

THREE-PHASE NOTE

ELECTRIC MOTORS USING THREE-PHASE POWER ARE NOT PROTECTED BY MOTOR PROTECTION DEVICES, SUCH AS THERMAL OVERLOADS, HEATERS, BREAKERS OR MAGNETIC STARTERS, UNLESS SPECIFIED OTHERWISE. THEY ARE THEREFORE SUBJECT TO BURNOUT AND **THEY MAY EVEN CATCH ON FIRE** IF ANYTHING GOES WRONG WITH THE MOTOR, WHATEVER THE MOTOR IS DRIVING OR THE INCOMING POWER SUPPLY.

For example, if the vanes on a vane-type compressor should break, the motor will not be able to turn. The locked rotor amps will run about three times higher than the full load amps. This will rapidly overheat the windings, melt the insulation and cause a short. Sparks, smoke and fire will continue until the wires melt, disconnecting the motor from a power source.

"Losing a leg" is the term given to the loss of one of the three wires into a three-phase motor. For example, a tree limb could snap a power line or an electrical connection might corrode, eliminating that "leg" of power. The two remaining power legs would then overload, generating so much heat that the winding insulation melts or burns, causing a short as in the example above.

To protect a three-phase motor, instruct an electrician to install one of several types of motor protectors. There are many variations, voltages and types to choose from; e.g., indoor, outdoor and waterproof enclosures; service disconnect with fuses; magnetic starters; plugin breakers; GFCI plugin breakers; and oversized enclosures to hold other required devices.

SUMMARY: Motor protection is never furnished with a three-phase motor unless specifically stated otherwise! Since three-phase motor-powered equipment does not come with any motor protection device, you or your electrician will need to provide it. Use an electrical contractor or firm that specializes in electric motor control devices. Be sure to comply with all local, state and national electrical codes.

THERMAL PROTECTION

Motors that start automatically (e.g., thermostatically controlled) and are located out of sight of the operator must be protected against dangerous overheating due to failure to start or overloading. This protection may be a separate overcurrent device (e.g., motor starter) complying with Article 430 of the National Electrical Code (NEC), a thermally protected motor (integral motor protection) or an impedance-protected motor.

Motors with automatic reset thermal protection must not be used where automatic or otherwise unexpected starting or the motor could be hazardous. Where such a hazard exists, always use a manual-reset thermally protected motor. Applications where automatic restarting could be hazardous include compressors, conveyors, power tools, farm equipment and some fans and blowers.



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