



**SDV 8000**  
**SINGLE DUCT VARIABLE VOLUME**  
**CONTROL ASSEMBLIES**  
**c/w PRICE DIGITAL CONTROLS**  
**INSTALLATION MANUAL**

Date: 04/11  
Reference #: F-51

## SDV 8000

### General Description

The SDV 8000 assembly is supplied with Price direct digital controls (DDC) for VAV pressure independent operation.

For information concerning controls, components, sequence of operation, etc., please refer to PIC - Price Intelligent Controller Installation and Service Manual on [www.priceelectronics.ca/PIC](http://www.priceelectronics.ca/PIC).

### Receiving Inspection

After unpacking the assembly, check it for shipping damage. If any shipping damage is found, report it immediately to the delivering carrier. During unpacking and installation do not handle by the inlet velocity sensor, damper shaft, or tubing. Damage may result.

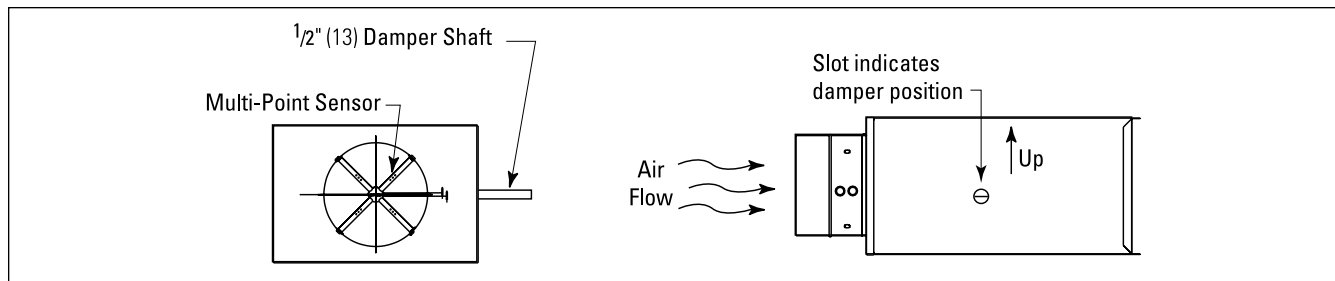
### Installing the SDV 8000 Terminal Unit

The basic SDV 8000 is light enough that it can be supported by the ductwork in which it is installed. Where accessory modules, such as coils, attenuators or multiple outlets are included, the assembly should be supported directly. Use the support method prescribed for the rectangular duct in the job specifications.

**Important:** For optimum performance there should be a minimum of three duct diameters of straight inlet duct, **same size as the inlet**, between the inlet and any transition, take off or fitting.

The assembly should be mounted right side up. It should be level within  $\pm 10$  degrees of horizontal, both parallel to the air flow and at right angles to the air flow. The side of the assembly is labelled with an arrow indicating UP. Do not mount the control side of the assembly tight to a wall, pipe or other obstruction. Allow sufficient room for access to the controls.

To prevent excess air leakage, all joints should be sealed with an approved duct sealer. This would apply to all accessory module connections as well as the basic assembly.



Damper rotation is always clockwise to the open position. An identification mark on the end of the shaft indicates the damper position.

The factory supplied sensing lines are color coded. Red indicates the total pressure or "HI" line which should be located on the upstream side. Green indicates the static pressure or "LO" line which should be located on the downstream side.

Protective enclosure is provided to house the terminal unit control components. The enclosure cover is removable with two sheet metal screws.

The velocity sensor is normally supplied as standard with the terminal unit. However, in some cases a flow sensing device supplied by the controls contractor may be factory or field mounted. Refer to the submittal drawing for illustration.

The air volume ranges listed are recommended for optimum performance. A minimum value of zero is also acceptable if no heating coils are attached.

Selection of air flow limits below the listed values is not recommended. Stability and accuracy may not be acceptable at lower than recommended air flow limits. The actual performance will vary depending on the terminal unit controls supplied.

