Package Air-Handling Units
7-Eleven Units
Ultra Low Leak Horizontal Economizer Accessory
60 Hz

Installation Instructions

Part Numbers: CAECOSEHU08A00
(Outside air on Side of Mixing Box)

CONTENTS

SAFETY CONSIDERATIONS

Installation and servicing of this equipment can be hazardous due to mechanical and electrical components. Only trained and qualified personnel should install, repair, or service this equipment.

Untrained personnel can perform basic maintenance functions such as cleaning and replacing air filters. All other operations must be performed by trained service personnel. When working on this equipment, observe precautions in the literature, on tags, and on labels attached to or shipped with the unit and other safety precautions that may apply.

Follow all safety codes. Installation must be in compliance with local and national building codes. Wear safety glasses, protective clothing, and work gloves. Have fire extinguisher available. Read these instructions thoroughly and follow all warnings or cautions included in literature and attached to the unit. In Canada, refer to current editions of the Canadian electrical code CSA 22.1 and current editions of the National Electrical Code (NEC) NFPA 70.

Recognize safety information. This is the safety-alert symbol ⚠. When you see this symbol on the unit and in instructions or manuals, be alert to the potential for personal injury. Understand these signal words; DANGER, WARNING, and CAUTION. These words are used with the safety-alert symbol. DANGER identifies the most serious hazards which will result in severe personal injury or death. WARNING signifies hazards which could result in personal injury or death. CAUTION is used to identify unsafe practices which may result in minor personal injury or product and property damage. NOTE is used to highlight suggestions which will result in enhanced installation, reliability, or operation.

Follow all safety codes. Wear safety glasses and work gloves. Have a fire extinguisher available.

⚠ WARNING

ELECTRICAL SHOCK HAZARD

Failure to follow this warning could cause personal injury or death. Before performing service or maintenance operations on unit, turn off mainpower switch to unit and install lockout tag. Ensure electrical service to rooftop unit agrees with voltage and amperage listed on the unit rating plate.

INTRODUCTION

The economizer accessory (Fig. 1) allows outside air to be mixed with return air for “free” cooling if outdoor-air-temperature and humidity are suitable. Economizer cooling can be used alone or in conjunction with mechanical cooling. The economizer can also be used to provide ventilation air to improve indoor air quality.

The 7-Eleven Economizer is shipped with these components:

- HH79NZ074 Return Sensor
- HH79NZ074 Supply Sensor
- HK06WC027 Filter Sensor
- 50TG504589 Mixed Air Sensor
- HL39ZZ013 Humidity Sensor
- HH79NZ039 Outside Air Temperature Sensor
- 50HJ540567 Actuator
- HY84HA101 Terminal Board
- (2) 32” Long Sensing Tubes

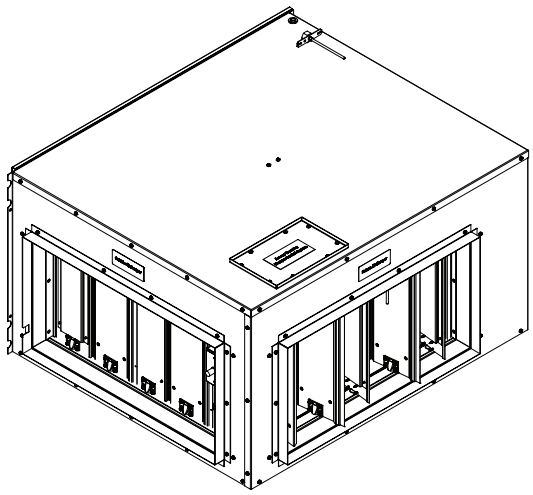


Fig. 1 - Economizer Accessory

PREINSTALLATION

Complete Preinstallation Checks — Remove accessory packaging and inspect shipment for damage. File claim with shipping company if accessory is damaged or incomplete.

Check Unit Clearance — Provide sufficient space for airflow clearance, wiring, and servicing accessory after if is mounted on unit. See Fig. 2 for accessory dimensions. Base unit service clearances of 2.5 ft. from front and sides of unit and 3 in. from rear of unit also apply to the economizer.

IMPORTANT NOTE: This economizer mixing box meets California’s Title 24 section 120.2 Fault Detection and Diagnostics and meets the requirements listed in section 140.4 including damper leakage, warranty, etc. The leakage rate also meets ASHRAE 90.1 requirements.

To maintain required leakage rates the mixing box must be installed perfectly square with tolerance of +/- 1/16”.

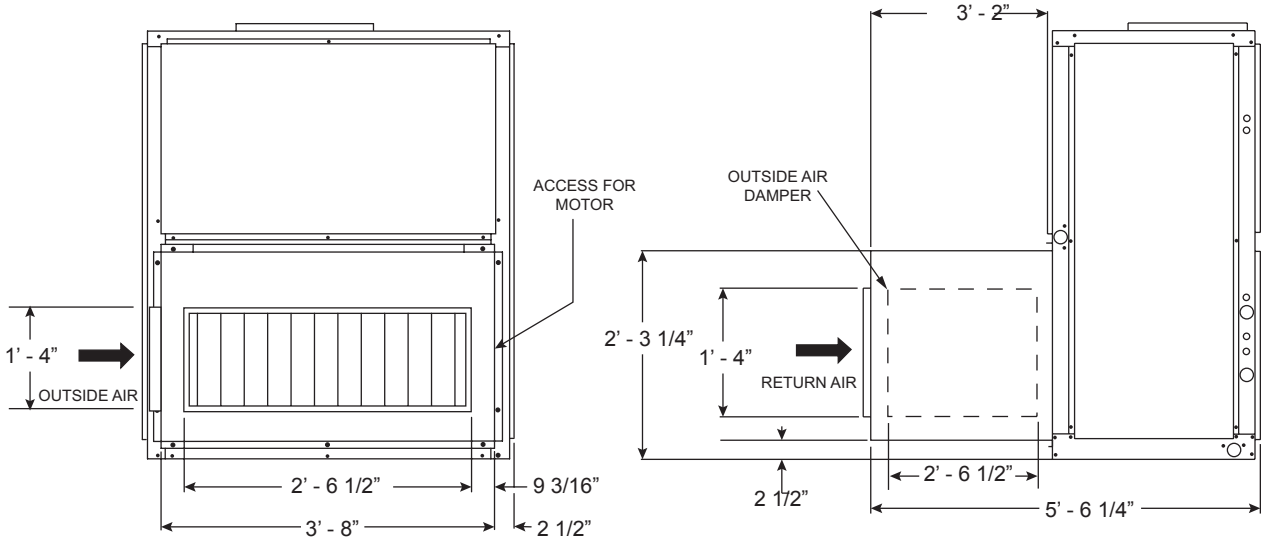


Fig. 2 — Economizer Mounted on Unit (Vertical Installation Shown)

