

INSTALLATION INSTRUCTION

INSTALLATION INSTRUCTIONS FOR 559375 ECONOMIZERS USED WITH P6/R6 072-090 UNITS

137D-0209

I - SHIPPING AND PACKING LIST

Package 1 of 1 contains:

- 1 - Economizer Assembly
- 1 - Fresh Air Hood w/ Filter
- 1 - Control Package
- 1 - Barometric Relief Hood
- 1 - Filter Access Panel
- 2 - Wire Nut (For Mixed Air Sensor)
- 6 - #10 x ½ x 16 Hex Tec

Check contents for shipping damage. Contact the last carrier immediately if any shipping damage is found.

II - APPLICATION

Economizers are used with 6 and 7 ½ ton P6SP/R6GP units for automatic sensor-controlled introduction of outdoor air into the system through an electro-mechanically controlled damper.

Economizer slides into horizontal return air opening. Mixed air sensor, TB11, and enthalpy control board relay are shipped in economizer and must be relocated to filter section. Intake and exhaust hoods are packaged with economizers and installed according to instructions provided.

III - INSTALLATION

1. Disconnect all power to unit.
2. Cut and discard wire tie securing wire bundle to the damper motor

Important - DO NOT cut other wires. Inspect for damaged connections or loose wires.

3. Remove box of controls to be installed over the assembly containing the logic control board and mixed air sensor. **See Figure 1.**
4. Remove from box the logic control board and wire bundle. Cut wire tie securing the bundle of wires to logic control board and mixed air sensor.
5. Locate S1, unit economizer connection and remove the installed dummy plug. **See Figure 3.**
6. Connect economizer jack S2 to economizer plug P2 on the economizer assembly.
7. Route wiring to the right side of the economizer and slide into the unit. Position the mixed air sensor and control board in the filter section routing wiring along right side of the horizontal return air section. Insert economizer side flanges into the unit standing seams. Using existing screws from bottom of discarded panel to secure economizer bottom flange to unit. **See Figure 2.**

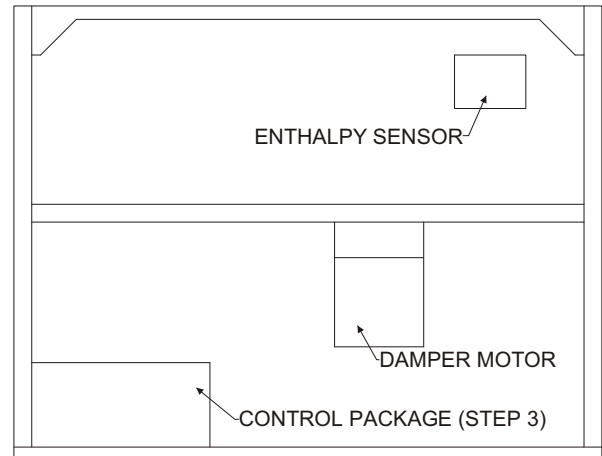


FIGURE 1

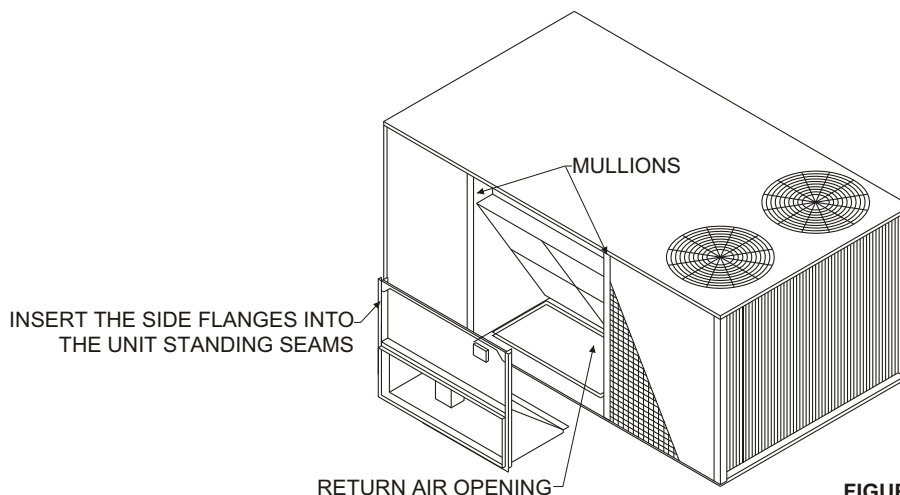


FIGURE 2

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8. Position logic control board in filter access area as shown in **Figure 3**. Secure control board with two #10-16 x 1/2 screws.
9. Insert mixed air sensor tube through the mounting hole into the supply air compartment. Secure using two #10-16 x 1/2 screws. **See Figure 3**.
10. Connect economizer plug P1 to unit jack S1 on units economizer control panel.

