AA4006
Speed Sensitive Trip Unit

User Manual

Software Version 2.00 Issued 01/2005

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Certificate No. FM21410
BS EN ISO 9001

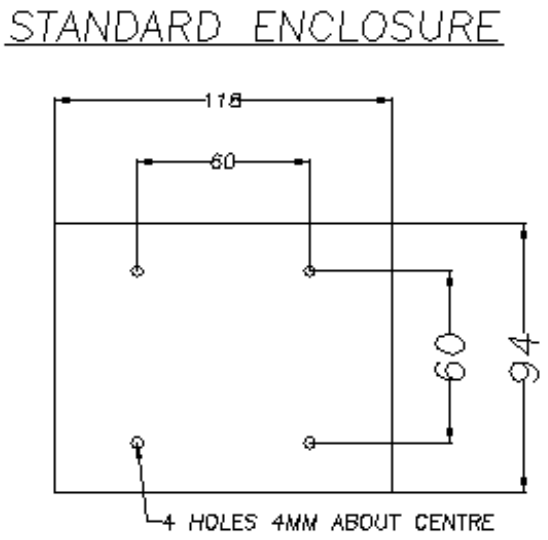
AA4006 - Standard Speed Sensitive Trip Unit (AARO)

Installation

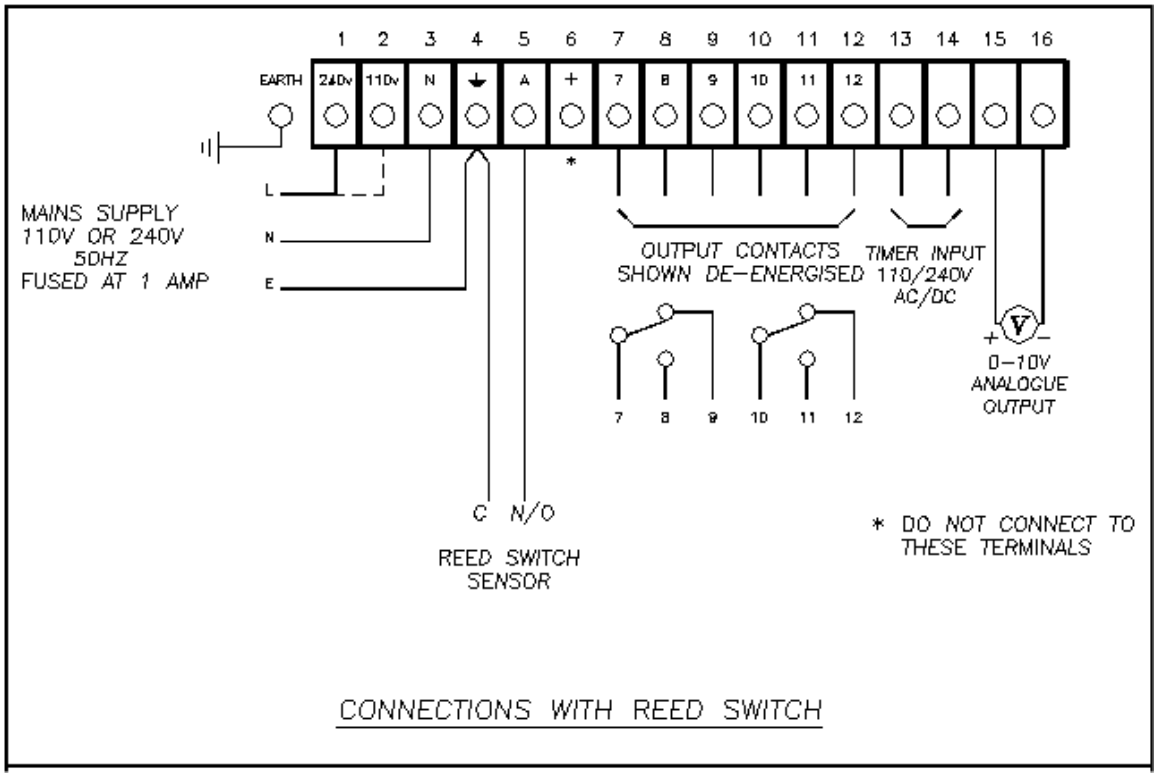
The standard AARO control unit is rated at IP62 and should be mounted in a control cabinet or enclosure with access for setting up and adjustment. There is practically no limitation on the distance between the AARO control unit and the rotating device that is to be monitored and therefore the control unit can be mounted in a remote location in a clean and safe environment.

