ICP

INSTALLATION INSTRUCTIONS
for Economizer NPECOMZR004A00

ICP's economizer is convertible-it will work in either a down discharge or horizontal discharge application. Read these instructions completely and carefully before beginning installation.

For Down Discharge

(for Horizontal Application go to page 4)

1. Unpack top and bottom filter racks and filters. Remove the side panel from the HVAC unit, ILL 1. Discard panel.

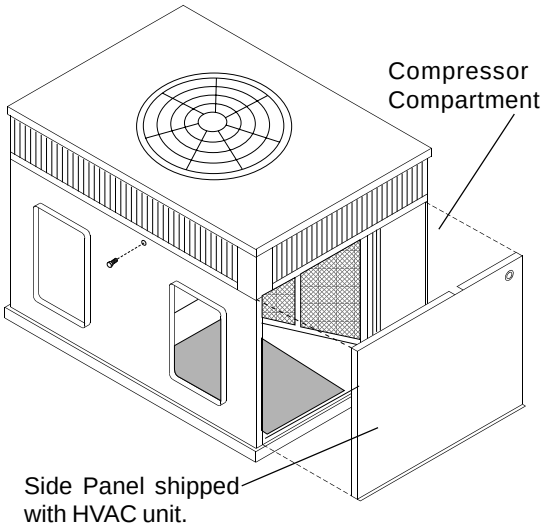
2. Install bottom rack. Slide rack over to right side (when facing coil) of HVAC unit. Set rack in front of coil and screw rack to coil frame through pre-punched hole. **Maximum screw length 1/2"**.

3. Install top rack. Slide rack over to right side of HVAC unit. Set rack in front of coil and screw rack to coil frame. **Maximum screw length 1/2"**. Blank-off should fit between top and bottom racks to the far left of HVAC unit. (If using 1" filters, spacer may need to be removed to position blank-off. Once blank-off is in position, re-install spacer.)

4. If using 2" wide filter, remove spacer from top and bottom filter racks. (ILL. 3.)

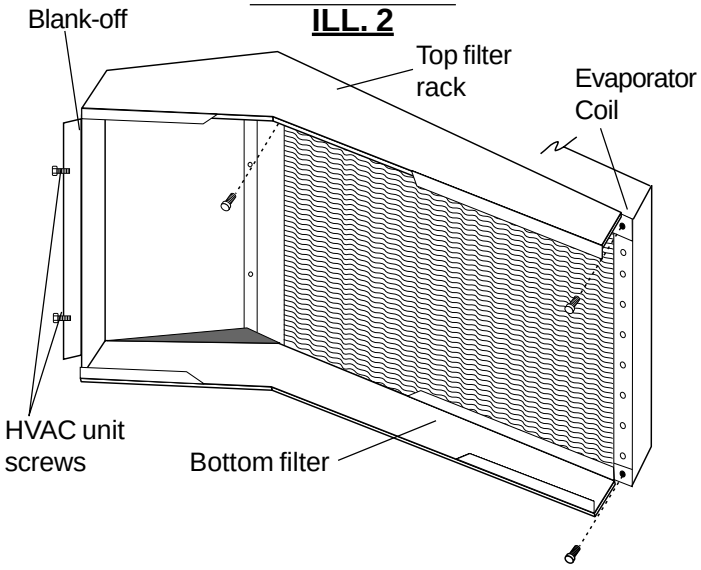
5. To change filter:
   - Open hinged door.
   - Remove middle filter first. Slide remaining filters to middle of rack for removal.
   - To install filters, reverse above operation.

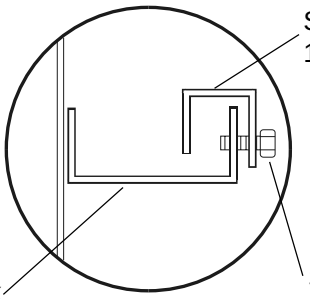
ILL. 1



Rack Detail

ILL. 2





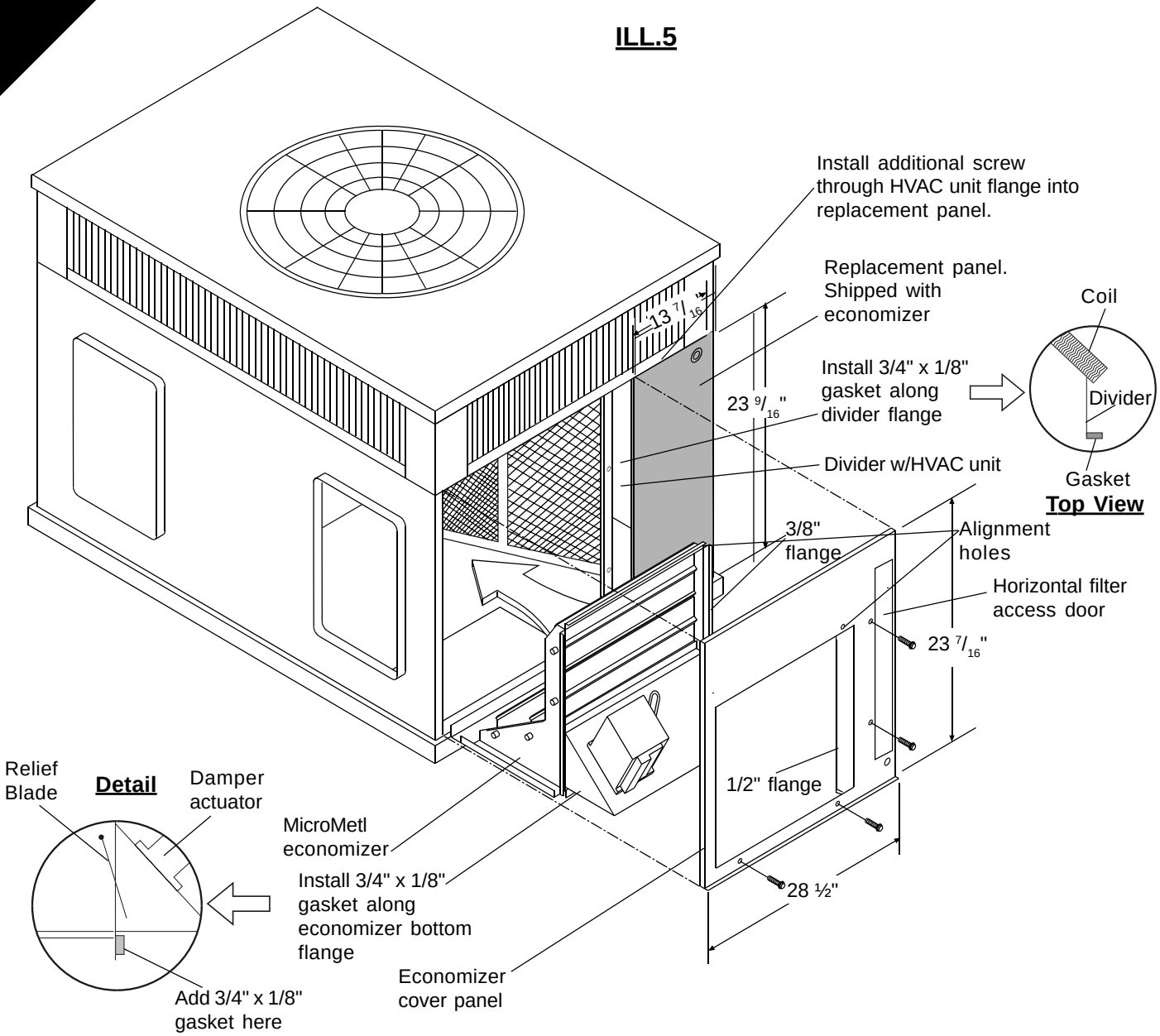
ILL. 3

Filter Width	Qty. / Size
1" filter	(3) 12" x 24" x 1"
2" filter	(3) 12" x 24" x 2"

Form No. 5056-1P

Down Discharge

ILL.5



5. Install the **replacement panel** (shipped with the economizer) over the compressor compartment of the HVAC unit. Screw in place through the prepunched holes.

