BeK2-K3 Sales bulletin summary

1.0 Description

The BeK2 is a 3-phase A.M.F / A.T.S. controller / Generator controller and monitoring system. 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 BeK2 interfaces with resistive-sensors and a magnetic Pick-up (or 'W'). Measurements including Vac, Aac, Vdc, kVA, kVar, kW, Energy, Pf, Hz, hour count, R.p.m., Oil Pressure, Engine Temperature, Battery Vdc (Engine) and Fuel Level. A monitoring and control software program is also provided. The Be-K2 provides RS485 with MODBUS protocol and complies with NFPA-110 / NFPA-99 specifications. Version K3 features CAN-BUS instead of Analog Inputs

2.0 State-of-the-art Innovative features

- *Ideal for Dual-Genset standby applications for Industry & Telecom*
- *RS485, MODBUS & TCP-IP protocol, generate compatible EXCEL files* (©)
- *200 Events Log history tagged by a Real Time Clock*
- *Reverse Power and Earth Fault monitoring*
- *Interfaces with Resistive sensors, indicates all Engine parameters*
- *Indicates kVA, kVAr, kW, PF, Aac, Vac, Hz and kWh-meter & h-meter*
- *Rental 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-hour dynamic burn-in, 3-Year warranty*
- *Support chinese language (character size 14x16 pixel) and CAN-BUS (K3)*

3.0 Programmable Inputs

The Be-K2 features 6 digital inputs and 3 analog inputs. The digital inputs can be configured normally closed or open with the following options:

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

The 3 analog inputs, can be programmed with a 6-points response curve.

4.0 Programmable Outputs

The Be-K2 features 7 outputs. Three outputs can be configured as follows:

OPTIONS		
The Output is disabled		Maintenance SERVICE 1,2 and 3
Under Speed Shutdown		Alarm 1: Shutdown / Warning
Over Speed Shutdown		Alarm 2: Shutdown / Warning
Pick-up Failure		Auxiliary Alarm 1-2-3: Shutdown / Warning
Common Speed Alarms		Panel Stop Shutdown
Under Frequency Shutdown		**Common Input Alarm**
Over Frequency Shutdown		Presence of Nominal Mains Parameters
Over Current Shutdown		Presence of Nominal Generator Voltage
Over Current Warning		Mains Failure Timing
Over KVA, KW Warning or Shutdown		Mains Restore Timing
Minimum KW Warning		KG Contactor of the GENERATOR Closed
Maximun KW Warining		KM Contactor of the MAINS Closed
Phase Sequence Error Shutdown		Crank Delay (Start Warning)
Reverse Power Shutdown		Pre-glow ACTIVATED
Over/Under Voltage Shutdown		PURGE (gas engine valve control)
Overload (input JF4) Shutdown		Engine Running Status
Alternator Failure Shutdown		Cooling Timing
Common Generator Alarms		Warm up Timing
Low Oil Pressure Warning or Sensor Failure		RENT Warning(<48h)/Shutdown (Expired)
Low Oil Pressure Shutdown (Sensor/Switch)		Be-K2 in OFF MODE (Status)
Common Oil Pressure Alarms		Be-K2 in MANUAL MODE (Status)
High Temperature 1 Shutdown		Be-K2 in AUTO MODE (Status)
High Temperature 2 Shutdown		Be-K2 in TEST MODE (Status)
High – Low Temperature Warning (Sensor)		Be-K2 in LOCK MODE (Status)
Common Temperature Alarms		Automatic Periodic Test
High – Low Battery Voltage Warning		Fail To START Shutdown
No Fuel in Tank Shutdown		Fail To STOP Shutdown
Low Level Fuel Warning		Engine Belt Break Shutdown
Fuel Reserve Warning		Indication of Parameter Error warning
High Fuel Warning		Idle Engine
Fuel Sensor Failure Warning		Clock Error or Periodic Test Error
Fuel Pump (to fill the TANK)		Lube Pump
Common Fuel Alarms / Sensor Failure		Can-Bus /ECU control (4 options)