## Air Volume Ranges

Unit Size	CFM	L/S
	Min. - Max	Min. - Max
4	50 - 225	24 - 106
5	63 - 350	30 - 65
6	66 - 450	31 - 212
7	99 - 650	47 - 307
8	132 - 800	62 - 378
9	167 - 1050	79 - 496
10	221 - 1350	104 - 637
12	304 - 2100	143 - 991
14	439 - 3000	207 - 1416
16	568 - 4000	268 - 1888
24 x 16	1187 - 8000	500 - 3776

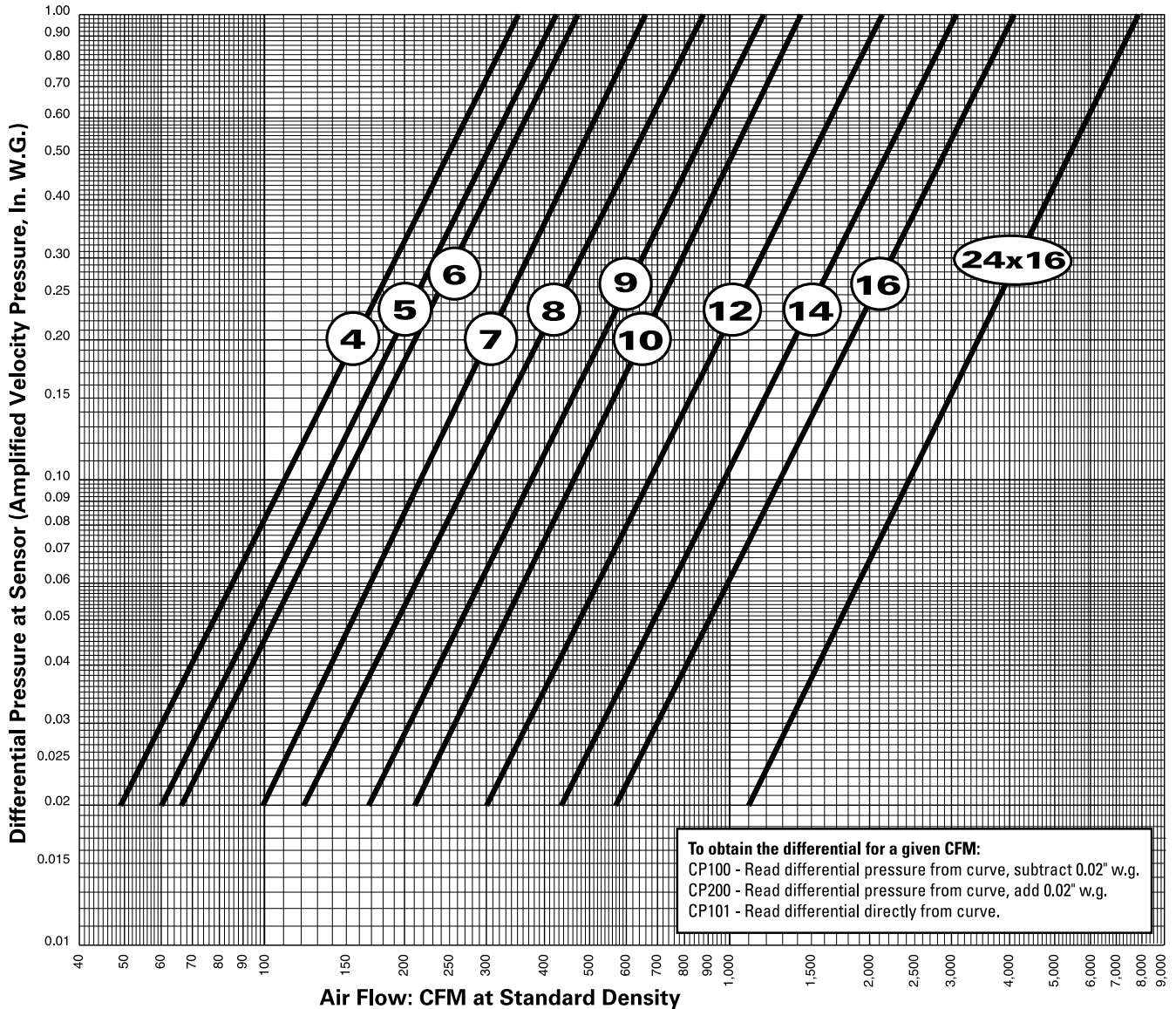
### Notes:

Factory calibrated controls must be selected within the above flow range limits. A minimum value of zero is also available. When an auxiliary flow setting is specified, the value must be greater than the minimum setting and within the range limits.