6. Slide the economizer into the return air chamber, ILL. 5. Slide the economizer as far to the left as possible. The economizer's right side will slightly overlap the bottom filter rack and divider, see details. Be sure economizer is flat.

7. Route the economizer wiring harness through the grommet in the economizer side and through the HVAC units provided hole located in the upper part of the HVAC unit divider. (Install provided grommet in divider hole of HVAC unit.) Follow the included harness routing diagram. (see page 9)

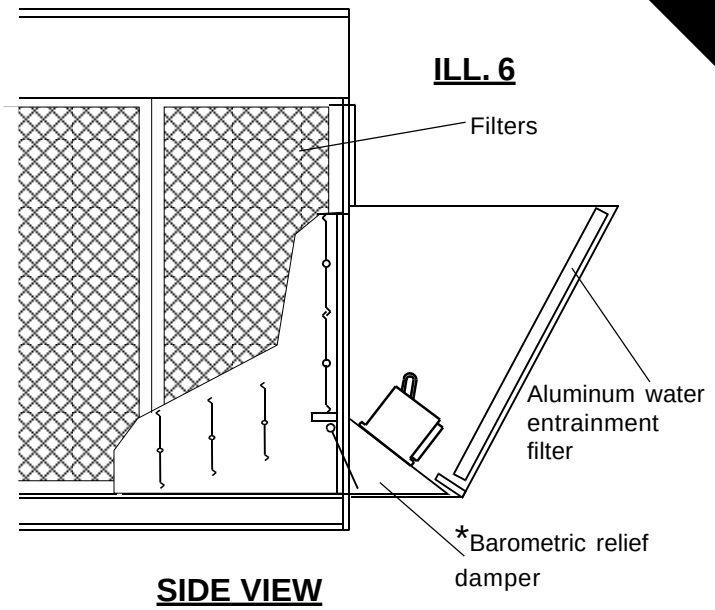
8. Install 3/4" x 1/8" gasket along economizers bottom flange. Install cover panel over the economizer. Slide panel underneath HVAC unit flange. Screw in place to the divider, in the HVAC unit, base and top. Also, align economizers 3/8" flange to the outside of 1/2" flange as shown and secure economizer cover panel to economizer using provided pre-punched alignment holes with 1" long tek screw.

9. Screw the rainhood to the economizer panel through prepunched holes. Caulk the mating flanges of the rainhood. The top flange of the hood slips underneath the HVAC unit flange. After adjusting the minimum position setting on the actuator, install the 24 $^{3}/_{8}$" x 19 $^{3}/_{8}$" aluminum filter in the rain hood.

11. Remove the cover panel shipped over the horizontal return opening. Locate the filter access panel and door latch angle. Install door latch angle. Screw the hinge to the HVAC unit over the horizontal return opening. Adjust the closure handles for a tight seal.

12. Install the provided filter access sticker on the hinged door.

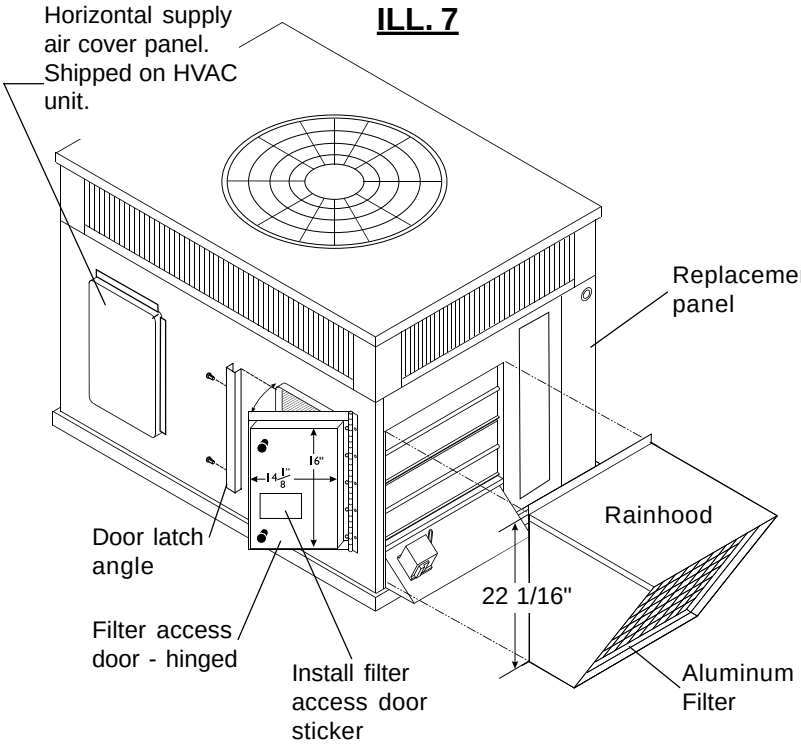
ILL. 6



SIDE VIEW
Down Discharge

*Barometric damper relieves approximately 25% of total system air. Actual relief will vary depending on job site conditions.

