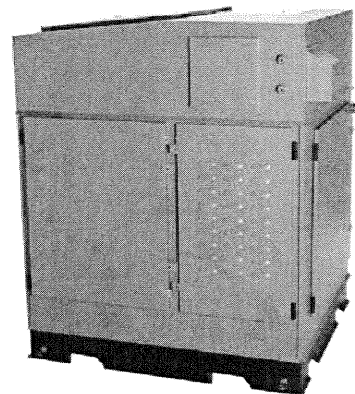
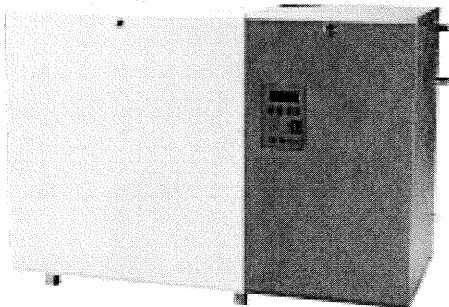


Installation, Operation & Maintenance Guide



IMPORTANT: Read and save this guide for future reference. This guide to be left with equipment owner.

WARNING:

Improper installation, adjustment, alteration, service or maintenance can cause injury or property damage. For assistance or additional information consult a qualified installer or a service agency.

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GENERAL

This installation guide has been designed to provide assistance when installing, mounting, and sizing a SE Series humidifier. Actual on site application may vary. Consult AXAIR NORTEC Technical Services or your local AXAIR NORTEC representative.

RECEIVING & UNPACKING EQUIPMENT

1. Check packing slip to ensure ALL material has been delivered.
2. All material shortages are to be reported to AXAIR NORTEC within 48 hours from receipt of goods. AXAIR NORTEC assumes no responsibility for any material shortages beyond this period.
3. Inspect shipping boxes for damage and note on shipping waybill accordingly.
4. After unpacking, inspect equipment for damage and if damage is found, notify the shipper promptly.
5. All AXAIR NORTEC products are shipped on an F.O.B. factory basis. Any and all damage, breakage or loss claims are to be made directly to the shipping company.

DELIVERY

The standard delivery includes:

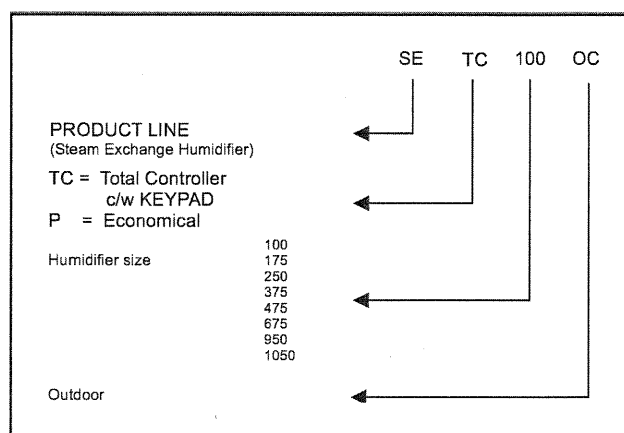
1. Steam Exchange humidifier equipped with desired options.
2. In a bag you will find:
 - Manuals.
 - Stainless Steel Compression fitting for DI or RO supply water connection.
 - Brass compression fitting for potable, RO or softened water connection.
 - Steam hose for steam outlet with clamps.
3. The SE Series comes complete with a telescopic stand mounted inside the unit legs. Stand cross bracing is shipped with the unit.
4. Steam valve, actuator, and wye strainer.
5. Desired accessories ordered.

GENERAL SPECIFICATIONS

The AXAIR NORTEC SE Series humidifier is a completely new design based on leading edge technology. The SE is designed to provide clean atmospheric steam at an economical price.

MODEL DESIGNATION

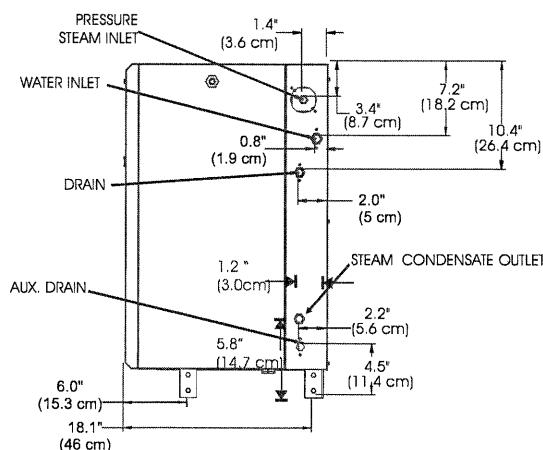
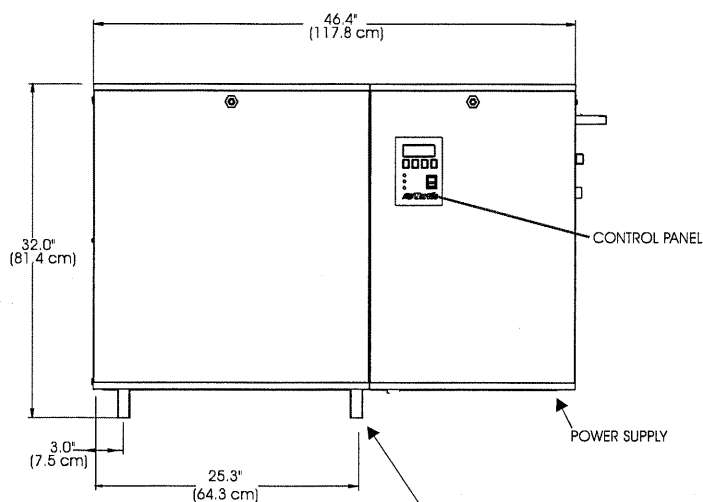
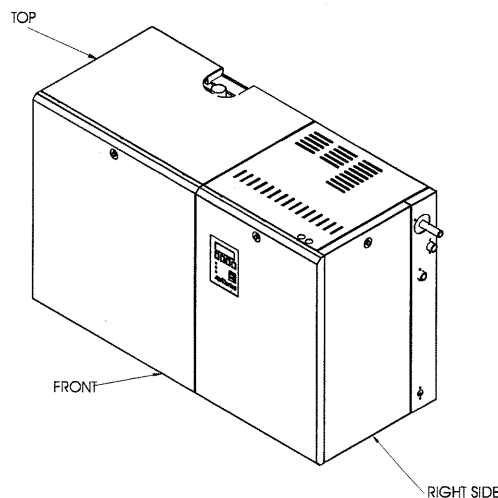
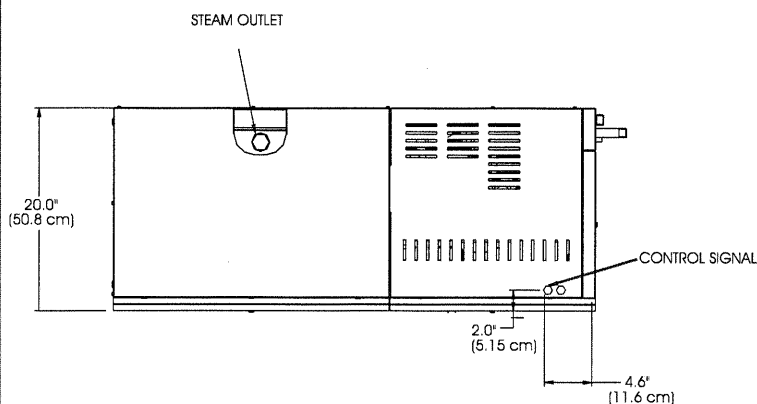
The unit specification label indicates the model of Steam Exchange humidifier according to the following chart:



MODEL CAPACITY & PHYSICAL DATA

Table #1

SETC/SEP	Operating Steam Pressure				
	5 psi (34kpa)	7 psi (48kpa)	10 psi (69 kpa)	13 psi (90 kpa)	15 psi (103 kpa)
	Lbs/hr (kg/hr)				
SE 100	33 (15)	41 (19)	58 (26)	80 (36)	100 (45)
SE 175	45 (20)	59 (27)	88 (40)	131 (59)	175 (79)
SE 250	77 (35)	98 (44)	140 (64)	200 (91)	250 (113)
SE 375	105 (48)	136 (62)	200 (91)	294 (133)	375 (170)
SE 475	161 (73)	201 (91)	279 (127)	388 (176)	475 (215)
SE 675	200 (91)	256 (116)	368 (167)	531 (241)	675 (306)
SE 950	386 (175)	463 (210)	609 (276)	800 (363)	950 (431)
SE 1050	446 (202)	529 (240)	682 (309)	880 (399)	1050 (476)
NOTE: Specification subject to change without notice. Rated capacity applies with no blowdown.					



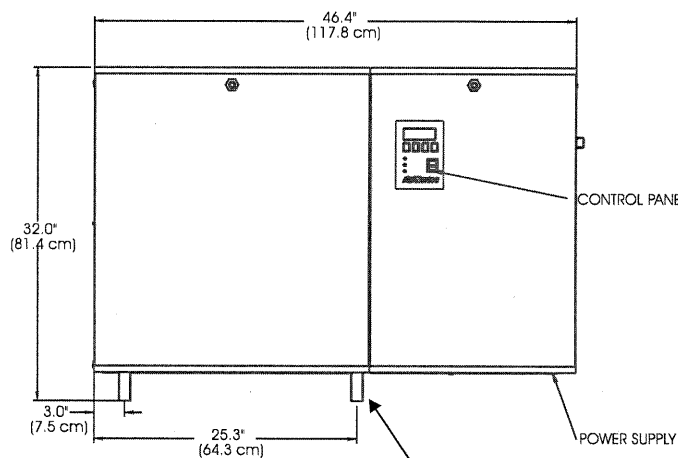
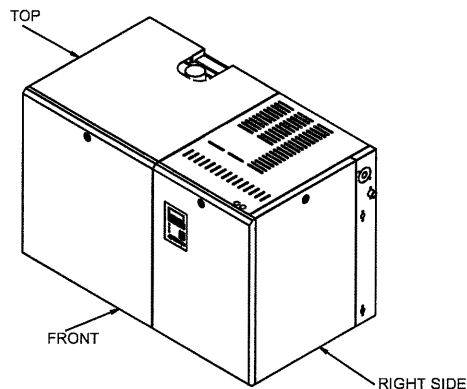
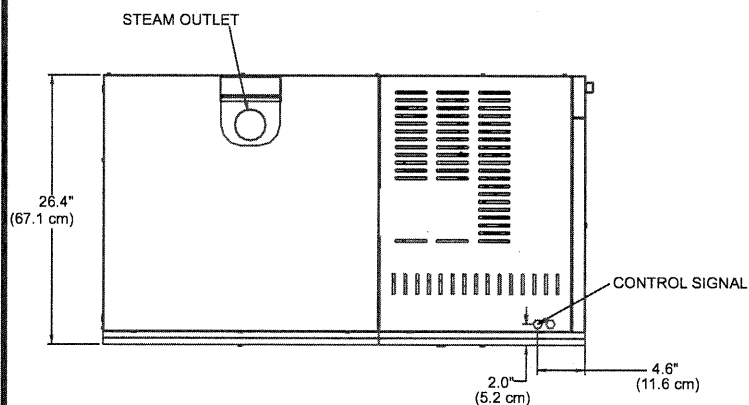
NOTE: Drawing not to scale

All models come with telescopic stand

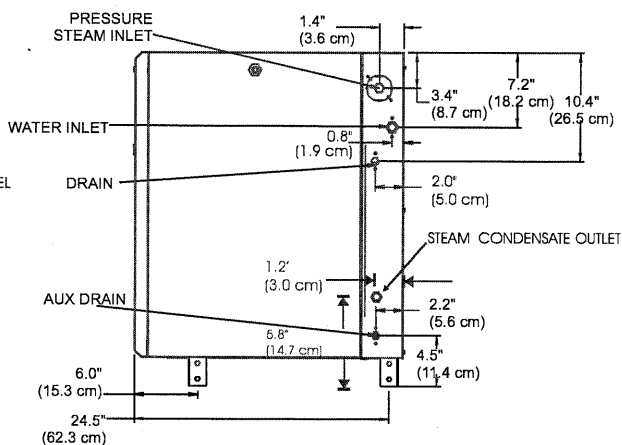
Service Clearance

Top	36"	(91cm)
Left	0"	(0 cm)
Right	30"	(76 cm)
Rear	0"	(5 cm)
Front	30"	(76 cm)
Bottom	0"	(0 cm)

Technical data	SE 100		SE 175	
Max. Rated Steam	105 lb/hr	48 kg/hr	180 lb/hr	82 kg/hr
Nominal @ 5psi	5-33 lb/hr	2-15 kg/hr	7-45 lb/hr	3-20 kg/hr
Nominal @ 10psi	9-58 lb/hr	4-26 kg/hr	13-88 lb/hr	6-40 kg/hr
Nominal @ 15psi	15-100 lb/hr	7-45 kg/hr	26-175 lb/hr	12-79 kg/hr
Steam Valve CV	2.8		7.5	
Supply water con.	0.5" NPT		0.5" NPT	
Drain water con.	0.75" O.D. tube		0.75" O.D. tube	
Aux. drain con.	0.5" NPT female		0.5" NPT female	
Pressure steam in.	0.5" NPT		0.5" NPT	
Steam Cond. Out.	.75" NPT		.75" NPT	
Atm. Steam Out.	1 x 1.75" OD	1 x 4.4 cm OD	1 x 3.00" OD	1 x 7.62cm OD
Weight Empty	267 lb	121 kg	267 lb	121kg
Weight Full	423 lb	192 kg	423 lb	192 kg



All models come with telescopic stand



NOTE: Drawing not to scale

Service Clearance

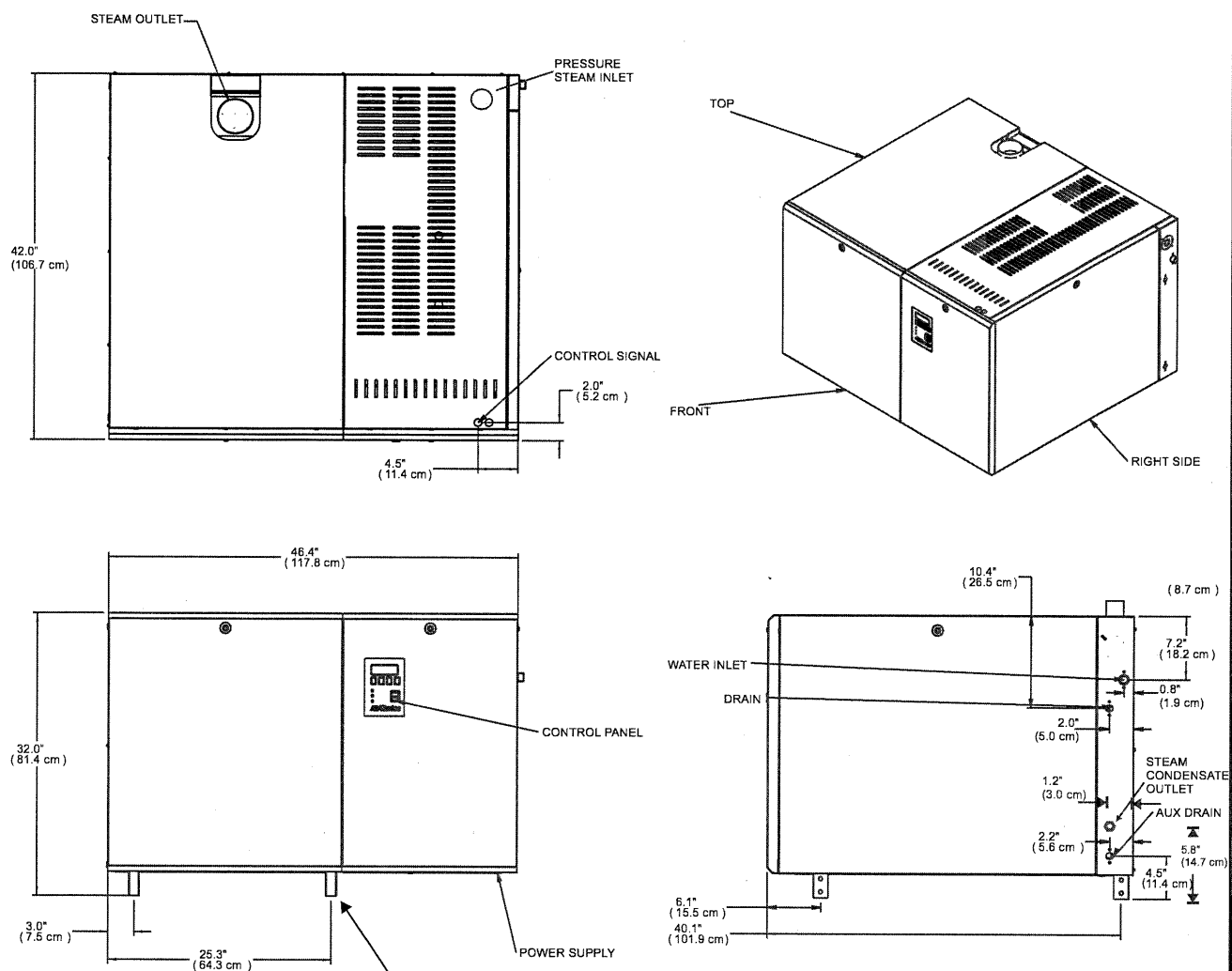
Top	36"	(91cm)
Left	0"	(0 cm)
Right	30"	(76 cm)
Rear	0"	(5 cm)
Front	30"	(76 cm)
Bottom	0"	(0 cm)

Technical data	SE 250		SE 375	
Max. Rated Steam	255 lb/hr	115 kg/hr	380 lb/hr	172 kg/hr
Nominal @ 5psi	11-77 lb/hr	5-35 kg/hr	15-105 lb/hr	7-47 kg/hr
Nominal @ 10psi	21-140 lb/hr	10-64 kg/hr	30-200 lb/hr	14-91 kg/hr
Nominal @ 15psi	37-250 lb/hr	17-114 kg/hr	56-375 lb/hr	25-170 kg/hr
Steam Valve	12		28	
Supply water con.	0.5" NPT		0.5" NPT	
Drain water con.	0.75" O.D. tube		0.75" O.D. tube	
Aux. drain con.	0.5" NPT female		0.5" NPT female	
Pressure steam in.	1.0" NPT		1" NPT	
Steam Cond. Out.	.75" NPT		.75" NPT	
Atm. Steam Out.	1 x 3" OD	1 x 7.62 cm OD	1 x 4" OD	1 x 10.2cm OD
Weight Empty	355 lb	161 kg	355 lb	161 kg
Weight Full	599 lb	272 kg	599 lb	272 kg

 **Nortec**
www.humidity.com

Physical Data
SETC/SEP 250 & 375
01/26/04

PAGE ____ OF ____



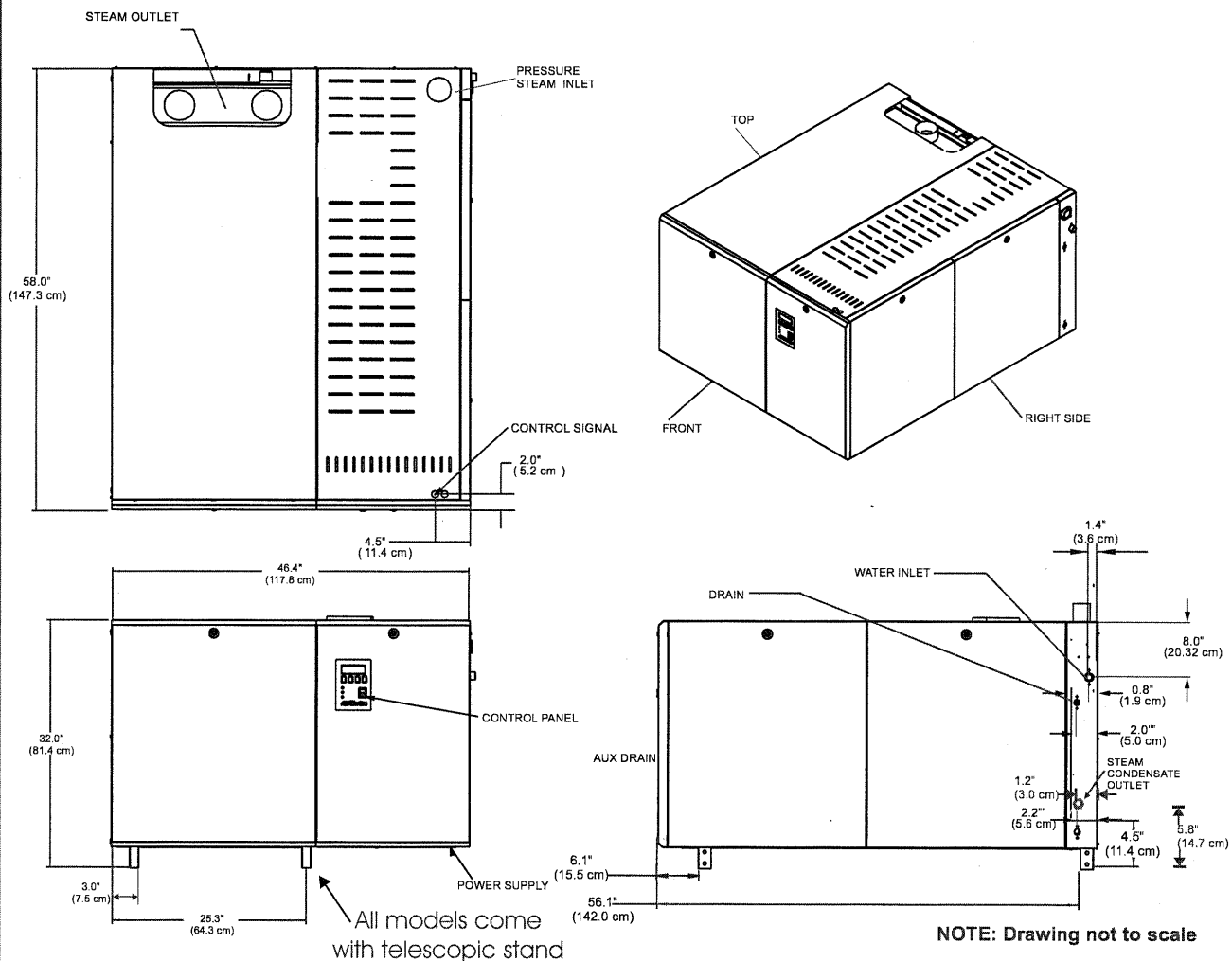
All models come
with telescopic stand

NOTE: Drawing not to scale

Service Clearance

Top	36"	(91cm)
Left	30"	(76 cm)
Right	30"	(76 cm)
Rear	0"	(5 cm)
Front	30"	(76 cm)
Bottom	0"	(0 cm)

