Multi-Steam™ HDR*

SKD-R Series

Direct Steam Injection Humidifier with Integrated Re-Evaporator

Installation Instructions and User Manual

For the following configuration:

- Multi-Steam with Integrated Re-Evaporator
- Includes integrated Re-Evaporator and X-Stream™ Technology

* The Multi-Steam™ HDR model is not available in the United States

Foreword and Safety Instructions

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^2 (80,000 ft^2) 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 Multi-Steam™ HDR.

- 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.

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.

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Technical Specifications

Product Description

The Multi-Steam™ HDR humidifier injects and disperses atmospheric or low pressure steam into a building's air supply system to attain and maintain the desired humidity level. It uses steam from an in-house boiler to humidify the air. The Multi-Steam™ HDR humidifier combined with the high efficiency insulated steam distributor, X-Stream™ increases the performance of the humidifier and provides an ideal solution for atmospheric and low pressure steam applications.

The Multi-Steam™ HDR is controlled by an Electronic Steam Controller (SKDESC-R) that has been specifically designed to control and operate the humidifier. It comes with user-friendly features such as easy start-up and diagnostics, large LCD display, simple configuration options, and factory configured settings. It controls the sequence of operations to optimize energy efficiency and prevent condensate ejection.

The following are the features of the Multi-Steam™ HDR and their functions:

- *Multi-Steam Distribution System*. The steam dispersion channels are made with stainless steel (1 3/8”). The Multi-Steam Distribution consists of multiple vertical dispersion channels mounted on a single horizontal header. Upon a demand for humidity, the SKDESC controller slowly opens the steam modulating valve feeding steam to the dispersion channels through a single horizontal header. The steam escapes the dispersion system through multiple eyelets on the vertical channels and mixes with the airflow to maintain the desired humidity level.
  The Multi-Steam™ HDR is the most energy efficient steam injection system and provides drain-free operations.
- *X-Stream™ Technology*. The Multi-Steam™ HDR comes with X-Stream™ technology, a high efficiency insulated steam distributor that enhances the functioning of the humidifier and reduces wasted energy up to 85%, airstream heat gain, and generated condensate.
- *Steam Header with Integrated Re-Evaporator**. The header contains a built-in re-evaporator that re-boils the condensate formed within the header and the steam dispersion channels. The re-evaporator is made of copper with stainless steel connection. The re-evaporator is sized as per the system steam pressure to eliminate all the condensate produced. Therefore, no condensate is drained while in operation, resulting in reduction of energy wastage.
  ** The Multi-Steam™ HDR model is not available in the United States*
- *Separator*. The separator is constructed with stainless steel. The separator supplies condensate-free steam to the steam control valve and discharges condensate to the steam trap.
- *Control Valves*. The humidifier comes with normally closed globe valve with equal percentage flow characteristics to control the flow of steam. It comes in variants such as bronze body and brass trim (stainless steel trim optional). The linear electric actuator is equipped with a heat shield. The control valves provide full modulation of the low pressure steam flow for a better control of the humidity level.
- *Isolating Valves*. The valves are the normally closed full port ball valve type made with bronze body and stainless steel trim. The valves control supply of the steam to the jacket in a multi channel configuration or to the heat exchanger in a Multi-Steam™ HDR.
- *Electronic Steam Controller (SKDESC-R)*. The SKDESC-R is a microprocessor based steam controller equipped with a backlit LCD display that allows programming the humidity setpoints and monitoring parameters such as actual humidity, air flow switch, interlock, and temperature sensors efficiently and easily.

- *Strainer*. The strainer strains foreign matter from pipelines and protects the components of the steam humidifier.
- *RTD Temperature Sensors*. The Multi-Steam™ HDR comes with RTD temperature sensors integrated in a brass thermowell. The temperature sensors monitor steam temperature and detect abnormal condensate levels to ensure safe operations.
- *Float and Thermostatic Steam Trap*. The design comes with universal four port design, all stainless steel internal components with the option of a stainless steel body construction as well. The Float and thermostat eliminates condensate from the steam line.

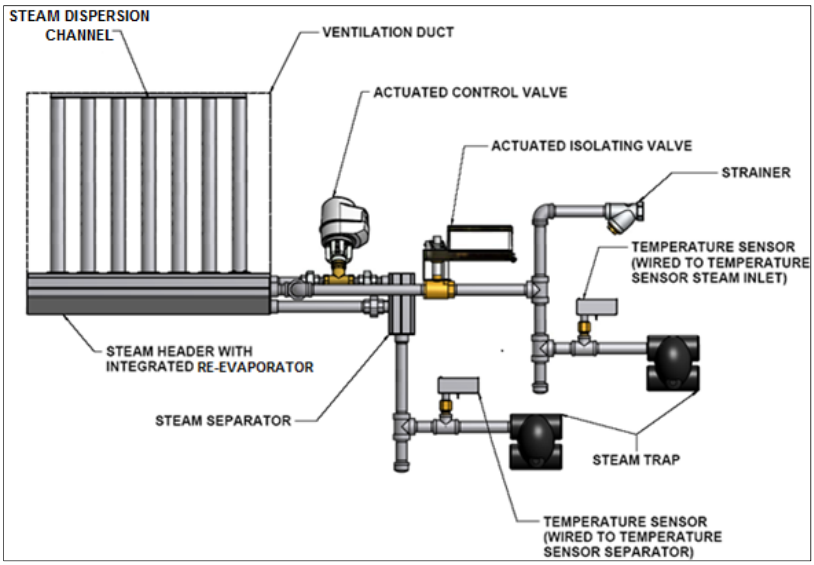


Illustration 1 - Multi-Steam™ HDR Components Overview

Handling and Packing

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 Multi-Steam™ HDR MUST always be handled and lifted with care and should remain in its original packaging for as long as possible prior to installation.

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

Unpacking

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

Installation Overview

All installation work must comply with local regulations.

All work related to the installation of Multi-Steam™ HDR MUST only be performed by skilled and qualified technical personnel such as plumbers or technicians with appropriate training. The customer is responsible for ensuring their suitability.

For the installation of the Multi-Steam™ HDR and associated components, there are no specific tooling requirements.

Installation Method Statement

Stage 1 – Steam Dispersion Channels and Header Installation
Stage 2 – Isolating Valve Installation
Stage 3 – Steam Control Valve Installation
Stage 4 – Steam Separator Installation
Stage 5 – Temperature Sensor Installation
Stage 6 – Float and Thermostat Steam Trap Installation
Stage 7 – Strainer Installation
Stage 8 – Electronic Steam Controller (SKDESC-R)