Table 1 - Accessory Usage and Weight

UNIT	ECONOMIZER ACCESSORY KIT NO.	WEIGHT — lb (kg)	KIT CONTENTS
Direct-Expansion Units, 6 to 10 Tons **Chilled Water Units, 7 1/2 to 10 Tons**	CAECOSEHU08A00	245 (111)	1 — Economizer Assembly w/ Actuator 1 — Supply Air Sensor HH79NZ074 1 — Humidity Sensor HL39ZZ013 1 — Return Air Sensor HH79NZ074 1 — Outside Air Temperature Sensor HH79NZ039 1 — Mixed Air Sensor 50TG504589 1 — Filter Sensor HK06WC027 1 — Terminal Board HY84HA101 2 — Sensing Tubes 32" Long 1 — Hardware Bag

INSTALLATION

Mount Economizer on Unit — Refer to Fig. 3 and 4 and perform the following steps:

1. Orient the unit so that the desired return-air opening is accessible. For vertical installations, reposition the panel from the rear to the bottom of the unit using the same screws.
2. Remove the bag containing loose parts and fasteners from inside the economizer. These parts will be used later.
3. Install field-supplied gasket material over economizer flanges.
4. Place the economizer and gasket over the return-air opening so that the flanges and screw holes on top and bottom of the economizer box are aligned with those surrounding the return-air opening.

IMPORTANT: To meet damper leakage requirements, dampers must be installed perfectly square - tolerance +/- 1/16".

5. Using field-supplied 1/4 in. x 3/4" in. (maximum length) sheet metal screws, fasten the long economizer flanges to the matching return-air opening flanges and tighten all screws.
6. Using the four 10 x 1/2 in. self-tapping screws supplied, fasten the short economizer flanges to the matching return air opening flanges and tighten all screws.

