

READ AND SAVE THESE INSTRUCTIONS

This manual must be left with the owner and should be accessible for reference.

DRI-STEEM Models GTS[®] and GTS-DI GAS-TO-STEAM HUMIDIFIERS

Installation, Operation and Maintenance Manual

WARNING: If the information in this manual is not followed exactly, a fire or explosion may result causing property damage, personal injury, or loss of life.

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

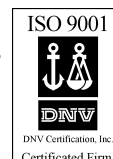
WHAT TO DO IF YOU SMELL GAS

- 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 technical
support call: 1-800-328-4447**



DRI-STEEM[®]
HUMIDIFIER COMPANY



FOREWORD

To the purchaser and the installer

Thank you for purchasing DRI-STEEM Model GTS® equipment. We have designed and built this equipment to give you total satisfaction and many years of trouble-free service. Proper installation and operating practices will ensure your achieving that objective. We therefore urge you to become familiar with the contents of this manual.

DRI-STEEM Humidifier Company

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GTS® PROGRAM CODE NOMENCLATURE

A 14-digit VAPOR-LOGIC₃ program code appears on the front of the control cabinet and on the wiring diagram inside the control cabinet. The program code specifies the parameters of the VAPOR-LOGIC₃ microprocessor, which controls your humidification system. An explanation of the program code is detailed below.

VAPOR-LOGIC₃ program code

A. Type of units:

E = English
M = Metric

B. VAPOR-LOGIC₃ system type:

G = GTS®
S = STS®
L = LTS®
V = VAPORSTREAM®
M = VAPORMIST®
C = CRU®V
U = ULTRA-FOG®
N = Steam Injection

C. VAPOR-LOGIC₃ board classification:

1 = One-tank system
2 = Two-tank system
3 = Three-tank system
4 = Four-tank system
5 = Five-tank system
6 = Six-tank system

D. Digital display/keypad features:

1 = Single keypad

E. Type of outputs:

0 = Steam valve/100% SSR
1 = One heat stage
2 = Two heat stages
3 = Three heat stages
4 = Four heat stages

F. System pounds output:

= Output capacity
(e.g., 00285 = output capacity in lbs/hr)

G. Type of water level control:

D = DI w/ manual drain
E = DI w/ end of season drain
M = Standard w/ manual drain
A = Standard w/ autodrain

H. Operating mode:

1 = Single staged
2 = Externally staged
3 = not used
4 = not used
5 = not used
6 = GTS
7 = TP
8 = SSR
9 = Steam valve

I. VAV options:

V = Option present
O = Option not selected
S = SDU option

J. Temperature compensation options:

T = Option present
O = Option not selected

K. Type of humidity sensing device:

N = None, for on/off
C = 0-135 ohm humidistat
D = 6-9 VDC humidistat
H = 0-10 VDC humidistat
E = 4-20 mA humidistat
X = 4-20 mA transmitter
Q = Dew point transmitter
S = Special

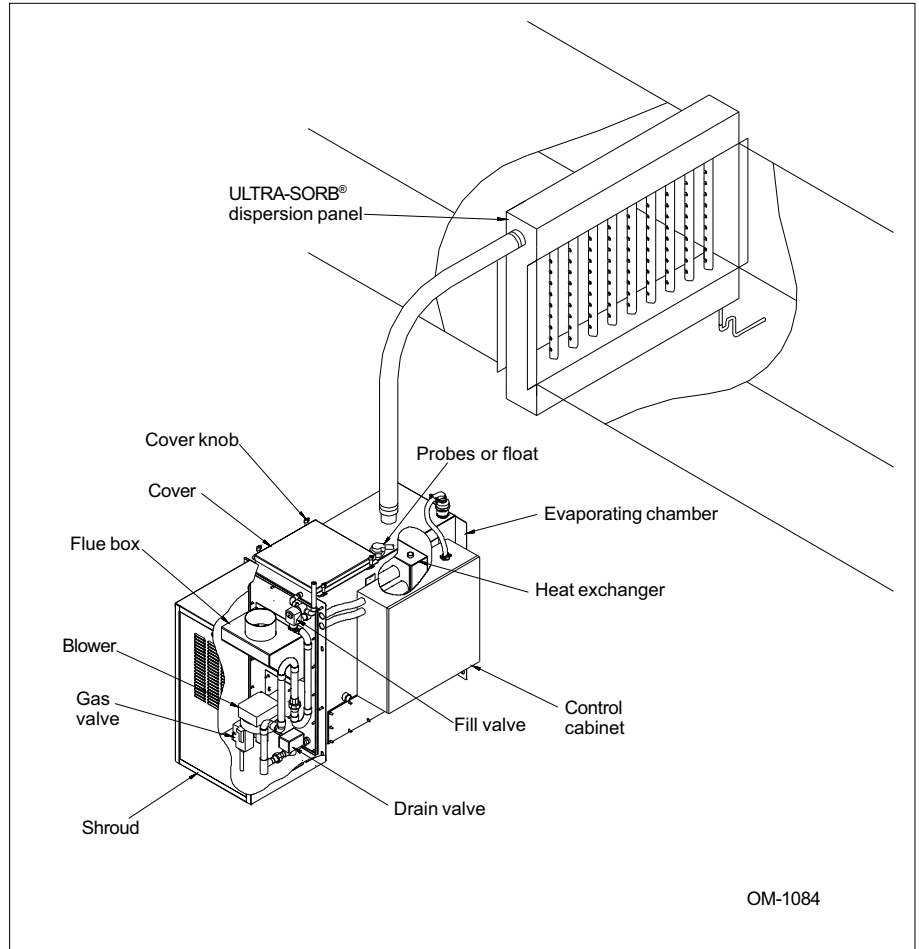
GTS® AND GTS-DI HUMIDIFIERS

GTS Gas-to-Steam Humidifier

The GTS is a gas-fired humidifier that burns either natural or propane gas to generate steam for humidification. The unit has from one to four burners, which are fired into a heat exchanger. This heat exchanger is, in turn, 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. The GTS is compatible with DRI-STEEM's dispersion panels RAPID-SORB® and ULTRA-SORB®.

The GTS humidifier is designed for use with all water types. The standard GTS model supports softened or unsoftened water and uses a probe-type level control system to sense water level. This probe requires water conductivity of 100 micromhos/cm (about 2 gr/gal) minimum to function. Therefore, it will not operate on water treated by reverse osmosis or deionization.

The GTS-DI model is available for use with deionized or reverse osmosis water. This unit produces chemical-free steam and reliable, accurate humidification control. It is virtually maintenance-free, with no wasted water, heat, or downtime. The DI unit uses a float valve to control water levels. The standard GTS model can be converted in the field to a GTS-DI.



SAFETY PRECAUTIONS

WARNING:

Improper installation, adjustment, alteration, service, maintenance, or use can cause carbon monoxide poisoning, explosion, fire, electrical shock, or other conditions which may cause personal injury or property damage. 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. A failure to follow this warning can cause electrical shock, fire, personal injury, or death.

- Inspect humidifier and accessories upon arrival for damaged, missing, or improper parts. If there is a problem, call DRI-STEEM.
- 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 use this appliance if any part has been under water. Immediately call a qualified service technician to inspect the appliance and to replace any part of the control system and any gas control that has been under water.
- Do not lift humidifier by gas controls, gas manifold, fire box, or control 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.

SPECIFICATIONS AND CAPACITIES

Specifications, capacities and weights

Model number	Steam capacity per hour		Input		Steam outlet	Recommended vent size		Operating weight		Shipping weight		Outdoor enclosure operating weight		Outdoor enclosure shipping weight		115 volt 60 Hz full load amps*
	lbs	kg	Mbh	kW		inches	mm	lbs	kg	lbs	kg	lbs	kg	lbs	kg	
GTS-100	75	34	100	29	2" NPT or 2" hose (DN50)	5	130	600	275	300	135	1150	520	850	385	1.8
GTS-200	150	68	200	59	2" NPT or 2" hose (DN50)	5	130	600	275	300	135	1150	520	850	385	1.8
GTS-300	225	102	300	88	3" flange (DN80)	7	180	775	350	375	170	1325	600	925	420	3.0
GTS-400	300	136	400	117	3" flange (DN80)	7	180	775	350	375	170	1325	600	925	420	3.0
GTS-600	450	204	600	176	4" flange (DN100)	8	205	1000	455	500	225	1750	795	1250	570	4.5
GTS-800	600	272	800	234	4" flange (DN100)	10	255	1275	580	600	275	2025	920	1325	600	6.0

* Add 15 full load amps for outdoor enclosure heater load on GTS 100-400.

* Add 20 full load amps for outdoor enclosure heater load on GTS 600-800.

Capacity notes

- At sea level, approximately 172 BTUs are required to raise the temperature of one pound of water from 40 to 212 °F. (At sea level, 2257 kJ are required to raise the temperature of one kilogram of water from 4 to 100 °C.)
- An additional 970 BTUs are required to change the state of one pound of 212 °F water to vapor. (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 hoses and tubes. Use the following steam loss guidelines:
 - Vapor hose: 0.15 lbs/ft/hr (0.22 kg/m/h)
 - Insulated pipe: 0.05 lbs/ft/hr (0.07 kg/m/h)
 - Dispersion tubes: 0.50 lbs/ft/hr (0.7 kg/m/h)

LP gas

All models operate at rated Mbh/kW input.

Connection sizes

Description	GTS 100-200	GTS 300-400	GTS-600	GTS-800
Gas	1/2" NPT (DN15)	1" NPT (DN25)	1" NPT (DN25)	1-1/4" NPT (DN32)
Water makeup (fill)	1/4" NPT (DN8)	1/4" NPT (DN8)	1/4" NPT (DN8)	1/4" NPT (DN8)
Drain	1" (DN25)	1" (DN25)	1" (DN25)	1" (DN25)

High altitude

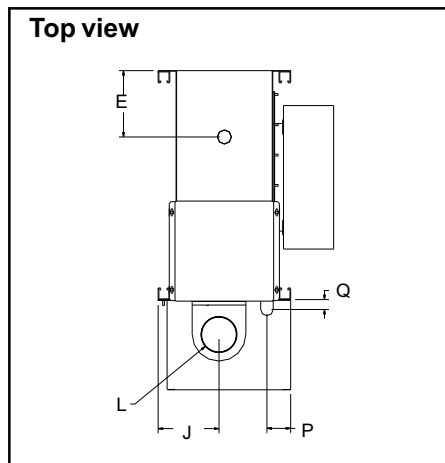
A derate in Mbh/kW exists due to high altitude. See the chart below for high altitude derate information.

Altitude		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

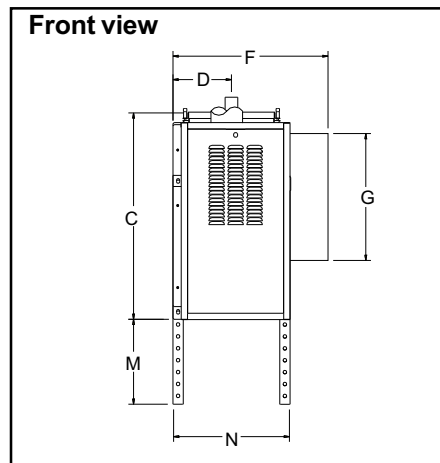
DIMENSIONS

Mechanical dimensions

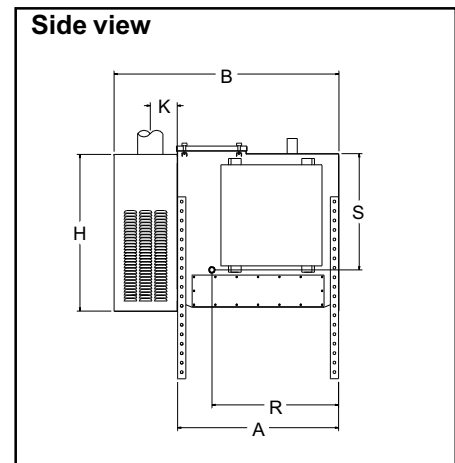
	Description	GTS-100, GTS-200		GTS-300, GTS-400		GTS-600		GTS-800	
		inches	mm	inches	mm	inches	mm	inches	mm
A	Floor stand length	31.85	809	31.85	809	31.85	809	31.85	809
B	Overall length	44.50	1130	49.00	1245	49.00	1245	49.00	1245
C	Height of evaporating chamber	33.25	845	33.25	845	33.25	845	33.25	845
D	Steam outlet position	9.25	235	12.00	305	17.25	438	20.25	514
E		9.25	235	9.25	235	9.25	235	9.25	235
F	Overall width	25.00	635	30.50	775	41.00	1041	47.00	1194
G	Height of control cabinet	20.00	508	20.00	508	20.00	508	20.00	508
H	Shroud height	32.00	813	32.00	813	32.00	813	32.00	813
J	Flue position	8.50	216	12.00	305	16.63	422	19.63	499
K		5.00	127	5.50	140	5.50	140	6.60	168
L	Flue diameter	5.00	127	7.00	178	8.00	203	10.00	254
M	Leg height (distance from floor)	13.35	339	13.35	339	13.35	339	13.35	339
N	Leg width	18.50	470	24.00	610	34.50	876	40.50	1029
P	Fill valve connection position	3.30	84	3.30	84	6.58	167	6.58	167
Q		1.38	35	1.38	35	1.38	35	1.38	35
R	Condensate return plug position	25.00	635	25.00	635	25.00	635	25.00	635
S		23.00	584	23.00	584	23.00	584	23.00	584



OM-1077



OM-1078-1



OM-1079

INSTALLATION

Precautions

- Installation must conform to the requirements of the authority having jurisdiction or, in the absence of such requirements, to the National Fuel Gas Code, ANSI Z223.1 (latest edition). In Canada, the installation of this unit must comply with 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 Applications and Equipment."
- 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 will cause accelerated corrosion, resulting in a reduction of 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.
- 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. The openings should provide one square inch of free area per 1000 BTUH input rating of the unit, with a minimum of 100 square inches for each opening. See the table and information on Pages 15 and 16 for additional information.
- Remove all shipping brackets and materials before operating the humidifier.
- Humidifier flue gases must be vented to the outside atmosphere.

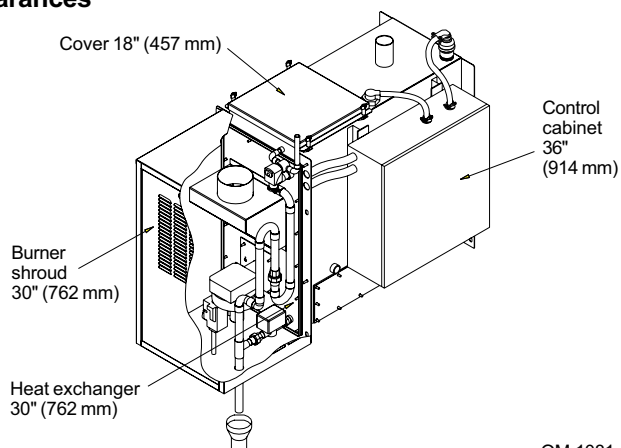
- Power supply disconnect switch must be in the off position while making wiring connections to prevent electrical shock and equipment damage. All units must be wired in strict accordance with the wiring diagram furnished with this unit.
- Turn off all gas while installing the gas piping and manual shutoff valve for the humidifier.

GTS clearance recommendations

For recommended service and maintenance purposes the following clearances should be maintained:

- Heat exchanger removal - front, 30" (762 mm)
- Burner shroud removal - front, 30" (762 mm)
- Control cabinet - right side, 36" (914 mm)
- Cover removal - top, 18" (457 mm)
- Distance from bottom of tank to floor, 13.25" (337 mm) minimum

Clearances



OM-1081

INSTALLATION

Locating the humidifier

- Provide a level, solid foundation for the humidifier. Locate the humidifier as near as possible to a chimney or outside wall so that the flue pipe from the humidifier is short and direct. The location should also be such that the gas ignition system components are protected from water during humidifier operation and service.
- The humidifier should be installed in a location away from drafts and should be properly protected. If installed in a separate room, follow the instructions concerning combustion and ventilation air.
- The humidifier should be located 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, it is recommended that a suitable drain pan, adequately drained, be installed under the humidifier. The pan must not restrict combustion air flow.
- The humidifier must not be installed on carpeting, tile or other combustible material other than wood flooring (indoor application only).
- Install humidifier so that electrical components are protected from water.
- The appliance must be kept free and clear of insulating materials when located in an insulated space. Insulating material may be combustible. Inspection of the appliance area must be performed when the appliance is installed, or when insulation is added.

Supply water and drain overflow connections

IMPORTANT: The humidifier is shipped with the automatic drain valve locked in the manual open position. This position reduces the possibility of the valve seat becoming damaged from the heat of sweating the drain connection during installation. After the drain connection has been completed, the “manual open” lever position must be reset to the auto position. Failure to close the drain valve will not allow the tank to fill.

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

- Union connections must be made at the humidifier on the cold water supply and drain/overflow lines.
- A shutoff valve should be provided in the supply water line to isolate the humidifier from the water system while servicing.
- If the water pressure is above 60 psig (414 kPa) and/or water hammer would be objectionable, a pressure reducing valve or shock arrester should be installed.
- A 1" (25 mm) opening is provided in the humidifier tank to accommodate skim and/or overflow protection. (Note: Follow local code requirements regarding size of drain pipe.)
- Insulating unions or bushings must be used 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, be sure the humidifier tank is full of water and the water is free to flow into the tank.

INSTALLATION

Makeup water piping and material

Minimum makeup water pressure must be 25 psi (172 kPa). When nonmetallic water piping is used, it must be rated to withstand 212 °F (100 °C) or greater temperature. If not, the final three feet of piping connected to the humidifier should be metallic and should not be insulated.

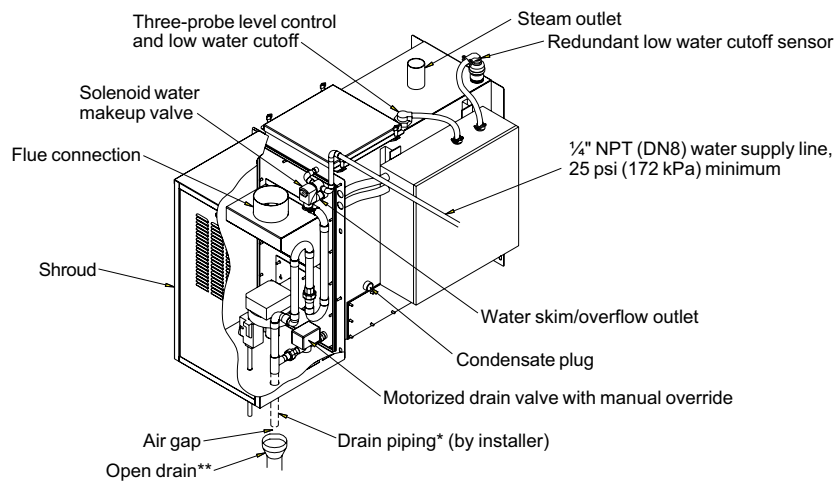
As part of the fill valve assembly, the needle valve restricts the rush of cold water entering the evaporating chamber during the fill cycle. Adjusting the supply water

flow with the needle valve will reduce fill cycle noise generated by collapsing steam in the humidifier. Adjusting the needle valve will also reduce the drop in output during a fill cycle. Care must be taken to not reduce the fill rate below the humidifier's capacity, as this will cause a low-water shutdown.

