Installation Instructions

Single Enthalpy Sensor Application AXB078ENT

Differential Enthalpy Sensor Application (Part # AXB078ENT and DNENTDIF004A00)

FOR ROOFTOP ECONOMIZERS EQUIPPED WITH HONEYWELL W7212 CONTROLLER

3 TO 25 TONS

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IMPORTANT: Read these instructions completely before attempting to install the accessory enthalpy sensor.

The AXB078ENT (Fast # 1176668) and DNENTDIF004A00 enthalpy sensors are used with the Economizer part numbers DNECOMZR008C00, 020A02, 021A02, 024A02, 025A02, 038A00, 039A00, 040A00, 041A00, 042A00, 046A00, 047A00, 062A00, 064A00 and are used on the following units:

UNIT	
PHH156–180	**PAE036–300**
PHS036–120	**PGE036–300**
PHH036–060	**PGH155–300**
PAH155–300	**PGH036–120**
PAH036–120	**RAS036–180**
RGS036–180	**RHS036–150**
RAH036–150	**RGH036–150**
RHH036–120	

The accessory enthalpy sensor can be used on all rooftop units with a factory–installed or accessory Economizer.

PACKAGE CONTENTS – AXB078ENT

QTY	CONTENTS
1	HH57AC078 – Enthalpy Sensor

DNENTDIF004A00

QTY	CONTENTS
1	Enthalpy Sensor
2	6–20, 3/4–in. Sheet Metal Screw
1	Grommet
1	Black Wire
1	Red Wire

SAFETY CONSIDERATIONS

Installation and servicing of air–conditioning equipment can be hazardous due to system pressure and electrical components. Only trained and qualified service personnel should install, repair, or service air–conditioning equipment.

Untrained personnel can perform the basic maintenance functions. All other operations should be performed by trained service personnel. When working on air–conditioning equipment, observe precautions in the literature, tags and labels attached to the unit, and other safety precautions that may apply.

Follow all safety codes. Wear safety glasses and work gloves. Use quenching cloth for unbrazing operations. Have fire extinguishers available for all brazing operations.

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 the 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 a hazard 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.

⚠ WARNING

ELECTRICAL SHOCK HAZARD

Failure to follow this warning could result in personal injury and/or death.

Disconnect power supply and install lockout tag before attempting to install accessory.

GENERAL

All units come with the dry–bulb sensor as standard with the factory–installed Economizer.

For units equipped with dry––bulb enthalpy sensors, accessory AXB078ENT (Fast # 1176668) can be used to reconfigure the Economizer for outdoor enthalpy changeover control.

Accessories AXB078ENT (Fast # 1176668) and DNENTDIF004A00 can both be added for differential enthalpy control and the sensor is used for outdoor temperature control. (See Table 1.)

OUTDOOR ENTHALPY CHANGEOVER CONTROL

For enthalpy control, accessory enthalpy sensor AXB078ENT (Fast # 1176668) is required. When the outdoor air enthalpy rises above the outdoor enthalpy changeover set point, the outdoor−air damper moves to its minimum position.

DIFFERENTIAL ENTHALPY CONTROL

For differential enthalpy control, the Economizer controller uses two enthalpy sensors AXB078ENT (Fast # 1176668 and DNENTDIF004A00), one in the outside air and one in the return airstream. The Economizer controller compares the outdoor air enthalpy to the return air enthalpy to determine Economizer use. The controller selects the lower enthalpy air (return or outdoor) for cooling. For example, when the outdoor air has a lower enthalpy than the return air and is below the set point, the Economizer opens to bring in outdoor air for free cooling.

TABLE 1 – ECONOMIZER SENSOR USAGE

APPLICATION	ECONOMIZER WITH OUTDOOR AIR DRY BULB SENSOR ACCESSORIES REQUIRED
OUTDOOR AIR DRY BULB	NONE. THE OUTDOOR AIR DRY BULB SENSOR IS FACTORY INSTALLED.
DIFFERENTIAL DRY BULB	DNTEMPSN002A00*
SINGLE ENTHALPY	AXB078ENT (FAST # 1176668)
DIFFERENTIAL ENTHALPY	AXB078ENT (FAST # 1176668) AND DNENTDIF004A00*
CO2 FOR DCV CONTROL USING A DUCT − MOUNTED CO2 SENSOR	DNCBDIOX005A00

* DNENTDIF004A00 and DNTEMPSN002A00 accessories are used on many different base units. As such, these kits may contain parts that will not be needed for installation.

