

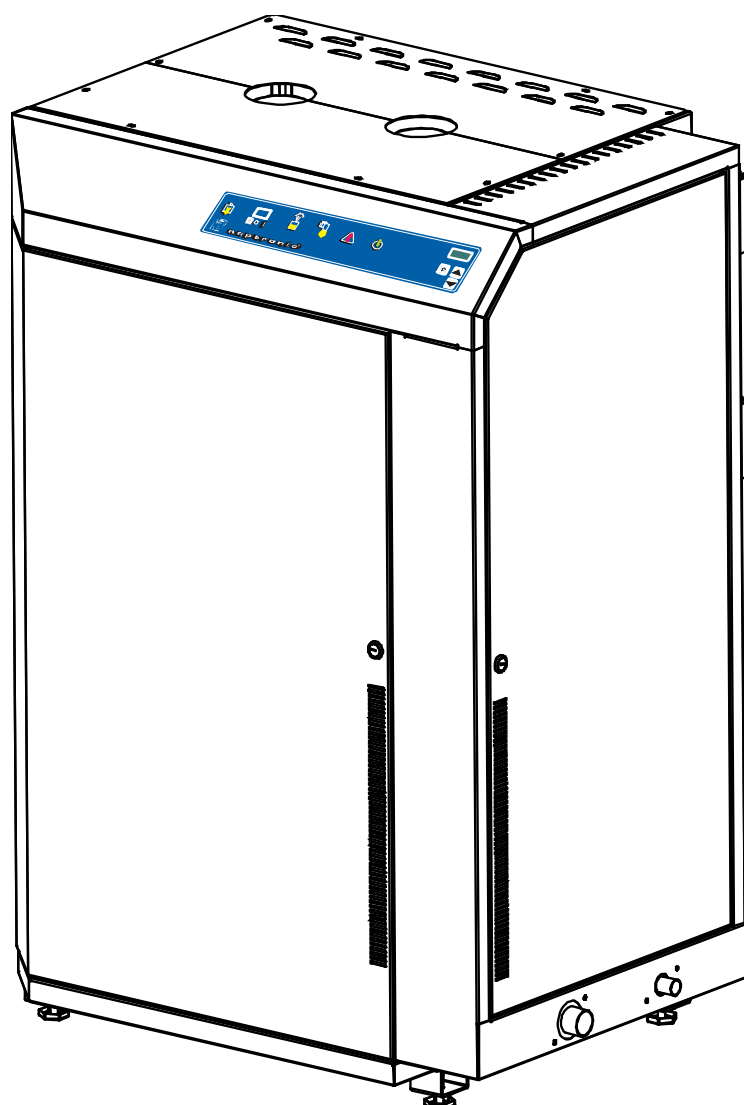


**neptronic®**

# **Electric Steam Humidifier SKE90/100/110/120 Series SKE-XL BACnet**

## **INSTALLATION INSTRUCTIONS**

CE



**Read and save these instructions**

**ELECTRICITY**

All work concerned with electrical installation **MUST** only be performed by skilled and qualified technical personnel (e.g. electrician or 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.

**HEALTH & SAFETY**

Neptronic® has considered aspects of the design of their humidification systems to reduce as far as possible the risk of Legionnaires' disease and other similar conditions but it is important that users are also aware of their responsibilities.

To prevent the growth of Legionella, users are required to:

- Avoid water temperature that favors the growth of Legionella 20-45°C.
- Avoid water stagnation.
- Clean and disinfect the humidification system.
- Have a competent person carry out a risk assessment of the water system supplying the humidifier to ensure the water supply is of an acceptable quality

**CORRECT USE**

Neptronic® systems and products are designed only for humidification use.

Any other application is not considered use for the intended purpose. The manufacturer cannot be made liable for any damage resulting from incorrect use.

**ACCESS**

**NEVER LEAVE SKE-XL CABINET KEYS IN THE DOORS AS UNAUTHORIZED ACCESS TO LIVE ELECTRICAL PARTS MAY BE GAINED – ALWAYS STORE KEYS CENTRALLY WITH NOMINATED RESPONSIBLE PERSON.**

**WATER**

Neptronic® systems are designed to be used with mains, reverse osmosis, demineralized or partially softened water. On no account attempt to introduce any other fluid or chemical into the system without first consulting Neptronic® or its authorized distributor.

Water supply must not exceed the max pressure of 480 kPa, or pressure limits laid out in the Specification and Installation Instructions, and must comply with local regulations.

## 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 SKE-XL 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 applicable European safety and electromagnetic compatibility standards and directives and bear the CE mark. The certificate of conformity CE is available upon request to the manufacturer.

2018©: All rights reserved. This document cannot be reproduced totally or partially by any means whether, electronic, mechanical, photocopy, recording or other, without prior written authorization of Neptronic.

### ***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>.

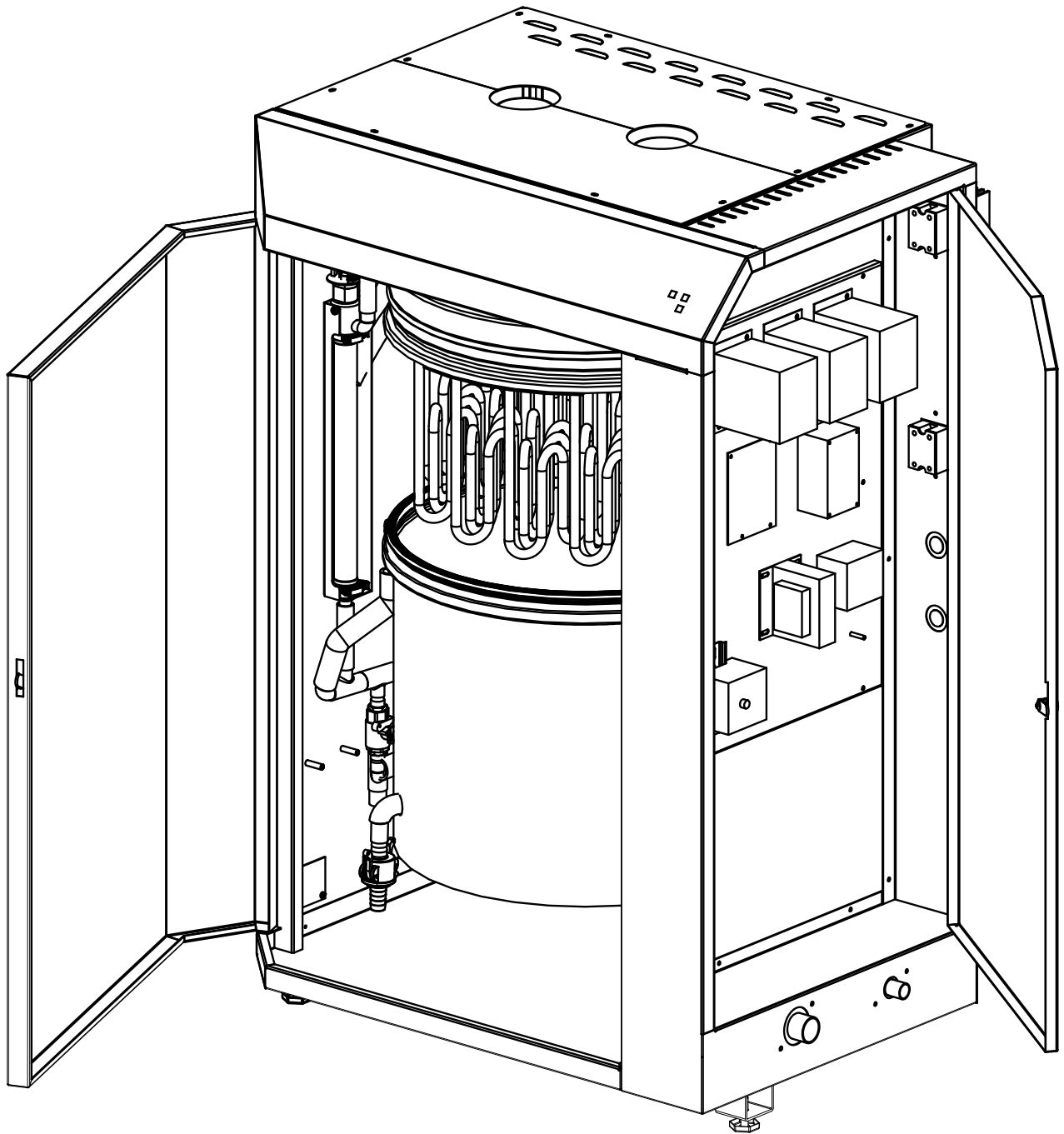
## Table of Content

---

<b>Safety .....</b>	<b>1</b>
<b>Foreword .....</b>	<b>2</b>
<b>Table of Content.....</b>	<b>3</b>
<b>Technical Specifications .....</b>	<b>4</b>
<b>Dimensions &amp; Weights .....</b>	<b>5</b>
<b>Handling &amp; Unpacking.....</b>	<b>7</b>
<b>Installation Overview .....</b>	<b>8</b>
<b>Stage 1 – Unit Positioning and Mounting.....</b>	<b>9</b>
<b>Stage 2 – Steam Distribution Installation .....</b>	<b>10</b>
<b>Stage 3 – Water Supply Installation.....</b>	<b>13</b>
<b>Stage 4 – Water Drain Connection.....</b>	<b>14</b>
<b>Stage 5 – Electrical Supply and Installation.....</b>	<b>15</b>
<b>Stage 6 – Electrical Control Connections .....</b>	<b>16</b>
<b>BACnet Interface Set-up.....</b>	<b>20</b>
<b>Initial Verification &amp; Start-up .....</b>	<b>21</b>
<b>Commissioning – Operation Description .....</b>	<b>22</b>
<b>Operation Display .....</b>	<b>23</b>
<b>List of Alarms .....</b>	<b>23</b>
<b>Programming Mode .....</b>	<b>25</b>
<b>User Adjustment &amp; Diagnostic Menu.....</b>	<b>26</b>
<b>Wiring Diagram .....</b>	<b>27</b>
<b>Exploded View.....</b>	<b>28</b>
<b>Bill of Material .....</b>	<b>29</b>



## Technical Specifications

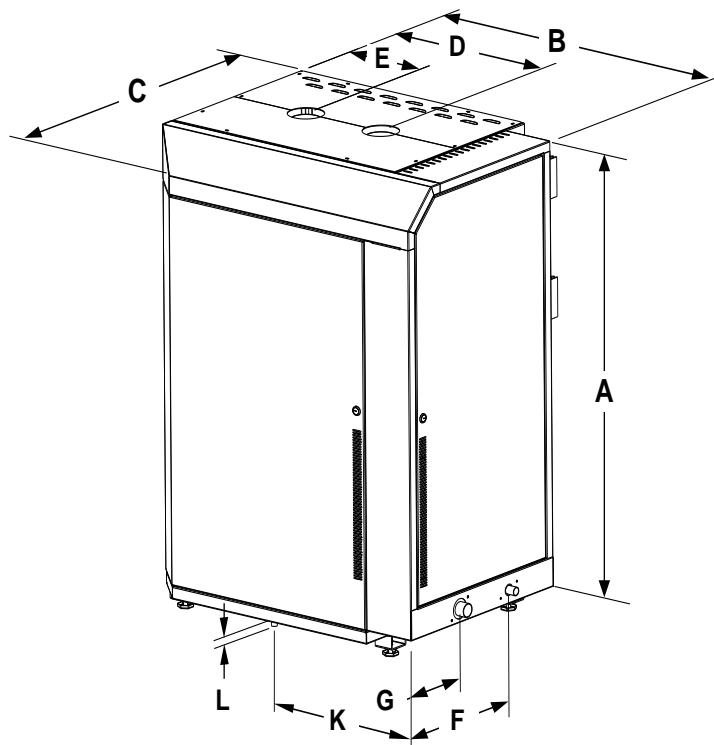


3D opened view  
(Illus. 1)