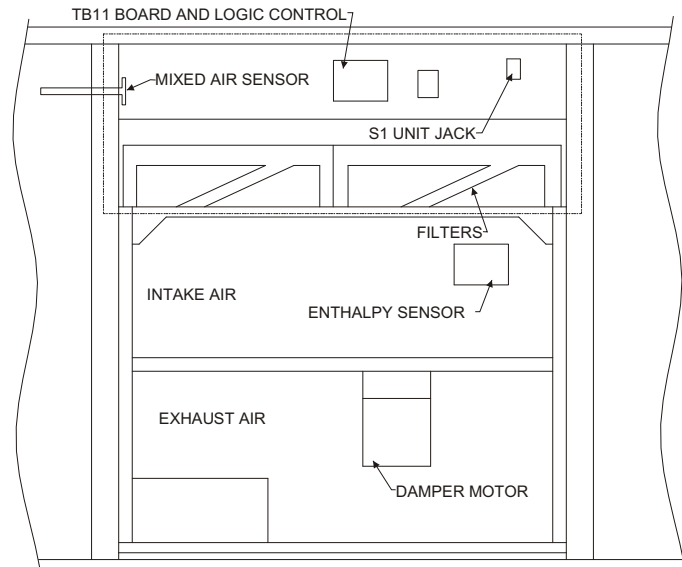


FIGURE 3

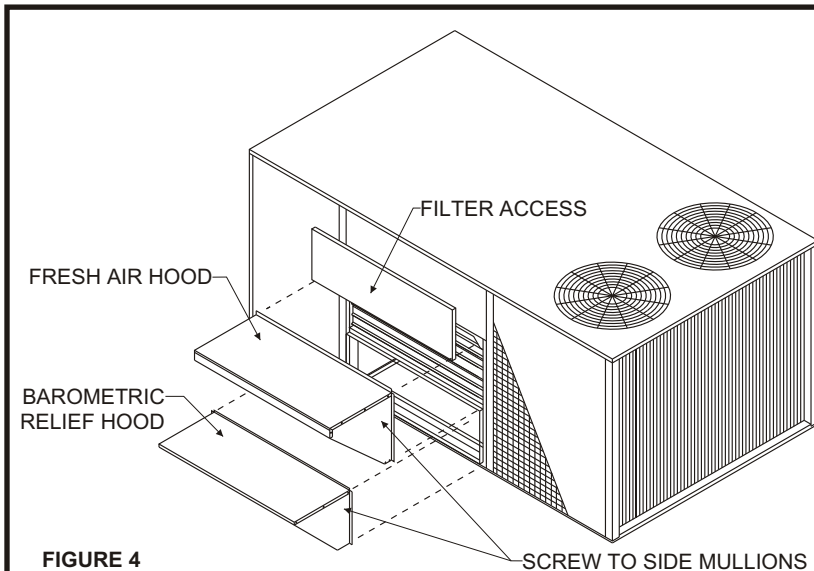


FIGURE 4

DOWN FLOW APPLICATION

11. Install barometric relief hood in front of exhaust air opening.
12. Install fresh air hood in front of intake opening.
13. Slide filter access panel underneath top of unit and secure to mullions.
14. Restore power to unit and check for proper damper operation (See System Check section).

NOTE: FOR THIS APPLICATION THE 547872 OR 920604 KITS ARE REQUIRED.

