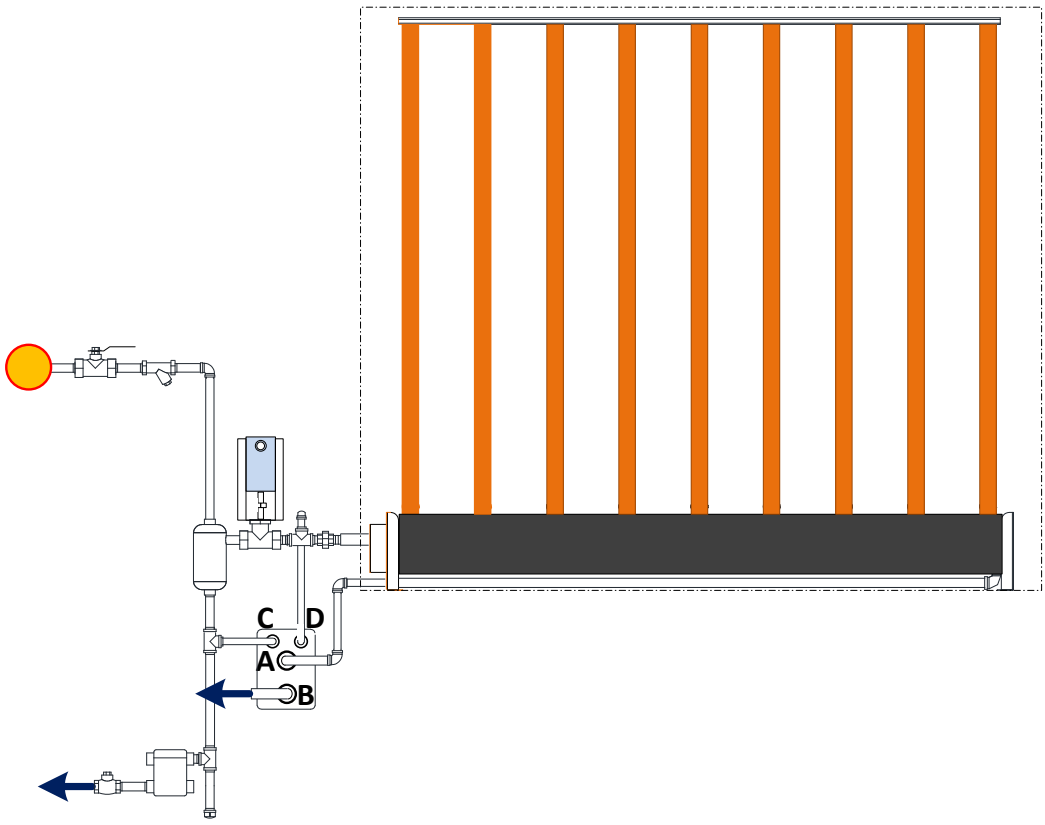
ILS-SO/SE

LIVE STEAM HUMIDIFIER - STEAMOSORB

To be used with a central steam boiler



Installation instructions and user manual

Read and save this document

Tel.: 1-844-357-4477 • www.steamOvap.com

Rev.190801

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Introduction

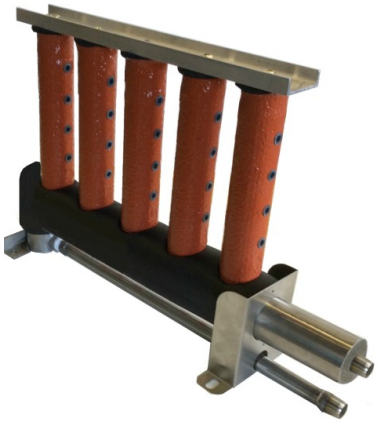


Figure 1 - ILS-SOE steamOsorb

Foreword

Thank you for purchasing ILS Live steam humidifier from steamOvap

If you have questions or comments please contact us:

www.steamOvap.com
info@steamOvap.com
1-844-357-4477

Intended use

ILS-SO/SE Live steam humidifier from steamOvap is conditioning and distributing steam from a central boiler in the Air Handling Unit (AHU) or an air duct with a vertical multi-ramp steam distribution pipes.

ILS-SO/SE humidifier is controlled by an, fully modulating and linear electronic steam motorized valve. Vertical multi-ramp steam distribution pipes are non-insulated on model **ILS-SO** and thermally insulated on model **ILS-SE**.

Thermal insulation is dramatically reducing the quantity of condensate resulting from the contact of air with the hot steam pipe.

This condensate can be evacuated to drain or pressurized and returned to the boiler in a closed loop circuit with a pressure motive pump option.

The intended use of the **ILS-SO/SE** Live steam humidifier is to condition and distribute steam from water at atmospheric pressure for the air humidification.

Installation and Operation Manual Limitation

This IOM is intended for trained and qualified personnel and must be applied along with the applicable local codes and regulations.

Any work related to installation or service for this humidifier must comply with local code and regulation regarding safety and prevention of accidents.

End of life disposition

Ensure that ILS **Live steam** humidifier is not pressurized and/or hot, if not put off by closing the shut-off valve at the inlet of the circuit and allow sometime for all components to cool off.

Disconnect **ILS** Live steam humidifier from power supply, electrical control signal, Steam supply line, and drain. **ILS** Live steam humidifier can then be removed.

ILS Live steam humidifier is an assembly of mechanical and electrical equipment and as such MUST not be disposed of in domestic waste.

This humidifier should be returned to the closest steamOvap authorized representative for proper recycling and disposition of components according to local regulations.

Safety Warning

section 0

General

Risk of electric shock.
Disconnect power supply before installation or service.

For safety and warranty reasons, Installation and service of this humidifier should be carried out by trained and qualified personnel.
Any work related to installation and service of this humidifier must comply with local code and regulation regarding safety and prevention of accidents.
Risk of Burnt: During and after the operation of this humidifier all of the steam components such as: steam pipes, strainer, steam valve(s), separator, steam ramps, steam trap, temperatures switch and others, can be very hot.

Electrical Warning

Risk of electric shock.
Disconnect power supply before installation or service.
Power supply connection must be done by a trained and qualified electrician.

Any work related to power supply installation or service of this humidifier must comply with local code and regulation regarding safety and prevention of accidents.

Plumbing safety warning

Any work related to steam supply, drain connections and condensate returns lines, installation or service of such for this humidifier must comply with local code and regulation regarding safety and prevention of accidents.

Steam supply and condensate lines connections must be done by a trained and qualified plumber.
Risk of malfunction. Steam lines should not have any restriction or blockage that may cause a burst of pressure in the steam line.

Others

Risk of flooding. In order to avoid any risk of flooding steamOvap recommends a Hi limit humidity switch installed in the air duct downstream of the steam distribution ramp.
Risk of freezing. Plan an anti-freeze protection in case of installation in a location that would be exposed to outside conditions and susceptible of freezing.
Risk of malfunction. Do not block steam outlet(s).

