



**neptronic®**

# Steam Humidifier

## SK300 Series BACnet

### Installation Instructions and User Manual



**Read and save these instructions**

## Foreword

### Neptronic Company Overview

Founded in 1976, we're a private corporation that designs, manufactures and distributes products for the HVAC industry. Our product line includes intelligent controllers, electronic actuators, actuated valves, humidifiers and electric heaters.

Our products are designed and manufactured by over 250 dedicated employees in our 7,500 m<sup>2</sup> (80,000 ft<sup>2</sup>) state-of-the-art facility located in Montreal, Canada. Using a vertical integration model, our entire manufacturing chain is under one roof from software and hardware development, to SMT circuit board assembly, to sheet metal fabrication, to product testing ensuring that our products are engineered to last.

We currently hold several national and international patents and with our continued commitment to research and development, we provide innovative products and technologies for the ever-evolving challenges of the HVAC industry. Exporting over 70% of our sales, we have an exclusive distribution network around the globe that provides comprehensive solutions to our worldwide customers.

### About the Manual

These installation and operation instructions have been developed to facilitate the installation of the Steam Humidifier.

- The strict application of these instructions will ensure the conformity of your installation and operation as per the manufacturer's recommendations.
- The application of these instructions is one of the conditions for the application of the warranty.
- The application of these instructions does not ensure, at any time conformity to procedures, regulation or local codes, regarding electric installation and connection to local water supply.

This product has been declared to conform to the applicable Canadian and American safety standards and directives and bear the CSA (c) & (us) mark. The Certificate of Conformity, CSA is available, upon request with the manufacturer.

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### Electricity



All work concerned with electrical installation **MUST** only be performed by skilled and qualified technical personnel such as an electrician or a technician with appropriate training). The customer is always responsible for ensuring the suitability of the technical personnel.

Please observe the local regulations concerning the provision of electrical installations.

### Correct Use

Neptronic systems and its products are designed only for humidification use. Any other application is not considered appropriate for the intended purpose. The manufacturer cannot be made liable for any damage resulting from incorrect use.

### General Warranty

This product is subject to the terms and conditions described at <http://www.neptronic.com/Sales-Conditions.aspx>.

## Handling and Lifting



Lifting or handling **MUST** be carried out by trained and qualified personnel. Ensure that the lifting operation has been properly planned, assessed for risk and that the equipment has been checked by a competent Health & Safety representative, and effective control measures are in place.

It is the customer's responsibility to ensure that the operators are trained in handling heavy goods and to enforce the relevant lifting regulations.

The Steam Humidifier **MUST** always be handled and lifted with care and should remain in its original packaging for as long as possible prior to installation.

The Steam Humidifier package may be carried using a forklift from the underside. Caution should be exercised to ensure balanced load before lifting.

## Unpacking

The Steam Humidifier is shipped inside carton boxes or in a wooden crate. Remove packing and skids prior to commissioning.

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# Overview

## List of Accessories Supplied

The following accessories are supplied with the SK300 Steam Humidifier:

- 2 sets of keys.
- 2 adjustable collars for the connection of the steam hose for each steam output.
- 1 female compression fitting  $\frac{3}{4}$  (DN20) hydraulic for the drain output of the evaporation chamber.
- 1 female compression fitting  $\frac{1}{2}$  (DN15) hydraulic for the drain output of the drip pan.
- 1 female fitting and a braided hose for the water supply connection.
- 1 Installation Instructions and User Manual.

## Visual Overview

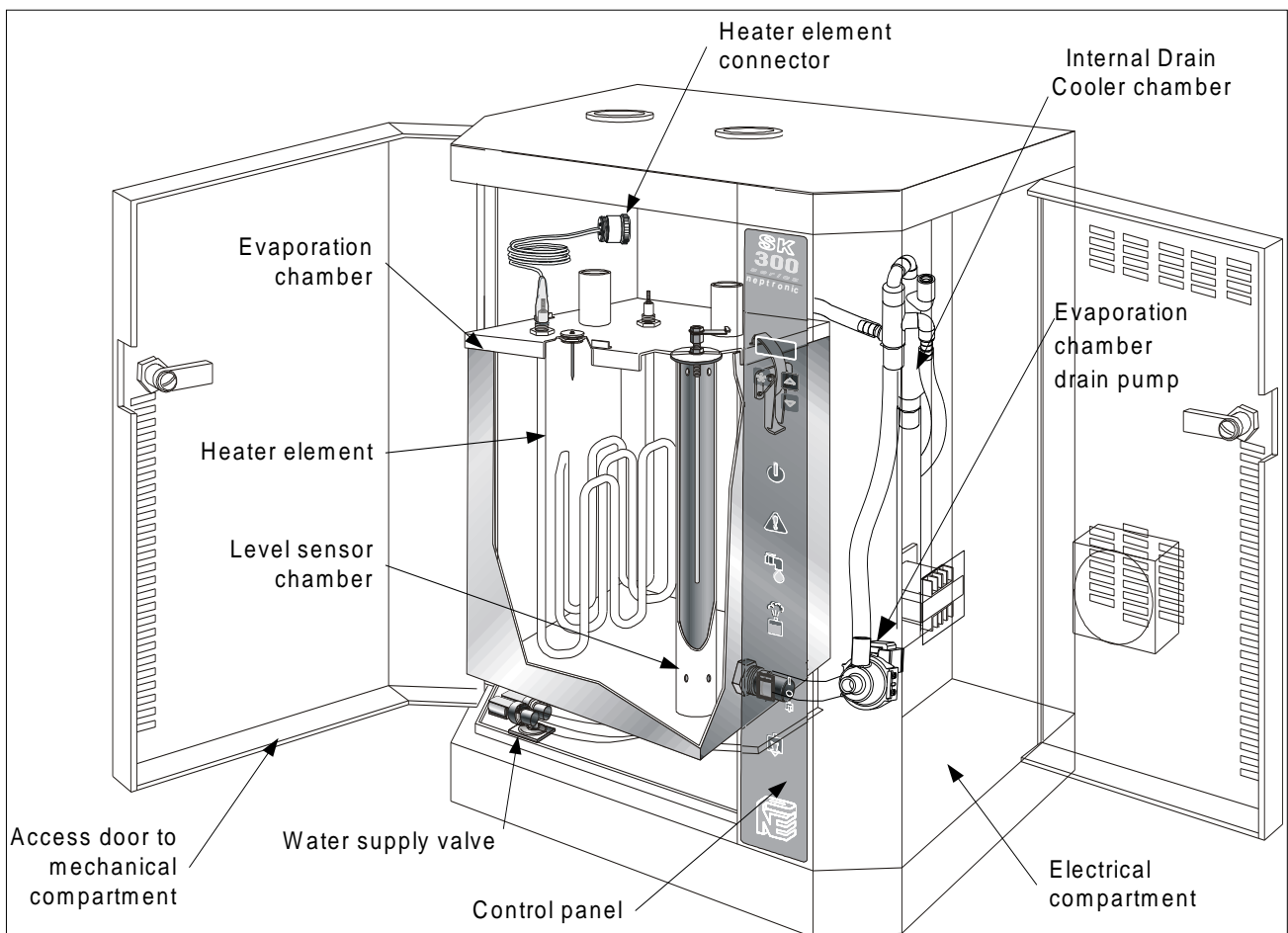


Illustration 1 - Overview of the Humidifier

## Available Options

The following options are available when purchasing an SK300 humidifier:

Model	Description
Suffix M (SK320M)	Modulating control humidifier
SF DI-APPLICATION	Humidifier for a system supplied with Deionised water or Reverse Osmosis water, dissolved solids more than 5 ppm
SF ULTRAPURE-DI	Humidifier for a system supplied with Deionised water or Reverse Osmosis water, dissolved solids more than 0.0625 ppm
SDU-REM	Space Distribution Unit mounted on humidifier (SDU) or remote installation
Suffix B (SK320M-600-3B)	Network Communication System - BACnet
SK320M-600-3P	Stainless steel humidifier cabinet
SF SK300 FANRELAY	Dry contact to activate an external fan relay on a call for humidity

## BACnet Network Communication Options

The SK300 humidifier series is available with the BACnet communication module. The following options are available with the BACnet network communication model.

- Humidity demand (0 to 100%R.H.)
- Room and duct humidity (0 to 100%R.H.)
- Drain and service delay
- PID adjustment
- Setpoint adjustment
- Humidity and temperature offset
- Lock On capacity adjustment
- Actual operating status
- Alarm indications

For additional information, see the BACnet Communication Module User Guide at [www.neptronic.com](http://www.neptronic.com).

## Description of Components

- *Evaporation Chamber.* Assembly includes a metal cylinder and a cover equipped with one or several heater elements. It is the most important part of the humidifier, which produces the steam.
- *Space Distribution Unit (SDU).* Integrated steam distribution unit, optional on certain humidifiers.
- *Multi-Steam System.* Custom made system for steam distribution. This system is designed to allow very short absorption distances (less than 3 feet or 900mm) applications.
- *Steam Absorption Manifold (S.A.M.).* Steam manifold adapted to air duct size, allows steam absorption in relatively short distance (less than 5 feet or 1500mm) applications.
- *Steam Absorption Manifold with 2 Eyelets (S.A.M.E2).* Steam manifold with two eyelets, adapted to applications with restricted air duct dimensions that allow steam absorption in relatively short distance (less than 5 feet or 1500mm) applications.



## Humidifier with Space Distribution Unit

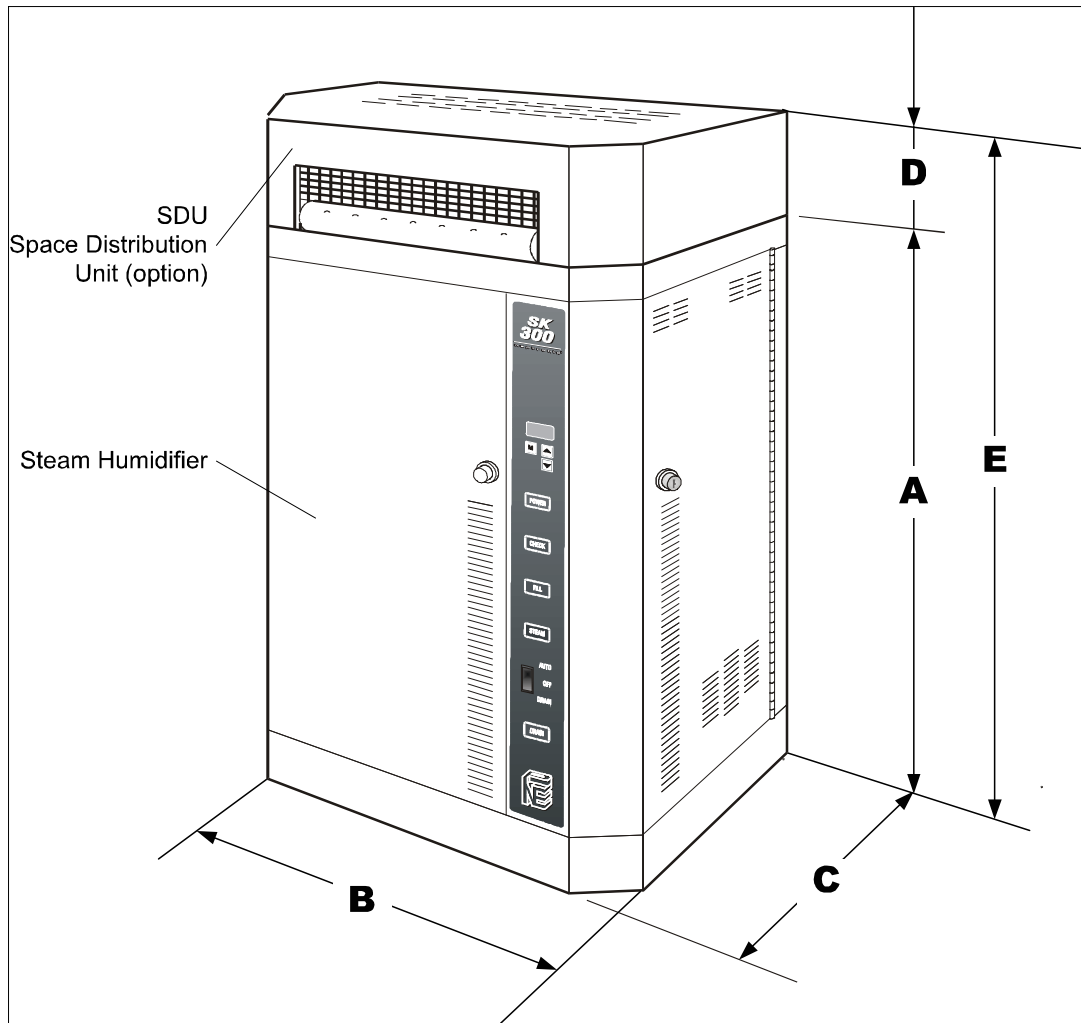


Illustration 2 - Steam Humidifier with Space Distribution Unit

### Dimensions and Weight

Table 1 - Dimensions and Weight of SDU

Model	Dimensions of the Cabinet inch (mm)					Weight lb (kg)		SDU lb (kg)
	A	B	C	D	E	Empty	Full	
SK302	23 ½ (597)	18 ½ (470)	11 ½ (292)	5 ⅝ (140)	29 ⅞ (737)	44 (20)	57 (26)	<b>SDU-1</b> 20 (9)
SK304								
SK306								
SK310	28 ½ (724)	21 (533)	12 ½ (318)	6 ⅝ (165)	35 ⅞ (890)	66 (30)	115 (52)	<b>SDU-2</b> 25 (11)
SK314								
SK316								
SK320	28 ½ (724)	21 (533)	12 ½ (318)	12 ⅞ (324)	41 ⅞ (1048)	66 (30)	115 (52)	<b>SDU-3</b> 45 (20)
SK330								
SK320 L								
SK340	31 ¼ (794)	32 (813)	12 ½ (318)	-	-	110 (50)	205 (93)	-
SK350								
SK360								



## Weather Proof Enclosure

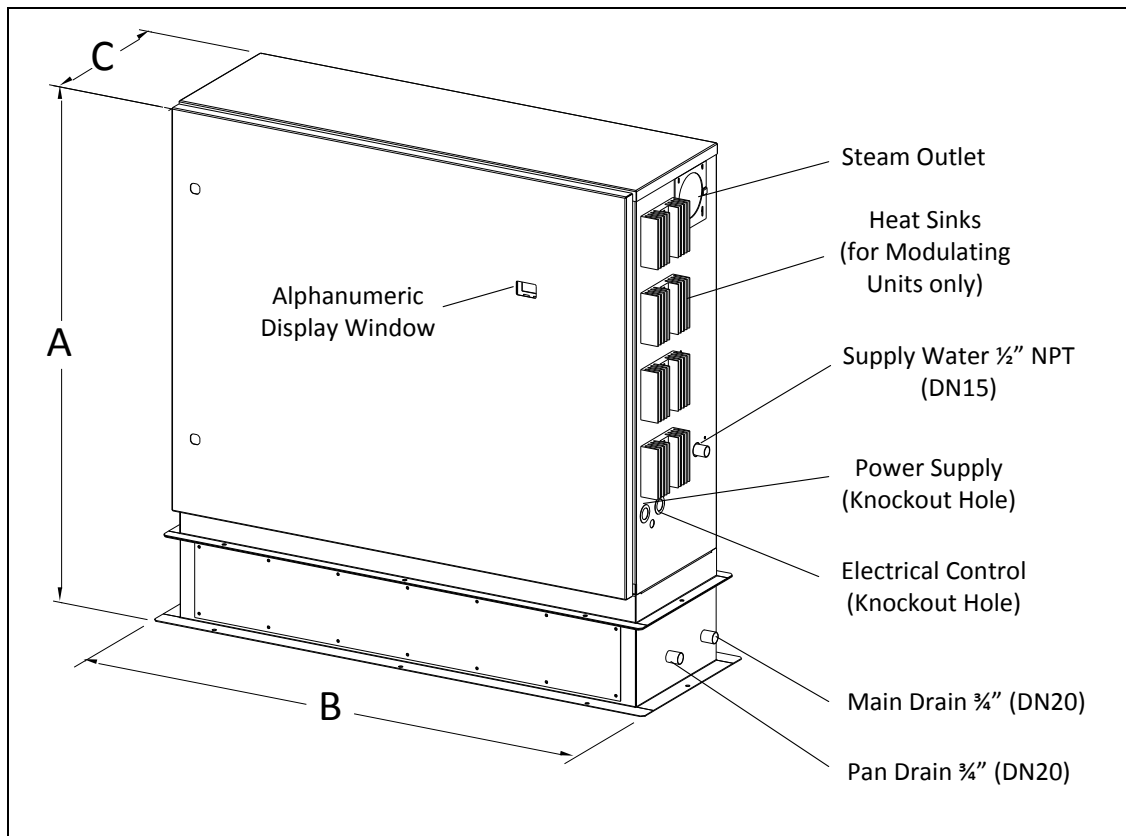


Illustration 3 - Weather Proof Enclosure

## Weather Proof Enclosure - Dimensions and Weight

Table 2 - Weather Proof Enclosure: Dimensions and Weight

Model	Dimensions of the Cabinet inch (mm)			Weight lb (kg)	
	A	B	C	Empty	Full
SK302 SK304 SK306	35.1 (892)	26.9 (682)	11.3 (287)	66 (30)	79 (36)
SK310 SK314 SK316 SK320 SK330	40.7 (1034)	30.9 (784)	13.3 (338)	95 (43)	144 (65)
SK320 L SK340 SK350 SK360	40.7 (1034)	41.9 (1063)	13.3 (338)	165 (75)	260 (118)



## Output and Power Consumption - Humidifier

Table 3 - Output and Power Consumption

Model	Steam	Power (KW)	Consumption								Steam Output	
	Capacity lb/hr (kg/hr)		Amperage (A)								Qty	Diameter inch (mm)
			120/1	240/1	208/1	208/3	480/1	480/3	600/1	600/3		
SK302	6 (2.7)	2	17	8.5	10	-	4.5	-	3.5	-	1	1 3/8 (35)
SK304	12 (5.5)	4	-	17	19	11.5	8.5	5	7	4	1	1 3/8 (35)
SK306	18 (8)	6	-	26	30	16.5	13	7.2	10.5	6	1	1 3/8 (35)
SK310	30 (14)	10	-	-	-	28	-	12	-	10	1	1 3/8 (35)
SK314	40 (19)	13.5	-	-	-	38	-	16.5	-	13.5	1	1 3/8 (35)
SK316	48 (21.8)	16	-	-	-	45	-	-	-	16	2	1 3/8 (35)
SK320	60 (28)	20	-	-	-	-	-	25	-	20	2	1 3/8 (35)
SK330	90 (41)	30	-	-	-	*	-	36	-	30	2	1 3/8 (35)
SK320 L	60 (28)	20	-	-	-	56	-	-	-	-	2	2 (51)
SK340	120 (56)	40	-	-	-	*	-	50	-	40	2	2 (51)
SK350	150 (68)	50	-	-	-	-	-	60	-	50	3	2 (51)
SK360	180 (82)	60	-	-	-	-	-	72	-	60	3	2 (51)

\* Available, consult factory.



