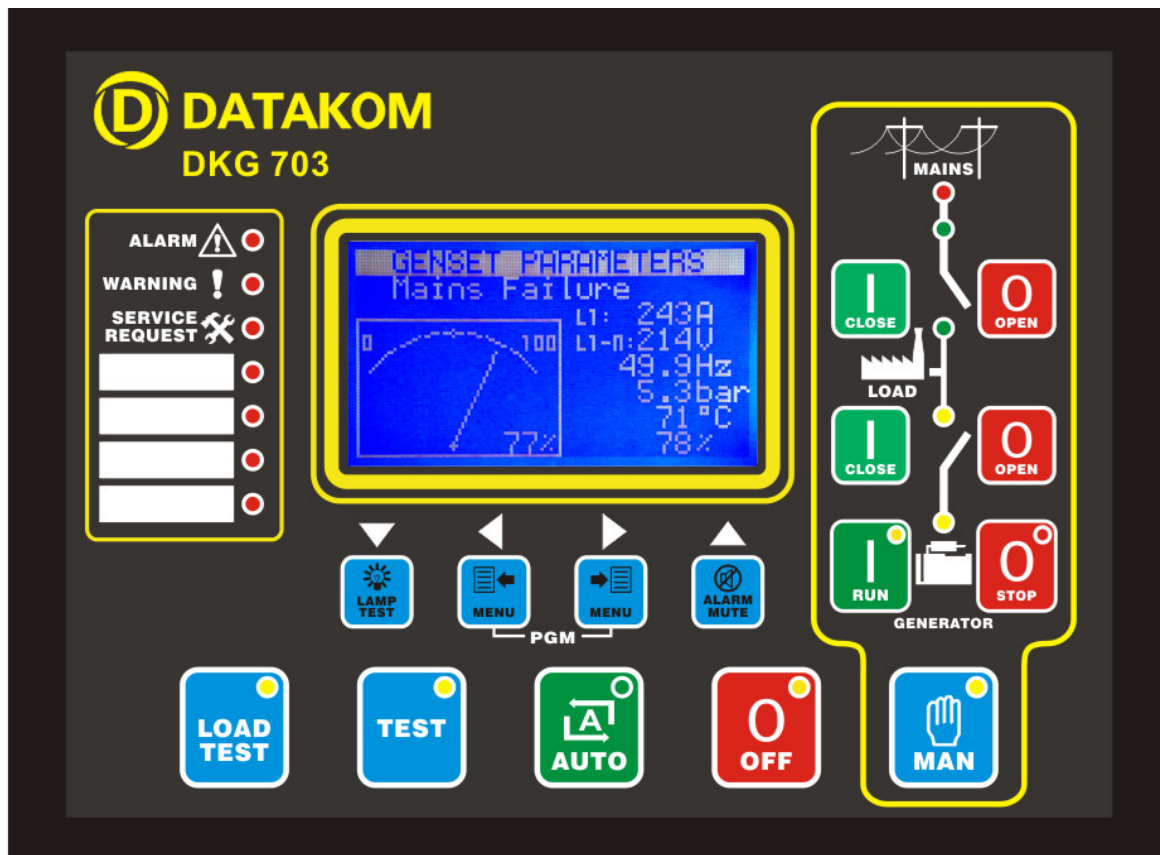


DKG-703 SINGLE GENSET PARALLEL TO MAINS UNIT WITH J1939 INTERFACE



STANDARD FEATURES

- Automatic mains failure*
- ECU control and monitoring through J1939 CAN*
- Various engine brands and models available*
- Engine control*
- Gas engine support*
- Engine Idle speed control*
- Generator protection*
- Built in alarms and warnings*
- Remote start operation available*
- True RMS measurements*
- Complete genset power measurements*
- Complete mains power measurements*
- Synchroscope*
- Governor and AVR control interfaces*
- No break transfer & no break load test*
- Soft transfer with ramp control*
- Power export to mains*
- KW/KVAr load control*
- G-59 mains protections*
- Battery backed-up real time clock*
- Built in daily / weekly / monthly exerciser*
- Mains simulation input*
- Load shedding*
- Periodic maintenance request indicator*
- Event logging with time stamp and measurements*
- Statistical counters*