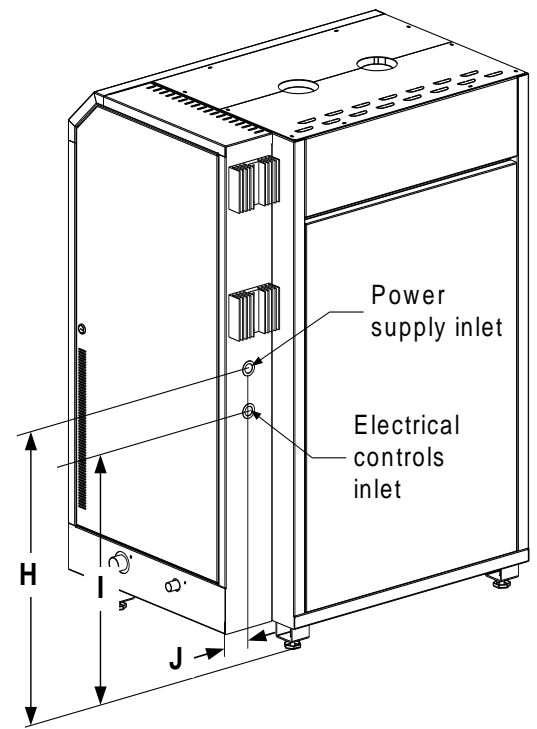
Model	Steam cap. [kg/h]	Power (kW)	Current (A)	Nb of outlets	Multi-Steam header diam. [mm]
			400V / 3ph		
<b>SKE90</b>	90	66	96	1	Ø76 mm
<b>SKE100</b>	100	74	107	1	Ø76 mm
<b>SKE110</b>	110	82	119	2	Ø76 mm
<b>SKE120</b>	120	90	130	2	Ø76 mm

**Notes:** Maximum static duct pressure is 1.25 kPa. For higher static duct pressures please consult Neptronic® or its authorized distributor.

## Dimensions & Weights



Front view  
(Illus. 2a)



Back view  
(Illus. 2b)

### General Dimension & Weight

Model	Dimensions in mm			Weight in kg	
	A	B	C	Empty	Full of water
SKE90 SKE100 SKE110 SKE120	1221	838	635	145	200

### Water Inlet, Steam and Main Drain Outlets Dimensions

Model	No of Steam Outlets	Dimensions in mm						
		Steam Outlet Diam.	D	E	Drain Outlet Diam	Water Inlet Diam	F	G
SKE90 SKE100	1	Ø76	462	n/a	Ø20	Ø15	383	190
SKE110 SKE120	2	Ø76	462	230	Ø20	Ø15	383	190

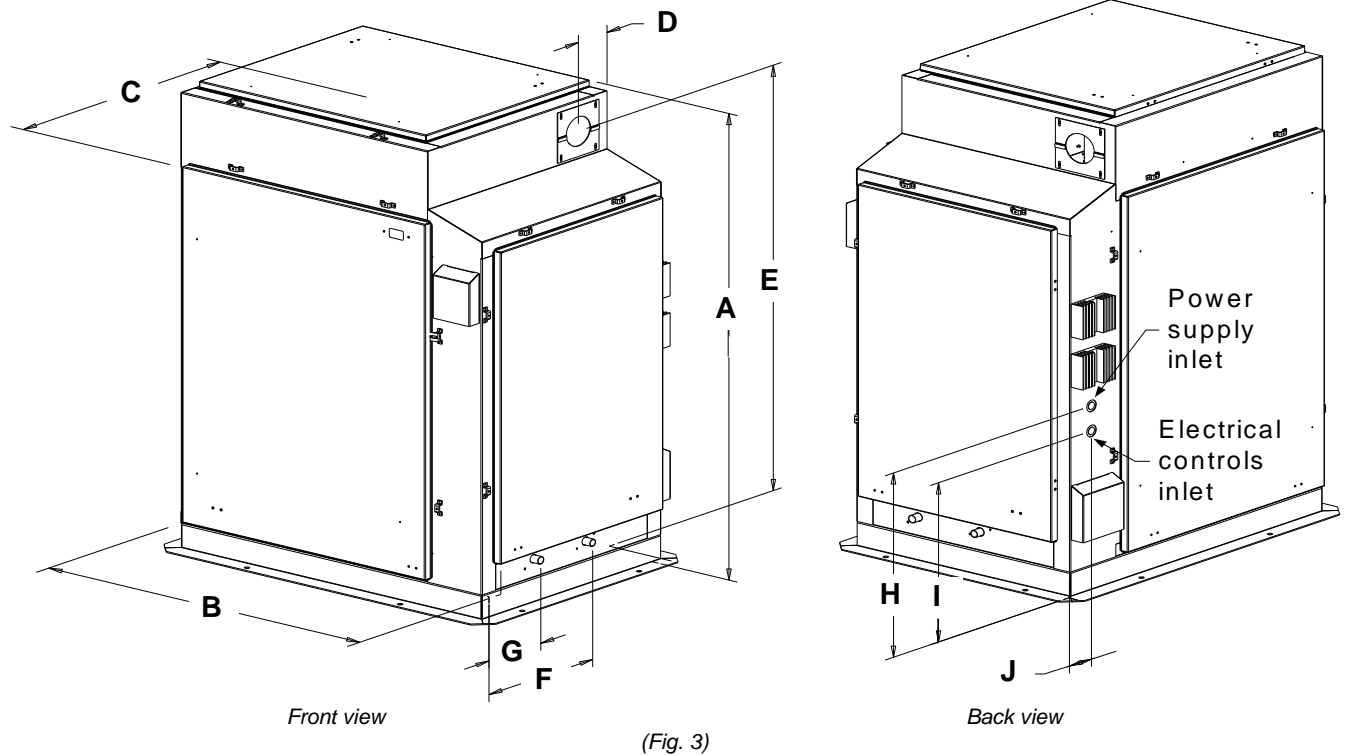
Note: Drain outlet and water supply inlet are located on the right hand side of the humidifier. Left hand side location of any of is available upon request.

### Electrical Inlets and Pan Drain Outlet Dimensions

Model	Dimensions in mm						
	Electrical KO Diam.	H	I	J	Pan Drain Outlet Diam.	K	L
SKE90 SKE100 SKE110 SKE120	Ø22 & 35	670	569	55	Ø15	488	25

## Dimensions & Weights

### Option: Weather Proof Enclosure General Dimensions And Weights



#### General Dimension & Weight

Model	Dimensions in mm			Weight in kg	
	A	B	C	Empty	Full of water
SKE90 SKE100 SKE110 SKE120	1417	965	727	184	240

#### Water Inlet, Steam and Main Drain Outlets Dimensions

Model	No of Steam Outlets	Dimensions in mm						
		Steam Outlet Diam.	D	E	Drain Outlet Diam	Water Inlet Diam	F	G
SKE90 SKE100	1	Ø76	109	1291	20	Ø15 NPT	383	190
SKE110 SKE120	1	Ø100	109	1291	20	Ø15 NPT	383	190

Note: Steam outlet, drain outlet and water supply inlet are located on the right hand side of the humidifier  
 Left hand side location of any of is available upon request.

#### Electrical Inlets and Pan Drain Outlet Dimensions

Model	Dimensions in mm			
	Electrical KO Diam.	H	I	J
SKE90 SKE100 SKE110 SKE120	Ø22 & 35	560	483	78

## Handling & Unpacking



### ***Handling and Lifting***

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

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

Refer to Dimensions & Weight section for system dry weights.

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

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

Lifting sling angle must be greater than 30° to the horizontal.

### ***Unpacking***

SKE-XL Steam Humidifier is shipped on a wooden crate.

Remove packing wooden crate and skids prior to installation.

### ***List Of Accessories Supplied***

#### ***Standard enclosure***

- 2 sets of keys.
- 2 adjustable steam hose collars per steam outlet.
- The present *Installation Instructions and User Manual*.
- *Wiring diagram* affixed onto the interior of the electrical compartment door.



## Installation Overview



All installation work must comply with local regulations.

All work related to the installation of the SKE-XL Steam Humidifier **MUST** only be performed by skilled and qualified technical personnel (e.g. qualified gas installer, fitters, electricians, plumbers or technicians with appropriate training).

The customer is responsible for ensuring their suitability.

To install the SKE-XL Steam Humidifier and its associated components, no special tooling is required above that of a fitter's toolkit.

### **Installation Method Statement**

Stage1: Unit Positioning and Mounting

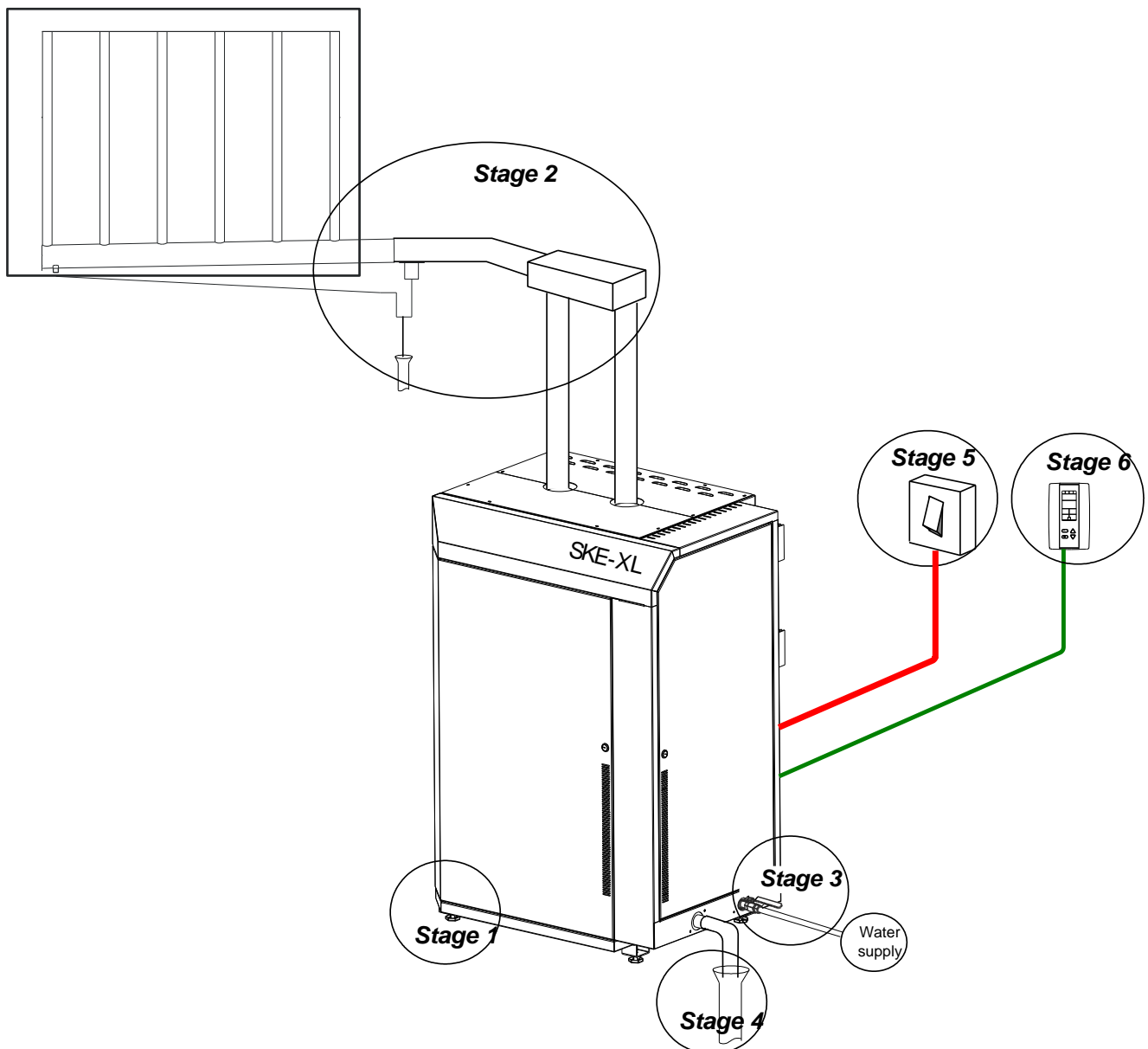
Stage 2: Steam Distribution Installation