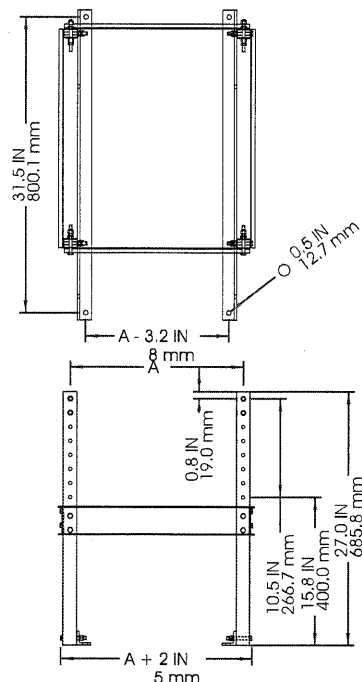
Technical data	SE 475		SE 675	
Max. Rated Steam	480 lb/hr	217 kg/hr	680 lb/hr	308 kg/hr
Nominal @ 5psi	24-161 lb/hr	11-73 kg/hr	30-200 lb/hr	14-91 kg/hr
Nominal @ 10psi	42-279 lb/hr	19-127kg/hr	55-368 lb/hr	25-167 kg/hr
Nominal @ 15psi	71-475 lb/hr	32-215 kg/hr	101-675 lb/hr	46-306 kg/hr
Steam Valve CV	20		28	
Supply water con.	0.5" NPT		0.5" NPT	
Drain water con.	0.75" O.D. tube		0.75" O.D. tube	
Aux. drain con.	0.5" NPT female		0.5" NPT female	
Pressure steam in.	1.25" NPT		1.5" NPT	
Steam Cond. Out.	1.0" NPT		1.0" NPT	
Atm. Steam Out.	1 x 4" OD	1 x 10.16cm OD	1 x 4" OD	1 x 10.16cm OD
Weight Empty	529 lb	240 kg	529 lb	240 kg
Weight Full	992 lb	450 kg	992 lb	450 kg



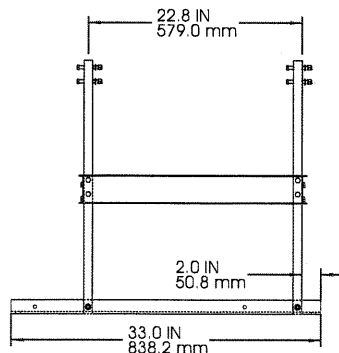
Service Clearance

Top	36"	(91cm)
Left	30"	(76 cm)
Right	30"	(76 cm)
Rear	0"	(5 cm)
Front	30"	(76 cm)
Bottom	0"	(0 cm)

Technical data	SE 950		SE 1050	
Max. Rated Steam	960 lb/hr	435 kg/hr	1070 lb/hr	485 kg/hr
Nominal @ 5psi	58-386 lb/hr	26-175 kg/hr	67-446 lb/hr	30-202 kg/hr
Nominal @ 10psi	91-609 lb/hr	41-276 kg/hr	102-682 lb/hr	46-309 kg/hr
Nominal @ 15psi	142-950 lb/hr	64-430 kg/hr	158-1050 lb/hr	72-476 kg/hr
Steam Valve CV	40		65	
Supply water con.	0.5" NPT		0.5" NPT	
Drain water con.	0.75" O.D. tube		0.75" O.D. tube	
Aux. drain con.	0.5" NPT female		0.5" NPT female	
Pressure steam in.	2.0" NPT		2.5" NPT	
Steam Cond. Out.	1.25" NPT		1.25" NPT	
Atm. Steam Out.	2 x 4" OD	2 x 10.16cm OD	2 x 4" OD	2 x 10.16cm OD
Weight Empty	703 lb	319 kg	703 lb	319 kg
Weight Full	1384 lb	628 kg	1384 lb	628 kg

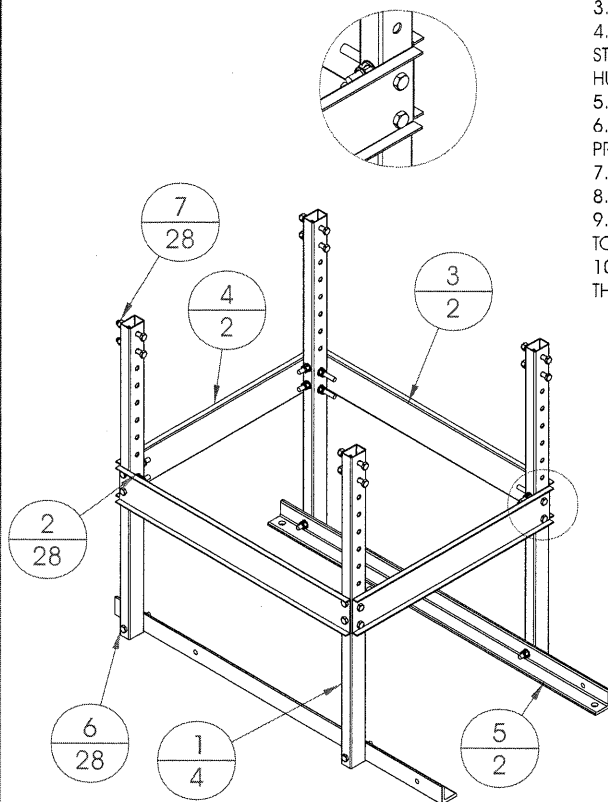


UNIT SIZE	DIMENSION A
SE 100-175	12.1" (306.8 mm)
SE 250-375	18.5" (469.4 mm)
SE 475-675	34.1" (865.6 mm)
SE 950-1050	49.7" (1261.9 mm)



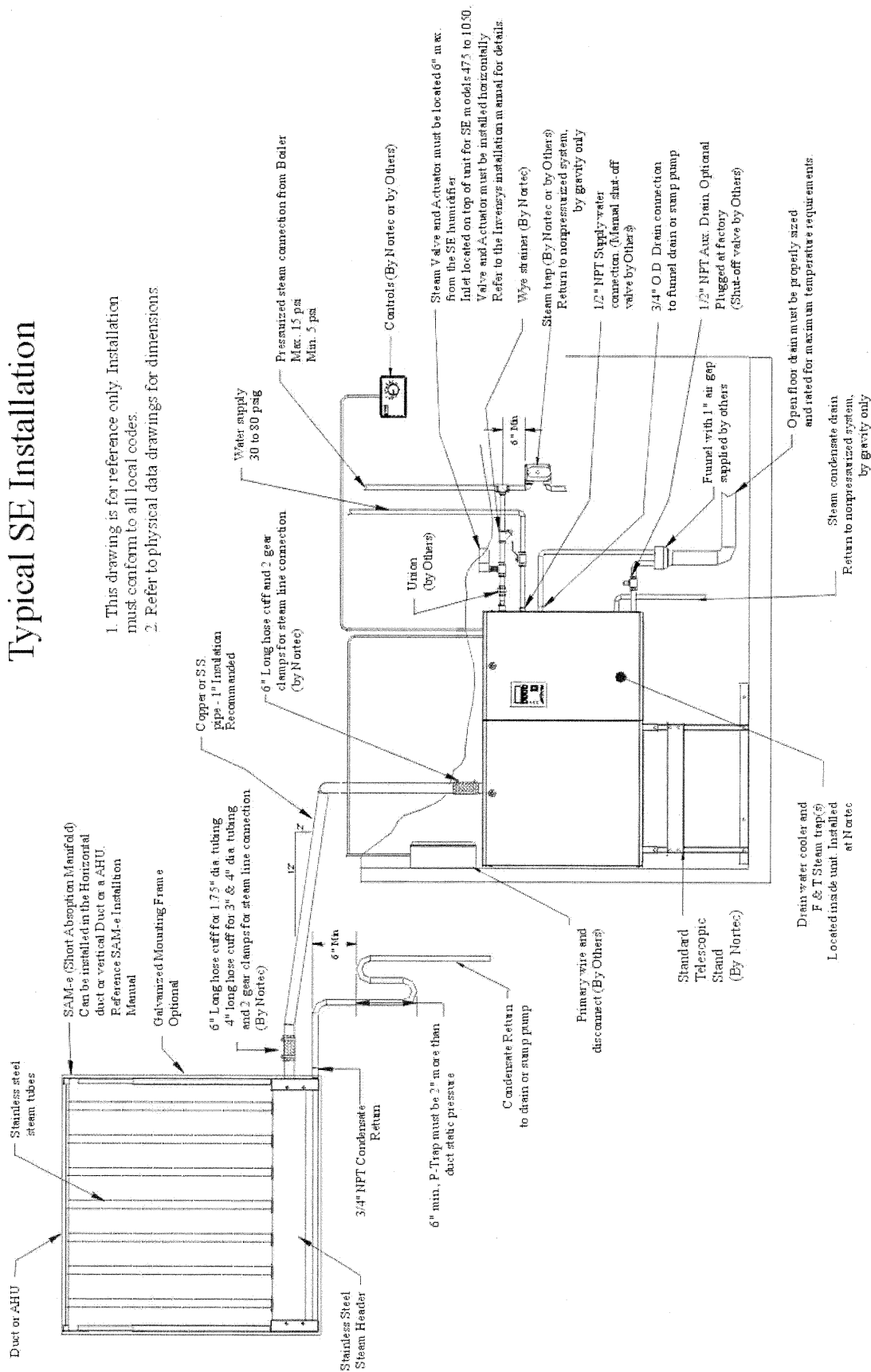
ASSEMBLY INSTRUCTIONS

1. UNPACK STAND AND CHECK THAT ALL PIECES ARE PRESENT AND UNDAMAGED.
2. ASSEMBLE STAND TO CONFIGURATION SHOWN. HAND TIGHTEN ALL BOLTS ONLY.
3. HOIST HUMIDIFIER UP ABOVE THE FLOOR A MINIMUM OF 27 IN (685.8 MM).
4. POSITION STAND BELOW THE LEGS OF THE HUMIDIFIER. ALIGN HUMIDIFIER AND STAND SO THAT THE SUPPORT LEGS OF THE STAND ENTER THE LEGS OF THE HUMIDIFIER.
5. LOWER HUMIDIFIER TO HEIGHT DESIRED. ALIGN WITH NEAREST HOLE.
6. FASTEN STAND TO HUMIDIFIER USING THE BOLTS, CUP WASHER AND NUTS PROVIDED.
7. TIGHTEN NUT AND BOLT PAIRS TO 200 IN-LB ((2.3 Kg-m) OR UNTILL SECURE.
8. LOWER ENTIRE ASSEMBLY TO FLOOR AND ENSURE THAT IT IS STABLE.
9. SHIMMING OF THE FLOOR BELOW THE LEGS OF THE STANDS MAY BE NECESSARY TO ENSURE BALANCE OF THE HUMIDIIFER
10. THE STAND MAY BE PERMANENTLY FASTENED TO THE FLOOR VIA THE HOLES IN THE LEG SUPPORT PLATES.

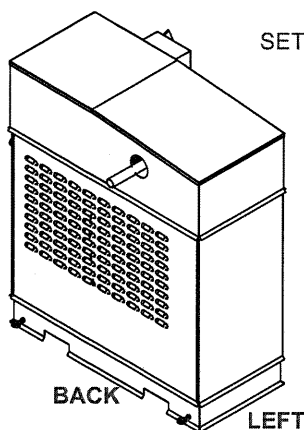
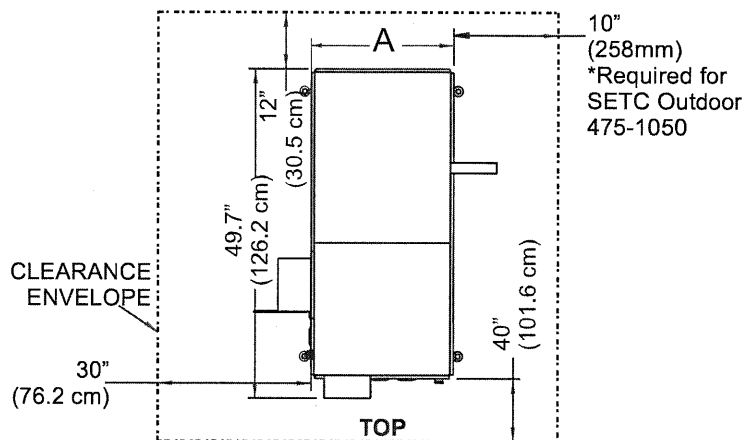
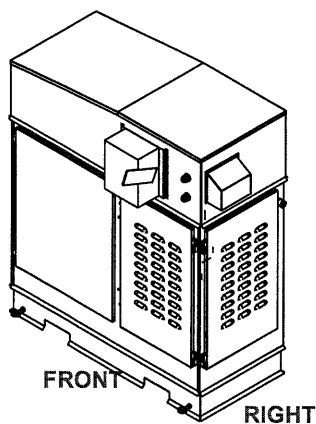


ITEM	DESCRIPTION	QTY
1	EXTENSION LEG, SE SERIES STAND	4
2	CUP WASHER, 5/16	28
3	CROSS MEMBER, COMMON, SE SERIES STAND	2
4	CROSS MEMBER, UNIQUE, SE SERIES STAND	2
5	BASE, TELESCOPIC FLOOR STAND, SE SERIES	2
6	BOLT, 5/16-18UNC X 2 1/2	28
7	NUT, 5/16-18UNC	28

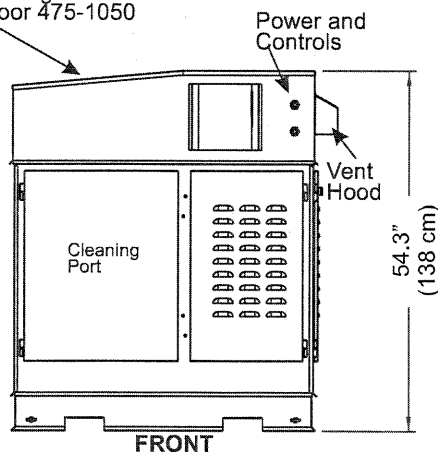
Short-Absorption Manifold (SAM-e)



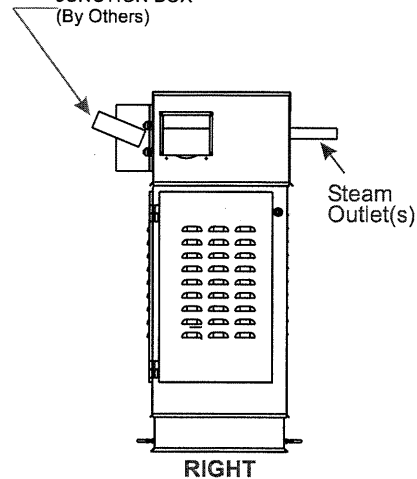
Typical SE Installation



*Cleaning Port for SETC Outdoor 475-1050



NEMA RATED JUNCTION BOX (By Others)



Model	A		Shipped Weight		Operating Weight		Steam Outlet (O.D.)		Pressure Steam Inlet	Steam Condensate Outlet
	in	cm	lbs	kg	lbs	kg	in	cm	NPT	NPT
SETC Outdoor 100	21.5	54.6	267	121	423	192	1x1.75	1x4.4	0.5	0.75
SETC Outdoor 175							1x3	1x7.6	0.75	
SETC Outdoor 250	27.9	70.8	355	161	599	272	1x3	1x7.6	1	0.75
SETC Outdoor 375							1x4	1x10.2	1.5	
SETC Outdoor 475	43.5	111	529	240	992	450	1x4	1x10.2	1.25	1
SETC Outdoor 675									1.5	
SETC Outdoor 950	59.1	150	703	319	1384	628	2x4	2x10.2	2	1.25
SETC Outdoor 1050									2.5	

SE INDOOR INSTALLATION

LOCATING AND MOUNTING

SE Series humidifiers are designed to mount on an SE Stand (Included with all models) or floor. The clearance dimensions shown in this manual are for reference only and are the minimum required for maintenance of the humidifier. Local and National Codes should be consulted prior to final location and installation of the humidifier. AXAIR NORTEC cannot accept responsibility for installation code violations.

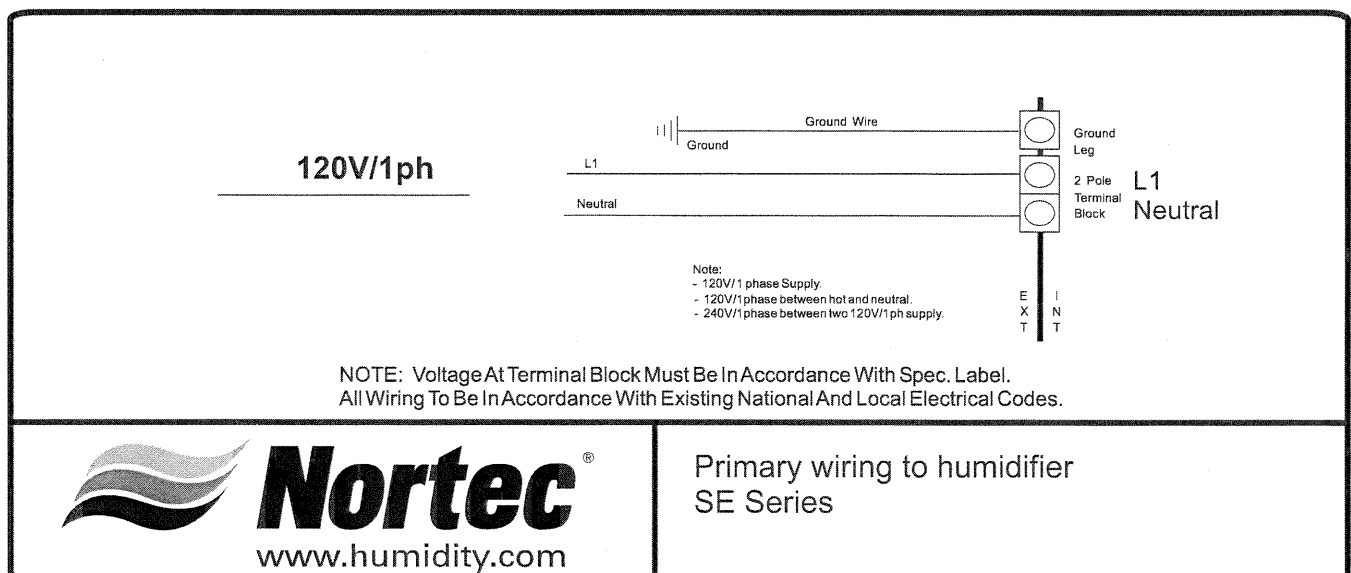
- Figure #1 shows the locations of all required connections to the Steam Exchange Humidifier. Careful consideration should be given to all of these connections when choosing a location for the humidifier.
- For front and side clearance requirements (for access during installation, maintenance and troubleshooting), refer to pages 3 - 6.
- DO NOT locate humidifier any further than absolutely necessary from steam distributor location. Net output will be reduced as a result of heat loss through steam line. Also, increased static pressure (over 12" W.C.) will result in hot water going down the drain. Consult factory if this situation occurs.
- Where possible, mount humidifier at a height convenient for servicing.