5.0 Display features

The Be-K2 features a graphic OLED 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	LOW OIL PRESSURE	
		MAINTENANCE 1-2 WARNING
OVER/UNDER VOLTAGE	OIL SENDER FAILURE	MAINTENANCE 3 SHUTDOWN
ALTERNATOR FAILURE	HIGH-LOW COOLANT TEMPERATURE	
OVERLOAD	TEMPERATURE SENDER FAILURE	FUEL RESERVE
OVER CURRENT		NO FUEL SHUTDOWN
SHORT CIRCUIT	REMOTE EMERGENCY	
		HIGH / LOW FUEL WARNING
PHASE SEQUENCE	LOCAL EMERGENCY	FUEL SENSOR FAILURE
EARTH FAULT		
		LOW BATTERY V
MAX / MIN KW WARNING	ALARM INPUT 1-2-3	HIGH BATTERY V
OVER KVA SHUTDOWN	FAIL TO STOP	CLOCK ERROR
	FAIL TO START	PARAMETER ERROR
REVERSE POWER	BELT BREAK	
		SYSTEM NOT IN AUTO
OVER/UNDER SPEED	REMOTE LOCK	
PICK UP FAILURE		
	RENT WARNING	PERIODIC TEST ERROR
MAINS FAILURE	RENT SHUTDOWN	
CONTACTORS ALARM		
KM / KG FAILURE		

5.2 Display: Menu & Measurements

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

6.0 Pushbuttons features

The Be-K2 features 12 membrane pushbuttons used for the following tasks :

Push buttons	**Notes**
[START-ON] [STOP-OFF]	Are used to Start-Stop the Engine or programming
[I] - [0] - [I]	Control the status of the contactors
[MAN-AUTO] [OFF]	Select the mode of operatiion
[RIGHT] [LEFT] [UP] [DOWM]	Are used to control the display or programming
[ACKNOWLEDGE]	It silences the horn

7.0 Speed detect

The Be-K2 detects the speed of the engine from one of the following sources:

Pick-up	It interfaces with magnetic pick-up (0-10 KHz)
W (charger Alternator)	It interfaces with 'W' analogue signal of the charger alternator
Generator	It detects the speed from the frequency of the Generator

8.0 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

9.0 Serial communications

The Be-K2 features an RS485 serial interface. The protocol MODBUS provides an easy way to interface with other equipment. Software running on computer is available. The software, running on PC, can generate .XLS compatible files and allows Wireless TCP-IP data communications (an external GPRS modem is required).

