STEAM DISTRIBUTOR PIPES

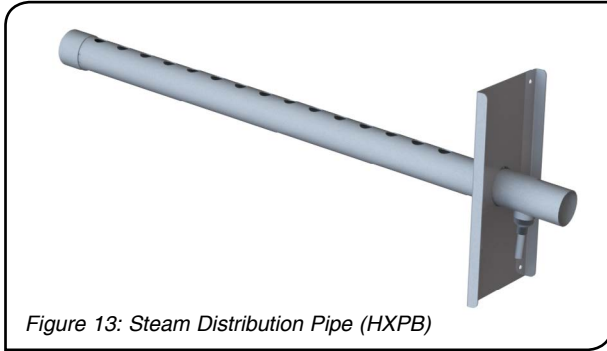*Figure 13: Steam Distribution Pipe (HXPB)*
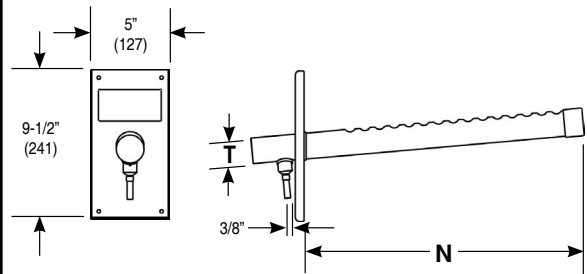
Distributor Pipes for Models: HTA, HSA, HTD, HSD

PIPE	N	T
HXPBB012S	11-13/16 (300mm)	7/8
HXPBB018S	17-13/16 (452mm)	7/8
HXPBB024S	23-13/16 (605mm)	7/8
HXPBB030S	29-13/16 (757mm)	7/8
HXPBB036S	35-13/16 (910mm)	7/8

PIPE	Minimum** N	Maximum** N	T
HXPBB040S	35 (889mm)	38 (965mm)	7/8
HXPBB044S	39 (991mm)	42 (1067mm)	7/8
HXPBB048S	43 (1092mm)	46 (1168mm)	7/8
HXPBB052S	47 (1194mm)	50 (1270mm)	7/8
HXPBB056S	51 (1295mm)	54 (1372mm)	7/8
HXPBB060S	55 (1397mm)	58 (1473mm)	7/8
HXPBB064S	59 (1499mm)	62 (1575mm)	7/8
HXPBB068S	63 (1600mm)	66 (1676mm)	7/8
HXPBB072S	67 (1702mm)	70 (1778mm)	7/8
HXPBB076S	71 (1803mm)	74 (1880mm)	7/8
HXPBB080S	75 (1905mm)	78 (1981mm)	7/8
HXPBB084S	79 (2007mm)	82 (2083mm)	7/8
HXPBB088S	83 (2108mm)	86 (2184mm)	7/8
HXPBB092S	87 (2210mm)	90 (2286mm)	7/8
HXPBB096S	91 (2311mm)	94 (2388mm)	7/8
HXPBB100S	95 (2413mm)	98 (2489mm)	7/8
HXPBB104S	99 (2515mm)	102 (2591mm)	7/8
HXPBB108S	103 (2616mm)	106 (2692mm)	7/8
HXPBB112S	107 (2718mm)	110 (2794mm)	7/8
HXPBB116S	111 (2819mm)	114 (2896mm)	7/8
HXPBB120S	115 (2921mm)	118 (2997mm)	7/8

**See Note A
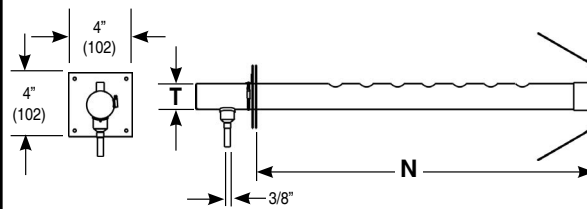
Lengths 012-036

Lengths 048-120

Figure 14

Distributor Pipes for Models: H_GJ, H_HJ

PIPE	N	T
HXPBC012S	11-13/16 (300mm)	1-5/8
HXPBC018S	17-13/16 (452mm)	1-5/8
HXPBC024S	23-13/16 (605mm)	1-5/8
HXPBC030S	29-13/16 (757mm)	1-5/8
HXPBC036S	35-13/16 (910mm)	1-5/8

