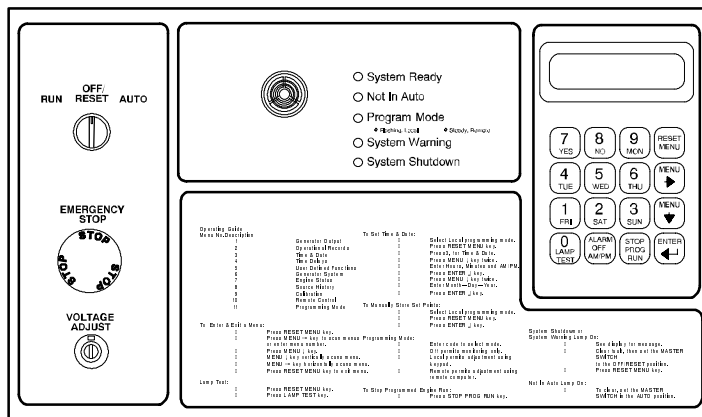




Kohler® Decision-Maker™ 340 Controller

Applicable to the following:

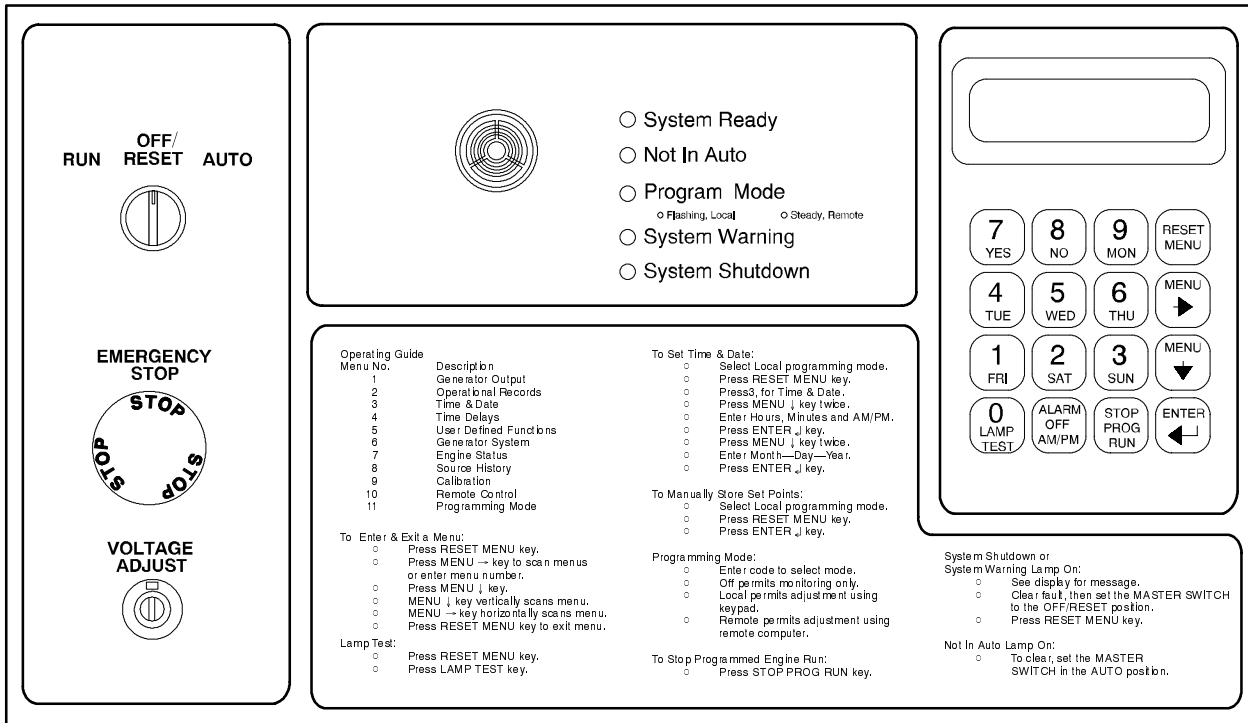
- 20-100RZ
- 20-180ROZJ/REOZJ
- 20-180ROZP/REOZP
- 135-275RZD
- 200-2000ROZD/ROZD-4/REOZD



- Controller is compatible with 12- or 24-volt engine electrical systems.
- Controller meets the National Fire Protection Association requirements of NFPA-99 and NFPA-110.
- Controller is listed under Underwriter's Laboratories UL-508.
- Digital display and keypad operation provide access to data. A two-line vacuum fluorescent display provides complete and understandable information.
- The controller contains microcomputer-based logic with a read-only memory (ROM) -based control algorithm.
- Controller can communicate with a personal computer individually or on a network when equipped with optional communication products. See Communications spec sheet G6-35 for more information.
- Optional menu-driven software monitors engine and alternator parameters and also provides control capability.
- Operator can control the generator set from a remote site over telephone lines.
- Connect up to 128 generator set controls and transfer switches on a single local area network with a personal computer for monitoring and control when equipped with optional communication products.

