

DKG-317 CANBUS AND MPU VERSIONS

INPUTS AND OUTPUTS

| Term | Function | Technical data | Description |
|------|----------------------|-----------------------------------|---|
| 1 | GENERATOR CONTACTOR | Relay output, 16A-AC | This output provides energy to the generator contactor. If the generator phases do not have acceptable voltage or frequency values, the generator contactor will be de-energized. In order to provide extra security, the normally closed contact of the mains contactor should be serially connected to this output. |
| 2 | GEN-L1 | Generator phase inputs, 0-300V-AC | Connect the generator phases to these inputs. The generator phase voltages upper and lower limits are programmable. |
| 3 | GEN-L2 | | |
| 4 | GEN-L3 | | |
| 5 | GENERATOR NEUTRAL | Input, 0-300V-AC | Neutral terminal for the generator phases. |
| 6 | - | | |
| 7 | - | | |
| 8 | - | | |
| 9 | - | | |
| 10 | - | | |
| 11 | GROUND | 0 VDC | Power supply negative connection. |
| 12 | BATTERY POSITIVE | +12 or 24VDC | The positive terminal of the DC Supply shall be connected to this terminal. The unit operates on both 12V and 24V battery systems. |
| 13 | FUEL LEVEL SENDER | Input, 0-5000 ohms | Analogue fuel level sender connection. Do not connect the sender to other devices. The input has programmable ohms for VDO senders. |
| 14 | OIL PRESSURE SENDER | Input, 0-5000 ohms | Analogue oil pressure sender connection. Do not connect the sender to other devices. The input has programmable characteristics and connects to any kind of sender. |
| 15 | COOLANT SENDER TEMP. | Input, 0-5000 ohms | Analogue high temperature sender connection. Do not connect the sender to other devices. The input has programmable characteristics and connects to any kind of sender. |
| 16 | CHARGE | Input and output | Connect the charge alternator's D+ terminal to this terminal. This terminal will supply the excitation current and measure the voltage of the charge alternator. |
| 17 | RELAY-2 (HORN RELAY) | Output 10A/28VDC | This relay has programmable function, selectable from a list. |
| 18 | RELAY-1 (STOP RELAY) | Output 10A/28VDC | This relay has programmable function, selectable from a list. |
| 19 | START RELAY | Output 10A/28VDC | This relay controls the engine cranking. |
| 20 | FUEL RELAY | Output 10A/28VDC | This relay is used for fuel solenoid control. |
| 21 | EMERGENCY STOP | Digital inputs | These inputs have programmable characteristics selected via the program menu. Each input may be driven by a 'normally closed' or 'normally open' contact, switching either battery+ or battery-. The effect of the switch is also selectable from a list. See PROGRAMMING section for more details. |
| 22 | SPARE-2 | | |
| 23 | PROGRAM LOCK | | |
| 24 | SPARE-1 | | |
| 25 | COOLANT LEVEL | | |
| 26 | HIGH TEMP | | |
| 27 | LOW OIL PRESSURE | | |
| 28 | RECTIFIER FAIL | | |

| Term | Function | Technical data | Description |
|------|------------------|-----------------------------------|---|
| 29 | CURR_1+ | Current transformer inputs, 5A-AC | Generator current transformer inputs. Do not connect the same current transformer to other instruments otherwise a unit fault will occur. Connect each terminal of the transformer to the unit's related terminal. Do not use common terminals. Do not use grounding. Correct polarity of connection is vital. If the measured power is negative, then change the polarity of each 3 current transformers. The rating of the transformers should be the same for each of the 3 phases. The secondary winding rating shall be 5 Amperes. (For ex. 200/5 Amps). |
| 30 | CURR_1- | | |
| 31 | CURR_2+ | | |
| 32 | CURR_2- | | |
| 33 | CURR_3+ | | |
| 34 | CURR_3- | | |
| 35 | OIL TEMP. SENDER | Input, 0-5000 ohms | Analogue oil temperature sender connection. Do not connect the sender to other devices. The input has programmable characteristics and connects to any kind of sender. |