*Note: Program maximum steam output using the Lock On function in Program Mode on Modulating Humidifier.*



**WARNING: For Modulating Humidifier, maintain the maximum power of the electrical installations according to the information in the Table 3 - Output and Power Consumption.**

**Do not consider a possible reduction of steam output due to modulation.**

# Mechanical Installation

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## General Recommendations



**WARNING:** Risk of electric shock. Disconnect the appliance from electric supply before commencing installation.



*Note: Mechanical installation should conform to local codes and regulations.*

## Location



**WARNING:** The SK300 series humidifiers are designed for indoor installation only. For outdoor installation, the SK300 must be installed using a Neptronic weather-proof enclosure (see Positioning and Mounting – Weather Proof Enclosure Unit on page 12). Failure to follow these guidelines will void the warranty.

Consider the following points before deciding the location for the SK300 Steam Humidifier:

- Plan a location that is easy to access and permits an easy inspection and servicing of the humidifier.
- Do not install the humidifier where the failure of the appliance could cause damage to the building structure or other expensive equipment.
- The location should be well ventilated and the ambient temperature should not exceed 85°F (30°C).
- Consider the total steam line length between the humidifier and the steam distributor based on the steam line material type:
  - For flexible steam hose, the total steam line should not exceed 16 feet (5 meters). For longer distances, use insulated hard piping.
  - For insulated hard piping, the total steam line is determined by the humidifier capacity: one equivalent foot for each lb/h capacity of the humidifier (0.67m for each kg/h), with a maximum of 50 feet (15m). For longer steam line runs, consult factory.



## Positioning

- The front panel and the right side (electrical compartment) should be accessible to permit servicing.
- Leave a clearance of at least 48" (1.25m) to the front panel and 24" (0.6m) to the right side.
- Mount the humidifier at a minimum height of 39" (1m) to 48" (1.2m) above floor level.
- Leave a clearance of at least 10" (0.25m) under the humidifier for installation of water supply, drain piping, and electrical connections.

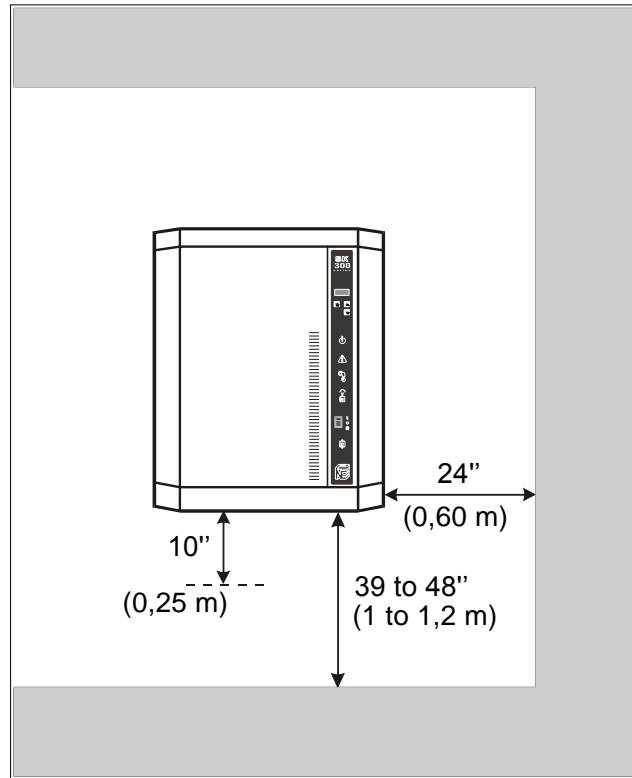


Illustration 4 - Positioning the Humidifier



## Wall Mounting



**Caution: Risk of malfunction. The humidifier must be placed at an equal level.**

**Caution: Risk of overheating. Do not block the ventilation openings located on the top, front, sides, and rear of the cabinet.**

Check the strength of the chosen support or wall (bricks, concrete, stud partition wall) on which the humidifier will be mounted. See the Dimensions and Weight section to know the weight of the unit.

- Use the keyholes located on the back panel of the humidifier.
- Before proceeding to perform the wall mounting, take off the Evaporation Chamber sub-assembly (see Service section).
- Drill holes for the upper anchors (holes with eyelet) into the support or wall as per dimensions specified in Table 4 - Dimensions for Drilling Holes.
- The holes dimensions (diameter and depth) should be in accordance with the recommendations of the chosen anchors.

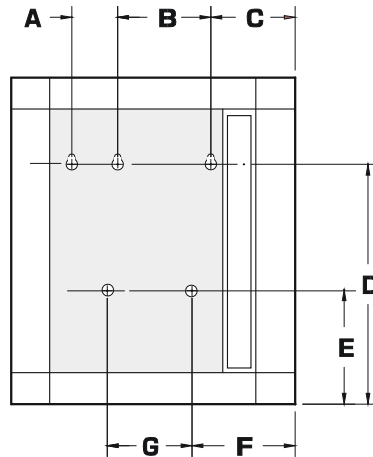


Table 4 - Dimensions for Drilling Holes

Model	Dimensions in inches (mm)						
	A	B	C	D	E	F	G
SK302 SK304 SK306	-	8 (202)	5 3/16 (165)	19 3/4 (516)	-	-	-
SK310 SK314 SK316 SK320 SK330	-	10 (254)	8 (203)	24 5/8 (625)	11 (276)	8 (203)	10 (254)
SK320 L SK340 SK350 SK360	4 (102)	12 (305)	10 1/2 (265)	27 1/2 (698)	11 (276)	22 43/64 (576)	-

- Install bolt anchors, if required.
- Screw on the 2 or 3 upper screws (holes with eyelet) of a minimum diameter of #10 (6mm) (screws are not supplied).
- Leave a clearance between head screws and the wall, to permit the mounting of the humidifier.
- Use the keyholes located on the back panel of the humidifier.
- Hang the humidifier on 2 or 3 screws. It is preferable to keep the front door open during this operation. Based on the size and weight of the humidifier, you may need the help of another person.
- When the humidifier is positioned on the upper screws, tighten the screws to secure the humidifier.
- If applicable, install and secure lower screws.



## Positioning and Mounting – Weather Proof Enclosure Unit

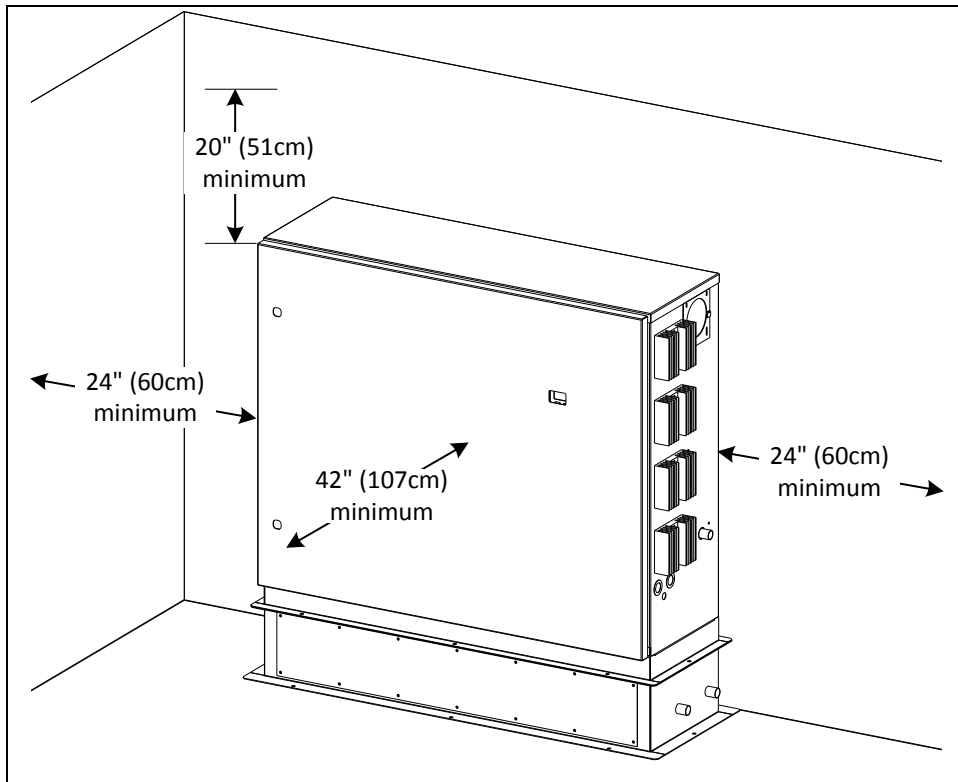


Illustration 5 - Weather Proof Enclosure Unit

### General Recommendations

- Plan a location that is easy to access and permits an easy inspection and servicing of the humidifier.
- Do not install the humidifier where the failure of the appliance could cause damage to the building structure or to other expensive equipment.
- Maintain the following minimum clearances while installing to enable access for inspection and servicing.

Side	Minimum Clearance
Top	20" (51 cm)
Both sides	24" (60 cm)
Front	42" (107 cm)

- The humidifier is designed to be installed directly on the floor/roof or a curb.
- Provide a level, solid foundation for the humidifier.
- Ensure that the floor/roof beneath the humidifier is waterproof to withstand any water spillage during servicing or if a problem occurs.
- Attach the SK enclosure securely and safely.

## Steam Dispersion System

### Steam Dispersion System Selection

To prevent the accumulation of condensation in air ducts, Neptronic has designed four basic configurations of steam distribution systems to provide you with the most economical solution for any particular application.

#### Steam Absorption Manifold (S.A.M) Horizontal Duct

The S.A.M system is suitable for installations where absorption distances are short, less than 5 feet (1500mm), and/or low duct temperatures are in effect.

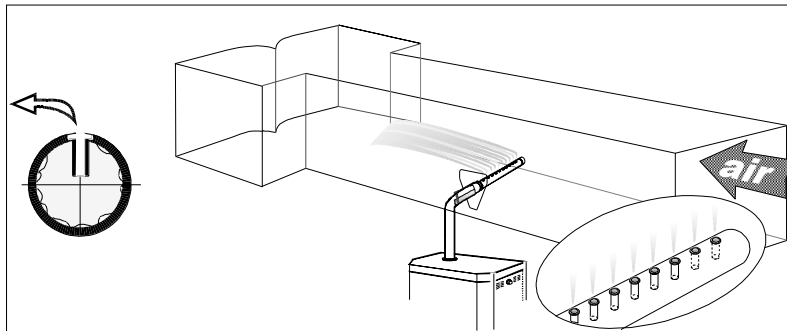


Illustration 6 - Steam Absorption Manifold (S.A.M) Horizontal Duct

#### Steam Absorption Manifold (S.A.M.E2) Horizontal Duct

The S.A.M.E2 system is suitable for installations where absorption distances are short, less than 5 feet (1500mm) and/or low duct temperatures are in effect. SAME2 are used in applications with restricted duct dimensions.

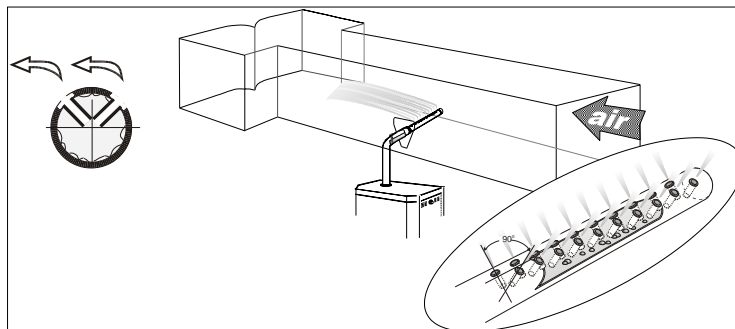


Illustration 7 - Steam Absorption Manifold (S.A.M.E2) Horizontal Duct

#### Steam Absorption Manifold (S.A.M. or S.A.M.E2 ) Vertical Duct

S.A.M or S.A.M.E2 systems for vertical ducts are used where the absorption distances are normal and the requirement is for an economical and efficient solution.

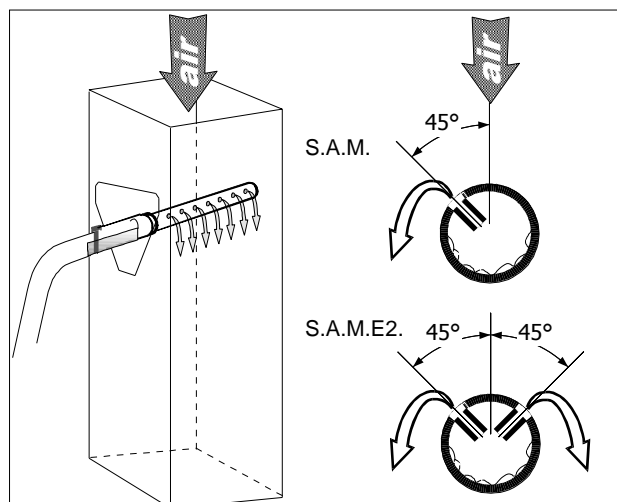


Illustration 8 - Steam Absorption Manifold (S.A.M. or S.A.M.E2 ) Vertical Duct

## Multi Steam System

The Multi-Steam system should be installed in critical locations in air handling systems, particularly where absorption distances are very short, less than 3 feet (900mm), or low air duct temperatures are in effect. The Multi-Steam is custom made to the dimensions of duct or AHU.

Instructions to install Multi-Steam system are described in a specific installation instructions manual enclosed with the Multi-Steam system.

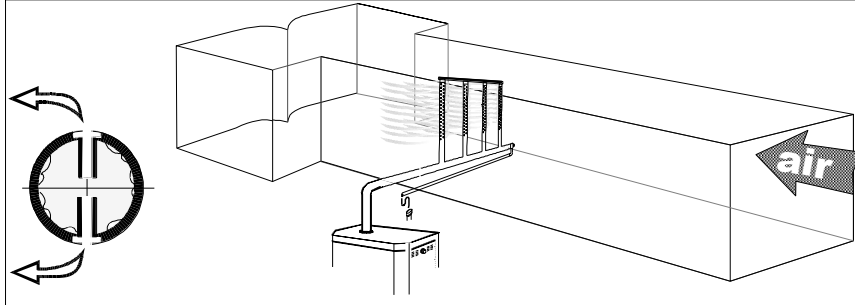


Illustration 9 - Multi Steam System

## Positioning S.A.M and S.A.M.E2

### Duct Mounting

The steam manifold should be mounted and secured through the side of the air handling unit or duct. Provision should be made for safe accessibility, ideally with an observation light and window. Ensure that the construction of the duct wall is suitable enough to support the steam pipe for the duration of the installation life.

Dimension of hole size in the duct must be as follows:

Steam Manifold Ø	Hole Size ØA
1 3/8" (35mm)	2" (51mm)
2" (51mm)	3" (78mm)

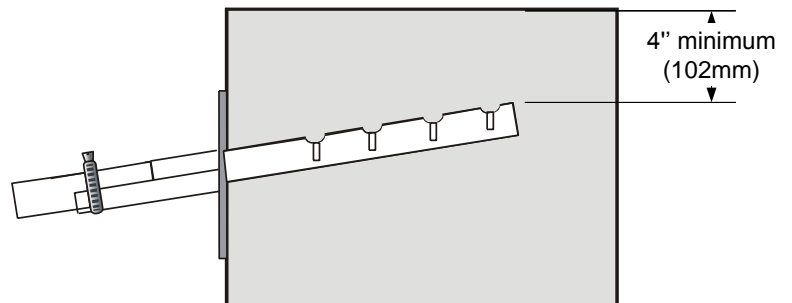
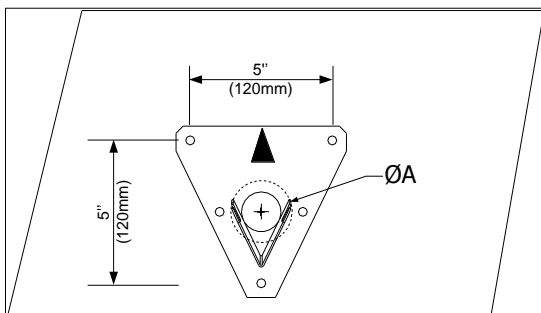


Illustration 10 - Duct Hole Dimensions and Minimum Distance



**WARNING: Risk of condensing. Ensure that the minimum distance at the end of the manifold is at least 4" (102mm) from the top of the duct.**

### Recommendation for S.A.M Distribution Pipes

Table 5 - Recommendation for S.A.M Distribution Pipes

Model	Max Capacity		Outlet		Distribution Pipes		Max Static Pressure	
	lb/hr	kg/hr	Qty	Diameter	Min Length	Max Length	in. of water	(Pa)
				in (mm)	in (mm)	in (mm)		
SK302	6	2.7	1	1 3/8 (35)	12 (300)	24 (600)	5	1245
SK304	12	5.5						
SK306	18	8						
SK310	30	14						
SK314	40	19						
SK316	48	22	2	24 (600)	48 (1200)	5	1245	
SK320	60	28						
SK330	90	41						
SK320 L	60	28						
SK340	120	56						
SK350	150	68	3	2 (51)	32 (800)	64 (1600)	5	1245
SK360	180	82						

For higher static pressure, contact the manufacturer.