- Weekly operation schedule programs*
- Field adjustable parameters*
- RS-232 serial port*
- Upgrade software downloadable from serial port*
- Free MS-Windows Remote monitoring SW:*
 - local and modem connection*
 - monitoring, download of parameters*
 - download of software updates*
 - modem networking*
- GSM and PSTN modem calls on fault*
- GSM SMS message sending on fault*
- MODBUS communications*
- Blue colour graphic LCD display (128x64 pixels)*
- User friendly graphic indicators*
- Customer logo display capability*
- Dual language support*
- Protected semiconductor digital outputs*
- Configurable analogue inputs: 3*
- Configurable digital inputs: 8*
- Configurable relay outputs: 6*
- Output expansion capability*
- Survives cranking dropouts*
- Sealed front panel (IP65)*
- Plug-in connection system for easy replacement*
- Internal buzzer*

DESCRIPTION

The DKG-703 is a comprehensive AMF unit for single generating set operating in **standby** or **parallel with mains** modes.

In AUTOMATIC position, DKG-703 monitors mains phase voltages and controls the automatic starting, stopping and load transfer of the generating set in case of a mains failure and 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, indicates the failure source on the LCD display and turns on the red ALARM led.

The DKG-703 unit is able to transfer the load between mains and genset in 4 different ways:

-transfer with interruption: there will be a power interruption period during the transfer

-no break transfer without synchronization: transfer will be made without power interruption. The unit waits until mains and generator phases match and makes a quick transfer.

-no break transfer with synchronization: transfer will be made without power interruption. The unit operates the governor and AVR control outputs to synchronize the generator voltages with the mains and makes a quick transfer.

-soft transfer: transfer will be made without power interruption. The unit operates the governor and AVR control outputs to synchronize the generator voltages with the mains and makes a smooth ramped transfer.

The operation of the unit is controlled with front panel pushbuttons. The LOAD TEST, TEST, AUTO, OFF and MANUAL pushbuttons select the operating mode. Other buttons select the program mode entry/exit, display parameter scroll, alarm mute and lamp test functions.

The DKG-703 provides a comprehensive set of digitally adjustable timers, threshold levels, input and output configurations and operating sequences. The unauthorized access to program parameters is prevented by a 3 level password system. 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, Load-dumps and Alarms. Measured values have separate programmable limits for warning and alarm conditions.

The service request indicator lamp turns on at the expiration of either engine hours or time limits.

It is possible to monitor the operation of the system locally or remotely with the WINDOWS based PC utility program. Remote connection is made through GSM or PSTN modems.

The unit is designed for front panel mounting. Connections are made with 2 part plug and socket connectors.

J1939 ENGINE COMMUNICATIONS

The unit connects to ECU controlled electronic engines through its standard J1939 CANBUS port, providing engine control, protection and instrumentation without extra senders. Various engine parameters are available in display pages. The ECU alarms are displayed in text together with SPN-FMI codes. Various engine brands and models are supported.

MODBUS COMMUNICATION

The unit supports MODBUS protocol enabling communication with PLCs and building management systems. The MODBUS protocol is also supported through GSM and PSTN modems.

MEASUREMENTS

Generator Volts: L1-N, L2-N, L3-N, L1-L2, L2-L3, L3-L1

Generator Amps: L1, L2, L3

Generator kW: L1, L2, L3, total

Generator kVA: L1, L2, L3, total

Generator kVAr: L1, L2, L3, total

Generator pf: L1, L2, L3, average

Generator Frequency,

Mains Volts: L1-N, L2-N, L3-N, L1-L2, L2-L3, L3-L1

Mains Amps: L1, L2, L3

Mains kW: L1, L2, L3, total

Mains kVA: L1, L2, L3, total

Mains kVAr: L1, L2, L3, total

Mains pf: L1, L2, L3, total

Mains Frequency,

Synchronoscope Phase Angle

Synchronoscope Voltage Match

Battery Voltage

Engine RPM

Engine Coolant Temperature

Engine Oil Pressure

Engine Fuel Level

STATISTICS

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

Generator kWh, kVAh, kVArh

Engine Hours Run

Engine Hours to Service

Time to Service

Number of Engine Cranks

Number of Genset Runs

Number of Genset on Load

DIGITAL INPUTS

The unit has 8 fully configurable digital inputs. Each input has following programmable parameters:

-input channel name: selectable from a list of 32,

-alarm type: shutdown / load-dump / warning / no alarm

-alarm polling: on engine running / always

-latching / non-latching operation,

-contact type: NO / NC

-switching: BAT+ / BAT-

ANALOG INPUTS

Engine analog inputs are provided for following functions:

-Coolant temperature

-Oil pressure

-Fuel level

The analog inputs connect to resistive sender units to provide precise and adjustable 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 6 relay outputs with programmable functions, selectable from a list of 128 entries.