Before to proceed to Installation

section 1

Please read this Installation and Operation manual before to proceed to the Installation

Receiving & Unpacking

1. Upon receipt verify that packaging is complete and not damaged.
   In case of damage, and/or missing boxes advise immediately the carrier by writing a note on the waybill.
2. Verify that model of the humidifier matches the purchase order and that all components are included.
3. Any missing item should be reported as soon as possible to steamOvap or its representative and within 5 business days after receipt.
   steamOvap will not assume any responsibility for missing item after this delay.
4. Proceed carefully to unpacking, and check that the all components forming the ILS humidifier are not damaged. in case of damage please proceed as for point 3

Included in standard delivery of ILS-SO/SE Live steam humidifier

1. ILS-SO or SE steam distribution (vertical) ramps
2. Electric control motorized valve
3. Steam separator
4. Strainer
5. Steam trap

Additional options & accessories

6. Steam trap safety temperature switch
7. Manual or electric On-Off shut off valve
8. Pressure motive pump
9. RH% sensors for duct or room or Room humidistat with display and set point control
10. HI Limit RH% safety switch
11. Air flow switch

ILS-SO Overview

section 2

ILS-SO – steamOsorb multiramp

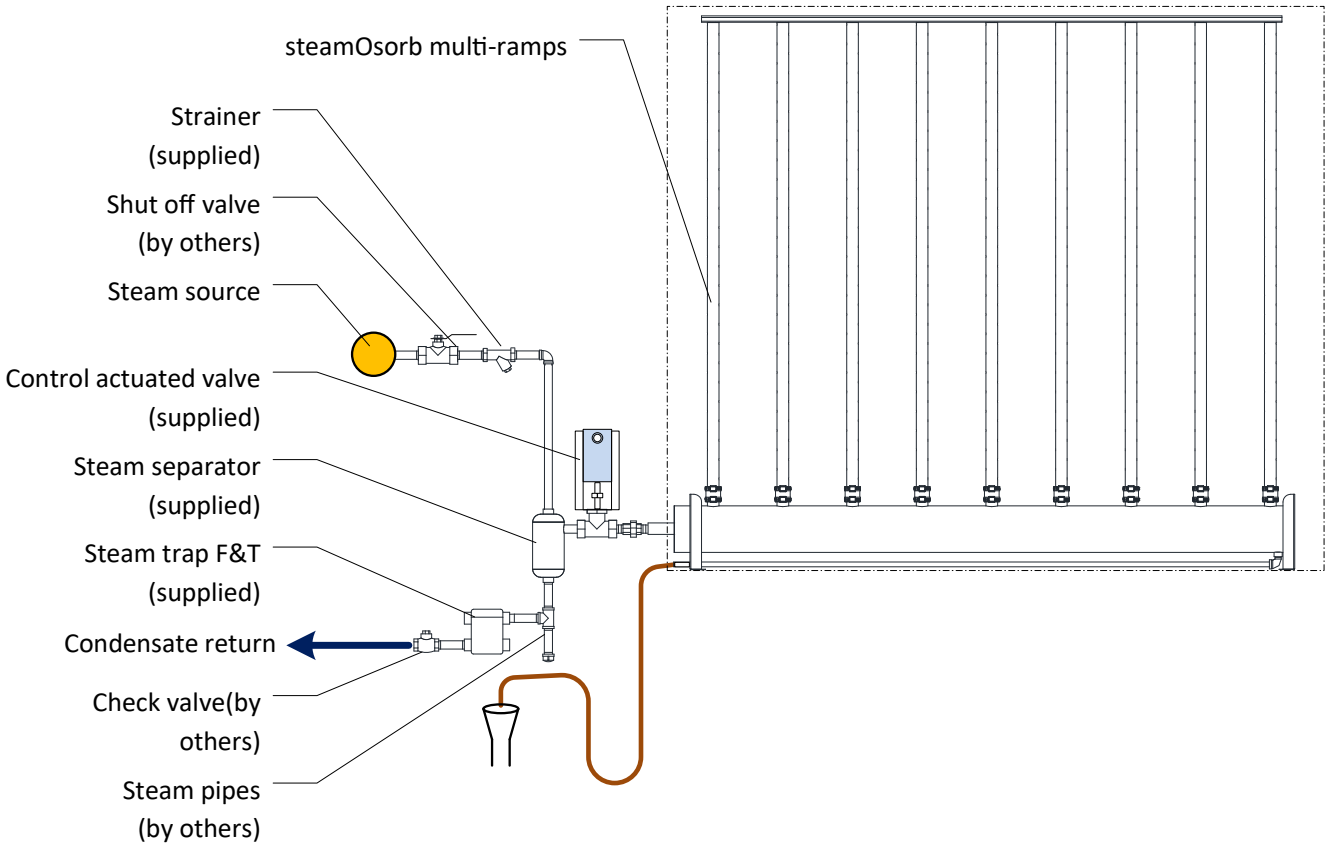


Figure 2 - Vue générale ILS-SO multi rampes

Optional components

- Steam trap safety temperature switch
- Electrical 2 position shut-off valve on steam inlet
- Electric drain cooler

Controls

- HI Limit RH% safety switch
- Air flow switch
- RH% sensors for duct or room or Room humidistat with display and set point control

Model ILS-SE – thermal insulation information

High efficiency thermal insulation is made of 2 materials

- Fiberglass braid hollow sleeve offering optimal thermal resistance with steam ramp.
- Iron oxide red silicone rubber outer shell with exceptional chemical, abrasion, UV and moisture resistance, ensuring robust and risk free damage during on-site installation.

Thickness : 0.142po [3.6mm]
Max operation temperature 500°F.
ASTM E84 (equivalent to UL723) certified.
Nozzle are made of polymeric material with no risk of condensate spitting.
Buses en matériau polymère, sans risque d'éjection de condensat

steamOvap high efficiency thermal insulation is a round sleeve which do not have longitudinal joint causing thermal bridge and premature degradation and is damage free risk during installation and during the life of the steam ramp.