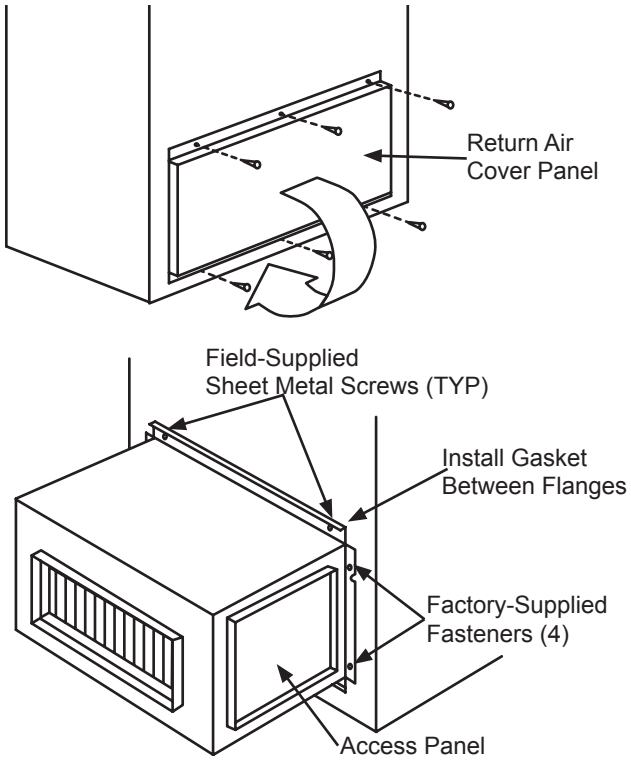


Fig. 3 — Economizer Installation on Vertical Unit

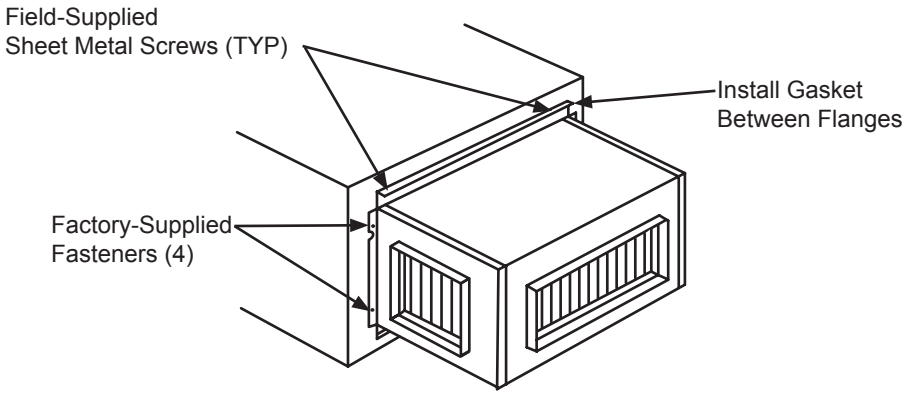


Fig. 4 — Economizer Installation on Horizontal Unit

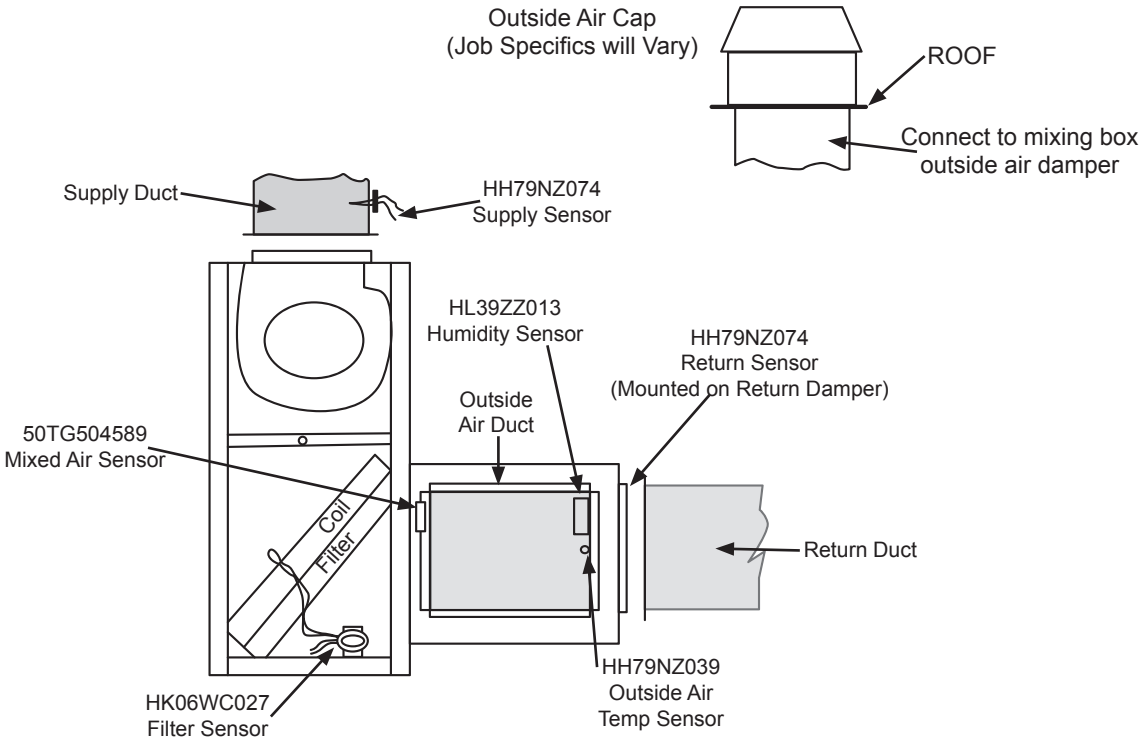


Fig. 5 — Vertical Application

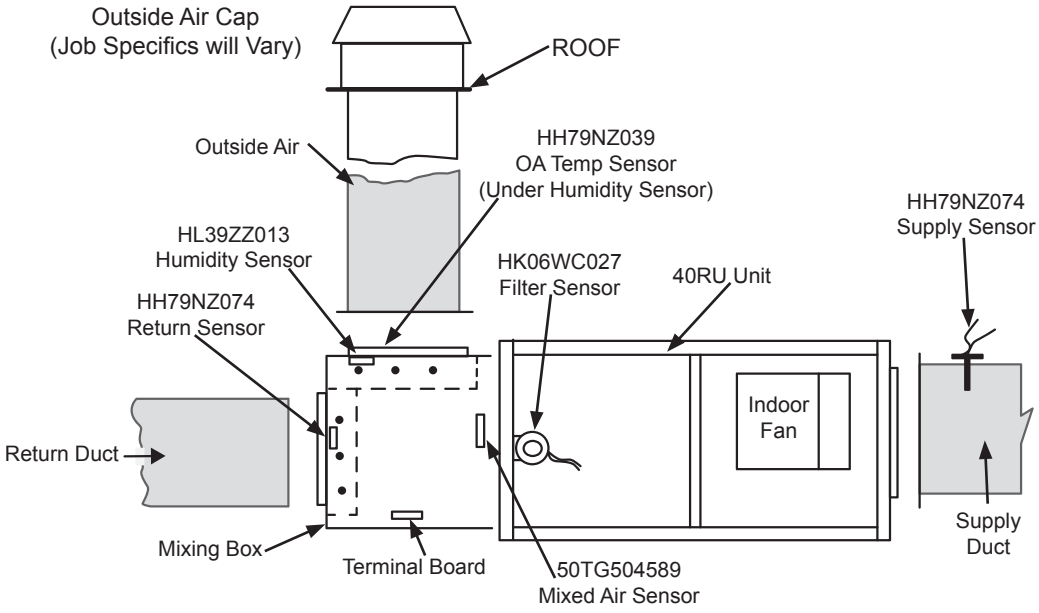


Fig. 6 — Horizontal Application (Top View)

The 7-Eleven Gemini I/O Flex economizer control board is mounted on the condensing unit control box. Connect the Gemini Flex control board to the mixing box terminal board as shown in Fig. 12 and 13.

SENSOR INSTALLATION

All sensors required are factory wired to the HY84HA101 terminal board. Installer will need only to route the wired sensors to the correct location and mount them. (NOTE: Same sensors factory mounted.)

Supply Air Temperature Sensor HH79NZ074 — This sensor is used to measure the temperature in the supply air as it is leaving the air handler and must be mounted in the field supplied supply air duct. The sensor includes 20 feet of wire.

Determine the desired location for the supply air temperature sensor, which should be roughly 10 feet from edge of air handler. Drill a 1/2" diameter hole in the middle of the supply duct. Route sensor wiring outside of unit and duct as shown in Fig, 5 and 6, making sure access doors are not covered and mixing box damper operation is not obstructed. Secure all wires in place. Insert sensor probe into 1/2" diameter hole and secure with (2) screws.