INSTALLATION

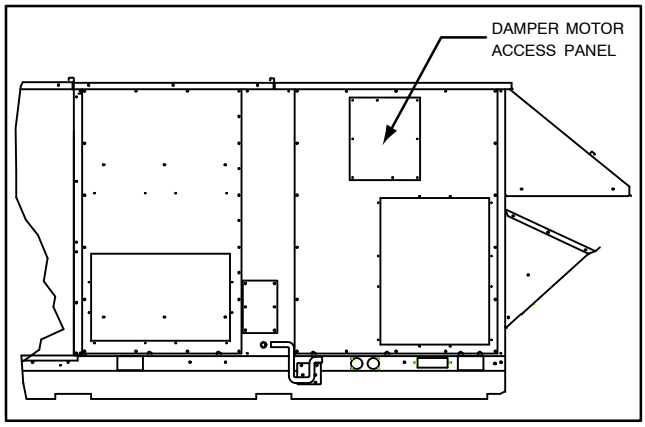

Fig. 1 – Back View – Damper Motor Panel Location

PGH/PAH210−300 Units

1. Remove the damper motor access panel at the return end of the unit. Save the screws for use in Step 6.
2. Remove the pre−−existing outdoor air enthalpy sensor and save the screws for Step. 3. Disconnect the pink and yellow wires from the enthalpy sensor and let them hang. The wires will be used to connect to the enthalpy sensor.
3. Mount the enthalpy sensor in the predrilled holes on the economizer frame (where the enthalpy sensor was removed in Step 2). (See Fig. 4.) Use the screws removed in Step 2.
4. Locate the pink and yellow wires coming from the Economizer controller terminals “SO+ a” (pink) and “SO” (yellow). (See Fig. 2.) Connect the wires to the enthalpy sensor. Connect the yellow wire to the “S” terminal and the pink wire to the “+” terminal on the enthalpy sensor. (See Fig. 3.)
5. If the accessory differential enthalpy sensor is also being installed, skip to the Differential Enthalpy Sensor section.
6. Replace the Economizer panel. Secure the panel using the screws saved from Step 1.
7. Restore power to the unit and configure the Economizer controller per the Configuration section in this manual.

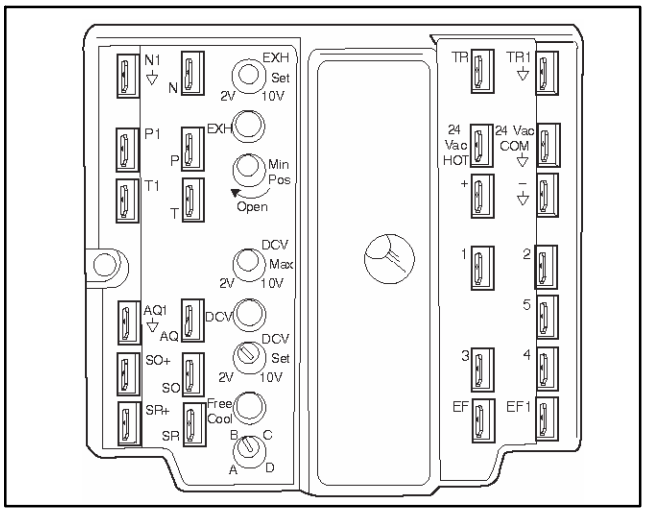

Fig. 2 – Economizer Controller (Honeywell W7212)