Figure 3 thermal insulation and nozzle detail

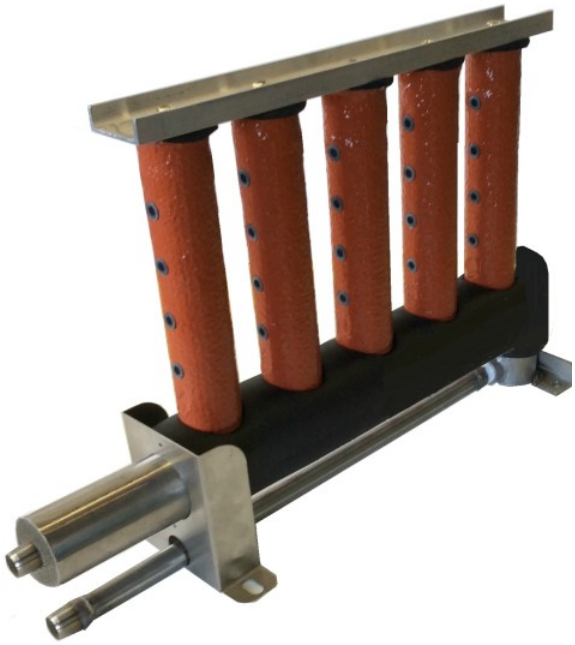


Figure 4– ILS-SE

ILS-SO & SE Multi ramps – Installation overview

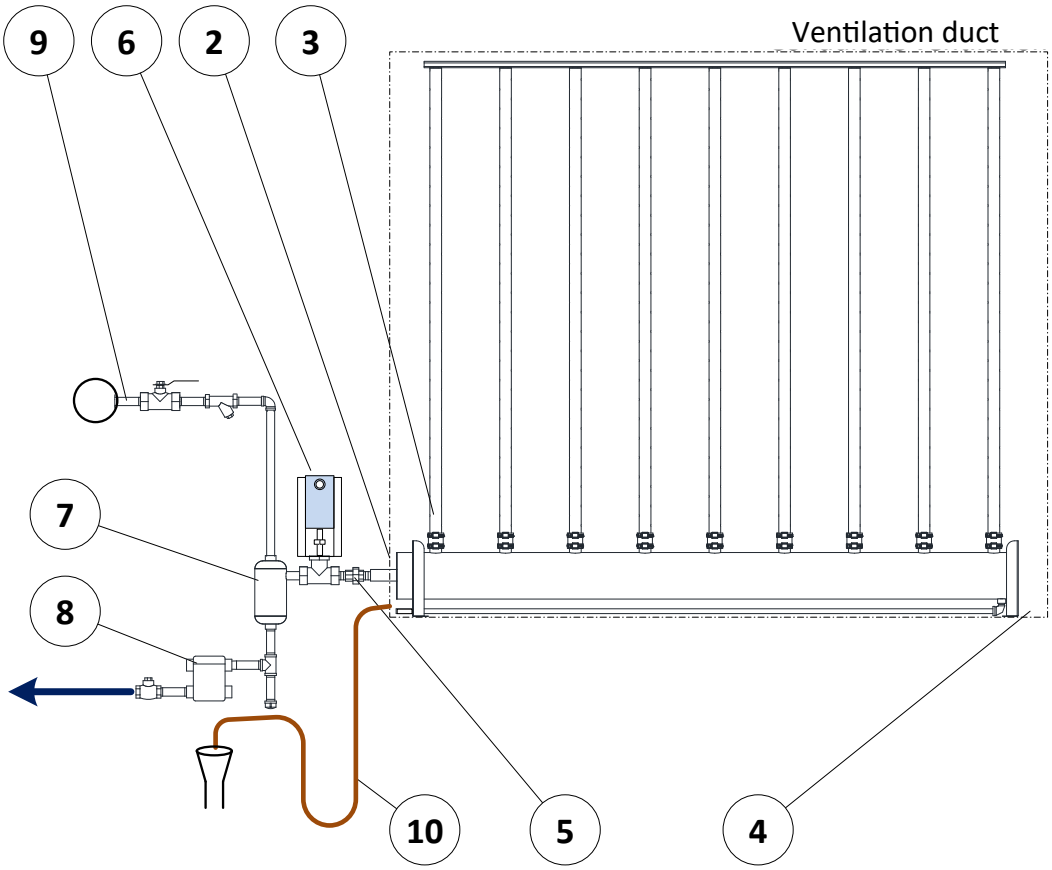


Figure 5 - Assembly steps for ILS-SO/SE

1. Make sure you have all the required components and tools on hand before to proceed.
2. Make an opening in the ventilation duct for the steam inlet in steamOsorb header, and for the condensate return line.
3. If required (assembly not factory made), proceed to the assembly of the steamOsorb multi-ramps
    a. Install the condensate return line at the outlet of the steamOsorb header. Ensure that the connection is leak free.
    b. Install the vertical steam distribution pipes on the header. Make sure that the steam outlet are perpendicular to air flow.

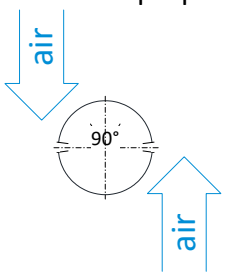


Figure 6 - vertical pipes position relative to air flow

    c. Install and secure the top bracket on the vertical tubes.

4. Position and attach the steamOsorb multi-ramps assembly inside the duct, secure the front and back bottom brackets, then attach the top bracket to the top of the duct.
   A blanking plate to seal the openings to the duct can then be installed and seal with proper and approved sealant.
   Sealant should be fire rated and rated for a temperature compatible to the steam temperature (250F or above).
5. It is a good practice to install unions connection allowing for the isolation and easy dismantling of the different sections of the humidifier steam components.
6. Install the motorized valve (control valve) at the inlet of the steamOsorb header.
   It is recommended to tilt the motorized valve to a 30 to 45° angle from the vertical in order to avoid direct heat transfer from the valve to the actuator.

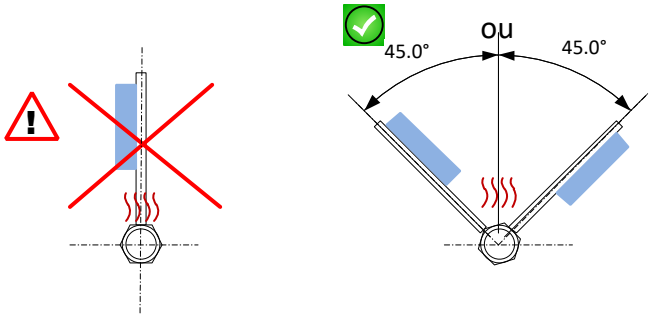


Figure 7 - Tilting motorized valve recommendation.

7. Install the steam separator upstream of the control valve, as closed as possible from this one. This way the steam supplied to the control valve will be free from condensate.
8. Install the condensate line from the steam separator and the F&T steam trap. Plan for sufficient vertical run to trap all the condensate from the separator.
   If a temperature safety switch is required, install this one on a horizontal line at around 12in from the inlet of the F&T steam trap.
   Condensate line from the F&T steam trap are pressurized and can be return to the boiler.
9. Install the steam supply line with the strainer,
   It is a good practice to install a manual (or motorized) shut off valve on this steam supply line.
10. Install the condensate drain line from the steamOsorb condensate outlet.
    This drain should be directed to a building drain line.
    Ensure that a P trap of sufficient height is provided (P-trap should be equal to duct static pressure in in.w.c plus a minimum of 2in).
    Caution: those condensate are not pressurized and cannot be returned with or mixed with the ones from F&T steam trap.
11. Before to put in service, make sure that all connections have been tightened up and are leak free.

