

# READ AND SAVE THESE INSTRUCTIONS

# CARNES®

## STEAM MANIFOLD MODEL HXMA INSTALLATION INSTRUCTIONS

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### LOCATION OF MANIFOLD

The manifold is usually located in the supply duct downstream of the fan, heating coil, cooling coil, and/or filter. When installed in packaged units, the manifold is to be mounted just downstream of the fan discharge where there is even flow throughout the duct. The unit must be mounted the minimum distance calculated in the catalog upstream of any obstruction to prevent condensation.

The non-wetting dimension is the distance necessary to prevent condensation on any obstruction downstream from the manifold that is the same temperature as the air. Condensation could occur on a cooling coil because of lower temperatures. Steam plumes may be visible beyond the non-wetting dimension and may moisten high efficiency filters. Additional distance is required for installation upstream of high efficiency filters.

Absorption is also dependent on uniform air flow across the steam manifold. Uneven flow will result in greater absorption distances.

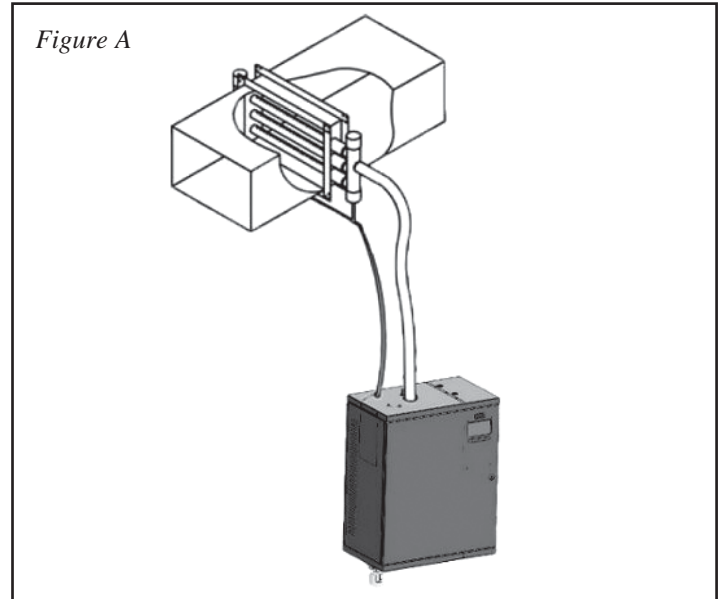
Carnes humidifiers operate at 1/2 psi or less so there are limitations on the maximum length of hose or piping that may be used between the humidifier cabinet and the steam manifold. The maximum distance depends on the static pressure in the duct and the losses in the piping between the humidifier and manifold and is shown in Table 1.

Table 1 **MAXIMUM STEAM HOSE LENGTH**

Duct Static Pressure "w.g."	0	1	2	3	4	5
Maximum Steam Hose Length (Ft.)	40	35	30	25	15	10

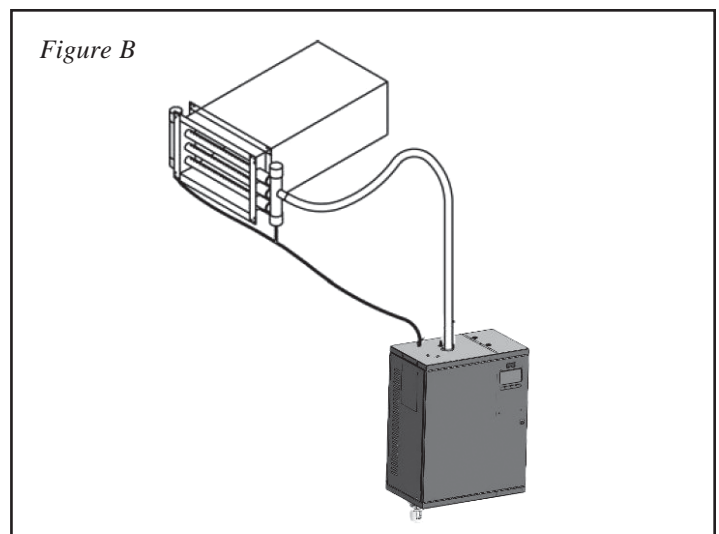
In a typical installation, the humidifier is located below the duct and the steam manifold is installed as shown in Figure A. In this installation any condensation in the manifold is returned through a condensate return line to the humidifier for maximum efficiency. The maximum recommended length of steam hose for this type of installation is 12 feet.

