

Keystart 7201 Engine Controller

Installation Instructions

yi6365
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catalogue section 75



Please read the following information before installing. A visual inspection of this product for damage during shipping is recommended before installation. It is your responsibility to ensure that qualified mechanical and electrical technicians install this product. If in doubt, please contact your local Murphy representative.

WARNING

BEFORE BEGINNING INSTALLATION OF THIS MURPHY PRODUCT

- ✓ Disconnect all electrical power to the machine
- ✓ Make sure the machine cannot operate during installation
- ✓ Follow all safety warnings of the machine manufacturer
- ✓ Read and follow all installation instructions

General

The Keystart 7201 provides manual start/stop and automatic fault protection for generators, pumps and other engine-driven applications.

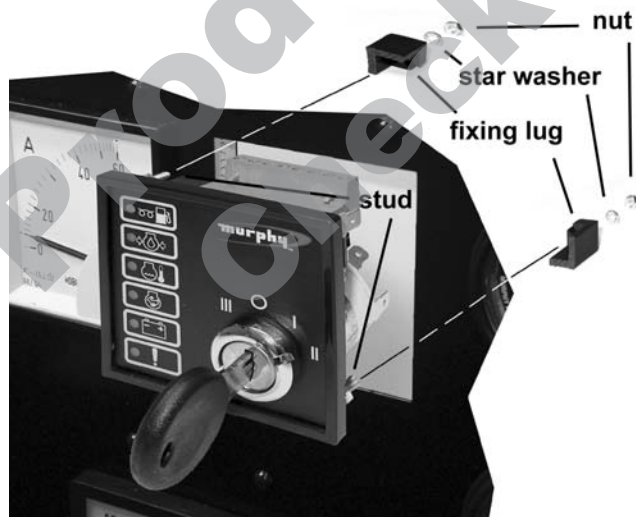
The front fascia features a 4 way keyswitch for operator control of the engine and 6 LEDs for indication of status and faults (see 'front fascia' opposite). Electrical connection and potentiometer adjustments are at the rear (see 'rear fascia' opposite).

For each Keystart 7201 ordered, the following is supplied:-

- 1 x Keystart 7201, complete with:-
 - 2 x keys
 - 2 x stud fixings, each with a plastic lug, washer and nut
- these instructions

Panel installation

The Keystart 7201 uses an ultra-compact, caseless design for use in DIN 68 x 68mm panel cut-outs. The Keystart is secured at the rear of the panel fascia using a pair of stud fixings:-



Front fascia and operation

LED indication:-

- preheat on - amber
- run (fuel on) - green
- low oil pressure fault shutdown - red
- high engine temperature fault shutdown - red
- overspeed fault shutdown - red
- charge fail warning - red
- plant fail shutdown - red

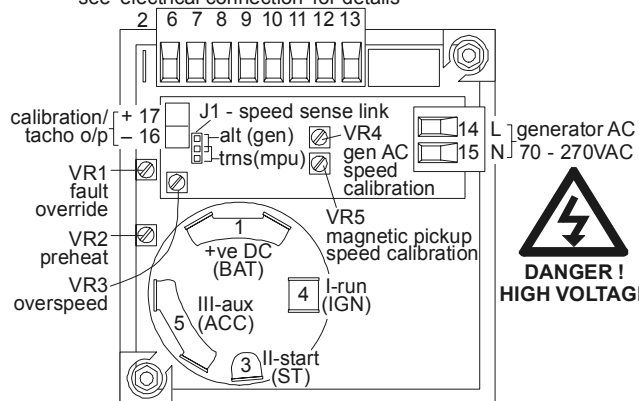


4 position keyswitch:

- **Off/Reset.** Removes power, stopping the engine and resetting any latched shutdown fault.
- || **Run.** Activates the timed Preheat output (if enabled), followed by activation of the Run relay (turning on the engine fuel or ignition). The fault 'override' timer begins as soon as the Run relay activates. Once the engine is fully running, Keystart monitors for faults and shuts down the engine if a fault is detected.
- ||| **Start/crank.** Maintains the RUN output, and activates the START output. Shutdown fault inputs are disabled and the fault override timer is reset. This position spring-returns to I (run) on release.
- |||| **Aux.** Provides a switched positive DC output (pin 5), which allows use of auxiliary equipment or (with pin 4) remote control of the Keystart (see typical connection).