section 3

Installation – step 1
steamOsorb Positioning & Mounting

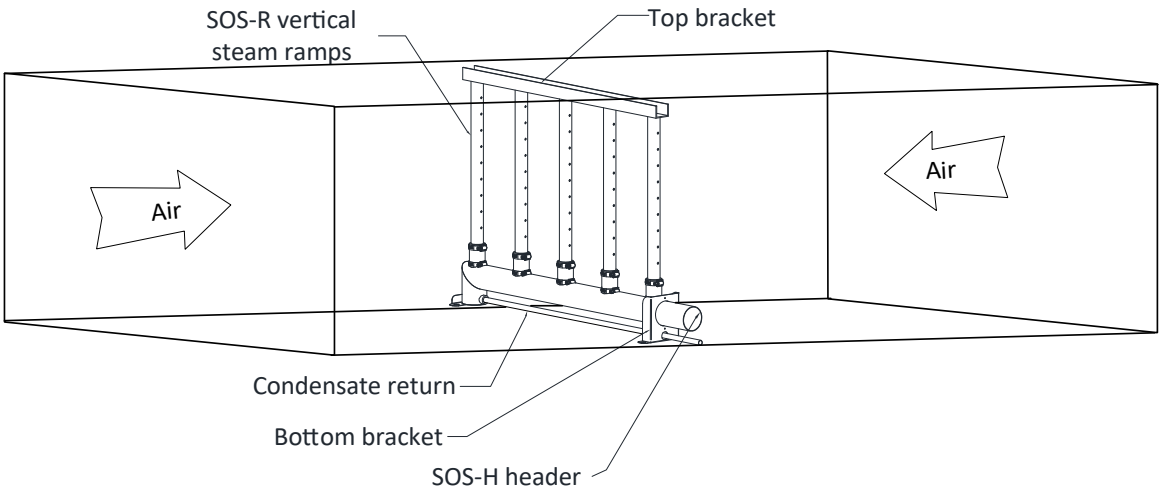


Figure 8 - SOS & SOE installation in horizontal duct

steamOsorb assembly

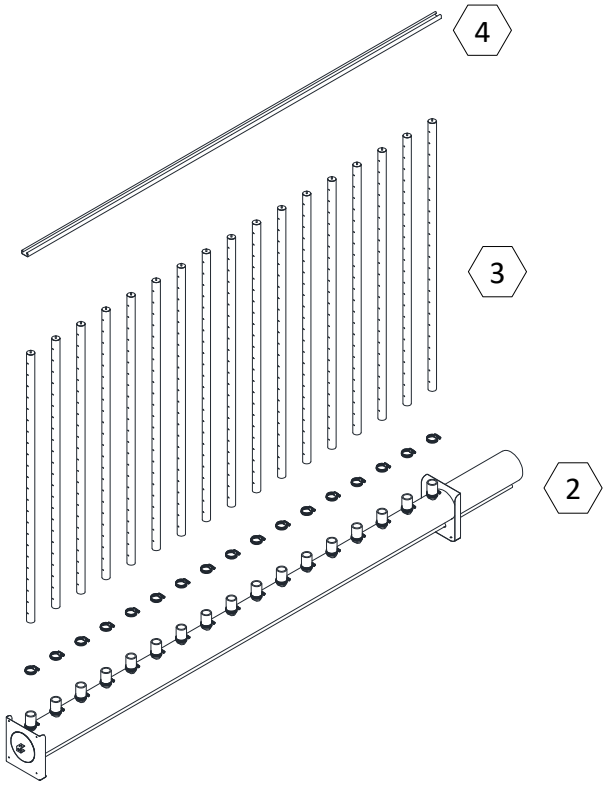


Figure 9 - SOS on site assembly & installation

Installation steps

1. Plan for the positioning of the **SOS or SOE** in the air duct.
   Make sure there will be sufficient space downstream for the full absorption of the steam.
   Prepare 1 or 2 openings in the air duct for the steam connection and for the condensate line.
   Condensate line can be located below the **SOS or SOE** header or a line can be returned below end next to the steam inlet.
2. Install the **SOS** or **SOE** Header into the air duct.
   in a horizontal duct the Header should be installed on the air duct floor.
   Attach the header's back and front bracket to the air duct
3. Install the vertical ramps onto the muffs connection already attached to the SOS Header.
   Make sure that the steam outlets are positioned perpendicular to the air flow.

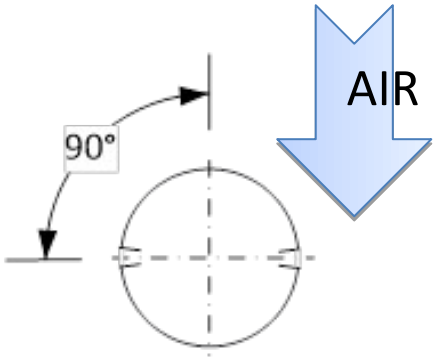


Figure 10 - steam outlets should be perpendicular to air flow

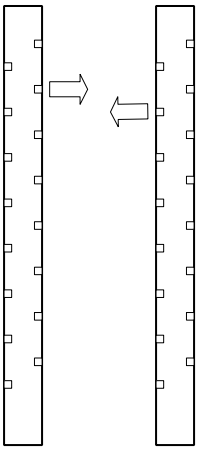


Figure 11 - steam outlets should be staggered

   Ensure that the steam outlets are staggered to each other's in between ramps.
   Once properly positioned, prepare the clamps on the muffs connections; do not tighten the clamps yet.
4. Install the top bracket onto the vertical ramps, and secure it with the provided nuts.
   At this point you can verify proper position of the vertical steam ramps and tighten all the muffs clamps.
5. Attach the top bracket to the air duct walls.
6. Connect the steam supply line to the steam inlet of **SOS** or **SOE** Header.
   It is a good practice to install a piece interconnection hose in between steam supply rigid line and the steam inlet of the **SOS** or **SOE** Header.
7. Connect the condensate line
   Make sure that the condensate line is equipped with a P-trap of sufficient height.
   Condensate P-trap height should be 2in +air duct static pressure measured in inch of water column [mm of water column].
   Ensure that the condensate line is made of material compatible to hot water (212°F [100°C]).

Installation – step 2
Control valve

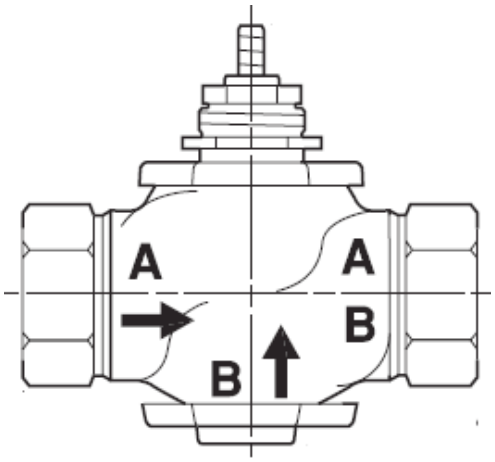


Figure 12–globe valve ports

Figure 13–motorized control valve

Motorized control valve specification

Max steam pressure: 100PSI
Type : Normally closed globe valve
Materials : Bronze body (stainless steel body in option), Stainless steel trim, Teflon seat
ANSI Pressure class: 250PSI
Max Delta P (steam) : 35PSI [241kPa]
Max steam temperature : 337°F [171°C]
Modulation ratio : >100 :1
Power supply : 24Vac 20/60Hz
Control signal : 2-10Vdc
Fail safe : Valve is closing in case of power loss.

Installation steps

1. It is a good practice to install unions connection allowing for the isolation and easy dismantling of the different sections of the humidifier steam components.
   Install the motorized valve (control valve) at the inlet of the steamOsorb header.
2. Ensure to align outlet of the valve with the inlet of the steamOsorb header. To do so follow indication on the valve body.

In case condensate from steamOsorb is directed to the boiler by using a pressure motive pump. A Tee connection should be installed at the outlet of the control valve. It will serve as vent for the pressure motive pump. Please refer to the installation step 6.