Drain piping and material

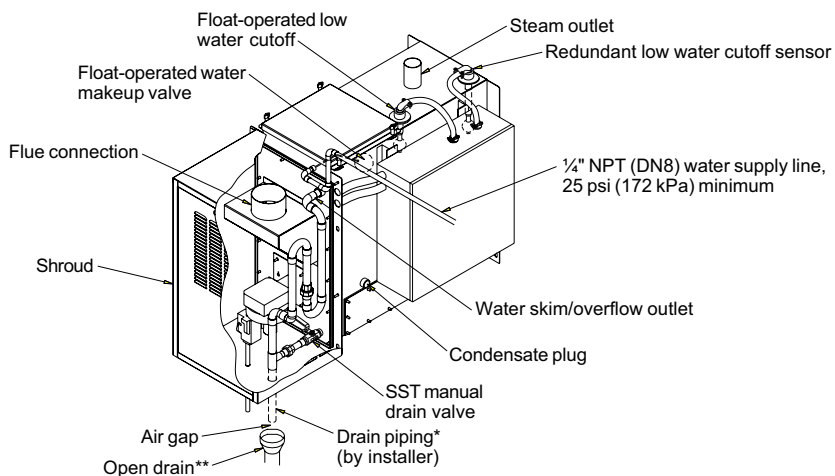
If nonmetallic pipe or hose is used, it must be capable of withstanding temperatures up to 212 °F (100 °C).

Standard water



OM-736N

DI water



OM-737N

* Drain piping material must be suitable for 212 °F (100 °C) water.

** Refer to local codes for drain pipe sizing and maximum temperature requirements.

INSTALLATION

Gas piping guidelines

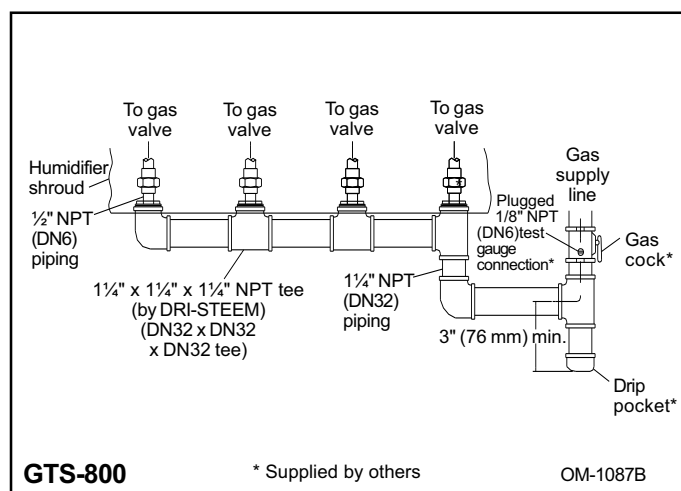
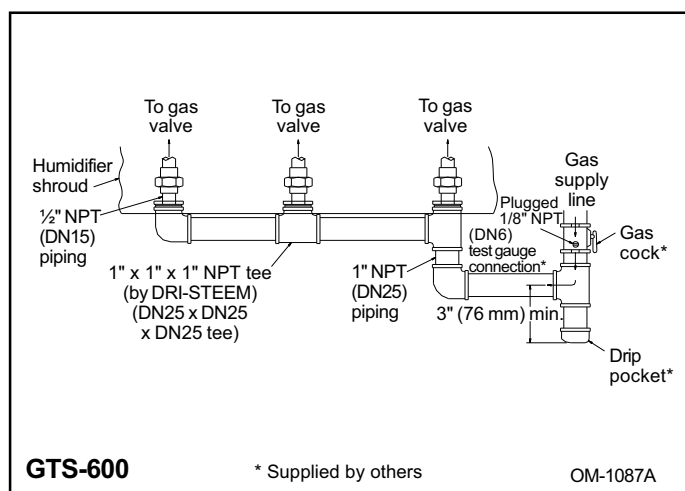
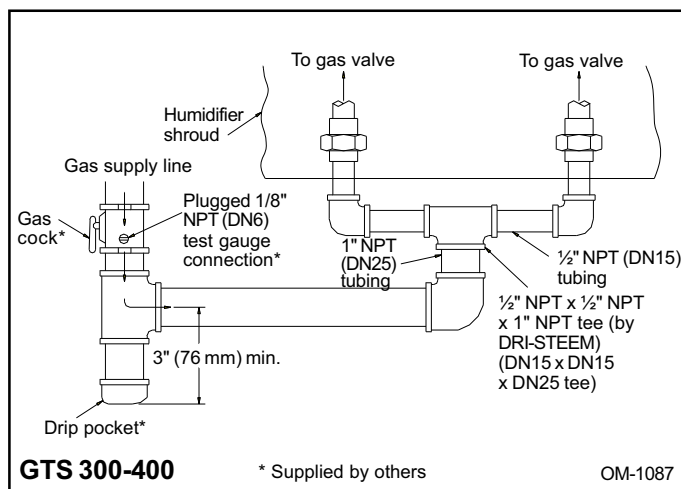
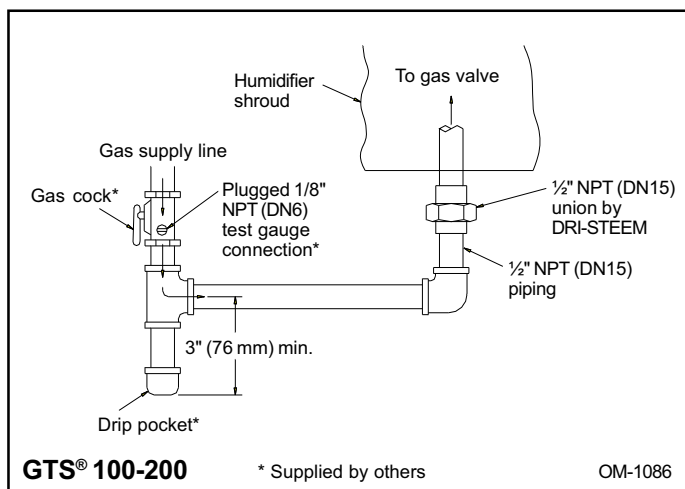
CAUTION:

Gas pressure to humidifier controls must never exceed 24" wc (6 kPa). A 1/8" NPT (DN6) plugged tapping, accessible for test gauge connection, must be installed immediately upstream of the gas supply connection to the appliance.

- After threading and reaming the ends of the pipes, inspect piping and remove loose dirt and chips.
 - Support piping so that no strains are imposed on unit or controls.
 - Use two wrenches when connecting piping to unit 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 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.
 - Purge air before lighting unit by disconnecting piping at gas control. **In no case should line be purged into heat exchanger.**
 - 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 including a 1/8" NPT (DN6) plugged tapping accessible for test gauge connection. Pressure tappings for test gauges are located on all gas valves.
 - Allow at least 5' (1.5 m) of piping between any high pressure regulator and unit pipe connection.
 - Piping installation must be in accordance with local codes, and ANSI Z233.1, "National Fuel Gas Code," or CAN/CGA-B149 in Canada. Do not use flexible connectors.
 - 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 the next page to determine the gas flow in cubic feet per hour or m³/hr for the type of gas and size of unit to be installed. 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). The Gas Pipe Capacities Table on the next page allows for the usual number of fittings with a 0.3" wc (0.7 kPa) pressure drop.
 - The Specific Gravity Conversion Table should be used when the specific gravity of the gas is other than .60 for natural gas or 1.53 for propane. Please refer to the example on Page 14 for the use of both tables on the next page.

INSTALLATION

Gas piping



Gas pipe capacities for gas pressures of .5 psig or less

Length of pipe		Gas flow in piping in cfh and m ³ /hr at pressure drop of 0.3 inches of water (.07 kPa) Specific gravity = 0.60										
		Iron pipe diameter in inches (DN)										
		1/2" (DN15)		3/4" (DN20)		1" (DN25)		1-1/4" (DN32)		1-1/2" (DN40)		
ft	m	cfh	m ³ /hr	cfh	m ³ /hr	cfh	m ³ /hr	cfh	m ³ /hr	cfh	m ³ /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	
Example	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

Specific gravity conversion factors

Multiplying factor to be used with table at left when the specific gravity of gas is other than 0.60 (natural gas) or 1.53 (propane)

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

INSTALLATION

Gas piping guidelines

Example

For this example, refer to the tables on the previous page.

To determine gas piping size, begin by calculating the cubic feet/hour (cfh) or m³/hr using the following formula:

$$\frac{Btuh \text{ (kW) input}}{\text{Calorific value of gas}}$$

Calorific values are:

Natural gas: 1025 btus/ft³ (10.6 kW-hr/m³)

Propane: 2500 btus/ft³ (25.9 kW-hr/m³)

For example, if you had a GTS-400 operating on natural gas, you would calculate the cfh or m³/hr as follows:

$$\frac{400,000 \text{ btuh}}{1025 \text{ btus/ft}^3} = 390 \text{ cfh}$$

$$\frac{117.2 \text{ kW}}{10.6 \text{ kW-hr/m}^3} = 11.05 \text{ m}^3/\text{hr}$$

If you needed to run your gas piping 60 feet (18 m), you would refer to the Gas Pipe Capacities Table and look horizontally across the 60 foot (18 m) line until you located the next highest value above your calculated cfh or m³/hr. In this example, you would be looking for the next highest value above 390 cfh (11.05 m³/hr), which would be 400 cfh (11.3 m³/hr), and would indicate the use of a 1¼" (DN32) pipe for this application.

Using the same example, if the specific gravity of your natural gas was .55 (instead of the .60 standard) you would need to refer to the Specific Gravity Conversion Table for an adjustment factor. In this case, the factor would be 1.04, which you would multiply by the 390 cfh (11.05 m³/hr) value. This gives you a new value of 406 cfh (11.49 m³/hr). Referring back to the Gas Pipe Capacities Table, you will see that for the same 60 foot (18 m) length, you now would 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, the humidifier and its gas shutoff valve must be disconnected during any pressure in excess of 24" wc (6 kPa). The humidifier must be isolated from the gas supply piping system by closing its field-installed manual shutoff valve during any pressure not equal to 24" wc (6 kPa).
- Check gas supply pressure, with all burners running, at the inlet pressure tap of the combination gas control valve. The **recommended** supply pressure is 7" wc (1.75 kPa) for natural gas or LP gas. Purging of gas piping should be performed as described in ANSI Z223.1 (latest edition) or, in Canada, in CAN/CGA-B149 codes. The **minimum** supply pressure is 6" wc (1.5 kPa) for natural gas or LP gas.

INSTALLATION

Combustion and ventilation air

The GTS supports both room air and sealed combustion. Requirements and recommendations for each follow.

CAUTION:

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, and other household products.

CAUTION:

The operation of exhaust fans, kitchen ventilation fans, clothes dryers, or fireplaces could create a negative pressure condition at the humidifier. Makeup air must be provided for the ventilation devices, in addition to that required by the humidifier. Units that may be operated in toxic environments should be equipped with sealed combustion piping.

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 will not be a negative pressure in the equipment room or space.
- Provisions for adequate combustion and ventilation air must be provided in accordance with Section 5.3, Air for Combustion and Ventilation, of the National Fuel Gas Code, ANSI Z223.1-1988, or applicable provisions of the local building 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 appliance 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 appliance area.
- **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 heater is located. Enclosed spaces, such as equipment rooms, must be vented at the blower for combustion air. The size of air openings must be based on all gas-burning equipment installed in the space involved. Four types of locations, and the requirements of each, are outlined in the table on Page 16.

Sealed combustion

The GTS® will support sealed combustion using 4" (DN100) PVC or CPVC piping (see drawings on the next page). On the GTS-100 and GTS-200, there will be a single point connection to the blower. On the GTS-300 through GTS-800, there will be a single point connection to a manifold below the shroud.

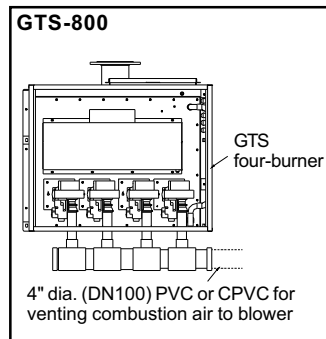
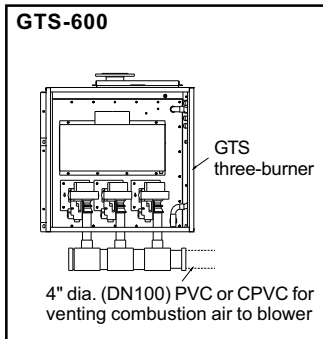
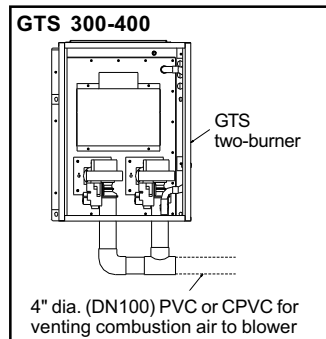
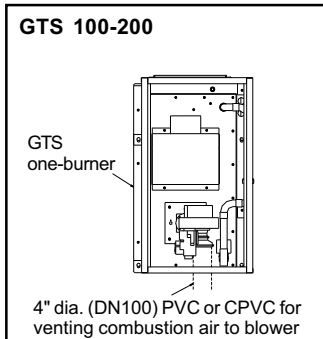
When running PVC or CPVC piping for sealed combustion, the maximum allowable distance to the outdoor air source is 70' (21.3 m) with a 5' (1.5 m) equivalent length for elbows. The outside air source may be either a final connection outside the building or a connection to an outdoor air plenum within 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. The air intake point must be located at least 10' (3 m) from the flue vent on horizontally vented units.

Note: GTS outdoor enclosures are always provided with a sealed combustion connection.

INSTALLATION

Combustion and ventilation air (cont'd.)

Sealed combustion connection



OM-1097, OM-1097A, OM-1097B

Location of humidifier and required air openings

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 ²) per opening per 1000 BTU/hr (293 W) input* The minimum free area of all openings combined is 100 square inches (645 cm ²)
Confined space with all air from outside the building through air ducts	Two openings, 2 ducts, 1 sq. in. (6.5 cm ²) 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 ²) 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

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

Electrical connections

CAUTION:

Do not connect aluminum wire between disconnect switch and humidifier. Use only copper wire.

WARNING:

The cabinet **must** have an uninterrupted or unbroken ground according to National Electrical Code, ANSI/NFPA 70 and Canadian Electrical Code, CSA C22.1, or according to local codes, to minimize personal injury if an electrical fault should occur. This ground may 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.

- GTS® humidifiers must be supplied with 120-volt AC, 60-Hz, separately fused electrical service. The GTS humidifier is equipped with a transformer to step down the voltage to 24 VAC control voltage.
- When installed, the GTS humidifier must be electrically grounded in accordance with local codes or, in the absence of local codes, in accordance with the National Electrical Code ANSI/NFPA No. 70-1987. The electrical conductors shall be Type MTW (105 °C) AWG #14 wire for line voltage (120V), with BLACK WIRE for HOT, WHITE WIRE for NEUTRAL, GREEN AND YELLOW WIRE for GROUND, and #18 gauge 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 humidifier is adjusted for correct performance. Do not alter throttle setting or restrict venturi opening.
- The electric current characteristics and capacity requirements should be checked against the nameplate. All wiring must be in accordance with all governing codes and with the GTS wiring diagram located inside the control cabinet. See the table on Page 7 for information on the various models.
- Refer to the VAPOR-LOGIC₃ Installation and Operation Manual for additional information on the controller furnished with this GTS humidifier.

INSTALLATION

Vertical and horizontal venting guidelines (stack connection)

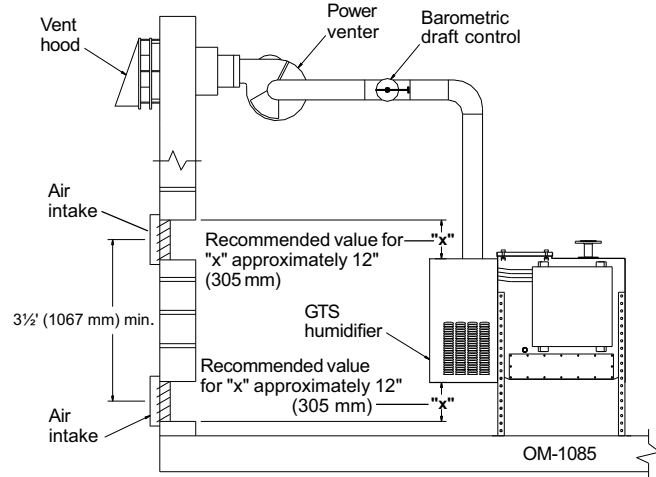
- The GTS® is a Fan Assisted Category II Appliance.
- Maximum flue temperature is 390 °F (217 °C) + ambient.
- Vent piping must be UL or UL/CSA listed type B, B-W, B-H, or L.
- Drip tee or flue box condensate port should be used for flue condensate removal.
- The purpose of venting the gas humidifier is to completely remove all products of combustion and ventilation gases to the outside air.
- 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, or Section 7, Venting Systems and Air Supply Appliances, of the CAN/CGA B149 Installation Codes, the local building codes, and the vent manufacturer's instructions.
- Do not reduce the vent diameter, and avoid short turns in the vent piping. Use the same size stack as the vent furnished with the humidifier. Maintain a minimum upward slope of ¼" per linear foot (2%) on all horizontal runs. Maintain proper support of vent connections and joints. Observe clearances (in accordance with applicable codes) from all combustible materials, and obtain an approved cap for the stack outlet. The bottom of the cap must be one stack diameter above the top of the stack.
- Inspect for proper and tight construction. Any restrictions or obstructions must be removed. An existing chimney may require cleaning.
- Chimney or vent must extend at least 3' (1 m) above its passage through a roof and at least 2' (.6 m) above any ridge within 10' (3 m) of the chimney (local codes apply).
- This humidifier must not be connected to a chimney flue servicing a separate appliance designed to burn solid fuel.
- Never connect this humidifier to a chimney serving a fireplace, unless the fireplace opening is permanently sealed off.
- Venting into an unlined masonry or concrete chimney is prohibited by code.
- If this humidifier is connected to a lined, masonry chimney, the chimney must be sized and installed according to the provisions of the National Fuel Gas Code or Canadian CAN/CGA.B149 requirements.
- Insulation must be added to any roof or wall penetration vent connector that will be exposed to ambient temperatures of 30 °F (0 °C) or less, especially any application using single-wall vent pipe as a connector.
- Do not insulate vent pipe exposed to outdoor weather conditions (e.g., above roof lines).
- Installation of the vent pipe should be as direct as possible, with a minimum number of turns or elbows.
- Rigidly support the vent pipe every 5' (1.5 m) or less with hangers or straps to ensure that there will be no movement after installation. The humidifier vent box should not be supporting the weight of the vent piping.
- No portion of the vent system shall 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 or CAN/CGA.B149 requirements, and must include a UL or CUL listed vent cap or roof assembly, unless prohibited by local codes.
- This humidifier may be commonly vented with other listed gas-fired appliances. Total input rates of all appliances will determine the vent size.
- All vent pipe passing through floors, ceilings, and walls must be installed with the proper clearances from combustible material, and be fire-stopped according to the National Fuel Gas Code requirements and Canadian Standards CAN/CGA.B149.
- In replacement installation, where an existing vent system may be used, the vent system must be inspected 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 installations 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, the local building codes, and the vent manufacturer's instructions.
- **For all applications, the horizontal length of the vent and vent connector must not exceed the height of the vent system.**

INSTALLATION

Special horizontal venting requirements

- Distances from the vent terminal to adjacent public walkways, buildings, and openable windows and building openings must be consistent with the National Fuel Gas Code, ANSI Z223.1, and/or CAN/CGA B149 Installation Codes.
- In areas accessible to the public, the vent terminal shall be at least 7' (2.1 m) above ground level to prevent burns from the 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.
- A minimum horizontal clearance of 4' (1.22 m) from electric meters, gas meters, regulators, and relief equipment must be maintained.
- Maximum equivalent length of vent pipe is 100' (30 m). Minimum equivalent length of vent pipe is 10' (3 m). Subtract 5' (1.5 m) equivalent length per elbow.
- Vent box pressure must be $-0.01''$ wc (-2.5 Pa). Set by adjusting power venter and barometric damper, with all burners running.