Stage 3: Water Supply Installation

Stage 4: Water Drain Connection

Stage 5: Electrical Supply and Installation

Stage 6: Electrical Control Connections



(Illus. 4)

## Stage 1 – Unit Positioning and Mounting

### General Considerations



Any installation work MUST be carried out by suitably qualified personnel.

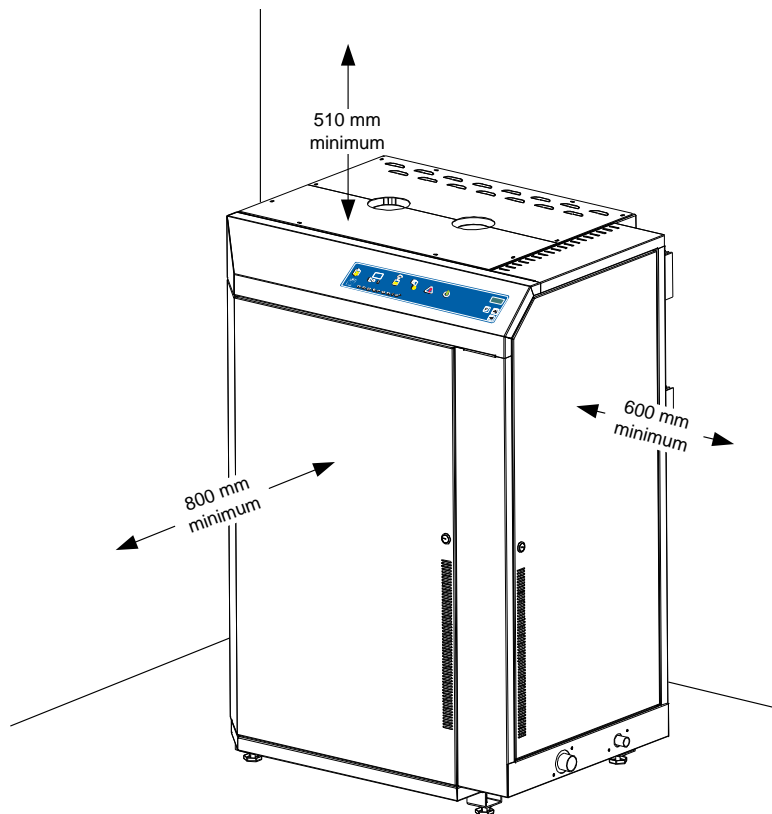
The following considerations must be taken into account before deciding on the location for the SKE-XL Steam Humidifier:

- Plan a location easy to access in order to permit an easy inspection and servicing of the humidifier.
- Do not install humidifier where failure of the appliance could cause damage to the building structure or to costly equipment.
- Location area must be well ventilated, ambient temperature must not exceed 30°C.

### Positioning the Humidifier

The humidifier must be installed to ensure the steam hose length is kept to the shortest possible length.

- For flexible steam hose: the total steam line length must not exceed 5 meters. For longer distances use insulated hard piping.
- For insulated hard piping: the total steam line length must not exceed 15 meters. For longer steam line runs, consult factory.
- Observe the minimum access distances as shown in Illustration 5.



(Illus. 5) Standard enclosure

### Minimum Clearances

Minimum clearances are :

- Top: 510mm minimum
- Electrical panel side: 600mm minimum
- Front: 800mm minimum

The humidifier is designed to be installed directly on the floor.

Provide a level, solid foundation for the humidifier.

Ensure that the floor beneath the humidifier is water proof to withstand any water spillage during servicing or if a problem occurs.

The humidifier is provided with adjustable legs in order to ensure proper level.



## Stage 2 – Steam Distribution Installation

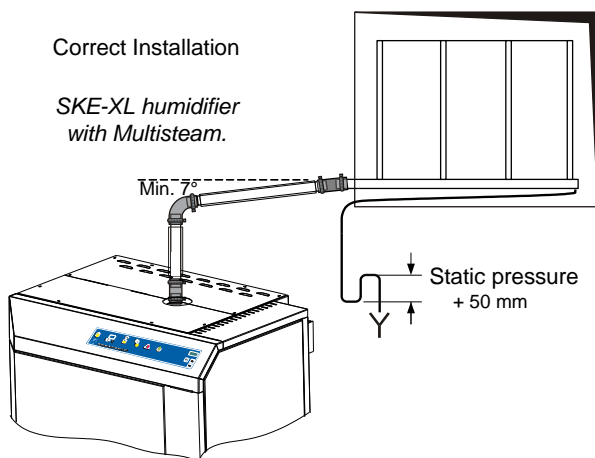
### Fundamental Design Concepts



1. Maximum steam velocity in a pipe must not exceed 12m/s velocity. Velocities above this will generate noise.
2. Minimum steam pipe gradient must be 125mm rise in 1m run.
3. The lowest point of any steam hose or rigid pipe must be the humidifier. A steam separator (S trap) must be installed higher than the static pressure of the system by at least 50mm.
4. Total length of the flexible steam hose must not exceed 5 m or insulated rigid piping must not exceed 15 m.
5. Whenever possible use rigid copper piping, flexible steam hose can be used for short runs or for interconnecting between rigid pipe runs, ensure that there is no kink in the flexible hose.  
When using rigid copper pipe, insulation must be used to diminish condensation build up.

Correct Installation

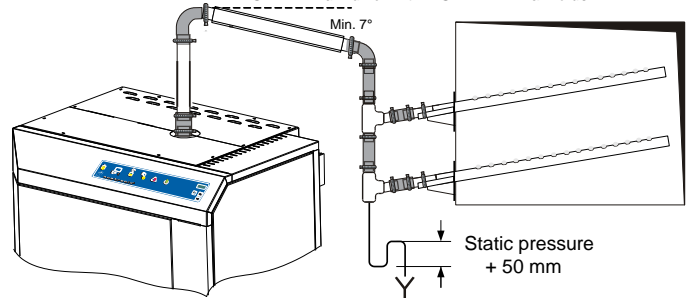
*SKE-XL humidifier with Multisteam.*



(Illus. 6)

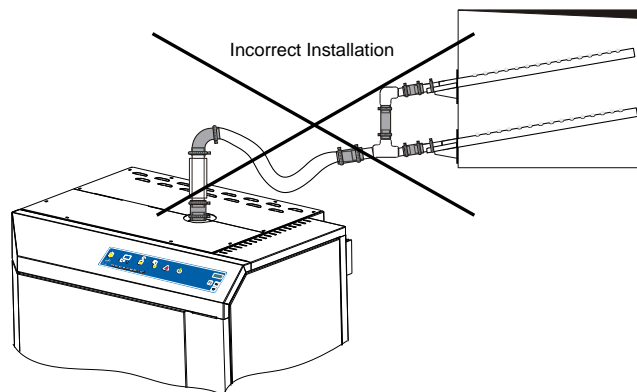
Correct Installation

*SKE-XL humidifier with 2 SAMB E2 manifolds*



(Illus. 7)

Incorrect Installation



(Illus. 8)

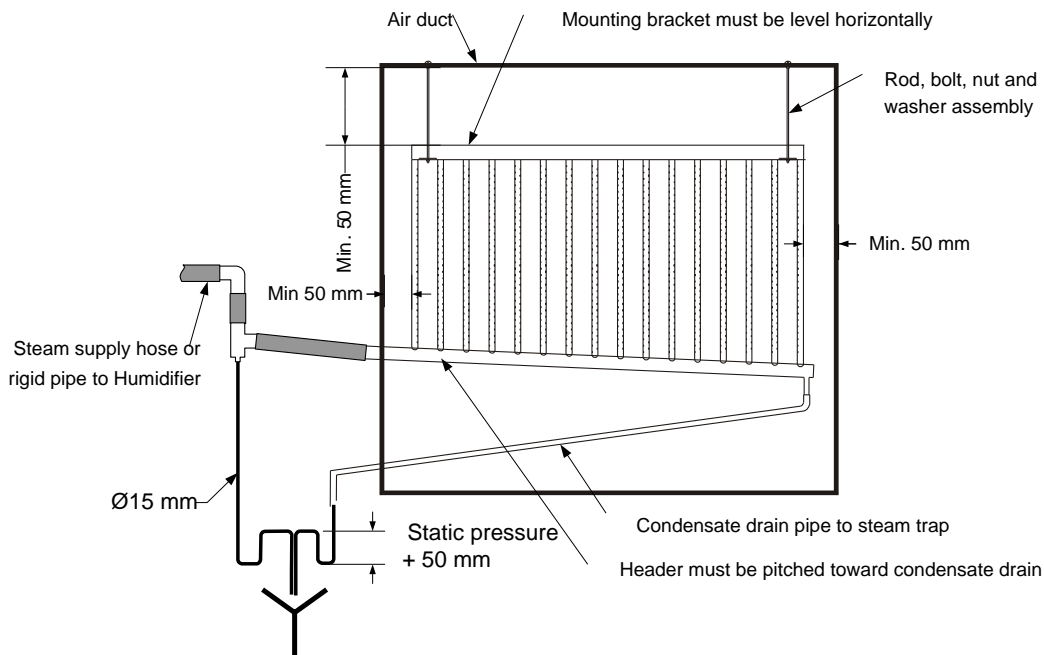
6. Connection pipe sizes between SKE-XL and steam distributor in the duct must be 108mm up to 240kg/h
7. All Humidifiers above 100kg/h capacity must use Multi-Steam.