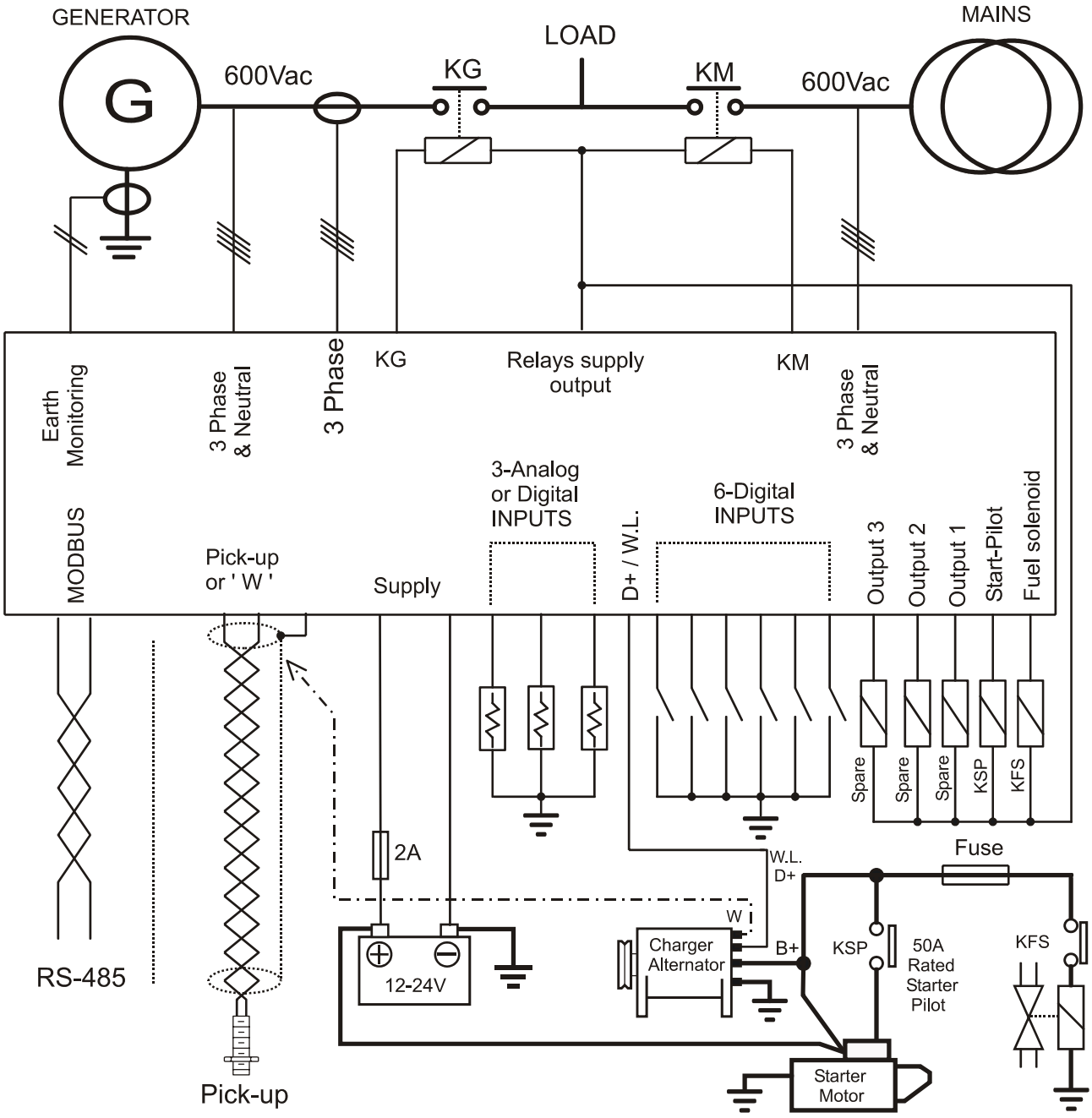
10.0 Characteristics

- 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 / StorageTemperature: -30 / +70°C
- Humidity: 5% up to 95% non-condensing

Be-K2 Design: 89/336 EEC, 89/392 EEC, 73/23 EEC, 93/68 EEC, IEC 68-2-6 Certification: CE

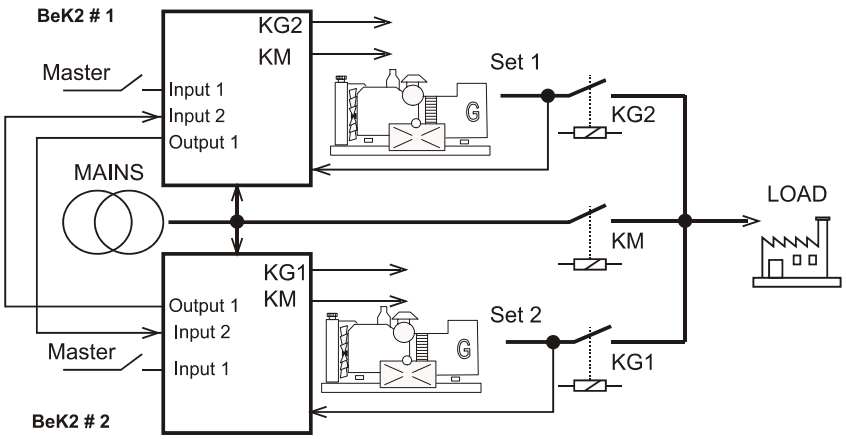
11.0 K2 Typical Application (*)