3. It is recommended to tilt the motorized valve to a 30 to 45° angle from the vertical in order to avoid direct heat transfer from the valve to the actuator.

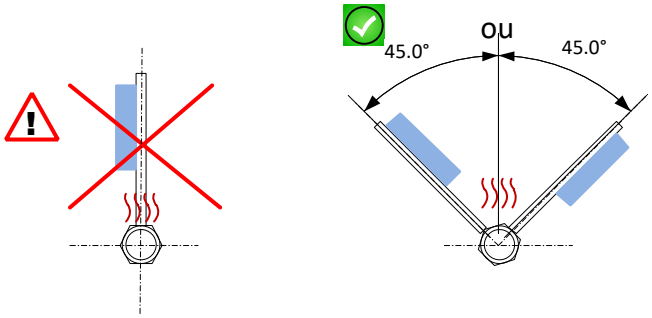


Figure 14 - Tilting motorized valve recommendation.

Installation – step 3
steam separator

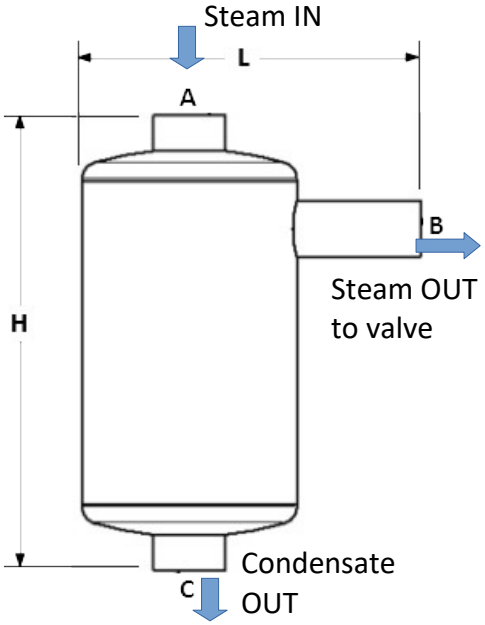


Figure 15–globe valve ports

Steam separator dimensions

Model	A	B	C	H	L
KS01	NPT1/2	NPT1/2	NPT3/4	7.5in	5in
KS02	NPT3/4	NPT3/4	NPT3/4	8.5in	6.3in
KS03	NPT1	NPT1	NPT3/4	11in	8in

Steam separator is made in stainless steel grade 304
Max pressure : 15PSI [1.03bar]

Installation steps

1. Install the steam separator upstream of the control valve, as closed as possible from this one. This way the steam supplied to the control valve will be free from condensate.
2. It is a good practice to install unions connection allowing for the isolation and easy dismantling of the different sections of the humidifier steam components.
3. Install the steam separator at the inlet of the control valve.
   Ensure to align steam outlet of the separator with the inlet of the control valve. To do so follow indication on the valve body.

Installation – step 4
Pressurized condensate line

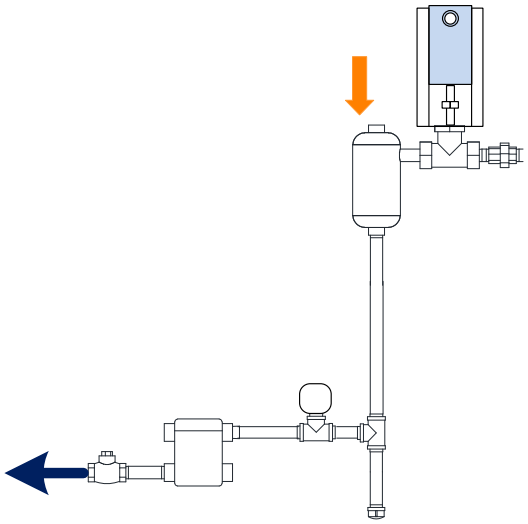


Figure 16–pressurized condensate line to steam trap

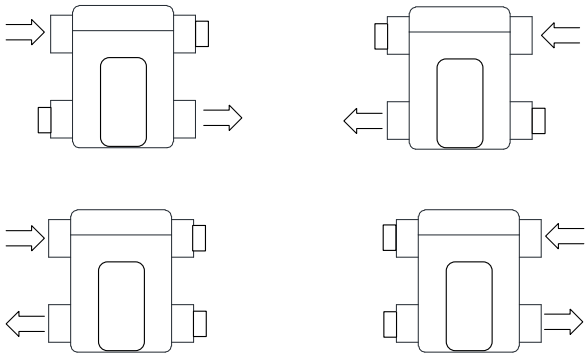


Figure 17–Inlet & Outlet options for steam trap

Installation steps

1. Install the condensate line from the steam separator to the F&T steam trap.
   Plan for sufficient vertical run to trap all the condensate from the separator.
   In case condensate from steamOsorb is directed to the boiler by using a pressure motive pump. A Tee connection should be installed at the outlet of the separator on the vertical line. It will serve as steam pressure inlet for the pressure motive pump. Please refer to the installation step 6.
2. If a temperature safety switch is required, install this one on a horizontal line at around 12in from the inlet of the F&T steam trap.
3. Condensate line from the F&T steam trap are pressurized and can be return to the boiler.
4. Any horizontal line should be pitched to avoid potential water hammer problems.
5. It is a good practice to install unions connection allowing for the isolation and easy dismantling of the different sections of the humidifier steam components.

Steam trap specification

Steam trap type : Float & Thermostatic
H configuration for easy and versatile installation
Material : Cast iron body, internal components in stainless steel.
Connexions size : NPT 3/4in

Figure 18 – F&T steam trap

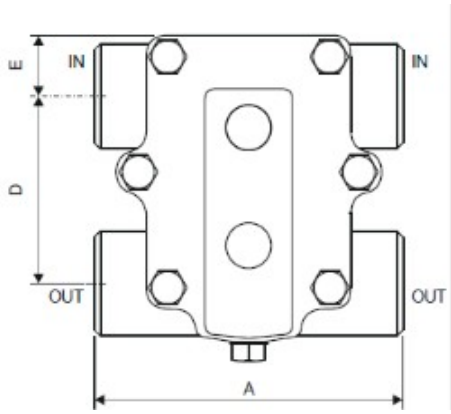


Figure 19– H configuration for easy installation

Optional Temperature switch specification

Figure 20 – Adjustable temperature safety switch

Temperature range : 0 to 225F
Wetted material: Brass
Temperature switch is mounted on a Tee with NPT3/4 in and out connections

Contacts: NO & NC
Rating: 1/8HP at 125Vac, 1/4HP at 250Vac

Temperature setting should be between 195 and 200F

Installation steps

1. If a temperature safety switch is required, install this one on a horizontal line at around 12in from the inlet of the F&T steam trap.
2. Any horizontal line should be pitched to avoid potential water hammer problems.
3. It is recommended to tilt the temperature switch to a 30 to 45° angle from the vertical in order to avoid direct heat transfer from the piping to the temperature casing.
4. Temperature setting should be between 195 and 200F

