



neptronic®

Gas Fired Humidifier SKGE3 Series

INSTALLATION INSTRUCTIONS



Read and save these instructions

**WHAT TO DO
IF YOU SMELL GAS!**

Do not try to light any appliance.

Do not touch any electrical switch; do not use any telephone in your building.

Immediately call your gas supplier from an off-site telephone.

Follow the gas supplier's instructions.

If you cannot reach your gas supplier, call the fire brigade.

**GAS**

Before installation, check that the local distribution conditions, nature of gas and pressure, and the current state adjustment of the appliance are compatible.



Improper installation, adjustment, alteration, service, maintenance or use can cause carbon monoxide poisoning, explosion, fire, electrical shock or other conditions which may cause personal injury or property damage.

This appliance **MUST** be used only in sufficiently ventilated space. Consult instructions before installation and use of this appliance

Installation and service **MUST** be performed by a qualified gas installer, service agency, or the gas supplier.

Ensure that local regulations concerning the provision of gas installations are followed.

ELECTRICITY

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

Ensure that the local regulations concerning the provision of electrical installations are followed.

**HEALTH &
SAFETY**

Neptronic has considered aspects of the design of their humidification systems to reduce as much as possible the risk of Legionnaires' disease and other similar conditions, but it is important that users are also aware of their responsibilities under Health & Safety regulations in reducing the risk of legionellosis.

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

- Avoid water temperature that favours the growth of Legionella (20-45°C).
- Avoid water stagnation.
- Clean and disinfect the humidification system in accordance to Health & Safety regulations and enclosed instructions.
- Carry out a risk assessment of the water system supplying the humidifier by a competent person, to ensure the water supply is of an acceptable quality

CORRECT USE

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

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

ACCESS

The SKGE3 cabinet keys **MUST** never be left in the door locks, as this may cause unauthorized access to live electrical parts. Always store keys centrally with a nominated responsible person.

WATER

Neptronic® systems are designed to be used with tap, reverse osmosis, de mineralized or partially softened water. On no account attempt to introduce any other fluids or chemicals into the system without first consulting Neptronic or its authorized distributor.

Water supply must not exceed the max pressure of 4.8 bar or pressure limits laid out in the specification and installation must comply with local regulations. Your attention is drawn to your responsibilities as outlined in the Health & Safety regulations. The control of Legionella bacteria in water systems and your SKGE3 steam humidifier must be included in the risk assessment of the water system in your building as a whole. In particular, if the humidifier is turned off for prolonged periods, you must ensure that the unit is drained and that stagnation is avoided in pipe work supplying it.

A competent individual or organization must be appointed to carry out water tests. A wide range of different tests are available to identify the presence of microbes in water, including total viable count (TVC), temperature-range specific tests and identification of particular species types including Legionella. **It is the responsibility of the person on whom the statutory responsibility falls to determine the type and frequency of this and all other controls and preventative measures outlined in this manual.**

WARRANTY

Failure to install this humidifier as outlined in this manual may invalidate the warranty.

***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 m² (80,000 ft²) 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 Gas Fired Humidifier.

The strict application of these instructions will ensure the conformity of your installation and operation as per the manufacturer's recommendations.

The application of these instructions is one of the conditions for the application of the warranty.

The application of these instructions does not ensure, at any time conformity to procedures, regulation or local codes, regarding electric installation and connection to local water supply.

This product has been declared to conform to applicable European safety and electromagnetic compatibility standards and directives and bear the CE mark. The certificate of conformity CE is available upon request to the manufacturer.

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Electricity

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

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

Correct Use

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

General Warranty

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

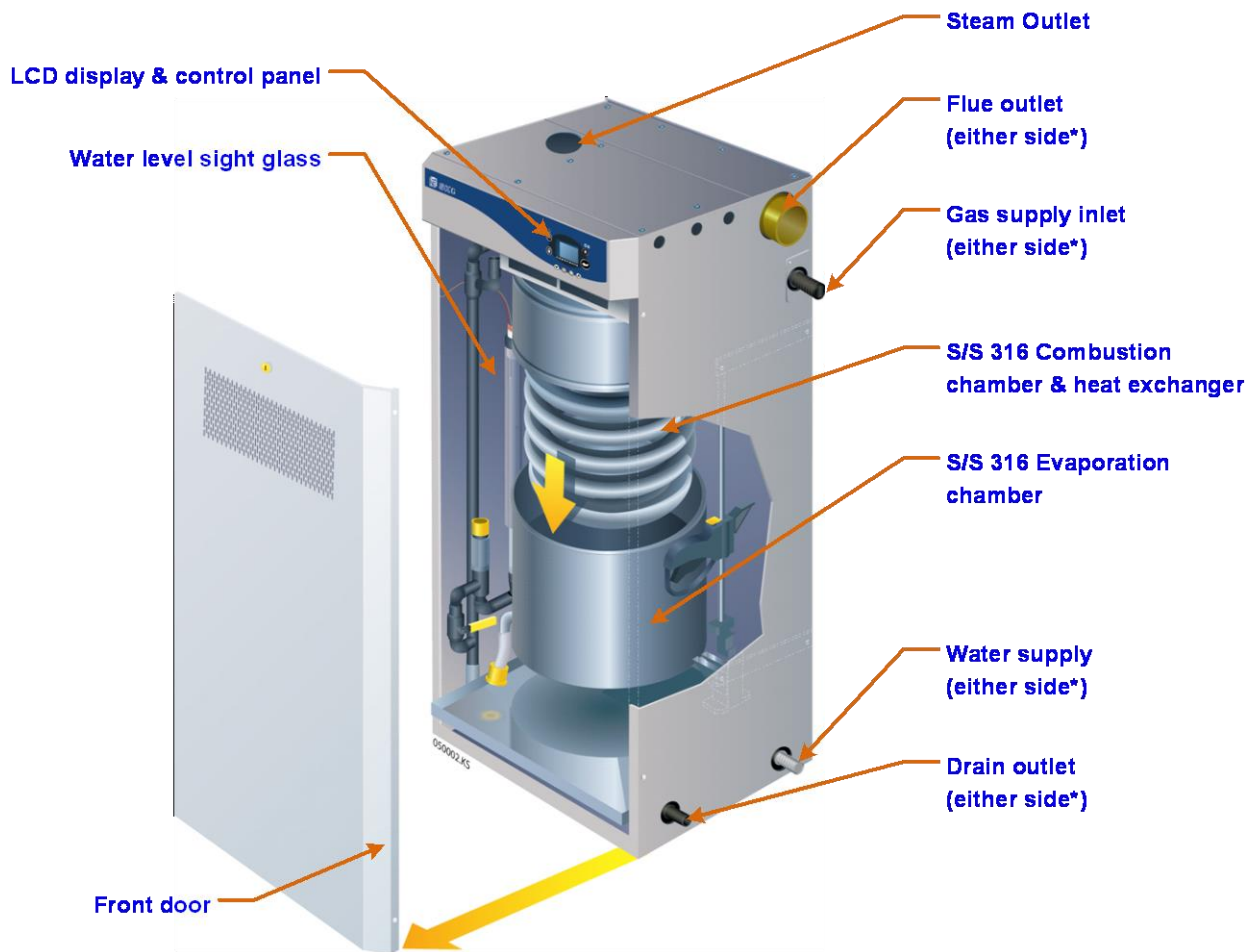
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Other related documents:

1. Start-up check list and Combustion Field Adjustment instructions
2. Wiring diagram
3. Service and troubleshooting guide
4. If humidifier is equipped with BACnet® option:
BACnet® communication module user guide.

Technical Specifications



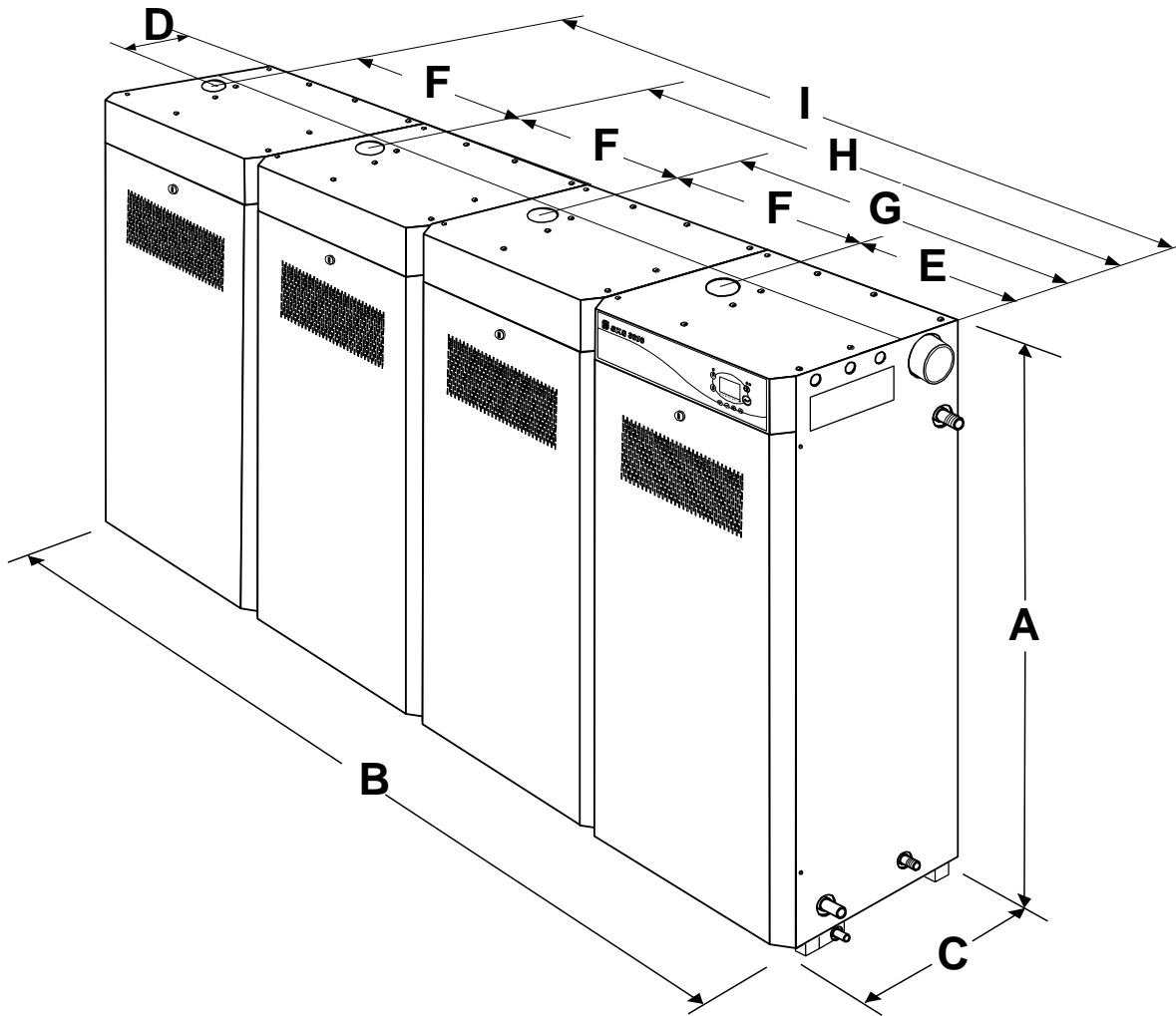
General overview - Fig.1

| Model | No of Modules | Steam capacity (kg/hr) | Natural Gas | | Propane Gas | | Current at 230V (Amp) | Multi-Steam header diameter (mm) |
|----------------|---------------|------------------------|-------------|---------------------------------|-------------|---------------------------------|-----------------------|----------------------------------|
| | | | Input (kW) | Consumption (m ³ /h) | Input (kW) | Consumption (m ³ /h) | | |
| SKGE3-0501 N/P | 1 | 50 | 49 | 4.6 | 55 | 2.1 | 3.5 | 76 |
| SKGE3-0701 N/P | 1 | 70 | 62 | 5.8 | 68 | 2.6 | 3.5 | 76 |
| SKGE3-0801 N/P | 1 | 80 | 69 | 6.5 | 75 | 2.9 | 3.5 | 76 |
| SKGE3-1001 N/P | 1 | 100 | 72 | 6.8 | 79 | 3.0 | 3.5 | 76 |
| SKGE3-1202 N/P | 2 | 120 | 110 | 10.4 | 123 | 4.8 | 4.5 | 100 |
| SKGE3-1502 N/P | 2 | 150 | 123 | 11.6 | 136 | 5.2 | 4.5 | 100 |
| SKGE3-1702 N/P | 2 | 170 | 134 | 12.6 | 147 | 5.7 | 4.5 | 100 |
| SKGE3-2002 N/P | 2 | 200 | 144 | 13.6 | 158 | 6.1 | 4.5 | 100 |
| SKGE3-2503 N/P | 3 | 250 | 203 | 19.1 | 222 | 8.6 | 6.0 | 125 |
| SKGE3-2703 N/P | 3 | 270 | 206 | 19.4 | 225 | 8.7 | 6.0 | 125 |
| SKGE3-3003 N/P | 3 | 300 | 216 | 20.4 | 236 | 9.1 | 6.0 | 125 |
| SKGE3 3504 N/P | 4 | 350 | 275 | 25.9 | 301 | 11.6 | 7.5 | (2x) 100 |
| SKGE3-3704 N/P | 4 | 370 | 278 | 26.2 | 304 | 11.8 | 7.5 | (2x) 100 |
| SKGE3-4004 N/P | 4 | 400 | 288 | 27.2 | 315 | 12.2 | 7.5 | (2x) 100 |

Notes: 1 - Maximum static duct pressure is 1.250 kPa (12.5 mbar). For higher static duct pressures, consult Neptronic or its authorized distributor.

2 - Standard humidifier is designed for natural ventilation combustion air, "Ducted Combustion Air" option is available upon request, see stage 6 of installation.

Dimensions & Weights



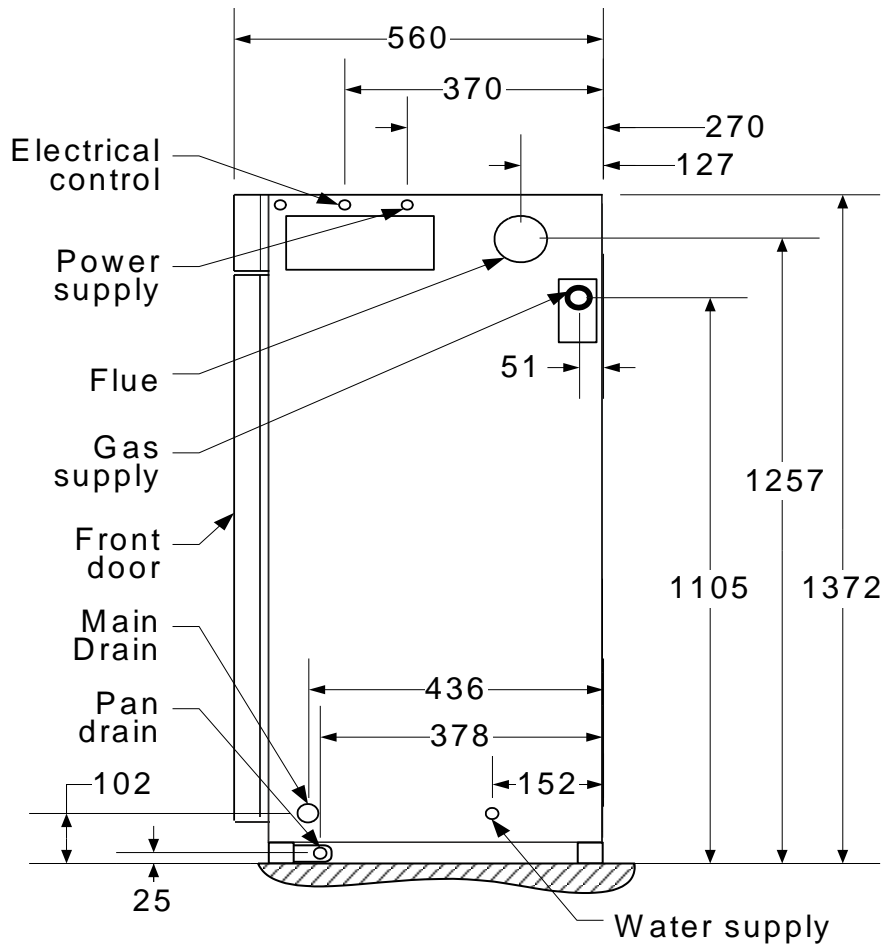
General dimensions - Fig. 2

General Dimensions, Weight & Steam Outlets detail

| Model | No of module | No of Steam Outlets | Steam Outlet Diam. | Dimensions in mm | | | | | | | | | Weight (Kg) | |
|----------------------------------------------------------------------|--------------|---------------------|--------------------|------------------|------|-----|-----|-----|-----|-----|------|------|-------------|---------------|
| | | | | A | B | C | D | E | F | G | H | I | Empty | Full of water |
| SKGE3-0501 N/P SKGE3-0701 N/P SKGE3-0801 N/P SKGE3-1001 N/P | 1 | 1 | Ø76 | 1372 | 610 | 560 | 230 | 460 | | | | | 145 | 200 |
| SKGE3-1202 N/P SKGE3-1502 N/P SKGE3-1702 N/P SKGE3-2002 N/P | 2 | 2 | Ø76 | 1372 | 1220 | 560 | 230 | 460 | 610 | 920 | | | 274 | 384 |
| SKGE3-2503 N/P SKGE3-2703 N/P SKGE3-3003 N/P | 3 | 3 | Ø76 | 1372 | 1830 | 560 | 230 | 460 | 610 | 920 | 1680 | | 431 | 600 |
| SKGE3 3504 N/P SKGE3-3704 N/P SKGE3-4004 N/P | 4 | 4 | Ø76 | 1372 | 2440 | 560 | 230 | 460 | 610 | 920 | 1680 | 2290 | 576 | 800 |

Dimensions & Weights

Position & Dimension of connections



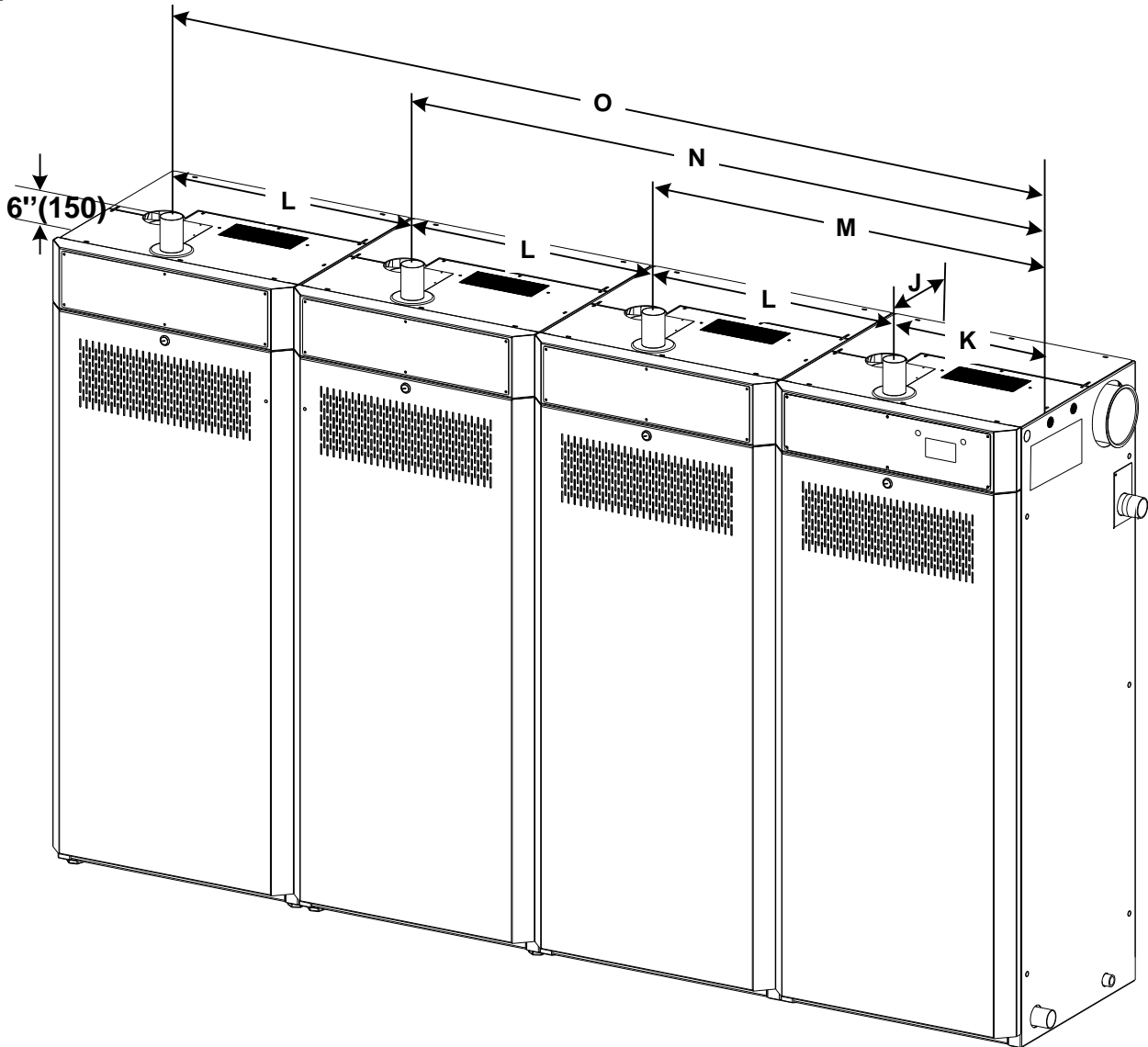
Connections position - Fig. 3
(all dimensions in mm)

| Model | No of module | Dimensions in mm | | | | |
|----------------------------------------------------------------------|--------------|--------------------|-----------------|-------------------|-----------------|-------------------|
| | | Drain Outlet Diam. | Pan Drain Diam. | Water Inlet Diam. | Gas Inlet Diam. | Flue Outlet Diam. |
| SKGE3-0501 N/P SKGE3-0701 N/P SKGE3-0801 N/P SKGE3-1001 N/P | 1 | Ø20 | Ø15 | Ø15 | Ø25 | Ø76 |
| SKGE3-1202 N/P SKGE3-1502 N/P SKGE3-1702 N/P SKGE3-2002 N/P | 2 | Ø40 | Ø15 | Ø15 | Ø25 | Ø100 |
| SKGE3-2503 N/P SKGE3-2703 N/P SKGE3-3003 N/P | 3 | Ø40 | Ø15 | Ø15 | Ø40 | Ø125 |
| SKGE3 3504 N/P SKGE3-3704 N/P SKGE3-4004 N/P | 4 | Ø40 | Ø15 | Ø15 | Ø40 | Ø125 |

Note: Drain outlet, water supply inlet, gas supply inlet and flue outlet are located on the right hand side of the humidifier. Left hand side location of any of these outlets or inlets is available upon request.