On controls mounted by Price but supplied by others, the air volume ranges are guidelines only.

Selection of air flow limits below the listed values is not recommended. Stability and accuracy may not be acceptable at lower than recommended air flow limits. The actual performance will vary depending on the terminal unit controls supplied.

## SP300 Calibration Curves



## Calibration Equation

$$VP = \left(\frac{Q}{K}\right)^2$$

- VP** - differential pressure at sensor, inches w.g.  
**Q** - air flow rate, cfm at standard density.  
**K** - calibration constant

Unit Size	K
4	340
5	426
6	468
7	673
8	890
9	1155
10	1487
12	2141
14	3045
16	4074
24 x 16	7785

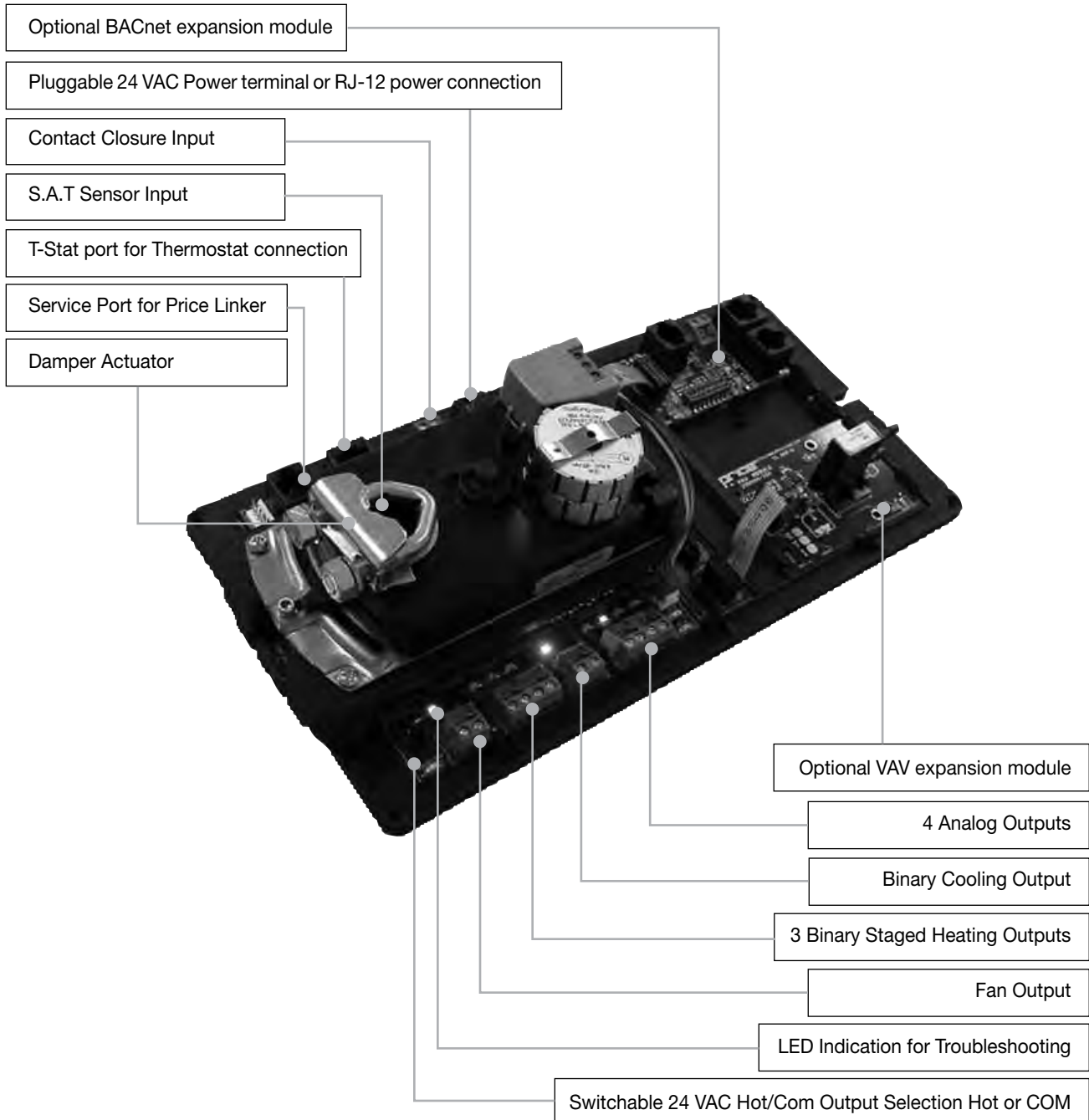
### Notes

- Setting flow limits for a differential pressure of less than 0.02 inches is NOT recommended. Stability and accuracy of flow limits may not be acceptable due to low velocity pressure signal. Performance will vary depending on the terminal unit controls provided.
- For field calibration of air flow limits refer to the control contractor's documentation.

## General Description

### PIC – Price Intelligent Controller

The Price Intelligent Controller (PIC) is a direct digital controller for VAV terminals or fan coils that offers cutting edge zone control. The PIC combines the accuracy of direct digital control with the flexibility of an individual room control system, providing maximum control and efficiency. An advanced and configurable proportional integral controller allows for exceptional user comfort and energy efficiency. Installation of the controller and thermostat is simple and error proof with RJ-45 (network type) connections to the thermostat and BACnet network. The PIC typically comes factory mounted to Price VAV boxes, but may also be ordered stand-alone for retrofit jobs.



For information concerning controls, components, sequence of operation, etc., please refer to PIC - Price Intelligent Controller Installation and Service Manual on [www.priceelectronics.ca/PIC](http://www.priceelectronics.ca/PIC).