Figure A

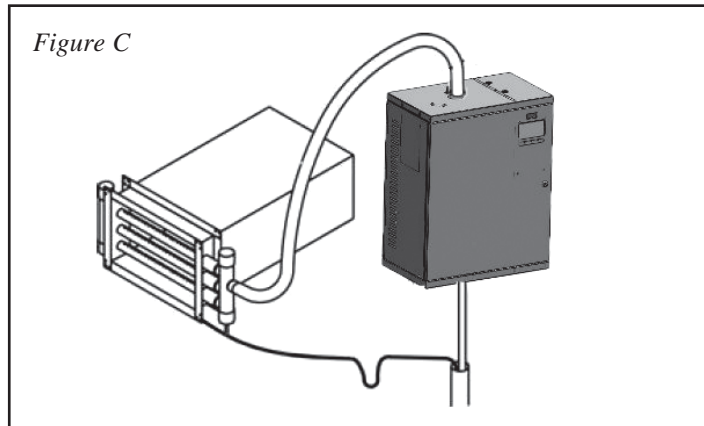


For lengths beyond 12 feet additional steps shown in Figure B are recommended so that condensate will drain from the steam manifold. It is preferable to have the steam hose rise vertically from the humidifier and then slope downward to the manifold. Steam flow will assist moving condensate toward the return line rather than opposing condensate flow back toward the cylinder if the hose is running with only a small upward rise. If sufficient headroom is not available, it is possible to install the steam hose with an upward slope with a minimum rise of 2" for every 12" of run.

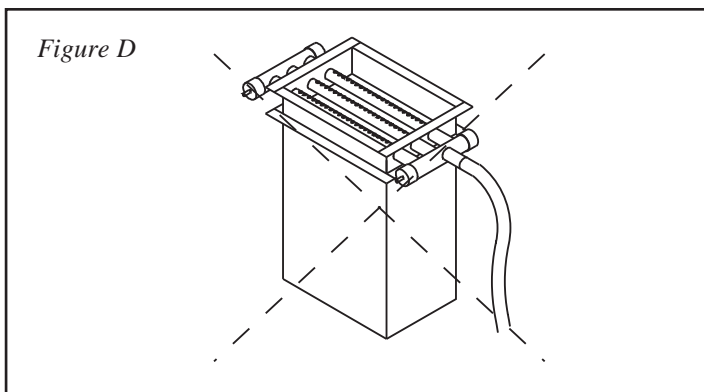
Figure B



The steam manifold may be located below the humidifier if the installation is made in accordance with Figure C. In this installation the condensate return line is routed to a drain below the humidifier and a steam trap is necessary to prevent live steam from flowing through the condensate line.

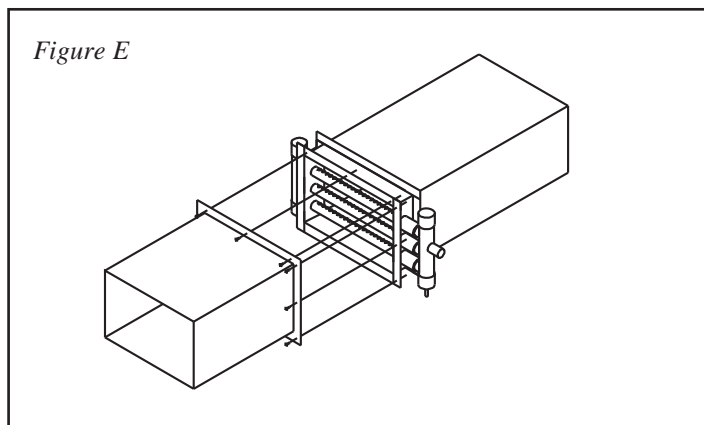


The steam manifold cannot be installed in a vertical duct as shown in Figure D because condensate will not drain properly and will discharge into the duct.



