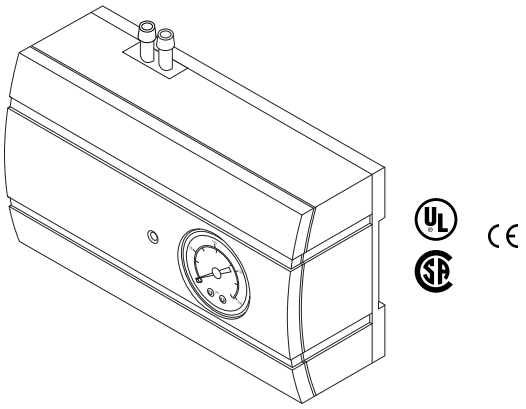
CP-8511

Electronic to Pneumatic Transducer
General Instructions

Application

The CP-8511 transducer receives a variable electronic input signal and produces a 3 to 15 psig (21 to 103 kPa) pneumatic output signal to position pneumatic damper and valve actuators in HVAC systems.



Features

- Durable enclosure with easily accessible wiring terminations
- Panel or DIN rail mounting for quick, snap-on installation
- High accuracy with low hysteresis
- Long-term driftless operation with high repeatability
- Low air consumption and large air flow capacity
- Field selectable input ranges
- Integral +20 Vdc power output for auxiliary components
- Factory installed branch pressure gauge
- Integral auto/manual override feature with indication
- BAS indication of auto/manual override

Applicable Literature

- Environmental Controls Reference Manual, F-21683
- EN-123 Air Quality Requirements for Pneumatic HVAC Control Systems Engineering Information, F-22516
- Pneumatic Products Catalog, F-27383

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SPECIFICATIONS

Transducer Input Signals

Input Signal & Impedance: See Table-1.
Input Range Selection: Jumper selectable (see Table-2).
Power Supply: Requires 20 to 30 Vac, 50/60 Hz, or 24 to 30 Vdc power supply, 3.8 watts maximum.
Air Supply Required: 20 psig (138 kPa) nominal, 30 psig (207 kPa) maximum. Clean, dry, oil-free air required (refer to EN-123, F-22516).
Air Consumption for Sizing Air Compressor: Maximum .012 scfm (5.66 ml/s).
Air Capacity for Sizing Air Mains: 550 scim (150.24 ml/s).
Air Connections: Male barbed fittings for flexible 1/4" O.D. pneumatic tubing.
Wiring Connections: Screw terminals for use with 16 to 22 AWG wire.

Transducer Output Signals

Output Signal: 3 to 15 psig (21 to 103 kPa).
Maximum Pneumatic Output: 1 to 18 psig (7 to 124 kPa).
Action: Direct or reverse acting, jumper selectable (see Table-2).
Output Air Capacity & Pressure: 515 scim (141 ml/s) with a 20 psig (138 kPa) supply.
Operating Characteristics:
Linearity, ±1% of span @ 75° F (24°C).
Hysteresis, 0.75% of span @ 75° F (24°C).
Adjustments: Field adjustable zero potentiometer.
Auxiliary Power Supply: +20Vdc @ 50mA (maximum).
Auto/Manual Feedback: Isolated open collector output transistor.
Auto/Manual Status: Green LED.
Pressure Gauge Accuracy: Within 2% of total scale range in middle portion of scale and 3% elsewhere (ANSI Class B).

Transducer Environment

Ambient temperature limits:
Shipping and Storage, -40 to 160°F (-40 to 71°C).
Operating, 32 to 140°F (0 to 60°C).
Humidity, 5 to 95% R.H., non-condensing.
Locations, NEMA Type 1.
Agency Listings:
UL 873.
CSA.
CE Compliant.

Table-1 Model Chart.

TAC Model No.	Field Selectable Input Range	Input Impedance	Output Range	Field Selectable Action[a]	Power Requirements
CP-8511-024	4 to 20 mA[b]	250 ¾	3 to 15 psig [c] (21 to 103 kPa)	D.A. or R.A.	20 to 30 Vac, 24 to 30 Vdc, 3.8 W
	1 to 5 mA	1000 ¾			
	6 to 9 V	> 10,000 ¾			
	1 to 5 V				
	0 to 10 V				
	1 to 11 V				
	2 to 10 V				

[a] D.A. = Direct acting, branch pressure rises as input increases. R.A. = Reverse Acting, branch pressure falls as input increases.
[b] Factory supplied.
[c] A maximum of 18 psig output is available when the zero potentiometer is increased to 6 psig,

Accessories

K-335	In-line air filter.
M-636	4 in. (102 mm) T and B wire tie.
P-610	35 mm DIN rail (1-3/8 W x 36 L x 3/10 H in).

