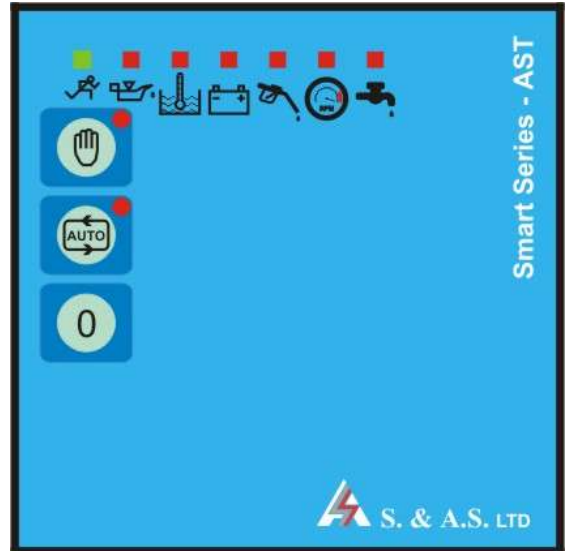# AUTO START MODULE – SMART-AST

FEATURES

Microcontroller based design
Operation by 3 push buttons
Easy to fit DIN standard 72x72 panel mount housing
Connection is via locking plug and socket connectors
Solid-state short circuit protected outputs
Front panel leds for status and alarm indication
Automatic engine starting and stopping
Automatic shutdown on fault condition
Low oil pressure alarm and shut down
High engine temperature alarm and shut down
Dynamo fail alarm and shut down
Low fuel alarm and shut down
Over / Under speed alarm and shut down
Coolant level alarm and shut down
Optional handheld tool to access all timers, set points and parameters

ACTUAL SIZE

DESCRIPTION

SMART series is an intelligent auto start and protection module. Automatic assembly and microcontroller based high integration design resulted in this low-cost yet high performance controller.

OPERATION

Stop Mode In this mode, the engine is shut down along with the module. All alarms are reset.

Auto Mode In this mode, the genset is ready to start. Starting is controlled by the remote control input. Following is a description of the operation in this mode:

1. The **Remote Control** input receives a start signal.
2. No action is taken until the delay set by **A01** is elapsed.
3. A starting sequence of a preset number of attempts **A04** will initiate.
4. The **Electric Valve** engages 0.5sec before the **Starter**.
5. If the start signal is removed before the engine starts, all timers are reset and the module is ready for a new sequence.
6. Cranking is disconnected when either the frequency on the **Line** and **Neutral** terminals exceeds **A11** or a voltage exceeding 9.16vdc appears on the **Dynamo** input or the oil pressure switch opens.
7. If the engine fails to start after the preset number of attempts, a scan of the five middle leds is initiated to indicate a start fail. The SMART-AST would retry starting by selecting the **Stop Mode** then selecting **Auto Mode** or by recycling the remote control signal.
8. After elapse of the warm-up delay, set by **A06**, the load contactor is engaged via terminal **Contactor**.
9. All protections are enabled when the engine is running and after the elapse of the fault bypass time set by **A05**.
10. Any fault will shut the load down and then shut the engine down and the appropriate led is lit.
11. When the start signal is removed, the **SMART-AST** will shut the load down after the elapse of the delay set by **A07**. The engine is shut down after the elapse of the cooling time set by **A08**.

Manual Mode This mode is similar to the **Auto Mode** except that the **Remote Control** input is internally activated.

ABSOLUTE MAXIMUM RATINGS

Supply voltage	8-30Vdc
Signal voltage	280vac
Outputs	1.4A
Operating temperature	-30 to 70°C

MENU DESCRPTION

A01	Response delay
A02	Starter time
A03	Time between trials
A04	Number of starting attempts
A05	Fault bypass delay
A06	Warm-up delay
A07	Load shut down delay
A08	Engine cooling time
A09	Over frequency set point
A10	Under frequency set point
A11	Crank disconnect frequency set point
A12	Over frequency delay (0 disables over frequency)
A13	Under frequency delay (0 disables under frequency)
A14	0 = energize to run else energize to stop and sets time for stop solenoid For energize to stop: - Connect dynamo to +Vbat if there is no dynamo - Note that selecting "Stop Mode" will not turn off the engine
A15	0 = No cooling after High temperature with contactor output 1 = Cooling after High temperature with contactor output 250 = No cooling after High temperature with alarm output 251 = Cooling after High temperature with alarm output
A16	0 = Dynamo bypass for crank disconnect
A17	Load factory settings

