

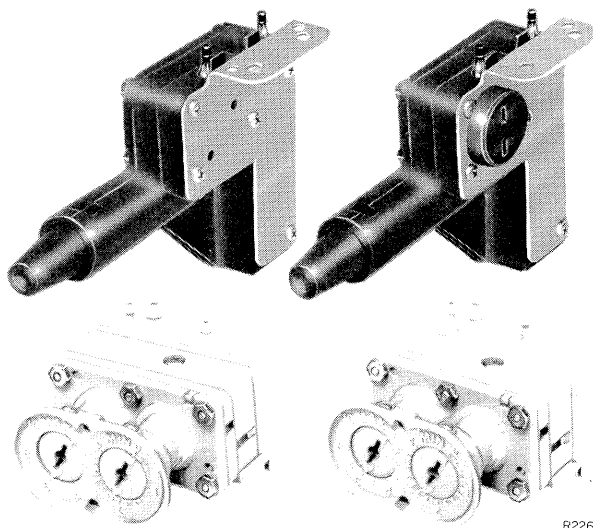
Velocitrol Velocity Sensor-Controller

MODEL NUMBERS CP980C,D,E AND F

General

The Velocitrol Sensor-Controller (referred to as the CP980) is a control system combining an ultrasensitive air velocity sensor with one of two pneumatic controllers to accurately detect and effectively control air flow in air terminal units, regardless of system static pressure.

Two models of the sensor are available, a reverse acting sensor for normally closed dampers and a direct acting sensor for normally open dampers. Sensors are true velocity measuring units and do not depend on differential air pressure for operation. Although designed primarily for use in higher velocity air systems, the sensor, when used with a velocity controller, can accurately sense velocities as low as 100 feet/min (0.5 m/sec) and still produce an output. One of several flow limiting orifices inserted into the sensor sampling tube allows a maximum duct velocity of 3500 ft/min (17.7 m/sec).



REVERSE ACTING

DIRECT ACTING

Two models of the controller are available. A type "B" controller provides high and low air volume limits and is used in conjunction with a 1-pipe bleed thermostat. A type "C" controller is used for two-pipe thermo-

stat applications, for sequencing with reheat, and in certain dual duct applications. Both "B" and "C" controllers can be reverse or direct acting (corresponding to R.A. or D.A. sensor).

Features

- Broad range of applications. Two sensor models, two controller types.
- Reliable with no frictional or wear parts.
- Not position sensitive.
- Readjustable without special test equipment, compressed air, or fan system operation.
- Insensitive to static pressure changes.
- Effective control throughout entire velocity range.
- Graduated scales for minimum and maximum velocity adjustments.
- Velocity reset by thermostat demand.

Specifications

MODELS

All models are reset by an increasing thermostat pressure causing an increased air flow. Thus, a direct acting thermostat is used for cooling applications.

CP980C: D.A. (normally open damper) with type "B" controller (1-pipe thermostat).

CP980D: R.A. (normally closed damper) with type "B" controller (1-pipe thermostat).

CP980E: D.A. (normally open damper) with type "C" controller (2-pipe thermostat).

CP980F: R.A. (normally closed damper) with type "C" controller (2-pipe thermostat).

DIMENSIONS

See Fig. 1 and 2.

SENSOR VELOCITY RATING

Velocity Rating ft/min (m/s)	Orifice Color
500 (2.5)	No orifice required.
750 (3.7)	Green
1250 (6.3)	Red
1500 (7.6)	White
2000 (10.1)	Blue
2500 (12.6)	Black
3500 (17.7)	Grey

NOTE: Velocity rating corresponds to a 10 setting on the controller's maximum dial.

