DKG-319

Manual and Remote Start Unit

FEATURES

- Both manual and remote starting and stopping
- Engine control
- Gas engine support
- Engine idle speed control
- Generator protection
- Built-in alarms and warnings
- Remote Start operation available
- Periodic maintenance request indicator
- Built in daily / weekly / monthly exerciser
- Event logging and time stamp and measurements
- Statistical counters
- Battery backed-up real time clock
- Weekly operation schedule programs
- Provision for dual genset operation
- Load shedding, dummy load
- RS-232 serial port
- Software downloadable from serial port
- Free remote monitoring software (Windows-based)
  - -- local, LAN, IP and modem connection
  - -- monitoring, download of parameters
  - -- modem networking
- GSM and PSTN modem support
- GSM SMS message sending on fault
- MODBUS communications
- Blue color graphic LCD display (128 x 64 pixels)
- User-friendly graphic indicators
- Triple language support
- Customer logo display capability
- Protected semiconductor digital outputs
- Configurable analog inputs: 3
- Configurable digital inputs: 7
- Configurable relay outputs: 2
- Total relay outputs: 4
- I/O expansion capability
- Survives cranking dropouts
- Sealed front panel
- Plug-in connection system for easy replacement

DESCRIPTION

The DKG-319 is a comprehensive generator control unit designed to start and stop the generating set both manually and remotely. The manual control is made using the pushbuttons on the front panel. The remote control is made via the REMOTE START input signal. In AUTOMATIC position, DKG-319 monitors the REMOTE START signal and controls the automatic starting, stopping and load transfer of the generating set.

Once the generator is running, it monitors internal protections and external fault inputs. If a fault condition occurs, the unit shuts down the engine automatically and indicates the failure source with the corresponding red LED lamp and text. The operation of the unit is controlled with front panel pushbuttons. The TEST, AUTO and OFF pushbuttons select the operating mode. Other buttons select the display parameter scroll, alarm mute and lamp test functions. The DKG-319 provides a comprehensive set of digitally adjustable timers, threshold levels, input and output configurations and operating sequences.

Unauthorized access to program parameters is prevented by the program lock input. All programs may be modified via front panel pushbuttons, and do not require an external unit. The fault conditions are considered in 3 categories as Warnings, Loaddumps and Shutdown Alarms. Measured values have separate programmable limits for warning and shutdown conditions. The unit is able to initiate modem calls and sending SMS messages in fault conditions. The last 100 faults are stored in the event log file. The event log includes not only the date-time information, but also a comprehensive list of measured genset parameters at the time that the fault has occurred.

The service request indicator lamp turns on at the expiration of either engine hours or time limits. It is possible to monitor and control the operation of the system locally or remotely with the WINDOWS based RAINBOW program. The unit supports MODBUS protocol enabling communication with PLCs and building management systems. The MODBUS protocol is also supported through GSM and PSTN modems. The unit is designed for front panel mounting. Connections are made with 2 part plug and socket connectors. The unit offers triple language support in English, Turkish and Chinese.

For more information or the latest certifications, please contact:
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www.pc-s.com

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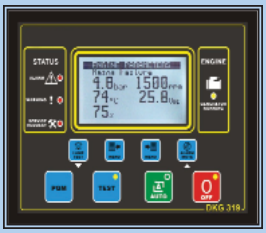


PC&S products are manufactured under a total quality system that provides total engineering integrity. Products have been engineered to satisfy specifications, performance, reliability and life cycle to exacting standards.

PC&S strives to meet customer requirements and exceed expectations. We do this through monitoring and measuring our process and product, customer satisfaction, internal auditing, analysis of production data, continual improvement including corrective and preventative action. Our quality management systems are certified in accordance with ISO 9001:2000 standards.

MEASUREMENTS

- **Generator Volts: L1-N, L2-N, L3-N, L1-L2, L2-L3, L3-L1**
- **Generator Amps: L1, L2, L3**
- **Generator total KW**
- **Generator pf**
- **Generator Frequency**
- **Engine RPM**
- **Battery Voltage**
- **Engine Coolant Temperature**
- **Engine Oil Pressure**
- **Fuel Level**

EVENT LOGGING

The DKG-319 records the last 100 events with date and time stamp. A total of 18 parameters can be measured. Recorded events are:

- **Shutdown alarms, load dumps and warnings**
- **Periodic records**
- **Generator status change**

DIGITAL INPUTS

The unit has 7 configurable digital inputs. Each input has the following programmable parameters:

- **Alarm type: Shutdown/Warning/No Alarm**
- **Alarm polling: On engine running / Always / On Mains OK**
- **Latching / Non-latching operation**
- **Contact type: N/O; N/C**
- **Switching: BAT + / BAT -**

STATISTICS

The following incremental counters provide statistics about past performance of the generating set:

- **Engine Hours Run**
- **Engine Hours to Service**
- **Time to Service**
- **Number of Engine Cranks**
- **Number of Genset Runs**
- **Total KWh**

WEEKLY OPERATION SCHEDULE

In AUTO mode only, the unit offers the capability of defining a weekly operation schedule. Programmable parameters allow the genset to operate automatically only in defined time limits of each weekday.