GTS® venting



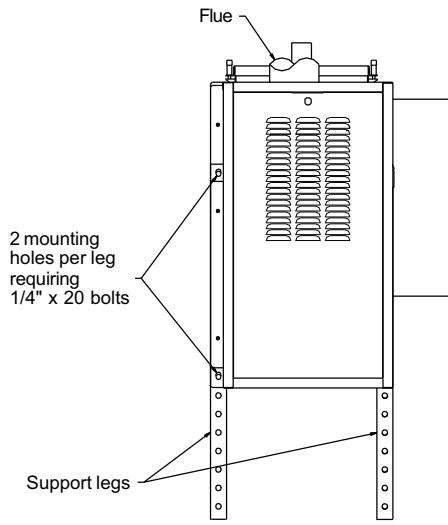
Note: Refer to power venter manual for clearance requirements relative to combustion air openings.

Equipment required for horizontal venting

Item	GTS 100-400 field controls model number	GTS 600-800 field controls model number
Power venter	PVO-600	PVE-1200
Barometric damper	MG-1 (5")	MG-1 (8")
Vent hood	SWH-1-5 (5")	SWH-8

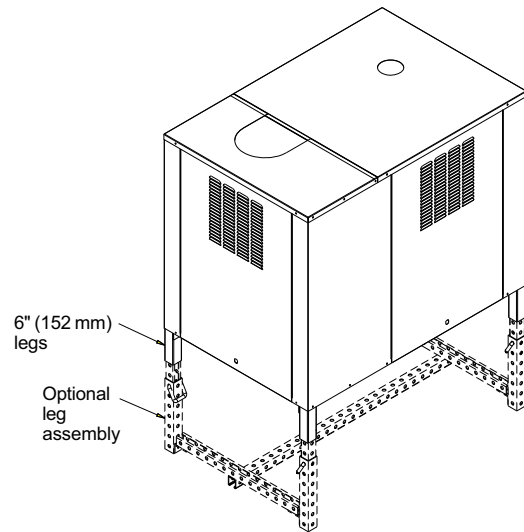
MOUNTING THE HUMIDIFIER

Floor stand mounting



OM-1078

Indoor enclosure mounting option



OM-3000

The GTS ships with support legs for floor stand mounting. For proper operation of the electrode-probe, water-level control and the skimmer system, the humidifier must be mounted level left to right and front to rear.

A keypad with standard 5' (1.5 m) cable ships loose with GTS units. A phone jack mounting plate is available for mounting the keypad on the control cabinet.

Note: See Page 20 for more drawings of the indoor enclosure.

The GTS® indoor enclosure is shipped with the GTS unit factory mounted within the cover. A keypad with standard 5' (1.5 m) cable ships mounted to the subpanel in the GTS indoor enclosure. The unit must only be moved into place by lifting the unit from under its base frame. The indoor enclosure may be mounted as is, or it may be mounted on an optional adjustable leg assembly (see adjustable leg assembly instructions on the next page). All necessary plumbing and electrical wires are to be run under the enclosure and into the appropriate access locations. There are two clearly marked removable access doors. One of them, on the front of the unit, is to gain access to the water fill connection, drain connection, gas connection, and the flue box outlet. The other, on the side of the unit, is to gain access to the electrical sub-panel, cleanout plate, and the steam outlet connection.

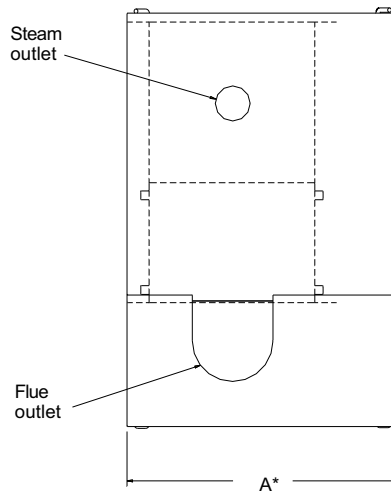
The top of the indoor enclosure consists of two pieces, which are removable. These two pieces may be removed to gain further access to the flue box connection, steam outlet connection, and the inspection cover. The two pieces are removed by backing off the sheet metal screws, which secure it to the sides of the enclosure. To reduce the risk of damage to the enclosure, reattach the two pieces whenever the unit is in operation or when the unit is being moved.

MOUNTING THE HUMIDIFIER

Indoor enclosure mounting (cont'd.)

The optional adjustable leg assembly, if ordered, will be packaged separately from the GTS indoor enclosure. The legs will raise the base of the unit off the floor from 15" to 24" (380 mm to 610 mm). To ease installation, the leg assembly should be assembled and the height adjusted prior to mounting the unit on the legs. Hand tighten all nuts and bolts. Do not make any electrical, gas or plumbing connections to the unit, nor fill the tank, prior to setting it on the legs. Place the leg assembly on a solid level surface where the unit is to be mounted, and place the unit on the leg assembly. Once the unit has been placed on the legs, square and level the assembly and then tighten the nuts and bolts securely. Never move the leg assembly with the unit mounted on it.

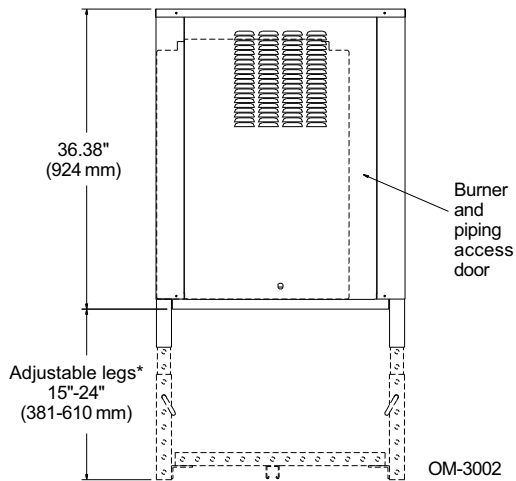
Top view indoor enclosure



OM-3001

* For GTS 100-400, A = 31" (787 mm).
For GTS 600-800, A = 47.5" (1207 mm).

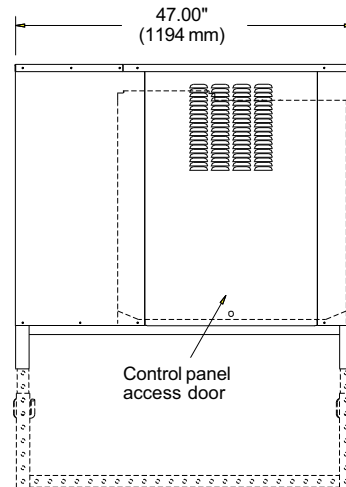
Front view indoor enclosure



OM-3002

* Standard legs fit within the optional leg assembly, and so the maximum leg height is 24" (610 mm).

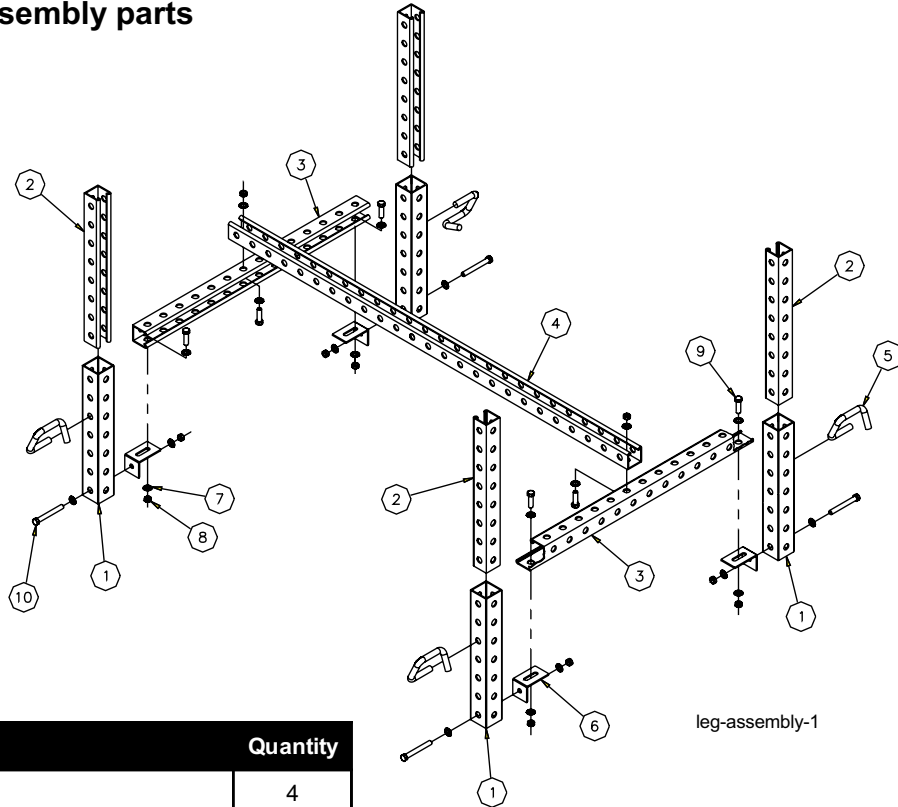
Side view indoor enclosure



OM-3003

MOUNTING THE HUMIDIFIER

Adjustable leg assembly parts



Part #	Description	Quantity
1	13" (33 cm) leg	4
2	17" (43 cm) leg	4
3	26" (66 cm) cross brace (for GTS 100-400)	2
	43" (109 cm) cross brace (for GTS 600-800)	2
4	47" (119 cm) cross brace	1
5	Gravity pin	4
6	Angle bracket	4
7	3/8" flat washer	20
8	3/8" hex nut	10
9	3/8"-16 x 1-1/4" hex bolt	6
10	3/8"-16 x 3" hex bolt	4

Adjustable leg assembly instructions

(Refer to drawing above.)

Step 1: Assemble cross braces

- Place a washer (#7) on a 1 1/4" bolt (#9) and place the bolt through a hole near the center of the #3 cross brace.
- Run the same bolt through a hole at the end of the 47"-long cross brace (#4).
- Add a washer (#7) and a nut (#8).
- Tighten the nut and bolt.
- Repeat procedures on the other end of the 47"-long cross brace.

Step 2: Assemble cross braces to the legs

- Attach the angle brackets (#6) to the four 13"-long legs (#1) using a 3"-long bolt (#10), two washers (#7) and a nut (#8) for each leg.
- Run the bolts through hole at the end of each leg.
- Attach the cross brace assembly (Step 1) to the angle braces.
- Run a 1/4" bolt (#9) with a washer down through the slot in the brace and through the hole on the end of the #3 cross brace.
- Secure with a washer and nut but do not overtighten – final adjustments may be necessary when attaching the unit to the leg assembly.
- Repeat for all four legs.

Step 3: Final assembly

- Slide the 17"-long legs (#2) into the 13"-long legs (#1).
- Align the holes at the desired height and place a gravity pin (#5) through the aligned holes.
- Repeat for all four legs.
- Place the assembly in the proper location.
- Place the humidifier unit on the leg assembly by inserting the tops of the four legs into the tubes on the base of the unit.
- Square and level assembly.
- Tighten all bolts.

After completing all of the above steps the unit is ready to be wired and plumbed.

MOUNTING THE HUMIDIFIER

Outdoor enclosure mounting option

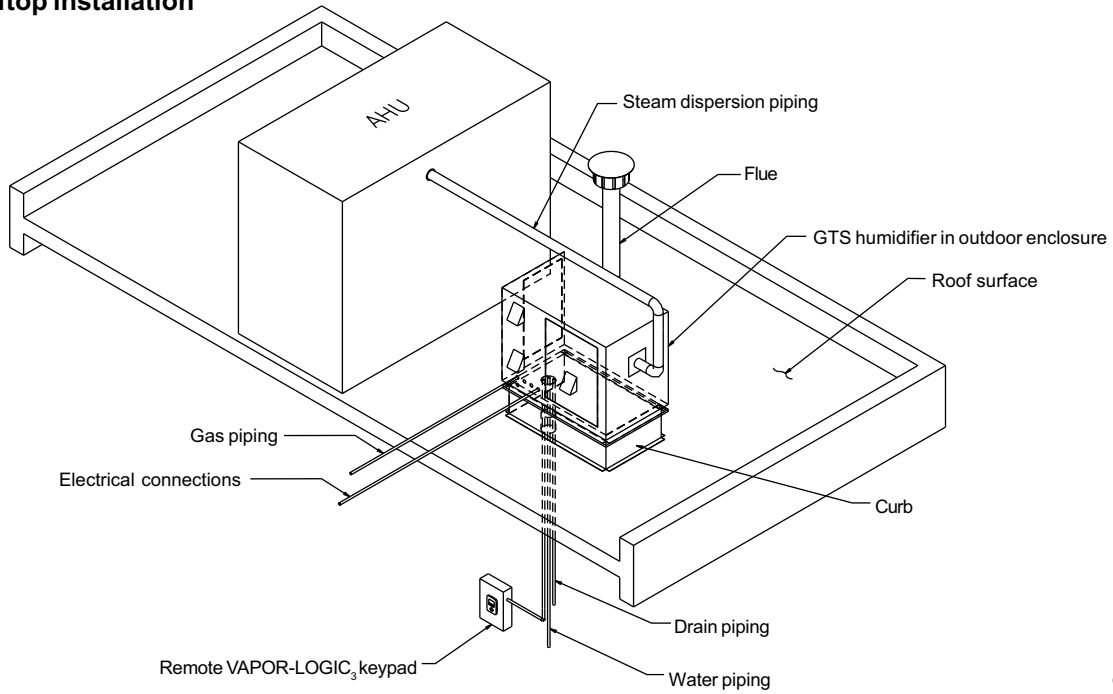
The outdoor enclosure option (see drawings on Pages 23-24) is used when the GTS® will be installed outdoors. The following information is not intended to supplant any requirements of federal, state, or local codes having jurisdiction; prior to locating the unit, authorities having jurisdiction should be consulted.

- The GTS outdoor enclosure must be level and located so that there is enough clearance for opening the access doors.
- Verify that the position of support legs, pad, or curb properly support the unit and that support structure dimensions coincide with unit dimensions.
- Locate unit so that air intakes are not too close to any exhaust fan outlets, gasoline storage, or other contaminants that could potentially cause dangerous situations. The use and storage of 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 that the prevailing winds do not blow into the air intakes.
- Be sure to remove all shipping brackets and other packaging prior to installing the unit.
- During the transit, unloading, and setting of the unit, bolts and nuts may have become loosened. Check that all nuts are tightened as required.
- There are four knockouts located on the right and left side of the enclosure. It is recommended that the electrical power and gas piping are run into the enclosure at these knockouts.
- When unit is to be 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 GTS outdoor enclosure is designed for handling by two methods. In both cases it 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 may occur. It is the installer's responsibility to verify the handling equipment's capability to safely handle the unit.
- The preferred method of lifting is by forklift. This is only possible if forks extend across the entire unit. Forks that do not extend across the entire unit could cause tipping resulting in unsafe conditions or damage to the unit.
- The alternative method of handling is through the unit's channel base frame and/or 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. If this type of spreader is not available, wood strips should be inserted between the cables and unit where necessary. All lifting points must be used and will be marked "lift here" on the unit.
- The outside 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 the drawings on Page 23.
- A pipe chase is located inside the burner section of the enclosure. A cover for the pipe chase will be provided to maintain proper pressure within the enclosure in the event that this opening is not utilized. However, it is recommended that this pipe chase be used for both the supply water piping and drain piping, in which case the pipe chase cover should be removed. Insulation should be used to completely fill the area around the pipes to maintain proper enclosure pressure.
- Supply water piping should be insulated to avoid dripping from condensation. For assurance that water will not remain in the fill line and freeze if there is a loss of power, field installation of additional valves upstream of the fill valve in a conditioned space is recommended. These valves should be powered on the same circuit as the GTS such that if the power goes off, water will drain out of the fill line to prevent freezing.
- 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.
- Sealed combustion air is piped directly from the outside of the enclosure to the burner, so no conditioned air will be removed from the space below. This is factory piped and no assembly is required. Check tightness of pipe clamps.

More outdoor enclosure mounting instructions on Page 24

MOUNTING THE HUMIDIFIER

Typical rooftop installation



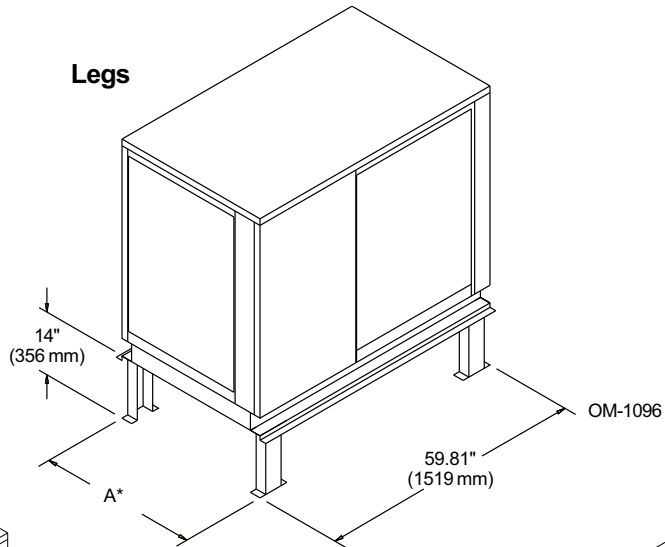
OM-1111

Outdoor enclosure mounting options

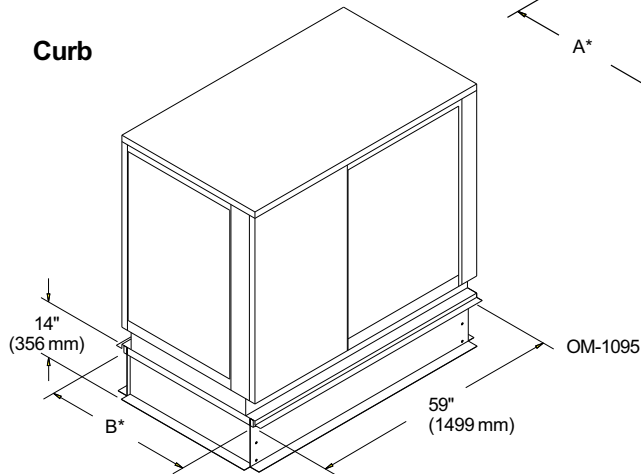
* For GTS 100-400:
 A = 35.88" (911 mm)
 B = 35" (889 mm)

* For GTS 600-800:
 A = 53.88" (1369 mm)
 B = 53" (1346 mm)

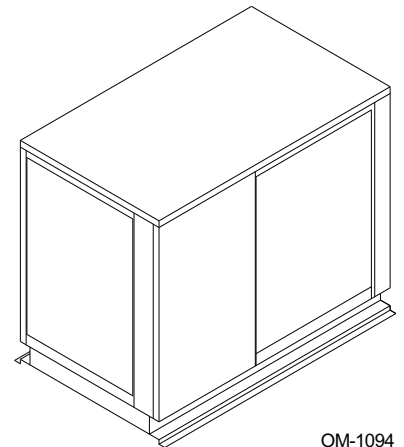
Legs



Curb



Flush



OM-1094

MOUNTING THE HUMIDIFIER

Outdoor enclosure mounting (cont'd.)

