



IER - ELECTRIC RESISTIVE STEAM HUMIDIFIER

Submittal

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Project name:	Generic
Engineer name:	
Engineering firm:	
steamOvap agent:	
Purchase Order No:	
Purchase Order Date:	
Date required:	
Comments:	

Description



Description & Intended use

IER electric steam humidifier is an electric steam generator that uses water immersed resistive heating elements to produce pure and sterile steam at atmospheric pressure that is distributed in air handling unit or ventilation duct, or directly into space.

IER humidifier can be supplied with tap or treated water such as reverse osmosis water or deionized water without alteration or additional required option.

When tap water is used, the scale will come off the heating elements by the natural contraction and expansion of the tube heaters having a coil shape. Scale pieces then accumulate at the bottom of the cylinder without the risk of clogging the drain outlet.

Regular maintenance consists in opening and removing the cylinder and cleaning the accumulated scale off. It is a simple, safe and proven technology and solution that requires no consumable and uses no unreliable plastic component.

IER electric steam humidifier is intended exclusively to produce steam from water at atmospheric pressure for air humidification.

Main features

- Very accurate +/-1% and constant steam production whatever water condition.
- Fully modulating humidifier.
- Drain water automatically cooled down at 140°F [60°C].
- Pre-heating function for quick reaction upon demand.
- Steam production reduction option.
- Permanent stainless steel cylinder with thermal insulation.
- Easy and quick regular maintenance with no tool required.
- Log of events and alarms easy to export.
- Modbus RTU remote communication
- Optional remote communication BACnet MSTP and Modbus RS485
- Three year warranty (when installation is commissioned by steamOvap authorized service representative)
- Certified as per UL998 safety standard for North America by TUV-SUD and conforms to safety, EMC and REACH European directives.

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Specifications

Section 23 84 13 – Humidifiers

Part 1 - General

1.1 SUMMARY

.1 Section includes:

- .1 Materials and installation for direct steam injection, packaged electrode steam generating, steam-to-steam, electric self-contained humidifiers and accessories.

1.2 RELATED SECTIONS

- .1 Section 01 33 00 – Submittal Procedures.
.2 Section 01 35 29.06 – Health and Safety Requirements
.3 Section 01 45 00 – Quality Control.
.4 Section 01 74 21 – Construction/Demolition Waste Management and Disposal
.5 Section 01 78 00 – Closeout Submittals.
.6 Section 01 91 13 – General Commissioning (Cx) Requirements.
.7 Section 23 31 13.01 – Metal Ducts – Low Pressure to 500 Pa.

1.3 REFERENCES

- .1 Air-Conditioning and Refrigeration Institute (ARI) ARI 640, Performance Rating of Commercial and Industrial Humidifiers

1.4 SUBMITTALS

- .1 Submittals in accordance with Section 01 33 00 - Submittal Procedures.
.2 Product data:
.1 Submit manufacturer's printed product literature, specifications and datasheet for heating, ventilation and air conditioning distribution piping and ductwork.
.3 Shop drawings:
.1 Submit shop drawings to indicate project layout, dimensions, and extent of humidification system.
.4 Test Reports: submit certified test reports from approved independent testing laboratories indicating compliance with specifications for specified performance characteristics and physical properties.
.5 Certificates: submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.
.6 Instructions: submit manufacturer's installation instructions.
.7 Manufacturer's field reports specified.
.8 Closeout submittals: submit maintenance and engineering data for incorporation into manual specified in Section 01 78 00 - Closeout Submittals.

1.5 QUALITY ASSURANCE

- .1 Pre-Installation Meetings:
.1 Convene pre-installation meeting one week prior to beginning work of this Section and on-site installations.
.1 Verify project requirements.
.2 Review installation and substrate conditions.
.3 Co-ordination with other building subtrades.
.4 Review manufacturer's installation instructions and warranty requirements.
.2 Health and Safety:
.1 Do construction occupational health and safety in accordance with Section 01 35 29.06 - Health and Safety Requirements.

1.6 DELIVERY STORAGE AND HANDLING

- .1 Waste Management and Disposal:
.1 Separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
.2 Remove from site and dispose of packaging materials at appropriate recycling facilities.

I E R S U B M I T T A L

- .3 Collect and separate for disposal, paper, plastic, polystyrene, corrugated cardboard, packaging material in appropriate on-site bins for recycling in accordance with Waste Management Plan (WMP).
- .4 Separate for reuse and recycling and place in designated containers steel, metal, plastic waste in accordance with Waste Management Plan (WMP).
- .5 Divert unused metal materials from landfill to metal recycling facility as approved by Owner's Representative.

1.7 MAINTENANCE

- .1 Extra materials:
 - .1 Provide maintenance materials in accordance with Section 01 78 00 – Closeout Submittals.
 - .2 Furnish list of individual manufacturer's recommended spare parts for equipment, addresses of suppliers, and list of specialized tools necessary for adjusting, repairing or replacing, for inclusion into operating manual.
 - .3 Provide following: one complete set of renewable evaporator media.

PART2 - PRODUCTS

2.1 Electric self-contained humidifier

- .1 The humidifier shall be certified as per UL998 by a Nationally Recognized Laboratory (NRTL).
- .2 Boiling chamber, cover and fittings constructed from series 300 stainless steel.
- .3 Boiling chamber provided with thermal insulation. Thermal insulation shall not be able to lose thermal properties when in contact with water.
- .4 Immersion heaters INCOLOY alloy-sheathed resistance type.
- .5 Humidifier to have the following safety protection features:
 - .1 Hi-limit temperature switch
 - .2 Electronic continuous water level sensor.
 - .3 Evaporation rate control algorithm.
 - .4 Conductive foam detection sensor.
- .6 Humidifier shall be able to be supplied with tap or treated water such as softened or reverse osmosis (RO) or deionised (DI) water without alteration or add-on option.
- .7 Removal of boiling chamber cylinder for regular maintenance shall be done quick release latch giving full access to heating elements and allowing for cleaning and removal of scale without the use of tooling.
- .8 Humidifier to provide full modulation using integrated SCR control.
- .9 Humidifier shall include an automatic wasted water drain cooling device ensuring a maximum water drained temperature of 140°F (60°C).
- .10 Humidifier control and user interface to be provided by 7in touch screen and microprocessor with real time operating system allowing access to Overview and Service screen and to restricted access configuration sub-menu for control and communication set-up and humidifier set-up.
- .11 Accessories
 - .1 Air flow proving switch.
 - .2 High limit switch humidistat.
 - .3 Electronic RH% sensor for duct or space.
 - .4 Modbus, or BACnet IP or MSTP remote communication to Building Management System (BMS).
 - .5 Stand metal frame for floor installation.
 - .6 Bracket to ease of wall installation
 - .7 IP65, equivalent to NEMA 4 type outdoor enclosure.

PART3 EXECUTION

3.1 MANUFACTURER'S INSTRUCTIONS

- .1 Compliance: comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and datasheet.

3.2 INSTALLATION

IER SUBMITTAL

- .1 Install in accordance with manufacturer's instructions.
- .2 Humidifier and evaporator media to be new and clean when project is accepted.
- .3 Install humidistat in accessible location.
- .4 Water service overflow drain: as indicated and to manufacturers' recommendation.
- .5 Install access doors or panels in adjacent ducting.
- .6 When installing in ducting, provide waterproof duct up and downstream in accordance with Section 23 31 13.01: Metal Ducts – Low Pressure to 500 Pa.
- .7 Install capped drain connection at low point in duct.

3.3 FIELD QUALITY CONTROL

.1 Manufacturer's Field Services:

- .1 Have manufacturer's representative of products, supplied under this Section, review work involved in the handling, installation/application, protection and cleaning, of its products and submit written reports, in acceptable format, to verify compliance of work with Contract.
- .2 Manufacturer's Field Services: provide manufacturer's field services consisting of product use recommendations and periodic site visits for inspection of product installation in accordance with manufacturer's instructions.
- .3 Schedule site visits, to review work, at stages listed:

.1 After delivery and storage of products, and when preparatory work, or other work, on which the work of this Section depends, is complete but before installation begins.

- .2 Twice during progress of work at 25% and 60% complete.
- .3 Upon completion of the work, after cleaning is carried out.

.4 Obtain reports, within three (3) working days of review, and submit, immediately, to Owner's Representative.

.2 Performance Verification (PV):

.1 General: in accordance with Section 01 91 13 - General Commissioning (Cx) Requirements: General Requirements, supplemented as specified.

.2 Timing:

- .1 After TAB of ducted air systems.
- .2 At same time as PV of related air handling units.

.3 Start-up:

.1 General: in accordance with Section 01 91 13 - General Commissioning (Cx) Requirements: General Requirements, supplemented as specified.

.2 Verify:

- .1 Steam lines are sloped to ensure steam condensate is drained away from the humidifier.
- .2 Vapour lines and manifolds are sloped to ensure condensate is drained away from the duct system.
- .3 Visually check distribution manifold to ensure:
 - .1 Even distribution of vapour.
 - .2 Freedom from water deposits.

.4 Commissioning Reports:

.1 General: in accordance with Section 01 91 13 - General Commissioning (Cx) Requirements: reports, supplemented as specified. Include:

- .1 PV results on approved PV Report Forms.
- .2 Product Information Report Forms.

3.4 DEMONSTRATION

- .1 Training: in accordance with Section 01 91 13- General Commissioning (Cx) Requirements: Training of O&M Personnel.

3.5 CLEANING

- .1 Perform cleaning operations as specified in Section 01 74 11 – Cleaning and in accordance with manufacturer's recommendations.

I E R S U B M I T T A L

.2 Upon completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.

END OF SECTION

Product designation

IER name plate

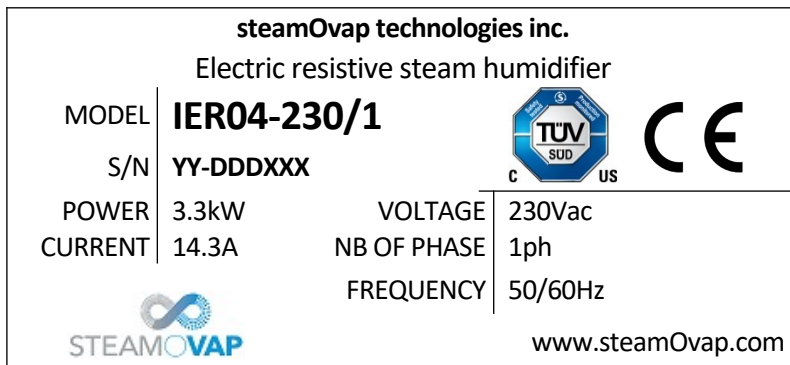
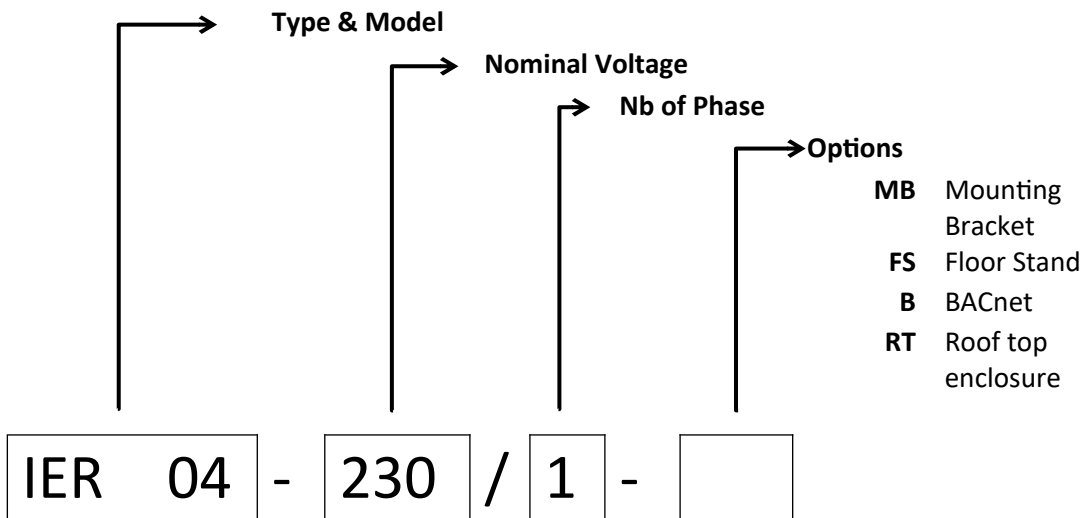


