



GTS®

Gas-to-Steam Humidifier  
LX Series

## Installation, Operation, and Maintenance Manual

### WARNING

#### **Fire or explosion hazard**

If the information in this manual is not followed exactly, a fire or explosion could result, causing property damage, personal injury, or death.

Do not store or use gasoline or other flammable vapors and liquids in the vicinity of this or any other appliance.

#### **If you smell gas:**


- Do not try to light any appliance.
- Do not touch any electrical switch; do not use any phone in your building.
- Immediately call your gas supplier from an off-site phone. Follow the gas supplier's instructions.
- If you cannot reach your gas supplier, call the fire department.





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

For toll-free support call DriSteem Technical Support: 1-800-328-4447



# Warnings and cautions

 <p><b>WARNING</b> Indicates a hazardous situation that could result in death or serious personal injury if instructions are not followed.</p>	<p><b>CAUTION</b> Indicates a hazardous situation that could result in damage to or destruction of property if instructions are not followed.</p>
---	---

 <p><b>WARNING</b></p>	
 	<p><b>Fire or explosion hazard</b></p> <p>A. This appliance does not have a pilot. It is equipped with an ignition device which automatically lights the burner. Do NOT try to light the burner by hand.</p> <p>B. Before operating, smell all around the appliance area for gas. Be sure to smell next to the floor because gas can be heavier than air and settle on the floor.</p> <p><b>If you smell gas:</b></p> <ul style="list-style-type: none"> <li>• Do not try to light any appliance.</li> <li>• Do not touch any electrical switch; do not use any phone in your building.</li> <li>• Immediately call your gas supplier from an off-site phone. Follow the gas supplier's instructions.</li> <li>• If you cannot reach your gas supplier, call the fire department.</li> </ul> <p>C. Do not use this appliance if any part has been under water. Immediately call a qualified gas appliance service technician to inspect the appliance and to replace any part of the control system and any gas control that has been under water.</p>
	<p><b>Attention installer</b></p> <p>Read this manual before installing, and leave this manual with product owner. This product must be installed by qualified HVAC and electrical contractors. Installation must be code approved. Improper installation can cause property damage, severe personal injury, or death as a result of electric shock, burns, or fire.</p> <p>DriSteen® Technical Support:          North America: 800-328-4447          Europe: +3211823595</p> <p><b>Read all warnings and instructions</b></p> <p>Read this manual before performing service or maintenance procedures on any part of the system. Failure to follow all warnings and instructions could produce the hazardous situations described, resulting in property damage, personal injury, or death.</p> <p>Failure to follow the instructions in this manual can cause moisture to accumulate, which can cause bacteria and mold growth or dripping water into building spaces. Dripping water can cause property damage; bacteria and mold growth can cause illness.</p>

*Continued*

# Warnings and cautions



## WARNING



### Carbon monoxide, fire, explosion, and electrical shock hazards

Improper installation, adjustment, alteration, service, maintenance, or use can cause carbon monoxide poisoning, fire, explosion, electrical shock, and other hazardous conditions. These hazardous conditions could cause personal injury, property damage, or death. To prevent hazardous conditions, read all warnings; lock all power disconnect switches in the OFF position before removing any access panels; and consult a qualified installer, service agency, local gas supplier, or your distributor or branch for information or assistance. The qualified installer or agency must use only factory authorized and listed kits or accessories when modifying this product.

- Inspect humidifier and accessories upon arrival for damaged, missing, or improper parts. If there is a problem, call your local DriSteem Representative/Distributor.
- Application of this humidifier should have special attention given to vent sizing and material, gas input rate, and unit sizing. Improper installation or misapplication of the humidifier can cause excessive servicing or permanent component failure.
- When working on equipment, observe precautions in literature, tags, and labels attached to or shipped with the unit and observe other safety precautions that may apply. Wear safety glasses and work gloves. Have a fire extinguisher available during start-up, adjustment procedures, and service calls.
- Do not lift humidifier by gas controls, gas manifold, fire box, or shroud.
- Should overheating occur, or the gas supply fail to shut off, shut off the manual gas valve to the appliance before shutting off the electrical supply.
- The evaporating chamber is designed as a nonpressurized vessel. **DO NOT restrict piping where steam exits the humidifier.** Install drain piping and piping that connects the evaporating chamber to the dispersion assembly only as described in this manual. DO NOT install a shut-off valve on the piping connecting the evaporating chamber to the steam outlet.
- Check the humidifier name plate for the gas type indicated (natural gas or propane gas). Supply the humidifier only with the gas type indicated, or burner failure will result. To convert the humidifier to a different gas type, contact DriSteem Technical Support or your local DriSteem Representative/Distributor.
- Installation must conform to the requirements of the authority having jurisdiction or, in the absence of such requirements, must conform to:
  - **In the United States:** The National Fuel Gas Code, ANSI Z223.1 (latest edition).
  - **In Canada:** Local plumbing or waste water codes and other applicable codes and with the current code CAN/CGA-B149.1, "Installation Code for Natural Gas Burning Appliances and Equipment," or CAN/CGA-B149.2, "Installation Code for Propane Burning Appliances and Equipment."
  - **In Europe:** The National Gas Safety (Installation & Use) Regulations.
- Do not install in potentially explosive or flammable atmospheres laden with grain dust, sawdust, or similar airborne materials.
- Installation of humidifier in high humidity or salt water atmospheres causes accelerated corrosion, reducing the normal life-span of the unit.
- To prevent premature heat exchanger failure, do not locate any gas-fired unit in areas where chlorinated, halogenated, or acid vapors are present in the atmosphere.
- Locate the humidifier in an area clear of combustible materials, gasoline, and other flammable vapors and liquids.

*Continued*

# Warnings and cautions



## WARNING









### **Carbon monoxide, fire, explosion, and electrical shock hazards (continued)**

- With the exception of sealed combustion units, do not locate units in tightly sealed rooms or small compartments without provision for adequate combustion air and venting. Room air combustion must be supplied through a minimum of two permanent openings in the wall, with at least one near the bottom. See "Combustion and ventilation air" for additional information.
- Remove all shipping brackets and materials before operating the humidifier.
- Do not locate humidifier in a negative pressure space. Combustion products could be suctioned from the venting. See page 27.
- Humidifier flue gases must be vented to the outside atmosphere.
- Do not interfere, disable, or tamper with the devices monitoring the combustion gas discharge, including the flue temperature and flue pressure sensors. Only authorized and trained technicians should perform any service on these items.
- Do not interfere or tamper with any sealed components. Only authorized and trained technicians should perform any service on these items.
- This humidifier is not intended for use by persons (including children) with reduced physical, sensory, or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety.
- Children should be supervised to ensure that they do not play with the humidifier.
- The GTS humidifier LX series must be vented and supplied with combustion and ventilation air as described in this IOM. Ensure the vent and air piping and the combustion air supply comply with these instructions regarding vent, system, air system, and combustion air quality. Inspect finished vent and air piping thoroughly to ensure all are airtight and comply with the instructions provided and with all requirements of applicable codes. Failure to provide a properly installed vent and air system will cause severe personal injury or death.
- This humidifier requires a special venting system. Use only approved stainless steel, PVC, CPVC, or polypropylene pipe and fittings listed in this IOM. Failure to comply could result in severe personal injury, death, or substantial property damage.
- Do not connect any other appliance to the vent pipe or multiple humidifiers to a common vent pipe. Failure to comply could result in severe personal injury, death, or substantial property damage.
- The flue gas vent shall not pass through any air duct or plenum. Do not insulate plastic flue gas vent pipe.
- Do NOT mix components from different systems. The vent system could fail, causing leakage of flue products. Mixing of venting materials will void the warranty.
- Power supply disconnect switch must be in the off position while making wiring connections to prevent electrical shock and equipment damage. All units must be wired in strict accordance with the wiring diagrams furnished with this unit.
- Turn off all gas while installing the gas piping and manual shutoff valve for the humidifier.
- The appliance and its individual shut-off valve must be disconnected from the gas supply piping system during any pressure testing of that system at test pressures exceeding 0.5 psig (3.5 kPa).

*Continued*

# Warnings and cautions

 <b>WARNING</b>	
  	<p><b>Hot surfaces and hot water</b></p> <p>This steam humidification system has extremely hot surfaces. Water in tank, steam tubing, and dispersion assemblies can be as hot as 212 °F (100 °C). Discharged steam is not visible. Contact with hot surfaces, discharged hot water, or air into which steam has been discharged can cause severe personal injury. To avoid severe burns, follow the cool-down procedure in this manual before performing service or maintenance procedures on any part of the system.</p>
 	<p><b>Disconnect electrical power</b></p> <p>Disconnect electrical power before installing supply wiring or performing service or maintenance procedures on any part of the humidification system. Failure to disconnect electrical power could result in fire, electrical shock, and other hazardous conditions. These hazardous conditions could cause property damage, personal injury, or death.</p> <p>Follow the shutdown procedure on Page 43 before performing service or maintenance procedures on any part of the system.</p>

*Continued*

## Warnings and cautions

### **CAUTION**

#### **Hot discharge water**

Discharge water can be as hot as 212 °F (100 °C) and can damage some drain plumbing.

The humidifier is equipped with integrated water drain tempering that needs make-up water less than 140°F (60 °C) in order to function properly. Make sure the water supply to the humidifier remains open during draining.

#### **Excessive supply water pressure**

Supply water pressure greater than 80 psi (550 kPa) can cause the humidifier to overflow.



# Table of contents

<b>PRODUCT OVERVIEW</b> .....	2
Supply water guidelines .....	2
Universal water .....	2
Water level control .....	3
<b>SPECIFICATIONS</b> .....	4
Models, capacities, electrical specifications, and weights .....	4
Dimensions .....	5
<b>INSTALLATION</b> .....	6
Location and clearance recommendations .....	6
Optional floor stand mount .....	7
Outdoor enclosure: .....	8
Mounting .....	8
Operation .....	15
Wiring .....	16
Piping .....	17
Supply water and drain overflow connections .....	18
Supply water .....	20
Drain .....	21
Flue gas condensate .....	22
Gas .....	23
General venting .....	27
Room air combustion .....	27
Sealed combustion .....	29
Guidelines .....	30
Vertical venting .....	33
Sidewall venting .....	35
Determine a location .....	35
Sidewall installation .....	37
Dispersion: .....	38
Selecting a location .....	38
Start-up .....	39
Start-up checklist .....	39
<b>OPERATION</b> .....	39
Start-up procedure .....	40
Start-up commissioning checklist .....	41
Inspection recommendations .....	43



# Table of contents

<b>MAINTENANCE</b> .....	43
Replacement parts .....	44
Water quality and maintenance .....	45
Water quality recommendations .....	45
Water quality and maintenance .....	46
Cool down procedure .....	46
Combustion assemblies .....	47
Removing the combustion assembly .....	47
Maintenance frequency .....	47
Burner maintenance instructions .....	48
Ignitor and flame sense rod .....	48
Inspection and maintenance .....	49
Inspection and maintenance .....	49
GTS humidifier .....	53
<b>REPLACEMENT PARTS</b> .....	53
Electrical parts .....	55
Outdoor enclosure .....	57
Authorized countries of destination .....	59
Appliance category .....	59
<b>EUROPEAN MODELS</b> .....	59
<b>WARRANTY</b> .....	64
Two-year Limited Warranty .....	64
Extended warranty .....	64

## **ATTENTION INSTALLER**

### **Original Instructions**

Read this manual before installing. Leave manual with product owner.

DriSteem Technical Support  
800-328-4447

### **Website:**

Documents can be viewed, printed or ordered from our website, [www.dristeem.com](http://www.dristeem.com).

### **DriCalc sizing and selection software:**

DriCalc® is our humidification system sizing and selection software, which can be accessed from [dristeem.com](http://dristeem.com).

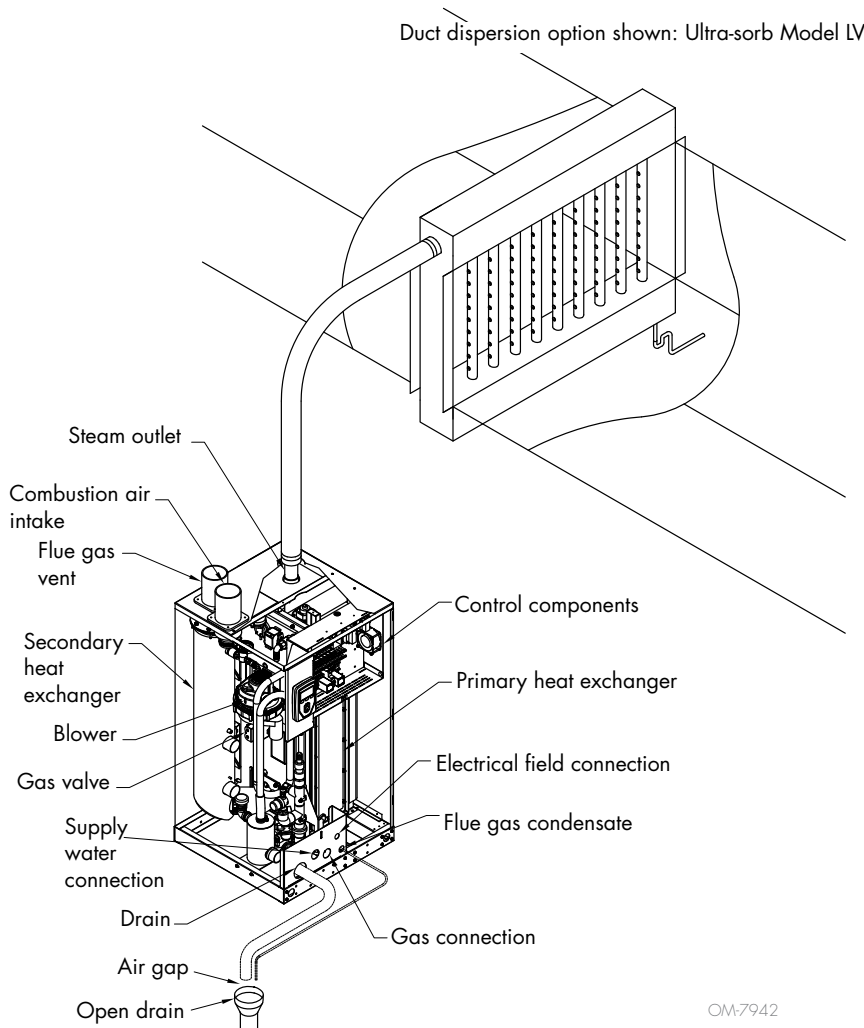
# Product overview

The GTS humidifier LX series burns either natural or propane gas to heat and boil fill water into steam for humidification. The unit has either one or two burners that fire into a heat exchanger submerged in a tank of water. When there is a call for humidity, the burners fire and generate steam until the call for humidity ends.

## UNIVERSAL WATER

DriSteem's GTS humidifier LX series incorporates universal water control for use with any potable water type (well, tap, softened, DI or RO water). There is no need to change control configurations based on water type when ordering equipment or retrofitting to fit new water sources in the field. The water level control algorithm monitors water quality and any changes over time to assure the user of accurate control no matter the type of water that is used.

**FIGURE 2-1: GTS HUMIDIFIER LX SERIES**



OM-7942

## Supply water guidelines

Supply water quality is an important component of humidifier reliability and maintenance.

Examples:

- Corrosive water can decrease the service life of the humidifier.
- Excessive water hardness can increase the humidifier maintenance requirements.

To maximize humidifier service life and minimize humidifier maintenance, DriSteem has established guidelines for supply water. See Table 2-1.

Table 2-1: DriSteem supply water guidelines	
<b>Chlorides*</b>	
Tap water	< 50 ppm
RO/DI water	< 5 ppm
Softened water	< 25 ppm
* Damage caused by chloride corrosion is not covered by your DriSteem warranty.	
<b>Total hardness</b>	
Tap water	< 500 ppm
<b>pH</b>	
Tap water	6.5 to 8.5
RO/DI, softened water	7.0 to 8.0
<b>Silica</b>	
	< 15 ppm
Supply water outside of the guidelines may void your DriSteem warranty. Please contact your DriSteem Representative or DriSteem Technical Support if you need advice.	

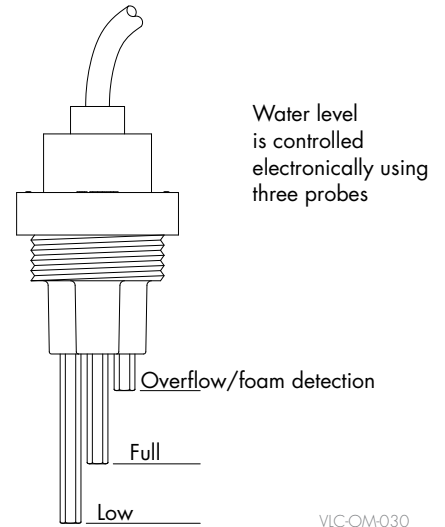
# Product overview

## WATER LEVEL CONTROL

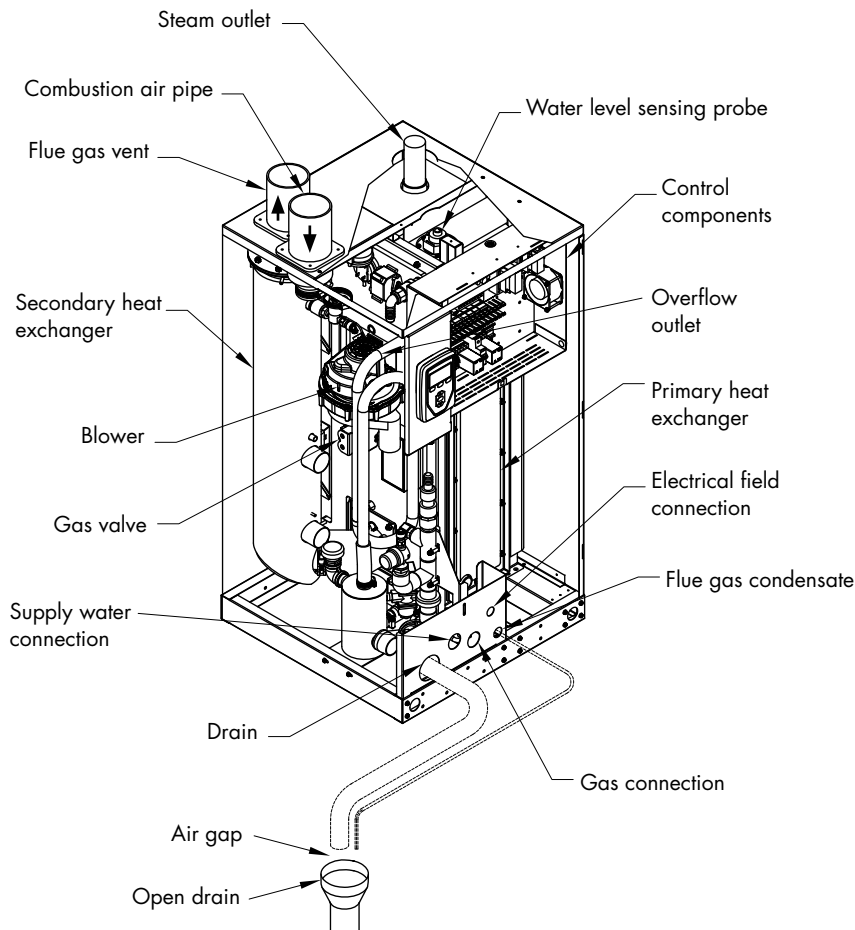
The LX series of GTS humidifiers control water level using a three-rod probe (see Figure 3-1). Any water type can be supplied to the GTS humidifier. Water scale related maintenance is significantly reduced when using softened water and is virtually eliminated when using RO/DI water.

Note: No control reconfiguration is necessary when switching between RO/DI water and tap/softened water.

**FIGURE 3-1: WATER LEVEL CONTROL**



**FIGURE 3-2: GTS HUMIDIFIER**



Note: Dashed lines indicate supplied by installer

OM7943

# Models, capacities, electrical specifications, and weights

**Table 4-1:**  
GTS models, capacities, electrical specifications, and weights

GTS model	Maximum steam capacity		Input			Water usage at maximum capacity		Tank volume		GTS humidifier LX series				LX series with outdoor enclosure				Full load amps*	
										Operating weight		Shipping (empty) weight**		Operating weight		Shipping (empty) weight			
	lbs/hr	kg/h	MBh	kW	m <sup>3</sup> /h	gals/hr	litres/hr	gals	litres	lbs	kg	lbs	kg	lbs	kg	lbs	kg	120V 60 Hz	230V 50 Hz
LX-50	50	23	61	17.8	1.7	6	23	16	61	303	137	187	85	478	217	362	164	1.5	1
LX-75	75	34	91.5	26.8	2.5	9	34	14	53	304	138	192	87	479	217	367	169	1.5	1
LX-100	100	45	122	35.7	3.4	12	45	28	106	443	201	240	109	618	280	415	188	2	1.5
LX-150	150	68	183	53.6	5.1	18	68	26	98	446	202	250	113	621	282	425	193	2	1.5

\* Add 15 full load amps for Outdoor Enclosure heater load on all LX models, add 1 full load amp for an Outdoor Enclosure without heaters.  
 \*\* Add approximately 40 lbs (18 kg) for packaging material.