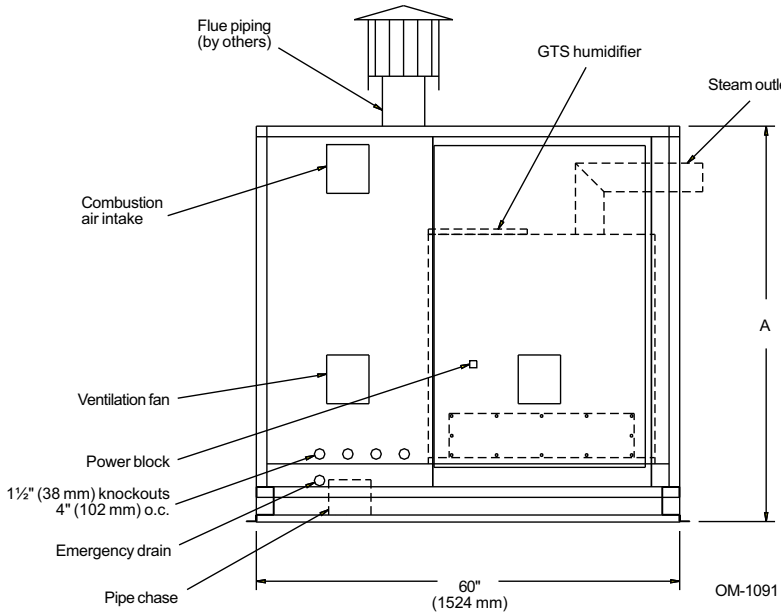
- Refer to the main installation section of this manual for directions on installation of electrical, gas, flue, and water connections. A separate electrical service connection for the outdoor GTS® is recommended. Insulation and/or heat taping of water piping is recommended.
- When ordered with the heater package, two thermostat-controlled heaters are provided: one strip heater is located in the control cabinet section, and one strip heater is located in the burner section to keep the enclosure at a constant minimum temperature.
- An emergency drain is provided. In case of any water leak, water will drain onto the roof through this emergency drain.
- External flue piping shall be provided by others and field installed. The flue of the outdoor enclosure exits out the left side of the unit and a vertical stack must be constructed. Typically, the stack must be a minimum of 5-10 feet (1.5 - 3.0 m) above the top of the roof. However, the exact height will vary depending on unit size, climate, etc. Local codes prevail. A UL/CUL (or equivalent) listed cap must be used and a drip tee included.
- A keypad with standard 5' (1.5 m) cable ships mounted to the subpanel in the GTS outdoor enclosure. 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, a remote mount keypad should be installed. Additional cable lengths up to 500 feet (152 m) are available as an option for this mounting configuration.
- Curbs (optional) will be shipped knocked down for ease of transporting to the roof. Curbs are manufactured of 16-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 2" x 1/2" closed-cell curb gasket with adhesive on one side is supplied with hardware. An installation drawing is also included.
- Stand legs (optional): Four symmetrically-shaped stand legs are provided with all the necessary hardware for elevating the unit 12" (300 mm) from the ground. The stand legs should be securely mounted to the grade by the installing contractor.

GTS outdoor enclosure sequence of operation

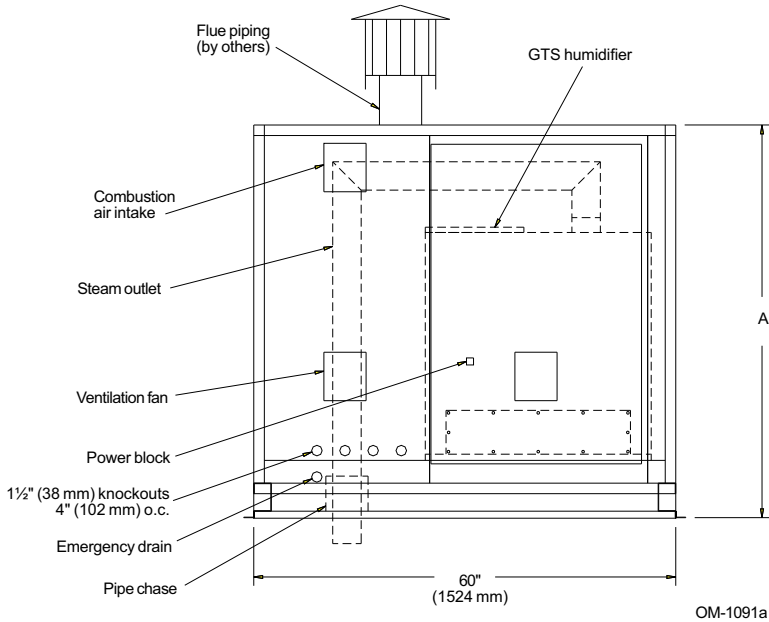
- Power is applied to the outdoor enclosure.
- If the ambient temperature in the enclosure is below 50 °F (10 °C), the strip heaters are powered up. When the enclosure temperature reaches 35 °F (2 °C), power is allowed to the GTS subpanel and the GTS unit is enabled. The strip heaters will remain on until the enclosure reaches 50 °F (10 °C) to ensure that the temperature inside the enclosure will not drop back below the freezing point.
- When the enclosure temperature is at or above 50 °F (10 °C), the GTS tank heats the enclosure. When there is no call for humidity, an aquastat maintains tank temperature at the factory default of 70 °F (21 °C). This temperature can be reset in the field to be from 40-180 °F (4-82 °C).
- When the ambient temperature in the enclosure reaches 95 °F (35 °C), two 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 will continue to run and, once the enclosure temperature falls below 130 °F (54 °C), the GTS will automatically resume normal operation.
- A normally open drain valve is provided on the GTS outdoor enclosure in order to drain the tank in the event of a power loss.

MOUNTING THE HUMIDIFIER

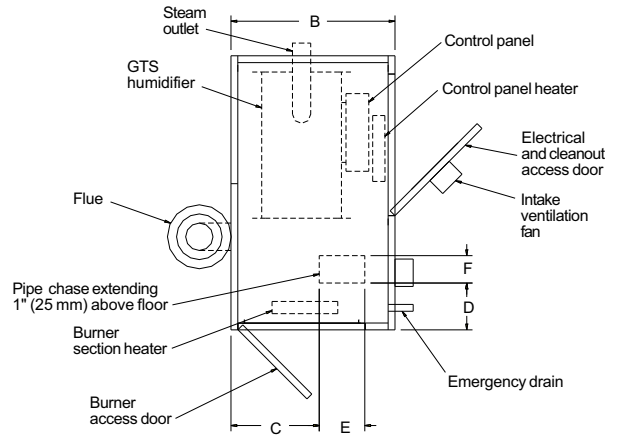
Right side view, outdoor enclosure with standard steam outlet



Right side view, outdoor enclosure with optional steam outlet



Top view, outdoor enclosure with standard steam outlet



Note: All piping from the GTS unit to the steam outlet is stainless steel pipe. Final connection to the steam outlet resides outside the outdoor enclosure and is consistent with the steam type selected. See the “Steam outlet” column in the “Specifications, capacities and weights” table on Page 7.

Operating temperatures

The GTS housed in an outdoor enclosure will operate properly from -40 to 120 °F (-40 to 50 °C).

GTS® outdoor enclosure dimensions

Item	Description	GTS 100-400		GTS 600-800	
		inches	mm	inches	mm
A	Enclosure height	56.00	1422	66.00	1676
B	Enclosure width	36.00	914	54.00	1372
C	Pipe chase position	19.38	492	34.00	864
D		10.25	260	4.00	102
E	Pipe chase size	10.00	254	16.00	406
F		6.00	152	10.00	254

STEAM SUPPLY CONNECTION METHODS

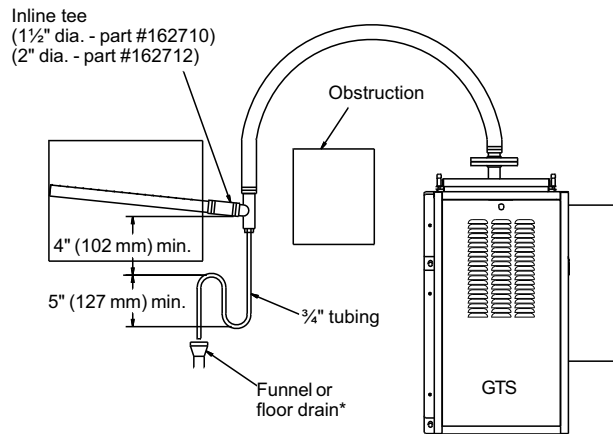
Vapor hose piping

When a vapor hose and stainless steel dispersion tubes are used, they should be pitched back to the humidifier. A minimum slope of 2" per foot (15%) with no low spots is recommended. When this is not possible due to duct elevation or an obstruction, alternate arrangements may be used as shown in the figures at right.

Any condensate that forms in the vapor hose must be removed. Preferably, it should be returned to an open drain with a water seal of sufficient height to contain the duct static pressure, as shown in the top right figure.

Condensate also can be returned to the GTS®, as shown in the figure on the next page, with an air vent. This method requires a water seal and an air gap to prevent back pressure from the GTS chamber. Excessive back pressures imposed on the humidifier may lead to dispersion tube(s) spitting, lost water seals, or leaking gaskets. When the distance between the humidifier and the dispersion device exceeds 10' (3 m), consult factory for special recommendations.

Piping method recommended when obstruction prevents dispersion tube from being continuously pitched back to humidifier



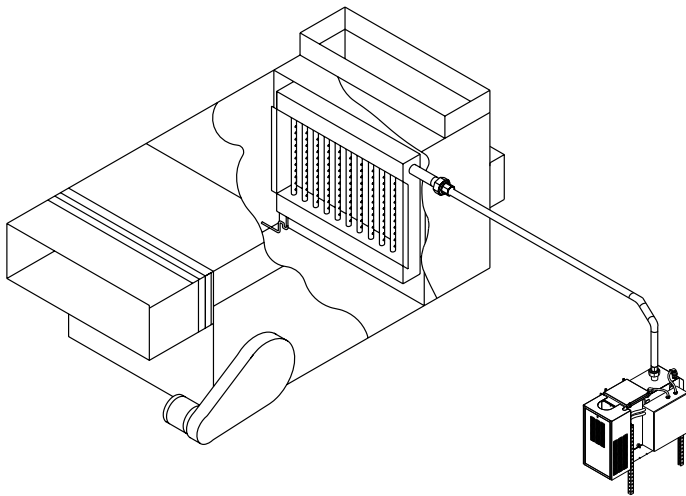
OM-749N

* Refer to local codes for drain pipe size requirements.

Steam supply using pipe or tubing

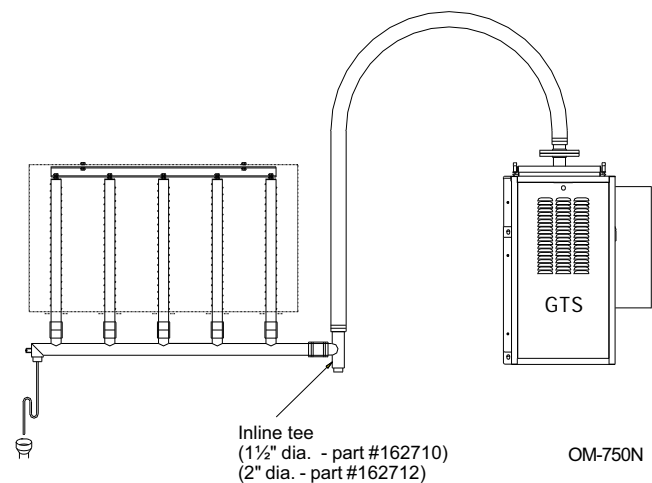
(flange option available)

Pipe insulation recommended



OM-743N

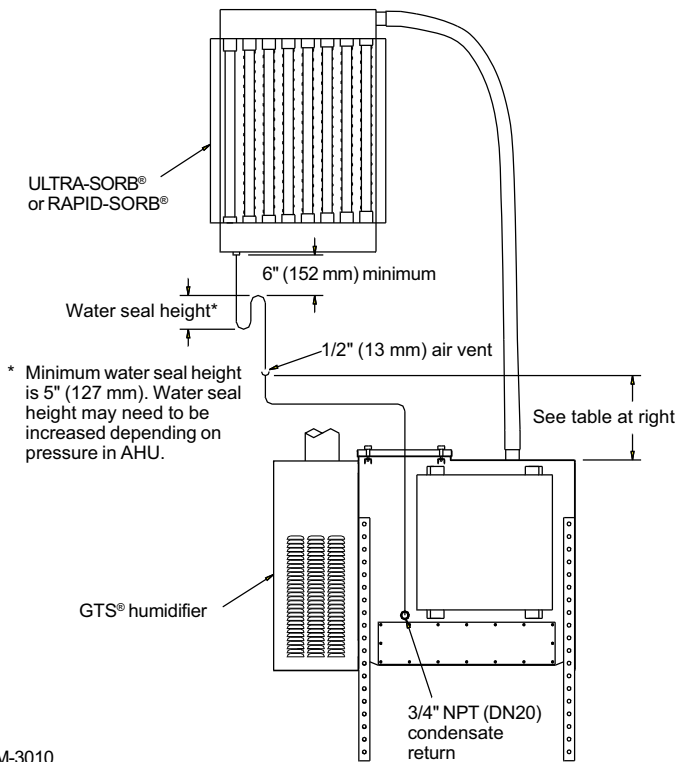
Piping method recommended when humidifier must be mounted higher than the duct



OM-750N

CONDENSATE RETURN PIPING

Condensate return to humidifier



OM-3010

Height required to overcome humidifier internal pressure

Humidifier model	Height * required to overcome humidifier internal pressure	
	Inches	mm
GTS-100	12	305
GTS-200	12	305
GTS-300	18	457
GTS-400	18	457
GTS-600	18	457
GTS-800	18	457

* Minimum height may need to be increased depending on pressure in AHU.

Horizontal duct installation

1. Unpack shipment and verify receipt of all RAPID-SORB® components with packing list. Report any shortages to the DRI-STEEM factory immediately.
2. Provide necessary access in and around duct work.
3. Locate 1" x 1½" (25 mm x 38 mm) stainless steel channel inside the duct. Hang the channel from the top of the duct, centered between duct side walls, using the two mounting holes provided.
4. If hose cuffs are used, slide cuffs over the open end of each tube. Install a pair of hose clamps on each tube.
5. Note direction of air flow within duct, then arrange each dispersion tube so steam will blow perpendicular to the air flow. Use the hex bolts provided to attach tubes to overhead 1" x 1½" channel. Do not secure. If the header is outside the duct, punch out necessary clearance holes in the base of the duct to slide dispersion tubes up from bottom.
6. Choose header location and refer to appropriate section:

a. For a header inside the duct (see figure on Page 28):

1. Punch or cut out necessary clearance holes for RAPID-SORB header. Slide header into the duct, position header and slide the dispersion tube hose cuffs or slip couplings over the header dispersion tube nipples.
2. Position the header so vertical dispersion tubes are perpendicular to duct and pitch the header to condensate drain. Secure header to the mounting bracket. Use escutcheon plates to secure header where it enters the duct.
3. Check that the dispersion tubes release steam perpendicular to the air flow. Secure tubes to the overhead channel. Secure the channel to the duct, position hose cuffs or slip couplings over tube and header tube nipples, and secure.

RAPID-SORB® ASSEMBLY AND INSTALLATION

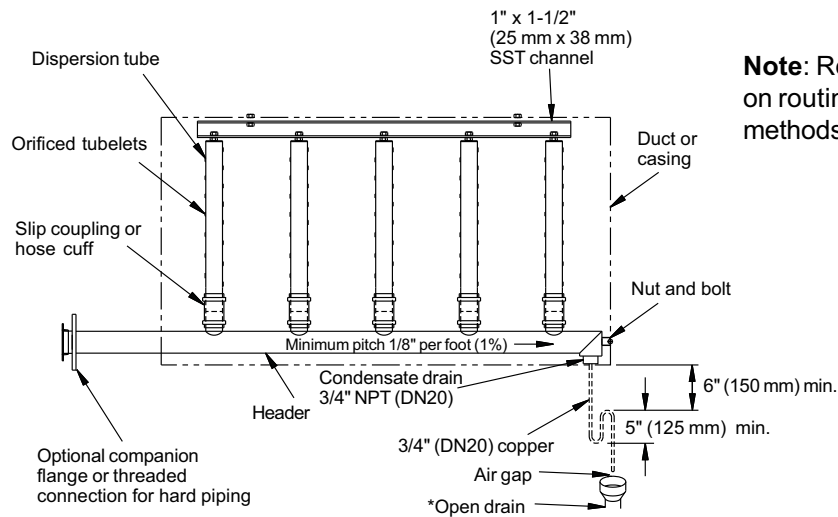
Horizontal duct installation (cont'd.)

b. For a header outside the duct (see figure below):

1. Position header under dispersion tubes, then slide hose cuffs or slip couplings over header dispersion tube nipples.
2. Position the header so dispersion tubes are perpendicular to duct and pitch the header to condensate drain. Secure dispersion tubes in place with the tube escutcheon plates provided.

3. Check the position of the tubes for steam release perpendicular to the air flow. Secure tubes to the overhead channel, and secure channel to the duct. With header pitched to condensate drain, slip hose cuffs or slip couplings over tube nipples and secure.
4. Connect a condensate drain to the header, provide the water trap as shown, and run to open drain, sized according to governing codes.
5. Attach the header steam supply connector to main header using the hose cuff and clamps provided, but do not secure.
6. Route the necessary number of vapor hoses or pipes from the humidifier tank, position connector to accept the hoses or pipes and secure.

RAPID-SORB unit: Header inside duct

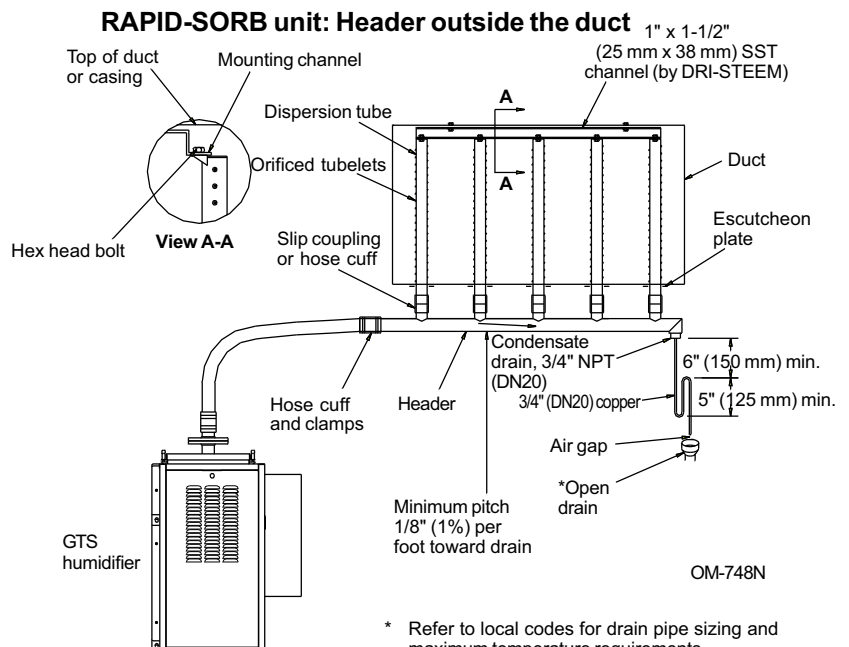


OM-101

* Refer to local codes for drain pipe sizing and maximum temperature requirements.

Note: Refer to Page 26 for vapor hose information on routing and for alternate vapor hose installation methods.

RAPID-SORB unit: Header outside the duct



OM-748N

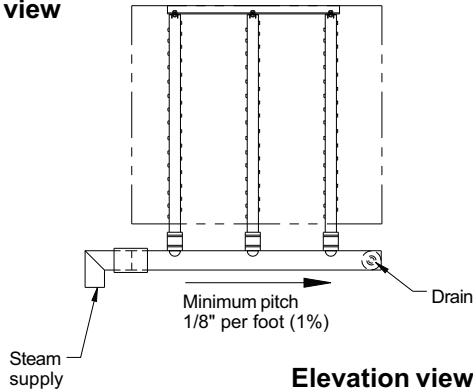
* Refer to local codes for drain pipe sizing and maximum temperature requirements.

RAPID-SORB® ASSEMBLY AND INSTALLATION

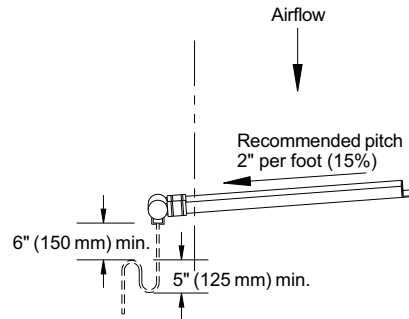
Vertical duct installation

Install the RAPID-SORB with dispersion tubes and header pitched to condensate drain as shown in the figures below. See “Horizontal duct installation” on the previous pages for additional information, as applicable.