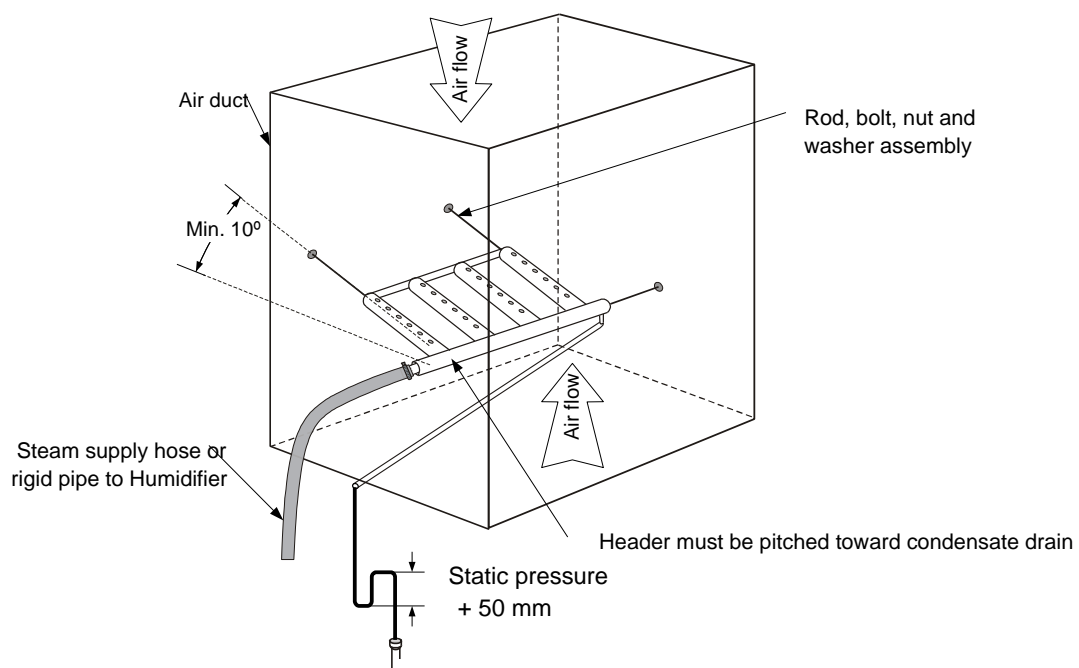
## Stage 2 – Steam Distribution Installation

### **Selection of Multi-Steam**

1. For all Multi-Steam units use the Neptronic® Humidisoft program to size the unit.
2. Where two Multi-Steam units are required, duties in excess of 240kg/h make your selection using the following rules:
  - Divide the air volume flow in half.
  - Divide the AHU / air Duct **width** in half.
  - **Height** of the duct must remain at 100% its height.
  - This will size Multi-Steam units so that they can be placed side by side.
3. For installation of Multi-Steam units please refer to Neptronic® Multi-Steam Installation Instructions



Horizontal duct (Illus. 9)



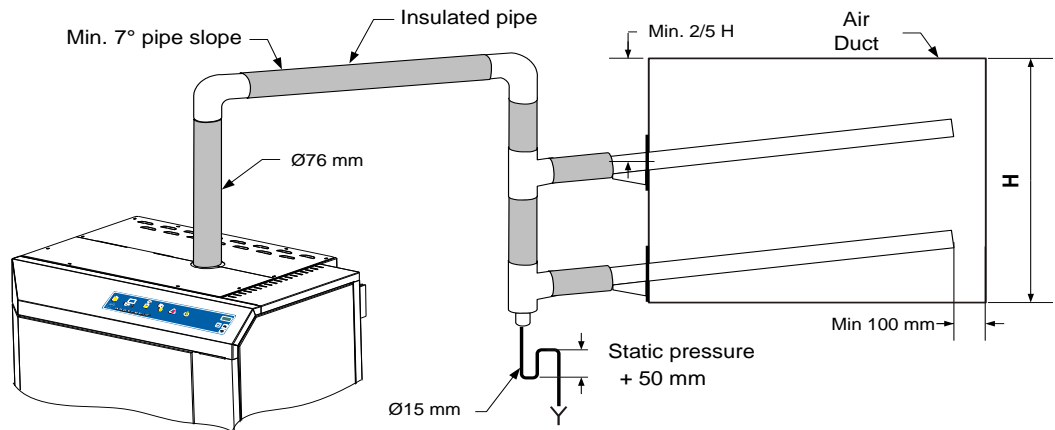
Vertical duct (Illus. 10)



## Stage 2 – Steam Distribution Installation

### Steam Pipe Work To Duct Connections

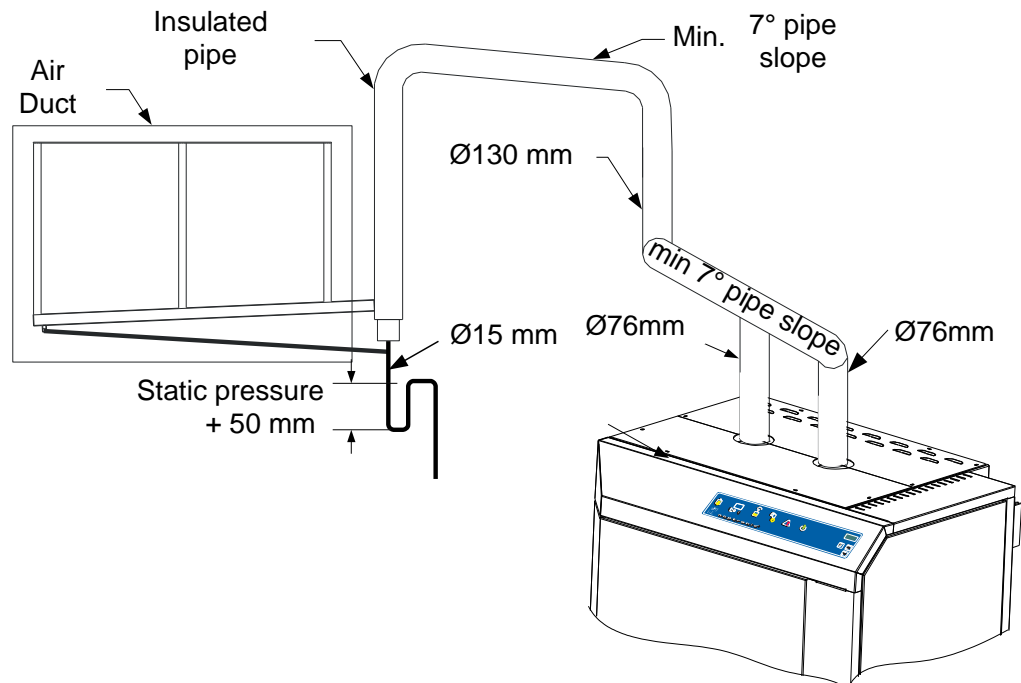
#### SKE90&100



(Illus. 11)

A single Ø76mm feed pipe must be connected to a single Multi-Steam with a suitable reduction at the lowest point to allow a Ø15mm condensate drain from the main steam supply.

#### SKE110&120



(Illus. 12)

Two Ø76mm steam outlets to a single Ø130mm feed pipe must be connected to a single Multi-Steam with a suitable reduction at the lowest point to allow a Ø15mm condensate drain from the main steam supply.

## Stage 3 – Water Supply Installation



Water supply installation must conform to local codes and regulations.  
 Any installation work must be carried out by suitably qualified personnel.

### **Water Inlet Specifications**

Neptronic® SKE-XL Humidifier is designed to be used with mains, reverse osmosis, de-ionized and de-mineralized water.

Maximum water supply pressure: 70 to 480kPa

Minimum water temperature: +4°C

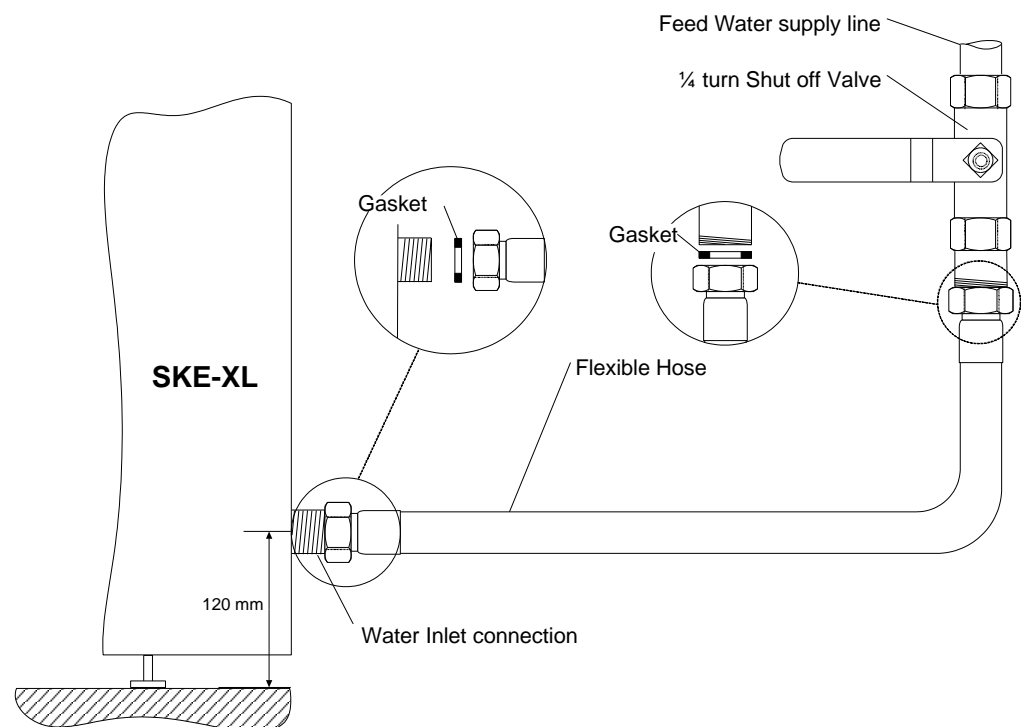
Maximum water temperature: +40°C

<i>Model</i>	<i>Water inlet Connection size</i>
<b>SKE90 SKE100 SKE110 SKE120</b>	Ø 15 mm

### **Water Supply Line Installation**

To facilitate servicing, it is recommended to install a shut off valve (not supplied) in the water line, within 1m of the humidifier.

It is recommended to install a water hammer arrestor, in order to absorb hydraulic shock and minimize water hammer when the fill valve closes.



(Illus. 13)

## Stage 4 – Water Drain Connection



### Water Drain Specification

Water Drain installation must conform to local codes and regulations.

Any installation work must be carried out by suitably qualified personnel.