### Placement of Steam Pipe in Horizontal Duct

#### 1 3/8" (35mm) Diameter Pipe

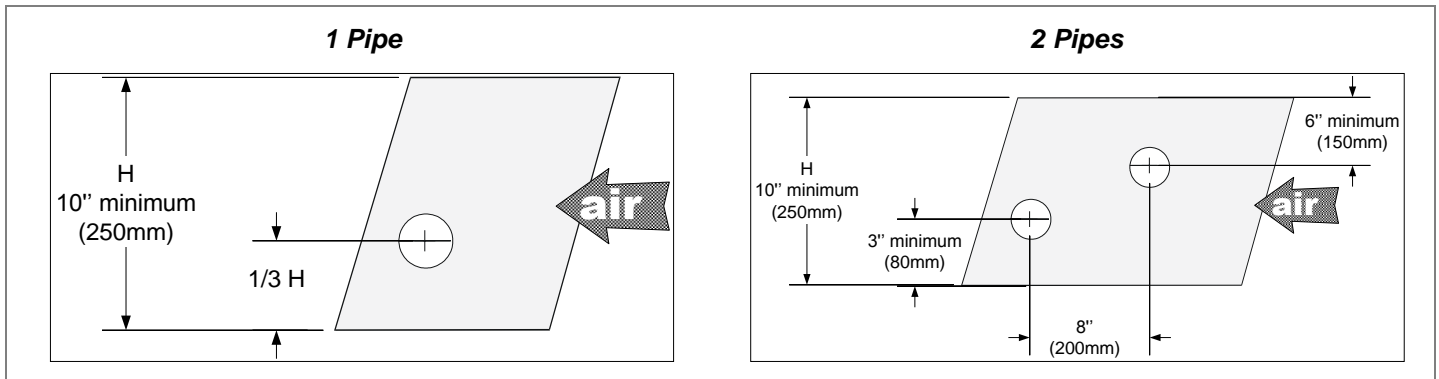


Illustration 11 - 1 3/8" (35mm) Diameter Pipe Placement: Horizontal Duct

#### 2" (51mm) Diameter Pipe

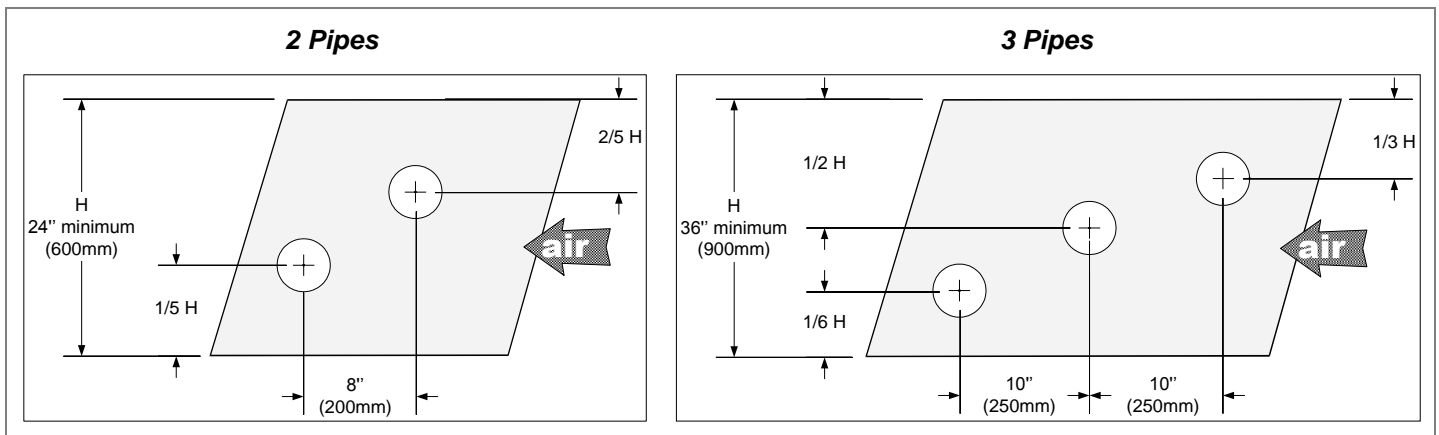


Illustration 12 - 2" (51mm) Diameter Pipe Placement: Horizontal Duct



Note: 2" (51mm) steam pipe must be supported on the end by appropriate duct hanger or strap (supplied by others).



## Placement of Steam Pipe in Vertical Duct

### Eyelet Orientation

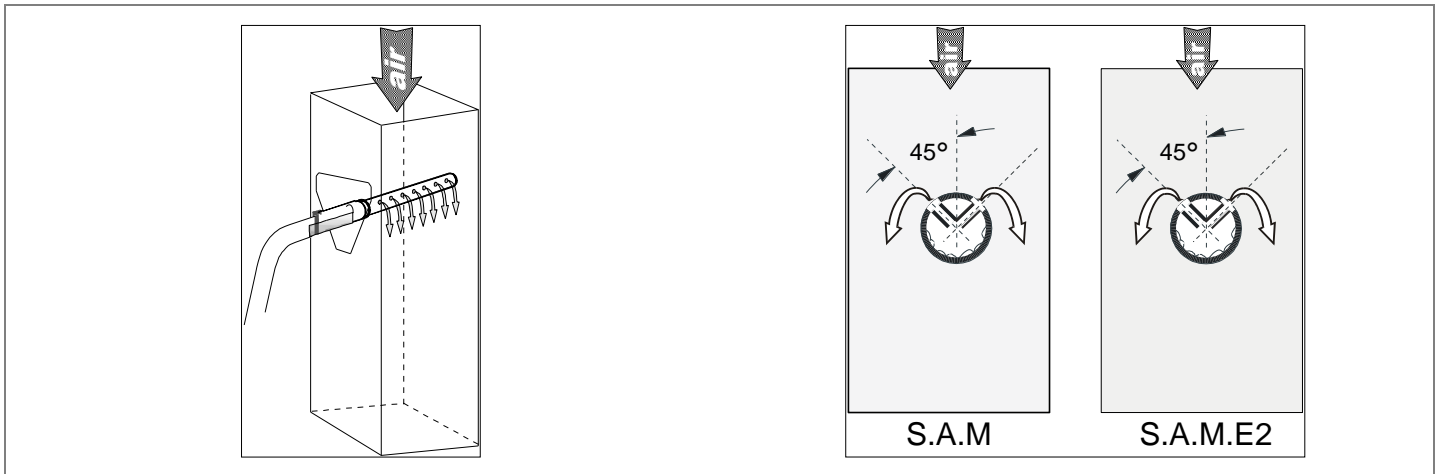


Illustration 13 - Eyelet Orientation

### 1 3/8" (35mm) Diameter Pipe

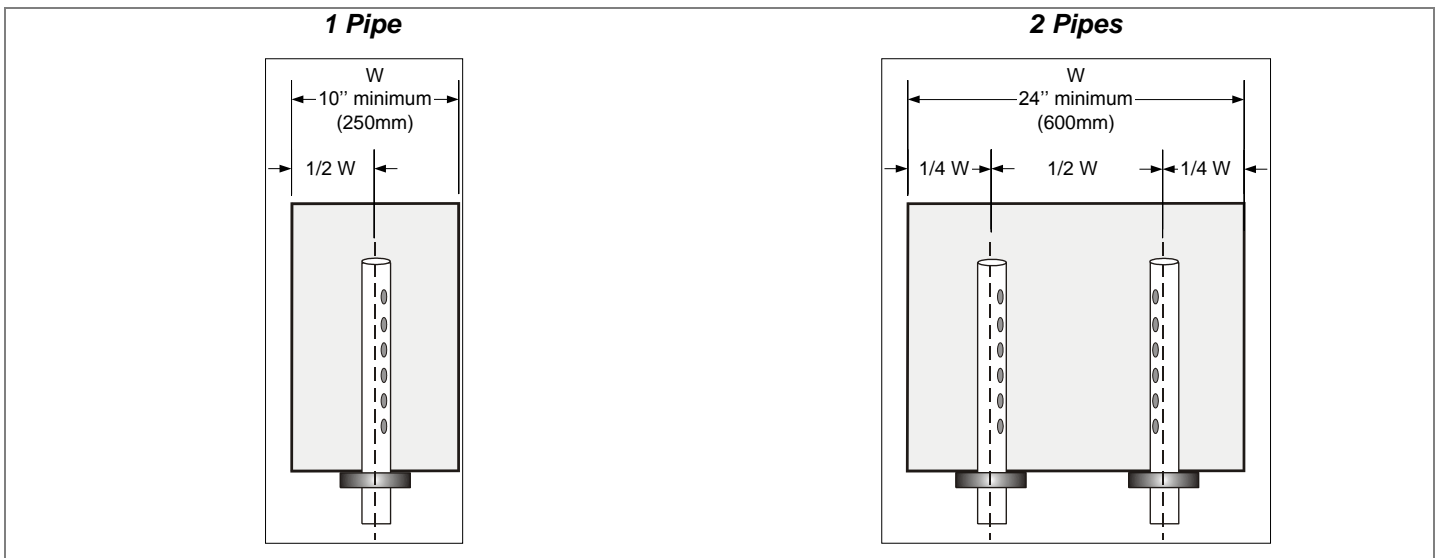


Illustration 14 - 1 3/8" (35mm) Diameter Pipe Placement: Vertical Duct

### 2" (51mm) Diameter Pipe

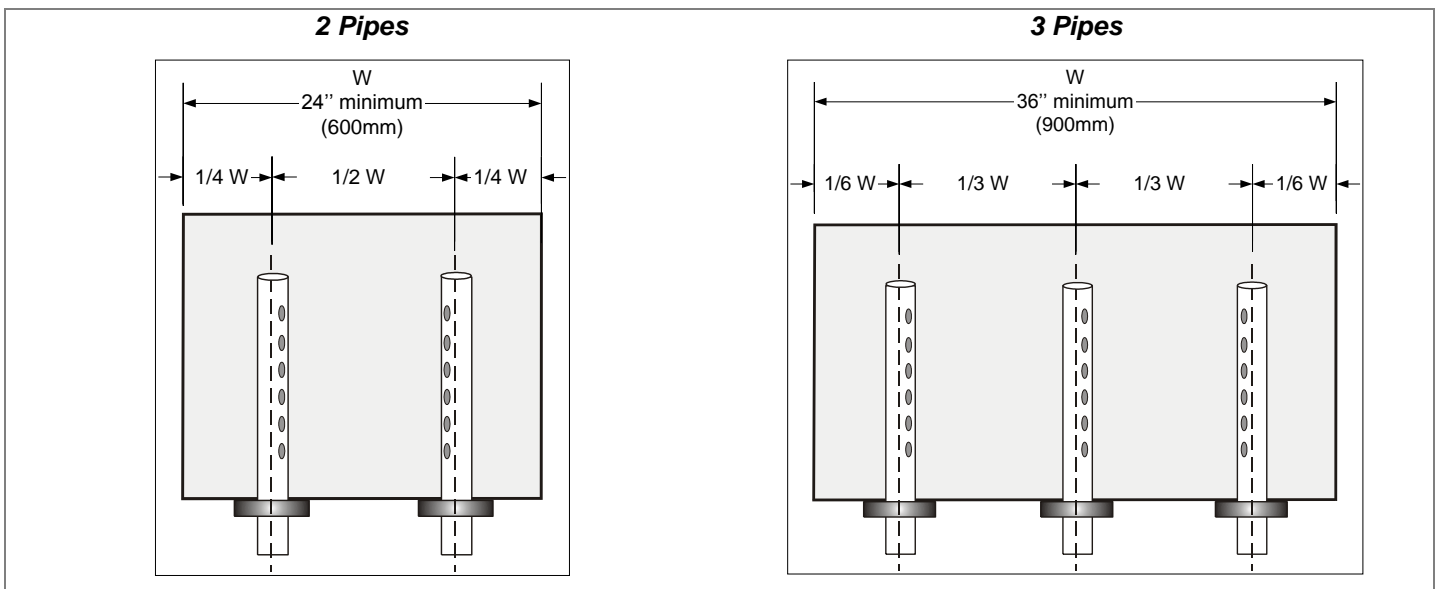


Illustration 15 - 2" (51mm) Diameter Pipe Placement: Vertical Duct

# Steam Output Connections

## Installation

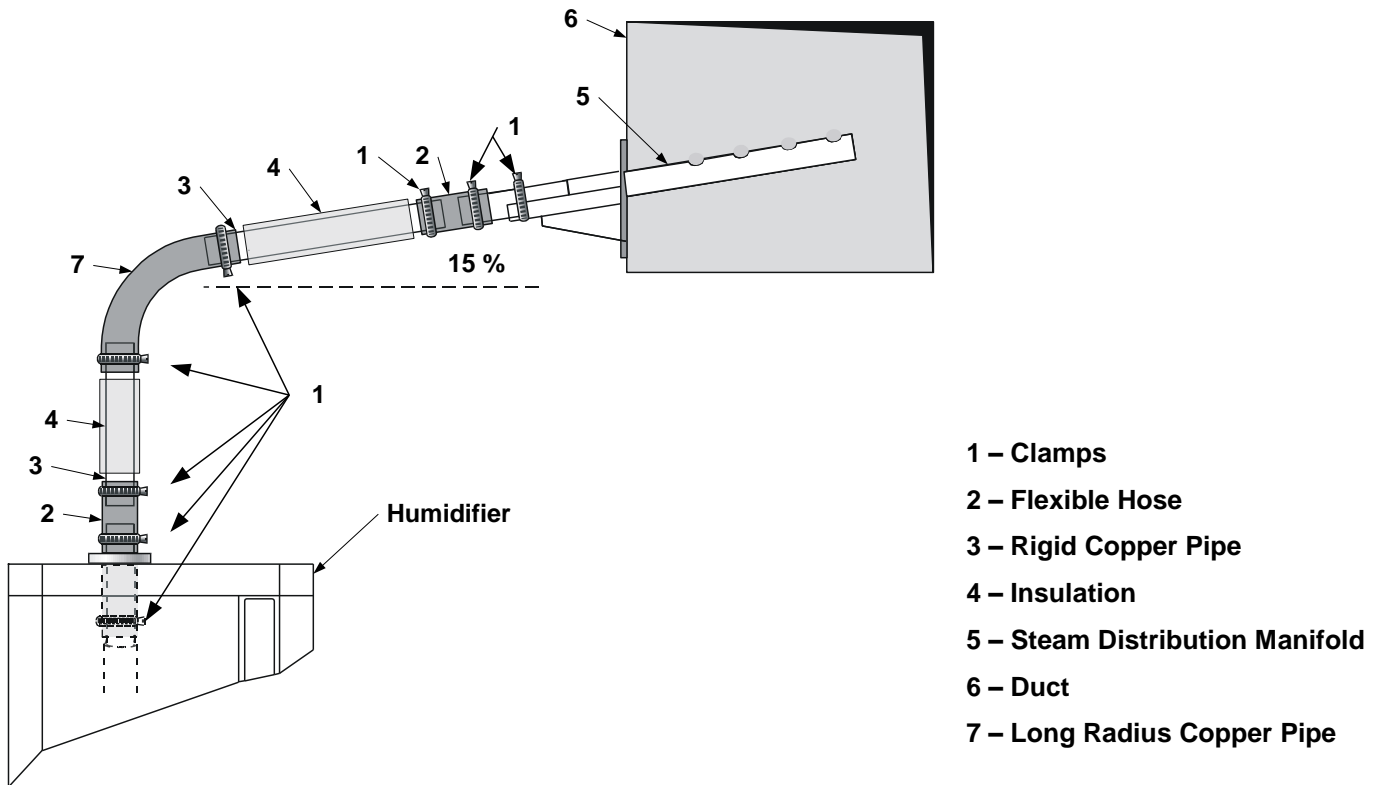


Illustration 16 - Steam Output Connections: Typical Installation

## General Recommendations

Follow these general installation rules to avoid any restrictions inside distribution pipes and humidifier evaporation chamber, and also condensation accumulation, which can lead to severe water accumulation in the duct or a humidifier malfunction.



**Caution:** Risk of malfunction. Avoid kinks, sags, and areas where condensate can be trapped.

- The slope of the steam hose (rigid or flexible) should not be less than 15% (7 horizontal lengths for 1 vertical length) to ensure continuous drainage of condensation back to humidifier or to a steam trap.
- Use flexible steam hoses for short runs (up to 16 feet or 5 m) or for interconnecting between the rigid pipe runs.
- Determine the total steam line for insulated hard piping based on the capacity of the humidifier such as one equivalent foot for each lb/h capacity of the humidifier (0.67 m for each kg/h) with a maximum of 50 feet (15 m). Consult factory for longer steam line runs.
- If you are using a rigid copper pipe, use insulation to diminish condensate build-up.

**S Trap Installation on the Steam Line**

- The lowest point of any steam hose or rigid pipe must be the humidifier. If the humidifier cannot be the lowest point of the piping, install a steam trap(s) (S Type) at the lowest point(s) of the steam supply piping. The steam separator (S trap) should be installed higher than the static pressure of the system by at least 2" (51 mm).

