

Motor Space Heater

This paper discusses the use of an integral motor space heater available as an option from most electric motor manufacturers.

Applications

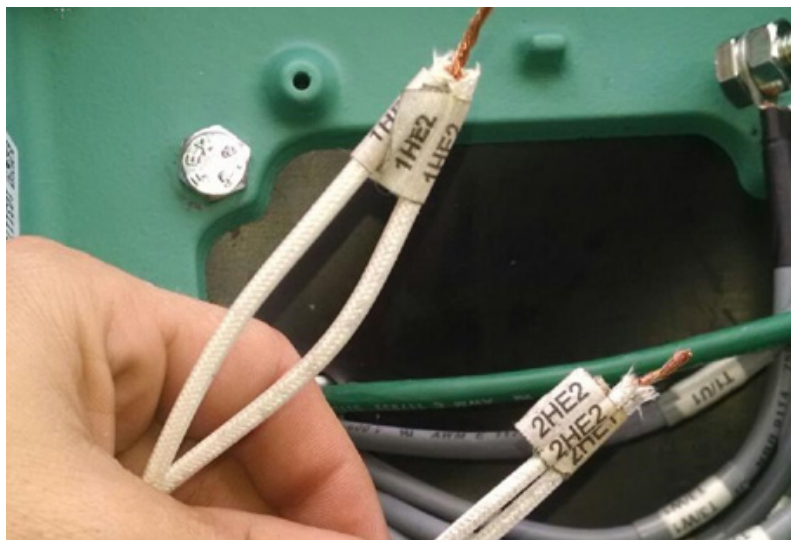
Cooling tower motors subjected to long term storage, extended or overnight shut down and ON and OFF cycling in varying outdoor weather conditions.

Purpose

The space heater keeps the internal temperature of the motor above the ambient dew point while the motor is OFF. The heater helps to prevent condensation from forming inside the motor which can be damaging to motor windings, bearings and electrical connections.

Note

- Refer to the motor nameplate or specific motor data sheet for electrical ratings of the space heater. Space heaters are available in many voltage ratings. In the US a typical rating is 120 or 220VAC.
- Kilowatt rating and number of heaters is dependent on the frame size of the motor. Larger frame motors require more kW to heat the material and internal air space.
- Typically a motor space heater is powered from the customer's remote electrical supply source through a set of logic contacts in a VFD or motor starter. Most off-the-shelf VFDs do not have 120VAC or 220VAC supply on board to power a space heater.
- Having the space heater powered from a remote source other than the VFD or motor starter helps to assure the heater is energized even when the disconnect switch for the VFD or motor starter is off.
- Cost effective, low cost compared to trickle charge heating.



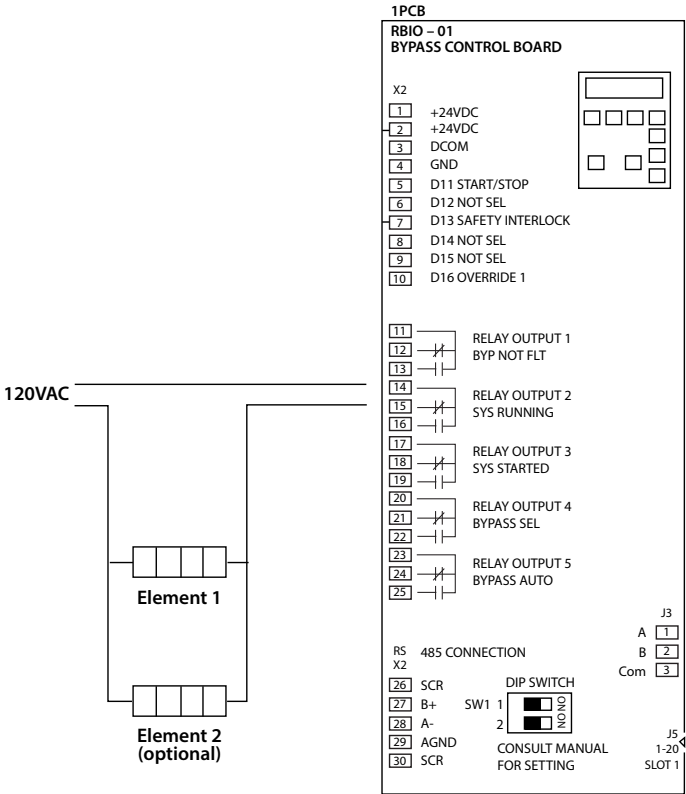
The use of the motor space heater is optional. If the space heater is not needed, these leads can be capped off and taped out of the way. The picture shows a typical two heater option wired in parallel.

Sequence of Operation

- Motor is being controlled by the VFD during normal operation. Speed varies according to heat load. RELAY OUTPut 2 (SYS RUNNING) contacts 14 and 15 are open.
- Motor is called to stop by either the absence of the run enable or heat load is such that the fan motor is not needed.
- RELAY OUTPUT 2 (SYS RUNNING) contact 14 and 15 are closed energizing the motor space heater element keeping the motor warm.
- Fan motor is called to run by either an increase heat load or presence of the run enable signal from the BMS.
- RELAY OUTPUT 2 (SYS RUNNING) contact 14 and 15 are open, turning off the motor space heater.

NEMA Frame*	Average Heating	WEG Motor Nameplate Data			
143-145	11	voltage	110-127V	200-240V	380-480V
		power	9.2-12W	9.1-13W	8.2-13W
182-184	22	voltage	110-127V	200-240V	380-480V
		power	18-25W	18-26W	16-26W
213-215	30	voltage	110-127V	200-240V	380-480V
		power	25-33W	25-35W	22-35W
254-256	30	voltage	110-127V	200-240V	380-480V
		power	25-35W	25-35W	22-35W
284-286 324-326	38	voltage	110-127V	200-240V	380-480V
		power	46-62W	32-46W	29-46W
364-365 404-405	56	voltage	110-127V	200-240V	380-480V
		power	46-62W	46-66W	41-66W
444-445-449 504-505	140	voltage	110-127V	200-240V	380-480V
		power	117-156W	115-166W	104-166W
586-587-588 589-5008	174	voltage	110-127V	200-240V	380-480V
		power	146-194W	144-207W	130-207W

*Two space heaters per motor



Simple wiring diagram, refer to the motor nameplate

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