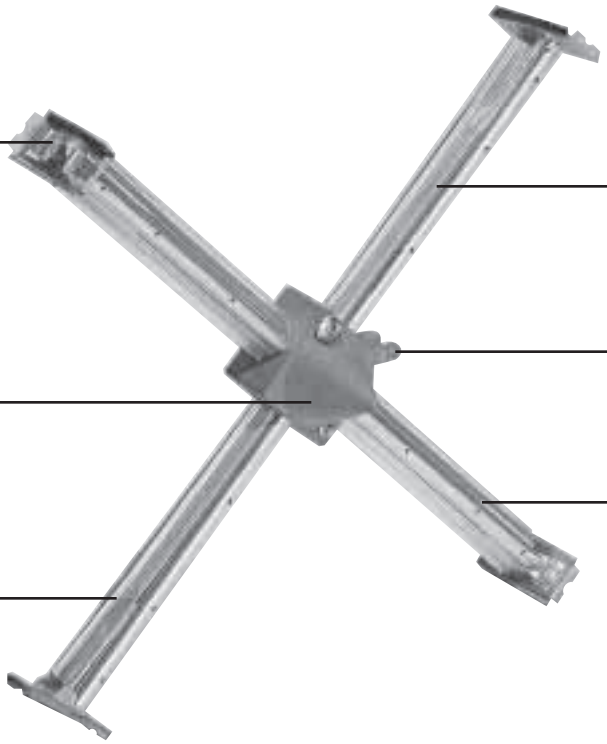
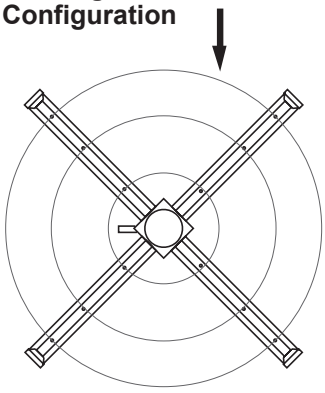
FLOW SENSING
FLO-CROSS® SENSOR

HART COOLEY
install confidence.



Upstream and Downstream Concentric Ring Sensing Port Configuration



Patent No. 4,453,419

- Accurate to +/- 5% throughout the catalog operating range.
- Sensing arms sample the inlet cross section mitigating turbulent flow effects.
- Barbed fittings positively lock plastic tubing.
- 24 total sensing ports provide a differential pressure (ΔP) output proportional to the average duct velocity.
- Amplification baffles strengthen ΔP signals to levels three times higher than standard Pitot tube readings.
- Center manifolds average velocity profiles and reduce pulsations from dynamic ΔP signals.
- Sensing tube construction eliminates signal loss due to leakage.
- Concentric ring sensing port configuration imitates major flow testing standards by locating them at the center of equal areas.
- Corrosion resistant construction.

FLO-CROSS SENSOR PERFORMANCE PARAMETERS/FORMULAS

Size	Area (FT^2)	Cv	K†
06	.1883	462	2.9
08	.3382	817	2.9
10	.5319	1250	3.0
12	.7691	1792	3.0
14	1.0500	2474	3.0

- Flow (CFM) = $Cv \times \sqrt{\Delta P}$
- ΔP (inches W.G.) = $K \times \left(\frac{FPM}{4005} \right)^2$
- $FPM = \frac{CFM}{\text{Area (sq. ft.)}}$
- 500 to 3000 FPM Nominal Velocity Range

†(K) is the amplification factor

PRE-INSTALLATION

General
Hart & Cooley terminal units are available in a no control configuration or with pressure independent volume control. The volume controller maintains a pre-set volume and responds to thermostat control between maximum and minimum set points. Factory installed electric heat and hot water coils provide reheat.

Controls
The controller monitors a differential pressure signal from the sensor as air flows in the duct section of the terminal. This differential signal is used to control the volume of air, which passes through the terminal. As room temperature changes, a signal is sent to a reset actuator on the controller to change the volume set point to satisfy the zone demand.

Packaging
Terminal units are packaged in cartons and/or are crated prior to shipment.

Storage
Units should not be stored outdoors. Units should be covered to protect against dirt, moisture, etc. Cartons may be stacked, but not over 5 cartons high. Crates must not be stacked.

Handling
Do not handle terminal units by damper rod extension, tubing connections, Flo-Cross® sensor, or other external attachments. Be careful not to damage controls when removing units from shipping containers.

Initial Inspection
Once items have been removed from the shipping container, check carefully for damage to duct connections, coils or controls. File damage claim immediately with transportation agency and notify Hart & Cooley.

