

Connecting a BE124 on a genset equipped with BE23/BE46. How to replace the BE23/BE46. [Page 1 of 5]

You can replace a BE23/BE46 controller with a Be124 controller. The first step is about wiring modifications. On the 'BE23/BE46 terminals' column you will find the Be23/Be46 connections list. The 'BE124 Terminals' column contains the correspondent BE124 connection. It might be necessary a modification to some settings. To do that, we vividly recommend that you follow the instructions on the BE124 OEM instruction manual. Contact Bernini design: bernini@bernini-design.com

WARNING: DISCONNECT THE BATTERY BEFORE COMMENCING ANY WORK ON THE ELECTRICAL WIRINGS

High voltage is present inside the Be124. The Be124 can start the engine at anytime. Do not work on equipment, which is controlled by the Be124. When servicing the engine, disconnect the battery and battery charger. We recommend that warning signs be placed on equipment indicating the above.

We recommend that you make several pictures of the system (back of the controller, connections, terminal block, inside views of the panel etc..) before commencing the modifications. This will help you in case you are no longer able to identify the wires. You can send the picture to us in a way that we can provide additional support.

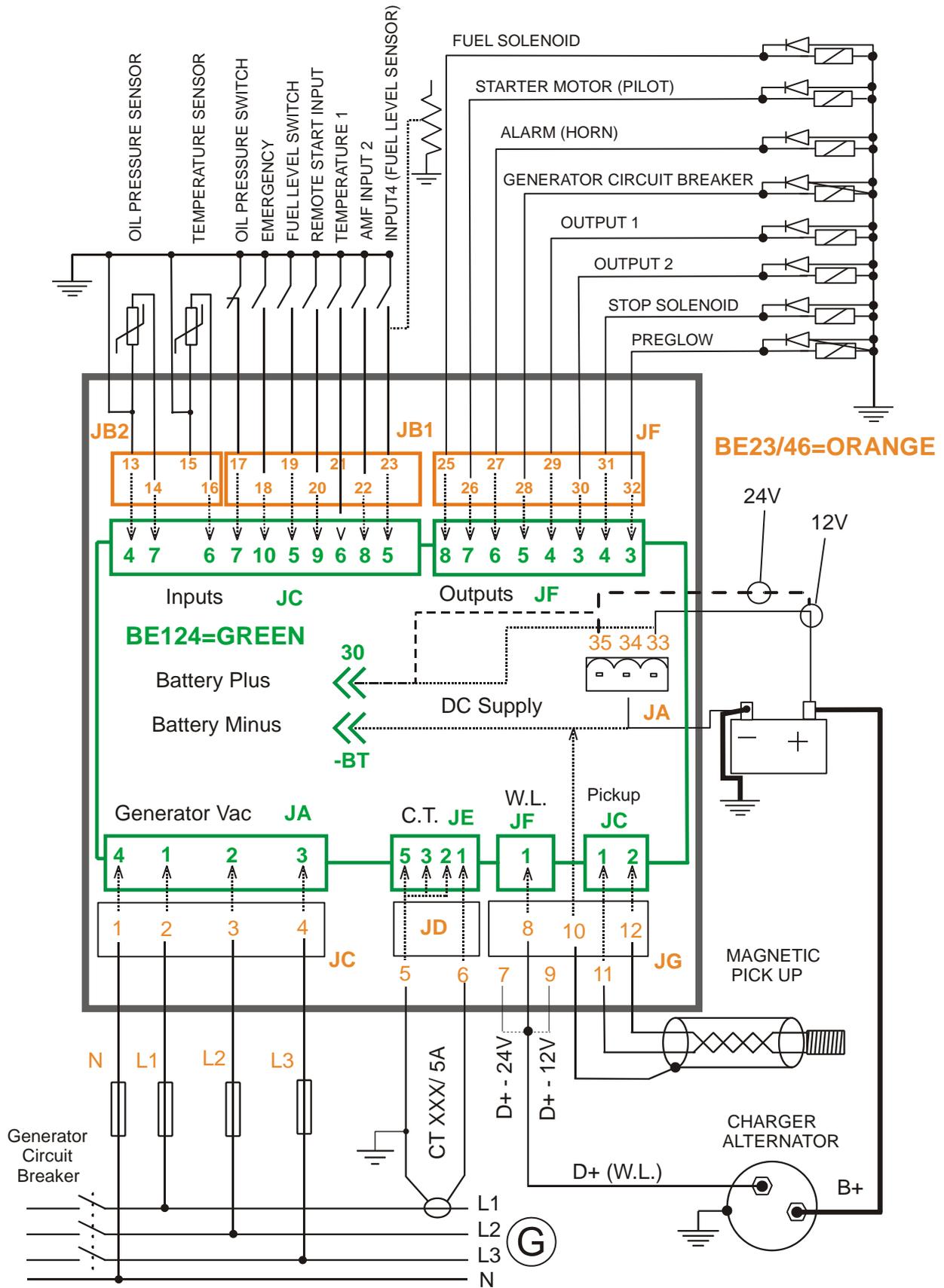
BE23/BE46	Description	BE124	BE124 Connections
JC-1	Generator Neutral	JA-4	These terminals must be connected to the generator. If not provided on your panel, we recommend that you protect the wires by using 1 Amp fast blow fuses. <u>We recommend that you protect the JA connector with a good insulating tape. This will avoid short circuits in case a wire disconnects from the terminal block receptacle. Use at least one cable tie to secure the insulating tape.</u>
JC-2	Generator Phase L1	JA-1	
JC-3	Generator Phase L2	JA-2	
JC-4	Generator Phase L3	JA-3	