Water Drain temperature: 60°C

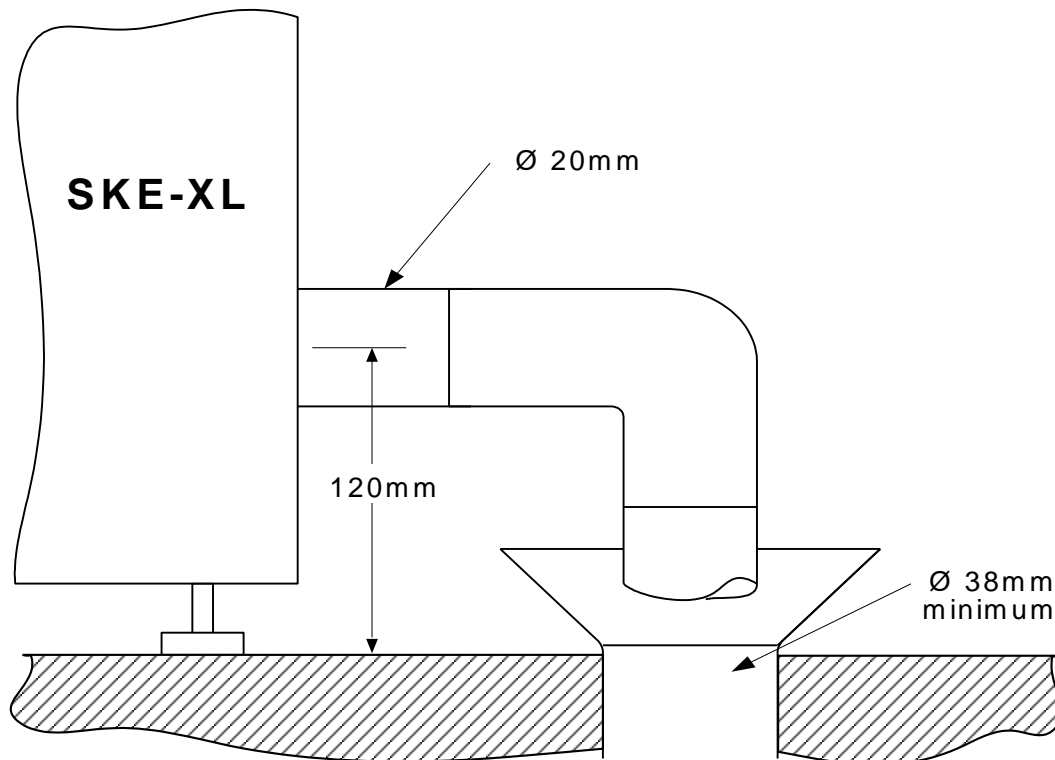
Model	Water Drain Outlet Connection size	Pan Drain Outlet Connection size
SKE90 SKE100 SKE110 SKE120	Ø 20mm	Ø 15mm

### Water Drain Installation

Water drain outlet connection must be connected to drain pipe of sufficient size. We recommend the use of Ø 20mm minimum standard copper hydraulic pipes.

Minimum water drain pipe gradient must be 6.5mm per 300mm horizontal run.

No drain trap is required.



(Illus. 14)

### Weather Proof Enclosure 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 +60°C.



**CAUTION:** During a power failure, the drain water temperature is not reduced. Installed drain piping must be rated to +100°C.

## Stage 5 – Electrical Supply and Installation

### Electrical Power Supply

The SKE-XL Steam Humidifier requires 400V three phase supply.

Model	Current (A)
<b>SKE90</b>	96
<b>SKE100</b>	107
<b>SKE110</b>	119
<b>SKE120</b>	130



### Electrical Connection

All incoming power supplies **MUST** be externally fused for over current protection. The electrical supply must also be isolated for the purpose of emergency and servicing. A disconnect switch must typically be installed within one meter of the humidifier.

The isolator must have a contact separation of at least 3mm.

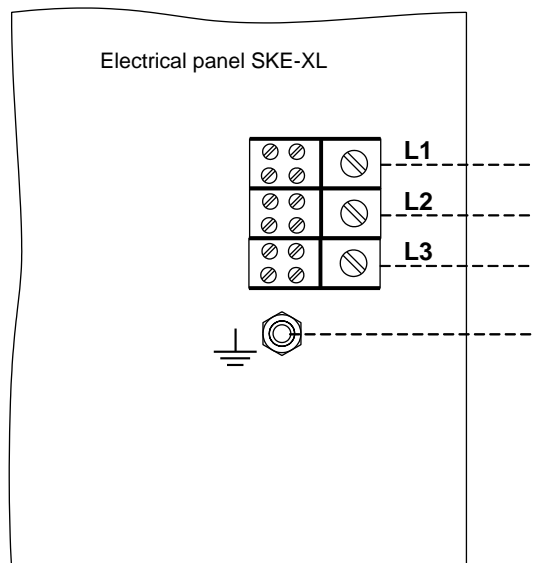
All work related to electrical installation **MUST** only be performed by skilled and qualified technical personnel (e.g. electrician or technicians with appropriate training).

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

- **WARNING.** Risk of electric Shock. Ensure that the electrical supply is isolated before beginning any installation.
- **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 installation engineer must ensure the following:

- Use of copper power conductor only.
- Size of the power conductors are suitable for the maximum current supplied.
- Incoming power cable is secured via suitably sized cable gland.
- Each terminal connection is secured firmly with a cable ferrule.
- The ground conductor must be equipped with ring terminal and must be connected directly to the electrical panel on the indicated location.
- Humidifier cabinet has an uninterrupted or unbroken electrical ground.



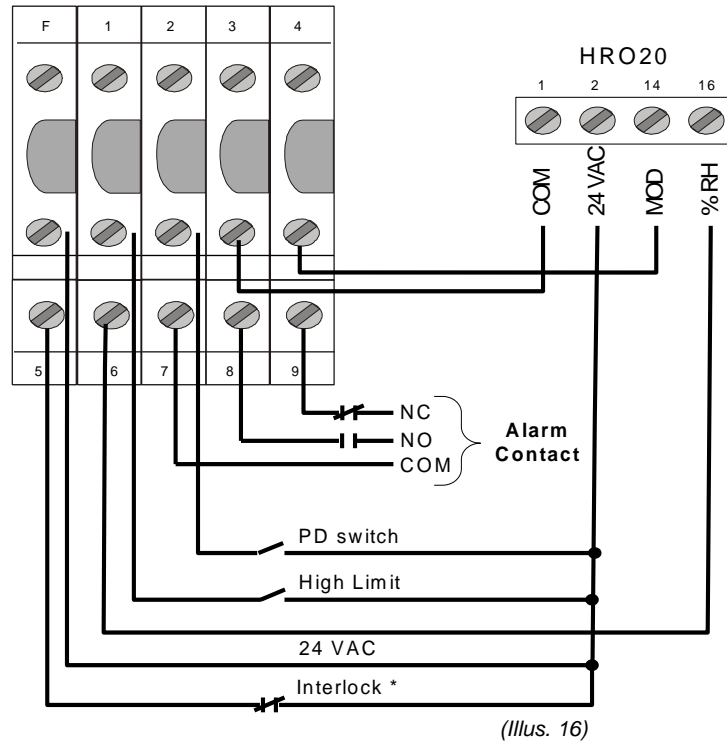
(Illus. 15)



## Stage 6 – Electrical Control Connections

### Humidifier Control with Humidity Controller

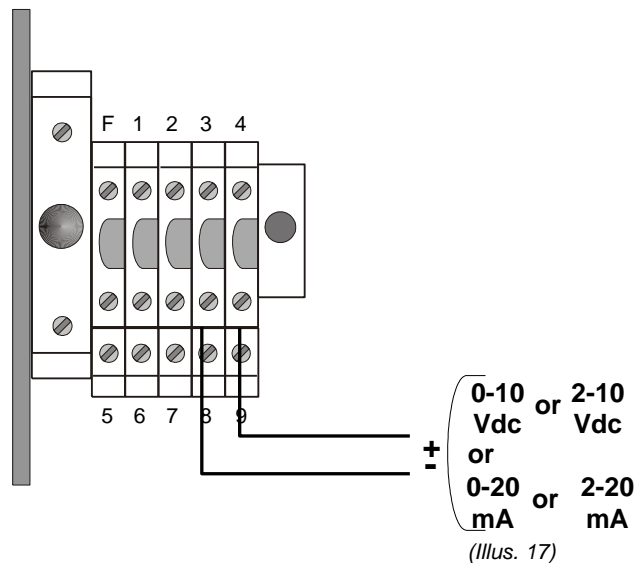
Neptronic® SKE-XL modulating Steam Humidifier can be installed in conjunction with Neptronic® HRO humidity controller.



Note: If interlock is not used, a jumper must be installed between terminals F & 5.

### Control Signal

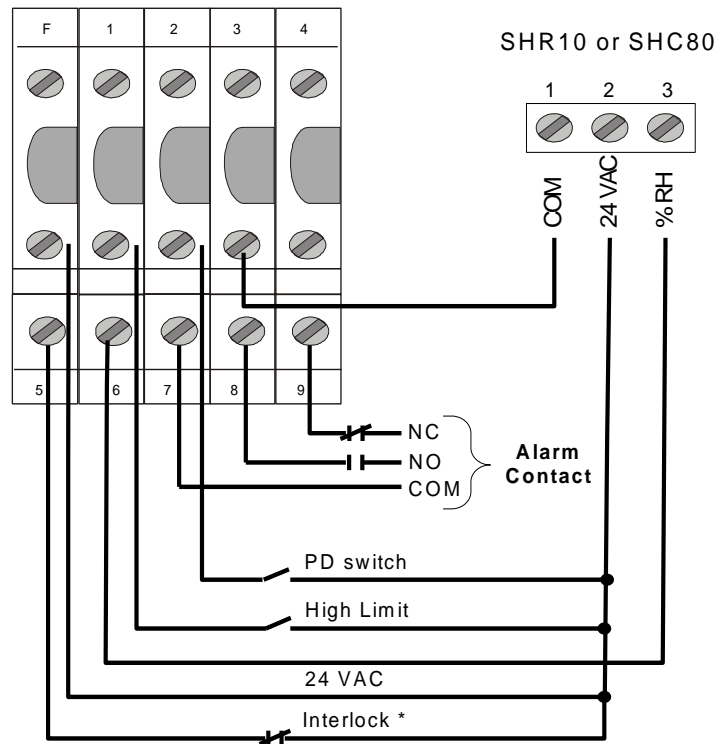
The selection of the control signal is made through the menu. Wire the control input to terminal 3 and 4 as indicated on the diagram below.



## Stage 6 – Electrical Control Connections

### **Humidifier Control with Humidity Sensors**

Neptronic® SKE-XL Steam Humidifier can be installed in conjunction with Neptronic® **SHR10** or **SHC80** humidity sensors.