The case dimensions are 94mm high x 119mm wide x 72 mm deep. Mounting holes are located in the base of the unit and the unit is fixed via 4 off 4mm screws.

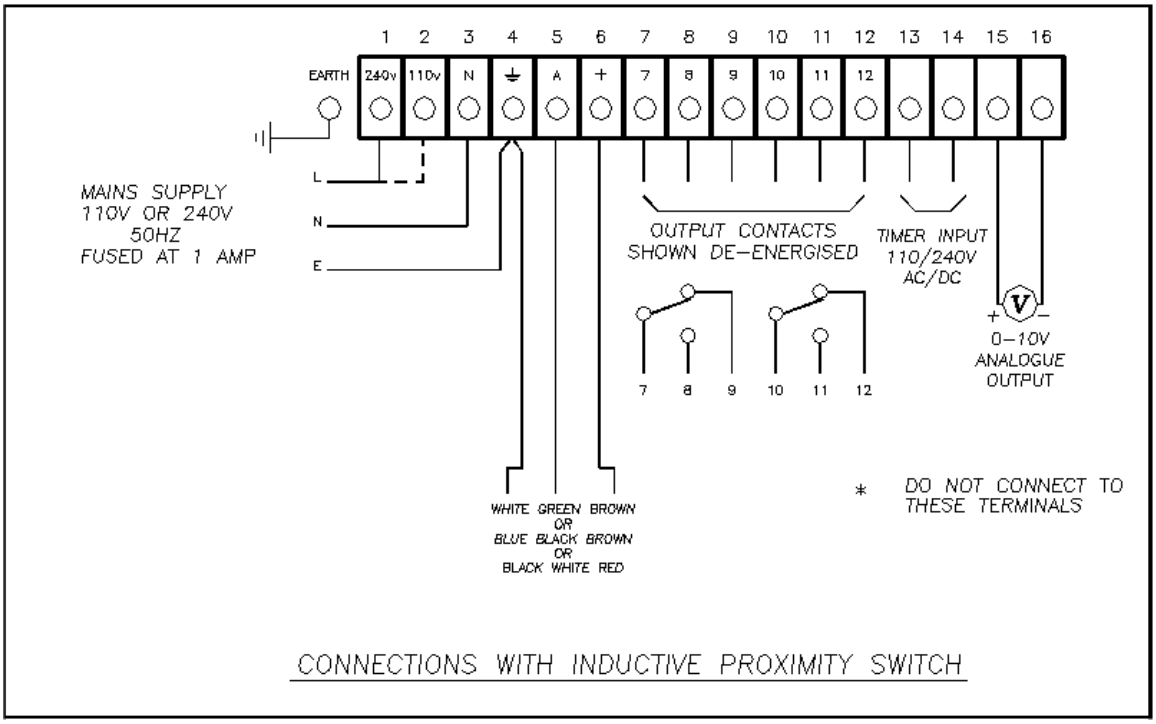
Fixing Details



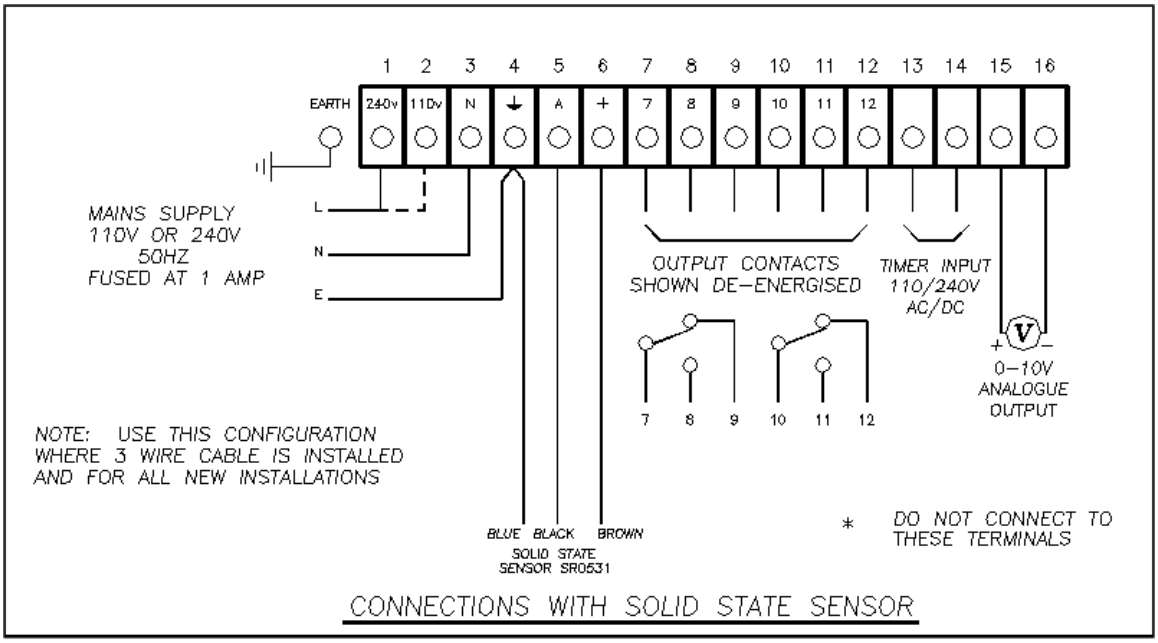
Electrical connections



CONNECTIONS WITH REED SWITCH



CONNECTIONS WITH INDUCTIVE PROXIMITY SWITCH



Wiring Notes:

1. Mains supply must be fused at 1 A

2. Ensure correct connection of mains supply.

   110V AC supply - connect **L** to terminal 2, **N** to terminal 3 and **E** to terminal 4.
   240V AC supply - connect **L** to terminal 1, **N** to terminal 3 and **E** to terminal 4.

3. Ensure the unit is correctly grounded. Earthing is an important safety procedure when installing the AARO and also assists in reducing the effects of electromagnetic interference (EMI) on solid state systems such as this unit.

4. Sensor supply for inductive proximity and solid state switches on terminal 6 is +12VDC

5. Sensor switching threshold for inductive proximity and solid state switches on terminal 5 is +6VDC

6. When the AARO is configured for a solid state or proximity switch sensor and an alternative sensor is used to our standard SR0531 or SR0422 then the current drawn by the selected sensor must not exceed 15mA, otherwise overloading of the AARO transformer could occur.

7. Relay contacts – 2 pole change over contacts – 2A @ 250V AC

Common	7	10
N/O	8	11
N/C	9	12

Configuration settings

Settings are made via 4 off dip switches (1 to 4) located on the underside of the front cover. Remove the 4 corner retaining screws and turn over the top cover. Identify the dip switch block.

Dip switch 1 and 2 select the required timer and relay operating mode.

Dip switch 1	Dip switch 2	Timer mode
OFF	OFF	T4
ON	OFF	T5
OFF	ON	T14
ON	ON	T15

T4 Timer mode

Following power-up, the relay is held in the **de-energised** state regardless of the input speed, for a time period 0 to 30 seconds. Thereafter the relay will remain
de-energised whilst the input speed is greater than the setpoint.

T5 Timer mode

Following power-up, the relay is held in the **energised** state regardless of the input speed, for a time period 0 to 30 seconds. Thereafter the relay will remain **energised** whilst the input speed is greater than the setpoint.

