

## Crankcase Heaters

A crankcase heater is an electrical component in a compressor in an air-conditioning system, heat pump system, or chiller system. The crankcase heater is normally on all the time, even when the unit is not running, though temperature sensors and set points may turn it off when not needed. A crankcase heater's sole purpose is to prevent refrigerant migration and mixing with crankcase oil when the unit is off, and to prevent condensation of refrigerant in the crankcase of a compressor. Migration of refrigerant to the compressor's crankcase during an off cycle is a serious problem. Significant compressor damage can occur if the problem is not corrected.

The crankcase heater keeps refrigerant at a temperature higher than the coldest part of the system. A crankcase heater generally has the same electrical symbol as a resistor because it converts electricity directly into heat via electrical resistance. The resistance in the heater coil determines the heat it produces when voltage is applied. Crankcase heaters are inserted in the compressor (insertion type) or mounted externally around the base of the compressor (bellyband type).

While the system is running, there is enough heat being generated by the compressor running to prevent refrigerant migration from occurring. Refrigerant vapor always migrates to the coldest part of the system (the compressor). The refrigerant migrates to the compressor crankcase where it is attracted to the compressor oil. This refrigerant vapor condenses and returns to a liquid in the off cycle. On the next startup of the compressor, the oil is in a watery state and washes



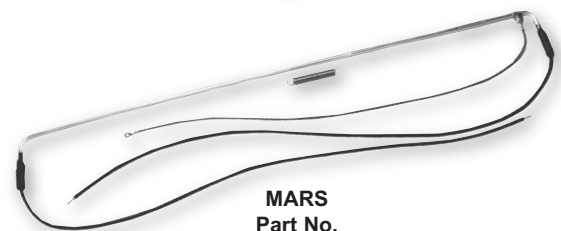
the bearings out which leads to locked-up, frozen or totally burnt out compressors. The temperature is sensed at the compressor, indoor coil, and outdoors. The sensed temperatures are compared and if the compressor temperature is not a specified amount higher than the lower of the other two sensed temperatures, then the crankcase heater is energized. When the compressor temperature rises to or is a specified amount above the lower of the two other temperatures, the crankcase heater is de-energized.

MARS offers a wide variety of direct replacement crankcase heaters for Copeland, Carrier, Tecumseh, Trane, Westinghouse, Fedders, Sanyo, Hitachi and Aspera. In addition, universal wrap-around and/or self-stick heaters are available.



Self-stick

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32342



Universal wrap-around

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32340