



Be-K3 (J1939) bulletin summary

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1.0 Description

The Be-K3 is a 3-phase A.M.F / A.T.S. controller / Generator controller and monitoring system for engines with CANBUS. Its programming runs quickly, and all parameters, alarms and operating functions are indicated by means of a high-performance 128X64 graphic display capable of operating in a temperature range between -25°C and +70°C. The Be-K3 interfaces also resistive-sensors if CAN-BUS is not available. Measurements including Vac, Aac, Vdc, kVA, kVar, kW, Energy, Pf, Hz, hour count, R.p.m., Oil Pressure, Engine Temperature, Battery Vdc (Engine), Fuel Level and measurements provided from J1939. A monitoring and control software program is also provided. The Be-K3 provides RS485 with MODBUS protocol and complies with NFPA-110 / NFPA-99 specifications.

2.0 State-of-the-art Innovative features

- *RS485, MODBUS , CAN-BUS (J1939) and TCP-IP protocol by optional adapter*
- *200 Events Log history tagged by a Real Time Clock*
- *Reverse Power and Earth Fault monitoring*
- *Interfaces with Resistive sensors in case J1939 is not available.*
- *Indicates kVA, kVAR, kW, PF, Aac, Vac, Hz and kWh-meter & h-meter*
- *Rental timer and 3 independent Maintenance Timers*
- *30 Options for each programmable input & 65 Options for each Output*
- *Embedded flywheel diodes on the static outputs circuitry*
- *High quality manufacturing, 72-hours dynamic burn-in, 3-Year warranty*

3.0 Programmable Inputs

The Be-K3 features 3 digital inputs and 3 analog inputs (6-points response curve). The digital inputs can be configured normally closed or open with the following options:

OPTIONS			
Disable input	Bypass and Warning	Remote LEDs test	KM Control
Immediate Stop	Remote Manual Mode	Remote Acknowledge	KM Control
Bypass and Stop	Remote Auto Mode	Display Control ↑↓	Overload
Cooling and Stop	Remote Off Mode	KG feedback	Reserve Generator
Bypass + Cooling + Stop	Remote LOCK	Idle Speed	Master Generator
Warning only	Generator simulation	Engine Test	NFPA Test Led
-	Mains Simulation	Genset test	-

4.0 Programmable Outputs

The Be-K3 features START/FUEL/KG/KM outputs and 3 configurable outputs with the following options:

OPTIONS		
The Output is disabled	Common of all Alarms (warnings+shutdowns)	KM Contactor of the MAINS Closed
Under Speed Shutdown	Maintenance SERVICE 1 and 2	Crank Delay (Start Warning)
Over Speed Shutdown	Maintenance SERVICE 3	Pre-glow
Common Speed Alarms	Auxiliary Alarm 1-2-3: Shutdown / Warning	PURGE (gas engine valve control)
Under Frequency Shutdown	Panel Stop Shutdown	Engine Running Status
Over Frequency Shutdown	Common Input Alarm	Cooling Timing
Over Current Shutdown	Presence of Nominal Mains Parameters	Warm up Timing
Over Current Warning	Presence of Nominal Generator Voltage	RENT Warning / Shutdown
Over KVA, KW Warning or Shutdown	Mains Failure Timing	Be-K3 in OFF MODE (Status)
Minimum KW Warning	Mains Restore Timing	Be-K3 in MANUAL MODE (Status)
Maximum KW Warning	KG Contactor of the GENERATOR Closed	Be-K3 in AUTO MODE (Status)
Phase Sequence Error Shutdown	High – Low Battery Voltage Warning	Be-K3 in TEST MODE (Status)
Reverse Power Shutdown	No Fuel in Tank Shutdown	Be-K3 in LOCK MODE (Status)
Over/Under Voltage Shutdown	Low Level Fuel Warning	Automatic Periodic Test
Overload Shutdown	Fuel Reserve Warning	Fail To START Shutdown
Alternator Failure Shutdown	High Fuel Warning	Fail To STOP Shutdown
Common Generator Alarms	Fuel Sensor Failure Warning	Engine Belt Break Shutdown
Low Oil Pressure Warning	Fuel Pump (to fill the TANK)	Parameter Error warning
Low Oil Pressure Shutdown	Common Fuel Alarms / Sensor Failure	Idle Engine
Common Oil Pressure Alarms	Common of all warnings	Clock Error or Periodic Test Error
High Temperature Shutdown	Common of all shut-downs	Lube Pump
High – Low Temperature Warning	Common Temperature Alarms	Can-Bus /ECU control (4 options)