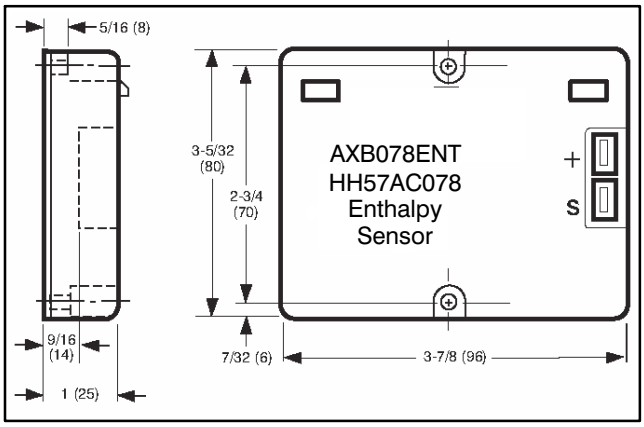

Fig. 3 – Enthalpy Sensor Specifications

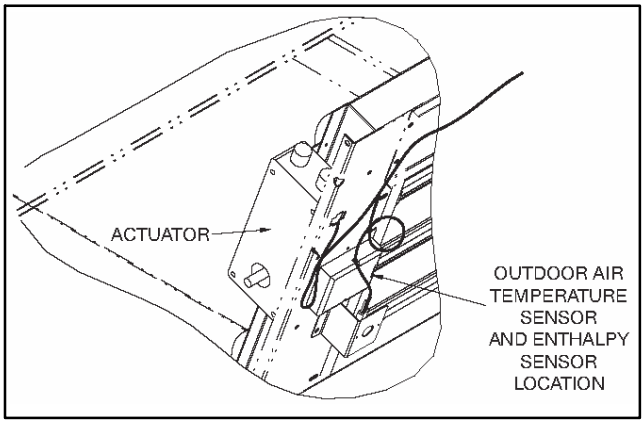

Fig. 4 – Outdoor Air Sensor Location – PAH/PGH210–300 Units

PHH036–120, PGH/PAH036–120, PGE/PAE036–150

NOTE: This section assumes you are starting with an Economizer installed in the rooftop and equipped with a dry bulb temperature sensor. If your economizer is already equipped with single enthalpy sensor, STOP. You do not need to continue with this section.

1. Remove the economizer hood from the base unit and save the screws for Step 8.
2. Disconnect the black and red wires from the pre–existing temperature sensorand let them hang. Remove the air temperature sensor and save screws (no. 8) for use in Step 3. The wires will be used later to connect to the enthalpy sensor.
3. Use the 2 sheet metal screws (no. 8) from Step 2 to mount the enthalpy sensor on the front left of the economizer frame. (See Fig. 6.) Use the 2 screw holes in the economizer frame.
4. Ensure the black and red wires are connected on the Economizer controller correctly. The red wire should be connected to the “SO” terminal and the black wire to the “SO+” terminal. If they are not connected this way, make the connections as described. If you are using DNENTDIF004A00, the kit contains an extra red and black wire.
5. Pick up the black and red wires left hanging from Step 2 and connect them to the enthalpy sensor. Connect the red wire to the sensor’s “S” terminal and the black wire to the sensor’s “+” terminal. See Fig. 3 for details.
6. If installation of the accessory differential enthalpy sensor is also planned, skip to Step 2 of the Differential Enthalpy Sensor installation section of this instruction.
7. Restore power to the unit and configure the Economizer controller per the Configuration section of this manual.
8. Re–install the economizer hood.

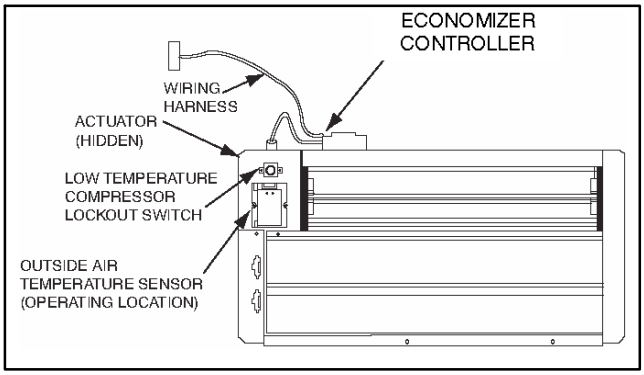

Fig. 5 – Economizer Component Locations — PHS036–60, PHH036–120, PGH/PAH036–120, PGE/PAE036–150

PHH156–180, PAH155–180, PGH155–180, PGE180–300, PAE180–300

NOTE: This section assumes you are starting with an Economizer installed in the rooftop and equipped with a dry bulb temperature sensor. If your economizer is already equipped with a single enthalpy sensor, STOP. You do not need to continue with this section.