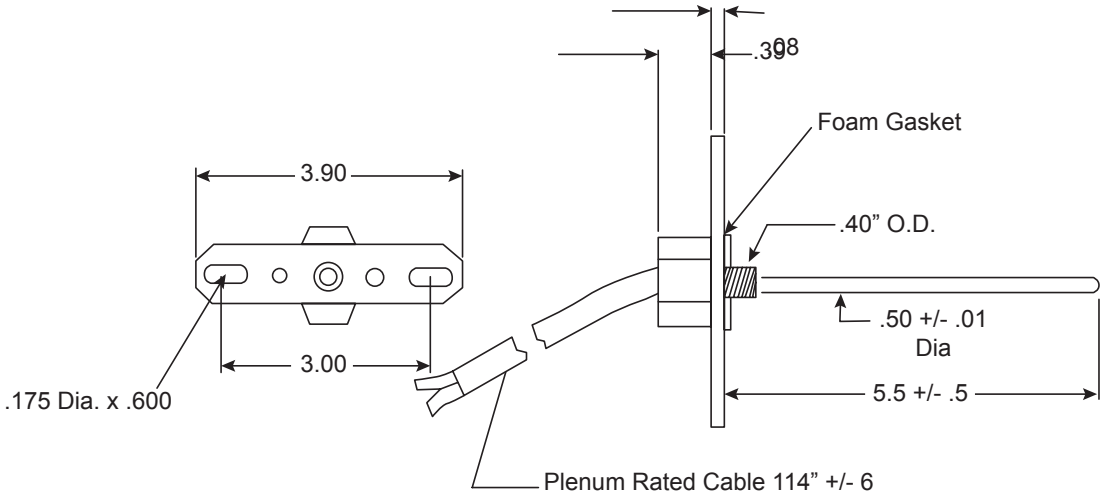


Fig. 7 — HH79NZ074

Return Air Temperature Sensor HH79NZ074 — This sensor is used to measure the temperature of the return air as it is entering the air handler and is mounted on economizer's Return Air Damper. Sensor is factory wired to terminal board.

Outside Air Temperature Sensor HH79NZ039 — This sensor is used to measure the temperature of the outside air for consideration of economizer's free-cooling mode, and is factory-mounted attached to the outside air damper.

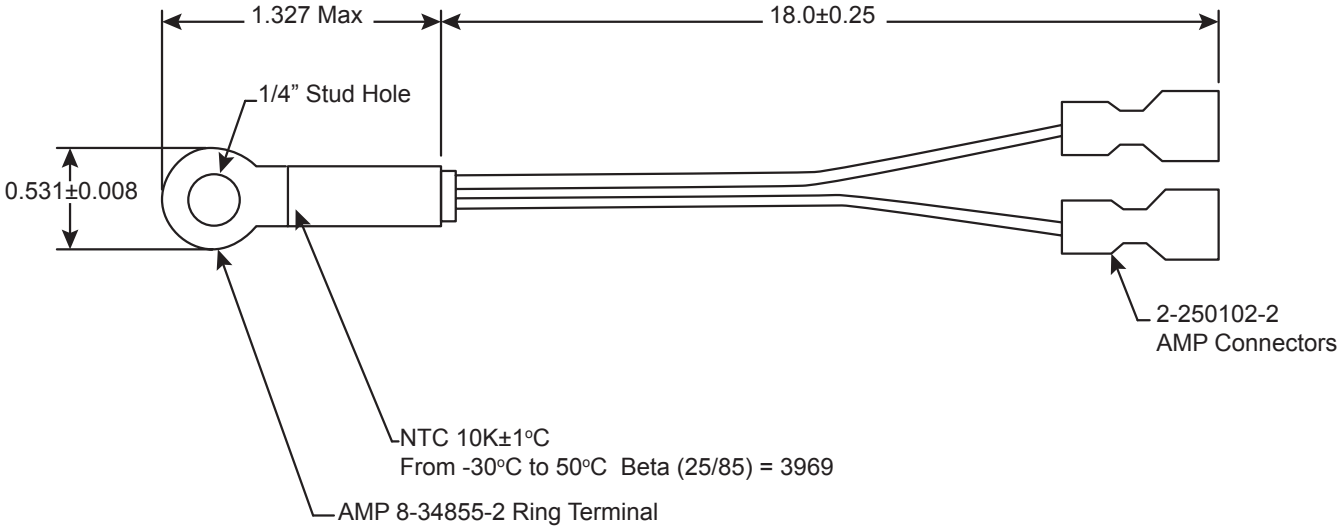


Fig. 8 — HH79NZ039

Outside Air Humidity Sensor HL39ZZ013 — This sensor is used to measure the humidity of the outside air for consideration of economizer's free-cooling mode, and is factory mounted on economizer's Outside Air Damper. DIP switches on outside air humidity sensor are factory set to all off positions.