5.0 Display features

The Be-K3 features a graphic display able to indicate the following:

- Electrical measurements	- Engine parameters / measurements
- Menu and sub Menu	- Programming
- Alarms & Log Events	- Miscellaneous parameters

5.1 Display: alarm indications

OVER/UNDER FREQUENCY OVER/UNDER VOLTAGE ALTERNATOR FAILURE OVERLOAD OVER CURRENT SHORT CIRCUIT PHASE SEQUENCE EARTH FAULT MAX / MIN KW WARNING OVER KVA SHUTDOWN REVERSE POWER OVER/UNDER SPEED PICK UP FAILURE MAINS FAILURE	LOW OIL PRESSURE OIL SENDER FAILURE HIGH-LOW COOLANT TEMPERATURE TEMPERATURE SENDER FAILURE REMOTE EMERGENCY LOCAL EMERGENCY ALARM INPUT 1-2-3 FAIL TO STOP FAIL TO START BELT BREAK REMOTE LOCK RENT WARNING RENT SHUTDOWN CONTACTORS ALARM	MAINTENANCE 1-2 WARNING MAINTENANCE 3 SHUTDOWN FUEL RESERVE NO FUEL SHUTDOWN HIGH / LOW FUEL WARNING FUEL SENSOR FAILURE LOW BATTERY V HIGH BATTERY V CLOCK ERROR PARAMETER ERROR SYSTEM NOT IN AUTO PERIODIC TEST ERROR KM / KG FAILURE
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5.2 Display: Menu & Measurements

MAIN MENU MEASUREMENTS ALARM STATUS PROGRAMMING DISPLAY & LANGUAGE SERVICE & MAINTENANCE CLOCK SETTINGS MEASUREMENTS GENERATOR MAINS POWER & ENERGY ENGINE & FUEL ALARM STATUS LOG EVENTS MISCELLANEOUS RENT CONTRACT REAL TIME CLOCK SERVICE STATUS PERIODIC TEST	PARAMETERS MENU RESTORE DEFAULT CHANGE PASSWORD /OEM & USER CALIBRATION CLEAR ENERGY COUNTER CLEAR MEMORY CLEAR EVENTS MAINS CONTROL GENERATOR CONTROL ENGINE PARAMETERS SPEED PARAMETERS FUEL LEVEL SETTINGS OIL PRESSURE SETTINGS TEMPERATURE SETTINGS FUEL SENSOR INPUTS & OUTPUTS COMMUNICATIONS SETTINGS	MEASUREMENTS MAINS VOLTAGES / Hz CONTACTOR STATUS PHASE SEQUENCE POWER FACTOR, KVA GENERATOR VOLTAGES / Hz GENERATOR CURRENT GENERATOR POWER KW-KVA ENERGY COUNTER kWh J1939 MESUREMENTS (Version K3) COOLANT TEMPERATURE OIL PRESSURE ENGINE SPEED FUEL LEVEL CHARGER ALTERNATOR (V) BATTERY VOLTAGE STARTINGS COUNT
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6.0 Pushbuttons features

The Be-K3 features 14 membrane pushbuttons used for the following tasks :

Push buttons	Notes
[START- I] [STOP - 0]	Are used to Start-Stop the Engine or programming. K3 provides two sets of buttons to gurantee a large number of operations of START-STOP.
[I] - [0] - [I]	Control the status of the contactors
[MAN-AUTO] [OFF]	Select the mode of operation
[RIGHT] [LEFT] [UP] [DOWM]	Are used to control the display or programming
[ACKNOWLEDGE]	It silences the horn

7.0 LED indicators

LEDs	Notes
1 Green indicator	Indicates that the engine is running
5 Green indicator	Indicate operating modes and the status of the contactors
2 Yellow indicator	Indicate the presence of a Warning and a low battery
2 Red indicators	Indicate a Shut down and No fuel

8.0 Serial communications

The Be-K3 features an RS485 serial interface. The protocol MODBUS provides an easy way to interface with other equipments. Software running on computer is available. The adapter Be-TCP/IP can provide MODBUS over TCP-IP protocol.

