

KEYSTART 9700 series

MANUAL START ENGINE CONTROLLER WITH AUTOMATIC FAULT PROTECTION SHUTDOWN

The Keystart 9700 range provides for the manual starting and stopping of a standby engine - a generator, pump or other application - with automatic monitoring and shutdown of the engine in the event of a fault.

The 9700 series is pin compatible with the Autostart range: this allows the use of standard wiring for both manual and automatic control panels, simplifying panel design and permitting easy upgrades from a manual to fully automatic control system.

Key features

- Keyswitch operation for enhanced security
- Up to four fault inputs, configurable for use with contacts which open or close on fault, with wiring to +ve or -ve DC
- Options for overspeed protection (magnetic pickup or AC alternator driven) and preheat/auxiliary control.
- Pin compatible with Autostart 705, 710, 720 and 730 series.
- 96 x 96mm DIN standard, front panel mounted case
- Switchable 12 or 24 V DC power supply

Operation

The Keystart is powered from the engine battery or similar low voltage DC source. A switch at the rear allows for 12V or 24V operation.

Control of the Keystart and engine is by use of a 3 or 4 position keyswitch on the front facia:-

STOP Removes power from the Keystart, stopping the engine and resetting a latched fault condition.

RUN Energises the Keystart's RUN relay (enabling the engine fuel or ignition). The fault 'override' timer begins as soon as the key is turned (or spring returns) to this position. Once the engine is fully running, Keystart monitors for faults and shuts down the engine if a fault is detected.

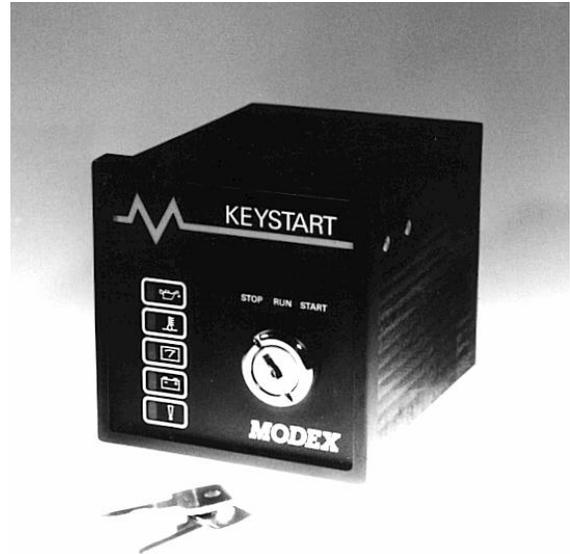
START Maintains fuel to the engine, and activates the START output (used for controlling the starter motor circuit). This position is spring-biased to return to the RUN position when the operator releases the key.

AUX (optional: 'A' models only) Provides a switched +ve DC output, used for preheat circuits or auxiliary control (remote power up) of Keystart.

The key is common to all Keystarts and is removable only in the STOP position.

The front facia also has five LED and pictogram indicators for the display of engine fault status:-

- | | |
|---|--|
|  | Low Oil Pressure |
|  | High Engine Temperature |
|  | Overspeed (or Plant Fail on non-overspeed units) |
|  | Charge Fail |
|  | Plant Fail |



Product Specifications

Power supply:

Operating voltage:	(12V setting)	(24V setting)
Steady state	9 – 20 V DC	18 – 33 V DC
Brown out / cranking	<= 5V for 2 secs	<= 10V for 2 secs
Current consumption	< 150mA	

Inputs:

Fault switch inputs:-	selectable: open or closed, + ve or - ve
+ ve input defined as:	80% to 100% of +ve DC supply
- ve input defined as:	-1V to +2V w.r.t -ve DC supply
Speed sensing inputs:-	
Magnetic pickup	10 – 60 VAC peak, < 2300 to > 3400 Hz.
AC alternator	90 – 350 VAC rms, < 50 to > 60 Hz. nom.

Outputs:

Run relay output	volt-free SPCO relay contacts 16 A max. @ 24V DC
Start output	+ ve DC (switched) 16 A max. @ 24V DC
Auxiliary/preheat output	+ ve DC (switched) 15 A max. @ 24V DC
Alarm output	- ve DC (open collector transistor) 300mA max. @ 33V DC max.
Tachometer / calibration	To suit 0 – 1 mA, 75 Ohm meter, output = 0.75mA at rated engine speed

Adjustable settings:

Fault Override timer	< 10 to > 30 secs.
Overspeed trip level	< 100 to >130 % of calibrated speed

General:

Overall dimensions (w x h x d)	96 x 96 x 130 mm
Panel cut-out size	DIN 92 x 92 mm
Weight	approx. 500 g
Operating ambient temperature	-10°C to +55°C
Case sealing	IP22
Vibration	1G, 50 Hz to 5 kHz.
Chemical/fire	case: glass filled Noryl, self extinguishing, non-dripping. facia: polycarbonate

Control Outputs

The following are provided:-

- Switched +ve RUN relay and START outputs, used for controlling the engine fuel and starter motor circuits.
- A -ve DC (open collector transistor), common ALARM output, used for remotely signalling a fault condition.

Fault protection and Alarm System

After the operator has started the engine and the fault override timer has expired, the Keystart monitors for engine and plant faults through remotely connected switch sensors.

Dedicated inputs are provided for Low Oil Pressure and High Engine Temperature switch sensors. 1 or 2 additional inputs may be used for general purpose 'plant fail' contacts. Switches at the rear allow the inputs to be configured for use with remote contacts which either open or close during fault, with wiring polarity to either +ve or -ve DC.

