

Overcurrent Motor Protector



610-012A
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Description

The 610-012A Motor Protector is a fully electronic overload protector that provides positive overcurrent protection for Across the Line and Part Winding Motors. The Control is a current sensing module or modules, that derives information from three or six C.T.s (current transformers). When a current in any phase exceeds the pre-determined adjustable “trip level”, the Control de-energizes the Across the Line motor starter, contactor or control circuit. When currents exceed the trip point, the product of time and overcurrent cause a “fail-safe” (de-energizing) of the control circuit. The greater the current above “trip level”, the shorter the time to trip. The lesser the current above “trip level”, the longer the time to trip. Overcurrent response is proportional to the “time to trip” for any overload from two seconds at locked rotor to 20 minutes at marginal overload.

Input power is provided by either 24, 120 or 208/240V-AC to terminals designated on the Controller. A single, isolated set of Form C (N.O./N.C.) relay contacts are also provided. The “N.O.” to “COM” contact is closed for all conditions below the “trip level” current. The “N.C.” to “COM” contacts may only be used if a common power source is used in both the N.C. and N.O. circuits. Mixing voltage sources is not allowed because of the single “COM” terminal.

When Part Winding motor starters are used two 610-012A Motor Protectors are required. The control circuit should be wired in “series” to assure both protectors are removed from the Line when

either or both Protectors “Trip”. See I&O Instructions for Part Winding Motors form # 175-0207-001.

When the Control circuit trips, a red “TRIP” LED will indicate a “fail-safe” condition. Carefully evaluate and correct the system fault before resetting the Control. There are two methods to reset the circuit; 1) press the red, manual “RESET” button, or 2) remotely de-energize the Control’s power momentarily. Reset allows the motor to restart or reconnect the load.

Precise calibration is completely dependent upon the accuracy of the current and voltage measuring meters utilized during calibration.

Application

The 610-012A Control is not limited to motor applications. Any electrical, inductive or resistive load may be monitored and protected from overcurrent conditions.

Typical applications include:

- Air conditioning or refrigeration compressors (open or hermetic type).
- Fans
- Blowers
- Pumps
- Conveyors
- Elevators
- Machine tools

Trip level is adjustable for any current for the type load, service factor, and/or insulation rating of the motor. The trip level may be set above nominal full load amps (FLA) to obtain the degree of protection required by the application. For part winding motor applications, divide FLA by two since each winding carries 1/2 of the current.

The Control may be applied to voltages up to 600VAC assuming properly rated U.L. or C.S.A. approved wire and wiring methods are used.

Single Phase, Three Phase, and Three Phase Part Winding applications are incorporated.

Important: Part winding motors / contactors require two 610-12A controls with all safety circuitry wired in series with motor protector. See Installation and Operating Instructions - Part Winding Motors # 173-0207-001 for details.

Features and Benefits

- Field selectable trip level adjustment from 20 to 175 amps.
- Manual push button Reset or optional remote reset.
- Current transformers (C.T.s) remote from logic.
- Isolated output Form C (N.O./N.C.) control circuit.
- Accurate positive overcurrent protection with no nuisance trip function.

Principles of Operation

Protection of an electrical system (current load) is directly proportional to the excess current that occurs above what is normally anticipated. Evaluating voltage is an indirect method of determining overload. The measurement of current will always indicate and provide the magnitude of overload as a result of electrical or mechanical abnormality.

Inductive Loads For Motors

The 610-012A Series Motor Protector has unique provisions for overload (current) protection for inductive loads. The “time to trip” from an extreme overload condition (locked rotor) to a marginal overload condition (1% above trip) varies infinitely. “Time to trip” will always be proportional to the magnitude of the overload current. Once the operating current exceeds and remains above trip level current, a fail-safe trip will occur.

If integration begins as a result of excessive current, and then falls below the trip level current (as set), trip will not occur. Integration will begin again only when the trip level current is once again exceeded.

This function provides positive and proportional time to trip for electrical or mechanical overloads while guarding against nuisance trips.