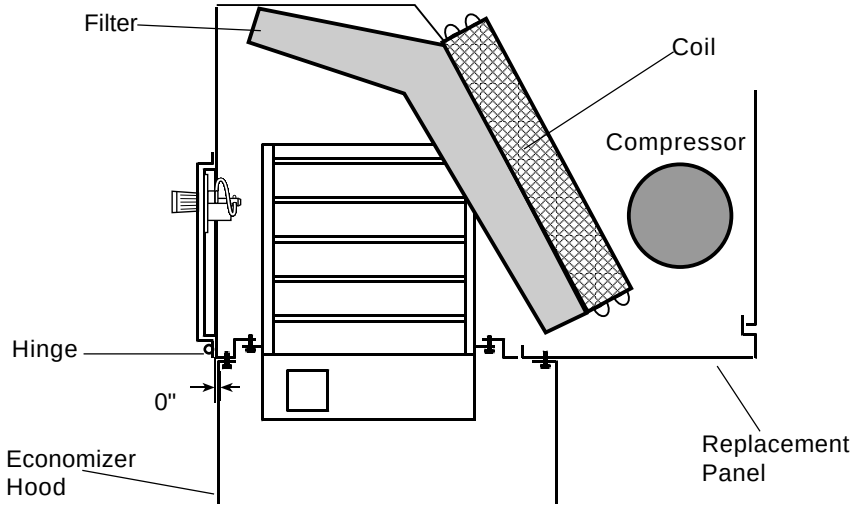
ILL. 7

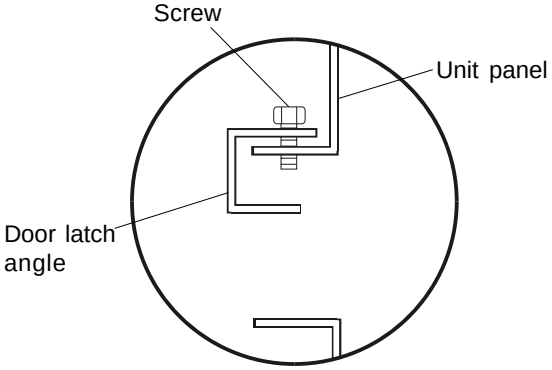


13. Be sure the seams are all water tight. Seal as required.

14. Follow the wiring instructions enclosed. (see page 7, 8)

TOP VIEW ILL. 8





DOOR LATCH ANGLE DETAIL

For Horizontal Discharge

(for Down Discharge Application go to page 1)

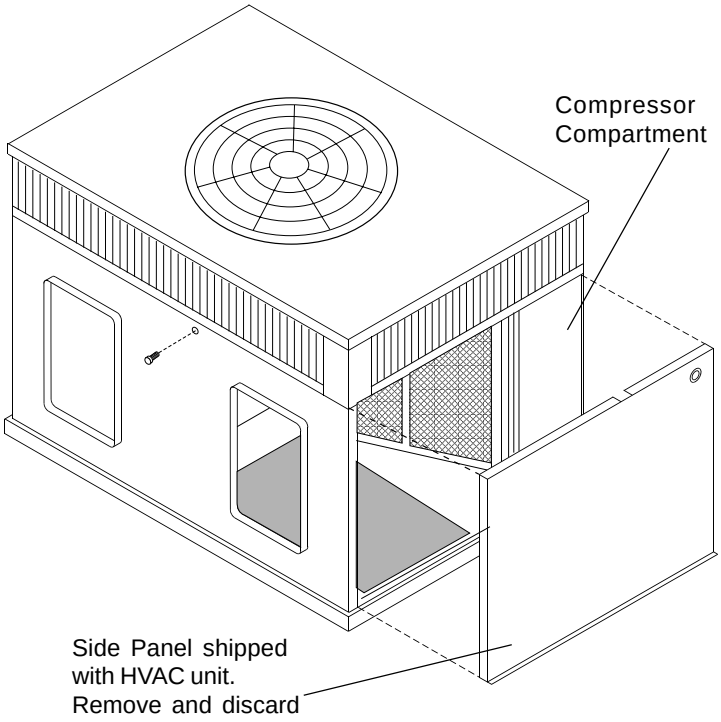
1. Unpack top and bottom filter racks and filters. Remove the side panel from the HVAC unit, ILL. 1, discard the panel.

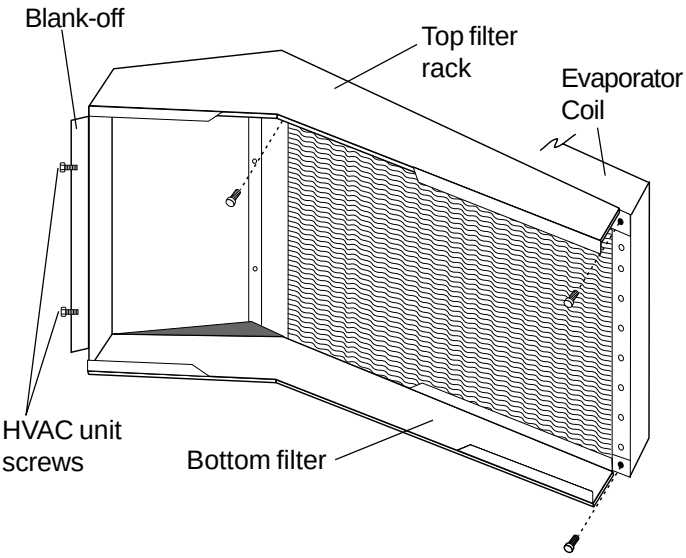
2. Install bottom rack. Slide rack over to right side (when facing coil) of HVAC unit. Set rack in front of coil and screw rack to coil frame through pre-punched hole. **Maximum screw length 1/2"**.

3. Install top rack. Slide rack over to right side of HVAC unit. Set rack in front of coil and screw rack to coil frame. **Maximum screw length 1/2"**. Blank-off should fit between top and bottom racks to the far left of HVAC unit. (If using 1" filters, spacer may need to be removed to position blank-off. Once blank-off is in position, re-install spacer.)

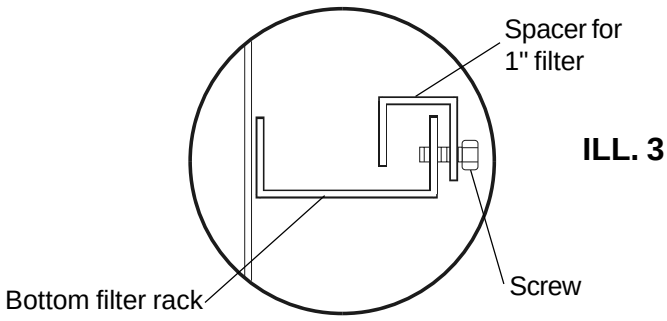
4. If using 2" wide filter, remove spacer from top and bottom filter racks. (ILL. 3.)

5. To change filter:
   - Remove horizontal filter access door on economizer cover panel.
   - Remove middle filter first. Slide remaining filters to middle of rack for removal.
   - To install filters, reverse above operation.