**LP GAS**

All models operate at rated input

**Important:** See Pages 59 and 60 for additional European model specifications and capacity notes.

**HIGH ALTITUDE**

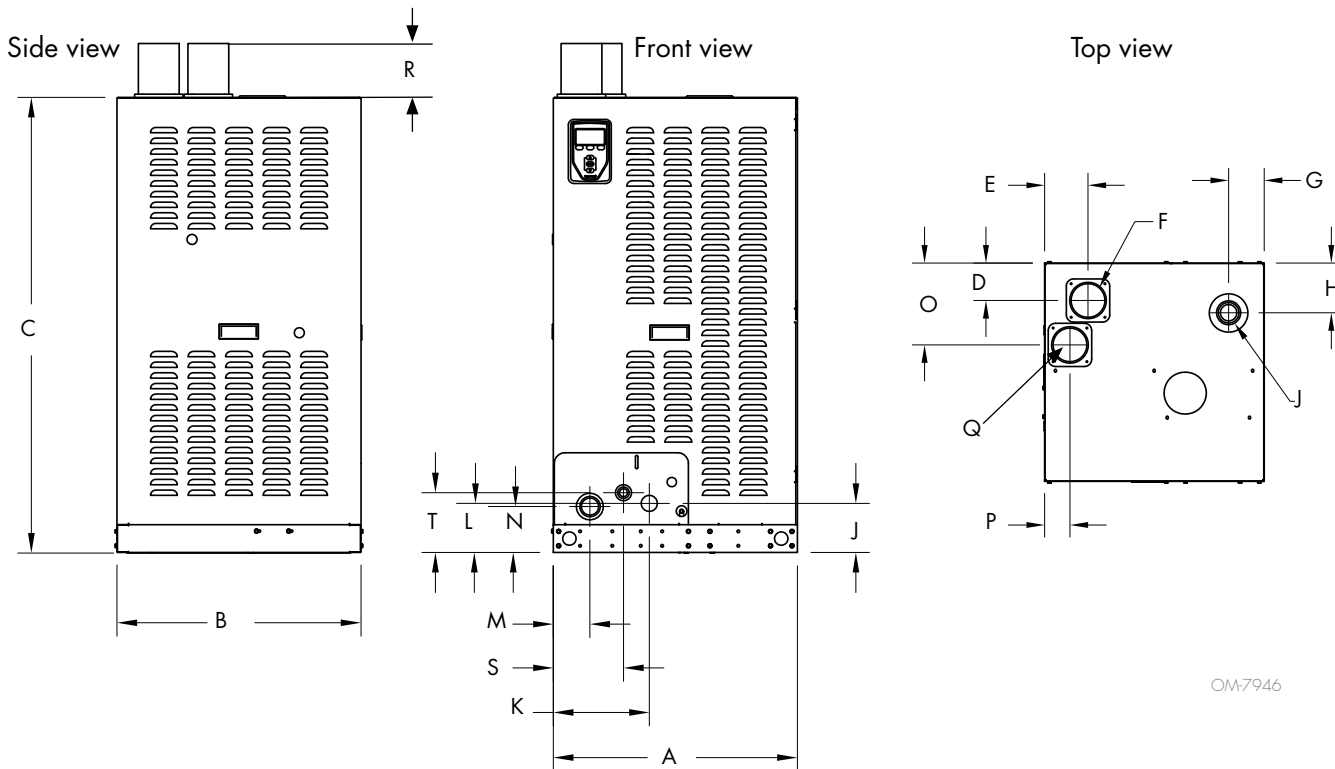
The input shown in Table 4-2 is derate when operating units at a high altitude. See the "Start-up procedure" on page 40 for adjusting oxygen levels on the LX series gas valve.

**Table 4-2:**  
High altitude derate

Altitude		Input derate %
feet	meters	
0-2000	0-610	0
2001-2500	610-765	2
2501-3000	765-915	4
3001-3500	915-1065	6
3501-4000	1065-1220	8
4001-4500	1220-1370	10
4501-5000	1370-1525	12
5001-5500	1525-1675	14
5501-6000	1675-1830	16
6001-6500	1830-1980	18
6501-7000	1980-2135	20
7001-7500	2135-2285	22
7501-8000	2285-2440	24

# Dimensions

**FIGURE 5-1: DIMENSIONS**



OM-7946

**Table 5-1:  
Dimensions**

	Description	LX-50 LX-75		LX-100 LX-150	
		inches	mm	inches	mm
A	Overall length	23.25	590	32.25	819
B	Overall width	23.25	590	23.25	590
C	Shroud height	42.75	1085	42.75	1085
D	Flue position	4.5	114	4.5	114
E		4	102	4	102
F	Flue diameter	3	76	3	76
G	Steam outlet position	5.25	133	5.25	133
H		3.5	89	3.5	89
J	Steam outlet diameter	1.5	38	2	51
K	Gas inlet position	5.5	140	5.5	140
L		6.5	165	6.5	165
M	Drain position	4.5	114	4.5	114
N		3.5	89	3.5	89
O	Combustion air	8.55	217	8.55	217
P		2.63	67	2.63	67
Q	Combustion air diameter	3	76	3	76
R	Flue and combustion air height	5.5	140	5.5	140
S	Fill valve connection position	6.59	167	6.59	167
T		5.60	142	5.60	142

## Location and clearance recommendations

### FINDING A LOCATION

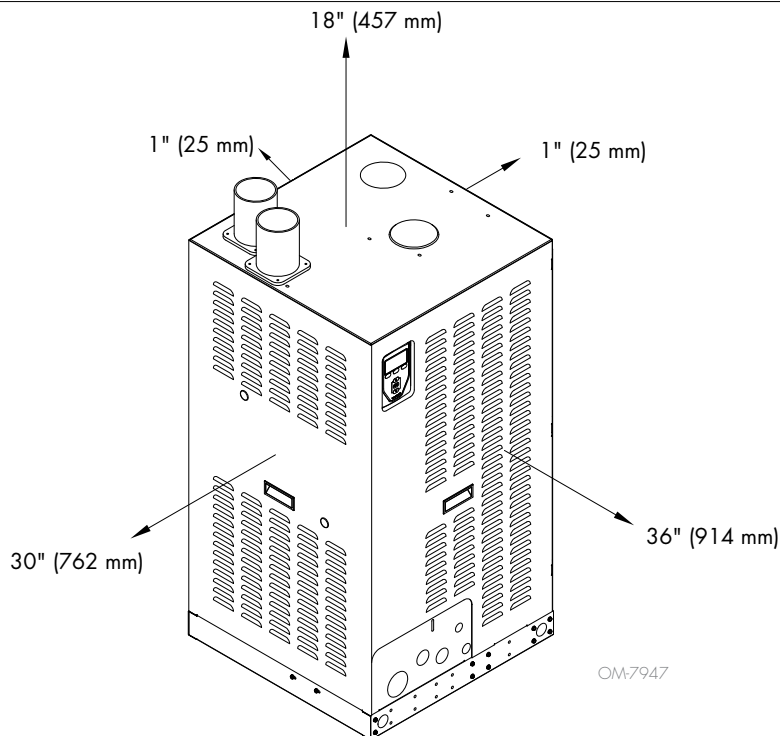
- Provide a level, solid foundation for the humidifier.
- The GTS humidifier LX series vent and air piping can be installed through the roof or through a sidewall. Use only vent/air piping methods described in this IOM. Locate the humidifier as near as possible to an outside wall or accessible roof space so that the flue pipe from the humidifier is short, direct, and limited to wind exposure.
- Locate the unit so it and its electrical components are protected from water during humidifier operation and service.
- Install the humidifier in a location away (and protected) from drafts. Follow the instructions concerning combustion and ventilation air.
- Locate the humidifier in an area where leakage from the tank or its connections will not result in damage to the adjacent structure or to lower floors of the structure. When such locations cannot be avoided, install a suitable drain pan (adequately drained) under the humidifier. The pan must not restrict combustion airflow.
- If located in an insulated space, keep the humidifier free and clear of insulating materials. Insulating material can be combustible. Inspect the humidifier area when the humidifier is installed or when insulation is added.
- See the combustion air and flue gas venting section on page 27 for pipe termination locations and instructions.

### WARNING

#### Installation requirements

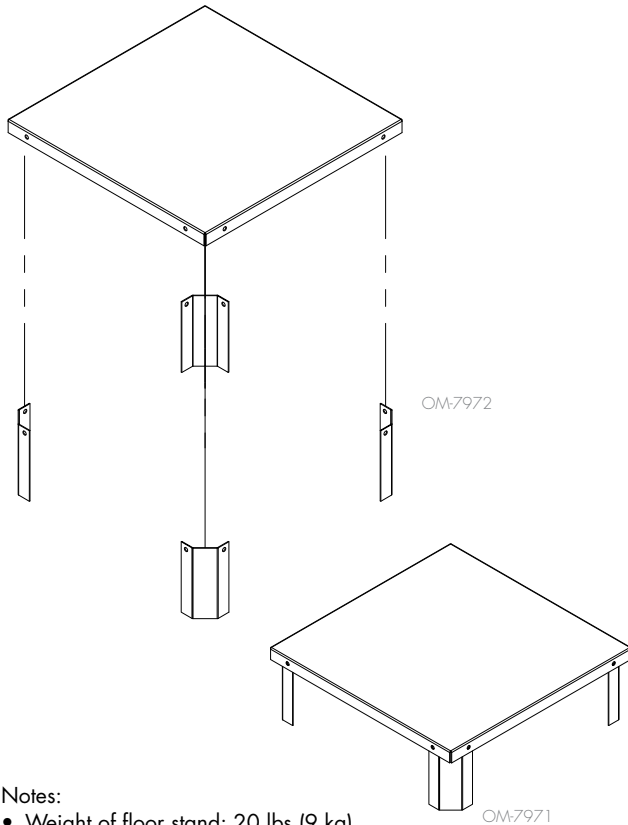
The humidifier must be installed by a qualified technician and meet the requirements of all governing codes. Failure to follow these instructions could cause severe bodily injury or death.

**FIGURE 6-1: LX SERIES CLEARANCE RECOMMENDATIONS**



# Optional floor stand mount

**FIGURE 7-1: LX SERIES FLOOR STAND MOUNT ASSEMBLY**



Notes:

- Weight of floor stand: 20 lbs (9 kg)
- Allows for condensate piping/pump

**FLOOR STAND MOUNTING INSTRUCTIONS**

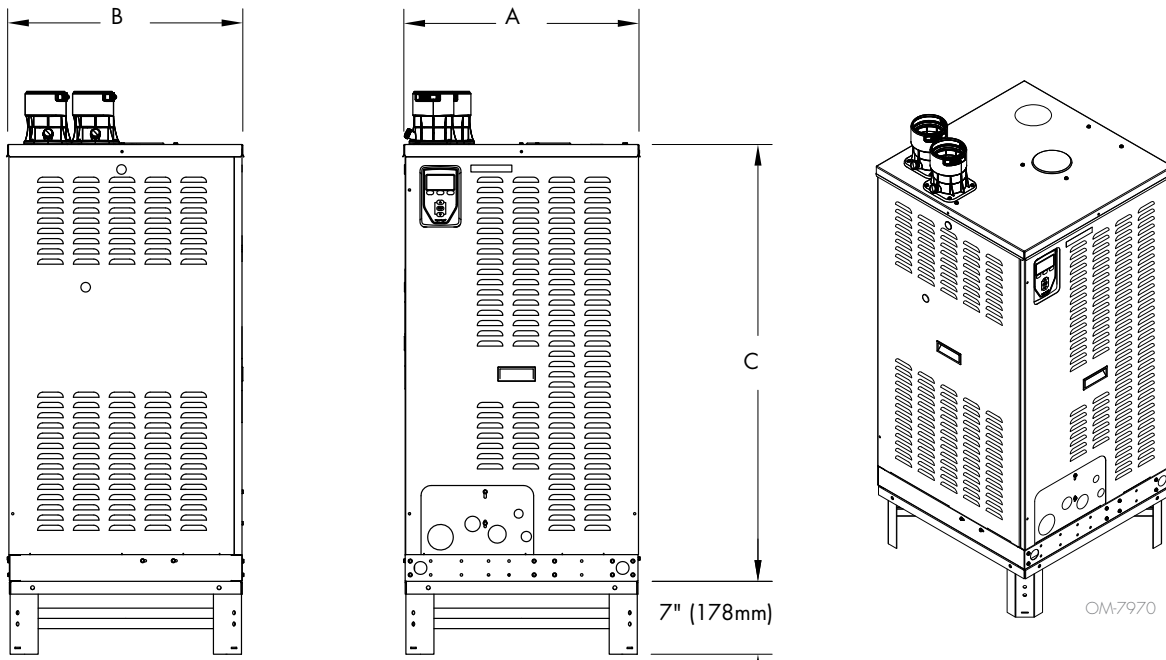
1. Refer to Figure 7-1 for assembly of the floor stand.
2. Use the hardware provided by DriSteem to assemble.
3. Arrange appropriate lifting mechanism and personnel to mount the GTS humidifier LX series on the floor stand. See Warning below.
4. Use the lifting hole on the base of humidifier to carefully lift it off the ground. See Warning below.
5. Slowly lower the humidifier on the floor stand.
6. Secure the base of the humidifier to the floor stand using sheet metal screws.

**WARNING**

**HEAVY OBJECT**

To avoid muscle strain or back injury, using lifting aids and proper lifting techniques when removing or replacing.

**FIGURE 7-2: LX SERIES WITH FLOOR STAND MOUNT**



See "Dimensions" on page 5-1.

OM-7962

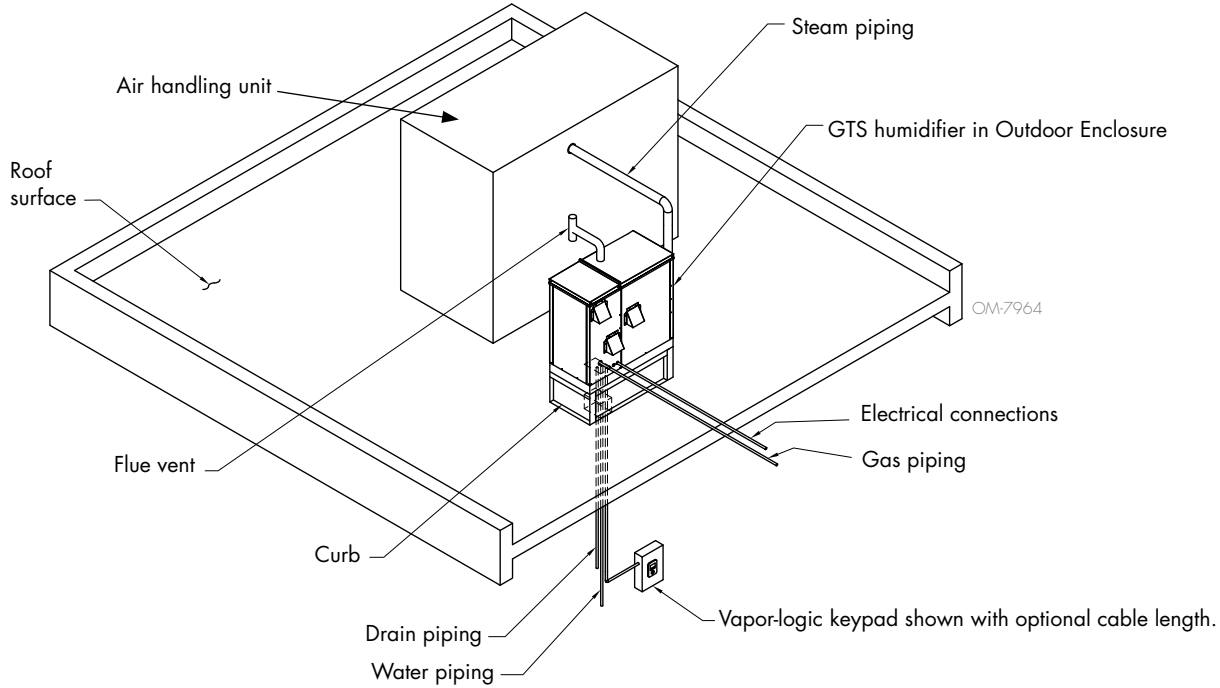


# Outdoor enclosure: Mounting

## OUTDOOR ENCLOSURE MOUNTING OPTION

The Outdoor Enclosure option is used when the GTS is installed outdoors. The following information is not intended to supersede any requirements of federal, state, or governing codes having jurisdiction; prior to locating the unit, authorities having jurisdiction should be consulted.

**FIGURE 8-1: OUTDOOR ENCLOSURE TYPICAL INSTALLATION OVERVIEW**



## Outdoor enclosure: Mounting

### **LIFTING**

The GTS Outdoor Enclosure must be lifted from the bottom base in a fashion that holds it level and keeps it from tipping, falling, or twisting. If the unit is severely twisted during handling, permanent damage can occur. It is the installer's responsibility to verify the handling equipment's capability to safely handle the unit.

Lift the Outdoor Enclosure by using special lifting lug hooks installed on the unit. All lifting operations must be accomplished with a load spreader of sufficient width to ensure that the lifting cables clear the side of the unit.

# Outdoor enclosure: Mounting

## **LOCATION**

- The GTS Outdoor Enclosure must be level and located so there is enough clearance for opening the access panels.
- Verify that the position of pad or curb properly supports the unit and that support structure dimensions coincide with unit dimensions.
- Do not locate unit in areas where the surrounding air has high levels of particulates, such as some industrial parks or areas near highways.
- Locate unit so air intakes are not too close to exhaust fan outlets, gasoline storage, or other contaminants that potentially could cause dangerous situations. Using and storing gasoline or other flammable vapors and liquids in open containers in the vicinity of this appliance is hazardous.
- When located on the roof, the air intakes must be a minimum of 14" (360 mm) off the roof to prevent intake of snow or splashed rain. The unit should be located so prevailing winds do not blow into the air intakes.
- An emergency drain is provided. In case of any water leak, water drains onto the roof through this emergency drain.
- A keypad ships mounted to the subpanel in the GTS Outdoor Enclosure. If the keypad cable is extended, the keypad must not come in contact with the strip heaters or block the intake ventilation hood.
- If constant monitoring of the unit is desired, or if the unit is located in a severe climate, install a remote mount keypad. Additional cable lengths up to 500' (152 m) are available as an option for this mounting configuration.
- Curbs (optional) are shipped knocked down for ease of transporting to the roof. Curbs are manufactured of 14-gauge galvanized steel and shipped with all hardware for bolt-together assembly. All holes are matched before leaving the factory. Curb is to be a minimum of 14" (360 mm) high. A closed-cell curb gasket with adhesive on one side is supplied with hardware. An installation drawing also is included.

## Outdoor enclosure: Mounting

### BEFORE YOU BEGIN

- Prior to installing the unit, remove all packaging.
- There are three knockouts located on the right and left side of the enclosure. Run electrical power into the enclosure at these knockouts.
- When pad-mounted or when the pipe chase cannot be used, the supply water and drain piping can be run through the knockouts, although preferably on the opposite side from the gas and electric.
- When unit is mounted on an outdoor curb, there must be a gasket between the top of the curb and the base surface of the unit to prevent moisture from leaking into the building from either driving rain or melting snow.
- The Outdoor Enclosure has two available steam distribution configurations. The standard configuration has a steam outlet at the back of the Outdoor Enclosure for connecting to steam dispersion unit piping. The optional internal steam distribution configuration routes steam within the Outdoor Enclosure and down through the pipe chase into a building. See Figure 13-1.

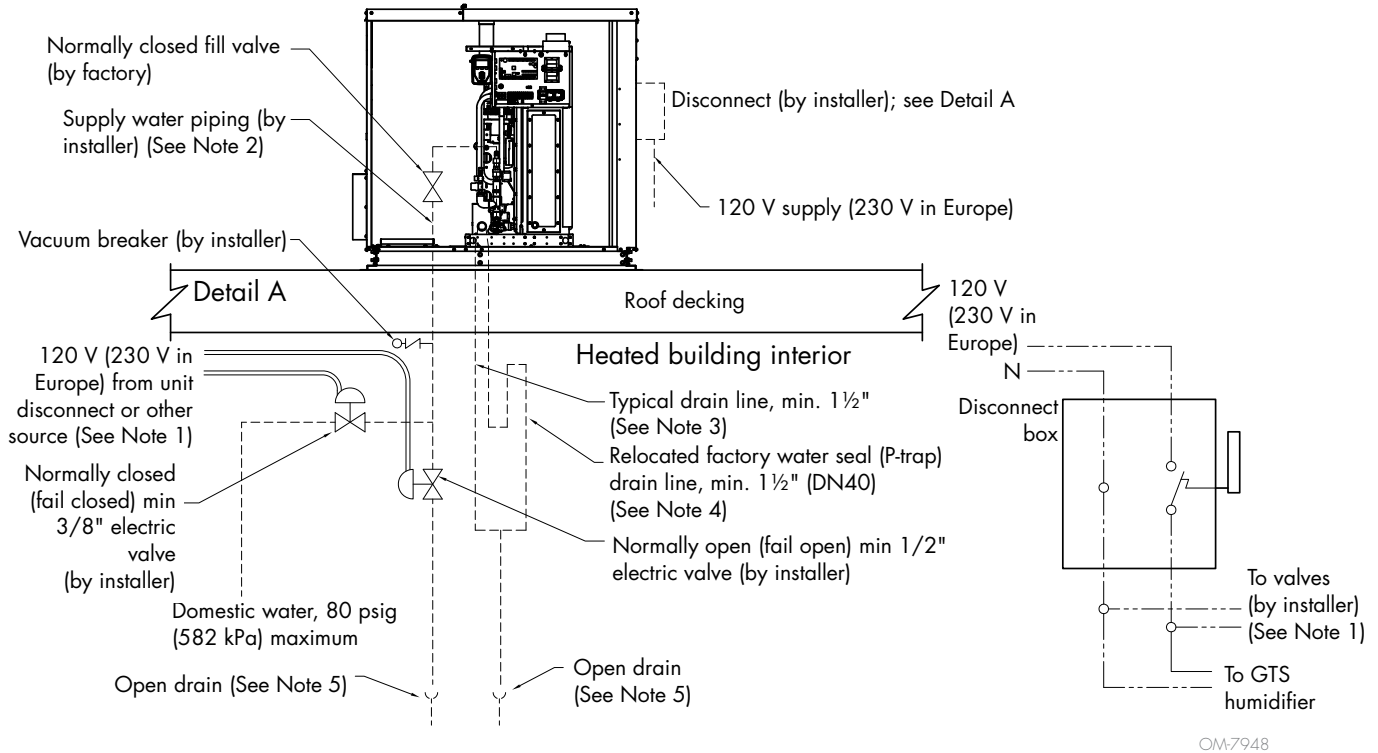
**Important:** A pipe chase is located inside the burner section of the enclosure. Use this pipe chase for both the supply water piping and drain piping. Use insulation to completely fill the area around the pipes to maintain proper enclosure pressure and protect unit components from elevated moisture levels within building; insulation must serve as an effective vapor barrier. Use the provided pipe chase cover to seal off the pipe chase. Cut necessary holes and seal after installation.

