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Parts List

BITZER KIT, LIQUID INJECTION, RECIP (347707-01)

- Controller (1)
- Controller faceplate (1)
- Faceplate mounting screws (4)
- In-line fuse holder with 1-amp fuse (1)
- Temperature sensor with tee fitting (1)
- Installation Instructions
Pre-Installation Considerations

In the past, converting low temperature refrigeration systems from R-502 refrigerant to R-22 refrigerant would result in high discharge temperatures that would lead to oil breakdown and compressor failure. With the installation of the ADT Valve, discharge temperatures are controlled to acceptable levels with no adverse effect on the compressor.

Pre-Installation

1. With ADT Valve system, mineral oil can be used and does not have to be changed to a POE based oil. If refrigeration system oil return is a problem, it can be resolved by changing the mineral oil to an alkylbenzene oil. It is proper refrigeration practice to change the oil at the time of the conversion.

2. When changing from R-502 to R-22, expansion valves can usually be adjusted down to work with the refrigerant changeover. However, if R-502 expansion valves were already being used at the lower limits of the valve, then the valve will have to be replaced with a low temp R-22 expansion valve. Usually by adjusting the superheat on existing expansion valves will allow the system to work fine.

3. Existing type filter-dryers will work fine with R-22 conversions. If changing filters and dryers, it should be done at the time of conversions.

4. Pressure regulators such as EPR valves must be reset to correct pressure settings for temperature control. This should be done at the time of the conversion.

5. Compressor rack controllers will have to be reset to correct pressure settings for proper rack control. This should be done at the time of the conversion.

6. Condenser fan cycling and head pressure controls will not have to be reset.
7. Systems that use a low-pressure controller to maintain space temperature will need cut-in and cut-out pressure points changed, which should be done at the time of the conversion.

8. If condenser was sized correctly for use with R-502, the condenser will be sized correctly for R-22 as well.

9. Refrigeration suction, liquid, and discharge lines for R-22 are generally the same size piping R-502. When converting a system, the pope size should be checked for proper sizing.

**Items Necessary for Installation**

- ADT Valve Kit (1 for each compressor being converted)
- ¼” copper tubing
- Shut-off valves (optional)
- Safety glasses and gloves
- Refrigerant service gauge
- Electronic Thermometer
- Leak detector
- Refrigerant recovery unit
- Proper recovery cylinders
- Proper recovery containers for refrigeration oil
- Replacement liquid line filter drier
- Replacement suction filter, if needed
Installation and Conversion Procedure

The refrigeration system should be thoroughly leak tested with the R-502 refrigerant still in the system. All leaks should be repaired **BEFORE** the conversion is done.

It is advisable that the system operating conditions be recorded while the R-502 is still in the system. This will provide base data for comparison after the system is converted to R-22.

Installing the Controller

1. Turn electrical power off to the compressor

2. Locate an area on the compressor control panel for the ADT controller.

3. Using a 2-¼” hole saw, drill a hole in the panel

4. Remove the mounting clamps and insert the controller into the panel cutout

5. Re-install the mounting clamps and gently tighten the screws

**DO NOT OVER-TIGHTEN MOUNTING SCREWS. IF THE SCREWS BEGIN TO SEPARATE FROM THE CASE THE ARE TOO TIGHT!**

6. The controller, when properly mounted, provides an NEMA 4/IP65 rating. Use the mounting collar, without the clamps, in applications where a NEMA 4 seal is not required.
Installing the Sensor: Semi-Hermetic Compressors

1. Front seat the service valves to isolate the compressor

2. If compressor has an 1/8” pipe plug in the discharge side of compressor head, remove pipe plug and install temp sensor and plug of tee fitting

3. If compressor has a high-pressure control in the 1/8” port on the discharge side if compressor head, remove the pressure control and fitting, then install sensor into 1/8” port and reinstall the high-pressure control onto the tee of the temperature sensor.
4. If compressor has a port on the discharge side of the compressor head other than a 1/8” port, use an adapter to change from compressor pipe thread to sensor pipe thread. Make sure discharge temperature sensor is extended inside of head for proper temperature reading.

WHEN INSTALLING THE SENSOR INSIDE OF THE COMPRESSOR HEAD, MAKE SURE THE SENSOR IS NOT HITTING ANYTHING IN THE COMPRESSOR DISCHARGE CHAMER.

5. If there is no port in the discharge chamber of the head to install temperature sensor, the head can be removed, and a hole drilled and tapped for the sensor. This will require a new head gasket set to put the compressor back together after drilling and tapping. Make sure the sensor will not hit anything once the head is replaced.
Installing the Sensor: Scroll and Hermetic Compressors

1. Located the strap-on sensor no more than 4 inches from the compressor to ensure an accurate temperature reading.

2. Clamp the sensor to the compressor discharge using copper straps provided.

3. Insulate the sensor by wrapping the sensor with insulation provided.

**THE SENSOR MUST BE INSTALLED NO MORE THAN 4 INCHES FROM THE COMPRESSOR. THE SENSOR SHOULD BE WELL-INSULATED USING INSULATION MATERIAL PROVIDED.**
Installing the ADT Valve

1. The ADT Valve should be located in the suction line of the compressor, and no more than 6” from the compressor.

2. The ADT Valve is supplied with a mounting bracket, which should be used.

3. To install the ADT Valve, pump the liquid and suction lines down.

4. Install the liquid line into the strainer side of the valve.

5. Install a ¼” copper line into the suction line of the compressor.

   IT IS RECOMMENDED TO INSTALL SHUT OFF VALVES ON THE LIQUID AND SUCTION SIDE OF THE ADT VALVE SO ADJUSTMENTS TO THE DISCHARGE TEMPERATURE OF THE COMPRESSOR CAN BE MADE QUICKLY AND EASILY.