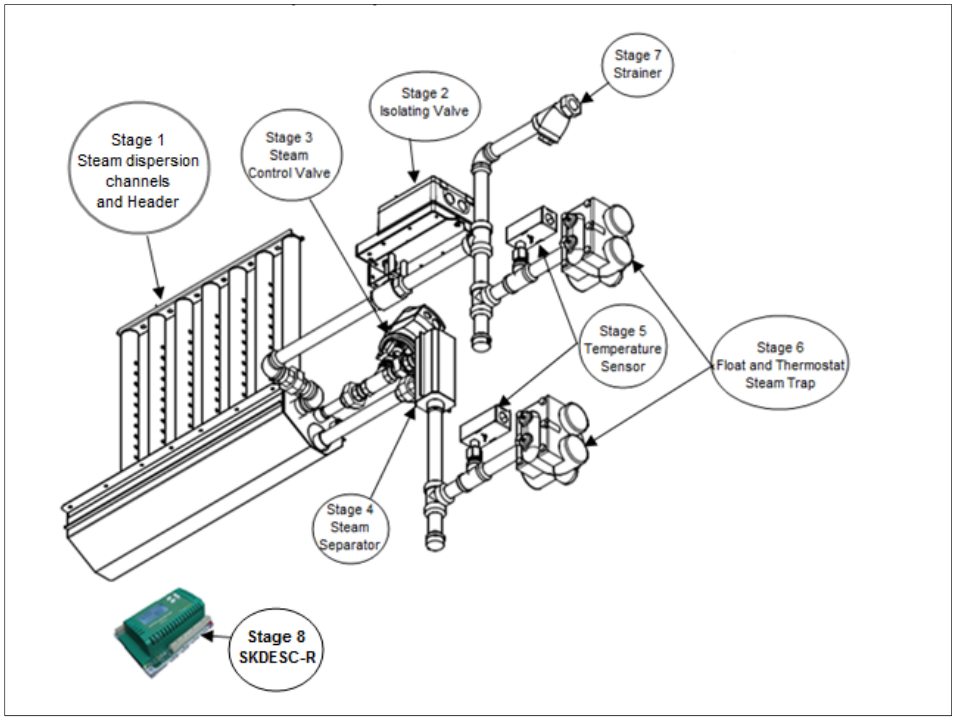


Illustration 2 - Installation Stages

Stage 1 – Steam Dispersion Channels and Header Installation

General Considerations

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

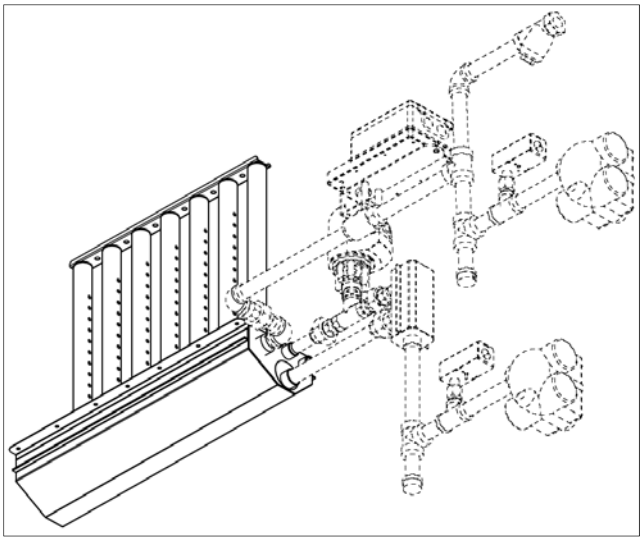


Illustration 3 - Steam Dispersion Channels and Header Installation

Consider the following points before deciding the location for the Multi-Steam™ HDR steam distribution system:

- Plan a location that is easy to access and permits an easy inspection and servicing of the humidifier.
- Do not install the humidifier where failure of the appliance could cause damage to the building structure or to other expensive equipment.
- Verify that the construction of the duct or AHU wall is suitable to support the steam distributors through the duration of the installation life.

Positioning the Steam Dispersion Channels

- Steam nozzles should face the airflow to minimize the absorption and non-wetting distance.
- Locate the steam distributors far enough from elbow or fan to be in laminar air flow to ensure proper evaporation distance.
- There must be sufficient straight duct downstream from the steam distributors for absorption of the steam.

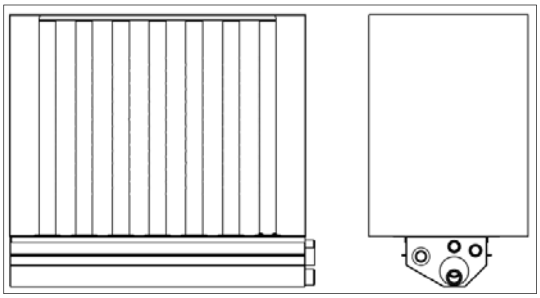


Illustration 4 - Insertion Type - Header under the duct

Positioning the Header Assembly

- Position the assembly so that the distance between them is the same.
- For insertion type, secure the header at the bottom of the duct with metal screws.
- Secure the top of the assembly by bolting the perforated top mounting plate to the ventilator.

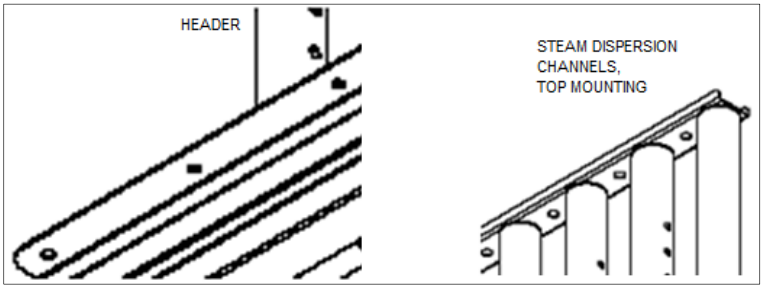


Illustration 5 - Mounting Bracket Details

Stage 2 – Isolating Valve Installation

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

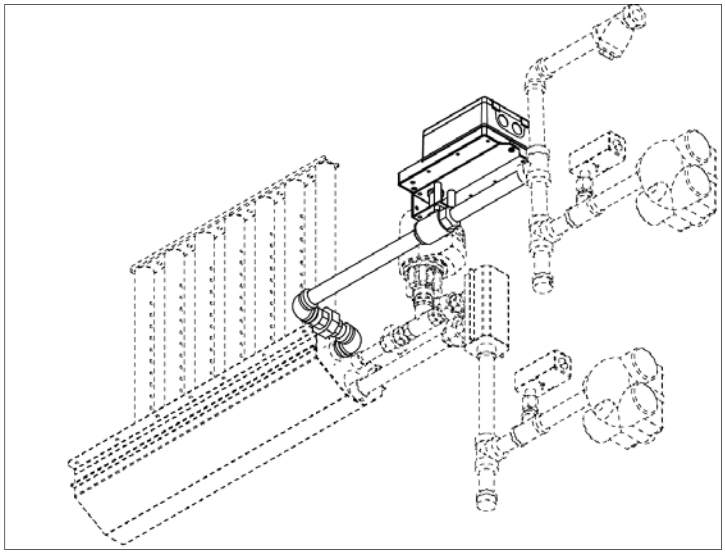


Illustration 6 - Isolating Valve Installation

- Use proper sizes to connect the isolating valve to the header.
- The isolating valve must be offset from the header to leave space for the actuator. The offset must be at least 4” (102 mm) from the header control valve port. Install the elbows between the isolating valve and the header.
- The distance between the isolating valve and the header must not exceed 12” (305 mm) so that the steam line condensation is reduced.