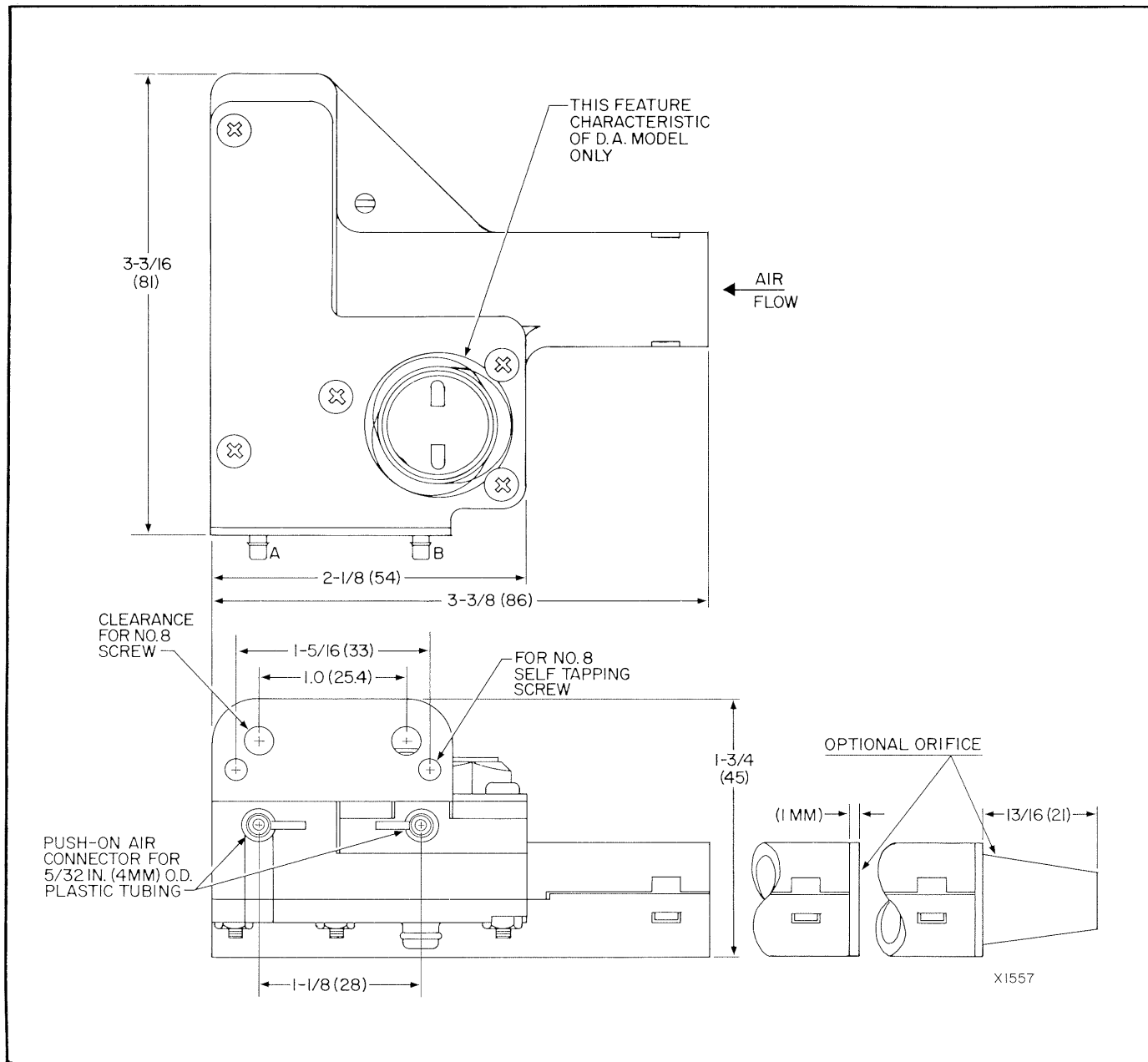
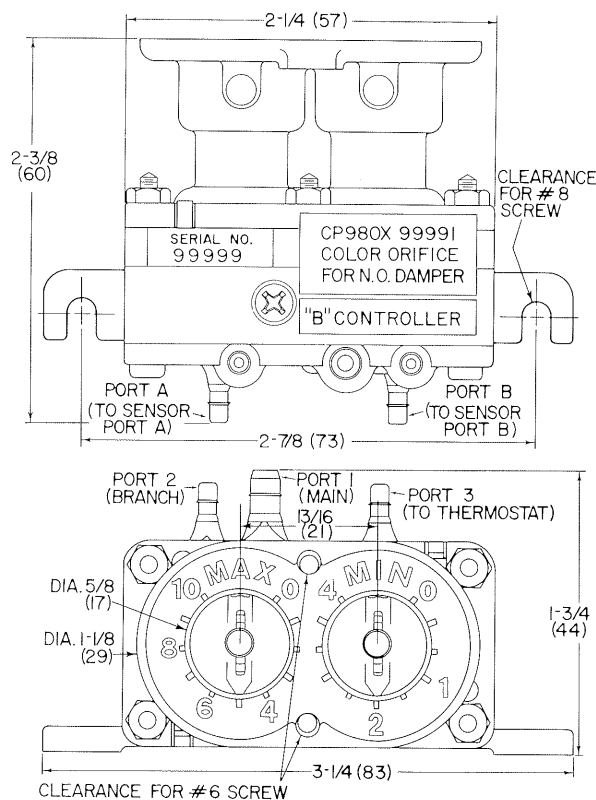