Figure 1 – IER Name plate

Model designation and options codification



Electrical rating

Model	Steam Capacity	Power	Current	
			230V/1p	400V/3p
IER02	2.8kg/h	2.1kW	9.2A	-
IER04	4.5kg/h	3.3kW	14.3A	4.8A
IER05	6.8kg/h	5.0kW	21.7A	7.2A
IER09	11.4kg/h	8.3kW	36.1A	12.0A
IER12	15.9kg/h	11.7kW	50.8A	16.8A
IER17	22.7kg/h	16.7kW	-	24.1A
IER22	29.5kg/h	21.7kW	-	31.3A
IER31	42.3kg/h	31.0kW	-	44.7A
IER44	59.1kg/h]	43.3kW	-	62.5A
IER62	84.1kg/h	61.7kW	-	89.1A

Dimensions & weight

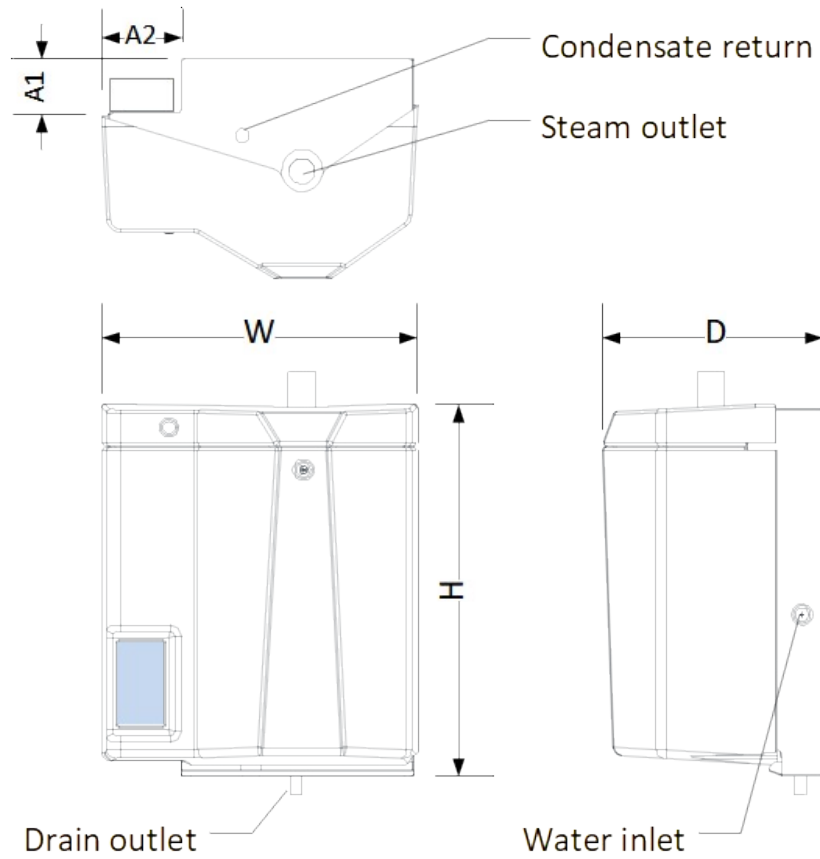


Figure 2 – IER dimensions, IER04 to IER31

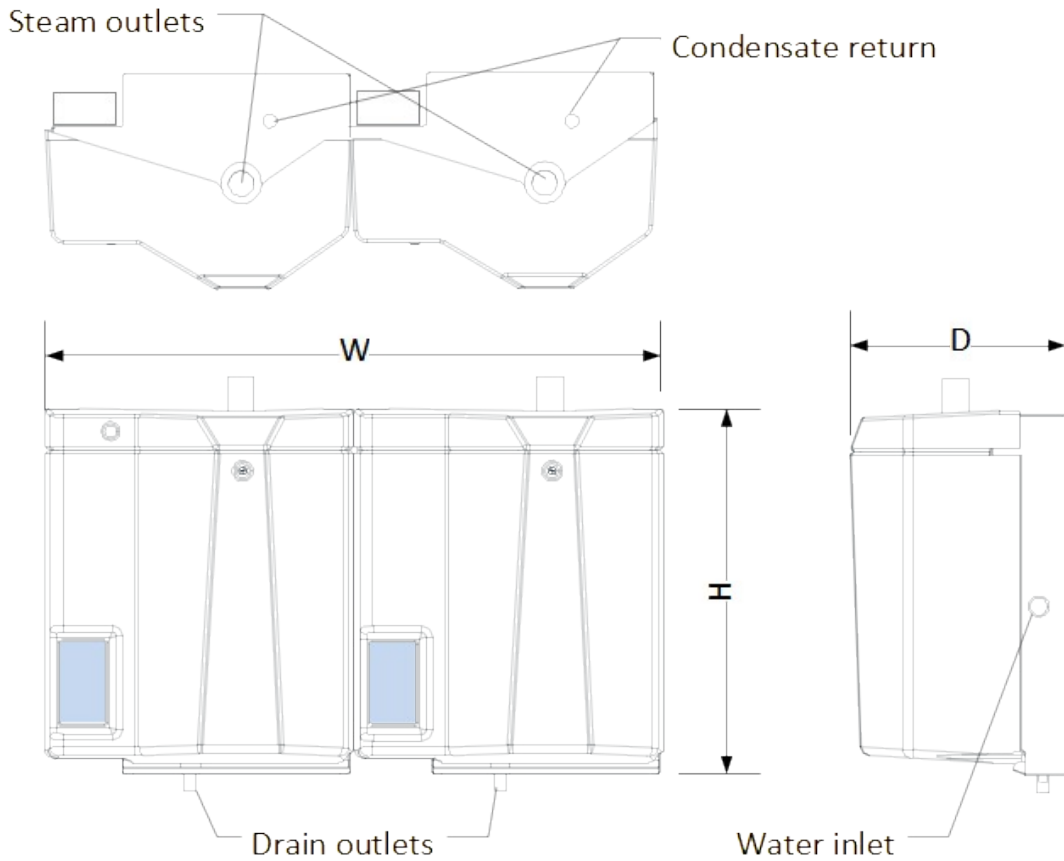


Figure 3, IER Dimensions, two modules, model IER44 & 62

IER SUBMITTAL

Model	Steam Capacity	Nb Cyl + size	Nb Steam Outlet + Ø	Dimensions			Net weight
				W	H	D	
IER02	2.8kg/h	1x small	DN40	510mm	585mm	330mm	21kg
IER04	4.5kg/h	1x small	DN40	510mm	585mm	330mm	21kg
IER05	6.8kg/h	1x small	DN40	510mm	585mm	330mm	21kg
IER09	11.4kg/h	1x small	DN40	510mm	585mm	330mm	21kg
IER12	15.9kg/h	1x medium	DN50	585mm	686mm	432mm	31kg
IER17	22.7kg/h	1x medium	DN50	585mm	686mm	432mm	31kg
IER22	29.5kg/h	1x medium	DN50	585mm	686mm	432mm	31kg
IER31	42.3kg/h	1x medium	DN65	585mm	686mm	432mm	31kg
IER44	59.1kg/h	2x medium	2x DN50	1067mm	686mm	432mm	62kg
IER62	84.1kg/h	2x medium	2x DN65	1067mm	686mm	432mm	62kg

IER maximum ambient conditions:

Temperature: +5 to +45°C

Relative Humidity: 90%RH max (non condensing)