Stage 3 – Steam Control Valve Installation

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

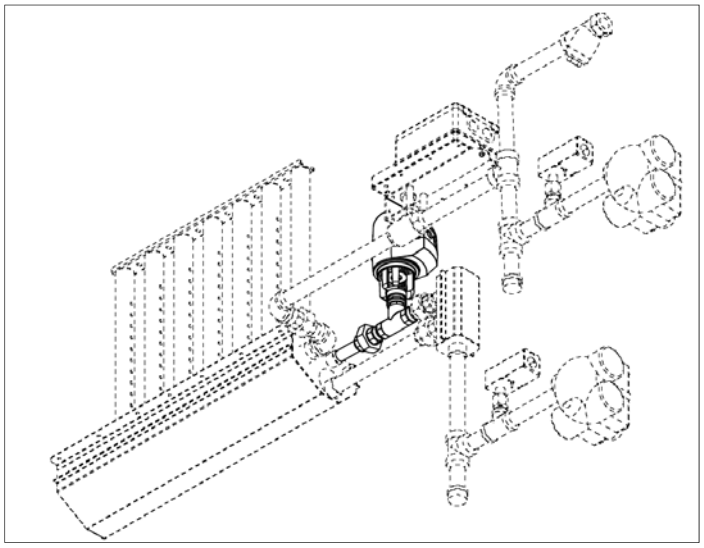


Illustration 7 - Steam Control Valve Installation

Control Valve Positioning

- Position the body of the valve properly to ensure that the steam supply is going into port A and exiting from the port AB. Do not refer to the orientation of the actuator head for positioning, since the head can be reversed.
- Install the actuated valve between 20 to 30 degrees from the vertical line to reduce the radiant heat to the actuator head.

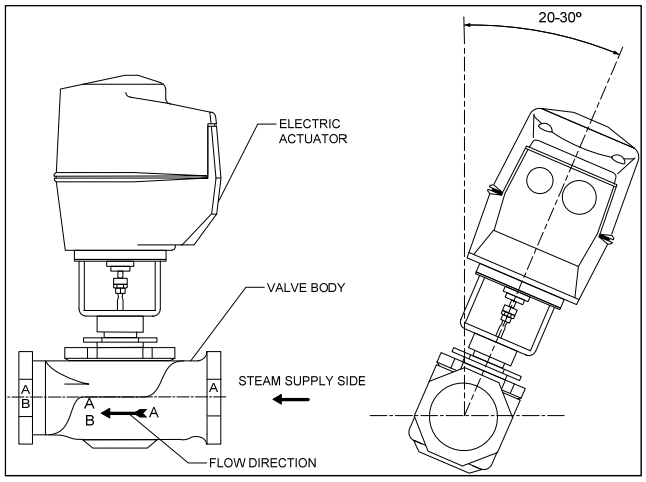


Illustration 8 - Steam Control Valve: Flow Direction and Angle

Control Valve Installation

- Use the proper size union to connect the control valve to the header steam inlet from control (port 3) valve port. The maximum distance between the steam control valve and the header should be 8” (203 mm).

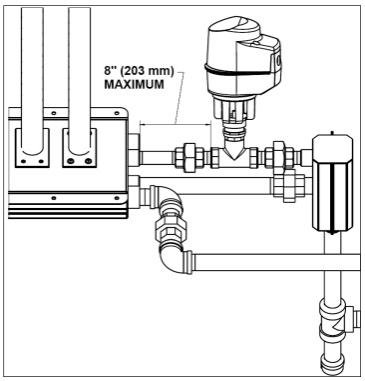


Illustration 9 - Steam Control Valve Max Distance from Header

Stage 4 – Steam Separator Installation

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

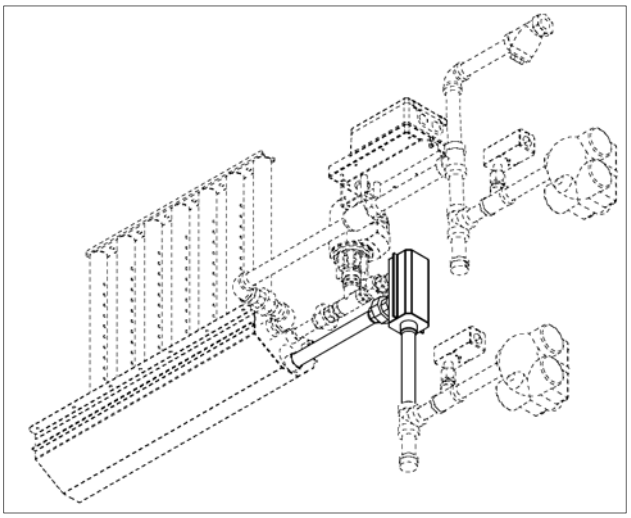


Illustration 10 - Steam Separator Installation

Steam Separator Positioning

- The steam separator must be installed so that the steam inlet and outlet always on the side, pointing horizontally. The condensate outlet must be pointing down vertically.

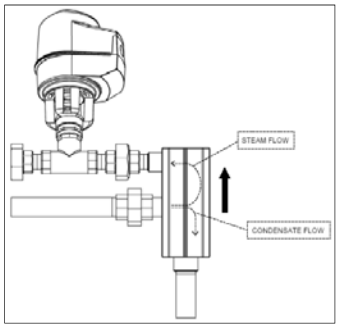


Illustration 11 - Separator Positioning

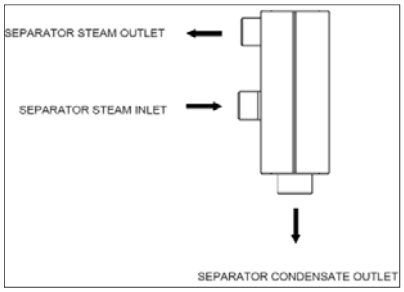


Illustration 12 - Separator Correct Installation

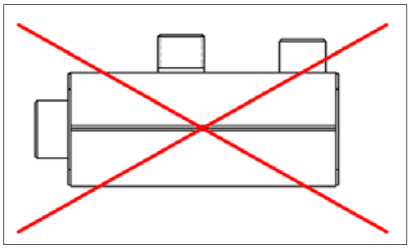


Illustration 13 - Separator Incorrect Installation

Steam Separator Installation

- Position the steam separator's steam outlet so that it is aligned with the steam control valve. A union must be used to replace the steam control valve easily. The separator steam inlet port must be aligned with the header steam outlet (connection 2). Distance between the steam control valve inlet port and the separator steam outlet must not exceed 8” (203 mm).

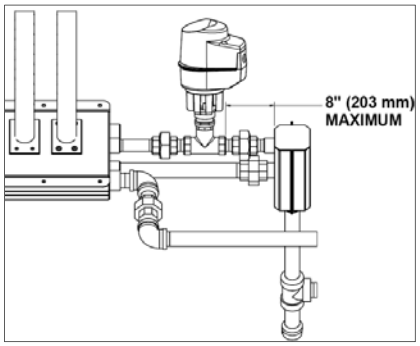


Illustration 14 - Maximum Distance between Inlet Port and Steam Outlet

- Use a proper size of threaded pipe to connect the steam separator and the control valve. The separator steam outlet must be ¼" (6.35 mm) smaller than the separator steam inlet. The separator condensate outlet is always a NPT ¾" (19 mm) connection.
- Separator connections on both sides must have a union for easy adjustment and disassembly.
- Connect the control valve with standard nipple sizes, separator steam inlet and the header steam outlet with a cut-to-length nipple.