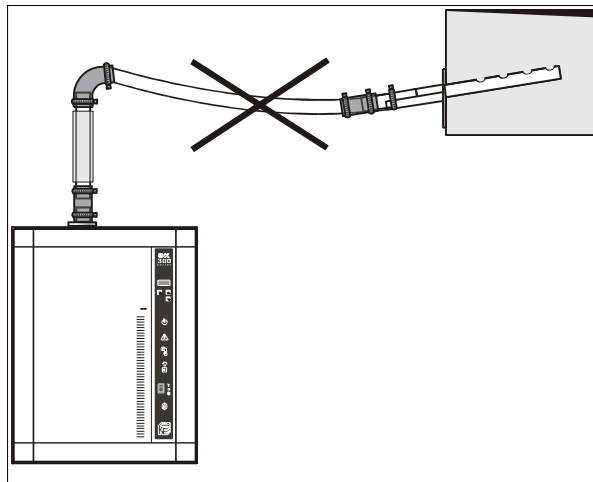


Illustration 17 - Steam Output Connection: Incorrect Installation

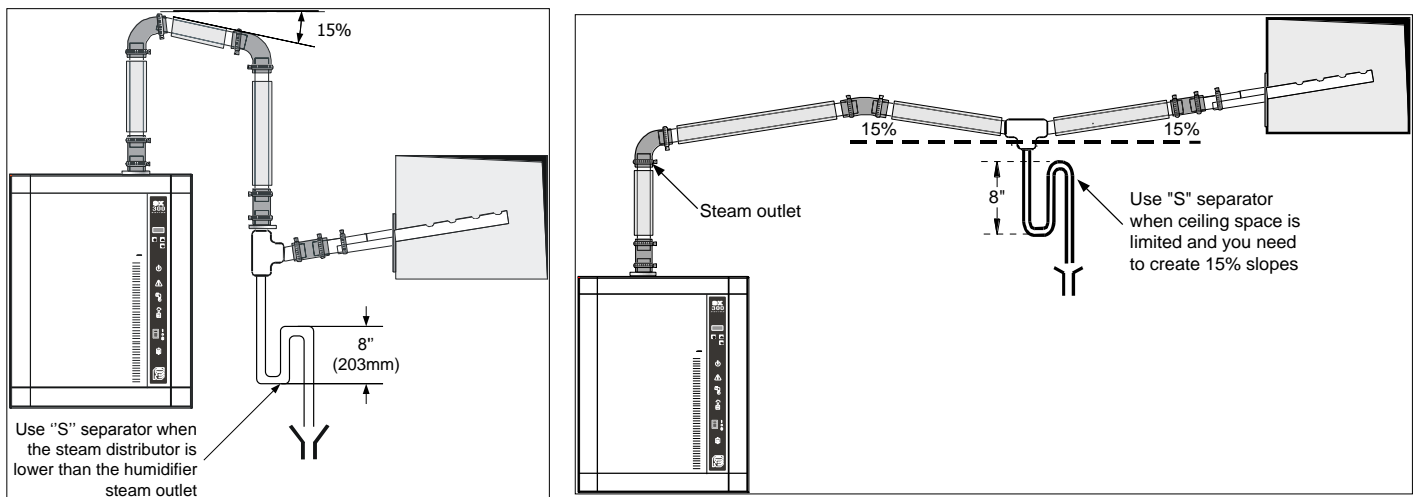
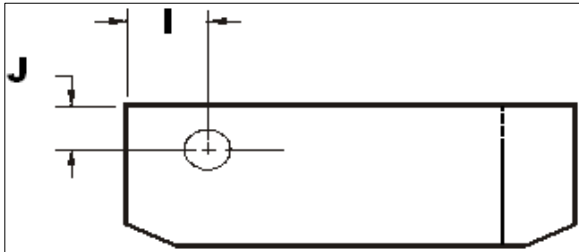


Illustration 18 - Steam Separator (S trap) Installation

## Position of Steam Output

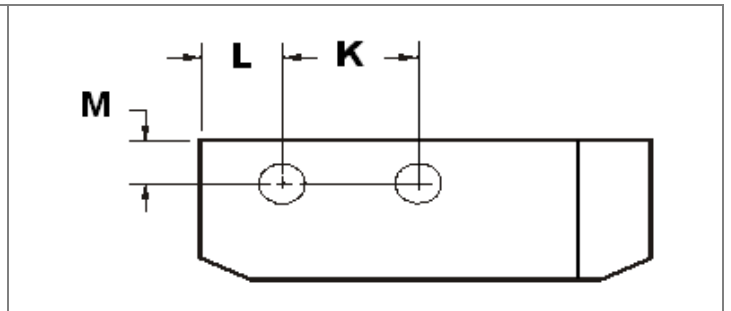
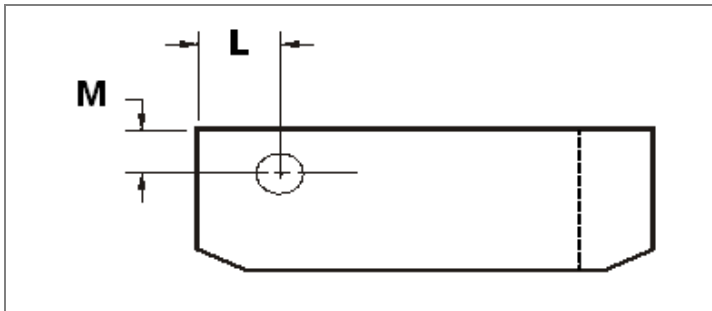
### Small Cabinet

Models	I	J
SK302 SK304 SK306	4 5/16 (110)	4 13/16 (122)



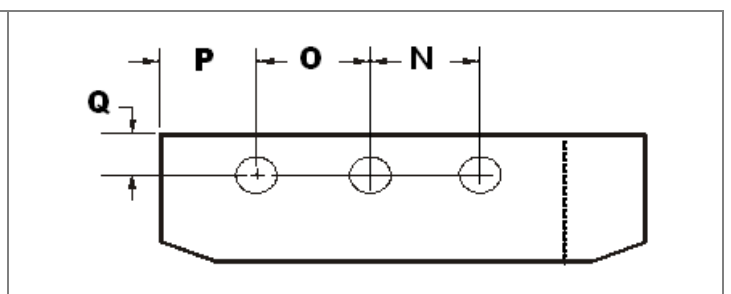
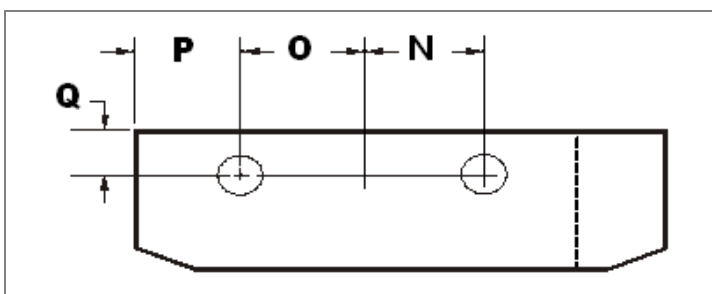
### Medium Cabinet

Models	K	L	M
SK310 SK314	-	4 (102)	5 5/8 (143)
SK316 SK320 SK330	5 9/32 (134)	4 (102)	5 5/8 (143)



### Large Cabinet

Models	N	O	P	Q
SK320 L SK340 SK350 SK360	7 (179)	7 (179)	5 3/16 (132)	5 11/16 (144)





## Installation - Humidifier with SDU

- The SDU should be installed in an environment where the air is relatively clean. This avoids the blower from getting clogged with dust.
- The humidifier should be mounted such that the SDU fan section is at least 78" (2 meters) above the floor.
- A minimum clearance of 18" (0.45 meters) from the ceiling should be allocated to avoid ceiling and wall condensation.
- If additional ventilation is not present, the fan should have a clearance from the ceiling of at least 54" (1.35 meters). Proper ventilation must be observed to avoid ceiling and wall condensation.

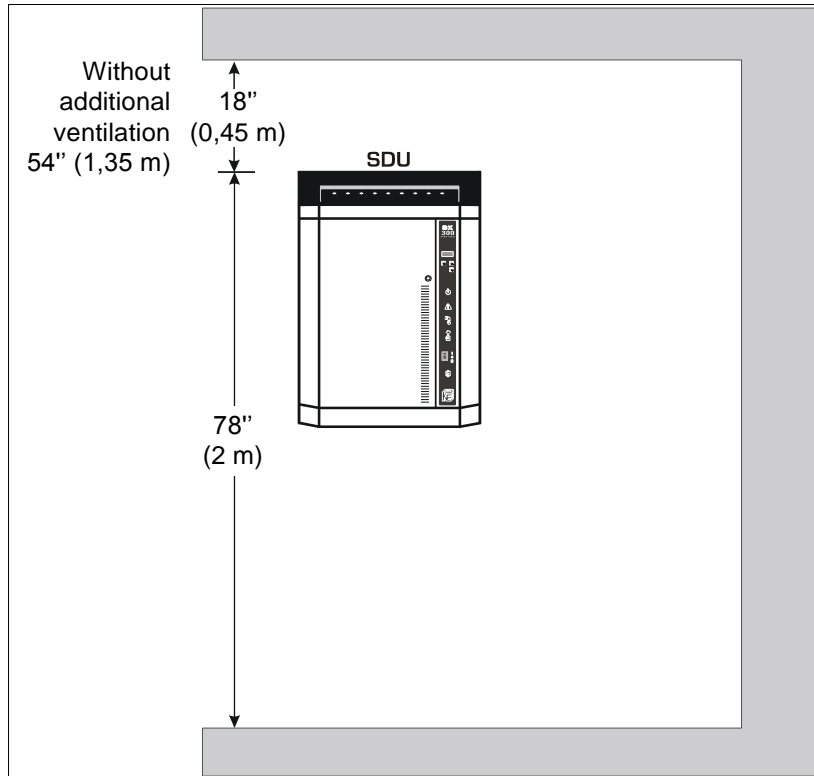


Illustration 19 - SDU mounted on Humidifier

## Remote Installation of SDU

The SDU can be installed in a different location from the humidifier (remote SDU). Follow the piping recommendations.

- Mount the SDU to the wall on brackets (not supplied); do not drill mounting holes through the cabinet of the SDU.
- Connect the steam hose(s) to the bottom inlet(s) of the SDU to the top of the steam outlet(s) of the humidifier.
- Secure the hose(s) with the supplied hose clamp.
- Connect the condensate hose to the bottom of the SDU to an open drain.
- Connect the electrical wires from the SDU to the top of the humidifier. Field wiring must conform to local codes.
- The fan of the SDU operates for four minutes after steam production has stopped to prevent condensation.
- Avoid any obstruction of the ventilation openings on top of the SDU.

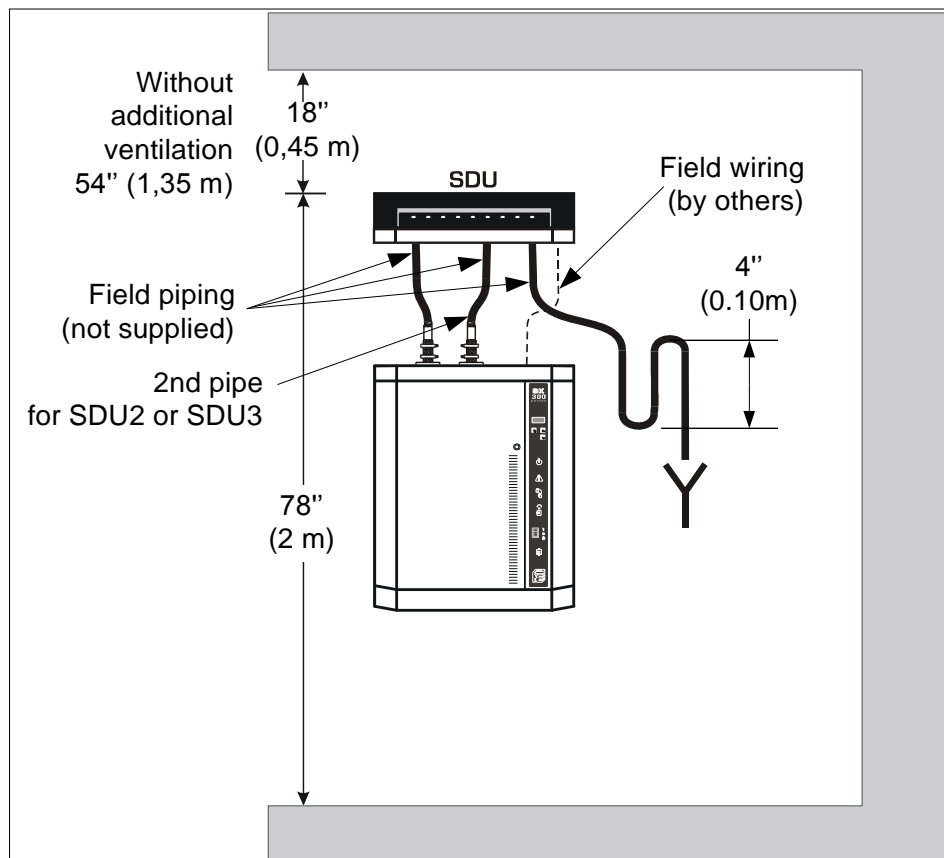


Illustration 20 - SDU Remote Installation

## Maintenance of the SDU

Clean the blower if there is an accumulation of dust.

# Plumbing Connections



**Plumbing Installation should conform to Local and National Codes.**  
**Any installation work must be carried out by suitably qualified personnel.**

The SK300 humidifier can operate with soft or hard water. For normal operation, pre-treatment of water is not necessary.

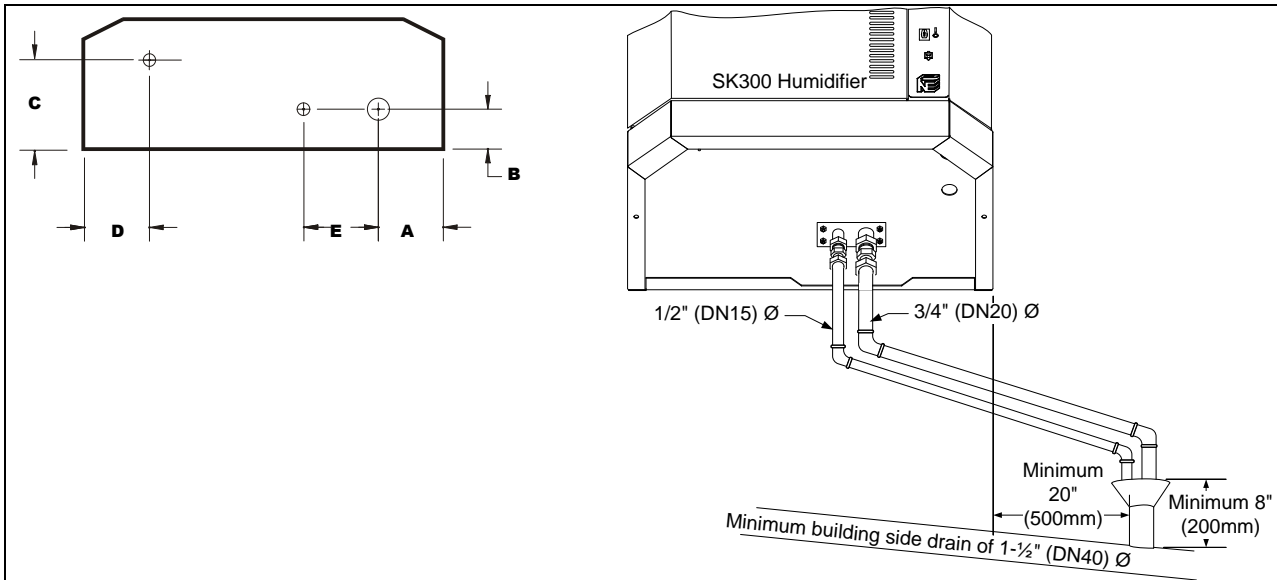


Illustration 21 - Plumbing Connections

Table 6 - Dimensions for Plumbing Connection

Model	Dimensions inches (mm)				
	A	B	C	D	E
SK302 SK304 SK306	6 ½ (165)	2 (51)	9 ⅛ (232)	4 ⅛ (105)	1 ¾ (44)
SK310 SK314 SK316 SK320 SK330	7 ¼ (184)	1 ¾ (44)	9 ¾ (248)	4 ⅛ (105)	1 ¾ (44)
SK320 L SK340 SK350 SK360	7 (179)	1 ¾ (44)	9 ¾ (248)	4 ⅛ (105)	1 ¾ (44)

## Water Supply

- Water Inlet Specifications
  - Inlet water pressure: 10 to 70 psig (0.7 to 4.8 bars)
  - Maximum temperature: 85°F (30°C) maximum
  - 3/8" (DN10) standard copper water line connection
- A shutoff valve (not supplied) should be installed in the water supply line close to the humidifier to facilitate servicing.
- It is recommended to install a standard water strainer in the water supply line.
- It is recommended to install a water hammer arrestor, to absorb hydraulic shock and minimize water hammer when the fill valve closes.

## Water Connections

Follow the steps below:

1. Connect 3/8" (DN10) copper pipe to the bottom 3/8" (DN10) compression fitting (supplied).
2. Place the swivel top 3/4" (DN20) fitting to the male threaded part of the valve and tighten it with fingers.



**Caution: Risk of damage to the valve. Do not use a wrench to tighten swivel.**

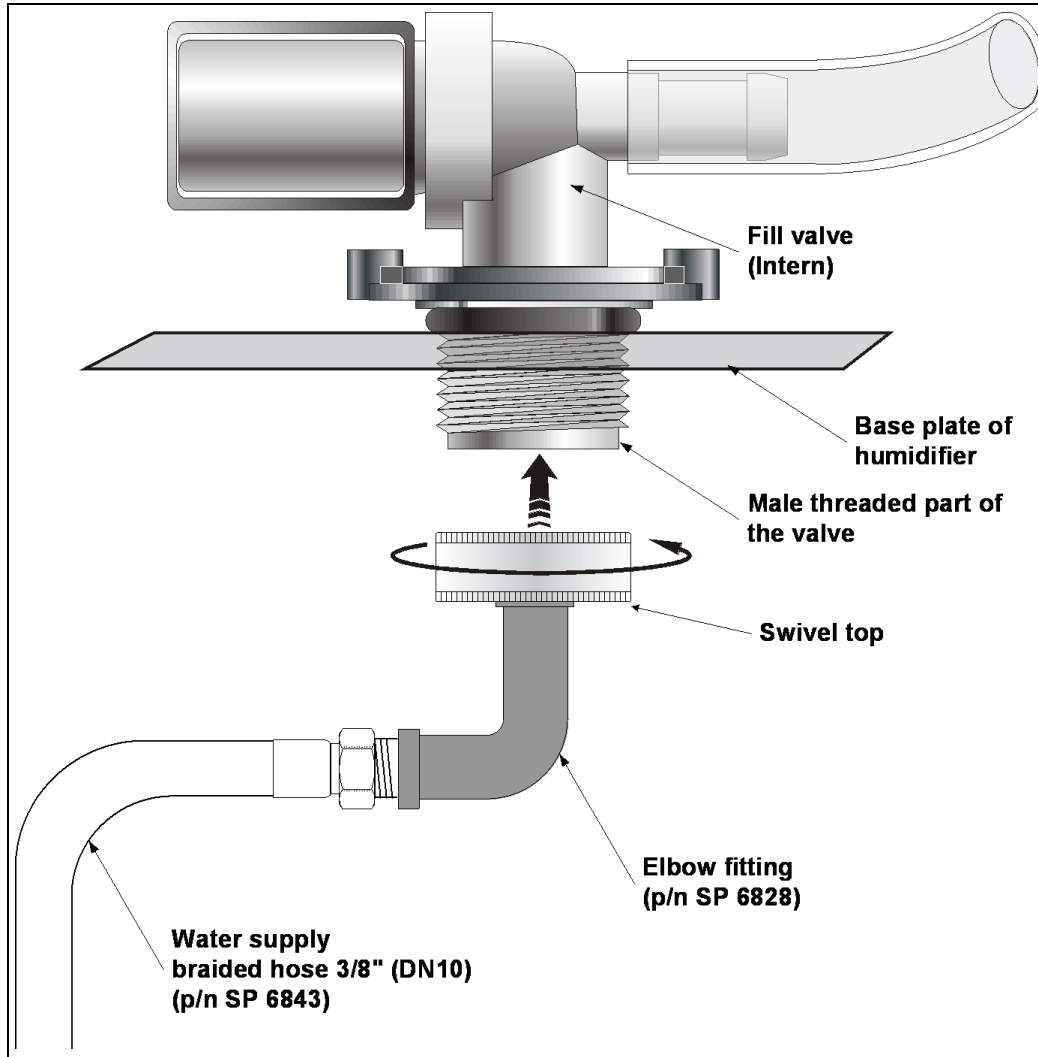


Illustration 22 - Water Supply Connections

## Drain Connections

- Evaporation chamber water drain temperature: 140°F (60°C).
- Standard hydraulic compression fittings: a 3/4" (DN20) for the evaporation chamber drain and a 1/2" (DN15) for the pan drain.
- 2 hydraulic pipes located under the humidifier (see Illustration 21 - Plumbing Connections) must be connected to the drain pipe.
- Use standard copper hydraulic pipes 3/4" (DN20) and 1/2" (DN15).
- Ensure that the drain pipe dimension is sufficient, especially if more than one humidifier is evacuating into the same drain line.