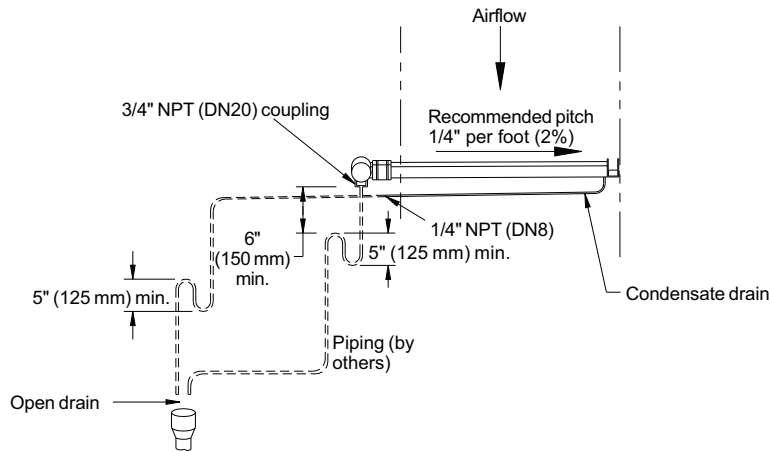
Top view



Elevation view, tube without drain



Elevation view, tube with drain



OM-700

Piping/hose sizing from the GTS® to a RAPID-SORB panel, and maximum steam carrying capacity*

Vapor hose				Copper or stainless steel tubing or Schedule 40 steel pipe			
Hose I.D.		10 feet (3 m)** developed length in feet**		Tubing O.D.		20 feet (6 m)** developed length in feet**	
in.	DN	lbs/hr	kg/hr	in.	DN	lbs/hr	kg/hr
1½	40	150	68	1½	40	140	64
2	50	250	113	2	50	210	95
--	--	--	--	3	80	410	186
--	--	--	--	4	100	700	318
--	--	--	--	5	125	1300	590
--	--	--	--	6	150	2100	953

* Based on total pressure drop in piping/hose of 5" wc (1.25 kPa).

** For developed length add 50% to measured length for pipe fittings. Note: To minimize loss of humidifier capacity and efficiency, the tubing/piping should be insulated.

ULTRA-SORB® INSTALLATION

For ULTRA-SORB installation, see the ULTRA-SORB Installation Instructions and Maintenance Operation manual.

GTS® AREA-TYPE HUMIDIFIER

AREA-TYPE humidifier application information

The operating characteristics of AREA-TYPE steam humidifiers should be considered when selecting humidifier capacities and choosing mounting locations.

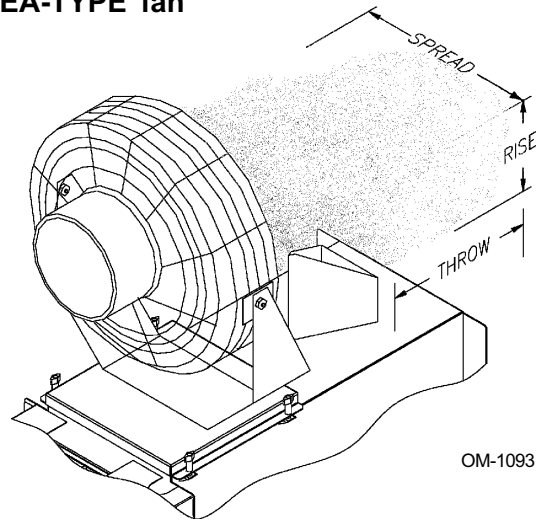
Steam discharge from the humidifier quickly cools and turns to visible, warm, microscopic drops or particles of water (fog), which are lighter than air.

Should this fog contact any solid surface (columns, beams, ceiling, pipes, etc.) before it disappears, it may collect and drip, as water.

The greater the space relative humidity, the higher and farther the fog will carry and rise in the space before disappearing.

The table below states the vertical (rise), width (spread) and horizontal (throw) dimensions that can be expected with AREA-TYPE humidifiers. To avoid steam impingement on surrounding areas, these dimensions should be observed.

AREA-TYPE fan



OM-1093

Notes:

- The AREA-TYPE fan and brackets are shipped separately and field installed on the GTS. After mounting the fan, terminate the wires as specified on the enclosed wiring diagram.
- The AREA-TYPE fan is not available on GTS-600 or GTS-800.

Minimum distance for rise, spread and throw

Space temp	Space RH		75 lbs/hr (34 kg/h)		150 lbs/hr (68 kg/h)		225 lbs/hr (102 kg/h)		300 lbs/hr (136 kg/h)	
			ft	m	ft	m	ft	m	ft	m
60 °F (16 °C)	30%	Rise	3	1	6	1.8	7	2.1	9	2.7
		Spread	3	1	5	1.5	7	2.1	9	2.7
		Throw	8	2.5	12	3.7	13	4.0	17	5.2
	40%	Rise	3	1	6	1.8	8	2.4	10	3
		Spread	3	1	5	1.5	7	2.1	10	3
		Throw	8	2.5	12	3.7	14	4.3	18	5.5
	50%	Rise	3	1	6	1.8	8	2.4	10	3
		Spread	4	1.2	5	1.5	7	2.1	10	3
		Throw	8	2.5	12	3.7	14	4.3	18	5.5
70 °F (21 °C)	30%	Rise	2	.6	4	1.2	5	1.5	7	2.1
		Spread	2	.6	4	1.2	5	1.5	7	2.1
		Throw	6	1.8	10	3	11	3.4	14	4.3
	40%	Rise	2	0.6	4	1.2	5	1.5	7	2.1
		Spread	2.5	0.8	4	1.2	5	1.5	7	2.1
		Throw	6	2	11	3.4	12	3.7	15	4.6
	50%	Rise	2	0.6	4	1.2	5	1.5	7	2.1
		Spread	2.5	0.8	4	1.2	5	1.5	7	2.1
		Throw	6	1.8	11	3.4	12	3.7	16	4.9

AREA-TYPE fan specifications

Motor 120V, 50/60 Hz

Blade diameter 18" (45.7 cm)

Speeds 3

Control Rotary switch

Item	High speed	Medium speed	Low speed
CFM	5350	4180	3010
M ³ /s	2.52	1.97	1.42
RPM	1600	1275	950
Amps	1.65	1.27	.95
Watts	194	148	110
dB A	67	58	49

START-UP AND OPERATION

Introduction

After the system has been properly installed and connected to gas, electrical, water supplies and controls, it may be started.

Start-up and checkout procedures

Mounting

Check mounting to see that unit is level and securely supported before filling with water.

Piping (gas)

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, water supply)

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 local codes and the enclosed GTS® wiring diagram.

Controls

Before proceeding with start-up and operation, 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-LOGIC₃ manual that was enclosed with the product shipment.

Do not place keypad in control cabinet due to electrical shock hazard. A bushing will be shipped loose to allow the VAPOR-LOGIC₃ keypad cable to easily and safely pass through the control cabinet.

Caution: Only qualified personnel should perform the start-up procedure.

Safety systems

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

- 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 gas valve will not pass any gas to the burner and will shut down the humidifier.
- During operation, the water level in the tank is monitored by a probe system for standard water units and by a low water float for DI/RO units. These water monitors tie into the microprocessor in the control cabinet. If the water level ever drops below a safe point, the humidifier is shut down.
- In standard water applications, the water level in the tank is also monitored by a redundant low-water system that runs independently of the microprocessor. This system is tied directly into the power source for the burners. If this system detects a low water condition, the humidifier is shut down.
- 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 will shut the humidifier down before an unsafe condition occurs.
- For standard water systems, an additional low water safety system exists. The microprocessor keeps track of approximately how much water has left the tank in the form of steam. If this total amount exceeds a preset limit without the fill valve being energized, a low water condition is assumed and the humidifier is shut down. Each time the fill valve is energized, the total amount is reset to zero. (This system is not implemented on a DI/RO humidifier because the float valve is not of the electric-solenoid type. On a DI/RO humidifier, a mechanical fill valve maintains the proper water level. This fill valve runs independently of the microprocessor. Therefore, there is no way to reset the steam total to zero as the tank fills.)
- First, 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 different from the demand speed, the GTS will not operate.

START-UP AND OPERATION

Start-up/commissioning check sheet for a GTS® with a VAPOR-LOGIC₃® controller

Visit date _____

Job site representation: _____

Model # _____

Serial # _____

Tag # _____

Job name _____

Program code _____

DRI-STEEM rep _____

Supply water

- DI
- RO
- Soft
- Potable

Grains hardness _____

- Hot
- Cold

Water pressure _____ psi

(must be between 25 and 90 psi

[172 and 620 kPa])

- Water supply piping is ¼" NPT minimum

Float adjustments (DI system)

Gas supply

- Natural
- LP

Manifold pressure _____ inches wc (_____ kPa)

Gas valve outlet pressure _____ inches wc (_____ kPa)

Supply shutoff valve distance _____

Supply line size _____

Flue piping

Class _____

Size _____

Rise _____

Run _____

- Slight pitch toward drip tee

- Termination point capped and covered

Power venter location _____

Barometric damper location _____

Required clearances

- Heat exchanger removal 36" (914 mm)
- Control cabinet 36" (914 mm)
- Top cover removal 18" (457 mm)
- Distance vent box to combustible 30" (762 mm)
- Cleanout plate area 36" (914 mm)

Wiring

- Control transmitter
Gauge _____
 - Shield
- High limit duct humidistat
Gauge _____
 - Shield
- Air flow proving switch
- Power vent
- 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

Rise _____

Run _____

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

More checklist on next page ...

MAINTENANCE

For high performance, and to minimize possible equipment failure, it is essential that periodic maintenance and inspections be performed on this appliance.

GTS® standard model only

Using softened water will significantly reduce mineral buildup in the humidifier. When softened water is not available, the GTS is designed to accommodate water hardness in one of two ways depending on the degree of hardness: For light to moderate hardness (up to 10 grains per gallon), using the surface water skim time feature with annual cleaning is recommended. For high mineral content water (above 10 grains per gallon), a periodic drain and flush through the motorized drain valve, in addition to the surface water skim time feature, is recommended. The frequency of cleaning will depend on water condition and evaporation load.

The humidifier and piping should be inspected for water and gas leaks at least annually. All safety devices in the control circuit should be cycled on and off to verify that they are functioning.

Makeup water piping - Use cold or hot makeup water. Even though the GTS has an internal 1" (25 mm) air gap, some local codes may require a vacuum breaker.

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

CAUTION: When performing maintenance on the GTS, always place the main electrical power disconnect switch in the off position and close manual water and gas valves.

Seasonally or as required

- **Clean evaporating chamber** - Remove the cleanout plate and dispose of any loose scale that has collected in the bottom of the tank. This should be done before the buildup reaches the underside of the heat exchanger.
- **Clean water level probes** - Disconnect the plug and cable assembly and unscrew the probe holder from the GTS unit. The scale will easily flake off from the sensing portion. The sensing portion (bottom 3/8" [10 mm]) of the probe should be brushed clean with stainless steel wool.
- **Clean low water cutout probe** - Remove the humidifier cover and inspect the probe rod for mineral accumulation. The rod is located on the top of the tank near the back. The probe should be brushed clean with stainless steel wool.

- **Clean skim overflow fitting** - Loosen deposits with a long tool, such as a screwdriver. Proper skimmer drainage should be verified by a weekly visual inspection. Water should drain from skimmer drain pipe after each fill cycle. (For cleaning piping, disconnect and flush out. If mineral deposits have restricted the flow, replace piping.)
- **Blower motor** - A lubrication port is not provided, therefore lubrication is not recommended.
- **Remove dust** - Using a vacuum, remove all dust from the areas around the motor, vent fan(s) and louvers that allow air to the shrouded area.

Off-season maintenance

After the humidification season, a complete inspection and cleaning of the probe control, skimmer, and water chamber is recommended. After cleaning, the unit should remain empty until humidification is required.

Adjusting the surface skim bleed-off quantity

The skim time determines the quantity of water skimmed with each fill cycle. The skim time is field adjustable using the microprocessor.

Each time the GTS refills, it fills to an elevation near the lip of the skim overflow fitting. A portion of the refill water then flows to drain carrying the minerals floating on the water with it. This reduces mineral concentration, thereby reducing the frequency of cleaning needed.

The heated water that flows to drain is a cost of operation. Cleaning the humidifier is also an operational cost. Therefore, it is recommended that the user observe and adjust the skimming quantity. By doing so, a balance between minimizing mineral buildup and conserving hot water can be achieved.

GTS-DI model only

The humidifier and piping should be inspected for water and gas leaks at least annually. Also, all safety devices in the control cabinet should be cycled on and off to verify that they are functioning.

Makeup water piping - Use cold or hot makeup water. Even though the GTS has an internal 1" (25 mm) air gap, some local codes may require a vacuum breaker.

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

Seasonally or as required

- **Cleaning evaporating chamber** - As long as mineral-free water is used in the GTS, no cleaning or flushing of the evaporating chamber should be necessary.

MAINTENANCE

GTS-DI model only (cont.)

- **Blower motor** - A lubrication port is not provided, therefore lubrication is not recommended.
- **Remove dust** - Using a vacuum, remove all dust from the areas around the motor, vent fan(s) and louvers that allow air to the shrouded area.

Off-season maintenance

After the humidification season, inspect floats and water chamber, drain and rinse.

Caution: Label all areas prior to disconnection when servicing controls. Wiring errors can cause improper and dangerous operation.

Both GTS® and GTS-DI models

Inspection recommendations:

- Inspect by user every 30 days.
- **Appliance system should be inspected once a year by a qualified service person.**

During inspection, verify the following:

- Proper field operation of burner. To verify, measure carbon monoxide (CO) level in the flue. If CO level is greater than 400 ppm, immediately shut down the GTS unit and consult the factory.
- Flue passageways external to the appliance, such as vent connector and chimney, are clear and free of obstructions.
- Vent connector is in place, sloping upward and is physically sound without holes or excessive corrosion.
- Physical support of the appliance is sound without sagging cracks or gaps between floor stand legs or tank flanges.
- There are no obvious signs of deterioration of the appliance.
- Burner flame is blue or orange in color - up to a ¼" (6 mm) from the surface of the burner.
- See "Cleaning water level probes" and "Cleaning low water cutout probe" on Page 32.

Inspecting the burner assemblies and heat exchanger tubes

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

- Turn off gas, electrical power, and water supply.
- Remove gas train shroud.
- Disconnect wiring to blowers, flame sensors, gas valves, and ignition controllers and remove burner assemblies (each assembly is mounted with four bolts).
- Remove vent box.
- Use a 6" (150 mm) flue brush with a 24" (600 mm) extension and reversible drill. Work brush in and out of

all combustion chambers. **Note:** Disconnecting components from one burner assembly at a time and then cleaning the corresponding combustion chamber and burner will ease reassembly.

- Remove loose deposits and residue that falls into rear header with a vacuum cleaner and hose extension.
- Inspect 2" (DN50) return tubes and clean if necessary.
- Run thin brush between turbulator and tube wall on all four sides.
- Reinstall burner assemblies and gaskets; vent box and gasket; all electrical wiring; gas train shroud; and pressure switch connections.

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

Burner maintenance

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 may result in reduced unit capacity or unacceptable CO levels in the flue. See burner maintenance instructions below.

Burner maintenance instructions

To service the burner system, clean both the blower and the burner. Remove the blower(s) from the system, and clean dust from the wheel. Remove the burner(s) for cleaning. Removing and cleaning one burner at a time will ease reassembly. Dislodge particulate matter from the burner surface matrix by using **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 since this tends to have a destructive effect to the burner surface. **WARNING: Personnel performing this maintenance should wear appropriate respiratory protection.** Allow particulate matter to fall from the burner through the air/gas inlet. A vacuum may be used at the burner's air/gas inlet to assist in removing the particulate matter.

Replacement parts

When servicing or repairing this equipment, use only DRI-STEEM approved service replacement parts. Complete replacement part lists are on Pages 50-58. Refer to the rating plate on the unit for complete unit model number, serial number and company address. Any substitution of parts or controls not approved by DRI-STEEM will be at owner's risk and will void the warranty.

TROUBLESHOOTING

When troubleshooting, check the VAPOR-LOGIC₃ Alarm Log first

The Alarm Log, accessed from the Main Menu of the VAPOR-LOGIC₃ keypad, contains a record of the previous 10 faults that have occurred on the humidifier. Once the user accesses the Alarm Log, alarms may be acknowledged, which may allow humidifier operation to continue, and/or alarms may be cleared to remove them from the Alarm Log. Pressing the Enter key while an alarm is highlighted will reveal the date and time the alarm occurred and a brief description of the fault shown.

While you will still probably need to review this troubleshooting guide to help you determine the source of a problem, the Alarm Log is a good place to start when diagnosing a problem.

The following is a list of Alarm Log faults. The bold headings next to the bullet points are what will appear on the VAPOR-LOGIC₃ screen.

Sensor faults

- **RH Trans Fault:** Humidity transmitter fault. The humidity sensor is incorrectly wired or defective.
- **DP Trans Fault:** Dew point transmitter fault. The dew point sensor is incorrectly wired or defective.
- **VAV Tran Fault:** VAV humidity transmitter fault. The duct humidity sensor is incorrectly wired or defective.
- **Temp Trans Flt:** Temperature compensation transmitter fault. The temperature compensation sensor is incorrectly wired or defective.

Fill and drain faults (standard water systems)

- **Fill Fault:** The fill valve has been energized for more than 40 minutes without the water reaching the top probe.
- **Drain Fault:** The drain valve has been energized for more than 20 minutes and water is still touching the bottom probe.
- **Fill Time Flt:** Low water timer fault. The unit has run too long without the fill valve opening.
- **LL Probe Fault:** Low-level probe fault. The water in the tank has reached the middle or upper probe without first reaching the lower probe.
- **ML Probe Fault:** Mid-level probe fault. The water in the tank has reached the upper probe without reaching the middle probe.
- **Probe Assy Flt:** Probe assembly fault. The system has detected the deterioration of the probe assembly to a point that replacement is necessary.

Humidifier faults

- **Tank Temp Flt:** Water temperature sensor fault. The temperature sensor on the humidifier tank is incorrectly wired or defective.
- **Thermal Trip:** Thermal trip fault. The tank temperature has exceeded 235 °F (113 °C).
- **Boil Time Flt:** Boil time fault. The water in the tank failed to boil within the maximum boil time.
- **EEPROM Fault:** The controller has detected a check sum fault in the EEPROM memory causing humidifier to not operate properly. Contact DRI-STEEM.
- **Flue Fault:** The air damper switch and/or the power vent pressure switch failed to close and, as a result, VAPOR-LOGIC₃ has shut down the humidifier.
- **Burner # Fault:** The burner failed to light after three ignition attempts.
- **Ignitor # fault:** The ignition module failed to energize the gas valve.
- **Blower # fault:** The blower was unable to reach the desired speed.
- **Slave # fault:** One of the humidifiers in a multiple tank system is not responding to communication requests.