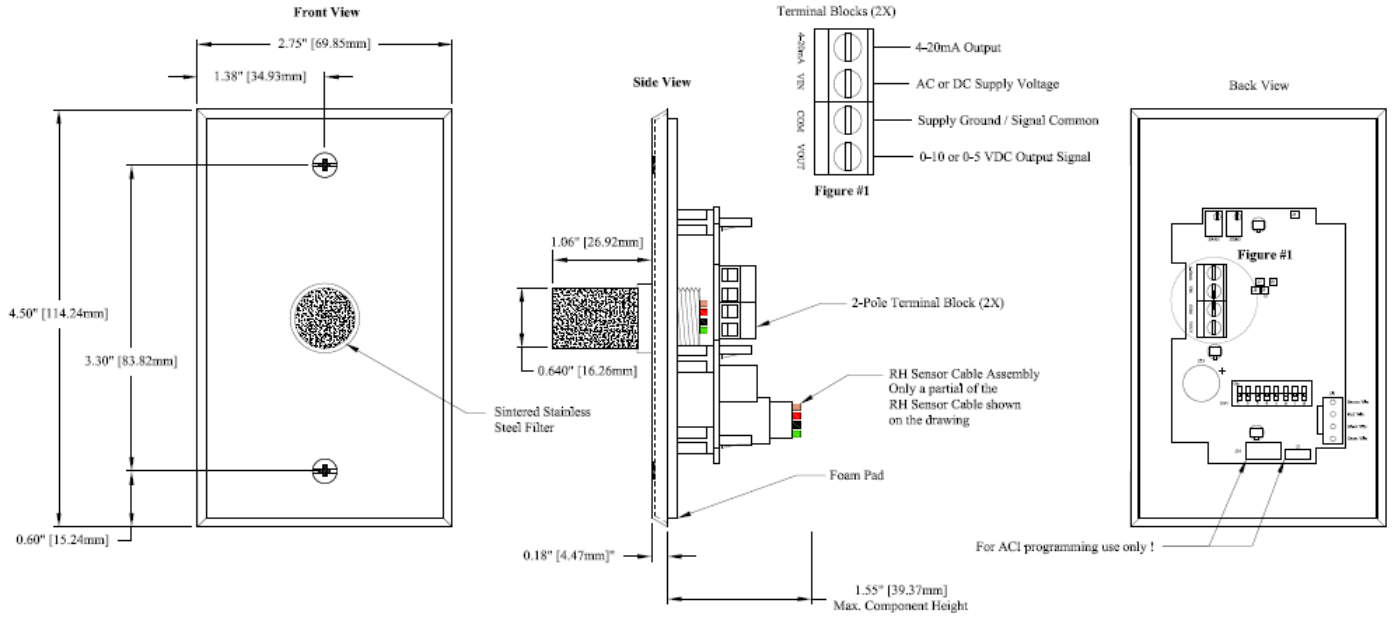


Fig. 9 — HL39ZZ013 (shown without outlet box)

Mixed Air Temperature Sensor 50TG504589 — This sensor is used to measure the temperature of the mixed air (outside and return air) for consideration of economizer's free-cooling mode, and is mounted in mixing box.

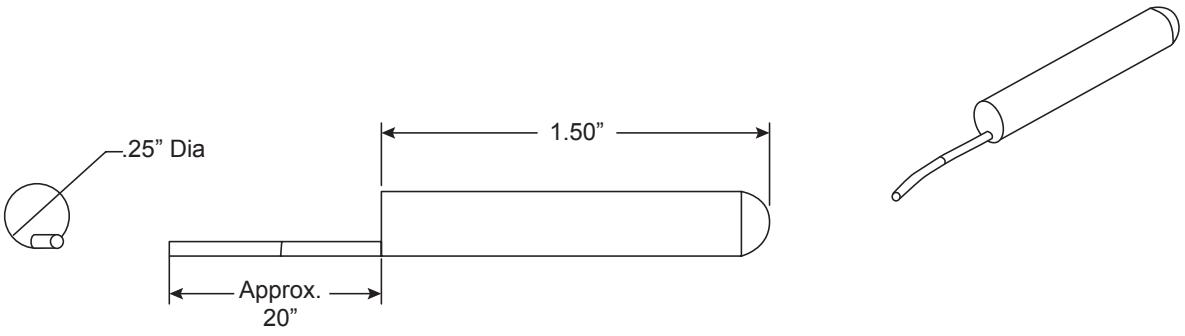
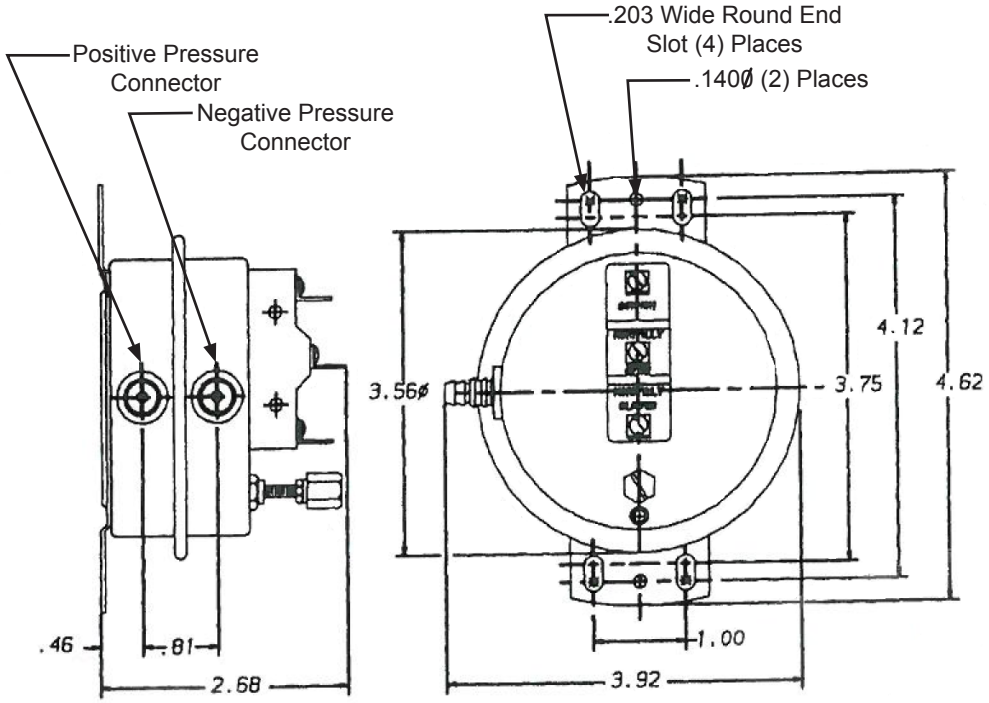


Fig. 10 — 50TG504589

Filter Pressure Sensor HK06WC027 — This sensor is used to measure the pressure differential across the air handler's filters and will send a signal when filters require maintenance, and must be mounted in the air handling unit. The sensor includes 10 feet of wire and (2) sensing tubes.

Determine desired location for the filter pressure sensor, see Fig. 5 and 6. Route sensor out the back side of the mixing box and into the air handling unit as shown in Fig. 5 and 6, making sure mixing box damper and air handling unit operation is not obstructed. Secure all wires in place. Screw sensor to inside of unit as shown in Fig. 5 and 6.