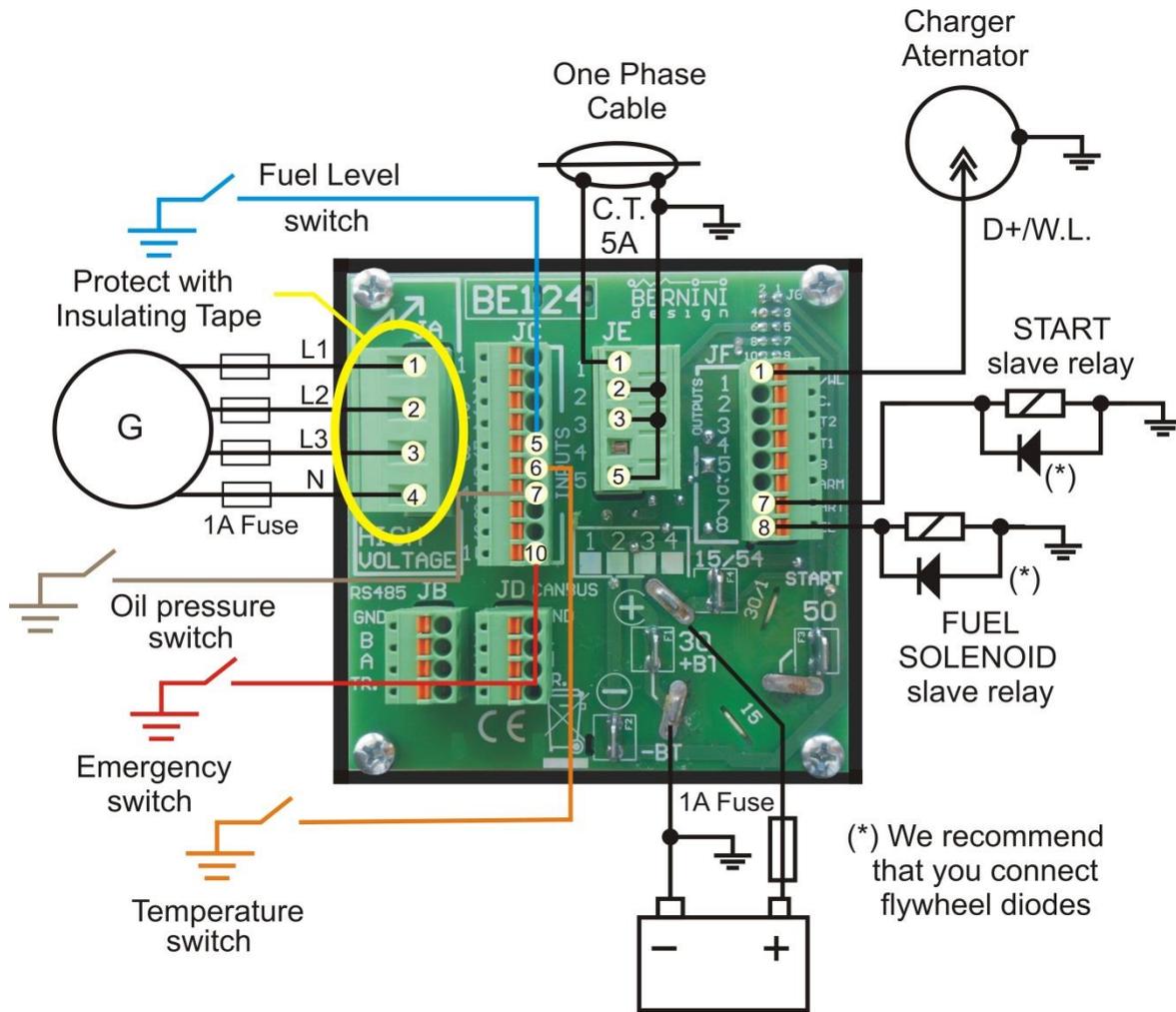
BE23/BE46	Description	BE124	BE124 Connections
JD-5	Current Transformer Phase L1 Terminal S1	JE-2 JE-3 JE-5 GND	It is about Current Transformer connection. To program the C.T. size, see section 11.3.13 of the Be124 manual. We recommend that you connect to ground the terminals JE-2-3-5 (battery minus).
JD-6	Current Transformer Phase L1 Terminal S2	JE-1	You can leave open the Earth Fault Current Transformer terminal (JE-4).

