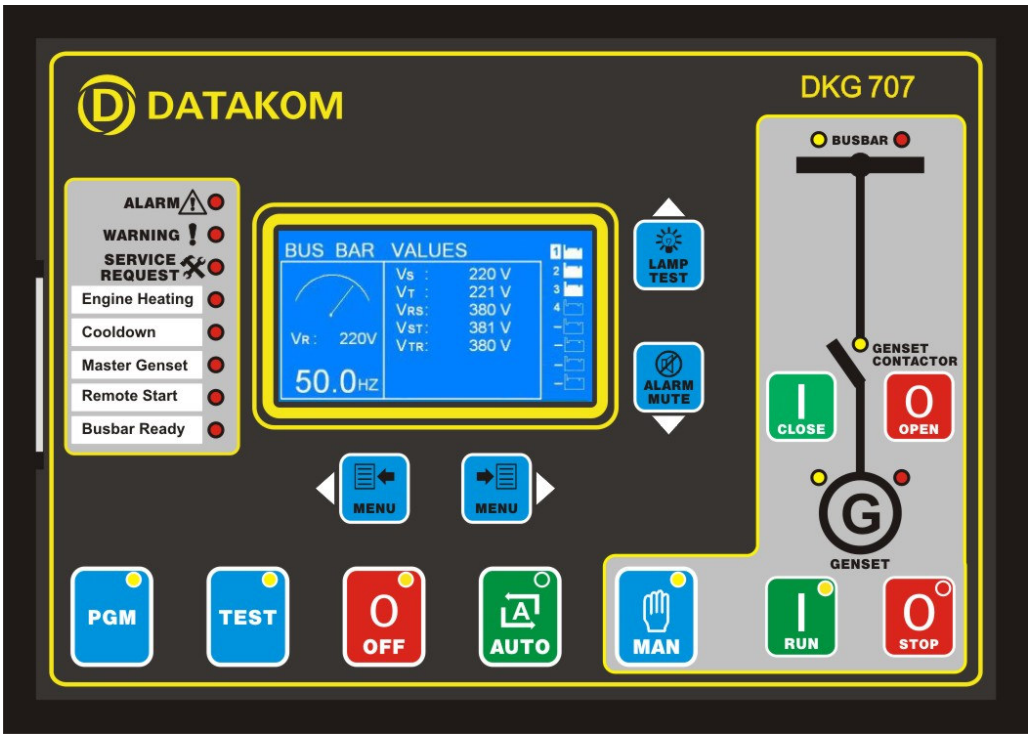
DKG-707 MULTI GENSET PARALLELLING UNIT WITH J1939 INTERFACE



STANDARD FEATURES

Automatic and manual start
Multi genset synchronization (up to 8 gensets)
Multi genset load sharing (up to 8 gensets)
Both active and reactive load sharing
J1939 electronic engine monitoring and control
Various engine brands and models available
Gas engine support
True RMS measurements
Complete genset power measurements
Busbar voltages and frequency measurements
Dead bus sensing
Synchroscope
Built-in Governor control with external reference
Fully isolated built-in AVR control
Fully isolated data link communication port
Magnetic pick-up input
Load dependent automatic Start/Stop
Load dependent quick and delayed start
Soft loading and unloading of gensets
Equal aging of gensets
Voltage transformer ratio for MV applications
Engine Idle speed control
Load shedding, load adding
Periodic maintenance request indicator
Battery backed-up real time clock
Built-in daily, weekly, monthly exerciser
Event logging with time stamp and genset status
Statistical counters
Weekly operation schedule programs
Field adjustable parameters
Password protected front panel programming
Upgrade software downloadable from PC (optional USB adapter needed)
Free MS-Windows Remote monitoring SW:
-monitoring, download of parameters
-download of software updates
High visibility, blue color 128x64 pixels graphic LCD
User friendly graphic indicators and bar graphs
Dual language support
Customer logo display capability
Protected semiconductor digital outputs
Output expansion capability
Configurable analogue inputs: 4
Configurable digital inputs: 12
Configurable digital outputs: 8
Configurable led indicators: 5
Led/Relay output functions selectable from list
Survives cranking dropouts
Dimensions: 235 x 167 x 48mm (WxHxD)
Sealed front panel (IP65)
Plug-in connection system for easy replacement

OPTIONAL FEATURES
DKG-707-MAINS is needed

Synchronization with mains
Soft transfer to/from mains with ramp control
Power export to mains
Peak Lopping

DESCRIPTION

The DKG-707 is a comprehensive Manual and Remote Start unit for multiple generating sets operating in parallel with load sharing.