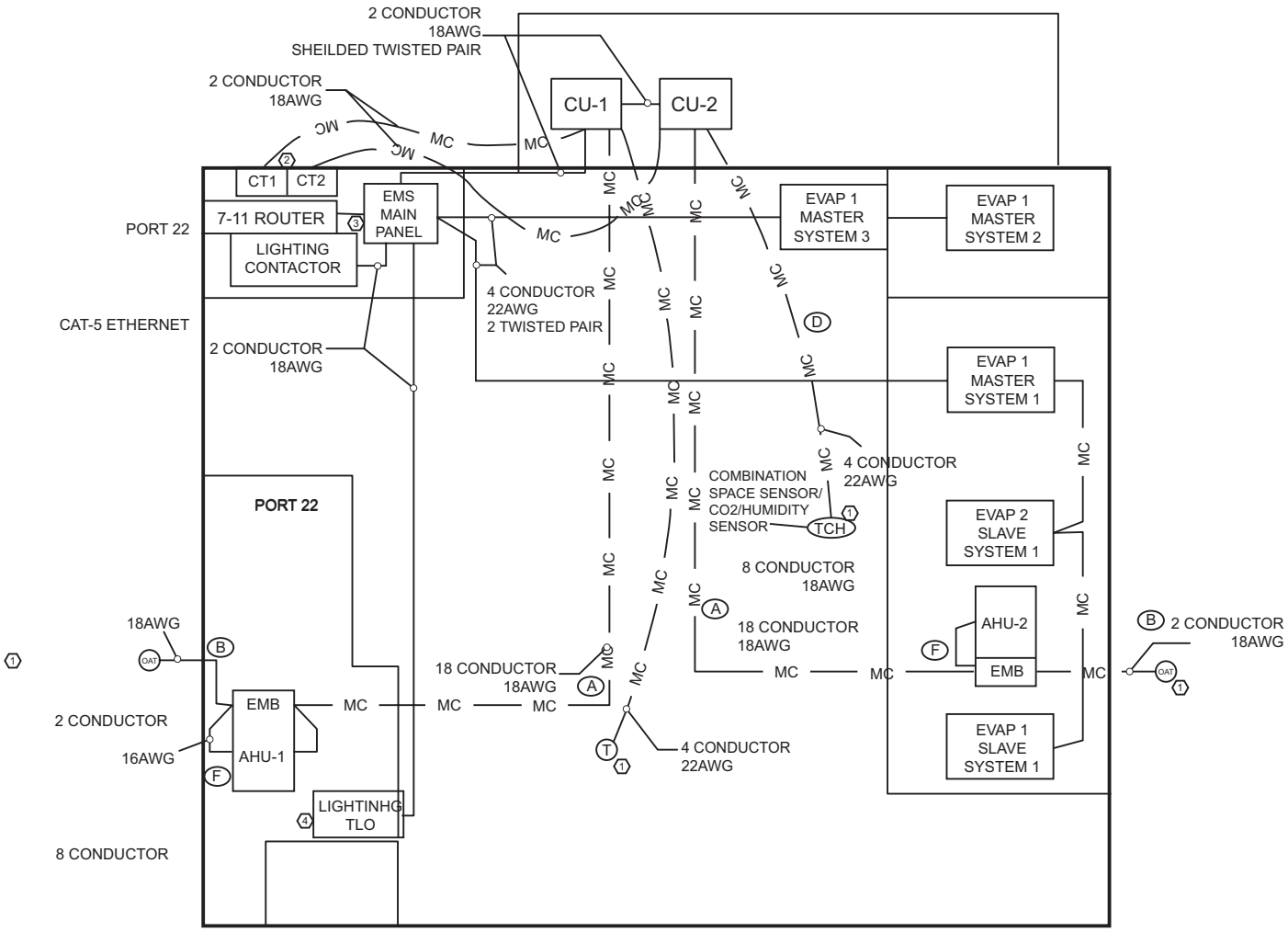
Attach 32" long plastic sensing tube to the positive side of the sensor and route tubing behind filter as shown in Fig. 5 and 6. Attach 32" long sensing tube to negative side of the sensor and set in place in front of filters. Secure tubes in place to make sure they do not interfere with the operation of the air handling.



Dual combination barbed type fittings for use with 1/4" or 5/16" I.D. flexible plastic or rubber tubing

Fig. 11 — HK06WC027

Carrier I/O Flex Split System



KEYED NOTES	
1	COORDINATE LOCATION WITH MECHANICAL.
2	CURRENT TRANSFORMER: INSTALL IN ELECTRICAL PANEL AROUND BOTH AHU AND CONDENSING UNIT PHASE WIRES TO MONITOR TOTAL LOAD.
3	REFER TO EMS 4/1.0 FOR TLO AND LIGHTING CONTACTOR WIRING DETAIL. REFER TO EMS 1/1.0 FOR SMART CONTROLLER AND EVAPORATOR WIRING DETAIL.
4	LIGHTING OVERRIDE SWITCH. INSTALL ON BACK WALL ABOVE WORK SURFACE OF WORKSTATION LOCATED IN BACK ROOM.
X	REFER TO EMS 2/1.0 FOR WIRING CONNECTIONS

SYMBOL	DESCRIPTION
TLO	LIGHTING TLO SWITCH
EMB	ECONOMIZER MIXING BOX
CT1,CT2	CURRENT TRANSFORMER
T	SPACE SENSOR
H	SPACE HUMIDITY SENSOR
CO2	CARBON DIOXIDE SENSOR
OAT	OUTSIDE AIR TEMPERATURE SENSOR

SPLIT SYSTEM C ARRIER SUPPLIED PARTS (SENSOR)	
1	MIXED AIR TEMP
2	RETURN AIR TEMP
3	OA TEMP
4	ROOM TEMP / HUMIDITY / CO2 SENSOR
6	HUMIDITY SENSOR
7	HUMIDITY SENSOR (Economizer)

