BALDWIN BOXALL
LEADING THE WAY TO SAFETY

BVMBC Battery Charger

Installation Instructions

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This equipment has been designed and manufactured to conform to both CE & UKCA requirements

Failure to use the equipment in the manner described in the product literature will invalidate the conformity.

A “Declaration of Conformity” statement and a “Declaration of Performance” is available on request.

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AMENDMENT RECORD

Change Note Number	Nature of Amendment	Date of Amendment
DP348	Initial release: Issue 1	Dec 2016
ECR3493	Issue 2: Table 2.1 (Rear Panel Details) update.	Nov 2018
ECR3599	Issue 3: Added Caution to Connection Details	Apr 2019
ECR4318	Issue 4: Added UKCA and minor text updates	Feb 2021

PROPRIETARY NOTICE

Safety Information

Personnel who install, maintain or repair this equipment must read the safety information below before starting work.

Voltages in excess of 30 Volts RMS or 50 Volts DC are considered Hazardous and in certain circumstances can be lethal.

If Functional Testing, Maintenance, or Repair is to be completed with the Mains Power (and/or battery backup) connected then this should only be undertaken by personnel who are fully aware of the danger involved and who have taken adequate precautions and training.

This Manual contains Warnings, Cautions and Notes.

Warnings describe potential threats to health or life, e.g.

Warning

Before attempting to remove this component, ensure the Mains Power Supply and Battery Backup have been disconnected.

Cautions describe potential threats to the equipment, e.g.

Caution

Notice must be taken of all cautions.
If a Caution is ignored the equipment may be damaged.

Caution: Electro-static Sensitive Devices

Observe the relevant precautions for the protection of Electro-static Sensitive Devices when handling this equipment.

Notes are statements that are useful to the user in the context of a particular section of the manual, e.g.

Note: Do not speak into the microphone until the "Speak Now" LED is illuminated.

Comments

Comments regarding the content of this manual are welcome and should be addressed to hello@baldwinboxall.co.uk.

1 Introduction

1.1 BVMBC Battery Charger Description

The BVMBC Battery Charger when used with VIGIL3 amplifiers forms a complete EN54-4 compliant power supply solution.

The BVMBC can be connected to up to 5 VIGIL3 amplifier modules.

The BVMBC is mounted in a VIGIL3 main frame with up to 2 VIGIL3 amplifier modules.

The BVMBC provides an Auxiliary DC output used for powering other equipment.

1.2 BVMBC Battery Charger Specifications

Table 1.1 — BVMBC Specifications

Parameter	**Specification**
Maximum Battery Capacity	5 x VIGIL3 Amplifer Modules : 150Ah 4 x VIGIL3 Amplifier Modules : 150Ah 3 x VIGIL3 Amplifier Modules : 150Ah 2 x VIGIL3 Amplifier Modules : 100Ah 1 x VIGIL3 Amplifier Module : 55Ah
Minimum Battery Capacity	1-5 x VIGIL3 Amplifer Modules : 40Ah *
Charge voltage @ 20°C	27.35V
Temperature compensation	-48mV/°C
Battery low fault voltage	21V
Battery deep discharge cut off voltage	18V
Battery high resistance fault	22mΩ (above set-point) ***
Aux dc output voltage	30V (mains present) Battery Voltage (mains not present)
Aux dc output max current	2A
Volt-free fault relay output contacts	100V @ 1A Max
Front Panel Indications	
Power on	Battery or Amplifier Supply Present
OK	No fault
Fuse **	No supply from connected VIGIL3 amplifier(s) AC mains not connected to VIGIL3 amplifier(s) VIGIL3 amplifier(s) internal 12V supply failed VIGIL3 amplifier(s) internal 180V supply failed BVMBC Aux DC output failed
Charger **	VIGIL3 amplifiers (s) DC charging supply <28V Charge voltage >29V Charge voltage <21V
Battery Hi Res **	Battery resistance greater than set-point**
Battery Low Volt **	BVMBC battery voltage <21V VIGIL3 amplifier(s) battery voltage <21V

*NOTE: * Ensure maximum charge rate is not exceeded:*

5 x VIGIL3 Amplifier Modules - max charge 10A

4 x VIGIL3 Amplifier Modules - max charge 8A

3 x VIGIL3 Amplifier Modules - max charge 6A

2 x VIGIL3 Amplifier Modules - max charge 4A

1 x VIGIL3 Amplifier Module - max charge 2A

Refer to Battery Manufacturer's specification for details.

*NOTE: ** If a fault has been indicated that has subsequently cleard the corresponding fault LED will flash. Briefly pressing the L/Test button will clear this indication. If the fault is currently present then the LED illuminates steadily and cannot be extinguished with the L/Test button.*

*NOTE: *** See "Battery Resistance" on page 9 for details of high resistance sensitivity setting.*

Table 1.2 — BVMBC Terminations

Description	**Type**
Battery Connection	2 pin screw connector
Aux DC, fault relay & external temp sensor connection	8 pin screw connector
DC & Data (VIGIL3 Amp Connections)	5 x RJ45 connectors

2 BVMBC Installation

The BVMBC Battery Charger has been designed for quick and simple connection and configuration.