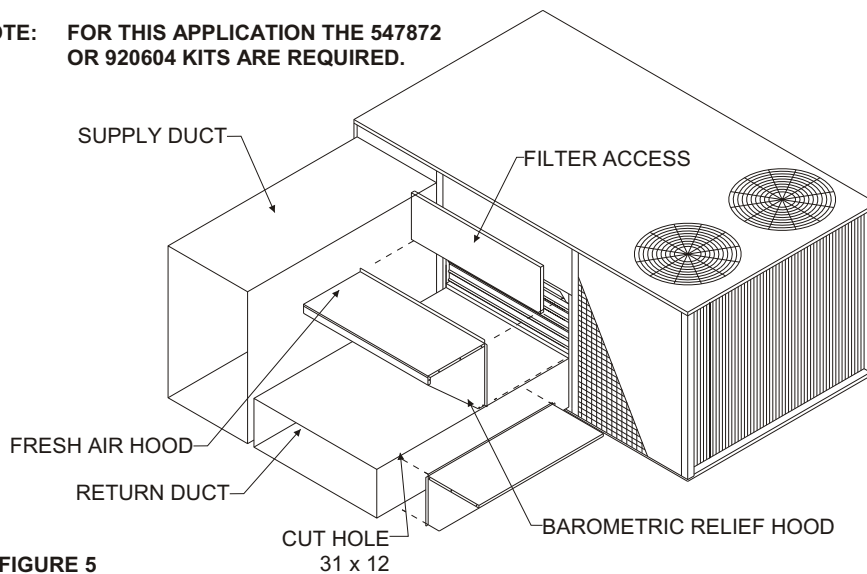


FIGURE 5

HORIZONTAL APPLICATION

11. Install barometric relief hood to return duct over the opening in duct.
12. Install fresh air hood in front of intake opening.
13. Slide filter access panel underneath top of unit and secure to mullions.
14. Restore power to unit and check for proper damper operation (See System Check section).

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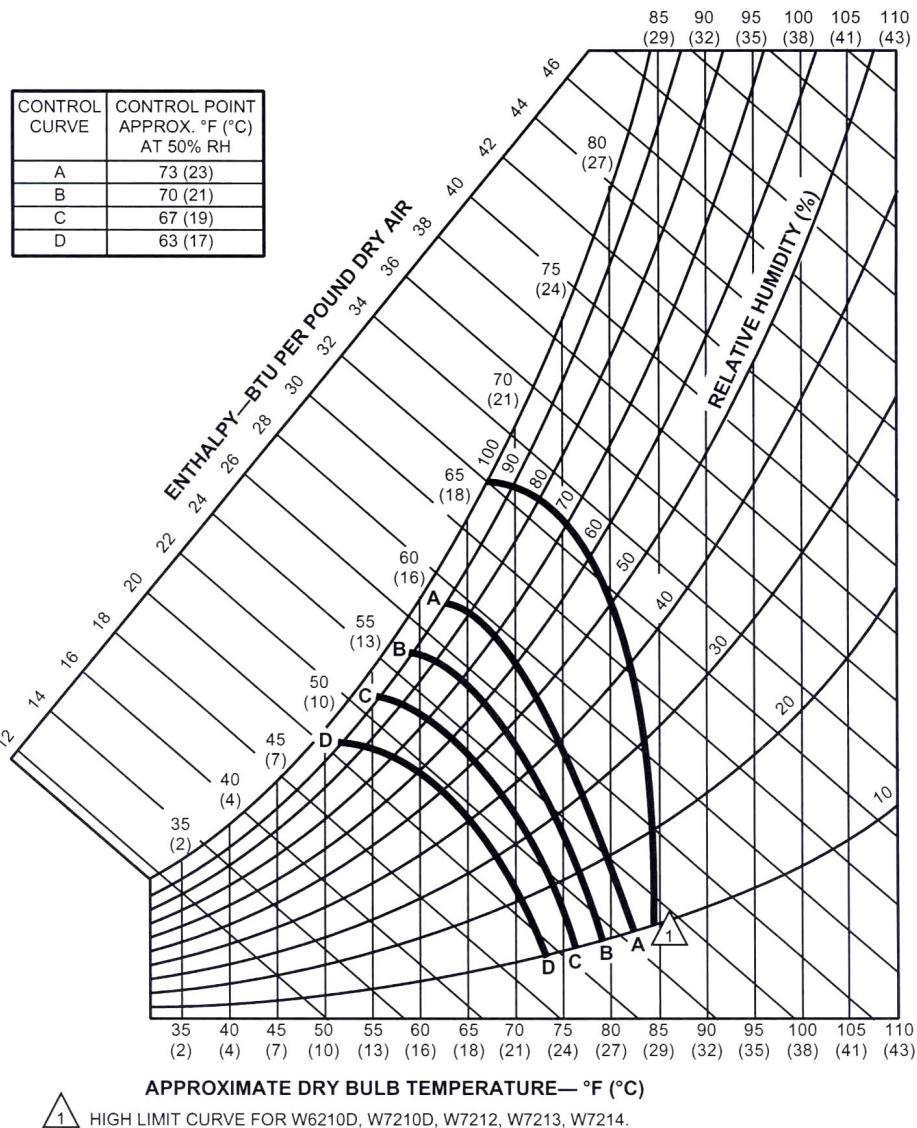