In addition to genset control signals any specific alarm information may be output as a relay contact.

Using two Relay Expansion Modules, the number of relays may be increased up to 22, 16 of them being volt-free contacts.

BUILT IN ALARMS

Under/Over Generator Volts
Under/Over Generator Frequency
Under/Over Engine RPM
High Battery Voltage
Low Fuel Level
High Oil Temperature
High Coolant Temperature
Low Oil Pressure
Fail to Stop
Fail to Start
Slave Unavailable
Generator Phase Sequence Fail
Communication Lost
J1939 Communication Fail

BUILT IN LOADDUMPS

Generator Reverse Power
Generator Excess Power
Overcurrent

BUILT IN WARNINGS

Under/Over Generator Frequency
Under/Over Engine RPM
Synchronization Fail
High/Low Battery Voltage
Low Fuel Level
High Oil Temperature
High Coolant Temperature
Low Oil Pressure
Mains Phase Sequence Fail
Charge Fail
AVR Control Fail
Governor Control Fail
Parallel Mains Fail
Mains Reverse Power
Mains Frequency Fail
No Mains Frequency
ROCOF df/dt Fail
Vector Shift df/dt Fail
Communication Lost
J1939 ECU Warnings
Service Request

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 will allow precise switching times.

EVENT LOGGING

The DKG-703 records last 250 events with date-time stamp and a total of 23 measured parameters.

Recorded events are:

- shutdown alarms, loaddumps and warnings
- periodic records
- generator status change

GSM SMS MESSAGE SENDING

The unit is able to send a GSM SMS message to a programmed telephone number in case of alarm.

A sample GSM SMS message is given below:

```
DKG703 <SITE-ID>  
STOP :LOW OIL PR.  
WARNING :ECU WARN.  
END OF ALARM LIST
```

TELEMETRY AND REMOTE PROGRAMMING

The DKG-703 module provides the user with large telemetry facilities via its standard RS-232 serial port. The unit can be either connected to a PC or a modem for remote communication.

The PC software offers local and modem operation capabilities.

In **local mode**, the PC is directly connected to the DKG-703.

In **modem mode**, both the PC and the DKG-703 will be connected to modems. The connection will be established over the telephone network.

The PC program is used for below purposes:

-software download: the DKG-703 unit's software is downloadable from serial port. This provides the user with field upgrading capability to new versions.

-parameter upload/download: program parameters may be saved to the PC or downloaded from PC. This provides the user with the capability of preparing standard configurations for different applications and taking backup copies of parameter values.

-remote monitoring: all measured values, statistics and event records may be visualized on the PC screen. The displays simulate analog meters with user selectable size, position, range and multiple zones with green, yellow and red colors. There are more than 60 possible displays and the user may design his own screen selecting between them. The values are also stored on disk for further analysis.

-diagnostics and analysis: the daily evolution of recorded values may be displayed or printed in a graphical form. This provides the service personnel with the capability of examining the history of an eventual fault condition.