- Make sure the humidifier is mounted level.
- DO NOT mount humidifier on hot surfaces.
- DO NOT mount humidifiers in an area where freezing may occur.
- If humidifiers are mounted on roof, a properly ventilated, temperature controlled, (above freezing), weatherproof model should be used. Consult your local representative for more information on AXAIR NORTEC's SETC Outdoor model.
- DO NOT mount humidifiers on vibrating surface. Consult factory.
- The humidifier shall not be installed directly on carpeting, tile or other combustible material other than wood flooring.
- Some insulating materials may be combustible. Prior to installing this appliance examine the area for insulating material. If this appliance is installed in an insulated space, it must be kept free and clear of insulating materials. If insulation is added after the appliance is installed, it will be necessary to examine the area again.

PRIMARY WIRING

All work concerning the electrical installation must be performed by qualified personnel.

Figure # 1



ELECTRICAL

WARNING: The electrical parts inside the humidifier are very sensitive to electrostatic discharge. Appropriate measures against electrostatic discharge (ESD protection) must be taken when carrying out installation work.

- The humidifier should only be connected to primary power (main power) after all installation work has been completed.
- An external disconnect switch (by others) must be installed close to the unit to allow for power interruption during servicing and/or maintenance.
- Humidifiers require field wiring to primary voltage terminal blocks. Power requirement must be 110-120/1/60Vac, 15A or 20 A for SETC Outdoor 950 & 1050 separately fused circuit, single phase. Wiring can be fed through a 7/8" hole on the bottom or the top of the control compartment.
- When installed, the appliance must be electrically grounded in accordance with local codes or, in the absence of local codes, with the National Electrical Code, ANSI/NFPA 70, and/or the CSA C22.1 Electrical Code, if an external electrical source is utilized.
- External wiring sizes must be in accordance with NEC and/or CEC and existing local electrical codes and by-laws.

LOW VOLTAGE CONTROL WIRING

(See Page 11 & 12 for details)

All SE models require at least one type of input control signal for unit operation. Refer to the sections below that detail the types of controls that can be used with each model.

Low voltage control terminal strips are provided in the electrical compartment. Refer to the specific control wiring diagram supplied with each unit.

Field wiring from humidistat to humidifier and between devices should be shielded 18 AWG or heavier and kept as short as possible.

Controls are available from AXAIR NORTEC as accessories and can be ordered with the humidifier. Controls by others may also be used as long as they meet the criteria noted below. The following is a

summary of the common types of controls that may be used with AXAIR NORTEC SE Humidifiers.

A – Wall or Duct Mounted Control On/Off Humidistat: Wired to make on drop in humidity, break on rise to set point. Set to desired RH. Can be a make/break set of contacts from a Building Management System.

B – Duct Mounted Safety High Limit On/Off Humidistat: Wired to make on drop in humidity, break on rise to safety set point. Set to approximately 85% RH as a safety to prevent saturation and wetting in the duct. Highly recommended for ducted applications.

C – Duct Mounted Safety Air Proving On/Off Switch: Wired to make when sensing air flow, break when no air flow. Used as a safety to prevent saturation when there is no air flow. Highly recommended for ducted applications.

D&E – Wall or Duct Mounted Modulating Humidistat: Provides a modulating signal to the unit that represents the output (up to 100%) required from the humidifier. Signal type can be changed in the field via dip switch settings on the logic control board. Refer to page 27 for settings.

The SETC can accept a single or dual control signal. The SEP can only accept a single control signal:

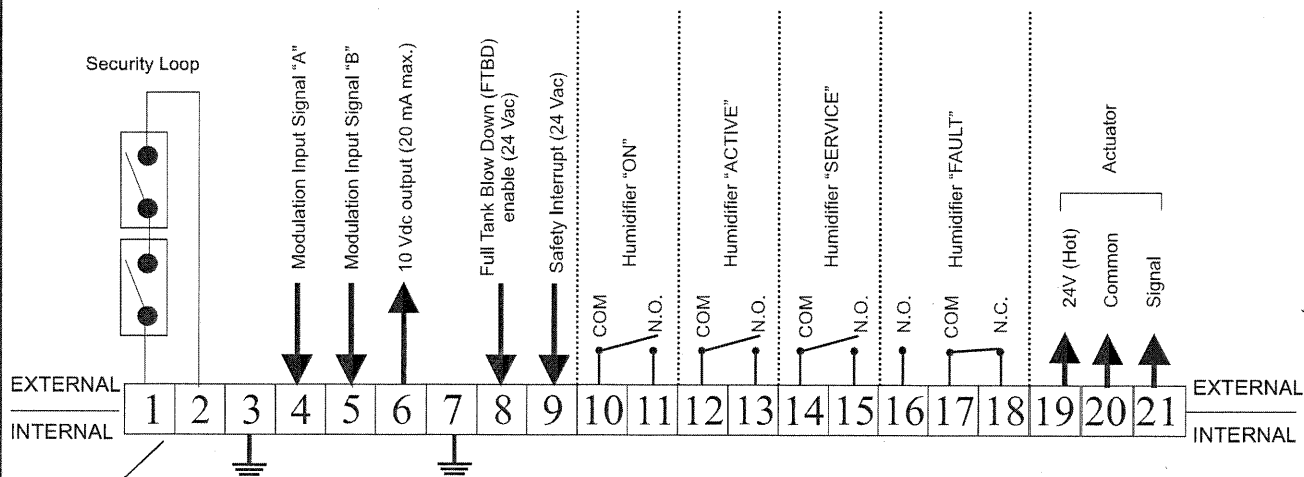
SETC	SEP
0-20 mA	
4-20 mA	4-20 mA
0-10 VDC	0-10 VDC
2-10 VDC	
0-5 VDC	
1-5 VDC	
ON/OFF	ON/OFF

The unit must be ordered from the factory for the desired signal type and number of channels. If no signal type was specified, ON/OFF control signal will be set as default. When configured for 2-channel modulation the humidifier will generate steam only if both channels indicate a demand (see D&E). If both channels are demanding steam the humidifier will satisfy the lower demand signal.

SETC SERIES EXTERNAL CONTROLS WIRING CONNECTIONS LOW VOLTAGE TERMINAL STRIP

NOTE: This is a *generic* wiring diagram only. For specific wiring instructions, it is necessary to refer to the wiring diagram which is supplied with each unit.

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



NOTE: If no On/Off Control is used then a field jumper must be connected across terminals 1 and 2 in order for the humidifier to operate.

Low Voltage Terminal Strip

1 & 2: Wire all on/off controls and safeties between these two terminals. If not used, jumper 1 & 2 for the unit to operate.

4: Modulating input to humidifier "A".

5: Modulating input to humidifier "B".

6: 10 Vdc output (20 mA max.) Can be used to simulate demand to unit..

8: When 24 Vac input received, the unit will initialize a full tank blowdown.

9: Safety interrupt (24 Vac).

10 & 11: Remote indication connection for humidifier "on" status indication.

12 & 13: Remote indication connection for humidifier "active" status.

14 & 15: Remote indication connection for service required indication.

16,17 & 18: Remote indication connection for fault indication.

19, 20 & 21: Modulating output and 24VAC power to actuator



SETC SERIES

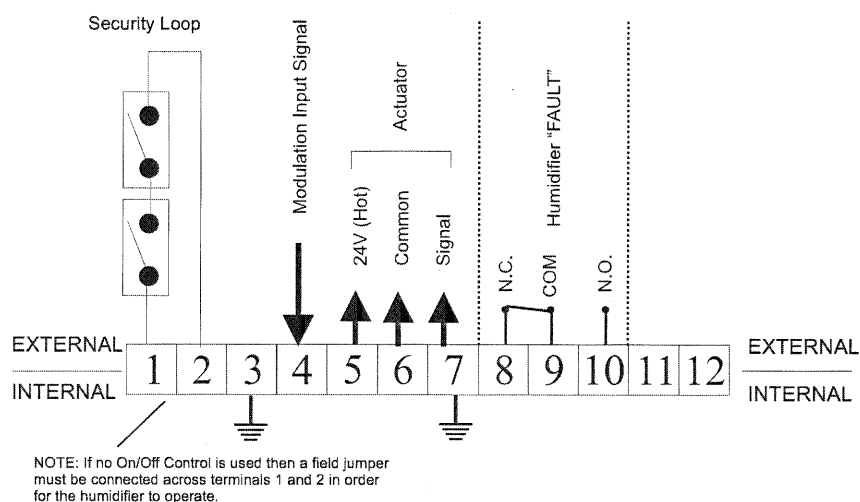
External Controls Wiring Connections

09/16/2004

SEP SERIES EXTERNAL CONTROLS WIRING CONNECTIONS LOW VOLTAGE TERMINAL STRIP

NOTE: This is a *generic* wiring diagram only. For specific wiring instructions, it is necessary to refer to the wiring diagram which is supplied with each unit.

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



Low Voltage Terminal Strip

1 & 2: Wire all on/off controls and safeties between these two terminals. If not used, jumper 1 & 2 for the unit to operate.

4: Modulating input to humidifier

5, 6 & 7: Modulating output and 24VAC power to actuator

8, 9 & 10: Remote indication connection for fault indication.

CONTROL INSTALLATION

- Mount any wall humidistat (control or high limit) over standard electrical box at height similar to typical thermostat. Any wall humidistat should be in location representative of overall space being humidified and not in path of blower pack or air supply grille. Do not mount on an outside wall where temperature fluctuations can affect control response. (Windows, sky lights, sinks, coffee machines, etc.)
- Mount duct humidistat in location representative of overall air humidity, usually in return duct. Do not mount it directly in front of steam distributor or in turbulent or mixing zone. Mount humidistat where air's humidity and temperature are uniform and representative of spaces being humidified.
- Mount duct high limit humidistat downstream of steam distributors far enough that, under normal humidity and air flow conditions, steam will have been fully absorbed (typically at least 10 feet). It must be located to sense high humidity only when uniform and representative air is over-humidified or approaching saturation.
- Mount duct air-proving switch so that it is able to sense air flow or lack of it. Wire it to make when air flow is sensed and break when air flow fails.
- Check operation of all on/off controls before starting humidifier.
- Calibration of controls (on/off or modulation) in the field may be necessary due to shipping and handling. Verify humidistat accuracy before commissioning system.

PLUMBING

NOTE: All water supply and drain line connections should be installed in accordance with local plumbing codes.

WATER QUALITY

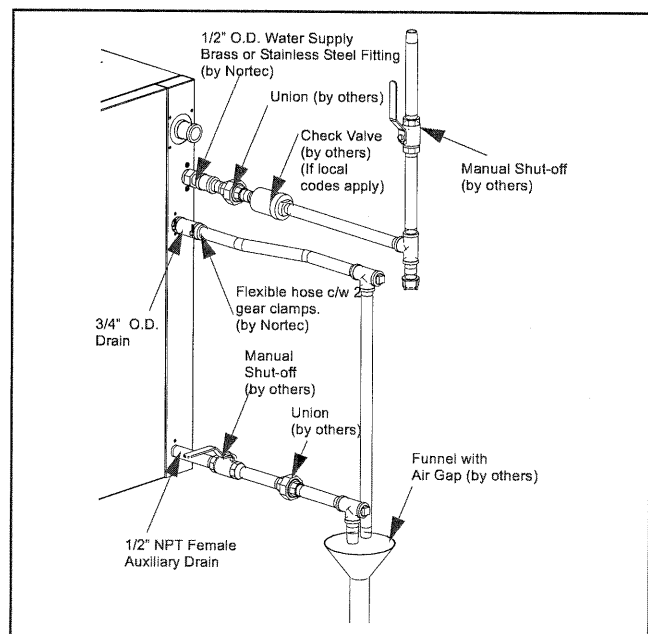
- The humidifier is intended to operate on cold water.
- DO NOT use a hot water source to supply the humidifier. Minerals will adhere more easily to surfaces and the fill valve's small flow regulating orifice could become plugged.
- Consider using a water softener. Longer operating times between tank cleaning will be reached on softened water.

- Reverse osmosis (RO) water can provide very long periods before cleaning is required since it is cleaner than softened water. Deionized (DI) water may be used with all models with the stainless steel water supply option. Consult your AXAIR NORTEC representative for a quote on a water treatment system.

FILL WATER SUPPLY LINE

- Each unit is supplied with an adapter for the fill valve ($\frac{1}{2}$ " NPT). The SE 100-675 has a fill rate of 10l/min (2.6 gpm) and the SE 950-1050 of 17l/min (4.5gpm). Size of piping is a minimum $\frac{1}{2}$ " copper, recommend $\frac{3}{4}$ " up to within 4 feet of unit.
- Standard fill valves are sized for water pressure ranging from 30 to 80 psig (ideally 55 to 60 psig). For other pressures, consult factory. This pressure should be measured at the humidifier if the water pressure is suspect.
- It is recommended to have a faucet installed close to the humidifier to allow quick filling of the system on initial start up. This can also be very useful for mandatory cleaning of the unit.
- ALWAYS supply and install a shut-off valve and union in the water supply line dedicated to the humidifier to facilitate servicing.

Figure # 2



DRAIN LINE

- The humidifier is equipped with a ¾" O.D. drain outlet connection on the side of the humidifier. A vacuum break valve is installed internal to the unit on the drain line. The drain water line must be piped to a drain funnel to provide an air gap before connection to the building drainage system.
- The drain line should not end in a sink used frequently by personnel, or where plumbing codes prohibit it. Route to a floor drain or equivalent for safety reasons. Internal drain water tempering will ensure a maximum of 140°F (60°C) exiting water temperature.
- Keep drain lines as short as possible. Keep drain lines sloped down, not level and not up since low spots in drain lines will accumulate sediment and cause backup. The drain line should be 1-1.5" O.D. or larger. Consult local codes.
- When the drain pump is activated, the tank drains at a rate of 7-8 gal/min (18-20 l/min).

STEAM CONDENSATE OUTLET

<u>MODEL</u>	<u>OUTLET</u>
SE 100, 175, 250 and 375	¾" NPT
SE 475, and 675	1" NPT
SE 950, and 1050	1 ¼" NPT

- The SE humidifier has a condensate return line connection for removal of the condensate formed in the heat exchange.
- Condensate line after the steam trap(s) must be atmospheric and lower than the traps at all times. If required, a condensate pump (by others) can be used to return condensate to the boiler.

AUXILIARY DRAIN OUTLET

- An auxiliary drain port is also provided on the side of the humidifier. It can be used to manually drain the unit, if required. The unit is shipped with this connection plugged. It is recommended to install a shut off valve on this line.
- The auxiliary drain port is used when the freeze protection option is required. Install a shut off valve on this line and pipe to the drain funnel. The manual shut off valve must always be in the open position when the unit is operating but can be closed for servicing of the unit.

STEAM LINES AND CONDENSATE LINES

For steam line installation between the humidifier and distribution system, consult the distribution system installation manual. Steam Distributor Installation Manual - Form #XX-231 and SAM-e, Short Absorption Manifold - Form #XX-249.

The SE series of Steam Exchange humidifiers can develop steam pressures up to 12" w.c. to overcome duct and steam line pressures. An enclosed trap on the drain line prevents steam from going to drain. Duct pressures above 12" will cause steam to exits through the drain line. Consult factory.

PRESSURIZED STEAM CONNECTIONS

Proper design and sizing of steam supply lines should be preformed by a qualified firm.

STEAM SUPPLY PIPING

The steam valve, actuator, wye strainer, and shut-off valve should be installed by a qualified technician.

Steam supply to the unit must be taken from the top of the supply main. Do not take from the sides or the bottom. The steam shut-off valve (supplied by others) should be installed on the supply line at the unit, followed by the wye strainer.

The steam valve and Actuator must be located as close as possible to the humidifier. Further than 6" (15cm) away may result in lower output.

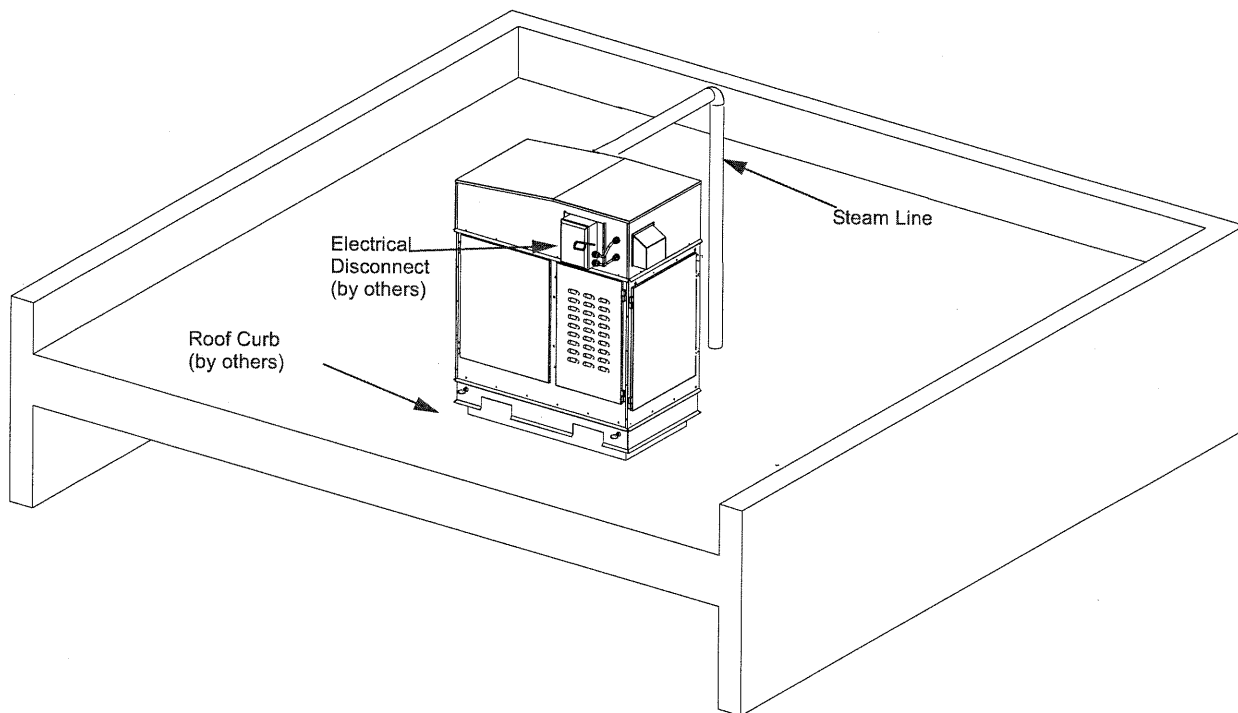
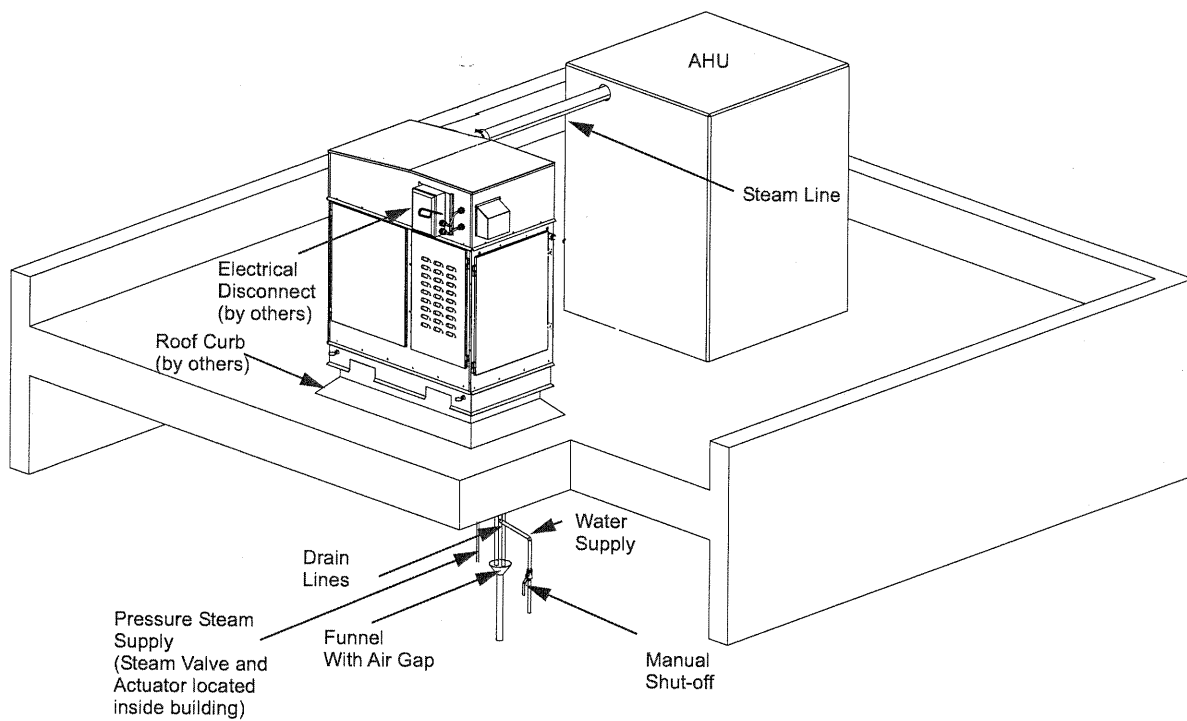
SETC OUTDOOR INSTALLATION

SETC Outdoor units come complete with internal ventilation (cooling) for the electronics, and optional heaters for freeze protection in cold climates.