PIPE	Minimum** N	Maximum** N	T
HXPBC048S	43 (1092mm)	46 (1168mm)	1-5/8
HXPBC060S	55 (1397mm)	58 (1473mm)	1-5/8
HXPBC072S	67 (1702mm)	70 (1778mm)	1-5/8
HXPBC084S	79 (2007mm)	82 (2083mm)	1-5/8
HXPBC096S	91 (2311mm)	94 (2388mm)	1-5/8
HXPBC108S	103 (2616mm)	106 (2692mm)	1-5/8
HXPBC120S	115 (2921mm)	118 (2997mm)	1-5/8

**NOTE A

The mounting plate on these pipes is adjustable to compensate for slight variations in ductwork dimensions. The "N" dimension is shown at both maximum and minimum depending on position of mounting plate. A mounting strap is provided on the end of the pipe to secure to the top or side of the duct for support.

MATERIAL

Standard distributor pipes are fabricated from stainless steel.

Humidifiers

Fan Distribution Units

Fan distribution units are available for use in areas which do not have duct systems or where duct air temperatures are too low to provide sufficient humidification. For example, in computer areas the desired relative humidity may not be possible in the conditioned space without causing condensation in the duct.

Figure 15: Remote Fan Unit

Table 10: *Blower Package Match List*

Humidifier Model	Nominal Steam Output Rate	Remote Mounted Fan Unit Model
H_AJ	005, 010	HXBJB (1 Req'd)
H_DJ	020, 030	HXBJB (1 Req'd)
H_GJ	030, 040, 050, 060, 080, 100	HXBJC (1 Req'd)

NOTE: *Blower Package not available on dual cylinder units (units over 100 lbs.)*

Figure 16: Mounted Fan Unit

Fan distribution units must be mounted securely on a level and plumb surface at least 3 feet below the ceiling for a Model HXBJB and at least 4 feet below the ceiling for a Model HXBJC to prevent steam condensing on the ceiling surface. Allow 20 feet in front of the HXBJB and 30 feet in front of the HXBJC for the steam to be absorbed into the air. <u>Do not mount the units above any items that would be damaged if a water leak were to develop</u>.

▼ OPTIONS

STANDARD MOUNTING: Factory attached to humidifier.

OPTION: Mounted remote from humidifier.

FAN VOLTAGE: 3 fans attached, 12 volt from humidifier

NOTE: *Selected control humidifiers (HXHAA-ON/OFF, HXHCG/Proportional, or HXHAM), whether mounted or remote units, will be mounted external to fan distribution boxes for more consistent and accurate operation. Field wiring, by others, will need to be done for both mounted and remote units. (Note wiring diagram on door of fan distribution unit.)*
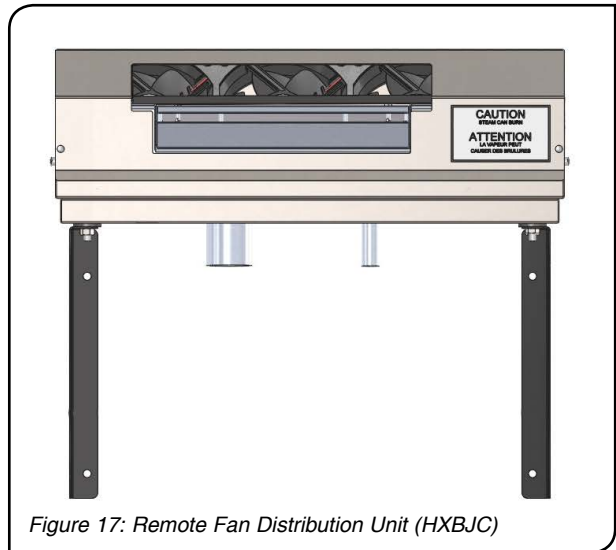

Figure 17: Remote Fan Distribution Unit (HXBJC)