Ingress Protection for **IER** standard enclosure: IP30

Clearances

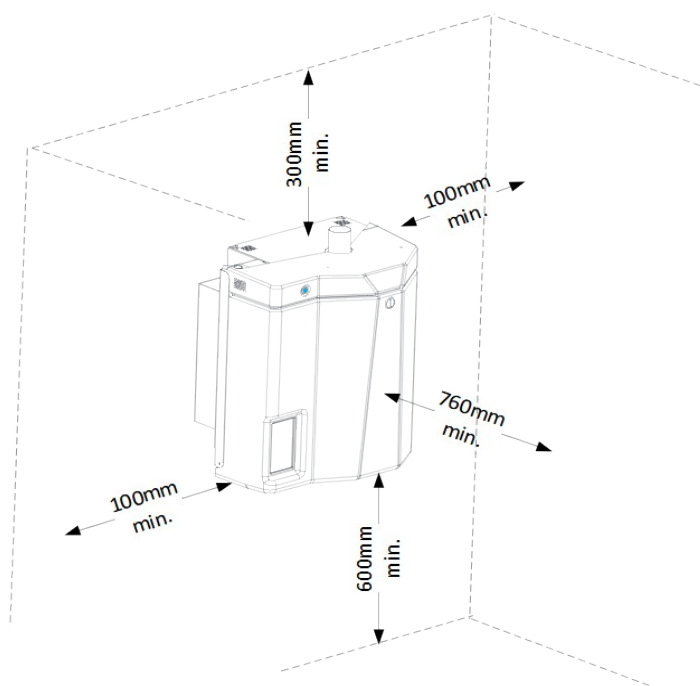


Figure 4, minimum clearances

Typical installation

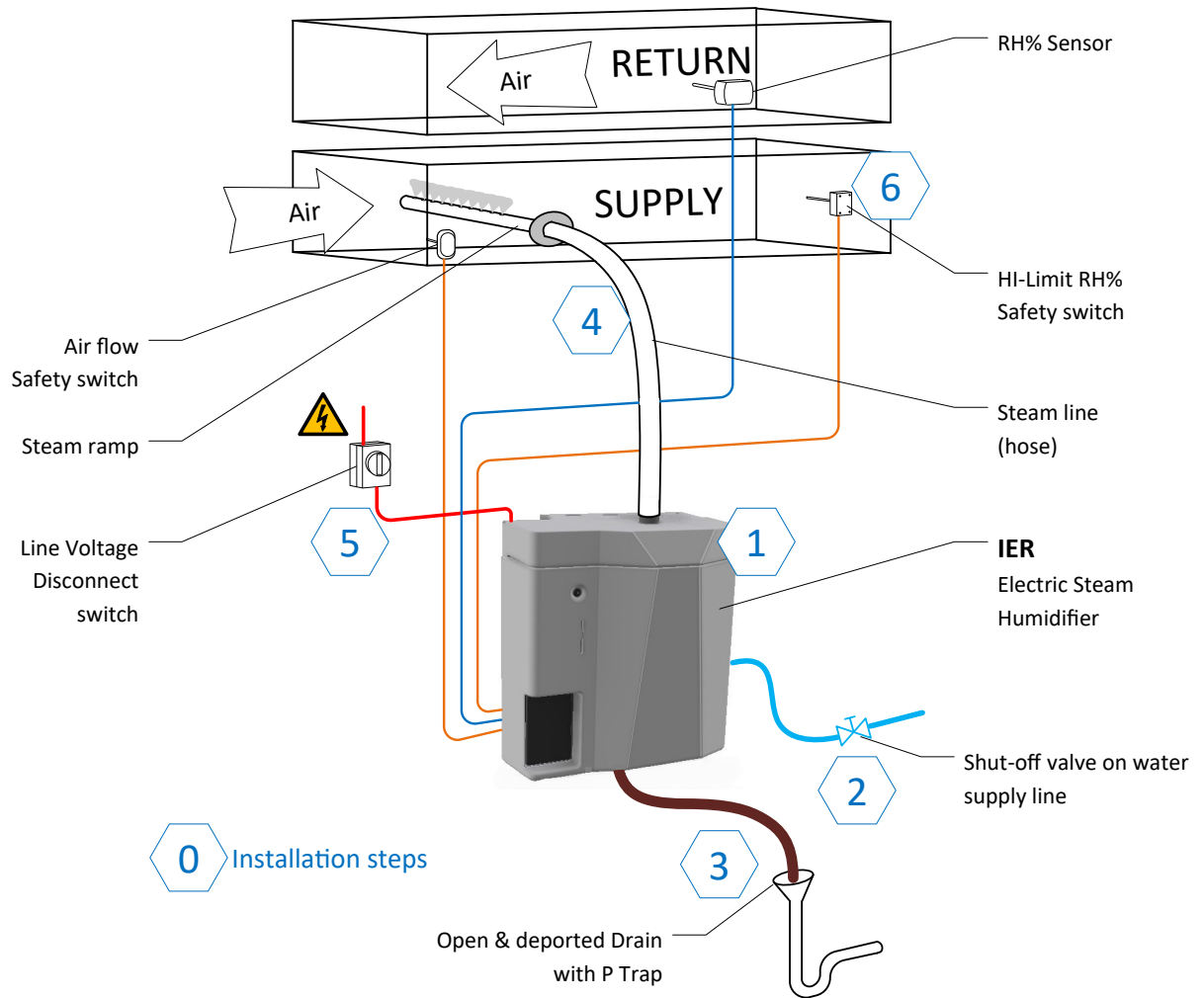


Figure 5 –IER typical installation

Typical installation steps :

1. Positioning & mounting of IER electric steam humidifier
2. Water supply installation
3. Drain installation
4. Steam line installation for duct humidification or Direct humidification in room
5. Power supply installation
6. Safety & RH% control installation

Typical installation with Space blower

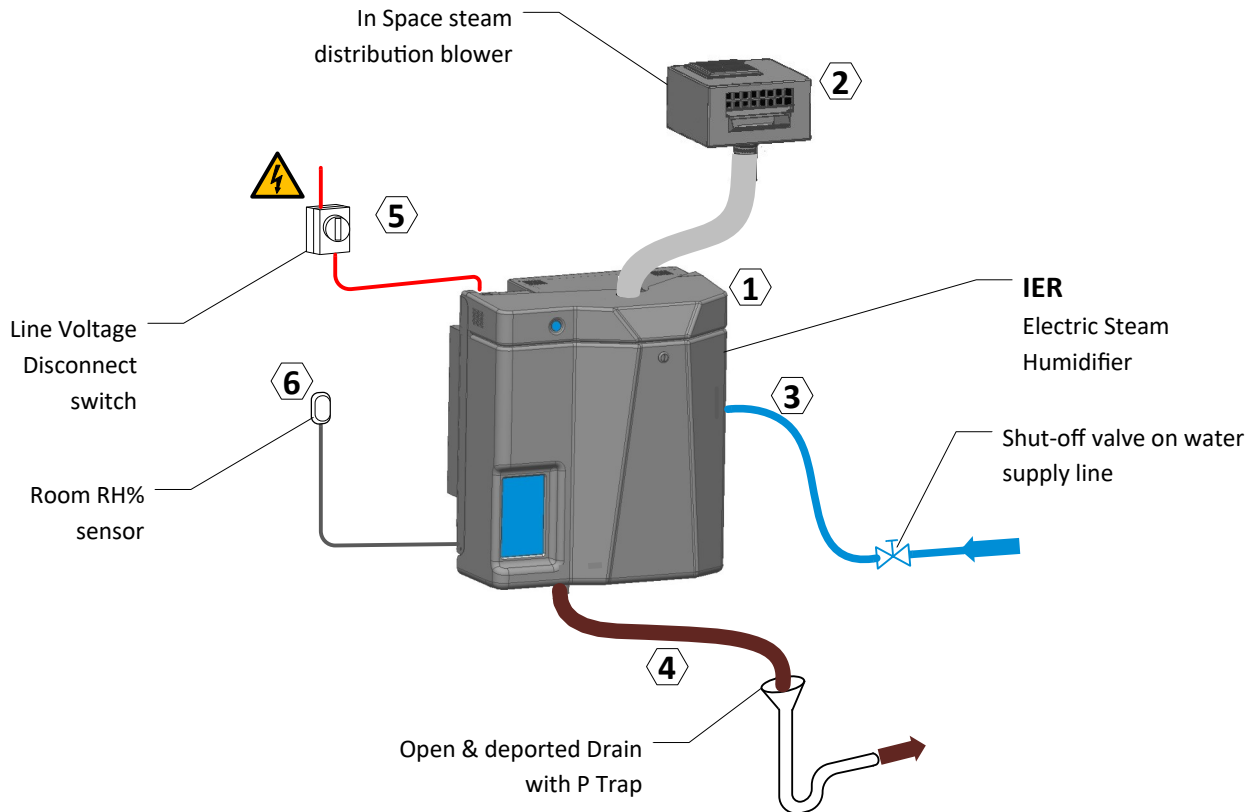


Figure 6 –IER with remote Space blower typical installation

Typical installation steps :

1. Positioning & mounting of IER electric steam humidifier
2. Space blower installation (only if remote)
3. Water supply installation
4. Drain installation
5. Power supply installation
6. RH% control installation

Water supply specification

Zone	Humidifier tag	Model	Water supply inlet Qty	Water supply inlet dimension
1	H-1	IER04 to 62	1x	G 3/4

Water supply specification & quality:

Water supply pressure: 1 to 5bar

Water supply temperature: 3 to 40°C

IER electric steam humidifier can accept a wide range of water quality.

Untreated water will lead to scale deposits that will need to be regularly removed from steam chamber.

Use of additives such as scale inhibitor or corrosion inhibitors, disinfectants or other can impair the normal operation of the humidifier and are not allowed.

Water supply conductivity: 1 to 1500µS/cm

Water supply hardness: 268mg CaCO₃/l [0 to 15°gH]