# Wiring

Below is an example of a typical PIC sequence diagram – Single duct box with 3 stages of binary heat. Each PIC has a sequence pre-programmed at the factory, however many adjustments can be made in the field with either an LCD thermostat or the USB LINKER service tool.

## SINGLE DUCT DIGITAL CONTROLS

## Control Sequence Number 2802

**NOTE 1:** NIGHT SETBACK IS STANDING BY, READY TO BE USED ON ALL PIC DDC CONTROLLERS. SEE NIGHT SETBACK SEQUENCE (9999) FOR DETAILS

**NOTE 2:** 24 VAC POWER SOURCE MUST BE FIELD WIRED IF OPTIONAL TRANSFORMER IS NOT PROVIDED.

TRANSFORMER SECONDARY COM MUST BE EARTH GROUNDED

+24V HOT 1  
-24V COM 2  
1ST STAGE 3  
2ND STAGE 4  
3RD STAGE 5

**NOTE 3:** WIRES 3-5 ARE PLENUM RATED CABLES FOR CONTROL CIRCUITS FIELD WIRED BINARY 24VAC REHEAT (PERIMETER RADIATION, BINARY HOT WATER, ETC) MAX 10VA PER CONTACTOR. \*STAGES 2 AND 3 ARE OPTIONAL.

**NOTE 4:** SEVERAL T-STAT OPTIONS AVAILABLE. (BLANK FACE, DIAL ADJUST, LCD, ETC.)

**NOTE 5:** T-STAT IS WIRED WITH CAT-5 CABLE WITH MODULAR RJ-45 CONNECTORS. CABLE SUPPLIED WITH T-STAT

**NOTE 6:** A CAT-5 BACNET NETWORK CABLE IS PROVIDED BY PRICE WITH EACH CONTROLLER ORDERED WITH THE BACNET OPTION

**NOTE 7:** XFORMER SECONDARY MUST BE GROUNDED

**NOTE 8:** DO NOT USE GAUGE TAPS!

**Sequence of Operation -- Heat/cool changeover OR cooling With up to 3 stage binary reheat - Pressure Independent**  
On power up the damper will calibrate closed for 2 minutes.  
\*\*If no SAT sensor is present, the controller assumes Cool supply air at all times\*\*

**Cool supply air:** On an increase in space temperature the controller regulates the actuator to open the VAV damper and increase the flow of cool air. On an increase of space temperature greater than the cooling proportional band, the airflow is maintained at its pre-selected maximum setting.