The internal battery backed-up real-time clock allows precise switching times.

ANALOG INPUTS

Engine analog inputs are provided for coolant temperature, oil pressure and fuel level. Analog inputs connect to resistive sender units to provide precise and adjustment protection. The inputs have programmable sensor characteristics so that they are suitable for any type and any brand of sensors.

RELAY OUTPUTS

The unit provides 4 relay outputs and 2 of them have programmable functions, selectable from a list. Any function or alarm condition may be output as a relay output. Using two Relay Expansion Modules, the number of relays may be increased up to 20 with 16 of them being volt-free contacts.

TELEMETRY AND REMOTE PROGRAMMING

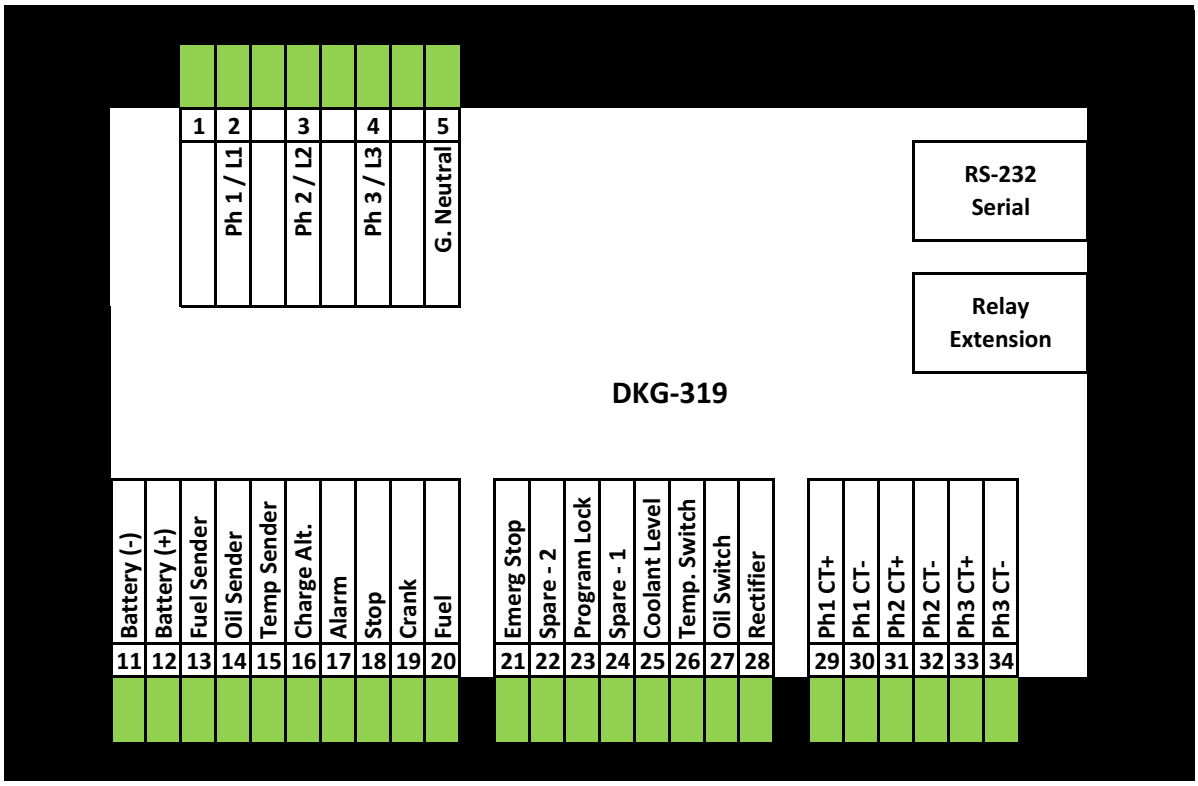
The DKG-319 module provides the user with many telemetry facilities via its standard RS-232 serial port. The unit can be either connected to a PC, PLC or a GSM or PSTN modem. The unit supports both RAINBOW and MODBUS communication protocols. The standard PC software offers local, Local Area Network (LAN), internet and modem operation capabilities, as well as modem networking features.

The Windows-compatible, PC program is used for the following purposes:

- **Parameter upload / download**
- **Remote monitoring and control**
- **Diagnostics and analysis**

The MODBUS interface allows the unit to be integrated in building management systems.