All installations must conform with local building codes. AXAIR NORTEC can not accept responsibility for installation code violations.

MOUNTING

- A typical rooftop installation is shown on page 15.
- The SETC Outdoor unit comes standard with cut-outs in the base to allow for lifting by a forklift. When lifting by this method, ensure that the forks extend across the entire base to prevent tipping or damage to the unit.



- The enclosure also comes complete with four (4) removable lifting lugs fastened to the base. All four lugs must be utilized if moving the unit in this manner. Protect the cabinet from damage from the lifting cables/chains during lifting. The lifting lugs should be removed from the base once the unit has been correctly positioned on the curb mounting.
- The SETC Outdoor models have a zero" clearance to combustibles. However, choose the location for the humidifier to allow for side and frontal clearances for access during installation, maintenance and servicing.
- The integral base of the SETC Outdoor model is designed to mount on a curb. The curb must be built to structurally support the entire weight of the humidifier when in operation.
- Ensure that the humidifier is mounted level.
- The pan in the bottom of all outdoor models has a pipe chase for routing of services into the humidifier from below.
- It is not necessary to make the hole in the roof the same size as the curb. The curb drawing shows the location and size of the pipe chase required. The pipe chase should be sealed when the installation is complete to ensure positive or negative pressure from the building.
- The panels of the outdoor model have louvers to provide ventilation for the electronics and air for the combustion process. Locate the unit so that louvered panels are a minimum of 10 ft (3m) from any mechanical exhaust outlet.
- When mounted on the curb, the lowest air intake louvers must be a minimum of 12" (30.5cm) above any surface where snow or ice could accumulate. In areas where normal snow accumulation is higher, mount the unit accordingly.
- Do not store or use gasoline or other flammable vapors and liquids in the vicinity of the humidifier.

PRESSURE STEAM SUPPLY

- Steam Lines are to be routed through the pipe chase located on the floor of the unit.
- The steam valve and actuator must be located as close as possible to the unit.
- A wye strainer must be installed prior to the valve.

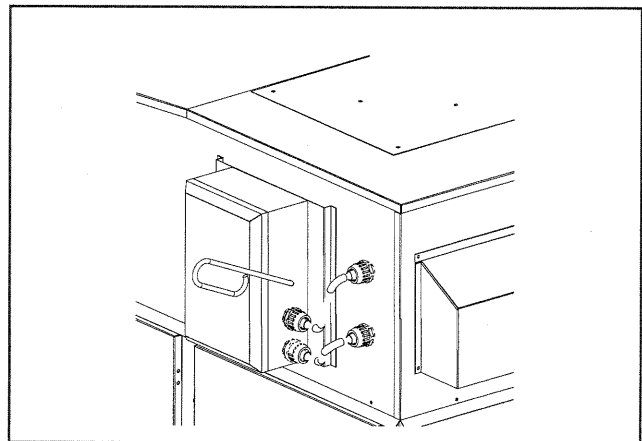
ELECTRICAL INSTALLATION

- Power and control wiring is to be routed into the humidifier through the pipe chase in the base pan of the outdoor models located in the heat exchange area.
- Installation details for primary and low voltage control wiring are the same as for indoor units (see page 9 & 11).
- A field supplied NEMA rated disconnect switch must be mounted external to the SETC Outdoor unit to allow for power interruption during servicing and/or maintenance. A mounting plate, located on the front of each outdoor model above the electrical access door, is available for mounting of the disconnect switch. Two electrical conduits are provided for routing the primary wiring to the disconnect switch and then back inside the enclosure to the main power terminal strip. See Figure #3 for details.

FILL WATER SUPPLY LINE

- Each unit is supplied with a ½" NPT male connection to the fill valve. Refer to figure #2 for connection details. A minimum fill rate of 10 l/min (2.6 gpm) is required for the SE 100-675 and 17 l/min (4.5 gpm) for SE 950-1050. Allowable pressure range is 30-80 psig.
- Always install a manual shut off within the building to allow isolation of the water to the unit. A union must be installed on the fill line prior to the fill valve to allow for servicing.
- Heat trace fill line piping above rooftop from the pipe chase up to the fill valve.

Figure # 3



DRAIN LINE

- SETC Outdoor units have an integrated 12" (30.5 cm) w.c. trap and vacuum break valve on the drain line.
- Route the drain hose to a drain funnel in the building to provide an air gap before entering main building drain/sewage system.
- When the drain pump is activated, the tank drains at a rate of 18-20 l/min (7-8 gpm).
- Internal drain water tempering will ensure a maximum of 140°F (60°C) during normal operation.

AUXILIARY DRAIN

- Standard SETC Outdoor units come with a capped ¾"NPT auxiliary drain connection at the bottom of the tank. It is recommended to install a manual shut-off valve on this connection and route to drain (provide an air gap).
- SETC Outdoor units equipped with a freeze protection package have a normally open drain valve mounted at the auxiliary drain connection and piping that terminates at the pipe chase in the base pan. This valve opens and will drain the contents of the tank in the event of a power failure. Install a manual shut off valve on this line and pipe to the drain funnel. This valve must always be left in the open position when in operation but can be closed for servicing of the unit.
- Drain pipe should be capable of withstanding 200°F temperatures.

STEAM LINES

- The steam outlet connection is located at the back of the SETC Outdoor unit. Steam hose(s) and clamps are supplied with the unit and are intended to provide a flexible coupling outside of the unit to the building steam lines. See figure 20.
- SETC OUTDOOR models can develop steam pressures up to 12" (30.5 cm) w.c. to overcome duct and steam line pressures. Pressures above 12" (30.5 cm) w.c. will cause steam to exit through the drain line.
- Steam lines can be routed to an air handler on the roof or pipe chase (external to the unit) through the rooftop to enter the building.

- All steam lines must be insulated to reduce losses.
- For steam line installation guidelines, consult the distribution system installation manual (Steam Distributor Installation Manual Form #XX-231 and SAM-e Short Absorption Manifold Form #XX-249

END OF SETC OUTDOOR

OPERATION

WATER MANAGEMENT

The SE Series is equipped with a unique float chamber water level monitoring device. Two magnetic floats measure 5 different water levels on the SETC models, and 2 different water levels on the SEP models for proper operation. The float chamber and board are located away from the boiling action to increase reading accuracy and reduce mineral build-up.

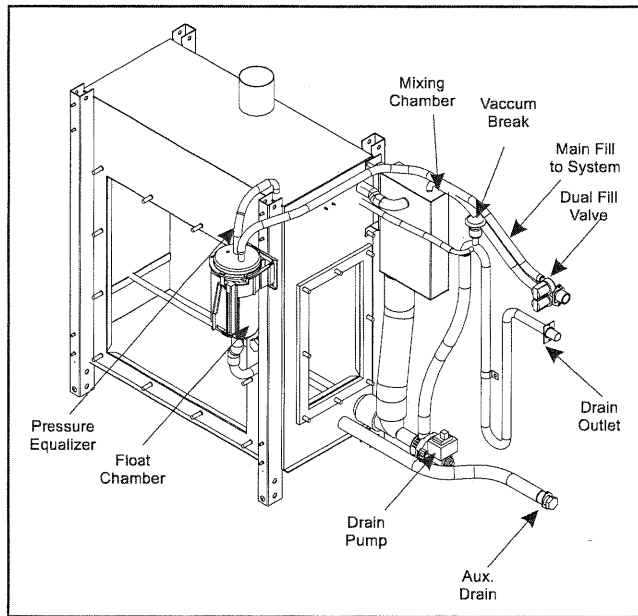
The float chamber is connected to the tank under the water level and above the water level to ensure equalization of pressure between the tank and float chamber. In addition, cooling water is introduced in the float chamber to reduce scale build-up. The unit also includes an internal 1" air gap and a vacuum breaker to prevent siphoning effect.

On initial start-up, the solenoid operated fill valve fills the tank. The water level reaches the backup float first and then the main float. If the backup and main floats do not read the same water level during the operation of the unit, the unit will shut down on a fault. The unit will continue to fill to the top yellow position. The drain pump will then be energized to drain the water level down to just below the bottom red position and then the fill valve will energize again to fill the unit to the middle green position. During this time the software is performing a test on the fill valve and drain pump.

If a demand signal is present, the unit will then begin to open the steam valve. As the unit operates, the fill valve will be pulsed to maintain the water level between the yellow and green positions. During steam production the unit will also check if the floats and drain pump are operational by activating a drain sequence every 24 hours. (adjustable to time of day)

Figure #4

Plumbing Connections



**INSPECTION AND START UP
PROCEDURE**

START-UP CHECKLIST

Before the SE humidifier is operated for the first time, a complete inspection must be performed to ensure that the installation and all water, pressure steam, atmospheric steam lines, and electrical connections to the humidifier conform to the guidelines in this manual. Complete the checklist on pages 20 & 21 before commissioning the unit.

Qualified personnel must correct any deficiencies with the installation before commissioning takes place.

Prior to starting the humidifier, it is necessary to ensure that no dirt or dust has accumulated in the electronics compartment. A build up of dust on the electronics can cause overheating and early failure of the components.

FILLING THE SYSTEM

Before the SE unit will open the steam valve, it must be filled with water and the internal controller must have completed a self-test to verify that the water fill system, level controller, and drain pump are functioning correctly.

- Close the shut-off valve in the pressure steam supply line.
- Remove any demand signal to the unit.

- Open the shut-off valve in the water supply line.
- Switch the humidifier on.
- The fill valve will energize and the tank will begin to fill (fill time is approximately 10 to 30 minutes depending on the SE model). Once the float chamber has registered low water level, the unit will perform an internal test of the fill and drain system as described in the Water Management section.
- At the completion of the test, the float chamber will indicate middle float position (green LED) and the unit will go into standby mode until a demand signal is received.

STARTING THE HUMIDIFIER

Once the tank has been filled, the humidifier is ready to be put into operation.

- Verify that the inspection checklist has been completed and all deficiencies with the installation have been corrected.
- Open the shut-off valve in the pressure steam supply line.
- Open the shut-off valve in the water supply line.
- Ensure all external controls connected to the security loop are closed.
- Verify that the building demand signal is connected to the humidifier.
- Install and secure all cabinet service doors.
- Switch the humidifier on.
- At the completion of the float test, the humidifier will begin to open the steam valve and warm up the water.
- Depending on the system demand, the actuator will open or close to control the amount of steam injected into the heat exchangers.
- The water in the tank will heat up and begin to boil, delivering steam to the distribution system.
- During the boiling sequence the water fill valve will periodically activate to replenish water that has evaporated from the tank.
- Once the humidity requirements have been satisfied (demand drops below minimum %) the

steam valve will be de-energized and will be shut off.

- The humidifier will go into standby mode until the next call for humidity.

TAKING OUT OF OPERATION

If it is required that the humidifier be taken out of operation (e.g. for service or end of season shut-down), proceed as follows:

- Remove the demand signal or open the security loop, allowing the steam valve to shut off.
- Switch the main power switch from On to Off and then to the Drain position. The drain pump will be energized and the tank will begin to drain.
- Once the tank has completely emptied, shut off the drain switch.
- Close the shut-off valve in the pressure steam supply line.
- Close the shut-off valve in the water supply line.
- Isolate the humidifier from the electrical power supply at the main disconnect switch.

SE INSPECTION CHECK LIST

HUMIDIFIER MOUNTING

- ☐ Verify proper clearances around the unit
- ☐ Humidifier mounted level
- ☐ Humidifier properly secured to stand and stand bolted to floor
- ☐ All service doors accessible
- ☐ Roof curb sized correctly (Outdoor Model Only)

PRESSURE STEAM PIPING

- ☐ Test joints for leaks
- ☐ Manual shut-off valve installed prior to Steam Valve & Actuator
- ☐ F&T Trap installed prior to Steam Valve & Actuator (by others)

STEAM LINES

Slope up 2" per 12" ☐

Slope down 1/2" per 12" ☐

Trapped 2" more than static duct pressure ☐

Traps ☐ - Size _____

Insulated ☐

Length/Size _____

90 deg. Elbows ☐ qty: _____

45 deg. Elbows ☐ qty: _____

Can condensate be trapped anywhere in the steam line? Yes ☐ No ☐

CONDENSATE LINES

- ☐ Sloped back to drain
- ☐ Trap is greater than 2" duct static pressure
- ☐ Size of Trap _____

SUPPLY WATER LINE

- ☐ Nortec supplied adapter installed on fill valve (1/2" NPT)
- ☐ Manual shut off valve and union installed
- ☐ Verified pressure (30-80 psig)
- ☐ Water source of 10 L/min (2.6 gpm) for SE 100-675 or 17L/min (4.5 gpm) for SE 950-1050
- ☐ Leak tested
- ☐ 1/2" dia. At max 4ft of the unit

DRAIN LINES

- ☐ Air gap located within 3ft of the unit
- ☐ Minimum drain line size of 1" – 1.5" in dia.
- ☐ Downward slope
- ☐ Tundish (funnel) installed to provide air gap
- ☐ Temperature rating of piping
- ☐ Hose connections tightened
- ☐ Auxiliary drain piped with shut off valve to tundish

WATER QUALITY

Well Water ☐ City Water ☐ Softened Water ☐ RO/DI ☐ Water ☐
Conductivity: _____ mhmos Hardness: _____ GPG Silica: _____ ppm
Chlorides: _____ ppm pH: _____

ELECTRICAL INSTALLATION

- ☐ Comply with local regulations
- ☐ Proper supply voltage (must match rating plate) and breaker size
- ☐ Electrical disconnect switch close to humidifier
- ☐ Cables properly affixed
- ☐ Low voltage wiring & control signal(s) wired to correct terminals
- ☐ Humidifier configured for correct control signal(s)

TYPE OF CONTROLS INSTALLED/LOCATION/WIRING/SETTING

- ☐ High Limit _____
- ☐ Air Proving _____
- ☐ Modulation Control _____
- ☐ On/Off Control _____
- ☐ Controls by Nortec _____
- ☐ Control by Others _____



SE Series Inspection Checklist

SCALE MANAGEMENT

The steam exchange humidifier will periodically "blowdown" water from the tank to reduce the concentration of total dissolved solids that accumulate during long term operation.

Steam Exchange Humidifiers are shipped factory set with a blowdown of 25%. This setting ensures that scale build-up will be minimized for all water conditions.

Once the water conditions are known, the blowdown rate can be adjusted by software (SETC models) or by using dip switches on the logic control board (SEP models).

Another effective means of controlling the amount of scale in the tank is with the use of the Full Tank Blowdown (FTBD) built into the software. When this feature is activated, the drain pump will be energized to drain the entire contents of the tank and then the tank will be refilled with fresh water, thus keeping the amount of total dissolved solids to a minimum. The feature can be programmed in the software to occur after a specific amount of operating time and can also be triggered by a signal sent to the humidifier from a building management system.

WATER QUALITY

Due to the wide range of water conditions found throughout North America it is important that the blowdown is set according to the local water conditions. By water conditions we are referring to the hardness of the water supplied to the humidifier. The hardness is measured in grains per gallon. It is also important to test for silica content. Silicates may cause foaming and contribute to scale buildup in the humidifier tank and float chamber.

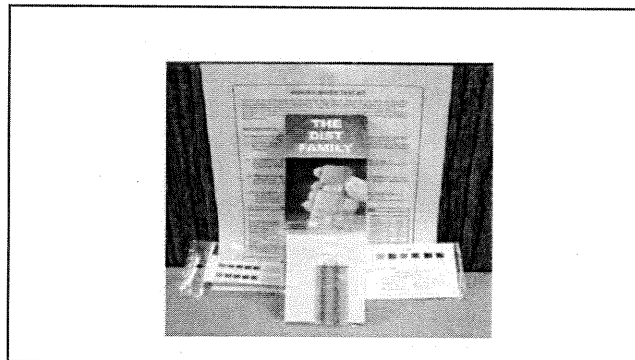
If you are unaware of the hardness or silica content of your water supply, there are many "do it yourself" kits which can be purchased, or there are several companies that will perform the tests for a reasonable price. You can even contact your municipality for your water condition or order the AXAIR NORTEC water test kit.

Note: Water quality conditions resulting in component failures are not covered under AXAIR NORTEC's standard warranty.

- Silica Test: Measured in ppm (parts per million)
Follow the directions with the kit. A high reading

Figure # 5

Site Water Test Kit P/N 1507214



will decrease the performance of your system.

The recommended operating range for silica is 0 ppm to 14 ppm. Note: A high silica content along with a high hardness content may increase the service intervals of the system. Consult the factory if this condition exists at the site.

- Hardness: Measured in gpg (grains per gallon). Follow the instructions on each individually wrapped test strip and use the colour chart provided. The recommended operating range for hardness is 0 gpg to 12 gpg. Note: High hardness along with high silica may increase the service intervals of the system. Consult the factory if this condition exists at the site.
- pH: Follow the directions on the test strip bottle. The recommended operating range for pH is 6.5 to 7.5 on the colour scale. Consult the factory if outside these parameters.
- Chlorides: Measured in ppm (parts per million). Follow the directions on the test strip bottle. The recommended level for chlorides is not to exceed 25 ppm. High levels of chlorides will attack stainless steel. Add an in-line carbon filter that will remove up to 99% of the chlorides. Consult the factory for additional information if your water contain high levels of chlorides.
- Conductivity: Measured in micromhos. Follow the directions for the conductivity pen found inside the box. Multiply the digital reading by 1.5. The recommended operating range for conductivity is 0 - 1500 micromhos. Consult the factory if you measure outside these parameters.

Tech-nology	Water Type	Water Cond. Range	Hard-ness Range	Silica Range	Alkalin. Range	Chlor. Range
Steam Exch-ange		Microm-hos	GPG	PPM	pH	PPM
	Potable	0-1500	0-12	0-14	6.5-7.5	0-25
	Treated	0-100	0-1	0-1	7-7.5	0-25

- AXAIR NORTEC recommends performing a semi-annual water analysis to ensure optimal performance.
- The humidifier is intended to operate on cold potable tap water.
- DO NOT use a hot water source to supply the humidifier. Minerals will adhere more easily to surfaces and the fill valve's small flow regulating orifice could become plugged.
- Consider using a water softener. Longer operating times between tank cleaning will be reached on softened water.
- Reverse osmosis (RO) water can provide very long times before cleaning is required since it is cleaner than softened water. Deionized (DI) water may be used with all models.
- Consult your AXAIR NORTEC representative for a quote on a water treatment system.

MAINTENANCE

To ensure proper performance and long operating life of the SE humidifier, a proper maintenance schedule should be followed. Since the amount and type of maintenance required is generally a result of how much the humidifier operates, all SE humidifiers monitor the amount of steam produced over time, and will indicate when service is required. All units come factory set with a service interval of 500 hours. This service interval can be adjusted through software (SETC models) or by jumpers settings (SEP models) on the logic control board. Refer to the maintenance schedule on page 47 for maintenance guidelines and intervals.

All maintenance work must be performed by experienced and trained personnel.

NOTE: Use only AXAIR NORTEC original parts to replace damaged or defective components. Failure to do so may cause improper operation of the humidifier and will void warranty.

DRAINING THE TANK

During extended periods of inactivity such as off-season, it is advisable to drain the water from the tank. On all models this is accomplished by switching the unit to "Drain".

Do not remove the front or top clean out port on the tank until the unit is completely drained and cool.

The SETC model includes a pre-cleaning sequence feature. When activated (through the keypad), the unit will flush the humidifier, refill with cold water, and flush again reducing the scale accumulated at the bottom of the tank.

CLEANING THE STAINLESS STEEL TANK & FLOAT CHAMBER

CAUTION: Water and scale may be hot enough to cause burns. Turn off humidifier and allow it to cool before cleaning.

It is recommended that the tank be cleaned at least once every season to maintain optimum operation. It may be necessary to increase the frequency of cleaning or increase the blowdown setting in areas of hard water or prolonged annual usage (see the "Blowdown Setting section of this manual).

Cleaning of the humidifier is mandatory and must be performed on a regular basis.

To reduce cleaning time, use the pre-cleaning sequence on the SETC model to help evacuate mineral debris from the unit. Check the controller operation to activate this feature.

The heat exchanger walls are usually self cleaning. The mineral build-up flakes off, due to the expansion and contraction and boiling action during on/off cycles, and settles to the bottom of the tank. The end block will have scale build-up. These surfaces must be cleaned at regular intervals.

Frontal port cleaning will be done through the front door of the unit. Remove cabinet door on the left of the LCD display using a Philips screwdriver. Remove the side tank port opening, by removing the 3/16" nuts (1/2" key or socket is needed).

Additional clean out ports are available on the top of the SE 475/675 and SE 950/1050 models. To access these ports, remove the top cabinet panel using a Phillips screwdriver. Remove the top clean out ports by removing the nuts.