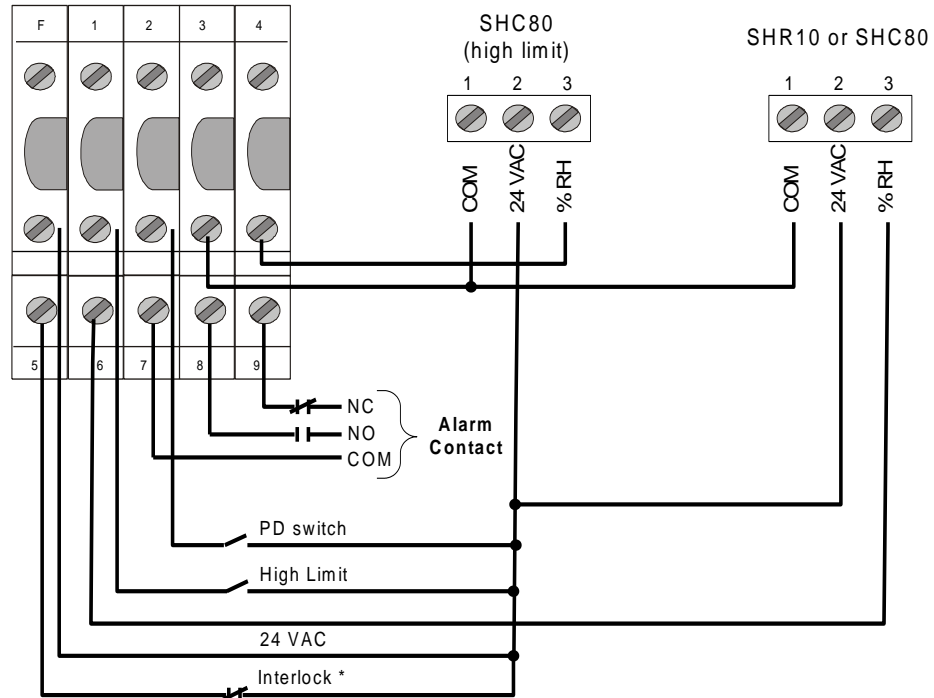


(Illus. 18)

## Stage 6 – Electrical Control Connections

### VAV System

Neptronic® SKE-XL modulating Steam Humidifier can be installed in conjunction with a VAV system, in this case Neptronic® **SHC80** Duct humidity sensor will act as a High level duct humidity sensor. Humidity will be controlled by Neptronic® **SHR10** or **SHC80** room or duct humidity controller.



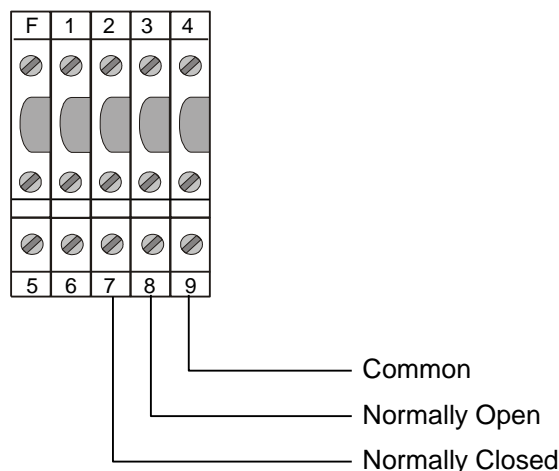
(Illus. 19)

### Dry Contacts

2 volt free contacts are provided :

- Operation (fan) contacts:  
One normally connected to common and one normally open contact

These contacts are used to switch a low voltage control, up to 24Vac or Vdc, with a switching current of no more than 3 A.



(Illus. 20)

## Stage 6 – Electrical Control Connections

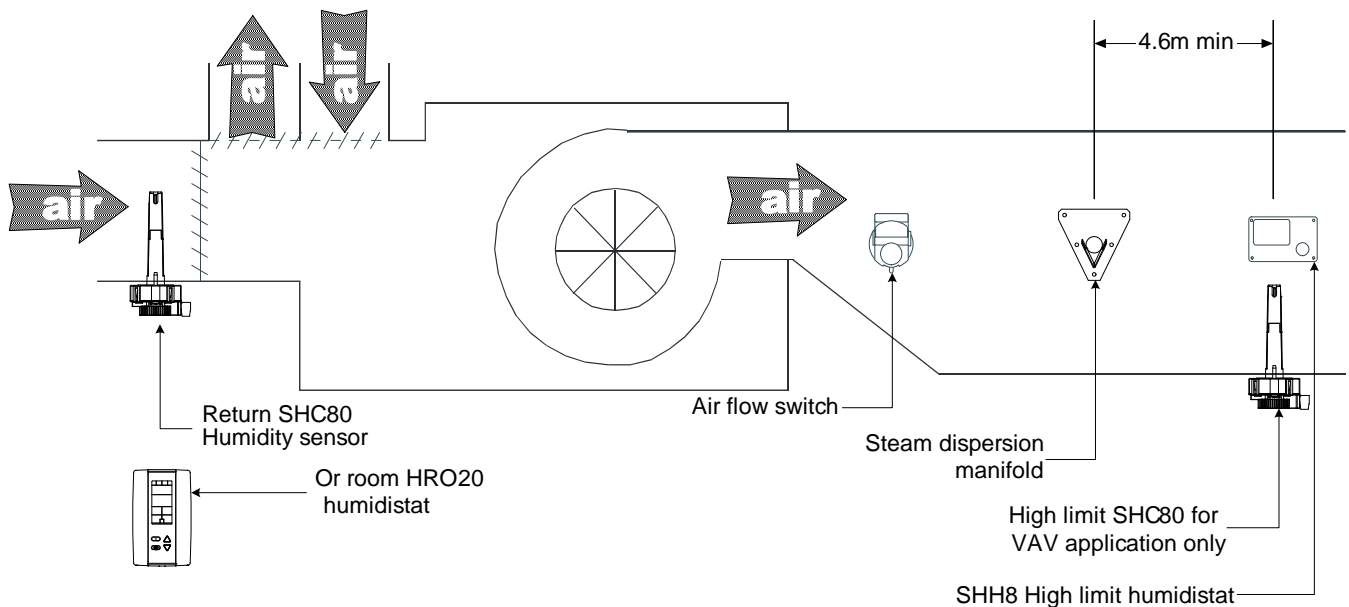
### Controls placement

A typical humidifier control system includes the following along with the humidifier:

- A wall or return duct humidistat
- A high limit duct humidistat,
- An airflow switch.

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

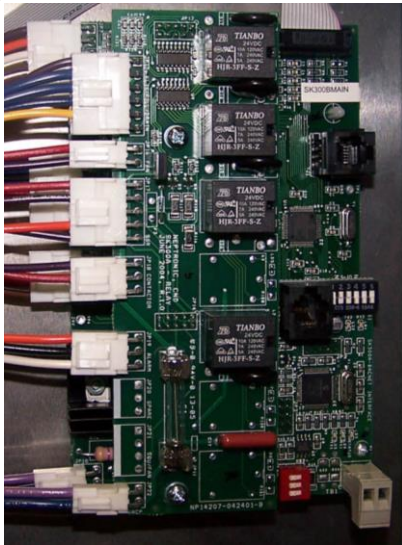
- The return duct humidistat must always be located before any outside air intake, in order to ensure accurate sensing of the air from the humidified space.
- Alternatively a room humidistat can be used. The room humidistat must be located on an inside wall or column. It must not be near any discharge 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 - 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.



(Illus. 21)

## BACnet Interface Set-up

### Locating BACnet Interface PCB

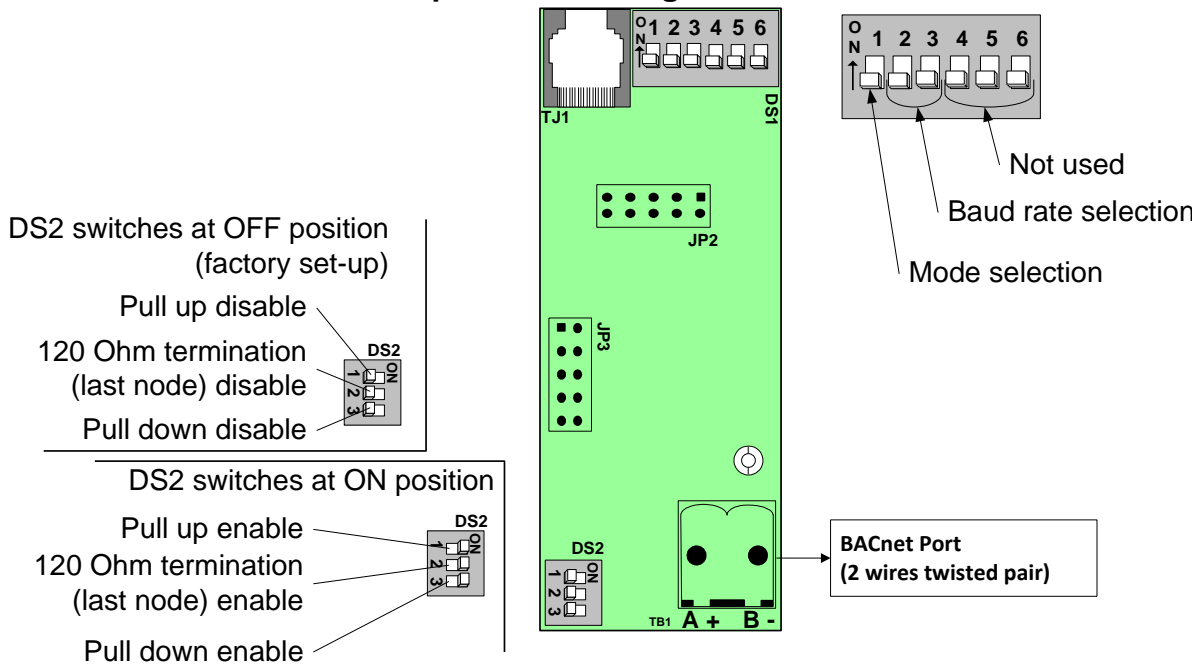


(Illus. 22)

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

BACnet interface PCB.

### Bacnet Port and Interface Dip Switch Setting



(Illus. 23)

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

## Initial Verification & Start-up



Initial verification and start-up – commissioning – must be carried out by suitable qualified personnel.