TERMINAL CONNECTIONS



1	not in use
2	Ph 1 (Generator L1)
3	Ph 2 (Generator L2)
4	Ph 3 (Generator L3)
5	Neutral (Generator)

6	not in use
7	not in use
8	not in use
9	not in use
10	not in use

11	Battery -
12	Battery +
13	Fuel Sender
14	Oil Sender
15	Temp Sender
16	Charge Excite/Fail
17	Common Alarm
18	Stop
19	Crank
20	Fuel

21	Emergency Stop
22	Spare - 2
23	Program Lock
24	Spare - 1
25	Coolant Level
26	Temperature Switch
27	Oil Pressure Switch
28	Rectifier (Bat. charger fail)

29	Ph 1 CT +
30	Ph 1 CT -
31	Ph 2 CT +
32	Ph 2 CT -
33	Ph 3 CT +
34	Ph 3 CT -

TECHNICAL SPECIFICATIONS

Alternator Voltage	0 - 300V,AC (L-N)
Alternator Frequency	0 - 100Hz
DC Supply Range	9.0 to 33.0V,DC
Cranking Dropouts	Survives 0V for 100ms
Typical Operating Current	100mA,DC
DC Outputs	1A @ 28V,DC
Charge Excitation Current	min. 150mA @ 10 to 30V,DC
Current Inputs	from CTs .../5A Max load 0.7VA per phase
Analog Input Range	0-5000 ohms
Serial Port	RS-232, 2400 bauds, no parity, 1 bit stop
Operating Temperature	-4°F to +158°F (-20°C to +70°C)
Storage Temperature	-22°F to +176°F (-30°C to +80°C)
Maximum Humidity	95% non-condensing
IP Protection	IP65 from front panel. IP30 from rear
Dimensions	6.50" W x 4.92" H x 1.89" D
Panel Cut-out Dimensions	5.94" W x 4.37" H minimum
Weight	0.55 lbs. (250 g. approx.)
Case Material	High-temperature, self-extinguishing ABS/PC (UL94-V0, 100°C / 230°F)

COMPATIBILITY / CONFORMITY

EU Directives Conformity

2006 / 95 / EC (low voltage)

2004 / 108 / EC (electro-magnetic compatibility)

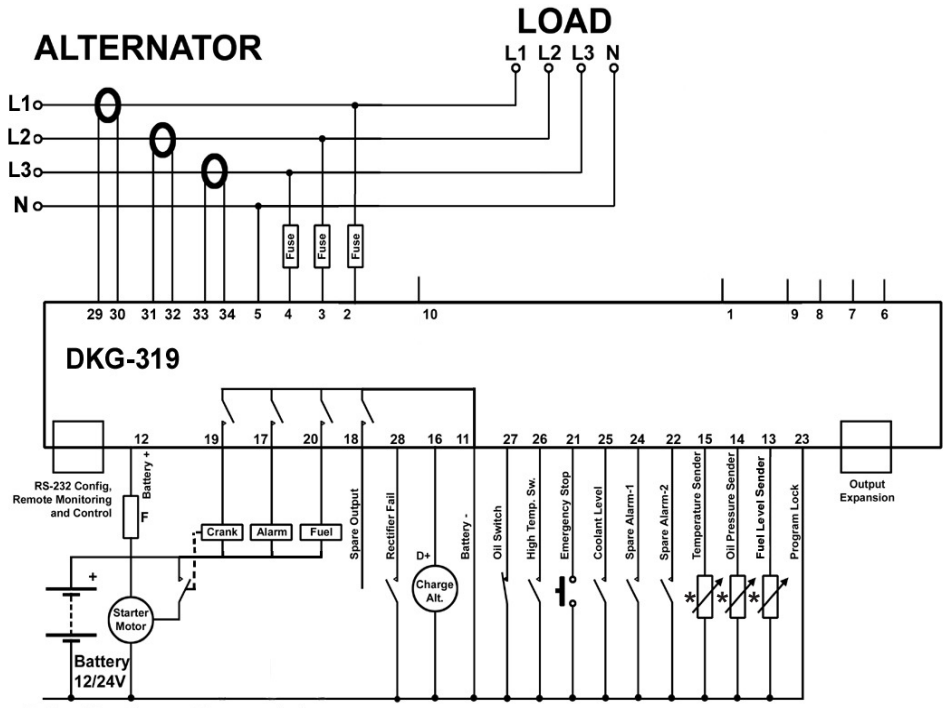
Norms of Reference:

EN 61010 (safety requirements)

EN 61326 (EMC requirements)

CE

TYPICAL CONNECTIONS



Battery Negative must be grounded.

* 2-wire senders are recommended.

PC&S

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