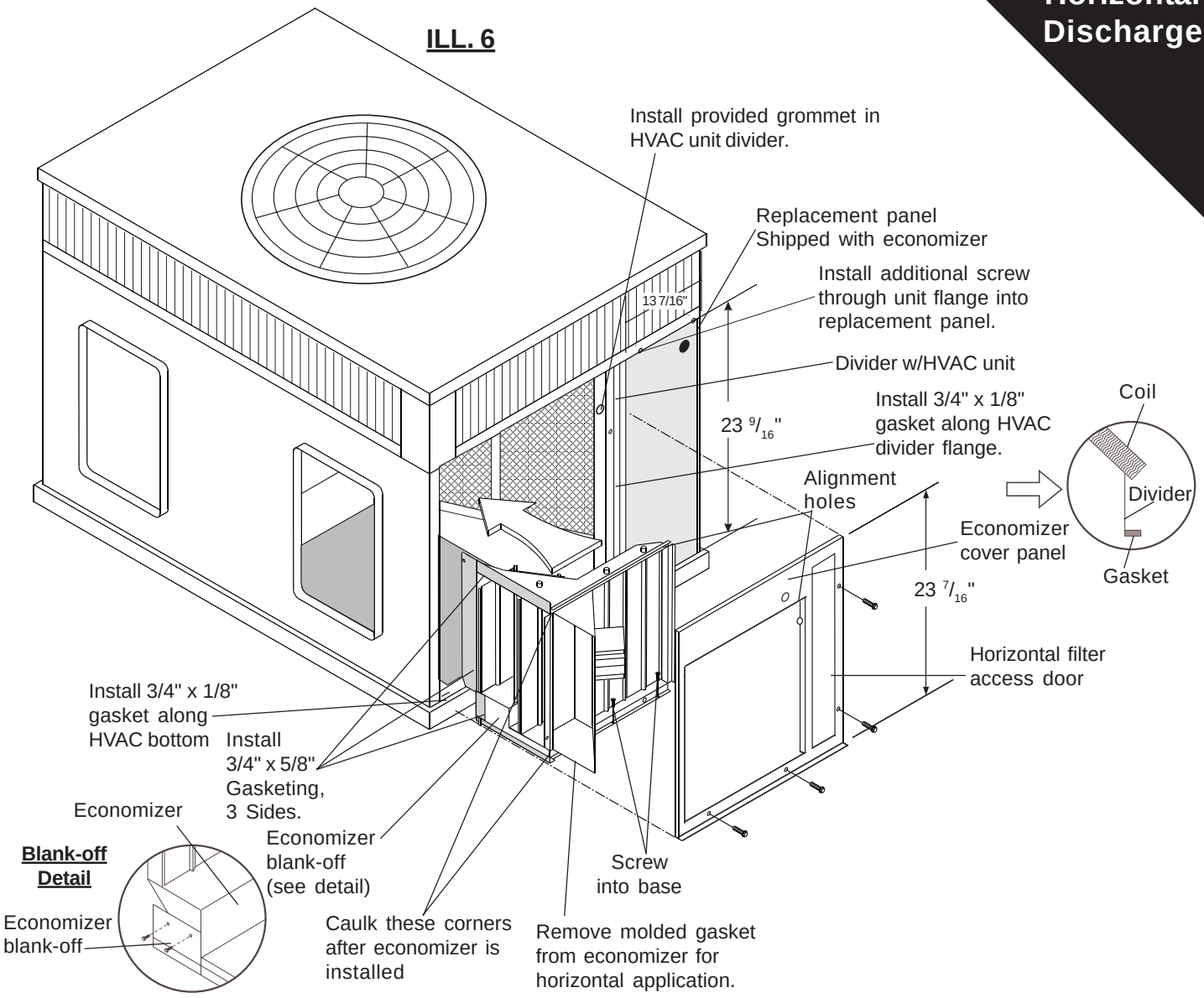
Rack Detail
ILL. 2



ILL. 3

Filter Width	Qty. / Size
1" filter	(3) 12" x 24" x 1"
2" filter	(3) 12" x 24" x 2"

ILL. 6



6. Install the replacement panel over the compressor compartment. Screw in place through the prepunched holes.

7. Install provided economizer blank-off to bottom of economizer. Screw in place through the pre-punched holes.

8. Install the 3/4 x 5/8" gasketing on the bottom flanges of the economizer (shaded area), ILL. 6., (economizer is shown in rotated position.)

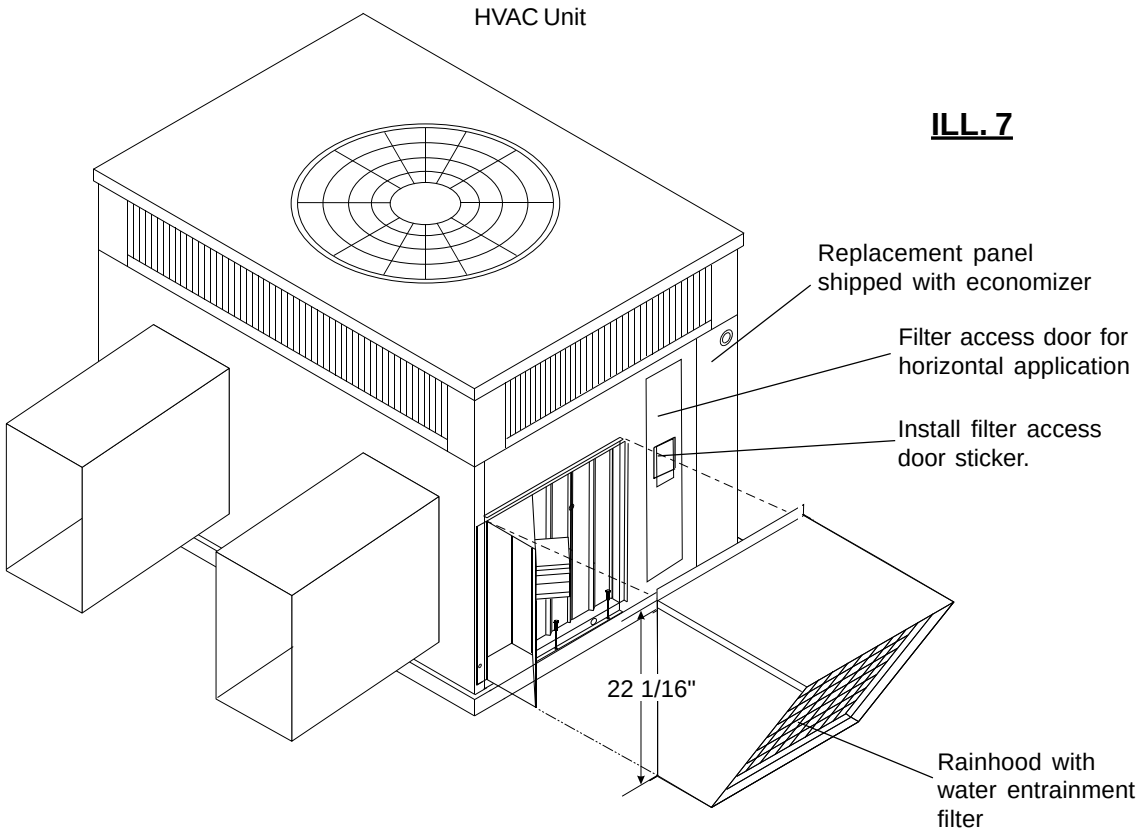
9. Rotate the economizer on its side as shown, ILL. 6. Slide the economizer into the cabinet and as far to the left as possible. The economizer will set against the left side of the HVAC unit. Caulk as required.

10. Install the economizer cover panel over the economizer. Slide panel underneath HVAC unit flange. Screw in place to the divider in the HVAC unit, base and top.

11. Align the economizer to the cover panel with 1" long tek screw using the provided pre-punched alignment holes.

NOTE: The relief damper must be sealed shut for the horizontal discharge application.

