

# DKG-217 MANUAL AND REMOTE START UNIT WITH SYNCHROSCOPE AND CHECK SYNCH RELAY

## DESCRIPTION

The DKG-217 is an innovative generator control unit integrating 4 different functions needed for manually synchronized parallel gensets in a **zero power consumption at rest** structure. Integrated functions are:

- a manual start unit with power metering
- a remote start unit
- a led bargraph synchroscope
- a configurable check synch relay

The DKG-217 is designed to operate 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.

The **RUN** and **STOP** pushbuttons select the operating mode. Other buttons select the display parameter scroll, alarm mute and lamp test functions.

- The unit has 4 different operation modes:
- power off (no current drain from battery)
  - power on (genset stopped)
  - genset running (synchronization not checked)
  - synchronization checking

Each depression of the **RUN** button causes the unit to switch to next operation mode listed above. Each depression of the **STOP** button causes a return to the previous operation mode. The **REMOTE START** signal causes the unit to switch between the first and the last operation modes.

The synchronization checking consists of the verification of below conditions during 4 consecutive busbar cycles:

- the busbar voltage between set limits
- genset phase voltages between set limits
- busbar-genset frequency difference below the set limit
- busbar-genset voltage difference below the set limit
- busbar-genset phase angle below the set limit

If all above conditions are satisfied for 4 consecutive busbar cycles then the **CHECK SYNCH** relay will be immediately energized. If the busbar is not powered up, the synch checking may be overridden with the **DEAD BUS ENABLE** signal input.

In genset running and synchronization checking modes, the DKG-217 controls the automatic starting and stopping 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.

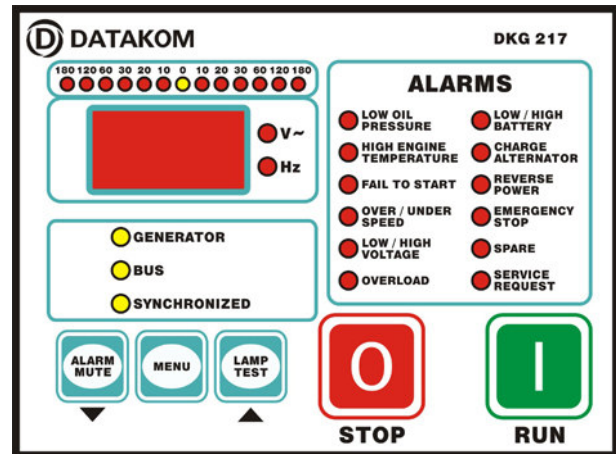
The DKG-217 provides a comprehensive set of digitally adjustable timers, threshold levels, input and output configurations and operating sequences. The unauthorized access to program parameters is prevented by the program lock input. All programs may be modified via front panel pushbuttons, and do not require an external unit.

The fault conditions are considered in 2 categories as Warnings 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.

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



## FEATURES

- Manual starting and stopping**
- Zero power consumption at rest**
- Remote Start operation available**
- LED bargraph synchroscope**
- Programmable  $\Delta V$ ,  $\Delta f$ ,  $\Delta \theta$  for check synch relay**
- Engine control**
- Generator protection**
- Built in alarms and warnings**
- 3 phase genset voltage inputs**
- 1 phase genset CT input**
- 1 phase busbar voltage input**
- Engine oil pressure measurement**
- Engine coolant temperature measurement**
- Genset active power measurement (single phase)**
- Genset power factor measurement (single phase)**
- Periodic maintenance request indicator**
- Engine hours run counter**
- Event logging**
- Statistical counters**
- Front panel configurable**
- 100+ adjustable parameters**
- Logic level serial port**
- Optional RS-232 adapter**
- Free MS-Windows Remote monitoring SW:**
  - local, LAN, IP and modem connection
  - monitoring, download of parameters
- LED displays**
- Configurable analogue inputs: 2**
- Configurable digital inputs: 5**
- Configurable relay outputs: 2**
- Total relay outputs: 5**
- Survives cranking dropouts**
- Sealed front panel**
- Plug-in connection system for easy replacement**
- Small dimensions (120x90x39mm)**
- Low cost**

## MEASUREMENTS

Generator Volt: U-N, V-N, W-N  
 Generator Amp: U  
 Generator KW phase U  
 Generator pf phase U  
 Generator Frequency  
 Busbar Volts: R-N  
 Battery Voltage  
 Engine Coolant Temperature  
 Engine Oil Pressure  
 Frequency difference busbar-phase U  
 Voltage difference busbar-phase U  
 Phase angle busbar-phase U

## STATISTICS

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  
 Number of Genset on Load

## TELEMETRY AND REMOTE PROGRAMMING

The DKG-217 module provides the user with large telemetry facilities via its optional RS-232 serial port. The unit can be either connected to a PC or a modem for remote communication. The PC software offers local, Local Area Network (LAN), internet and modem operation capabilities. The modem mode is also compatible with LAN and internet modes, so that the modem data may be served by PC for reuse in the LAN or internet.