Figure 6

OPERATION

A. Cooling Mode

1. On a call for cooling, with ambient temperature and humidity above enthalpy control setpoint, damper will open to minimum vent position.
2. On a call for cooling, with ambient temperature and humidity suitable for cooling, enthalpy control will shift stage one control to outside air and shift stage two thermostat to first stage compressor. Damper will modulate to control supply air temperature at 55° F (13° C). If additional cooling is required, compressor one may be energized through second stage of thermostat.

B. Heating Mode

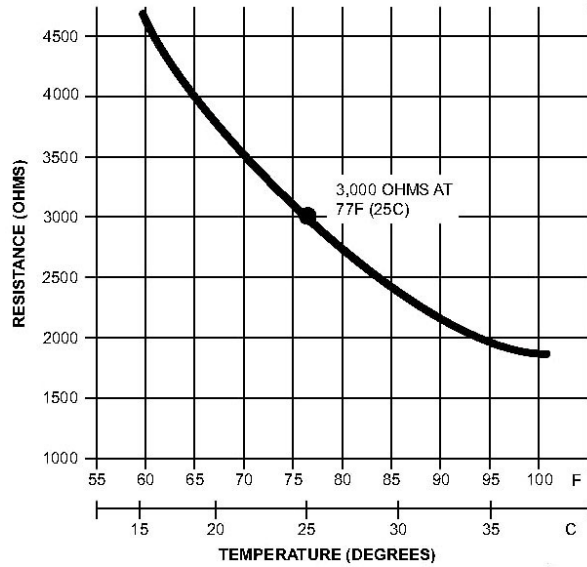
1. On a call for heat damper will open to the minimum vent position only.

Setting the Outdoor Enthalpy Changeover Point

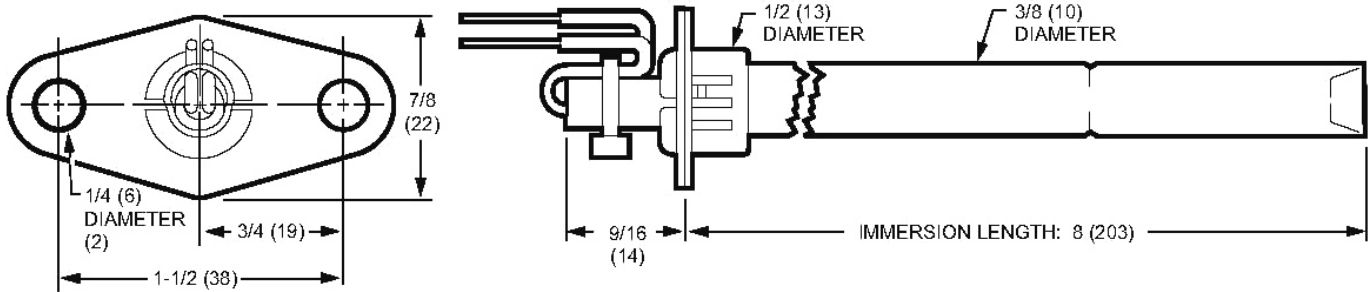
The enthalpy control senses both temperature and humidity or the heat content of the outside air. It controls the amount of outdoor air brought into the system. When the heat content of the outside air is below control setpoint, the control modulates outdoor dampers to meet cooling needs of the building. When the heat content rises above control setpoint, the control closes outdoor dampers to minimum position. The recommended setpoint is "A". If Economizer is allowing air which is too warm or too humid to enter the system, control may be changed to a lower setpoint (B, C, or D). **Refer to Figure 6.**