Horizontal Discharge



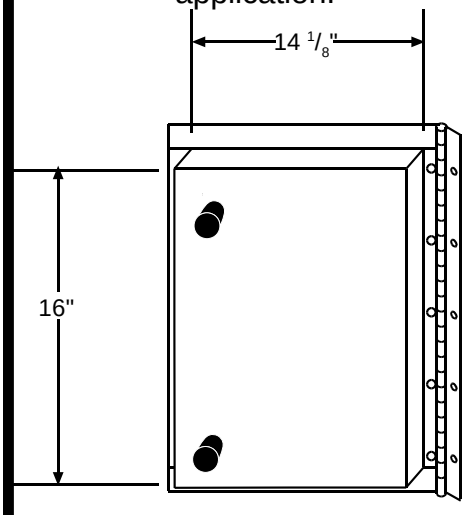
ILL. 7

11. Route the economizer wiring harness through the grommet in the economizer side and through the HVAC unit's provided hole located in the upper part of the HVAC unit divider. (Intall provided grommet in divider hole.) Follow the harness routing diagram. (see page 9)

12. Screw the rainhood to the economizer panel through the prepunched holes. Caulk the mating flanges of the rainhood. The top flange of the hood slips underneath the HVAC unit flange. An extended socket will be required for the left side of the hood. After adjusting the minimum position setting on the actuator, install the aluminum filter in the rainhood. Install the provided filter access sticker on the horizontal filter door.

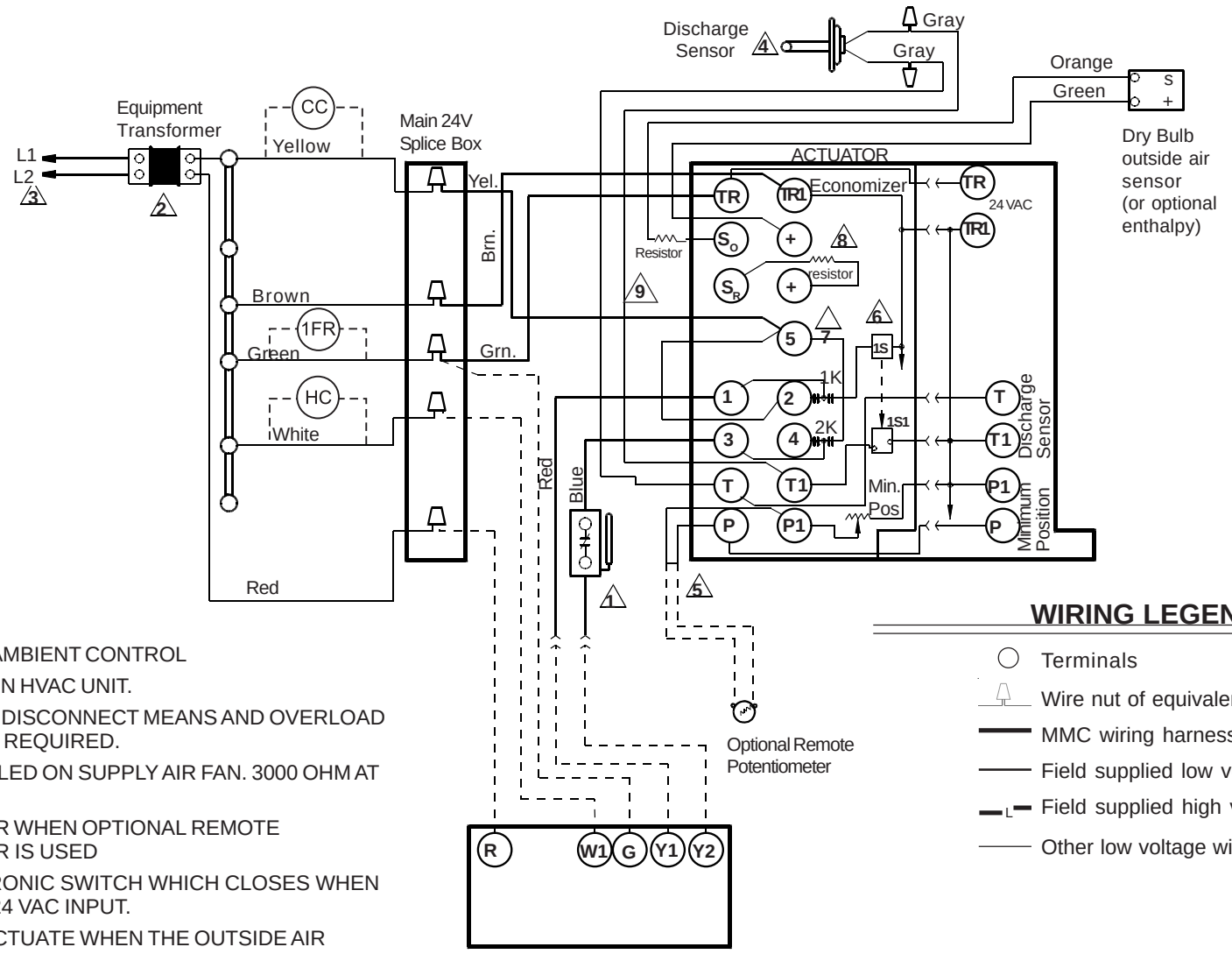
13. Follow the wiring instructions, see page 7,8.

The side hinged panel and horizontal cover panel will not be used in the horizontal application.



ILL. 8

Wiring Diagram for Economizers (not Heat Pump) - NPECOMZR003A00 & NPECOMZR004A00



NOTES:

1. OPTIONAL LOW AMBIENT CONTROL
2. TRANSFORMER IN HVAC UNIT.
3. POWER SUPPLY. DISCONNECT MEANS AND OVERLOAD PROTECTION AS REQUIRED.
4. MUST BE INSTALLED ON SUPPLY AIR FAN. 3000 OHM AT 25 C, 77 F
5. REMOVE JUMPER WHEN OPTIONAL REMOTE POTENTIOMETER IS USED
6. 1S IS AN ELECTRONIC SWITCH WHICH CLOSES WHEN POWERED BY A 24 VAC INPUT.
7. RELAY 1K & 2K ACTUATE WHEN THE OUTSIDE AIR SENSED BY THE ENTHALPY OR DRY BULB IS LOWER THAN THE SET POINT A-D.
8. FACTORY INSTALLED 620 OHM, 1 WATT, 5% RESISTOR SHOULD BE REMOVED ONLY IF A SENSOR IS ADDED TO SR AND + FOR DIFFERENTIAL CHANGEOVER.
9. RESISTER ONLY REQUIRED FOR FIXED DRY BULB.