Water supply PH: 6.5 to 7.5

Water supply chloride content: 0 to 50ppm

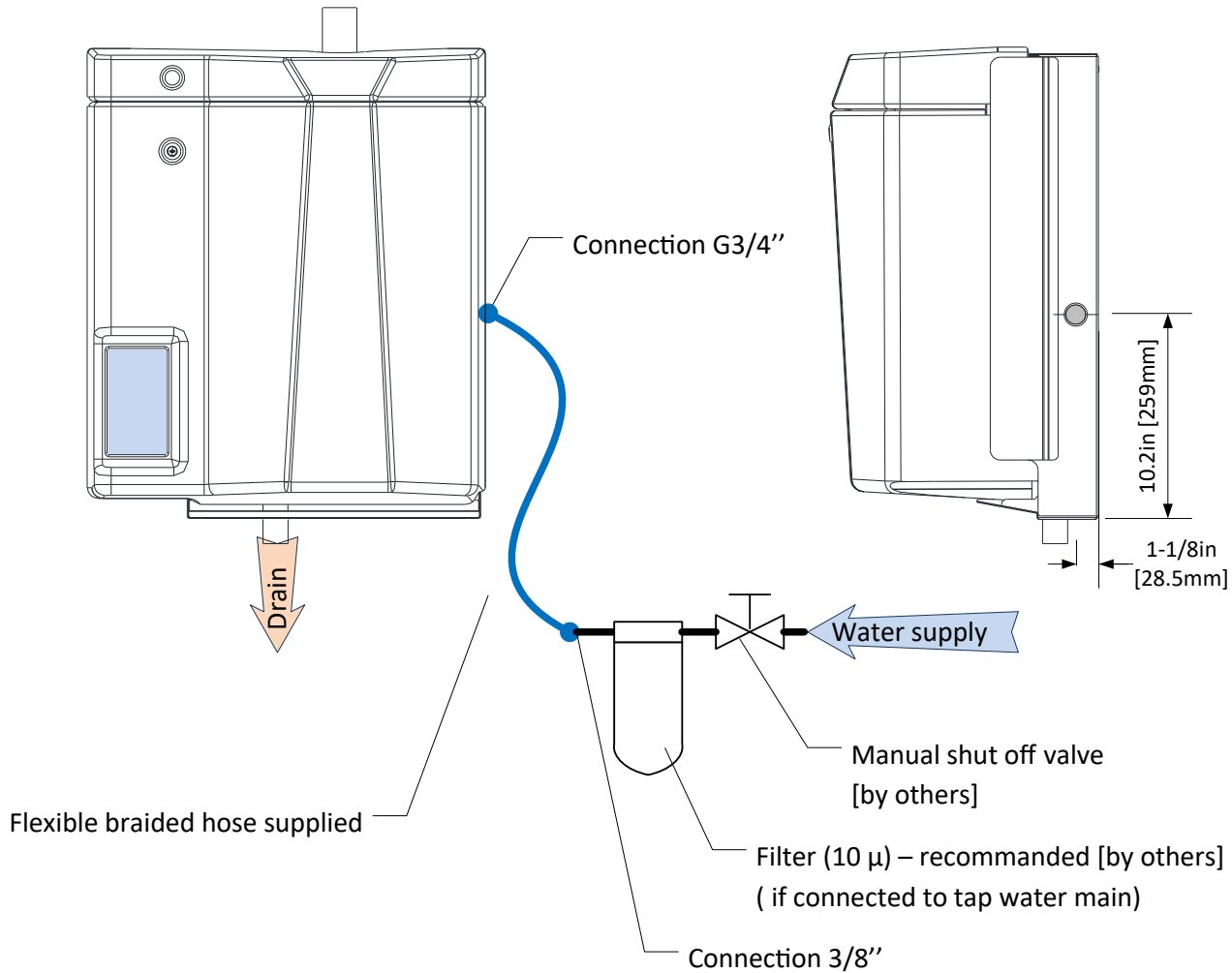


Figure 7– water supply connection, IER04 to IER31

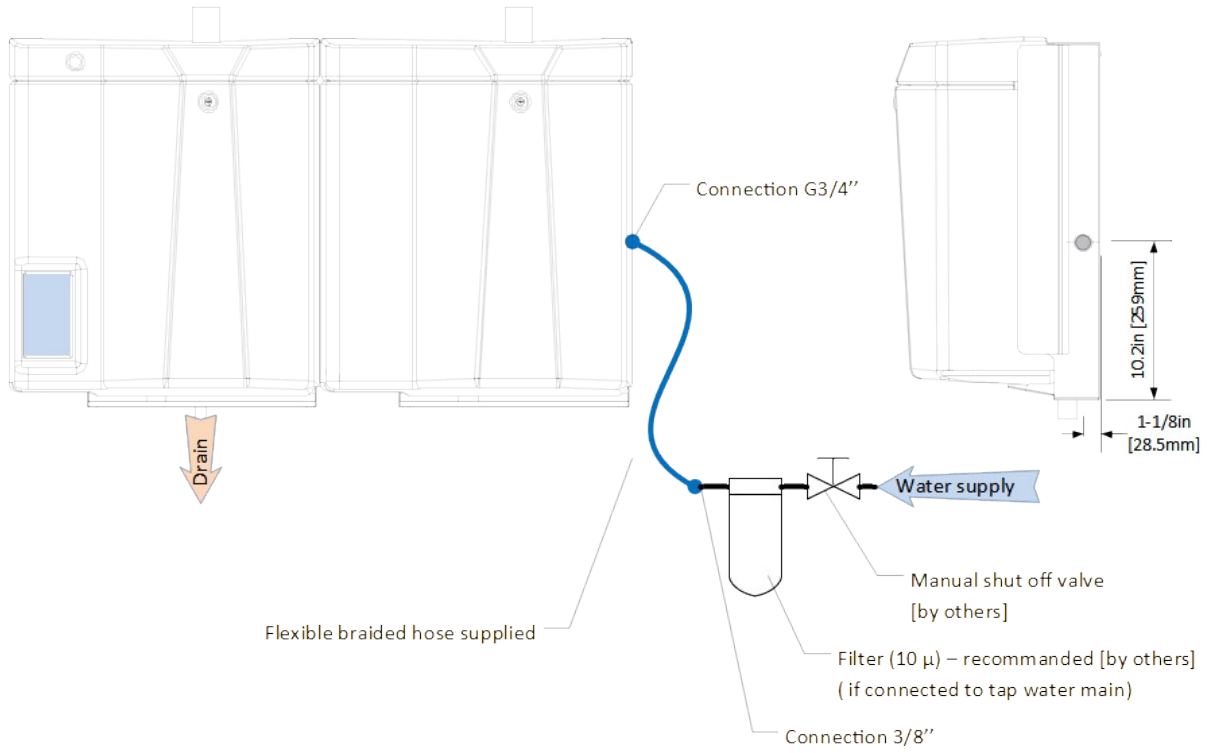


Figure 8– water supply connection, IER044 & 62

Drain specification

Zone	Humidifier tag	Model	Drain outlet Qty	Drain outlet dimension
		IER04 to 31	1x	1-1/4in [32mm]
		IER44 & 62	2x	1-1/4in [32mm]

Drained water maximum temperature: 60°C (when supplied with cold water supply)

Drained water flow rate: 25 l/min

Drain volume for full cylinder drain: **IER04 to 09: 21L**
IER12, IER17, IER22, IER31: 46L
IER44 & 62: 86.5L

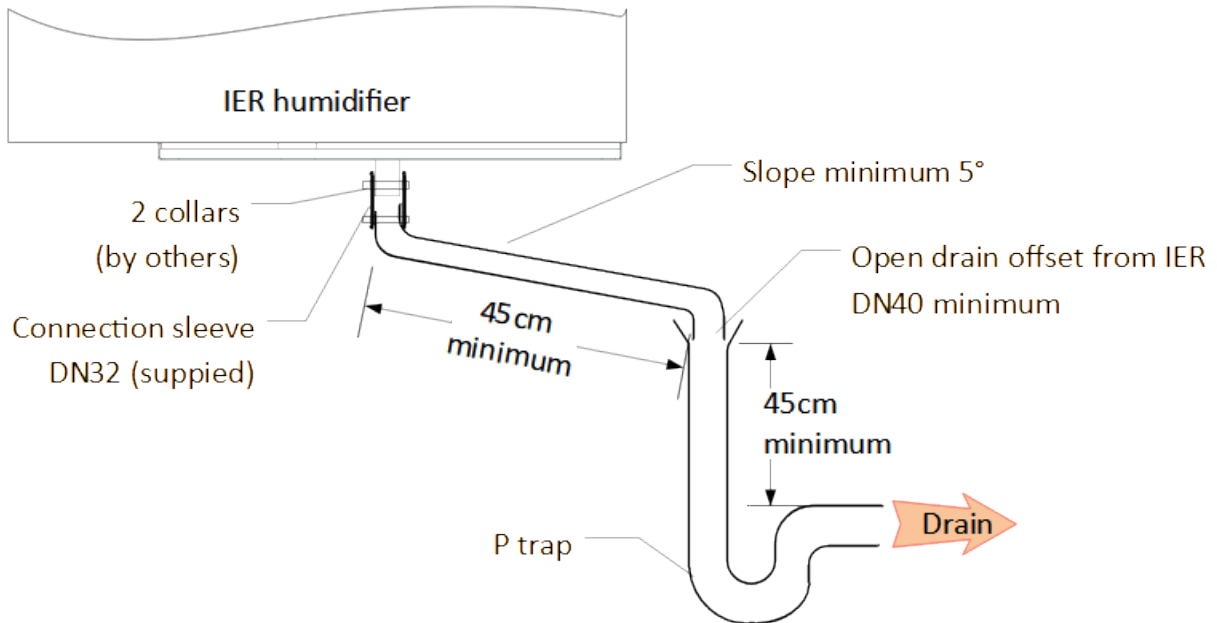


Figure 9, water drain connection (single module)

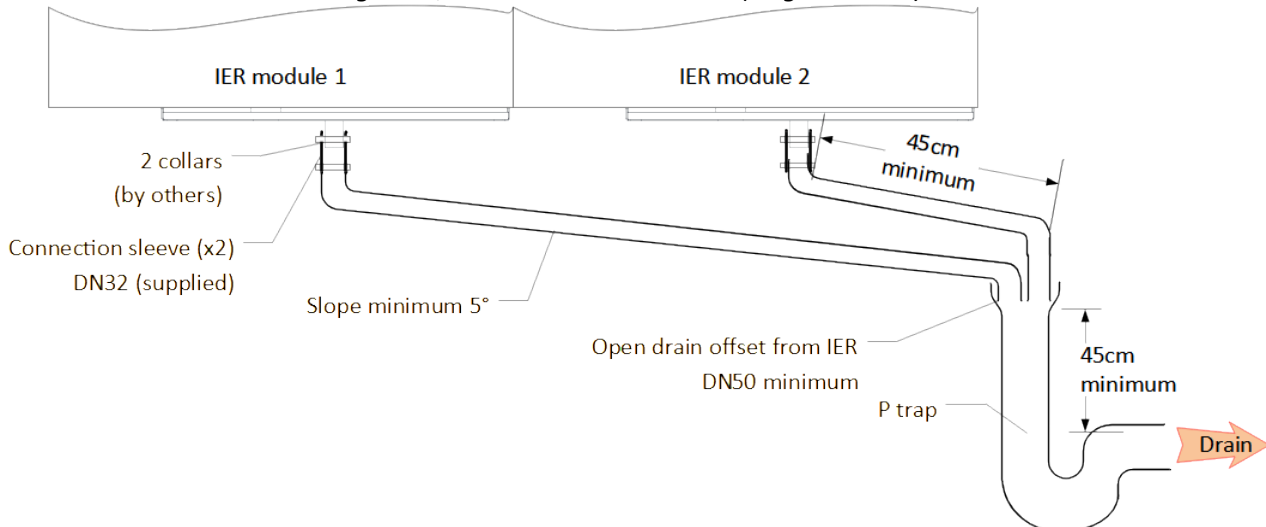


Figure 10, water drain connection, 2 modules, model IER44 & 62

Steam ramp specification

Zone	Humidifier tag	Model	Steam outlet Qty	Steam outlet dimension
		IER04 to IER09	1x	1-1/2in
		IER12 to IER22	1x	2in
		IER31	1x	2-1/2in
		IER44	2x	2in
		IER62	2x	2-1/2in