- The heater package has two thermostat-controlled heaters: one strip heater is located in the control section, and one strip heater is located in the burner section to keep the enclosure at a constant minimum temperature. Once the humidifier tank is full and up to temperature, the tank will keep the enclosure at an appropriate temperature. The heaters will turn off.
- See “Wiring” on Page 15 and “Piping” beginning on Page 16 for directions on installing electrical, gas, flue, drain, and water connections. A separate electrical service connection for the outdoor GTS is recommended. Insulation and/or heat taping of water piping is recommended.
- Combustion air is drawn from within the DriSteem outdoor enclosure which is sufficiently vented to provide combustion air.
- For units installed within roof top unit air handlers, the combustion air can be drawn from within the roof top unit if sufficient ventilation for combustion air is provided and static pressure at combustion air inlet remains neutral ( $\pm 1$ " water).
- Flue gas venting should include a 90° elbow and end with a tee to the side of the unit to minimize effects of wind and prevent condensate from dripping onto unit.

# Outdoor enclosure: Mounting

**FIGURE 12-1: OUTDOOR ENCLOSURE FREEZE PROTECTION PIPING**

GTS humidifier in Outdoor Enclosure installed on rooftop



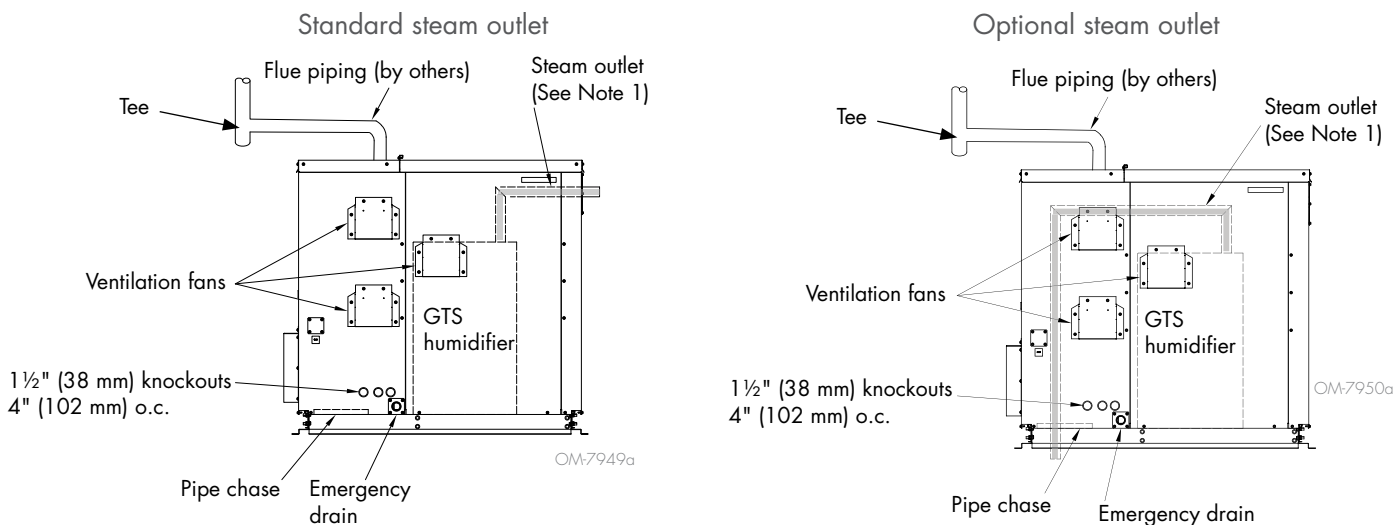
**Piping notes:**

1. Insulate supply water piping to avoid dripping from condensation. To ensure that water does not remain in the fill line and freeze if there is a loss of power, use field installing additional valves upstream of the fill valve in a conditioned space. Power these valves on the same circuit as the GTS; if the power goes off, water drains out of the fill line to prevent freezing (see above).
2. Ensure that water lines are protected from freezing conditions.
  - Install heat tracing and insulation on fill piping inside the Outdoor Enclosure.
  - In extreme or critical applications in which the unlikely event of a water leak could cause severe damage, use a thermostat with a remote sensor on the fill line to cut power to the GTS and safety valves to stop fill water to the GTS and drain the fill piping when the temperature is below freezing.
3. Use copper or iron drain piping for Outdoor Enclosures. On a loss of power the tank water will drain, but not be cooled by the drain tempering device because of the field supplied safety shut-off valves.
4. If it is critical to keep the drain tempering device functional in the case of a power loss, disconnect the drain tempering device and relocate it down inside the conditioned space of the building. Pipe the supply water for the drain tempering device before the safety shut-off valves.
5. If copper or iron piping is used for both the fill and drain piping, these drains may be tied together. Locate 1" air gap only in spaces with adequate temperature and air movement to absorb flash steam; otherwise, condensation may form on nearby surfaces. Refer to governing codes for drain pipe size and maximum discharge water temperature.

OM-7948

# Outdoor enclosure: Mounting

**FIGURE 13-1: GTS OUTDOOR ENCLOSURE WITH STANDARD OR OPTIONAL STEAM OUTLET, ELEVATION VIEW**



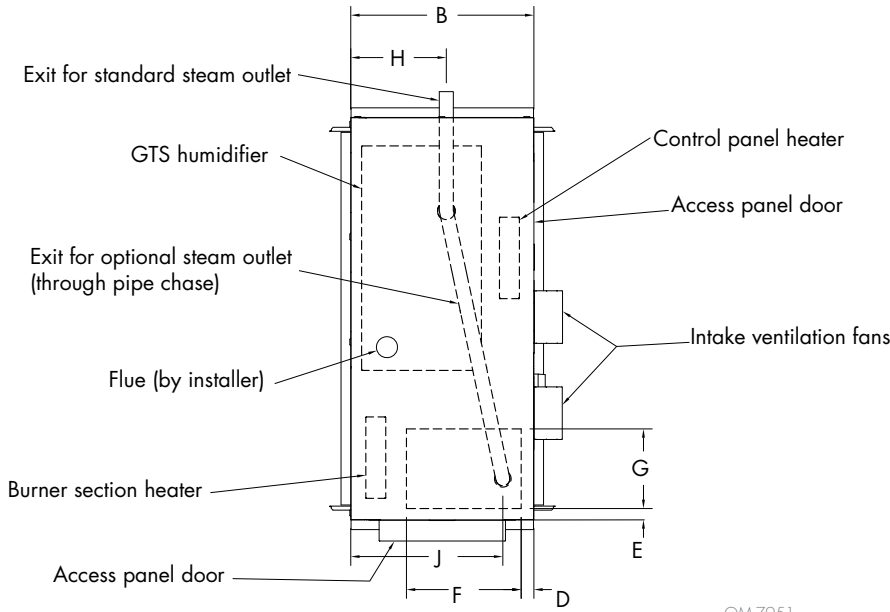
**Notes:**

1. The Outdoor Enclosure has two available steam distribution configurations. The standard configuration has a steam outlet at the back of the Outdoor Enclosure for connecting to steam dispersion unit piping. The optional internal steam distribution configuration routes steam within the Outdoor Enclosure and down through the enclosure pipe chase into the building.
2. There are three knockouts located on the right and left side of the enclosure. Run the electrical power and gas piping into the enclosure at these knockouts.
3. Piping from the GTS unit to the steam outlet is stainless steel pipe. Piping from the steam outlet to the dispersion assembly is provided by the installer. Choose interconnecting steam piping material that is appropriate for the application (e.g., for high-purity steam applications, consider using stainless steel interconnecting steam tubing). See Table 19-1 for steam outlet sizes.
4. The GTS housed in an Outdoor Enclosure will operate properly in operating temperature of  $-40^{\circ}\text{F}$  to  $122^{\circ}\text{F}$  ( $-40^{\circ}\text{C}$  to  $50^{\circ}\text{C}$ ).
5. External flue piping shall be provided by installers and field installed. The flue of the Outdoor Enclosure exits out of the unit. Governing codes prevail.

Table 13-1: Outdoor Enclosure dimensions			
	Description	LX-50, LX-75 LX-100, LX-150	
		inches	mm
A	Enclosure height	54.6	1388
B	Enclosure width	26.0	660
C	Enclosure length	57.3	1454

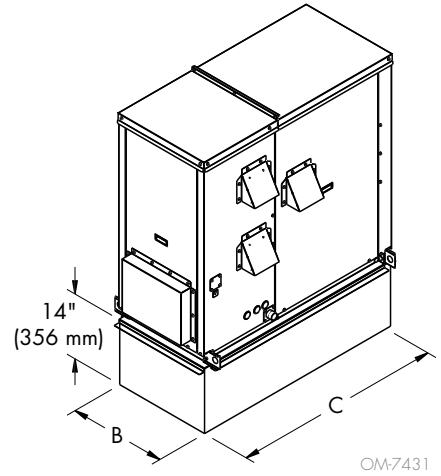
# Outdoor enclosure: Mounting

**FIGURE 14-1: OUTDOOR ENCLOSURE TOP VIEW**

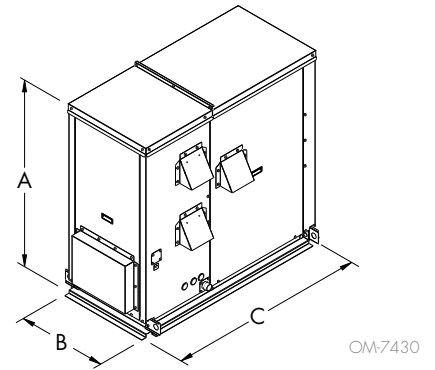


OM-7951

**FIGURE 14-2: OUTDOOR ENCLOSURE MOUNTED ON A CURB**



**FIGURE 14-3: OUTDOOR ENCLOSURE MOUNTED FLUSH**



**Table 14-1:**  
Outdoor enclosure top view dimensions

Description	LX-50 LX-75		LX-100 LX-150	
	inches	mm	inches	mm
B Enclosure width	26.00	660	26.00	660
D Pipe chase position	3.00	76	3.00	76
E Pipe chase position	3.00	76	3.00	76
F Pipe chase size	16.00	406	16.00	406
G Pipe chase size	11.00	279	11.00	279
H Steam pipe position	14.12	359	20.12	511
J Steam pipe position	21.00	533	27.00	686



## Outdoor enclosure: Operation

### SEQUENCE OF OPERATION

- Power is applied to the Outdoor Enclosure.
- If the ambient temperature in the enclosure is below 50 °F (10 °C), the strip heaters are powered up. The strip heaters remain on until the enclosure reaches 50 °F (10 °C) to ensure that the temperature inside the enclosure does not drop below the freezing point.
- When there is no call for humidity, an aquastat maintains tank temperature at the factory default of 50 °F (10 °C). This temperature can be reset in the field to be from 50-180 °F (10-82 °C).
- When the temperature in the enclosure reaches 85 °F (29 °C), the ventilation fans turn on to cool the electronic components. A high limit is also provided to power down the GTS if the enclosure temperature reaches 150 °F (66 °C). In a high limit situation, the ventilation fans continue to run and once the enclosure temperature falls below 130 °F (54 °C), the GTS automatically resumes normal operation.
- A normally open drain valve is provided on the GTS Outdoor Enclosure to drain the tank in the event of a power loss.

# Wiring

**⚠ WARNING**

**Grounding**

Installation must meet the requirements of governing codes or, in the absence of governing codes, in accordance with the National Electrical Code, ANSI/NFPA 70, or Canadian Electrical Code, CSA C22.1, or IEE wiring regulations (BS7671). The electrical subpanel must have an uninterrupted or unbroken ground to minimize personal injury if an electrical fault should occur. This ground can consist of electrical wire or conduit approved for electrical ground when installed in accordance with existing electrical codes. Do not use gas piping as an electrical ground.

**⚠ WARNING**

**Fire hazard**

Do not connect aluminum wire between disconnect switch and humidifier. Use only copper wire. Failure to follow these instructions could cause a fire, resulting in severe bodily injury, death, or significant property damage.

- GTS humidifiers must be supplied with 120 Vac, 60 Hz (North American models) or 230 Vac, 50 Hz (European models) separately fused electrical service. The GTS humidifier is equipped with transformers to step down the voltage to 24 Vac control voltage.
- When installed, the GTS humidifier must be electrically grounded in accordance with governing codes or, in the absence of governing codes, in accordance with the National Electrical Code, ANSI/NFPA 70; or Canadian Electrical Code, CSA C22.1; or IEE wiring regulations (BS7671).

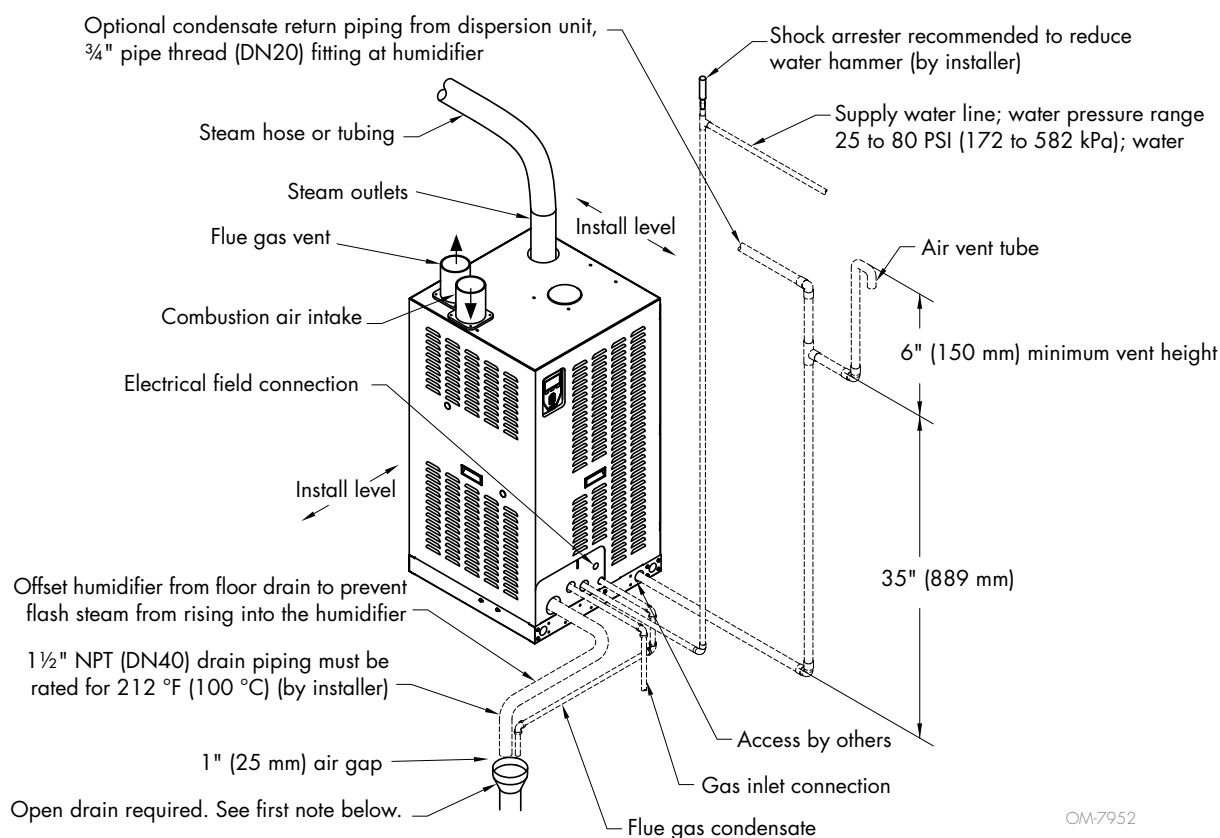
In North America, the electrical conductors shall be Type MTW (105 °C) AWG #14 (2.5 mm<sup>2</sup>) wire for 120 V line voltage, with BLACK WIRE for HOT, WHITE WIRE for NEUTRAL, GREEN AND YELLOW WIRE for GROUND. Units with Outdoor Enclosure must use AWG #12 (4 mm<sup>2</sup>) for 120 V line voltage. Use #18 gauge (1 mm<sup>2</sup>) for control wiring.

In Europe, the electrical conductors shall be Type MTW (105 °C) 2.5 mm<sup>2</sup> wire for line voltage (230V), with BLACK WIRE for LINE, BLUE WIRE for NEUTRAL, GREEN AND YELLOW WIRE for GROUND, and 2.5 mm<sup>2</sup> wire for control wiring.

- All electrical components and wiring must be protected from mechanical damage and water. The control system requires an earth ground for proper operation.
- The GTS humidifier is adjusted for correct performance at the factory. Only a qualified gas appliance technician may alter throttle setting.
- Check the electric current characteristics and capacity requirements against the nameplate. All wiring must be in accordance with all governing codes and with the GTS wiring diagrams located inside the control cabinet. See the electrical specifications in Table 4-1 (North America) and Table 71-1 (Europe).
- Refer to the *Vapor-logic Installation and Operation Manual* for additional information on the controller furnished with this GTS humidifier.

# Piping

**FIGURE 17-1: LX SERIES FIELD PIPING OVERVIEW**



OM-7952

**Notes:**

- Locate air gap only in spaces with adequate temperature and air movement to absorb flash steam; otherwise, condensation may form on nearby surfaces. Refer to governing codes for drain pipe size and maximum discharge water temperature.
- Dashed lines indicate provided by installer.
- Humidifier flue gases must be vented to the outside atmosphere.
- Supply water inlet is more than 2" (51 mm) above skim/overflow port, eliminating the possibility of backflow or siphoning from tank. No additional backflow prevention is required; however, governing codes prevail.
- See the next page for recommended supply water piping for RO/DI water models.
- In order to minimize RO/DI water use, disconnect factory piping to inlet of the water tempering device and pipe directly to tap water.
- Damage caused by chloride corrosion is not covered by your DriStem warranty.
- For additional backflow prevention installation, install at a minimum of 40' (12 m) from the humidifier.

## Piping: Supply water and drain overflow connections

### **AUTOMATIC DRAIN WATER TEMPERING**

The GTS humidifier LX series is shipped with drain water tempering set to ON. When drain water tempering is selected, the humidifier tempers drain water by opening the fill valves to mix in cool fill water whenever the drain valve is energized.

NOTE: Manually energizing the drain valve when the supply water is shut off can allow 212°F (100 °C) water to enter the drain line.

The Vapor-logic controller controls the drain water tempering using input from a temperature sensor in the drain assembly. This ensures drain water is less than 140°F (60 °C) with minimum water usage under various supply water pressures and temperatures.

The LX series in outdoor enclosures use a non-powered drain water tempering device to provide tempering during power outage.

### **SUPPLY WATER CONNECTIONS**

Regardless of the type of water used, the following general instructions **MUST** be followed:

- Make union connections at the humidifier on the make-up water supply and drain/overflow lines.
- Provide a shutoff valve in the supply water line to isolate the humidifier from the water system while servicing.
- A shock arrester, provided by installer, is required to reduce water hammer.
- A 2" (51 mm) air gap is provided in the humidifier tank to accommodate skim and/or overflow protection and prevent water backflow.

Note: Follow governing code requirements regarding size of drain pipe.

- Use insulating unions or bushings to make connections between copper and other dissimilar metal fittings, such as galvanized steel. These insulating fittings are required to minimize electrolytic corrosion, which results from the direct connection of dissimilar metals in a water system.
- Before beginning ignition sequence of the humidifier at a new installation, make sure the humidifier tank is full of water and the water is free to flow into the tank.
- Do not use heated supply water. Using supply water over 90°F (32 °C) will adversely effect the performance of the GTS humidifier LX series.
- Water inlet and outlet must be permanent pipe connections shown in Table 19-1. Do not connect with hose-sets or other non-permanent methods.

# Piping: Supply water and drain overflow connections

**Table 19-1:**  
Connection sizes

Description	LX-50 LX-75		LX-100 LX-150	
	inches	DN	inches	DN
Gas supply	1/2 (pipe thread)	15	1/2 (pipe thread)	15
Sealed combustion piping	3	80	3	80
Flue vent	3	80	3	80
Supply water*	3/8 (pipe thread - side)	10	3/8 (pipe thread - side)	10
	1/2 (pipe thread - bottom)	15	1/2 (pipe thread - bottom)	15
Drain	1 1/2 (pipe thread)	40	1 1/2 (pipe thread)	40
Steam outlet**	1 1/2 (all steam: hose/pipe thread)	40	2 (all steam: hose/pipe thread)	50
Condensate return (recommended)	3/4 (pipe thread)	20	3/4 (pipe thread)	20

**Notes:**

- \* To minimize RO/DI water use on outdoor units, disconnect factory piping to the supply of water tempering device and pipe directly to tap water.
- \*\* For pipe thread steam outlet options, see DriCalc, DriSteam's free sizing and selection software, available at [www.drirsteem.com](http://www.drirsteem.com).

# Piping: Supply water

**SUPPLY WATER PIPING**

The GTS humidifier has a 2" (51 mm) internal air gap to prevent back siphoning into a potable water system. However, some governing codes may require additional protection such as a vacuum breaker or backflow preventer.

The supply water pressure range must be 25 psi to 80 psi (172 kPa to 552 kPa).

**SUPPLY WATER PIPING**

The supply water assembly has both a 3/8" (DN10) pipe thread (side) and 1/2" (DN 15) pipe thread (bottom) connection.

During an integral drain tempering event, cold water in the internal drop tube may cause a low rolling sound.

In cases where water hammer occurs when the fill solenoid closes, a shock arrester is recommended. Reducing the supply water pressure (minimum 25 psi [172 kPa]) or using flexible tubing (rated for 212 °F [100 °C] minimum continuous operating temperature) may diminish the noise, but installing a shock arrester is the best solution.

The end-of-season feature drains the tank when there is no demand for humidity for 72 hours. (This length of time is a default setting and is user-adjustable. See the *Vapor-logic Installation and Operation Manual* for more information.)

