

K45 AUTOSTART CONTROLLER

For Stationary Diesel Off-Road Engines

Reliability, Ease of Use, Functionality

Description

The K45 engine controller is designed for the off-road stationary diesel engine market. The controller's basic function is the management of your diesel engine and features intelligent software to protect your investment. The K45 has been designed for a number of applications, including power generation, fluid transfer and various industrial applications.

Featuring both manual and automatic start modes, the K45 offers great flexibility of use at the touch of a button. In automatic mode, the K45 is able to start and stop your engine based on a number of triggers such as: single or dual float switches, low pressure switch, telemetry/PLC module, pressure transducer, water depth level transducer and mains failure contactor. The option is yours.

On mechanical engines, the optional throttle linear actuator (automatic engine speed throttling electric motor) can adjust engine speed to a set speed point or vary the engine speed with respect to a pump pressure set point. Automatic engine throttling is supplied as standard on electronic engines with engine control modules (ECM). All automatic throttling options come with adjustable engine warm up, cool down and line fill timers.

Features

- RPM engine speed detection via flywheel teeth, magneto, alternator pulsing or CAN J1939. This includes adjustable engine **Over speed**

/Under speed engine shutdowns.

- **Automatic engine starting and stopping** via multiple methods, including: single or dual float switches, low pressure switch, radio transmitter, NextG telemetry / PLC module, 4-20mA pressure transducer, 4-20mA water depth level transducer and mains failure contactor. Simply, set the start/stop method and walk away. The panel will do the rest.
- **Dual engine operation.** Will operate on engines with an ECM or with a mechanical fuel stop solenoid.
- **Fail safe** protection on all sensors connected to the panel. If a sensor wire, i.e. low flow switch or pump pressure signal, falls off or breaks from the sensor terminal, the K45 control module will prevent the engine from running.
- Automated **100 hour engine run timer.** Simply set the timer, allow the engine to start and walk away. The timer does the rest.
- Less than **20mA current consumption** in shut down mode. The **sleep mode** function is activated when the controller is no longer in use for a period of time. This conserves battery power.
- Powered by **embedded microcontroller** solid state technology running customized software.
- The backlit **LCD display shows:** engine status, engine speed RPMs, engine coolant temperature, engine oil

pressure, battery voltage, engine run hours, run timer, pump/hydraulic pressure, pump/hydraulic temperature, pump/hydraulic flow rate, suction pressure, dam level depth and fuel level. On CAN J1939 engine, the K45 will show: fuel rate, % load etc.

- The backlit **LCD display shows, details of shutdown faults,** including CAN J1939 engine generated warnings / alarms. Thus allowing for easy diagnosis of engine faults. Status LEDs indicates: RED for faults and AMBER for warnings. On engines with an ECM, the engine's configuration can be easily viewed via the LCD display This includes all Active Codes and Fault History.
- **Easy to use interface and menu structure** thus allowing change of optimal pressure, temperature and flow alarm/shutdown points. A password protected area prevents unauthorized users from changing critical engine setups.
- **Sturdy IP66** electrical powder coated metal enclosure with clear window on the door.
- **Engine protection** on low oil pressure, high engine temperature, alternator fail/belt-break, low radiator water coolant level and over-speed/under-speed.

Controlled Engine Shutdowns

- When activated, this feature permits the K45 to slowly reduce engine speed and allow

the engine to cool down prior to switching off. Ramp rates and cool down timers are adjustable and located in the password protection menu screen.

- All analogue sensors connected to the K45 have the ability for a user adjustable controlled engine shutdown. For example, in the event of pump low flow or loss of prime, the control panel can be set to stop the engine instantly or enable the engine cool down timer. In cool down, the engine will steadily reduce speed and run at idle for the duration of the set cool down time.