Dimensions & Weights

Option - Ducted combustion air inlet dimension

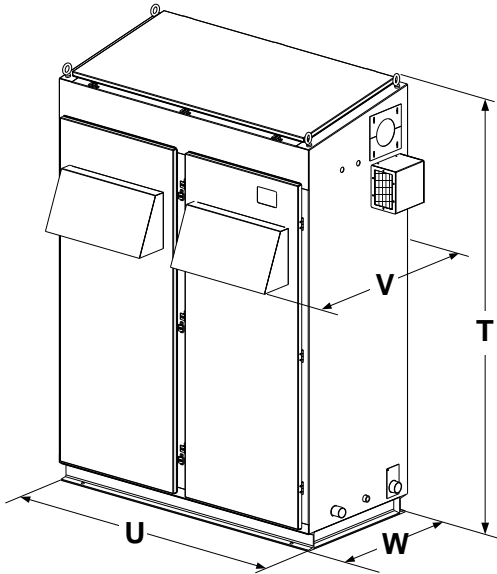


Ducted combustion air dimensions - Fig. 4
 (all dimensions in mm)

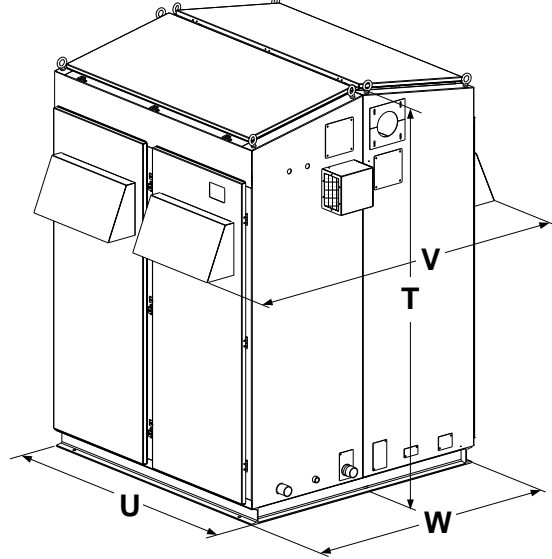
| Model | No of modules | No of Air inlet | Dimensions in mm | | | | | | |
|----------------------------------------------------------------------|---------------|-----------------|------------------|-----|-----|-----|-----|------|------|
| | | | Air inlet Diam. | J | K | L | M | N | O |
| SKGE3-0501 N/P SKGE3-0701 N/P SKGE3-0801 N/P SKGE3-1001 N/P | 1 | 1 | Ø51 | 448 | 352 | - | - | - | - |
| SKGE3-1202 N/P SKGE3-1502 N/P SKGE3-1702 N/P SKGE3-2002 N/P | 2 | 2 | Ø51 | 448 | 352 | 609 | 962 | - | - |
| SKGE3-2503 N/P SKGE3-2703 N/P SKGE3-3003 N/P | 3 | 3 | Ø51 | 448 | 352 | 609 | 962 | 1571 | - |
| SKGE3 3504 N/P SKGE3-3704 N/P SKGE3-4004 N/P | 4 | 4 | Ø51 | 448 | 352 | 609 | 962 | 1571 | 2180 |

Dimensions & Weights

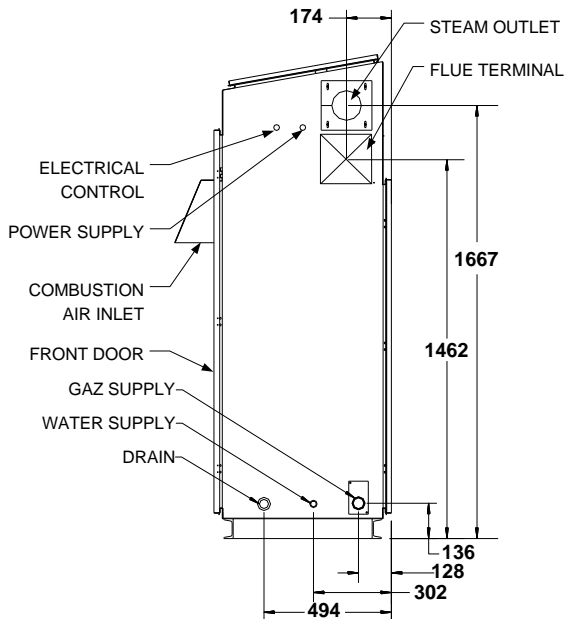
Option - Weather proof enclosure general dimension and weight



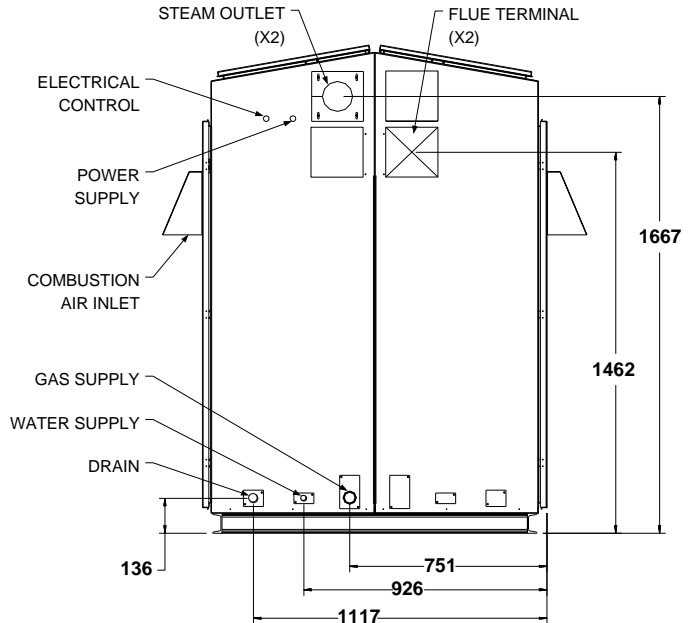
Weather proof enclos. 1 to 3 modules configuration – Fig. 5



Weather proof enclos. 4 modules configuration – fig. 6



Weather proof enclosure
 Connections position 1 to 3 modules configuration – Fig. 7
 (All dimensions in mm)



Weather proof enclosure
 Connections positions 4 modules configuration – Fig. 8
 (All dimensions in mm)

| Model | No of modules | Dimensions (mm) | | | | Weight (kg) | |
|----------------------------------------------------------------------|---------------|-----------------|------|------|------|-------------|---------------|
| | | T | U | V | W | Empty | Full of water |
| SKGE3-0501 N/P SKGE3-0701 N/P SKGE3-0801 N/P SKGE3-1001 N/P | 1 | 1867 | 762 | 841 | 762 | 285 | 340 |
| SKGE3-1202 N/P SKGE3-1502 N/P SKGE3-1702 N/P SKGE3-2002 N/P | 2 | 1867 | 1407 | 841 | 711 | 472 | 582 |
| SKGE3-2503 N/P SKGE3-2703 N/P SKGE3-3003 N/P | 3 | 1867 | 2064 | 841 | 711 | 653 | 818 |
| SKGE3 3504 N/P SKGE3-3704 N/P SKGE3-4004 N/P | 4 | 1867 | 1407 | 1616 | 1335 | 830 | 1050 |

Handling & Unpacking



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

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

Any personnel handling or lifting the SKGE3 Steam Humidifier **MUST** follow the Lifting Operations and Lifting Equipment Regulations 1998 and Approved Code of Practice L113. The regulation imposes duties on employers, self-employed persons and persons who have control, to any extent of lifting equipment.

Refer to Dimensions & Weight section for system dry weights.

Handling and Lifting

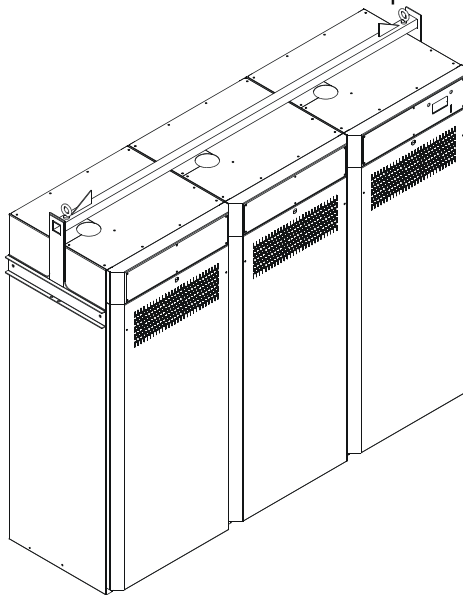
The SKGE3 Steam Humidifier **MUST** always be handled and lifted with care and must remain within its original packaging for as long as possible prior to installation

The SKGE3 Steam Humidifier package may be carried using a fork lift from the underside. Caution must be exercised to ensure balanced load before lifting.

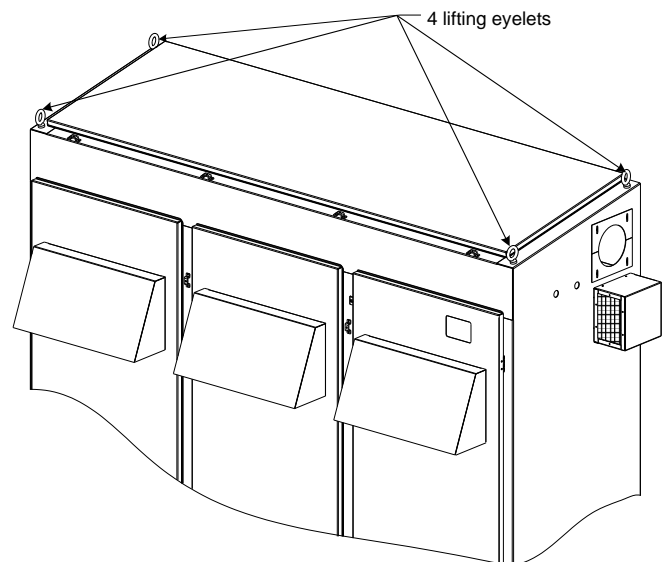
Lifting of SKGE3 Steam Humidifier **MUST** always be carried out using the appropriate Neptronic Lifting Bracket (sold separately), see fig. 9.

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

Optional weather proof enclosure is provided with four (4) lifting eyelets located at each corner on the top of the enclosure, see fig. 10.



(Fig. 9) Standard enclosure



(Fig. 10) Option Weather proof enclosure

Unpacking SKGE3 Steam Humidifier is shipped in a wooden crate.

Ensure packing wooden crate and skid is removed prior to commissioning.

List of Accessories Supplied

Standard enclosure

- 2 sets of keys.
- 2 adjustable steam hose collars per module to connect on the steam output.
- *Startup check list & Combustion field adjustment instructions.*
- *The present Installation Instructions and User Manual.*
- *Wiring diagram* affixed onto the interior of the front access door.
- *Service and troubleshooting guide.*
- *BACnet® communication module user guide* (if BACnet® option is installed).

Weather proof enclosure

- 2 adjustable steam hose collars per internal steam manifold.

Installation Overview



All installation work must comply with local regulations.

All work related to the installation of the SKGE3 Steam Humidifier **MUST** only be performed by skilled and qualified technical personnel (e.g. qualified gas installer, fitters, electricians, plumbers or technicians with appropriate training).
The customer is responsible for ensuring their suitability.

To install the SKGE3 Steam Humidifier and its associated components, no special tooling is required above that of a fitter's toolkit.

**Installation
Method
Statement**

Stage 1: Unit Positioning and Mounting

Stage 2: Steam Distribution Installation

Stage 3: Gas Supply Connection

Stage 4: Water Supply Installation

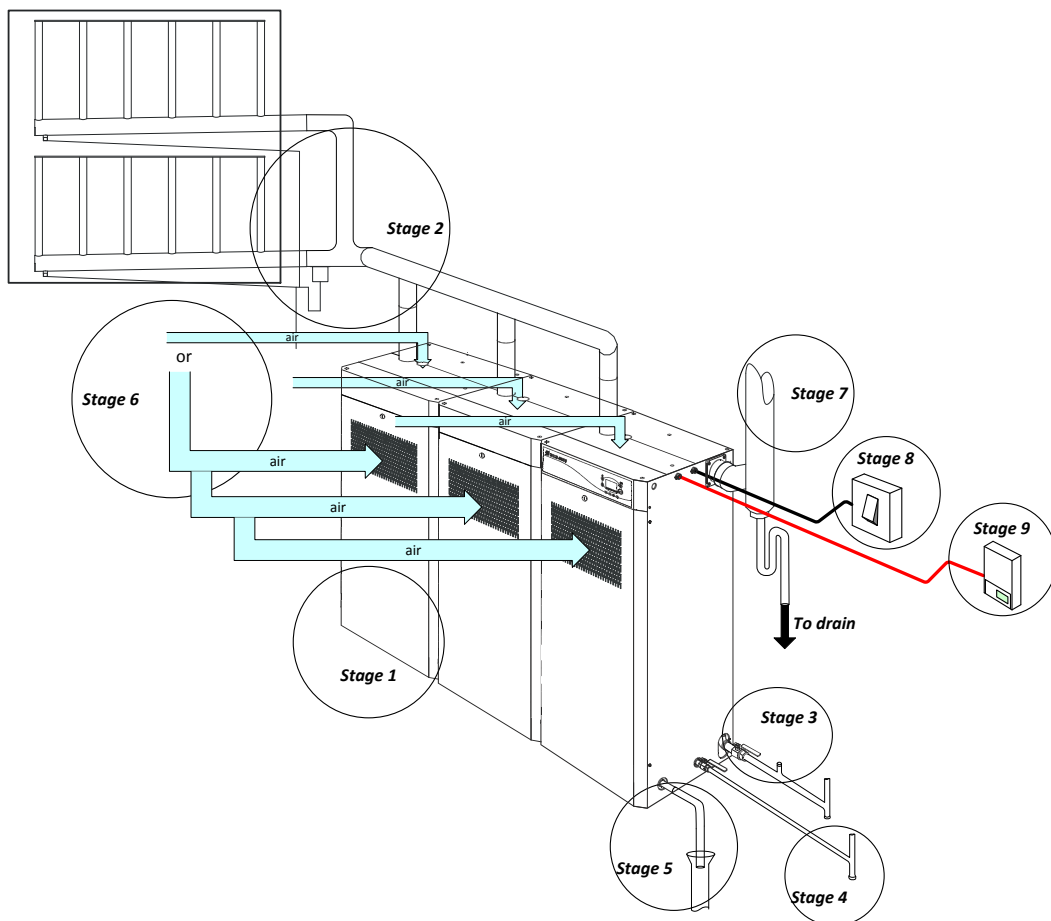
Stage 5: Water Drain Connection

Stage 6: Combustion Air Installation

Stage 7: Flue Gas Venting Connection

Stage 8: Electrical Supply and Installation

Stage 9: Electrical Control Connections



Installation overview - Fig. 11

Stage 1 – Unit Positioning and Mounting

Safety Considerations



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

The following considerations must be taken into account before deciding upon the location for the SKGE3 Steam Humidifier:

- Locate the SKGE3 Steam Humidifier in an area clear of combustible materials, gasoline, and other flammable vapours and liquids. Do not install in potentially explosive or flammable atmospheres laden with grain dust, sawdust, or similar airborne materials.
- If the appliance is installed in an insulated area, it must be kept free and clear of insulating materials, as they may be combustible. If insulation is added after the humidifier is installed, an inspection of the humidifier area must be carried out to ensure that there is no insulation coming into contact with the humidifier.
- Provide adequate room ventilation air in accordance with local codes and regulations.
With the exception of ducted combustion air installation, do not locate units in tightly sealed rooms or small compartments without provision for adequate air for combustion and room ventilation. Combustion and ventilation air must be supplied through one permanent low-level and one permanent high-level opening communicating directly with the outside air.
- Humidifier flue gases must be vented to the outdoors. Locate the humidifier as near as possible to an outside wall or roof so that the flue pipe from the humidifier is short and direct.
- Locate the SKGE3 Steam Humidifier on a water proof floor or install a drain pan beneath the humidifier.
- The humidifier must be installed to ensure the steam hose length is kept to the shortest possible length.
- For flexible steam hoses: the total steam line length must not exceed 5 meters. For longer distances use insulated hard piping.
- For insulated hard piping: the total steam line length must not exceed 15 m. For longer steam line runs, consult factory.
- The humidifier must be located in an area that is fully accessible for inspection and servicing. Observe the minimum access distances as shown in figures 12 & 13.

Positioning the Humidifier

Ambient Condition & Altitude

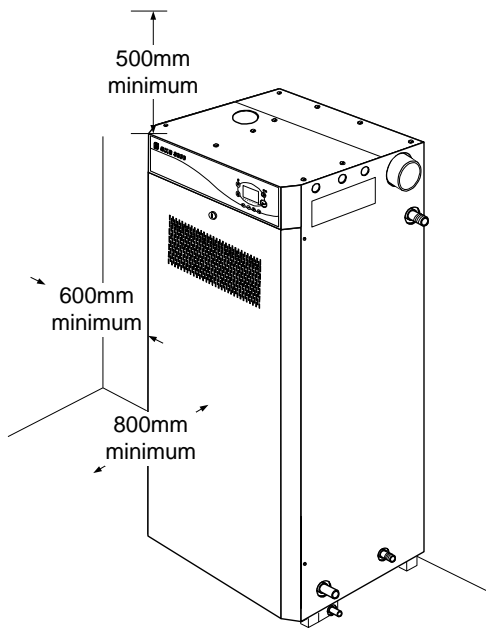
The humidifier location **MUST** have an ambient temperature of less than 30°C.

If the above condition is not respected for indoor humidifiers, the warranty of the unit will be void, as it has not been designed to operate under extreme external conditions.

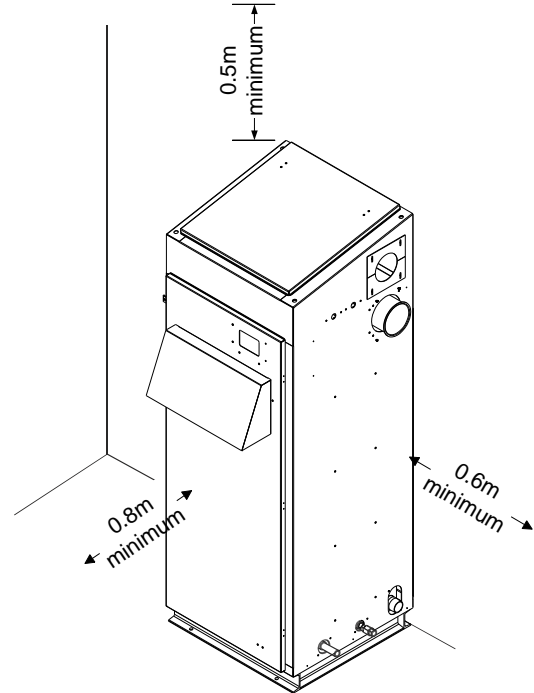
The combustion burner of the SKGE3 Steam Humidifier is self-adjusting for any altitude; the burner will maintain proper combustion and low emission at any altitude. Steam capacity will be affected by altitudes over 1050m above sea level. Please refer to the table below to anticipate the ratio of output reduction:

| Altitude above sea level (m) | Output reduction (%) |
|------------------------------|----------------------|
| 0 to 1050 | 0 |
| 1051 to 1350 | 2 |
| 1351 to 1650 | 4 |
| 1651 to 1950 | 6 |
| 1951 to 2250 | 8 |

Stage 1 – Unit Positioning and Mounting



Standard enclosure clearances - Fig. 12



Weather proof enclosure clearances - Fig. 13

Minimum Clearances

Minimum clearances are :

Standard enclosure

- Top: 0.50m minimum
- Both sides: 0.60m minimum
- Front: 0.50m minimum

Weather proof enclosure

- Top: 0.50m minimum
- Connection side: 0.60m minimum
- Front: 0.8m minimum

Note: Above minimum clearances are indicated for inspection and servicing access. The SKGE3 Steam Humidifier is designed for 0 clearance to combustable materials, except on top and front, where minimum clearances to combustable materials is respectively 500 and 762 mm.

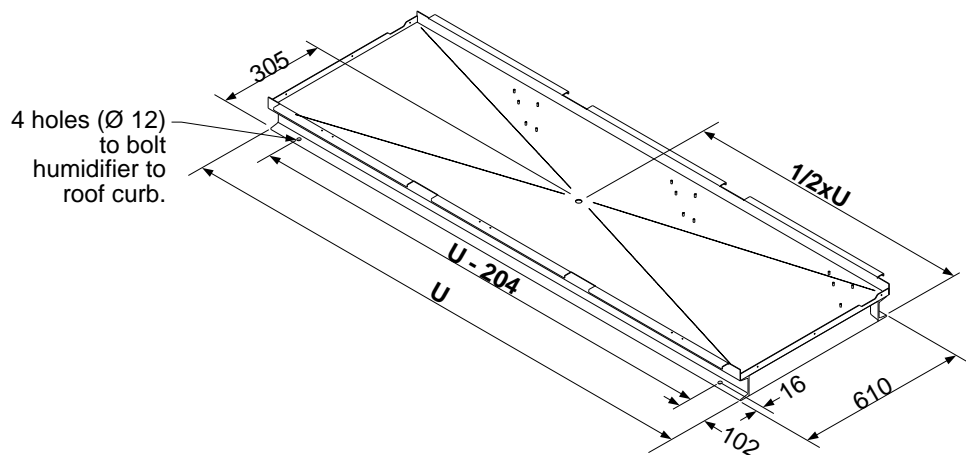
The humidifier is designed to be installed directly on the floor.

Provide a level, solid foundation for the humidifier.

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

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

Roof Curb for Weather Proof Enclosure



Weather proof enclosure base dimensions(in mm) - Fig. 14

Ensure that roof curb is structurally built to support the weight of the SKGE3 humidifier.

Roof curb must provide proper level to the humidifier.

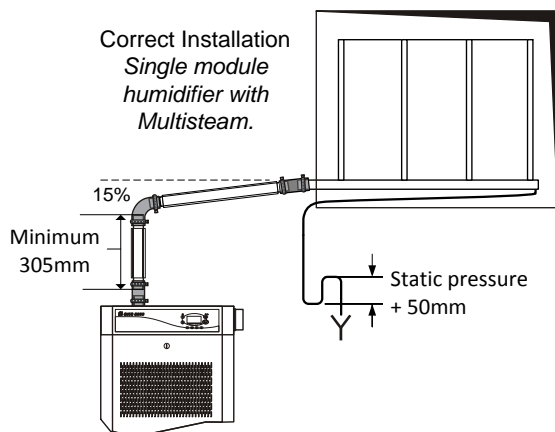
The base of the weather proof enclosure is provided with 4 holes Ø12mm to bolt the SKGE3 humidifier to the roof curb.