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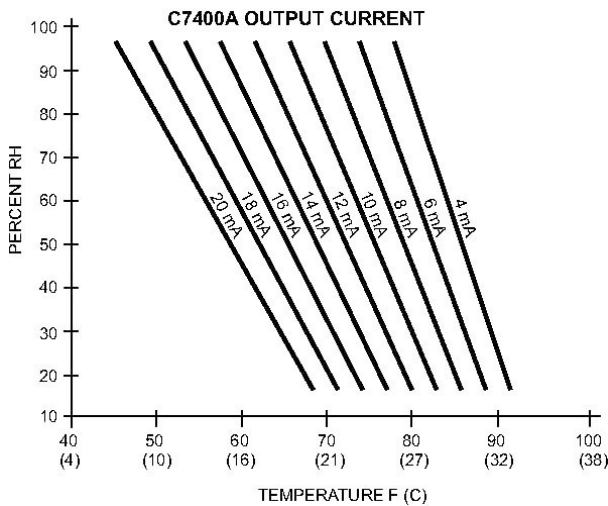
INSTALLATION INSTRUCTIONS FOR 559375 ECONOMIZERS USED WITH P6/R6 072-090 UNITS



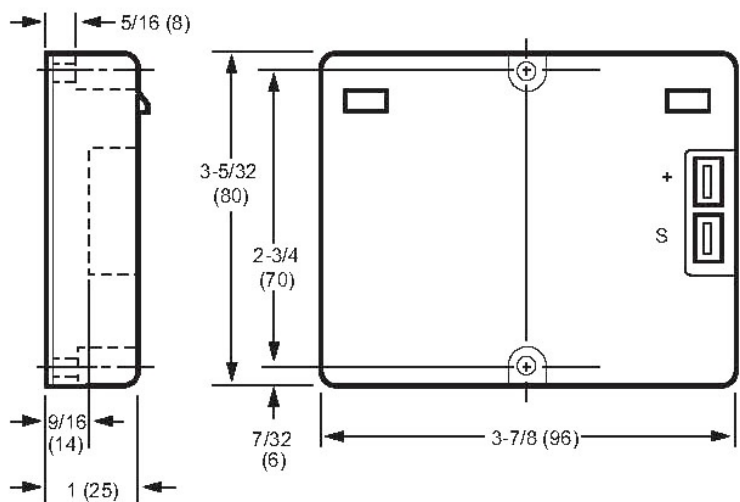
**C7046C Air Temperature Sensors
resistance versus temperature.**



Approximate dimensions of C7046C Air Temperature Sensor in in. (mm).



**C7400A Sensor output current
vs. relative humidity**



**Approximate dimensions of C7400A Solid State Enthalpy Sensor
C7650A Solid State Temperature Sensor in in. (mm)**

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CHECKOUT AND TROUBLESHOOTING

Check the W7459 for proper operation. Table 1 describe how to simulate various environmental conditions. Make necessary minor adjustments to the minimum position until desired operation is obtained.

If the economizer system does not operate properly, check individual components of the system according to the instructions provided with each device.

If the other components operate properly when disconnected from the W7459, but the system (as a whole) does not, replace the W7459.

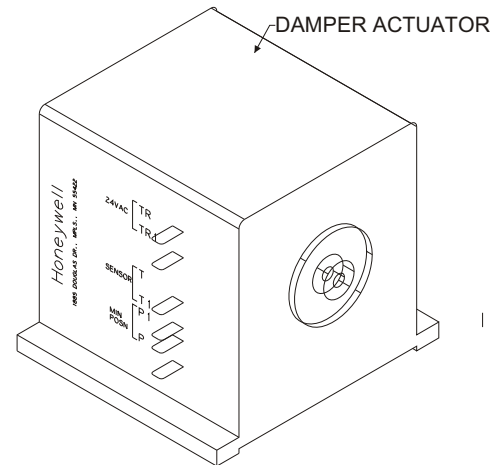
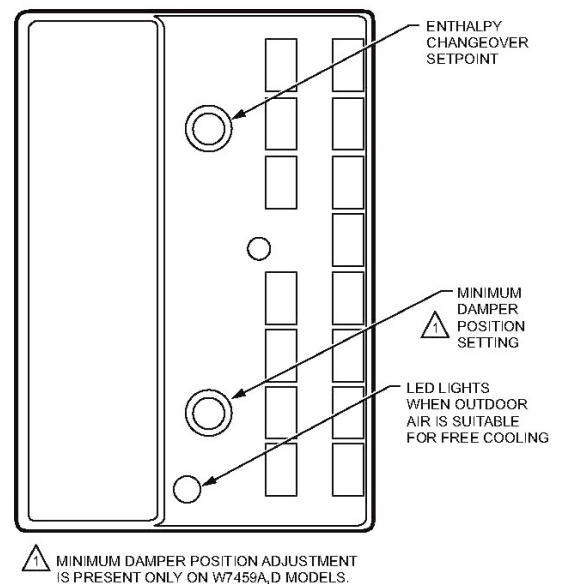