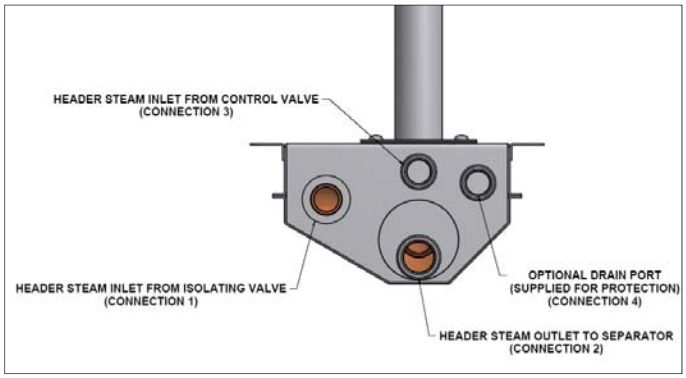


Illustration 15 - Header Connection Ports

Stage 5 – Temperature Sensor Installation

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

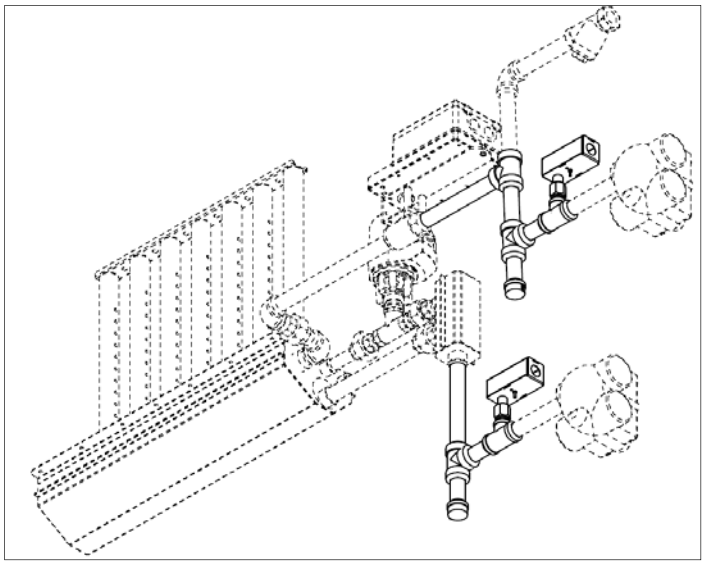


Illustration 16 - Temperature Sensor Installation

- The Multi-Steam™ HDR system requires two temperature sensors. Install the temperature sensors in the following way:
    - Upstream of the isolating valve
    - Downstream of the condensate outlet of the steam separator

Stage 6 – Float and Thermostat Steam Trap Installation

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

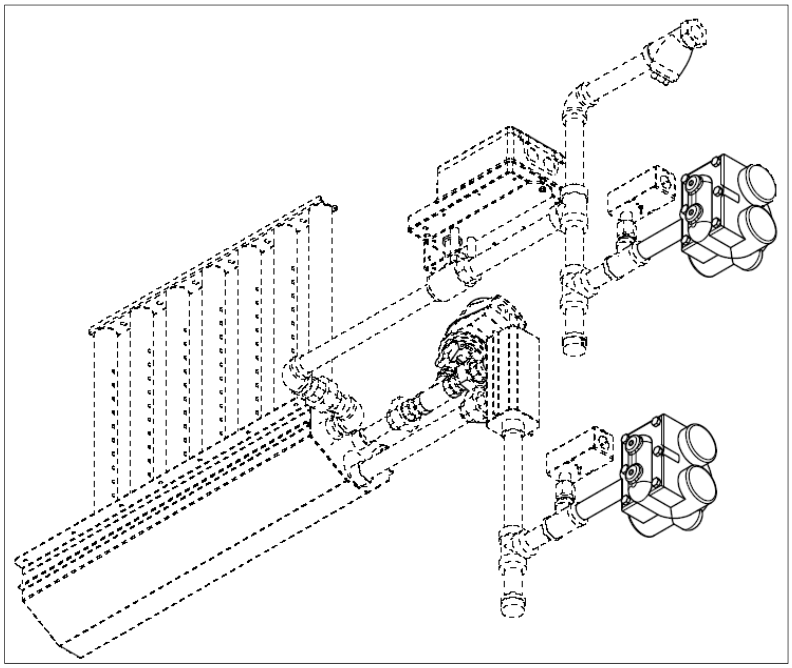


Illustration 17 - Float and Thermostat Steam Trap Installation

- The Multi-Steam™ HDR system requires installation of 2 float and thermostatic steam traps.
- Install a float and thermostatic steam trap downstream of each temperature sensor.
- Connect the float and thermostatic steam trap inlet to the temperature sensor using a single nipple.
- Connect the float and thermostat steam trap outlet to the system condensate return line.
- The distance between the temperature sensor and the steam trap should be between 5" and 7” (100-175 mm).
- If condensate has to be lifted, a check valve should be installed downstream the steam trap on the condensate side.

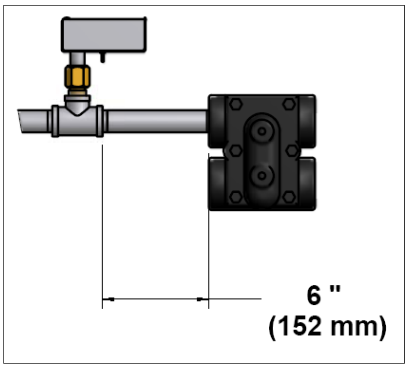


Illustration 18 - Proper Distance between Temperature Sensor and Steam Trap

Stage 7 – Strainer Installation

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

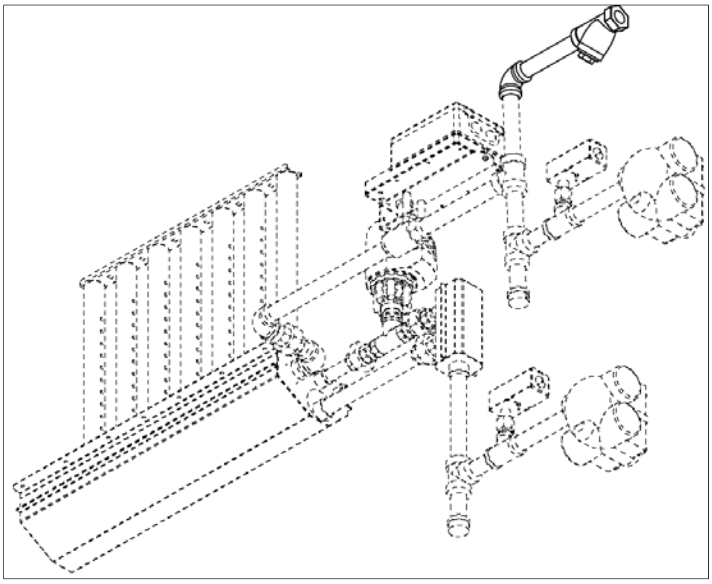


Illustration 19 - Strainer Installation

Strainer Positioning

- Install the strainer upstream the isolating valve.
- Install the strainer within six linear feet from the isolating valve, reducing the pipe length for the strainer and the first Multi-Steam™ HDR component.

Drain Port Installation

Use a drain port for cleaning the humidifier or correct the abnormal operation of steam generation, if any. It is supplied along with the humidifier.

- Connection with P-trap is not required. If not connected, the drain port must be plugged.
- If the drain port is connected, a P-trap should be installed. Dimension of the P-trap should be 10” (254 mm) in order to prevent steam from going out from the P-trap.

