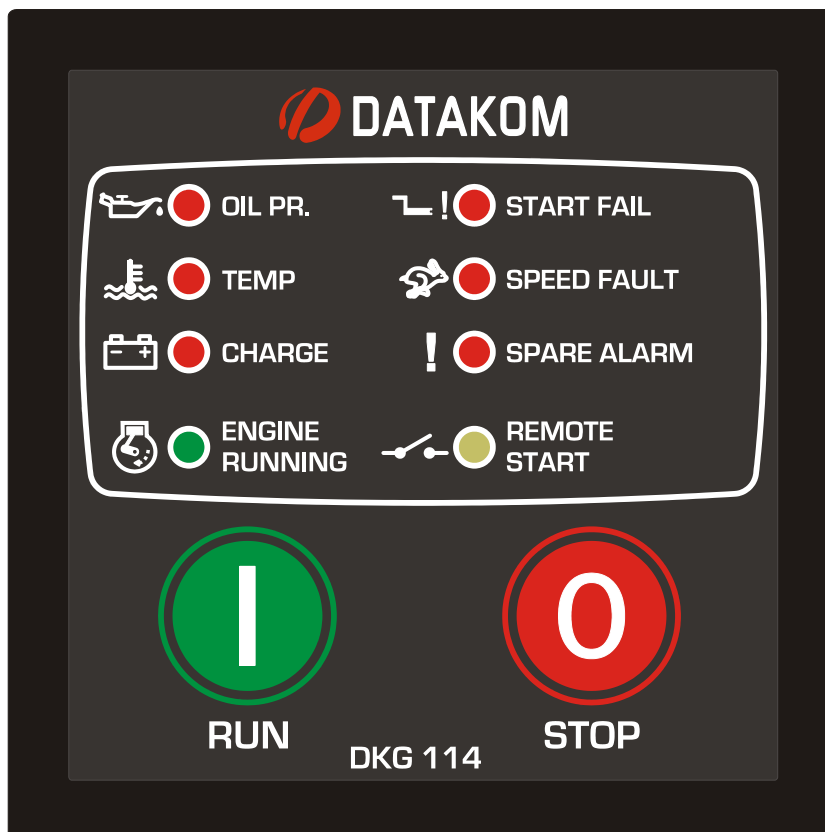




# DKG-114 MANUAL AND REMOTE START UNIT



## FEATURES

*Both manual and remote controlled engine starting and stopping,  
Automatic shutdown on fault condition,  
Optional cooldown cycle on remote start operation,  
Optional energize to stop or preheat output,  
Survives cranking dropouts,  
High current relay outputs,*

*Selectable engine running signal (from genset voltage or charge alternator),  
Delayed overspeed and underspeed alarm,  
Sealed front panel, IP65 protection.  
Plug-in connection system for easy replacement,  
Low cost,  
Small dimensions,  
Standard panel dimensions, (72x72mm)*

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## 1. INSTALLATION

### 1.1 Introduction to the Control Panel

The control panel is designed to provide user friendliness for both the installer and the user. Jumper modification is usually unnecessary, as the factory settings have been carefully selected to fit most applications. However jumper selectors allow the complete control over the generating set or engine.

### 1.2 Mounting the Unit

The unit is designed for panel mounting. The user should not be able to access parts of the unit other than the front panel.

Mount the unit on a flat, vertical surface. The unit fits into a standard panel meter opening of 68x68 millimeters. Before mounting, remove the steel spring and the plug connectors from the unit, and then pass the unit through the mounting opening. The unit will be maintained in its position by the steel spring.

### 1.3 Wiring the Unit



**WARNING: THE UNIT IS NOT FUSED.**

Use external fuses for; Generator phase: G, Battery positive: BAT(+).

Install the fuses as nearly as possible to the unit in a place easily accessible for the user.

The fuse rating should be 6 Amps.



**WARNING: ELECTRICITY CAN KILL**

**ALWAYS** disconnect the power **BEFORE** connecting the unit. The fuse rating should be 6 Amps.

- 1) *ALWAYS* remove the plug connectors when inserting wires with a screwdriver.
- 2) *ALWAYS* refer to the *National Wiring Regulations* when conducting installation.
- 3) An appropriate and readily accessible set of disconnection devices (e.g. automatic fuses) **MUST** be provided as part of the installation.
- 4) The disconnection device must **NOT** be fitted in a flexible cord.
- 5) The building mains supply **MUST** incorporate appropriate short-circuit backup protection (e.g. a fuse or circuit breaker) of High Breaking Capacity (HBC, at least 1500A).
- 6) Use cables of adequate current carrying capacity (at least 0.75mm<sup>2</sup>) and temperature range. Use cables of adequate current carrying capacity (at least 0.75mm<sup>2</sup>) and temperature range.