Supply water tubing must be rated for at least 80 psi (552 kPa) at 140°F (60 °C) continuous service.

**In order to minimize RO/DI water use on outdoor units, disconnect factory piping to the water tempering device and pipe directly to tap water (see Table 2-1).**

**Important:** Damage caused by chloride corrosion is not covered by your DriSteem warranty. See "Supply water guidelines" on Page 2.

**Table 20-1:  
Supply water guidelines**

Supply water pressure	25-80 psi	172-552 kPa
Supply water flow rate	5.5 gpm	21 l/min
Supply water temperature	34°F to 90°F	1°C to 32°C

**Table 20-2:  
Water tempering specifications**

Water type	Maximum Flow rate		Maximum temperature	
	U.S. gpm	L/m	°F	°C
Hot water inflow	6	22.7	212	100
Cold water inflow*	6	22.7	70	21
Tempered water outflow	12	45.4	140	60

\* Cold water inflow pressure must be between 25 psi and 80 psi (172 kPa and 552 kPa).

## Piping: Drain

The drain line piped from the humidifier must be run to an approved sanitary waste or suitable drain. Although the GTS humidifier is equipped with integral water tempering, if nonmetallic drain pipe or hose is used, it should be rated for 212 °F (100 °C) minimum continuous operating temperature.

Minimum drain pipe size is 1½" (DN40) inside diameter. Do not reduce the size of the drain piping. If the length of the drain piping exceeds 10' (3 m), increase the pipe size. If combining multiple drain lines together, ensure proper common pipe sizing practices are used.

Do not locate the humidifier directly above a floor drain — skim and drain water dumped into the drain will cause flash steam. This steam will rise and saturate electrical components, adversely affecting component life and performance.

An open drain with a 1" (25 mm) air gap between the drain piping and the drain is required. Locate air gap only in spaces with adequate temperature and air movement to absorb flash steam; otherwise, condensing on nearby surfaces may occur.

Drain piping after the water seal must be pitched a minimum of 1/8"/ft (1%) toward the drain. Governing codes may require more pitch.

If the proximity of a drain requires the humidifier drain and skim water to be lifted, use a water pump with capacity of at least 12 gallons per minute (gpm) or 45.4 litres per minute (L/m). A check valve is required on the discharge of the pump (see Figure 21-1). Electrical power for the pump is independent of the humidifier.

The GTS humidifier has an auxiliary 3/4" (20 DN) drain outlet located on the cleanout plate. This drain outlet can be hard-piped during installation to enable rapid tank draining before maintenance. This outlet can also provide access for removing scale from the tank bottom. If this connection is used, install a union to facilitate removal of the cleanout plate.

### Drain water tempering

Governing codes may require that the 212 °F (100 °C) drain and skim/overflow water from the humidifier be tempered before it is discharged into the building drain piping. The GTS humidifier has a closed loop integral drain tempering and may also be equipped with an external thermostatic tempering valve (for outdoor units). Both fill into a drain cup that tempers 6 gpm (22.7 L/m) of 212 °F (100 °C) water to 140 °F (60 °C).

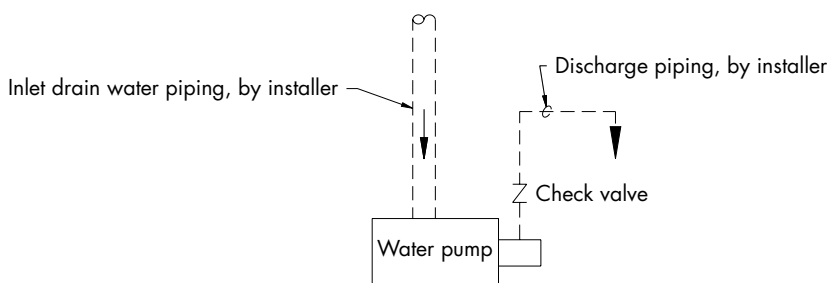
### Integral tempering sequence:

1. Water greater than 140 °F (60 °C) is detected in the drain cup with a temperature sensor.
2. Tank fill valve opens and directs cold water through the tank and toward the drain.
3. Drain valve opens and sends tempered water to the drain cup.
4. Feedback from the drain cup temperature sensor will open/close the drain valve/fill valves to maintain a maximum of 140 °F (60 °C) in the drain cup.

### Thermostatic valve sequence:

1. Hot water discharged from the humidifier enters the water tempering chamber from either the skim/overflow port or the tank drain.
2. Cold water enters the water tempering chamber through a temperature-actuated valve to mix with the hot discharged water.
3. Tempered water at 140 °F (60 °C) maximum exits through the water tempering chamber side outlet for safe discharge into a municipal sewer system or PVC pipe.
4. In order to minimize RO/DI water use for outdoor units, disconnect factory piping to the water tempering device and pipe directly to tap water.

**FIGURE 21-1: LIFTING DRAIN WATER**



Note: Size water pump to handle a minimum of 12 gpm (45.4 L/m).

DC-1117

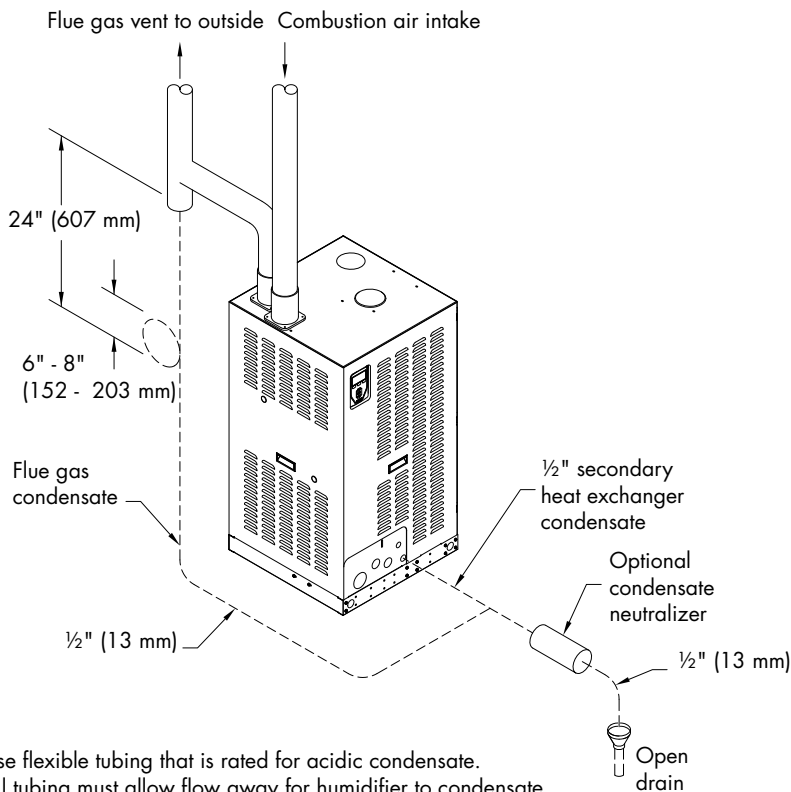


# Piping: Flue gas condensate

## FLUE CONDENSATE PIPING GUIDELINES

- Follow local code requirements for discharge of condensate. The flue gas condensate will have a 2-4 pH range and may need to be treated prior to discharge.
- Minimum drain pipe size is 1/2" inside diameter.
- If treatment is needed, DriSteem offers a condensate neutralizer kit. The neutralizer should be installed in a vertical position below condensate p-trap level. Avoid obstructions as condensate could be damaging to surrounding surfaces and articles.

**FIGURE 22-1: GTS SEALED COMBUSTION CONNECTION**



**Notes:**

1. Use flexible tubing that is rated for acidic condensate.
2. All tubing must allow flow away for humidifier to condensate neutralizer (if equipped).
3. Condensate neutralizer can be installed horizontally or vertically as long as gravity flow is maintained.
4. If floor drain is greater than 5' (1.5 m) from humidifier, use a 1/2" PVC pipe instead of a hose.

OM-7967

# Piping: Gas

## GAS PIPING GUIDELINES

- After threading and reaming the ends of the pipes, inspect piping and remove loose dirt and chips.
- Support piping so there are no strains imposed on unit or controls.
- Use two wrenches when tightening piping to unit or controls.
- Provide a drip pocket before each unit and in the line where low spots cannot be avoided.
- Takeoff to unit should come from top or side of main to avoid trapping condensate.
- Piping that is subject to wide temperature variations should be insulated.
- Pitch piping up toward unit at least 1/4" (6 mm) per 15' (4.5 m) of horizontal run.
- Compounds used on threaded joints of gas piping must be resistant to the harmful action of liquefied petroleum gases.

### WARNING

#### Fire or explosion hazard

Purge air before lighting unit by disconnecting piping at gas control. In no case should line be purged into heat exchanger. Failure to follow these instructions could cause a fire or explosion, resulting in bodily injury, death, or significant property damage.

- After installation, check field piping and humidifier gas train for gas leaks.
- Do not use soap solution or open flame on humidifier gas train. A gas leak detector is recommended.
- Install a ground joint union and a manual shutoff valve immediately upstream of the unit. Install a plugged tapping upstream of the shut-off valve, accessible for test gauge connection (see Caution).
- Allow at least 5' (1.5 m) of piping between any high pressure regulator and unit pipe connection.
- Piping installation must conform to the requirements of the authority having jurisdiction or, in the absence of such requirements, must conform to:

In the United States: The National Fuel Gas Code, ANSI Z223.1 (latest edition).

In Canada: Local plumbing or waste water codes and other applicable codes and with the current code CAN/CGS-B149.1, "Installation Code for Natural Gas Burning Appliances and Equipment," or CAN/CGA-B149.2, "Installation Code for Propane Burning Appliances and Equipment."

In Europe: The National Gas Safety (Installation & Use) Regulations.

### WARNING

#### Fire hazard

Supply the humidifier only with the gas type (natural gas or LP gas) listed on the humidifier name plate. Failure to supply the humidifier with the listed gas type could result in burner failure or a fire, causing property damage, personal injury, or death.

To convert the humidifier to natural gas or LP gas, contact DriSteem Technical Support or your DriSteem Representative/Distributor.

**Important:** For North American models, the recommended supply pressure is 7" wc (1.75 kPa) for natural gas or 11" wc (1.83 kPa) for LP gas.

For European models, the required supply pressure is 20 or 25 mbar for natural gas and 30, 37, or 50 mbar for propane gas.

### CAUTION

#### Install connection for gas pressure test gauge

Gas pressure to the humidifier controls must never exceed 24" wc (6 kPa, 60 mbar), or the gas valve will become damaged and require replacement.

The gas pressure diagnostic port on the gas valve can be used to check pressure. Loosen the screw and push a 5/16" ID hose over the fitting connected to a gauge. Remove the hose and tighten the screw when finished.

Install a 1/8" pipe thread (DN6) plugged tapping, accessible for test gauge connection, immediately upstream of the gas supply connection to the appliance.

# Piping: Gas (continued)

- Piping to units should conform with local and national requirements for type, volume, and gas handled and for pressure drop allowed in the line. Refer to the tables on this page to determine the gas flow in ft<sup>3</sup>/hr or m<sup>3</sup>/hr for the type of gas and size of unit to install. Using this value and the length of pipe necessary, determine the pipe diameter. Where several units are served by the same main, the total capacity, gas flow, and length of main must be considered. Avoid pipe sizes smaller than 1/2" (DN15). Table 24-2 allows for the usual number of fittings with a 0.3" wc (0.07 kPa) pressure drop.
- When the specific gravity of the gas is other than 0.60 for natural gas or 1.53 for propane, use Table 24-1.

**Table 24-1:**  
Specific gravity conversion factors

Natural gas	
Specific gravity	Factor
0.55	1.04
0.60	1.00
0.65	0.962
Propane gas	
Specific gravity	Factor
1.50	0.633
1.53	0.626
1.60	0.612

Note:  
Use the above multiplying factor with Table: 24-2 when the specific gravity of gas is other than 0.60 (natural gas) or 1.53 (propane).

**Table 24-2:**  
Gas pipe capacities for gas pressures of 0.5 psig (3.45 kPa) or less

Length of pipe		Gas flow in piping in ft <sup>3</sup> /hr and m <sup>3</sup> /hr at pressure drop of 0.3" wc (0.07 kPa) Specific gravity = 0.60									
		Nominal iron pipe diameter in inches (DN)									
		1/2" (DN15)		3/4" (DN20)		1" (DN25)		1 1/4" (DN32)		1 1/2" (DN40)	
ft	m	ft <sup>3</sup> /hr	m <sup>3</sup> /hr	ft <sup>3</sup> /hr	m <sup>3</sup> /hr	ft <sup>3</sup> /hr	m <sup>3</sup> /hr	ft <sup>3</sup> /hr	m <sup>3</sup> /hr	ft <sup>3</sup> /hr	m <sup>3</sup> /hr
10	3	132	3.7	278	7.9	520	14.7	1050	29.7	1600	45.3
20	6	92	2.6	190	5.4	350	9.9	730	20.7	1100	31.1
30	9	73	2.1	152	4.3	285	8.1	590	16.7	890	25.2
40	12	63	1.8	130	3.7	245	6.9	500	14.2	760	21.5
50	15	56	1.6	115	3.3	215	6.1	440	12.5	670	19.0
60	18	50	1.4	105	3.0	195	5.5	400	11.3	610	17.3
70	21	46	1.3	96	2.7	180	5.1	370	10.5	560	15.9
80	24	43	1.2	90	2.5	170	4.8	350	9.9	530	15.0
90	27	40	1.1	84	2.4	160	4.5	320	9.1	490	13.9
100	30	38	1.1	79	2.2	150	4.2	305	8.6	460	13.0

See example on page 25

## Piping: Gas (continued)

### EXAMPLE

For this example, refer to the tables on Page 24.

To determine gas piping size, begin by calculating the cubic feet/hour (ft<sup>3</sup>/hr) or m<sup>3</sup>/hr using the following formula:

$$\text{Btuh (kW) input} / \text{calorific value of gas}$$

Calorific values are:

- Natural gas: 1025 Btu/ft<sup>3</sup> (10.6 kW-hr/m<sup>3</sup>)
- Propane: 2500 Btu/ft<sup>3</sup> (25.9 kW-hr/m<sup>3</sup>)

For example, if you have a LX-150 operating on natural gas, calculate the ft<sup>3</sup>/hr or m<sup>3</sup>/hr as follows:

$$400,000 \text{ Btuh} / 1025 \text{ Btu/ft}^3 = 390 \text{ ft}^3 \text{ per hour}$$

$117.2 \text{ kW} / 10.6 \text{ kW-hr/m}^3 = 11.1 \text{ m}^3 \text{ per hour}$  lue above your calculated ft<sup>3</sup>/hr or m<sup>3</sup>/hr. In this example, you are looking for the next highest value above 390 ft<sup>3</sup>/hr (11.05 m<sup>3</sup>/hr), which is 400 ft<sup>3</sup>/hr (11.3 m<sup>3</sup>/hr) and indicates the use of a 1¼" (DN32) pipe for this application.

Using the same example, if the specific gravity of your natural gas was 0.55 (instead of the 0.60 standard), see Table 24-2 for an adjustment factor. In this case, the factor would be 1.04, which you multiply by the 390 ft<sup>3</sup>/hr (11.05 m<sup>3</sup>/hr) value. This gives you a new value of 406 ft<sup>3</sup>/hr (11.49 m<sup>3</sup>/hr). Referring again to Table 24-2, you see that for the same 60 ft (18 m) length, you now need to use 1½" (DN40) pipe due to the change in the specific gravity of the gas.

### Gas leak testing

- When leak-testing the gas supply piping system, disconnect the humidifier and its gas shutoff valve during any pressure in excess of 24" wc (6 kPa). Isolate the humidifier from the gas supply piping system by closing its field-installed manual shutoff valve during any pressure not equal to 24" wc (6 kPa).
- With the burner running at full capacity, check gas supply pressure at the inlet pressure tap of the combination gas control valve.

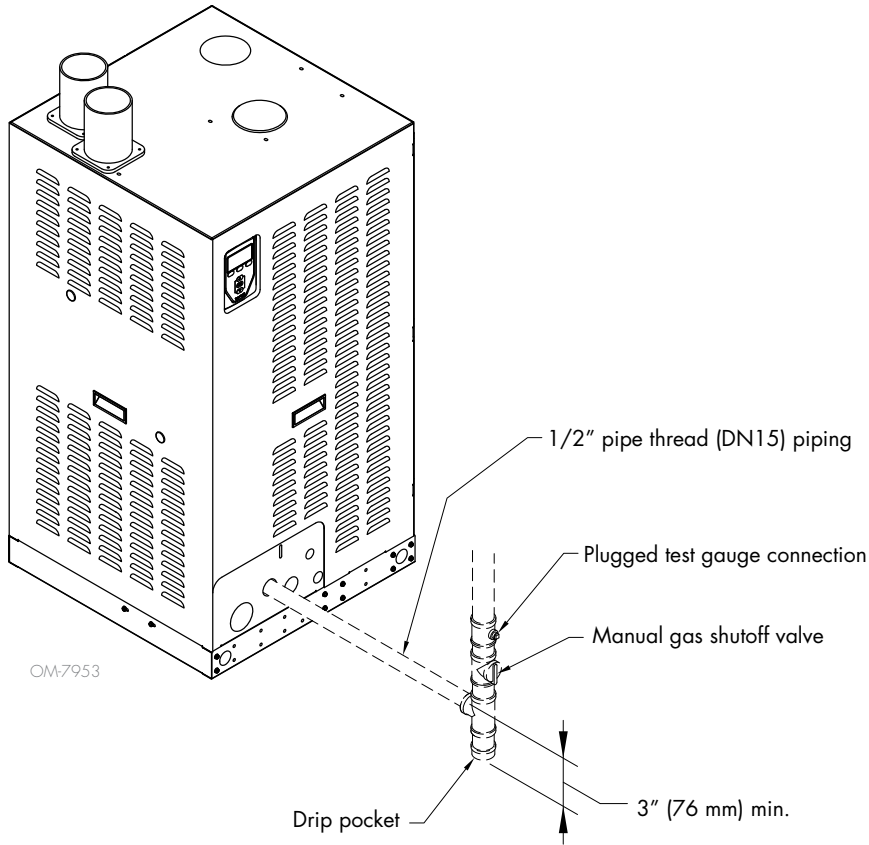
For North American models, the recommended supply pressure is 7" wc (1.75 kPa) for natural gas or 11" wc (1.83 kPa) for LP gas. Perform gas piping purging as described in ANSI Z223.1 (latest edition) or in Canada, CAN/CGA-B149 codes. The minimum supply pressure is 6" wc (1 kPa) for natural gas or LP gas.

For European models, the required supply pressure is 20 or 25 mbar for natural gas and 30, 37, or 50 mbar for propane gas.

# Piping: Gas (continued)

**FIGURE 26-1: GTS GAS PIPING**

Models LX-50, LX-75, LX-100, LX-150



## General venting

The GTS humidifier is pre-plumbed to support both room air and sealed combustion. See Warning. Requirements and recommendations for each follow.

### ROOM AIR COMBUSTION

- All fuel burning equipment must be supplied with air for combustion of the fuel. Sufficient air must be provided to ensure there is not a negative pressure in the equipment room or space.
- Provide adequate combustion and ventilation air in accordance with Section 5.3, Air for Combustion and Ventilation, of the National Fuel Gas Code, ANSI Z223.1 or applicable provisions of governing codes. Canadian installations must be installed in accordance with sections 7.2, 7.3, and 7.4 of the CAN/CGA.B149 Installation Codes and all authorities having jurisdiction.
- For proper and safe operation this humidifier needs air for combustion and ventilation. **Do not** block or obstruct air openings on the appliance, spaces around the appliance, or air openings communicating with the humidifier area.
- Do not locate in a dusty environment.
- **Do not** block the flow of combustion and ventilation air. To provide for necessary oxygen for proper combustion, openings must be provided to allow outside air to enter the space where the humidifier is located. Enclosed spaces, such as equipment rooms, must be vented for combustion air. The size of air openings must be based on all gas-burning equipment installed in the space involved. Table 27-1 outlines four types of locations, and the requirements of each.

**Table 27-1:**  
**Location of humidifier and required air openings (non-ducted combustion air)**

Location description	Required air opening
Confined space with all air from inside the building; conventional frame, brick or stone construction with normal infiltration (Note: this location rarely provides enough air for higher capacity units.)	Two openings, 1 sq. in. (6.5 cm <sup>2</sup> ) per opening per 1000 Btu/hr (293 W) input The minimum free area of all openings combined is 100 sq. in. (645 cm <sup>2</sup> ).
Confined space with all air from outside the building through air ducts	Two openings, 2 ducts, 1 sq. in. (6.5 cm <sup>2</sup> ) per opening per 2000 Btu/hr (586 W) input*
Confined space with all air from outside the building from through-wall openings only (no ducts)	Two openings, 1 sq. in. (6.5 cm <sup>2</sup> ) per opening per 4000 Btu/hr (1172 W) input*
Unconfined space with all air from outside the building	Same as confined space; all air from outside the building

\* The minimum dimension of any opening is 3" x 3" (76 mm x 76 mm).

### WARNING

#### Air for combustion

Air for combustion must not be contaminated by halogen compounds, which include fluoride, chloride, bromide, and iodide. These elements are found in aerosol sprays, detergents, bleaches, cleaning solvents, salts, air fresheners, chlorine and other household products.

When the GTS is located in an environment with negative pressure or toxic air, pipe the sealed combustion connection to fresh supply air at atmospheric pressure.