Removal of the heat exchanger(s) is not necessary to clean the inside of the tank.

Scoop out loose scale with a small shovel such as those used for gardening. Once loose scale is removed, use a scraper such as a plastic windshield scraper to remove scale adhering to the tank or heat exchanger walls. DO NOT use a metal scraper that will scratch the stainless steel surfaces of the tank. Once all large pieces of scale have been removed, vacuum the tank out with a shop vacuum, fill part way with water, and flush remaining sediment from the tank through the drain.

Due to the presence of polymer gaskets around the heat exchanger, do not use any harsh cleaning chemicals. Please consult AXAIR NORTEC prior to using any chemicals. Once the lid has been replaced, fill the unit with water and examine for leaks.

Inspect the drain and fill lines assembly for scale build-up and if necessary, remove them from the humidifier for cleaning. If the blowdown assembly becomes blocked, scale build-up in the tank will be accelerated and damage to the humidifier could result. The drain pump may be opened and cleaned. Consult AXAIR NORTEC for proper procedure.

Re-assemble the drain and blowdown if they were removed. Re-install tank top and side lids making sure tank cover gasket is intact. Do not over tighten hold down nuts. If using a torque wrench do not exceed 50 in-lb (5 ft-lb). Re-seal all cabinet lids.

Cleaning the float chamber is accomplished by removing the hold down screws to access the floats and using a small brush to gently clean the scale from the floats and chamber. Ensure that floats are back in place and o-ring is properly seated before tightening screws on float chamber. Special attention must be used when removing or re-installing the float chamber. The switch board must be replaced into the same position as before cleaning and the tie-wrap must be used to hold the float chamber in position.

ADJUSTMENTS/REPLACEMENTS OF COMPONENTS

NOTE: CONSULT FACTORY PRIOR TO THE REPLACEMENT OF ANY COMPONENT.

DANGER - SHOCK HAZARD - Make sure electrical power to the appliance is disconnected to avoid potential serious injury or damage to components.

SERVICING THE UNIT

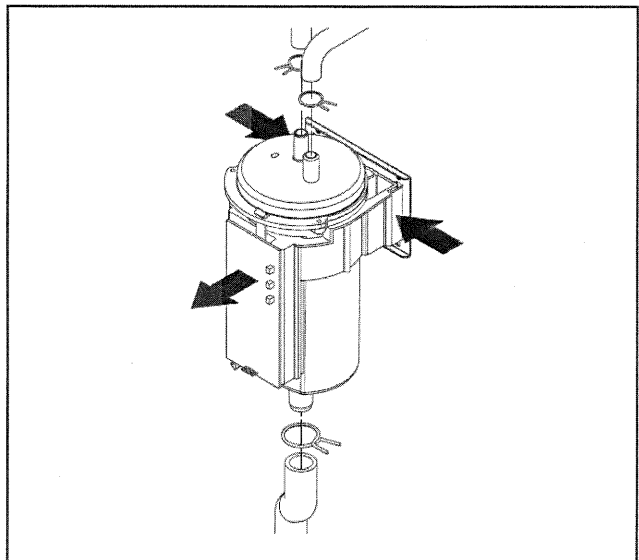
Caution: Disconnect power before servicing this appliance.

Caution: Label all wires prior to disconnection when servicing controls. Wiring errors can cause improper and dangerous operation.

Float Chamber Replacement (Figure #6)

1. Drain the contents of the tank and then shut off electrical power and water supply to the humidifier.
2. Remove the left front service access door.
3. Remove the cable connection to the float board.
4. Remove the hose clamps on the float chamber and remove all hoses (note the correct hose assignment).
5. Squeeze both sides of the mounting bracket to release it from the slots in the support bracket behind the float chamber.
6. Reverse the above sequence to install the new module.
7. Leak test all water connections before re-commissioning the humidifier.

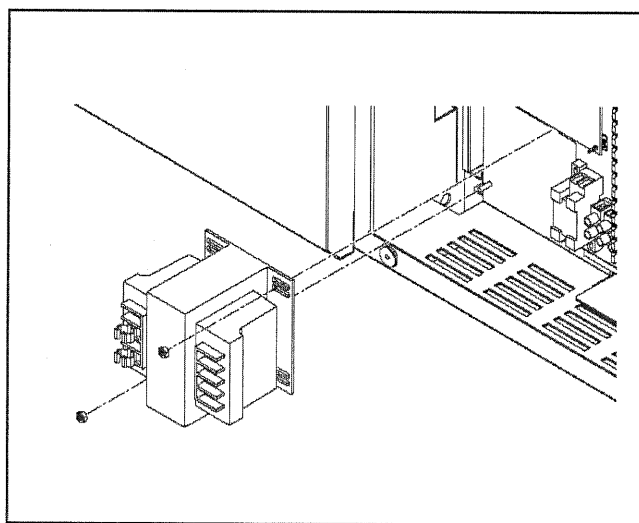
Figure # 6



Transformer Replacement (Figure #7)

1. Shut off electrical power to the appliance.
2. Remove front access door.
3. Disconnect wiring connections from transformer leads labeling as required.
4. Remove screws (2) holding transformer.
5. Reverse above procedure to re-install.

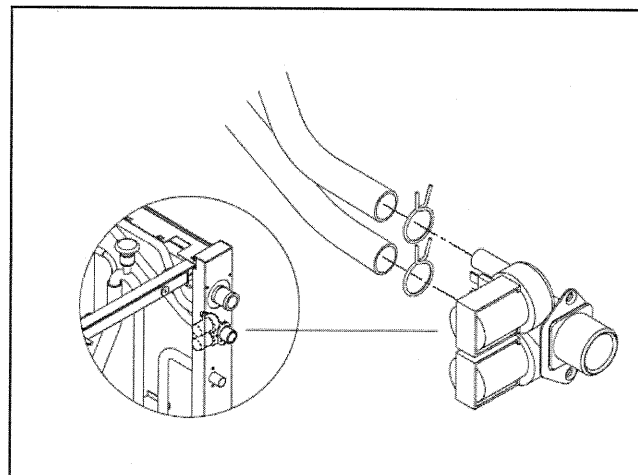
Figure # 7



Fill Valve Replacement (Figure #8)

1. Shut off electrical power and water supply to the humidifier.
2. Remove the right side service access door.
3. Remove all wiring connections to the fill valve.
4. Remove the hose clamps on the fill valve outlets and remove hoses (note the correct hose assignment).
5. Remove the 2 screws securing the fill valve to the cabinet and remove the valve.
6. Reverse the above sequence to install the new module.
7. Leak test all water connections before re-commissioning the humidifier.

Figure # 8

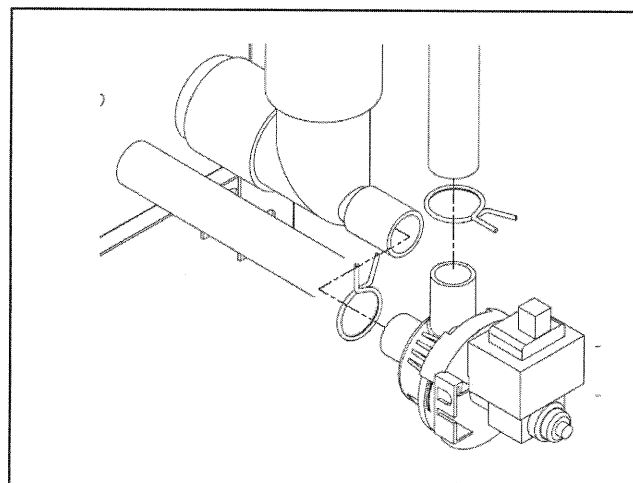


Drain Pump Replacement (Figure #9)

1. Drain the unit completely. If the pump is broken use the auxiliary drain out port.
2. Shut off electrical power to the appliance.
3. Remove front and right doors.
4. Remove wiring connections to the pump.
5. Remove hoses attached to the pump.
6. Reverse above procedure to re-install.

NOTE: To avoid water spillage (some water will be left on the tank bottom after manual draining) use shop vac to remove left over water.

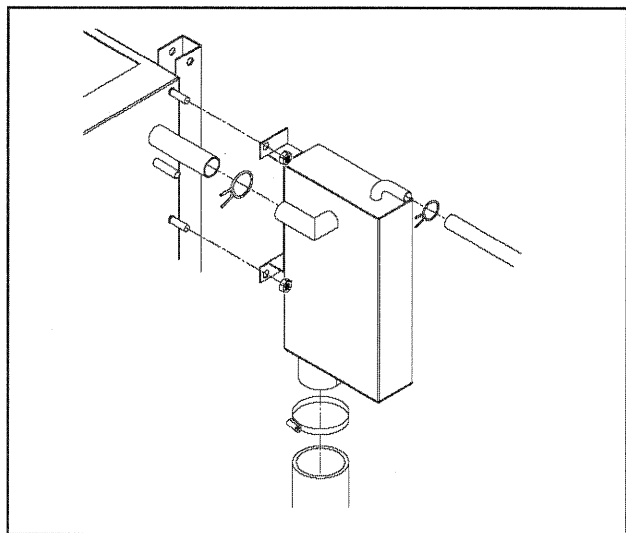
Figure # 9



Fill Box Replacement (Figure #10)

1. Drain the contents of the tank and then shut off electrical power and water supply to the humidifier.
2. Remove the right side service access door.
3. Remove the hose clamps and remove all hoses.
4. Undo the 2 nuts securing the fill box to the tank.
5. Reverse the above sequence to install the new module.
6. Leak test all water connections before re-commissioning the humidifier.

Figure # 10



Removal of Heat Exchanger

1. Take the humidifier out of operation.
2. Unlock and remove the right side panel(s).
3. Unlock and remove the left and the right top panels.
4. Free all piping of the respective heat exchanger.
5. Unscrew the nuts on the heat exchanger and pull out the heat exchanger from the tank.

Re-installation is carried out in the reverse sequence. **Replace all seals with new ones.**

SETC MODELS

Faults are indicated with a fault message on the display of SETC models. Recovery from lockout requires resetting of the humidifier. This can be achieved by momentarily shutting off the power switch then turning it back on, or by pressing the reset button on the logic control board mounted inside the electrical cabinet.

A history of all faults is stored in memory of the software and can be viewed through the service level on the display. Refer to the keypad display menu structure at the end of the manual.

SEP MODELS

Faults are indicated on SEP models with blinking red lights. Check the LED sequence for the fault before shutting off the unit. Resetting the humidifier clears the fault. This can be achieved by shutting off the power switch, then turning it back on.

FAULT CONDITIONS

Fault F1- Humidifier no filling: Yellow LED Flashes twice.

Probable Cause:

- Fill Valve not energizing
- Water supply interrupted
- Float level indication interoperable
- Tank leaking.

Fault F2 - Humidifier not draining: Yellow LED flashes once.

Probable Cause:

- Drain pump blocked
- Drain pump inoperable
- Float level indication inoperable
- Drain line restricted

Fault F3 - Float level inconsistent: Yellow LED flashes four times.

Probable Cause:

- Defective float level board
- Defective float chamber

SETC SETTINGS

3 DAY DRAIN

3 DAY DRAIN FUNCTION	SW3/7
Function Disabled	OFF
Function Enabled (Factory set)	ON

KEEP WARM/INDOOR FREEZE PROTECTION PACKAGE

3 DAY DRAIN FUNCTION	SW5/7
Function Enabled	ON
Function Disabled (Factory set) - 3 day drain	OFF

ANALOG CHANNEL 1

Input Range	SW1/1	SW4/1	SW 4/2
0-10V input	OFF	OFF	OFF
0-5V input	OFF	ON	OFF
2-10V input	OFF	OFF	ON
1-5V input	OFF	ON	ON
0-20mA input	ON	OFF	OFF
4-20mA input	ON	OFF	ON
ON/OFF + inst. jumper between 4 & 6	ON	ON	ON

ANALOG CHANNEL 2

Input Range	SW1/2	SW4/1	SW 4/2
0-10V input	OFF	OFF	OFF
0-5V input	OFF	ON	OFF
2-10V input	OFF	OFF	ON
1-5V input	OFF	ON	ON
0-20mA input	ON	OFF	OFF
4-20mA input	ON	OFF	ON
ON/OFF + inst. jumper between 4 & 6	ON	ON	ON

INPUT CHANNEL

DUAL CHANNEL FUNCTION	SW4/5
One Channel Input	OFF
Dual Channel Inputs	ON

TIME PROPORTIONING

TIME PROPORTIONING	SW4/7
Disabled (Factory set)	OFF
Enabled	ON

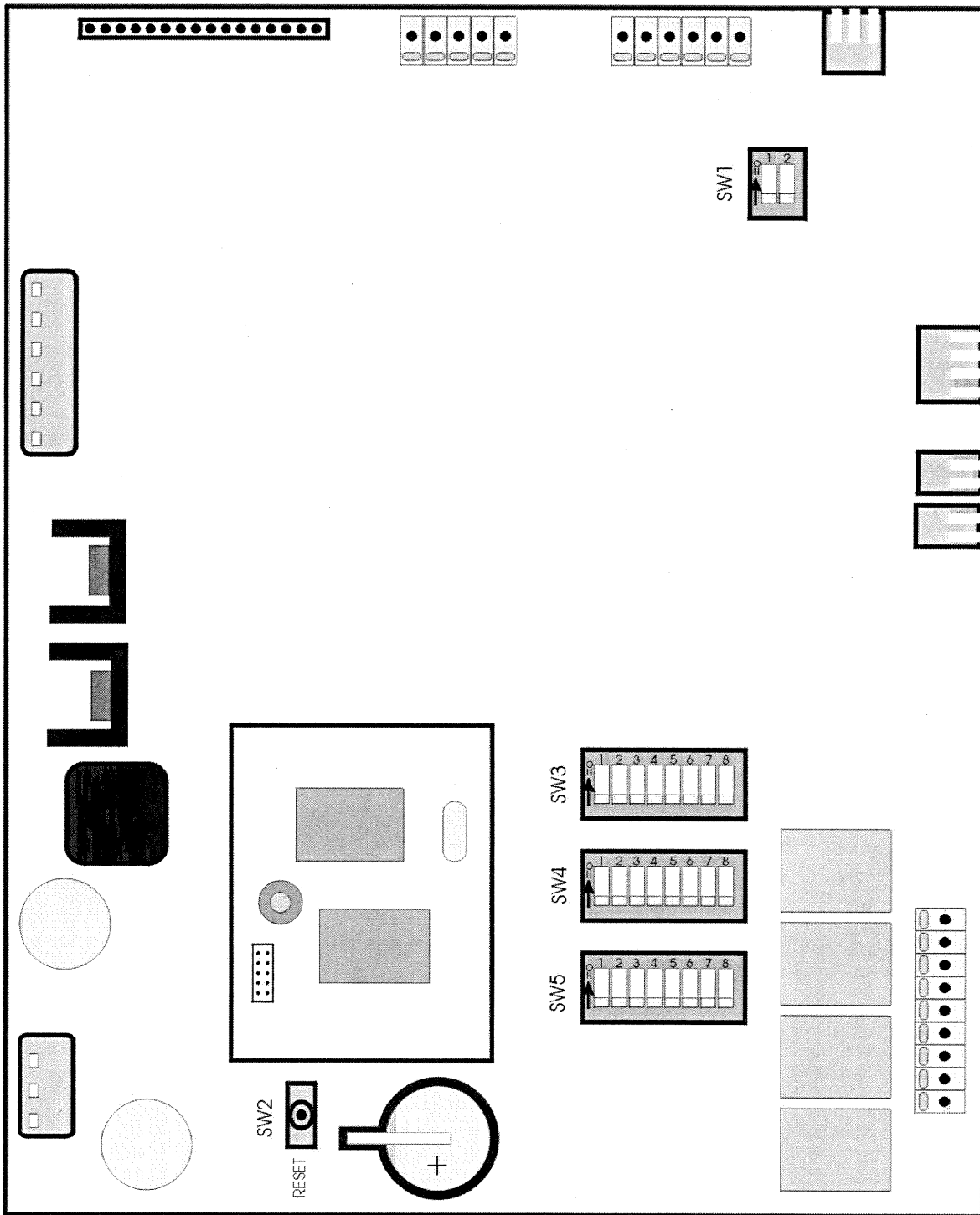
MAINTENANCE SHUTDOWN

MAINTENANCE SHUTDOWN FUNCTION	SW5/4
Unit will shutdown 72 hours after service time expired, by generating an error.	OFF
Unit will display warning but continues to operate. (Factory set)	ON