Horizontal duct

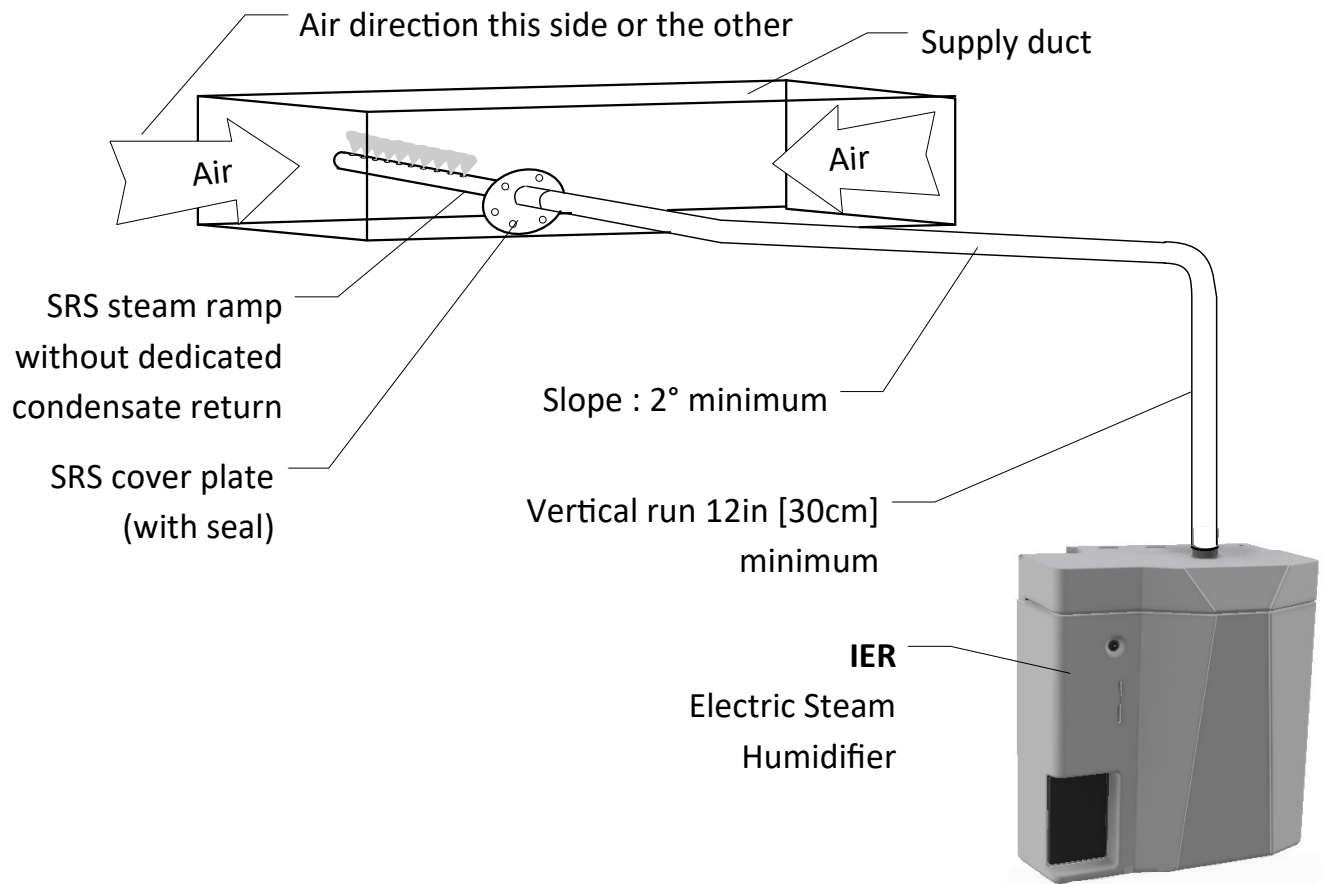


Figure 11 – SRS & SRSX installation – no dedicated condensate return line

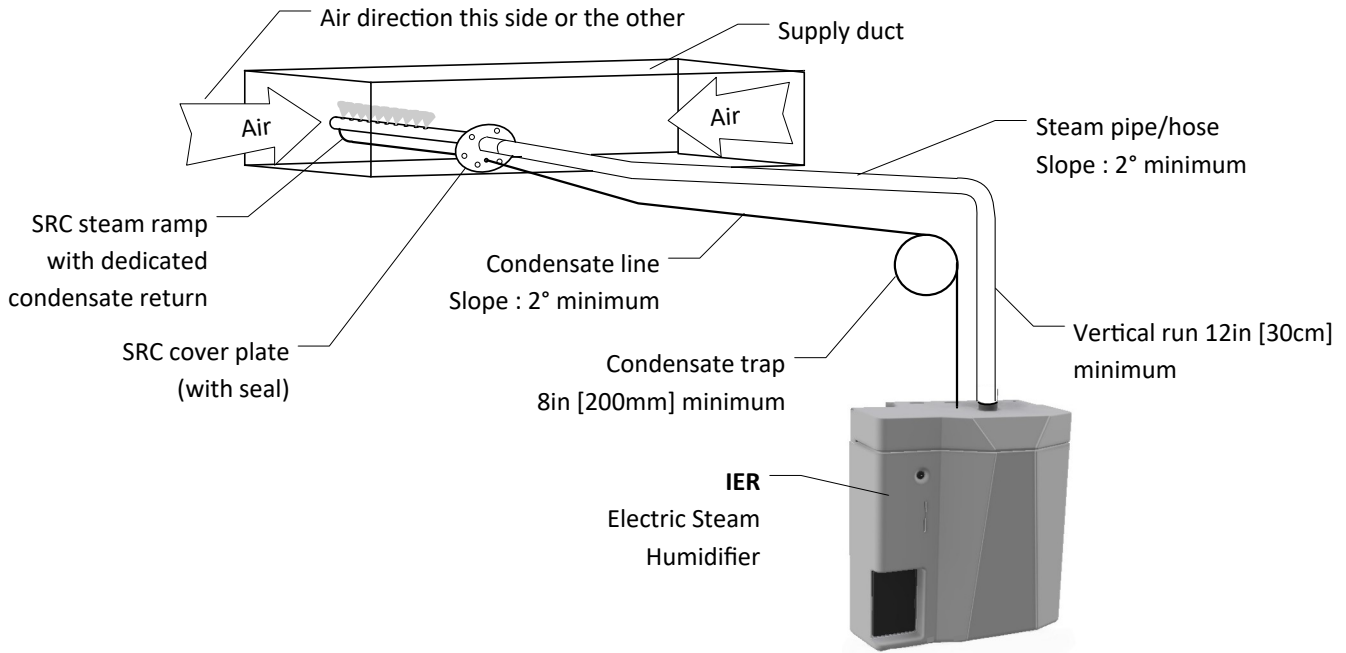


Figure 12– SRC & SRCX installation – with dedicated condensate return line to IER

Steam ramp description

<p align="center">SRS - Steam ramp without dedicated condensate return</p> <p align="center"><i>Figure 13 – SRS</i></p>		<p align="center">SRC - Steam ramp with dedicated condensate return</p> <p align="center"><i>Figure 14 – SRC</i></p>	
<p>Simpler to install, but not recommended when large quantity of condensate is produced (in case of long steam line run or large duct with low air temperature).</p>		<p>Avoid any possible trouble due to condensate flow against the steam flow inside steam pipe or hose. A condensate line must be installed and connected to drain or returned to humidifier</p>	
<p align="center">Standard absorption</p> <p align="center"><i>Figure 15 – SRS</i></p>	<p align="center">Short absorption</p> <p align="center"><i>Figure 16 – SRSX</i></p>	<p align="center">Standard absorption</p> <p align="center"><i>Figure 17 – SRC</i></p>	<p align="center">Short absorption</p> <p align="center"><i>Figure 18 – SRCX</i></p>
<p>SRS40: \varnothing1-1/2in [40mm] SRS50: \varnothing2in [50mm]</p> <p align="center"><i>Figure 19 – SRS & SRSX cover plate dimension</i></p>		<p>SRC40: \varnothing1-1/2in [40mm] SRC50: \varnothing2in [50mm]</p> <p align="center"><i>Figure 20 – SRC & SRCX cover plate dimension</i></p>	

Minimum distances for SRS & SRSX

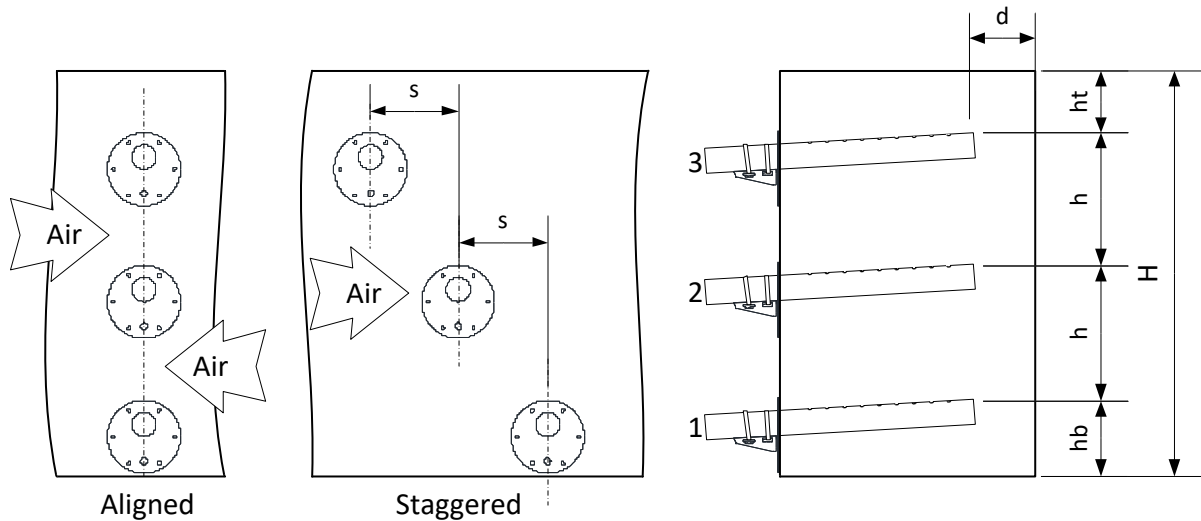


Figure 21 – SRS & SRSX minimum distances

In order to avoid condensing on the duct surface or on ramps, steamOvap recommends the following minimum distances:

- $ht(\min)$
Minimum height distance between end of top ramp (#3) and top of the duct.
 $ht(\min) = 4.5\text{in} [115\text{mm}]$
- $d(\min)$
Minimum depth distance between top ramp and side wall of the duct.
 $d(\min) = ht(\min) = 4.5\text{in} [115\text{mm}]$
- $hb(\min)$
There is no minimum height distance required for the bottom ramp (#1) and the bottom of the duct. However we recommend a minimum: $hb(\min) = 4\text{in} [100\text{mm}]$
- $h(\min)$
Height in between ramps (h) should be equal / even.
 $h = H - (ht + hb) / (\text{nb of ramps} - 1)$
If ramps are aligned
 $h(\min) = 8\text{in} [200\text{mm}]$
Air flow can be one or the other direction.

If ramps are staggered
 $h(\min) = 4.5\text{in} [115\text{mm}]$
Important: the air flow direction should be as indicated on above drawing.
 $s(\min)$ minimum distance between ramps
 $s(\min) = 4\text{in} [100\text{mm}]$

Minimum distances for SRC & SRCX

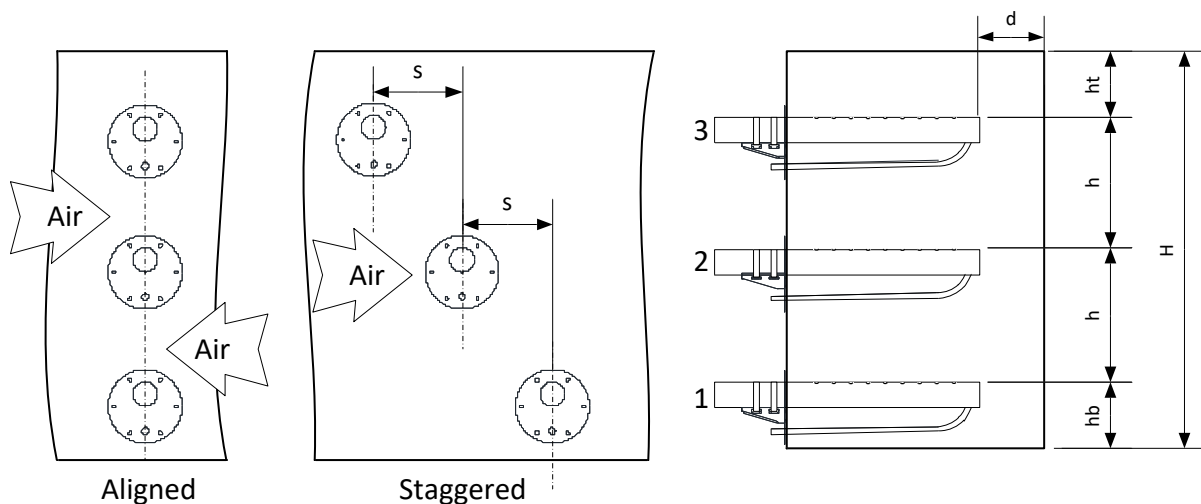


Figure 22 – SRC & SRCX minimum distances

In order to avoid condensing on the duct surface or on ramps, steamOvap recommends the following minimum distances:

- ht(min)
Minimum height distance between end of top ramp (#3) and top of the duct.
ht (min) = 5in [130mm]
- d(min)
Minimum depth distance between top ramp and side wall of the duct.
d(min) = 4.5in [115mm]
- hb(min)
There is no minimum height distance required for the bottom ramp (#1) and the bottom of the duct. However we recommend a minimum: hb(min)=4in [100mm]
- h(min)
Height in between ramps (h) should be equal / even.
h=H-(ht+hb)/(nb of ramps -1),

<u>If ramps are aligned</u> h(min) = 8in [200mm] Air flow can be one or the other direction.	<u>If ramps are staggered</u> h(min) = 4.5in [115mm] Important: the air flow direction should be as indicated on above drawing. s(min) minimum distance between ramps s(min) = 4in [100mm]
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SR models for Vertical duct - Option -V