Stage 2 – Steam Distribution Installation

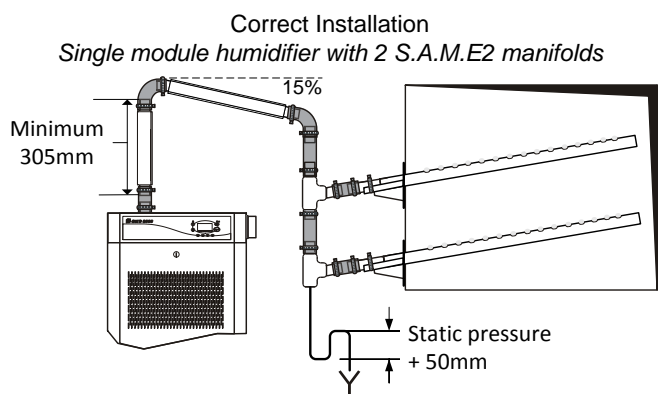
Fundamental Design Concepts



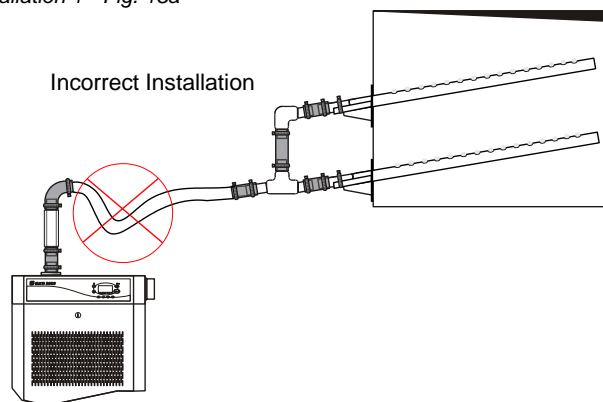
1. Minimum steam pipe gradient must be 7° i.e. 125mm rise in 1000mm run.
2. The lowest point of any steam hose or rigid pipe must be the humidifier. Otherwise, a steam trap (S trap) must be installed at the lowest point of the steam line. This steam trap must be installed higher than the static pressure of the system by at least 50mm.
3. Total length of the flexible steam hose must not exceed 5 m or insulated rigid piping must not exceed 15 m.
4. Whenever possible use rigid copper piping, flexible steam hose can be used for short runs or for interconnecting between rigid pipe runs. Ensure that there is no kink in the flexible hose.
When using rigid copper pipe, insulation must be used to diminish condensation build up.



Steam distribution correct installation 1 - Fig. 15a



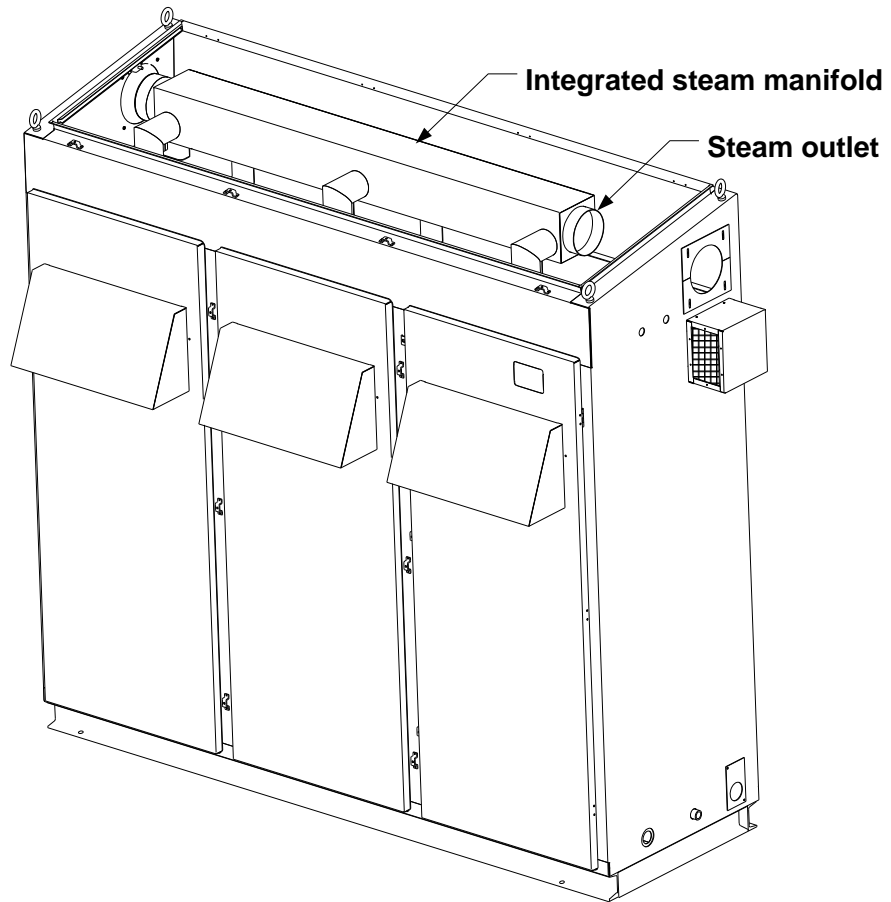
Steam distribution correct installation 2 - Fig. 15b



Incorrect installation - Fig. 16

5. Connection pipe sizes between the SKGE3 and the steam distributor in the duct must be:
 - 76mm up to 100kg/h
 - 100mm up to 200kg/h
 - 125mm up to 300kg/h
6. All humidifier below 100kg/h capacity must use the standard Neptronic® S.A.M.E2 Steam distribution pipes. Multi-Steam can be offered if shorter absorption distances are required.
7. All humidifiers above 100kg/h capacity must use the Multi-Steam configuration.
8. All humidifiers above 300kg/h must use 2 Multi-Steam units per Air Handling Unit (AHU) or air duct, with an equal duty split to each Multi-Steam

Stage 2 – Steam Distribution Installation



Steam Outlet Configuration for Weather Proof Enclosure

Weather proof enclosure single steam outlet - Fig. 17

The SKGE3 humidifier with weather proof enclosure is provided with an integrated steam manifold with an outlet located on either one of the sides of the humidifier.

By default, the steam outlet will be on the right side of the humidifier (when facing the control panel). Steam outlet side can be switch to left upon request to factory.

Weather Proof Enclosure Steam Outlet Dimension & Quantity

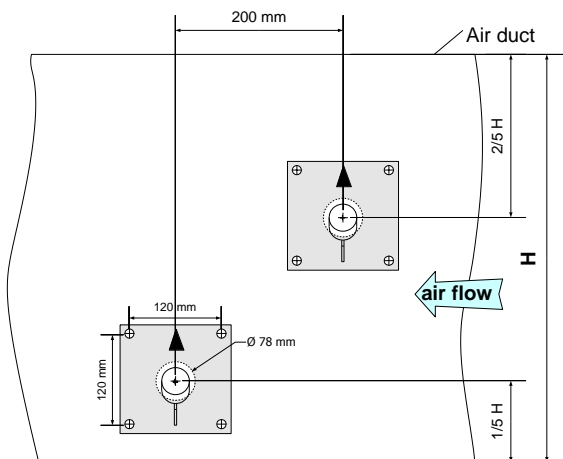
| <i>Model</i> | <i>Steam outlet Qty</i> | <i>Steam outlet diameter</i> |
|-------------------------------------|-------------------------|------------------------------|
| SKGE3-0501, 0701, 0801, 1001 | 1 | Ø76mm |
| SKGE3 1202, 1502, 1702, 2002 | 1 | Ø100mm |
| SKGE3 2503, 2703, 3003 | 1 | Ø125mm |
| SKGE3-3504, 3704, 4004 | 2 | Ø100mm |

Stage 2 – Steam Distribution Installation

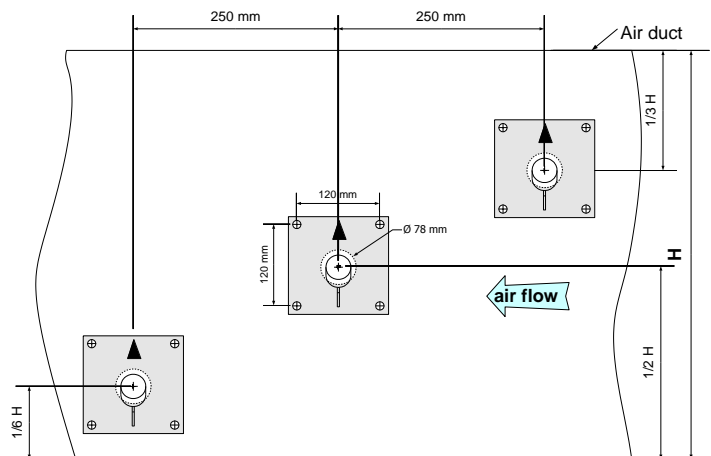
Selection of Steam Distribution Manifolds

1. The minimum steam manifold length that can be used with the SKGE3-0501 to SKGE3-1001 is 900mm. Any manifold below this dimension will have insufficient outlet spigots to allow proper steam distribution.
2. If duct size is below a width of 900mm, it will be necessary to either fit multiple pipes or use a Multi-Steam system.

Horizontal Duct

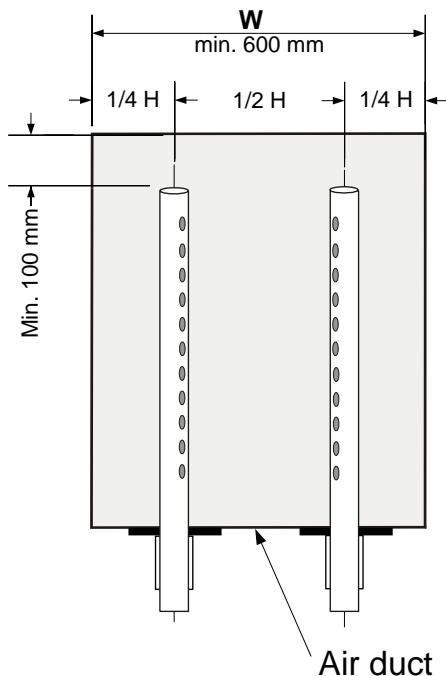


Horizontal duct – 2 manifolds - Fig. 18

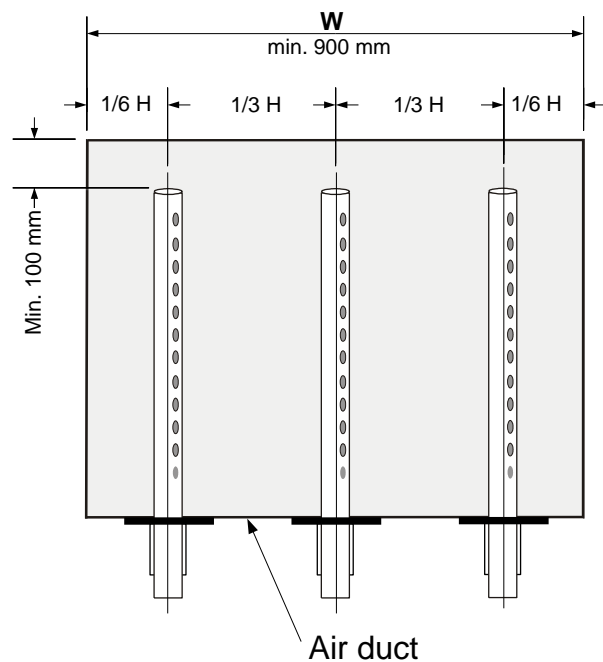


Horizontal duct – 3 manifolds - Fig. 19

Vertical Duct



Vertical duct – 2 manifolds - Fig. 20



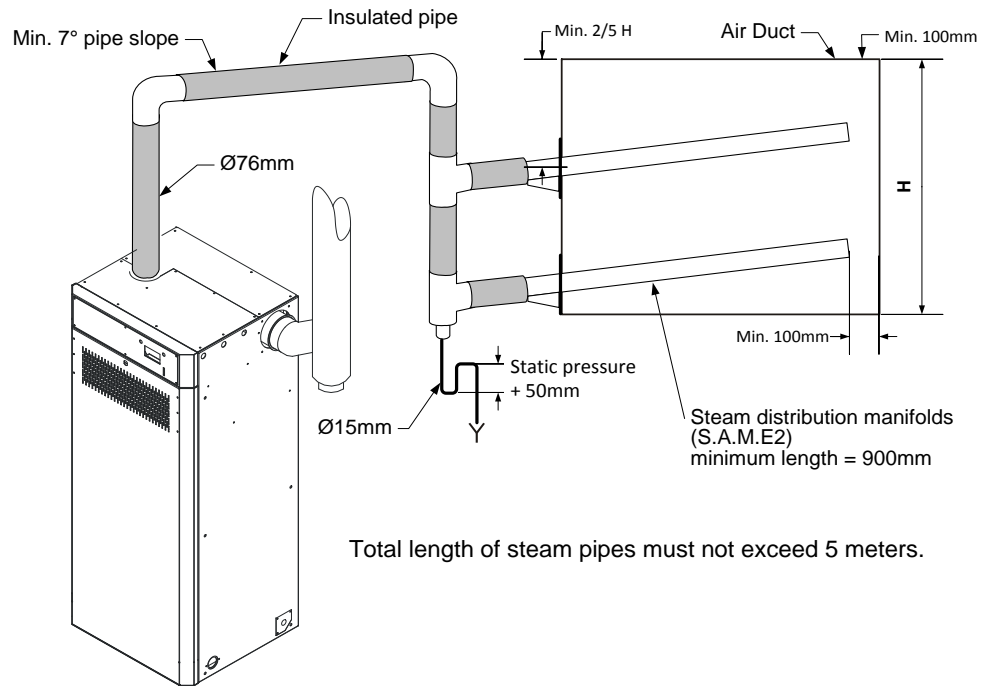
Vertical duct – 3 manifolds - Fig. 21

Stage 2 – Steam Distribution Installation

Manifolds Configurations

All humidifiers above 100kg/h capacity must use the Multi-Steam configuration.

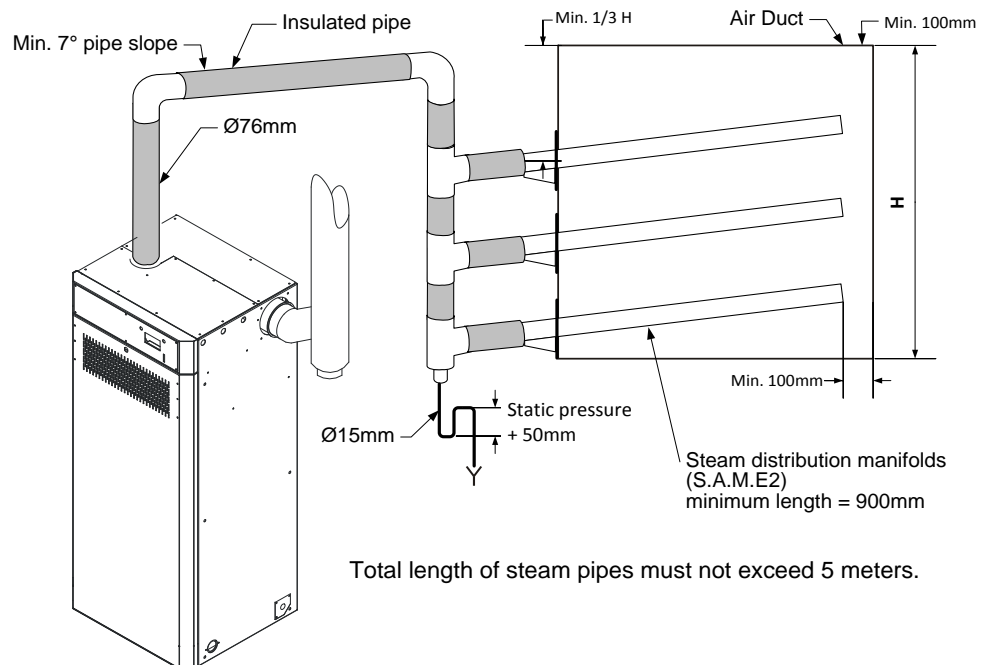
Single Module Humidifier: SKGE3-0501



Steam pipe work SKGE3-0501 - Fig. 22

A single Ø76mm feed pipe must be connected to two (2) S.A.M.E2 Steam manifolds with a suitable reduction at the lowest point to allow a Ø15mm condensate drain from the main steam supply.

Single Module Humidifiers: SKGE3-0701 SKGE3-0801 SKGE3-1001



Steam pipe work SKGE3-0701 to 1001 - Fig. 23

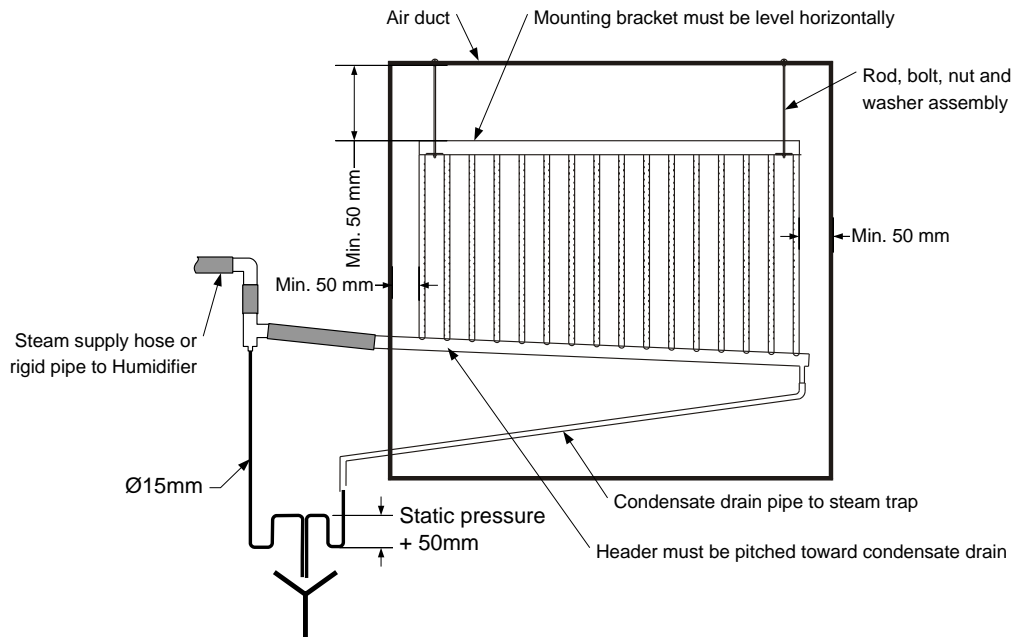
A single Ø76mm feed pipe must be connected to 3 S.A.M.E2 Steam manifolds with a suitable reduction at the lowest point to allow a Ø15mm condensate drain from the main steam supply.

Stage 2 – Steam Distribution Installation

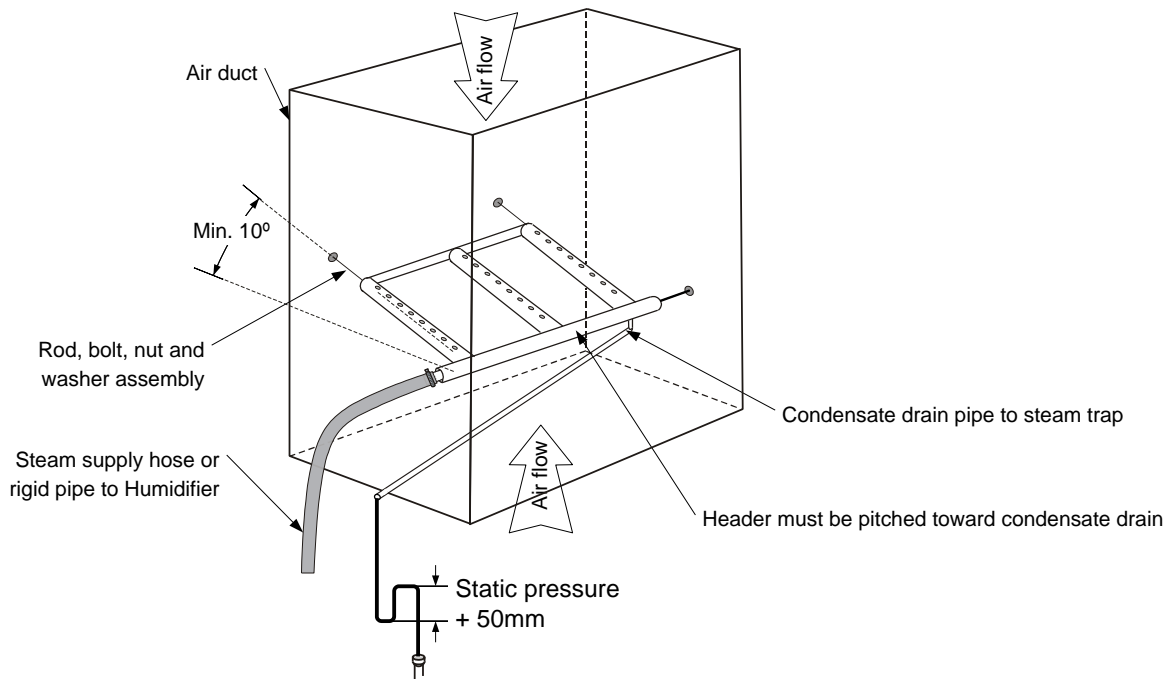
Selection of Multi-Steam

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

Horizontal Duct



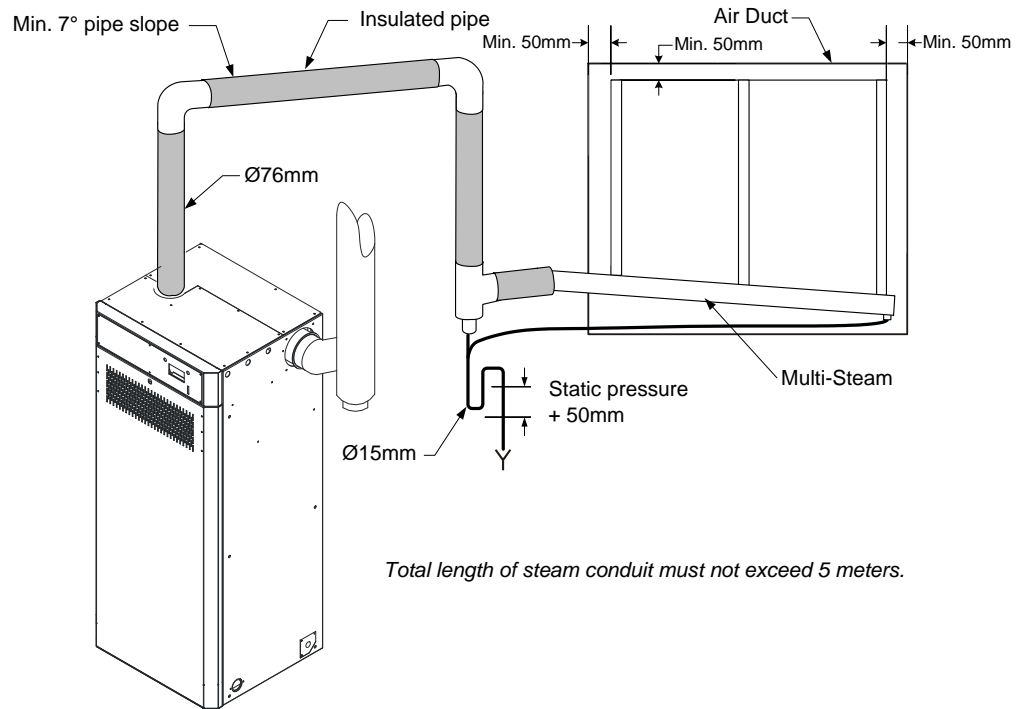
Vertical Duct



Stage 2 – Steam Distribution Installation

Multi-Steam Configurations

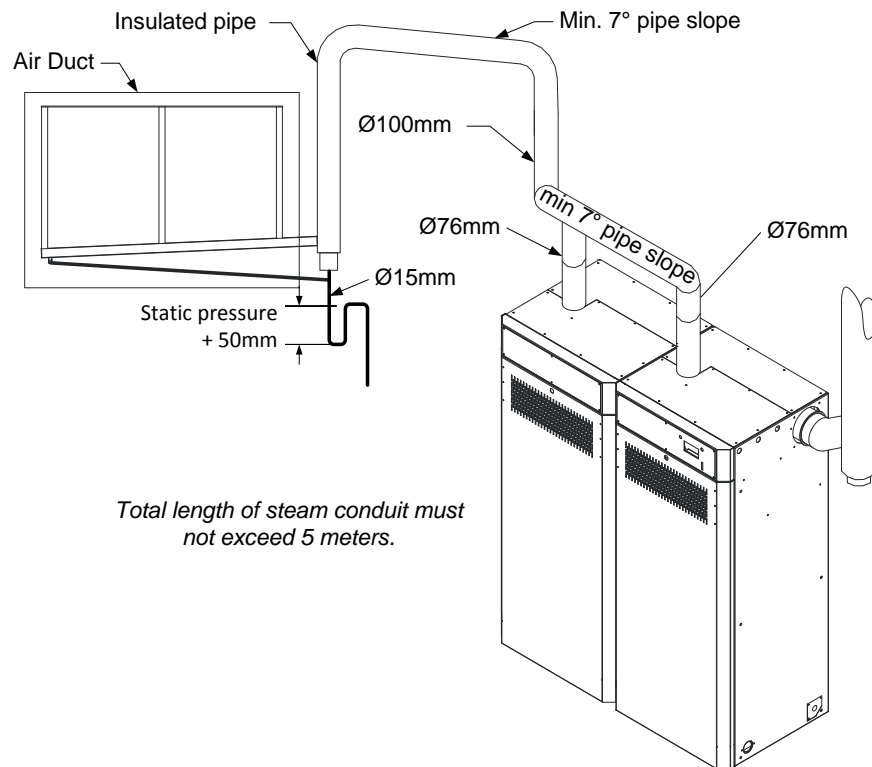
Single Module Humidifiers:
SKGE3-0501
SKGE3-0701
SKGE3-0801
SKGE3-1001



