

# MURPHYMATIC® Engine Micro-Controller

AEC-97079B  
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Catalog Section 40  
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## A91 Series

- Microprocessor Based Automatic Controller
- Field Programmable Trip Points
- Five LED Signal Indicators
- Startup Lockout Timer
- Interfaces With Other Existing Murphy Products
- NEMA 3R “Weatherproof” Enclosure

### Description

A completely unattended startup/shutdown and run controller for engine driven equipment. This user friendly, compact, state-of-the-art microprocessor based controller, covers all basic start stop operations plus other features only found on more sophisticated and expensive controllers.

The A91 is designed to operate from a 12 or 24 volt battery, and requires a magnetic sensor (pick-up) for speed detection. It includes features, such as crank and rest cycles, time delay lockouts, sensing circuit for crank disconnect and over-speed, time delays before start and stop. Warmup and cool down are connected only on the WC model. Four LED's indicate shutdown for: low lube oil, high temperature, over crank and over-speed, and are reset by turning the power off. A fifth LED for engine running indicates when crank disconnect occurs.

The micro-controller is available in several configurations and is factory programmed. Certain parameters can be field adjusted without altering the basic control program. Custom programming of the microchip is available to OEM's and quantity orders.

The A91 is housed in a NEMA 3R enclosure with a hinged and gasketed dead front door. This weatherproof enclosure includes two 1/2 in. conduit holes, [7/8 in. (22 mm) diameter] in the bottom for input and output wiring.

All of the electrical components are installed on a “box” shaped, hinged front sub panel assembly. This working assembly can be purchased and installed in the user's choice of enclosures.

### Applications

A variety of applications can be covered with the micro-controller such as:

- Air/Gas Compressors
- Standby Generator Sets
- Fire/Pipeline/Emergency Flood Pumps
- Booster/Transfer Pumps
- Municipal Fresh/Waste Water Treatment
- Sewage Lift Stations

### Models Available

**A91:** For less than 5 amp current draw up to 24 VDC electric run output\*

**A91-S:** For 10 amp current draw up to 240 VDC electric run output\*

**A91-WC:** Same as A91 — with a warmup/cool-down relay.

**A91-S-WC:** Same as A91-S — with a warmup/cool-down relay.

**Any Model -LC:** Less weatherproof enclosure.

\*Run output is the voltage and current required for an ignition system, fuel valve, or solenoid actuator that allows the engine to run.

### Warranty

A limited warranty on materials and workmanship is given with this FW Murphy product. A copy of the warranty may be viewed or printed by going to [www.fwmurphy.com/support/warranty.htm](http://www.fwmurphy.com/support/warranty.htm)

### Features

The A91 Series combines the advantages of solid state microprocessor control logic with the dependability of Murphy's experience in Engine Automation Systems. This engine controller eliminates the need for most electromechanical logic and control relays, while providing built-in design features:

- Applicable to All Types of Engines
- Built-in Speed Sensing Circuit with:
  - Adjustable Crank Disconnect RPM
  - Adjustable Over speed RPM
- Three-position Selector Switch allows for “Automatic”, “Off” or “Test” mode.
- Engine Running LED indicator
- Four First-Out Shutdown LED indicators for:
  - Low Lube Oil
  - High Temperature
  - Overcrank
  - Overspeed
- Quality 16 point Terminal Block
- Either start from remote contact close to start, open to stop, or N.O. contacts close to start, close to stop.
- Relays are plug-in type with LED indicator for fast service and maintenance.

### Optional Features

- S:** Includes a relay to isolate magneto and capacitor discharge ignition systems.
- WC:** Includes a relay for loading and unloading driven equipment for engine warmup and cooldown.



## Specifications

**Power Input:** 12 or 24 VDC nominal (specify).

**Standby Power Consumption:** <50mA.

**Magnetic Pickup Input:** Requires 2 V rms minimum.

**Sensor Input Polarity:** Negative (-).

**Outputs:** Five (5) open collector transistor 500 mA sink.

Two (2) relay, 5 Amp maximum at 12 or 24 VDC (sourcing).

**Reverse Polarity Protection:** 200 volt peak reverse voltage.

**On-board Memory:** 8k PROM (programmable, read only memory); data retention 10 years.

**Operating Temperature Range:** -20 to 140°F (-25 to 60°C).

**Operating Humidity Range:** 0-95% Non-Condensing

**User Trip point Adjustments:** Five (5) on-board potentiometers (320° turn).

**Test-Off-Automatic Toggle Switch:** Three position switch for:

- Test: Starts engine in automatic mode and runs until switched "off" or emergency shutdown occurs.
- Off: Disconnects all power to control circuits, Stop/disables engine from starting and resets shutdown indicators.
- Auto: Automatic start/stop sequencing is initiated by external switches and signals.