Fig. 1. Approximate Sensor Dimensions in Inches (mm).



NOTE: PORT 1 IS SIZED FOR 1/4 INCH (6mm) TUBING.
ALL OTHER CONNECTIONS ARE SIZED FOR
5/32 INCH (4mm) TUBING.

X1244-1

Fig. 2. Approximate Controller Dimensions in Inches (mm).

AIR VELOCITY ADJUSTMENT RANGE

Maximum limit: 40 to 100 percent of velocity rating.

Minimum limit: 0 to 50 percent of velocity rating.

AIR CONSUMPTION

.029 SCFM (821 SCCM): Includes air supply for bleed thermostat for "B" controller, but does not include thermostat air on "C" controller.

AMBIENT OPERATING LIMITS

Temperature: 40-130 F (5-55 C).

Humidity: 5 to 95 percent RH.

MAXIMUM SAFE AIR PRESSURE

30 lb/in² (207 kPa).

NORMAL OPERATING AIR PRESSURE

Nominal Main Supply: 20 lb/in² (138 kPa); Minimum: 18 lb/in² (124 kPa).

Nominal Thermostat Line:

"B" Controller—1 to 15 lb/in² (7 to 103 kPa).

"C" Controller—9 to 15 lb/in² (62 to 103 kPa).

MAXIMUM CONTROL POINT VARIATION DUE TO STATIC PRESSURE CHANGES

±5 percent: 0 to 4 in. wc (0 to 1 kPa).

±10 percent: 0 to 6 in. wc (0 to 1.5 kPa).

SENSITIVITY

Less than 5 ft/min (0.025 m/s) maximum (no orifice).

CAPACITY (Branch Line)

.011 SCFM (312 SCCM) maximum. (Equivalent to .005 in. [0.13 mm] restriction).

ACCESSORIES

RP470B, Lockout Relay (used with type "B" controller for two-pipe non-sequencing thermostat applications).

WHEN ORDERING SPECIFY

Sensor: Direct Acting (Normally Open Damper). Reverse Acting (Normally Closed Damper).

Controller:

Type B

Type C

Duct Velocity Rating (or orifice color).

Typical Operation

Single Duct Variable Constant Volume (Type B Controller Application)

See Fig. 3.

Minimum and/or maximum air flow limits are dialed into the controller. Thermostat senses room temperature and resets velocity sensor-controller within limits. This repositions terminal unit damper, increasing or decreasing air flow. If duct static pressure changes flow, sensor-controller repositions damper to maintain flow.

If thermostat calls for flow greater or less than the controller maximum and minimum settings, the controller settings take precedence over thermostat control and maintain the specified air flow as shown in Fig. 4.

Use of the "C" controller makes reheat by demand possible.

Dual Duct Variable Constant Volume (See Fig. 5)

The minimum air flow limit is set equal to specified air flow required from the heating duct. A "C" controller maintains air flow at the minimum limit setting until the thermostat modulates from full heat to full cool and reaches a pressure greater than 9 lb/in² (62 kPa). The thermostat pressure greater than 9 lb/in² increases flow to the maximum limit setting.