## 1.4 Inputs and Outputs

**1- G:** Connect one of the generator phases to this input. The generator phase voltage low limit is 50V-AC.

**2- NEUTRAL:** Neutral terminal for the generator phase.

**3- BAT(-):** The negative (-) terminal of the DC Supply shall be connected to this terminal. Be careful for the polarization, in case of polarity error the unit will not operate. The unit operates on both 12V and 24V battery systems.

**4- CRANK OUTPUT:** Engine crank output. Relay automatically turns off when the alternator voltage reaches 50 volts and the alternator frequency reaches 10Hz. Relay contact rating is 10A/28V-DC.

**5- REMOTE START / SPARE FAULT INPUT:** A battery positive connection to this terminal will initiate a REMOTE START cycle. If the signal is disconnected, this will stop the engine. A cooldown cycle will be entered if selected by **JP4**. If the terminal is pulled to battery negative, this will generate a SPARE FAULT and will immediately stop the engine.

**6- HIGH TEMPERATURE SWITCH:** Connect the high temperature switch to this input. This switch shall be negative closing switch type.

**7- LOW OIL PRESSURE SWITCH:** Connect the low oil pressure switch to this input. The switch should be negative closing in case of loss of oil pressure. This input must be properly connected for the correct operation of the unit. If oil pressure is provided, the generator will not start and the oil pressure alarm indicator will flash. However, if the oil pressure is removed, the unit will resume normal operation.

**8- BAT(+):** The positive (+) terminal of the DC Supply shall be connected to this terminal. Be careful for the polarization, in case of polarity error the unit will not operate. The unit may operate on both 12V and 24V battery systems.

**9- FUEL OUTPUT:** The unit activates this output before starting the engine and deactivates it to stop it. Relay contact rating is 10A/28V-DC.

**10- AUXILIARY RELAY OUTPUT:** This relay fulfills 4 different functions following jumper selection. Relay contact rating is 10A/28V-DC.

1) JP2=ON, JP1=ON: ALARM RELAY: If an alarm occurs, the relay will be activated. It will be deactivated after 1 minute period.

2) JP2=ON, JP1=OFF: STOP RELAY: The relay will operate during 30 sec. period in order to stop the engine (Activate to Stop)

3) JP2=OFF, JP1=ON: SHORT PREHEAT RELAY: The relay will operate during 10 seconds before the cranking of the engine. It will be deactivated during cranking and reactivated during the rest period between cranks. It will be deactivated when the engine runs.

4) JP2=OFF, JP1=OFF: LONG PREHEAT RELAY: The relay will operate during 30 seconds before the cranking of the engine. It will be deactivated during cranking and reactivated during the rest period between cranks. It will be deactivated when the engine runs.

**11- CHARGE ALTERNATOR:** This terminal will be connected to the charge alternator's **D+** terminal. This terminal will supply the charge alternator's excitation current and will measure the charge voltage. If the charge voltage disappears a CHARGE FAIL alarm will be generated. Following **JP3** selection, this terminal may act as ENGINE RUNNING signal input. In this way, additionally to genset applications, the unit is able to command engine applications

## 1.5 Displays

**POWER:** (green) it flashes when the unit is powered on. It turns steadily on when the engine is running.

**REMOTE START:** (yellow) it turns on when the remote start signal is present.

## 1.6 Alarms

Alarms indicate an abnormal situation in the generating set and cause the engine to stop immediately. Only the first occurring alarm will be stored.

If an alarm occurs, the related LED will turn on and the alarm relay will be activated. (if selected by JP2/JP1)

Alarm will be controlled after 10 seconds period when the engine is running. Alarm LEDs will stay on and disable the operation of the generating set even if the alarm source is removed. In order to reset the alarm conditions press the STOP button.

**LOW OIL PRESSURE ALARM:** It is on when a signal comes from the oil pressure/oil level input. This alarm will be controlled 10 seconds after the engine is running. If oil pressure is provided when the unit attempts to start the engine, the oil pressure alarm led will flash and the unit will wait until oil pressure disappears.

**HIGH TEMPERATURE ALARM:** It is on when a signal comes from the high temperature input.

**CHARGE FAIL ALARM:** It is on when the charge voltage disappears when the engine is running.

**START FAIL:** It is on if the engine cannot start to run after the 3 start attempts.

**SPEED FAULT ALARM:** It is on when the alternator frequency is below 30Hz or above 57Hz for a longer period than 3 seconds. Alternator frequency will be controlled 10 seconds after the engine is running.

**SPARE FAULT ALARM:** It is on when the REMOTE START/SPARE FAULT input is pulled to battery negative.

## 1.7 Modes of Operation

The modes of operation are selected by pressing the front panel keys.

**MANUAL START / REMOTE START:** Manual start mode is entered by pressing the front panel RUN key, remote start mode is entered by applying the battery positive voltage to the REMOTE START terminal.