Figure 7 - M7415A

Checkout Procedure	Proper Response
1. a. Disconnect power at TR and TR1.	----
b. Disconnect Jumper P to P1.	
c. Jumper TR to 1.	
d. Jumper T1 to T.	
e. If connected, remove C7400 Solid State Enthalpy Sensor from terminals S _O and +. Ensure factory-installed 620 ohm resistor is connected to terminals S _R and +.	LED is off.
f. Apply power (24 Vac) to terminals TR and TR1.	Motor is in closed position.
2. a. Disconnect factory-installed 620 ohm resistor from terminals S _R and +.	LED turns on (A model only, for D model, go to step 3). Motor drives toward open.
3. a. To simulate high and low enthalpy (single enthalpy sensor), reconnect factory-installed 620 ohm resistor from terminals S _R and +. Connect 1.2K ohm 4074EJM Checkout Resistor across terminals S _O and +	----
b. Turn enthalpy setpoint potentiometer to "A".	LED turns on, indicating low enthalpy. Motor drives toward open.
c. Turn enthalpy setpoint potentiometer to "D".	LED turns on, indicating high enthalpy. Motor drives toward closed.
d. Disconnect the 1.2K ohm checkout resistor.	----
4. a. To verify sensor operation, reconnect the + lead of outdoor enthalpy sensor to the + terminal of W7459	----
b. Connect a DC milliammeter between terminal S _O of the W7459A and terminal S of the enthalpy sensor. (Positive meter lead to terminal S of the enthalpy sensor.)	Milliammeter indication is between 3 and 25 mA if sensor is operating properly. If milliammeter indicates zero, the sensor may be wired backwards.
c. When using differential enthalpy, check the return air enthalpy sensor by connecting a DC milliammeter between terminal S _R of the W7459A and terminal S of the return air enthalpy sensor. (Positive meter lead to terminal S of the enthalpy sensor.)	Milliammeter indication is between 3 and 25 mA if sensor is operating properly. If milliammeter indicates zero, the sensor may be wired backwards



MINIMUM DAMPER POSITION ADJUSTMENT IS PRESENT ONLY ON W7459A,D MODELS.

Figure 8 - W7459A

$$\left[\begin{array}{c} \text{Return Air} \\ \text{Temperature} \end{array} \right] \times \left[\begin{array}{c} \% \text{ of} \\ \text{Return Air} \end{array} \right] + \left[\begin{array}{c} \text{Outside Air} \\ \text{Temperature} \end{array} \right] \times \left[\begin{array}{c} \% \text{ of} \\ \text{Outside Air} \end{array} \right] = \text{Temperature of Mixed Air}$$

Formula for Adjusting the Minimum Position Control

For design requirements for CFM per person for all building types, refer to ASHRAE standard 62.1 section 6 and/or local or state building codes.

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Adjusting Minimum Damper Position

The minimum position potentiometer keeps outdoor air damper from closing completely during system operation to provide ventilation.

Minimum Position Adjustment

W7459A

1. Disconnect mixed air sensor from terminals T and T1.
2. Make sure either factory-installed jumper is in place across terminals P and P1 or if remote damper positioner is required, that it is wired according to **Figure 9** and turned fully clockwise.
3. Connect 24 Vac across terminals TR and TR1.
4. Adjust potentiometer on face of W7459 with screwdriver to desired minimum position.

Optional Applications

Remote Minimum Position Control

Remote control of outdoor air dampers is desirable when potential exists for temporary additional ventilation. The potentiometer in W7459 controls damper minimum position. Adding S963B1128 Remote Manual Potentiometer allows occupants to open dampers beyond minimum position for additional ventilation. Connect potentiometer as shown in **Figure 9**.