CANBUS VERSIONS

| | | | |
|----|----------|----------------------------|---|
| 36 | CANBUS-L | Digital communication port | Connect the J1939 port of an electronic engine to these terminals. The 120 ohm terminating resistors are inside the unit. Please do not connect external resistors. Use a twisted cable pair or coaxial cable for best results. |
| 37 | CANBUS-H | | |

MPU INPUT VERSIONS

| | | | |
|----|-------|-----------------------------|---|
| 36 | MPU - | Analog input, 0.5 to 30V-AC | Connect the MPU unit to these inputs. Use a twisted cable pair or coaxial cable for best results. |
| 37 | MPU + | | |

PROGRAMMING

To **enter the program mode**, hold pressed the **MENU ►** button for 5 seconds.

When the program mode is entered, the upper display will show "PRGM" and the mid display will indicate the program parameter number. The lower display will show the parameter value.

If the **PROGRAM LOCK** input is tied to **GROUND**, the program value modification will be disabled to prevent unauthorized intervention.

It is advised to keep the **PROGRAM LOCK** input tied to **GROUND**.

The program mode will not affect the operation of the unit. Thus programs may be modified anytime, even while the genset is running.

Navigation between program parameters is performed via the **MENU ►** button. Holding the button pressed will cause the program parameter number to increase faster.

Parameter value may be increased and decreased with ▼ and ▲ buttons. If these keys are held pressed, the program value will be increased/decreased faster.

When a program parameter is modified, it is automatically saved in memory.

If **MENU ►** button is pressed, next parameter will be displayed.

Program parameters are kept in a non-volatile memory and are not affected from power failures.

To **exit the program mode** press one of the mode selection keys. If no button is pressed during 1 minute the program mode will be cancelled automatically.

Program parameters are organized in 2 groups as low and high levels. Entering the program mode by pressing the **MENU ►** button will allow access to only low level parameters.

In order to access all parameters please hold **OFF** and **MENU ►** buttons pressed.

| PGM | Parameter Definition | Unit | Fact.Set | Description |
|-------|------------------------------------|------|----------|--|
| P_000 | Current Transformer Ratio | A | 500 | This is the rated value of current transformers. All transformers must have the same rating. The secondary of the transformer will be 5 Amps. |
| P_001 | Overcurrent Limit | A | 0 | If the current goes above this limit, during the period defined in Overload Timeout then a Overcurrent Load Dump alarm will be generated. If this parameter is 0 then Overcurrent check is disabled. |
| P_002 | Excess Power Limit | KW | 0 | If the active power goes above this limit, during the period defined in Overload Timeout then an Excess Power Load Dump alarm will be generated. If this parameter is 0 then Excess Power check is disabled. |
| P_003 | - | | | |
| P_004 | - | | | |
| P_005 | - | | | |
| P_006 | - | | | |
| P_007 | Genset Low Voltage Shutdown Limit | V | 190 | If one of the generator phase voltages goes under this limit when feeding the load, this will generate a GENSET LOW VOLTAGE shutdown alarm and the engine will stop. |
| P_008 | Genset Low Voltage Warning Limit | V | 200 | If one of the generator phase voltages goes under this limit when feeding the load, this will generate a GENSET LOW VOLTAGE warning. |
| P_009 | Genset High Voltage Warning Limit | V | 250 | If one of the generator phase voltages goes above this limit when feeding the load, this will generate a GENSET HIGH VOLTAGE warning. |
| P_010 | Genset High Voltage Shutdown Limit | V | 260 | If one of the generator phase voltages goes over this limit when feeding the load, this will generate a GENSET HIGH VOLTAGE alarm and the engine will stop. |
| P_011 | Low Frequency Shutdown | Hz | 30 | If the genset frequency goes under this limit, a GENSET LOW SPEED alarm is generated and the engine stops. |
| P_012 | Low Frequency Warning | Hz | 35 | If the genset frequency goes under this limit, a GENSET LOW SPEED warning is generated. |
| P_013 | High Frequency Warning | Hz | 54 | If the genset frequency goes over this limit, a GENSET HIGH SPEED warning is generated. |
| P_014 | High Frequency Shutdown | Hz | 55 | If the genset frequency goes over this limit, a GENSET HIGH SPEED alarm is generated and the engine stops. |
| P_015 | Low Battery Voltage Warning | V | 9.0 | If the battery voltage falls below this limit, this will generate a LOW BATTERY warning. |
| P_016 | High Battery Voltage Warning | V | 31.0 | If the battery voltage goes over this limit, this will generate a HIGH BATTERY warning. |
| P_017 | High Battery Voltage Shutdown | V | 33.0 | If the battery voltage goes over this limit, this will generate a HIGH BATTERY shutdown alarm and the engine will stop. |
| P_018 | Low Oil Pressure Warning | bar | 1.4 | If the oil pressure measured from the analog input falls below this limit, this will generate a LOW OIL PRESSURE SENDER warning. |
| P_019 | Low Oil Pressure Shutdown | bar | 1.0 | If the oil pressure measured from the analog input falls below this limit, this will generate a LOW OIL PRESSURE SENDER alarm is generated and the engine stops. |