Steam pipe work SKGE3-0501 to 1001 - Fig. 26

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

2 Modules Humidifiers:
SKGE3-1202
SKGE3-1502
SKGE3-1702
SKGE3-2002

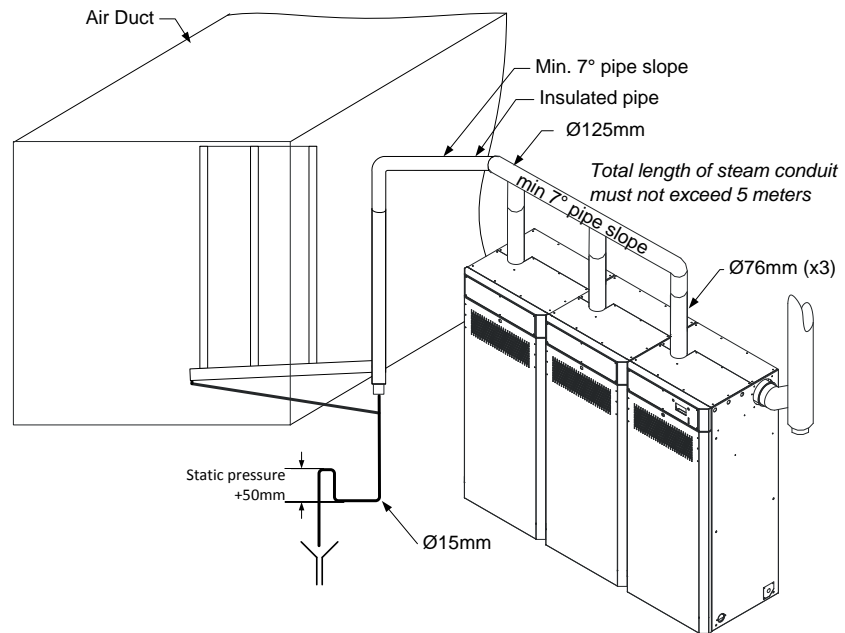


Steam pipe work SKGE3-1202 to 2002 - Fig. 27

Two Ø76mm steam outlets to a single Ø100mm feed pipe must be connected to a single Multi-Steam with a suitable reduction at the lowest point to allow a Ø15mm condensate drain from the main steam supply.

Stage 2 – Steam Distribution Installation

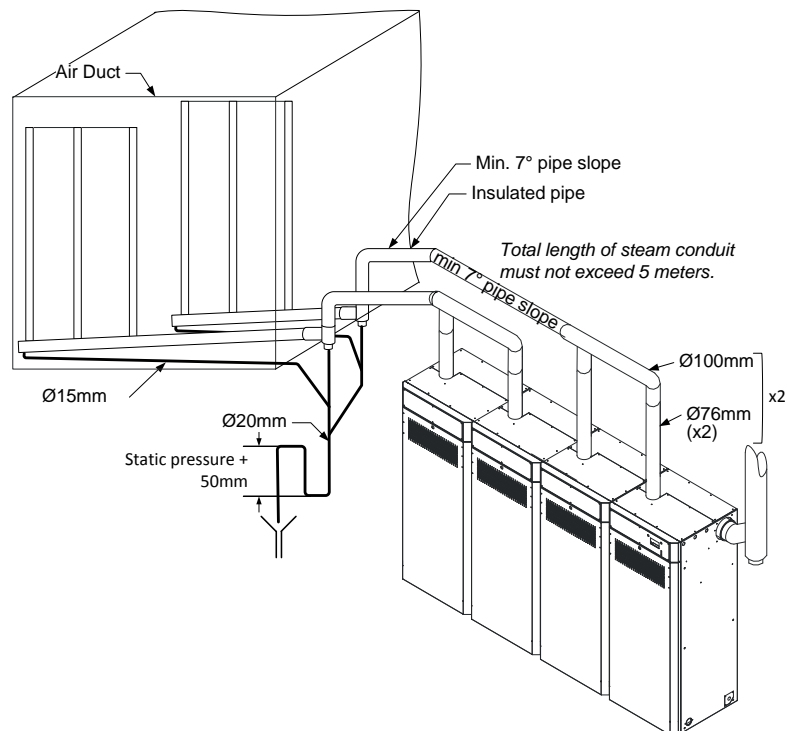
**3 Modules
Humidifiers:
SKGE3-2503
SKGE3-2703
SKGE3-3003**



Steam pipe work SKGE3-2503 to 3003 - Fig. 28

Three Ø76mm steam outlets to a single Ø125mm feed pipe must be connected to a double Multi-Steam with a suitable reduction at the lowest point to allow a Ø15mm condensate drain from the main steam supply.

**4 Modules
Humidifiers:
SKGE3-3504
SKGE3-3704
SKGE3-4004**



Steam pipe work SKGE3-3504 to 4004 - Fig. 29

Two Ø76mm steam outlets to a single Ø100mm feed pipe must be connected to a single Multi-Steam with a suitable reduction at the lowest point to allow a Ø15mm condensate drain from the main steam supply.

This must be reproduced two times.

If the two Ø15mm condensate pipes are connected, the common condensate drain must be Ø20mm.

Stage 3 – Gas Supply Connection

CAUTION Gas piping installation **MUST** comply with all local codes and regulations.



Gas pressure to the humidifier **MUST** never exceed 6kPa (60 mbar).

A manual shut off valve (not supplied) **MUST** be installed on the gas supply line to the humidifier. Ensure adequate size for the gas supply line (see below table).

A DN6 (1/8" BSP) plugged tapping for test pressure gauge connection must be installed immediately upstream of the gas supply line.

Pressure tapings for test gauges must be located at the Gas valve.

Pipes must be inspected for dirt and chips after threading and reaming the end of pipes.

Gas piping installation must be supported to avoid mechanical strain/stress.

Two wrenches must be used when connecting gas piping to the humidifier.

Drip pocket must be provided at any low spot in the gas line.

Minimum gas pipe gradient must be 1.5mm in 1000mm horizontal run.

Air purge must be done by disconnecting piping at the gas valve.

Air purge **MUST NOT** be done at the heat exchanger of the humidifier.

After installation, field piping and humidifier gas train must be checked for leaks.

Do not use soap solution or open flame on the humidifier gas train. A gas leak detector must be used.

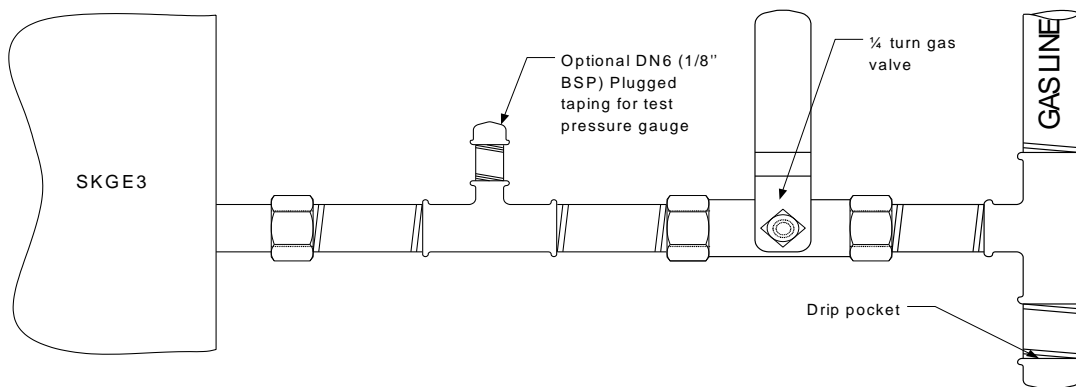
All leaks **MUST** be sealed prior to commissioning the humidifier.

Gas Pipe Diameter

| <i>Model</i> | <i>Gas Connection size</i> |
|----------------------------------------------------------------|----------------------------|
| SKGE3-0501, 0701, 0801, 1001 1202, 1502, 1702, 2002 | Ø25mm Male |
| SKGE3-2503, 2703, 3003 3504, 3704, 4004 | Ø40mm Male |

Please refer to local codes and regulations regarding the type and volume of gas handled, in order to obtain the pressure drop allowed in the gas line and to determine gas pipe diameter.

When multiple SKGE3 humidifier modules are installed, consideration must be taken to total capacity, gas flow and length of main.



Gas supply connection - Fig. 30

Gas Leak Test

Pressure testing of the gas supply piping must be performed by the gas Installer in accordance with local codes and regulations.

Test pressure must be relieved from the gas piping system prior to opening the manual shut off valve of the humidifier.

For any test pressure over 350kPa (3.5 bar), the humidifier **MUST** be disconnected (at the gas shut off valve).

Gas supply pressure at the inlet pressure tap, when all burners are running, must be:

- 1.75kPa (17.5 mbar) for Natural Gas.
- 3.5 kPa (35 mbar) for Propane and Butane.

Stage 4 – Water Supply Installation



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

Water Inlet Specifications

The Neptronic® SKGE3 Humidifier is designed to be used with tap, reverse osmosis, deionised and de-mineralized water.

Maximum water supply pressure: 70 to 480kPa (0.7 to 4.8 bar).

Minimum water temperature: +4°C

Maximum water temperature: +40°C

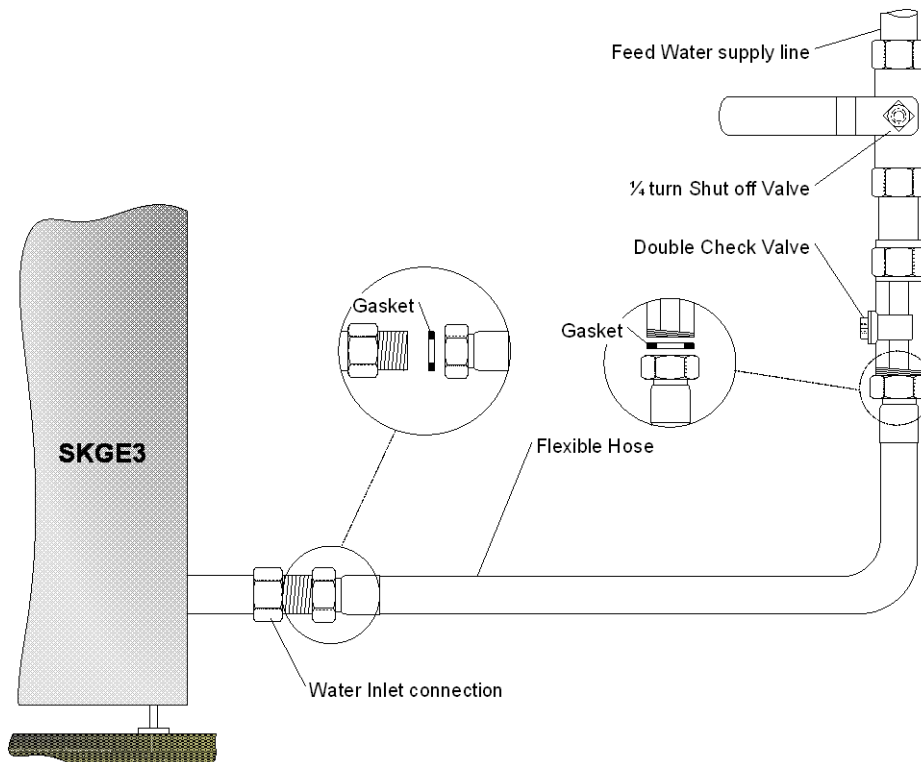
| <i>Model</i> | <i>Water inlet Connection size</i> |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|
| SKGE3- 0501, 0701, 0801, 1001 1202, 1502, 1702, 2002 2503, 2703, 3003 3504, 3704, 4004 | Ø15mm Male |

Water Supply Line Installation

To facilitate servicing, a shut off valve (not supplied) must be installed in the water line, within 1 meter of the humidifier.

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

For outdoor installations in which the ambient temperature is below 0°C, ensure that all outdoor water supply pipe lines are properly insulated and heat traced in order to prevent freezing.



Water supply connection - Fig. 31

Double Check Valve

In order to comply with WRAS (Water Regulations Advisory Scheme) regulations in force in the United Kingdom, a double check valve must be installed as indicated in the above figure.

All connections must be made using the gaskets provided. On the inlet side of the check valve shown is a compression fitting for a 15mm pipe.

Stage 5 – Water Drain Connection



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

Water Drain Specification

Water drain temperature: +60°C

| Model | Water Drain Outlet Connection size | Pan Drain outlet connection size |
|--------------------|------------------------------------|----------------------------------|
| SKGE3-0501 to 1001 | Ø20mm | Ø15mm |
| SKGE3-1202 to 4004 | Ø40mm | |

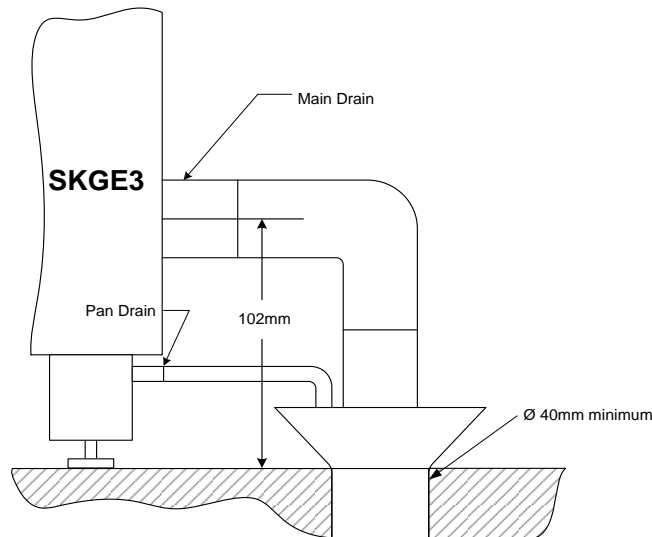
Water Drain Installation

Water drain outlet connection must be connected to drain pipe of sufficient size. It is recommended to use Ø40mm minimum standard copper hydraulic pipes.

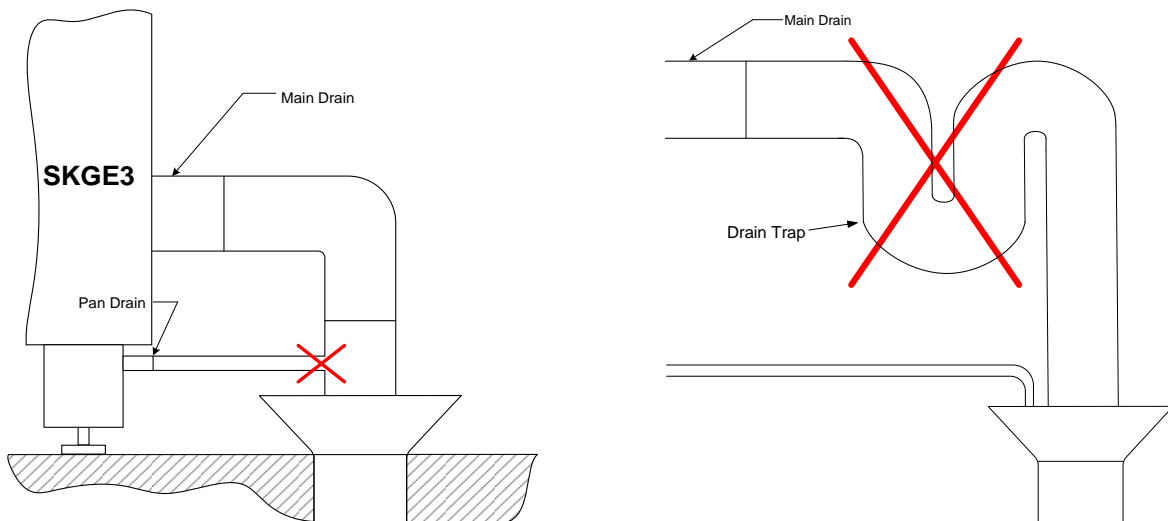
Minimum water drain pipe gradient must be 6.5mm in 300mm horizontal run.

No drain trap is required.

Pan drain connection must be connected to drain pipe through separated line.



Drain connection: Correct installation - Fig. 32

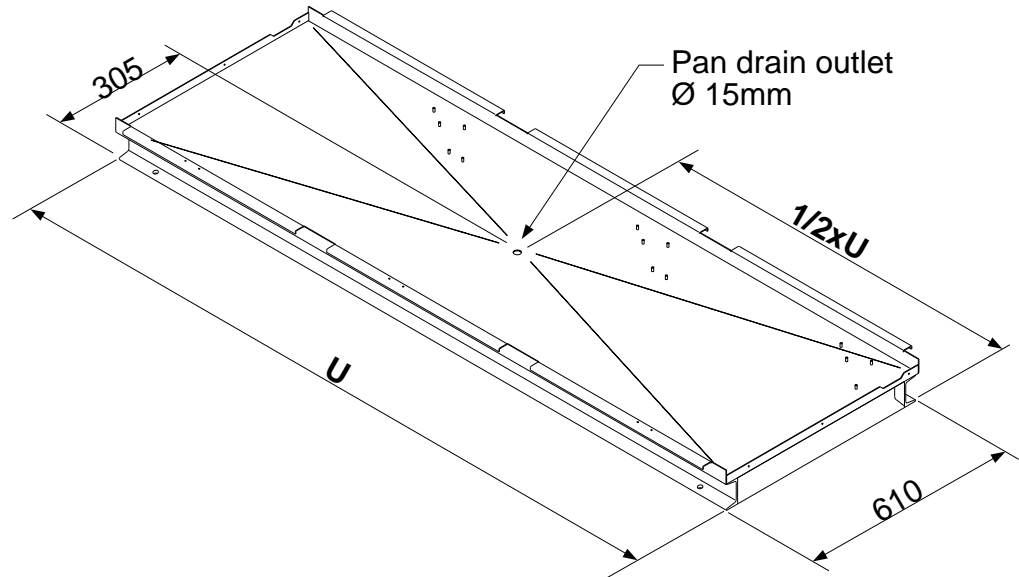


Drain connection: Incorrect installation - Fig. 33

Stage 5 – Water Drain Connection

Pan Drain Connection on Weather Proof Enclosure

The weather proof enclosure is provided with a pan drain at the base of the SKGE3 humidifier.



Weather proof enclosure base pan drain outlet dimension (in mm). - Fig. 34

Weather Proof Enclosure Water Drain Valve

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



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

Stage 6 – Combustion Air Installation

CAUTION



Combustion and room ventilation air must conform to local codes and regulations.

Air for combustion **MUST** not be contaminated by halogens, ammonia, bromides, chlorides, fluorides, iodides or dust. Excessive exposure of humidifier to these contaminants will result in performance related problems.

A humidifier that may be operated in toxic environments must be equipped with ducted combustion air installation.

The operation exhaust of fans such as ventilation fans or other combustion appliances can create a negative pressure condition on the humidifier. Adequate air supply must be provided for the ventilation devices, in addition to that required by the humidifier.

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

With the exception of ducted combustion air installation, do not locate units in tightly sealed rooms or small compartments.

Combustion and ventilation air must be supplied through one permanent low-level and one permanent high-level opening communicating directly with the outside air.

Air intake(s) location must be at a sufficient height above ground level to prevent blocking by accumulated debris.

Supply air intake vent(s) must be equipped with a weather cap and bird screen, in order to prevent gusts of wind or water from entering, preventing mold build up or leakage in the ducts.

The SKGE3 Steam Humidifier has filtered air openings through the front door. Do not block or obstruct the air openings of the humidifier.

The humidifier is factory adjusted for correct performance. Do not alter throttle setting or restrict blower combustion air inlet.