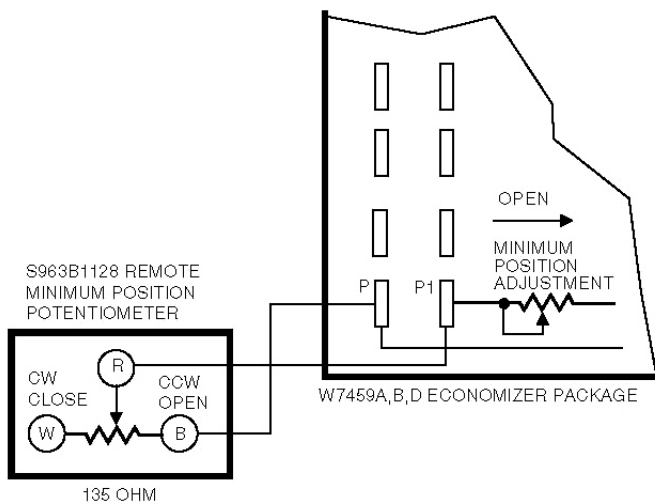
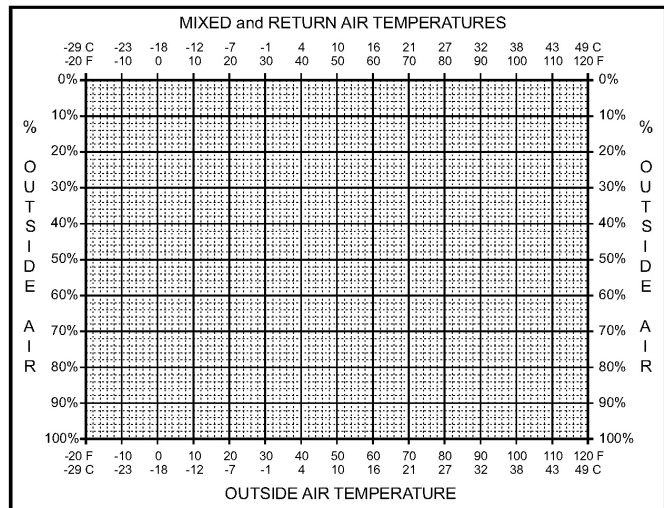


Figure 9

S963B1128 Remote Minimum Position Potentiometer used with W7459 for remote damper control.



This chart can also be used for measuring the percentage of outside air on an air handler. The same three temperatures are measured per the formulas on the preceding page. Lines are drawn on the chart using a ruler. As with the formulas this chart is most effective if there is at least a 10 degree F difference between the return and outside air. This will typically require either a warm or cold day rather than moderate weather. It is more accurate to measure outside air percentage on a day when the outside temperature is 10°F (-12°C) rather than on a day when it is 70°F (21°C). If the temperature difference between the return and outside air is only a few degrees, a small error in measurements can alter the results by as much as 50% using this method. If the temperature difference is 40 or 50°F (22 or 28°C) small errors in measurement do not substantially affect the results of the calculations. **A full size chart is provided on the last page of these instructions.**

