Installation PART-IN-1

Library	**Service Literature**
Product Section	**Commercial Aftermarket Products**
Product	**Compressors**
Model	**PART**
Literature Type	**Installation**
Sequence	**1**
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Causes of Compressor Failure

Compressor failure is usually the result of system deficiencies. Failure to look for and correct the cause of the problem(s) will place the new compressor in jeopardy and may lead to another failure.

The following steps are recommended:

1. Determine if the failure is electrical or mechanical. Note that an electrical failure does not rule out the possibility of a mechanical failure also.
2. If the failure is electrical, check for system contamination using an acid test kit for oil analysis. If acid is present, a replaceable core suction filter with an acid cleanup core is required. If no acid is present, a standard suction filter must be installed to remove any debris/contamination from the original failure.
   Look for defective contactors, loose connections, unbalanced voltage; review the control system to insure that it works properly; check for chattering contactors or relays.
3. If the failure is mechanical, a standard suction filter must be installed to remove any contamination from the original failure. Mechanical failures can be caused by poor refrigerant control or loss of refrigerant. Check for defective expansion valves, restricted air/water flow, excessively long or oversized liquid line, defective or improperly selected components such as refrigerant distributors, distributor tubes and hot gas by pass valves, or refrigerant control valves.

   If the system is equipped with a solenoid valve, it should be checked for proper operation.The scroll compressor must not be allowed to run into a vacuum.

   Check the low pressure switches to insure that they are operating properly.
4. Loss of oil may be a problem. Drain the oil out of the compressor and measure the oil. The approximate operating oil charge should be as follows:

   If the amount of oil is significantly below the oil charge shown, look for the cause of oil loss. Look for oversize suction lines, improperly formed suction line traps, poorly designed refrigerant piping, oil leaks, oil logged evaporator or condenser. **Note**: It is important not to overcharge the system with oil. Overcharging the system with oil can result in suction pressure swings.

CSHS	093,100 - 8 Pints	140, 150 - 14 Pints
CSHA	093,100 - 7 Pints	140, 150 - 11.5 Pints

5. Oil Appearance—What it tells you:
   - Dark and Thick—Indicates a general motor burn. Oil in the system should be changed. Suction filter-drier cleanup is mandatory.
   - Discolored and Slightly Odorous—Indicates a possible spot burn or probable dirty system due to copper oxides generated during the installation of the system without the use of inert gas-suction line filter suggested.
   - Fine Metallic Particles in the Oil—Indicates a bearing or scroll failure. Look for excessive flood back. Compressor seriously diluted with refrigerant. Oil in system should be changed. Suction filter drier cleanup is mandatory.
   - If Water is in the Oil—If the system is a chiller or has a water cooled condenser, look for a refrigerant to water side leak. Ensure a liquid line drier is replaced/added.
   - Clean and Sweet—This condition does not tell what happened but it tells you what probably didn't happen—no burn out, no system contamination, no excessive wear.
6. Changing Oil Manifold Sets—Whenever one of the compressors fails in a manifold set, the oil must be changed in the remaining compressors in that set.
7. Approved Replacement Oil—Refer to CSHA-SB-1B or most recent revision for compressors installed in Trane products.
8. Liquid Line Driers—Install or change the liquid line drier to help protect the new compressor against the inclusion of moisture or other contaminants. This should be done any time a system is opened for service.
9. Evacuation—Use a vacuum pump and an electronic vacuum gauge; evacuate the system to 500 microns or less. Once 500 microns has been obtained, a time vs. pressure rise should be performed. Maximum allowable rise over 15 minutes is 200 microns.
10. Charge Properly— Refrigeration systems require accurate charging. Weigh the charge in or charge system to proper subcooling value. Refer to unit operation/maintenance manual for proper charging methods and proper superheat/subcooling valves.

    Subcooling is determined by taking the refrigerant pressure in the liquid line at the liquid line king valve, converting it to a saturated liquid temperature, and subtracting the liquid line temperature. The difference between these two temperatures is *subcooling*. Standard range (unit running at full load) for water cooled products is 10 to 15°F and for air cooled products is 15 to 20°F, with a minimum allowable at the expansion valve of 5°F.

    Superheat is determined by taking the suction pressure, converting it to a saturated temperature, and subtracting that temperature from the suction line temperature. The difference between these two temperatures is *superheat*. It should be in the 12 to 15° F range but should not exceed 20° F at the compressor.
11. Manifolded Compressors—Do not modify suction manifold piping. It contains one or more orifices for proper oil management. Modifying the manifold piping will result in improper oil return to the compressors.