

Dry All®

Full Range of HVAC&R Line Products



Crankcase Heater

Introduction

In refrigeration and air conditioning systems, maintaining the proper flow of refrigerant within the compressor is crucial for optimizing performance and extending the compressor's life. One common challenge is preventing the mixing of lubricant oil and liquid refrigerant, as it can lead to reduced efficiency and potential damage. To address this issue, a popular method involves using a Crankcase Heater—a specialized electric resistance heating element that heats the oil within the compressor.

The Crankcase Heater helps to counteract the solubilization of refrigerant in the lubricant oil. By maintaining a constant temperature of approximately 30/35°C within the compressor, the heater ensures that the oil remains warmer than the refrigerant circuit. This temperature differential forces the refrigerant to stay within the evaporator and/or condenser, reducing the chances of unwanted mixing and ensuring the efficiency and smooth operation of the refrigeration or air conditioning system.

A crankcase heater is used to prevent refrigerant from migrating into the shell during a standstill period. They feature a heating element that's powered by electricity, electricity helps the crankcase heater to produce heat. The variable frequency compressors get the power source from variable frequency drives. The crankcase heater receives the power source before the compressor is turned on to heat the compressor oil.

The crankcase heater not only keeps the refrigerant warm and above the refrigerant boiling point it also keeps the oil in the compressor warm. By using a crankcase heater, it brings the fluids to its operating temperature before starting, the compressor motor can start easily and pick up where it left from. Without the crankcase heater the compressor would have to work a lot harder during startup, causing wear and tear to the internal parts of the compressor.

Applications

The Crankcase Heater finds widespread use in various refrigeration and air conditioning systems. Some of its key applications include:

Compressors: The primary application of the Crankcase Heater is in the compressors used for refrigeration and air conditioning. It helps maintain the proper separation of oil and refrigerant, preventing refrigerant dilution in the oil and ensuring the compressor's efficient functioning.

Industrial Refrigeration Systems: Large-scale refrigeration systems, commonly found in industries, often utilize Crankcase Heaters to enhance their overall efficiency and reliability.

Commercial Air Conditioning: In commercial air conditioning units, where compressors are frequently employed, Crankcase Heaters play a vital role in optimizing performance and increasing the system's longevity.

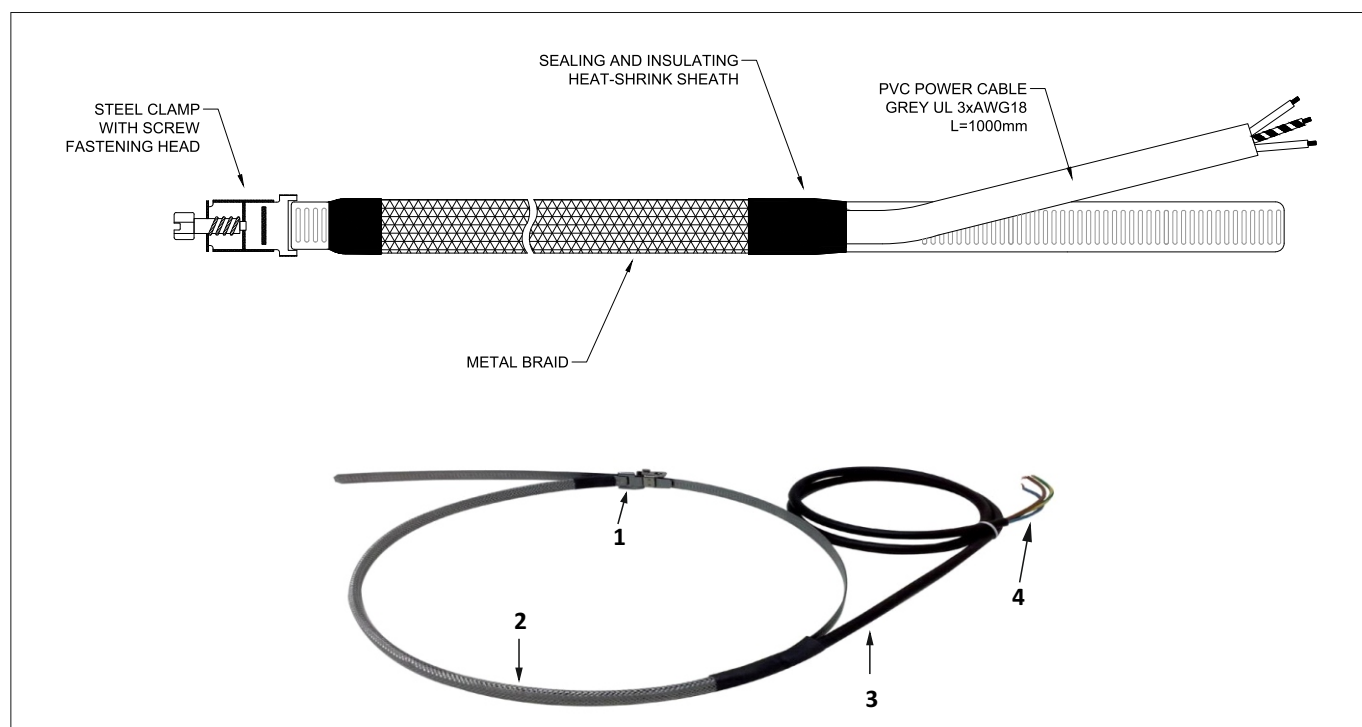
Chillers: Chiller systems used for cooling in various applications benefit from Crankcase Heaters, as they aid in the smooth operation of the refrigeration cycle.