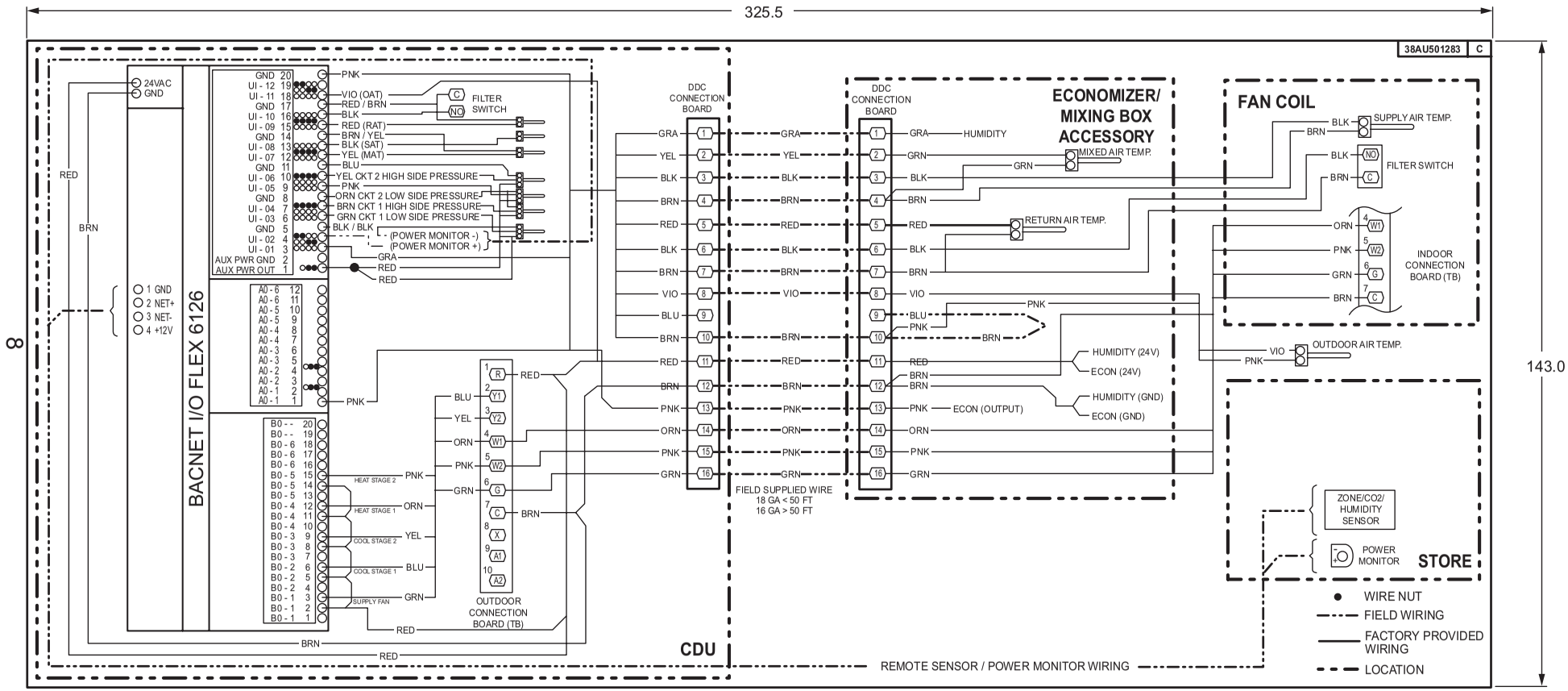


Fig. 12 – Heat Pump / Electric Heat

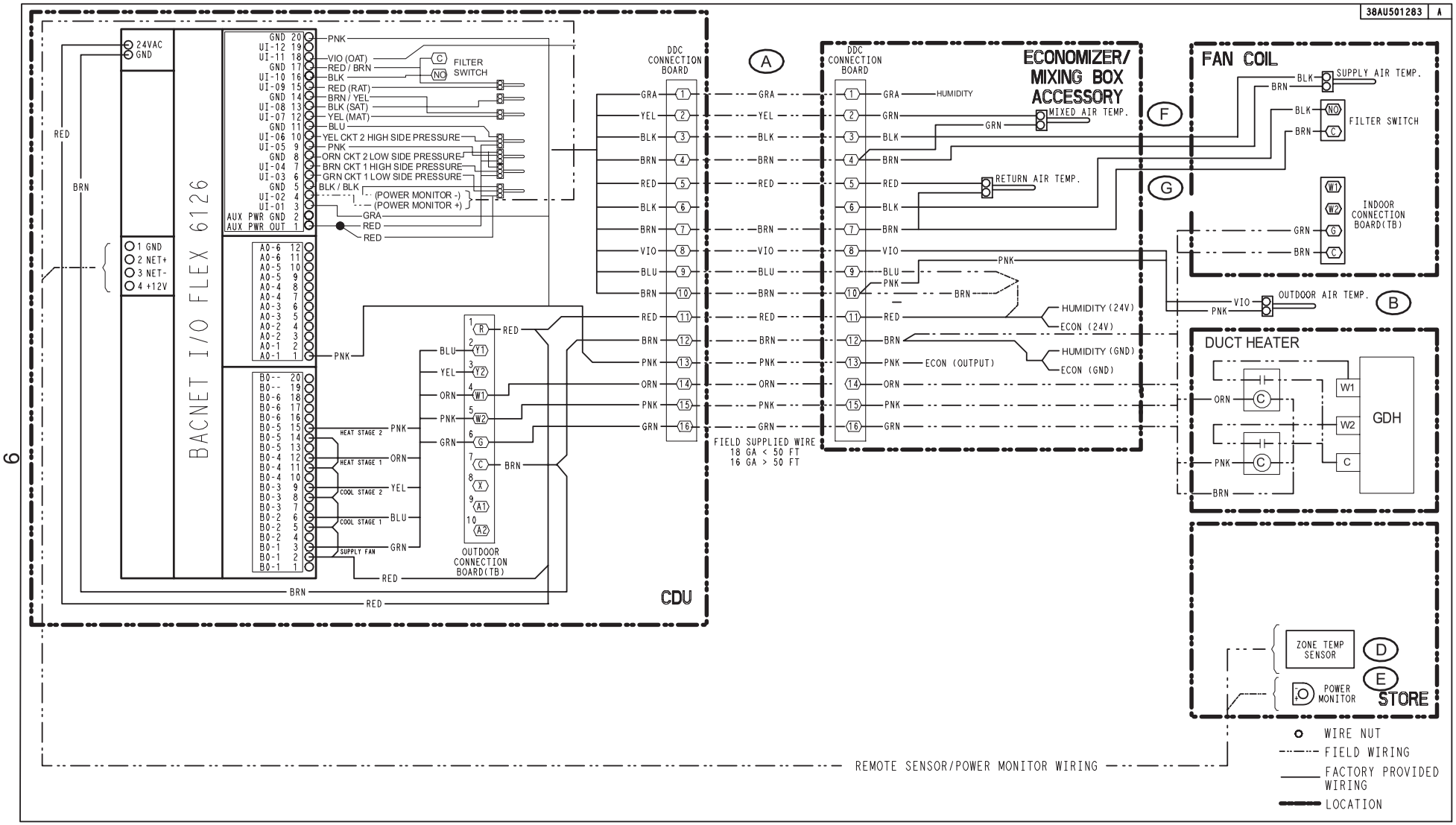


Fig. 13 – Gas Heat

Carrier Commercial Split System Installation Notes

- **Provide wiring and installation of wiring between condensing unit and AHU** per electrical drawing on last page of MicroMetl mixing box installation instructions.

- **Mount all sensors as indicated in Economizer Accessory Installation Instructions** provide with economizer/mixing box.

- **Mount Space/CO2/Humidity sensor in space per mechanical drawings for project**. Need to Provide and install wire from sensor to I/O FLEX on Condensing unit per electrical drawing. Note: Only one used per store.

- **Mount Space sensor in space per mechanical drawings for project**. Need to Provide and install wire from sensor to I/O FLEX controller per electrical drawing. Note: One sensor shipped in each condensing unit control panel.

- **Install CT sensor to power leg feeding AHU**. Need to install and wire per electrical drawing. One CT Sensor shipped in each condensing unit control panel.

- **Provide and install refrigerant tubing between condensing unit and AHU**.

- **Units come pre-programmed per 7-11 specifications** for set-point and operation mode. Once power is applied indoor fan will come on and unit will provide cooling or heating as required to maintain space temperature set-points.

***Special Note: **For units with Reznor gas duct heaters two 24 volt N/O single pole relays will be required to keep the control voltage of the Reznor heaters separate from the HVAC units. These can be mounted at the Reznor units. Three conductors for "W1", "W2" and "Common" need to be run to the Reznor unit from each of the Carrier AHU for heat operation. Connect the "W1" to the coil of relay 1 for first stage heat and "W2" to the coil of relay 2 for second stage heat. The "Common" wire will be jumped between the other side of coils for relay 1 and 2. These relays will energy each stage of heat on the Reznor duct heaters when required.**

- **For questions or assistance please contact for Carrier National Accounts Manager or send email to 711@carrier.utc.com**

Carrier Commercial Split System
Unit Operation Checks Guidelines

NOTE: **Unit operational checks are to be performed ONLY during initial start-up by the installing contractor to insure the units operate properly in cooling and heating modes. It is important that these procedures be performed according to these instructions to insure units are not damaged.**

<u>The following checks should be performed at the outside condensing unit location.</u>

1. **Turn off 24 volt power on I/O FLEX board prior to performing checks. There is a power switch on corner of board marked 24 VAC/GND where the power can be turned off just to the board..**

2. **To start indoor fan motor on the "Outdoor Connection Board (TB)" place jumper from terminal 1 "R" to terminal 6 "G". Verify that the indoor fan motor is running. Insure that indoor fan motor jumper is kept in place throughout the testing process for steps "3" and "4".**