TYPICAL APPLICATIONS (wiring diagram)

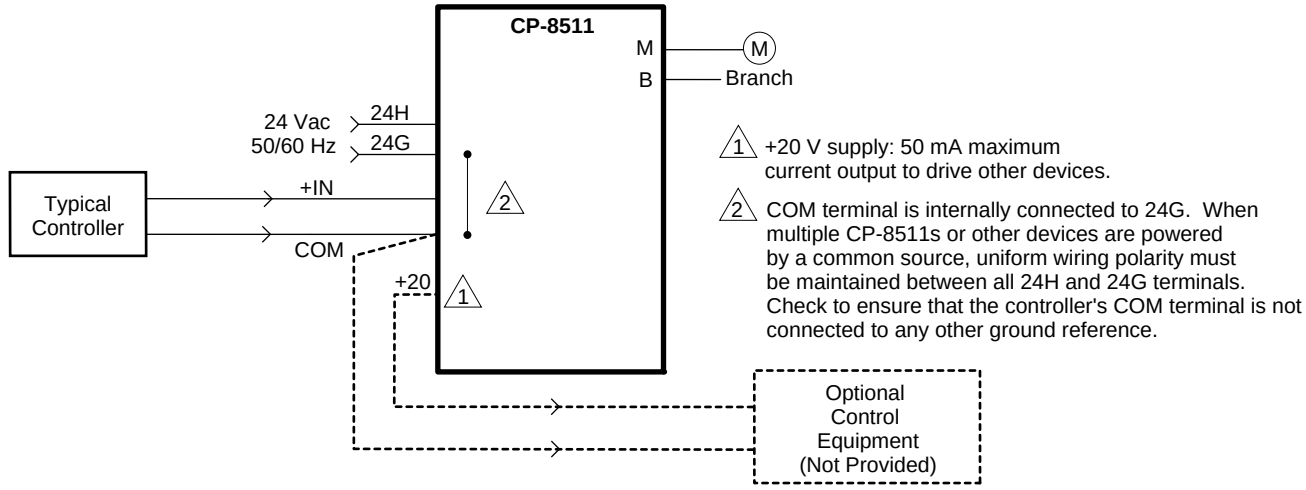


Figure-1 CP-8511 Typical Wiring with Optional +20 Vdc Supply.

INSTALLATION

Inspection

Inspect the package for damage. If damaged, notify the appropriate carrier immediately. If undamaged, open the package and inspect the device for obvious damage. Return damaged products.

Requirements

Note: System control accuracy will depend on the accuracy of the equipment used for setup.

- Wiring diagrams.
- Tools (not provided):
  - Digital Voltmeter (DVM).
  - Screwdriver for mounting screws and terminal connections.
  - Drill and drill bit for mounting screws.
- Appropriate accessories.
- Two (2) #6 mounting screws (not provided) or DIN rail (not provided).
- M-636 4 in. (102 mm) T and B wire tie (not provided).
- Training: Installer must be a qualified, experienced technician.

Precautions

General

Warning:

- Disconnect the power supply (line power) before installation to prevent possible electrical shock and equipment damage.
- Make all connections in accordance with the wiring diagram and in accordance with national and local electrical codes. Use copper conductors only.
- Do not exceed the ratings of the device(s).

Supply Air

Caution:

- Particles in the air supply larger than 0.03 microns (4 mPa) will adversely affect the reliability and life of the transducer. If air supply is questionable, install a K-335 filter between the main air supply and the main air port of the device.
- A refrigerated air dryer, particulate filter, and coalescing filter will provide a quality air supply (refer to EN-123, F-22516).
- Compressor oil must be non-paraffin mineral base or naphtha base. Synthetic base oils will destroy pneumatic controls and void the warranty.
- Factory installed branch pressure gauge is for reference only.

Location

Caution:

- NEMA Type 1 devices are intended for indoor use primarily to provide a degree of protection against contact with the enclosed equipment.
- Do not locate unit in areas subject to incidental contact, vibration, severe mechanical shock, excessive moisture, or corrosive fumes.