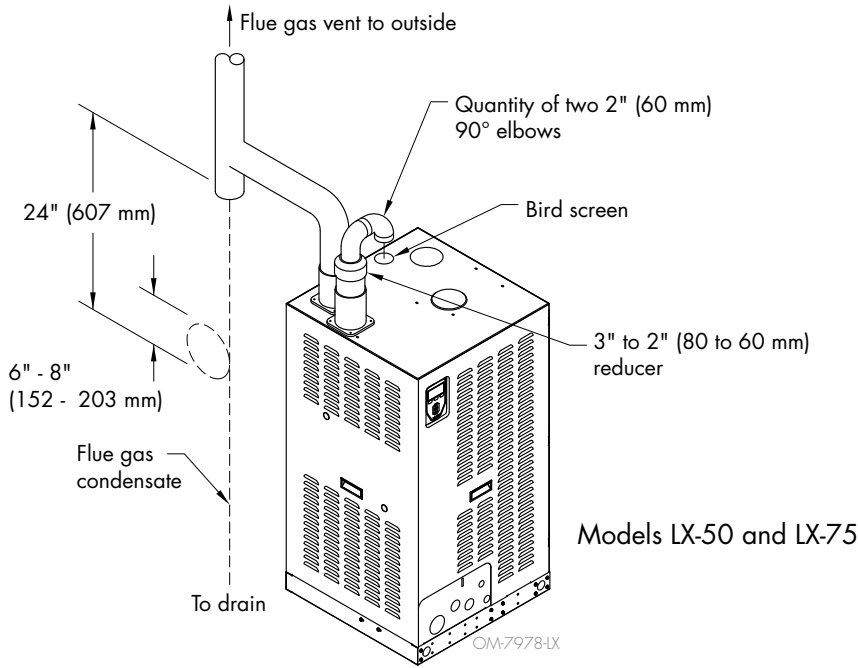
Failure to follow these instructions could cause severe bodily injury or death.

### WARNING

Do not interfere, disable, or tamper with the devices monitoring the combustion gas discharge, including the flue temperature and flue pressure sensors. Only authorized and trained technicians should perform any service on these items. If the unit fails repeatedly due to a discharge (flue) fault, have the device serviced and tested by authorized and trained technicians.

# General venting (continued)

**FIGURE 28-1: ROOM AIR COMBUSTION FOR THE LX-50 AND LX-75**

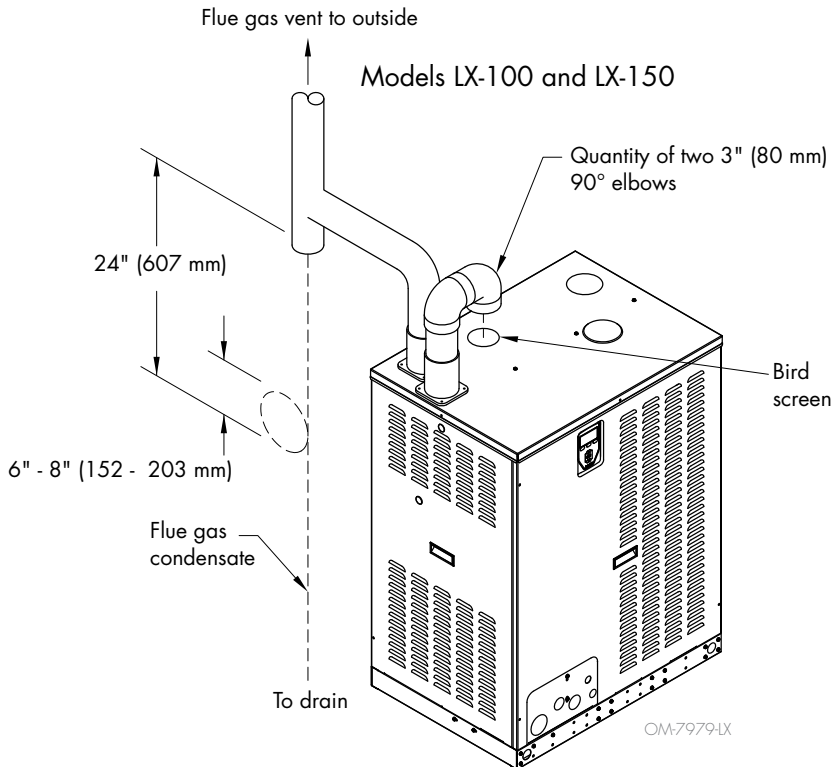


**CAUTION**

**Flue condensate removal**

Install a drip tee within the first 3' (1 m) of flue venting for flue condensate removal. Failure to follow these instructions could reduce the service and efficiency of the secondary heat exchanger.

**FIGURE 28-2: ROOM AIR COMBUSTION FOR THE LX-100 AND LX-150**





# General venting (continued)

## SEALED COMBUSTION

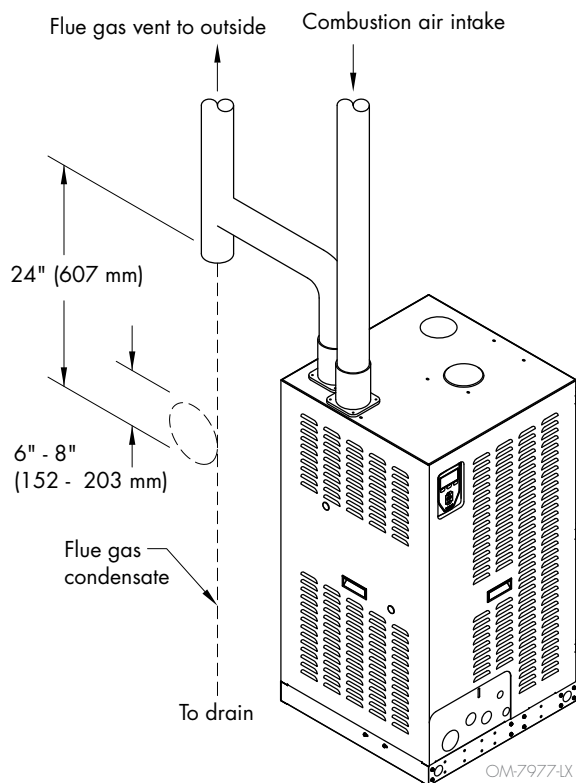
- The GTS is pre-plumbed to support sealed combustion using PVC, CPVC, ABS, polypropylene, or stainless steel or piping (see Figure 29-1, Figure 29-2 and Figure 29-3). All GTS models have a single point connection on top of the humidifier shroud.
- When running piping for sealed combustion, see Tables 31-1 and 32-1 for maximum and minimum equivalent length of vent pipe and equivalent length of each elbow (maximum of eight elbows including terminations). The outside air source can be either a final connection outside the building or a connection to an outdoor air plenum within the building. When the combustion air origination point is outside the building, the opening must be covered with a large mesh screen to prevent the introduction of unwanted materials without restricting airflow.
- If sealed combustion piping passes through warm, conditioned space insulate piping to prevent condensation.

## **⚠ WARNING**

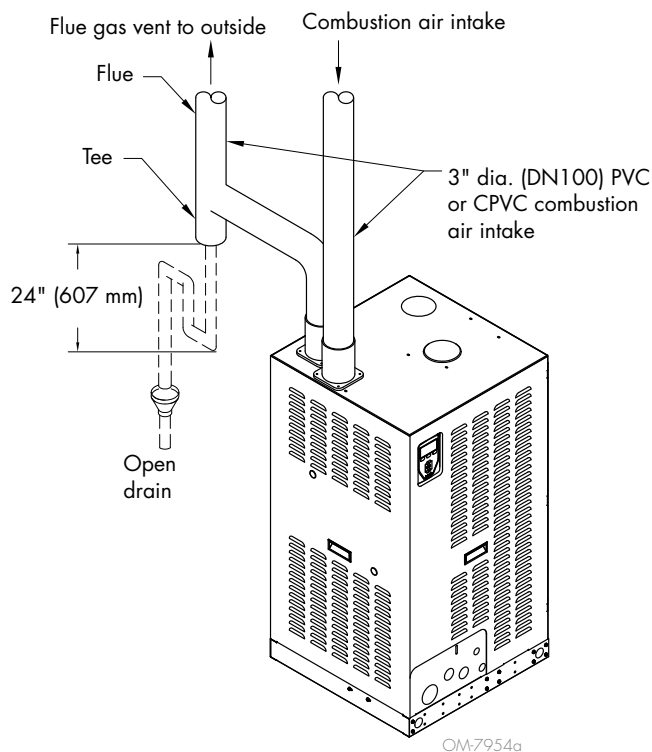
### **Requirement for manifolding sealed combustion piping runs**

When installing sealed combustion piping for more than one GTS humidifier, do not commonly manifold multiple sealed combustion piping runs without having the manifold sized for the specific installation by a licensed engineer. Failure to follow these instructions could starve the GTS humidifier of combustion air resulting in either the unit not being able to light or high carbon monoxide (CO) levels, which may cause severe personal injury or death.

**FIGURE 29-1: LX SERIES SEALED COMBUSTION CONNECTION**



**FIGURE 29-2: GTS HUMIDIFIER LX SERIES OPTIONAL SEALED COMBUSTION CONNECTION**



# General venting (continued)

**GUIDELINES**

- The GTS is a Fan Assisted Category IV (condensing, positive pressure) Appliance.
- Maximum flue temperature is 140 °F (60 °C).
- Vent piping must be UL or UL/CSA listed PVC, CPVC, polypropylene or any other vent type approved for a Category IV appliance.
- Follow supplier fitting and cement/primer instructions to ensure proper fit, adhesion, and assembly.
- Clean and seal inlet piping per the pipe manufacturer's recommended solvents and cements. Follow manufacturer's recommended procedures for pipe and fitting preparation, cutting and attachment with appropriate solvents and cements for the material.
- Do not use vent equipment from more than one application/manufacturer.
- Installation must be in accordance with Part 7, Venting of Equipment, of the National Fuel Gas Code, ANSI Z223.1; or Section 7, Venting Systems and Air Supply Appliances, of the CAN/CGA B149 Installation Codes; or National Gas Safety Code (Installation & Use) Regulations (latest revision); governing codes, and the vent manufacturer's instructions.

**! WARNING**

**Installation requirements**

The humidifier must be installed by a qualified technician and meet the requirements of all governing codes. Failure to follow these instructions could cause severe bodily injury or death.

Note:

For European models, contact your distributor for horizontal venting parts.

**! WARNING**

**Installation requirements**

Failure to properly seal all joints and seams as required in the air inlet piping may result in flue gas recirculation, spillage of flue products and carbon monoxide emissions causing severe personal injury or death.

**Table 30-1:**  
Approved PVC/CPVC flue gas vent pipe and fittings

Item	Vent material	United States	Canada
Piping	PVC	DWM, ANSI/STM D2665	ULC S636
	PVC, Sch. 40	ANSI/ASTM D1785	
	PVC, SDR series	ANSI/ASTM D2241	
	CPVC, Sch. 40	ANSI/ASTM F441	
	CPVC, SDR series	ANSI/ASTM F422	
Fittings	PVC, DWV, Sch. 40	ANSI/ASTM D2665	
	PVC, Sch. 40	ANSI/ASTM 2466	
	PVC, Sch. 80	ANSI/ASTM 2467	
	CPVC, Sch. 40	ANSI/ASTM F438	
	CPVC, Sch. 80	ANSI/ASTM F439	
Cement, primer	PVC	ANSI/ASTM D2564	
	CPVC	ANSI/ASTM F493	

Note: Do not use cellular (foam) core PVC pipe, ASTM F891, or cellular core CPVC or RADEL (Polyphenylsulfone).

**Table 30-2:**  
Approved vent manufacturers

Item	Manufacturer
Polypropylene	Centrotherm Eco Systems
	DuraVent (M&G Group)
Stainless steel	DuraVent (M&G Group)
	Z-Flex
	Heat Fab
	Metal Fab
	Security Chimney

## General venting (continued)

- When applying the codes, reference also the venting manufacturer's instructions, the service gas supplier's regulations, and the specific instructions provided in this manual.
- Install vent piping as direct as possible, with a minimum number of turns or elbows.
- Install a drip tee within the first 3' (1 m) of flue venting. See Figure 29-1.
- The purpose of venting the gas humidifier is to completely remove all products of combustion and ventilation gases to the outside air.
- Maintain a minimum upward slope of 1/4" per linear foot (2%) and supported every 4' (1 m) on all horizontal runs of the flue gas. Maintain proper support of vent connections and joints. Observe clearances (in accordance with applicable codes) from all combustible materials.
- Inspect for proper and tight construction. Clean and remove any restrictions or obstructions. An existing chimney may be used as a chase.
- Do not connect this humidifier to a chimney flue servicing any other appliance.

**Table 31-1:**  
Flue vent lengths

Model	Minimum equivalent pipe length ft (m)				Maximum equivalent pipe length ft (m)			
	Combustion air intake		Flue gas vent		Combustion air intake		Flue gas vent	
	2" (60 mm)	3" (80 mm)	2" (60 mm)	3" (80 mm)	2" (60 mm)	3" (80 mm)	2" (60 mm)	3" (80 mm)
<b>LX-50</b>	10 (3)	70 (21)	10 (3)	70 (21)	100 (30)	250 (76)	100 (30)	250 (76)
<b>LX-75</b>	5 (1.5)	30 (9)	10 (3)	30 (9)	50 (15)	200 (61)	50 (15)	200 (61)
<b>LX-100</b>	5 (1.5)	10 (3)	10 (3)	20 (6)	25 (8)	150 (46)	25 (8)	150 (46)
<b>LX-150</b>		10 (3)		10 (3)		100 (30)		100 (30)

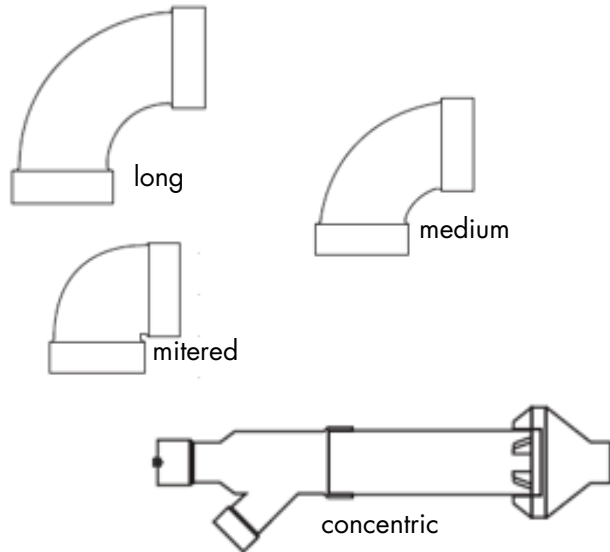
## General venting (continued)

- Dedicated flue gas venting and combustion air piping must be used for each individual LX series GTS humidifiers.
- The flue gas outlet and combustion air inlet pressures at the vent adapters on the LX series GTS humidifier must be within the ranges shown in Table 32-2 from full output to minimum output.
- Do not common vent the LX series GTS humidifier with another LX series or any other appliance.
- Flue gas outlet and combustion air inlet adapters on the LX-50 through LX-150 accept 3" PVC, CPVC, Polypropylene and stainless steel piping.
- LX-50, LX-75 and LX-100 can use a 3"-2" (80-60 mm) adapter to use 2" (60 mm) piping.
- 3" - 2" (80-60 mm) adapters must be installed vertically at the point of connection to the GTS humidifier LX series.

Description	Minimum	Maximum
Flue gas outlet pressure	-0.05" WC (+12 Pa)	+0.45" WC (+112 Pa)
Combustion air inlet pressure	-0.45" WC (-112 Pa)	+0.05" WC (+12 Pa)

Description	ft (m)
Long radius 90° elbow	3 (0.9)
Medium radius 90° elbow	5 (1.5)
Mitered 90° elbow	8 (2.4)
Long radius 45° elbow	1.5 (0.5)
Medium radius 45° elbow	2.5 (0.8)
Mitered 45° elbow	4 (1.2)
Concentric vent termination	5 (1.5)
Tee	16 (4.9)
3" to 2" (80 to 60 mm) step down adapter	5 (1.5)

FIGURE 32-1: VENT ELBOWS AND TEES



Note: A maximum of eight elbows, including terminations, are allowed.

## Vertical venting

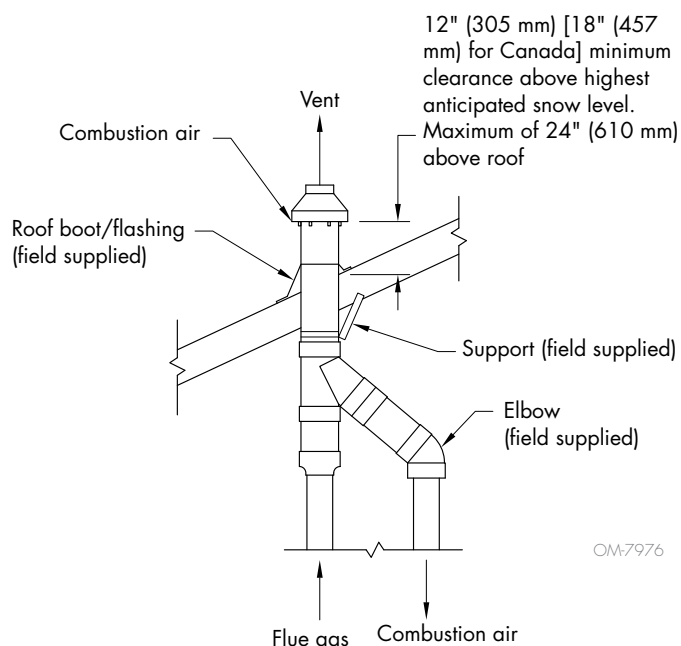
- Never connect this humidifier to an existing chimney.
- Rigidly support the vent pipe every 3' (1 m) or less with hangers or straps to ensure there is no movement after installation. The humidifier's secondary heat exchanger should not support the weight of the vent piping.
- No portion of the vent system should extend into, or pass through, any circulation air duct or plenum.
- The vent system must terminate above the roof surface per the National Fuel Gas Code, CAN/CGA.B149, or National Gas Safety Code (Installation & Use) Regulations (latest revision) requirements or governing codes, and must include a UL or UL/CSA listed vent cap or roof assembly, unless prohibited by governing codes. Install a high-wind vent cap on all GTS humidifiers.
- For vertical vent pipe terminations only: This humidifier may be commonly vented with other listed Category IV gas-fired appliances. Total input rates of all appliances determines the vent size.
- Install and fire-stop all vent pipe passing through floors, ceilings, and walls with the proper clearances from combustible material according to the National Fuel Gas Code, Canadian Standards CAN/CGA.B149, the National Gas Safety Code (Installation & Use) Regulations (latest revision), or governing codes.
- In replacement installation where an existing vent system may be used, inspect the vent system for condition, size, type of vent material, and height to meet the requirements in these instructions. When connecting the humidifier to a gas vent or chimney, the installation must be in accordance with Part 7, Venting of Equipment, of the National Fuel Gas Code, ANSI Z223.1; Section 7, Venting Systems and Air Supply Appliances, of the CAN/CGA B149 Installation Codes; The National Gas Safety Code (Installation & Use) Regulations (latest revision), governing building codes, and the vent manufacturer's instructions.

### WARNING

#### Horizontal

For applications where the vent pipe terminates in a vertical position, the horizontal length of the vent and vent connector must not exceed the height of the vent system unless a power vent is used. Failure to follow these instructions could cause flue gases to exit the vent piping, causing severe personal injury or death.

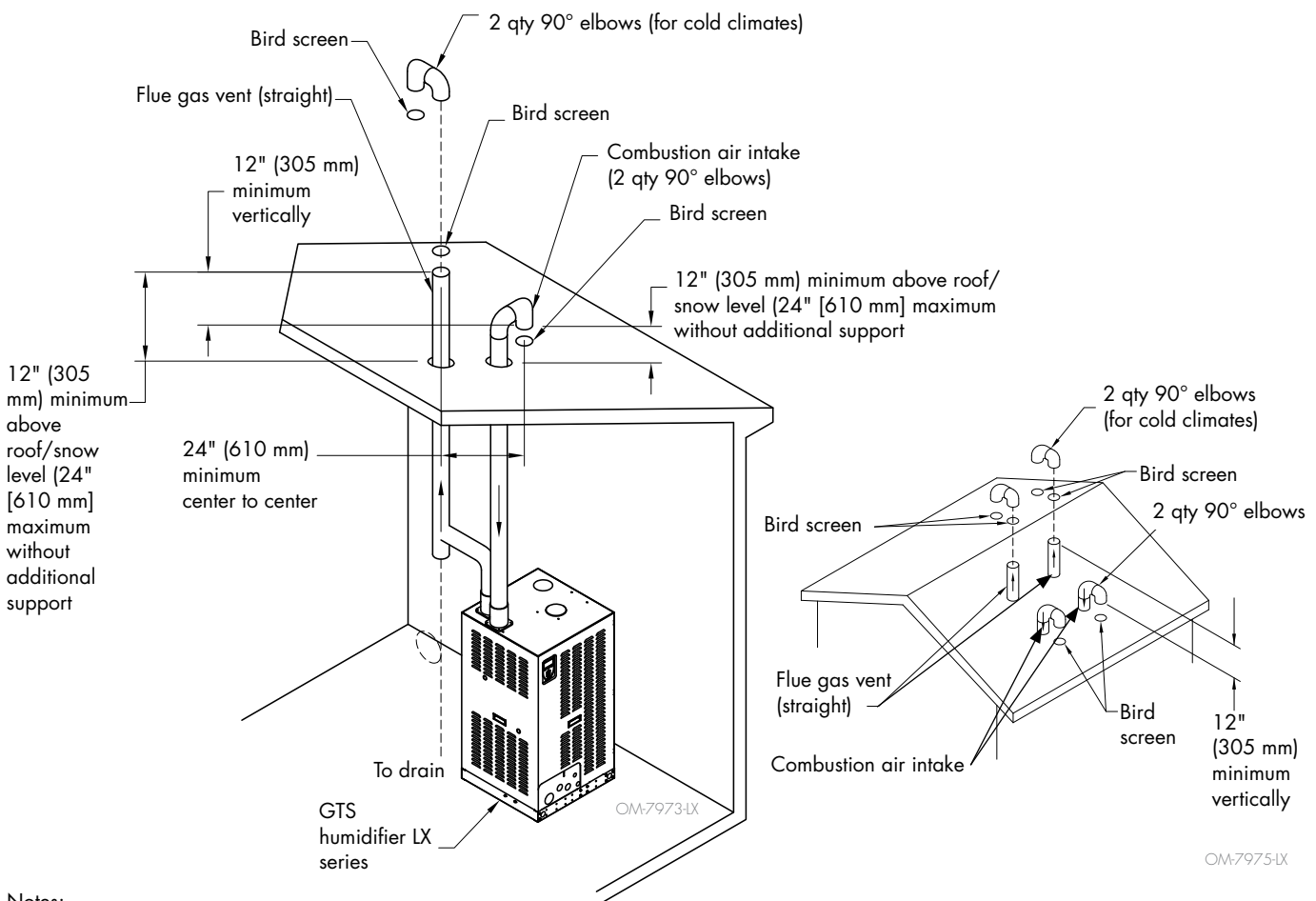
**FIGURE 33-1: CONCENTRIC VENT ROOF INSTALLATION**



## Vertical venting (continued)

- Ensure that distances from vent terminal to adjacent public walkways, buildings, and openable windows and building openings are consistent with National Fuel Gas Code, ANSI Z223.1, CAN/CGA B149 Installation Codes, National Gas Safety Code (Installation & Use) Regulations (latest revision), or governing codes.
- In areas accessible to the public, vent terminal must be at least 7' (2.1 m) above ground level to prevent burns from hot terminal surface.
- The vent terminal and air intake locations must be at sufficient height above ground level to prevent blocking by expected snowfall.
- Building materials must be protected from degradation by flue gases.
- Maintain minimum horizontal clearance of 4' (1.22 m) from electric meters, gas meters, regulators, and relief equipment.
- See Tables 31-1 and 32-1 for maximum and minimum equivalent length of vent pipe.