Decision-Maker™ 340 Controller

Meets and Exceeds NFPA-110, Level 1 Requirements



Specifications

- Power source with circuit protection: 12- or 24-volt DC
- Operating temperature range: -40°C to +70°C
- Storage temperature range: -40°C to +85°C
- Humidity range: 5% to 95% noncondensing
- Generator control standards:
 - NFPA 99
 - NFPA 110

Standard Equipment and Features

- Alarm horn.
- Indicators:
 - Not in auto (yellow)
 - Program mode (yellow)
 - System ready (green)
 - System shutdown (red)
 - System warning (yellow)
- Switches and standard features:
 - Keypad, 16-button multi-function soft-membrane environmentally sealed
 - Rheostat, front-mounted voltage-adjusting ($\pm 5\%$ of nominal voltage) (350–2000 kW models have a ± 60 -volt adjustment on voltage regulator in junction box)
 - Switch, auto/off-reset/run (engine start)
 - Switch, emergency stop (normally closed contacts)
- Vacuum fluorescent, lighted digital display with two lines of 20 characters.

Displays

- Engine functions:
 - Battery voltage
 - Coolant temperature (English or metric units)
 - Oil pressure (English or metric units)
 - RPM
- General functions:
 - Number of starts
 - Run time (loaded and unloaded)
 - Source history
 - Starting aid
 - System shutdowns
 - System warnings
 - Time and date
 - Time delay engine cooldown (TDEC)
 - Time delay engine start (TDES)

- Generator functions:
 - Generator current (L1, L2, L3), $\pm 2\%$ accuracy
 - Generator frequency 0.5% accuracy
 - Gen. voltage (line-to-line & line-to-neutral for all phases), $\pm 2\%$ acc.
 - Kilowatts
 - Kilowatt hours
 - Percent alternator duty level (actual load kW/standby kW rating)
 - Power factor

System Inputs

- Customer and remote digital inputs:
 - Auxiliary contact (up to four user-supplied shutdowns or warnings)*
 - Ground fault detector*
 - Remote reset*
 - Engine and generator analog inputs:
 - Engine battery voltage
 - Engine coolant temperature
 - Engine oil pressure
 - Generator output (all voltage and line currents)
 - Engine digital inputs:
 - Air damper fault, if equipped
 - Battery charger fault*
 - Engine speed sensor
 - High coolant temperature
 - High coolant temperature warning*
 - High oil temperature*
 - Low coolant level
 - Low coolant temperature (optional)*
 - Low fuel (level or pressure)*
 - Low oil pressure
 - Low oil pressure warning*
 - Other inputs:
 - Remote emergency stop*
 - Remote 2-wire start*
- * Requires optional input sensors.

System Outputs

- Controller outputs:
 - Air damper, if equipped
 - Digital voltage regulator (DVR) adjustment (2)
 - Engine crank
 - Engine fuel
 - Ten user-defined relay output drivers (relays not included)
 - Thirteen NFPA-110 relay output drivers (relays not included)

System Diagnostics

The controller features shutdowns and warnings as text messages on the digital display.

- Shutdowns stop the generator set.
- Warnings signal an impending problem.

Shutdown Functions

- Engine functions:
 - Air damper fault, if equipped
 - High coolant temperature
 - High oil temperature
 - Low coolant level
 - Low oil pressure
 - Overcrank
 - Overspeed
- General functions:
 - Auxiliary (up to four programmable shutdowns or warnings)
 - Emergency stop
 - Internal fault
 - Master switch in off/reset position
- Generator functions:
 - Locked rotor (failed to crank)
 - Under and over AC output voltage
 - Underfrequency and overfrequency

Warning Functions

- Engine functions:
 - Coolant temperature sensor loss
 - High and low battery voltage
 - High and low coolant temperature
 - Low fuel (level or pressure)‡
 - Low oil pressure
 - Oil pressure sensor loss
 - Speed sensor fault
 - Weak battery
 - General functions:
 - Auxiliary (up to four programmable shutdowns or warnings)
 - Battery charger fault‡
 - Emergency power system (EPS) supplying load
 - Load shed
 - Master switch not in auto
 - System ready
 - Generator functions:
 - Generator running
 - Ground fault‡
 - Kilowatt overload
 - Low AC output at startup
 - Overcurrent
 - Underfrequency
- ‡Requires optional input sensors.

Common Fault and Status Outputs

The user customizes outputs through a menu of shutdowns and warnings.