The Keystart may optionally be fitted with an engine overspeed trip, available in alternator sensing (generator AC, 50/60Hz) or magnetic pickup sensing variants.

If any of the above faults occur, Keystart will:-

- turn off its RUN output (stopping the engine)
- indicate the fault on the appropriate front fascia LED
- activate its Alarm output (to remotely signal that a fault has occurred).

The automatic fault shutdowns operate on a first-up and latching basis - subsequent faults are not indicated and the displayed fault can only be cleared by switching the Keystart to STOP.

Charge Fail Warning

A charge failure warning LED is provided for use with an engine driven charge alternator. The charge alternator's WL terminal is connected to the Keystart, which will in turn monitor the WL voltage and provide the alternator with excitation current at engine start up.

Installation

The Keystart uses a DIN standard 96 x 96 mm casing, designed for mounting in a control panel cut-out (92 x 92mm DIN). Electrical connection is through a pair of 'two-part' type terminal blocks at the rear of the unit, with 2 separate 1/4" blade terminals on overspeed versions for the tachometer or calibration meter.

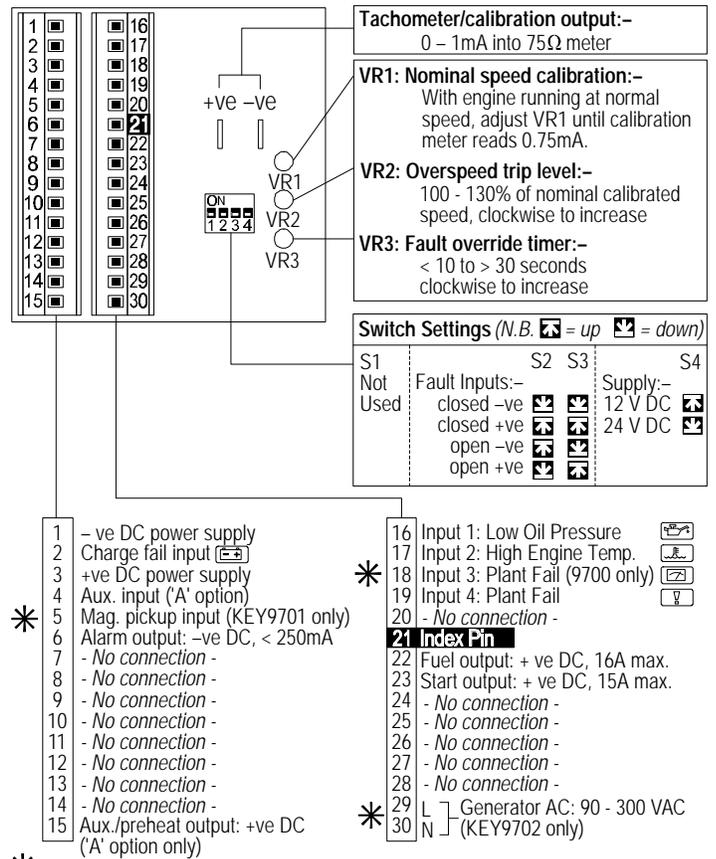
Also at the rear is are 4 switches for the setting of the supply voltage and alarm input configurations, and up to 3 potentiometers: one to set the fault 'override' time (all units), and 2 more to set the speed calibration and overspeed trip level, where fitted.

When ordering, please specify:-

- Base unit type:-
 - Keystart 9700:** no overspeed
 - Keystart 9701:** magnetic pickup sensing overspeed
 - Keystart 9702:** AC alternator (50/60Hz) overspeed
- Options:-
 - 'A': auxiliary control/preheat option

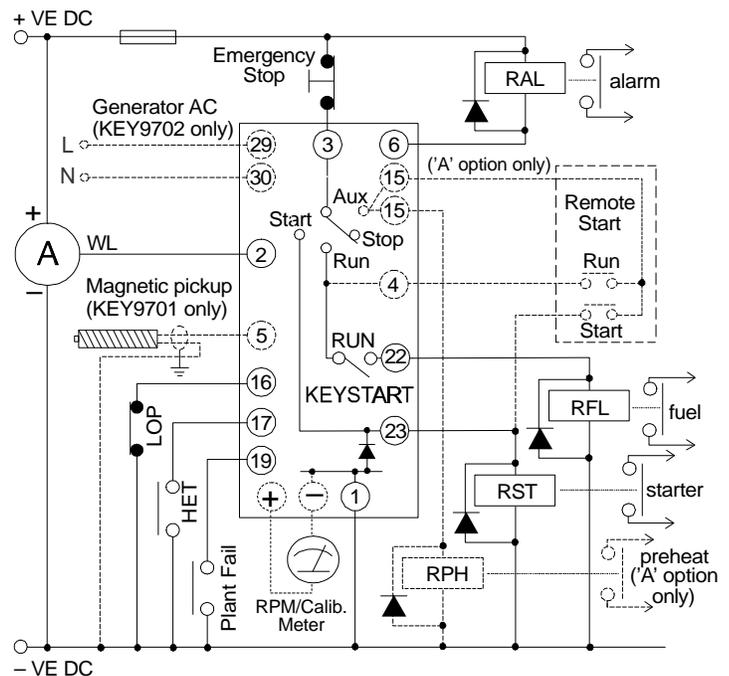
N.B: stock units are supplied with switch settings for 24VDC power supply, inputs closing to -ve DC during fault.

Rear Facia Settings & Electrical Connection



* Note:-
Pin 5 is not used on models 9700 and 9702.
Pin 18 is not used on overspeed models 9701 and 9702.
Pins 29 and 30 are not used on models 9700 and 9701.

Typical Connection Circuit



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