Index to troubleshooting guide

The following is an index to the troubleshooting guide on the pages that follow:

Problem number	Problem	Page
1	Alarm light on keypad	37
2	System will not energize	37
3	Tank will not fill with water	38
4	Tank will not stop filling	39
5	Tank will not drain	40
6	Tank will not heat up	41
7	Reduced or no steam output (or low humidity) ..	42
8	Humidity is above desired level	44
9	Fluctuations in output or hunting	45
10	Noisy operation	47
11	Steam is coming from drain	47
12	Tank interior is dirty	48
13	Water leaks	49
14	Tank or cover is deformed	49
15	Humidifier appearance problems	49

TROUBLESHOOTING

Problem number	Problem	Possible cause	Action
1	Alarm light on VAPOR-LOGIC₃ keypad	The controller has identified a system malfunction.	<p>On the VAPOR-LOGIC₃ keypad, go to the Alarms screen from either the Idle screen or Main Menu to identify the fault. Refer to the "Fault messages, diagnostics" section of the VAPOR-LOGIC₃ manual.</p> <p>Go to the Diagnostics screen (accessible from the VAPOR-LOGIC₃ keypad's Main Menu) for more information.</p> <p>Refer to related problems listed in this troubleshooting guide.</p> <p>Acknowledge or clear the alarm on the keypad to resume operation.</p>
2	System will not energize. (The tank is quiet and no lights are on.)	Nonexistent power supply to the unit	<p>Check main-line fuse.</p> <p>Check main-line safety switch.</p> <p>Check main-line supply voltage.</p>
		Nonexistent control voltage	<p>Check for proper supply.</p> <p>Verify proper transformer voltage characteristics.</p> <p>Verify proper wiring of transformer.</p> <p>Check for control circuit voltage (24 VAC). If voltage is not present, check transformer circuit breaker. Reset if needed.</p>
		Field-installed external interlocks	<p>Verify proper operation of field-installed switch wiring for:</p> <ul style="list-style-type: none"> -- Cabinet door interlock -- Combustion air damper interlock -- Power venter interlock
		Incorrect field wiring	<p>Remove field wire connections and check supply voltages.</p>
		Faulty control board	<p>Remove all wires from the control board terminals except the 24 VAC power supply. If board will not power up, replace the control board.</p>
		Outdoor enclosure high or low temperature thermostat has been tripped.	<p>Reset and verify that the outdoor enclosure and its cooling fans are operating correctly.</p>

TROUBLESHOOTING

Problem number	Problem	Possible cause	Action
3	Tank will not fill with water.	No water supply through the fill valve	<p>Check if water supply line strainer is plugged.</p> <p>Check fill valve for sediment.</p> <p>Verify that manual water line shut-off valve is open and that pressure exists (minimum 25 psi [172 kPa], maximum 90 psi [621 kPa]).</p>
		Inlet water needle valve is closed or plugged	Check to make sure needle valve is open and/or free of sediment. Replace if needed.
		Malfunctioning fill valve	<p>Verify voltage to fill valve (24 VAC).</p> <p>Verify that valve stem moves freely.</p> <p>If "water hammer" exists, inspect fill valve for damage and replace if needed. Install a shock arrester.</p>
		Unit is not in Auto Mode.	Go to the Control Modes screen on keypad and select Auto Mode.
		Unit is in End of Season (EOS) drain mode	Go to the Set Up screen on the VAPOR-LOGIC ₃ keypad (accessed from the Main Menu screen) and review ADS (automatic drain sequence) screens and Inactivity until EOS screen. In End of Season (EOS) Mode, the tank will be empty and will not fill again until the controller senses that humidity has dropped below the defined set point.
		Malfunctioning level control system	<p>Check if probe head is fully plugged in. If needed, clean probe rod tips (standard water systems only).</p> <p>A foaming agent in the tank may be causing false probe readings (standard water systems only). Clean tank.</p> <p>A mineral-laden tank may be causing a violent boil, causing false probe readings (standard water systems only). Clean tank.</p> <p>Verify probe voltages (standard water systems only). To do this, go to the Diagnostics screen on the VAPOR-LOGIC₃ keypad (accessed from the Main Menu screen). Remove the probe plug and have all three legs of the probe plug come in contact with tank metal. In the probe diagnostic screens, high, mid and low probe voltages should show 0.0 VAC when the probe legs are touching metal. With the probe plug in contact with air only, the probe diagnostic screens should show 2.2 - 2.5 VAC.</p> <p>Verify that fill valve wiring is correct.</p> <p>Check date code on top of probe rod assembly (standard water systems only). If probe is more than three years old, replace probe.</p> <p>Verify that input signals are matched to the program code configuration string (refer to the Set Up screens accessed from the Main Menu), and that all control board outputs operate as per the program code configuration string. See the "Program code nomenclature" section of the VAPOR-LOGIC₃ manual.</p> <p>Run "Test" function using VAPOR-LOGIC₃ keypad.</p>

TROUBLESHOOTING

Problem number	Problem	Possible cause	Action
4	Tank will not stop filling (or fill valve cycles on and off frequently).	Drain valve is open.	<p>If unit has an automatic drain valve, it may be locked in the manual open position. Reset to auto.</p> <p>If tank has a manual drain valve, make sure it is closed.</p> <p>Clean or replace drain valve if there is an obstruction in the valve that will not allow complete closure.</p> <p>Replace drain valve if faulty.</p>
		Fill valve does not close (standard water systems and DI systems with end of season drain).	<p>Check if fill valve is plumbed backwards. Note valve inlet markings.</p> <p>Check internal spring or diaphragm in the fill valve. If faulty, replace valve.</p> <p>Check if there is an obstruction that will not allow valve to seat properly. Clean or replace valve as needed. Make sure there is a strainer in the water supply line.</p> <p>Check for control voltage across the fill valve coil. If control voltage is not present, replace valve (standard water systems only).</p> <p>If "water hammer" exists, inspect fill valve for damage and replace if needed. Install a shock arrester.</p> <p>Reduce water pressure to less than 90 psi (621 kPa).</p>
		Fill valve does not close (DI water systems).	<p>If there is water consistently overflowing, check float valve assembly. Adjust arm for shutoff 1/4" below the overflow port.</p> <p>Reduce water pressure to less than 90 psi (621 kPa).</p>
		Fill valve cycles on and off frequently (standard water systems).	Verify level control system (see below).
		Malfunctioning level control system	<p>Check if probe head is fully plugged in. If needed, clean probe rod tips (standard water systems only).</p> <p>Verify probe voltages (standard water systems only). To do this, go to the Diagnostics screen on the VAPOR-LOGIC₃ keypad (accessed from the Main Menu screen). Remove the probe plug and have all three legs of the probe plug come in contact with tank metal. In the probe diagnostic screens, high, mid and low probe voltages should show 0.0 VAC when the probe legs are touching metal. With the probe plug in contact with air only, the probe diagnostic screens should show 2.2 - 2.5 VAC.</p> <p>Verify that water conductivity is at least 100 micromhos per centimeter (2 grains per gallon). Or, add a handful of salt to the tank. If this solves the problem, consult DRI-STEEM for advice (standard water systems only).</p> <p>Verify that fill valve wiring is correct.</p> <p>Check date code on top of probe rod assembly. If probe is more than three years old, replace probe</p> <p>Verify that input signals are matched to the program code configuration string (refer to the Set Up screens accessed from the Main Menu), and that all control board outputs operate as per the program code configuration string. See the "Program code nomenclature" section of the VAPOR-LOGIC₃ manual.</p> <p>Run "Test" function using VAPOR-LOGIC₃ keypad.</p>

TROUBLESHOOTING

Problem number	Problem	Possible cause	Action
5	Tank will not drain.	Drain valve, outlet or drain lines are plugged with minerals.	Clean.
		Manual drain valve is closed.	Open valve.
		Electric drain valve malfunction	Check for 24 VAC across valve; if not present, replace valve. Verify that drain valve is wired correctly to the control system by checking the wiring diagram.
		Drain lines are backing up with water.	Check to make sure that drain line pitch is at least 1/4"/ft (2%) and that drain pipe is sized correctly. We recommend 1" NPT (DN25) drain piping for a single tank, and 1-1/4" NPT (DN 32) for multiple tanks. Due to increased friction, drain pipe lengths over 10 feet (3 m) will have reduced flow (especially with limited fall) requiring an increase in drain pipe size.
		Malfunctioning autodrain sequence	Go to Set Up screens (accessed from the Main Menu) and verify ADS (autodrain sequence) screens and Inactivity until EOS (end of season drain) screen. Run "Test" function using VAPOR-LOGIC ₃ keypad.
		No power to automatic drain valve	Verify voltage to drain valve (24 VAC). Verify that drain valve is wired correctly to the control system by checking the wiring diagram.

TROUBLESHOOTING

Problem number	Problem	Possible cause	Action
6	Tank will not heat up.	There is no water in the tank.	See Problem No. 3 in this troubleshooting guide.
		Tank fills continuously.	See Problem No. 4 in this troubleshooting guide.
		Control malfunction	Go to the Diagnostics screen on VAPOR-LOGIC ₃ keypad, (accessed from the Main Menu) and refer to the VAPOR-LOGIC ₃ manual for instructions.
		Auxiliary limit control malfunction	Verify proper operation of duct humidistats, air flow proving switches, etc. Reset, replace or calibrate as needed. Note: Air flow switch measures 24 VAC if open; on-off high limit measures 21 VDC if open.
		Burner(s) not operating	Verify that ignitor energizes. Verify gas supply pressure. With all burners running, at the inlet pressure tap of the combination gas control valve the recommended supply pressure is 7" wc (1.75 kPa) for natural or LP gas. The minimum supply pressure is 4" wc (1.0 kPa) for natural or LP gas. Burner assembly(s) and/or heat exchanger tubes may need cleaning. See maintenance section of this manual for cleaning instructions. Check for control voltage if limit controls (air flow proving switch, high limit, etc.) are not allowing unit to operate.
		Incorrect polarity or grounding of power wiring	Verify and correct if needed.
		System is not energized.	See Problem No. 2 in this troubleshooting guide.

TROUBLESHOOTING

Problem number	Problem	Possible cause	Action
7	Reduced or no steam output (or low humidity)	Controller has shut system down.	Go to the Diagnostics screen on the VAPOR-LOGIC ₃ keypad (accessed from the Main menu) and refer to the VAPOR-LOGIC ₃ manual for instructions. See also Problem No. 1 in this troubleshooting guide.
		System is not energized.	See Problem No. 2 in this troubleshooting guide.
		Malfunctioning control system	<p>Verify proper operation of duct humidistats, air flow proving switches, etc. Reset, replace or calibrate as needed. Note: Air flow switch measures 24 VAC if open; on-off high limit measures 21 VDC if open.</p> <p>Go to the Reports section on the VAPOR-LOGIC₃ keypad (accessed from the Main Menu) to verify demand signal.</p> <p>Verify that control signal wiring is correct.</p> <p>Verify that input signals are matched to the program code configuration string (found in one of the Set Up screens accessed from the Main Menu), and that all control board outputs operate as per the program code configuration string. See the "Program code nomenclature" section of the VAPOR-LOGIC₃ manual.</p>
		Burner(s) not operating properly	<p>Verify that ignitor energizes.</p> <p>Verify gas supply pressure. With all burners running, at the inlet pressure tap of the combination gas control valve the recommended supply pressure is 7" wc (1.75 kPa) for natural or LP gas. The minimum supply pressure is 4" wc (1.0 kPa) for natural or LP gas.</p> <p>Burner assembly(s) and/or heat exchanger tubes may need cleaning. See the maintenance section of this manual for cleaning instructions.</p> <p>Check control voltage if limit controls (air flow proving switch, high limit, etc.) are not allowing unit to operate.</p>
		Tank is producing steam, but it is not visible at the dispersion unit.	<p>Check burner operation. If operating correctly, system is producing steam that is probably not visible due to low relative humidity levels at start-up. As humidity level rises, steam will become visible. CAUTION: DO NOT COME INTO CONTACT WITH STEAM LINES OR STEAM DISCHARGE AREAS. Even though steam may not be visible at discharge, steam vapor is very hot (212 °F [100 °C]) and can cause burns.</p>
		Distance between tank and dispersion unit is too great.	<p>Check burner operation. If burners are operating correctly, the system may be losing energy in travel from the tank to the dispersion unit(s). If using more than one tank in your building, verify that tanks and dispersion units are matched as originally specified.</p>
	<i>More on next page.</i>		

TROUBLESHOOTING

Problem number	Problem	Possible cause	Action
7 (cont'd.)	Reduced or no steam output (or low humidity)	No or low-strength signal from humidistat, high limit humidity transmitter, or signal by others	<p>Check for proper wiring of controls per the wiring diagrams.</p> <p>Check humidity transmitter output (4-20 mA).</p> <p>Increase set point if set point is below actual environmental conditions.</p> <p>Consult DRI-STEEM regarding possible incompatibility between control signal and program.</p>
		Unit is undersized.	If unit is operating properly but fails to meet required output, replace with a larger unit or add an additional humidifier.
		Skimmer rate is set too high.	Reduce skim rate. See VAPOR-LOGIC ₃ manual for instructions.
		Drain valve is not closed.	<p>Go to Control Mode screen on VAPOR-LOGIC₃ keypad and verify the system is in Auto Mode, not Manual Drain.</p> <p>If unit has an automatic drain valve, it may be locked in the manual open position. Reset to automatic.</p> <p>If tank has a manual drain valve, make sure it is closed.</p> <p>Clean or replace drain valve if there is an obstruction in the valve that will not allow complete closure.</p> <p>Replace drain valve if faulty.</p>
		No water in p-trap	<p>If steam is going down the drain the p-trap may not have filled at start-up. To fill p-trap, increase skim time (standard water systems) or manually hold float valve open (DI water systems). Readjust skim time or float after p-trap fills.</p> <p>Excessive back pressure may have blown water out of p-trap. Possible causes of back pressure include high duct static pressure, undersized orifices in dispersion tubes, crushed vapor hose, or a low point in the steam line to the dispersion unit(s) that may be causing condensate to back up and block the steam line. Repair or replace as required.</p>
		Leaking gasket or vapor hose	Repair/replace as needed
		Controls are out of calibration.	Recalibrate controls.
		Tank fills continuously.	See Problem No. 4 in this troubleshooting guide.
HVAC system	Temperature and air changes affect relative humidity levels. Verify proper operation of fans, dampers, VAV systems, etc. Check to make sure there is not excessive exhausting of air or excessive cooling.		

TROUBLESHOOTING

Problem number	Problem	Possible cause	Action
8	Humidity is above desired level	Humidity control input type is different than what was originally specified.	Verify that input signals are matched to the program code configuration string (refer to the Set Up screens accessed from the Main Menu), and that all control board outputs operate as per the program code configuration string. See the "Program code nomenclature" section of the VAPOR-LOGIC ₃ manual.
		Improperly located humidistat or humidity transmitters	Replace poorly located sensing devices. See "Placement of sensing devices" in the VAPOR-LOGIC ₃ manual.
		Reduced air flow	Check fans, dampers, VAV systems, etc.
		High entering relative humidity	Dehumidify.
		RH offset adjustment	Recalibrate.
		Malfunctioning control system	<p>Verify proper operation of duct humidistats, air flow proving switches, etc. Reset, replace or calibrate as needed. Note: Air flow switch measures 24 VAC if open; on-off high limit measures 21 VDC if open.</p> <p>Go to the Reports section on the VAPOR-LOGIC₃ keypad (accessed from the Main Menu) to verify demand signal.</p> <p>Verify that control signal wiring is correct.</p> <p>Verify that input signals are matched to the program code configuration string (refer to the Set Up screens accessed from the Main Menu), and that all control board outputs operate as per the program code configuration string. See the "Program code nomenclature" section of the VAPOR-LOGIC₃ manual.</p> <p>Verify that all humidistats and transmitters are wired with shielded cable, with shield grounded at the control source end ONLY.</p>
		Unit oversized	Consult DRI-STEEM.

TROUBLESHOOTING

Problem number	Problem	Possible cause	Action																
9 (cont'd.)	Fluctuations in output (or "hunting")	Hunting	<p>"Hunting" describes cyclical humidity swings above and below the desired set point. Possible causes and actions include:</p> <table border="0" style="width: 100%;"> <thead> <tr> <th style="text-align: left;"><u>Cause</u></th> <th style="text-align: left;"><u>Action</u></th> </tr> </thead> <tbody> <tr> <td>Air temperature varying rapidly</td> <td>Stabilize air temperature to +/- 1°.</td> </tr> <tr> <td>Air volume varying rapidly</td> <td>Stabilize.</td> </tr> <tr> <td>Saturated air</td> <td>Move duct high limit farther downstream, or change set point.</td> </tr> <tr> <td>Signal by others not wired correctly</td> <td>Rewire.</td> </tr> <tr> <td>Wiring not properly shielded or grounded</td> <td>Verify that all humidistats and transmitters are wired with shielded cable, with shield grounded at the control source end ONLY.</td> </tr> <tr> <td>Electrical interference</td> <td>Route control wiring separately from high voltage wiring.</td> </tr> <tr> <td>Malfunctioning control system</td> <td>Verify operation of humidity controllers or transmitters. Repair or replace as needed. Verify RH set point and PID settings. Replace poorly located sensing devices. See "Placement of sensing devices" in the VAPOR-LOGIC₃ manual. Verify that correct control components are being used.</td> </tr> </tbody> </table>	<u>Cause</u>	<u>Action</u>	Air temperature varying rapidly	Stabilize air temperature to +/- 1°.	Air volume varying rapidly	Stabilize.	Saturated air	Move duct high limit farther downstream, or change set point.	Signal by others not wired correctly	Rewire.	Wiring not properly shielded or grounded	Verify that all humidistats and transmitters are wired with shielded cable, with shield grounded at the control source end ONLY.	Electrical interference	Route control wiring separately from high voltage wiring.	Malfunctioning control system	Verify operation of humidity controllers or transmitters. Repair or replace as needed. Verify RH set point and PID settings. Replace poorly located sensing devices. See "Placement of sensing devices" in the VAPOR-LOGIC ₃ manual. Verify that correct control components are being used.
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TROUBLESHOOTING

Problem number	Problem	Possible cause	Action
10	Noisy operation	"Thunder" type noise coming from tank during refill	This noise, normal on large capacity units, is caused by cold fill water collapsing steam in the tank. Try reducing inlet water supply pressure (minimum of 25 psi [172 kPa]); or adjust inlet needle valve for a slower fill rate.
		Fill valve noise	A clicking sound as the fill valve opens or closes, and a hissing sound during fill, are normal. A slamming sound as the fill valve closes, or a loud buzzing sound with the power off, may indicate "water hammer" and can be minimized by installing a shock arrester, or by reducing supply water pressure (minimum water pressure is 25 psi [172 kPa]). A loud buzzing sound may also indicate poor alignment of the fill valve stem. Replace valve.
		Noise coming from blower of Area-Type fan unit	Verify that fan shroud is properly aligned.
		Noise coming from burner blowers	Check for foreign material in blower wheel and clean assembly if needed. See the maintenance section of this manual for burner assembly cleaning instructions.
11	Steam is coming from drain	Flash steam	During skim cycles it is normal to see small puffs of flash steam at the drain. Flash steam is vapor that appears when 212 °F (100 °C) water runs into a drain and evaporates.
		Incorrectly installed vapor hose or hard pipe to dispersion unit	If more than one tank or dispersion unit is in the building, verify that each tank, vapor hose/pipe and dispersion unit are matched as originally specified. For example, a large tank mismatched with a small hose will cause steam backup. Make sure that vapor hose/pipe is pitched correctly. See the dispersion unit piping instructions in this manual. Remove any low spots in vapor hose by reducing hose run length or by supporting properly.
		Tank is foaming	Tank may be foaming due to improperly rinsed cleaning agents, contamination of water during installation, or because water has a high mineral content. Drain, clean and flush tank, then refill.
		No water in p-trap	If steam is going down the drain the p-trap may not have filled at start-up. To fill p-trap, increase skim time (standard water systems) or manually hold float valve open (DI water systems). Readjust skim time or float after p-trap fills. Excessive back pressure may have blown water out of p-trap. Possible causes of back pressure include high duct static pressure, undersized orifices in dispersion tubes, crushed vapor hose, or a low point in the steam line to the dispersion unit(s) that may be causing condensate to back up and block the steam line. Repair or replace as required.