**Combustion Air
Specification -
Natural
Ventilation**

| Model | Number of Modules | Natural Ventilation Installation (2) | |
|----------------|-------------------|------------------------------------------------------|--------------------------------------------------------|
| | | Minimum Low level opening - inlet (cm ²) | Minimum High level opening - outlet (cm ²) |
| SKGE3-0501 N/P | 1 | 540 | 270 |
| SKGE3-0701 N/P | 1 | 558 | 549 |
| SKGE3-0801 N/P | 1 | 567 | 554 |
| SKGE3-1001 N/P | 1 | 743 | 641 |
| SKGE3-1202 N/P | 2 | 770 | 655 |
| SKGE3-1502 N/P | 2 | 954 | 747 |
| SKGE3-1702 N/P | 2 | 1031 | 785 |
| SKGE3-2002 N/P | 2 | 1215 | 878 |
| SKGE3-2503 N/P | 3 | 1427 | 983 |
| SKGE3-2703 N/P | 3 | 1503 | 1022 |
| SKGE3-3003 N/P | 3 | 1688 | 1114 |
| SKGE3 3504 N/P | 4 | 1899 | 1220 |
| SKGE3-3704 N/P | 4 | 1976 | 1258 |
| SKGE3-4004 N/P | 4 | 2160 | 1350 |

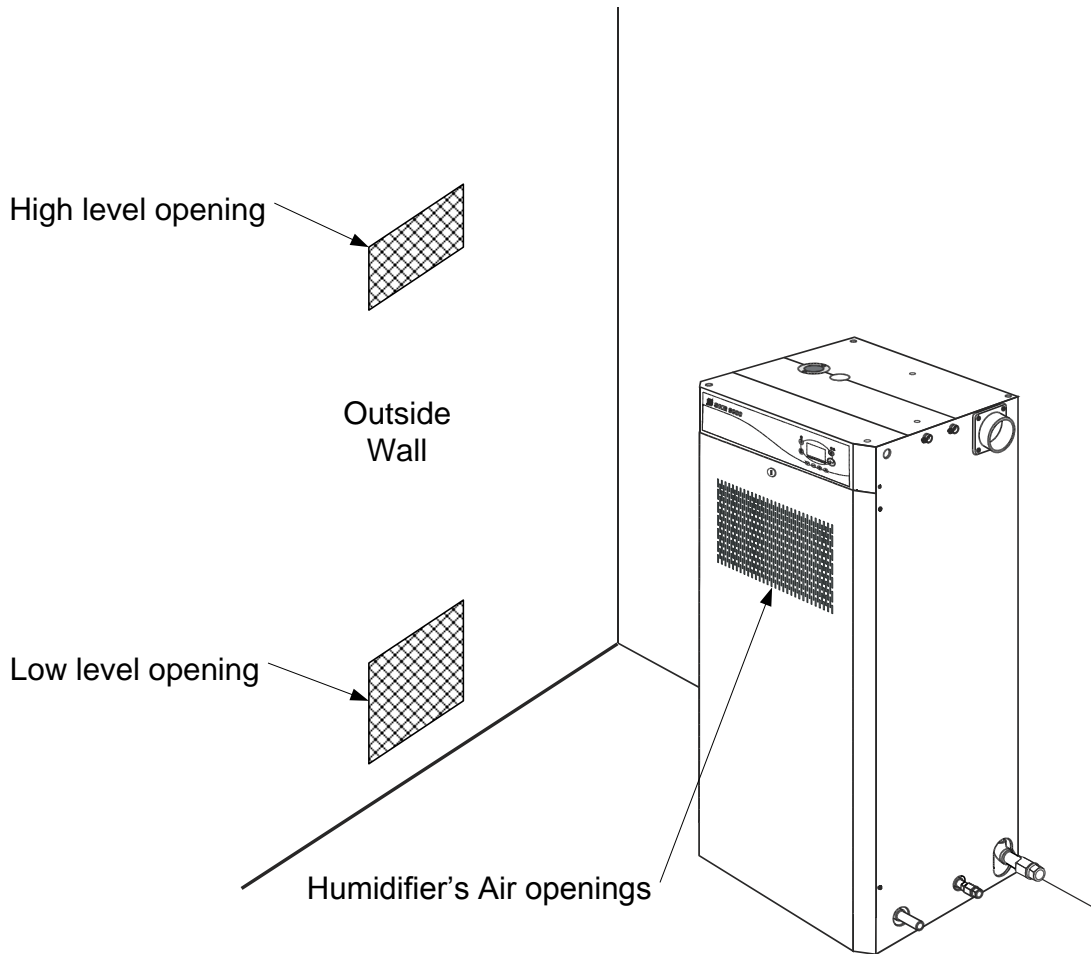
Note 1: Information of the above table is from BS6644, Specification for Installation of gas-fired hot water boilers of rated inputs between 70 kW (net) and 1.8 MW.

Note 2: These minimum openings section are specified for the combustion air requirement of the SKGE3 Humidifier. If other gas fired appliances are installed in the same room, openings will have to be increased to be able to supply adequate combustion air for all the appliances.

Note 3: For comparison with minimum flue gas venting spacing, refer to Stage 7 – Flue Gas Venting Connection.

Stage 6 – Combustion Air Installation

Natural Ventilation Installation



Natural ventilation configuration - Fig. 35

Ducted Combustion Air

“Ducted Combustion Air” option, also called Sealed Combustion, is available upon request.

Installation of the combustion air duct must be as direct as possible, minimizing the number of turns or elbows, with a maximum of 6 elbows in total.

Use only duct materials suitable to supply air from the outside to the humidifier.

Combustion air duct length and flue gases venting pipe must not exceed:

30m – 3m x (total number of 90° elbow) – 1.5m x (total number of 45° elbow).

Combustion air duct must be insulated to avoid condensation around the duct when outside air temperature is below 0°C.

Ensure that combustion air duct connections are air tight.

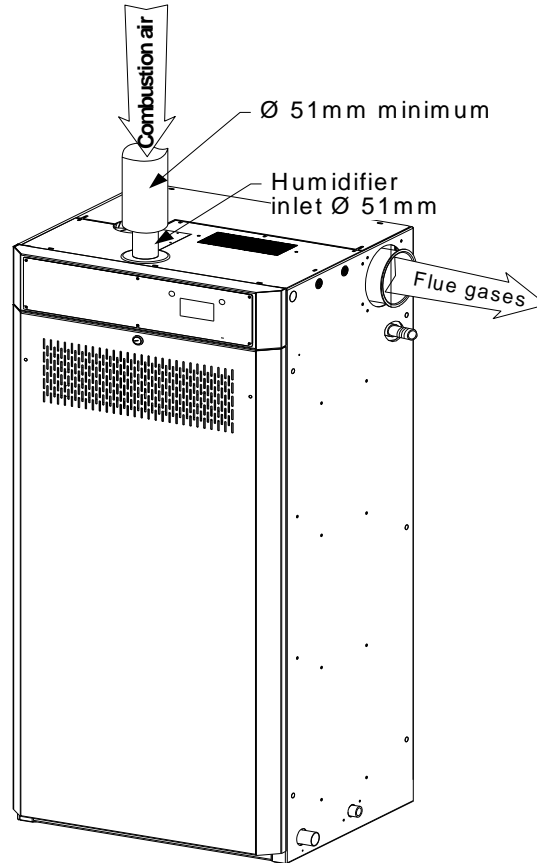
Minimum combustion air duct upward gradient must be 20mm in 1000mm horizontal run.

| <i>Model</i> | <i>Combustion air inlet diameter per module</i> |
|---------------------------|-------------------------------------------------|
| SKGE3-0501 to 4004 | Ø 51mm O.D. |



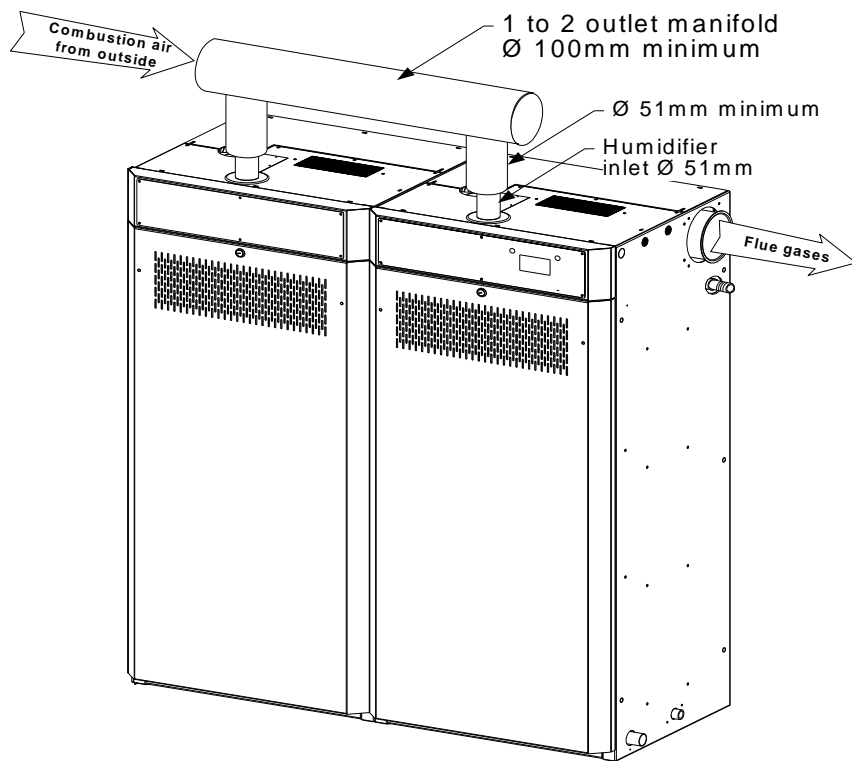
Stage 6 – Ducted Combustion Air Installation

Single Module
Humidifiers:
SKGE3-0501
SKGE3-0701
SKGE3-0801
SKGE3-1001



Ducted combustion air 1 module - Fig. 36

2 Modules
Humidifiers:
SKGE3-1202
SKGE3-1502
SKGE3-1702
SKGE3-2002

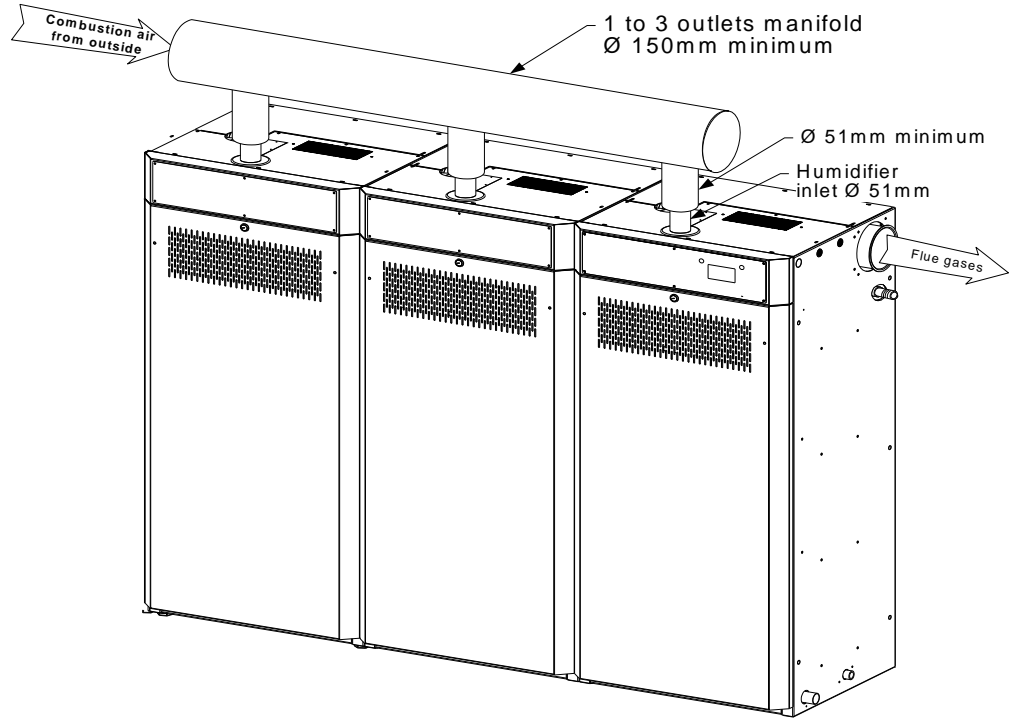


Ducted combustion air 2 modules - Fig. 37



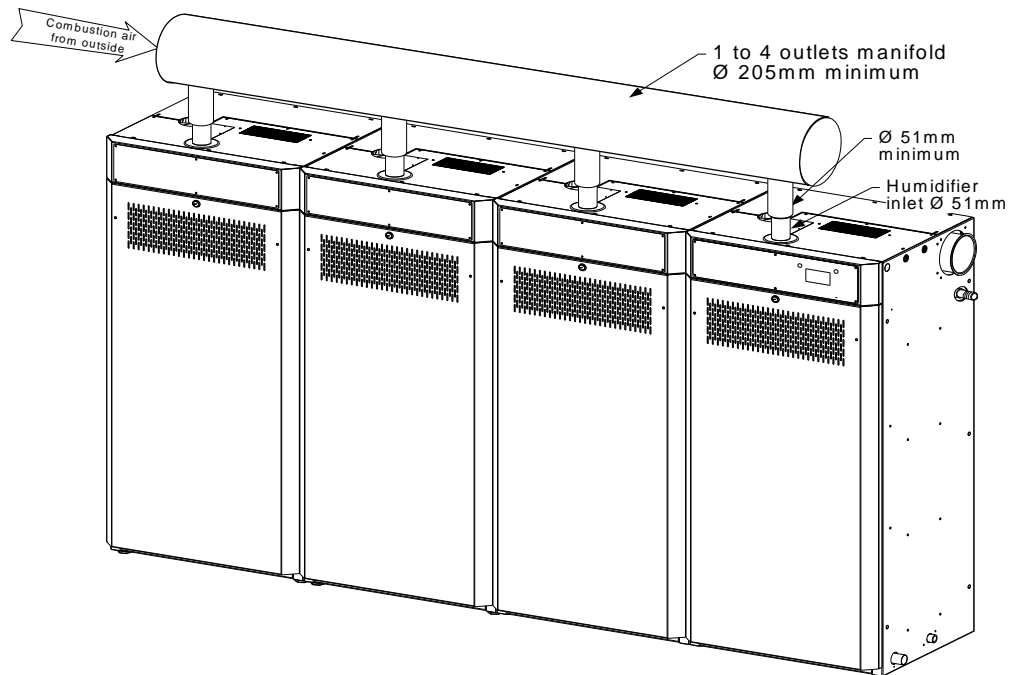
Stage 6 – Ducted Combustion Air Installation

**3 Modules
Humidifiers:
SKGE3-2503
SKGE3-2703
SKGE3-3003**



Ducted combustion air 3 modules - Fig. 38

**4 Modules
Humidifiers:
SKGE3-3504
SKGE3-3704
SKGE3-4004**



Ducted combustion air 4 modules - Fig. 39

Stage 7 – Flue Gas Venting Connection

CAUTION


For safe and efficient operation of the SKGE3 Steam Humidifier, flue gases (product of combustion) **MUST** be evacuated through a dedicated flue gas venting system to the outside air.

Flue gas venting must conform to local codes and regulations.

Install flue gas venting systems in accordance with vent manufacturer's instructions.

Do not vent the SKGE3 Steam Humidifier into another venting system serving another appliance. The humidifier must be vented by its own approved/listed flue system.

Any flue gas venting pipes passing through floors, ceilings, and walls **MUST** be installed with proper clearances to combustible materials, and **MUST** be fire stopped according to local codes and regulations.

Use only roof and wall penetration systems recommended by the flue gas venting system manufacturer.

Flue gas venting pipe **MUST** be free of any restrictions or obstructions. The flue gas venting pipe diameter **MUST** be same as the SKGE3 flue gas connector.

Do not use unlined masonry or concrete chimney as a flue gas venting system.

The flue gas venting system must not extend into, or pass through, any circulation air duct or plenum.

Installation of the flue gas venting pipes must be as direct as possible, minimizing the number of turns or elbows, with a maximum of 6 elbows in total.

If flue gas venting pipe length exceeds 6.1m, it is recommended to install an approved insulated flue gas venting pipe, in order to reduce the formation of condensate.

Ensure that the flue connection to the humidifier is air tight. Failure to do this will result in damage due to moist flue gases condensing.

Flue Gas Venting Specification

The Neptronic® SKGE3 Steam Humidifier is a fan assisted condensing positive pressure flue gas appliance.

Maximum flue gases temperature: Ambient + 217°C.

Maximum flue gases venting pipe length:

30m – 3m x (total number of 90° elbow) – 1.5m x (total number of 45° elbow).

| <i>Model</i> | <i>Single flue gases outlet diameter</i> |
|----------------------------|--------------------------------------------------------------|
| SKGE3- 0501 to 1001 | Ø 76mm O.D. |
| SKGE3- 1202 to 2002 | Ø 100mm O.D. |
| SKGE3-2503 to 4004 | Ø 125mm O.D. <i>flue pipe connector, Ø125mm, supplied</i> |

Flue gas venting pipe diameter **MUST** be same as the SKGE3 flue gas connector.

Minimum flue gas venting pipe upward gradient must be 20mm in 1000mm horizontal run or as per flue gas venting manufacturer's instructions.

The Neptronic® SKGE3 Steam Humidifier is a condensing appliance. As such, its high efficiency may cause condensation in the flue gas venting. Condensate drip tee must be installed, as per flue gas venting manufacturer's instructions.

Flue Gas Terminal


A Proper flue gas terminal must be installed to prevent back flow or any other outside weather condition that may affect proper operation of the SKGE3 Humidifier.

Distances from the flue gas venting terminal to adjacent public walkways, buildings, and any open able windows or building opening **MUST** conform to local codes and regulations.

Flue gas terminal **MUST** be at sufficient height above the ground level to prevent blocking by accumulated debris.

Building materials **MUST** be protected from degradation by flue gases.

Vertical flue gas terminal **MUST** extend at least 1 meter above the roof top, and 0.6 meter above any ridge located within 3 meters from the terminal.

The terminal inlets and outlets from separate combustion and air supply circuits for the supply of combustion air and the evacuation of combustion products must not terminate on different walls of the building.

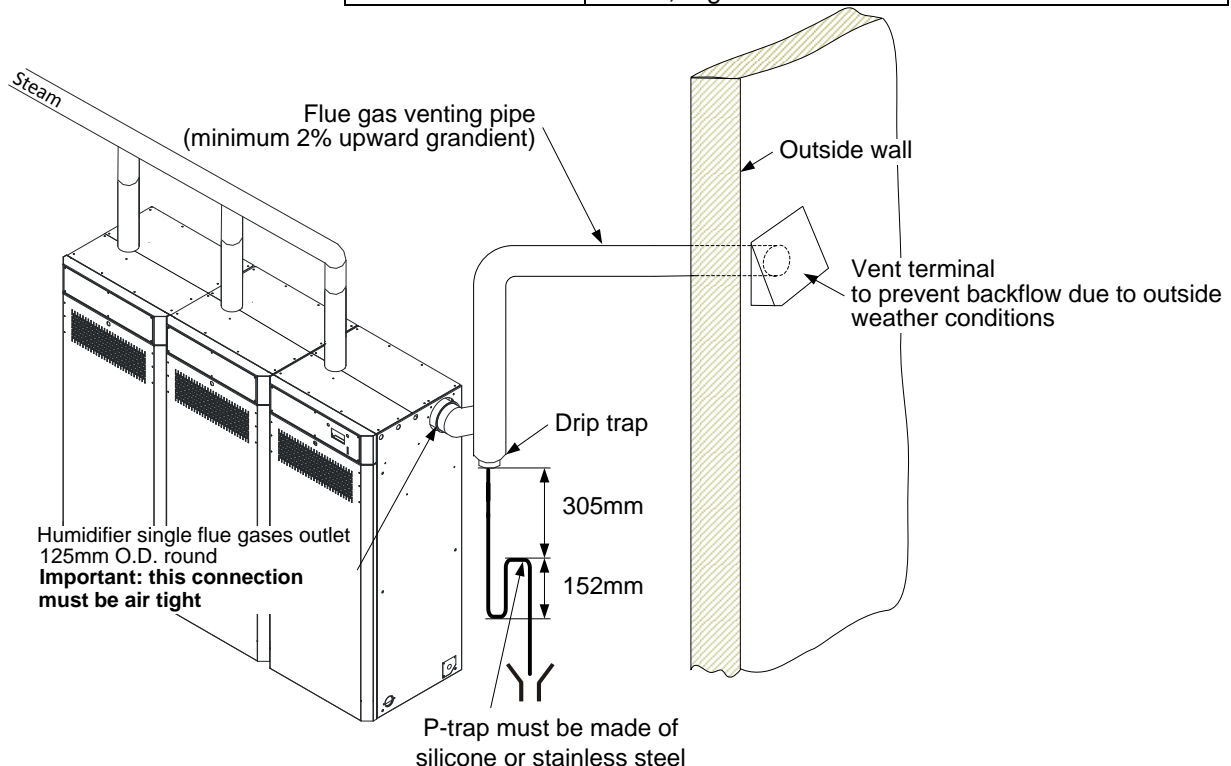
Stage 7 – Flue Gas Venting Connection

Minimum Spacing When Flue gas terminal is located at outside air.

| Minimum spacing (mm) | Building or other element |
|----------------------|---------------------------------------------------------------------------------------|
| 300 | Below adjacent opening (window, air vent or any other ventilation opening) |
| 75 | Below a gutter, drain or soil pipe |
| 200 | Below eaves catch or, balcony |
| 75 | Beside vertical drain or soil pipe |
| 300 | Beside adjacent corner or other flue gas terminal |
| 150 | Beside adjacent opening (door, window, air vent or any other ventilation opening) |
| 300 | Above adjacent ground or balcony level |
| 2100 | Above ground level, in areas accessible to public |
| 1500 | Above or below other flue gas terminal |
| 600 | From a surface facing the terminal |
| 1200 | From a facing other flue gas terminal. |
| 1250 | Above, below, beside or facing any electric or gas meter, regulator or relief device. |

When Flue gas terminal is located in car port in residential building

| Minimum spacing (mm) | Building or other element |
|----------------------|---------------------------------------------------------------------------------------|
| 200 | Below car port ceiling |
| 75 | Beside vertical drain or soil pipe |
| 300 | Beside adjacent corner or other flue gas terminal |
| 1200 | Beside adjacent opening (door or window) |
| 300 | Above adjacent ground or balcony level |
| 2100 | Above ground level, in areas accessible to public |
| 1500 | Above or below other flue gas terminal |
| 600 | From a surface facing the terminal |
| 1200 | From a facing other flue gas terminal. |
| 1250 | Above, below, beside or facing any electric or gas meter, regulator or relief device. |



Typical flue gas installation, 3 modules - Fig. 40

Stage 8 – Electrical Supply and Installation

Electrical Power Supply

The SKGE3 Steam Humidifier requires a 230V single phase supply.

| Model | Voltage | Standard Current (Amp) | Weather proof enclosure option Current (Amp) |
|----------------------------------------|-----------|------------------------|----------------------------------------------|
| SKGE3 0501, 0701, 0801, 1001 | 230 V 1ph | 3.5 | 3.8 |
| SKGE3 1202, 1502, 1702, 2002 | 230 V 1ph | 4.5 | 5.8 |
| SKGE3 2503, 2703, 3003 | 230 V 1ph | 6.0 | 7.8 |
| SKGE3 3504, 3704, 4004 | 230 V 1ph | 7.5 | 9.5 |



Electrical connection

All incoming power supplies **MUST** be externally fused for over current protection.

The electrical supply must also be isolated for the purpose of emergency and servicing. A disconnect switch must be installed typically within one meter of the humidifier.

