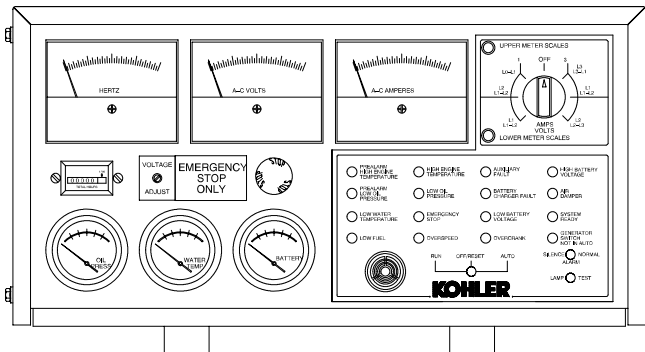


**ISO 9001**  
KOHLER  
POWER SYSTEMS  
NATIONALLY REGISTERED



### Decision-Maker™ 3+ Controller

#### General Description and Function

The generator set controller provides system control, monitoring, and diagnostics for optimum performance.

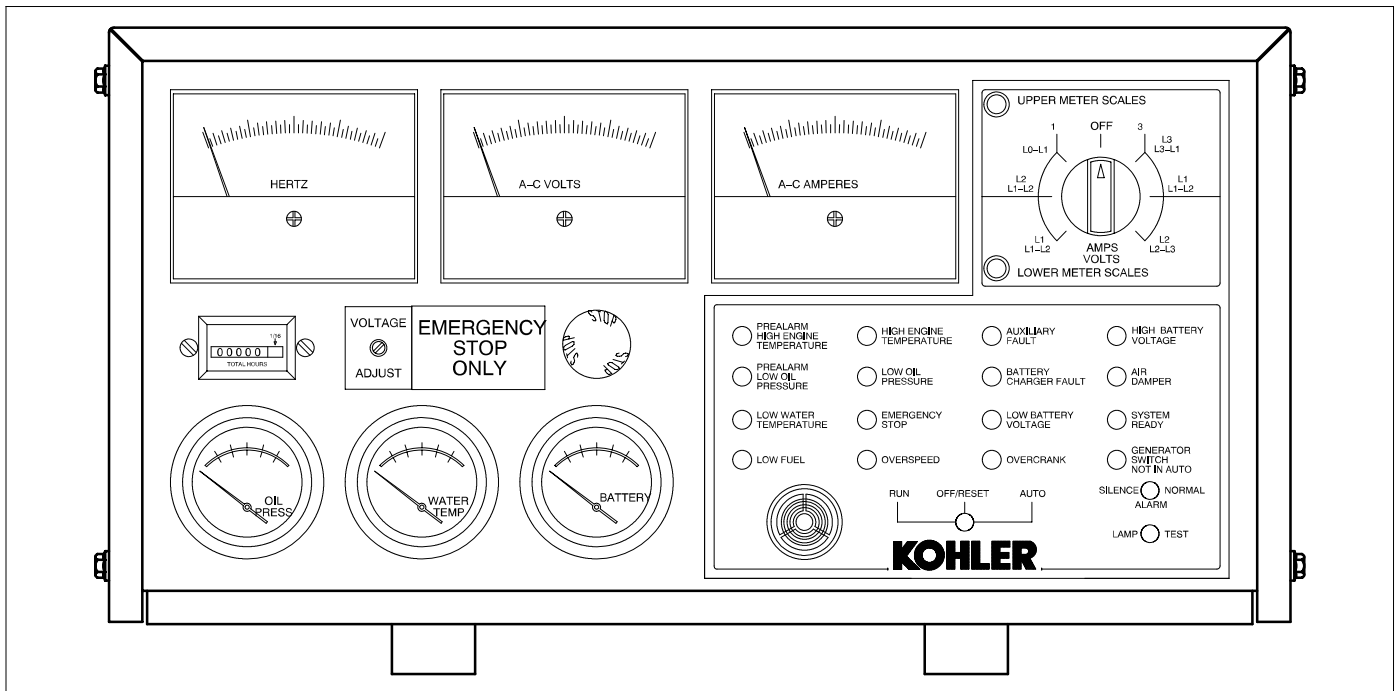
The generator set controller provides both analog AC meters and engine gauges and 16-light annunciation of shutdowns, warnings, and status events.

