

MODEL 412

Automatic Reverse Controller

- Adjustable Current Level
- Up to 5 Forward-Reverse Cycles
- Push-button Simulator/Tester

DESCRIPTION

The **Model 412 Automatic Reverse Controller** is a current sensor designed to detect jamming of sewage grinders, and to initiate the reversing of the grinder. This controller allows the selection of up to 5 forward/reverse cycles, and provides for an alarm output if the number of cycles is exceeded.

The current loop inputs are designed for direct connection of 10 amps at 240VAC, or 5 amps at 480VAC (up to 2 hp motors). For higher currents, a current transformer (CT) must be used (CT secondaries are connected to the 5 amp terminals, regardless of voltage).

A push-button is used to simulate an over-current condition and to test the relay contacts and alarm. A current level adjustment is used to optimize the trip point setting. LED indicators show the running direction of the motor and the alarm condition.

OPERATION

When operating the Model 412 in the forward mode, an over-current condition of a half second will cause the START contact to open for 3 seconds. The FWD/REV contact switches to REV and the START contact re-closes. One half second later the START contact opens and the FWD/REV contact switches to FWD. Three seconds later the START contact will close.

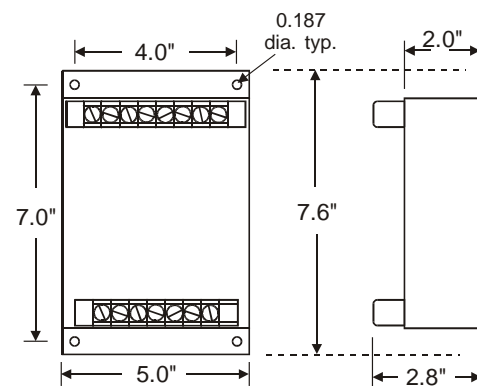
If the over-current condition persists, this sequence repeats for the number of cycles selected. After the last cycle, the START contact opens and the ALARM contact closes. The controller is locked out and must be reset by removing and re-applying the operating voltage.



SPECIFICATIONS

Model	412
Nominal Input Voltage	120VAC $\pm 10\%$ 50/60 Hz
Power Consumption	less than 2 watts
Input Currents	5 amps at 480VAC 3-phase 10 amps at 240VAC 3-phase (a CT must be used with higher currents)
Transient Protection	2500 VRMS for 10 msec
Cycles	0 to 5 cycles user-selectable
Full Cycle Period	7 seconds
Reverse Cycle Time	0.5 seconds
Contacts	SPDT 10 amps at 240VAC resistive
Expected Relay Life	Mech: 10 million operations Elec: 100,000 operations at rated load
Operating Temperature	- 20° to +140° F
Humidity Tolerance	0-97% w/o condensation
Enclosure Material	20 gauge CRS
Weight	2.3 lbs

DIMENSIONS



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Automatic Reverse Controller

READ ALL INSTRUCTIONS BEFORE INSTALLING, OPERATING OR SERVICING THIS DEVICE.
KEEP THIS DATA SHEET FOR FUTURE REFERENCE.

GENERAL SAFETY

POTENTIALLY HAZARDOUS VOLTAGES ARE PRESENT AT THE TERMINALS OF THE MODEL 412.
ALL ELECTRICAL POWER SHOULD BE REMOVED WHEN CONNECTING OR DISCONNECTING WIRING.
THIS DEVICE SHOULD BE INSTALLED AND SERVICED BY QUALIFIED PERSONNEL.

Installation Instructions

INSTALLATION

Mount the Model 412 in a suitable enclosure. Connect 120VAC to the terminals marked SUPPLY.

Refer to marking on the unit and in the Typical Application diagram on this sheet for control circuit connections.

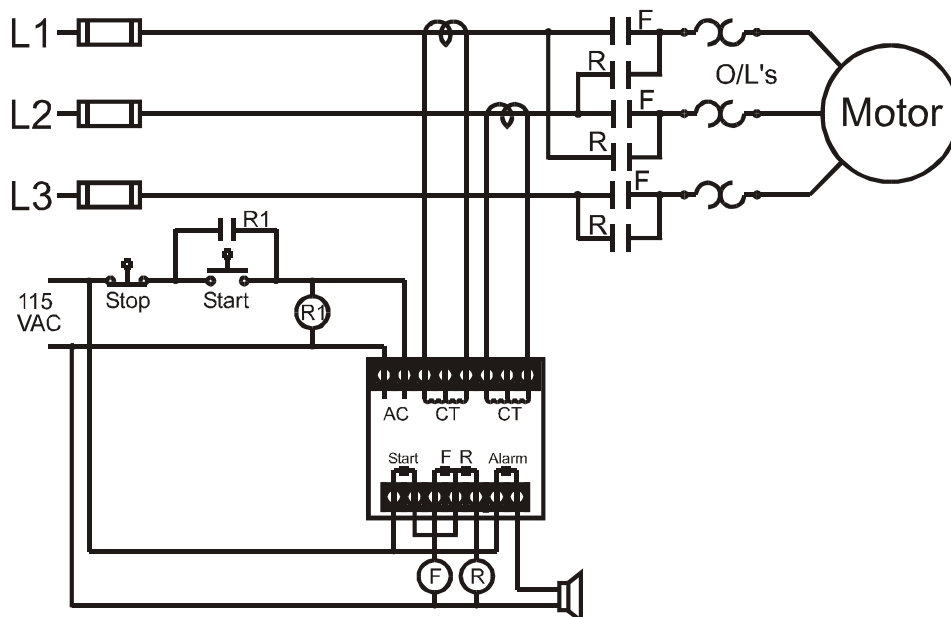
TROUBLESHOOTING

Should the Model 412 fail to operate properly, check that the operating voltage is present and of the correct level. Check all fuses and verify that all wiring connections are correct. Should problems persist, contact the manufacturer for assistance.

WARRANTY

The **Model 412 Automatic Reverse Controller** is warranted to be free from defects in materials and workmanship for one year. Should this device fail to operate, we will repair or replace it for one year from the date of purchase. For complete warranty details, see the *Terms and Conditions of Sales* page in the front section of the Time Mark catalog.

TYPICAL APPLICATION



Shows No Power Applied

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