Rear fascia, connections and settings

see 'electrical connection' for details



Potentiometer/link settings:-

ref.	function	range	factory setting
VR1	fault override	2 – 20 secs	10 secs
VR2	preheat	0.25 – 20 secs	0.25 secs
VR3	overspeed (% of VR4/VR5)	100 – 130%	110%
VR4	AC speed calibration	<50 to >60 Hz.	50 Hz.
VR5	transducer speed calibration	2000 – 6500 Hz	3000 Hz.
J1	gen AC / mag pu selection	-	alt (gen AC)



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USA - ISO9001:2000 FM 28221
UK - ISO9001:2000 FM 29422

Electrical connection



DANGER ! HIGH VOLTAGE

The Keystart 7201 uses connections to high voltage generator AC signals. For all models, ensure that all AC and/or DC supplies are isolated before connection or disconnection.

Electrical connection is at the Keystart rear (see 'rear facia' overleaf) using screw terminal blocks on the circuit board and 6mm blade connectors (one on the circuit board, four on the keyswitch). With the exception of the speed calibration output (pins 16 and 17), all screw terminals are in the form of removable, two-part type connector blocks. High voltage AC connections use a separate terminal block, pins 14/15.

Pin Function

- 1 (BAT on keyswitch) Positive DC power supply
- 2 Negative DC power supply

The Keystart will operate with any smooth DC / battery voltage in the range 7 – 30V. Supply brown-out protection is fitted as standard. Connect a 5 Amp anti-surge fuse in the positive DC line (pin 1).

- 3 (ST on keyswitch) Start output

Used to control the engine starter motor circuit, pin 3 gives a positive DC, 16 Amp rated output when the key is switched to position II (START). To prolong keyswitch contact life, Murphy recommend the use of a slave relay with suppressed coil between pin 3 and starter solenoid - see 'typical connection' opposite.

- 4 (IGN on keyswitch) external Run input

This should only be used when remote control of the Keystart is required. Connection of positive DC to pin 4 will power the Keystart into RUN mode, exactly as if the key had been turned to position I.

- 5 (ACC on keyswitch) Auxiliary output

Gives a positive DC output (maximum rating 16A) when the key is switched to position III (AUX).

- 6 Alarm output

Pin 6 is a semiconductor-based (open collector NPN transistor) output. It gives a negative DC (100mA max. rated) output immediately after a fault shutdown. The output is typically used to drive an audible/visible alarm circuit, using a slave relay with suppressed coil - see 'typical connection' opposite.

- 7 Plant fail 2 input

- 10 Low Oil Pressure (LOP) fault input

- 11 High Engine Temperature (HET) fault input

Use remote fault contacts to connect these inputs to battery negative during fault. The Keystart shuts down the engine, lights the appropriate front facia LED, and activates the alarm output. Shutdown is inhibited during engine cranking and until the end of the fault 'override' time (adjustable 2 – 20 secs using VR1, anti-clockwise to increase). Reset a shutdown fault condition by turning the key to O (Off) or removing the DC power supply.

- 8 Magnetic pickup (transducer) speed input

To allow overspeed sensing by magnetic pickup and engine flywheel combination, ensure circuit board link J1 is in the 'TRNS' position (see 'rear facia' diagram). Connect the pickup signal output to pin 8, and the pickup return connection to pin 2 or battery negative. Two-core and screen cable should be used for the interconnection, with the screen earthed at one end only.

See 'speed calibration' opposite for correct setup of this input.

- 9 Charge fail

The front facia charge fail LED lights (but there is no shutdown or alarm) when pin 9 is connected to battery negative. When using a charge alternator, connect pin 9 to the alternator WL terminal.

- 12 Preheat output

- 13 Run (Fuel) output

These outputs provides control for a the engine's preheater and (energised to run) fuel / ignition circuit.

If a preheat time is set (0.25 – 20 secs using VR2, anti-clockwise to increase), pin 12 gives a positive DC output (and the front facia preheat LED lights) as soon as the key is switched to the I (RUN) position.