The unit supports both diesel and gas gensets based on electronic and non-electronic engines.

Up to 8 gensets may be combined together using DKG-707 units without the need for extra modules. The communication between modules is made with the Data Link connection.

In AUTOMATIC position, DKG-707 monitors the Remote Start input and controls the automatic starting, stopping, synchronizing and load sharing of the generating set. When 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.

On a Remote Start request, the sufficient number of gensets to supply the programmed prime power are started, synchronized and closed to the busbar. They will share the load in equal percentage of the rated genset power. The master unit will monitor continuously the power delivered to the load and starts/stops slave gensets automatically.

The genset which is to run first is automatically elected as master. If the master genset fails or the running priority changed, a new master will be elected automatically.

The unit provides user configurable speed governor and AVR outputs allowing direct connection to various engines and alternators. The AVR output is fully isolated for a more flexible usage.

The operation of the unit is controlled with front panel pushbuttons. The TEST, AUTO, MANUAL and OFF pushbuttons select the operating mode. Other buttons run and stop the genset, control synchronizing and load sharing, select the program mode entry/exit, scroll display parameters, provide alarm mute and lamp test functions.

The DKG-707 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 modification of programs may be disabled also by the hard wired PROGRAM LOCK input.

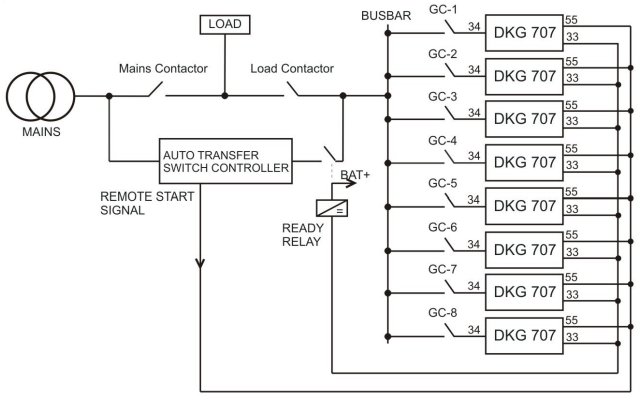
The fault conditions are considered in 3 categories as Warnings, Load-dumps and Alarms. Measured values have separate programmable limits for warning and alarm conditions.

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

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.

MULTI-GENSET SYNCHRONIZATION



The unit allows the synchronization scheme defined in the above picture. The application is made with standard units and standard software, without extra cost. No additional parts are needed.

Basic features are below:
-simple and cost effective application
-automatic start/stop, synchronization and load sharing
-both active and reactive load sharing
-interfaces to all models of AVR and GOV controllers without extra hardware
-gensets do not need to be identical
-equal aging, user defined run/stop priority levels
-every unit monitors status of all available gensets
-genset run/stop logic based on user defined power levels and time delays
-automatic master/slave switching in case of failure of the master unit

MEASUREMENTS

Generator Volts: U-N, V-N, W-N, U-V, V-W, W-U
Generator Amps: U, V, W
Generator KW: U, V, W, total
Generator KVA: U, V, W, total
Generator KVAr: U, V, W, total
Generator pf: U, V, W, average
Generator Frequency,
Busbar Volts: R-N, S-N, T-N, R-S, S-T, T-R
Busbar Frequency,
Synchronoscope Phase Angle
Voltage Match U-R
Frequency match U-R
Percent Load
Governor and AVR output positions
Battery Voltage
Engine RPM
Engine Coolant Temperature
Engine Oil Pressure
Engine Oil Temperature
Engine Fuel Level

EVENT LOGGING

The DKG-707 records last 512 events with date and time stamp together with the complete status of the genset including all measured values.