## Weather Proof Enclosure Plumbing Connection

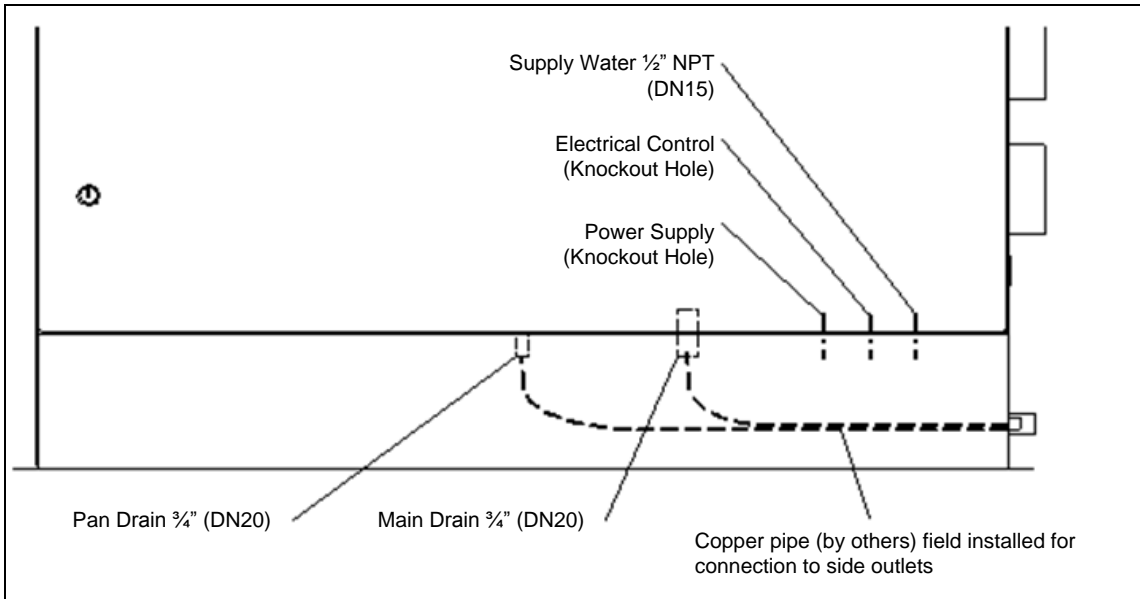


Illustration 23 - Weather Proof Enclosure Plumbing: Front View

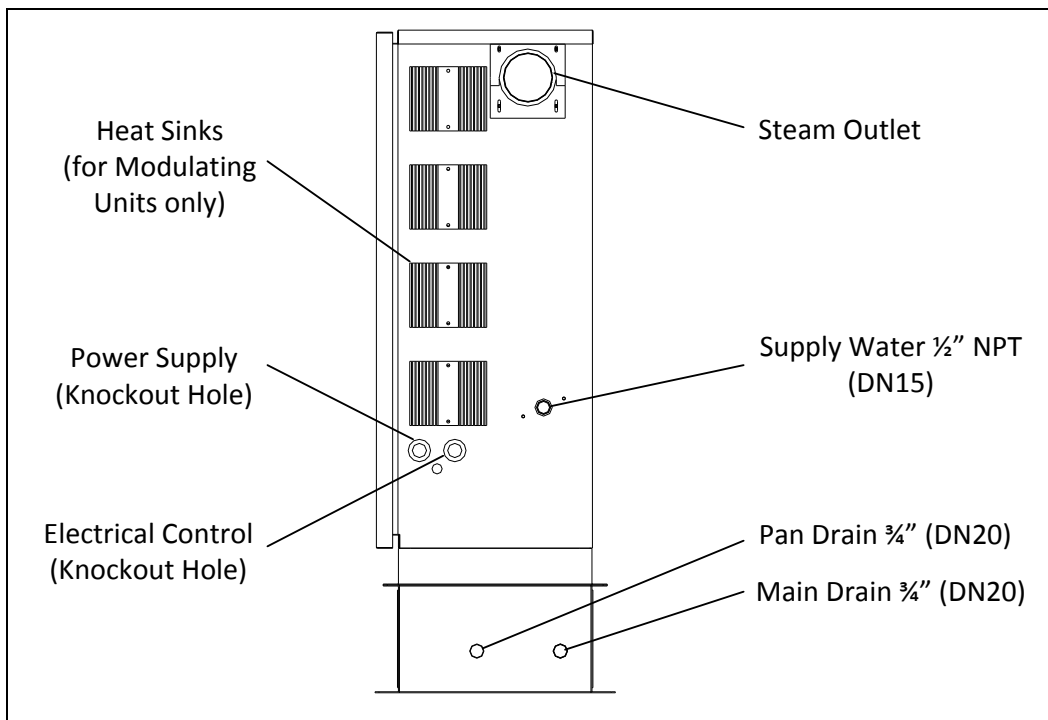


Illustration 24 - Weather Proof Enclosure Plumbing: Side View

### Water Drain Valve

The weather proof enclosure is equipped with a normally open valve, enabling the humidifier to drain all water during a power failure, in order to prevent water from freezing within the unit. During normal operation, the humidifier reduces drain water temperature to 140°F (60°C).



**Caution: During a power failure, the drain water temperature is not reduced. Installed drain piping must be rated to 212°F (100°C).**



# Power Supply Connections



**Caution:** Risk of electric shock. Disconnect the Humidifier from the electric supply before proceeding with the connection.



**WARNING:** Risk of fire. Do not interchange the power terminal block designated L1, L2 and L3 with low voltage terminal block designated 1, 2 and 3.

- The wiring to the humidifier should be done by a qualified electrician and should conform to the procedure, regulation and local codes.
- Use only copper conductors.
- An external overcurrent protection and disconnect circuit breaker should be installed on the supply, adjacent to the humidifier.
- A knock-out (not supplied) should be installed at the bottom of the electrical compartment of the humidifier for strain relief of the supply cable.
- Ensure that the size of the wire conductors is appropriate for the current supplied.
- Ensure that each terminal connection is properly secured.
- The ground conductor should be equipped with a ring terminal and should be connected directly to the electrical panel on the indicated location.

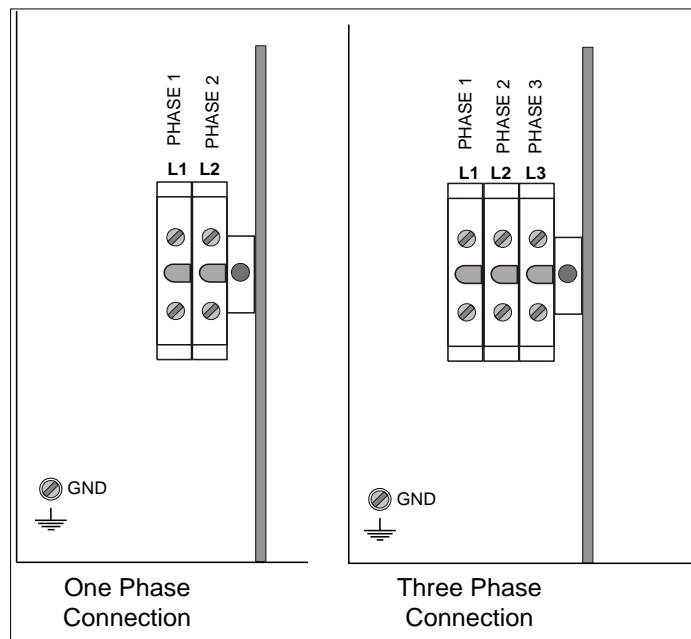


Illustration 25 - One and Three Phase Power Connections



### Humidity Control by Humidifier (Internal Mode)

Humidity is controlled by the humidifier using an SHR10 or SHC80 as a space sensor.



Note: If the humidifier is equipped with a Space Distribution Unit (SDU), the PD switch is already factory wired inside the SDU, do not wire the terminal #2.

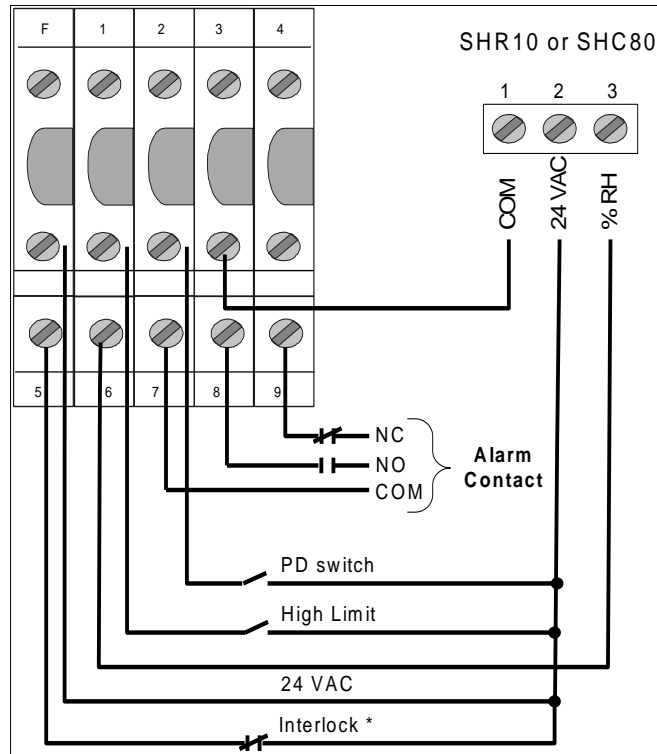


Illustration 27 - Humidity controlled by humidifier with SHR10 or SHC80 as space sensor

A VAV system with humidity is controlled by the humidifier using an SHC80 as a high-limit duct sensor and SHR10 or SHC80 as space sensor.



Note: If an interlock is not used, a jumper must be installed between terminal F and 5.

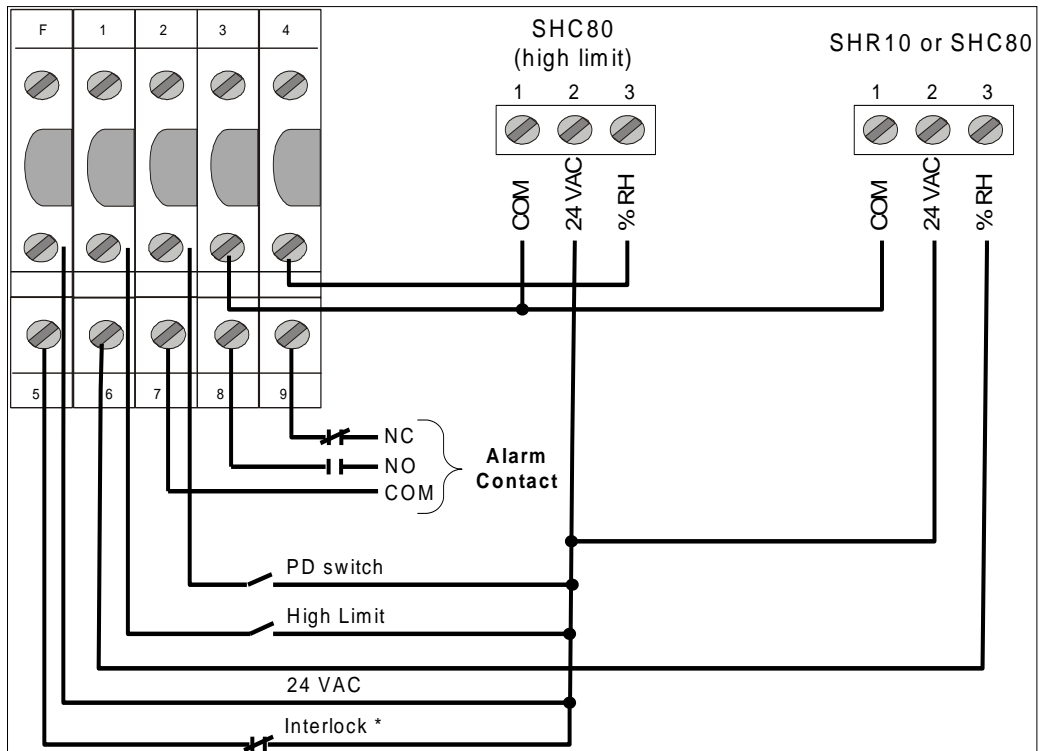


Illustration 28 - VAV system with humidity controlled by humidifier using high-limit sensor and space sensor



### Control Signals

Select the control signal through the menu. Wire the control input to terminal 3 and 4 as indicated in the illustration.

#### Control Signal 0-10 Vdc

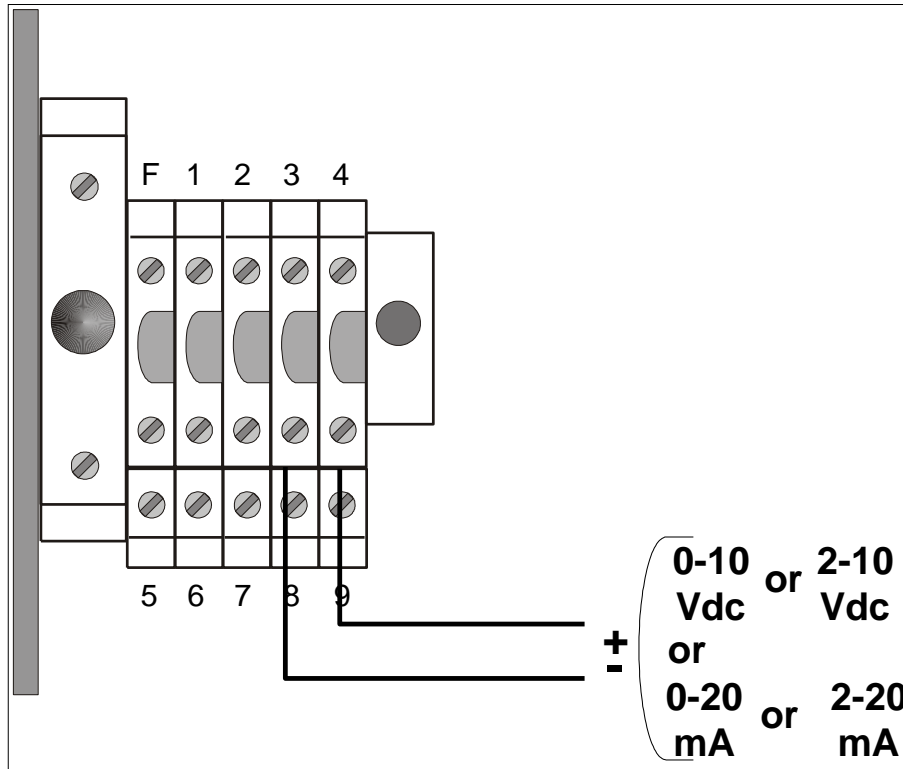


Illustration 29 - Control Signal 0 to 10 Vdc

### Common Alarm Connections

- A volt free contact is provided in the form of both a Normally Open and Normally Closed contact that switches on, in the event an alarm is activated on the SK300 humidifier.
- Wherever possible, it is recommended to use the Normally Closed contact. This contact opens in the event of a humidifier fault.
- These contacts should be used to switch a low voltage, ideally 24V, with a switching current of no more than 3 Amps.

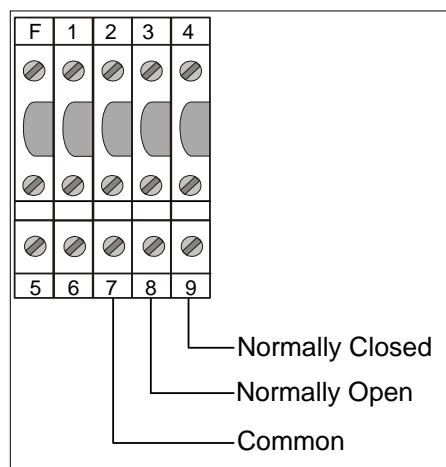


Illustration 30 - Common Alarm Connections

## Controls Placement (Steam Dispersed into a Duct or AHU)

A typical humidifier control system should include the following along with the humidifier:

- A wall or return duct humidistat
- A high limit duct humidistat
- An air proving switch

Placement of these devices is critical to the proper operation of the overall system.

- The return duct humidistat must always be located before any outside air intake, to ensure accurate sensing of the air from the humidified space.
- Alternatively, a room humidistat can be used. The room humidistat should be located on an inside wall or column. It should not be near any discharge air from supply ducts or sources of heat or cold.
- The airflow switch must be positioned to accurately open on a loss of air flow, to prevent the humidifier from running when there is no air to absorb humidity.
- The high limit humidistat must be positioned far enough, 15' minimum (4.6m), downstream of the steam dispersion manifold(s) to prevent it from getting wet, but still allows it to accurately prevent over humidification of the duct that could result in condensation.