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

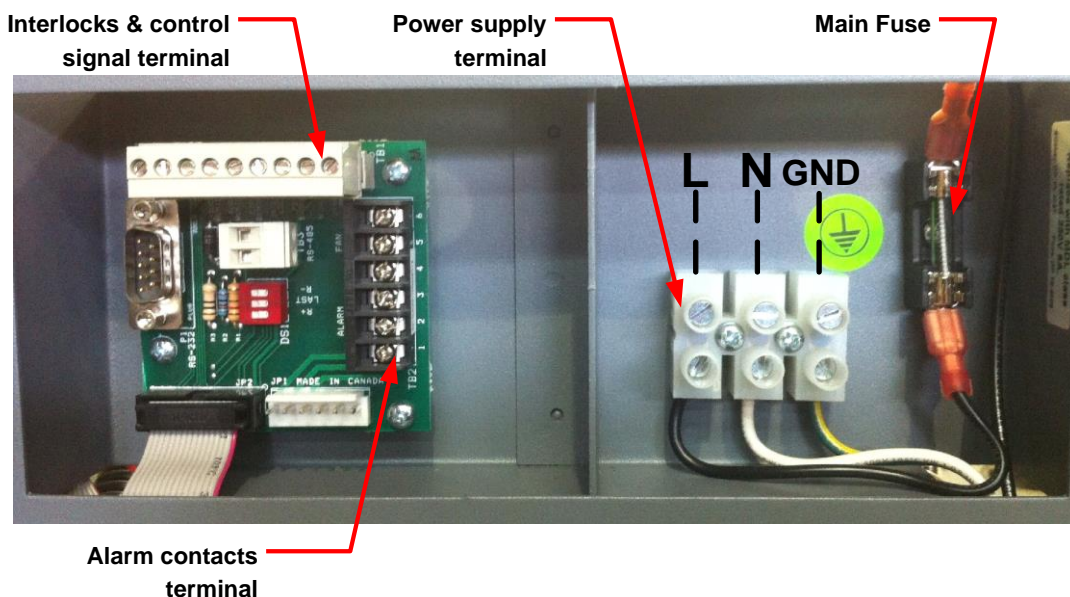
All work concerned with electrical installation **MUST** only be performed by skilled and qualified technical personnel (e.g. electrician or technicians with appropriate training).

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

WARNING. Risk of electric Shock. Ensure that the electrical supply is isolated before commencing any installation.

The installation engineer must ensure the following:

- Use of copper power conductor only.
- Size of the power conductors are suitable for the maximum current supplied.
- Incoming power cable is secured via suitably sized cable gland.
- Each terminal connection is secured firmly with a cable ferrule.
- Humidifier cabinet has an uninterrupted or unbroken electrical ground. Do not use gas piping as an electrical ground.



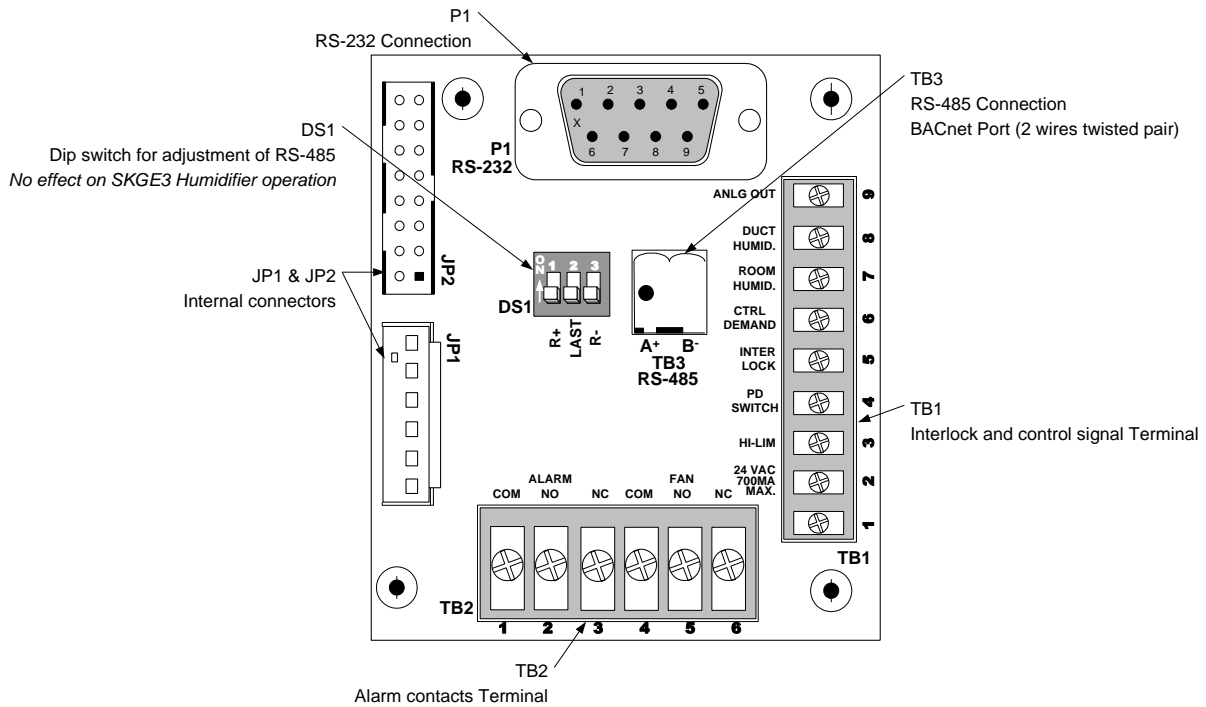
Electrical connection - Fig. 41

Stage 9 – Electrical Control Connections

Electrical Control Connections

The Neptronic® SKGE3 Steam Humidifier has a modulating control system and requires an analog control signal.

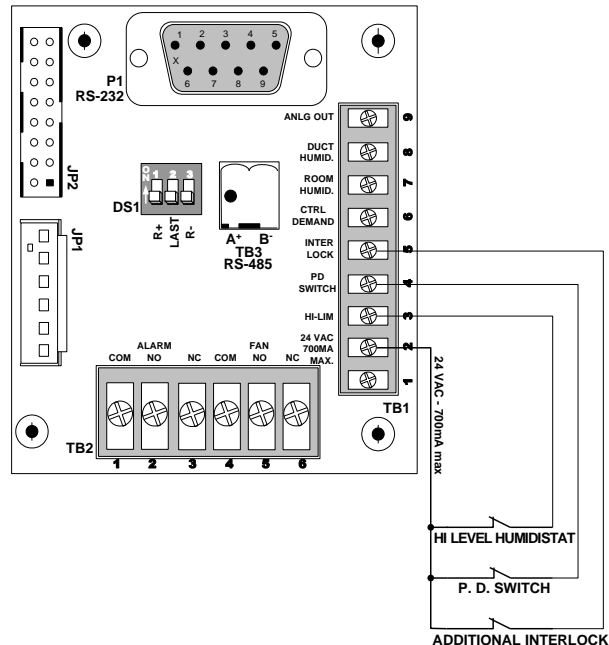
All controls connections has been grouped on a specific Interface P.C.B.



Electrical control connection interface - Fig. 42

Humidifier Interlocks

The Neptronic® SKGE3 Steam Humidifier has three interlock entries:



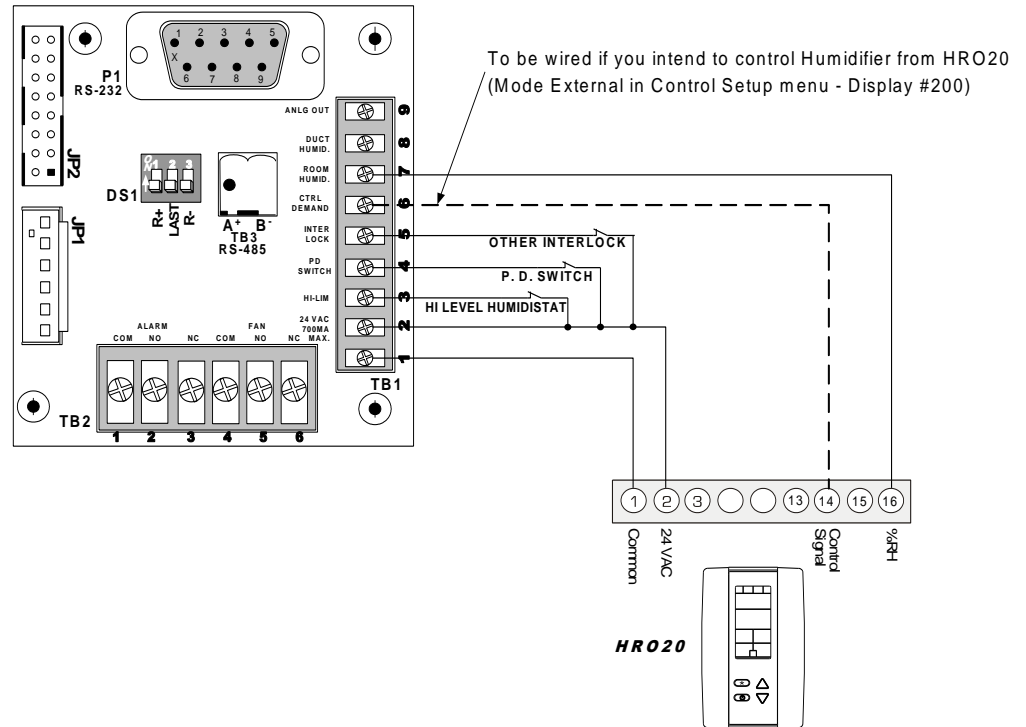
Interlocks connection - Fig. 43

- **High level humidistat** contact must be wired between terminals TB1 2 & 3. If this contact is open, operation of the humidifier will stop and an **Alarm** message will be displayed.
- **P.D. Switch** contact must be wired between terminals TB1 2 & 4. If this contact is open, operation of humidifier will stop. **No Alarm** message will be displayed.
- **A third interlock** switch can be wired between terminals TB1 2 & 5. If this contact is open, operation of humidifier will stop and an **Alarm** message will be displayed.

Stage 9 – Electrical Control Connections

Humidifier Control with Humidity Controller

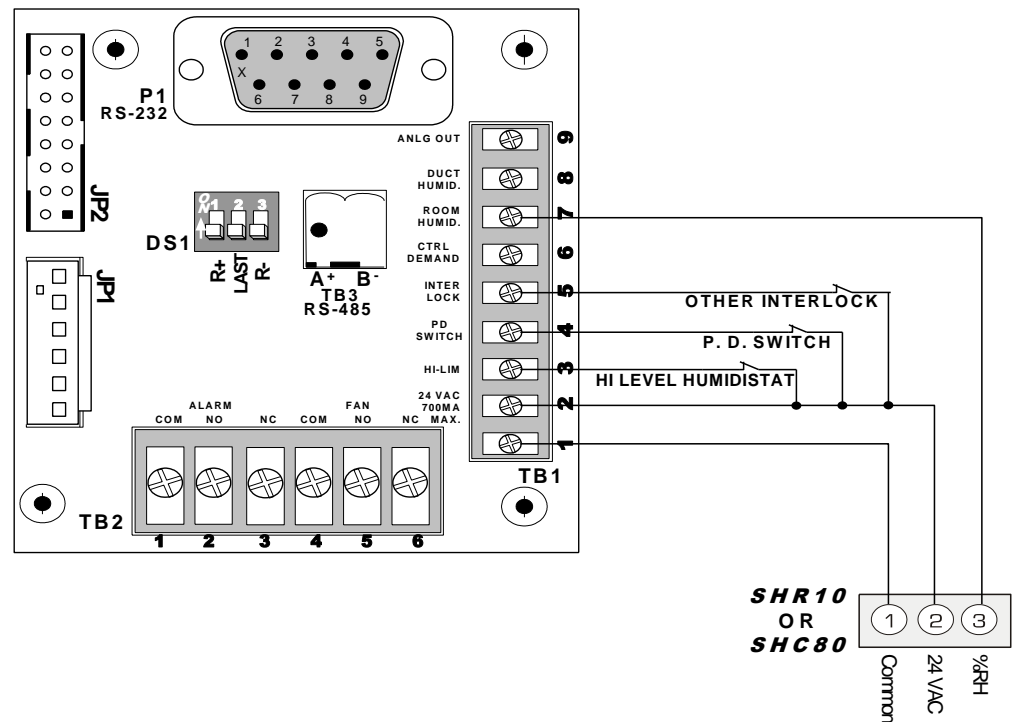
The Neptronic® SKGE3 Steam Humidifier can be installed in conjunction with the Neptronic® **HRO20** humidity controller.



Control signal from HRO20 humidity controller - Fig. 44

Humidifier Control with Humidity Sensors

The Neptronic® SKGE3 Steam Humidifier can be installed in conjunction with the Neptronic® **SHR10** or **SHC80** humidity sensors.

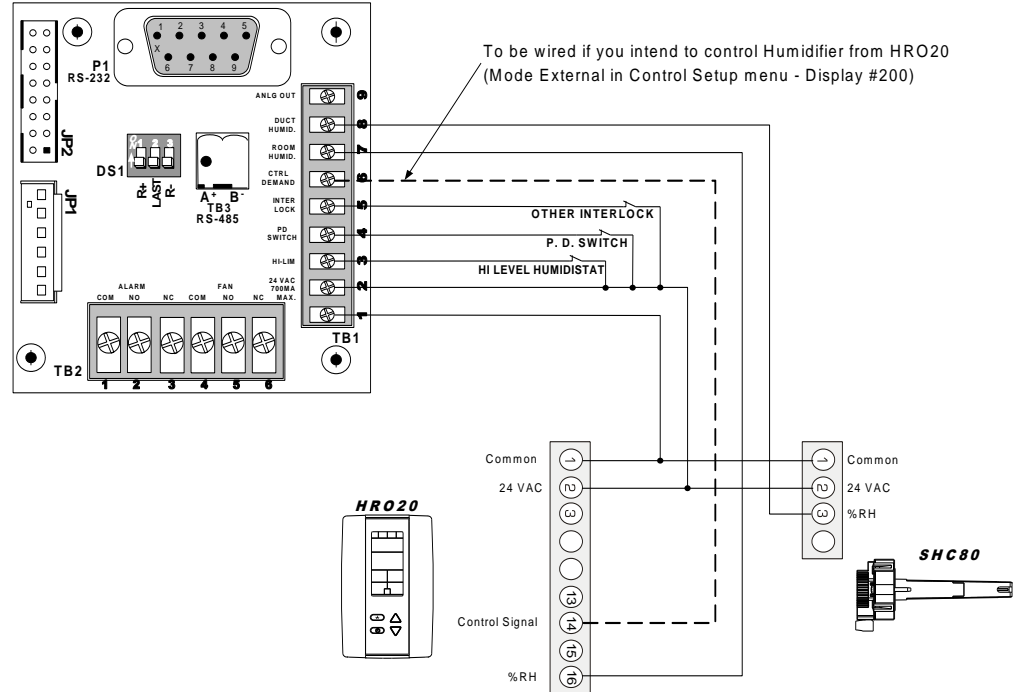


Humidity signal from humidity sensors - Fig. 45

Stage 9 – Electrical Control Connections

VAV System

The Neptronic® SKGE3 modulating Steam Humidifier can be installed in conjunction with a VAV system. In this case the Neptronic® **SHC80** duct humidity controller placed in the supply air will act as a high level duct humidity sensor. Humidity will be controlled by the Neptronic® **HRO20** room humidity controller.



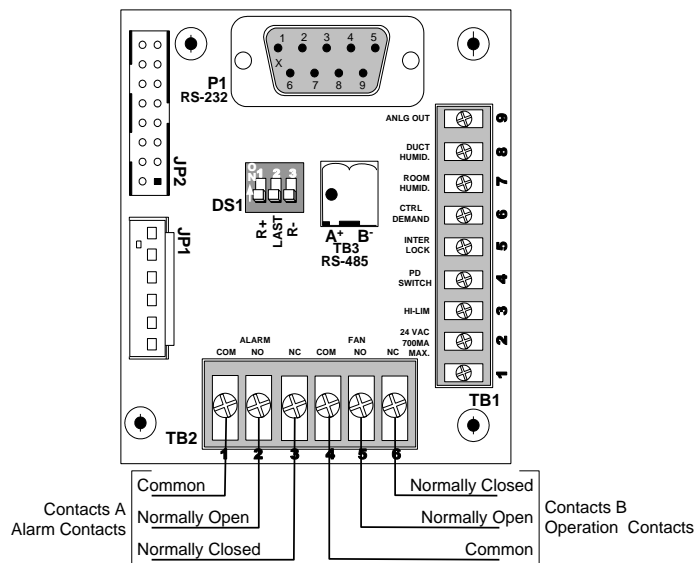
VAV configuration typical wiring - Fig. 46

Dry Contacts

Two series of volt free contacts are provided :

- Alarm contacts:
One normally connected to common and one normally open contact.
- Operation contacts:
One normally connected to common and one normally open contact.

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



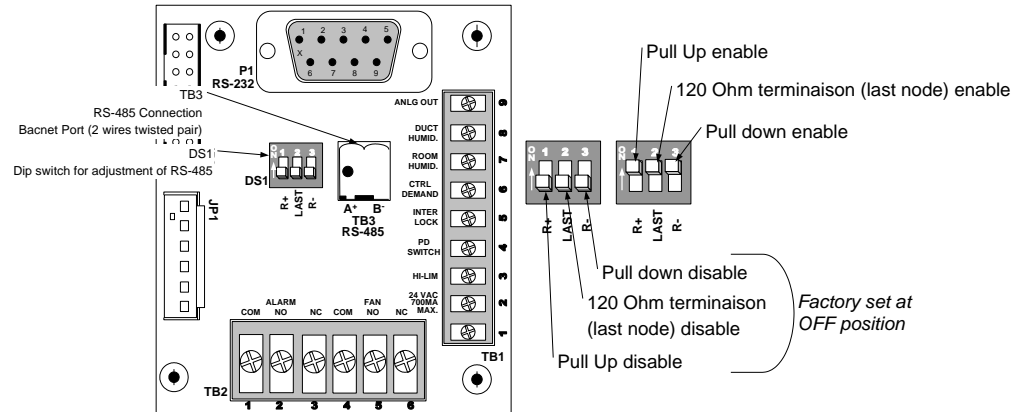
Operation & Alarm contact wiring - Fig. 47

Stage 9 – BACnet® Interface Set-up

Important Note

This page describes the BACnet® interface set-up. The “BACnet® interface” option is available only upon request.

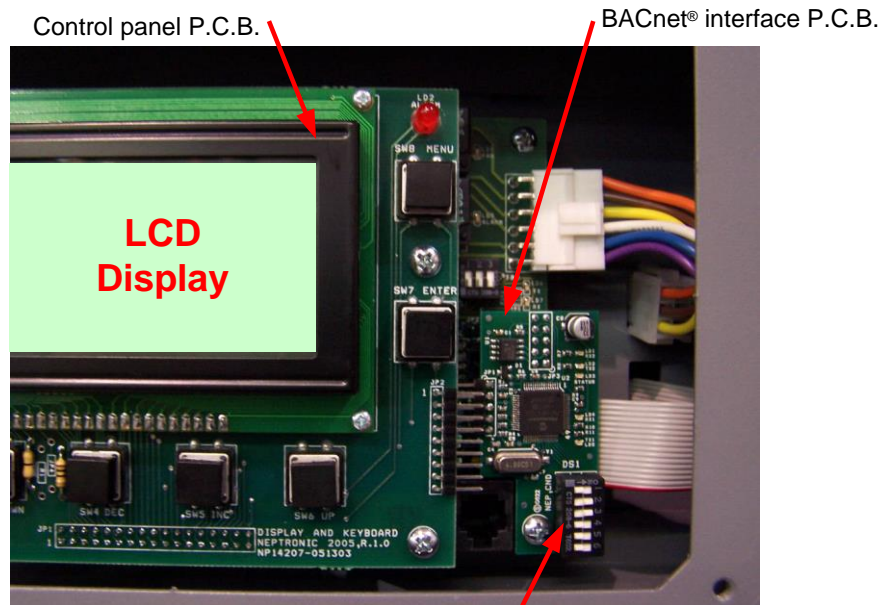
Dip Switch Adjustment for RS-485 BACnet® Port



BACnet interface - Fig. 48

Mode & Baud Rate Setting

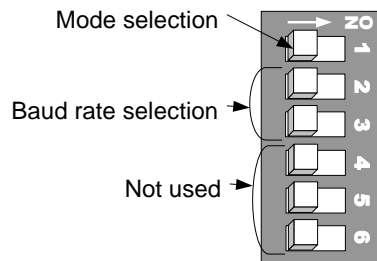
Mode & baud rate dip switch setting is located next to the Control panel P.C.B. To access it, remove the front panel plate.



BACnet® interface Dipswitch

Location of BACnet interface Dip switch - Fig. 49

BACnet® interface Dip switch setting:



Dip switch setting - Fig 50

| Switch #1 : Mode selection | |
|----------------------------|--------------------------------------------------------------|
| OFF | = Mode Operational (<i>factory setting</i>) |
| ON | = Mode Configuration (linked with Com Port menus #601 & 602) |

| Switch #2 & 3 : Baud rate selection | | |
|-------------------------------------|-----------|-----------|
| Baud rate | Switch #2 | Switch #3 |
| 9600 | OFF | OFF |
| 19200 | ON | OFF |
| 38400 | OFF | ON |
| 76800 (<i>factory setting</i>) | ON | ON |

See also the **BACnet® communication module user guide** supplied.

Initial Verification



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

Clearance

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

Electrical

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

Water

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

Steam

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

Gas

8. Verify that a proper regulator and gas test point have been installed on the gas line to the humidifier.
9. Confirm that gas is supplied to the humidifier and that the shut-off valve located outside the humidifier is closed. Once the shut-off valve is turned ON, check for leaks, gas, smell or hissing sound.

Flue Gases Venting

10. Verify the flue gases venting as follow:
- a) A tee is installed with a drain trap for the flue gases condensate.
- b) Check that all connections are air tight.
- c) The total length of the vent equivalent is not longer than 30 meters.
- d) An approved venting system is used.


Note: Aluminum B vent is not acceptable.

Controls

11. Ensure that a high limit duct humidistat is installed, properly connected to the humidifier and that the setpoint is properly adjusted.
12. Verify that a room humidistat or return air duct humidistat is installed, properly connected to the humidifier and that the setpoint is properly adjusted
13. Turn the power ON at the disconnect switch. The LCD screen located on control panel must display the model number and serial number of the humidifier, along with the message "Unit is off".
14. Confirm the control set-up of the humidifier (display #200). The humidifier is factory set with EXTERNAL control set-up, which means that the humidity demand is controlled by the room or duct humidistat.
15. Ensure that the type of signal (0-10Vdc, 2-10Vdc or 4-20mA) of the humidistat corresponds to the type set in the humidifier control set-up menu (display # 201).

