DEEP SEA ELECTRONICS

402
WATERPROOF
MANUAL START

CE

Issue 4
MR 29/01/03

DESCRIPTION

The Model 402 is a Waterproof Manual **Engine Control Module**. The module is used to start and stop the engine, indicating any fault conditions, automatically shutting down the engine and indicating the engine failure by a steady red LED on the front panel.

Operation of the module is via a **3 position 'waterproof' key-switch** with STOP(O), RUN(I) and START(II) positions.

Turning the switch to the 'I' position will initiate a pre-heat relay for a period of 10 Seconds. Pre-heat operation is indicated by LED. Once the timer has expired the pre-heat relay will de-energise and the LED will extinguish. The FUEL relay will then energise and the Safety On delay timer will commence.

Pre-heat mode can be overridden at any time by turning the switch from the 'I' position to the 'II' position while the pre-heat LED is illuminated.

Turning the key-switch to the 'II' position will initiate the following sequence:

- Safety On delay alarm timer is activated, if not already running
- Pre-heat relay is re-activated
- Pre-heat timer is cancelled, if still running
- Fuel relay is activated, if not already active
- Starter Relay is activated.

Engine will then commence cranking.

Once the engine fires, the key-switch should be released and spring returns to the 'I' position. Once released the Starter and Pre-heat relays will de-energise.

Once the **delayed alarm** timer expires all alarm circuits will be armed.

Inputs (Normally open, closing on fault) are available for Low Oil Pressure, High Engine Temperature. An additional input is provided to give an Auxiliary Shutdown alarm (Shutdown/Immediate). A battery charge alternator failure alarm is also provided. Provision is made for an Overspeed Shutdown (from either MPU or AC Hz - specified on ordering).

Multiple alarm channels are provided to monitor the following:

- Charge Fail Warning
- Low Oil Pressure
- High Engine Temperature
- Auxiliary Shutdown
- Overspeed Trip from MPU or AC Hz.

First up shutdown alarm is indicated by a steady red LED.

Fixed internal timers are provided for Pre-heat Time and Safety On.

The 402 series modules have been designed for front panel mounting. The module is fitted into the cut-out and then secured using nuts & bolts. Connection is made to the terminal strip at the rear or via optional flying leads (see note)

SPECIFICATION

DC Supply
8 to 35 V Continuous

Cranking Dropouts
Able to survive 0V for 50 mS, providing supply was at least 10V before dropout and supply recovers to 5V. This is achieved without the need for internal batteries.

Max. Operating Current
120 mA at 12V. 170 mA at 24V.

Typical Running Current
60 mA at 12V. 75 mA at 24V
In stop position consumption is zero.

Start Output
Max 20A @ 12V, 8A @ 24V
Less Pre-heat output load

Fuel Relay Output
Max 15A @ 12V - plus full 5A pre-heat output available.
Max 8A @ 24V -less Pre-heat output load

Pre-heat Relay Output
Max 5A shared with fuel and start output ratings as shown above. I.e if 2A pre-heat output load is present then the start output would be 18A max and the fuel output would be 15A @12V DC.

Dimensions
157mm x 111mm x 60mm (approx) depth
(6.2" x 4.4" x 2.4")

Charge Fail / Excitation Range
0V to 35V

Operating Temperature Range
-30° to +70°C

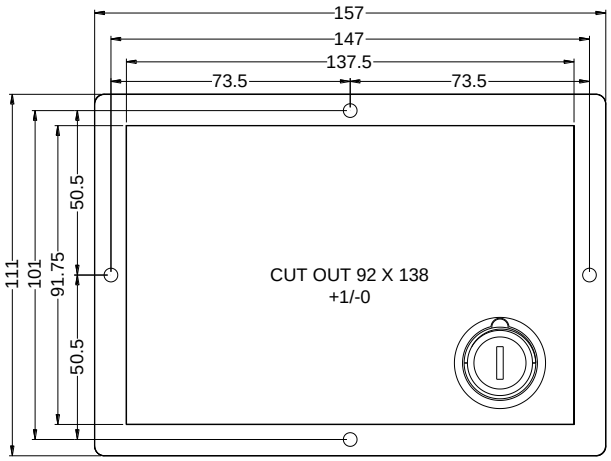
Ingress Protection Rating
Front IP66 D when installed in panel.
Rear IP54 (suitable grease should be applied to terminals if exposed to a harsh environment)
The Key-switch barrel has a drain hole which exits on the underside of the switch behind the mounting flange. Ensure suitable arrangements are made if mounting the module within an enclosure.