On a decrease in space temperature the controller regulates the actuator to close the VAV damper and reduce the flow of cool air. If the space temperature decreases to less than the cooling proportional band, the airflow is maintained at the pre-selected minimum setting.

**Warm supply air:** On a decrease in space temperature the controller regulates the actuator to open the VAV damper and increase the flow of warm air. On a decrease of space temperature greater than the heating proportional band, the airflow is maintained at its pre-selected maximum setting.

On an increase in space temperature the controller regulates the actuator to close the VAV damper and reduce the flow of warm air. If the space temperature increases above the heating proportional band, the airflow is maintained at the pre-selected minimum setting.

**Reheat Operation:** On a decrease in space temperature into the heating proportional band, the 1st stage binary 24VAC reheat output will energize. Upon further decreases, the 2nd then 3rd stages of reheat (if used) will energize.

**LEGEND**

———— FACTORY FLOW SENSOR TUBING

———— FACTORY ELECTRICAL WIRING

----- FIELD ELECTRICAL WIRING

**CONTROL GRAPH**


<b>PROJECT:</b>			
<b>ENGINEER:</b>			
<b>CUSTOMER:</b>		249532	
<b>SUBMITTAL DATE:</b>	<b>SPEC. SYMBOL:</b>	DEC 08	

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For information concerning controls, components, sequence of operation, etc., please refer to PIC - Price Intelligent Controller Installation and Service Manual on [www.priceelectronics.ca/PIC](http://www.priceelectronics.ca/PIC).


## PIC – Price Intelligent Controller – Thermostat Options x 4

Below is an example of a typical PIC sequence diagram – Single duct box with 3 stages of binary heat. Each PIC has a sequence pre-programmed at the factory, however many adjustments can be made in the field with either an LCD thermostat or the USB LINKER service tool.



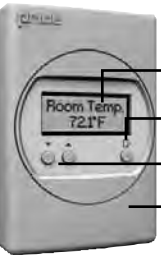
**Room Sensor Thermostat: PIC-TS-SENS**

- Set point adjust from hidden dial on the back
- Service Port - Linker Connection



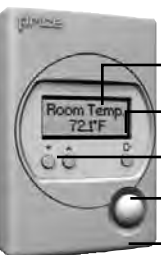
**Dial Thermostat: PIC-TS-DIAL**

- Dial Adjustment for Temperature
- LED – 1 blink cooling mode, 2 – heating, 3 - neutral
- Occupancy Override Button
- Service Port - Linker Connection



**LCD Thermostat: PIC-TS-LCD**

- LCD screen for menu display
- Menu Button
- Increase and decrease push buttons for day temperature setpoint adjustment
- Service Port - Linker Connection