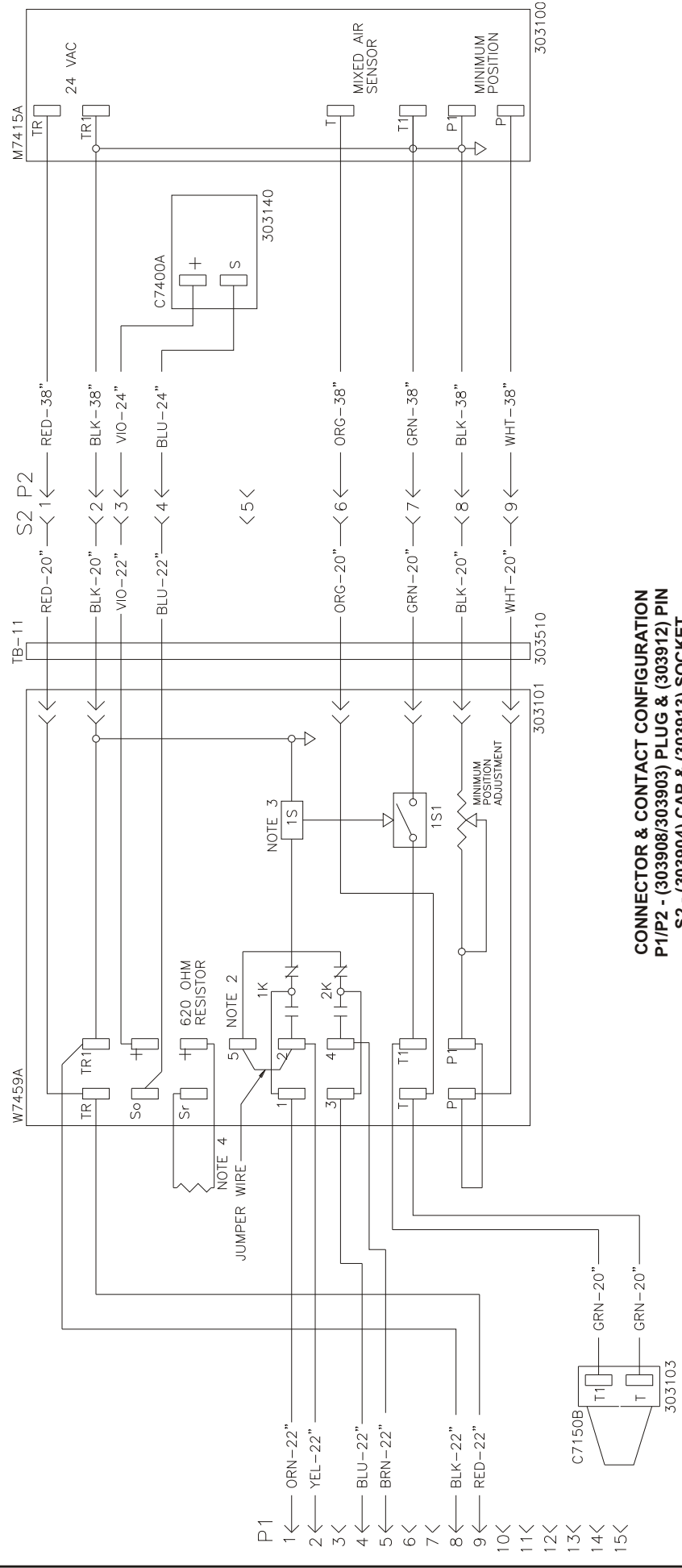
For detailed instructions on the use of this chart, refer to Honeywell publication # 63-8597, Honeywell Economizers. Pages 12-13.

MAINTENANCE

1. Damper motor is prelubricated and does not require further lubrication.
2. Make visual inspection of dampers and linkage assemblies during routine maintenance.
3. Filters should be checked periodically and cleaned when necessary. At least on a quarterly schedule.
4. The washable filters supplied with the economizer can be cleaned with water and a mild detergent.
5. Take note of "Air Flow Direction" marking on filter frame when reinstalling.
6. If filter must be replaced, filter of like kind and size must be used. DO NOT replace permanent filters with throwaway type filters.

HARNES DETAIL		COMPONENT CODE		WIRE COLOR CODE		Revision		Change		Date	
E# = WIRE END DESIGNATION		C7046C	Mixed Air Sensor	BLK	Black	A	Changed Note 1			11/20/08	
E2 STUD #6 18 Ga. Wire		C7400A	Fresh Air Sensor	BLU	Blue						
E3 Female ¼ Quick Disc.		M7415A	Damper Actuator 24V	BRN	Brown						
E4 Male ¼ Quick Disc. Insul		P1/S1	Plug/Cap Economizer	GRN	Green						
E6 Wire Nut Size 73B		P2/S2	Plug/Cap Economizer	ORN	Orange						
		TB-11	Terminal Board	RED	Red						
		W7459A	Logic Module	VIO	Violet						
				WHT	White						
				YEL	Yellow						

HARNES ENDS AT (P1) ECONOMIZER PLUG



CONNECTOR & CONTACT CONFIGURATION
P1/P2 - (303908/303903) PLUG & (303912) PIN
S2 - (303904) CAP & (303913) SOCKET

Modulating Downflow Economizer P6-R6 072-090	
Roofop Systems, Inc. 2405 McIver Lane Carrollton, Texas 75006 Phone (972) 247-7447 Fax (972) 243-0940	Date: January 27, 2009 Supercedes: Drawn by: MGL Unit #: 47-314-07C Diagram#: 4731407CW Approved by:

- Notes:
- Connection at P1 terminal 2:
 "R" units: Yellow side of gas valve
 "P" units: "W" on A/C unit
 "Q" units: "O" on indoor thermostat sub-base.
 - Y2 must be energized for the compressor to operate during economizer operation.
 - Refer to economizer Instructions, Page 6, for Heatpump changes.

See Unit Wiring Diagram for Connections at S1

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Outside Air Percentage Chart