Wall Humidistat, Proportional Control

The Model HXHAM is a wall-mounted, microprocessor-controlled humidistat solution for humidity control. The HXHAM employs a backlit LCD module, which displays both the ambient temperature and humidity of the surrounding air. The embedded software allows user navigation between temperature/humidity viewing mode, setpoint adjustment mode, and outdoor temperature/humidity viewing mode. An optional outdoor temperature compensation sensor can be added (HXHAMT).
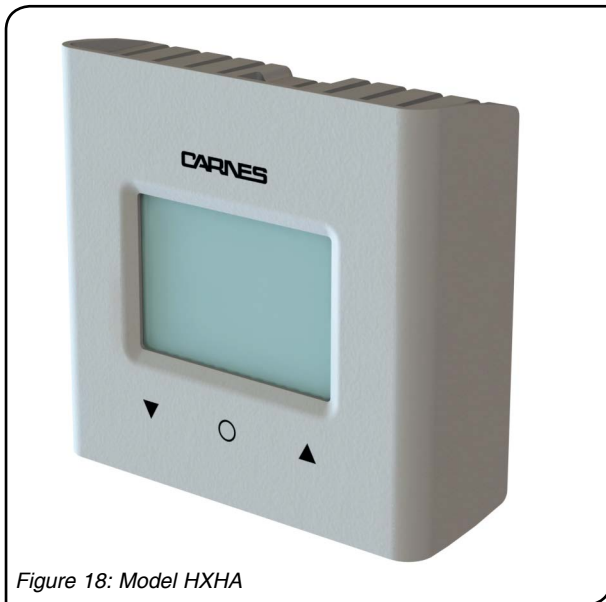

Figure 18: Model HXHA

Humidistat (Carnes Model HXHAW, HXHAWT, HX-HAS, HXHAST)

- **Humidistat:** A humidistat is the industry standard humidity controller. It functions by sending an analog (0-10VDC, 4-20mA) or an on/off demand signal directly to the input of a humidifier. A humidistat calculates the demand output by measuring the difference between actual relative humidity and the desired humidity setpoint selected by the user.

- If on-off mode is used, the humidifier will generate steam at the max output rate and cycle on or off as necessary to satisfy the conditioned area requirements. All humidifiers are preset at the factory for the maximum rating of the unit. The maximum output may be easily reset to a lower limit between 20-100% in the settings menu of the touchscreen.

- If proportional mode is used the humidifier will automatically vary the steam output rate in the range of 20-100% of the humidifier's maximum output (set by the user) in response to the 0-10V signal from the humidistat. However, the output of the humidifier will not drop below 20% of the preset nominal output of the humidifier set at the factory. Proportional control provides less cycling of the humidifier.

- A wall humidistat or duct mounted humidistat in the return air needs to be used. The wall mounted humidistat is the most common as it allows the

setting to be easily changed to accommodate for changing requirements or to lower the level of relative humidity in the space to prevent condensation on windows during extremely cold weather. In applications where it may be desirable to prevent the occupants of a space from changing the setting, a duct mounted humidistat in the return may be used. This is normally mounted in the equipment room or in the duct.

- **Humidity Sensor:** A humidity sensor is a device which only measures relative humidity, and does not allow a user to control the desired conditions. Carnes commercial humidifiers have the ability to operate using a standalone humidity sensor, so long as it can send a 0-10VDC or 4-20mA signal corresponding to 0-100% relative humidity. The humidifier unit needs to be reconfigured before operating in this mode, as each Carnes humidifier is shipped with a standard humidistat as the default control method to serve the industry standard. Humidifiers which use standalone sensors must have their relative humidity setpoint programmed into the unit itself, and the controller calculates a demand internally. The main advantage of this style of control is the ability to use extra features inside the humidifier. Additional features include password protected settings, graphical status indicators, and scheduling functions of the humidifier. The scheduling function allows the user to choose certain desired humidity levels for a given timeslot. Another feature of this style of control is that the humidifier can then communicate the measured humidity level over external communication to a Building Management System.

- **Control Humidistat / Temperature Compensated**: The HXHAWT or HXHAST can be used if your application has a requirement for an outdoor temperature compensation feature. Both controls will provide monitoring of RH percentage and outdoor temperature, along with automatically adjusting the RH setpoint as outdoor temperatures change. The HXHAWT or HXHAST provides a 0-10V signal in either a proportional or on-off configuration. See *Figure 18*.