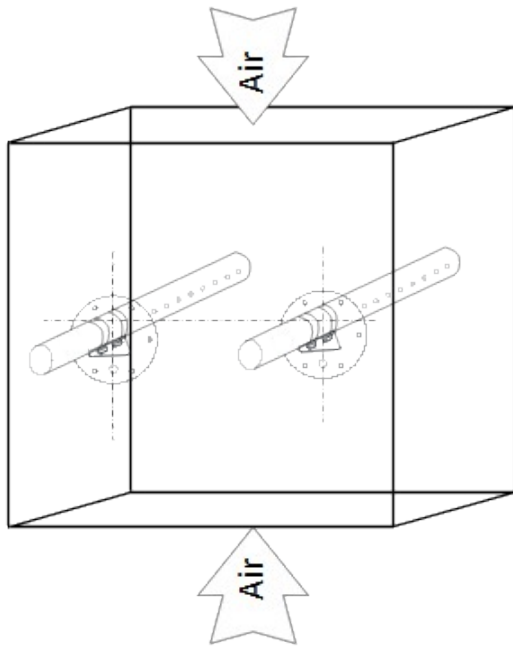


Figure 23, SRS -V on vertical air flow duct

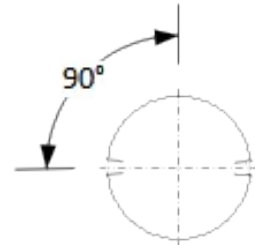


Figure 24, SRS or C-V section

SR models for round duct - Option -R

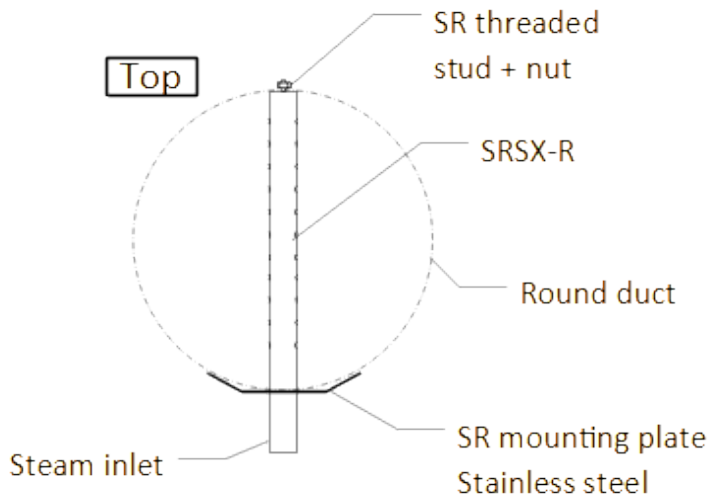


Figure 25, SRS -R on round duct

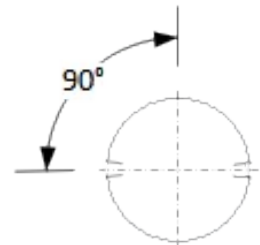


Figure 26, SRSX-R section

steamOsorb information

Zone	Humidifier tag	Model	Header Diam.	Header Lenght	Steam ramp qty	Steam ramp Diam.	Steam ramp length

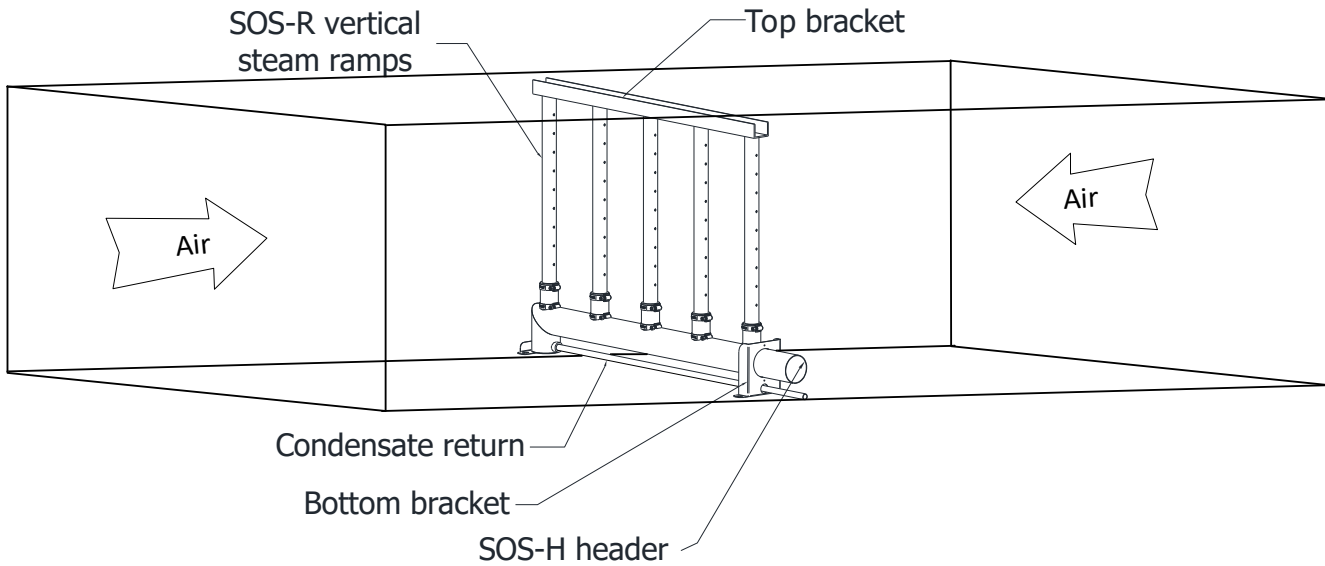


Figure 27– steamOsorb multiramp installation

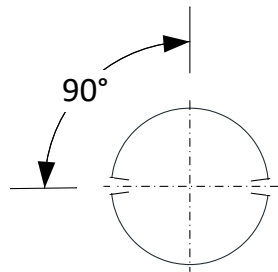


Figure 28– steam ramp profile and outlets position

SO with option FF or FI

Frame with flanges or Frame for insertion

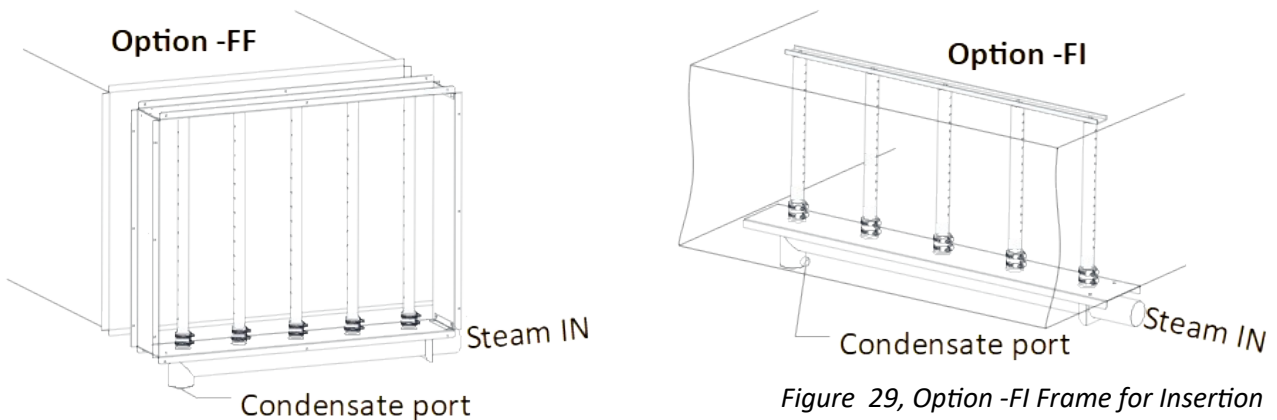


Figure 29, Option -FI Frame for Insertion

Figure 30, Option -FF Frame with flanges

SO for Vertical duct
Option -V

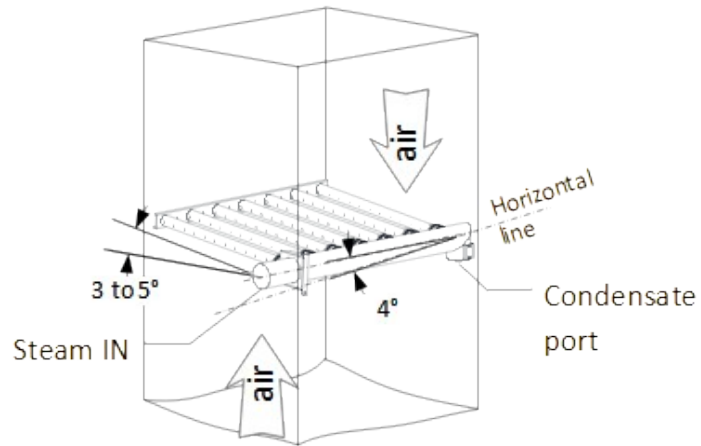


Figure 31, steamOsorb (SOS or SOE) for vertical air flow duct

Thermal insulation, high efficiency steam ramps

High efficiency thermal insulation is made of 2 components:

- A fiber glass sleeve in direct contact with stainless steel ramp ensuring the best thermal resistance.
- An external layer of high temperature red oxide silicon resistant to UV, abrasion, humidity, chemical agents and fire, offering a robust and damage free solution

Thickness : 0.142in [3.6mm]

Maximum operating temperature: 500°F [260°C]

certified to ASTM E84 (equivalent to UL723).

Nozzles are made of polymeric material, they are condensate free.

No risk of damage during installation and during the life of the steam ramp.

Made with no longitudinal joint that can result in thermal bridge and premature loss of performance.



Figure 32 - Nozzle detail



Figure 33 – Model SOE

Steam line installation

steamOvap recommends the use of rigid pipe (stainless steel or copper) for steam line longer than 3m. There is no maximum length for steam line, however plan for the following steam losses depending on material used and length :

Losses [kg/h/m]	Hose		Rigid pipe (stainless steel or copper)					
	Diam	DN40	DN50	DN40	[DN50]	[DN80]	[DN100]	[DN125]
Non insulated		[0.23]	[0.33]	[0.18]	[0.22]	[0.31]	[0.40]	[0.46]
	With thermal insulation [50mm] thick			[0.045]	[0.045]	[0.06]	[0.06]	[0.075]

When using flexible steam hose, ensure that the hose is maintained and attached in order to avoid any kink or sagging.

Caution: Risk of malfunction. Steam lines should not have any restriction or blockage that may cause a burst of pressure in the steam line.

Do not reduce diameter of the steam line from humidifier steam outlet to steam distribution ramp(s).