| PGM | Parameter Definition | Unit | Fact.Set | Description |
|-------|-------------------------------|------|----------|--|
| P_020 | High Temperature Warning | °C | 95 | If the coolant temperature measured from the analog input goes over this limit, this will generate a HIGH TEMPERATURE SENDER warning. |
| P_021 | High Temperature Shutdown | °C | 98 | f the coolant temperature measured from the analog input goes over this limit, this will generate a HIGH TEMPERATURE SENDER alarm and the engine will stop. |
| P_022 | Low Fuel Warning | % | 20 | If the fuel level measured from the analog input falls below this limit, a LOW FUEL LEVEL SENDER warning is generated. |
| P_023 | Low Fuel Shutdown | % | 10 | the fuel level measured from the analog input falls below this limit, a LOW FUEL LEVEL SENDER shutdown alarm is generated and the engine stops. |
| P_024 | High Oil Temperature Warning | °C | 100 | If the oil temperature measured from the analog input goes over this limit, this will generate a HIGH OILTEMPERATURE SENDER warning. |
| P_025 | High Oil Temperature Shutdown | °C | 120 | f the oil temperature measured from the analog input goes over this limit, this will generate a HIGH OIL TEMPERATURE SENDER alarm and the engine will stop. |
| P_026 | Oil Pressure Sender type | - | 1 | This parameter selects the oil pressure sender type. 0: Non standard sender. The sender characteristics are defined in Sender Characteristics table. 1: VDO 0-7 bars (10-180 ohms) 2: VDO 0-10 bars (10-180 ohms) 3: DATCON 0-7 bars (240-33 ohms) 4: DATCON 0-10 bars (240-33 ohms) 5: DATCON 0-7 bars (0-90 ohms) 6: DATCON 0-10 bars (0-90 ohms) 7: DATCON 0-7 bars (75-10 ohms) |
| P_027 | Coolant Temp. Sender Type | - | 1 | This parameter selects the temperature sender type: 0: The sender characteristics are defined in Sender Characteristics table. 1: VDO 2: DATCON DAH type 3: DATCON DAL type |
| P_028 | Oil Temp. Sender Type | - | 1 | Temperature sender type selection: 0: The sender characteristics are defined in Sender Characteristics table. 1: VDO 2: DATCON DAH type 3: DATCON DAL type |
| P_029 | Hysteresis Voltage | V | 8 | This parameter provides the mains and genset voltage limits with a hysteresis feature in order to prevent faulty decisions. For example, when the mains are present, the mains voltage low limit will be used as the programmed low limit. When the mains fail, the low limit will be incremented by this value. It is advised to set this value to 8 volts. |
| P_030 | Engine Heating Temperature | °C | 0 | If it is requested that the engine runs without load until reaching a certain temperature, this parameter defines the temperature. If the coolant temperature falls below this parameter, an Engine Low Temperature warning will occur. |
| P_031 | Fault Holdoff Timer | sec | 12 | This parameter defines the delay after the engine runs and before the fault monitoring is enabled. |