FULL TANK BLOWDOWN

FULL TANK BLOWDOWN FUNCTION	SW5/8
Disabled	OFF
Enabled (Factory set)	ON

DIP Switch Settings



INTRODUCTORY SCREEN

NORTEC SETC-250
VERSION X.XX
SYSTEM LOCKOUT
09.05.03 9:30

MENU

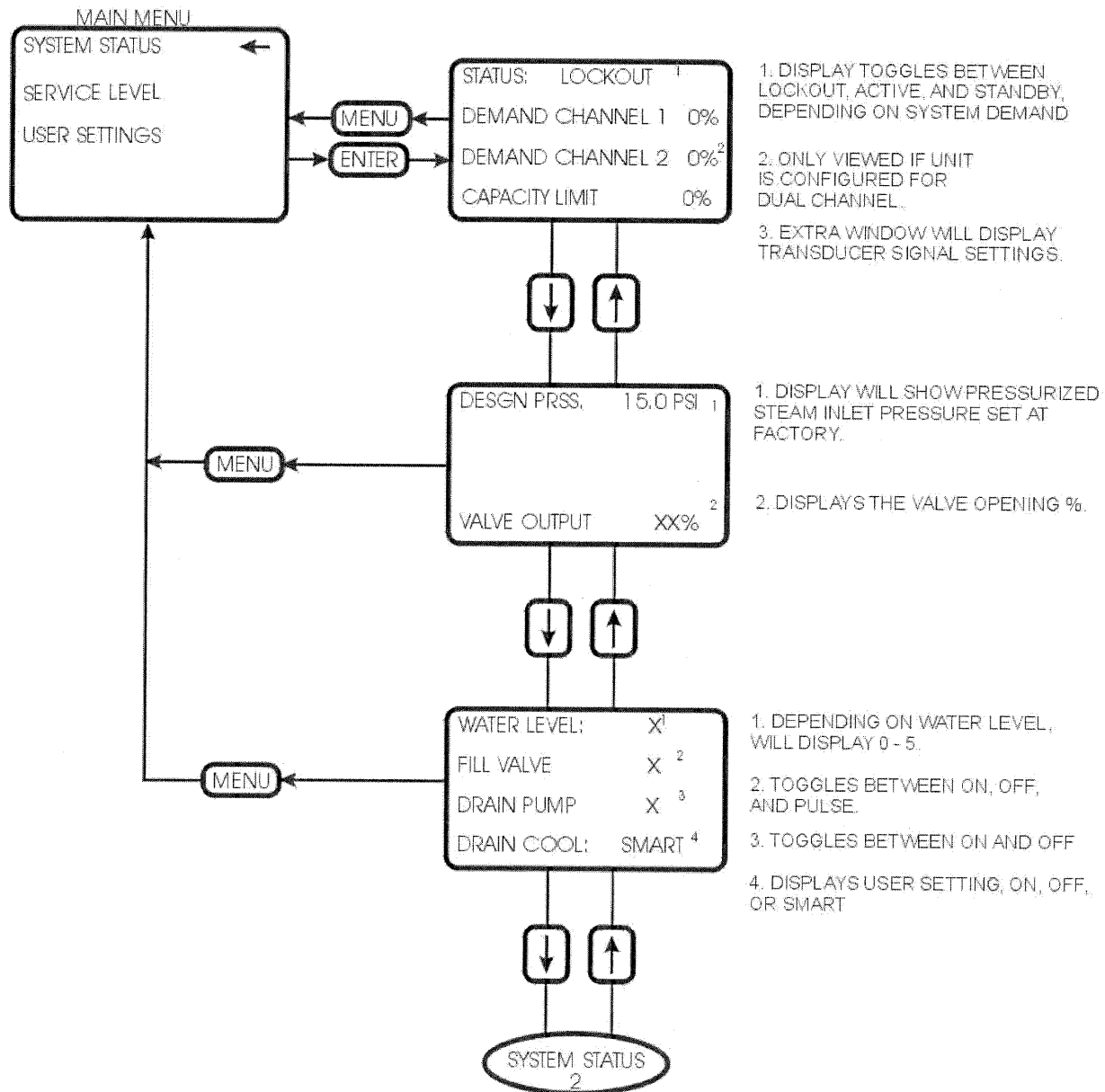
MENU

MAIN MENU

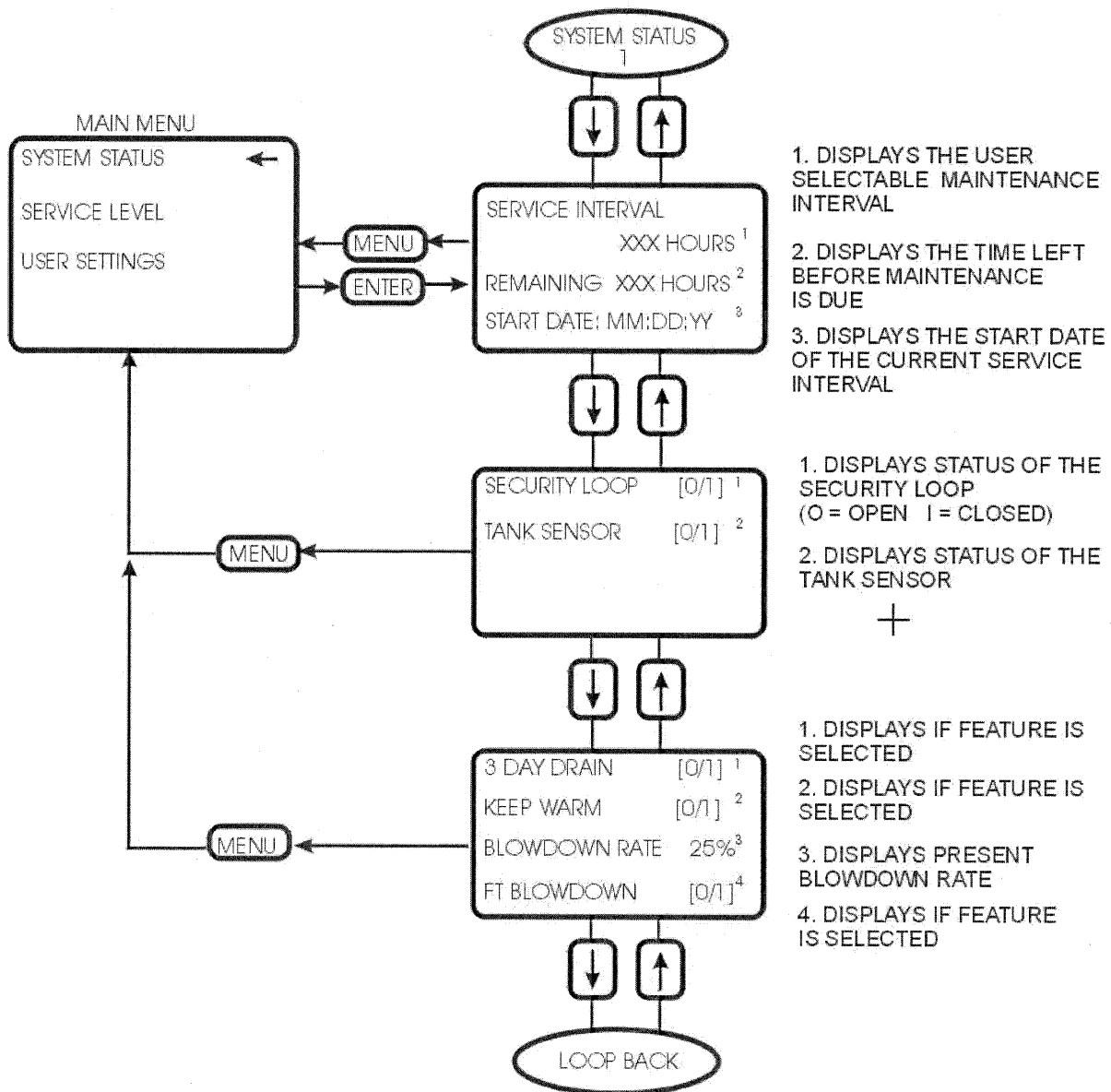
SYSTEM STATUS
SERVICE LEVEL
USER SETTINGS

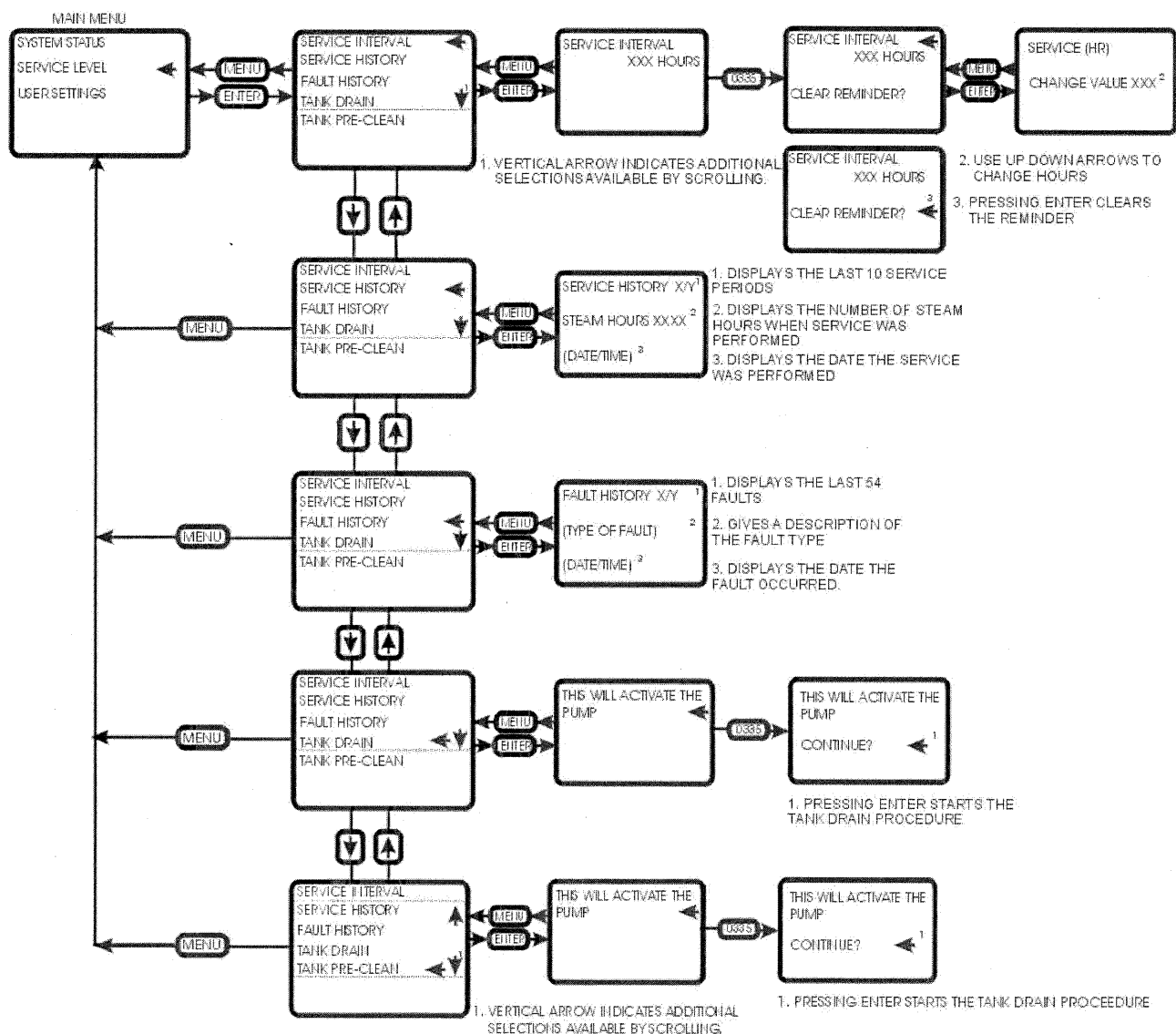
USE THE
UP/DOWN
ARROWS
TO MOVE THE
POINTER TO
SELECT A
MENU ITEM.

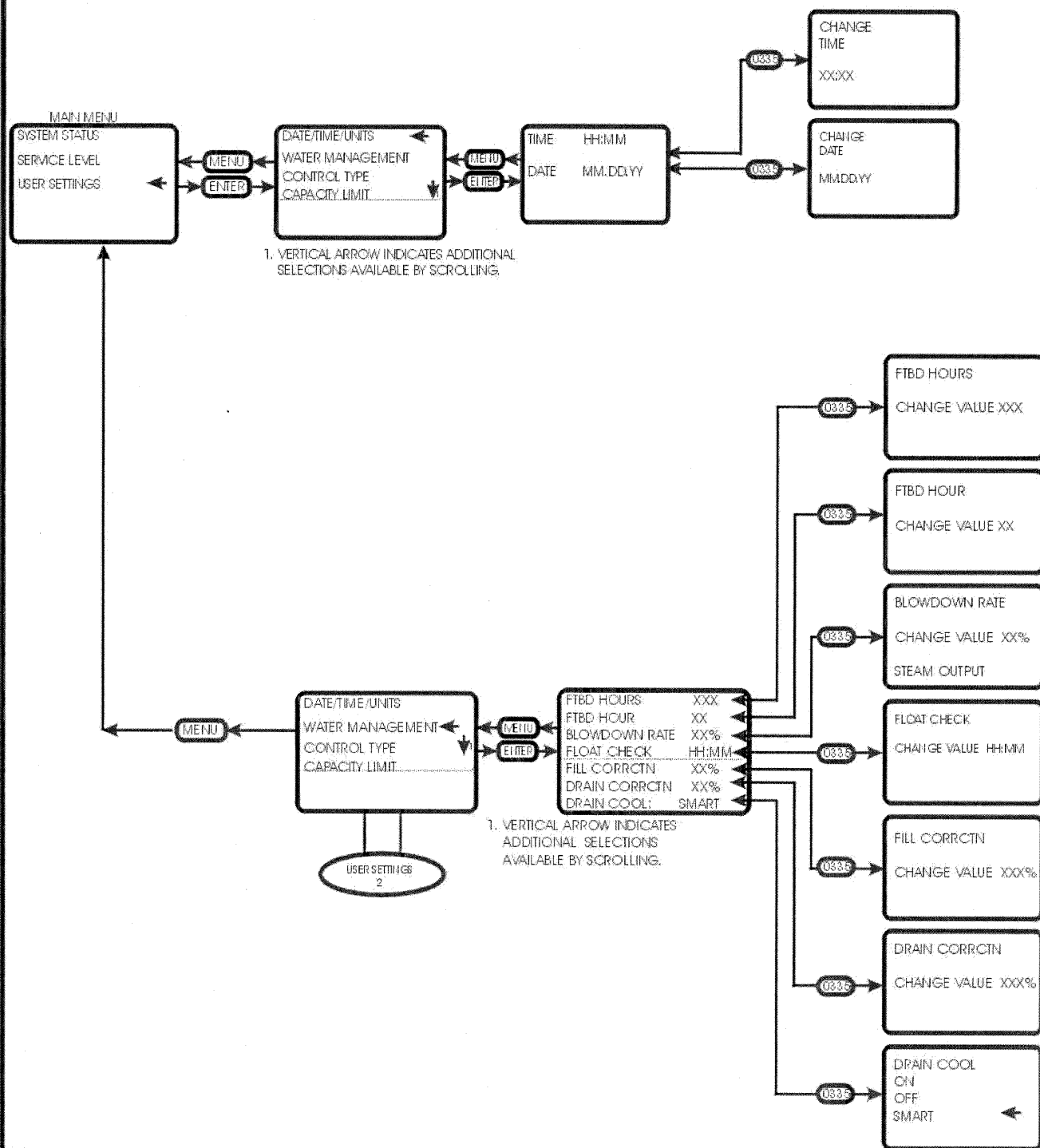
TO OPEN THE
SELECTION,
PRESS THE ENTER
BUTTON.

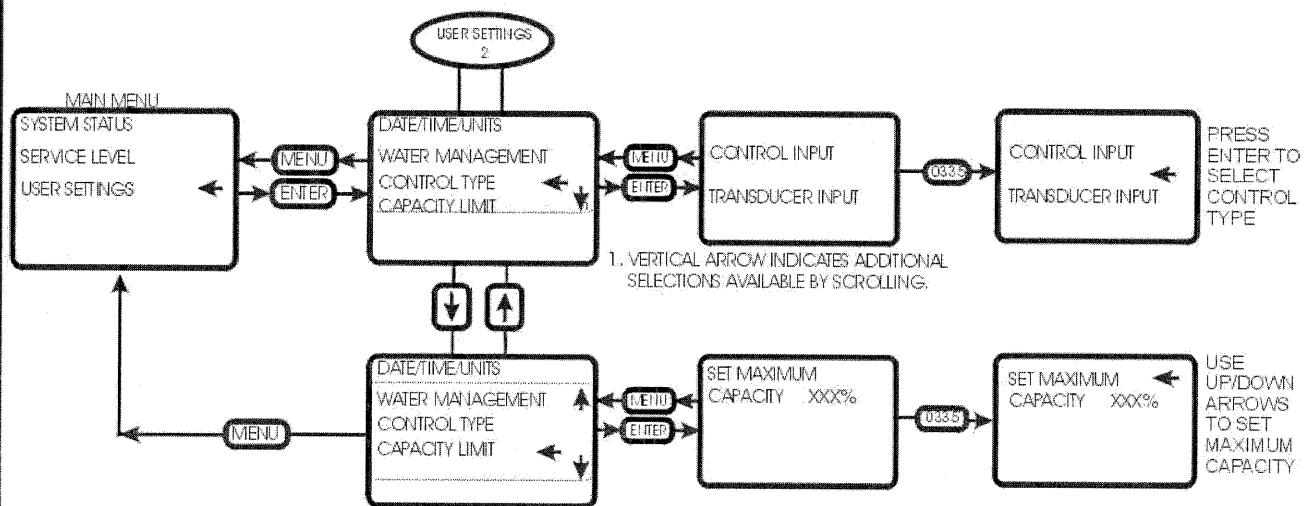


SYSTEM STATUS 2 of 2









AXAIR NORTEC TC CONTROLLER

INTRODUCTORY SCREEN

NORTEC SETC 250
VERSION X.XX

SYSTEM LOCKOUT

06.07.03 9:30

Product name

AXAIR NORTEC SETC (100-1050)

Version

The display will indicate the revision level of the control software

System

Depending on system activity, the display will toggle between LOCKOUT, ACTIVE or STANDBY.

Date/Time

The actual date and time will be displayed.

MAIN MENU

The main menu lists the available sub menus where system adjustments can be made. Some of the menus are password and jumper protected to

SYSTEM STATUS

SERVICE LEVEL

USER SETTINGS

block access by unauthorized personnel.

System status

Displays various system parameters as the user scrolls through the lists. For further details see specific section below.

Service Level: (password protected)

This section is specific to all service related activity. For further details see specific section below.

User Settings: (password protected)

This section allows the user to set parameters specific to their requirements. For further details see specific section below.

SYSTEM STATUS

SCREEN 1:

Status:

STATUS:	LOCKOUT
DEMAND CHANNEL 1	0%
DEMAND CHANNEL 2	0%
CAPACITY LIMIT	0%

Displays the present status of the system. Depending on system activity at the time, the field could display: lockout (security loop open), active (unit generating steam) or standby (security loop closed but no modulation demand signal).

Demand channel 1:

This field will display the modulation demand input on that channel.

Demand channel 2:

Field only visible if the unit is configured for dual modulation. This field will display the modulation demand input on that channel.

Capacity limit:

This field displays the user adjusted capacity limit set for the humidifier.

SCREEN 2:

System demand:

DESIGN PRSS.	15.0 PSI
VALVE OUTPUT	XXXLB

This field displays the total system demand as a percentage.

Valve output:

This field will display how much open the valve is in %.

SCREEN 3:

Water level:

This field displays the present water level detected by the float system.

Fill valve:

WATER LEVEL:	X
FILL VALVE	[O/I]
DRAIN PUMP	[O/I]
DRAIN COOL:	SMART

This field displays status of fill valve, on, off, or pulsed.

Drain pump:

This field displays status of drain pump, on or off.

Drain cool:

This field displays the user (or factory default) setting.

OFF: fill will not activate when drain is activated.

ON: fill will activate whenever the drain activates.

SMART: fill will activate only when drain water is hot.

SCREEN 4:

Service interval:

SERVICE INTERVAL	XXX HOURS
REMAINING	XXX HOURS
START DATE:	MM:DD:YY

This field displays the user (or factory default) setting for the humidifiers service reminder in steam hours.

Remaining:

This field displays the amount of time (steam hours) remaining before the next service is to be performed.

Start Date:

This field displays the date this service interval began.

SCREEN 5:

Security loop:

SECURITY LOOP	[0/1]
TANK SENSORS	[0/1]

This field displays the status of the security loop (terminals 1 and 2 on LV terminal strip). If it is open the display will indicate "0", if it is closed the display will indicate "1".

Tank sensor

This field displays the status of the tank sensor input. If it is open the display will indicate "0", if it is closed the display will indicate "1". Closed indicates that the tank temperature is above 160°F (70°C).

This input is used for the "keep warm" feature and for activating the fill valve during blowdown cycles.

SCREEN 6:

3 day drain

3 DAY DRAIN	1
KEEP WARM	0
BLOWDOWN RATE	XX%
FT BLOWDOWN	1

This field indicates if the feature has been selected (0 = no, 1 = yes).

Keep warm

This field indicates if the feature has been selected (0 = no, 1 = yes).

Blowdown rate:

This field displays the selected blowdown rate.

Full tank blowdown

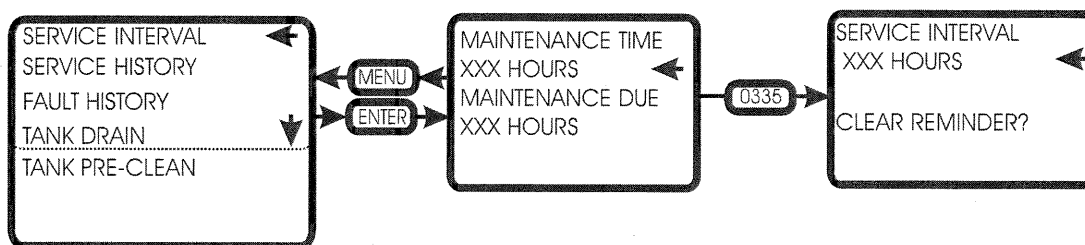
This field indicates if the feature has been selected (0 = no, 1 = yes).

SERVICE LEVEL

SERVICE INTERVAL
SERVICE HISTORY
FAULT HISTORY
TANK DRAIN
TANK PRE-CLEAN
BURNERS
SHORT CYCLE DELAY

The service level area is where service related tasks are performed. Below is a description of each field and what can be performed in them. When a parameter requires a change, press the two arrow key and enter the password (0335). As long as you remain in this section, you will not need to enter the password more than once.

Service interval



In this area the customer can set a service interval for humidifier MAINTENANCE.

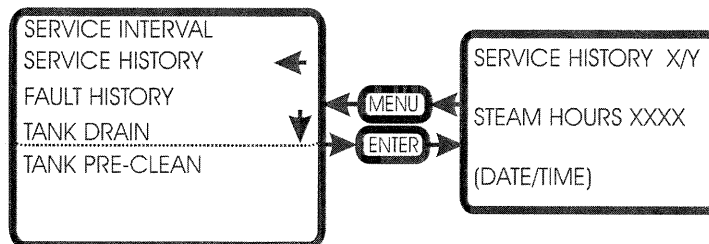
MAINTENANCE TIME
XXX HOURS

This field displays the user selected MAINTENANCE time. To change the time selected enter the user code and adjust the time in SET MAINT. TIME (0-3000 hours, 0 = disabled).

MAINTENANCE DUE
XXX HOURS

This field displays the time remaining until the next service interval. To reset the MAINTENANCE due time, enter the user code and select CLEAR REMINDER?

Service history



In this area the customer can view the history of service maintenance performed on the humidifier.

SERVICE HISTORY X/Y

The service history stores the last 10 service periods.

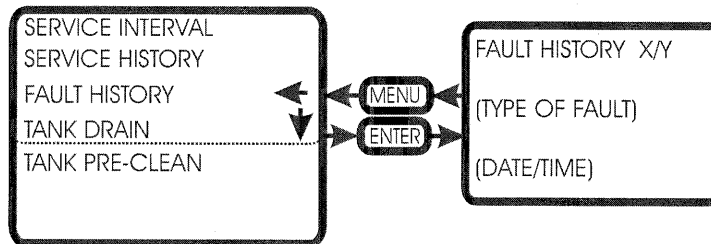
X = service occurrence, where 1 is the most recent.

Y = total number of recorded services (up to 10 maximum).

STEAM HOURS XXX
(DATE/TIME)

This field displays the steam hours and the date and time when the specific service (X) was performed.

Fault history



In this area the customer can view the history of recorded faults for the humidifier.

FAULT HISTORY X/Y

The fault history stores the last 54 system faults.