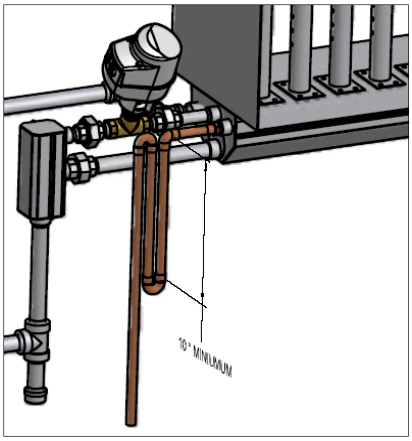


Illustration 20 - P-trap Installation

Stage 8 – Electronic Steam Controller (SKDESC-R)

Models

SKDESC-R
SKDESC-RB *with BACnet Communication*
SKDESC-RD *with Modbus Communication*

Description

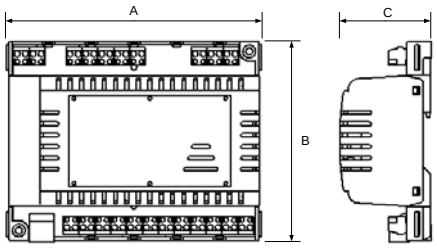
The Electronic Steam Controller is made specifically for Neptronic Multi-Steam™ HDR* Multi-Steam with Integrated Re-Evaporator Humidifiers.

Electronic Steam Controller Series

Features

- Conserves energy and eliminates condensate (dry operation)
  - o Manages isolating and modulating valves
  - o Pre-heats channel jackets only on demand for humidity
- Automatic temperature sensor adjustment
- On/Off or Modulating control
- Selectable internal or external control
- Configurable proportional control band & dead band
- Selectable Fahrenheit or Celsius scale
- BACnet or Modbus models available
- 24 Vac power supply (by others)
- Easy start up and troubleshooting
- Backlit LCD with simple icon and text driven menus

Technical Specifications

Description	SKDESC-R	SKDESC-RB	SKDESC-RD
Power Supply	24 Vac		
Power Consumption	50 VA		
Relay Output	2 relay		
Relay Rating	125 Vac, resistive load 10 amps		
Communication	-	BACnet	Modbus
Operating Temperature	0ºC to 50ºC [32ºF to 122ºF]		
Storage Temperature	-30ºC to 50ºC [-22ºF to 122ºF]		
Relative Humidity	5 to 95% non condensing		
Weight	635 g. [1.4 lb]		
Dimensions A = 6.3” | 160mm B = 5” | 126mm C = 2.25” | 57mm			

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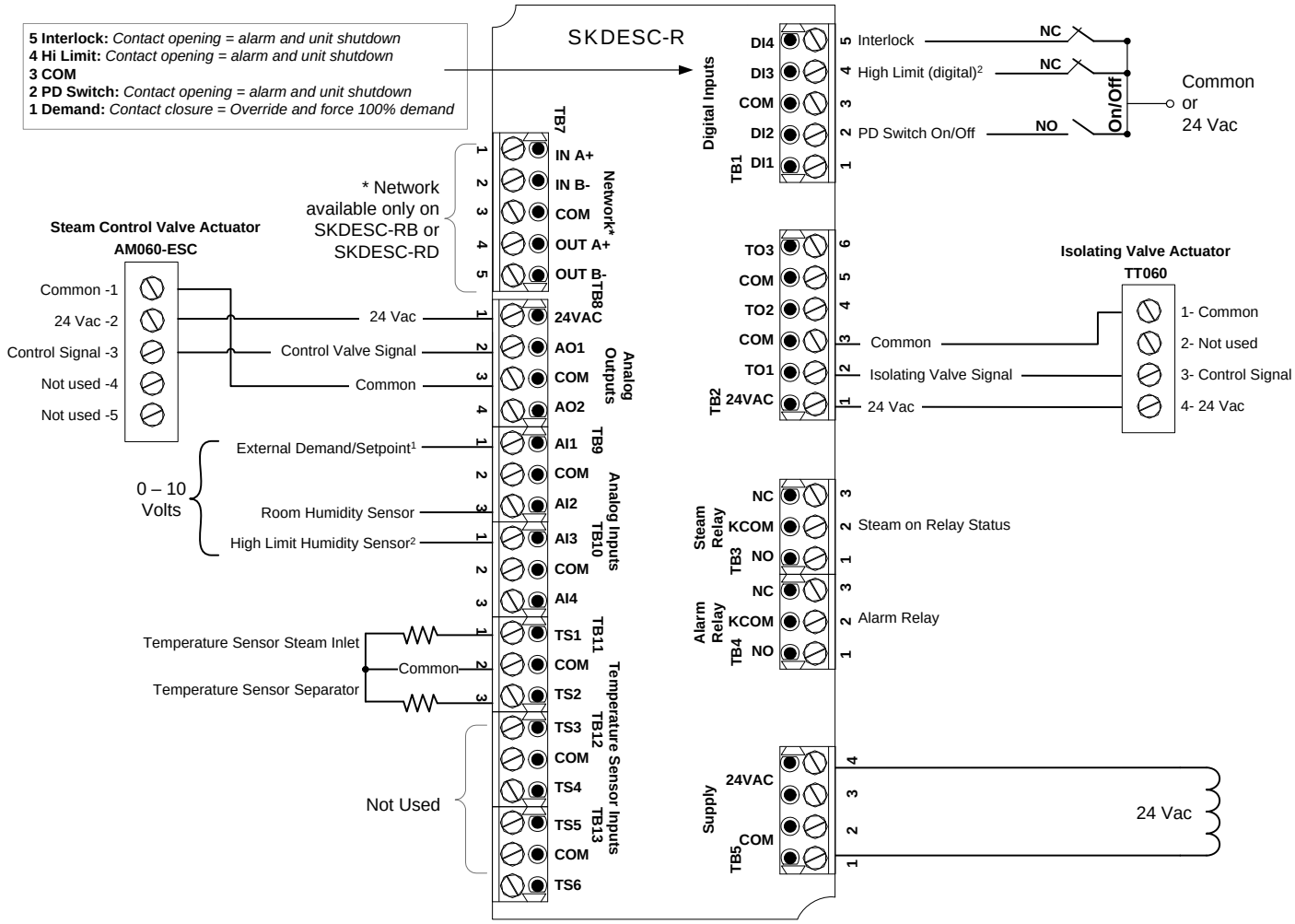
Wiring

We strongly recommend that all Neptronic products be wired to a separate grounded transformer and that transformer shall service only Neptronic products. This precaution will prevent interference with, and/or possible damage to incompatible equipment.