Mounting

See Figure-3 for mounting dimensions.

Caution: The CP-8511 must be mounted within 5° of the upright position (refer to "UP" arrow on circuit board in Figure-2).

1. Remove transducer cover by grasping both sides of cover and pulling gently.
2. Select the mounting location.
3. Rail mount transducer on a vertical surface by snapping to a 35 mm DIN mounting rail (not provided) or panel mount with two #6 screws (not provided).
4. Pull wires through bottom of enclosure and make necessary connections.
5. Position wires to clear the wiring access hole in the cover.
6. Use a small plastic wire tie to secure the wires to the strain relief tab provided on the mounting base below the terminal strip.
7. Replace cover and make pneumatic connections.

Wiring

Use 16 to 22 AWG wire for Class II wiring terminals. Use flexible 1/4" O.D. pneumatic tubing for main and branch pneumatic connections. See Figure-1 for wiring information and Table-2 for jumper designations.

Jumper Selection

The CP-8511 has seven jumper selectable input ranges. Make proper jumper selections as follows:

1. Choose input range and determine whether direct or reverse action is required.
2. Consult Table-2 for correct jumper positions.

Note:

- The CP-8511 must be calibrated after input range selection. Refer to CHECKOUT procedure for calibration instructions.
- All input ranges require four jumpers.
- Refer to Figure-2 for an example of correct jumper arrangement for 4 to 20 mA input, Direct Acting.
- Jumper must span vertical width of jumper block (Figure-2).

3. Place jumpers on appropriate blocks.
4. Calibrate by performing CHECKOUT procedure.

Table-2 CP-8511 Jumper Selection.

Range	Action	x = Insert jumper at positions shown in chart.										
		A	B	C	D	E	F	G	H	I	J	K
1 to 5 mA	D.A.			X	X	X				X		
4 to 20 mA[a]			X		X	X				X		
1 to 5 V		X			X	X				X		
6 to 9 V		X			X	X			X			
2 to 10 V		X			X	X					X	
0 to 10 V		X			X	X						X
1 to 11 V		X			X	X						X
1 to 5 mA	R.A.			X			X	X		X		
4 to 20 mA			X				X	X		X		
1 to 5 V		X					X	X		X		
6 to 9 V		X					X	X	X			
2 to 10 V		X					X	X			X	
0 to 10 V		X					X	X				X
1 to 11 V		X					X	X				X

[a] The CP-8511-024 is factory calibrated and supplied with jumpers set for 4 to 20 mA, D.A input.