**Cycle Crank Timer:** 5 crank attempts 7 seconds each; 4 rest periods 15 seconds each, before overcrank.

**Overspeed Trip Point Setting:** From 2500-9000 Hz.

**Crank Disconnect Speed Setting:** From 400-2500 Hz.

**Shutdown Time Delay:** 15 seconds after engine start; locks out low lube oil and high temperature.

**Engine Run LED:** Turns "on" when crank disconnect occurs.

**Shutdown Output:** Removes DC output or operates dry relay contacts for engine shutdown (depending on model used).

**Start/Stop:** SPDT momentary; or SPST maintained switches.

**Warmup Time Delay:** Field adjustable from 0-300 seconds to load the engine after warmup (model -WC only).

**Cooldown Time Delay:** Field adjustable from 0-300 seconds (model -WC only).

**Enclosure:** Weatherproof NEMA 3R.

**Enclosure Coating:** Red enamel.

**Subpanel Coating:** White enamel.

**Shipping Weight:** 17 lb. (8 kg); subpanel: 7 lb (3.2 kg).

**Shipping Dimensions:** 12 x 12 x 9 in. (305 x 305 x 229 mm).

## Accessories

**MP3298:** Magnetic pickup.

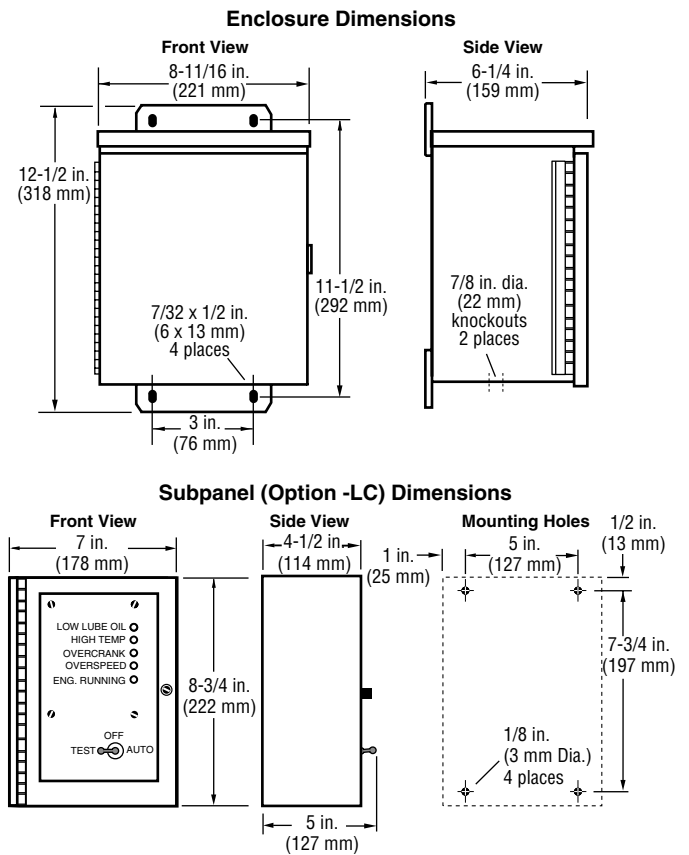
**00002062:** 12 V auxiliary starter solenoid.

**00002063:** 24 V auxiliary starter solenoid.

**AT67207:** Throttle controller.

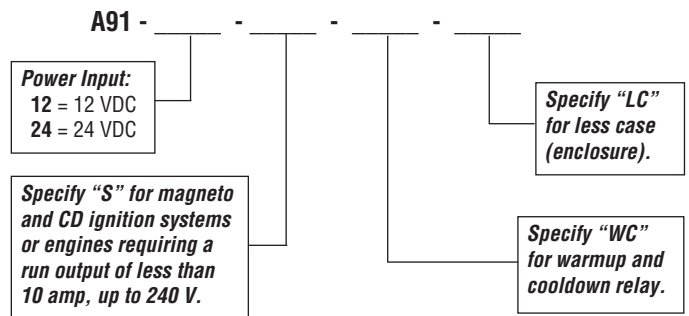
**CO3:** Clutch actuator.

## Dimensions



## How to Order

**NOTE:** Run output is 5 amp @ 12 or 24 VDC. Run output is the voltage required for an ignition system, fuel valve, or solenoid actuator that allows the engine to run.



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