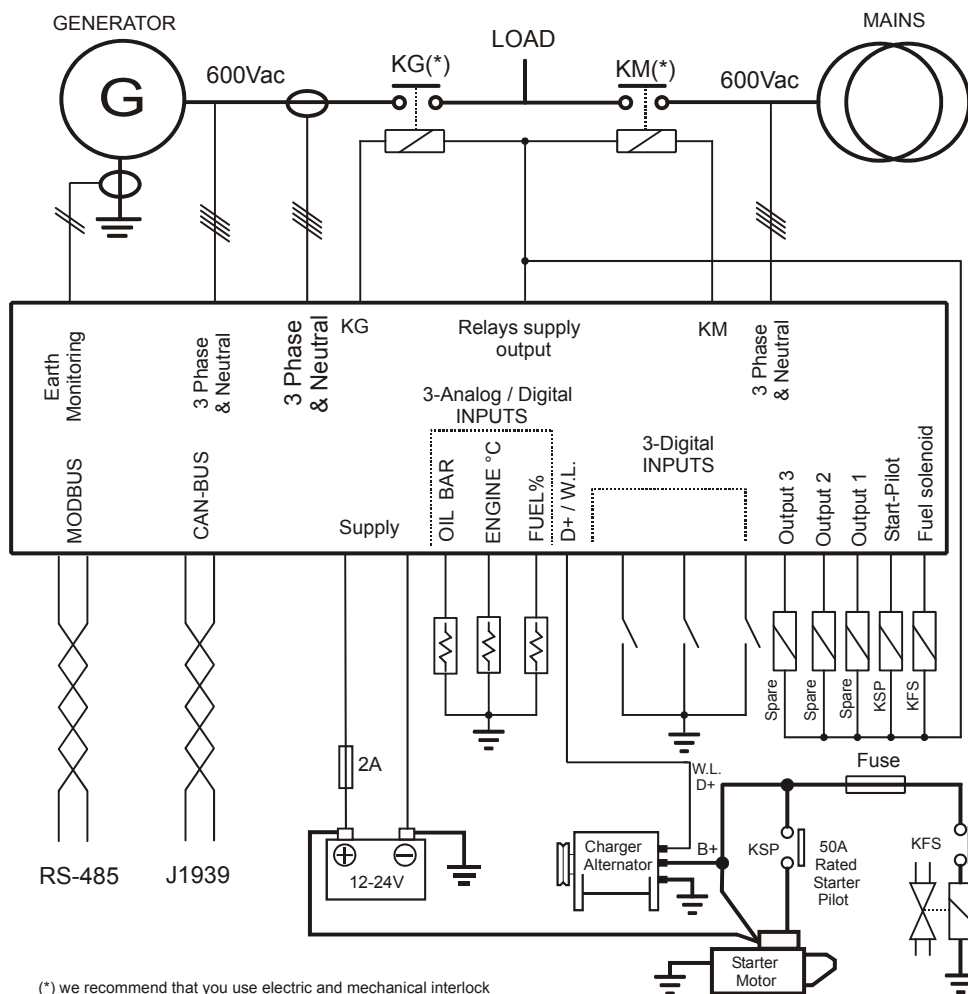
9.0 Characteristics

- Supply Voltage: 5.5-36Vdc (120mA)
- Dimensions: DIN 192X144X67(mm)
- Weight: 500 gr.,
- Static Outputs: 300mA/100Vdc
- Digital Inputs: -100 / +100Vdc
- Rated Vac Max: 600Vac. Rated Aac Max: 7Aac
- Charger Alternator: up to 36Vdc
- Vibration: 40mm/sec.
- Operating / Storage Temperature: -30 / +70°C
- Humidity: 5% up to 95% non-condensing

Be-K3 Design: 89/336 EEC, 89/392 EEC, 73/23 EEC, 93/68 EEC, IEC 68-2-6 Certification: CE