The PC program is used for below purposes:

- parameter upload/download
- remote monitoring
- diagnostics and analysis

The PC software detects automatically new versions over the internet. A menu system will guide the user if he desires to download the new version.

## RELAY OUTPUTS

The unit provides 5 relay outputs and 2 of them have programmable functions, selectable from a list. In addition to genset control signals any specific alarm information may be output as a relay contact.

## DIGITAL INPUTS

The unit has 5 configurable digital inputs. Each input has following programmable parameters:

- alarm type: shutdown / warning / no alarm
- alarm polling: on engine running / always
- latching / non-latching operation,
- contact type: NO / NC
- switching: BAT+ / BAT-

The REMOTE START input is not programmable and if used, should be supplied with the battery positive voltage.

## ANALOG INPUTS

Engine analog inputs are provided for following functions:

- Coolant temperature
- Oil pressure

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.

## TECHNICAL SPECIFICATIONS

**Alternator voltage:** 15-300 V-AC (Ph-N)

**Alternator frequency:** 0-100 Hz.

**Busbar voltage:** 300 V-AC max. (Ph-N)

**Busbar frequency:** 50/60 Hz.

**Current input:** from current transformer, .../5A. Max load 0.7VA

**Digital inputs:** 0 - 30 V-DC

**Analog inputs:** 0 to 5000 ohms

**DC Supply Range:** 9.0 to 33.0 V-DC

**Cranking dropouts:** survives 0 V for 100ms.

**Typical Standby Current:** 100 mA-DC

**Maximum Operating Current:** 350 mA-DC (Relay outputs open)

**Check Synch Relay Output:** 16 A / 250V

**DC Relay Outputs:** 10 A / 28V

**Charge excitation current:** 54mA @ 12V-DC.

**Serial port:** logic levels, 2400 bauds, no parity, 1 bit stop

**Operating temp.:** -20°C (-4°F) to 70 °C (158°F).

**Storage temp.:** -30°C (-22°F) to 80 °C (176°F).

**Maximum humidity:** 95% non-condensing.

**IP Protection:** IP65 from front panel, IP30 from the rear.

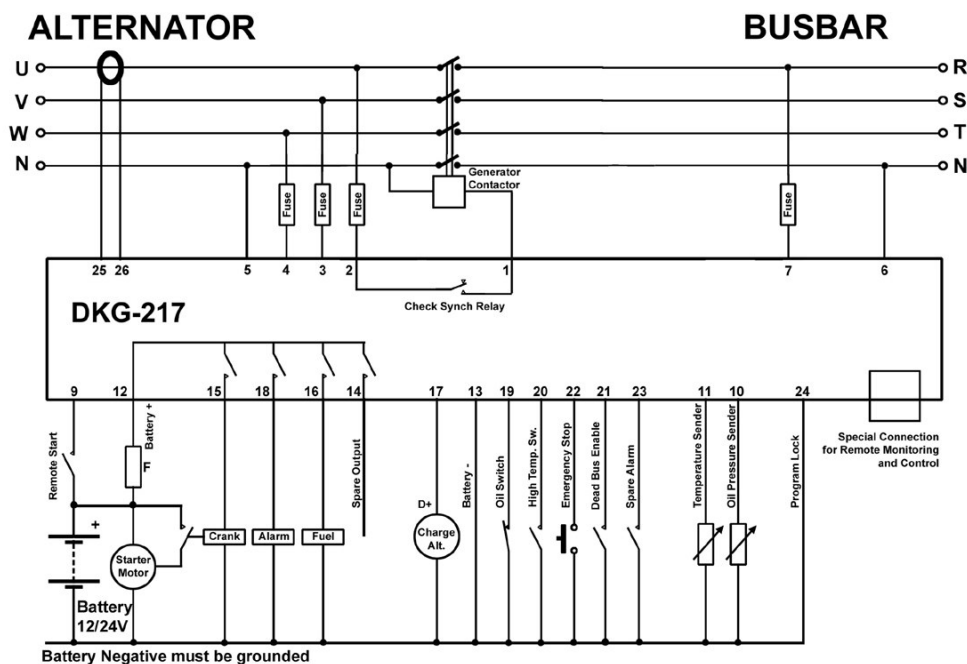
**Dimensions:** 120 x 90 x 39 mm (WxHxD)

**Panel Cut-out Dimensions:** 116x86 mm minimum.

**Mounting:** Front panel mounted with rear retaining steel spring.

**Weight:** 250 g (approx.)

**Case Material:** High Temperature ABS (UL94-V0, 110°C)



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