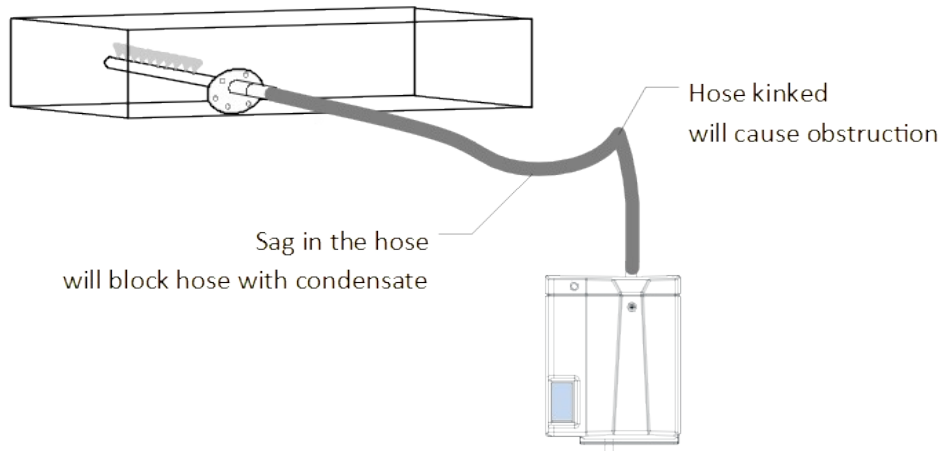


Figure 34, Kink or hose sagging will cause damage & malfunction

Long steam line installation

Make sure to install condensate trap(s) at each of the steam line low point(s)

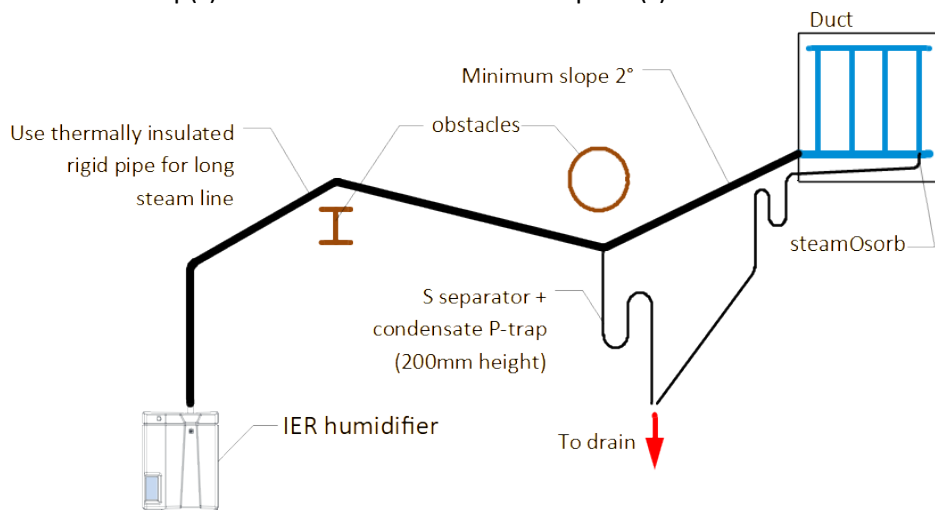


Figure 35, Long steam line run

Space blower information

SB ratings

Model	Steam Capacity	Airflow	Power	Voltage		Current
				Remote	Built-in	
SBS	12kg/h	[375m ³ /h]	34W	230Vac	Same as IER	0.15A
SBM	29.5kg/h	[560m ³ /h]	60W	230Vac	Same as IER	0.3A
SBL	44kg/h	[560m ³ /h]	60W	230Vac	Same as IER	0.3A

Dimensions

Built-in

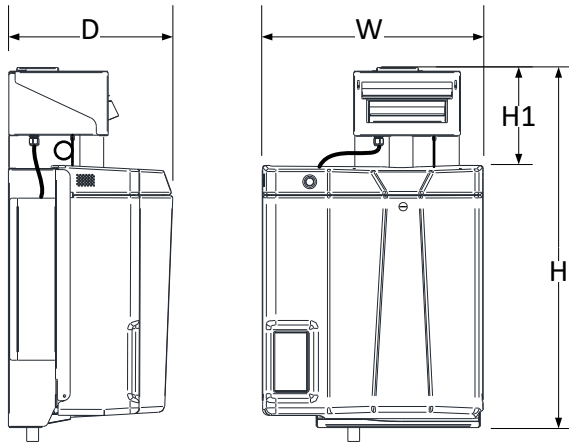


Figure 36 – Built-in SB dimensions

Remote

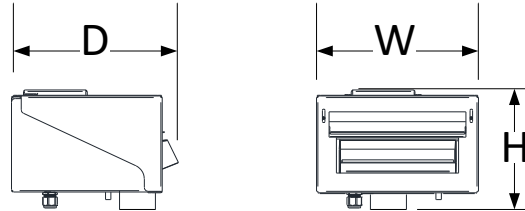


Figure 37 – Remote SB dimensions

Model	Dimensions				Steam Inlet Ø	Net weight
	W	H	H1	D		
SBS Built-in	20in [510mm]	23in [585mm]	8.5in [216mm]	13in [330mm]	1.5in [DN40]	8lb [3.6kg]
SBS Remote	9.25in [235mm]	7in [178mm]	/	9in [229mm]		
SBM / SBL Built-in	23.5in [590mm]	38in [965mm]	10.5in [267mm]	17.5in [445mm]	2in [DN50]	10lb [4.5kg]
SBM / SBL Remote	11.25in [292mm]	9in [229mm]	/	12in [305mm]		

Remote Space Blower recommendations

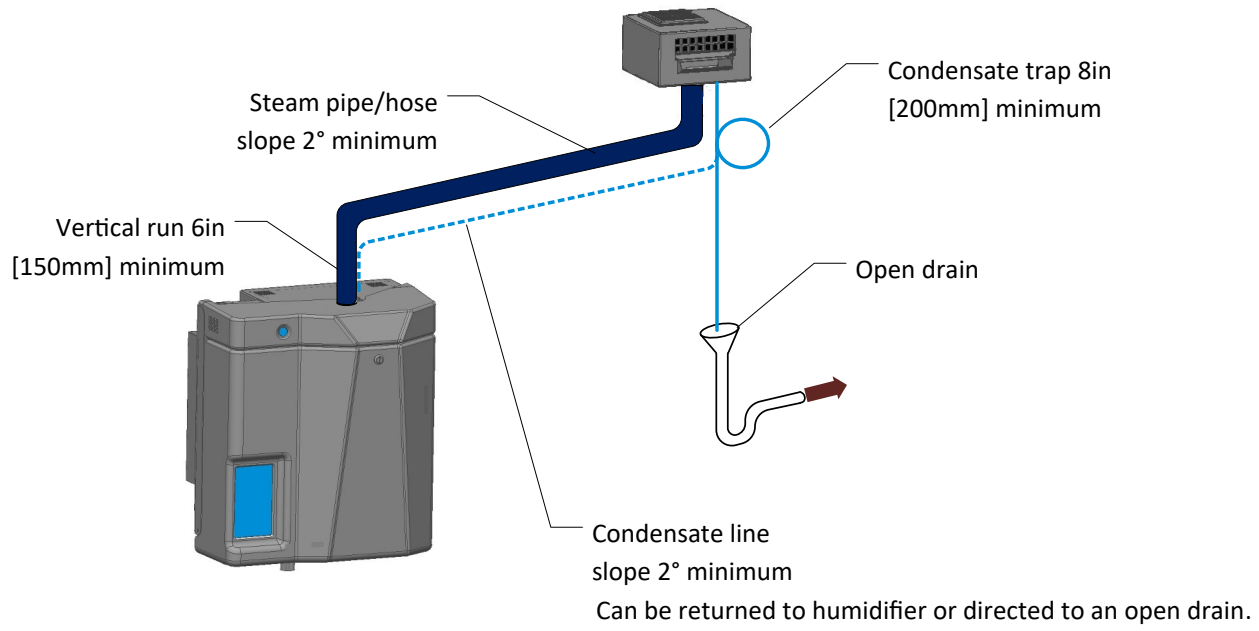


Figure 38 – Steam & condensate line for Remote SB

Power supply specification

Model	Steam Capacity	Power	Current	
			230V/1p	400V/3p
IER02	2.8kg/h	2.1kW	9.2A	-
IER04	4.5kg/h	3.3kW	14.3A	4.8A
IER05	6.8kg/h	5.0kW	21.7A	7.2A
IER09	11.4kg/h	8.3kW	36.1A	12.0A
IER12	15.9kg/h	11.7kW	50.8A	16.8A
IER17	22.7kg/h	16.7kW	-	24.1A
IER22	29.5kg/h	21.7kW	-	31.3A
IER31	42.3kg/h	31.0kW	-	44.7A
IER44	59.1kg/h]	43.3kW	-	62.5A
IER62	84.1kg/h	61.7kW	-	89.1A

Power supply wiring conductors must be copper only and rated for 105 °C. Refer to the above current rated to determine the appropriate wire sizes as well as conduit size and fused disconnect requirements. The earth must be made by solid metal to metal connections. Ground wire should be same size as power wiring.

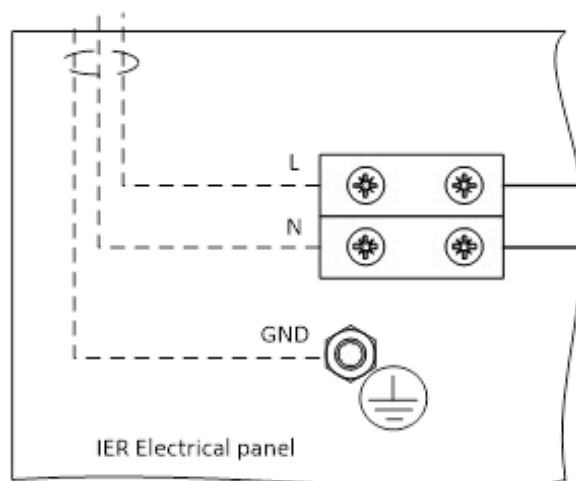


Figure 39 – Power supply connection- 1ph

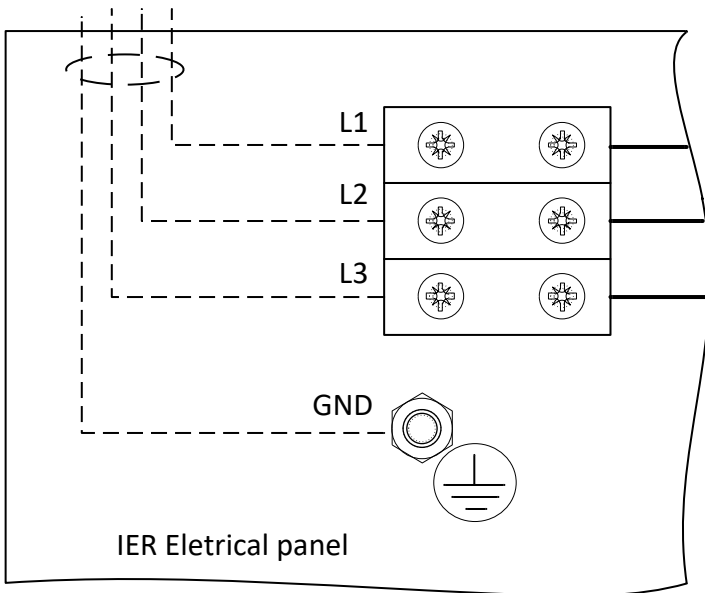


Figure 40 – Power supply connection- 3ph, IER04 to 31

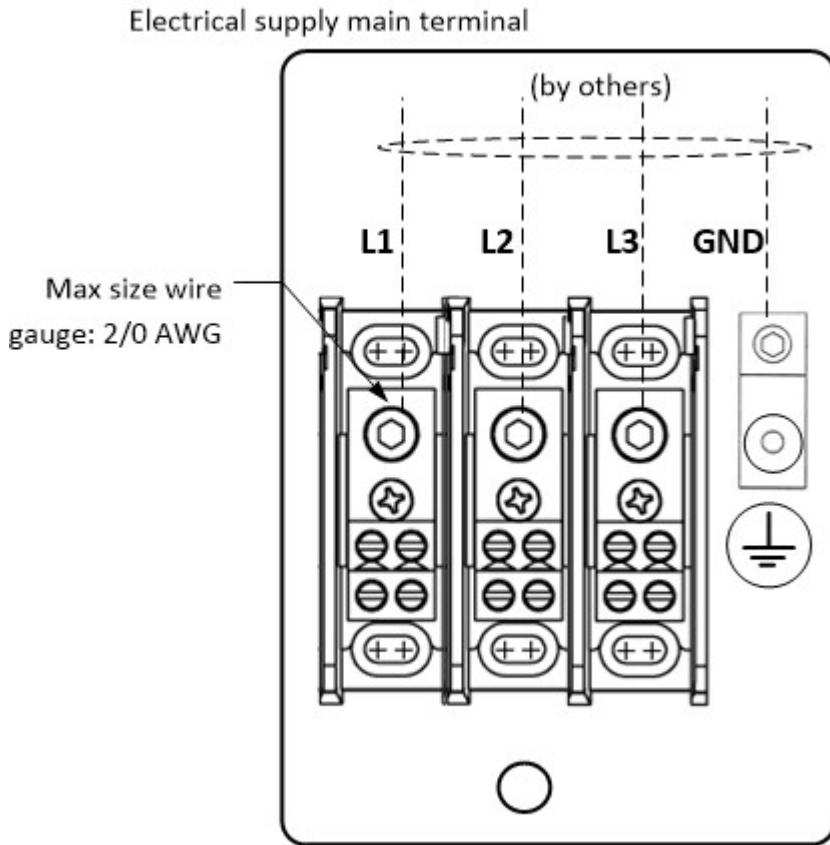


Figure 41 – Power supply connection- 3ph, IER44 & IER62

Control circuit specification

Zone	Humidifier tag	Model	Control signal	Feedback signal	BMS remote communication
		IER04 to 62	0-10Vdc	0-10Vdc	Modbus RTU (std)