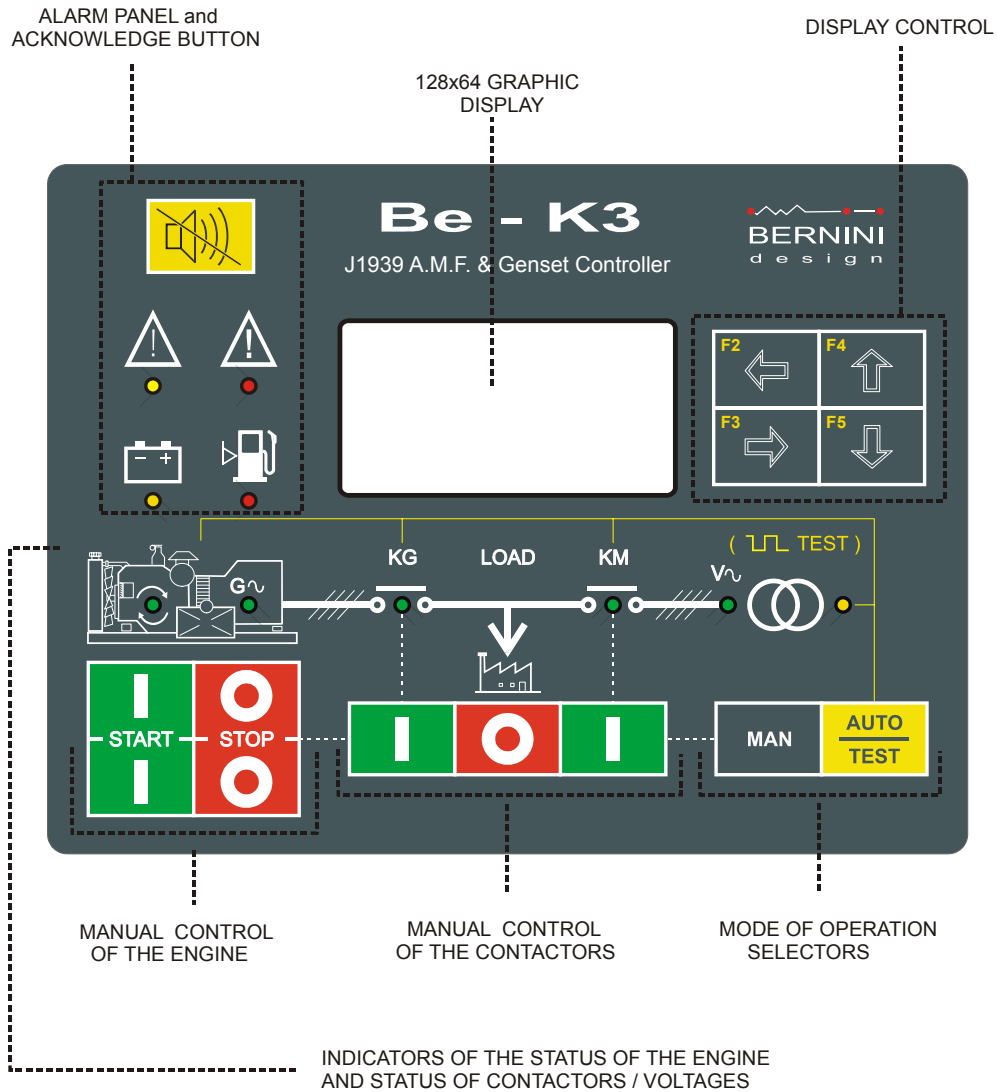
10.0 K3 Typical Application

MODEL K3: SIMPLIFIED WIRING DIAGRAM



(*) we recommend that you use electric and mechanical interlock

Section 11.0 Front Panel / Layout



12.0 Programmable Parameters

<u>MAINS MONITORING</u>	<u>ENGINE</u> (see next page also)	<u>CLOCK & TEST</u>
<ul style="list-style-type: none"> -Mains Failure timing -Mains Breaker timing -Mains Restore timing -Contactors changeover timing -Over voltage & delay -Under voltage & delay -Under Hz limit & delay -Over Hz limit & delay -Phase Sequence monitoring -Phase Mode -PT ratio 	<ul style="list-style-type: none"> -Crank delay -Crank time -Rest time -Crank attempts -Pre-glow time -Pre-lube time -Pre-glow mode -Warm up time -Cooling down time -Stop Solenoid time 	<ul style="list-style-type: none"> -Clock (Date) -Clock (Time) -Periodic Test enable -Test Date -Test time