WIRING LEGEND

- Terminals
- Wire nut of equivalent connection
- MMC wiring harness
- Field supplied low voltage wire
- Field supplied high voltage wire
- Other low voltage wire

CAUTION

1. Disconnect power supply before connecting writing to prevent electrical shock or equipment damage

Form No. 2387-6PW

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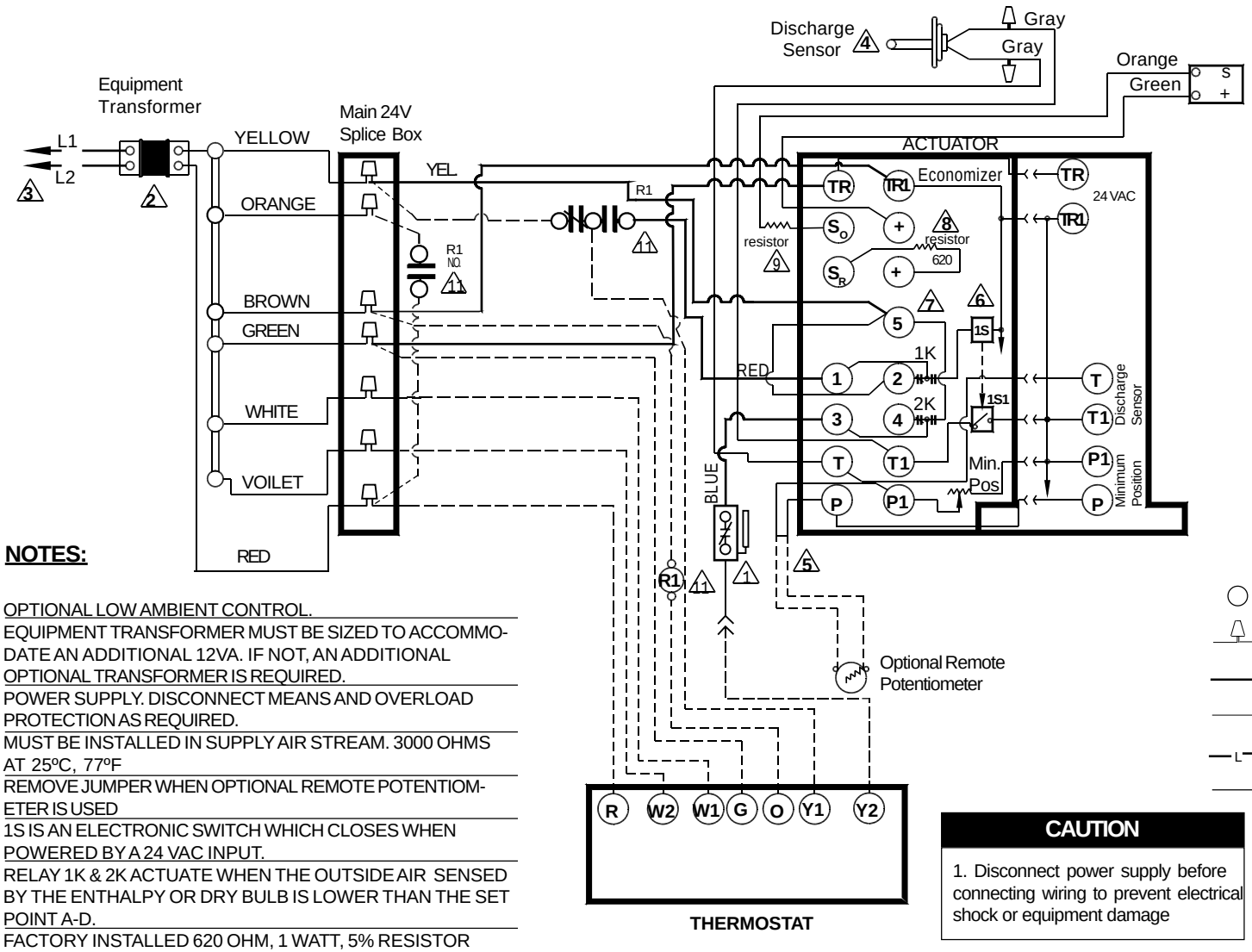
Wiring Diagram For Economizers with Heat Pump



NOTES:

1. OPTIONAL LOW AMBIENT CONTROL.
2. EQUIPMENT TRANSFORMER MUST BE SIZED TO ACCOMMODATE AN ADDITIONAL 12VA. IF NOT, AN ADDITIONAL OPTIONAL TRANSFORMER IS REQUIRED.
3. POWER SUPPLY. DISCONNECT MEANS AND OVERLOAD PROTECTION AS REQUIRED.
4. MUST BE INSTALLED IN SUPPLY AIR STREAM. 3000 OHMS AT 25ºC, 77ºF
5. REMOVE JUMPER WHEN OPTIONAL REMOTE POTENTIOMETER IS USED
6. 1S IS AN ELECTRONIC SWITCH WHICH CLOSES WHEN POWERED BY A 24 VAC INPUT.
7. RELAY 1K & 2K ACTUATE WHEN THE OUTSIDE AIR SENSED BY THE ENTHALPY OR DRY BULB IS LOWER THAN THE SET POINT A-D.
8. FACTORY INSTALLED 620 OHM, 1 WATT, 5% RESISTOR SHOULD BE REMOVED ONLY IF AN ENTHALPY OR ADJUSTABLE DRY BULB SENSOR IS ADDED TO SR AND + FOR DIFFERENTIAL.
9. RESISTOR ONLY REQUIRED FOR FIXED DRY BULB.
11. R1- RELAY IS FIELD SUPPLIED AND FIELD INSTALLED. MOUNT RELAY IN CONTROL BOX, ABOVE INDOOR FAN RELAY.

WIRING LEGEND

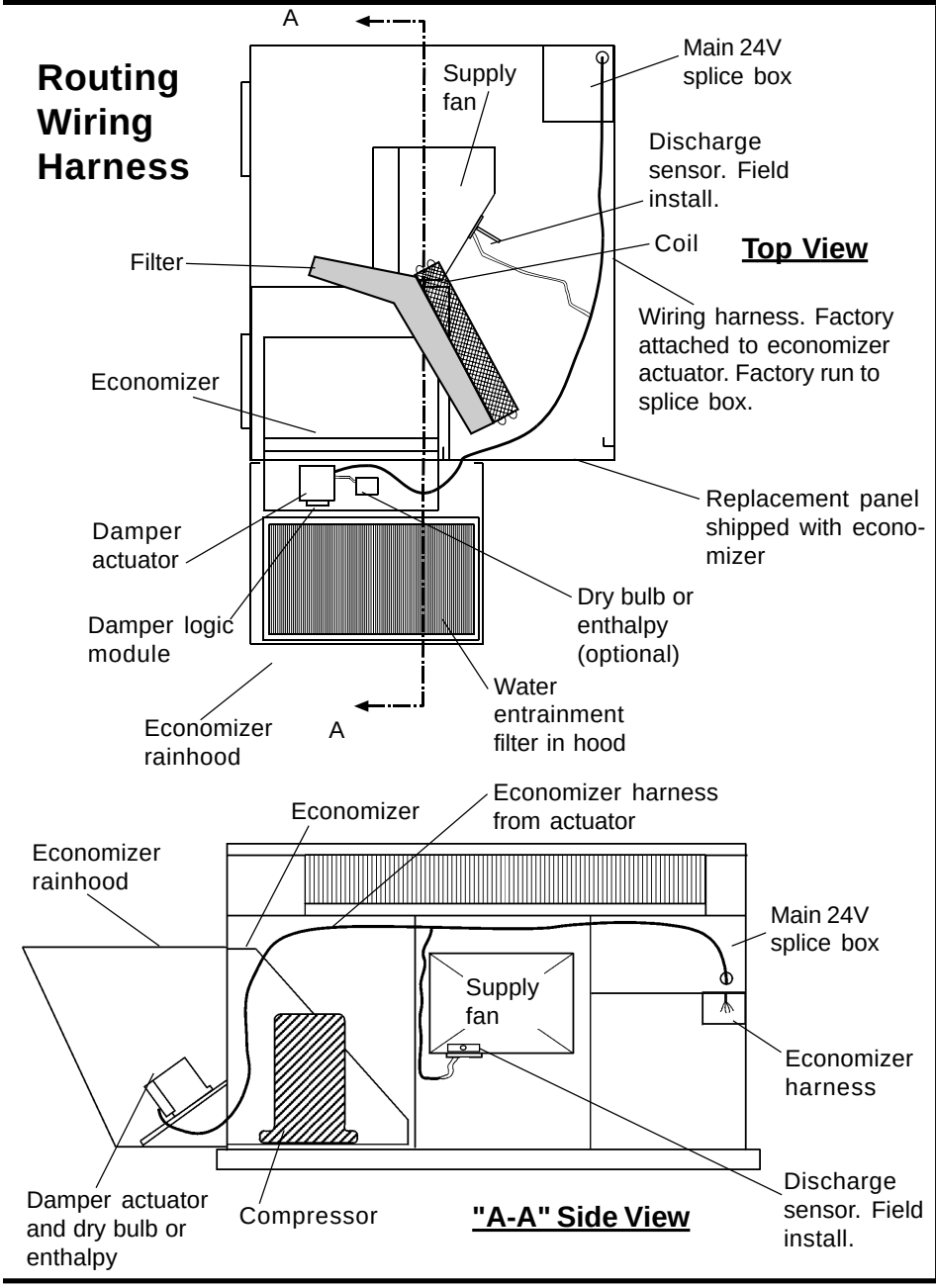
- Terminals
- Wire nut or equivalent connection
- MMC wiring harness
- Field supplied low voltage wire
- Field supplied high voltage wire
- Other low voltage wire