General guidelines for control installation

It is a good practice to install the following safety controls:

- An air proving switch (model DAP) in the same duct as the humidifier’s steam ramp so that it can prevent humidifier from producing steam in case there is no air flow.
7. A high limit humidistat (model DHL) 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 (NWD). If the NWD is not known, locate it at least 3m downstream of the steam ramp.
 For system that needs very accurate RH% control a RH% sensor can replace or supplement the On/Off Hi Limit humidistat in this case the IER humidifier will not only modulate the steam production based on the control; signal demand but also on this proportional Hi-Limit signal.
8. An enable dry contact can also be wired to switch the humidifier ON or OFF, this enable contact can be used either as a third safety control or as a way to control the humidifier ON and OFF, although IER steam humidifier is fully modulating.

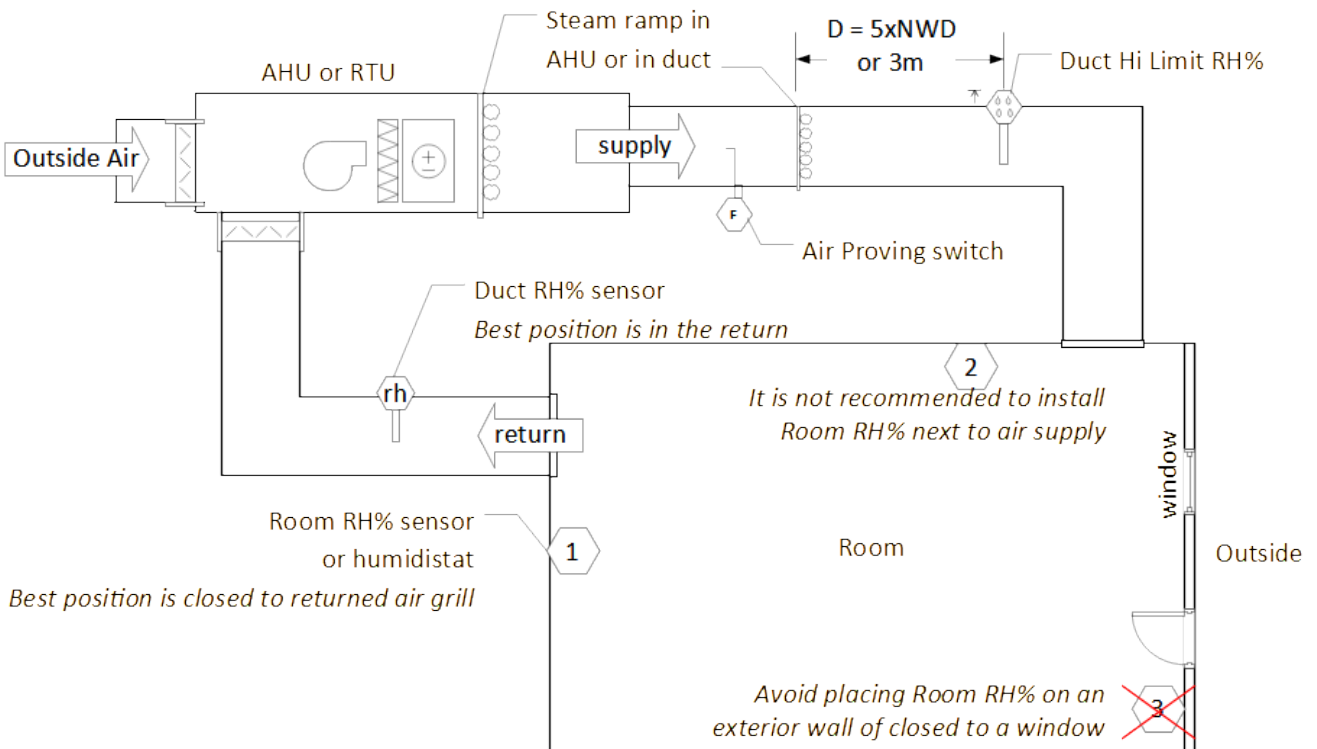


Figure 42, Controls placement recommendations

If Duct RH% sensor is used, it should be placed in return air duct

If Room RH% or humidistat is used, it should not be placed on an exterior wall, or next to supply air grill. Best position is closed to returned air grill.

Air proving switch should not be placed next of a fan or a plate that can vibrate, this would lead to wrong readings or early failure.

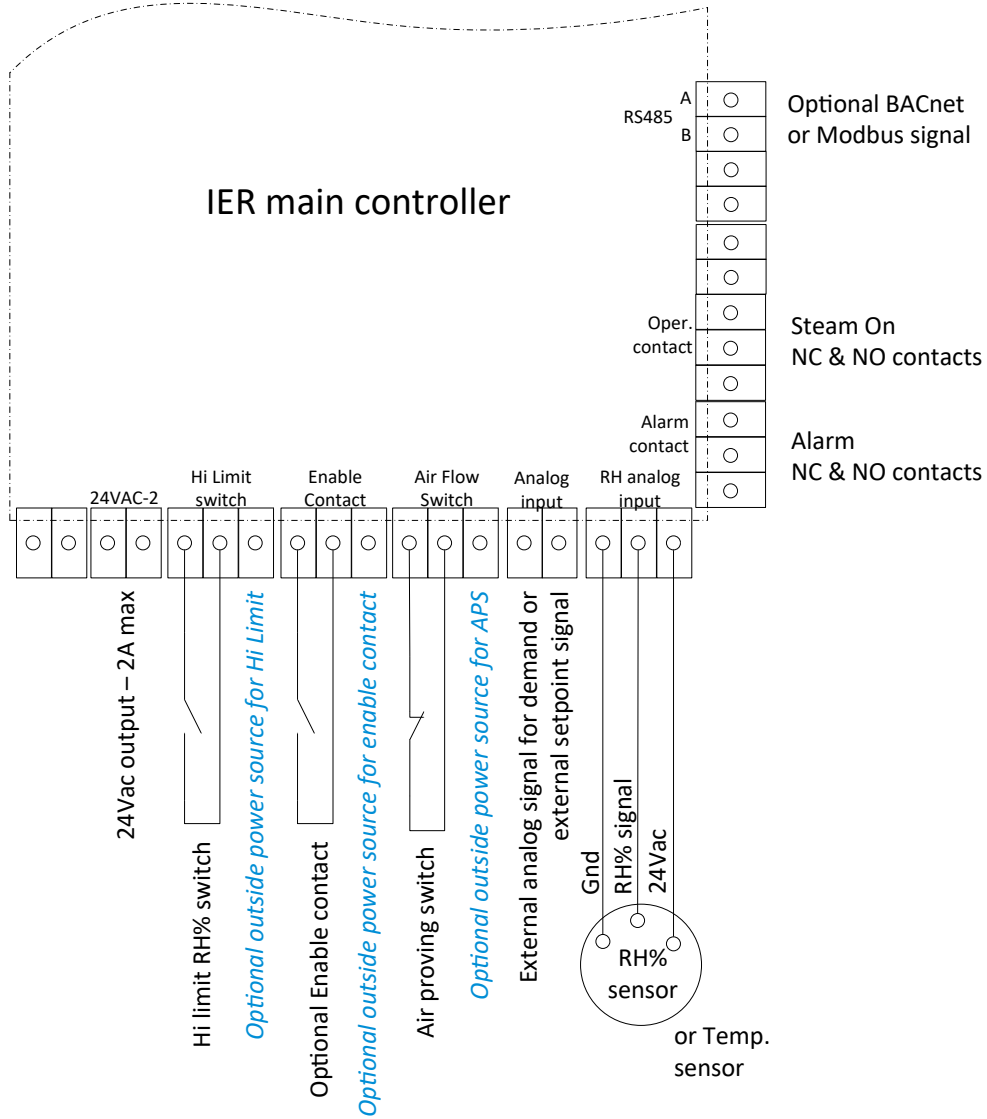


Figure 43 – Control connection

Admissible control signal

IER electric steam humidifier can be controlled by one of the following signal:

Control	Admissible signals
Proportional External demand Analog input	0-10Vdc, 0-5Vdc, 1-5Vdc, 2-10Vdc or 4-20mA
On-Off external signal Enable contact	Dry contact
Proportional RH% sensor RH% (or temperature) analog input	0-10Vdc, 0-5Vdc, 1-5Vdc, 2-10Vdc or 4-20mA
BACnet or Modbus signal (optional)	BACnet MS/TP or Modbus through RS485 terminal

Control signal is selectable in the control setting sub menu of the user interface.

Steam ON contacts (norm. open & norm. close) as well as alarm contacts (norm. open & norm. close) can be connected to get remote operation status of the humidifier.

A proportional feedback signal (0-10Vdc, 0-5Vdc, 1-5Vdc, 2-10Vdc or 4-20mA) is also available.

Accessories

List of accessories to be delivered with the humidifier

A. Electrical safeties & Controls

Zone	Humidifier tag	Model	Duct Air Proving switch	Duct Hi Limit switch	Control



Figure 44 – DAP

DAP specifications

Pressure range : 0.2 to 2 inH2O
 Contact SPDT 2A, 250Vac



Figure 45 – DHL

DHL specifications

Set point range : 15 to 95%RH
 Contact 5A, 24Vac/Vdc



Figure 46 – DHS

DHS specifications

Range : 0 to 100%RH
 Output: 0-10VDC
 Accuracy: ≤3%RH (at 25°C, 20 to 80%RH)
 Hysteresis: ≤+/-1%RH
 Response time: : ≤10s (25°C no air movement)
 Drift: ≤+/-0.5%RH
 Voltage: 15 to 28Vac or 15 to 36Vdc



Figure 47 – RHS

RHS specifications

Range : 0 to 100%RH
 Output: 0-10VDC
 Accuracy: ≤3%RH (at 25°C, 20 to 80%RH)
 Hysteresis: ≤+/-1%RH
 Response time: : ≤10s (25°C no air movement)
 Drift: ≤+/-0.5%RH
 Voltage: 15 to 28Vac or 15 to 36Vdc

B. Water treatment

Zone	Humidifier tag	Model	Water filters	Softener	RO treatment



Figure 48 – WF-105

WF 105 specifications

1st stage : 10 microns sediment

2nd stage : 5 microns sediment

Cartridge Dimensions: 10in

Water flow : 1GPM

Max pressure : 100 PSI

Fittings: ½" NPT