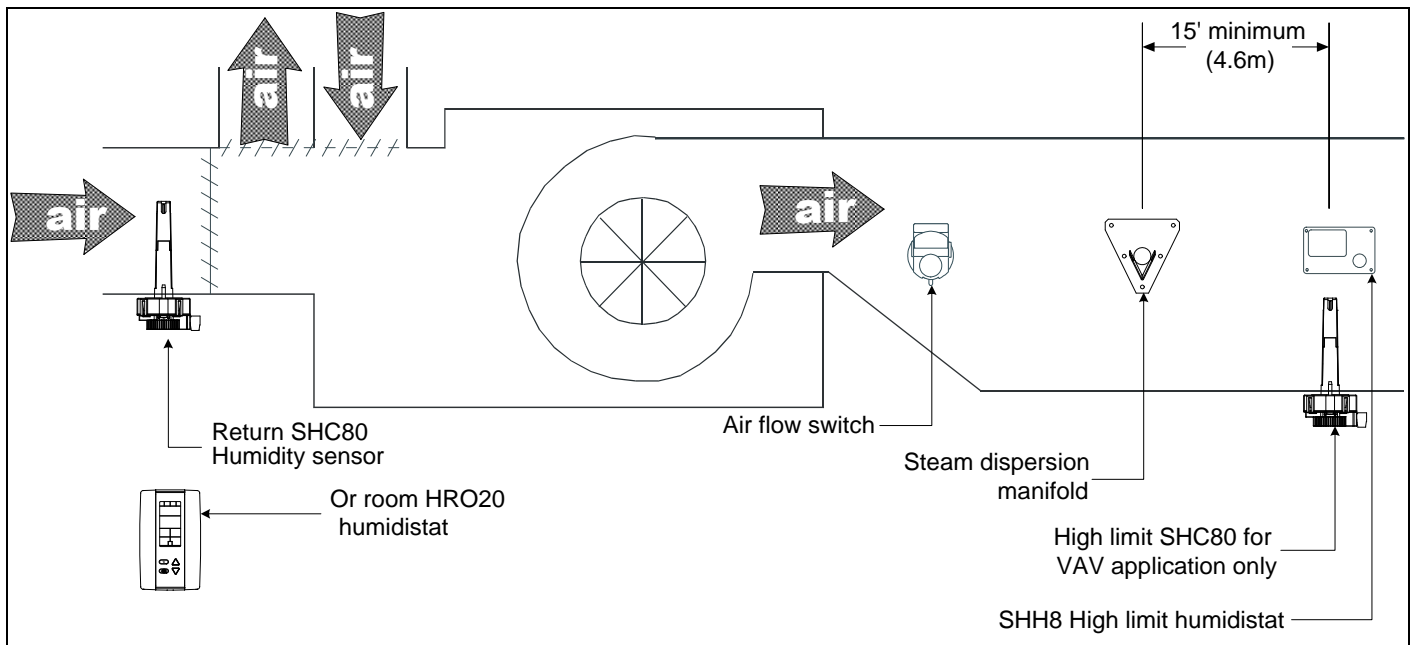


Illustration 31 - Controls Placement (Steam Dispersed into a Duct or AHU)

# BACnet Interface Setup

The BACnet Interface PCB is located on the top right corner inside the electrical compartment.

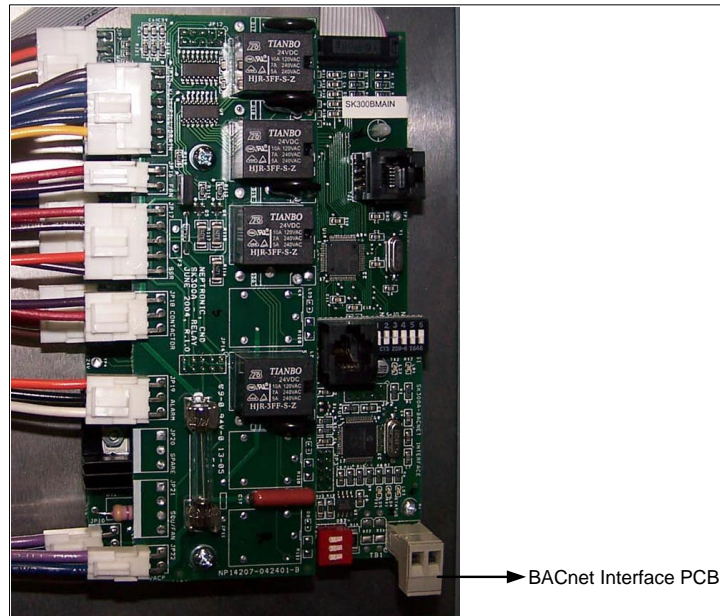


Illustration 32 - BACnet Interface PCB

## DIP Switch Settings

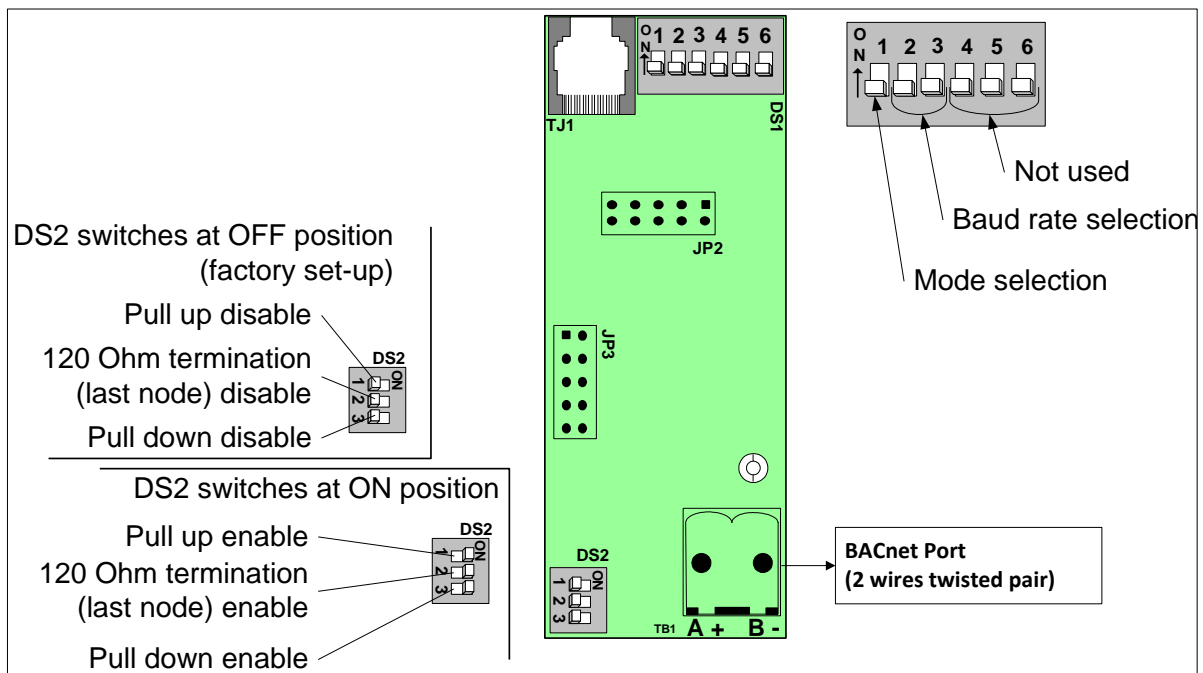


Illustration 33 - BACnet Interface Port

DS1-1 : Mode selection
OFF = Mode Operational (factory set-up)
ON = Mode Configuration

DS1-2&3 : Baud rate selection		
Baud rate	Switch #2	Switch #3
9600	OFF	OFF
19200	ON	OFF
38400	OFF	ON
76800 (factory set-up)	ON	ON

# Display

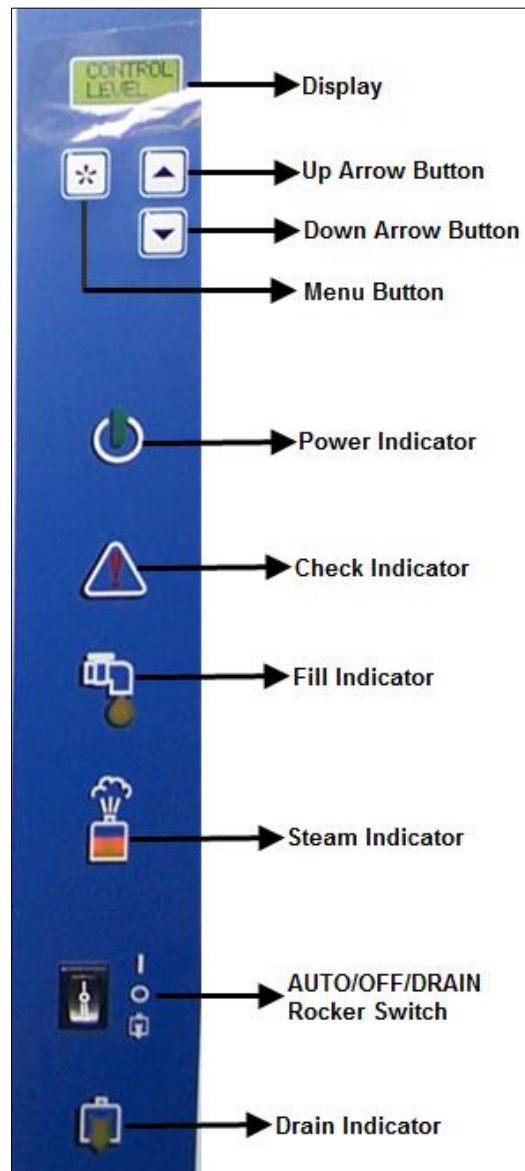







Illustration 34 - Display Features: Front Panel






## Front Panel

The following are the display features of the Front Panel and their description:

Table 7 - Humidifier Front Panel Display Description

Options		Description
Display		The Alphanumeric display indicates all the operation parameters and error messages.
Menu Button		The Menu button is used to access Programming mode.
Up and Down Arrow Buttons	 	▲ - Used to increase the control parameters of the humidifier. ▼ - Used to decrease the control parameters of the humidifier.
Power Indicator		☼ - The humidifier is powered by electricity and the switch is at the AUTO position. O - The humidifier is disconnected from the power supply.



Options		Description
Check Indicator		☀ - The CHECK indication is normally off. It will be activated as a warning during abnormal conditions of operation. ☀ (blinking) - If the CHECK indication is on, it means that maintenance is required. The running hours have exceeded the Service hours. See Service section on page 37. O - No abnormal conditions of operation.
Fill Indicator		☀ - Indicates that the water supply (fill) valve is open. O - Indicates that the water supply (fill) valve is closed.
Steam Indicator		☀ - For ON/OFF models, the STEAM indicator is ON when the contactor is closed and steam is being generated. ☀ (blinking) - For modulating models, the STEAM indicator blinks ON and OFF in proportion to the percentage of steam output percentage the humidifier is generating. This proportion appears on the display. When the output reaches 100%, the indicator stops flashing. O - Indicates that steam is not being produced.
Rocker Switch AUTO/OFF/DRAIN		AUTO - Position AUTO (I) The humidifier generates steam based on demand from the humidistat.  OFF - Position OFF (O) - Humidifier will shut off.  DRAIN - Position DRAIN The humidifier stops operating and the evaporation chamber drains the water out. This is done typically at regular service.
Drain Indicator		☀ - Indicates that the drain pump is on, either as a result of an automatic drain cycle or because the front panel Rocker switch is manually set to DRAIN. O - Indicates that the drain pump is off.

## Modes – Description

### OFF Mode

When the Rocker switch is in the OFF position, the display shows the model of the humidifier and the program version number as follows:

**SKB 3XX**  
**NEP R1.5**



### Scroll Mode

When the Rocker switch is in the AUTO position, the display scrolls the following information every 6 seconds:

Table 8 - Scroll Mode Display Description

Display and Description	Notes
<b>HUMIDITY 45.2%</b> Percentage of relative humidity	Only on modulating humidifiers (suffix M). Percentage of relative humidity.
<b>DEMAND 92%</b> Percentage of demand	Control signal input response from 0 to 100%.
<b>OUTPUT 100%</b> Percentage of output	Output capacity of the humidifier.
<b>WATR LVL 92%</b> Percentage of water level	Corresponds to 100% of the optimum water level in the evaporation chamber.
<b>WATR TMP 65 C</b> Temperature of water in Celsius scale	Temperature of water inside the evaporation chamber.

## Diagnostic Mode

To enter the Diagnostic menu: press and hold  (down) and then press  (menu).

When the following conditions occur, the diagnostic messages override the scrolling information:

Table 9 - Diagnostic Mode Display Descriptions




Display	Description	Values
<i>SSR TMP 40 C</i>	Displays the SSR temperature.	-
<i>WTR TOFF 100 C</i>	Adjust the water temperature offset.	Default: 0, Range: -10°C to +10°C
<i>WTR FREQ 8000 HZ</i>	Displays the water level frequency.	-
<i>WTR LOFF 100%</i>	Adjust the water level offset.	Default: 0%, Range: -10% to +10%
<i>FOAM PRB 207</i>	Displays the foaming probe value.	-
<i>DRN TM OUT 5 MIN</i>	Adjust the drain time.	Default: 5 mins SK302/304/306 7 mins SK310/314/320/330 8 mins SK340/360 Range: 4 to 16 mins
<i>NO DEMND 72 HRS</i>	Adjust the delay to drain out the humidifier from its remaining water when there is no demand. Drain remaining water to prevent the growth of bacteria.	Default: 72Hrs, Range: 1 to 250 Hrs
<i>HOLD TMP OFF</i>	Adjust the holding temperature of the evaporation chamber for a faster response to demand.	Default: OFF Range: 15°C to 90°C or OFF
<i>ANTI-FRZ OFF</i>	Adjust the anti-freezing temperature of the evaporation chamber of humidifier that has to be installed in the weather proof enclosure.	Default: OFF Range: from 4°C to 10°C or OFF
<i>ALARM BEEP ON</i>	Adjust the alarm beep.	Default: OFF Range: ON or OFF
<i>T UNIT CELSIUS</i>	Adjust the temperature unit scale between Celsius and Fahrenheit.	Default: Celsius Range: Celsius/Fahrenheit -
<i>CONTRAST 25</i>	Adjust the contrast level of LCD.	Default: 25 (legible LCD) Range: 0 to 40
<i>SKB 3XX NEP R1.5</i>	Displays the humidifier model and revision number of the installed program.	-


## Alarms

Display	Description
<i>AIR FLOW OPEN</i>	Indicates that the airflow is not detected by the air pressure switch. (Modulating unit only)
<i>HI LIMIT CUT-OUT</i>	Indicates that the humidity level has exceeded the setpoint on the high limit humidistat.
<i>DRAIN CYCLE</i>	Indicates that the unit is in the automatic drain mode.
<i>OVER HEATED</i>	Indicates that the temperature inside the container has exceeded the boiling temperature. The humidifier has shut off automatically.
<i>PROBE DEFECTED</i>	Indicates that the water level sensor is not operational. The humidifier has shut off automatically.
<i>NO LEVEL</i>	Indicates that the water has not reached the level probe. This message appears when turning on the humidifier if the evaporation chamber is empty.
<i>CLEANING REQUIRED</i>	Indicates that the humidifier has reached the number of hours of operation and requires cleaning of the evaporation chamber. No interruption to the operation of the humidifier.
<i>SERVICE UNIT NOW</i>	Indicates that the humidifier has reached the number of hours of operation and requires service. The operation of the humidifier has been interrupted.
<i>FOAMING CYCLE</i>	Indicates that the Anti-Foam Energy Conservation (AFEC) has detected foam. The unit drains for a few minutes and returns to normal operation.
<i>DRN/PROBE BLOCK</i>	Indicates that the unit has drained, but the water level does not decrease. The humidifier has shut off automatically.
<i>KLIXON OPEN</i>	Indicates that the temperature in the evaporation chamber exceeded the preset temperature set by the high-temperature switch.
<i>PCB FUSE OPEN</i>	Indicates that the internal 24Vac is shorted.
<i>24 VAC SHORTED</i>	Indicates that the external 24Vac (for humidity) controller is shorted or overloaded.
<i>24 VDC SHORTED</i>	Indicates that the internal 24Vdc (probe or fan) is shorted.
<i>REFILL TIME OUT</i>	Indicates that the time to fill the evaporation chamber has exceeded the preset time in the

Display	Description
	microprocessor.
<i>WATR TMP DEFECTED</i>	Indicates that the water temperature sensor is not present or is defective.
<i>SSR OVER HEATED</i>	Indicates that the temperature of the SSR is too high. Verify the operation of the cooling fan.
<i>INTERLCK OPEN</i>	Indicates that the interlock safety is open. The humidifier has stopped functioning.
<i>END OF SEASON</i>	Indicates that the humidifier is in stand-by mode. When there is no humidity demand for more than 72 hours, the humidifier drains the water from the evaporation chamber automatically and will be in stand-by mode.

## Programming Mode

To access the Programming Mode, push the  button. To move to the next program function, push the button twice. Use the  and  buttons to make any selection.

The changes made in the Program Mode are saved into a non-volatile memory. When the humidifier is in Program Mode, the normal operation of the humidifier is halted. To resume normal operation, exit the menu program mode by pressing the  button until the alphanumeric display is clear.

### 1. "CONTROL EXTERNAL"

Default: External  
 Range: Internal, External, Com Port

Select the control mode.

- If you select External, the humidifier receives control demand from the control input.
- If you select Com Port, the humidifier receives control demand from the BACnet communication port.

### 2. "SP SOURC INTERNAL"

Default: Internal  
 Range: Internal, External, Com Port

Select the source for room humidity setpoint.

### 3. "SETPOINT 40% RH"

Range: 10% to 90%

Select the relative humidity setpoint.

### 4. "DUCT SRC DISABLE"

Default: Disable  
 Range: Disable, External, Com Port

Select the source for duct's high limit relative humidity (control Internal only).

### 5. "DUCT SP 80% RH"

Range: 10% to 90%

Select the high limit relative humidity setpoint (duct source External only).

### 6. "DRAIN 4 HRS"



Default: 4 hours  
 Range: 1 to 24 hours  
 Increment: 1 hour

Select the frequency for drain cycle. Generally, the harder the water is, higher the drain cycle frequency should be. Drain cycle setting does not affect the AFEC system.

### 7. "RUNNING 0645 HRS"

Number of running hours (information display only)

Indicates the number of hours the humidifier has been running since the last servicing.