Recorded events are:
-alarms, load-dumps and warnings
-generator on-load/off-load information
-operating mode change (AUTO, OFF,etc…)
-genset status change (crank, run, cooldown, etc)
-periodic recording

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 12 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
- -Oil temperature
- -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.

DIGITAL OUTPUTS

The unit provides 8 semiconductor outputs with programmable functions, selectable from a list of 192 entries.
In addition to genset control signals, any specific alarm information may be output as a relay contact.
Using two DKG-705 Relay Expansion Modules, the number of relays may be increased up to 24, 16 of them being volt-free contacts.

TELEMETRY AND REMOTE PROGRAMMING

The optional USB adapter module is necessary for PC connection. One module allows communication with all units connected on the same Data Link loop.
The DKG-707 module provides the user with large telemetry facilities via the optional USB interface module.

The PC program is used for below purposes:
-software download: the DKG-707 unit's software is downloadable. 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 settings.
-remote monitoring: measured values may be visualized on the PC screen. 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.

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
Genset Phase Sequence Fail
J1939 Communication Fail

BUILT IN LOADDUMPS

Address conflict
Data Link Error
Genset Reverse Power
Genset Excess Power
Alternator Overcurrent
Synchronization Fail
Genset Contactor Closing Error
Genset Contactor Opening Error
Data Link Communication Lost
Busbar Phase Sequence Fail
No busbar for synchronization
Busbar out of limits
Dead bus

BUILT IN WARNINGS

Under/Over Generator Frequency
Under/Over Engine RPM
High/Low Battery Voltage
Low Fuel Level
High Oil Temperature
High Coolant Temperature
Low Oil Pressure
Charge Fail
AVR Control Fail
GOV Control Fail
Inadequate Prime Power
Too Few Gensets
Data Link 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.

MODBUS COMMUNICATION

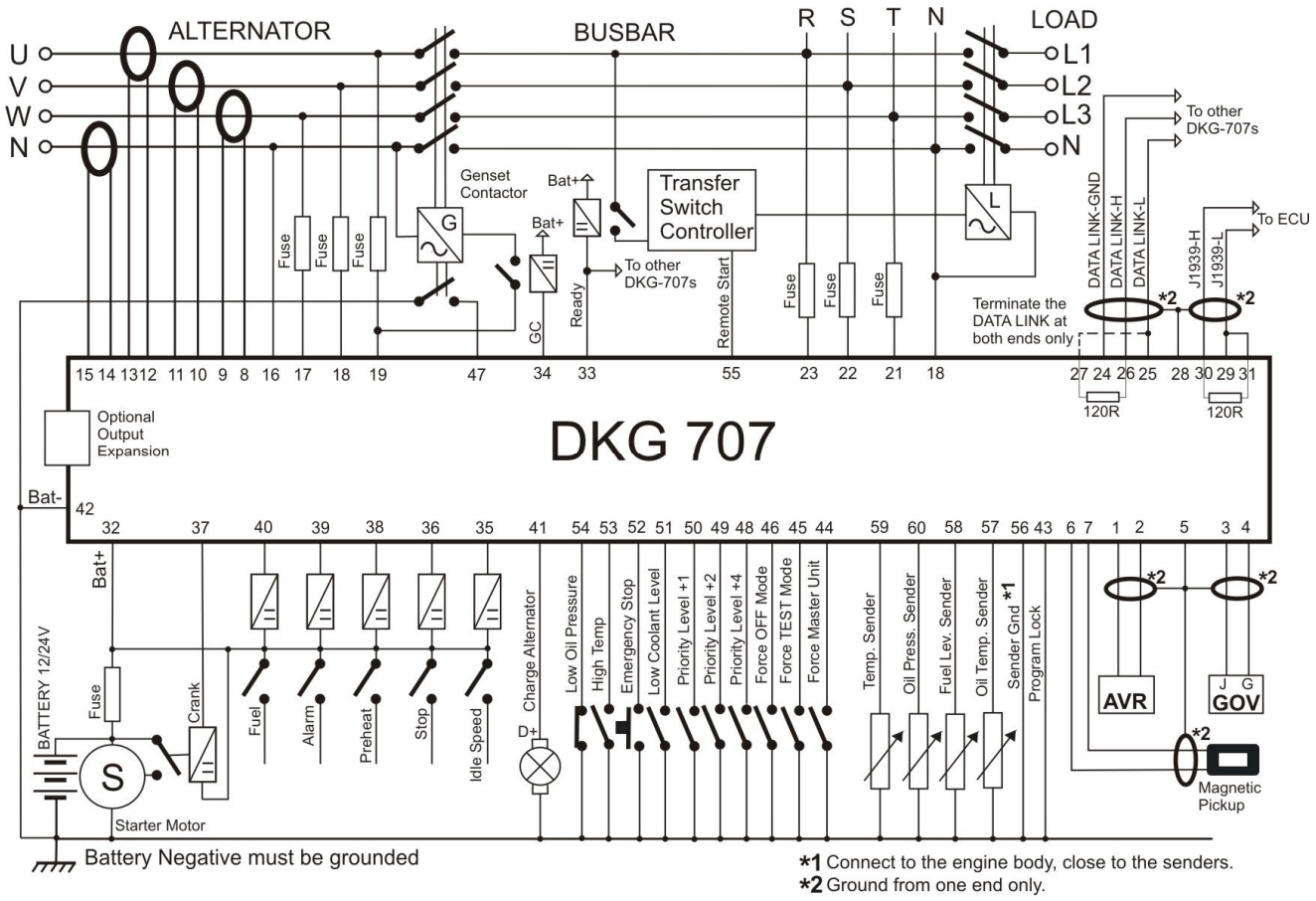
The optional DKG-707-MAINS unit supports MODBUS protocol enabling communication with PLCs and building management systems. The MODBUS protocol is also supported through GSM and PSTN modems.