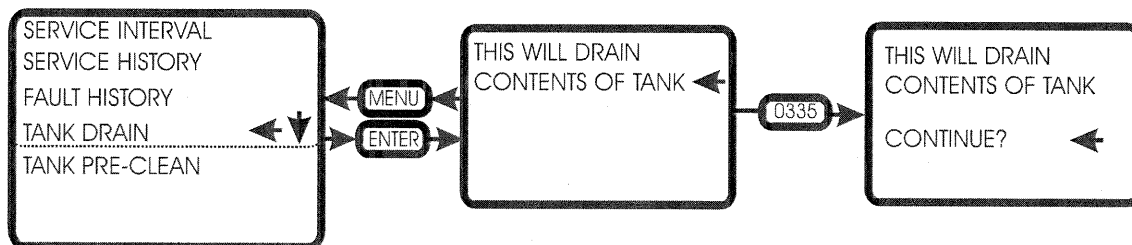
X = fault occurrence, where 1 is the most recent.

Y = total number of recorded faults (up to 54 maximum).

(type of fault) and (date/time)

A description of the fault type is displayed along with a date and time stamp when the fault occurred.

Tank Drain



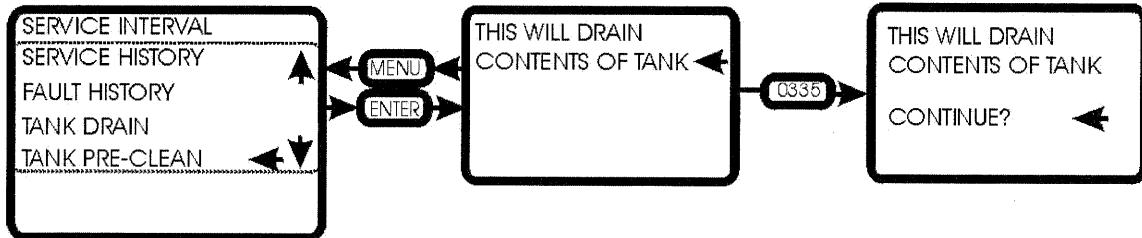
The tank drain feature, when activated, will activate the drain valve for a fixed period of time (depending on unit size).

To drain the tank press enter when CONTINUE is selected. During the tank drain cycle the display will indicate the tank is draining and the amount of time remaining on the cycle. To interrupt the cycle the unit must be switched off then on. Must enter service password to activate this function.

Tank Pre-Clean

The tank pre-clean feature when activated will activate the drain valve for a fixed period of time (depending on unit size). The fill valve will then activate, filling the tank partially with cold water. At the completion of the fill cycle the tank will once again drain.

This will help to flush out any accumulated minerals as well as cool the tank for the service personnel.



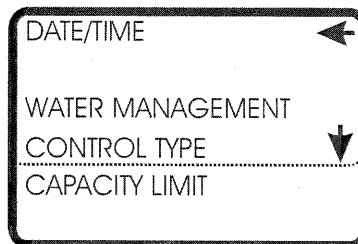
To pre-clean the tank press enter when CONTINUE is selected. During the tank pre-clean cycle the display will indicate the tank is draining and the amount of time remaining on the cycle. To interrupt the cycle the unit must be switched off then on. Must enter service password to activate this function.

User Settings

When a parameter requires a change, press the two arrow key and enter the password (0335). As long as you remain in this section, you will not need to enter the password more than once.

Date / Time Units

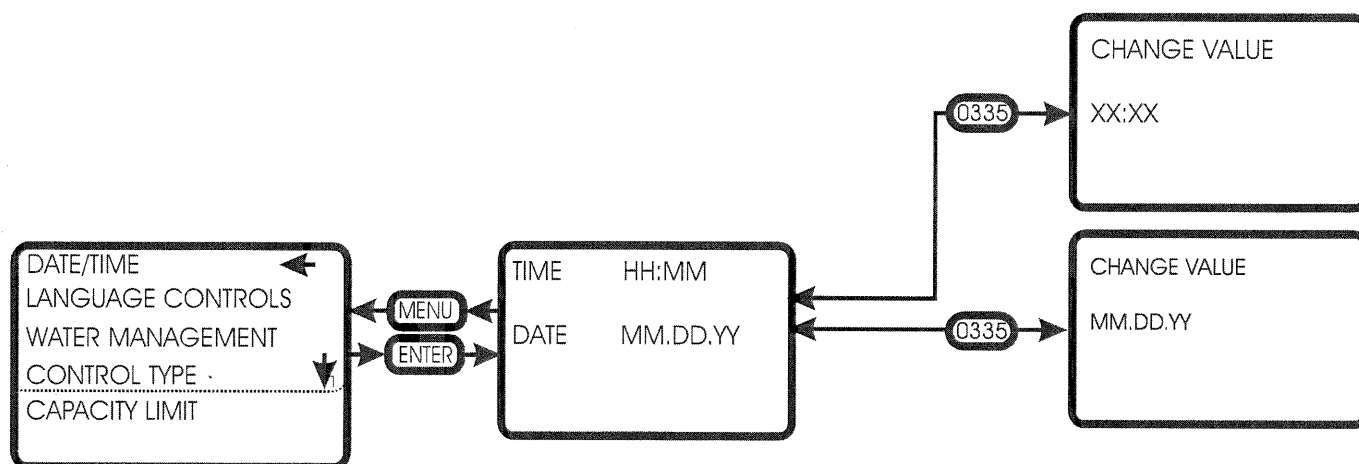
This field is used for modifying the Date, time and the units of measurement. The date and time are important parameters when features such as full tank blowdown are enabled.



Time (of day)

To set the time of day, highlight the selection then enter the user code (0335). Press enter. Use the UP/DOWN arrows to adjust the hours (24 hour format). Pressing enter saves the setting and indexes the display to minutes. Use the UP/DOWN arrows to adjust the minutes. Pressing enter saves the setting and returns the user to the previous menu.

Date



To set the date, highlight the selection then enter the user code (0335). Press enter. Use the UP/DOWN arrows to select the month. Pressing enter saves the setting and indexes the display to number of the month. Use the UP/DOWN arrows to adjust the number. Pressing enter saves the setting and indexes the display to year. Use the UP/DOWN arrows to adjust the year. Pressing enter saves the setting and returns the user to the previous menu.

Water Management

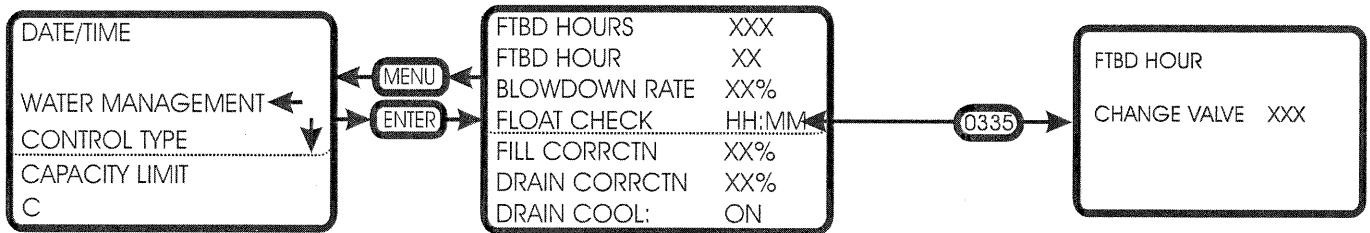
This section allows the user to set time based parameters and adjust water control parameters.

FTBD Hours

This section allows the user to set the frequency of full tank blowdowns (FTBD). FTBD's drains and re-fills the entire contents of the humidifier after a preset accumulated operating time. Run time is measured in steam hours (weighted run time hours), and can be adjusted from 0 hours (feature off) to 400 hours in 25 hour increments.

Once the FTBD time has expired, the controller will wait until the FTBD hour to initiate the cycle. This prevents random drains at times when they would be inconvenient.

FTBD Hour

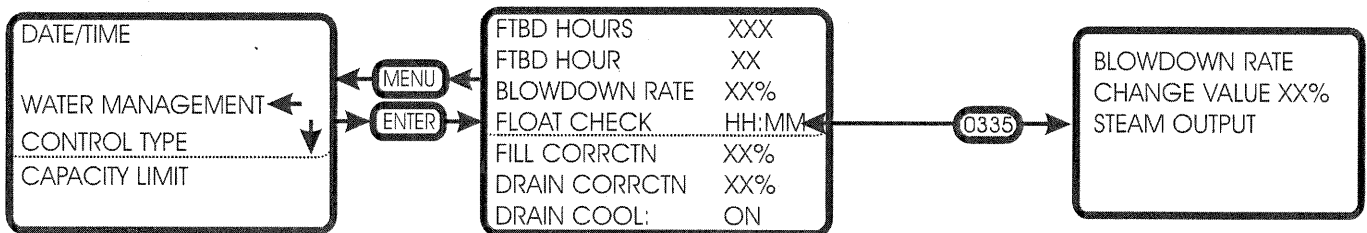


Works in conjunction with FTBD hours.

Here the user sets the time of day (24 hour format) when they want the FTBD to execute. The time can be set to trigger the cycle during off hours, when the humidity requirements are minimal.

The time is adjusted in one-hour increments.

Blowdown Rate

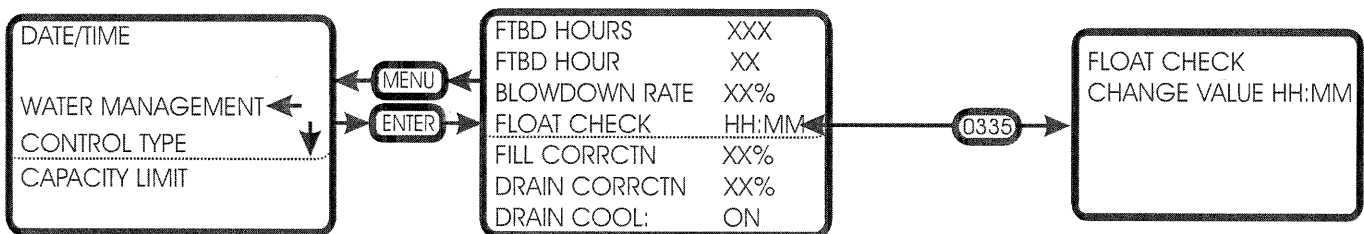


This parameter adjusts the frequency of blowdown cycles.

Depending on water quality, the blowdown rate can be adjusted from 5% to 50%. The percentage is based on the steam production rate i.e. a 10% BD rate will drain 10 kg. of water for every 100 kg. of steam produced.

The higher the mineral content of the water the higher the BD rate should be set.

Float Check



This parameter sets the time of day the controller will force a float check.

Float checks are important to ensure the water level detection system is operating correctly. The float check also tests the fill and drain system and will report any problems detected.

To set the time of day, highlight the selection then enter the user code (0335). Press enter. Use the UP/DOWN arrows to adjust the hours (24 hour format). Pressing enter saves the setting and indexes the display to minutes. Use the UP/DOWN arrows to adjust the minutes. Pressing enter saves the setting and returns the user to the previous menu.

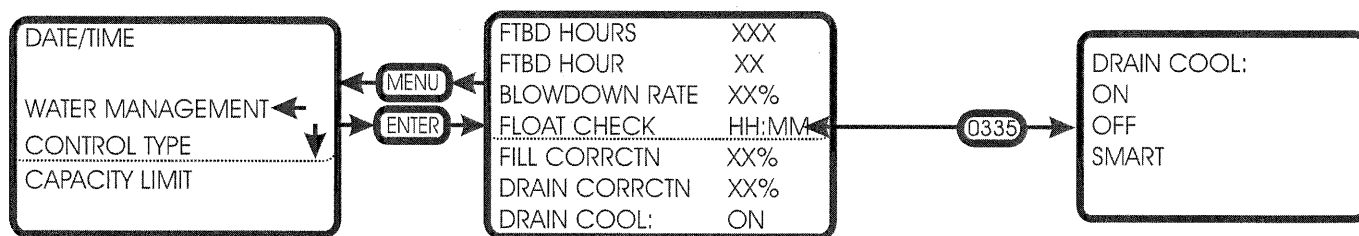
Fill CORRCTN (correction)

Used for adjusting the fill rate. Adjustments to be made under factory direction only.

Drain CORRCTN (correction)

Used for adjusting the drain rate. Adjustments to be made under factory direction only.

Drain Cool



The customer can select the type of drain water tempering they require (depending on local plumbing codes)

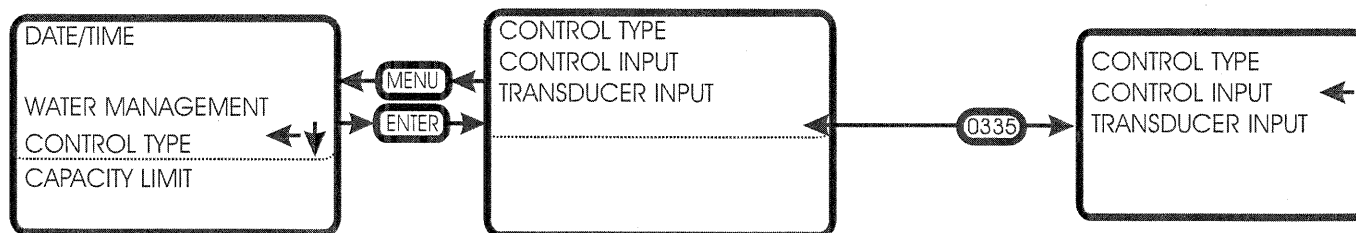
The customer can select ON, OFF, or SMART.

ON – whenever the drain valve is activated through software, the fill valve will automatically activate. This is the factory default setting, but is the most wasteful of water since it will activate even if the drain water is cool.

OFF – The drain water is never tempered. This can be used where plumbing codes permit. Some process waters are very expensive, so the customer may choose to temper the drain water through other means.

SMART – The humidifier has a tank sensor that communicates the water temperature to the controller. If the water is hot during drain cycles the fill valve will be activated. This is the most “water smart” of the settings.

Control Input

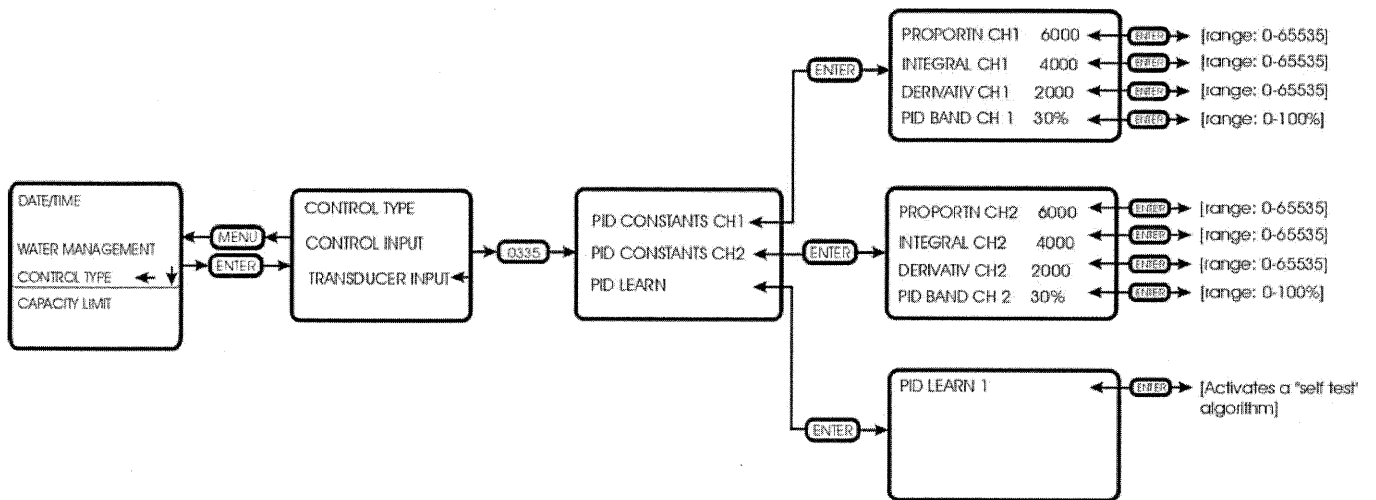


This section is used for configuring the controller for a controller input or a transducer input.

To select control input, highlight the selection then enter the user code (0335). Press enter. Use the UP/DOWN arrows to select control input.

The controllers dip switches then determine the type (0-10 Vdc, 0-20 mA, etc.) of control signal to process.

Transducer Input



This section is used to configure the controller for transducer signals

In this section you can adjust the proportional, integral and derivative constants. There is also a PID learn algorithm which will tune the various PID constants for optimal performance.

Capacity Limit

In this section the customer can adjust the maximum output of the humidifier between 25-100%.

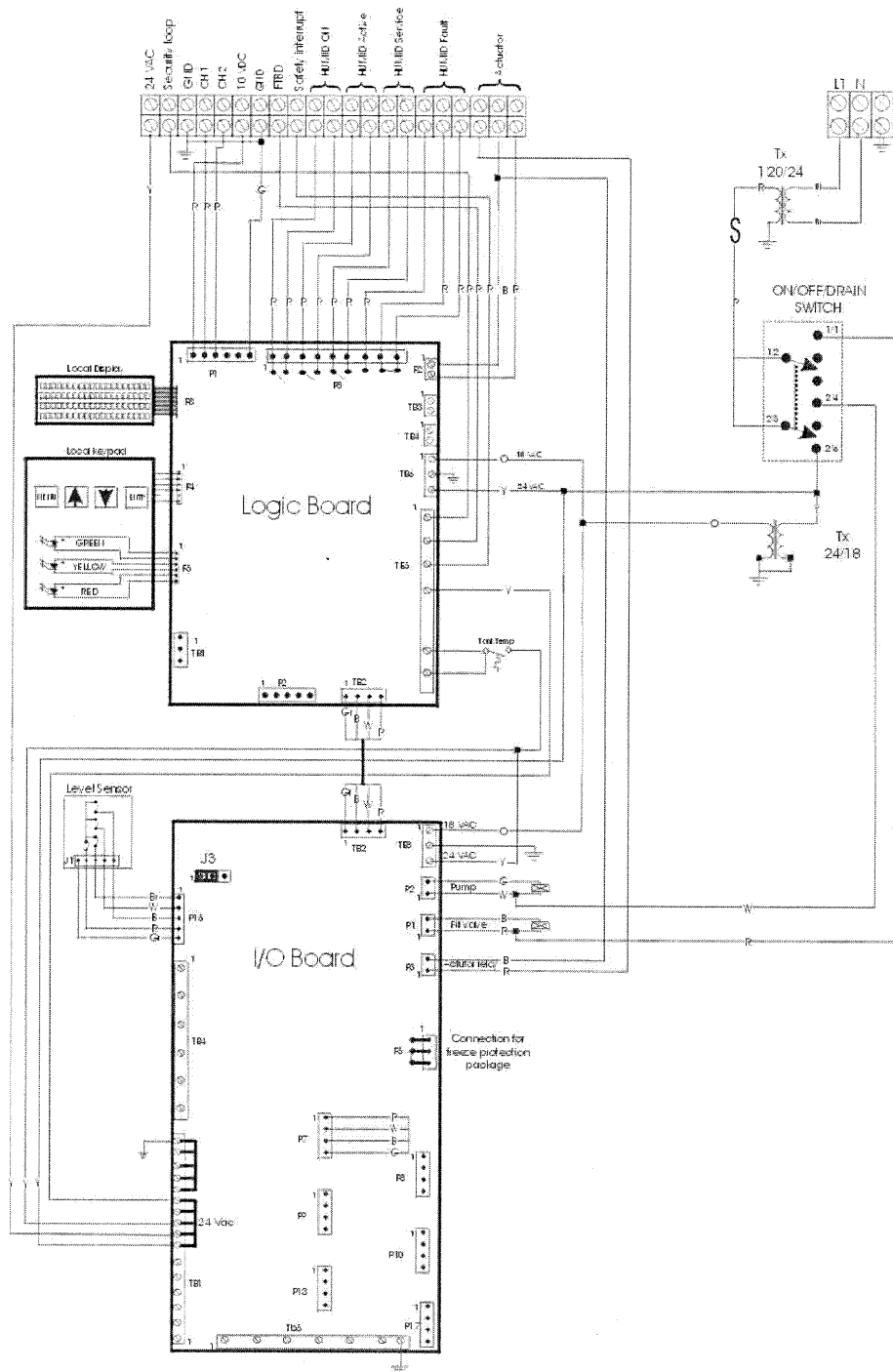
To adjust the maximum capacity, highlight the selection then enter the user code (0335). Press enter. Use the UP/DOWN arrows to adjust the output between 25 and 100%.