High Limit Humidistat (Model HXHAD)

The high limit humidistat functions similarly to the standard control humidistat. However, it is always mounted in a duct and has a higher setpoint than the primary controller. The high limit humidistat is used as an interlock to prevent excess condensation building up in the duct or conditioned space. The duct mounted sensor must be a minimum of 10 feet downstream of the steam distribution pipe. The high limit humidistat is installed 10 feet downstream from the distribution pipe and is normally set to 90-95% RH. The high limit humidistat opens the circuit if the humidity level in the duct exceeds the setpoint. Use of this device is recommended particularly when the humidifier is used in applications where cooling air is being humidified or where a VAV system may throttle back to a point where air flow is insufficient to absorb the steam being introduced. Either an on-off or proportional control high limit humidistat may be used with Carnes humidifiers. If a proportional humidistat is used the output of the humidifier will automatically be decreased to reduce the possibility of condensation. Two proportional humidistats may be used to control Carnes humidifiers if desired. One humidistat is in the area to be humidified or return duct and another humidistat is used as a high limit in the supply duct. The humidifier will automatically select the lowest signal to control the humidifier output.
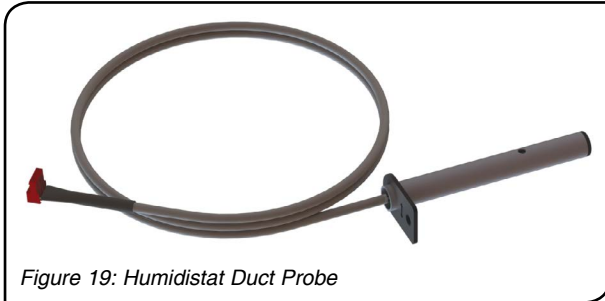

Figure 19: Humidistat Duct Probe

Figure 20: Model HXAAE

Air Flow Switch, Pressure Differential Type

Air flow in the duct may be sensed by using this differential pressure switch. The differential in pressure between the interior of the duct closes a switch when air is moving. Air pressure differential as low as .07 w.g. may be sensed with this switch.

Environment:

    Ambient Temperature Limits,

        Shipping -40 to 140°F (-40 to 60°C).

        Operating 35 to 140°F (0 to 60°C).

    Humidity, 5 to 95% RH, non-condensing.

    Locations, NEMA Type 1 indoor only.

Mounting: In vertical position on any surface free of vibration
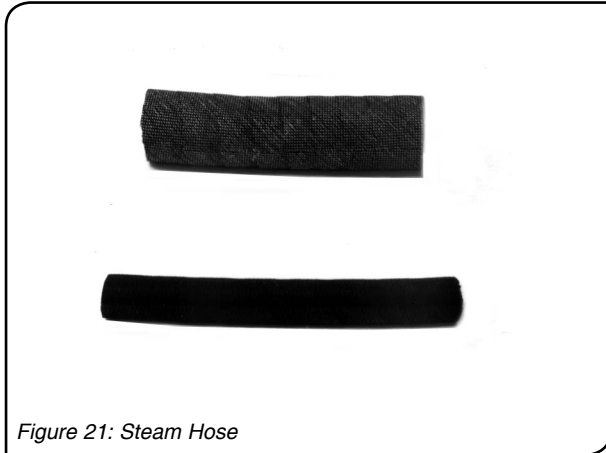
STEAM HOSE

Figure 21: Steam Hose

Carnes steam hose is made from EPDM compound to withstand the low pressure steam without deterioration. Model HXSAB steam hose has an I. D. of 7/8" for use with units that use "AX" or "B" steam cylinders. Model HXSAC has an I. D. of 1-5/8" for use with units that use "C" cylinders. The hose may be easily cut to the exact length at time of installation.
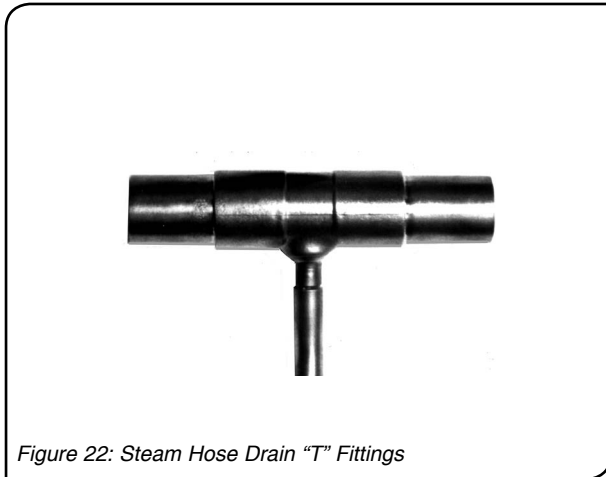
STEAM HOSE DRAIN "T" FITTINGS