---

**Clearance**

1. Ensure that the humidifier cabinet is installed in a location where the humidifier can be serviced correctly. ☐

---

**Electrical**

2. Check that the power supply (voltage) conforms to the appliance name plate on the humidifier side. ☐
3. Confirm that 24Vac is present between tab 1&2 of Control terminal, located on the control connection PCB. Remove the front top cover to get to this PCB. ☐

---

**Water**

4. Ensure that water is supplied to the humidifier. A shut-off valve must be placed outside the humidifier. Once the water shut-off valve is turned ON, ensure that there are no apparent leaks. ☐
5. Confirm that Drain piping is properly connected with a pitch of least 6.5mm per 300mm horizontal run. ☐

---

**Steam**

6. Check that steam distributors are properly installed into the ventilation duct. ☐
7. Verify that the flexible steam hoses and rigid steam supply pipes are shorter length than 5m in total and properly sloped and have condensation S traps wherever required. ☐

---

**Controls**

8. Ensure that an air flow switch is installed and properly connected to the humidifier. ☐
9. Ensure that a High limit duct humidistat is installed, properly connected to the humidifier and set point is properly adjusted (recommended value: 80%). ☐
10. Verify that a Room humidistat or returned air duct humidistat is installed, properly connected to the humidifier and set point is properly adjusted. ☐
11. Turn Power ON at the disconnect switch. ☐
12. Confirm the control signal is matching control signal jumper on Main PCB. ☐

---

**Start-up**

13. Proceed to start-up the Humidifier, as follows: ☐
  - a) Open the front access door of the humidifier cabinet; make sure that manual drain valve is closed. ☐
  - b) Verify that there is a humidity demand. Humidity demand is displayed on the humidifier LCD screen.
  - c) Start up the humidifier by putting rocker switch located on the humidifier control panel at the ON position ☐
  - d) Water will start to flow in and slowly rise in the water level sight glass located on the side of the evaporation chamber. Observe for water leak along the water line. ☐
  - e) Humidifier LCD screen will display the water level with 3 levels of information: Alarm level / Control level / High level ☐
  - f) As soon as Control level is reached, contact will be activated and heater elements powered. From a cold start steam will be produced 3 to 5 minutes after contactors closing ☐
  - g) Observe for water and steam leaks. ☐

---

**Safety Test**

14. Check the location of the air flow switch in the system and its operation by stopping the fan. With no air movement in the air duct, the humidifier will automatically stop. ☐

---

**Drain and Reset**

15. Turn the humidifier OFF, by putting rocker switch of the control panel to the 0 (middle) position ☐
16. Execute a manual drain, by putting rocker switch of the control panel to the Drain position. A water jet directed on the water level sensor located in the water level sight glass will start and create bubbles around it. ☐
17. Reset Air flow switch and humidistat(s) to the proper value, if needed. ☐

---

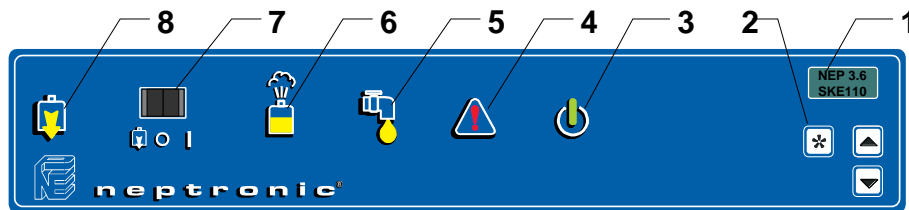
**End**














18. Humidifier is ready for normal operation. ☐



## Commissioning – Operation Description

**Control Panel Description** Control panel of Neptronic® SKE-XL Steam humidifier is equipped with a user friendly LCD display and extensive access to status, alarms, and set-up menus.



1	Alphanumeric Display: Indicates all operation parameters and the error messages.		
Push button  ,  and 			
2			button gives access into program mode.
	 	Up and Down button: Used to increase or decrease the controlled parameters of the humidifier.	
"POWER" indicator			
3		⊙○⊖	The humidifier is powered by electricity and the switch is at the AUTO position.
		○	The humidifier is disconnected from the power supply.
"CHECK" indicator			
4		⊙○⊖	The "CHECK" indication is normally off. It will go on as a warning against abnormal conditions of operation. For details consult the Alphanumeric Display (see List of Alarms section).
		⊙○⊖ <i>blinking</i>	Maintenance is required. The Running hours have exceeded the Service hours and the humidifier has to be serviced. To stop the CHECK indicator from flashing after servicing, see Step 03 in the Programming Mode section.
		○	No abnormal conditions of operation.
"FILL" indicator			
5		⊙○⊖	Indication that the water supply (fill) valve is open.
		○	Indication that the water supply (fill) valve is closed.
"STEAM" indicator			
6		⊙○⊖	ON/OFF model, the STEAM indicator lights when the contactor is closed and steam is being generated.
		⊙○⊖ <i>blinking</i>	Modulating model, the STEAM indicator blinks ON and OFF in proportion to the percentage of steam output the humidifier is generating. (The proportion is displayed on the alphanumeric display (1)). When the output reaches 100%, the indicator stops flashing.
		○	There is no steam being produced.
Switch "AUTO/OFF/DRAIN"			
7		AUTO	Position AUTO (I): Humidifier will generate steam based on demand from the humidistat.
		OFF	Position OFF (O): Humidifier will shut off.
		DRAIN	Position DRAIN: Humidifier will stop operating and the evaporation chamber will drain the water out. This will be done at regular service.
Indicator "DRAIN"			
8		⊙○⊖	Drain valve is opened, whether as a result of an automatic drain cycle or because the front panel switch is manually set to DRAIN.
		○	Drain valve is closed.

## Operation Display

### Description Display Modes

#### "OFF" Mode

When the rocker switch is in the "OFF" position, the display shows the model of the humidifier and the program version number.

**NEP 3.6**  
**SK390M**

(Illus. 24)

#### Scroll Mode

When the rocker switch is in the auto position, the display scrolls the following information every 6 seconds:

Display	Description	Comment
<b>HUMIDITY</b> <b>45.2%</b>	Percent of relative humidity	Only on modulating units (suffix M).
<b>DEMAND</b> <b>92%</b>	Percent of demand	Control signal input response from 0-100%
<b>OUTPUT</b> <b>100%</b>	Percent of output of the humidifier	Capacity output of the humidifier.
<b>WATR LVL</b> <b>92%</b>	Water level in percent to the objective	100% correspond to optimum water level in evaporation chamber.
<b>WATR TMP</b> <b>65C</b>	Water temperature in Celsius	Water temperature inside the evaporation chamber.

## List of Alarms


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



Display	Description	Comment
<b>AIR FLOW</b> <b>OPEN</b>	Air flow proof	The airflow is not detected by the air pressure switch (modulating unit only).
<b>HI LIMIT</b> <b>CUT-OUT</b>	Hi limit cut out	Humidity level has exceeded the set point on the high limit humidistat.
<b>DRAIN</b> <b>CYCLE</b>	Drain cycle	The unit is in the automatic drain mode
<b>OVER</b> <b>HEATED</b>	Overheated	The temperature inside the container has exceeded the boiling temperature. The humidifier has automatically shut off.
<b>PROBE</b> <b>DEFECTED</b>	Defective probe	The water level sensor is not operational. The humidifier has automatically shut off







<b>NO LEVEL</b>	No water	Water has not reached the level probe. This message appears when turning on the humidifier if the evaporation chamber is empty."
<b>CLEANING REQUIRED</b>	Cleaning required	The humidifier has reached the number of hours of operation and requires cleaning of the evaporation chamber with no interruption of the operation of the humidifier.
<b>SERVICE UNIT NOW</b>	Service unit now	The humidifier has reached the number of hours of operation and requires service. The operation of the humidifier is interrupted.
<b>FOAMING CYCLE</b>	Drain foam	AFEC (Anti Foam Energy Conservation) detects foam. The unit drains for a few minutes and returns to normal operation.
<b>DRN/PROB BLOCK</b>	Drain or probe block	The DRAIN indicator is on but the water level does not decrease, the humidifier has automatically shut off.
<b>KLIXON OPEN</b>	Klixon open	Temperature in the evaporation chamber exceeded the preset temperature of the high temperature switch.
<b>PCB FUSE OPEN</b>	PCB Fuse open	Internal 24vac is shorted.
<b>24 VAC SHORTED</b>	24 VAC Shorted	External 24vac (for humidity) controller is shorted or over loaded.
<b>24 VDC SHORTED</b>	24 VDC Shorted	Internal 24vdc (probe or fan) is shorted.
<b>REFILL TIME OUT</b>	Refill time out	Time to fill the evaporation chamber exceeded the preset time in the microprocessor.
<b>WATR TMP DEFECTED</b>	Water temperature sensor defective	The water temperature sensor is not present or defective.
<b>SSR OVER HEATED</b>	SSR Overheated	The temperature of the SSR is too high. Verify the operation of the cooling fan.
<b>INTERLCK OPEN</b>	Interlock Open	Interlock safety is open. Humidifier is stopped.
<b>END OF SEASON</b>	End of season	When there is no humidity demand for a period of more than 72 hours, the humidifier will drain the water from the evaporation chambers automatically and will stay into a standby mode.

## Programming Mode

To enter into programming mode, please push  button at any time, to advance the program function to the next programming step in the menu push the same button twice.

Unless other instructions, you can make a selection by using  &  buttons on control panel.



Seq #	Display	Description	Values
01	<b>CONTROL EXTERNAL</b>	Selection of Control mode. If External is selected, the control demand will be received by the control input; if Com Port is selected, the control demand will be received by the communication port (BACnet option).	Internal or External or Com Port  Default: External
01A	<b>SP SOURC INTERNAL</b>	Selection of the Set Point Source (Control Internal only). Selection of source for room humidity set point.	Internal or External or Com Port  Default: Internal
01B	<b>SETPOINT 40% RH</b>	Selection of room relative humidity set point. (SP Source Internal only)	Percentage From 10 to 90%
01C	<b>DUCT SRC DISABLE</b>	Hi limit control mode. Selection of the source for the duct high limit relative humidity (Control Internal only).	Disable or External or Com Port  Default: Disable
01D	<b>DUCT SP 80% RH</b>	Selection of high limit relative humidity set point. (Duct Source External only).	Percentage From 10 to 90%
02	<b>DRAIN 8 HRS</b>	Setting of automatic drain cycle of evaporation chamber. <i>Note: In general, harder the water is, more often the drain cycle must be. Drain cycle setting does not affect the AFEC system.</i>	From 1 to 24 hours Increment: 1 hour  Default: 4 hours.
03	<b>RUNNING 0645HRS</b>	Number of running hours reading and reset To reset this counter: After service has been done, press simultaneously the  and  buttons for 30 seconds to reset the number of hours of operation to zero. The timer reset stops the CHECK indicator from flashing.	N/A
04	<b>SERVICE 1000HRS</b>	Hour span between services. <i>Note: In general, harder the water is, lower the number of hours of operation before service must be.</i>	From 400 to 1500 hours. Increment: 100  Default: 1000 hours.
05	<b>LOCK ON 80% PWR</b>	Selection of humidifier capacity reduction. <i>i.e.: In this case, the humidifier will deliver 80% of its maximum rated output when at full demand.</i>	From 00 to 100%. Increment: 1%  Default: 100%
06	<b>RESET ALRM NO</b>	Reset of alarm  To reset an alarm, press simultaneously the  and  buttons.	Yes or No  Default: No
07	<b>CTRL INP 2-10 VDC</b>	Control signal input selection.	0-10VDC, 2-10VDC, 0-20mA or 4-20mA  Default : 2-10VDC

08	<b>HUM. INP 2-10 VDC</b>	Humidity signal input selection.	0-10VDC, 2-10VDC, 0-20mA or 4-20mA  Default : 2-10VDC
09	<b>DUCT INP 2-10 VDC</b>	Duct Humidity signal input selection.	0-10VDC, 2-10VDC, 0-20mA or 4-20mA  Default : 2-10VDC
10	<b>SKB 3XX NEP r1.5</b>	Revision level of the program installed	N/A