| PGM | Parameter Definition | Unit | Fact.Set | Description |
|-------|-----------------------------|------|----------|--|
| P_032 | Overload Timeout | sec | 5 | This is the period between the current or active power go over the limits and OVERCURRENT or EXCESS POWER Load Dump alarms occur. This is also the period between the frequency goes out of the limits and OVERSPEED or UNDERSPEED alarms occur. This is also the period between the genset voltage goes out of the limits and HIGH VOLTAGE or LOW VOLTAGE alarms occur. |
| P_033 | Engine Start Delay | sec | 0 | This is the time between the mains fails and the fuel solenoid turns on before starting the genset. It prevents unwanted genset operation in battery backed-up loads. |
| P_034 | Preheat Timer | sec | 1 | This is the time after the fuel solenoid is energized and before the genset is started. During this period the PREHEAT relay output is energized (if assigned by Relay Definitions) |
| P_035 | Choke Timer | sec | 5 | This is the control delay of CHOKE output. The choke output is activated together with the crank output. It is released after this delay or when engine runs (whichever occurs first). |
| P_036 | Gas Solenoid Delay | sec | 5 | The gas solenoid of the gas engine will be opened after this delay during cranking. |
| P_037 | Crank Timer | sec | 10 | This is the maximum start period. Starting will be automatically cancelled if the genset fires before the timer. |
| P_038 | Wait Between Starts | sec | 10 | This is the waiting period between two start attempts. |
| P_039 | Idle Speed Timer | sec | 0 | When the engine runs, the Idle output relay function will be active during this timer. |
| P_040 | Engine Heating Timer | sec | 4 | This is the period used for engine heating following the program parameter. |
| P_041 | Mains Waiting Timer | min | 0.5 | This is the time between the mains voltages entered within the limits and the generator contactor is deactivated. |
| P_042 | Cooldown Timer | min | 1.0 | This is the period that the generator runs for cooling purpose after the load is transferred to mains. |
| P_043 | Genset Contactor Timer | sec | 1 | This is the period after the mains contactor has been deactivated and before the generator contactor has been activated. |
| P_044 | Mains Contactor Timer | sec | 1 | This is the period after the generator contactor has been deactivated and before the mains contactor has been activated. |
| P_045 | Stop Solenoid Timer | sec | 10 | This is the maximum time duration for the engine to stop. During this period the STOP relay output is energized (if assigned by Relay Definitions). If the genset has not stopped after this period, a FAIL TO STOP warning occurs. |
| P_046 | Number of Starts | - | 3 | This is the maximum number of start attempts. |
| P_047 | Mains Phase Order Enable | - | 0 | 0 : mains phase order checking disabled 1 : if mains phase order is faulty, then a warning is given and mains contactor deenergized. |
| P_048 | Genset Phase Order Loaddump | - | 0 | 0 : genset phase order checking disabled 1 : if genset phase order is faulty, then a loaddump is generated and the genset stops after cooldown. |

| PGM | Parameter Definition | Unit | Fact.Set | Description |
|-------|---------------------------|-------|----------|---|
| P_049 | RPM from genset frequency | - | 1 | This parameter is used in the conversion of the genset frequency to engine rpm. 0: read rpm from the optional MPU input 1: convert frequency to rpm (using crank teeth count) |
| P_050 | Crank Teeth Count | - | 30 | This is the number of pulses generated by the magnetic pickup sensing unit in one turn of the flywheel. This parameter is also used in the conversion of the genset frequency to engine rpm. The frequency in Hz is multiplied with this parameter during conversion to rpm. |
| P_051 | Low rpm Shutdown | rpm | 0 | If the engine speed goes under this limit, a GENSET LOW SPEED alarm is generated and the engine stops. |
| P_052 | Low rpm Warning | rpm | 0 | If the engine speed goes under this limit, a GENSET LOW SPEED warning is generated. |
| P_053 | High rpm Warning | rpm | 0 | If the engine speed goes over this limit, a GENSET HIGH SPEED warning is generated. |
| P_054 | High rpm Shutdown | rpm | 0 | If the engine speed goes over this limit, a GENSET HIGH SPEED alarm is generated and the engine stops. |
| P_055 | Alarm Relay Timer | sec | 60 | This is the period during which the ALARM relay is active. If the period is set to 0, this will mean that the period is unlimited. |
| P_056 | Intermittent Alarm Relay | - | 0 | 0: continuous 1: intermittent (turns on and off every second) |
| P_057 | Service Engine Hours | hour | 50 | The SERVICE REQUEST led indicator will turn on after this quantity of engine hours from the last service. If the period is set to '0' no SERVICE REQUEST will be generated depending on engine hours. |
| P_058 | Service Period | month | 6 | The SERVICE REQUEST led indicator will turn on after this amount of time from the last service. If the period is set to '0' no SERVICE REQUEST will be indicated depending on time. |

TECHNICAL SPECIFICATIONS

Alternator voltage: 0 to 300 V-AC Ph-N

Alternator frequency: 0-100 Hz.