After any preheat time, pin 12 de-activates, the green 'run' LED lights and pin 13 gives a positive DC output (operating engine fuel). The LED and output remain active until the operator switches the key to O (STOP) or the Keystart initiates an automatic fault shutdown.

Both outputs' relay contacts are rated to 1 Amp max. Slave relays with suppressed relay coils must be connected between these outputs and engine preheaters and fuel solenoid - see 'typical connection' below

- 14 Generator AC (alt) Live

- 15 Generator AC (alt) Neutral



DANGER ! HIGH VOLTS

For overspeed sensing by generator AC frequency, ensure circuit board link J1 is in the 'ALT' position (see 'rear facia' diagram). Nominal voltage connection range is 70 and 270 VAC rms. A 1 Amp anti-surge fuse should be connected in series with pin 14.

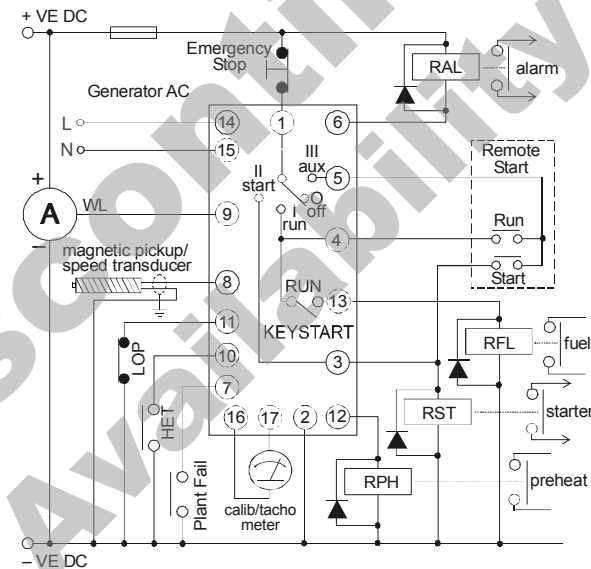
See 'speed calibration' below for correct setup of this input.

- 16 Calibration/RPM meter negative output (overspeed models only)

- 17 Calibration/RPM meter positive output

This output is designed to work with a 0 - 1 mA DC scale ammeter either a) during set-up to aid speed calibration, or b) in normal operation to indicate engine speed or generator Hz. Connect meter positive to pin 17 and meter negative to pin 16. See also 'speed calibration' below.

Typical connection



Speed calibration

The Keystart's overspeed shutdown trip is driven by either (but not both) magnetic pickup or generator AC, as selected by circuit board link J1 (see 'rear facia' diagram) and ensure correct connection of the appropriate speed input (see 'electrical connection' above).

Before use, the speed sensing circuits must be calibrated. Calibration is a two stage process:-

1) Nominal speed calibration

For generator AC (alternator) speed sensing, factory calibration is 50Hz. For magnetic pickup (transducer) sensing, factory calibration is 3000Hz (120 flywheel teeth @ 1500 RPM). To recalibrate for other settings:-

- Connect a 0 – 1mA, 75 Ohm meter to pins 16 and 17, as detailed in 'electrical connection' above.

For generator AC sensing (60Hz systems) – potentiometer VR4

- Turn VR4 fully clockwise (to maximum nominal frequency)
- Start and run the generator to normal speed (60Hz frequency)
- Turn VR4 anti-clockwise until the meter rises to read 0.75mA.

Magnetic pickup sensing – potentiometer VR5

- Turn VR5 fully clockwise (to maximum nominal frequency)
- Start and run the engine to normal speed
- Turn VR5 anti-clockwise until the meter rises to read 0.75mA.

2) Overspeed setting

The overspeed setting potentiometer VR3 is adjustable between approximately 100 and 130% (of the nominal calibration set on VR4 or VR5). VR3 is factory set to 110%. To adjust the overspeed trip level:-

- Turn VR3 fully clockwise (to approx. 130%)
- Start and run the engine. Increase engine speed to the required overspeed/over-frequency trip level.
- Turn VR3 anti-clockwise until the Keystart shuts down the engine.

Where engine speed cannot be adjusted, an approximate overspeed setting must be made.