**FIGURE 34-1: GTS VERTICAL VENTING**



**Notes:**

- Install a tee after the first elbow from the humidifier as shown.
- Required distance between air intake and vent hood is defined by governing codes.
- Slope horizontal runs  $\frac{1}{4}$ "/ft ( $2^\circ$ ) back towards the tee at humidifier.
- 4' (1.2 m) minimum from any cable, dormer, or other roof structure with building interior access (e.g. vent or window).
- 10' (3 m) minimum from any forced air inlet to the building, including make up air inlets such as dryer or furnace areas.

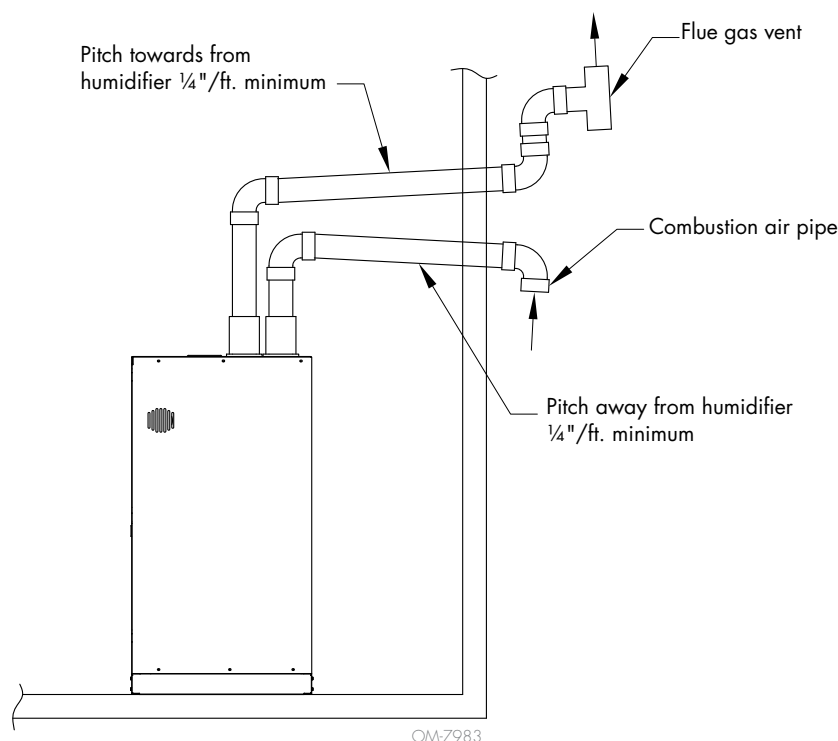
# Sidewall venting

## DETERMINE A LOCATION

Consider the surroundings when terminating the vent and air:

- Position the vent where vapors will not damage nearby shrubs, plants, or air conditioning equipment or be objectionable.
- The flue will form a noticeable plume as it condenses in cold air. Avoid areas where the plume could obstruct window views.
- Prevailing winds could cause freezing of condensate and water/ice buildup where flue products impinge on building surfaces or plants.
- Avoid possibility of accidental contact of flue gas with people or pets.
- Do not locate the vent where wind could affect performance or cause recirculation, such as inside building corners, near adjacent buildings or surfaces, window wells, stair wells, alcoves, courtyards, or other recessed areas.
- Do not locate the vent above any door or window. Condensate can freeze, causing ice formations.
- Locate or guard vent to prevent condensate damage to exterior finishes.
- Combustion air and flue gas terminations should be seated in the same atmospheric zones.

**FIGURE 35-1: GTS HUMIDIFIER LX SERIES SIDEWALL VENTING**



## **!** WARNING

A gas vent extending through an exterior wall shall not terminate adjacent to wall or below building extensions such as eaves, parapets, balconies, or decks. Failure to comply could result in severe personal injury, death, or substantial property damage.

Sidewall vent and air inlet terminations must terminate in the same pressure zone.

Failure to prime all flue gas condensate traps (tees and secondary heat exchanger P-trap) with water will result in combustion gas entering the living space (which may contain carbon monoxide).

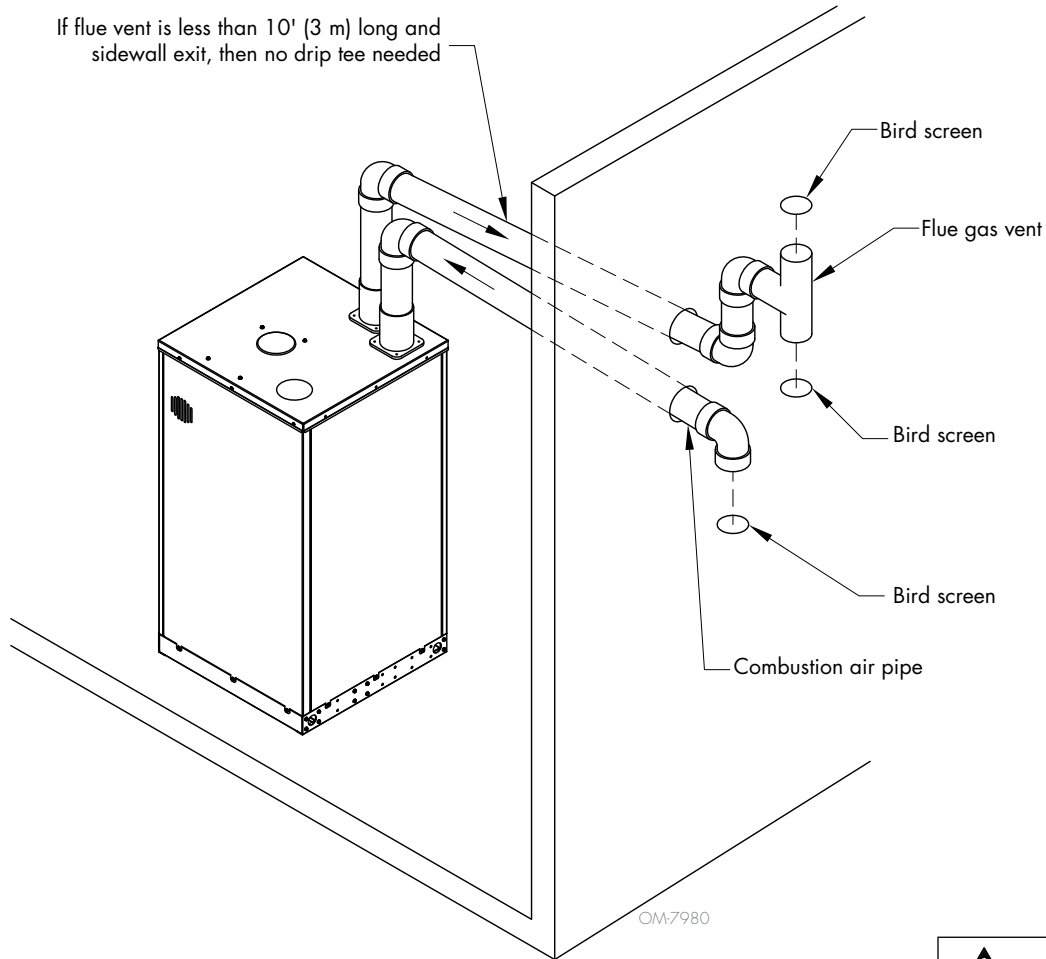
To avoid the risk asphyxiation from carbon monoxide, never operate the humidifier unless the condensate drip tees and secondary heat exchanger P-trap are sealed with water.

## CAUTION

Sidewall venting commercial products will result in large exhaust plumes in cold climates. Consideration should be taken when locating in proximity to windows, doors, walkways, etc.

# Sidewall venting (continued)

**FIGURE 36-1: GTS HUMIDIFIER LX SERIES SIDEWALL VENTING**



<p><b>⚠ WARNING</b></p> <p>Do not exceed the maximum lengths of the outside vent piping as shown in Figure 37-1. Excessive length exposed to the outside could cause freezing of condensate in the vent pipe, resulting in potential humidifier shutdown.</p>
---



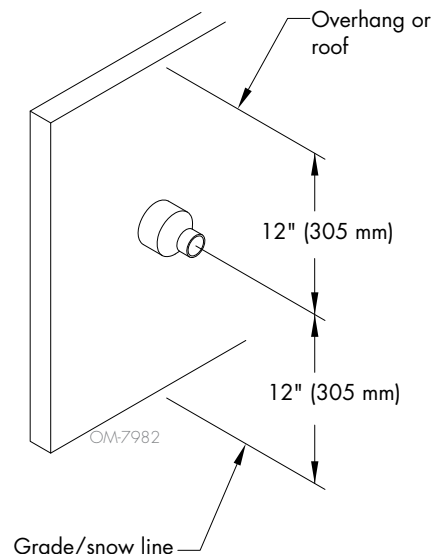
# Sidewall venting (continued)

## SIDEWALL INSTALLATION

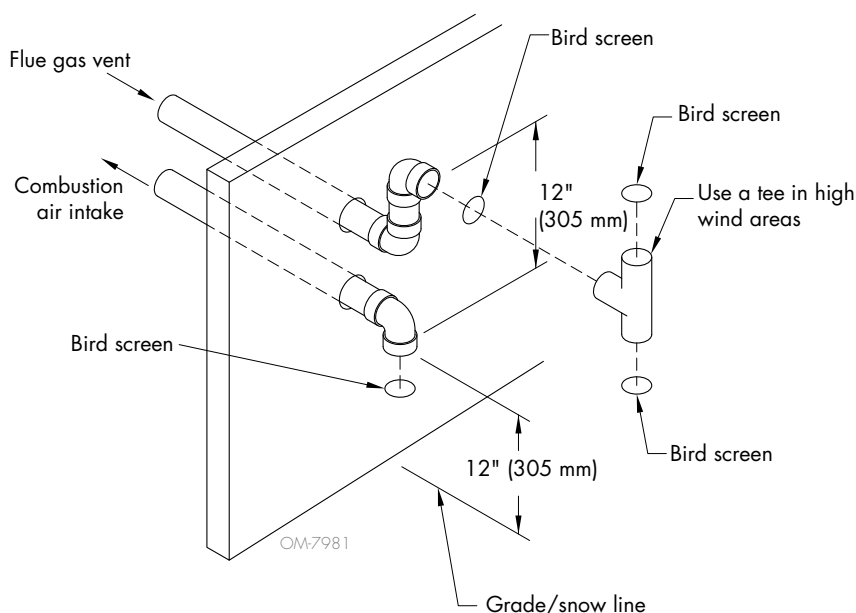
See Figures 36-1 and Figures 36-2.

- Install a tee within 12" (305 mm) of the humidifier for flue gas venting runs exceeding 10' actual length.
- If total actual length of flue gas venting is less than 10' AND sidewall exit is used, a tee is not needed.
- The combustion **air** piping must end in a down-turned elbow. This arrangement avoids recirculation of flue products into the combustion air stream.
- The flue gas **vent** piping must terminate in an elbow pointed outward or away from the air inlet at least 12" (305 mm) above the combustion air inlet. Use a tee as a termination to minimize effects of wind.
- The vent must end:
  - At least 6' (1.8 m) from adjacent walls.
  - No closer than 12" (305 mm) below roof overhang.
  - At least 3' (0.9 m) above any forced air intake within 10' (3 m).
  - No closer than 12" (305 mm) below or horizontally from any door or window or any other gravity air inlet.
- Air inlet must be at least 12" (305 mm) above grade or snow line; at least 12" (305 mm) below the vent end; and the vent pipe must not extend more than 24" (610 mm) vertically outside the building unless supports are added.

**FIGURE 37-2: GTS HUMIDIFIER LX SERIES SIDEWALL VENTING WITH CONCENTRIC VENT**



**FIGURE 37-1: GTS HUMIDIFIER LX SERIES SIDEWALL VENTING**



## Dispersion: Selecting a location

### SELECTING THE DISPERSION ASSEMBLY LOCATION

- It is important that the dispersion assembly is positioned where the water vapor being discharged is carried off with the airstream and is absorbed before it can cause condensation or dripping in the duct.
- Non-wetting distance is the dimension downstream from the leaving side of the steam dispersion assembly to the point where wetting will not occur, although wisps of steam may be present. This distance was calculated during humidification system design and is dependent on several application parameters. To determine your dispersion assembly's non-wetting distance, consult your system's design engineer or project documentation. Non-wetting distance can also be calculated using DriSteem's DriCalc sizing and selection software, available at [www.dristeem.com](http://www.dristeem.com). Note that your current design conditions may vary from conditions used for system design.
- In general, the dispersion assembly is best placed where the air can most readily absorb the moisture being added without causing condensation at or after the unit. This normally is after the heating coil or where the air temperature is highest.
- Place the dispersion assembly so that absorption occurs before the intake of a high efficiency filter. The filter can remove the visible moisture and become waterlogged.
- Place the dispersion assembly so absorption occurs before coming in contact with any metal surface.
- Place the dispersion assembly so absorption occurs before fire or smoke detection devices.
- Place the dispersion assembly so absorption occurs before a split in the duct. Otherwise, the dispersion assembly may direct more moisture into one duct than the other.
- When draining dispersion condensate to an open drain, provide a 1" (25 mm) gap between the condensate drain piping and the drain. Locate air gap only in spaces with adequate temperature and air movement to absorb flash steam; otherwise, condensing on nearby surfaces may occur.
- Refer to the Interconnecting Piping Instructions for further information (Part #: 890000-631).

# Start-up

## START-UP CHECKLIST

After the system is installed and connected to gas, electrical, water supplies, controls, steam dispersion, and drain check the following items:

- ❑ Verify that the GTS humidifier, controls, piping, electrical connections, steam supply, and dispersion unit(s) are installed according to the following:
  - Installation instructions in this manual
  - *Vapor-logic Installation and Operation Manual* (shipped with the humidifier)
    - Installation section
    - Installation checklist
  - Ladder style wiring diagram (shipped inside unit)
  - External connections wiring diagram (shipped inside unit)
  - Gas connection instructions in this manual
  - Mounting instructions in this manual
  - All governing codes
- ❑ Piping (gas)
  - Verify that the gas type supplied to the humidifier matches the unit nameplate label.
  - Verify that all field and humidifier gas piping has been tested for leaks. (Soap and water are not recommended near gas valves.)
- ❑ **Piping (steam, drain, supply water)**—Verify that all piping connections have been completed as recommended and that water pressure is available.
- ❑ **Electrical**—Verify that all wiring connections have been made in accordance with all governing codes and the GTS wiring diagrams.
- ❑ **Controls**—Verify that all control wiring has been completed as specified and required for correct and safe operation of the GTS humidifier. Refer to the *Vapor-logic Installation and Operation Manual*.
- ❑ Verify that the humidifier tank is securely installed and level before filling with water (see the operating weights in Table 4-1).
- ❑ Verify that the humidifier tank is level front to back and side to side after it is full of water.

## WARNING

### Startup

Only qualified electrical and gas personnel should perform the start-up procedure.

The *Vapor-logic Installation and Operation Manual* is a comprehensive operation manual. Refer to it for information regarding the following features:

- Keypad display setup and menu information
- Control input signals and functions
- Drain, flush, and skim features
- Safety features
- Alarm screens and fault messages

The manual was shipped with your humidifier. Additional copies can be viewed, printed, or ordered on our website: [www.drsteem.com](http://www.drsteem.com)

# Start-up

## START-UP PROCEDURE

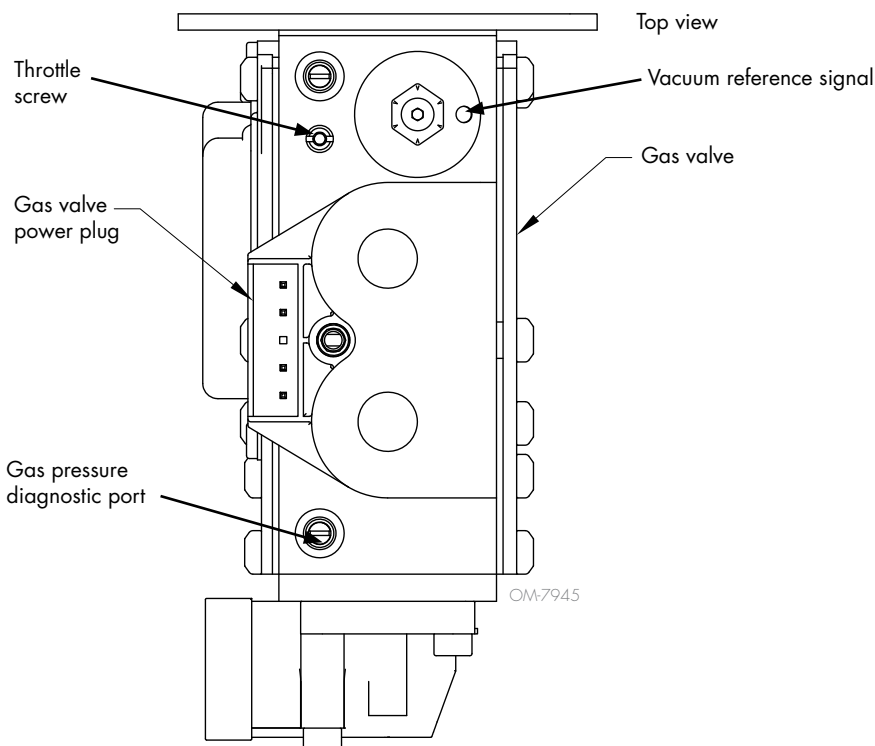
1. Refer to the *Vapor-logic Installation and Operation Manual*, and verify that the installer has followed the Pre-installation Checklist (including proper wiring).
2. Prime the condensate p-trap at the base of the secondary heat exchanger.
3. Follow the "Start-up commissioning checklist" on Pages 41 and 42 of this manual.

Note: During start-up, do not leave the humidifier unattended.

4. Monitor oxygen levels and adjust if out of range. Desired oxygen range is  $6.0\% \pm 0.5\%$ . To adjust oxygen levels turn the gas valve throttle screw clockwise to increase oxygen and turn counterclockwise to decrease oxygen levels.

For complete operating instructions, read and follow the instructions in the "Operation" section of the *Vapor-logic Installation and Operation Manual*.

**FIGURE 40-1: DETAIL OF GAS VALVE**



## Systems and safeguards

The GTS humidifier has a number of systems and safeguards to ensure proper operation.

- When there is a call for humidity, all of the combustion blowers must start. Each combustion blower sends a signal to the microprocessor relaying its current speed. If this actual speed is outside an acceptable range, the GTS will not operate.
- The negative pressure gas valves used on the GTS are designed to keep a constant ratio of air and gas throughout the operating range of the blower. If the flue becomes blocked or the blower fails to run, the blocked flue sensor will shut down the humidifier.
- During operation, the water level in the tank is monitored by a probe system that ties into the Vapor-logic controller. If the water level drops below a safe point, the controller turns the burners off and tries to refill the tank. If humidifier is unable to fill within a defined time period, an "Excessive refill time" alarm appears in the Vapor-logic Alarm Log. The burners will remain off until this alarm is cleared. (For more about alarms, see the *Vapor-logic Installation and Operation Manual*.)
- Low water conditions are redundantly identified by a temperature sensor/switch located inside the tank. This sensor/switch is utilized by the Vapor-logic controller and is additionally tied directly into the power source for the gas valves. If this system detects an elevated temperature condition, the humidifier shuts down until the alarm is cleared from the Vapor-logic Alarm Log.
- In addition to monitoring the water level, there is a temperature sensor located near the top of the heat exchanger. If the water level drops too low and both the main and redundant low water sensors fail to detect it, the temperature sensor shuts down the humidifier before an unsafe condition occurs.

# Start-up commissioning checklist

Visit date \_\_\_\_\_

Model # \_\_\_\_\_

Serial # \_\_\_\_\_

Tag # \_\_\_\_\_

**Important:** Troubleshooting information for this humidifier is located in the *Vapor-logic Installation and Operation Manual* shipped with your humidifier. If you do not have this manual, go to [www.drysteem.com](http://www.drysteem.com) to download or order a copy.