1. Remove the economizer hood from the base unit and save the screws for Step 8.
2. Provide access to the economizer by removing the return–air filter access panel. Save the screws for Step 10.
3. Disconnect the black and red wires from the pre–existing temperature sensor and let them hang. Remove the air temperature sensor and save the screws (no. 8) for use in Step 3. The wires will be used later to connect to the enthalpy sensor.
4. Mount the enthalpy sensor to the front right of the economizer frame, as shown in Fig. 6. Use the two sheet metal screws (no. 8) from Step 3 and screw into the holes in the economizer frame.
5. Ensure the black and red wires are connected on the Economizer controller correctly. The red wire should be connected to the “SO” terminal and the black wire to the “SO+” terminal. If they are not connected this way, make the connections as described. If you are using DNENTDIF004A00, the kit contains an extra red and black wire.

6. Pick up the the black and red wires left hanging from Step 3 and connect them to the enthalpy sensor. Connect the red wire to the sensor's "S" terminal and the black wire to the sensor's "+" terminal. See Fig. 3 for details.
7. If installation of the accessory differential enthalpy sensor is also planned, skip to Step 3 of the Differential Enthalpy Sensor installation section of this instruction.
8. Re−install the economizer hood using the screws from Step 1.
9. Restore power to the unit and configure the Economizer controller per the Configuration section of this manual.
10. Re−install the return−air filter access panel using the screws from Step 2.

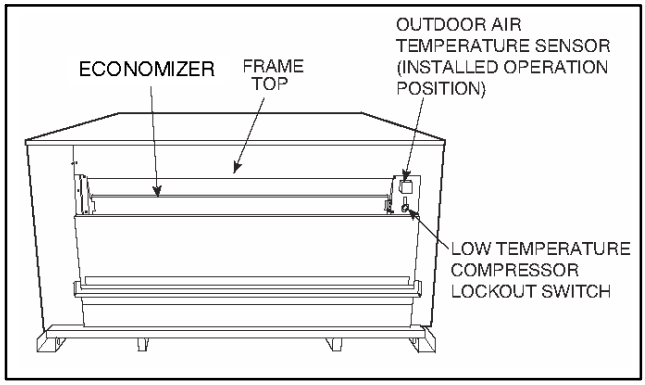

Fig. 6 − Economizer Component Locations — PHH156−180, PAH155−180, PGH155−180, PGE180−300, PAE180−300

Differential Enthalpy Sensor

If installing the differential enthalpy sensor on an accessory economizer, it is easier to install the differential enthalpy sensor before installing the economizer. If installing the sensor on a factory−installed economizer, it is easier to install the differential enthalpy sensor before installing the economizer hoods.

A single enthalpy sensor (Fast # 1176668) must be installed in addition to the differential enthalpy sensor (DNENTDIF004A00) to achieve differential enthalpy economizer control.

For horizontal applications, it is easiest to install the differential enthalpy sensor before making duct connections.