After every service, reset the number of hours of operation to zero by pressing the ,  buttons simultaneously for 30 seconds. This resets the number of hours of operation to zero.

**8. "SERVICE 1000 HRS"**

Default: 1000 hours  
Range: 400 to 1500 hours  
Increment: 100 hours

---

Set the number of hours of operation before the humidifier calls for servicing. Generally, the harder the water is, the lesser the number of hours of operation before servicing can be initiated.

**9. "LOCK ON 80% PUR"**

Default: 100%  
Range: 0 to 100%  
Increment: 1%



---

Select the output span, the rate at which the humidifier delivers 80% of the maximum rated output at full demand.

**10. "RESET ALRM NO"**

Default: No  
Range: Yes/No

---

Select Yes or No to enable or disable the reset alarm option by pressing the  and  buttons simultaneously.

**11. "CTRL INP 2-10 VDC"**

Default: 2 to 10 Vdc  
Range: 0 to 10 Vdc, 2 to 10 Vdc, 0 to 20mA, 4 to 20 mA

---

Select control input signal.

**12. "HUM. INP"**

Default: 2 to 10 Vdc  
Range: 0 to 10 Vdc, 2 to 10 Vdc, 0 to 20mA, 4 to 20 mA

---

Select humidity input signal.

**13. "DUCT INP 2-10 VDC"**

Default: 2 to 10 Vdc  
Range: 0 to 10 Vdc, 2 to 10 Vdc, 0 to 20mA, 4 to 20 mA

---

Select duct humidity input signal.

**14. "SKB 3XX NEP R1.5"**

Revision level of the installed program (information display only)

---





## Start-up Procedure

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We recommend to strictly following this Start-up procedure to avoid any anomaly resulting from wrong cleaning of the components. In the case of a problem or discrepancy, see the Troubleshooting section.

1. Ensure that the mechanical, electric and plumbing connection are done and secured.
2. Ensure that the low voltage control circuit is done and correct.
3. Turn the water shutoff valve on (outside the humidifier) and check that the drain connections are connected to the main drain line with sufficient diameter.
4. Turn the power on to the humidifier from the circuit breaker disconnect switch. The POWER indicator should be on.
5. Press the front Rocker switch to the AUTO (I) position.

Perform a manual cleaning cycle.


- a. Press the Rocker switch to the drain down position . The humidifier initiates a drain cycle and empties the evaporation chamber.
  - b. Press the Rocker switch upward to the Auto (I) position . The humidifier fills the evaporation chamber with water. The Fill  light is illuminated.
  - c. Press the Rocker switch to drain down position  again to empty the chamber.
6. Your humidifier is now fully operational.

## Service


The humidifier requires a regular maintenance service to ensure efficient and trouble-free running. Regular service involves cleaning the evaporation chamber and its components manually. The frequency of cleaning can range from 2 months to once in a year. However, the cleaning frequency depends on the following specific factors:

- Quality of water
- Frequency of automatic drain cycles
- Demand placed on the humidifier

All SK300 humidifiers are programmed by default for 1000 hours of operation.

To view the number of hours the humidifier has run and the number of service hours, press the menu  button on the front panel several times till you view the information on the digital display.



At the end of 1000 hours of operation, the red LED  on the front panel starts blinking on off continuously. Though the humidifier continues to run, it is important to service the humidifier at the earliest.

## Clean the Evaporation Chamber

Cleaning the Evaporation Chamber involves the following steps:

**Stage 1 - Shut down electrical supply and disassemble the humidifier**





**Stage 2 - Remove and clean the evaporation chamber**

**Stage 3 - Reassemble the evaporation chamber**

**Stage 4 - Restart the humidifier**

### Pre-requisite for cleaning the Evaporation Chamber

Before you commence the cleaning procedure, ensure that the evaporation chamber is cool and comfortable to handle as the evaporation chamber and its contents can be extremely hot and can cause burning. If it is hot, allow the evaporation chamber to cool by initiating a drain cycle.


1. Press the Rocker switch to the drain down position . The humidifier initiates a drain cycle and empties the evaporation chamber.
2. Press the Rocker switch upward to the Auto (I) position . The humidifier fills the evaporation chamber with water. The Fill  light is illuminated.
3. Press the Rocker switch to drain down position  again to empty the chamber.

At the end of the drain cycle, check the temperature of the evaporation chamber. To check the temperature, open the front door of the humidifier and touch the chamber with the back of your hand. If it is cool enough to handle, shut down the electrical supply. If not, repeat the drain cycle till it is cool enough. If further drain cycle is not required, press the Rocker switch to OFF (O) position.

### Stage 1 - Shut down electrical supply and disassemble the humidifier

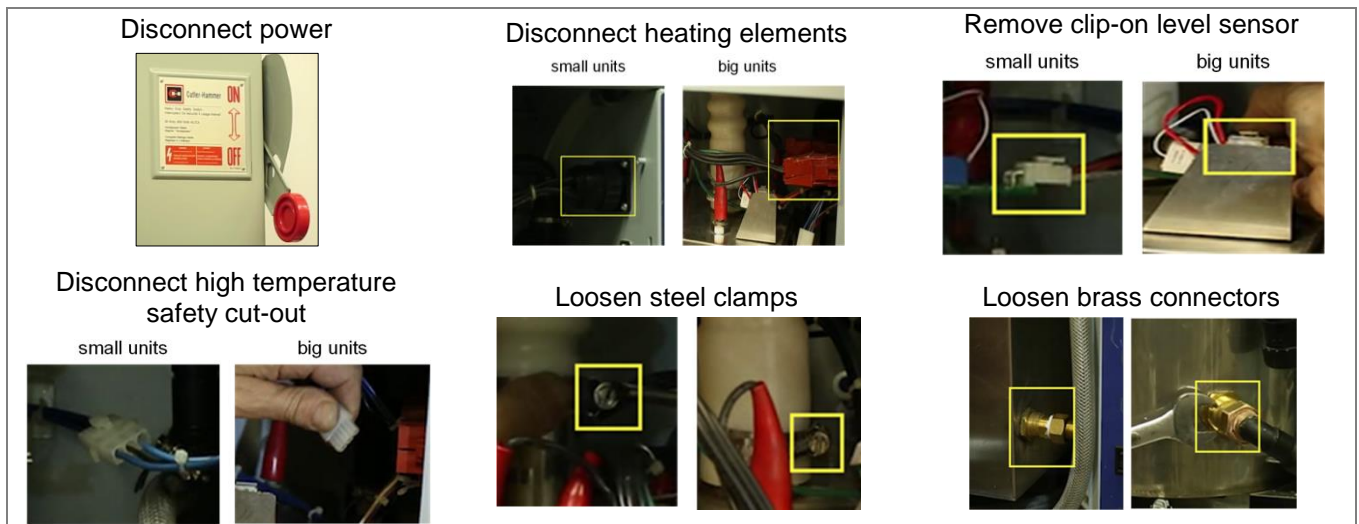


**Caution: Risk of electric shock. Shut down the electric supply of the humidifier. Disconnect the power at the External Breaker/Fused Disconnect before commencing servicing**

1. Press the Power  button on the control panel to switch off the humidifier.
2. Remove the power supply to the humidifier at the disconnect switch or the breaker.
3. Disconnect the power connector to the heating elements.

Model	Method
SK302 to 306	Unscrew the connector
SK310 to SK360	Squeeze the locking ears of the high voltage connector and pull it apart

4. Remove the clip-on level sensor board located on the chamber cover.
5. Disconnect the wire connector to the high-temperature safety cut-out .
6. Loosen the steel clamps that hold the steam hose in place with a 5/16" (8mm) nut driver or a standard screwdriver.
7. Loosen the compression brass connectors using an adjustable wrench and an 11/16" (17mm) key. Unscrew the brass nut and slide it back.



### Stage 2 - Remove and clean the evaporation chamber

1. Slide out the boiling chamber.



The evaporation chamber still contains few inches of water, tilt it slightly to ensure that you do not spill this water on yourself.

Ensure that your footing is secure when lifting the evaporation chamber. Evaporation chambers in large humidifiers such as SK340 and SK360 may weigh more than 35 lbs (15 kgs). Seek assistance from another person while removing the chamber.

2. Uncouple the clamp connectors.

Model	Method
SK302 to 306	Unlatch the three latches located around the evaporation chamber.
SK310 to SK360	Turn the four or eight latches located around the evaporation chamber.

3. Open the lid along with the elements inside.



The heating elements are self-cleaning. Any mineral accumulation breaks off and falls to the bottom during operation.



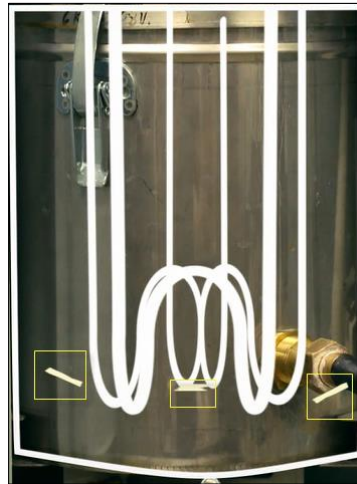


Illustration 35 - Metal deposit dislodge during operation

- Remove the residue that has accumulated inside the chamber.
- To clean out the remaining scale from the container, use a stiff brush (synthetic filament only) and some vinegar or any weak acid suitable for cleaning stainless steel.



**WARNING: The use of a wire brush or any non-recommended acid will void the warranty.**

- The components installed on the cover (heating elements and water level sensor) and the cover itself should be cleaned as necessary, only if some scale has been accumulated on them.
  - Do not scrape off the walls of the chamber.
  - Ensure that the fill drain aperture is not blocked.
4. Check the gasket and ensure that it is in good shape. Replace the gasket if it is dry, torn or hardened.
  5. Replace the lid back on the chamber.



### Water Level Sensor

The water level sensor is encased in a chamber that protects the sensor.

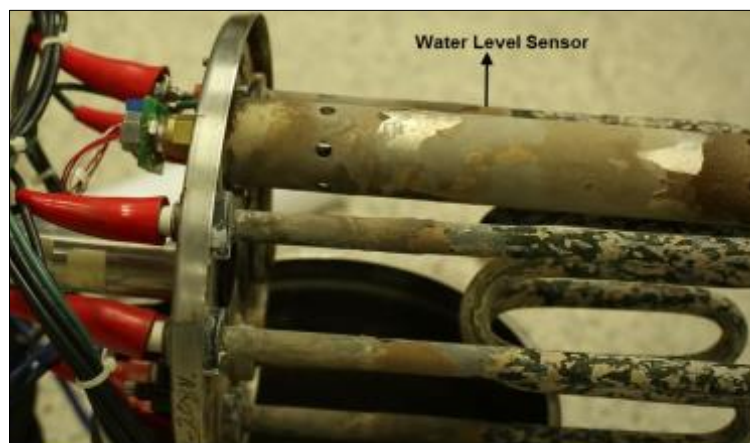


Illustration 36 - Water Level Sensor





To clean the sensor, perform the following steps:

1. Remove the chamber from the unit by unscrewing the two screws that hold the chamber. These screws are located on the chamber itself.
2. Remove the chamber carefully without touching or damaging the water level sensor.
3. Clean the sensor using a soft cloth.



The water level sensor is covered by a thin layer of Teflon. Any scratch or damage to this layer results in non-functioning of the humidifier.

4. Clean the protection chamber in the same way as the evaporation chamber.
5. Reattach the chamber to the cover by tightening the screws on top of the cover.

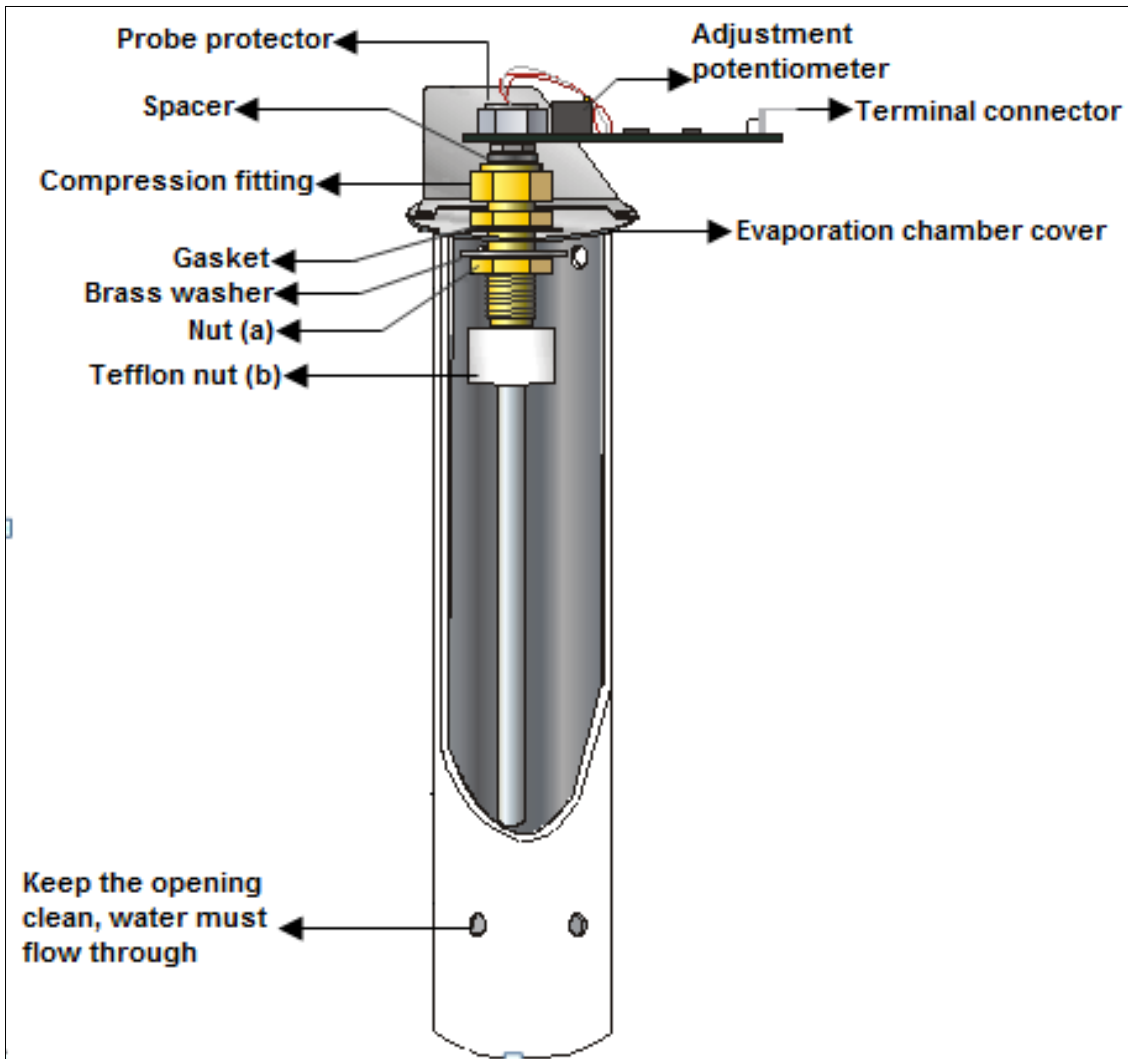


Illustration 37 - Water Level Sensor and Protection Chamber

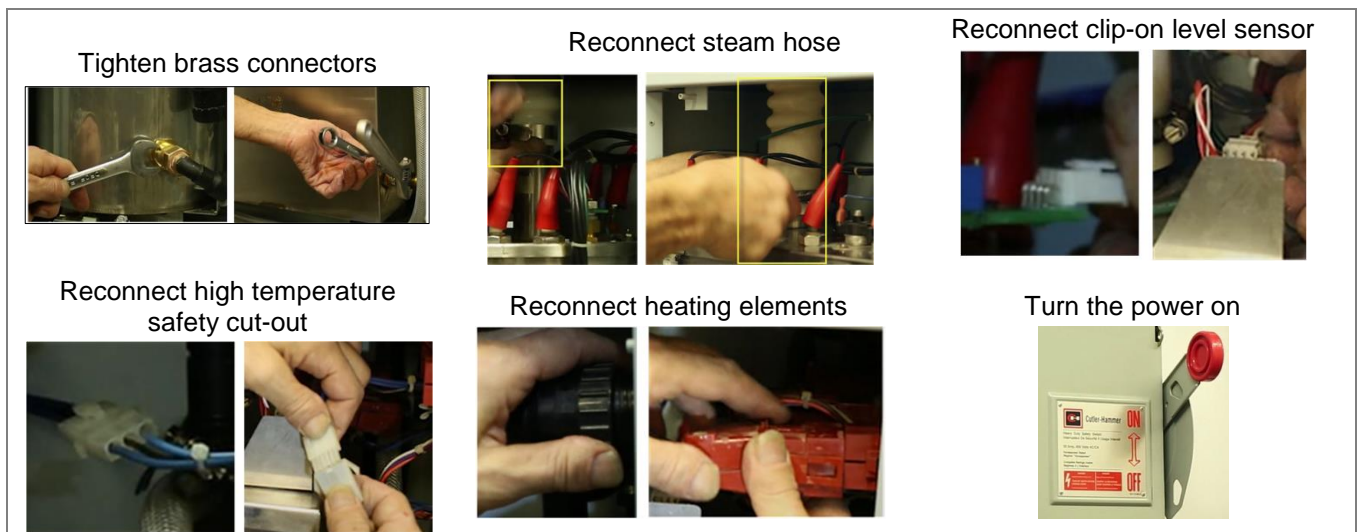
### Stage 3 - Reassemble the humidifier

1. Mount the boiling chamber back into the unit.
2. Tighten the compression brass connectors.
3. Reconnect the steam hose.
4. Reconnect the clip-on level sensor.






Reconnect the clip-on level sensor only when the power is disconnected. If, for any reason, you did not connect the level sensor during the reassembling, ensure to disconnect the power first, and then reconnect.

5. Reconnect the high-temperature safety cut-out wire.
6. Reconnect the heating elements.
7. Turn the power back on at the disconnect switch or the breaker



### Stage 4 - Restart and reset the humidifier

1. Power up the humidifier. The  light is illuminated.
2. Press the  button to enter the Programming mode and reset the Running hours.
3. Set the front panel Rocker switch to AUTO. The humidifier initiates a fill cycle, the  indicator is illuminated. The humidifier starts producing steam as soon as there is a demand.