Start-Up

Start-up

1. Proceed to start-up the humidifier, as follow:
- a) Open the front access door of the humidifier cabinet; make sure that the manual drain valve is closed.
- b) Start up the humidifier by pushing the  (ON/OFF) button located on the humidifier control panel.
- c) After 5 seconds, water will start to fill. Verify that the water level slowly rises in the water level sight glass located on the side of the evaporation chamber
- d) Verify that there is a humidity demand. Humidity demand is displayed on the humidifier LCD screen.
- e) The humidifier LCD screen will display the water level in percentage (%). When the display indicates that the water level is at 100%, verify that the water level in the water level sight glass is approximately 20mm below the safety belt band of the evaporation chamber.
- f) If there is a humidity demand, the burner combustion blower(s) will start, and after approximately 90 seconds the combustion will start. From a cold water start, the humidifier will require 5 to 10 minutes to produce steam. The Humidifier LCD display will indicate water temperature and flue gases temperature.
- g) During normal operation while steam is produced, the water temperature must be 100°C and the flue gases temperature around 120 to 200°C. Water level percentage must not indicate less than 95%.
- h) Observe for water, steam and flue gases leaks.



Combustion Field Adjustment

2. Please refer to the *Combustion field adjustment instructions* enclosed in this package to perform this operation

Safety Test

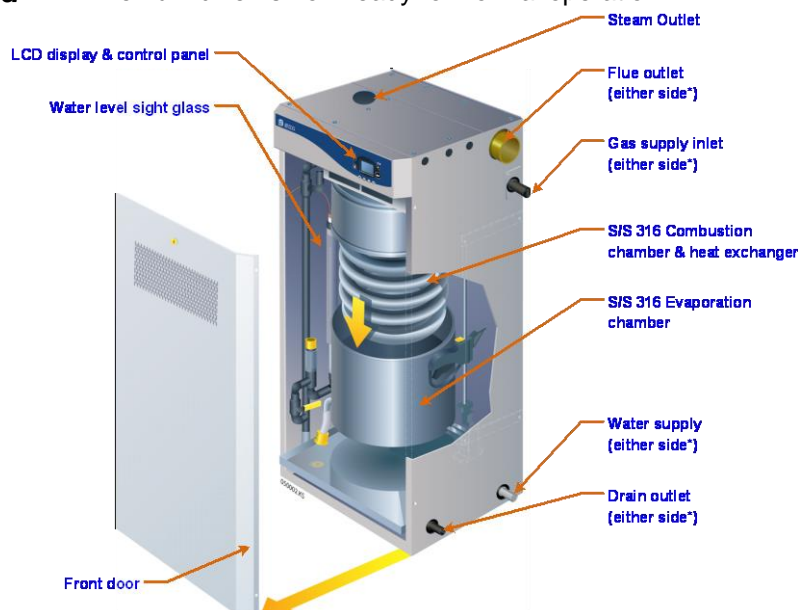
3. Check the location of the air flow switch in the system and its operation by stopping the fan. With no air movement in the air duct, the humidifier must automatically stop the combustion burner(s).

Drain and Reset

4. Turn the humidifier OFF, by pushing the  (ON/OFF) push button on the control panel.
5. Execute a manual drain, by pushing the  (DRAIN) push button on the control panel. A water jet directed on the water level sensor located in the water level sight glass will start and create bubbles around it.
6. Reset the air flow switch and humidistat(s) to the proper value, if needed.

End

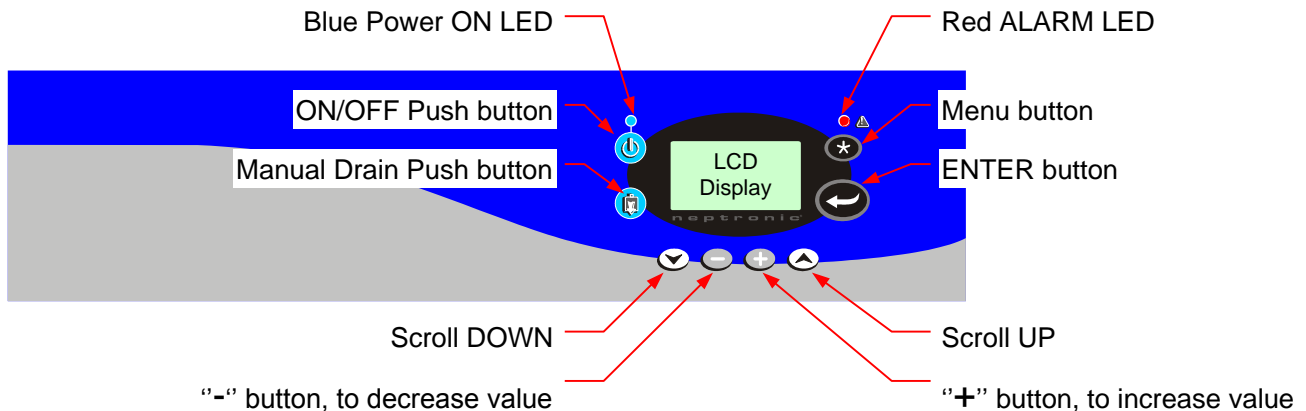
7. The humidifier is now ready for normal operation.




General overview reminder - Fig. 51

Commissioning – Operation Description




Control Panel Description The control panel of the Neptronic® SKGE3 Steam humidifier is equipped with a user friendly LCD display and extensive access to status, alarms, and set-up menus.






Control panel - Fig. 52



Access to Menu To access the menu, press on the  button. The LCD will display the following list of menus:


1. Status
2. Control Set-up
3. System Set-up
4. Alarms
5. Diagnostics
6. Com Set-up

Use the  or  buttons to scroll up or down, and access a menu by pressing the  button.

Within a menu, press on the  or  buttons to pass from one screen to another.

The initial menu may be returned to at any time by pressing the  button.

Changing Values Within the selected screen, press the  or  buttons until you have reached the desired value.

Validate your selection by pressing on the  button.

Operation Display

**Operation Scrolling
Messages on
Display**

During normal operation, the following display will indicate main information about the system:

DEMAND: 100%
OUTPUT: 100%
ROOM HUMIDITY
30%RH

| Scrolled Message | Description |
|--------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ROOM SETPOINT | Current room setpoint in % RH. |
| ROOM HUMIDITY | Current room humidity reading in % RH. |
| HI-LIMIT SETPOINT | Current high limit duct setpoint in % RH. |
| WATER LEVEL | Current water level reading in the evaporation chamber for each module in %. |
| WATER TEMPERATURE | Current water temperature reading in the evaporation chamber for each module in °C. |
| AIR FLOW IS OPEN | No air flow is detected in the duct. Humidifier is stopped. |
| DRAIN CYCLE | Drain cycle in process. |
| END OF SEASON DELAY IS OVER | 72 hours without humidity demand. Evaporation chamber(s) of the humidifier has been flushed of the remaining water in order to prevent growth of bacteria. Upon new humidity demand, evaporation chamber(s) will fill up with fresh water and produce steam. |
| !!! INPUT SUPPLY TOO LOW | Voltage supply is below the minimum value. Humidifier is stopped. |
| !!! HI-LIMIT CUT OUT | High limit RH% is above Hi limit set point. Humidifier is stopped. |
| !!! INTERLOCK OPEN | Interlock safety is open. Humidifier is stopped. |
| !!! CLEANING REQUIRED CALL SERVICE PEOPLE | Number of hours to service will be reached within 50 hours. Humidifier continues to operate but will stop for service soon. |
| !!! SERVICE UNIT NOW | Number of hours to service has been reached. Humidifier is stopped. It is time to service the humidifier. |
| !!! CRITICAL ALARM PRESENT SEE MENU | Abnormal critical situation has been detected. Humidifier is stopped. Go to Alarm menu for details. |
| !!! NON-CRITICAL ALARM PRESENT SEE MENU | Abnormal non-critical situation has been detected. Humidifier may continue to operate. Go to Alarm menu for details. |

Status Menu

| <i>Display</i> | <i>Description</i> |
|--------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| STATUS 101 Room Rel. Humidity 64%RH | Room Relative Humidity: Displays the room relative humidity if a room humidistat is connected to the humidifier. |
| STATUS 104 System Demand 64,3% | System Demand: Displays the humidity demand from the system. 100% represent a full demand. |
| STATUS 105 System Output H1: 45,5% H2: 43,0% H3: 42,5% H4: 41,0% | System Output: Displays the output for each module. Value is indicated in %. (50% of a 300kg/hr module would represent 150kg of steam per hour output.) |
| STATUS 106 Hours before drain H1: 4H H2: 2H H3: 3H H4: 1H | Hours before drain: Displays the remaining time before the next automatic flush for each module. The automatic flush of the evaporation chamber is fully programmable. Please refer to display # 301 for more details. <i>Note: If Drain has been disabled by an authorized service engineer, this display will be disabled as well.</i> |
| STATUS 107 Running Hours H1: 2H H2: 2H H3: 3H H4: 1H | Running Hours: Displays the number of hours of operation since the last servicing for each module. Value is indicated in hours. This counter can be reset after each servicing. |
| STATUS 108 Total Running Hours H1: 40H H2: 25H H3: 22H H4: 20H | Total Running Hours: Displays the total number of hours of operation for each module since the original start-up. This counter cannot be reset. |
| STATUS 109 Water level H1: 98% H2: 99% H3: 101% H4: 98% | Water level: Displays the reading of water level electronic probe for each module. Value is indicated in %, 100% indicate that the evaporation chamber is full of water. During normal operation, the value can fluctuate between 95% and 105%. |
| STATUS 110 Water Temperature H1: 32°C H2: 35°C H3: 31°C H4: 29°C | Water Temperature: Displays the water temperature inside the evaporation chamber for each module. Value is indicated in °C. During normal operation, this temperature must be around 100°C. |
| STATUS 111 Chimney Temperature H1: 41°C H2: 45°C H3: 60°C H4: 51°C | Chimney Temperature: Displays the Flue gases temperature for each module. Value is indicated °C. During normal operation, this temperature must be lower than 210°C. |
| STATUS 112 Unit Size H1: 100 kg/Hr H2: 105 kg/Hr H3: 103 kg/Hr H4: 72 kg/Hr | Unit Size: Displays the total capacity of each module. Value is indicated in kg/hr. |

Note: Displays shown in these instructions are representing a display for a 4 module SKGE3 Steam humidifier. If your SKGE3 Steam humidifier is equipped with 1, 2 or 3 modules, only H1, H1 and H2, or H1, H2 and H3 will appear on the LCD display.

Control Set-up Menu

| <i>Display</i> | <i>Description</i> | <i>Values</i> |
|--------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|
| CONTROL SETUP 200 Control Mode INTERNAL | Control Mode: Selection of control mode. <i>If External is selected, the control demand will be received by the analog input. If Com Port is selected, the control demand will be received by the communication port (BACnet option).</i> | External Internal Com Port |
| CONTROL SETUP 201 Control Input Setup Volt/Amp: Voltage Vin Min.: 2.00V Vin Max.: 10.00V | Control Input Setup: Selection of input control settings. <i>Allows you to select voltage or current signal and range of the signal.</i> | Voltage or Amp. From 0 to 10 V or 2 to 10 V Or 4 to 20 mA |
| CONTROL SETUP 202 Room SP Source INTERNAL | Room SP Source: Selection of source for room humidity setpoint. | External Internal Com Port |
| CONTROL SETUP 203 Room Set Point 40 % | Room Set Point: Selection of room relative humidity value. | Percentage From 10 to 90 % |
| CONTROL SETUP 204 Room Humidity SetPoint Volt/mA: Voltage Vin Min.: 2.00V Vin Max.: 10.00V | Room Humidity SetPoint: Selection of room humidity setpoint settings. <i>Allows you to select voltage or current signal and range of the signal.</i> | Voltage or Amp. From 0 to 10 V or 2 to 10 V Or 4 to 20 mA |
| CONTROL SETUP 205 Room RH Source EXTERNAL | Room RH Source: Selection of room relative humidity source. | External Com Port |
| CONTROL SETUP 206 Humidity Input Setup Volt/Amp: Voltage Vin Min.: 2.00V Vin Max.: 10.00V | Humidity Input Setup: Selection of humidity input. | Voltage or Amp. From 0 to 10 V or 2 to 10 V Or 4 to 20 mA |
| CONTROL SETUP 207 Humidity Input Offset 45.5%RH Off: 0.00% | Humidity Input Offset: Selection of room humidity input offset. | Offset in % From -5.0% to +5.0% |
| CONTROL SETUP 208 Hi Limit Ctrl Mode Disable | Hi Limit Ctrl Mode: Selection of high limit control Mode | Disable External Com Port |
| CONTROL SETUP 209 Hi Limit SP Adjust. 80% | Hi Limit Set Point Adjustment: Selection of high limit relative humidity value. | Percentage From 50 to 90 % |

Control Set-up Menu

| | | |
|----------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|
| CONTROL SETUP 210 Hi Limit SetPoint Volt/mA: Voltage Vin Min.: 2.00V Vin Max.: 10.00V | Hi Limit SetPoint: Selection of high limit setpoint settings. <i>Allows you to select voltage or current signal and range of the signal.</i> | Voltage or Amp. From 0 to 10 V or 2 to 10 V Or 4 to 20 mA |
| CONTROL SETUP 211 Hi Limit Offset 45.5%RH off: 0.00% | Hi Limit Offset: Selection of duct relative humidity input offset. | Offset in % From -5.0% to +5.0% |
| CONTROL SETUP 212 PID Control Band 5.0 % | PID Control Band Selection of PID control band value | Percentage From 1 to 20 % |
| CONTROL SETUP 213 PID Control Gain KP = 20 KI = 0 KD = 0 | PID Control Gain Selection of PID control gain values | KP from 0 to 100 KI from 0 to 100 KD from 0 to 100 |
| CONTROL SETUP 214 Tank Operation SEQUENTIAL | Tank Operation: Selection of tank operation, when SKGE3 humidifier is built with more than one module. For optimum humidity control, it is recommended to use sequential operation. | Sequential Parallel |
| CONTROL SETUP 215 Lock On Capacity 100 % | Lock On Capacity: Selection of humidifier capacity reduction | Percentage From 20 to 100 % |




System Set-up Menu



| Display | Description | Values |
|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------|
| SYSTEM SETUP 300 Service Timer 1000 Hrs | Service Timer: Selection of delay between service alarms. Value is indicated in Hours. | From 400 to 3000 Hrs Increment: 100 Hrs Default: 1000 Hrs |
| SYSTEM SETUP 301 Auto Drain Delay 4 Hrs | Auto Drain Delay: Selection of delay between automatic drain cycles. Value is indicated in Hours. <i>Note: If Auto-Drain has been disabled by an authorized service engineer, this display will indicate "Drain Disabled".</i> | From 1 to 24 Hrs Increment: 1 Hr Default: 4 Hrs |
| SYSTEM SETUP 302 No Demand Delay 72 Hrs | No Demand Delay: Selection of delay when there is no demand. Value is indicated in Hours. <i>Note: If Auto-Drain has been disabled by an authorized service engineer, this display will indicate "EOS Disabled".</i> | From 1 to 250 Hrs Increment: 1 Hrs Default: 72 Hrs |
| SYSTEM SETUP 303 Fan ON Delay 10 Min | Fan ON Delay: Selection of delay to keep fan ON when there is no humidity demand. If the fan is connected to the Operation volt free contact, refer to stage 9. Value is indicated in Minutes. | From 3 to 30 Min. Increment: 1 Min. Default: 10 Min. |
| SYSTEM SETUP 304 Holding Temperature OFF | Holding Temperature: Selection of evaporation chamber temperature between humidity demands. If enabled, combustion will be ordered to maintain a specific water temperature. Value is indicated in °C, when setting is enabled. | From 50 to 90°C or OFF Increment: 5°C Default: OFF |
| SYSTEM SETUP 305 Anti Freeze Temper. OFF | Anti Freeze Temperature: Selection of evaporation chamber anti-freeze temperature. If enabled, combustion will be ordered to maintain water temperature between 7 and 12°C. This feature must be enabled when using direct outside combustion air in a freezing environment. <i>This screen is not available for humidifiers with the weather proof enclosure option.</i> Value is indicated in °C, when setting is enabled. | From 7 to 12°C or OFF Increment: 1°C Default: OFF |
| SYSTEM SETUP 306 Water Temp. Offset H1: 0°C H2: 0°C H3: 1°C H4: -1°C | Water Temperature Offset: Selection of evaporation chamber temperature offset for each module, in order to adjust reading of the water temperature probe to proper temperature. When producing water temperature, probe must indicate 100°C. Value is indicated in °C. | From -10 to 10°C Increment: 1°C Default: 0°C |
| SYSTEM SETUP 307 Water Level Offset H1: 0% H2: -1% H3: 2% H4: 0% | Water Level Offset: Selection of evaporation chamber water level offset for each module, in order to adjust reading of the water level probe to the proper level. Value is indicated in %. | From -10 to 10% Increment: 1% Default: 0% |

System Set-up Menu

| <i>Display</i> | <i>Description</i> | <i>Values</i> |
|---------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------|
| SYSTEM SETUP 308 Chimney Temp. Offset H1: 0°C H2: 1°C H3: -1°C H4: 0°C | Chimney Temperature Offset: Selection of chimney temperature offset for each module, in order to adjust reading of the chimney temperature probe to proper temperature. Value is indicated in °C. | From -10 to 10°C Increment: 1°C Default: 0°C |
| SYSTEM SETUP 309 Lcd Contrast 160 | LCD Contrast: Selection of the LCD display contrast. Value is indicated in relative number. | From 140 to 180 Increment: 1 Default: 160 |
| SYSTEM SETUP 310 Language Selection English | Language Selection: Selection of the language displayed by interactive menus. | English or Français Default: English |
| SYSTEM SETUP 311 Time/Date Set N/A | Time/Date Setup: Reset of the internal clock. | Not programmable in this firmware version Default: N/A |
| SYSTEM SETUP 312 Set Alarm Beep ON Sound ON | Set Alarm Beep ON: Select whether to enable the beep sound in case of an alarm. | ON or OFF Default: ON |

Alarms Menu

| <i>Display</i> | <i>Description</i> |
|-------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <pre> ALARMS 400 Operation Period H1: 1000Hr H2: 800Hr H3: 550Hr H4: 550Hr +/- to Reset Timer </pre> | <p>Operation Period:</p> <p>Displays the <u>running hours countdown</u>, it displays the reverse number of hours of Display # 107.</p> <p>IMPORTANT:</p> <p>This countdown must be reset after servicing in order to remove the alarm for call of service.</p> <p>To reset the running hours <u>press first on the</u>  button to select which module you wish to reset, then press and hold the  &  buttons simultaneously for 10 seconds.</p> <p>Value indicated is in Hours.</p> |
| <pre> ALARMS 401 Alarms for Unit 1 No Alarm </pre> | <p>Alarms for Unit 1:</p> <p>Displays alarm(s) message(s) for module 1, whenever necessary.</p> |
| <pre> ALARMS 402 Alarms for Unit 2 No Alarm </pre> | <p>Alarms for Unit 2:</p> <p>Displays alarm(s) message(s) for module 2, whenever necessary.</p> |
| <pre> ALARMS 403 Alarms for Unit 3 No Alarm </pre> | <p>Alarms for Unit 3:</p> <p>Displays alarm(s) message(s) for module 3, whenever necessary.</p> |
| <pre> ALARMS 404 Alarms for Unit 4 No Alarm </pre> | <p>Alarms for Unit 4:</p> <p>Displays alarm(s) message(s) for module 4, whenever necessary.</p> |

Note: To manually reset alarm, press and hold the  &  buttons simultaneously for 3 seconds.



List of Alarms



No alarm must be reset prior to identifying and rectifying the cause of fault.

Please refer to the troubleshooting guide for help on identifying and resolving potential problems.

When an alarm is indicated by the LCD display, the red LED Alarm will flash. Normal operation of the humidifier is altered.

To manually reset alarm, press and hold the  &  buttons simultaneously for 3 seconds.

| Message Displayed | Description |
|-----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Power Fuse Open | The power fuse located on the Slave PCB is open. Replacing this fuse will automatically reset this alarm. |
| Input Volt. Too low | Power supply voltage is too low for proper operation of the humidifier. Verify power supply voltage level and take necessary actions. Proper voltage level will automatically reset this alarm. |
| No Water T. Sensor | Humidifier is not receiving signal from the water temperature sensor. The alarm will have to be manually reset after communication is re-established. |
| No Chimney T. Sensor | Humidifier is not receiving signal from the flue gases venting temperature sensor. The alarm will have to be manually reset after communication is re-established. |
| Water level error | Humidifier is not receiving signal from the water level sensor. The alarm will have to be manually reset after communication is re-established. |
| Foaming in the tank | Humidifier is detecting foam in the tank and has performed a de-foaming cycle. This alarm will automatically reset when foaming conditions are eliminated. |
| Water Temp. too low | Water holding temperature is below the pre-set minimum value; humidifier will fire-up the burner to heat-up the water. This alarm will reset automatically when the water temperature reaches the proper value. |
| Water Temp. too high | Water holding temperature is above the pre-set maximum value; humidifier will shut-off and cool down until water temperature reaches a proper value. This alarm will reset automatically when the water temperature reaches the proper value. |
| Chim. Temp. too high | Flue gases temperature is above the pre-set maximum value; humidifier will shut-off and cool down until flue gases temperature reaches a proper level, at which time the alarm will reset automatically. |
| Tank cannot fill | Water filling of the evaporation chamber is taking more than predetermined maximum time. Humidifier will not fire-up until proper water level is reached. This alarm will reset automatically once water reaches the proper level. |
| Tank cannot refill | The time period between two refills of the evaporation chamber is longer than expected. Investigation to define the cause of this fault is necessary. This alarm will reset automatically. For more details, please refer to the Service and Troubleshooting guide . |
| Tank cannot drain | Water draining of the evaporation chamber is taking more time than predetermined. This alarm will reset automatically once water has been totally evacuated. |
| Burner Fan Defect | Burner fan is not synchronized with the humidity output. This alarm will have to be reset manually. For more details, please refer to the Service and Troubleshooting guide . |
| Burner Locked | Gas burner did not light-up after 3 retries. Gas burner must be verified. This alarm will automatically reset once after 30 minutes. If the gas burner is still not light up, the alarm will then have to be reset manually. For more details, please refer to the Service and Troubleshooting guide . |

For information on troubleshooting please refer to the **Service and Troubleshooting guide** supplied.