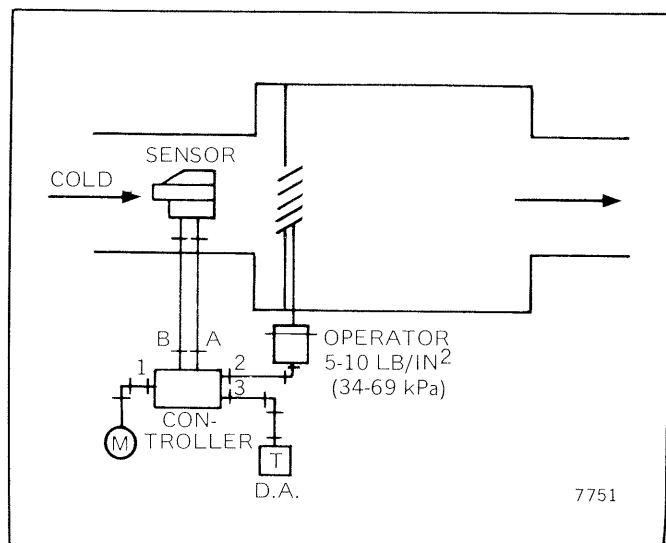


Fig. 3. Single Duct Variable Constant Volume Application.

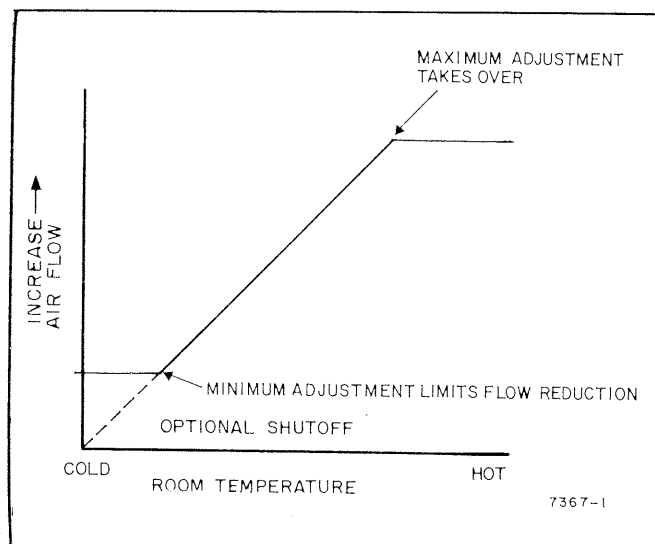


Fig. 4. Air Flow Control in Single Duct Variable Constant Volume Application.

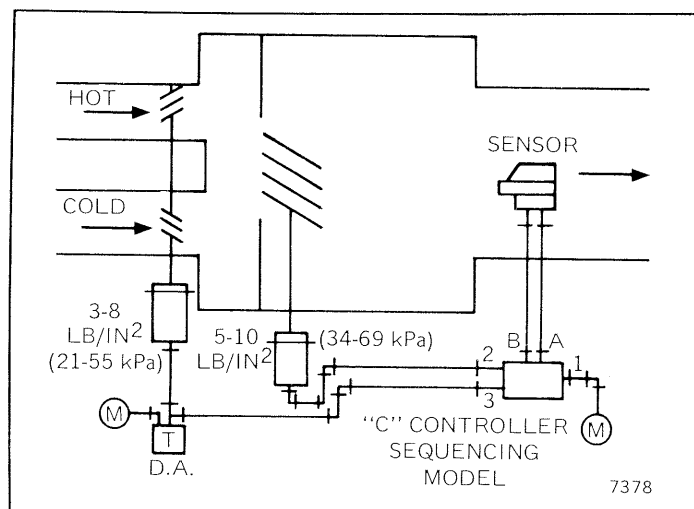


Fig. 5. Dual Duct Variable Constant Volume Application.