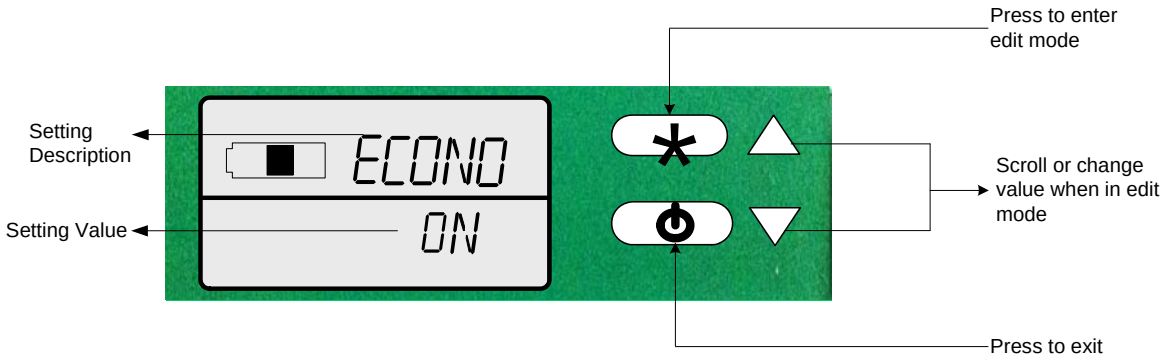


Step	Description	Terminal Block	
Step 8, “Control Mode” = extern	Used for external control signal	TB9	Pin 1
Step 8 “Control Mode” = *INTERN* and Step 13, “Externa Humidty Setpnt” = *ON*	Used for external setpoint signal		
Step 19, “High limit sensor” = *DIGITAL*	Used for connecting high limit sensor (Digital)	TB1	Pin 4
Step 19, “High limit sensor” = *ANALOG*	Used for connecting high limit sensor (Analog)	TB10	Pin 1

Symbols used in this manual

	Humidity
	Temperature
	Communication/Network
	Air Flow
	Timer/Clock

Programming Mode



To enter the Programming Mode, perform the following steps:

1. Press ⊛ to start and enter password (see Step 1 “enter passwrd”).
2. Use the arrows buttons △ or ▽ to navigate the menu.
3. Press ⊛ to enter edit mode of the displayed value.
4. Once in edit mode, use the arrows buttons △ or ▽ to change values. Changed values are automatically saved.
5. Press ⊛ to exit edit mode of the displayed value.
6. Return to step 2 or press ⏻ to exit the mode. Auto exits if no actions are taken after 5 minutes.

1. "ENTER PASSWRD"

Value: 637

Enter the password within 1 minute. After entering the correct password, press ⊛ to proceed. If you enter the wrong password, the controller returns to the normal operation mode and you have to repeat this step.

2. "LANGUAG"

Default: ENG (English)
Range: ENG (English)

Select the desired language.

3. "METRIC DISPLAY UNITS"

Default: ON
Range: ON (metric units - ºC, kg H_2O/Hr), OFF (imperial units - ºF, lbs H_2O/Hr)

Select the desired measurement system.

4. "ECONO MODE"

Default: ON (econo mode activated)
Range: ON (econo mode activated), OFF (econo mode deactivated)

In Econo mode, the isolation valve will be closed when there is no demand.

*Important: For correct operation, set the econo mode feature to **ON** (econo mode activated).*

5. "WORKING CAPACIT IN PCT"

Default: 100%
Range: 10 to 100%
Increment: 5%

This option enables you to adjust the maximum demand capacity of the full system capacity in %. This percentage is a factory setting. We recommend that you do not change this value without consulting Neptronic.

6. "STEAMIN TEMPER OFFSET"

Default:	0	
Range:	-10 to 10ºC	[-18 to 18ºF]
Increment:	0.1ºC	[0.1ºF]

Set the desired temperature reading.

7. "SEPARAT TEMPER OFFSET"

Default:	0	
Range:	-10 to 10ºC	[-18 to 18ºF]
Increment:	0.1ºC	[0.1ºF]

Set the desired temperature reading.

8. "CONTROL MODE"

Default: Extern
Range: Intern, Extern, Net

Select the desired control mode from the available options.

- *If Intern is selected: the humidifier is controlled by the SKDESC-R.*
- *If Extern is selected: the humidifier is controlled by an external signal.*
- *If Net is selected: the humidifier is controlled over the network. This option is available only on SKDESC-RB and SKDESC-RD models.*

If you selected Intern or Net, go to Step 10"network room humidty".

9. "DEMAND SIGNAL RANGE"

Default: 2-10 Vdc
Range: 0-10 Vdc, 2-10 Vdc

Select the desired relative humidity sensor signal.

10. "NETWORK ROOM HUMIDTY"

Default: OFF
Range: OFF, ON

This option is only available on BACnet or Modbus models (SKDESC-RB or SKDESC-RD). Select **ON** if you want to control the humidity over the network.

If you selected ON, go to Step 13 "Externa Humidty Setpnt".

If you selected Intern at Step 8 "Control Mode", go to Step 12 "Room humidty signal range".

11. "ROOM HUMIDTY OFFSET IN PCT"

Default: 0% RH
Range: -10 to 10% RH
Increment: 0.1% RH

Adjust the room relative humidity reading by using the offset.

12. "ROOM HUMIDTY SIGNAL RANGE"

Default: 2-10 Vdc
Range: 0-10 Vdc, 2-10 Vdc

Select the desired signal range from the available options.

If you selected Extern at Step 8 "Control Mode", go to Step 19 "High limit sensor".

13. "EXTERNA HUMIDTY SETPNT"

Default: OFF
Range: OFF, ON

Select **ON** if you want to use an external setpoint for humidity.

If you selected OFF, go to Step 15 "interna humidty setpnt in pct".

14. "SETPNT SIGNAL RANGE"

Default: 2-10 Vdc
Range: 0-10 Vdc, 2-10 Vdc

Select the desired relative humidity sensor signal. **Go to Step 16 "control dead band in pct".**

15. "INTERNA HUMIDTY SETPNT IN PCT"

Default: 40% RH
Range: 10% to 90% RH
Increment: 1% RH

Set the desired humidity setpoint in % RH.

16. "CONTROL DEAD BAND IN PCT"

Default: 2.0% RH
Range: 0% to 5% RH
Increment: 0.1% RH

Set the desired control dead band.

17. "CONTROL PROP RAMP IN PCT"

Default: 5.0%
Range: 1% to 10%
Increment 0.1%

Set the desired control proportional ramp.

18. "CONTROL INTEGRA RAMP IN PCT"

Default: 5.0%
Range: 1% to 10%
Increment: 0.1%

Set the desired control integral ramp.

19. "HIGH LIMIT SENSOR"

Default: Digital (On/Off)
Range: Disable, Analog, Digital (On/Off), Network

Select the desired type of high limit sensor from the available options. The Network option is available only on BACnet or Modbus models (SKDESC-RB or SKDESC-RD).

If you selected Digital, go to Step 24 "High limit max demand in pct".

If you selected Disable, go to Step 25 "end of season delay in hr".

20. "HIGH LIMIT SETPNT IN PCT"

Default: 80% RH
Range: 10% to 90% RH
Increment: 1% RH

Set the high limit relative humidity setpoint.

21. "HIGH LIMIT PROP RAMP IN PCT"

Default: 10.0 %
Range: 0% to 20%
Increment: 0.1%

Set the desired high limit proportional ramp.

If you selected Network at Step 19 "High limit sensor", go to Step 24 "High limit max demand in pct".

22. "HIGH LIMIT HUMIDTY OFFSET IN PCT"

Default: 0% RH
Range: -10% RH to 10% RH
Increment: 0.1% RH

Adjust the relative humidity reading of the room.

23. "HIGH LIMIT SIGNAL RANGE"

Default: 2-10 Vdc
Range: 0-10 Vdc, 2-10 Vdc

Select the high limit signal range.

24. "HIGH LIMIT MAX DEMAND IN PCT"

Default: No default (information display only)

Displays the actual reading of the high limit sensor.

25. "END OF SEASON DELAY IN HR"

Default: 100 hours
Range: 100 to 250 hours
Increment: 5 hours

This option does not appear if you have selected **econo mode** at Step 4 "econo mode". Indicates that the isolation valve will be turned off after 100 hours if there is no demand.