Installation – step 5
Steam supply line

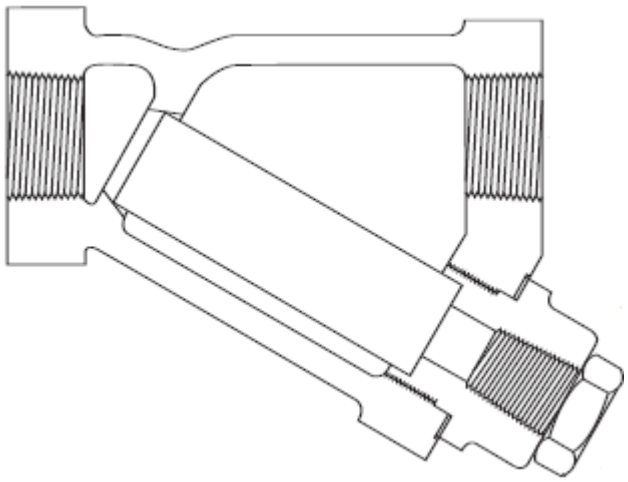


Figure 21- Strainer section view

Steam strainer specifications

Max steam pressure : 400PSI [28.5bar] – without hammering
Material : Cast iron body (ASME B16.4), strainer in stainless steel

Installation steps

1. Install the steam supply line with the strainer,
2. If required, install a manual (or motorized) shut off valve (not supplied) on the steam supply line.
3. Any horizontal lines should be pitched to avoid potential water hammer problems.

Installation – step 6
Condensate line from steamOsorb

Option 1 – Condensate to building drain

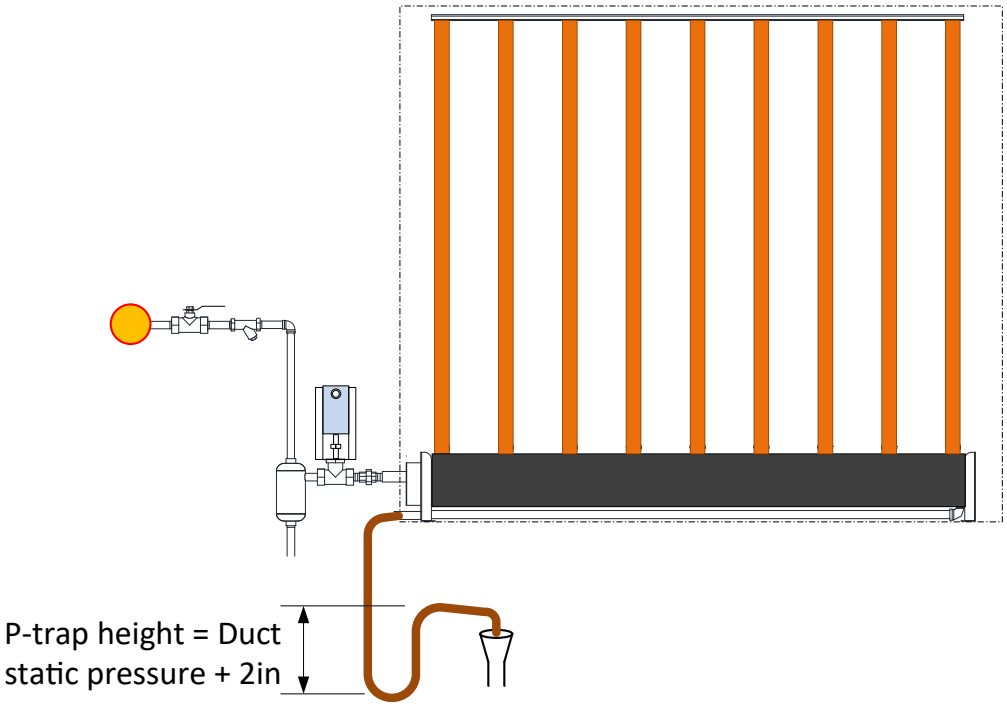


Figure 22 – Condensate from steamOsorb to drain (SOE)

Installation steps

Caution : Condensate from steamOsorb are not pressurized and cannot be returned with or mixed with the ones from F&T steam trap.

1. Install the condensate drain line from the steamOsorb condensate outlet.
   This drain should be directed to a building drain line.
   Ensure that a P trap of sufficient height is provided (P-trap shoul be equal to duct static pressure in in.w.c plus a minimum of 2in).

Option 2 – Condensate returned to boiler with pressure motive pump

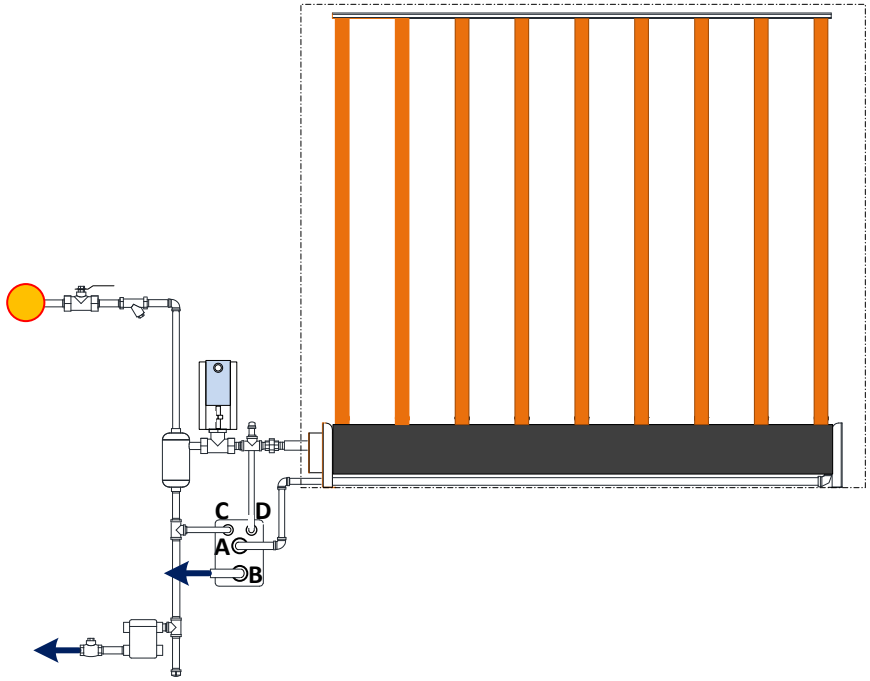


Figure 23 – Condensate from steamOsorb to boiler (SOE)