Unit Identification
Terminal units are assembled as indicated on unit label. Each unit is supplied with an identification label, as shown.

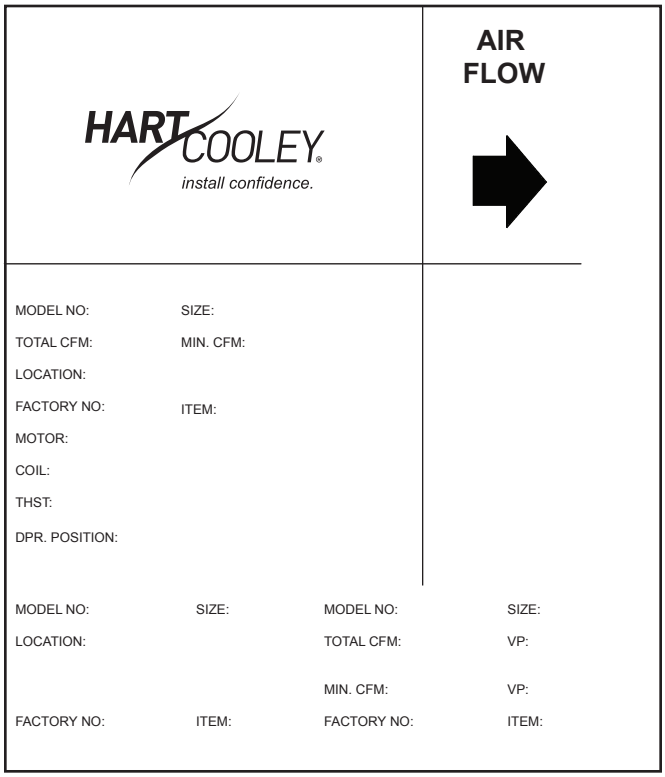
Installation Precautions
Check that construction debris does not enter unit or ductwork. Do not operate the central-station air-handling fan without final or construction filters in place. Accumulated dust and construction debris distributed through the ductwork can adversely affect unit operation.

Service Access
Provide service clearance for unit access.

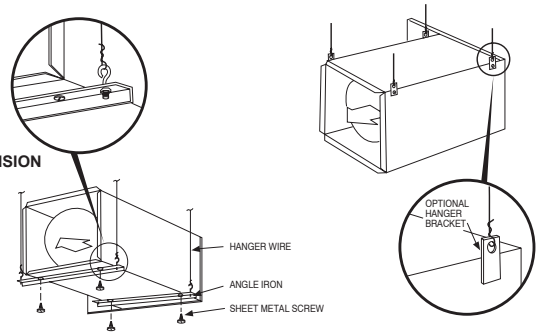
Codes
Install units in compliance with all applicable code requirements.

Warranty
All Hart & Cooley furnished items carry the standard Hart & Cooley warranty. Control components and items furnished by others, whether or not installed at Hart & Cooley's factory, are not warranted by Hart & Cooley.

UNIT IDENTIFICATION



UNIT SUSPENSION DETAILS (TYPICAL)



Installation

INSTALL UNIT

1. Move unit to installation area. Remove unit from shipping package. *Do not handle by controls, Flo-Cross® sensor, or damper extension rod.*
2. Install the field-supplied angle iron or accessory hanger to the terminal unit. Avoid interference with internal parts or access panel. Optional hanger brackets also available.
3. Suspend units from building structure with straps or hanger wires. Secure the unit and level it in each direction. Note that reheat coil is in heavy end of unit.

MAKE DUCT CONNECTIONS

1. Install supply ductwork on unit inlet collar. Check that air supply duct connections are airtight and follow all accepted duct installation procedures.
2. Install the discharge duct. Seal and insulate duct as required.

START-UP
CONTROLLER DIAGRAMS

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General

Air volume delivery to the conditioned space is controlled by the modulated opening and closing of a damper within the terminal unit. The damper is positioned by the actuator and volume controller.

System Check

1. Check that all controls, control box, and ductwork have been properly installed and set per installation instructions and job requirements.
2. Check that final filters have been installed in the air-handling apparatus. Dust and debris can adversely affect system operation.
3. Check electrical system and connections of any optional electric reheat coil. If hot water reheat is used, check piping and valves per job drawings.
4. Check pneumatic control system for proper control air pressure at terminal unit.
5. Check that all air duct connections are tight.
6. See that all balancing dampers at terminal outlets are in full-open position.