Figure 22: Steam Hose Drain "T" Fittings

Steam hose drain "T" are available for use when the duct is located below the top of the humidifier or where the length of steam hose is in excess of 12 feet.

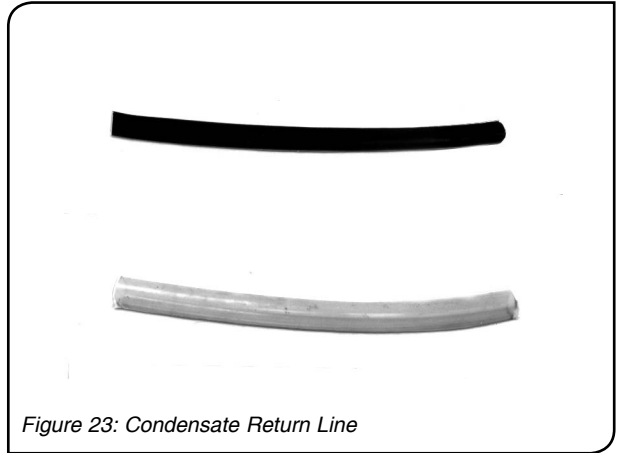| Humidifier Model	Drain "T" Model	Dimensions
HBA, HCA, HSA, HTA HBD, HCD, HSD, HTD	HXTABB	7/8"x7/8"x3/8"
HBG, HCG, HSG, HTG HBH, HCH, HSH, HTH	HXTACB	1-5/8"x1-5/8"x3/8"

CONDENSATE RETURN LINE

Figure 23: Condensate Return Line

Two models of condensate return line are available. Model HXRA has an I. D. of 3/8" and is used whenever steam distributor pipes are used with the humidifier. Model HXLA has an I. D. of 5/8" and is used with optional fan distribution units.
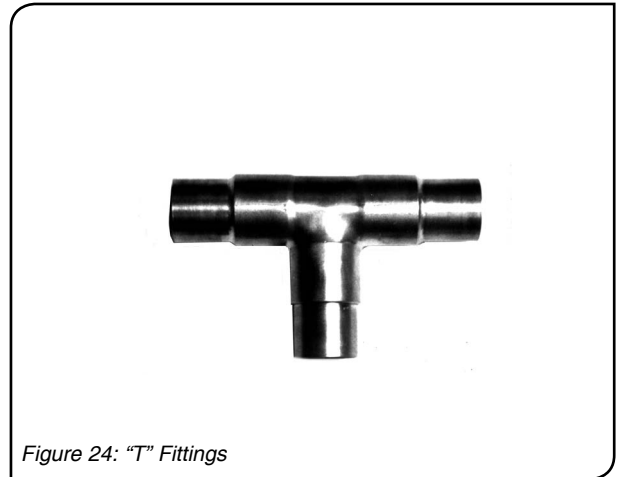
"T" FITTINGS

Figure 24: "T" Fittings

In some applications it may be desirable to have the steam generator cylinder feed two steam distributor pipes. "T" fittings can be installed in the steam hose and condensate return line.