#### Standard Features

- Supports Modbus® RTU (Remote Terminal Unit) communication protocol via RS-485 networks.
- Supports CANbus J1939 communication protocol for ECM engines
- Contains microcomputer-based logic with a ROM (read-only memory)-based control algorithm.
- Features upgradeable software for new system functionality.
- Provides overspeed protection, cooldown mode, and a selectable crank mode.
- Provides audio and visual alarms.
- Features analog meters and engine gauges.
- Meets the National Fire Protection Association requirements of NFPA 99 and NFPA 110 with additional accessories. NFPA 110, Level 1 requirements typically apply to health care facilities; NFPA 110, Level 2 requirements apply to less-critical applications.
- Uses conformal coated circuit boards for environmental durability.

Modbus® is a registered trademark of Schneider Electric.

# Decision-Maker™ 3+, 16-Light Controller



## Controller Features

### General Specifications

- Power source with circuit protection: 12- or 24-volt DC
- Power draw: 220 milliamps in system ready mode (or 200 milliamps without panel lamps)
- Humidity range: 5% to 95% noncondensing
- Operating temperature range: -40°C to +70°C (-40°F to +158°F)
- Storage temperature range: -40°C to +85°C (-40°F to +185°F)
- Standards:
  - NFPA 99
  - NFPA 110
  - UL 508
- Dimensions—W x H x D, 461 x 247 x 297 mm (18.15 x 9.71 x 11.68 in.)

### Hardware Features

- AC interlock to prevent starter reengagement with engine running
- Battery (DC) circuits are fuse protected
- Controller mounts locally or remotely up to a distance of 12 m (40 ft. ) and viewed from one of four positions
- LEDs for visual annunciation
- Gauges and meters for system data

### Communication Features

- Supports Modbus® RTU (Remote Terminal Unit) via RS-485 (Comm. module GM32644-KA1 or GM32644-KP1 required)
- Supports Modbus® TCP (Transmission Control Protocol) via Ethernet (Converter GM41143-KP1 required)
- Supports CANbus J1939 communication protocol

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## NFPA Requirements

- In order to meet NFPA 110, Level 1 requirements the generator set controller must monitor and display specific engine/generator safety indications and shutdowns
- Engine functions:
  - Overcrank shutdown
  - High engine temperature shutdown
  - High engine temperature warning \*
  - Low water (engine) temperature warning \*
  - Low oil pressure warning \*
  - Low oil pressure shutdown
  - Overspeed shutdown
  - Low fuel (level or pressure) warning \*
  - Low coolant level (auxiliary fault) shutdown
  - High battery voltage warning \*
  - Low battery voltage warning \*
  - Air damper indicator
- General functions:
  - Battery charger warning \*
  - Master switch not-in-auto
  - Lamp test
  - Audible alarm silence