6. Make sure there is an orifice in the ADT Valve. This is found by removing the end of the ¼” flare housing with 2 wrenches. The kit includes three different size orifices:
   
   a. #4 1 to 3 horsepower
   b. #6 5 to 10 horsepower
   c. #8 10 to 30 horsepower

   *NOTE: OTHER ORIFICES ARE AVAILABLE FOR SPECIAL APPLICATIONS*
Converting the System

1. Leak check the joints and repair any leaks found. Pull vacuum.

2. Turn the system back on and let the system pull down to temperature

3. Reclaim the R-502 refrigerant

4. Change the oil and filter-dyers and the suction filters

5. Pull vacuum down to an acceptable level

6. Recharge the system with R-22 refrigerant. Charge the system the same as if charging with R-502
Wiring the Controller

1. Use the wiring diagram that matches the system the valve is being installed on.

2. Connect power to the controller. The unit will operate on either 110VAC or 230VAC.

3. Connect the ADT Valve to the controller.

4. If a high temperature cutout is used, connect as shown in the wiring diagrams.

5. Connect the temperature sensor leads to the controller.
Figure 6 – Wiring Diagram for 208/230 VAC, 1 Phase System With Contactor

Figure 7 – Wiring Diagram for 208/230 VAC, 1 Phase System Without Contactor
Figure 8 – Wiring Diagram for 115 VAC, 1 Phase System Without Contactor
Starting the System

1. Turn the electrical power on

2. The ADT controller will turn on and display the temperature of the discharge chamber of the compressor head for semi-hermetic installations, or the temperature of the discharge line for scroll and hermetic installations.

3. The controller is setup to turn the valve on 5°F above the control setpoint and turn the valve off 5°F below the control setpoint. This provides a 10°F deadband.

4. Depending on whether your kit is for semi-hermetic or scroll compressors, the controller is shipped with the control setpoint set to the value shown in the chart below:

5. The discharge high temperature safety turns on 30°F above the control setpoint value and turns off at the control setpoint value.

EXAMPLE: For a setpoint of 260°F, the high alarm would come on at 290°F and turn the compressor off. When the compressor head cools down to 260°F, the alarm will turn off, and the compressor will automatically restart.
Testing the ADT Valve

1. As the temperature in the compressor head rises to the injection point (265°F for semi-hermetic and 235°F for scroll), the ADT Valve will open, and cool the discharge temperature to the shut off point (255°F for semi-hermetic and 225°F for scroll).

2. If the valve is injecting and the discharge temperature is not coming down, install the next size larger orifice in the ADT Valve. See Changing the Orifice instructions.

3. To test that the ADT Valve will not flood the compressor, set the controller set point value low enough to run the controller for at least one hour. If flooding does occur, change the orifice in the ADT Valve to the next size smaller orifice. See Changing the Orifice instructions.

4. Depending on the outside conditions, discharge temperatures may not be high enough to start the injection mode of operation. By setting the controllers setpoint value low enough, the ADT Valve can be tested to see if the system is operating properly. If this testing is done, recheck the system for proper operation once the weather turns warmer.

Changing the Orifice

1. Isolate and remove refrigerant from the ADT Valve

2. Using two wrenches, remove the ¼” flare nut from the ADT Valve

3. Remove the ¼” flare housing from ADT Valve

4. Using a screwdriver, remove the orifice from ADT Valve and install a different size orifice

5. Using two wrenches, replace the ¼” flare housing and nut onto the ADT Valve

6. Restart system, and recheck the operation of ADT Valve
Changing the Controller Setpoint

1. There are four digits on the controller. Using the ↑ key, press it the number of times (1 to 4), to select the digit you wish to change. The digit selected will be highlighted. Press and hold the ↑ or ↓ key to change the number on the display until you reach the desired value. Release the arrow key. The controller will reset to the new setting after 20 seconds.

For example, the display shows the number 0260 (260°F). If you want to change it to 0265 (265°F), press the ↑ key four times in a row until the last digit (0) is highlighted. Then, press and hold the ↑ key. The number on the display will change. Release the ↑ key when the number 5 appears on the display. After 20 seconds the controller will control at the new setpoint value.

2. The valve will turn on (injection setpoint) 5°F above the control setpoint value

3. The ADT Valve will turn off 5°F below the control setpoint value

4. The alarm will turn on 30°F above the control setpoint value

5. The alarm will turn off at the control setpoint value

Locking the Controller Panel

To Lock the controller, press and hold the ↑ and ↓ the keys at the same time for four seconds, then release. When locked, the keypad operation is disabled to protect the controller’s setpoint from tampering.

To Unlock the controller, press that ↑ and ↓ keys at the same time for four seconds, then release. The controller setpoints can now be changed.
Assistance

If you have any installation questions or need application assistance, please call or email:

- BITZER Tech Support
  techsupport@bitzerus.com
  (770) 503-9226

- BITZER Customer Service
  customerservice@bitzerus.com
  (770) 718-2900

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