# Exploded View and Bill of Material

## Exploded View

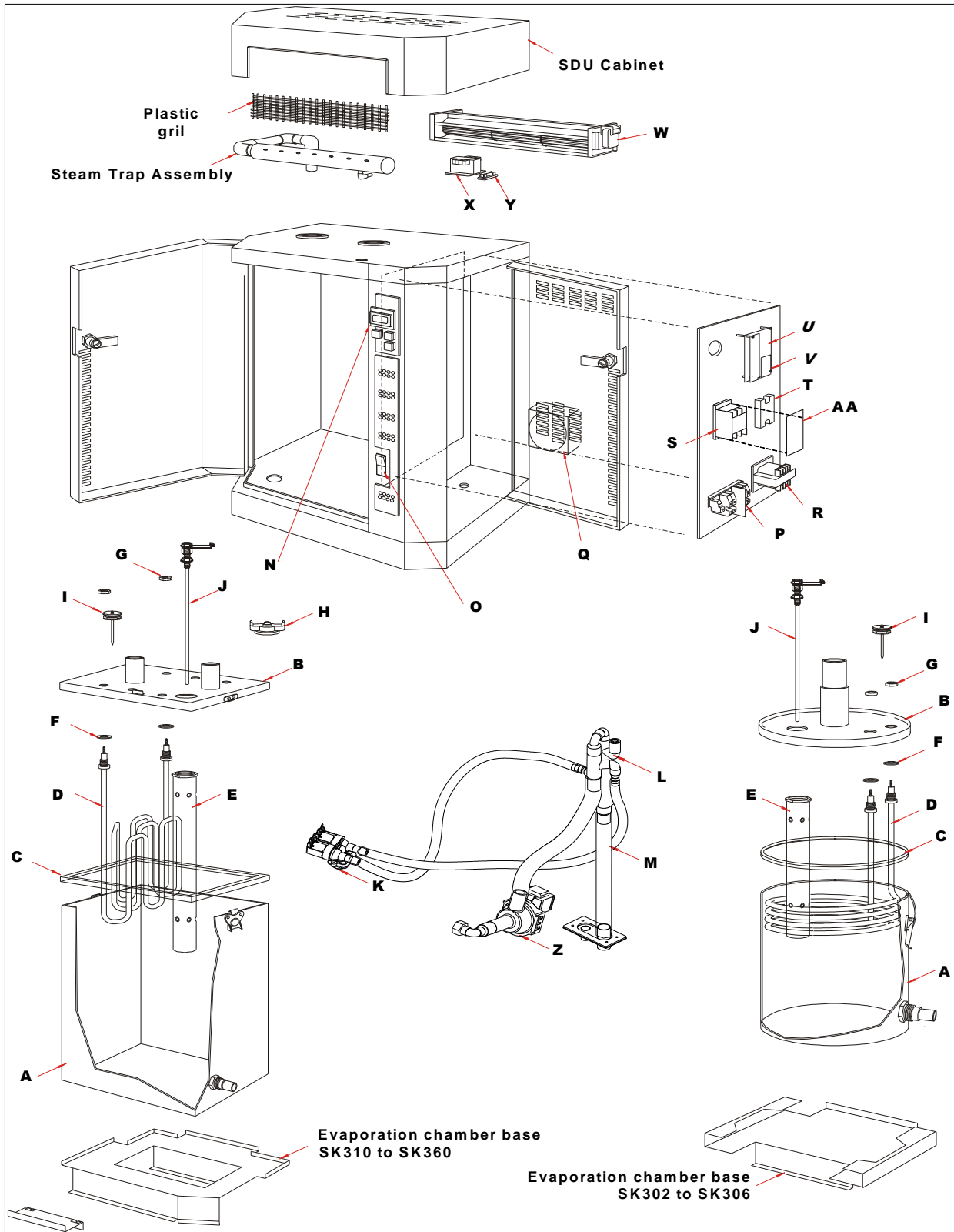


Illustration 38 - Exploded View of Humidifier

## Bill of Material

Table 10 - Model Description and Part Numbers

Item	Description	Model	Part number
A	Container of evaporation chamber	SK302 to 306	SW CONTSMA-ASSY
		SK310 to SK330	SW CONTMED-ASSY
		SK320 L, SK340 to SK360	SW CONTLAR-ASSY
B	Cover of evaporation chamber	SK302 to 306 (1 phase)	SP 4018-M
		SK304 to 306 (3 phases)	SP 4019-M
		SK310 & SK314	SP 4183A
		SK316 to SK330	SP 4183B
		SK320 L & SK340	SP 4186
		SK360	SP 4185A
C	Evaporation chamber gasket	SK302 to 306	SP 1008
		SK310 to SK330	SP 1021
		SK320 L, SK340 to SK360	SP 1022
D	Heater element	See Table 11 - Model, Heater Element, Transformer, and Voltage Description	
E	Level sensor chamber	SK302 to 306	SP 4196-M
		SK310/314/316/320/320 L/340	SP 4197-M
		SK330/350/360	SP 4198-M
F	Washer (elements)	SK302 to SK360	SP 1005
G	S/S hex. Jam nut (elements)	SK302 to SK360	SP 2330
H	High temperature switch (klixon)	SK302 to SK360	SP 3035
I	Foam sensor	SK302 to 306	SW FOAMSM-ASSY
		SK310/314/316/320/320 L/340	SW FOAMMED-ASSY
		SK330/350/360	SW FOAMLG-ASSY
J	Water level sensor	SK302 to 306	SW SK3BPROBSMAR1
		SK310/314/316/320/320 L/340	SW SK3BPROBMEDR1
		SK330/350/360	SW SK3BPROBMEDR1
K	Water supply valve	SK302 to SK360	SP 6007
L	Fill and drain trap assembly	SK302 to 306	SW TRAPSMA-P
		SK310 to SK330	SW TRAPMED-P
		SK340 & SK360	SW TRAPLAR-P
M	Silicone tubing 1/2"	SK302 to SK360	SP 1023A
	Silicone tubing 3/4"		SP 1023B
	PCV tubing 1/2"		SP 1027
N	Alphanumeric display	SK302 to SK360	NW SK300BDISPSS
O	"AUTO/OFF/DRAIN" Rocker switch	SK302 to SK360	SW SKSWITCH-ASSY
P	Terminal block and high voltage connectors	SK302 to SK360	-
Q	Cooling fan	SK302 to SK360	SP 3007
R	Transformer	Refer to Table 11 - Model, Heater Element, Transformer, and Voltage Description	
S	Contactator	Refer to Table 11 - Model, Heater Element, Transformer, and Voltage Description	
T	Solid State Relay	50 A	SP 3102
		90 A	SP 3103
		125 A	SP 3105
U	Main Printed Circuit Board	SK302 to SK360	NW SK300BMAIN-TES
V	BACnet Interface Printed Circuit Board	SK302 to SK360	NW SK300BBACNETSS
W	SDU fan	SDU I	SW FANSDU1-RET
		SDU II	SW FANSDU2-RET



Item	Description	Model	Part number
		SDU III	SP 3010
X	Transformer	Refer to Table 11 - Model, Heater Element, Transformer, and Voltage Description	
Y	Fuse inside SDU	SDU I and SDU 2	SP 5105
		SDU 3	SP 5106
Z	Drain pump	SK302 to SK360	SP G4101


Table 11 - Model, Heater Element, Transformer, and Voltage Description

Model	Voltage	D Heater element	R Transformer	S Contactor	X SDU Transformer
SK302	120V/1~	SW 5943	SP 3380	SP 3029	-
	240V/1~	SW 5932	SP 3310	SP 3029	SP 3312
	208V/1~	SW 5933	SP 3308	SP 3029	SP 3305
	480V/1~	SW 5934	SP 3321	SP 3029	SP 3329
	600V/1~	SW 5935	SP 3341	SP 3029	SP 3349
SK304	240V/1~	SW 5937	SP 3310	SP 3029	SP 3312
	208V/1~	SW 5940	SP3308	SP 3029	SP 3305
	208V/3~	SW 5924	SP3308	SP 3080	SP 3305
	480V/1~	SW 5941	SP 3321	SP 3029	SP 3329
	480V/3~	SW 5923	SP 3321	SP 3080	SP 3329
	600V/1~	SW 5942	SP 3341	SP 3029	SP 3349
	600V/3~	SW 5925	SP 3341	SP 3080	SP 3349
SK306	240V/1~	SW 5938	SP 3310	SP 3029	SP 3312
	208V/1~	SW 5943	SP3308	SP 3029	SP 3305
	208V/3~	SW 5933	SP3308	SP 3080	SP 3305
	480V/1~	SW 5944	SP 3321	SP 3029	SP 3329
	480V/3~	SW 5934	SP 3321	SP 3080	SP 3329
	600V/1~	SW 5945	SP 3341	SP 3029	SP 3349
	600V/3~	SW 5935	SP 3341	SP 3080	SP 3349
SK310	208V/3~	SW 5959	SP 3308	SP 3100	SP 3305
	480V/3~	SW 5958	SP 3321	SP 3080	SP 3329
	600V/3~	SW 5957	SP 3341	SP 3080	SP 3349
SK314	208V/3~	SW 5946	SP 3308	SP 3084	SP 3305
	480V/3~	SW 5947	SP 3321	SP 3080	SP 3329
	600V/3~	SW 5948	SP 3341	SP 3080	SP 3349
SK316	208V/3~	SW 5960	SP 3308	SP 3084	SP 3351
	600V/3~	SW 5958	SP 3341	SP 3100	SP 3351
SK320	480V/3~	SW 5950	SP 3321	SP 3100	SP 3352
	600V/3~	SW 5951	SP 3341	SP 3100	SP 3353
SK330	480V/3~	SW 5952	SP 3321	SP 3100	SP 3352
	600V/3~	SW 5939	SP 3341	SP 3100	SP 3353
SK320 L	208V/3~	SW 5959	SP 3381	SP 3084 (2x)	-
SK340	208V/3~	*	*	*	-
	480V/3~	SW 5950	SP 3321	SP 3100 (2x)	-
	600V/3~	SW 5951	SP 3341	SP 3100 (2x)	-
SK350	480V/3~	SW 5950 SW 5952	SP 3321	SP 3100 (2x)	-
	600V/3~	SW 5951 SW 5939	SP 3341	SP 3100 (2x)	-
SK360	480V/3~	SW 5952	SP 3321	SP 3100 (2x)	-
	600V/3~	SW 5939	SP 3341	SP 3100 (2x)	-

\* Available, please consult factory.

# Troubleshooting

## Humidifier does not operate (Power Off)

Indicator	Status	Display (blank)
Power	OFF	
Check	OFF	
Fill	OFF	
Steam	OFF	
Drain	OFF	


### Cause

- The humidifier is not powered.
- Wires harnesses inside the humidifier are not secured properly.

### Corrective Action

- Check for the main power supply and fuses.
- Check the transformer and the low voltage fuse.
- Check the high-temperature switch, the wire harnesses, and the main PC board.

## Humidifier does not operate (Power On)

Indicator	Status	Display
Power	BLINK	
Check	OFF	
Fill	OFF	
Steam	OFF	
Drain	OFF	


### Cause

- The Rocker switch is at the OFF position.
- Wire harness from the LED display panel to the main PC board is not secured properly.

### Corrective Action

- Press the Rocker switch to the AUTO position.
- Check the white color wire harness.
- Press the RESET button on the main PC board.

## Humidifier does not produce steam (No Demand)

Indicator	Status	Display
Power	ON	
Check	OFF	
Fill	OFF	
Steam	OFF	
Drain	OFF	


### Cause

- Modulating humidifier: no analog signal.
- On/Off humidifier: no demand from the humidistat .
- Control wires are not properly secured to the terminal blocks.

### Corrective Action

- Verify the setting of the humidistat.
- Verify the connections of the wires to the control terminal blocks.

### Humidifier does not produce steam

Indicator	Status	Display
Power	ON	
Check	OFF	
Fill	OFF	
Steam	OFF	
Drain	OFF	


**Cause**

- Air flow is not detected by the air pressure switch .
- Control wires are not properly secured to the terminal blocks.

**Corrective Action**

- Check the fan operation.
- Verify the wires to the control terminal blocks #1 & 2.

### Humidifier does not produce steam

Indicator	Status	Display
Power	ON	
Check	ON	
Fill	OFF	
Steam	OFF	
Drain	OFF	


**Cause**

- High limit humidistat is open.
- Control wires are not properly secured to the terminal blocks.

**Corrective Action**

- Check the operation of the high limit humidistat.
- Verify the wires to the control terminal blocks #1 & 2.

### No water inside the evaporation chamber or Humidifier does not stop draining

Indicator	Status	Display
Power	ON	
Check	ON	
Fill	ON	
Steam	OFF	
Drain	OFF	

**Cause**


- The humidifier is filling water but has not reached yet or does not reach the high limit of the water level sensor.
- The humidifier is not filling water.

**Corrective Action**

- Verify if the drain valve is open.
- Check if the shutoff valve on the water supply line is open.
- Verify the operation of the fill valve.
- Check that the fill valve strainer and the external strainer are not blocked.



### Humidifier is always on Foam cycle

Indicator	Status	Display
Power	ON	
Check	ON	
Fill	ON	
Steam	OFF	
Drain	ON	

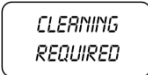
#### Cause

- Excessive foaming condition inside the evaporation chamber.
- Foaming sensor is grounded.

#### Corrective Action

- Verify the quality of the supply water.
- Verify if chemical products were used to clean the evaporation chamber during maintenance. Rinse the chamber properly with water.
- Check the setting of the Drain cycle. Reduce the time between Drain cycles.

### Humidifier is operating and the CHECK light is flashing

Indicator	Status	Display
Power	ON	
Check	BLINK	
Fill	OFF	
Steam	ON	
Drain	OFF	


#### Cause

- The running hours have exceeded the Service hours.

#### Corrective Action

- Service the evaporation chamber, see Service section.
- Reset the Running hours to cancel the blinking of the CHECK light.

### Humidifier is not operating and the CHECK light is ON

Indicator	Status	Display
Power	ON	
Check	ON	
Fill	OFF	
Steam	OFF	
Drain	OFF	

#### Cause

- The electronic temperature sensor inside the water level sensor had sensed abnormal temperature.

#### Corrective Action

- Verify if the humidifier was operating below the standard water level and then replace the water level sensor, item J.



### Humidifier is not operating and the CHECK light is ON

Indicator	Status	Display
Power	ON	<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: auto;">           PROBE DEFECTED         </div>
Check	ON	
Fill	OFF	
Steam	OFF	
Drain	OFF	

**Cause**

- The water level sensor is damaged.

**Corrective Action**

- Replace the water level sensor, item J.

### Humidifier does not drain and the CHECK light is ON

Indicator	Status	Display
Power	ON	<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: auto;">           DRN/PROB BLOCK         </div>
Check	ON	
Fill	OFF	
Steam	OFF	
Drain	OFF	

**Cause**

- During a Drain or Foaming cycle, the water level sensor has sensed that the water level has not decreased.

**Corrective Action**

- Verify that the drain pump, the fill and drain water pipe connection, the water level sensor chamber are not obstructed.

### Humidifier does not operate and the CHECK light is ON

Indicator	Status	Display
Power	ON	<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: auto;">           KLIXON OPEN         </div>
Check	ON	
Fill	OFF	
Steam	OFF	
Drain	OFF	

**Cause**

- The high-temperature switch has detected abnormal temperature.

**Corrective Action**

- Verify if the humidifier was operating below the standard water level.
- Replace item J water level sensor, if necessary.
- Press the manual reset to close the Klixon.

### Humidifier does not operate and the CHECK light is ON

Indicator	Status	Display
Power	ON	<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: auto;">           PCB FUSE OPEN         </div>
Check	ON	
Fill	OFF	
Steam	OFF	
Drain	OFF	

**Cause**

- The internal 24vac of the humidifier is shorted.

**Corrective Action**

- Verify the internal wiring and connections.
- Replace the fuse.

### Humidifier does not operate and the CHECK light is ON

Indicator	Status	Display
Power	ON	<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: auto;">           24 VAC SHORTED         </div>
Check	ON	
Fill	OFF	
Steam	OFF	
Drain	OFF	

**Cause**

- The external 24Vac provided to the humidifier is shorted.

**Corrective Action**

- Check the external wiring.

### Humidifier does not operate and the CHECK light is ON

Indicator	Status	Display
Power	ON	<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: auto;">           24 VAC SHORTED         </div>
Check	ON	
Fill	OFF	
Steam	OFF	
Drain	OFF	

**Cause**

- The water level sensor or the cooling fan is shorted.

**Corrective Action**

- Verify the connection of water level sensor and cooling fan.
- Replace the water level sensor (item J) or the cooling fan (item Q), if necessary.

### Humidifier does not operate and the CHECK light is ON

Indicator	Status	Display
Power	ON	<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: auto;">           REFILL TIMEOUT         </div>
Check	ON	
Fill	OFF	
Steam	OFF	
Drain	OFF	

**Cause**

- Time lapse between two refills is too long when the humidifier is producing steam.

**Corrective Action**

- Verify the water level sensor and water level chamber and clean, if necessary.
- Reset the Alarm. See Alarms.

### Humidifier does not operate and the CHECK light is ON

Indicator	Status	Display
Power	ON	<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: auto;">           WTR TMP DEFECTED         </div>
Check	ON	
Fill	OFF	
Steam	OFF	
Drain	OFF	

**Cause**

- Water temperature is defective.

**Corrective Action**

- Verify the connection the to water level sensor.
- Replace the water level sensor item J, if necessary.

### Humidifier does not operate and the CHECK light is ON

Indicator	Status	Display
Power	ON	<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: auto;">           SSR OVER HEATED         </div>
Check	ON	
Fill	OFF	
Steam	OFF	
Drain	OFF	

**Cause**

- The temperature on the SSR is too high.

**Corrective Action**

- Verify the cooling fan is operational and the air vents are free of dirt.
- Replace the cooling fan (item Q), if necessary.

### Humidifier does not produce steam

Indicator	Status	Display
Power	ON	<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: auto;">           INTERLOCK OPEN         </div>
Check	OFF	
Fill	OFF	
Steam	OFF	
Drain	OFF	

**Cause**

- The interlock contact is open.

**Corrective Action**

- Check the interlock switch.
- Verify the wires to the control terminal blocks #F & 5.



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