3. **To start compressor cooling place additional jumper from terminal 1 "R" to terminal 2 "Y1". This should cause the compressor to start in cooling mode. Once the unit has been checked out in cooling remove this jumper but leave the jumper from step "2" in place.**

4. **To energize heat perform the following:**
   On "Gas" or "Electric" or "Heat Pumps" to energize the heat place a jumper from terminal 1 "R" to terminal 4 "W1". Verify that the gas or electric heat has been energized. Once check has been completed remove this jumper.
   a. **Remove all jumpers between terminals 1 "R" and 4 "W1" when test completed.**

5. **Once testing is completed remove all jumpers and turn power switch on I/O FLEX board back to the "ON" position. Insure indoor fan comes ON prior to leaving units.**

6. **The EMS system is now ready for installation by ALC.**

7. **If problems occur related to any of the above test steps please consult "Installation and Troubleshooting" guides.**

Carrier Commercial Split System Troubleshooting Checks

1. **What if blower fan does not come on:**
    a. **Verify main electrical power is connected to blower motor contactor per installation instructions.**
    b. **Verify main electrical power is connected to main power connections at outside condensing unit per installation instructions.**
    c. **Insure all wiring between condensing unit and AHU are properly run and connected per installation instructions.**
    d. **Verify brown common wire from fan contactor terminal "C" is connected to economizer terminal strip terminal "12".**
    e. **Check voltage to at fan contactor terminal "G" in AHU. If 24 volts not present trace back to I/O FLEX board.**
    f. **Verify I/O FLEX board has 24 volts power per electrical drawing in installation instructions.**

2. **Unit does not come on in Cooling or Heating:**
    a. **What is space temperature? If below 76 or above 66 the unit will be satisfied. Depending upon the outside air temperature the economizer may be open to maintain space temperature set point.**
    b. **How do you check unit operation if unit satisfied? See "Unit Operation Checks" guidelines.**

3. **What if Economizer does not operate properly:**
    a. **Economizer does not open? Verify outside air temperature is below 72 degrees. Verify enthalpy switch properly wired per wiring diagram and installation instructions. Please note that warm or humid conditions will prevent economizer from opening for "Free Cooling" if space temperature is out of range.**
    b. **What if Economizer stays open when unit is operating? Verify economizer and enthalpy switch are properly wired per wiring diagram and installation instructions. High CO2 sensor levels will cause economizer to open until these levels drop. Disconnect CO2 sensor wire terminal "8" at sensor and economizer should close.**

Edition Date: 2/15 Catalog No. IIK-CAECOSEHU08-01

Replaces: New