## Supply water

- RO
- DI
- Softened
- Potable

Grains hardness \_\_\_\_\_

Water pressure \_\_\_\_\_ psi

(must be between 25 and 80 psi  
[172 and 582 kPa])

- Supply water piping is 3/8" (DN10) pipe thread (side) or 1/2" (DN 15) pipe thread (bottom) connection

## Gas supply

- Natural
- LP

Manifold pressure \_\_\_\_\_ inches wc

\_\_\_\_\_ kPa \_\_\_\_\_ mbar

Supply shutoff valve distance \_\_\_\_\_

Supply line size \_\_\_\_\_

Check for leaks \_\_\_\_\_

## Flue piping

- Flue piping material
  - PVC
  - CPVC
  - Polypropylene
  - Stainless steel

Size \_\_\_\_\_

Rise \_\_\_\_\_

Run \_\_\_\_\_

- Dedicated flue gas and combustion air piping
- Slight pitch toward drip tee
- All pipe connections sealed and tight
- All flue gas condensate traps primed.
- Plastic flue gas vent pipe is **not** insulated.
- Total developed length is within requirements.

Job site representation:

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Job name \_\_\_\_\_

Program code \_\_\_\_\_

DriSteem rep \_\_\_\_\_

## Required clearances

- Top cover removal 18" (457 mm)
- Cleanout plate/electrical panel side 36" (914 mm)

## Wiring

- Control transmitter
  - Gauge \_\_\_\_\_
  - Shield
- High limit duct humidistat
  - Gauge \_\_\_\_\_
  - Shield
- Airflow proving switch
- Combustion air damper
- Area-type fan
- External fault contact
- Twisted pair connection between boards (for multiple units only)

## Steam pipe

Outlet size \_\_\_\_\_

- Flange
- Hard pipe
- Insulated
- Steam hose (do not insulate)

Rise \_\_\_\_\_

Run \_\_\_\_\_

- Pitched back to humidifier
- 45° angles used in piping

*Continued*



# Inspection recommendations

## USER INSPECTION EVERY 30 DAYS

- Vent adapter and flue gas inspection port are in place with vent pipe seated and secured.
- Physical support of the appliance is sound without sagging, cracks, or gaps between floor stand or tank flanges.
- There are no obvious signs of deterioration of the appliance.
- Burner flame is primarily orange in color when operated under low demand, and primarily blue in color when operated under high demand.
- Check for alarms and messages through the message/alarm log. See Vapor-logic controller instruction manual for description and troubleshooting.
- Check ignition sequence:
  1. Blower RPMs ramp up and then level off.
  2. Gas valve on (click) 4 seconds after blower starts
  3. Flame on the burner
  4. Flame rectification - flame is sensed
  5. Burner stays on - visual flame/glow

## WARNING

### SHUTDOWN PROCEDURE

To prevent severe personal injury or death from electrical shock, fire, or explosion, follow this shutdown procedure before performing service or maintenance procedures on this humidifier.

1. Use Vapor-logic keypad/display, change the control mode to Standby.
2. Place all power disconnects in OFF position and lock in OFF position.
3. Close field-installed manual supply water shut-off valve.
4. Close gas shut-off valves.

**Table 43-1:**  
GTS products of combustion guidelines (at 100% demand)

CO	Less than 40 ppm; 0 or low single digits is typical
CO <sub>2</sub> %	8-9% is typical for natural gas, 9-10% is typical for LP gas
O <sub>2</sub> %	5.5 - 6.5%
Flue temperature	Less than 140°F (Less than 60°C)
Thermal efficiency	Greater than 91%

## Troubleshooting

The *Vapor-logic Installation and Operation Manual* that shipped with your humidifier is a comprehensive operation manual. Refer to it for troubleshooting information.

## Inspection recommendations

### **APPLIANCE SYSTEM INSPECTED AT A MINIMUM ONCE A YEAR BY A QUALIFIED SERVICE PERSON (ANNUAL PRE-SEASONAL INSPECTION)**

- Proper field operation of burner. Measure CO, CO<sub>2</sub>%, O<sub>2</sub>%, flue temperature, and burner efficiency at 100% demand with the tank at a boil. Verify that measurements are within the guidelines described in Table 43-1; if not, consult DriSteem.
- Flue passageways external to the appliance, such as vent connector, sealed combustion piping, and chimney, are clear and free of obstructions.
- Upgrade Vapor-logic software to the latest version.
- At least annually, inspect the ventilation apparatus, ensuring the following:
  - Vent connector is in place, sloping upward, and physically sound without holes or excessive corrosion.
  - Physical support of the appliance is sound without sagging, cracks, or gaps between floor stand or tank flanges.
  - Adequate combustion and ventilation air in accordance with Section 5.3, Air for Combustion and Ventilation, of the National Fuel Gas Code, ANSI Z223.1 or applicable provisions of governing codes. Canadian installations must be installed in accordance with sections 7.2, 7.3, and 7.4 of the CAN/CGA.B149 Installation Codes and all authorities having jurisdiction.

### **REPLACEMENT PARTS**

When servicing or repairing this equipment, use only DriSteem-approved service replacement parts. Complete replacement part lists are on Pages 53 through 58. Refer to the rating plate on the GTS humidifier for complete unit model number, serial number, and company address. Any substitution of parts or controls not approved by DriSteem will be at owner's risk and will void the warranty.



# Water quality and maintenance

## WATER QUALITY RECOMMENDATIONS

The best way to determine how often your particular system needs maintenance is to remove the water detection probe and inspect the interior of the unit for mineral deposits after three months of duty. Potable water carries a variety of minerals and other materials in a mix that varies from location to location. This variation in water quality, combined with the hours of operation and duty cycle, will determine your own unique maintenance schedule.

## WATER QUALITY MAKES A DIFFERENCE

- Light to moderately hard water (2 to 10 grains hardness per gallon [35 mg/L to 170 mg/L]) requires:
  - Annual cleaning
  - Occasional skimming and draining
- High mineral content water (more than 10 grains hardness per gallon [more than 170 mg/L]) requires:
  - Cleaning frequency determined by use and water quality
  - More frequent skimming and draining
  - Periodic drain and flush cycles
- Softened water dramatically reduces mineral accumulation

Note: Solids, like silica, are not removed in the softening process.

- RO/DI water virtually eliminates the build-up of minerals.

## Humidifier De-scaling solution

Scale buildup on humidifier heat exchangers acts as an insulator, reducing humidifier performance while increasing energy costs. To keep humidifiers operating as efficiently as possible, remove scale with DriSteem's Humidifier De-scaling Solution, available for purchase from your DriSteem representative or distributor.

The De-scaling Solution cleans without risk of corroding humidifier tanks or welds. The De-scaling Solution also cleans surfaces unreachable by hand scraping.

DriSteem's Humidifier De-scaling Solution is the only approved cleaner/de-scaler for use with DriSteem humidifiers. Use of other cleaners/de-scalers may void your DriSteem warranty.  
mc\_021908\_1405

# Water quality and maintenance

## **RO/DI WATER QUALITY RECOMMENDATIONS**

- Verify regularly that water processing equipment is operating correctly. The presence of chlorides in improperly processed DI water can cause pitting and failure of the tank and heat exchanger. Your DriSteem warranty does not cover damage caused by chloride corrosion.
- GTS humidifiers that use RO/DI water do not require regular cleaning, although regular inspections are advised.
- GTS humidifiers that use RO/DI water do not require skimming or draining and flushing to remove precipitated minerals. However, at the end of a humidification season, drain all DI humidifiers by programming the humidifier to automatically drain at end-of-season.

## **COOL DOWN PROCEDURE**

Before performing any maintenance, allow the tank to cool down.

- Insulated and uninsulated tanks will have hot surfaces.
- Verify that there is no call for humidity and that the aquastat set point (adjusted using the keypad/display Set Up screens) is less than room temperature (default setting is 40 °F [4 °C]) so the burners do not energize while cooling down the tank.
- Use the keypad to perform the cool down process.
  1. From the Main menu, enter the Tank Status submenu.
  2. Change mode to Drain, and allow approximately half the water to drain out of the tank.
  3. Change the mode back to Auto; the fill valve opens and the humidifier cools down.
  4. When the fill valve closes, go back into Drain mode, and allow the tank to drain completely. The humidifier should be cool enough to work on.

Note: For more information about using the keypad, see the *Vapor-logic Installation and Operation Manual*.

# Combustion assemblies

## REMOVING THE COMBUSTION ASSEMBLY

This is not a regular maintenance item, but if the heat exchanger tubes contain carbon deposits, soot, or other residue, clean as follows:

1. Follow the shutdown procedure on Page 43.
2. Remove shroud.
3. Disconnect wiring to blowers, flame sensors, gas valves, and ignition controllers. Remove sealed combustion tube, pressure equalization tube, primary gas line and enhanced spark ignition gas supply line.
4. Remove the four burner assembly nuts from each assembly and pull the entire valve, blower, and burner assembly out.
5. Perform maintenance as required.
6. Reinstall the combustion assembly with the new gasket.
7. Reconnect all electrical wiring, intake venting, pressure switches, and gas supply lines.

Note: To ease reassembly, disconnect components from one burner assembly at a time, and clean each individually.

## MAINTENANCE FREQUENCY

Under normal use conditions, the burner(s) should not need cleaning for a minimum of five years. However, depending on the operating environment, the burner(s) may require periodic cleaning to remove accumulated materials. Failure to clean burners can result in reduced unit capacity. Use sealed combustion in dirty environments. See burner maintenance instructions on page 48.

### WARNING

#### Respiratory hazard

When cleaning burners with compressed air, wear appropriate respiratory protection. Failure to do so may cause severe bodily injury.

#### Note:

Soot and carbon deposits may indicate a combustion problem that needs to be corrected. Consult the factory.

# Combustion assemblies

## **BURNER MAINTENANCE INSTRUCTIONS**

To service the burner system, clean both the blower and the burner. Remove the blower(s) from the system and allow you to clean dust from the wheel. Remove the four nuts from each burner assembly for cleaning. Removing and cleaning one burner at a time eases reassembly. To dislodge particulate matter from the burner surface matrix, use compressed air (100 psig [700 kPa] maximum). Keep the air nozzle about 2" (50 mm) from the burner's surface, blowing air perpendicular to the burner surface while moving the nozzle back and forth lengthwise. This dislodges particles trapped in the matrix, pushing them back inside the burner. Avoid blowing air across the surface, which tends to have a destructive effect on the burner surface. Allow particulate matter to fall from the burner through the air/gas inlet. To assist in removing the particulate matter, use a vacuum at the burner's air/gas inlet.

## **IGNITOR AND FLAME SENSE ROD**

The enhanced spark ignition and flame sensor rod, as well as their supporting gaskets, should be replaced at the same time every 5 years. The entire combustion assembly does not need to be removed to replace these components.

1. Follow the shutdown procedure on Page 43.
2. Remove shroud.
3. Disconnect flame sensor wire, ignition wire and enhanced spark ignition from gas line.
4. Remove the mounting nuts and pull the components free from the assembly.
5. Replace with the new components.
6. Reconnect flame sensor wire, ignition wire and enhanced spark ignition to the gas line.
7. Replace shroud.

# Inspection and maintenance

## INSPECTION AND MAINTENANCE

1. **Annually** (also recommended when maintenance is performed)
  - Inspect tank, piping, and gaskets for water and gas leaks.
  - Inspect condensate lines for blockage and verify condensate neutralizer is in working condition (pH above 5).
  - All safety devices in the control circuit should be cycled on and off to verify they are functioning. These include:
    - High limit switch
    - Airflow proving switch
    - Low water level probe. Pull out probe plug; fill valve should energize.
    - Flue temperature sensor. Observe the temperature read out on the Vapor-logic display during normal operation. The temperature will fluctuate slightly during refill events.
    - Tank temperature sensor. Observe the tank temperature read out on the Vapor-logic home screen during a cold start of the humidifier. The temperature will gradually increase to boiling temperature.
2. **Seasonally** (or as required, depending on water quality)
  - Clean tank
    - Drain tank.
    - Remove cleanout plate and dispose of any loose scale that has collected in the tank. Do this before the scale buildup reaches the bottom of the heat exchanger.
    - Inspect the area inside the tank in front of the drain valve fitting and thoroughly clean all scale and mineral buildup from that area.
    - Replace the cleanout plate using new gaskets.
  - Dismantle and clean drain valve and associated piping
  - Clean the probes
    - Access the probe assembly through the round pop cover on the roof panel.
    - Disconnect the probe plug and cable assembly and unscrew the probe rod assembly from the humidifier probe housing.
    - Inspect the probe housing and clean, ensuring that all the housing passageways are clear. The probe housing can be removed when the primary heat exchanger is removed. (See page 51 for removal of the secondary heat exchange instructions).
    - The scale should flake off easily from the probe assembly rods.
    - The bottom 3/8" (10 mm) of each rod is the sensing portion; clean these areas with a wire brush, abrasive pad, or steel wool.
    - Inspect the composite plastic probe head for any signs of cracking, roughness, or deterioration. If found, replace entire probe assembly.
    - Reassemble the probe assembly.

### **WARNING**

#### **Follow the shutdown procedure**

Follow the shutdown procedure on Page 43 before performing service or maintenance procedures on this humidifier. Failure to follow the shutdown procedure could cause electrical shock, fire, or explosion and severe personal injury or death.

# Inspection and maintenance

- Clean the skim/overflow port
  - Water should drain from the skimmer drain pipe after each daily probe check. This should be verified visually by a weekly inspection.
  - Loosen deposits in and around the skimmer/overflow port with a long tool such as a screwdriver.
  - If flow through the water seal/P-trap is diminished due to mineral accumulation:
    - Remove the water seal piping from the humidifier and flush out.
    - Replace the water seal with new piping if the minerals have hardened in the water seal.
- Clean the tank temperature probe — Inspect the probe for mineral accumulation. The probe is located on the heat exchanger plate just above the combustion assembly. Use stainless steel wool to clean the probe.
- Inspect blower motor — A lubrication port is not provided, therefore lubrication is not required.
- Remove dust — Using a vacuum, remove all dust from areas around the motor, vent fan(s), and louvers that allow air to the shrouded area.
- When the maintenance requirements are complete:
  - Replace cleanout plate and tighten the nuts on the plate. Torque the nuts to 25 to 35 in-lb (2.8 to 4.0 N-m).  
Note: Always install a new gasket when the clean out plate is reassembled.
  - Verify that the probe head is secure and that the probe plug and cable assembly are plugged into the probe rod holder.
  - Verify that the drain valve assembly is in the closed position.
- After confirming the plumbing connections are secure, perform a tank de-scaling procedure using the DriSteem GTS humidifier tank de-scaling kit.
- When the chemical de-scaling process is complete:
  - Replace and secure all covers and doors.
  - Turn on the water supply.
  - Turn on the electrical power.
  - Turn on gas.
  - Do not leave humidifier unattended. Allow the humidifier to cycle through multiple fill cycles and verify that the humidifier cover, cleanout plate, and probe holder gasket are not leaking.

**Important:**

Minimum supply water pressure is 25 psi (172 kPa).

 **WARNING**

**Prevent wiring errors**

When servicing controls, before disconnecting, label all connections. Wiring errors can cause explosion or fire, resulting in severe bodily injury, death, or significant property damage.

## Inspection and maintenance

### 3. Off-season maintenance

- Perform complete inspection and cleaning of the following:
  - Probe rods
  - Skimmer port and water seal
  - Humidifier tank
  - Primary heat exchanger (see page 51 for instructions)
- Drain humidifier tank and rinse.
- Perform a tank de-scaling using the DriSteem GTS humidifier tank de-scaling kit.
- After cleaning, the humidifier should remain empty until humidification is required.

### **REMOVAL OF THE PRIMARY HEAT EXCHANGER**

#### 1. Disconnect:

- Incoming gas line
- Water lines (at the primary tank secondary tank and Drain-cooler water tempering device)
- Main drain line
- Component power connections (blower, ignition module and tank temp sensor)

#### 2. Remove secondary heat exchanger. See page 52 for instructions).

#### 3. Remove the water tempering device.

#### 4. Remove nuts around the perimeter of the heat exchanger face.

#### 5. Pull heat exchanger out horizontally

Note: Support the heat exchanger face once it is free of the studs.

#### 6. Reverse this procedure to reassemble.

Note: Always install a new gasket when the heat exchanger is reassembled.

## Inspection and maintenance

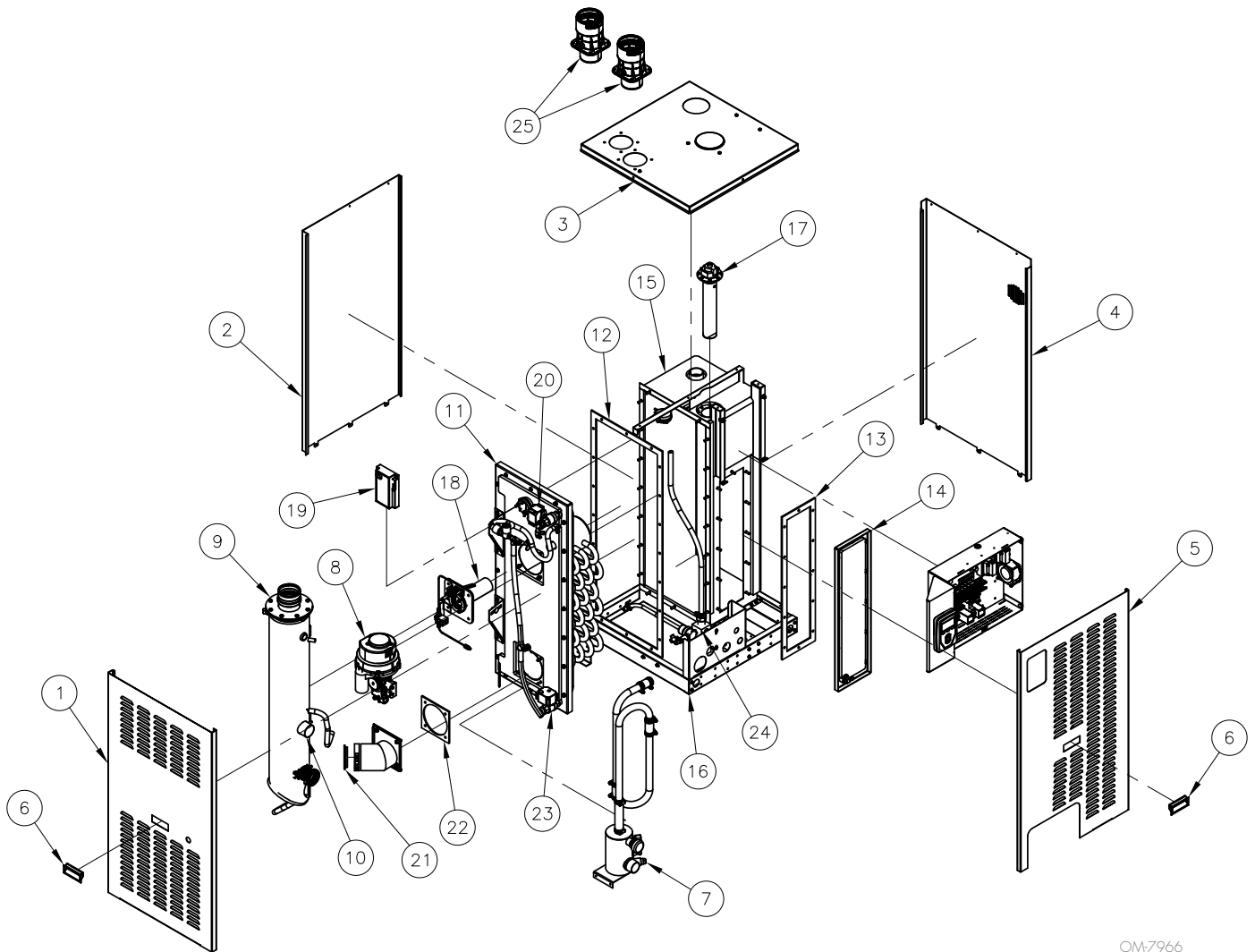
### **REMOVAL OF THE SECONDARY HEAT EXCHANGER**

1. Follow the shut down procedure on page 43.
2. Disconnect from the secondary heat exchanger:
  - Combustion air hoses
  - Combustion air vacuum line
  - Incoming water
  - Discharge water
  - Pressure equalization hose
  - Pressure switch
  - Temperature switch
  - Condensate p-trap
3. Remove the tri-clover clamp connecting the primary and secondary heat exchangers.
4. Loosen the worm gear clamp on the stainless steel collar at the top of the heat exchanger.
5. Remove the four nuts securing the heat exchanger to the primary tank and allow it to drop free from the plastic flue adapter.