SPECIFICATION

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Operating voltage	8 to 28vdc
Signal voltage range	50 to 250vac
Outputs	1A 50V
Dimensions (WidthxHghtxDepth)	72x72x32 mm

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INSTALLATION
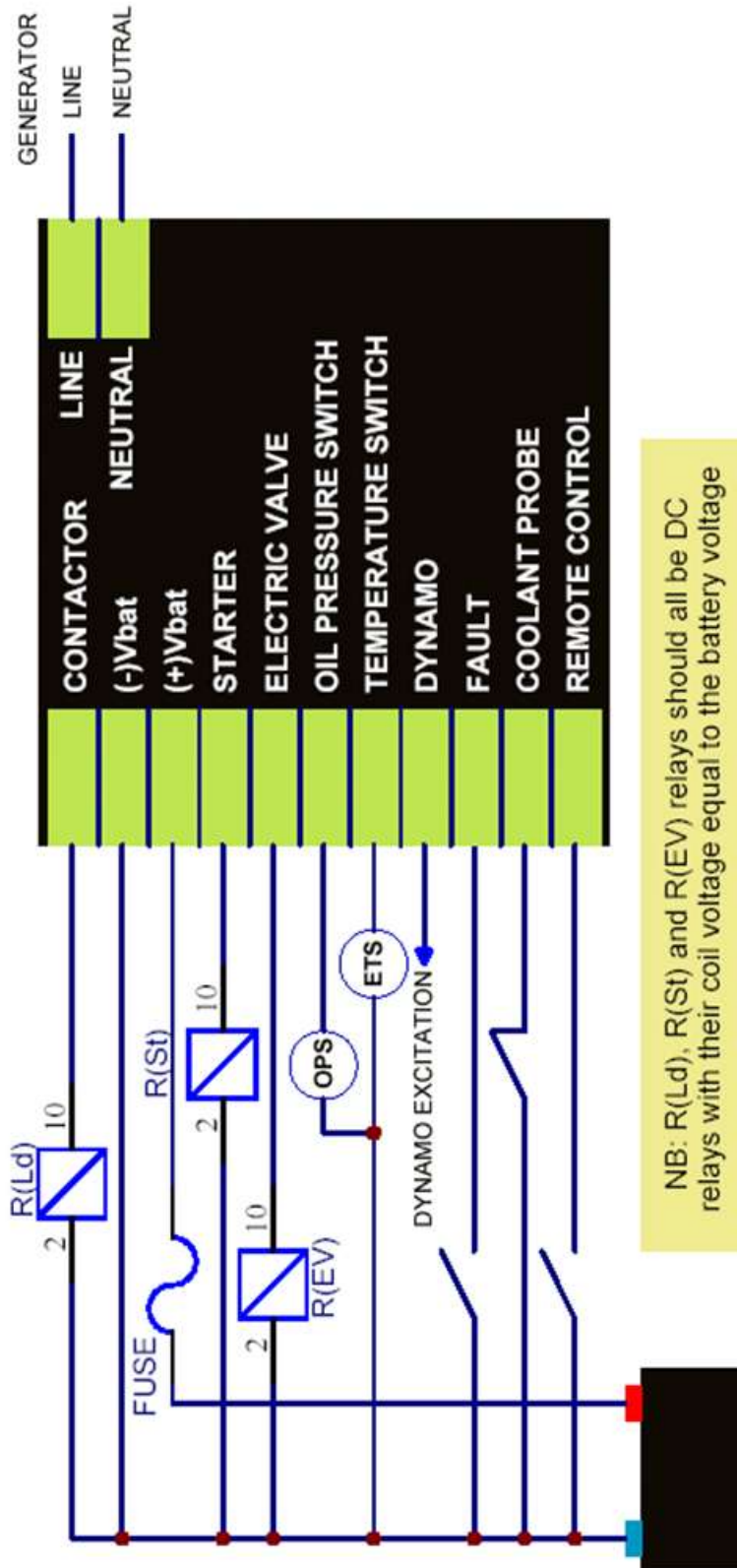
NB: R(Ld), R(St) and R(EV) relays should all be DC relays with their coil voltage equal to the battery voltage

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