T14 Timer mode

When the timer input is active (signal on terminal 13 & 14), the relay is held in the **de-energised** state regardless of the input speed, for a time period 0 to 30 seconds. Thereafter the relay will remain **de-energised** whilst the input speed is greater than the setpoint.

T15 Timer mode

When the timer input is active (signal on terminal 13 & 14), the relay is held in the **energised** state regardless of the input speed, for a time period 0 to 30 seconds. Thereafter the relay will remain **energised** whilst the input speed is greater than the setpoint.

Configuration notes

1. The time delay period of 0 to 30 seconds is common to all timer selections and is set by the screwdriver adjustable potentiometer located on the front face of the AARO marked DELAY.

2. T14 and T15 timer options are enabled (initiated) when a signal is applied to terminal 13 and 14. A signal level greater than 100V ac/dc will enable the timer function and a signal level of less than 20V ac/dc will disable the timer function.

   This option can be used with run/stop interlocking on existing equipment.

   If the signal is removed and re-applied during the time period then the time period will be re-started

3. Other timing options are available on request and made to special order.

Dip switch 3 and 4 select the required speed range.

Dip switch 3	Dip switch 4	Speed @ 2 Pulses/Rev	Speed @ 1 Pulse/Rev
OFF	OFF	5 to 55 RPM	10 to 110 RPM
ON	OFF	50 to 550 RPM	100 to 1100 RPM
OFF	ON	500 to 2000 RPM	1000 to 4000 RPM
ON	ON	Reserved for future	Reserved for future

Operational settings

After setting all the switches, re-assemble the unit and check all connections. Check that the supply voltage is within the correct limits and that connections have been made to the correct terminals. Switch on the supply with the rotating device at rest. All of the LED's will be illuminated for approximately 2 seconds; this indicates the unit is in self-test mode. When the test is completed, the LED's will turn off and the left most LED will flash. Check that the relay is energized or de-energised as required determined by the dip switch configuration.

The trip adjustment potentiometer enables the controller to cover the set speed range. Turning the dial clockwise will increase the trip speed. The speed indication LED's show the speed of the rotating device relative to the trip setting. An increase in input speed will cause the LED indication to move to the right, increasing the trip setting will cause the LED indication to move to the left. When the left most LED indicator is flashing then the input speed is less than 2/3 of the trip speed setting. When the right most LED indicator is flashing then the input speed is greater than 2 times that of the trip speed setting.

When the rotating device is running at the correct speed, set the trip potentiometer as follows:

For underspeed detection, turn the trip potentiometer fully clockwise then turn counter clockwise slowly until the unit just trips. Then turn further counter clockwise to give the required amount of trip margin.

For overspeed detection, turn the trip potentiometer fully counter clockwise then turn clockwise slowly until the unit just trips. Then turn further clockwise to give the required amount of trip margin.

If it is not possible to set the trip point then check:

1. The actual rotating speed of the device is within the speed range that has been configured for the AARO
2. The input sensor is connected correctly.
3. The distance between the sensor and the magnet/flag is within tolerance.
4. The sensor switching threshold is within tolerance and the input LED is switching - on the AARO as the magnet/flag passes the sensor.

Note – The input LED is switched OFF when the input sensor switches ON

Make adjustments to the trip time delay period as required. When the DELAY potentiometer is turned fully clockwise the delay will be set to 30 seconds and when the potentiometer is fully counter clockwise the delay will be 0.

Analogue output

The AARO is equipped with an analogue output. The signal is ranged 0 - 10V DC with the 0V connection on terminal 16 and the +V connection on terminal 15. The signal represents the actual input speed within the range determined by the speed range dip switches SW3 and SW4. For example, with the speed range switches set to 50 to 550 RPM then the analogue output will be 0 Volts at 50 RPM and +10 V at 550 RPM. This value is based upon 2 pulses per revolution. The output is provided for use with an analogue or digital speed indicator or connection to a PLC. A maximum current of 5mA is available from the analogue output terminals. The signal has an accuracy of 5% of full scale at maximum current.