TECHNICAL SPECIFICATIONS

Alternator voltage: 0 to 300 V-AC (Ph-N)
Alternator frequency: 0-200 Hz.
Busbar voltage: 0 to 300 V-AC (Ph-N)
Busbar frequency: 0-200 Hz.
DC Supply Range: 9.0 to 33.0 V-DC.
Current consumption: 250 mA-DC max.
Current Inputs: from current transformers. ../5A.
Digital inputs: input voltage 0 to 35 V-DC.
Analog input range: 0-5000 ohms.
Digital Outputs: Protected mosfet semiconductor outputs, rated 1Amp@28V-DC
Measurement Category: CAT II
Air Category: Pollution degree II
Cranking dropouts: survives 0V for 100ms.
Magnetic pickup voltage: 0.5 to 50Vpk.
Magnetic pickup frequency: 0 to 10000 Hz.
GOV Control Output: 0–10VDC with external reference
AVR Control Output: 0-10VDC, fully isolated
Charge Alternator Excitation Current: 150mA min.
Data Link Port: Fully isolated, 115.2Kb, canbus levels.

Operating temperature: -20°C to 70°C (-4 to +158 °F).
Storage temperature: -40°C to 80°C (-40 to +176°F).
Maximum humidity: 95% non-condensing.
IP Protection: IP65 from front panel, IP30 from the rear.
Dimensions: 235 x 167 x 48mm (WxHxD)
Panel Cut-out Dimensions: 219 x 151 mm minimum.
Weight: 550 g (approx.)
Case Material: High Temperature Self Extinguishing ABS/PC (UL94-V0, 100°C)
Mounting: Front panel mounted with rear retaining plastic brackets.
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)
UL Compatibility: UL 508 – Industrial Control Equipment
CSA Compatibility: CAN/CSA C22.2 No. 14-2005 - Industrial Control Equipment

TYPICAL CONNECTIONS



DATAKOM Electronics Ltd.
Tel : +90-216-466 84 60 Fax : +90-216-364 65 65
http: www.datakom.com.tr
e-mail : datakom@datakom.com.tr