BE23/BE46	Function	Description	BE124 Connections	
JG-7	Output	Charger Alternator Monitoring D+ /W.L.	If a wire is present on the JG-7 terminal, simply do not use it. You can cut the wire.	
JG-8	Input	Charger Alternator Monitoring D+ /W.L.	JF-1	This connection is mandatory for detecting an 'engine running' condition. <u>Please note that if you leave this terminal open, you will not be able to start the engine (Be124 will detect an 'Engine Running' condition).</u>
JG-9	Output	Charger Alternator Monitoring D+ /W.L.	If a wire is present on the JG-9 terminal, simply do not use it (you can cut the wire).	
JG-10	Ground	Pick Up (Shield)	Connect the shield directly to battery minus or leave it open.	
JG-11	Input	Pick Up +	JC-1	In order to getn the speed indication, you are required to set up the TEETH number (see [PICKUP/W RATIO] on section 11.5.5).
JG-12	Input	Pick Up -	JC-2	

BE23/BE46	Function	Description	BE124	BE124 Connections
JB-13	Inputs	Ground Zeroing	JC-4	It allows Be124 to compensate the error introduced by the difference of the potential in between the engine body and battery minus. If JB2-13 is connected to BE23/BE46, connect now to BE124 JC-4. If it was not connected, leave the BE124 JC-4 terminal block connection open (it means that the engine does not feature sensors).
JB-14		Oil Pressure Sensor	JC-7	This input monitors the Oil Pressure Sensor. See section 11.4.11 to set an alarm and table 11.10 for the programmable response curve. Factory programming sets the input to digital mode (you are required to connect a switch). To enable the 'sensor mode' you are required to set one alarm (Low Pressure Warning or Shutdown) and connect the ground sense JC-4.
JB-15		Not Used (see JB2-13)		
JB-16		Engine Temperature Sensor	JC-6	This input monitors the Temperature sensor. See section 11.4.09-10 to set an alarm and table 11.10 for the programmable response curve. Factory programming sets the input to digital mode (you are required to connect a switch). To enable the sensor mode you are required to set one alarm (Low or High Temperature) and connect the ground sense JC-4.
JB-17		Oil Pressure Switch	JC-7	Oil Pressure Switch Input. The Be124 will shut down the engine in case of low oil pressure. If the terminal JC-7 is already use for the Oil Sender, contact us for support.
JB-18		'Input 3' (Emergency Stop)	JC-10	Input 1 / Emergency Input. It stops the engine immediately and the display will indicate a SHUTDOWN alarm. Factory programming features a Normally Open Contact. You can set a Normally Closed Mode: see section 11.8 of the OEM manual.
JB-19		Fuel Level Switch	JC-5	Fuel Level Switch Input. The Be124 will shut down the engine after the TANK EMPTY DELAY time-out (see 11.6.1). In case you set the timer in OFF mode, the Be124 will provide a warning only. If your application features Level Switch & Level Sensor, contact us for support.
JB-20		Remote Start	JC-9	Input 2. Remote Engine Start. Be124 monitors the input only in 'AUTO' mode. If you program option N.O., the engine will start when you connect the input to battery minus. Be124 stops the engine when you open the switch. Program the option N.C. if you want to reverse the logic (see section 11.8).
JB-21		Temperature switch '1'	JC-6	Coolant Temperature Switch Input. If the temperature switch closes the contacts in case of high temperature the Be124 will shut down the engine. If the engine features Switch Temperature & Temperature Sender contact us for support.
JB-22		Input	'A.M.F. input 2' Remote start input	JC-8