STEAM HOSE "T" FITTINGS

Humidifier Model	Drain "T" Model	Dimensions
HBA, HCA, HSA, HTA HBD, HCD, HSD, HTD	HXTABA	7/8"x7/8"x7/8"
HBG, HCG, HSG, HTG HBH, HCH, HSH, HTH	HXTACA	1-5/8"x1-5/8"x1-5/8"

CONDENSATE HOSE "T" FITTINGS

Humidifier Model	Drain "T" Model	Dimensions
ALL	HXTAD	3/8"x3/8"x3/8"

DRAIN WATER PUMP

Figure 25: Drain Water Pump

Model HXWA

The HXWA is a drain water pump for mounting directly under the humidifier cabinet. This pump is ideal for an application where the building drain is remotely located or is at a higher elevation than the humidifier drain connection. This unit operates on a float principle which automatically starts the pump when the reservoir ins 3/4 full of water.
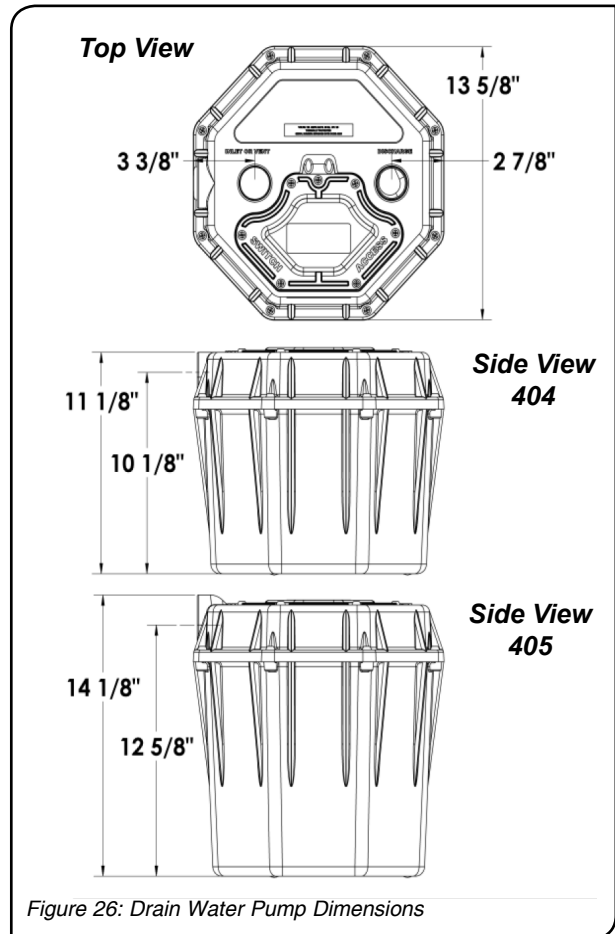

Top View

13 5/8"

3 3/8"

2 7/8"

Side View 404

11 1/8"

10 1/8"

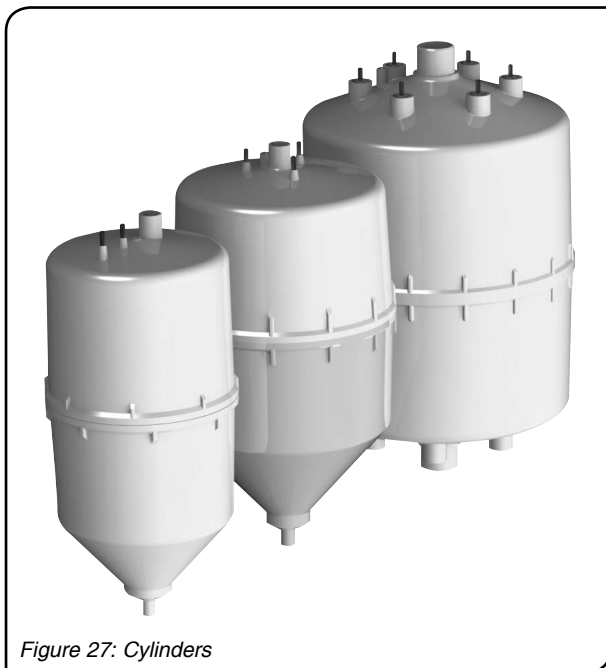**Side View 405**

14 1/8"

12 5/8"

Figure 26: Drain Water Pump Dimensions

Figure 27: Cylinders

Models Available		
HXCBAX145	HXCBB381	HXCBC6F
HXCBAX220	HXCBB500	HXCBC6X
HXCBAX380	HXCBB600	HXCBC61
HXCBAX500	HXCBB700	HXCCC62
HXCBAX600		HXCBC63
HXCBAX700		HXCBC64
		HXCBC65
		HXCBC12