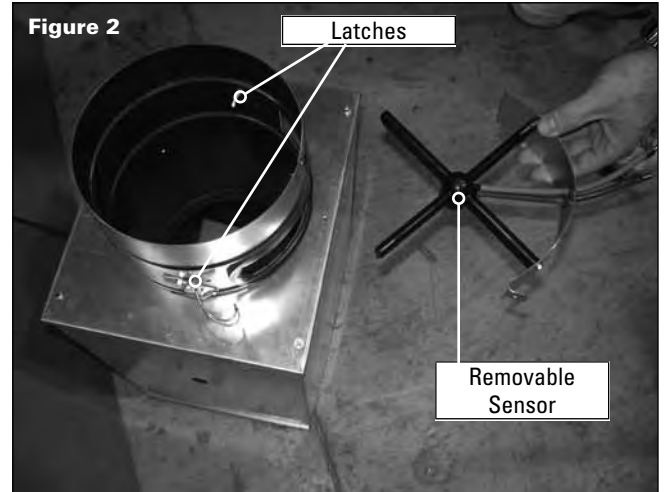
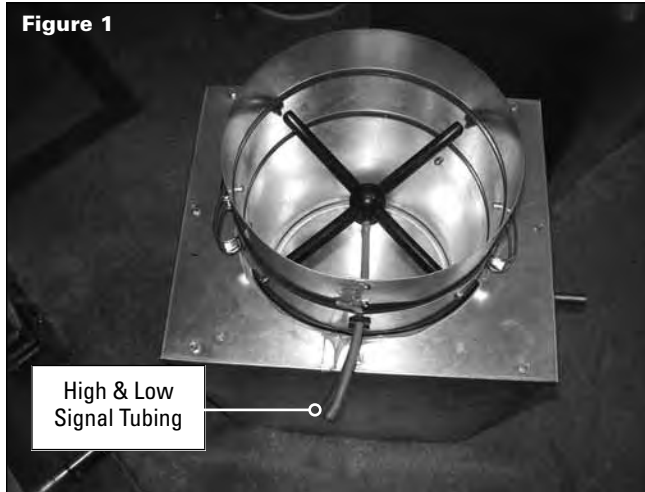
**LCD Thermostat w/ Motion Sensor: PIC-TS-MOTION**

- LCD screen for menu display
- Menu Button
- Increase and decrease push buttons for day temperature setpoint adjustment
- Motion sensor allows for automatic detection of occupancy
- Service Port – Linker connection

For information concerning controls, components, sequence of operation, etc., please refer to PIC - Price Intelligent Controller Installation and Service Manual on [www.priceelectronics.ca/PIC](http://www.priceelectronics.ca/PIC).

## SP 300 Removable Sensor Maintenance Instructions

1. Detach SP 300 Hi and Low signal tubing between sensor and controls at the tee connections as shown in Figure 1.
2. Undo latches holding sensor in unit and remove sensor as shown in Figure 2.
3. Clean sensor by blowing compressed air through both hi and low signal tubing.
4. Wipe off any foreign particles with a clean rag.
5. Reinstall sensor into unit ensuring that it is in the correct orientation and fasten latches to securely hold sensor in unit.
6. Reattach hi and low signal tubing from sensors at the tee connections.



## Replacement Parts

Component	Part#	Description
<b>Removable SP300 Sensor</b>	041688-001	Sensor SP300, Sizes 4,5 & 6
	041688-002	Sensor SP300, Size 7
	041688-003	Sensor SP300, Size 8
	041688-004	Sensor SP300, Size 9
	041688-005	Sensor SP300, Size 10
	041688-006	Sensor SP300, Size 12
	041688-007	Sensor SP300, Size 14
	041688-008	Sensor SP300, Size 16
	247072-001	Duct Cover, for Removable Sensor Sizes 4,5 &6
	247072-002	Duct Cover, for Removable Sensor Size 7
	247072-003	Duct Cover, for Removable Sensor Size 8
	247072-004	Duct Cover, for Removable Sensor Size 9
	247072-005	Duct Cover, for Removable Sensor Size 10
	247072-006	Duct Cover, for Removable Sensor Size 12
	247072-007	Duct Cover, for Removable Sensor Size 14
	247072-008	Duct Cover, for Removable Sensor Size 16
	203132-999	.250" Green Tubing, Low signal
	203136-999	.250" Red Tubing, High Signal
	041510-001	Rubber Grommet RB-215
	041683-001	Tee, Brass, .250" x .250" x .250"



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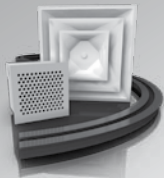
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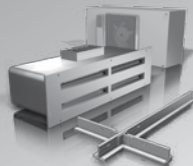
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Your Local Price Representative:

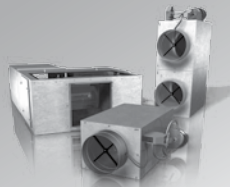
Grilles & Diffusers



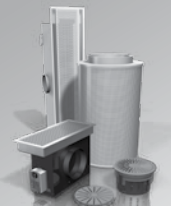
Critical Environments



Terminals



Sustainable Building



Noise Control