CAUTION

1. Disconnect power supply before connecting wiring to prevent electrical shock or equipment damage

Form No. 2387-6PW2

ECONOMIZER CONTROLS INSTALLATION



ACCESSORY SLIDE-IN ECONOMIZER CONTROL INSTALLATION.

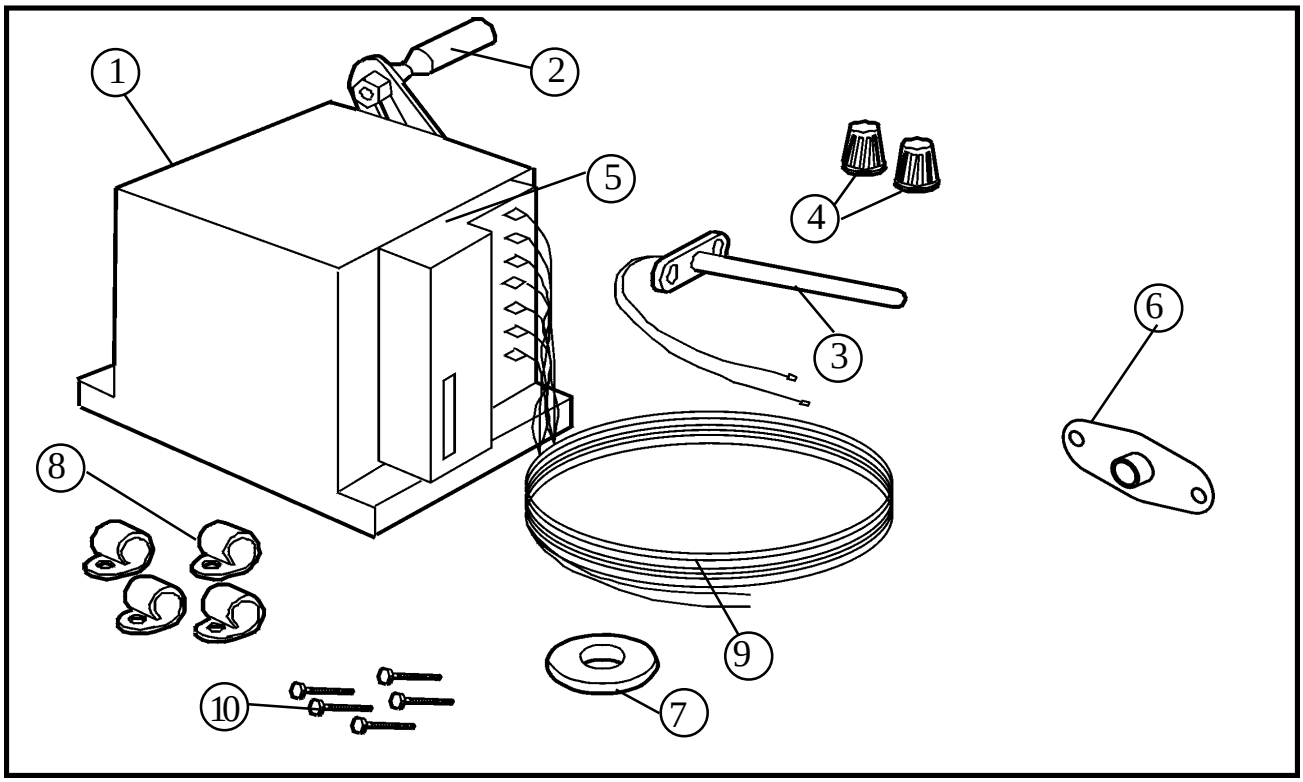
1. Unpackage economizer.
2. Install accessory in unit per installation instructions provided.
3. Remove parts bag and instructions from inside of accessory.
4. Install the discharge sensor in the supply fan section. The sensor must protrude into the supply air stream. It should not interfere with blower, etc.
5. Uncoil the wiring harness. Connect the two gray wires of the harness to the discharge sensor leads using the two wire nuts provided.
6. Route the remainder of the wire harness through the unit to the main 24V splice box.
7. Mount thermostat downstairs per the manufacturer's instructions. Run proper wire from the thermostat to the unit control panel.
8. Review the wiring diagram from this booklet . Connect unit , wire from the thermostat and harness from the economizer, together to match the diagram.
9. Follow start-up instructions below.
10. Adjust change over setpoint on logic module.
11. Adjust minimum position set point on logic module.

START-UP INSTRUCTIONS

1. After unit is wired begin start-up procedures.
2. Set thermostat functions to OFF. Set comfort levels to minimum cool and minimum heat.
3. Turn unit power on following manufacturer's start up instructions.
4. Turn thermostat fan function to ON. Unit indoor blower should start and damper motor will drive to minimum vent position. Minimum vent position should be adjusted on the economizer logic for the proper percentage of outdoor air.
5. Switch the thermostat function from OFF to HEAT or AUTO. Bring the comfort setpoint for heat up to engage first stage heating. Follow manufacturer's procedures to check heating cycle. Bring the comfort setpoint for heat up to engage second stage heating if available. Check this heating cycle also.
6. Under no circumstance should the economizer operate in a heating mode except for minium vent position.
7. Change the thermostat function from HEAT to COOL or leave in AUTO. Drop the comfort setpoint down to engage first stage call for cooling. The first stage cooling call travels to the economizer. If the outdoor air is above the A through D setpoint, (see chart on next page), the first stage mechanical cooling is brought on. As the comfort setpoint is reduced more there will be a second call for cooling which will bring on second stage mechanical cooling if available.
8. In the cooling mode if the outdoor air is below the setpoint, the first stage call for cooling will open the economizer. As the comfort setpoint is reduced more there will be a second call for cooling. This call will bring on the first stage mechanical cooling to back up the economizer.
9. Once all stages have been cycled, and all adjustments made return thermostat to its proper operating mode, replace all doors, panels and hoods.
10. Leave a copy of these instructions with the customer.

