

## Fan Motor Space Heater

This paper outlines the use of integral motor space heaters as a cost-effective alternative to trickle charge heating. These heaters are commonly available from electric motor manufacturers.

### Applications

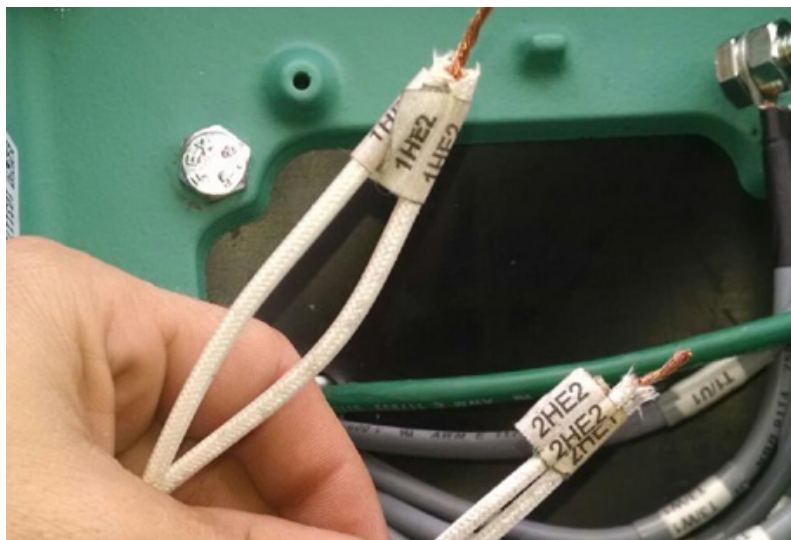
Cooling tower motors subjected to long-term storage, extended or overnight shut down, and ON and OFF cycling in varying outdoor weather conditions.

### 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.

### Notes

- 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 VAC.
- 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 Variable Frequency Drive (VFD) or motor starter. Most off-the-shelf VFDs do not have auxiliary power supply on board to power a space heater.
- Powering a space heater from a remote source other than the VFD or motor starter helps ensure the heater is energized even when the disconnect switch for the VFD or motor starter is off.



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.

# FAN MOTOR SPACE HEATER

Remote or Integral Interface Engineering Data

## Sequence of Operation With Space Heater Interface

The 120 VAC supply power is routed through a 2 Amp fuse to a normally closed system relay contact, then returned to the fan motor space heater interface. The neutral conductor is connected directly to the fan motor space heaters. The system supports a maximum heater load of 240 W.

**Note:** The 120 V power supply should always remain live; it is never switched OFF.

- **Control Signal Input:** The interface system operates based on an external normally closed contact provided by the VFD, motor starter or Programmable Logic Controller (PLC) (relay output rated for 120 VAC).
- **Fan Motors OFF:** The external normally closed contact remains closed, completing the circuit and energizing the fan motor space heaters.
- **Fan Motors Running:** The external normally closed contact opens, breaking the circuit and de-energizing the fan motor space heaters.

## Sequence of Operation Without Space Heater Interface

The 120 VAC supply power is routed to the system relay's normally closed contact and then returned to the fan motor space heater interface. The neutral conductor is connected directly to the fan motor space heaters.

- **Control Signal Input:** The interface system operates based on an external normally closed contact provided by the VFD, motor starter or PLC (relay output rated for 120 VAC).
- **Fan Motors OFF:** The external normally closed contact remains closed, completing the circuit and energizing the fan motor space heaters.
- **Fan Motors Running:** The external normally closed contact opens, breaking the circuit and de-energizing the fan motor space heaters.