Diagnostics Menu

| <i>Display</i> | <i>Description</i> |
|----------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| DIAGNOSTICS 500 Input Voltage Input #1: 7.15V Input #2: 7.13V Input #3: 7.14V | Input Voltage: Displays the analog inputs: Input #1: Control setpoint input voltage Input #2: Room humidity input voltage Input #3: Duct humidity input voltage Value indicated is in Volts. <i>If input signal is 4-20mA, the humidifier will convert it into voltage.</i> |
| DIAGNOSTICS 501 Digital input Input #1: ON Input #2: ON Input #3: ON | Digital Input: Displays the digital inputs: Input #1: High Limit Humidistat Input #2: Pressure differential switch (fan proof) Input #3: Interlock Value indicated is On or Off. |
| DIAGNOSTICS 502 Water Level Sensor H1: 17598Hz H2: 17550Hz H3: 17585Hz H4: 17601Hz | Water Level Sensor: Displays water level reading from electronic water level sensor for each module. Value is indicated in Hz. |
| DIAGNOSTICS 503 Burner Fan Speed H1: 0Hz H2: 0Hz H3: 0Hz H4: 0Hz | Burner Fan Speed: Displays burner fan speed reading from electronic burner fan speed sensor for each module. Value is indicated in Hz. |
| DIAGNOSTICS 504 Burner Gas Valve H1: OFF H2: OFF H3: OFF H4: OFF | Burner Gas Valve: Displays the state of the burner gas valve. Value indicated is On or Off. |
| DIAGNOSTICS 505 Foaming Probe H1: 128 H2: 132 H3: 140 H4: 135 | Foaming Probe: Displays conductivity value of the foaming probe. The lower the value, the more conductive the probe. Value indicated is a relative number from the minimum of 128. |
| DIAGNOSTICS 506 Firmware Revision SKG3000 Rev.: 1.8 August 2009 | Firmware Revision: Displays the revision level of the program. |

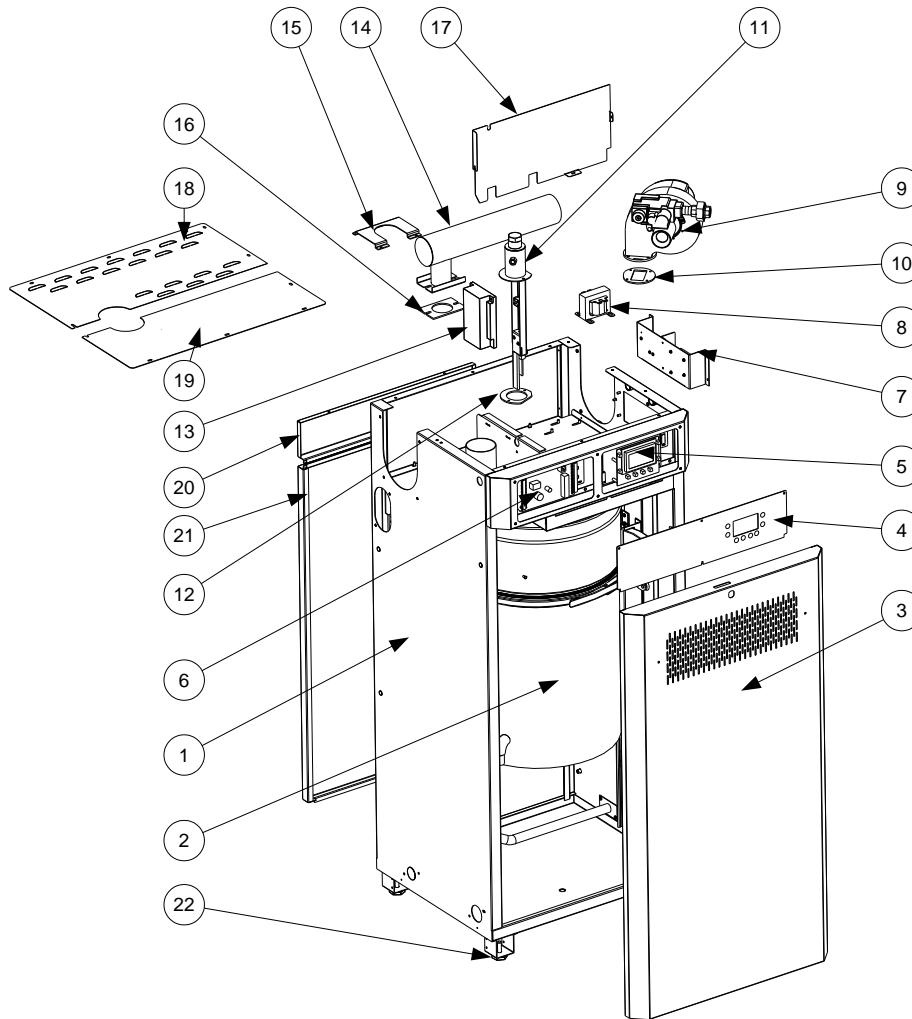
*For information on troubleshooting please refer to the **Service and Troubleshooting guide** supplied.*

Com Port Set-up Menu

| <i>Display</i> | <i>Description</i> | <i>Values</i> |
|-------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|
| COM PORT SET UP 600 Com Port Speed N/A Baud | Com Port Speed: N/A Baud Not Applicable, communication speed unit is not a variable. The communication speed is expressed in Baud. | Default: N/A |
| MS/TP MAC Address | | |
| COM PORT SET UP 601 MS/TP MAC Address 255 Value is locked ! | Selection of MS/TP MAC address This value is locked, in order to avoid incorrect set-up of the MAC Address. To unlock the setting, put the BACnet [®] interface dip switch No1 at the ON position (Configuration mode), see the "Stage 9 – BACnet [®] Interface Set-up" section of the manual. | From 0 to 255 Increment: 1 Default: 0 |
| Device Instance | | |
| COM PORT SET UP 602 Device Instance 01530000 Value is locked ! | Selection of device instance value. This value is locked, in order to avoid incorrect set-up of the device instance. To unlock the setting, put the BACnet [®] interface dip switch No1 at the ON position (Configuration mode), see the "Stage 9 – BACnet [®] Interface Set-up" section of the manual. | From 0 to 4194303 Increment: 1 Default: 01530000 |

Exploded Views & Parts List

General

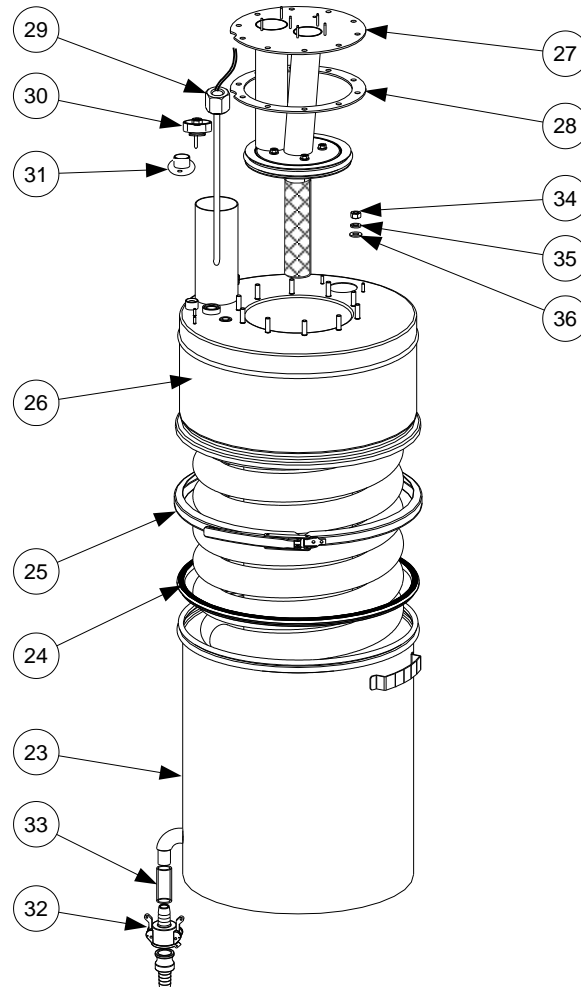


General exploded view - Fig. 53

| Item | Description | Model | Part number |
|------|----------------------------------------|----------------------------------|-------------------|
| 1 | SKG Cabinet | All models | SW G1012 |
| 2 | Evaporation chamber assembly | | See detail |
| 3 | Front door assembly | | See detail |
| 4 | Front Panel | Master (1 st) module | SP G1002-21 |
| | | Slave module | SP G1002-24 |
| 5a | Master control PCB (with LCD display) | All models | NW SKGAZMAINSS |
| 5b | BACnet communication PCB | All models | NW SKGAZBACNET-SS |
| 6 | Slave control PCB | All models | NW SKGAZSLAVESS |
| 7 | Interconnection panel | All models | SW GELECT-ASSY |
| 8 | Transformer 230/24Vac – 100VA | All models | SP 3365 |
| 9 | Combustion blower & gas valve assembly | | See detail |
| 10 | Combustion blower gasket | All models | SP G2104 |
| 11 | Igniter holder assembly | | See detail |
| 12 | Igniter holder gasket | All models | SP G2103 |
| 13 | Combustion controller | All models | SP G2001 |
| 14 | Internal flue pipe | SKGE3-0501 to 1001 | SP G4211 |
| | | SKGE3-1202 to 2002 | SP G4222 |
| | | SKGE3-2503 to 4004 | See detail |
| 15 | Flue pipe holder | SKGE3-0501 to 2002 | SPG 1002-1 |
| | | SKGE3-2503 to 4004 | SWG WATFIT1-ASSY |
| 16 | Flue pipe gasket | All models | SP G2107 |
| 17 | Heat shield panel | All models | SP G1012-18 |
| 18 | Top back cover | All models | SP G1012-9 |
| 19 | Top front cover | All models | SP G1012-8 |
| 20 | Back gas pipe panel | All models | SP G1012-7 |
| 21 | Back door | All models | SP G1012-6 |
| 22 | Leg | All models | SP G3401 |

Exploded Views & Parts List

Item 2 – Evaporation chamber assembly detail

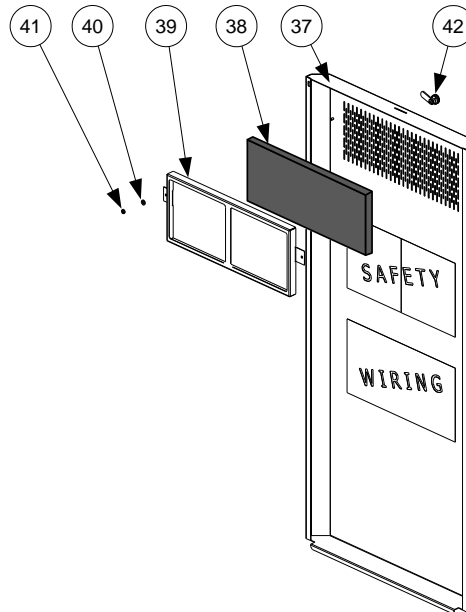


Evaporation chamber exploded view - Fig. 54

| Item | Description | Model | Part number |
|------|-------------------------------|------------|---------------------------------------|
| 23 | Water tank | All models | SW G3208 |
| 24 | Water tank gasket | All models | SW G2101 |
| 25 | Band clamp | All models | SP G3150-M |
| 26 | Heat exchanger | | See combustion component detail table |
| 27 | Burner assembly | | See combustion component detail table |
| 28 | Burner assembly gasket | All models | SP G2111 |
| 29 | Water temperature sensor | All models | SW GWATTEMP-ASSY |
| 30 | AFEC probe | All models | SW GAFECPROBE-ASSY |
| 31 | High temperature limit switch | All models | SP 3035 |
| 32 | Quick release drain connector | All models | SP G3210 |
| 33 | 3/4in silicone hose | All models | SW G3210-ASSY |
| 34 | S/S 1/4-20 Nut | All models | SP G9212 |
| 35 | Lock washer 1/4 | All models | SP G9232 |
| 36 | Flat washer 1/4 | All models | SP G1008 |

Exploded Views & Parts List

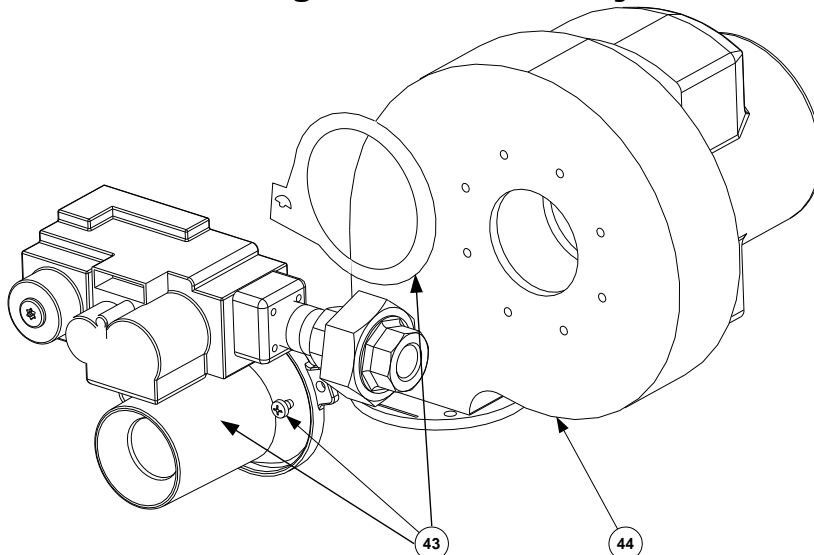
Item 3 - Door assembly detail



Door assembly detail - Fig. 55

| Item | Description | Model | Part number |
|------|-------------------|------------|-------------|
| 37 | Front door | All models | SP G1012-5 |
| 38 | Air filter | All models | SP G4202 |
| 39 | Air filter holder | All models | SP G1012-27 |
| 40 | Spring washer | All models | SP 2112 |
| 41 | Nut M5 | All models | NP NEP188 |
| 42 | Key lock | All models | SP 6854 |

Item 9 - Combustion blower & gas valve assembly



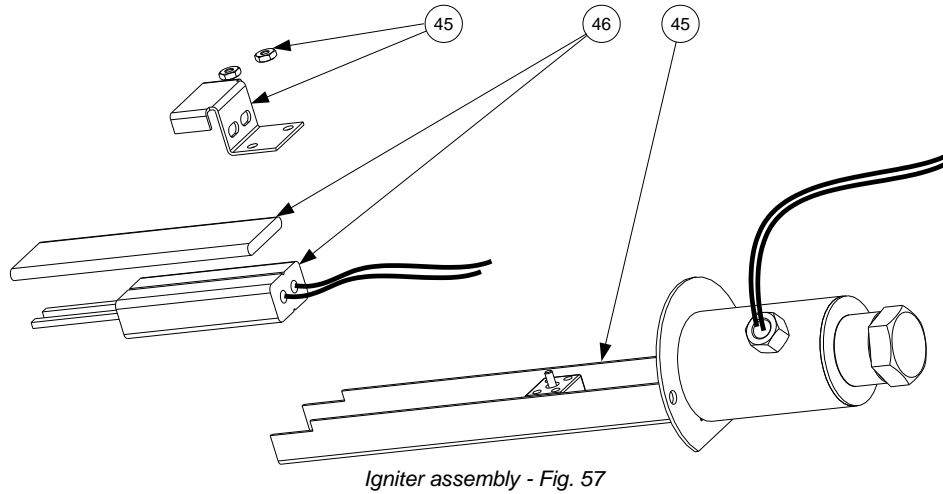
Combustion blower and gas valve assembly - Fig. 56

Combustion component detail table

| Item | Description | Part number by Module type | | | |
|------|------------------------------|----------------------------|--------------------|--------------------|----------------------|
| | | Module SKG 100 | Module SKG 150 | Module SKG 180 | Module SKG 200 |
| 26 | Heat Exchanger | SW GTANKCOVER175 | SW GTANKCOVER175 | SW GTANKCOVER200 | SW GTANKCOVER200 |
| 27 | Burner assembly | SW GBURN100-ASSY | SW GBURN150-ASSY | SW GBURN150-ASSY | SW GBURN200-ASSY |
| 43 | Gas valve & Venturi assembly | SWG GASVENT53-ASSY | SWG GASVENT01-ASSY | SWG GASVENT01-ASSY | SWG GASVENT51-ASSY |
| 44 | Combustion blower | SW G2017-230 | SW G2017-230 | SW G2017-230 | SW G2017-230 |
| 55 | Orifice for propane | | | | All models: SP G2114 |

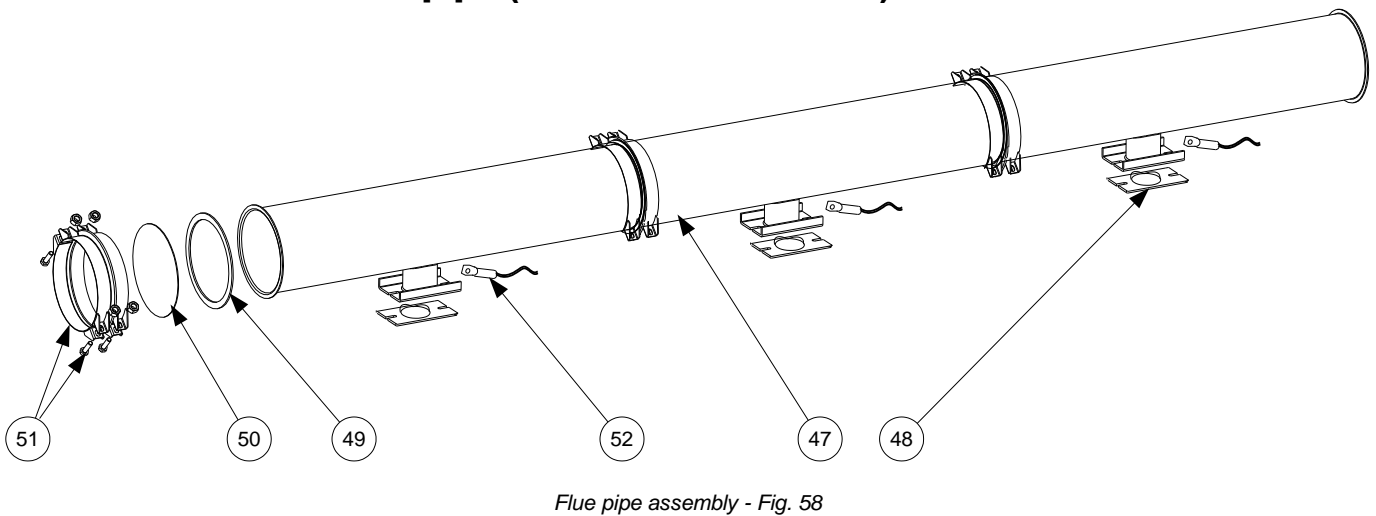
Exploded Views & Parts List

Item 11 – Igniter assembly



| Item | Description | Model | Part number |
|------|-------------------------|------------|------------------|
| 45 | Igniter holder assembly | All models | SW GIGNHOLD-ASSY |
| 46 | Igniter | All models | SP G2018-230 |

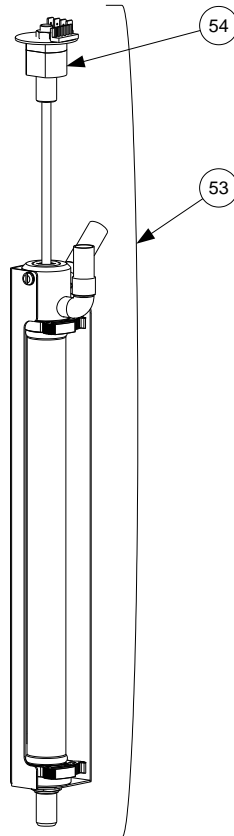
Item 14 – Internal flue pipe (SKGE3-2503 to 4004)



| Item | Description | Model | Part number |
|------|--------------------------------|--------------------|--------------------|
| 47 | Flue section | SKGE3-2503 to 4004 | SP G2201 |
| 48 | Flue breech pipe gasket | All models | SP G2107 |
| 49 | Flue joint fiber gasket | SKGE3-2503 to 4004 | SP G2108 |
| 50 | Flue section blind flange | SKGE3-2503 to 4004 | SP G2206 |
| 51 | Flue connection clamp assembly | SKGE3-2503 to 4004 | SP G2203 |
| 52 | Flue temperature sensor | All models | SW GCHIMPROBE-ASSY |

Exploded Views & Parts List

Water level sensor assembly

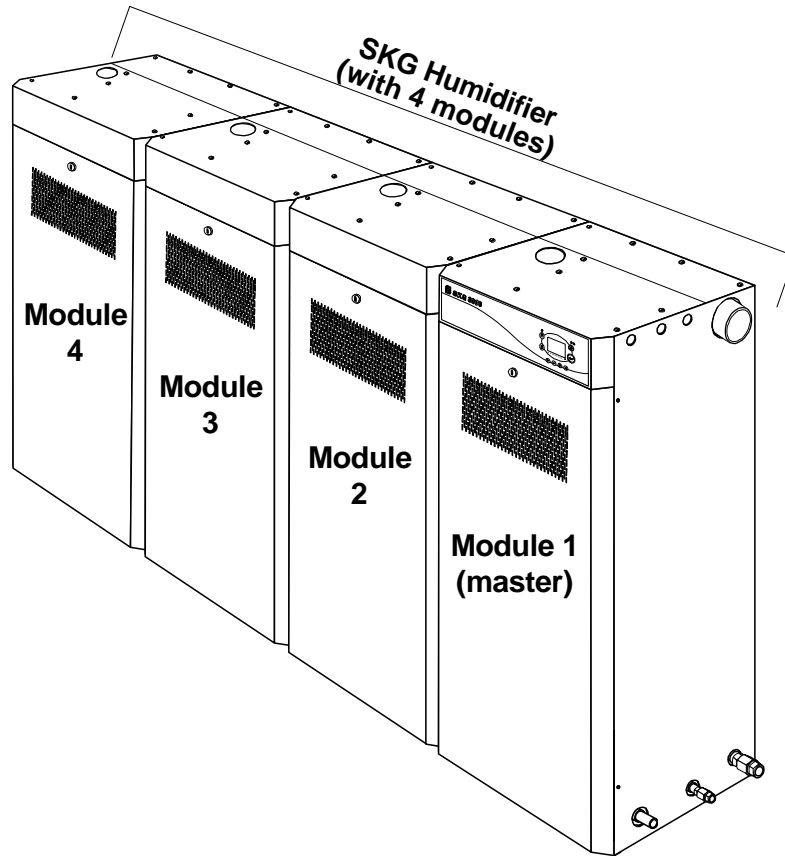


Water level sensor assembly - Fig. 59

| Item | Description | Model | Part number |
|------|-----------------------------|------------|-----------------|
| 53 | Water level sensor assembly | All models | SW GWATLEV-ASSY |
| 54 | Water level sensor | All models | SW GWATLEV-SUB |



Multiple Modules Composition Table



(fig.60)

| Humidifier Model | No of Modules | Module model number & quantity | | | |
|------------------|---------------|--------------------------------|--------|--------|--------|
| | | SKG100 | SKG150 | SKG180 | SKG200 |
| SKGE3-0501 N/P | 1 | x1 | | | |
| SKGE3-0701 N/P | 1 | | x1 | | |
| SKGE3-0801 N/P | 1 | | | x1 | |
| SKGE3-1001 N/P | 1 | | | | x1 |
| SKGE3-1202 N/P | 2 | x1 | x1 | | |
| SKGE3-1502 N/P | 2 | | x2 | | |
| SKGE3-1702 N/P | 2 | | x1 | | x1 |
| SKGE3-2002 N/P | 2 | | | | x2 |
| SKGE3-2503 N/P | 3 | | x1 | x1 | x1 |
| SKGE3-2703 N/P | 3 | | x1 | | x2 |
| SKGE3-3003 N/P | 3 | | | | x3 |
| SKGE3 3504 N/P | 4 | | x1 | x1 | x2 |
| SKGE3-3704 N/P | 4 | | x1 | | x3 |
| SKGE3-4004 N/P | 4 | | | | x4 |



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