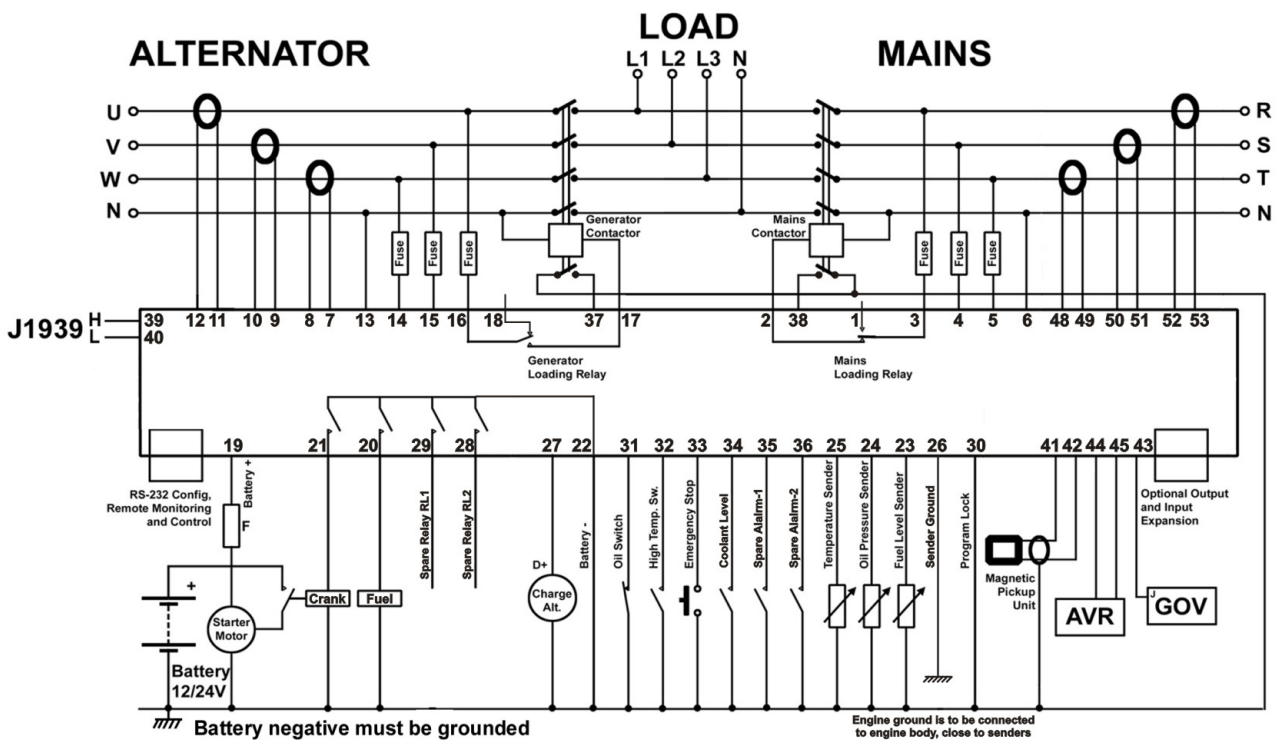


TECHNICAL SPECIFICATIONS

Alternator voltage: 0 to 300 V-AC (Ph-N)
Alternator frequency: 0-100 Hz.
Mains voltage: 0 to 300 V-AC (Ph-N)
Mains frequency: 0-100 Hz.
DC Supply Range: 9.0 to 33.0 V-DC
Cranking dropouts: survives 0 V for 100ms.
Typical Standby Current: 130 mA-DC
Maximum Operating Current: 250 mA-DC (Relay outputs open)
Generator / Mains Contactor Outputs: 16 A @ 250V
DC Outputs: 1 A @ 28V-DC, protected semiconductor
Current inputs: 5A CTs, max load 0.4VA per phase.
Magnetic pick-up voltage: 0.5 to 10 Vpk.
Magnetic pick-up frequency: 10 KHz max.
Gov Control Output: 0 – 10 V-DC
AVR Control Output: 0-10 V-DC (isolated)
Charge excitation current: 150mA @ 10 to 30 V-DC.

Analog input range: 0-5000 ohms.
Serial port: RS-232, 9600 bauds, no parity, 1 bit stop
Operating temp.: -20°C (-4°F) to 70 °C (158°F).
Storage temp.: -40°C (-40°F) to 80 °C (176°F).
Maximum humidity: 95% non-condensing.
IP Protection: IP65 from front panel, IP30 from the rear.
Dimensions: 202 x 148 x 48 mm (WxHxD)
Panel Cut-out Dimensions: 183x134 mm minimum.
Weight: 450 g (approx.)
Case Material: High Temperature ABS/PC (UL94-V0)
Conformity (EU directives)
 -2006/95/EC (low voltage)
 -2004/108/EC (electro-magnetic compatibility)
Norms of reference:
 EN 61010 (safety requirements)
 EN 61326 (EMC requirements)

TYPICAL CONNECTIONS



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