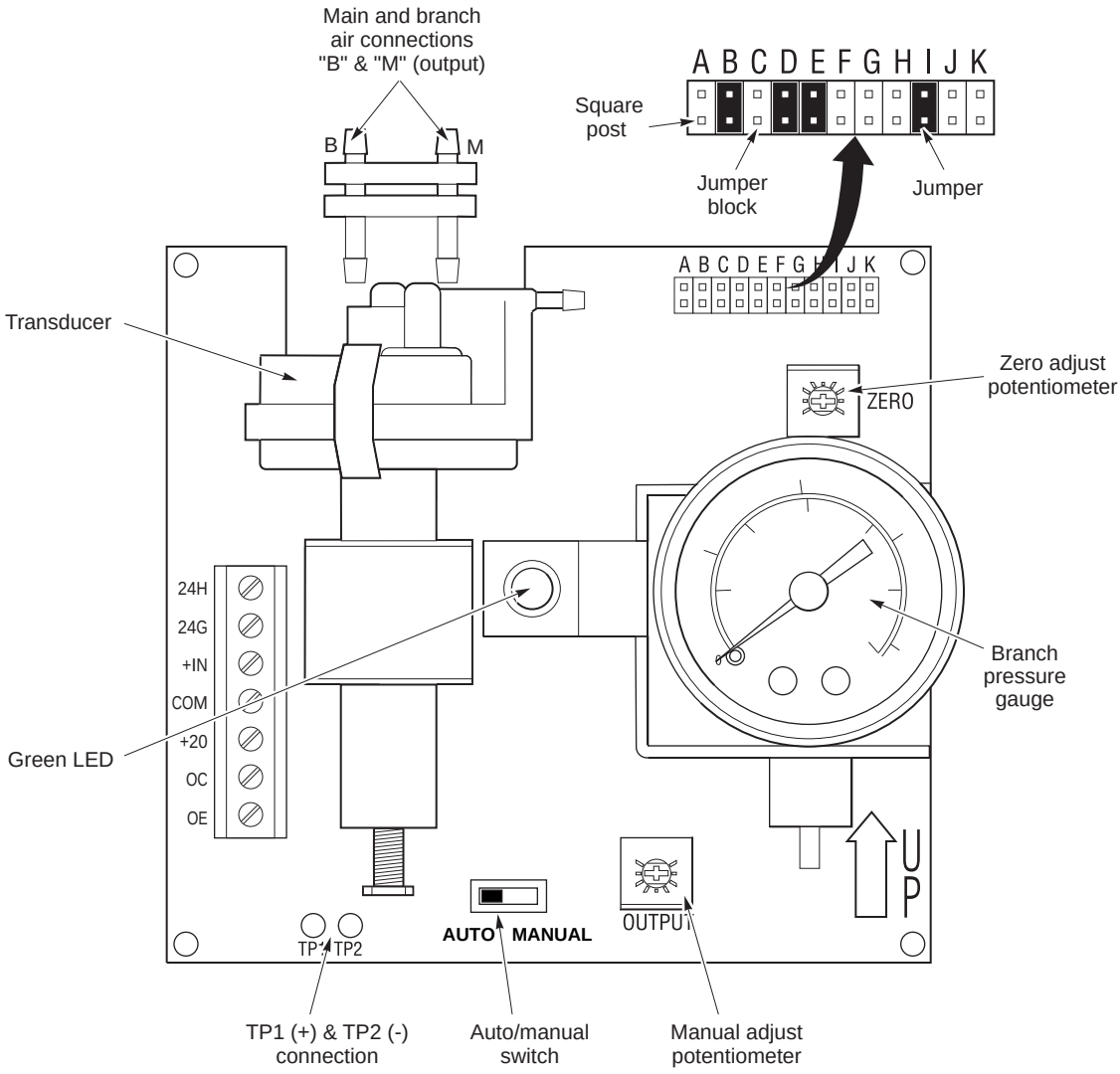


Figure-2 CP-8511 Interior View with Sample Jumper Block Arrangement.

MANUAL/AUTO SWITCH

The CP-8511 features a manual/automatic switch which determines the source of the input signal to the CP-8511. In manual mode, the input signal to the CP-8511 is provided by the manual adjust potentiometer. In automatic mode, the CP-8511 receives the unit's input signal. The CP-8511 can be switched to manual mode during checkout, setup, field repair, etc. Table-3 describes how the features of the CP-8511 are affected by the manual and automatic modes.

Table-3 Manual/Automatic Modes.

Features	Manual Mode	Auto Mode
Manual Adjust Potentiometer	Provides input to CP-8511.	Has no effect on CP-8511.
TP1 (+) & TP2 (-)	Provide a digital voltmeter connection for monitoring voltage supplied by manual adjust potentiometer.	Provide a digital voltmeter connection for monitoring controller input.
Green LED	OFF	ON
OC/OE	In manual mode, Vdc is less than 0.5 V	Vdc > 1.0 V[a]

[a] Voltage is dependent upon power source provided by Building Automation System.

CHECKOUT

Note: The following is a functional check only.

The CP-8511 is factory calibrated for a direct acting 4 to 20 mA input range and 3 to 15 psig (21 to 103 kPa) output range. To change inputs, outputs, or action, internal jumper connections must be changed and branch output pressure recalibrated as follows:

1. Use Table-2 to select correct range and action.
2. Place jumpers in correct positions (Table-2).
3. Connect 20 psig (138 kPa) main air to port "M" (Figure-2).
4. Connect a suitable pneumatic device to port "B" (Figure-2).
5. Apply power to the unit. The green LED should be illuminated when the Auto/Manual switch is set to "Auto" (Figure-2).
6. Set Auto/Manual switch to "Manual." The green LED should be extinguished.
7. Use a digital voltmeter to measure the voltage between TP1 (+) and TP2 (-) (Figure-2).
8. Use the pressure gauge to adjust the zero adjust potentiometer to minimum desired output.
9. Set Auto/Manual switch to "Auto" (Figure-2).