In both modes, the diesel will be started 3 times. When the engine runs, the crank relay will be immediately deactivated. 10 seconds after the engine is running, the alarm checking process will be enabled.

**MANUAL STOP / REMOTE STOP:** Manual stop mode is entered by pressing the front panel STOP key, remote stop mode is entered by disconnecting the battery positive voltage from the REMOTE START terminal.

In the manual stop mode, the engine will immediately stop and the unit disconnects from the power source in order to reach zero power consumption.

In the remote stop mode, if set by the **J4** jumper switch, a cooldown cycle of 2 minutes will be entered. At the end of the cooldown cycle the engine will stop. If no alarm exists, the unit disconnects from the power source in order to reach zero power consumption. If alarm exists, the unit will not power off until the front panel STOP key is pressed.

## 2. MAINTENANCE



**DO NOT OPEN THE UNIT !**  
**There are NO serviceable parts inside the unit.**

Wipe the unit, if necessary with a soft damp cloth. Do not use chemical agents

## 3. TROUBLESHOOTING

**The engine does not run after the first start attempt, then the unit does not start again and the OIL PRESSURE ALARM led flashes:**

-The oil pressure switch closes very lately. As the unit senses an oil pressure, it does not start. When oil pressure falls the unit will start. Optionally the oil pressure switch may be replaced.

**The engine starts to run but the unit gives START FAIL alarm and then the engine stops:**

-The generator phase voltage is not connected to the unit. Measure the AC voltage between terminals (G) and (Neutral) at the rear of the unit while the engine is running. The fuse protecting the generator phase may be failed. A misconnection may be occurred. If everything is OK, turn all the fuses off, and then turn all the fuses on, starting from the DC supply fuse. Then test the unit again.

**The unit is late to remove engine cranking:**

-The alternator voltage rises lately. Also the generator remanant voltage is below 50 volts. The unit removes starting with the generator frequency, and needs at least 50 volts to measure the frequency. If this situation is to be avoided, the only solution is to add an auxiliary relay. The coil of the relay will be between BATTERY (-) and charging alternator D+ terminal. The normally closed contact of the relay will be connected serially to the unit's START output. So the starting will also be removed when the CHARGE voltage builds up.

## 4. JUMPER SELECTOR SWITCHES

FUNCTION	JUMPERS	SETTINGS
Aux Relay Function	JP2-JP1	ON-ON: Alarm (1 minute) ON-OFF: Activate to Stop (30 sec) OFF-ON: Short preheat (10 sec) OFF-OFF: Long Preheat (30 sec)
Run Signal Source	JP3	ON: Genset AC Voltage OFF: Charge Alternator D+ signal
Cooldown Cycle	JP4	ON: No Cooldown Cycle OFF: 2 minutes Cooldown Cycle
Nominal Frequency	JP5	ON: 50Hz OFF: 60Hz

## 5. TECHNICAL SPECIFICATIONS

**Generator voltage:** 277V-AC (Ph-N)

**Generator frequency:** 0-200Hz.

**DC Supply Range:** 9 to 30V-DC.

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

**Current consumption:**

0 ma-DC in OFF mode

250 mA-DC max. (Relay outputs open)

**Total DC Current Output Rating:** 10A-DC.

**Max. Current for each Terminal:** 10A-RMS.

**Operating temp:** -30°C (-22°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:** 72 x 72 x 43mm (WxHxD)

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

**Panel cut-out dimensions:** 68 x 68mm.

**Weight:** 180 g (approx.)

**Charge excitation current:** 36mA @ 12V-DC, 70mA @ 24V-DC

**Charge alternator voltage:** min 6 V-DC.

**Genset low frequency limit:** 30Hz.

**Genset high frequency limit:** 57Hz.

**Frequency error delay:** 3 sec.

**Preheat timer:** 10 or 30 seconds, jumper selectable.

**Number of starts:** 3

**Start duration:** 6 sec.

**Wait between starts:** 10 sec.

**Cooldown duration:** 2 min.

**Stop duration:** 30 sec.

**Alarm duration:** 1 minute.

**Protection delay:** 10 sec.

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



**Stresses exceeding above limits may result to a degradation of the unit's protection level.**

## **6. DECLARATION OF CONFORMITY**

The unit conforms to the EU directives  
-73/23/EEC and 93/68/EEC (low voltage)  
-89/336/EEC, 92/31/EEC and 93/68/EEC (electro-magnetic compatibility)

Norms of reference:

EN 61010 (safety requirements)  
EN 50081-2 (EMC requirements)  
EN 50082-2 (EMC requirements)

The CE mark indicates that this product complies with the European requirements for safety, health environmental and customer protection.



7. CONNECTION DIAGRAM