DC Supply range: 9.0 VDC to 33.0 VDC

Cranking dropouts: survives 0 V for 100ms

Typical stand-by current: 100 mADC.

Maximum current consumption: 250 mADC.

Gen/mains contactor outputs: 16A@250 VAC.

DC outputs: 10A@28 VDC. relay outputs.

Charge alternator excitation: min 2W.

Magnetic pickup input:: 0.5 – 30 V-AC.

Magnetic pickup frequency: 10 KHz max.

Current inputs: from current transformers, .../5A. Max load 0.7VA per phase.

Digital inputs: 0 - 30 VDC. Internally connected to battery positive via 47'000 ohm resistor.

Analog inputs: 0 to 5000 ohms connected to the battery negative. Sources 5 mA when closed to battery negative.

Communication port: RS-232. 9600 bauds, no parity, 1 stop bit.

Operating temperature range: -40°C to +70°C (-40 °F to +158 °F)

Storage temperature range: -55°C to +80°C (-67°F to +176°F)

Maximum humidity: 95%, non-condensing

Dimensions: 172x134x46mm (WxHxD)

Panel Cut-out: 151 x 111mm minimum.

Weight: 340 g (approx.)

Case material: High temperature, self extinguishing ABS/PC (UL94-V0)

IP protection: IP65 from front panel, IP30 from the rear

TROUBLESHOOTING

AC voltages or frequency displayed on the unit are not correct:

- Check engine body grounding, it is necessary.
- The error margin of the unit is +/- 3 volts.
- If there are faulty measurements only when the engine is running, there may be a faulty charging alternator or voltage regulator on the engine. Disconnect the charging alternator connection of the engine and check if the error is removed.
- If there are faulty measurements only when mains are present, then the battery charger may be failed. Turn off the rectifier fuse and check again.

kW and cos Φ readings are faulty although the Amp readings are correct:

- Current transformers are not connected to the correct inputs or some of the CTs are connected with reverse polarity. Determine the correct connections of each individual CT in order to obtain correct KW and cos Φ for the related phase, and then connect all CTs.

When the Remote Start signal comes, the unit energizes the fuel solenoid, but does not start and OIL PRESSURE led flashes:

The unit is not supplied with battery (-) voltage at the oil pressure input.

- Oil pressure switch not connected.
- Oil pressure switch connection wire cut.
- Oil pressure switch faulty.
- Oil pressure switch closes too lately. If oil pressure switch closes, the unit will start. Optionally oil pressure switch may be replaced.

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

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

When the Remote Start signal comes, the engine starts to run but the unit gives START FAIL alarm and then the engine stops:

- The generator phase voltages are not connected to the unit. Measure the AC voltage between terminals **GEN L1** and **Generator Neutral** at the rear of the unit while the engine is running. A fuse protecting the generator phases 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 generator voltage rises lately. Also the generator remnant voltage is below 20 volts. The unit removes starting with the generator frequency, and needs at least 20 volts to measure the frequency. If this situation is to be avoided, please adjust program parameters in order to cut cranking with the charge alternator voltage.

The unit is inoperative:

- Measure the DC-supply voltage between terminals 19 and 22 at the rear of the unit. If OK, turn all the fuses off, then turn all the fuses on, starting from the DC supply fuse. Then test the unit again.

Program parameters cannot be modified:

- The program lock input disables parameter modification. Disconnect the program lock input from battery negative before modification. Do not forget to make this connection again to prevent unauthorized program modifications.