Specification for pressure motive pump

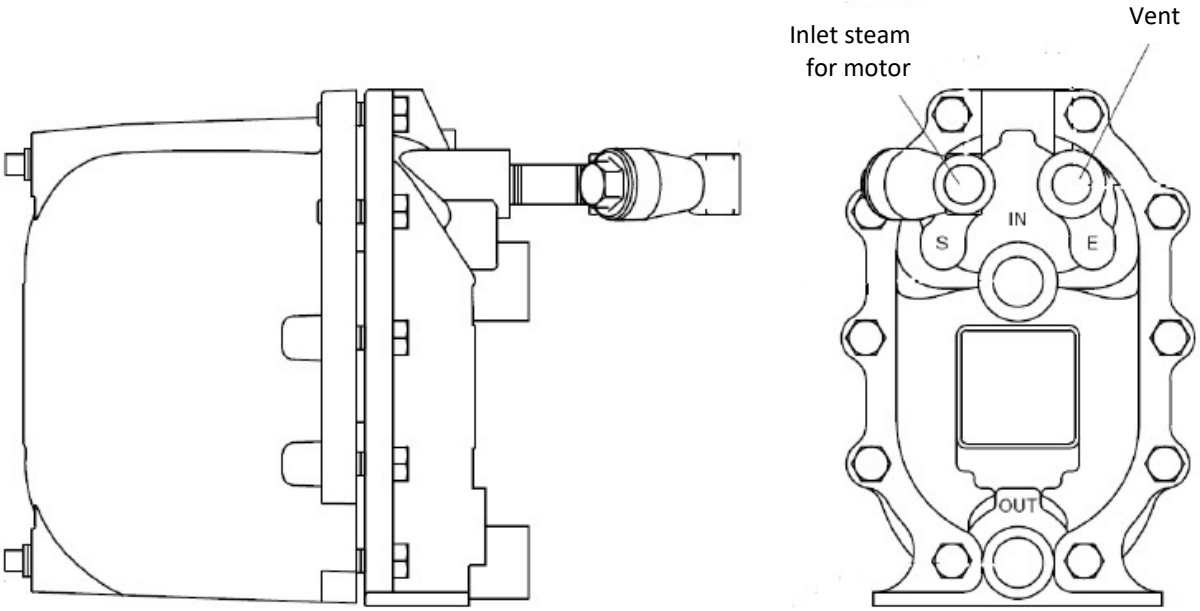


Figure 24–pressure motive pump

Pressure motive pump is using the steam pressure – same as the humidifier – as source of energy to pressurized atmospheric condensate coming from steamOsorb multi ramp distributor.
It is compact, does not require any electrical connection and it is easy to install.
Max steam pressure :65PSI [450kPa]
Flow per cycle : 1.5Gal [2.6l]

Pressure motive pump connection sizes :

Condensate return		Motor	
Inlet Diam.	**Outlet Diam.**	**Inlet Diam.**	**Outlet Diam.**
NPT 3/4po	NPT 3/4po	NPT 1/2po	NPT 1/2po

Installation steps

1. Install the condensate line from the steamOsorb condensate outlet to the port A of the pressure motive pump
2. Port D of the pressure motive pump should be connected to a Tee piece located at the outlet of the control valve
3. Port C of the pressure motive pump should be connected to a Tee piece located on the vertical condensate line at the outlet of the separator.
4. Port B is the pressurized condensate outlet to be returned to the boiler.

Any horizontal line should be pitched to avoid potential water hammer problems.

Installation – step 7
Control connections

Recommended Air duct safety control specification

1. It is a good practice to install the following safety controls:
2. An air proving switch (APS) in the same duct as the humidifier's so that it can prevent humidifier from producing steam in case there is no air flow.
3. A high limit humidistat shall be installed downstream of the steam ramp so that it can prevent any over humidity (condensing) occurrence. High limit humidistat is usually provided by an on-off switch its set point should be 85%RH minimum.
   High limit humidistat should be placed at least at a distance equivalent to five times the non-wetting distance. If the non-wetting distance is not known, locate it at least 9 feet (3m) downstream of the steam ramp.

Recommended Condensate return safety control specification

1. It is a good practice to install a safety thermostat on each condensate line upstream of the condensate management device (F&T steam trap or pressure motive pump).
2. Set point of this thermostat should be below water boiling point (195°F to 200°F) in order to detect any abnormal operation of the condensate management devices.

Admissible control signal

Control	Admissible signal
External modulating demand	2-10Vdc
External On/Off signal	Dry contact

Recommended control sequence

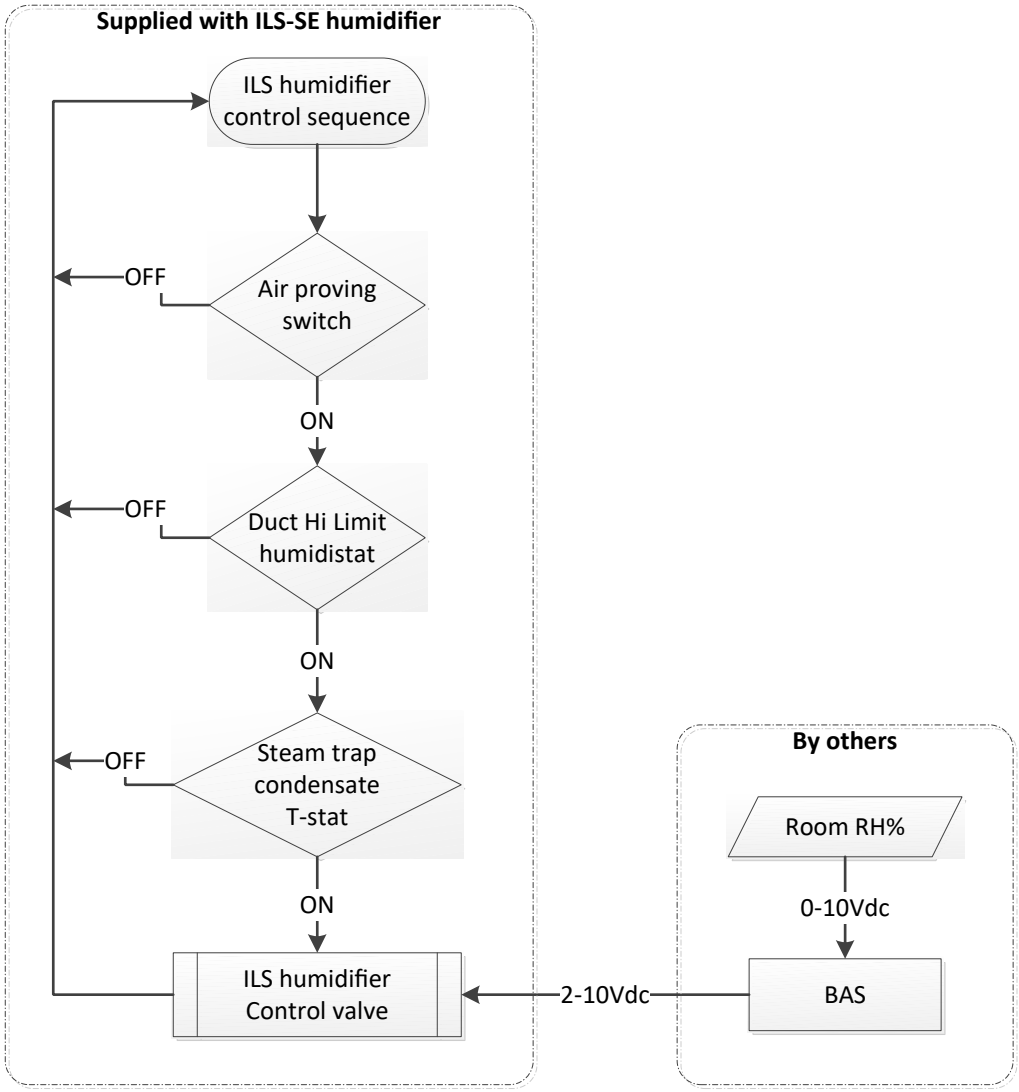


Figure 25 – Recommended control sequence ILS

Verification before start up

section 4

Warning

For safety and warranty reasons, Installation and service of this humidifier should be carried out by trained and qualified personnel.
Any work related to installation and service of this humidifier must comply with local code and regulation regarding safety and prevention of accidents.