TROUBLESHOOTING

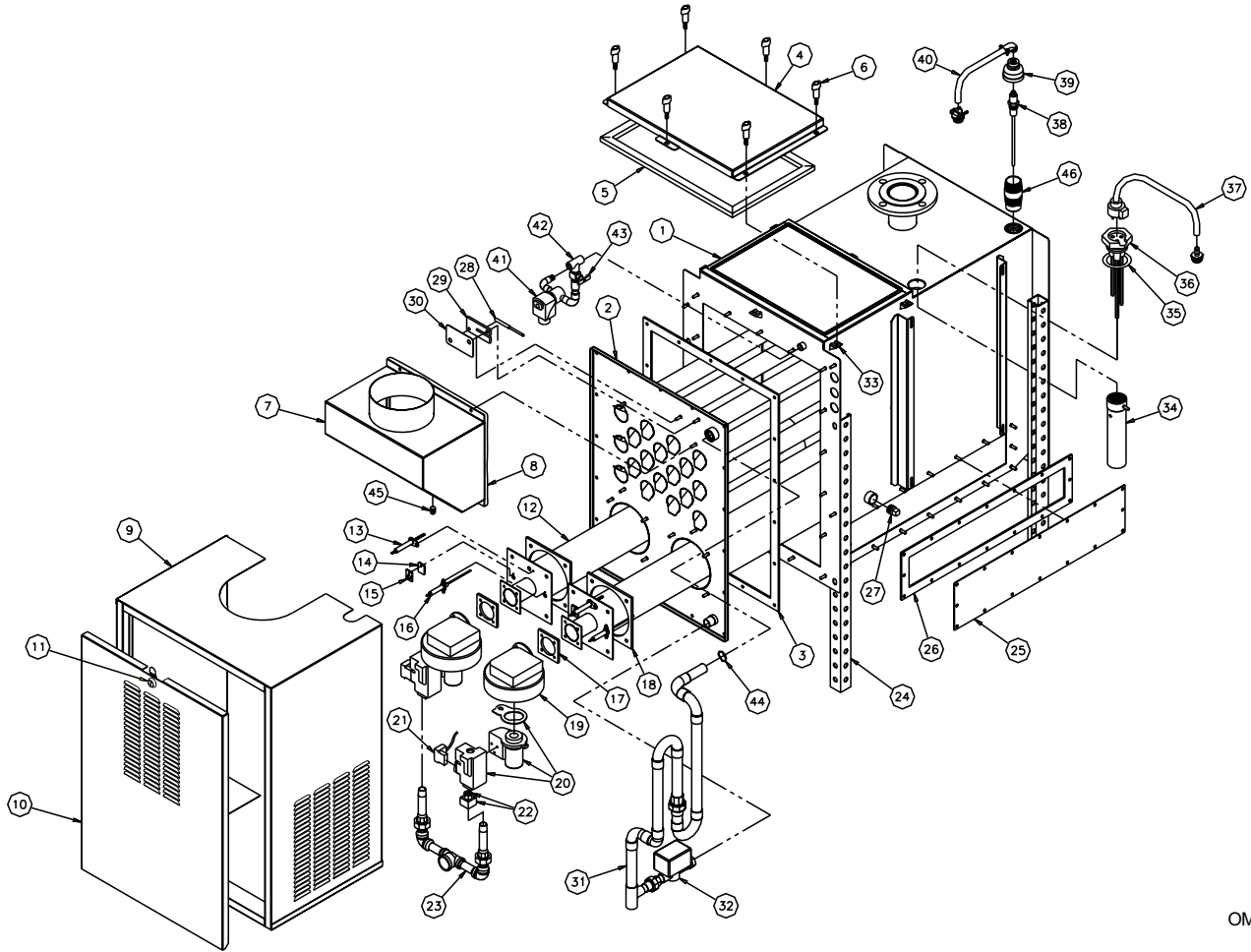
Problem number	Problem	Possible cause	Action
12	Tank interior is dirty.	Inadequate maintenance	<p>Water type and usage will determine how often you need to clean your humidifier tank(s). The best way to determine how often your particular system will need cleaning is to remove the cover and inspect it after its first three months of duty, and then inspect it regularly thereafter. A hard water system with a high humidity demand will require cleaning more often than a system with low demand using softened water. Systems using DI/RO water will need little or no cleaning because of the low mineral content of the water.</p> <p>Increasing skim time and decreasing the drain/flush interval will help maintain a cleaner tank. See the VAPOR-LOGIC₃ manual for instructions on how to change these settings.</p>
		High mineral content in water (over 10 grains per gallon)	<p>Use softened makeup water.</p> <p>Increase skim rate; adjust drain and flush frequency intervals and duration. These settings will vary depending on the mineral content of your water. See the VAPOR-LOGIC₃ manual for instructions on how to change these settings.</p>

TROUBLESHOOTING

Problem number	Problem	Possible cause	Action
13	Water leaks	Leak in solder joint or fitting	Reapair/replace fitting or joint.
		Cover gasket leaks	Tighten thumb screws on cover gasket. Make sure gasket is seated properly. Replace gasket if worn or crimped.
		Hole in tank wall	If using DI/RO water, you may have a high chloride content in your water (usually due to improperly maintained DI/RO processing equipment). Consult DRI-STEEM.
		Water leaking from burner blower	Find source of water, correct problem, drain water from burner blower, and replace blower and gas valve. Possible sources of water include a leak in the heat exchanger, moisture from incorrectly adjusted burner operation, or water present in gas supply.
14	Tank or cover is deformed	Steam supply piping is not properly supported	Refer to design drawings for locations of elbows or swing arms. Provide support from structure where needed. Replace cover if permanently deformed.
15	Humidifier appearance problem	A leaking cover gasket has caused sagging or discolored tank insulation	Reseat or replace cover gasket and replace insulation.
		A leaking cover gasket or cleanout plate gasket has caused mineral streaking on exterior tank walls	Reseat or replace cover gasket and/or cleanout plate gasket.

REPLACEMENT PARTS

Standard GTS® replacement parts



OM-1098

Notes

- Two-burner unit is shown above.
- Parts are consistent across all models.
- See tables on next page for parts listing.

REPLACEMENT PARTS

Standard GTS® replacement parts (see illustration on previous page)

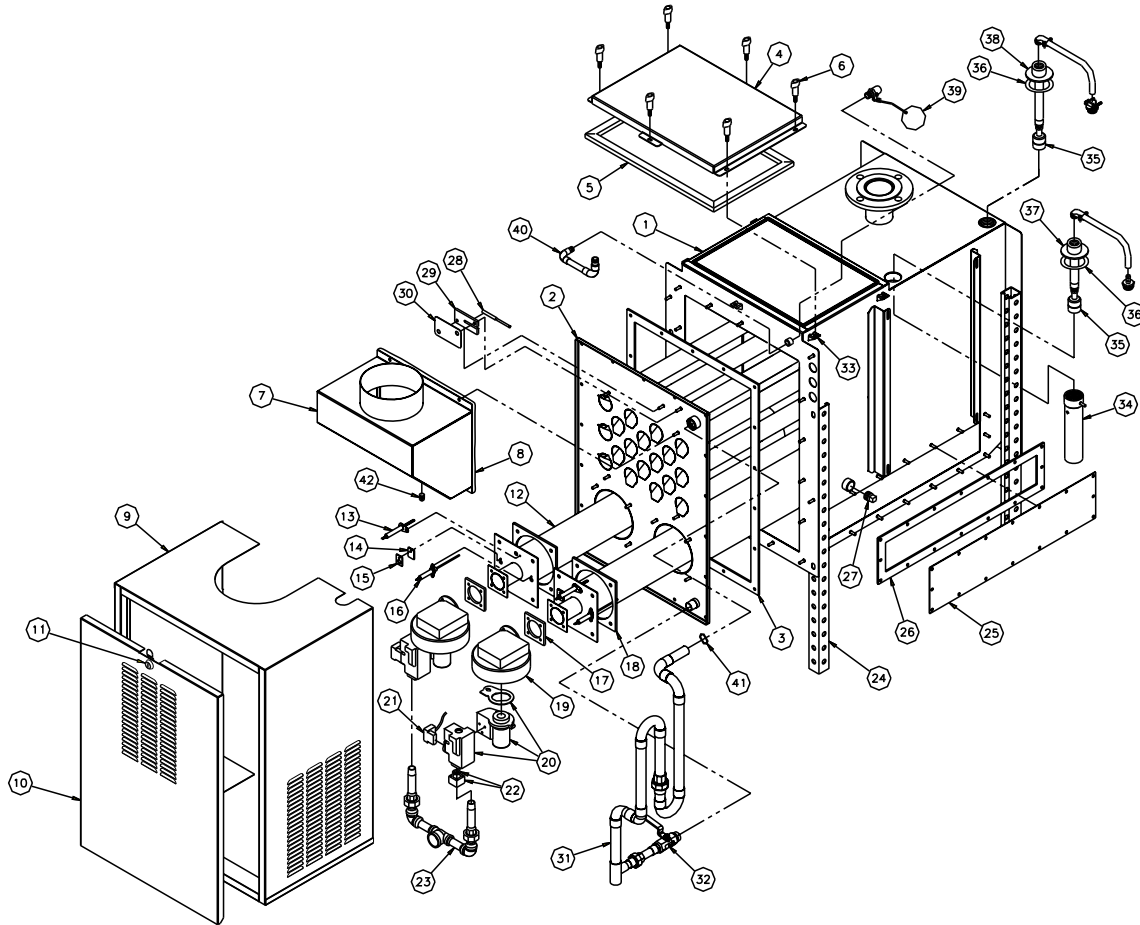
ITEM	DESCRIPTION	PART NUMBER
1	Tank	168000-TAB
2	Heat exchanger	168001-TAB
3	Gasket, heat exchanger	308230-TAB
4	Cover	167742-TAB
5	Gasket, cover	308230-TAB
6	Cover knob	700725
7	Flue box	168005-TAB
8	Silicone, high temp	320001
9	Shroud	168008-TAB
10	Shroud door	128622-TAB
11	Door lock with key	700700
12	200K burner	405788-002
13	Ignitor	405715
14	Sight glass	405720
15	Bracket, sight glass	128661
16	Flame rod	405725
17	Gasket, blower mounting	308230-007
18	Gasket, burner mountng	308230-006
19	Blower	405800-TAB
20	Gas valve/venturi	405800-007
21	Cable, gas valve	405800-010
22	Flange, gas valve	405800-009
23	Gas manifold (two-burner)	*

ITEM	DESCRIPTION	PART NUMBER
24	Leg, floor stand	405800-013
25	Clean out plate	165479
26	Gasket, clean out plate	308230-005
27	Plug, 3/4" SST	250192-075
28	Temperature sensor	405760
29	Insulation, temp sensor	308230-008
30	Mounting plate, temp sensor	128666
31	Drain assembly	*
32	Valve, electric drain	505400-001
33	Nut retainer clip	700650
34	Probe housing	165301-001
35	Gasket, probe assembly	309750-004
36	Probe assembly	406280
37	Probe plug assembly	406050-004
38	Sensor, redundant low water	405726-001
39	Bell reducer, 1-1/2" x 1/2"	205930-002
40	Cable assembly, redundant low water	*
41	Valve, solenoid fill	505084
42	Strainer, 1/4" brass sediment	30050
43	Needle valve, 1/4" NPT brass	505070-001
44	O-ring, 1-1/8"	300400-010
45	Plug, 1/4" NPT stainless steel	250650-001
46	Adaptor weld	168010-001

* These items are an assembly of multiple parts. Contact DRI-STEEM customer service to order.
 TAB = Refer to your specific model number for correct part.

REPLACEMENT PARTS

GTS®-DI replacement parts



OM-1099

Notes

- Two-burner unit is shown above.
- Parts are consistent across all models.
- See tables on next page for parts listing.

REPLACEMENT PARTS

GTS®-DI replacement parts (see figure on previous page)

ITEM	DESCRIPTION	PART NO.
1	Tank	168000-TAB
2	Heat exchanger	168001-TAB
3	Gasket, heat exchanger	308230-TAB
4	Cover	167742-TAB
5	Gasket, cover	308230-TAB
6	Cover, knob	700725
7	Flue box	168005-TAB
8	Silicone, high temp	320001
9	Shroud	168008-TAB
10	Shroud door	128622-TAB
11	Door lock with key	700700
12	200K burner	405788-002
13	Ignitor	405715
14	Sight glass	405720
15	Bracket, sight glass	128661
16	Flame rod	405725
17	Gasket, blower mounting	308230-007
18	Gasket, burner mounting	308230-006
19	Blower	405800-TAB
20	Gas valve/venturi	405800-007
21	Cable, gas valve	405800-010
22	Flange, gas valve	405800-009

ITEM	DESCRIPTION	PART NO.
23	Gas manifold (two-burner)	*
24	Leg, floor stand	405800-013
25	Clean out plate	165479
26	Gasket, clean out plate	308230-005
27	Plug, 3/4" SST	250192-075
28	Temperature sensor	405760
29	Insulation, temp sensor	308230-008
30	Mounting plate, temp sensor	128666
31	Drain assembly	*
	Drain assembly, end of season**	*
32	Valve, manual drain	505000-001
	Actuator assy, Belimo 24V	193768-001
33	Nut retainer clip	700650
34	Probe housing	165301-001
35	Float switch, 1/8" NPT	408420-002
36	Gasket, float switch	309750-004
37	Tube weld, low water	167789
38	Tube weld, redundant float	167789-001
39	Float valve	505320
40	Fill assy, DI	*
	Fill assy, DI, end of season**	*
41	O-ring, 1-1/8"	300400-010
42	Plug, 1/4" NPT stainless steel	250650-001

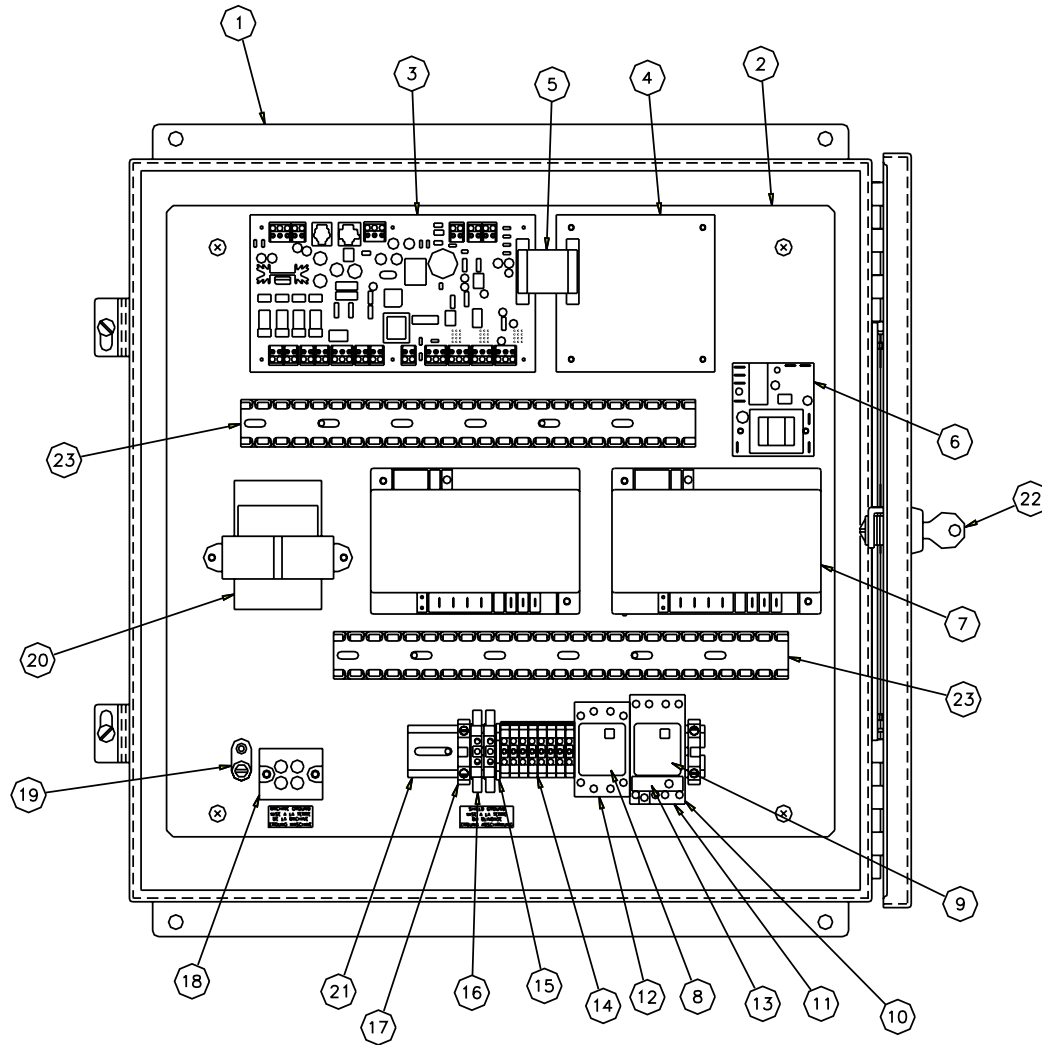
* These items are an assembly of multiple parts. Contact DRI-STEEM customer service to order.

** End of season drain option only.

TAB = Refer to your specific model number for correct part.