Auxiliary Power Supply Checkout

Check the 20 (+1, -1.5) Vdc power supply by measuring with a digital voltmeter between the +20 and COM terminals. If the 20 Vdc is not present or is out of tolerance, then check the following:

1. Verify the input power by measuring the voltage between 24 H and 24 G with a digital voltmeter.
2. Check to see if the 20 Vdc supply is overloaded externally (Š 50 mAdc).
3. Check to see if an external device is shorting the 20 Vdc supply.
4. If none of the above apply, transducer may be inoperative.

Auto/Manual Feedback Checkout

Verify correct operation of the Auto/Manual feedback signal feature as follows:

1. Connect the CP-8511 to a functional Building Automation System (BAS). BAS should correctly report "AUTO" or "MANUAL" according to the switch position of the CP-8511.
2. If BAS fails to report switch position, check to ensure that the CP-8511 is correctly wired to the BAS. If the BAS fails to report switch position when the CP-8511 is correctly wired, the BAS may not be compatible with the CP-8511.

MAINTENANCE

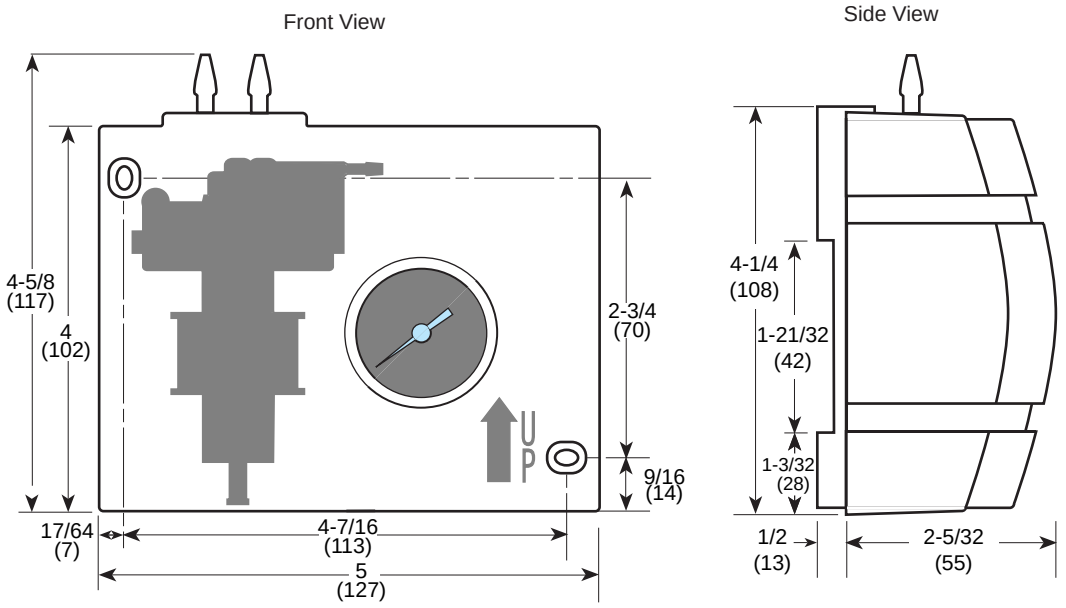
Regular maintenance of the total system is recommended to assure sustained optimum performance.

FIELD REPAIR

Field repair is not recommended. Replace an inoperative transducer with a functional unit. Before replacing the transducer, check the following:

1. Verify that the unit is mounted upright (Figure-2) and wired per the job wiring diagram.
2. Check input signal, supply voltage, and auto/manual switch position.
3. Check main air pressure.
4. Check to see that jumpers are positioned correctly.
5. Verify the presence of output pressures by attaching a separate pressure gauge to port "B" (Figure-2).
6. Repeat checkout procedures listed above.
7. Check for foreign material such as dirt or oil in the air supply. (The contamination of the air supply with dirt or oil is the most likely cause of miscalibration.)
8. Decontaminate air supply before replacing transducer.

DIMENSIONAL DATA



Dimensions shown are in inches (mm).

Figure-3 CP-8511 Dimensions.

On October 1st, 2009, TAC became the Buildings business of its parent company Schneider Electric. This document reflects the visual identity of Schneider Electric, however there remains references to TAC as a corporate brand in the body copy. As each document is updated, the body copy will be changed to reflect appropriate corporate brand changes.

Schneider Electric
1354 Clifford Avenue
P.O. Box 2940
Loves Park, IL 61132-2940
www.schneider-electric.com/buildings