System Description

These instructions are for fully modulating electronically controlled economizers utilizing solid state logic throughout. A standard single or (recommended) two stage thermostat is all that is needed to complete the control and economizer system for the HVAC equipment.



Component Description

1. Damper actuator ... 9901-0083 provides 24v modulating control of economizer dampers, 25 in. lb. of torque. (Honeywell M7415A-1006)
2. Ball joint for linkage connection.
3. Discharge sensor ... 9901-0001 provides a signal (3000 Ohms at 25°C or 77°F) to the actuator during free cooling or economizer mode. The signal opens the economizer damper until the discharge temperature drops below 55°. At this time the signal causes the motor to modulate the damper and mix outside air with return air to maintain a 50° F. to 56° F. discharge temperature.
4. Wire nuts to connect discharge sensor to the harness.
5. Economizer logic ... 9901-0017 accepts input from discharge sensor and outside air sensor. Analyzes input to control actuator modulation and economizer switching. Logic also houses minimum position adjustment and enthalpy or adjustable dry bulb adjustment. When used with optional differential sensors in the return air, the logic is capable of selecting the most economical air available for cooling. (Honeywell W7459A-1001)
6. Dry bulb...9901-0183 senses temperature of outside air and provides signal to the economizer logic. Opens outside air at 60°, closes outside air at 70° (enthalpy optional).
7. 5/8" grommet fits 5/8" hole that wires may pass through to keep from chaffing.
8. Wire clamps to secure wires to base, dividers, etc..
9. Wire harness color coded and pre-wired to actuator and economizer logic... 9962-0087.
10. 1/2" hex head screws to secure wire clamps.

INTEGRATED ECONOMIZERS

The purpose of an economizer is to use outdoor air for cooling , whenever possible, to reduce compressor operation.

The economizer system initially responds to a signal from the cooling thermostat and functions as a true first stage for cooling, while providing maximum fuel economy. The economizer is automatically locked out during the heating mode and holds the outdoor air damper at the minimum position settings.

During the occupied period, on a call for cooling, when outdoor air temperature or enthalpy (optional) conditions are low, the economizer actuator will proportion to maintain between 50º F and 56º F at thermistor discharge sensor.

If the mixed or discharge temperature is above 56º F, actuator will open to admit additional outdoor air until the temperature returns to the 50º to 56º F range. If the mixed or discharge air temperature is below 50º F, the actuator will proportion closed, shutting the outdoor air damper until the temperature returns to the 50º to 56º F range. During the occupied period, the actuator will not close past the minimum position.

If the fully open actuator cannot satisfy the space demand, mechanical cooling is sequenced on. During the unoccupied period, the actuator will override minimum position setting and drive fully closed. On a loss of power, the actuator will spring return fully closed.

When in heating operation, or when outdoor air temperature or enthalpy (optional) conditions are high, economizer operation is locked out, and actuator is held at minimum position.

The staging relay is used when the first stage compressors must provide mechanical cooling when assisting the economizer.

The staging relay can be omitted when the second stage compressors can be used to assist the economizer with mechanical cooling.

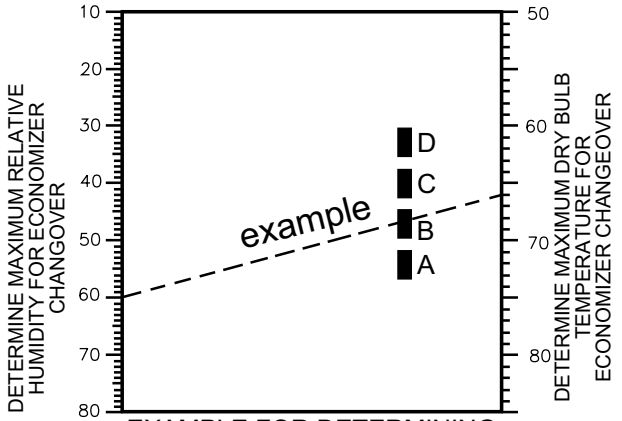
Minimum Position Adjustment

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

1. Make sure the factory installed jumper is in place across terminals P and P_1.
2. If remote control of dampers is desired, connect the remote potentiometer to P and P_1 and turn it fully clockwise before adjusting the minimum position.
3. Connect 24V AC to system and adjust the potentiometer on the face of the logic module with a screwdriver for desired minimum position.

Enthalpy Changeover Setpoint (optional)

Single enthalpy: The enthalpy changeover setpoints is set to return the outdoor air damper to minimum position when the enthalpy rises above its set point. The enthalpy setpoint scale markings, located on W7459 are A,B,C,D as shown below. The factory-installed 620-ohm jumper must be in place across terminals + and S_R unless using differential enthalpy.

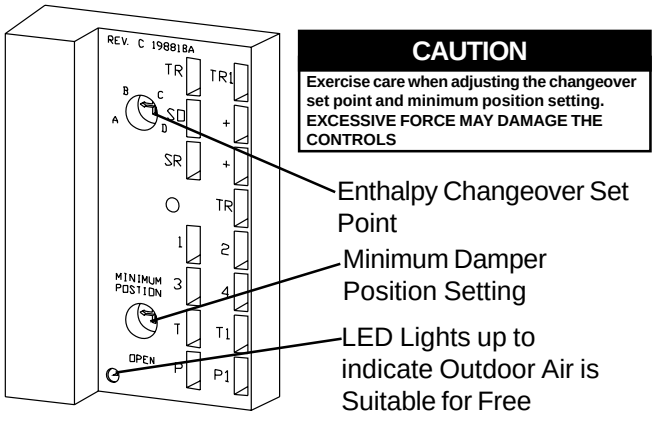


EXAMPLE FOR DETERMINING ENTHALPY CONTROL SETTING (1008-0100)

Differential Changeover Setting (optional)

Differential enthalpy control (optional) utilizes two enthalpy sensors connected to one W7459 Economizer Control. The enthalpy setpoint scale markings, located on the W7459, are A,B,C,D. Turn the setpoint potentiometer fully clockwise past the D setting. The economizer will select the air with lower enthalpy for cooling; i.e., if outdoor air has lower enthalpy than return air, then the outdoor air damper will be opened to bring in outdoor air for free cooling. The differential enthalpy connects to S_R and + on the W7959 logic.

Note: The C7650A adjustable dry bulb can also be used for differential change over. Only the temperature of the outdoor air and return air will be compared and the best selected for free cooling.



W7459 Logic Module

CAUTION

Exercise care when adjusting the changeover set point and minimum position setting. EXCESSIVE FORCE MAY DAMAGE THE CONTROLS