REPLACEMENT PARTS

GTS® electrical replacement parts for GTS 100-400 models



OM-2017

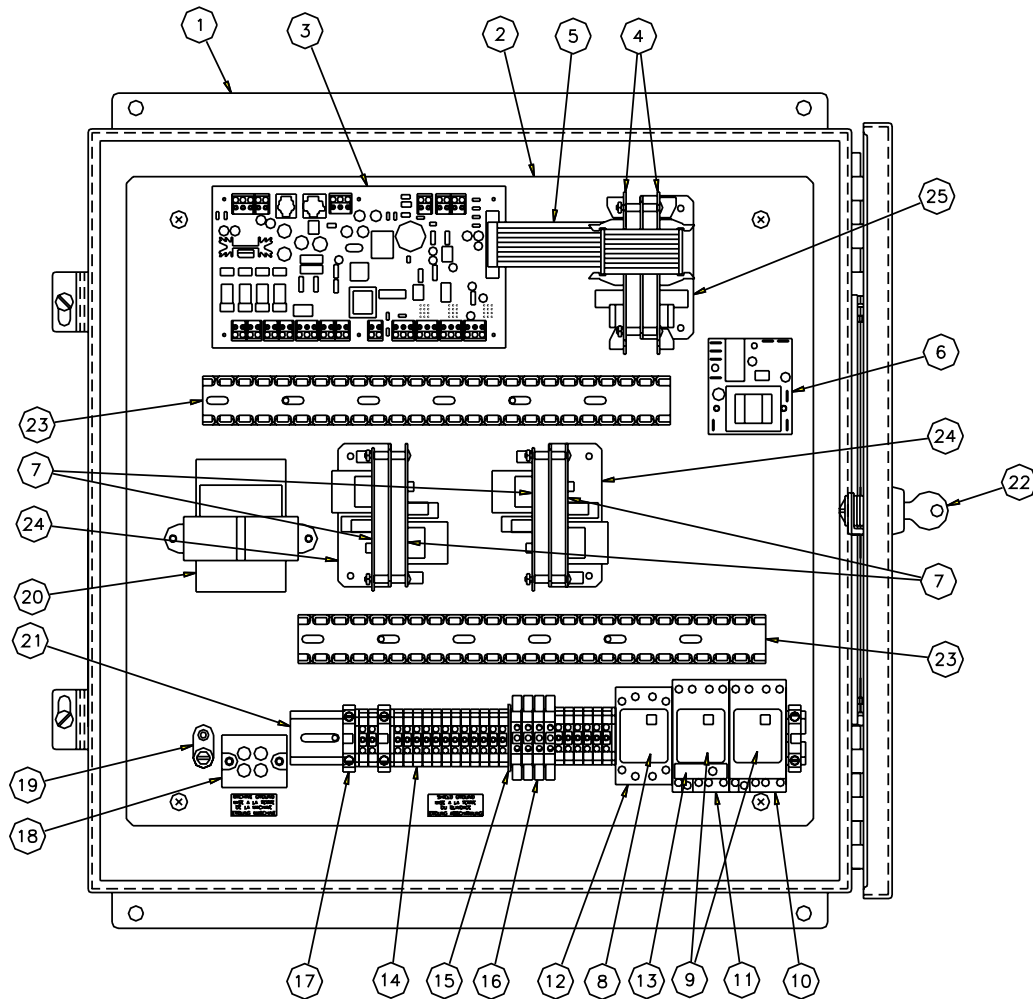
ITEM	DESCRIPTION	PART NO.
1	Control cabinet, 20X20X7	407100-007
2	Subpanel, VAPOR-LOGIC3	165722-004
3	Main board, VAPOR-LOGIC3	408490-001
4	GTS expansion board, VAPOR-LOGIC3	408490-004
5	Ribbon cable, GTS expansion board	408490-016
6	Control, low level cut-out**	405726
7	Ignition control, 120 VAC	405800-006
8	Relay, 24V DPDT	407900-016
9	Relay, 24V 3PDT (GTS 300-400)	407900-017
10	Relay socket, 3PDT without time delay** (GTS 300-400)	407900-009
	Relay socket, DPDT with time delay* (GTS 100-200)	407900-010
11	Relay socket, 3PDT with time delay* (GTS 300-400)	407900-008
12	Relay socket, DPDT without time delay	407900-011

ITEM	DESCRIPTION	PART NO.
13	Time delay*	407900-018
14	Terminal, 20AMP DIN rail	408252-001
15	End cap, DIN rail	408252-005
16	Terminal, ground	408252-010
17	End bracket, DIN rail	408252-006
18	Terminal block, 2-pole	408300-001
19	Ground lug	409250-017
20	Transformer, 120V Pri, 24V Sec, 75 VA	408965-001
21	DIN rail, 10.75" long	167765-0107
22	Door lock with key	700700
	Wire channel, 12" long	408999-001
23	Wire channel cover	408999-002

* DI water models only
 ** Standard water models only

REPLACEMENT PARTS

GTS® electrical replacement parts for GTS 600-800 models



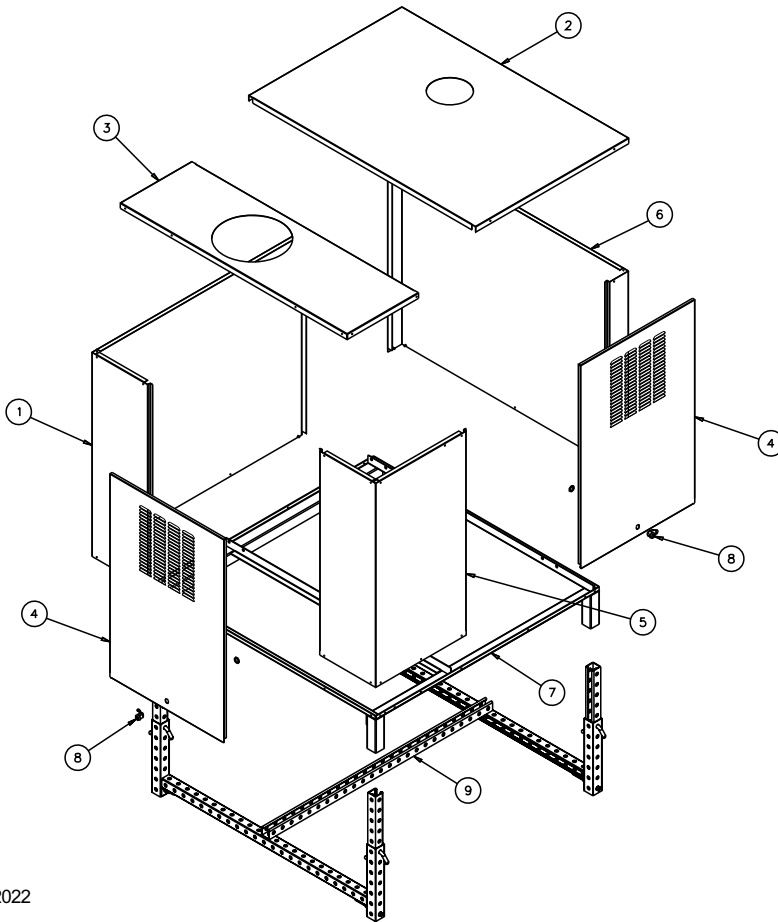
OM-2017A

ITEM	DESCRIPTION	PART NO.
1	Control cabinet, 20x20x7	407100-007
2	Subpanel, VAPOR-LOGIC3	165722-004
3	Main board, VAPOR-LOGIC3	408490-001
4	GTS expansion board, VAPOR-LOGIC3	408490-004
5	Ribbon cable, GTS expansion board	408490-016
6	Control, low level cut-out**	405726
7	Ignition control, 120 VAC	405800-006
8	Relay, 24V DPDT	407900-016
9	Relay, 24V 3PDT (GTS-800**, GTS 600-800*)	407900-017
10	Relay socket, 3PDT without time delay (GTS-800)	407900-009
11	Relay socket, 3PDT with time delay*	407900-008
12	Relay socket, DPDT without time delay	407900-011
13	Time delay*	407900-018
14	Terminal, 20AMP DIN rail	408252-001

ITEM	DESCRIPTION	PART NO.
15	End cap, DIN rail	408252-005
16	Terminal, ground	408252-010
17	End bracket, DIN rail	408252-006
18	Terminal block, 2-pole	408300-001
19	Ground lug	409250-017
20	Transformer, 120V Pri, 24V Sec, 75 VA	408965-001
21	DIN rail, 13.5" long	167765-0135
22	Door lock with key	700700
23	Wire channel, 12" long	408999-003
	Wire channel cover	408999-002
24	Bracket, ignition control	165611-001
25	Bracket, expansion board	165611-002
* DI water models only		
** Standard water models only		

REPLACEMENT PARTS

GTS® indoor enclosure replacement parts



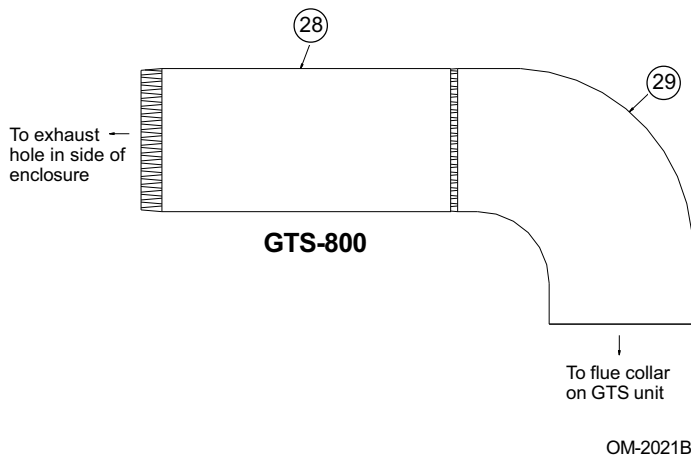
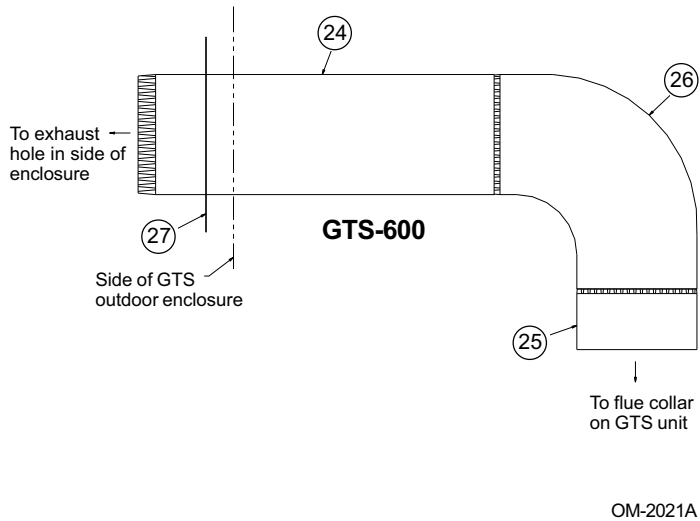
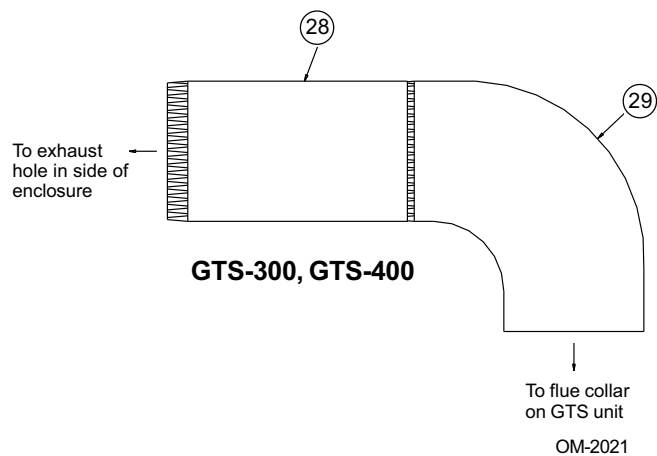
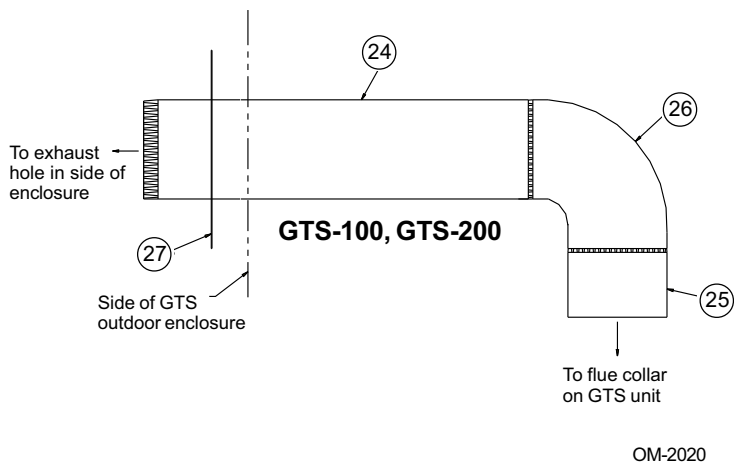
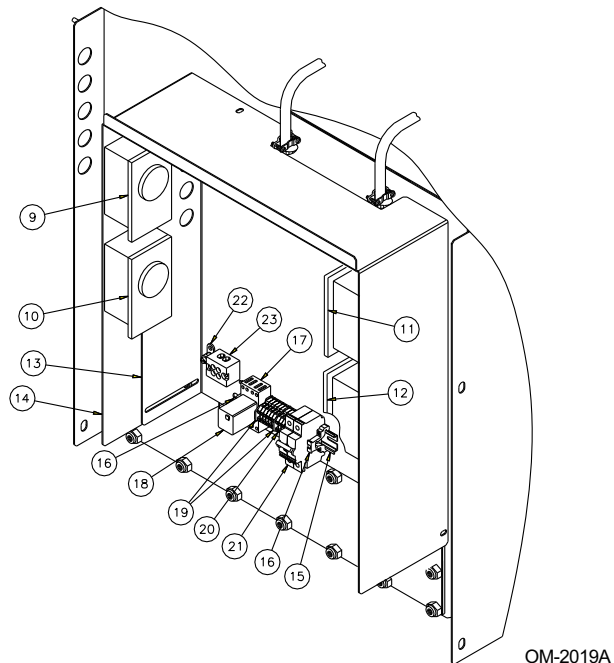
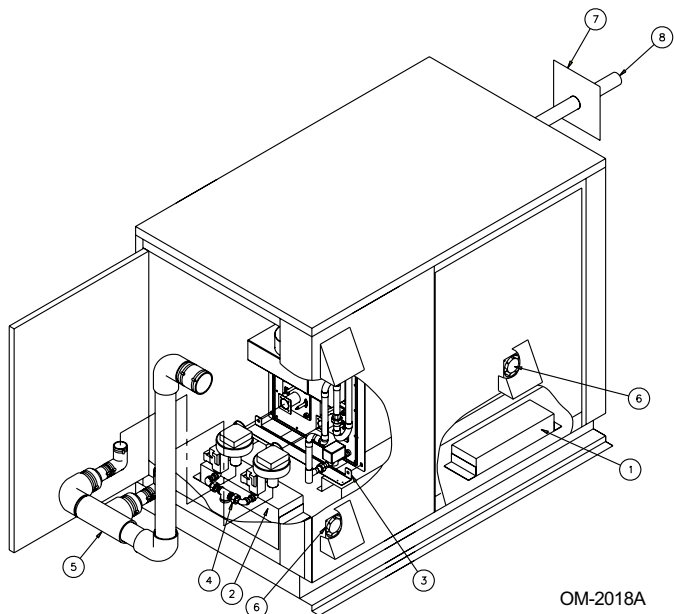
OM-2022

ITEM	DESCRIPTION	GTS-100, GTS-200, GTS-300, GTS-400 PART NUMBER	GTS-600, GTS-800 PART NUMBER
1	Side wrap	165702-006	165703-006
2	Access cover	165702-002	165703-002
3	Flue top	165702-003	165703-003
4	Door	165702-004	165702-004
5	Corner wrap	165702-005	165703-005
6	Back wrap	165702-001	165703-001
7	Base	165511-001	165511-002
8	Door lock with key	700700	700700
9	Leg assembly (optional)	*	*

* These items are an assembly of multiple parts.
Contact DRI-STEEM customer service to order.

REPLACEMENT PARTS

GTS® outdoor enclosure replacement parts



Note: See table on next page for parts listing.

REPLACEMENT PARTS

GTS® outdoor enclosure replacement parts (refer to illustrations on previous page)

ITEM	DESCRIPTION	PART NO.
1	Heater, 500 watt finned (GTS 100-400)	405800-052
	Heater, 1100 watt finned (GTS 600-800)	405800-053
2	Heater, 1100 watt finned	405800-053
3	Mounting bracket	165024-TAB
4	Blower/gas valve assembly	*
5	Sealed combustion assembly	*
6	Fan, ventilation	405800-068
7	Steam plate, 12" x 12"	165052-TAB
8	Steam outlet	*
9	Thermostat, low limit	405800-066
10	Thermostat, ventilation fan	405800-055
11	Thermostat, high limit	405800-065
12	Thermostat, heater	405800-060
13	Subpanel, GTS enclosure	165722-007
14	Sealing box, GTS enclosure	165722-008
15	DIN rail, 8" long	167765-008
16	End bracket, DIN rail	408252-006
17	Relay socket, DPDT without time delay	407900-011
18	Relay, 120V DPDT	407900-012
19	End cap, DIN rail	408252-005
20	Terminal, 20 Amp DIN rail	408252-001
21	Circuit breaker	406775-005
22	Ground lug	409250-017
23	Terminal block, 2-pole	408300-001
24	Vent pipe, 5" dia x 14" long** (GTS 100-200)	405800-056
	Vent pipe, 8" dia x 24" long** (GTS 600)	405800-073
25	Vent pipe, 5" dia x 4" long** (GTS 100-200)	405800-056
	Vent pipe, 8" dia x 4" long** (GTS 600)	405800-073
26	Elbow, 5" dia vent (GTS 100-200)	405800-058
	Elbow, 8" dia vent (GTS 600)	405800-074
27	Flue plate (GTS 100-200)	165620-010
	Flue plate (GTS 600)	165620-011
28	Vent pipe, 7" dia x 12" long** (GTS 300-400)	165800-057
	Vent pipe, 10" dia x 22" long** (GTS 800)	405800-075
29	Elbow, 7" dia vent (GTS 300-400)	405800-059
	Elbow, 10" dia vent (GTS 800)	405800-076

* These items are an assembly of multiple parts. Consult DRI-STEEM customer service to order.

** Specify the length listed in the description when ordering.

TAB Refer to your specific model number for correct part.

FOR YOUR SAFETY READ BEFORE OPERATING

! WARNING



If you do not follow these instructions exactly, a fire or explosion may result causing property damage, personal injury or loss of life.

- 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.
- B. **BEFORE OPERATING** smell all around the appliance area for gas. Be sure to smell next to the floor because some gas is heavier than air and will settle on the floor.

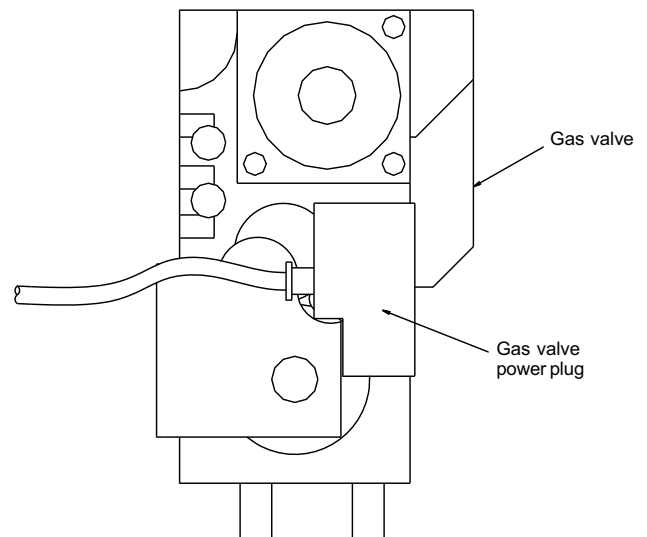
FOR YOUR SAFETY “WHAT TO DO IF YOU SMELL GAS”

- 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 a neighbor’s phone. Follow the gas supplier’s instructions.
 - If you cannot reach your gas supplier, call the fire department.
- 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.

OPERATING INSTRUCTIONS

1. **STOP!** Read the safety information above.
2. Set the humidistat to lowest setting.
3. Turn off all electric power to the appliance.
4. This appliance is equipped with an ignition device that automatically lights the burner. Do not try to light the burner by hand.
5. Remove control access panel.
6. Unplug the black power plug on the gas valve.
7. Wait five (5) minutes to clear out any gas. If you then smell gas, **STOP!** Follow “B” in the safety information above. If you don’t smell gas, go to the next step.
8. Plug the black power plug back into the gas valve.
9. Replace control access panel.
10. Turn on all electric power to the appliance.
11. Set humidistat to desired setting.
12. If the appliance will not operate, follow the instructions “To Turn Off Gas To Appliance” and call your service technician or gas supplier.



TO TURN OFF GAS TO APPLIANCE

1. Set the humidistat to lowest setting.
2. Turn off all electric power to the appliance if service is to be performed.
3. Remove control access panel.
4. Unplug the black power plug on the gas valve.
5. Replace control access panel.

TWO-YEAR LIMITED WARRANTY

DRI-STEEM Humidifier Company ("DRI-STEEM") 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 DRI-STEEM ships such product, whichever date is the earlier.

If any DRI-STEEM product is found to be defective in material or workmanship during the applicable warranty period, DRI-STEEM'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 DRI-STEEM's election. DRI-STEEM shall not be liable for any costs or expenses, whether direct or indirect, associated with the installation, removal or reinstallation of any defective product.

DRI-STEEM's limited warranty shall not be effective or actionable unless there is compliance with all installation and operating instructions furnished by DRI-STEEM, or if the products have been modified or altered without the written consent of DRI-STEEM, or if such products have been subject to accident, misuse, mishandling, tampering, negligence or improper maintenance. Any warranty claim must be submitted to DRI-STEEM in writing within the stated warranty period.

DRI-STEEM's limited warranty is made in lieu of, and DRI-STEEM 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.

DRI-STEEM 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 DRI-STEEM has notice of the possibility of such damages.

By purchasing DRI-STEEM's products, the purchaser agrees to the terms and conditions of this limited warranty.

DRI-STEEM[®]
HUMIDIFIER COMPANY

14949 Technology Drive • Eden Prairie, MN 55344
Phone: (952) 949-2415 • Fax: (952) 229-3200
E-Mail: sales@dristeem.com • Web: www.dristeem.com



Continuous product improvement is a policy of DRI-STEEM Humidifier Company therefore, product features and specifications are subject to change without notice.

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