Specifications

Voltage, Input (Select)	24, 120 or 208/240V AC
Power	2.5 VA
Frequency	60 Hz
Response Time To Trip	
Minimum	2 sec. @ LRA
Maximum	20 Min. @ 1.02% FLA
Trip Current Range, Min./Max.	20 to 175 Amps
Trip Level Setting,	Adjustable
Setting Range	± 0.2%
Relay Rating,	
Volts	24 to 240V AC
Current (Max.)	4 Amps
Ambient Temperature Range	
Operating & Storage	-30°C to 65°C
Dimensions (L x W x H)	5.56" x 3.32" x 1.3"

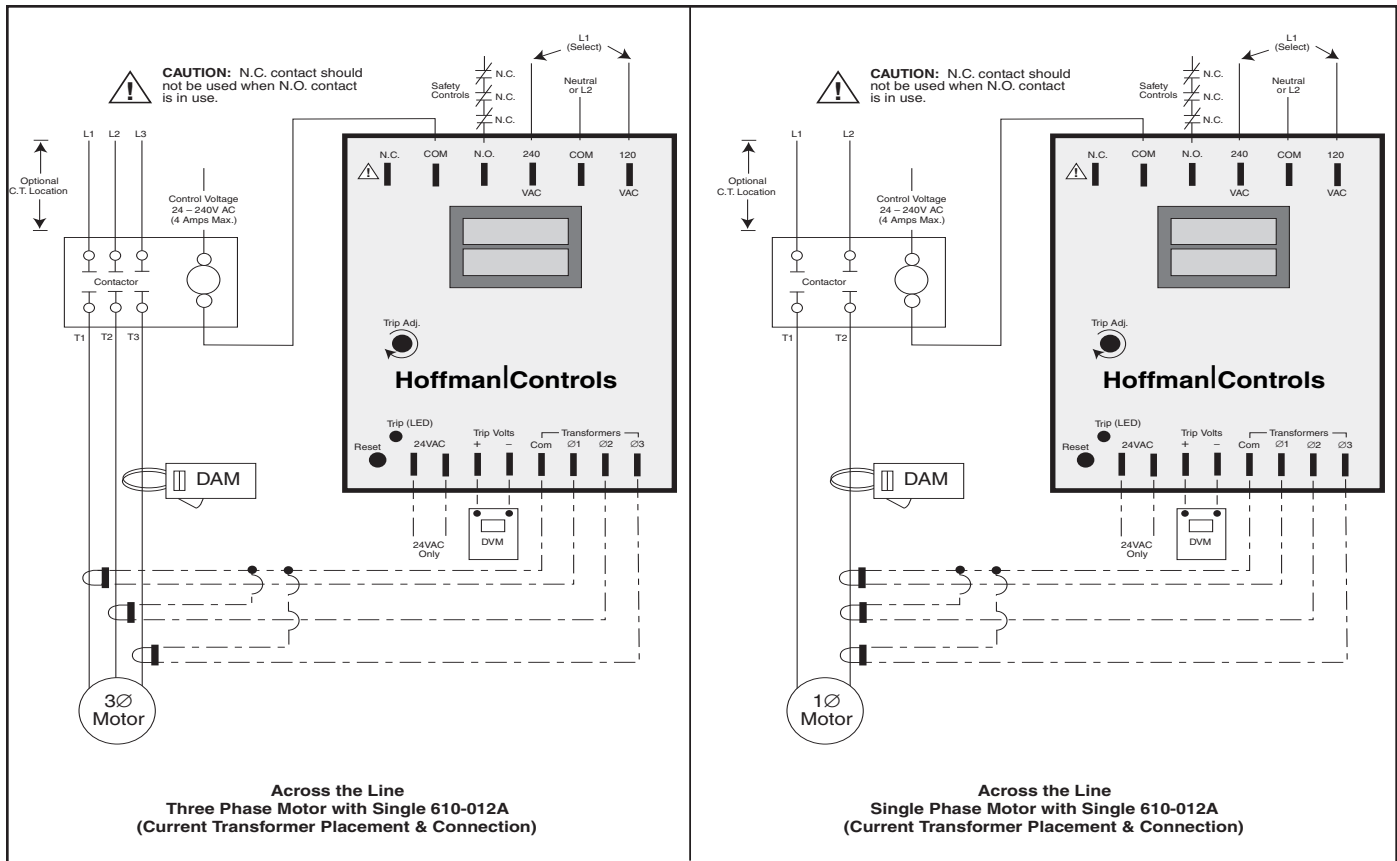


Figure 1- 610-012A Wiring Diagrams

Hoffman Controls