Crankcase Heater for Compressor

General Characteristics

- Input voltage: 230 Volt standard, other options available upon request.
- Frequency : 50/60 Hz as required.
- Standard power, dimensions, and length as indicated in the table. Other models are available upon request.

Drawing



1. Steel clamp with screw fastening head.
2. Multi-wire metal braiding external protection.
3. Sealing and insulating thermos shrinking sheath.
4. Power cable with earth connection.

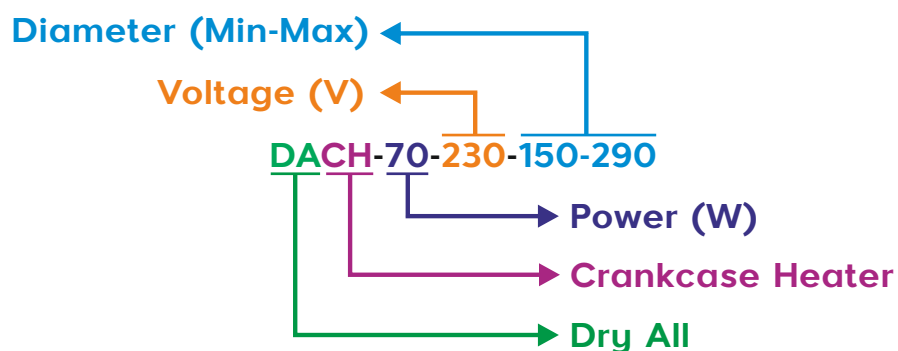
Crankcase Heater for Compressor



Available Models

S/N	Dry All Model No	Power (W)	Voltage (V)	Diameter (Min-Max) (mm)	Equivalent Compressor Model No
1	DACH-70-230-150-290	70	230	150-290	ZR 72
2	DACH-70-230-210-330	70		210-330	ZR 108
3	DACH-120-230-210-330	120			ZR 144/ZR 160
4	DACH-65-230-210-330	65		210-330	SM147/SM110
5	DACH-75-230-230-380	75		230-380	SM 185
6	DACH-130-230-315-380	130		315-380	SY 240/SY 300/SY 380

Nomenclature



Advantages

The use of Crankcase Heaters offers several advantages, making them an essential component in modern refrigeration and air conditioning systems:

Enhanced System Performance: By maintaining the oil at a higher temperature than the refrigerant circuit, Crankcase Heaters prevent refrigerant dilution in the oil. This ensures optimal compressor performance and prevents potential damage or inefficiencies caused by lubricant contamination.

Extended Compressor Life: Crankcase Heaters help reduce wear and tear on the compressor by minimizing the chances of oil breakdown due to refrigerant mixing. This leads to a longer operational life for the compressor, reducing maintenance costs and downtime.

Energy Efficiency: Heating the oil to a specific temperature helps the compressor reach its peak efficiency faster during start-up. This reduces power consumption and energy waste, contributing to energy-efficient operations.

Reliable Operation: By keeping the refrigerant confined within the appropriate sections of the system, the risk of refrigerant migration and associated issues, such as oil logging and reduced cooling capacity, is minimized.

Installation Guidelines

1. Assembly Instructions

For installation, the manufacturer/installer shall follow the recommendations mentioned hereunder:

- a. Choose the appropriate model according to compressor size and required wattage.
- b. Check the compressor application guidelines for crankcase heater connection and operation.
- c. Place the crankcase heater between the lower cover and lower bearing weld projection (Fig 1).
- d. Fit the heater horizontally around the crankcase, ensuring that it is in close contact with the compressor housing along the entire length (Fig 2).
- e. Avoid having the heating portion of the heater in contact with the weld projection.
- f. Avoid having the heater assembly inclined.
- g. Close the lock and tighten the screw.
- h. The excess clamp bracket may be trimmed.
- i. Sharp edges must not come in contact with wires.

Drawing & Image

Crankcase Heater Installation

Figure 1

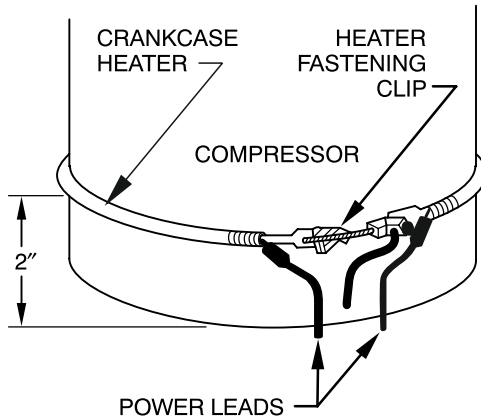


Figure 2



2. Electrical Connection

- Connect the crankcase heater according to the compressor application guidelines.
- The crankcase heater must be connected only to its rated voltage.
- Tighten the crankcase heater around the compressor and attach the green wire to the compressor terminal housing (proper earthing).
- Connect both the power cables properly to the contactor or desired control box.
- Use wire ties to tie the crankcase heater wires to ensure that the cables do not come in contact with the compressor discharge line, any moving parts, or any sharp edges.

Electrical security and safety measures should be provided on-site.

General Tests and Packing

All Dry All heating cables are singularly electrically tested before being delivered to the customer using a special packing designed to guarantee the integrity and safety of the material during the handling, transport and storage.

In summary, Crankcase Heaters play a vital role in ensuring the proper functioning and efficiency of refrigeration and air conditioning systems. By maintaining the correct temperature of the lubricant oil, they prevent refrigerant dilution and promote optimal compressor performance, ultimately leading to reliable, energy-efficient, and long-lasting systems.

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