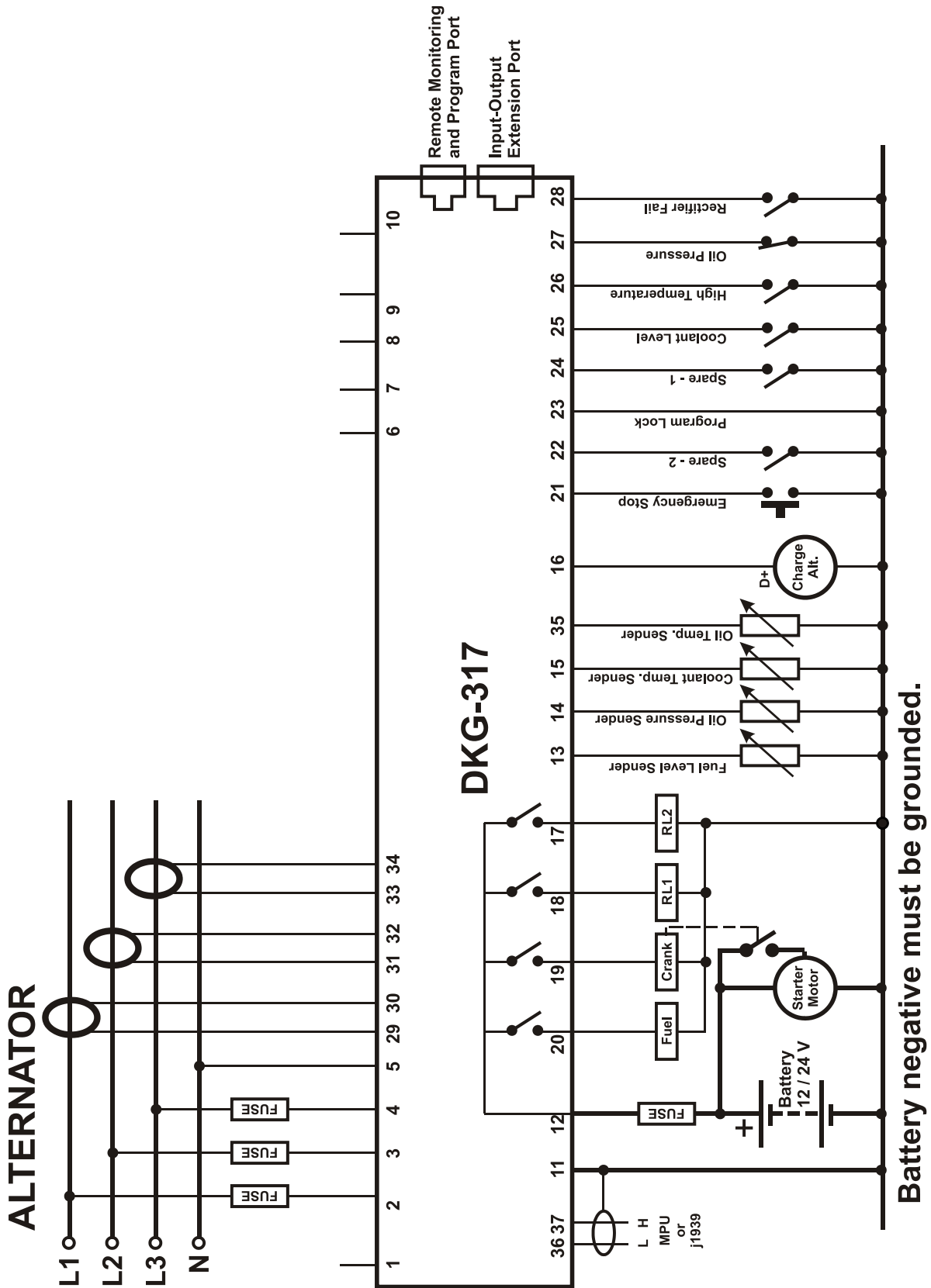
Some program parameters are not displayed:

- These parameters are reserved for factory setting and cannot be modified.

AUTO led flashes and the genset does not run when the Remote Start signal comes:

- The unit is in Weekly Schedule **OFF** time. Please check date and time setting of the unit. Please check also Weekly Schedule program parameters.

CONNECTION DIAGRAM



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