Automatic Engine Speed Control (Throttling)

- The K45 autostart controller is able to control engine speed RPMs on mechanical engines or engines with an ECM.
- On mechanical engines, a throttle linear actuator (sold separately) is required. This actuator is designed to mount to the base of an engine frame or skid. Wiring connections to the controller are provided.
- On engines with an ECM and include CAN J1939, the K45 controller provides automatic engine speed control as standard. Simply enter the desired throttling parameters and the controller does the rest.
- The intelligent throttling software in the K45 permits changes to: idle speed, engine warm up timer, line-fill timer, fixed engine run speed, increment/decrement speed, ramp-rate speed and the engine cool down timer.
- Two engine speed control options are offered in the K45. The first is, throttling to a fixed speed point and the second is varying engine speed to a pump pressure set point.

- **Fixed Speed engine throttling** is activated when the K45 controller is set in automatic mode. When the controller receives a signal to start, the engine will start, run and increase the engine speed to a set point. This speed will be maintained until a stop signal is received. In this case, the engine speed will slowly decrease to idle and then stop.
- **Variable engine speed throttling to a target pressure** is activated when the K45 controller is set in automatic mode. When the controller receives a signal to start, the engine will start, run and increase the engine speed until a target pressure is achieved. Engine speed will automatically vary to achieve the target pressure. Engine speed increment and decrement can be adjusted for optimum performance and efficiency. If the target pressure cannot be achieved, the software includes an inbuilt safety feature which protects the engine from over speeding for a prolonged period of time. Variable speed throttling is suited to irrigation and fluid transfer solutions for multiple locations.

Analogue Inputs

- **High/Low Pump pressure discharge (KPa)** protection and pressure readout. Built in user adjustable high and low alarms /shutdowns with adjustable pump pressure bypass timer (1 to 20min) and slush timer (10 to 60sec). Range 0-100 Bar. Sensor (4-20mA type) is purchased separately.
- **High/low Pump flow rate (L/s)** protection and readout. Built in user adjustable high and low alarms/shutdowns with adjustable bypass timer (1 to 20min) and slush timer (10 to 60sec) Range 0-500L/s. Sensor (4-20mA type) is purchase separately.

NOTE: The sensor above can either be configured for pressure or flow. If both pump flow and pump pressure inputs are required, please allow for an additional sensor and connector.

Digital Inputs

- **Spare 4 x Digital inputs** for grounded switch sensors. The K45 permits the re-naming of these inputs. These inputs can be normally open or normally closed. A bypass and slush timer is included on each input.
- These inputs can be used as **auxiliary shutdowns, high vacuum switch and pump loss of flow/prime switch.**
- Automatic engine starting and stopping via **single or dual float switches.** (Float switches sold separately)

Optional Extras

- **Optional Fuel level display and monitoring.** Low fuel warning or engine shutdown can be activated. Sensor (resistive type) is purchased separately.
- **Telemetry** option available. The K45 can connect to the Telstra NextG (3G) network and send text messages to mobile phone devices. This includes text messaging of all engine / pump / generator faults. The K45 is capable of accepting text messages to start or stop the engine.
- **MODBUS** option available. The K45 can communicate to other PLC or MODBUS capable devices. Real time sensor information can be sent over RS232/485 MODBUS protocol. This includes engine and pump information.
- **Optional engine running relay output for LED strobe light.** Voltage free contacts can also be supplied.
- **Optional engine common fault relay output.** Voltage free contact used.

Specifications

Outer Metal Case Dimension:
350mm X 220mm X 150mm
include, clear window on door.

Operating Temperature:
-15°C to 85°C

Power Supply:
9 - 28V DC continuous supply.

Connector to Engine
Pricing will vary depending on connector type specified. Deutsch, Metripak and Quick Connects can be provided.

Wiring Type
On mechanical engines, the wiring loom from the panel is 1.5mtrs long. On engines with an ECM the panel includes a flush mounted Deutsch connector.

Summary of Extras

- Telemetry NextG modem.
- Emergency Stop.
- Vibration Mounts (4 off).
- Panel light switch and fuse.
- Engine running Strobe Light relay output.
- Engine common fault relay output.
- All analogue 4-20mA and resistive sensors.
- Float Switches, Vacuum and Low Flow switches.
- Mining spec option with stainless steel enclosure.
- Engine wiring loom with mating panel connector.
- MODBUS connection.
- Linear throttle actuator



- Deutsch connectors fitted on engines with CAN J1939.
- Emergency Stop button optional.