\* Requires optional input sensors on some generator set models

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## Standard Features

- Sixteen LED indicating lights for status, warnings, and shutdowns
- Status indicators:
  - Air damper (red) (if equipped)\*
  - Master switch not-in-auto (red)
  - System ready (green)
- Warning indicators:
  - Auxiliary (multiple function)(red)
  - Battery charger (red)\*
  - Fuel, low—level or pressure (red)\*
  - Pressure, low oil (yellow)\*
  - Temperature, low water (engine) (red)\*
  - Temperature, high engine (yellow)\*
  - Voltage, high battery (yellow)\*
  - Voltage, low battery (red)\*
- Shutdown indicators:
  - Auxiliary (multiple function)(red)
  - Emergency stop (red)\*
  - Low fuel (utilizes auxiliary indicator)(red); 125RZG model only
  - Level, low coolant (utilizes auxiliary indicator) (available with radiator-mounted generator set models only)
  - Overcrank (red)
  - Overspeed (red)
  - Temperature, high engine (red)
  - Pressure, low oil (red)
  - Underfrequency (utilizes auxiliary indicator)(red)
- Panel illumination lamps (2)
- Analog gauges, 51 mm (2 in.):
  - Pressure gauge, oil
  - Temperature gauge, engine cooling system
  - Voltmeter, DC battery
- Analog meters, 89 mm (3.5 in.):
  - AC ammeter, 2% of full-scale accuracy
  - AC voltmeter, 2% of full-scale accuracy
  - Frequency meter, 0.5% of full-scale accuracy
- Running time meter
- Switches and standard features:
  - Horn, alarm (with silencing switch)
  - Mode, prime power via jumper selection
  - Potentiometer, generator output voltage-adjusting (front panel mounted,  $\pm 5\%$  of nominal voltage) (350–2000 kW models have adjustment on voltage regulator in junction box)
  - Shutdown, overvoltage protection
  - Switch, latch-type emergency stop (standard on most 200–2000 kW generator set models)
  - Switch, lamp test
  - Switch, meter range selector
  - Switch, run, off/reset, auto (engine start) generator set master
  - Timer, engine cooldown, (5-minute fixed)
- Eight DIP switches for control and communication:
  - Cooldown disable
  - Crank mode select for continuous or cyclic cranking. The cranking provides up to 30 seconds of continuous cranking or 75 seconds of cyclic cranking (crank 15 seconds, rest 15 seconds, crank 15 seconds, etc.). The crank disconnect speed is 750 rpm (25 Hz).
  - Engine communication setting (2)
  - Modbus® addresses (bit 0, bit 1, bit 2)
  - Overspeed protection selection of 60 Hz for 50 Hz models or 70 Hz for 60 Hz models
- Terminal strips:
  - Terminal strip connections for 2-wire remote start
  - Terminal strip connections for 2-wire (series connection) remote emergency stop
  - Terminal strip connections for remote annunciator
  - Terminal strip connections for remote dry contact kit
  - Terminal strip connections for prime power feature (prevents battery drain when not in use and no battery charger connected)
- LEDs on circuit board for troubleshooting diagnosis
  - Crank fault
  - Emergency stop
  - Overvoltage fault
  - Run operation

\* Requires optional kit or user-provided device to enable function and lamp indication.

## Selected Decision-Maker™ 3+ Accessories

- Common Failure Relay** remotely signals auxiliary fault, emergency stop, high engine temperature, low oil pressure, overcrank, and overspeed via one single-pole, double-throw relay with 10 amp at 120 VAC, 10 amp at 28 VDC contacts.
- Controller Cable**, 12 m (40 ft.), enables remote mounting of the controller.
- Controller Connection Kit** provides a cable connecting the controller to a terminal strip in the junction box. Specify the controller connection kit for junction box remote device connections.
- Dry Contact Kits** interface between the controller signals and customer-supplied accessories providing contact closure to activate warning devices such as lamps or horns. Kits are available in either one or ten single-pole, double-throw relays with 3 amp at 250 VAC contacts. A kit with twenty single-pole, double-throw relays with 3 amp at 250 VAC contacts is available on 450–2000 kW models.
- FASTCHECK®** hand-held diagnostic fault detector activates controller circuits without operating engine/generator. Helps service or maintenance personnel quickly identify faults in controller and engine circuits.
- 10 Amp Float/Equalize Battery Charger with Alarm Feature** warns controller of battery charger fault, high battery voltage, and low battery voltage.
- 6 Amp Float/Equalize Battery Charger** has automatic 3-stage charging with indicator LEDs. Durable potted assembly for full waterproofing and shockproofing. UL 1236 listed.
- Controller-Mounted Emergency Stop Switch** shuts down generator set immediately in emergency situations. Use the generator set master switch for normal shutdowns. Standard on most 200–2000 kW generator set models (see respective generator set specification sheet for details).
- Remote Emergency Stop Panel** immediately shuts the generator set down from a remote station.
- Prealarms** warn of low water (engine) temperature, approaching low oil pressure, and approaching high engine temperature. Kits for gas-fueled models include a low fuel pressure switch.
- Remote Audiovisual Panel** warns the operator of fault shutdowns and prealarm conditions. Common fault lamp and horn with silence switch.
- Remote Serial Annunciator Panel** enables the operator to monitor the status of the generator from a remote location. May be required for NFPA 99 and NFPA 110 installations. Uses Modbus® RTU (Remote Terminal Unit), an industry standard open communication protocol.
- Communication Module** GM32644-KA1 or GM32644-KP1 is required when using the remote serial annunciator (RSA) and/or Modbus®/Ethernet communications.
- Remote Annunciator Panel** enables the operator to monitor the status of the generator from a remote location. May be required for NFPA 99 and NFPA 110 installations.
- Run Relay** provides a three-pole, double-throw relay with 10 amp at 250 VAC contacts for indicating that the generator set is running or shut down.
- Modbus®/Ethernet Converter** GM41143-KP2 for network communications.

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