (hereinafter collectively referred to as THE COMPANY), warrant for a period of two years after installation or 30 months from manufacturer's ship date, whichever date is earlier, that THE COMPANY's manufactured and assembled products, not otherwise expressly warranted are free from defects in material and workmanship. No warranty is made against corrosion, deterioration, or suitability of substituted materials used as a result of compliance with government regulations.

THE COMPANY's obligations and liabilities under this warranty are limited to furnishing replacement parts to the customer, F.O.B. THE COMPANY's factory, providing the defective part(s) is returned freight prepaid by the customer. Parts used for repairs are warranted for the balance of the term of the warranty on the original humidifier or 90 days, whichever is longer.

The warranties set forth herein are in lieu of all other warranties expressed or implied by law. No liability whatsoever shall be attached to THE COMPANY until said products have been paid for in full and then said liability shall be limited to the original purchase price for the product. Any further warranty must be in writing, signed by an officer of THE COMPANY.

THE COMPANY's limited warranty on accessories, not of the companies manufacture, such as controls, humidistats, pumps, etc. is limited to the warranty of the original equipment manufacturer from date of original shipment of humidifier.

THE COMPANY makes no warranty and assumes no liability unless the equipment is installed in strict accordance with a copy of the catalog and installation manual in effect at the date of purchase and by a contractor approved by THE COMPANY to install such equipment.

THE COMPANY makes no warranty and assumes no liability whatsoever for consequential damage or damage resulting directly from misapplication, incorrect sizing or lack of proper maintenance of the equipment.

THE COMPANY makes no warranty and assumes no liability whatsoever for damage resulting from freezing of the humidifier, supply lines, drain lines, or steam distribution systems.

THE COMPANY makes no warranty and assumes no liability whatsoever for equipment that has failed due to ambient conditions when installed in locations having climates below 14°F (-10°C) during January or above 104°F (40°C) during July.

THE COMPANY retains the right to change the design, specification and performance criteria of its products without notice or obligation.

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