26. "SERVICE DELAY IN HR"

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

Set the number of hours running at 100% capacity before servicing is due.

27. "SERVICE RUNTIME IN HR"

Default: No default (information display only)

Displays the running time in hours at 100% capacity since the last service has been performed. To reset this value to 0 and reset any associated alarms, press the edit button and then press and hold both △ and ▽ arrow keys.

28. "RUNS WHILE SERVICE ALARM"

Default: ACt (active)
Range: INACt (Inactive), ACt (active)

Select **ACt** to enable the system to run even when the servicing is due.

29. "TOTAL RUNTIME IN HR"

Default: No default (information display only)

Displays the running time in hours at 100% capacity.

30. "AUTO BAUD RATE"

Default: ON
Range: ON, OFF

This option is available only on BACnet or Modbus models (SKDESC-RB or SKDESC-RD). Enable or disable Auto Baud Rate detection. When enabled, the controller automatically configures its baud rate by detecting the network speed upon connection to the network. When disabled, you must manually select the baud rate. (**go to Step 31, "baud rate"**)

31. "BAUD RATE"

Default: No default (information display only)
Range:
BACnet 9.6k, 19.2k, 38.4k, 76.8k
Modbus 9.6k, 19.2k, 38.4k, 57.6k

This option is available only on BACnet or Modbus models (SKDESC-RB or SKDESC-RD). If you selected **ON** at Step 30 "auto baud rate", the baud rate is detected and displayed automatically. If you selected **OFF** at Step 30 "auto baud rate", select the baud rate value from the available options.

32. "NETWORK ADDRESS"

BACnet

Default: 0
Range: 0 to 254

Modbus

Default: 1
Range: 1 to 246

This option is available only on BACnet or Modbus models (SKDESC-RB or SKDESC-RD). Select the desired address.

33. "ADJUST DEVICE INSTANCE"

Default: 0153001
Range: No, Yes

To change the device instance, select **Yes**. If you select **No**, the device instance will be modified automatically according to the MAC address.

34. "NETWORK PARITY"

Default: None
Range: None, Odd, Even

This option is available only on Modbus model (SKDESC-RD).Select the desired parity control from the available options.

35. "NETWORK STOP BITS"

Default: 1
Range: 1,2

This option is available only on Modbus model (SKDESC-RD). Select the desired network stop bits.

36. "NETWORK FALLBACK TIMEOUT"

Default: 0 sec
Range: 0 to 900 sec
Increment: 1 sec

This option appears if you've set one of the inputs to **Net** at Step 8 "Control Mode". Set the desired network fallback timeout.

37. "NETWORK FALLBACK SETPOINT"

Default: 0.0%
Range: 0% to 100%
Increment: 0.1%

This option appears if you've set one of the inputs to **Net at Step 8** "Control Mode"**.** Set the desired network fallback setpoint.

38. "NETWORK FALLBACK COUNTER"

Default: 0 sec
Range: 0 to 900 sec
Increment: 1 sec

This option appears if you've set one of the inputs to **Net at Step 8** "Control Mode"**.** Set the desired network fallback counter.

39. "CONTROL OUTPUT SIGNAL IN MV"

Default: No default (information display only)

Displays the control valve output in mV.

40. "ISOLAT VALVE OUTPUT STATE"

Default: No default (information display only)
Range: INACt (closed), ACt (open)

Displays whether the isolating valve is open or closed.

41. "ALARM RELAY OUTPUT STATE"

Default: No default (information display only)
Range: INACt (closed), ACt (open)

Displays whether the alarm relay is open or closed.

42. "STEAM ON OUTPUT RELAY OUTPUT STATE"

Default: No default (information display only)
Range: INACt (closed), ACt (open)

Displays whether the steam output relay is open or closed.

43. "STEAMIN TEMPER INPUT SIGNAL IN MV"

Default: No default (information display only)

Displays the steam inlet temperature sensor reading in mV.

44. "SEPARAT TEMPER INPUT SIGNAL IN MV"

Default: No default (information display only)

Displays the separator temperature sensor reading in mV.

45. "DEMAND INPUT SIGNAL IN MV"

Default: No default (information display only)

This option appears only if you've selected **Extern** at Step 8 “Control Mode”. Displays the reading of demand in mV.

46. "ROOM HUMIDITY INPUT SIGNAL IN MV"

Default: No default (information display only)

This option does not appear if you've selected **OFF** at Step 10 “network room humidty”. Displays the relative humidity reading of the room in mV.

47. "SETPNT INPUT SIGNAL IN MV"

Default: No default (information display only)

This option appears only if you've selected **ON** at Step 13 “Externa Humidty Setpnt”. Displays the setpoint reading in mV.

48. "HIGH LIMIT INPUT SIGNAL IN MV"

Default: No default (information display only)

This option appears only if you've selected **Analog** at Step 19 “High limit sensor”. Displays the high limit sensor reading in mV.

49. "EXTERN DEMAND INPUT STATE"

Default: No default (information display only)
Range: INACt (closed), ACt (open)

This option appears only if you've selected **Extern** at Step 8 "Control Mode". Displays if the demand is open or closed.

50. "AIR FLOW INPUT STATE"

Default: No default (information display only)
Range: INACt (closed), ACt (open)

Displays if the air flow switch is open or closed.

51. "HIGH LIMIT SWITCH INPUT STATE"

Default: No default (information display only)
Range: INACt (closed), ACt (open)

This option appears only if you've selected **Digital** at Step 19 "High limit sensor". Displays if the high limit switch is open or closed.

52. "INTRLCK INPUT STATE"

Default: No default (information display only)
Range: INACt (closed), ACt (open)

Displays if the interlock is open or closed.

53. "MICRO TEMPER"

Default: No default (information display only)

Displays whether the microcontroller temperature is in ºC or ºF mode.

54. "PCB TEMPER"

Default: No default (information display only)

Displays whether the PCB temperature is in ºC or ºF mode.

Alarms and Notifications

The following is a list of alarms and notifications displayed by the Steam Controller under different conditions. When each one of these occurs, the controller performs certain actions as described in the table. The alarm symbol, ⚠ is displayed along with the all the alarms and notifications.

Display	Description
NO AIR FLOW ALARM	Indicates that the air flow sensor is not detected. - control valve is closed - isolating valve is closed
HIGH LIMIT CUTOUT ALARM	Indicates that the duct humidity has exceeded the high limit level. - control valve is closed - isolating valve is closed - alarm relay is activated
SERVICE WARNING ALARM	Indicates that the servicing is due in less than 100 hours. - alarm relay is activated Service the unit and reset the unit by pressing the arrow keys △, ▽ for three seconds.
SERVICE UNIT ALARM	Indicates that the service is due. This alarm is displayed only if you've set the option to *INACT* at Step 28 “runs while service alarm”. - control valve is closed - isolating valve is closed - alarm relay is activated
INTER LOCK ALARM	Indicates that the inter lock is activated. - control valve is closed - isolating valve is closed - alarm relay is activated
FLOODED SEPARATE STEAM TRAP FAILURE	Indicates that either the separator steam trap is flooded or the temperature is too low. - control valve is closed - alarm relay is activated
FLOODED STEAMIN TRAP FAILURE	Indicates that either the steam inlet trap is flooded or the temperature is too low. - control valve is closed - alarm relay is activated
SEPARAT TEMPER SENSOR FAILURE	Indicates that the separator sensor is defective. - control valve is closed - isolating valve is closed - alarm relay is activated
STEAMIN TEMPER SENSOR FAILURE	Indicates that the steam inlet sensor is defective. - control valve is closed - isolating valve is closed
ROOM HUMIDITY SENSOR FAILURE	Indicates that the room humidity sensor has failed. - control valve is closed - isolating valve is closed - alarm relay is activated
HIGH LIMIT HUMIDITY SENSOR FAILURE	Indicates that the high limit humidity sensor has failed. - control valve is closed - isolating valve is closed - alarm relay is activated

Power Up

Upon power up, the LCD illuminates and all segments appear for 2 seconds. The thermostat then displays its serial number, model, and revision for 2 seconds. In the Operation Mode, the information is displayed automatically in a sequence. If you wish to scroll the information quickly, use the △, ▽ arrow keys.