### INSTALLATION OF MANIFOLD

1. The manifold has an integral mounting flange for ease of installation. Separate mounting flanges, supplied by others, are needed for the duct to mate with the manifold. Refer to Figure E.
2. Make sure the manifold is oriented properly with the steam discharge holes facing upward.
3. Use #12x3/4" self-tapping screws spaced no farther than 12" to secure the unit to the duct.

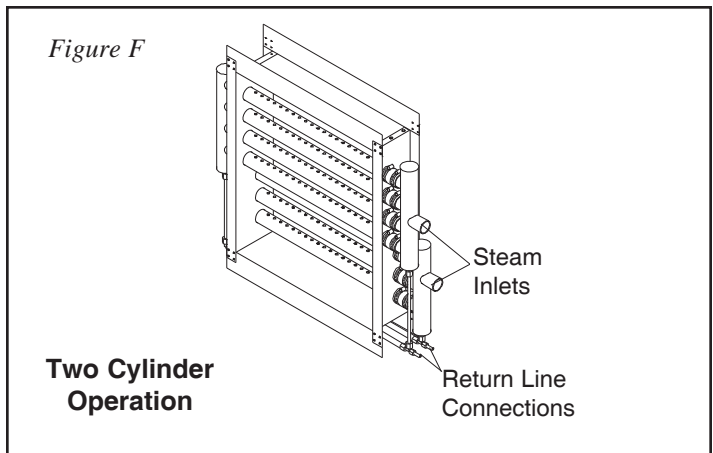


### INSTALLATION OF STEAM HOSE AND CONDENSATE RETURN LINE

It is very important that both the steam hose and condensate return line be installed so that sags are prevented. The steam is at very low pressure and cannot overcome resistance caused by water standing in the steam hose. Water accumulating in sags in the return line will restrict the flow of condensate and may cause water to be discharged into the duct.

#### INSTALL THE STEAM HOSE:

If the steam manifold is used with a humidifier having two cylinders it will require two separate lengths of steam hose to connect to the two inlets on the steam manifold. **Do not combine the outputs of two cylinders into one steam hose.** See Figure F.



If it is difficult to prevent sags, it is recommended that copper tube be used as a substitute. If copper tube is used, a minimum of one inch of insulation must be applied to prevent excessive condensation and contact with the hot pipe. A short length of steam hose must be used to connect the plastic cylinder in the humidifier to the copper tube and another short length to connect the copper tube to the steam manifold. Size 3/4" copper tube can be used with steam cylinders having output rates up to 30 pounds per hour. Size 1-1/2" copper tube should be used with steam cylinders over 30 pounds per hour. Length restrictions shown in Table 1 also apply where copper tube is used and any 90° elbows add approximately three feet of equivalent length.

Connect the steam hose to the plastic steam cylinder and steam manifold using the clamps provided.

#### INSTALL THE CONDENSATE RETURN LINE:

If it is impossible to maintain a 6" drop from the bottom of the manifold to the top of the humidifier cabinet the return line can be run to a separate drain. A trap (usually 8" is sufficient) may be necessary to prevent loss of steam through the return line. **Do not install a trap if the condensate is returned to the top of the humidifier cabinet.**

If the humidifier has two cylinders, two return lines will be required. Connect the return line to the inlet at the top of the humidifier and to the steam manifold using the clamps provided.