Risk of electric shock.
Disconnect power supply before verification.

Risk of malfunction. Steam lines should not have any restriction or blockage that may cause a burst of pressure in the steam line.
Risk of Burnt: During and after the operation of this humidifier all of the steam components such as: steam pipes, strainer, steam valve(s), separator, steam ramps, steam trap, temperatures switch and others, can be very hot.
Risk of malfunction. Do not block steam outlet(s).

Check list

1. Ensure that the installation has been completed and that this one is conforming to local code and to the recommendation of this IOM:
   - Steam and condensate lines should be properly connected and tightened.
     All the steam and condensate connections have been verified for any leak and are leak free.
   - The steamOsorb multi-ramp is perperly mounted and attached in the duct
     Steam nozzles of the vertical steam distribution pipes are perpendicular to the air flow.
   - Electrical control and safety circuit has been completed
     Power supply is connected on the control valve
     Hi limit humidistat, air flow switch and steam trap temperature safety switch are connected in series to the poer supply line to the control valve.
     A control (room or duct) humidistat or a control signal (2-10Vdc) is connected to the control valve.
   - Verify the steam pressure of the steam supply of the humidifier. This pressure should not exceed a maximum of 15PSI
     Steam pressure should be set according to design requirement. Please refer to the project reference design information.
     Applying a more or less pressure than the design requirement will directly affect the capacity of the ILS humidifier.

2. Slowly open the isolation valve (manual shut-off) that should be installed at the inlet of the ILS humidifier circuit.
   - Verify that there is no steam or condensate leak on all of the connections up to the control valve inlet.
   - Confirm that there is no abnormal noise or hissing sound.
     Hissing sound can be due by a steam leak of abnormal pressure.
1. After at least a 5 minutes delay, power to the control valve and control signal (between 2 and 10Vdc) can be applied in order to slowly open the control valve.
   - Control valve should slowly open steam should be distributed into the air duct.
   - Verify agin for any possible steam or condensate leak.
   - Verify that the steam distribution in the air duct is correct.
   - Change the control signal and verify that the steam production is proportional to the signal sent.
2. Verify that the steam trap is operating properly by opening the thermostatic valve from time to time.
3. Verify the Air flow switch and/or Hi limit humidistat and/or steam trap safety temperature switch proper operation.
   Control valve should close as soon as any of the above safety switch is opening
4. Verify that the control valve is closing in case of loss of power.

After the first 24hours of operation

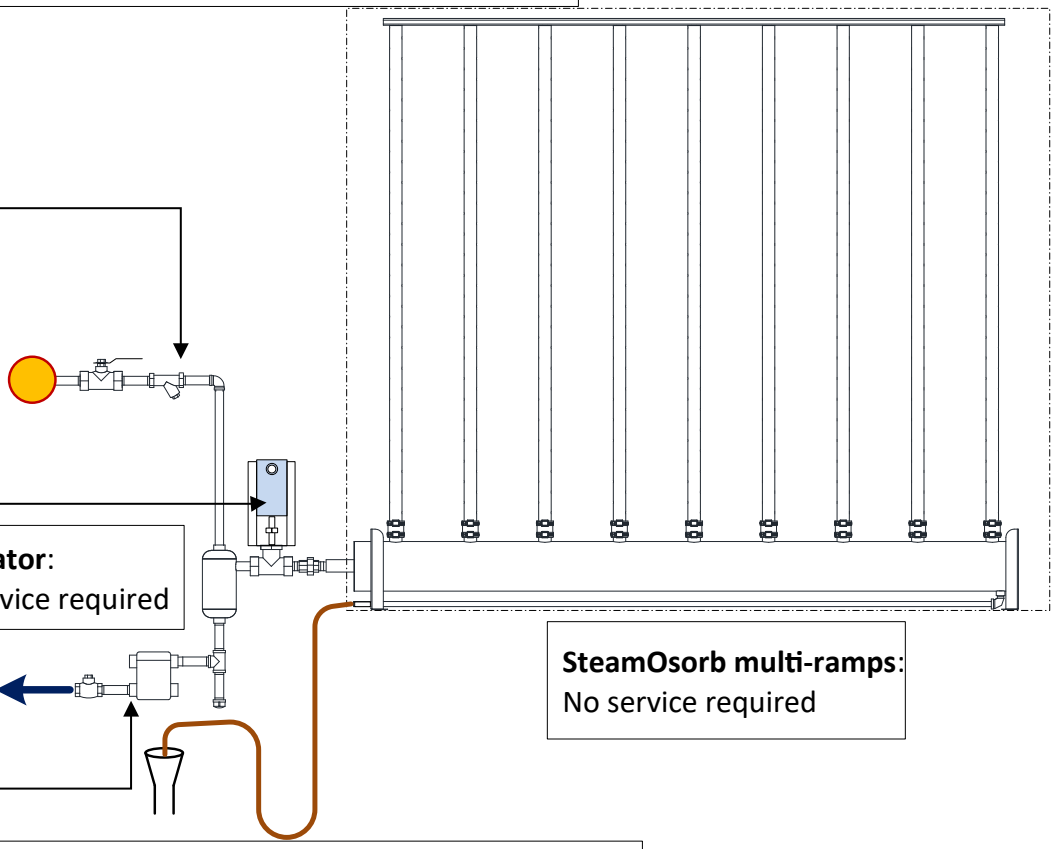
1. Verify that there is still no steam or condensate leak from any of the connections.
2. Verify that all of the mounting and attachment screws are still properly tightened.

Service

section 5

Control valve:
Once a year, Verify that the seat of the valve is leak free. Close the valve and confirm that there is no steam going out of the steamOsorb

Strainer
First year, Verify that the strainer and the amount of dirt accumulated.
Adapt service frequency based on this 1s verification.



Separator:
No service required

SteamOsorb multi-ramps:
No service required

F&T condensate trap
At least twice a year: Verify its proper operation.
If blocked it would be cold
If leaking, it would make a constant noise and a long run of the condensate line to the boiler will be hot

Figure 26 – Service guide

Warranty

steamOvap technologies inc. (hereinafter referred to as **steamOvap**), warrant for a period of 3 years after installation, that steamOvap manufactured and assembled products are free from defects in material and workmanship; provided that a start-up report with no default has been done and signed by the authorized **steamOvap** local representative. Otherwise the warranty period is reduced to 18 months.

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

No liability whatsoever shall be attached to **steamOvap** until said products have been paid for in full and then said liability shall be limited to the original purchase price for the product. Any further warranty must be in writing, signed by an officer of **steamOvap**.

steamOvap makes no warranty and assumes no liability unless the equipment is installed in strict accordance with installation manual in effect at the date of purchase and by qualified and trained personnel and in accordance to local codes and regulations.

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

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

In case of litigation or dispute arising, all parties agree that the exclusive venue for any litigation shall be vested with a court of competent jurisdiction located in the Judicial District of Montreal, Quebec, Canada.

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