Humidity Levels

The following humidity levels are displayed:

- *HUMIDITY SETPNT IN PCT* - Humidity setpoint in % RH
- *ROOM HUMIDTY IN PCT* - Room humidity reading in % RH
- *HIGH LIMIT HUMIDTY IN PCT* - Duct sensor reading in % RH

Control Parameters

The following control parameters are displayed:

- *CONTROL DEMAND IN PCT* - Current demand of the total system capacity measured in %
- *CONTROL OUTPUT IN PCT* - Current output of the total system capacity measured in %
- *CONTROL DEMAND* - Current demand measured in kg/hr or lbs/hr
- *CONTROL OUTPUT* - Current output measured in kg/hr or lbs/hr

Temperature Levels

The following temperature levels are displayed:

- *STEAMIN TEMPER* - Steam inlet temperature measured in ºC or ºF
- *SEPARAT TEMPER* - Separator temperature measured in ºC or ºF

Initial Verification

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

Installation

- Ensure that the humidifier is installed properly according to the installation manual.
- Check that steam distributors are properly installed into the ventilation duct.
- Ensure that there is no leakage on the Multi-Steam™ HDR piping.

Electrical

- Confirm that 24 Vac is present between tab 1&4 of terminal block TB5 on the SKDESC-R Steam Controller.

Drain if required

- If there is a steam trap on the header, confirm that the drain piping is properly connected with a pitch of least ¼'' (1.5 mm) per 40'' (1m). There is no header on the jacketed single channel configuration and therefore there is no steam trap on the header.

Steam Supply

- Ensure that the steam supply is on.
- Ensure that there is no leakage on the steam piping while the steam supply is on.

Controls

- Ensure that a high limit duct humidistat is installed, properly connected to the SKDESC-R and the setpoint is properly adjusted.
- Verify that the room humidistat or returned air duct humidistat is installed, properly connected to the SKDESC-R, and the setpoint is properly adjusted.
- Turn on the power at the disconnect switch.
- Confirm the control set-up of the humidifier. The humidifier is factory set with EXTERNAL control set-up, which means that the humidity demand is controlled by the room, duct humidistat, or a BMS.
- Ensure that the type of signal (0-10 Vdc, 2-10 Vdc or 4-20 mA) of the humidistat corresponds to the type set in the humidifier control set-up.

Start-Up Procedure

Start-up

Proceed to start-up the humidifier as follows:

- Make sure that the steam is supplied to the Multi-Steam™ HDR.
- Switch on the SKDESC-R.
- Make sure that there is no alarm. If the A6 alarm stays on, it means that the steam does not reach the separator or there is a problem with evacuating the condensate from the separator steam trap.
- Wait for a call for humidity or create it by setting the SKDESC-R “Control Mode” to Internal (step #8 and the “Externa Humidty Setpnt” to OFF (step #13). Then, adjust the setpoint to a higher value than the room humidity reading (operation mode B).
- The isolating valve will open within 30 seconds. If not, check for alarms (no airflow, enable/disable off). If there is no alarm, there is no humidity demand. Make sure there is a demand and redo start-up procedure (d).
- After the isolating valve opens, the temperature of the separator will increase. Within 30 seconds, the temperature of the separator should be higher than 212°F (100°C). The temperature is displayed on the SKDESC-R LCD.
- Once the temperature is high enough, the control valve will open slowly.
- The start-up is completed and the humidifier is now functional.

Safety Test

- Check for steam or condensate leakage while the humidifier is in operation.
- Check the bottom of the airflow switch in the system and its operation by stopping the fan or by disconnecting air pressure connection. With no air movement in the duct, SKDESC-R should automatically stop the humidifier by closing control valve.

Reset the Setpoint and Control Mode

- If the humidity setpoint is controlled by the SKDESC-R, reset the setpoint to the desired relative humidity % as suits the room.
- If the humidity setpoint is controlled by another device than the SKDESC-R (typically by the BMS), set the internal control signal to OFF.

End

- The humidifier is ready for normal operation.

General Conditions of Sales and Warranty

General warranty policy

- Provided that the terms of payment are observed, the purchaser is offered a warranty of 24 months from the original purchase date of delivery for any Neptronic Humidifier SK300, SKR, SKE, SKS, SKD-R and SKG Series, provided the equipment has been properly installed and operated in accordance with Neptronic instructions.

- The warranty covers faulty manufacture, design and/or defective materials and is limited to the equipment and components. The warranty shall cease to be valid in the event of misapplication, incorrect installation, improper maintenance or any other incorrect uses or misuse of the product.

- For the SK Series, the warranty furthermore ceases to be valid if the user disconnects or removes any electronic or mechanical components prior disconnecting the input power. Neptronic assumes no responsibility for repairs made on equipment, unless performed by Neptronic's authorized personnel.

- All defective product or component under warranty must have a valid Return Material Authorization (RMA) number issued prior to be processed. To request an RMA number, purchaser must provide the model number and serial number/date code of humidifier and certain components such as sensor and PC board etc.

- Neptronic agrees under the warranty to repair or replace (at the discretion of Neptronic) such standard products or components, which on examination by Neptronic are found to be defective.

- Product or component replaced or repaired under warranty will be sent back to the purchaser, standard ground freight paid by Neptronic.

- Expenses in connection with travelling time, dismantling and mounting shall not be paid by Neptronic.

- Guarantee for products or components sold but not manufactured by Neptronic, is only given to the same extent as given to Neptronic, however, not exceeding the normal Neptronic warranty.

- Parts used for repairs are warranted for the balance of the term of the warranty on the original humidifier or 90 days, whichever is longer.

- Any repairs made at the Neptronic facilities after the original warranty period are warranted for 1 month from the date of repair.

Special agreement on components under warranty

- For certain defected components under warranty, based on valid reasons, the purchaser has two options:

  1) Send back immediately the defective component(s) for inspection and the purchaser is responsible for freight to Neptronic. The full purchase price will be credited once the defective component(s) is received and the manufacturing defect is found upon inspection by Neptronic.
  OR
  2) Replacements will be sent without requiring returning of the defective component(s), standard ground freight paid by Neptronic at zero value invoice. Although the purchaser must hold defective component(s) for a period of 12 months whereas Neptronic reserves the right to claim the defective component(s) back for inspection at any time. If the claim is found to be out of warranty coverage upon inspection by Neptronic, the replacement parts sent free of charges will be then charged to the purchaser.

** The Multi-Steam™ HDR model is not available in the United States*

Notes

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