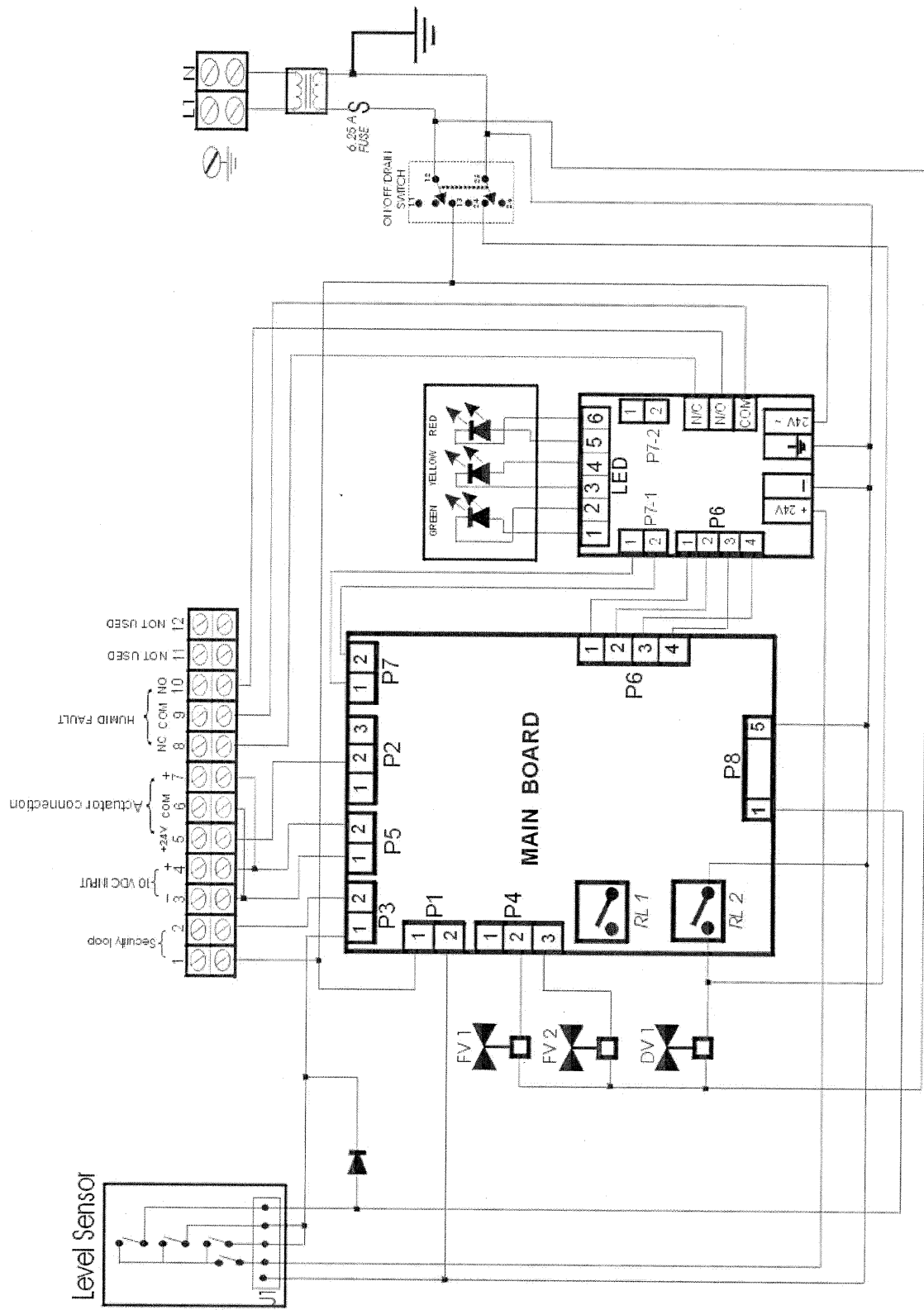
FAULT AND WARNING LIST

SETC Fault (Warning) Displayed	Description of Fault	Troubleshooting
FAULT DRAIN NOT WORKING DRAIN IS BLOCKED	There are many time windows in the GS software. If, during a drain cycle, the time window for the water level to drop is exceeded, this fault is generated	-Ensure that pump is being energized -Check for blockage in all aspects of the drain system -Float board defective -Consult factory
FAULT FLOAT CHECK	Once every 24 hours (provided the unit is powered and in an operating or standby condition) the controller will test the water level detection circuit. If the test fails this fault is displayed	-Ensure the proper operation of the fill valve and drain valve via the diagnostics screen -Float board is defective -Consult factory
FAULT ILLEGAL FLOAT COMBINATION	If the controller detects two or more float level readings, which are not expected (ex. Switch 1 and 3 ON or switch 1, 2, and 3 ON) this fault will be recorded.	-Miswired float board -Defective float board -Consult factory
FAULT FILL VAVLE ON DETECTION INCONSISTENT	The controller monitors the water level as it fills and drains. It expects to see the levels increase logically (1-2-3-4-5). If the water level increases and jumps a step (1-2-4-5) this fault will be generated. The same holds for water level decreasing.	-Float board defective -Contact agent for replacement float board
FAULT KEEP WARM TIME OUT TOO LONG TO HEAT	During a keep warm cycle, if the tank temperature sensor does not open within a certain time window, this fault is generated.	-Ensure that the tank temperature sensor is connected -Defective tank temperature switch -Contact agent for replacement switch.
FAULT (WARNING) MAINTENANCE TIME HAS ELAPSED	In the user menu the user sets the maintenance time. Once this time expires a warning is displayed. 72 hours later the warning changes to this fault. The maintenance time is measured in weighted operational hours. With switch 5, #4 deactivated, this fault is enabled	-Perform tank cleaning and all other maintenance requirements outlined in the manual.

MANDATORY MAINTENANCE SCHEDULE

PARTS	30 DAYS after initial start-up	MID	End of Season	WHAT NEEDS TO BE DONE?	
				REGULAR MAINTENANCE	PREVENTATIVE MAINTENANCE
Drain Lines			X	- Switch to drain and make sure water flows freely. Unit should be completely drained after a maximum of 20 min.	
Tank	X	X	X	- Adjust blow down times when required. Check that scale has not accumulated above 2".	- Drill out tank nipples when required to ensure nipples are not blocked with scale.
				- Clean tank when required.	- Clean tank.
Float Chamber	X	X	X	- Ensure floats move freely	- Clean scale from float chamber and hose connecting to it.
Fill Lines	X	X	X		- Inspect for leaks.
Drain Lines	X	X	X	- Inspect for leaks at the drain pump, fill cup and float chamber.	
Steam Traps			X	- Clean to remove all deposits. - If damaged replace trap seat if required - Inspect for corrosion - Check floats move freely	- Install new thermal disc if - Check if orifices are not plugged - Clean
Wye Strainer		X	X	- Inspect for corrosion - Clean strainer	- Replace any parts showing signs of wear
Condensate			X	- Check for leaks - Clean	- Replace worn seals. - Follow maintenance recommendations.
Steam Valve's			X	- Check valve seat - Clean to remove all deposits. - If damaged replace steam valve if required	
Boiler			X	- Putting out correct steam pressure - Water test	- Follow manufacturer's recommendations



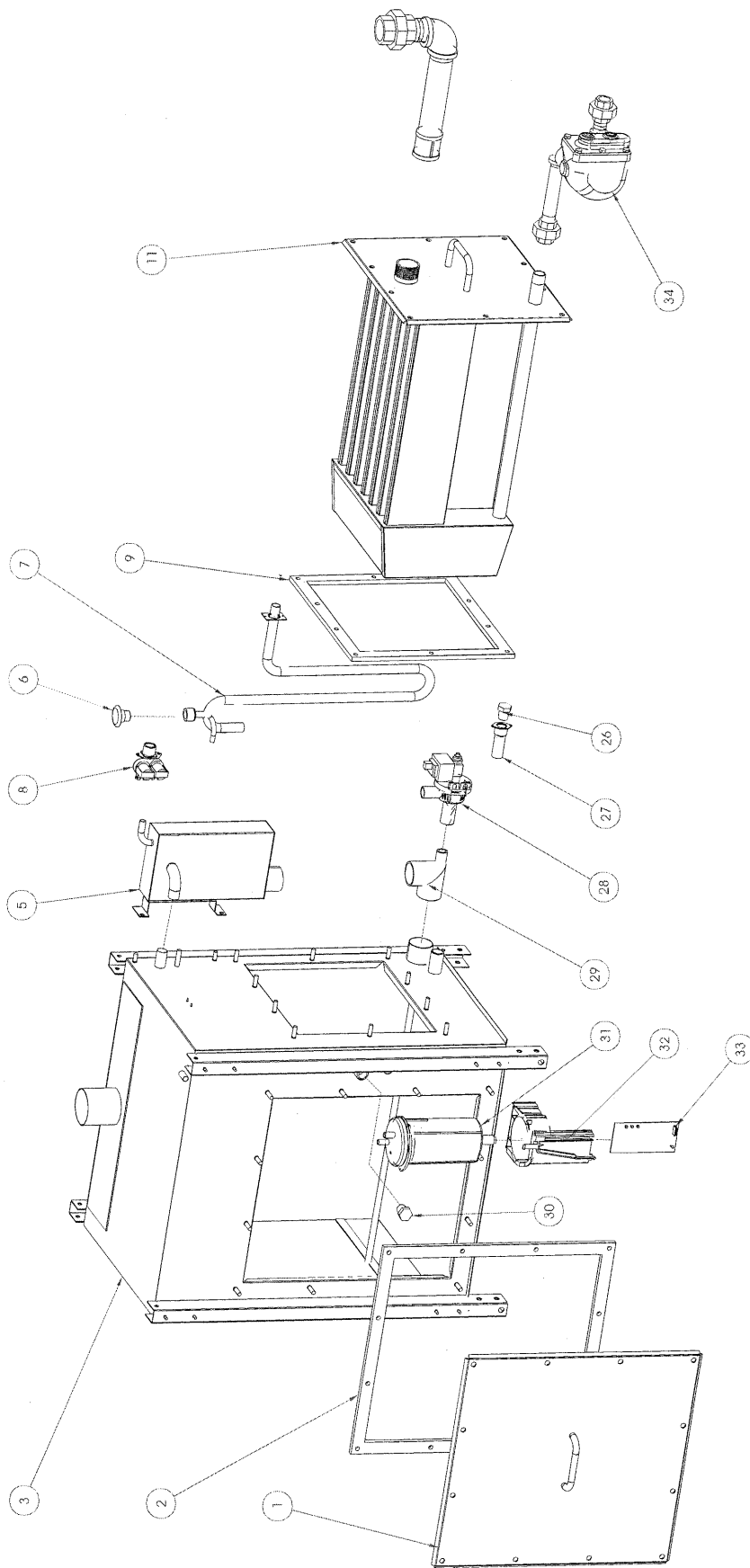


SEP Series Humidifier
INTERNAL WIRING DIAGRAM

Diagram No 150-8349

Rev. A

June 1, 2004



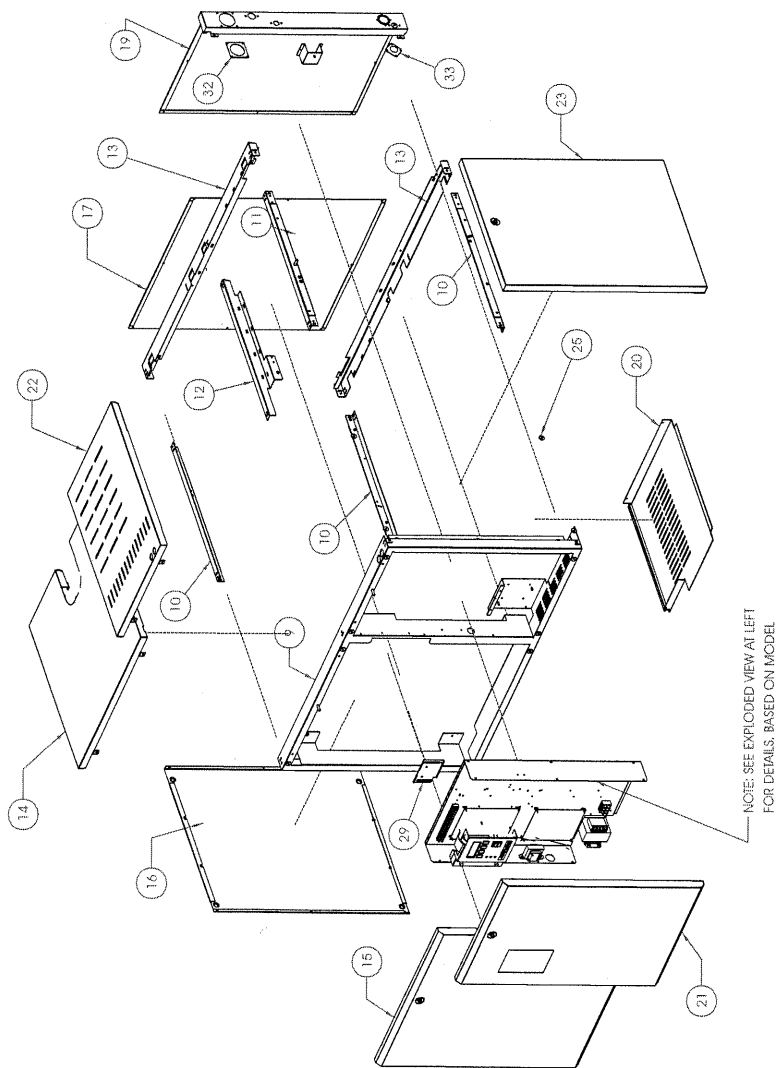
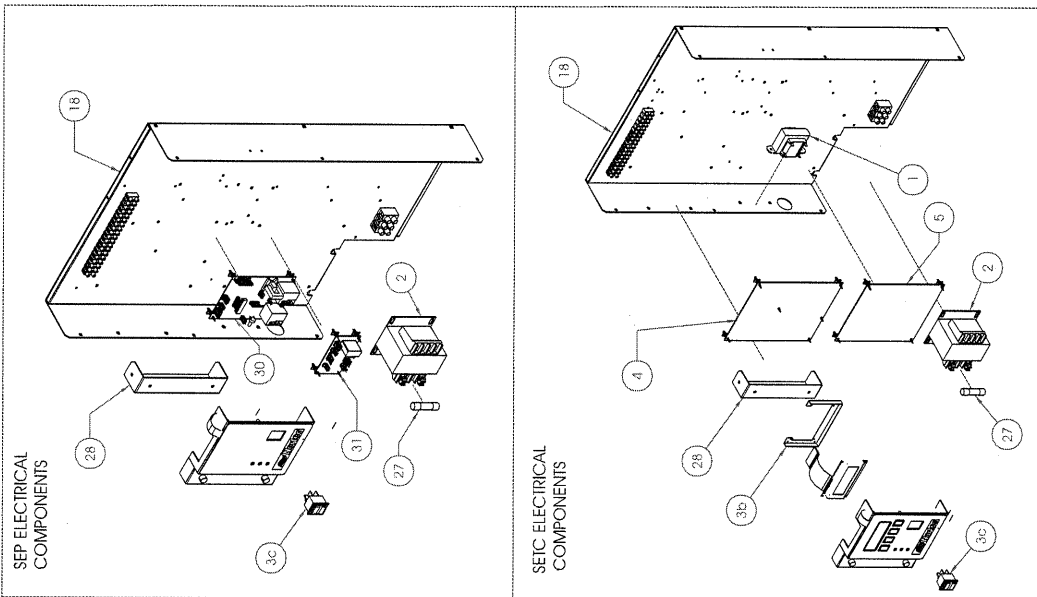
Note: Water hose not shown for graphical clarity. Refer to parts list.

SE Series
Internals - Exploded View

Nortec
www.humidity.com

SE Spare Parts List - Internals

			Quantity per unit							
	Description	Part #	SE 100	SE 175	SE 250	SE 375	SE 475	SE 675	SE 950	SE 1050
1	Clean-Out Port Tank Cover	1506990	1	1	1	1	2	2	3	3
2	Gasket, Tank Cover Plate	1505949	1	1	1	1	2	2	3	3
3	Tank Replacement Kit SE 100	1507653	1							
	SE 175	1509060		1						
	SE 250	1507654			1					
	SE 375	1509061				1				
	SE 475/675	1507656					1	1		
	SE 950/1050	1509062							1	1
5	Fill Box	1505801	1	1	1	1	1	1	1	1
6	Vacuum Break Valve	1505959	1	1	1	1	1	1	1	1
7	P-Trap Assembly (complete)	1507023	1	1	1	1	1	1	1	1
8	Dual Fill Valve 10.0 l/min & 0.35 l/min	1505759	1	1	1	1	1	1		
	Dual Fill Valve 17.0 l/min & 0.35 l/min	1508581							1	1
9	Heat Exchanger Gasket Mini	1505972	1	1						
	Single	1505941			1	1	2	2	3	3
11	Heat Exchanger kit Mini	1509063	1	1						
	Single	1509064			1	1	2	2	3	3
26	Auxiliary Drain Plug	1507043	1	1	1	1	1	1	1	1
27	Auxiliary Drain termination	1506925	1	1	1	1	1	1	1	1
28	Drain Pump 24v 60 hz	1502644	1	1	1	1	1	1	1	1
29	Lower Mixing Box	1506749	1	1	1	1	1	1	1	1
30	Tank Thermal sensor (SETC models)	1506026	1	1	1	1	1	1	1	1
	Pipe plug (SEP models)	1507043	1	1	1	1	1	1	1	1
31	Float Chamber	1503031	1	1	1	1	1	1	1	1
32	Float Chamber Mounting Bracket	1502647	1	1	1	1	1	1	1	1
33	Float Board	1502648	1	1	1	1	1	1	1	1
34	Steam Trap, Spirax	1508849	1	1	1	1	1	1	1	1
Not Shown										
	Hose Replacement kit	1507696	1	1	1	1	1	1	1	1



SE Series
Cabinetry - Exploded View



SE Spare Parts List - Cabinetry

	Description	Part #	Se 100	SE 175	SE 250	SE 375	SE 475	SE 675	SE 950	SE 1050
1	Transformer 24/16V 15VA (SETC models)	1505760	1	1	1	1	1	1	1	1
2	Transformer 120-24Vac 150VA	1504859	1	1	1	1	1	1	1	1
3a	LCD Display Assembly (SETC models)	1507741	1	1	1	1	1	1	1	1
b	LCD Mounting Bracket (SETC models)	1506027	1	1	1	1	1	1	1	1
c	On-Off-Drain Switch	1453001	1	1	1	1	1	1	1	1
4	SETC Logic Control Board	1508357	1	1	1	1	1	1	1	1
5	I/O Board	1504760	1	1	1	1	1	1	1	1
7	Slotted wire duct (not shown)	1506041	order by length required							
9	Front Frame	1506959	1	1	1	1	1	1	1	1
10	Cross Member	Mini 1506957	3	3						
		Single 1506979			3	3				
		Double 1506981					3	3		
		Triple 1506971							3	3
11	Top Right Cross Member	Mini 1506962	1	1						
		Single 1506980			1	1				
		Double 1506982					1	1		
		Triple 1506970							1	1
12	Mid Cross Member	Mini 1506958	1	1						
		Single 1506978			1	1				
		Double 1506983					1	1		
		Triple 1506972							1	1
13	Rear Frame Element	1506963	2	2	2	2	2	2	2	2
14	Top Tank Cover	Mini 1506944	1	1						
		Single 1506974			1	1				
		Double 1506986					1	1		
		Triple 1506967							1	1
15	Front Door Tank cabinet	1506947	1	1	1	1	1	1	1	1
16	Left Skin	Mini 1506946	1	1						
		Single 1506973			1	1				
		Double 1506985					1	1		
		Triple 1506968							1	1
17	Back Skin	1506945	1	1	1	1	1	1	1	1
18	Electrical Cabinet	1506989	1	1	1	1	1	1	1	1
19	Rear Corner Skin	1506964	1	1	1	1	1	1	1	1
20	Bottom Electrical Cover	Mini 1506954	1	1						
		Single 1506977			1	1				
		Double 1506984					1	1		
		Triple 1506969							1	1
21	Front Door Electrical Cabinet	1506948	1	1	1	1	1	1	1	1
22	Top Electrical Cover	Mini 1508462	1	1						
		Single 1508463			1	1				
		Double 1508464					1	1		
		Triple 1508465							1	1
23	Service Door	Mini 1506949	1	1						
		Single 1506976			1	1				
		Double 1506988					1	1		
		Triple 1506965							2	2
24	Steam Line Bracket (not shown)	1506960					1	1	1	1
25	Door Locator	1506879	12	12	12	12	12	12	16	16
27	Fuse 6.25 Amp	1505020	1	1	1	1	1	1	1	1
28	Display Bracket Holder	1506950	1	1	1	1	1	1	1	1
29	Float Chamber Bracket	1506961	1	1	1	1	1	1	1	1
30	SEP Control Board Assembly	1508577	1	1	1	1	1	1	1	1
31	SEP LED Board assembly	1508619	1	1	1	1	1	1	1	1
32	Inlet Steam Seal Plate	Mini 1506081	1	1						
		Single 1508486			1	1				
		Blank 1508487					1	1	1	1
33	Condensate Seal Plate	Mini 1508483	1	1						
		Single 1508484			1	1				
		Double 1508485					1	1		

LIMITED WARRANTY

AXAIR NORTEC INC. and/or **AXAIR NORTEC LTD.** (hereinafter collectively referred to as **THE COMPANY**), warrant for a period of two years from date of shipment, 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 **AXAIR NORTEC's** 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 retains the right to change the design, specification and performance criteria of its products without notice or obligation.

AxAir Nortec

a WMH Company



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