**Note:**

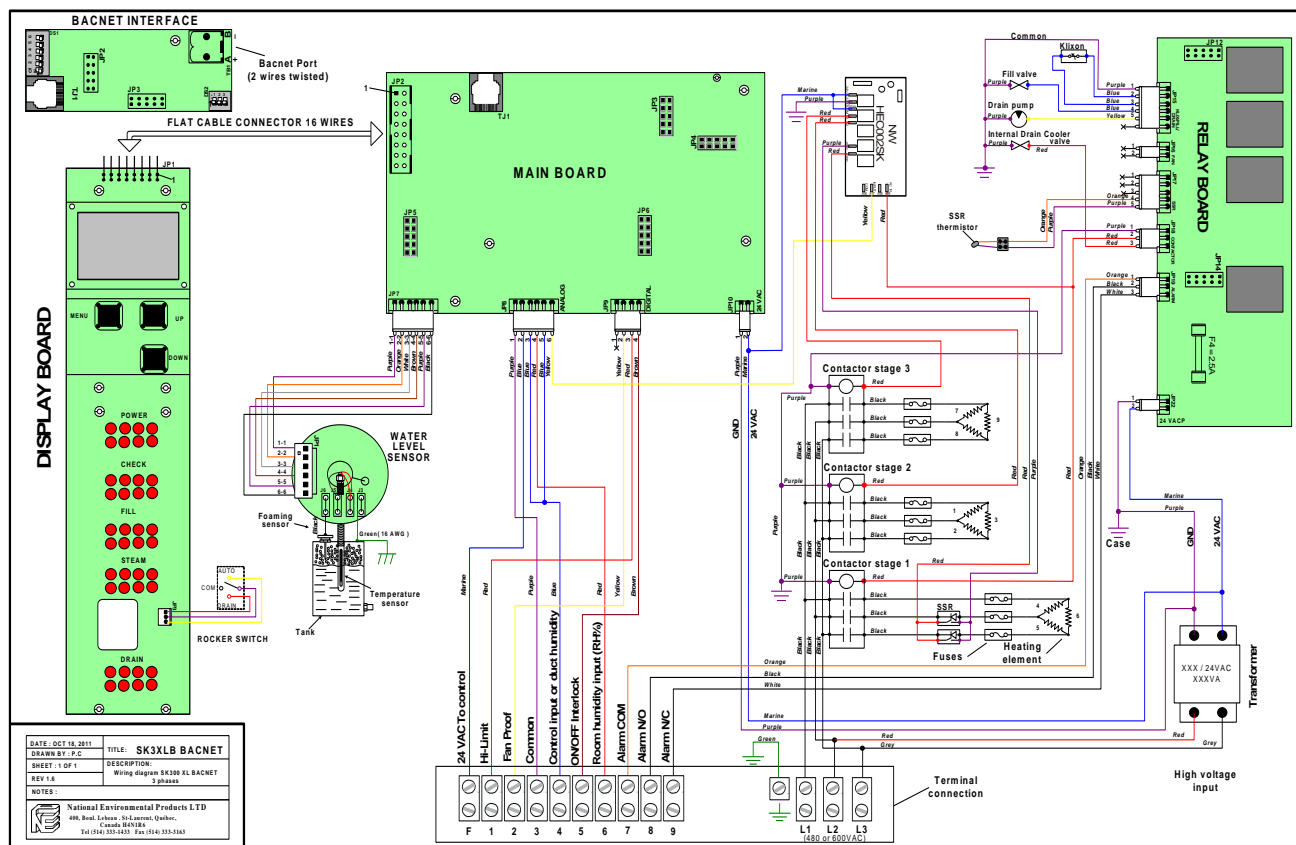
- Any changes made in the Program Mode are saved into a non-volatile memory.

## User Adjustment & Diagnostic Menu

To enter to User adjustment & Diagnostic menu: press and hold  (down) and then press  (menu).

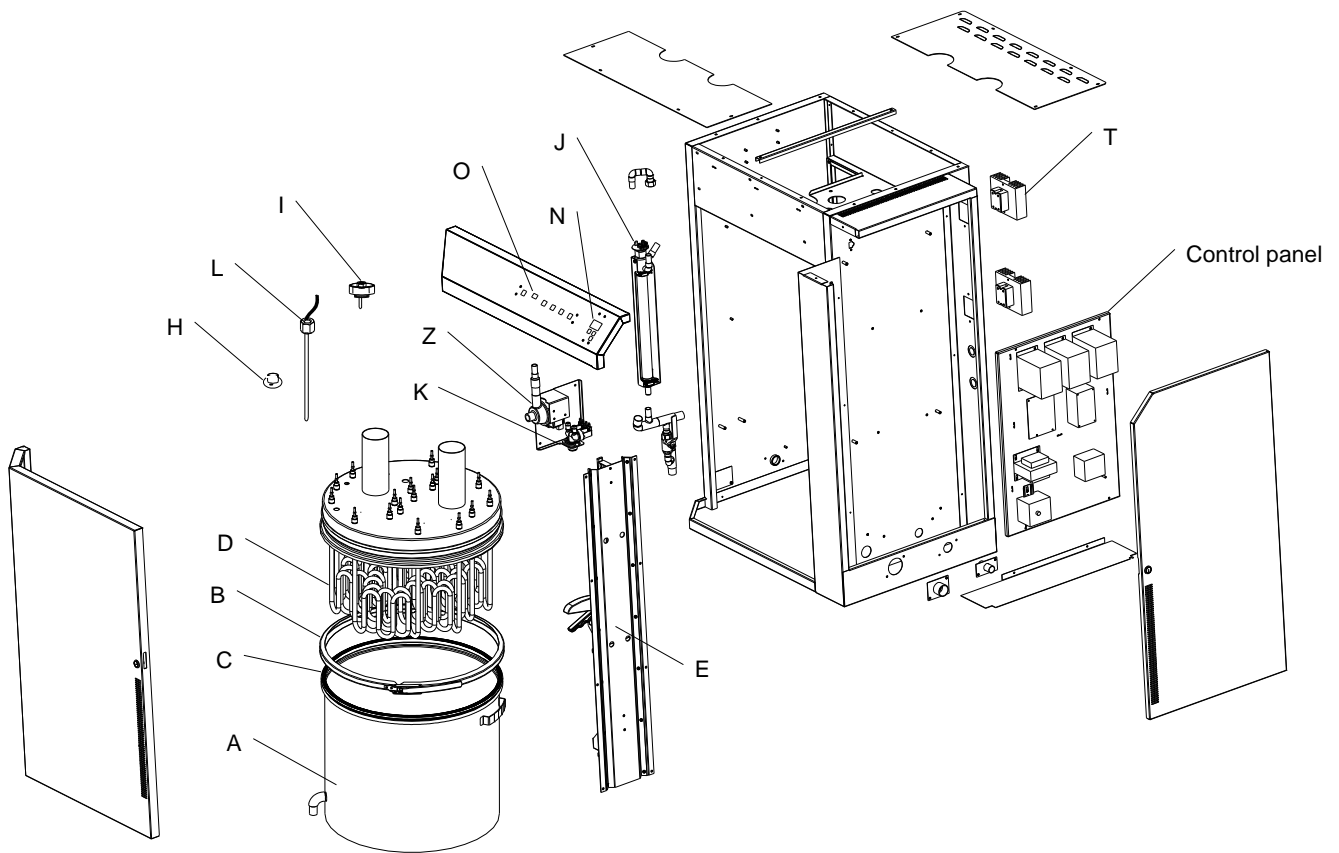
Seq #	Display	Type	Description	Value
01	<b>SSR TmP 40 C</b>	Reading	SSR Temperature reading	N/A
02	<b>WTR TOFF 100 C</b>	User adjustment	Water temperature offset user adjustment	Range: from -10°C to +10°C Default: <b>0</b>
03	<b>WTR FREQ 8000 Hz</b>	Reading	Water level frequency reading	N/A
04	<b>WTR LOFF 100 %</b>	User adjustment	Water level offset user adjustment	Range: from -10% to +10% Default: <b>0%</b>
05	<b>FOAM PRB 207</b>	Reading	Foaming probe value reading	N/A
06	<b>Drn Tm Out 5 min</b>	User adjustment	Drain time user adjustment	Range: from 4 to 16 min
07	<b>No Demnd 72 HRS</b>	User adjustment	Delay to drain out the humidifier from its remains water when there is no demand, in order to prevent bacteria growth	Range: from 1 to 250 Hrs Default: <b>72Hrs</b>
08	<b>Hold Tmp OFF</b>	User adjustment	Holding temperature of the evaporation chamber for fast response to demand	Range: from 15 to 90°C or OFF Default: <b>OFF</b>
09	<b>Anti-Frz OFF</b>	User adjustment	Anti-freezing temperature for the evaporation chamber for humidifier to be installed in weather proof enclosure.	Range: from 4 to 10°C or OFF Default: <b>OFF</b>
10	<b>ALARM Beep ON</b>	User adjustment	Alarm beep, to be selected ON or OFF	Range: ON or OFF Default: <b>OFF</b>
11	<b>T Unit CELSIUS</b>	User adjustment	Temperature unit scale Celsius or Fahrenheit	Range: Celsius or Fahrenheit Default: <b>Celsius</b>
12	<b>CONTRAST 25</b>	User adjustment	LCD Display contrast level	Range: from 0 to 40 Default: <b>25</b> (legible LCD)
13	<b>SKB 3xx NEP r1.5</b>	Reading	Model of humidifier and revision number of program installed.	N/A

## Wiring Diagram





## Exploded View



(Illus. 25)

## Bill of Material

### General

Item	Description	Model	Part Number
A	Evaporation chamber tank	All models	SP 4253
B	Band clamp	All models	SP 4254-M
C	Tank gasket	All models	SW 4255
D	Heating element	See <i>Heating Element, Contactor, and Transformer</i> table.	
E	Lifting mechanism	All models	SW G1010-ASSY
F	Gasket for element (not shown)	All models	SP 1005
G	S/S hexagonal nut for element (not shown)	All models	SP 2330
H	High temperature switch	All models	SP 3035
I	Foam sensor	All models	SW GAFECPROBE-ASSY
J	Water level sensor sub assembly	All models	SW GWATLEV-SUB
K	Water supply valve	All models	SP 6007
L	Water temperature sensor	All models	SW GWATTEMP-ASSY
N	SKE LCD display	All models	NW SK300BDISPLAY
O	On/Off/Drain switch	All models	SW SKSWITCH-ASSY
Control Panel	Main pc board	All models	NW SKEBMAIN-TEST
	Sequence pc board	All models	NW HEC0002SK
	Contactor	See <i>Heating Element, Contactor, and Transformer</i> table.	
	Transformer		
T	Solid state relay with heat sink	All models	DW SSR90Y1 (2x)
Z	Drain pump	All models	SP G4101

### Heating Element, Contactor, and Transformer

Model	Voltage	Heating Elements	Contactor	Transformer
SKE90	400V/3~	SW 5983 (9x)	SP 3100 (3x)	SP 3385
SKE100	400V/3~	SW 5955 (3x), SW 5983 (6x)	SP 3084 (3x)	SP 3385
SKE110	400V/3~	SW 5955 (6x), SW 5983 (3x)	SP 3084 (3x)	SP 3385
SKE120	400V/3~	SW 5988 (9x)	SP 3084 (3x)	SP 3385



**neptronic®**

400 Lebeau blvd, Montreal, Qc, H4N 1R6, Canada

[www.neptronic.com](http://www.neptronic.com)

Toll-free in North America: 1-800-361-2308

Tel.: (514) 333-1433

Fax: (514) 333-3163

Customer service fax: (514) 333-1091

Monday to Friday: 8:00am to 5:00pm (Eastern time)