Mounting
4 off M4 Countersunk Head Screws
Recommend stainless steel Material

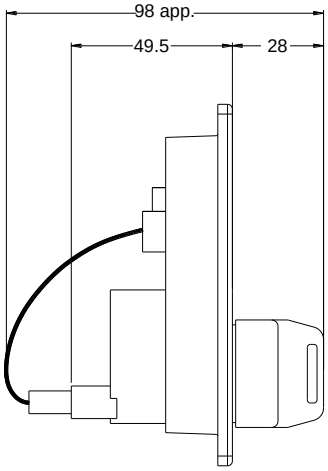
Max Tightening torque
1.6N.m (15lbf.in, 16.32kgf.cm)

Note
Connections to MPU speed sensing versions are via rear terminal strip. If AC Hz speed sensing option is used, connection to this option is via flying leads approximately 1 metre long. Suitable termination of these leads should be made by the customer in accordance with environmental conditions present on the installation.

CASE DIMENSIONS

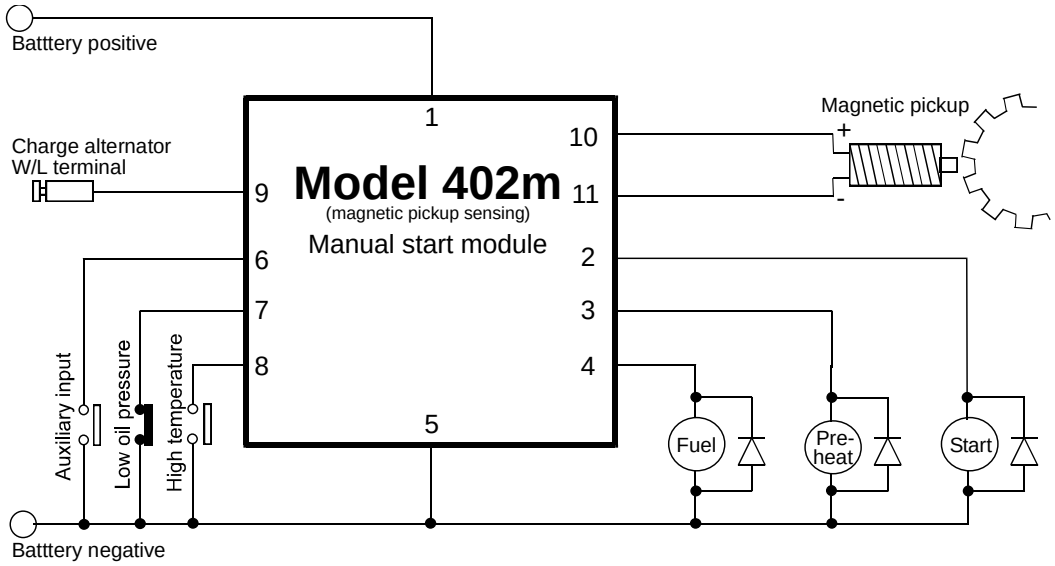


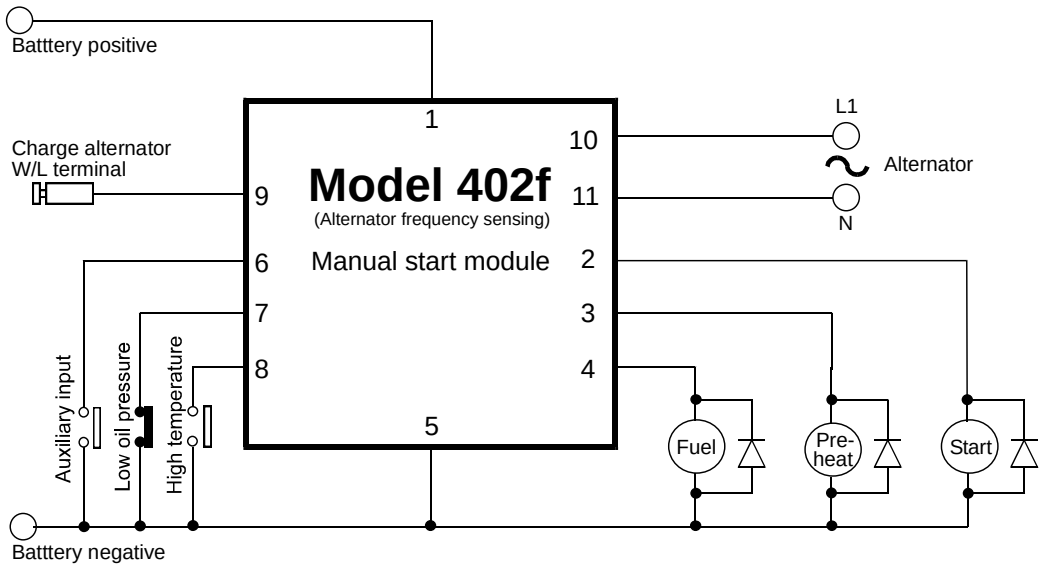
All Dimensions in mm



Imperial/US dimensions
6.2" x 4.4" x 2.4"
Cut-out
5.4" x 3.6"

TYPICAL CONNECTIONS





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