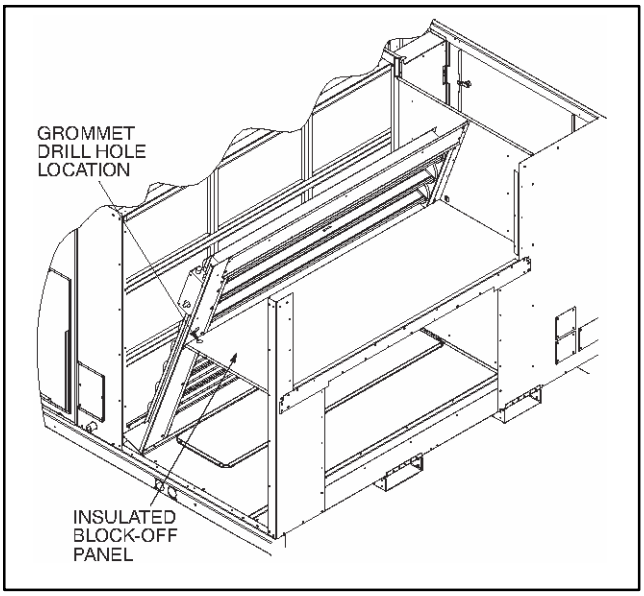

Fig. 7 − Economizer Block−Off Panel Location — PGH/PAH210−300

PHH036−120, PGH/PAH036−120, PGE/PAE036−150, RGS/RAS036−180, RHS036−150, RGH/RAH036−150, RHH036−120

NOTE: This section assumes you are starting with an Economizer installed in the rooftop and equippe with a single enthalpy sensor installed, regardless of whether the economizer came that way or you have completed the installation of an accessory sensor. If you do not already have a single enthalpy sensor installed, first install the single enthalpy sensor as described earlier in this instruction.

1. Remove the economizer hood from the base unit and save the screws for Step 8.
2. Using the screws provided in the DNENTDIF004A00 kit, mount the differential enthalpy sensor in the return air duct as shown in Fig. 8.
3. Remove the 620−ohm resistor that connects "SR+" and the "SR" terminals on the Economizer controller.
4. Route the red and black wires (provided in the DNENTDIF004A00 kit) between the Economizer controller and the installed location of the differential enthalpy sensor.
5. Connect the red wire to the "S" terminal and the black wire to the "+" terminal on the sensor. (See Fig. 2.)
6. Connect the red wire to the "SR" terminal and the black wire to the "SR+" terminal on the Economizer controller. (See Fig. 3.)

7. Restore power to the unit and configure the Economizer controller per the Configuration section of this manual.
8. Re−install the economizer hood.

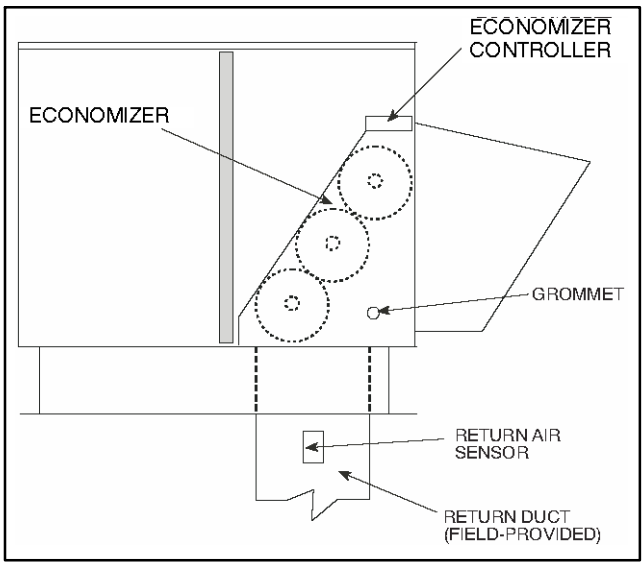

Fig. 8 − Return Air Enthalpy Sensor Mounting Location — PHH036−120, PGH/PAH036−120, PGE/PAE036−150, RGS/RAS036−180, RHS036−150, RGH/RAH036−150, RHH036−120

PHH156−180, PAH155−180, PGH155−180, PGE180−300, PAE180−300

NOTE: This section assumes you are starting with an Economizer installed in the rooftop and equipped with a single enthalpy sensor (p/n Fast # 1176668) installed. If you do not already have a single enthalpy sensor installed, first install the single enthalpy sensor as described earlier in this instruction.

1. Remove the economizer hood from the base unit and save the screws for Step 7.
2. Provide access to the economizer by removing the return−air filter access panel. Save the screws for Step 10.
3. Disconnect the black and red wires from the pre−existing temperature sensor and let them hang. Remove the air temperature sensor and save the screws (no. 8) for use in Step 3. The wires will be used later to connect to the enthalpy sensor.
4. Using the screws provided in the DNENTDIF004A00 kit, mount the differential enthalpy sensor to the economizer frame. (See Fig. 9.)
5. Remove the 620−ohm resistor connected to the “SR+” and the “SR” terminals on the Economizer controller.
6. Connect the red wire, provided in the DNENTDIF004A00 kit, to the “S” terminal and the black wire, also provided, to the “+” terminal on the sensor. (See Fig. 2.)
7. Connect the red wire to the “SR” terminal and the black wire to the “SR+” terminal on the Economizer controller. (See Fig. 3.)
8. Re−install the economizer hood using the screws from Step 1.
9. Restore power to the unit and configure the Economizer controller per the Configuration section of this manual.
10. Re−install the return−air filter access panel using the screws from Step 2.