User-definable functions. User defines up to ten relay driver outputs (RDOs), (relays not included) from the following list of functions:

- Engine functions:
 - Air damper fault
 - Coolant temperature gauge sensor loss
 - High battery voltage
 - Low coolant level
 - High oil temperature
 - Oil pressure gauge sensor loss
 - Speed sensor fault
 - Starting aid
 - Time delay engine cooldown (TDEC)
 - Time delay engine start (TDES)
 - Weak battery
- General functions:
 - Auxiliary 1-4
 - Defined common fault
 - Emergency power system (EPS) supplying load
 - Internal fault
 - Load shed (underfrequency or kW overload)
 - NFPA-110 common alarm
- Generator functions:
 - Generator running
 - Ground fault
 - Kilowatt overload
 - Locked rotor (failed to crank)

- Low AC output
- Over and undervoltage
- Overcurrent
- Underfrequency
- Underfrequency warning

Additional announced alarms including NFPA-110 alarms. Thirteen standard RDOs—one for each NFPA-110 alarm:

- Engine functions:
 - High coolant temperature
 - High coolant temperature warning‡
 - Low battery voltage
 - Low coolant temperature‡
 - Low fuel (level or pressure)‡
 - Low oil pressure
 - Low oil pressure warning‡
 - Overcrank
 - Overspeed
 - General functions:
 - Battery charger fault‡
 - Emergency stop
 - Master switch not in auto
 - System ready
- ‡Requires optional input sensors.

Additional Standard Functions

- **Automatic Restart**

The controller automatic restart feature initiates the start routine and recrank if the generator slows to less than 390 RPM after exceeding crank disconnect speed.
- **Clock and Calendar**

Real-time clock and calendar functions time stamp shutdowns for local display and remote monitor. Also, use these functions as an actual and resettable record to determine the generator start date and days of operation.
- **Control Power Shutdown**

Controller automatically conserves engine battery power.
- **Cyclic Cranking**

The controller has programmable cyclic cranking. The customer selects the number of crank cycles 1–6 and the crank time 1–60 seconds. The crank disconnect depends upon the speed sensor input information or the generator frequency information. The crank disconnect speed is 750 RPM. The default cyclic crank setting is 15 seconds on, 15 seconds off for three cycles.
- **Generator Number of Starts**

Total number of generator successful starts is recorded and displayed on the local display and remote monitor. This information is a resettable and total record.
- **Load Shed**

The load shed function provides an RDO for removing load from the generator if an underfrequency or kW overload exists.
- **Programming Access**

The setup access and programming information is password protected. When locally accessing programming information, the PM (programming mode) LED flashes. When remotely accessing programming information, the PM LED is steady.
- **Remote Reset**

The remote reset function resets faults and allows restarting of the generator without going to the master switch off-reset position. The remote reset function is initiated via the remote reset input. This function is also part of the remote communication option.
- **Running Time Hourmeter**

Running time hourmeter function is available on the local display and remote monitor. Information displayed uses real time loaded and unloaded run time as an actual and resettable record.
- **Self-Test**

Memory protection and microprocessor self-test.
- **Starting Aid**

Starting aid function for operation of an ether injection system. This setup has adjustable “on” time before engine crank from 0-10 seconds. This function is also part of the remote communication option.

Hardware Features

- Controller mountable locally or remotely to a distance up to 40 feet (12 m).
- Engine harness is the same as earlier microprocessor controllers for possible retrofit.
- Relay, voltage adjustment (for DVR voltage regulator).
- Terminals for remote annunciator.

Decision-Maker™ 340 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.
- Communication Products and PC Software** are available; see spec sheet G6-35.
- Controller Cable, 40 feet (12 m)** enables remote mounting of the controller.
- Controller Connection Kit** provides a cable connecting the controller output terminals to a terminal strip in the junction box. Specify the controller connection kit if single-strand solid conductors connect the controller to remote devices.
- Dry Contact Kit** interfaces between the controller signals and customer-supplied accessories providing contact closure to activate warning devices such as lamps or horns. Kits are available with either one or ten single-pole, double-throw relays with 3 amp at 250 vac contacts.
- Engine Sensors** detect low water temperature, approaching low oil pressure, and approaching high water temperature.
- Float/Equalize Battery Charger with Alarm Feature** signals controller of battery charger fault.
- Prime Power Switch** reduces controller current draw. Use on applications where no battery charger is continuously present. Controller mounted switch provides the ability to switch prime power mode on and off.
- 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. Includes 14-relay dry contact box for connection between controller terminal strip and remote annunciator panel. Remote annunciator panel has surface or flush mounting capability.
- Remote Audio/Visual Panel** warns the operator of fault shutdowns and warning conditions. Kit includes common fault lamp and horn with silence switch.
- Remote Emergency Stop Panel** immediately shuts the generator set down from a remote station.
- Run Relay** provides a three-pole, double-throw relay with 10 amp at 250 vac contacts for indicating that the generator set is running.

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