BE23/BE46	Function	Description	BE124	BE124 Connections	
JB-23	Input	Fuel Level Sensor	JC-5	This input monitors the Fuel Level sensor. See section 11.6 to set an alarm and table 11.10 for the programmable response curve. Factory programming sets the input in digital mode. To enable the analog mode, you are required to set at least one alarm (Low/High fuel) and connect the ground sense JC-4. If your application features Level Switch & Level Sensor simultaneously, contact us for support.	
JB-24	-----	Not used			
JF-25	Output	Fuel Solenoid	JF-8	Energized to run output for Fuel solenoid and ancillary circuitry. This output drives the slave relay.	
JF-26		Start Pilot	JF-7	It drives the Starting Motor via a start pilot relay. This output drives the slave relay.	
JF-27		Horn	JF-6	It drives the Horn via an auxiliary slave relay.	
JF-28		Generator Circuit Breaker Output	JF-5	It drives the auxiliary relay of the Generator Circuit Breaker.	
JF-29		Output '1'	JF-4	These are configurable output. We recommend that you browse the 11.9 section to find the correspondent function used in the Be23/Be46 controller. In case of problems contact us for support.	
JF-30		Output '2'	JF-3		
JF-31		Stop Solenoid	JF-4	Stop Solenoid output. Used in case you require an energized to stop solenoid. You are required to set the option [23] for the 'output 1' (see table 11.9). See section 11.4.7 to setup a time for this function.	
JF-32		Preglow	JF-3	Preglow output. You are required to connect a driver relay for preglow. See section 11.4.5 for programming.	
JA-33 Or JA-35		Battery Plus Supply	12V or 24V Battery Plus Supply	+BT 30 Faston	An internal Electronic 300mA Thermal Protection is provided. You can use a 12V or 24V battery.
JA-34		Battery Minus	Battery Minus	-BT Faston	Should be connected straight to the battery minus. We recommend that you use a wire with minimum size of about 2.5 sq.mm.





Important notes:

- a) The improper wiring of a controller could damage your Engine, Generating Set, Panel or equipment fitted with a Bernini Design controller (genset controller, genset control system).
- b) The improper wiring or improper arrangement of our controller could also be dangerous for people working with the equipment that you are going to build (genset or similar).
- c) Bernini Design is not responsible for installation or operation of any generator set, diesel generator set, generator panel, or equivalent equipment fitted with a Bernini Design controller.
- d) If there is any doubt about the use of a generator set (or equipment) controlled by a Bernini Design controller, you must contact the company responsible for the installation.

About Safety issues please note:

- A) Installing a Bernini Design Controller implies work with dangerous currents and voltages. All the time provide fuses to limit the amount of the current especially with batteries.
- B) The installation must be carried out by qualified personnel only (qualified electrical technician).
- C) Disconnect all Electrical Power (Mains, Battery and others) and make sure the engine (or equipment) is inoperative before commencing the installation.
- D) Any modification to a Bernini Design controller or any use outside the specifications provided by Bernini Design may cause personal injury or damages to equipment.
- E) Ensure that MAINS Power (network supply) is isolated and connect only after observing the correct rated input voltage
- F) All the time consider the risk of explosive gases working closer of LEAD ACID BATTERIES.