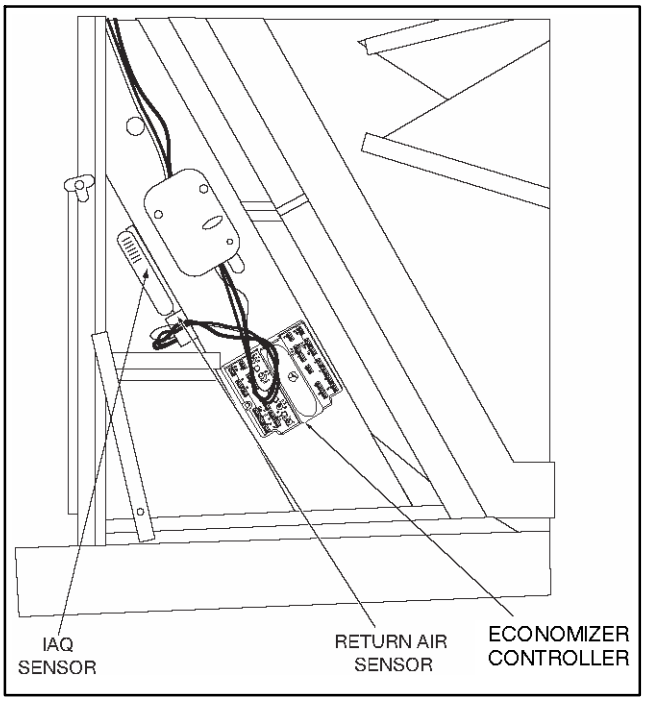

Fig. 9 − Return Air Enthalpy Sensor Mounting Location — PHH156−180, PAH155−180, PGH155−180, PGE180−300, PAE180−300

CONFIGURATION

Outdoor Enthalpy Changeover Control

When the outdoor air enthalpy rises above the adjustable free cooling/enthalpy changeover set point, the outdoor−−air damper moves to its minimum position. The free cooling/enthalpy changeover set point is set with the free cooling/enthalpy changeover set point potentiometer on the Economizer controller. The set points are A, B, C, and D. (See Fig. 10 and 11.) The factory−installed 620−ohm jumper must be in place across terminals SR and SR+ on the Economizer controller. (See Fig. 2.)

Differential Enthalpy Control

The Economizer controller compares the outdoor air enthalpy to the return air enthalpy to determine whether to select the lower enthalpy air (return or outdoor) for cooling purposes. For example, when the outdoor air has a lower enthalpy than the return air and is below the set point, the Economizer brings in outdoor air for free cooling.

When using this mode of changeover control, turn the free cooling/enthalpy changeover set point potentiometer fully clockwise to the D setting.