# GTS humidifier

**FIGURE 53-1: GTS REPLACEMENT PARTS**



OM-7966

## GTS humidifier LX series

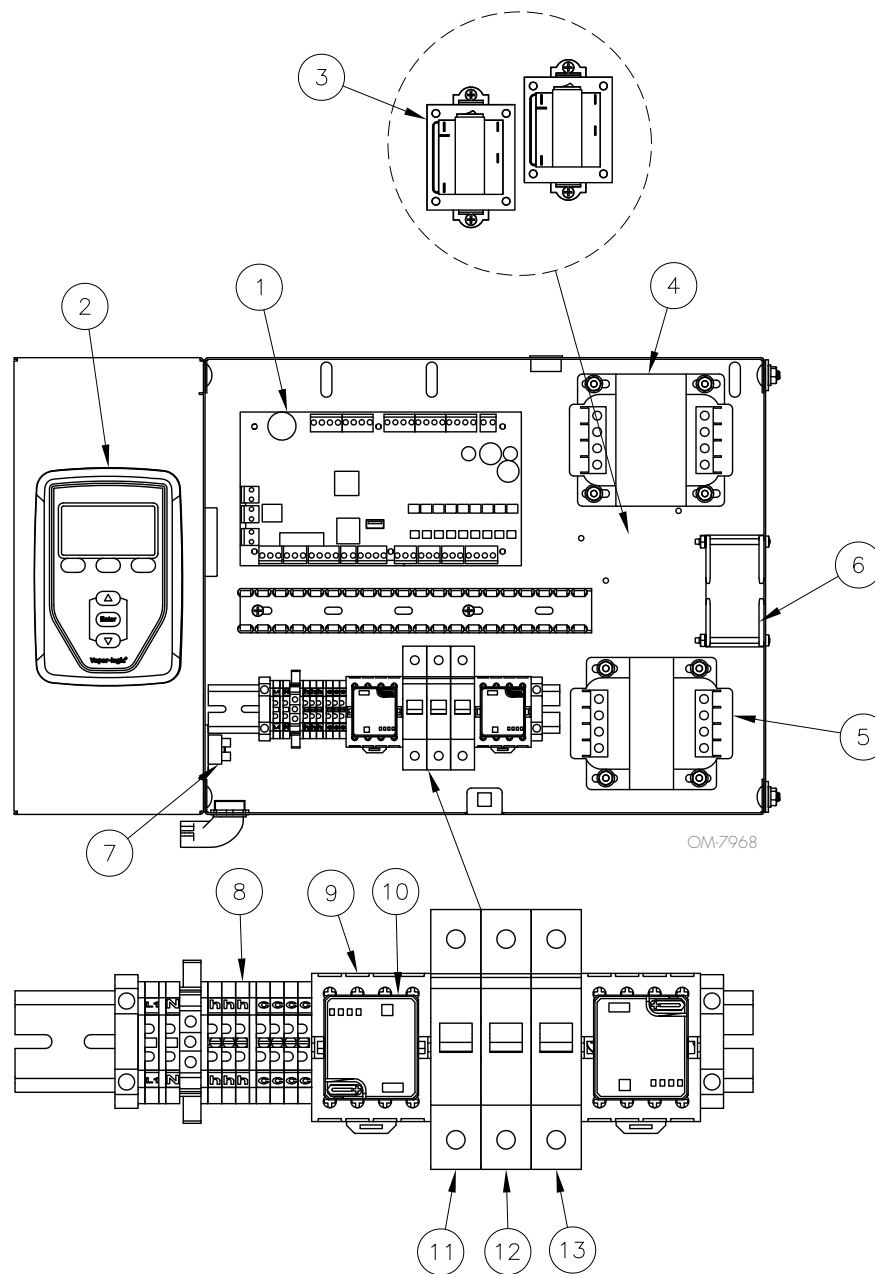
Table 54-1:  
GTS replacement parts

No.	Description	Part no.	No.	Description	Part no.
1	LEFT BURNER SHROUD GTS LX 50-150	127596-050		CLEANOUT PLATE WELD LX 50/75 304	161112-050
2	BACK SHROUD GTS LX 50/75	Contact Dristeem	14	CLEANOUT PLATE WELD LX 50/75 316	161112-051
	BACK SHROUD GTS LX 100/150	Contact Dristeem		CLEANOUT PLATE WELD LX 100/150 304	161112-100
3	TOP SHROUD GTS LX 50/75	Contact Dristeem		CLEANOUT PLATE WELD LX 100/150 316	161112-101
	TOP SHROUD GTS LX 100/150	Contact Dristeem		15	TANK WELD LX 50/75 304
4	RIGHT SHROUD GTS LX 50-150	Contact Dristeem	TANK WELD LX 50/75 316		161115-051
5	FRONT SHROUD GTS LX 50/75	Contact Dristeem	TANK WELD LX 100/150 304		161115-100
	FRONT SHROUD GTS LX 100/150	Contact Dristeem	TANK WELD LX 100/150 316		161115-101
6	HANDLE DOOR PLASTIC BLACK	405805-003	16	FRAME GTS LX 50/75 22.75 X 22.75	184310-001
7	DRAIN CUP INDOOR ASSY	184320-001		FRAME GTS LX 100/150 22.75 X 31.75	184310-002
		DRAIN CUP OUTDOOR ASSY	184320-002	17	PROBE ASSY GTS LX
8	BLOWER ASSY GTS LX 50/75	400092-050	18	GTS LX BURNER ASSY 50/75	184335-075
	BLOWER ASSY GTS LX 100	400092-100		GTS LX BURNER ASSY 100/150	184335-150
	BLOWER ASSY GTS LX 150	400092-150	19	IGNITION CONTROL 24VAC SPARK	405811-001
9	FLUE FLANGE 5" TO 3" WELD	161145-001	20	VALVE 3/4" NPT SST (NC)	505077-001
10	HEAT EXCH SECONDARY SLOPED BOTTOM 19 QTY	161135-001	21	INTERCONNECTING PIPING SEC HEAT EXCH 5"	161125-001
11	316 HEAT EXCHANGER 50 19.16" CENTER ASSY	161120-050	22	GASKET 5.75 X 5.75 CONN 3" PIPING EPDM	308239-001
	316 HEAT EXCHANGER 75 19.16" CENTER ASSY	161120-075	23	DRAIN 3/4" INDOOR ASSY LX	184325-001
	316 HEAT EXCHANGER 100 19.16" CENTER ASSY	161120-100		DRAIN 3/4" OUTDOOR ASSY LX	184325-002
	316 HEAT EXCHANGER 150 19.16" CENTER ASSY	161120-150	24	MANIFOLD BLOCK FILL 3/8" INDOOR ASSY	184330-001
	304 HEAT EXCHANGER 50 19.16" CENTER ASSY	161120-051		MANIFOLD BLOCK FILL 3/8" OUTDOOR ASSY	184330-002
	304 HEAT EXCHANGER 75 19.16" CENTER ASSY	161120-076	25	ADAPTER 3 TO 1 DURO BENT 3"	305394-003
	304 HEAT EXCHANGER 100 19.16" CENTER ASSY	161120-101			
	304 HEAT EXCHANGER 150 19.16" CENTER ASSY	161120-151			
12	GASKET HEAT EXCHANGER EPDM	308239-003			
13	GASKET CLEANOUT PLATE LX 50/75 EPDM	308238-050			
	GASKET CLEANOUT PLATE LX 100/150 EPDM	308238-100			

\* Tap/softened water GTS only  
\*\* GTS with RO/DI water option only  
\*\*\* Not shown

# Electrical parts

**FIGURE 55-1: GTS ELECTRICAL REPLACEMENT PARTS**



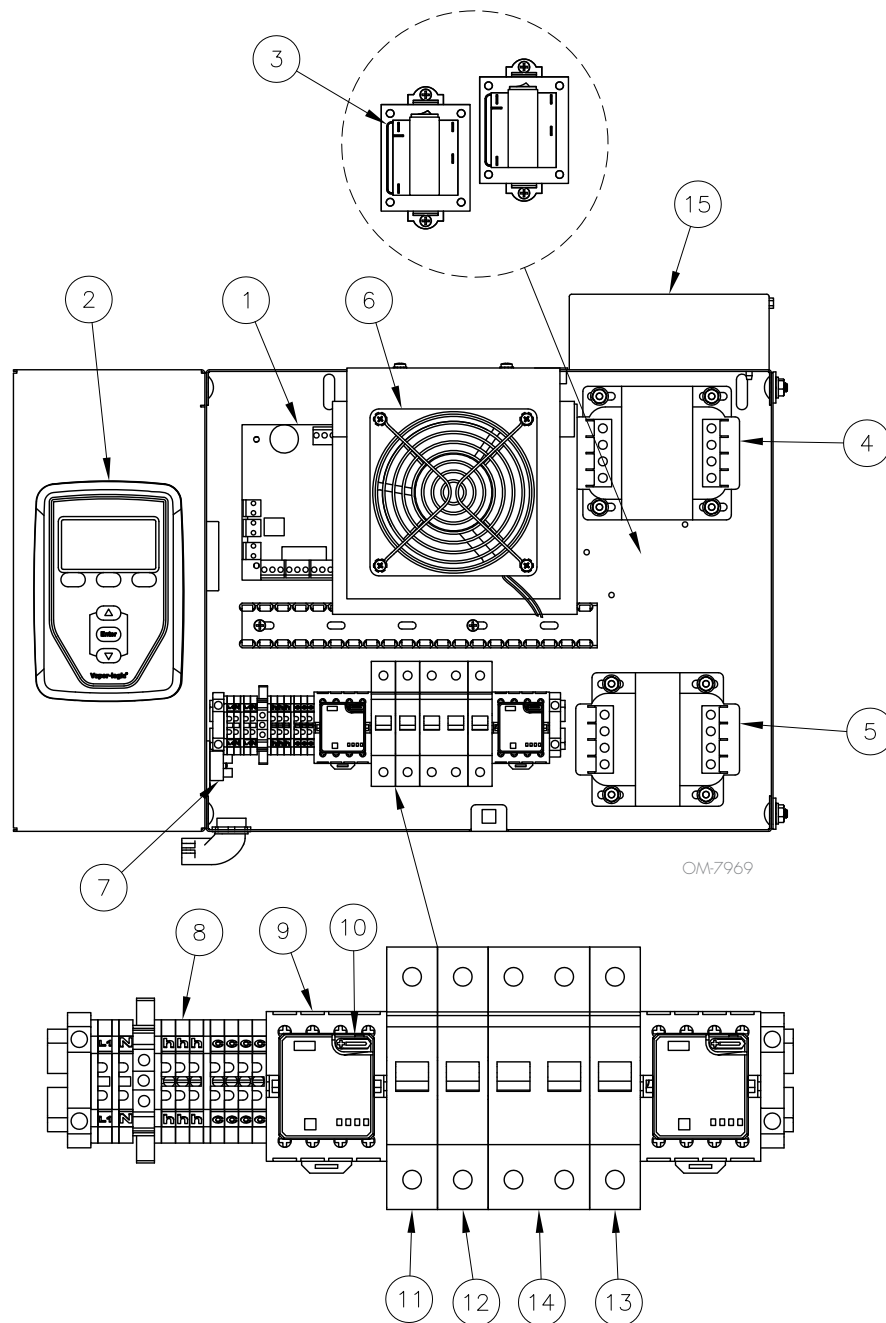
Note: See Pages 57 and 58 for GTS Outdoor Enclosure replacement parts.

## Electrical parts

**Table 56-1:**  
**GTS electrical replacement parts**

No.	Description	Part no.
1	MAIN CONTROLLER VL6	408496-006
2	DISPLAY VL W/O BACK VAPOR-LOGIC	408495-002
3	TRANSFORMER, 120V, 24V SEC - QC	408965-101
4	TRANSFORMER, 230/400, 24V SEC - 100VA (EUROPEAN)	408985-201
5	TRANSFORMER, 230/400, 115V SEC - 150VA (EUROPEAN)	408985-202
6	FAN SQ 24V 36CFM 3.13" X 1.5"	407115
7	TERMINAL 3 POSITION 10MM SPACING WECO (SDU OPTION)	530010-073
8	TERMINAL DIN RAIL 20A CENTER	408252-001
9	SOCKET RELAY DPDT W/OUT TIME DELAY	407900-019
10	RELAY 24V DPDT FINDER	407900-016
11	BREAKER CIRCUIT 2A 480V 1POLE GE D-CURVE (EUROPEAN)	406775-107
12	BREAKER CIRCUIT 5A 480V 1POLE GE D-CURVE (EUROPEAN)	406775-112
13	BREAKER CIRCUIT 4A 480V 1POLE GE D-CURVE (SDU OPTION)	406775-109

## Outdoor enclosure

**FIGURE 57-1: OUTDOOR ENCLOSURE ELECTRICAL REPLACEMENT PARTS**

## Outdoor enclosure

**Table 58-1:**  
Outdoor Enclosure electrical replacement parts

No.	Description	Part no.
1	MAIN CONTROLLER VL6	408496-006
2	DISPLAY VL W/O BACK VAPOR-LOGIC	408495-002
3	TRANSFORMER, 120V, 24V SEC - QC	408965-101
4	TRANSFORMER, 230/400, 24V SEC - 100VA (EUROPEAN)	408985-201
5	TRANSFORMER, 230/400, 115V SEC - 150VA (EUROPEAN)	408985-202
6	FAN ASSY CABINET 120V	185110-003
	FAN ASSY EURO CABINET 230V	185110-004
7	TERMINAL 3 POSITION 10MM SPACING WECO (SDU OPTION)	530010-073
8	TERMINAL DIN RAIL 20A CENTER	408252-001
9	SOCKET RELAY DPDT W/OUT TIME DELAY	407900-019
10	RELAY 24V DPDT FINDER	407900-016
11	BREAKER CIRCUIT 2A 480V 1POLE GE D-CURVE (EUROPEAN)	406775-107
12	BREAKER CIRCUIT 5A 480V 1POLE GE D-CURVE (EUROPEAN)	406775-112
13	BREAKER CIRCUIT 4A 480V 1POLE GE D-CURVE (SDU OPTION)	406775-109
14	BREAKER CIRCUIT 10A 480V 2POLE GE D-CRVE	406775-113
	BREAKER CIRCUIT 4A 480V 2POLE GE D-CURVE (EUROPEAN)	406775-104
15	THERMOSTAT HI LMT ROOF TOP	405800-065

# European models only

This equipment has been tested by the Canadian Standards Association International to the Low Voltage, Gas Appliance, and EMC directives and has been certified by AFNOR for use in all EU countries.

### Electrical warning label



Location: Control cover, shroud  
 Definition: Electrical shock hazard

### AUTHORIZED COUNTRIES OF DESTINATION

GTS humidifiers bearing the CE mark are authorized for use in the European countries listed below.

Austria	AT	Greece	GR
Belgium	BE	Ireland	IE
Switzerland	CH	Iceland	IS
Germany	DE	Italy	IT
Denmark	DK	Luxembourg	LU
Spain	ES	Netherlands	NL
Finland	FI	Norway	NO
France	FR	Portugal	PT
United Kingdom	GB	Sweden	SE

### Important:

This equipment is for use with second family (G20, G25) natural gases; and third family (G30, G31) propane gas. Contact your distributor before converting to another group or supply pressure.

### APPLIANCE CATEGORY

In relation to the country of destination, this humidifier is classified under one of the following boiler categories: category I<sub>2H'</sub>, I<sub>2L'</sub>, I<sub>2E'</sub>, I<sub>2E+'</sub>, I<sub>2LL'</sub>, I<sub>2ES'</sub>, I<sub>2Fi'</sub>, I<sub>2ER'</sub>, I<sub>3B/P'</sub>, I<sub>3P</sub>

See the unit data plate for the specific category of your appliance.

Table 59-1:  
 Gas specifications for European models

Model LX	Volumetric flow rate by gas category					Average flue temperature	Maximum flue back pressure	Mass flow rate of combustion products
	2H-G20-20 mbar 2E-G20-20 mbar 2Es-G20-20 mbar	2L-G25-25 mbar 2LL-G25-20 mbar 2Ei-G25-25 mbar	2E+G20/G25-20/25 mbar 2ER-G20/G25-20/25 mbar	3B-G30-30 mbar 3B-G30-50 mbar	3P-G31-30 mbar 3P-G31-37 mbar 3P-G31-50 mbar			
LX-50	1.41 m <sup>3</sup> /h	1.72 m <sup>3</sup> /h	1.42-1.72 m <sup>3</sup> /h	0.80 m <sup>3</sup> /h	0.91 m <sup>3</sup> /h	50 °C	1.2 mbar	6.9 g/s
LX-75	2.11 m <sup>3</sup> /h	2.58 m <sup>3</sup> /h	2.11-2.58 m <sup>3</sup> /h	1.20 m <sup>3</sup> /h	1.36 m <sup>3</sup> /h	50 °C	1.2 mbar	13.8 g/s
LX-100	2.82 m <sup>3</sup> /h	3.44 m <sup>3</sup> /h	2.81-3.44 m <sup>3</sup> /h	1.60 m <sup>3</sup> /h	1.82 m <sup>3</sup> /h	50 °C	1.2 mbar	20.7 g/s
LX-150	4.23 m <sup>3</sup> /h	5.16 m <sup>3</sup> /h	4.23-5.16 m <sup>3</sup> /h	2.40 m <sup>3</sup> /h	2.73 m <sup>3</sup> /h	50 °C	1.2 mbar	27.6 g/s

## European models only

Table 60-1:  
GTS models, capacities, electrical specifications, and weights, European models

GTS model	Steam capacity per hour in kg*	P = (kW)	Q = (kW)	Steam outlet	Recommended flue size	Operating weight in kg	Shipping weight in kg	Full load amps
LX-50	23	0-17	0-18	DN40 (1½") hose/BSP	DN50 or 80 (2" or 3")	137	85	1.5
LX-75	34	0-25	0-27	DN40 (1½") hose/BSP	DN80 (3")	138	87	1.5
LX-100	45	0-33	0-36	DN50 (2") hose/BSP	DN80 (3")	201	109	2.1
LX-150	68	0-50	0-54	DN50 (2") hose/BSP	DN80 (3")	202	113	2.1

\* Maximum steam capacities listed may be as much as 10% lower than the given values due to local variations in the Wobbe index of G20 and G25 gases.

**CAPACITY NOTES**

- At sea level, 402 kJ are required to raise the temperature of one kilogram of water from 4 °C to 100 °C.
- An additional 2257 kJ are required to change the state of one kilogram of 100 °C water to vapor.
- Another factor to consider is condensation steam loss from piping.

**LP GAS**

All models operate at rated kW input.

**OPERATING CHARACTERISTICS**

- Unit is capable of operating in ambient conditions of 5 °C to 40 °C.
- Unit is capable of operating in ambient conditions between 30% RH and 95% RH (noncondensing).
- NO<sub>x</sub> class 5

**GAS SUPPLY PRESSURE**

20 or 25 mbar for natural gas (depending on gas group),  
and 30, 37 or 50 mbar for propane gas (depending on gas group)

**PMS (ALL UNITS)**

7.0 bar

**ELECTRIC SUPPLY**

230V, 667W to 2415W (see data plate)

**INLET WATER TEMPERATURE**

See Table 20-1.

**CAUTION****Install connection for gas pressure test gauge**

Gas pressure to the humidifier controls must never exceed 6 kPa (60 mbar), or the gas valve will become damaged and require replacement. Install a 1/8" pipe thread (DN6) plugged tapping, accessible for test gauge connection, immediately upstream of the gas supply connection to the appliance.









### Expect quality from the industry leader

Since 1965, DriSteem has led the industry with innovative methods for humidifying and cooling air with precise control. Our focus on ease of ownership is evident in the design of the GTS humidifier, which features cleanable, stainless steel construction. DriSteem also leads the industry with a Two-year Limited Warranty and optional extended warranty.

### For more information

www.drirsteem.com  
sales@drirsteem.com

For the most recent product information visit our website: [www.drirsteem.com](http://www.drirsteem.com)

### DRI-STEEM Corporation

a subsidiary of Research Products Corporation  
DriSteem U.S. operations are ISO 9001:2015 certified

U.S. Headquarters:  
14949 Technology Drive  
Eden Prairie, MN 55344  
800-328-4447 or 952-949-2415  
952-229-3200 (fax)

European office:  
Grote Hellekensstraat 54 b  
B-3520 Zonhoven  
Belgium  
+3211823595  
E-mail: [drirsteem-europe@drirsteem.com](mailto:drirsteem-europe@drirsteem.com)

Continuous product improvement is a policy of DriSteem; therefore, product features and specifications are subject to change without notice.

DriSteem, Area-type, Drane-kooler, DriCalc, Rapid-sorb, Ultra-sorb, and Vapor-logic are registered trademarks of Research Products Corporation and are filed for trademark registration in Canada and the European community.

Product and corporate names used in this document may be trademarks or registered trademarks. They are used for explanation only without intent to infringe.

© 2018 Research Products Corporation

Patents pending.



Form No. GTS-LX-IOM-EN-REVC  
Part No. 890000-251 REV C

### TWO-YEAR LIMITED WARRANTY

DRI-STEEM Corporation ("DriSteem") warrants to the original user that its products will be free from defects in materials and workmanship for a period of two (2) years after installation or twenty-seven (27) months from the date DriSteem ships such product, whichever date is the earlier. If any DriSteem product is found to be defective in material or workmanship during the applicable warranty period, DriSteem's entire liability, and the purchaser's sole and exclusive remedy, shall be the repair or replacement of the defective product, or the refund of the purchase price, at DriSteem's election. DriSteem shall not be liable for any costs or expenses, whether direct or indirect, associated with the installation, removal or reinstallation of any defective product. The Limited Warranty does not include cylinder replacement for electrode steam humidifiers or media replacement for Wetted Media Systems.

DriSteem's Limited Warranty shall not be effective or actionable unless there is compliance with all installation and operating instructions furnished by DriSteem, or if the products have been modified or altered without the written consent of DriSteem, or if such products have been subject to accident, misuse, mishandling, tampering, negligence or improper maintenance. Any warranty claim must be submitted to DriSteem in writing within the stated warranty period. Defective parts may be required to be returned to DriSteem. Excluded from the Limited Warranty are all consumable and wear and tear items such as cylinders, membranes, filters, or media replacements. These items are subject to usual wear and tear during usage.

DriSteem's Limited Warranty is made in lieu of, and DriSteem disclaims all other warranties, whether express or implied, including but not limited to any IMPLIED WARRANTY OF MERCHANTABILITY, ANY IMPLIED WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE, any implied warranty arising out of a course of dealing or of performance, custom or usage of trade. DriSteem SHALL NOT, UNDER ANY CIRCUMSTANCES BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, LOSS OF PROFITS, REVENUE OR BUSINESS) OR DAMAGE OR INJURY TO PERSONS OR PROPERTY IN ANY WAY RELATED TO THE MANUFACTURE OR THE USE OF ITS PRODUCTS. The exclusion applies regardless of whether such damages are sought based on breach of warranty, breach of contract, negligence, strict liability in tort, or any other legal theory, even if DriSteem has notice of the possibility of such damages.

By purchasing DriSteem's products, the purchaser agrees to the terms and conditions of this Limited Warranty.

### EXTENDED WARRANTY

The original user may extend the term of the DriSteem Limited Warranty for a limited number of months past the initial applicable warranty period and term provided in the first paragraph of this Limited Warranty. All the terms and conditions of the Limited Warranty during the initial applicable warranty period and term shall apply during any extended term. An extended warranty term of an additional twelve (12) months or twenty four (24) months of coverage may be purchased. The extended warranty term may be purchased until eighteen (18) months after the product is shipped, after which time no extended warranties are available. When a DriSteem humidifier is purchased with a DriSteem RO system, an extended twenty-four (24) month coverage is included.

Any extension of the Limited Warranty under this program must be in writing, signed by DriSteem, and paid for in full by the purchaser.