MODEL K2: SIMPLIFIED WIRING DIAGRAM

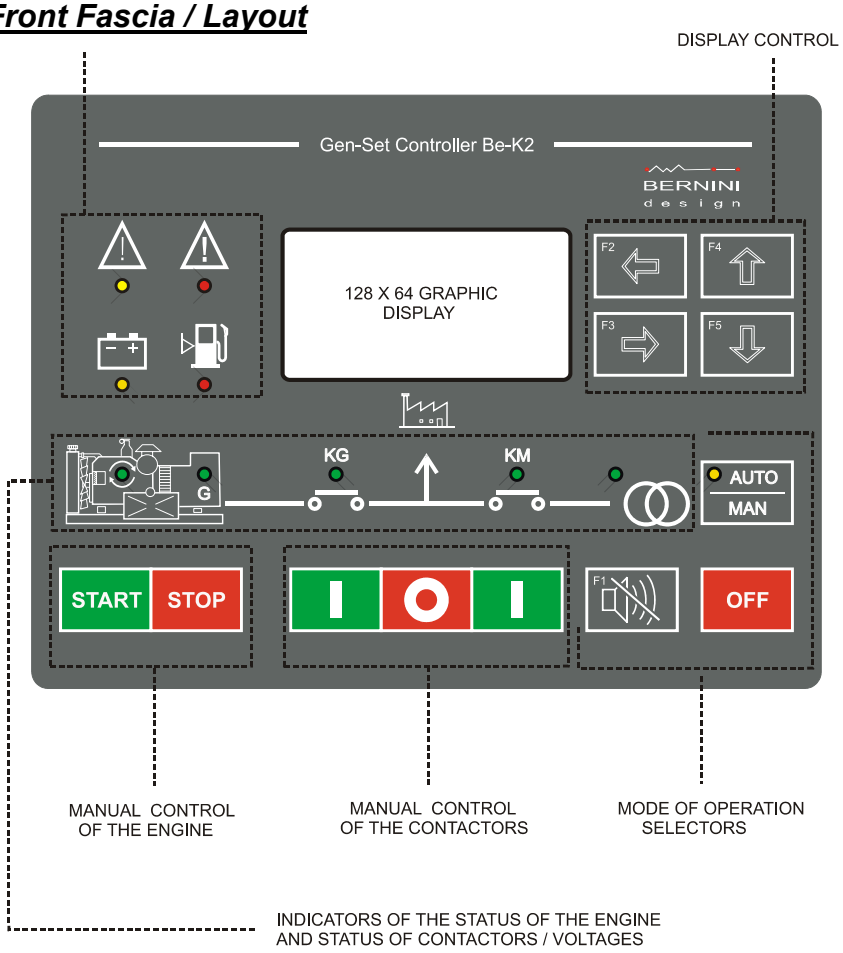


(*)Version K3 features J1939 port instead of Analog Inputs

12.0 Dual Genset application



Section 13.0 Front Fascia / Layout



14.0 Programmable Parameters

MAINS MONITORING
-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

AUTOSTART CONTROL

VDC High limit	Temperature High
VDC Low limit	Temperature Low
MAINS failure	Remote Controls
Periodic Test	Exerciser

GENERATOR
-Under voltage & delay
-Over voltage & delay
-Under Frequency & delay
-Over Frequency & delay
-Warning current & delay
-Over current & delay
-Short Circuit & delay
-Max KW Warning & delay
-Min KW Warning & delay
-Over KVA Shutdown & delay
-Reverse power settings & delay
-Alternator failure settings
-Alternator Poles
-Earth Fault setting
-Contactor Control
-Phase sequence monitoring
-Phase Mode
-CT size
-PT ratio

PROGRAMMABLE INPUTS
30 options for each inputs

PROGRAMMABLE OUTPUTS
65 options for each outputs

ENGINE
-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
-Crank termination Vdc
-Belt break setting
-Charger Failure
-Crank termination Vdc
-Crank termination Vac
-Crank termination Hz
-Crank termination CAN-BUS
-Low Oil pressure warning / shut down
-High Temperature warning / shut down
-Low Temperature warning
-Gas Purge
-Idle Speed
-Alarms bypass timing
-Fail to stop enable

-Tooth count
-Under Speed & bypass delay
-Over Speed & bypass delay

-Canbus /J1939 settings (model K3)

MISCELLANEOUS
-EJP time
-Test timeout
-Maintenance 1 setting
-Maintenance 2 setting
-Maintenance 3 setting
-NFPA - 110 Level 1&2
-RENTAL CONTRACT
-Horn Timeout
-Hour Counter set
-Periodic Test
-In field Calibration

COMMUNICATION SETTINGS
-Modem settings
-Phone book programming
-SMS editing
-Rs485-MODBUS

CLOCK & TEST
-Clock (Date)
-Clock (Time)
-Periodic Test enable
-Test & Date
-Test & time
-Date & Options

FUEL CONTROL
-Low Fuel Warning %
-High Fuel Warning %
-Pump Start %
-Pump Stop %
-No Fuel bypass
-Fuel Reserve
-Delay settings

OIL PRESSURE SENSOR
Warning / Shutdown
0-1000 OHM

FUEL SENSOR
Warning / Shutdown
0-1000 OHM

TEMPERATURE SENSOR
Warning / Shutdown
0-1000 OHM

SECURITY SETTINGS
-Passwords OEM
-Password USER
-Calibration
-Memory
-Default settings

15.0 Front and Rear view