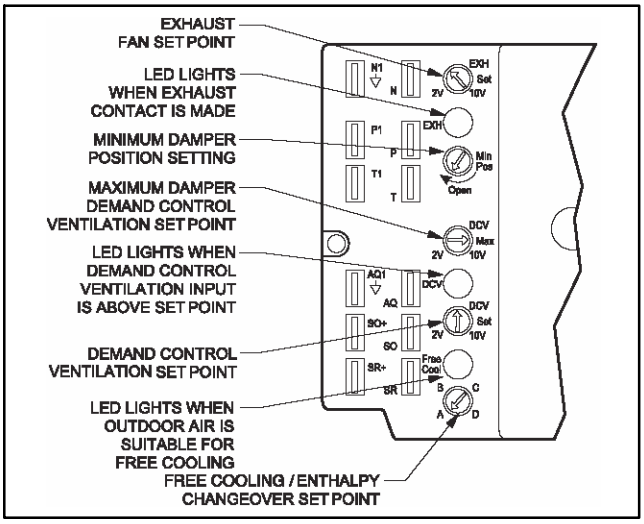

Fig. 10 – Economizer Controller Potentiometer and LED Locations

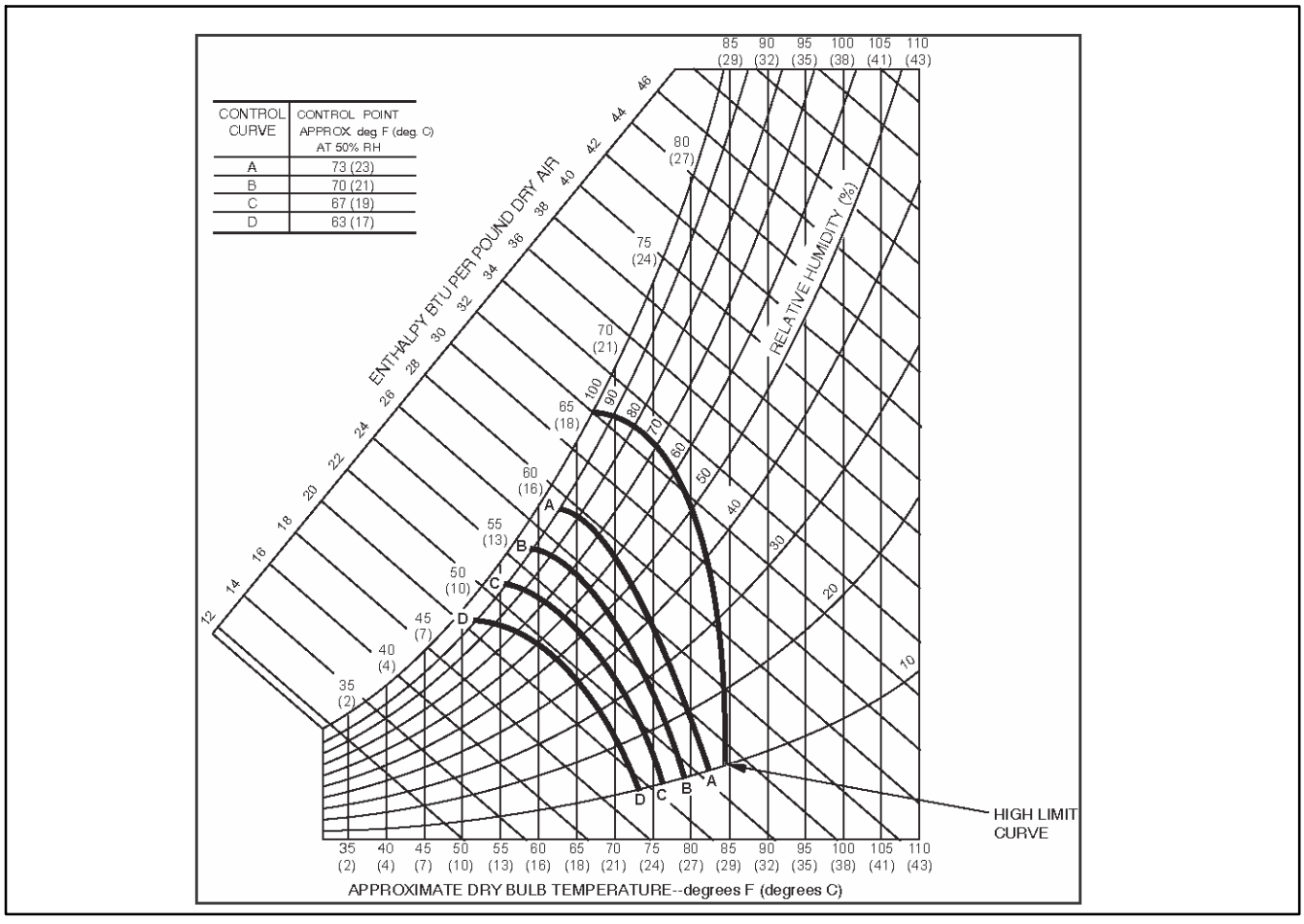

Fig. 11 – Enthalpy Changeover Set Points