## Typical WEG Space Heater Details

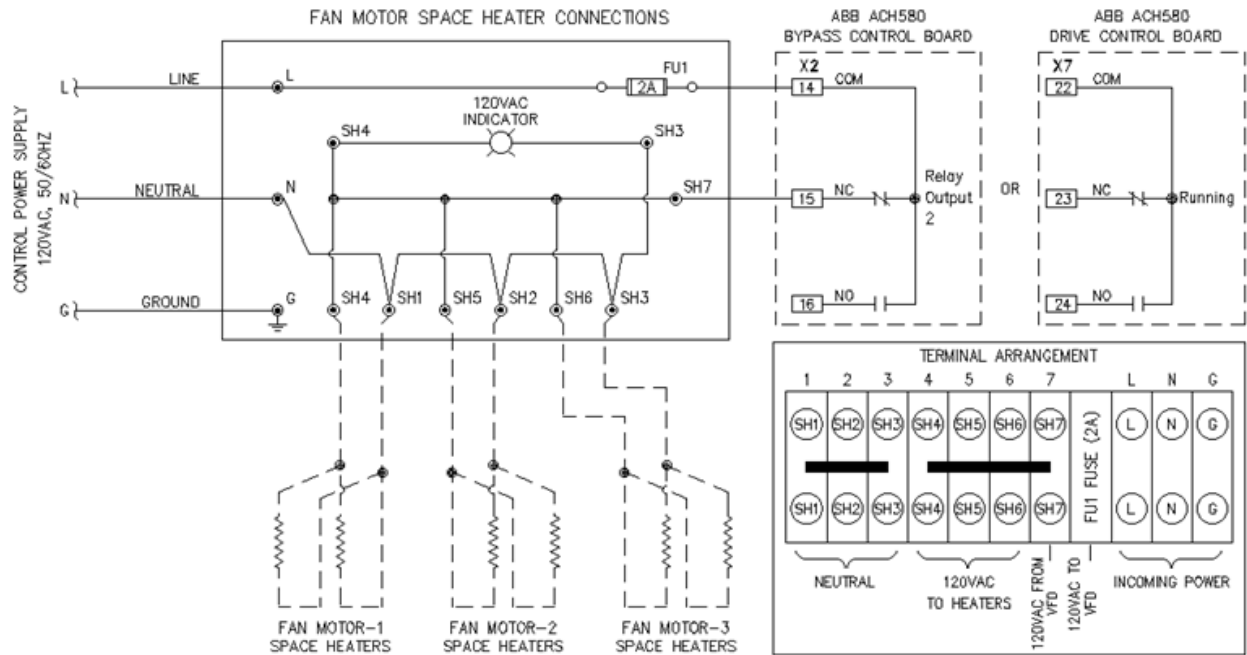
NEMA Frame	Fan Motor (HP)	Space Heater Total Wattage
143 - 145	1-2	13W
182 - 184	3-5	26W
213-215	7.5-10	35W
254-256	15-20	35W
284 - 286 324 - 326	25-30 40-50	62W
364 - 365 404 - 405	60-75 100	66W
444 - 445 - 449 504 - 505	125-350	166W
586 - 587 - 588 589 - 5008	400-700	207W

\*Total wattage shown powers two space heaters per motor

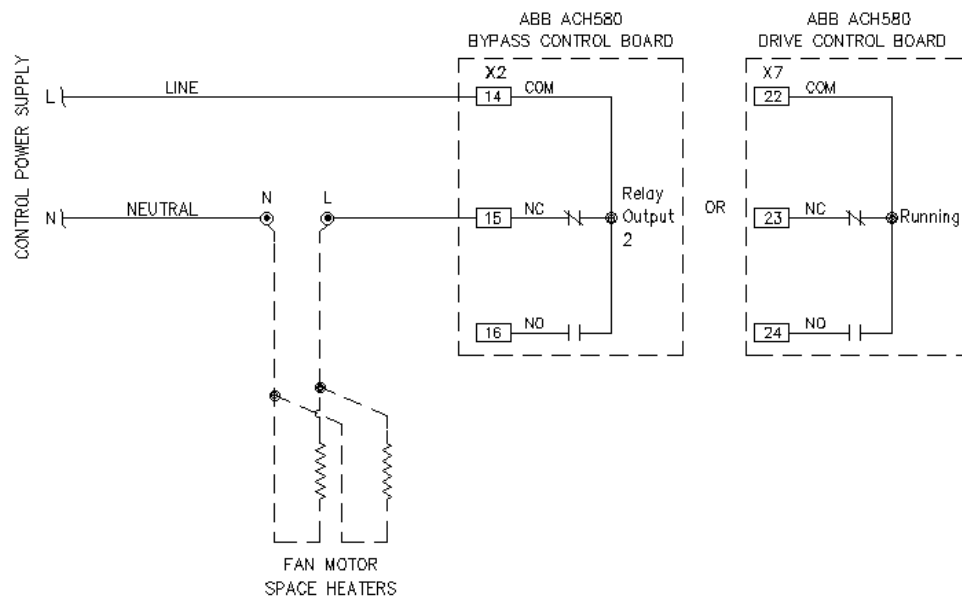
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## System Diagram With Space Heater Interface



## System Diagram Without Space Heater Interface



**Note:** Incoming power shall not exceed the drive relay capability.

ABB ACH580 relays are limited to 2 Amps at 120/220 VAC, 50/60 Hz.

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