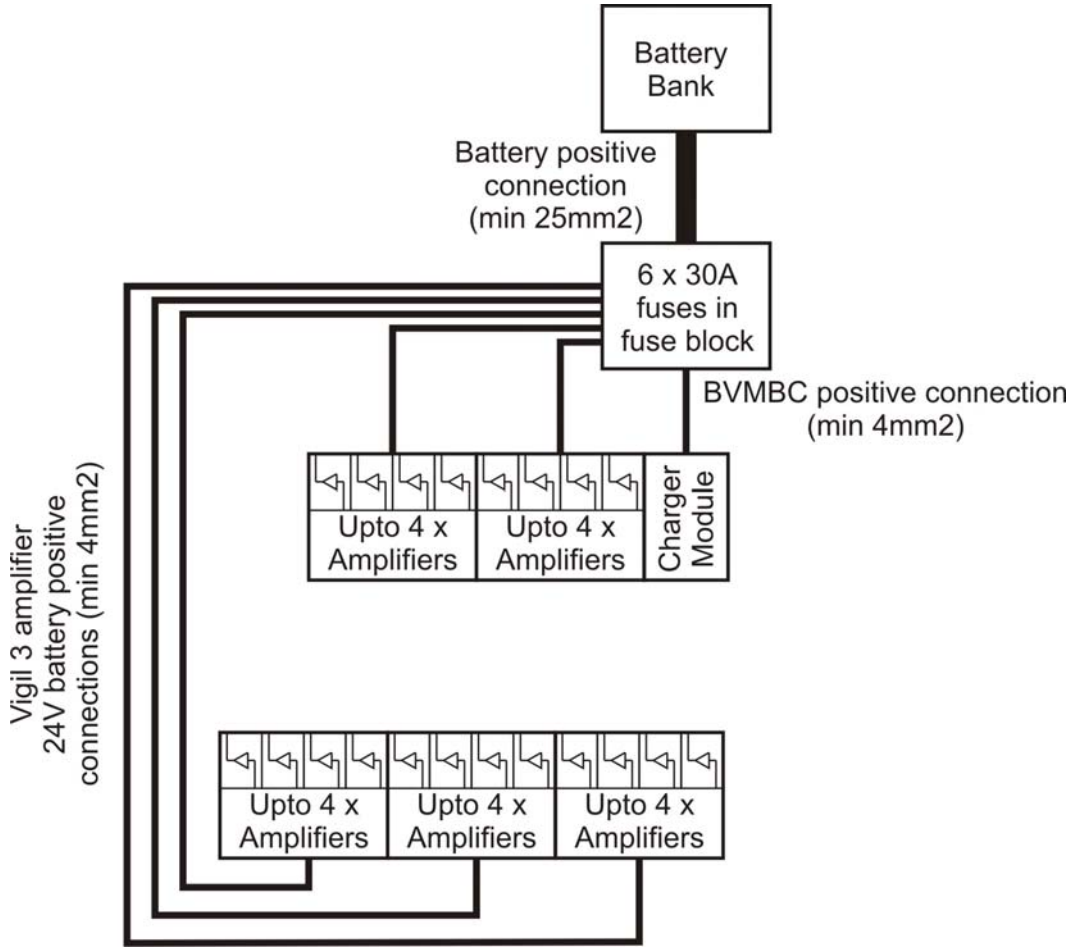
The BVMBC must be connected to up to 5 Vigil 3 amplifier modules as these provide charging power for the batteries.

CAUTION

Ensure the "Battery Charger" connection on the rear panel is plugged in and the black cable is connected to ground before power up.
If power is applied with this cable disconnected the charger may be damaged.

2.1 BVMBC / VIGIL 3 AMPLIFIER CONNECTIONS

Figure 2.1 — Battery Connections



NOTE: Battery negative connection should be taken back to the central earth point using minimum 25mm2 cable. VIGIL3 amplifier and BVMBC negative connections should be taken back to the central earth point using minimum 4mm^2 cable.

Figure 2.2 — VIGIL3 Amplifier to BVMBC connections

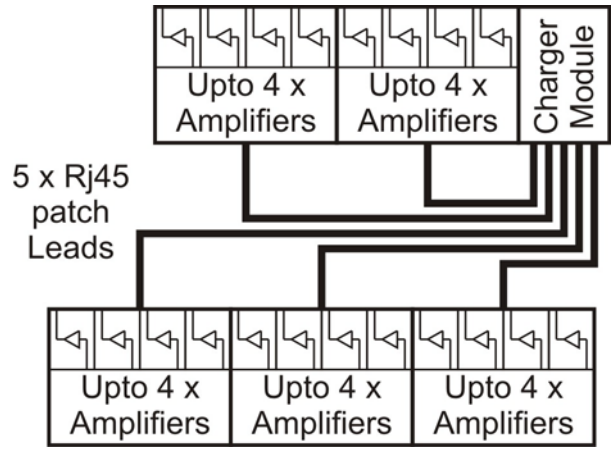
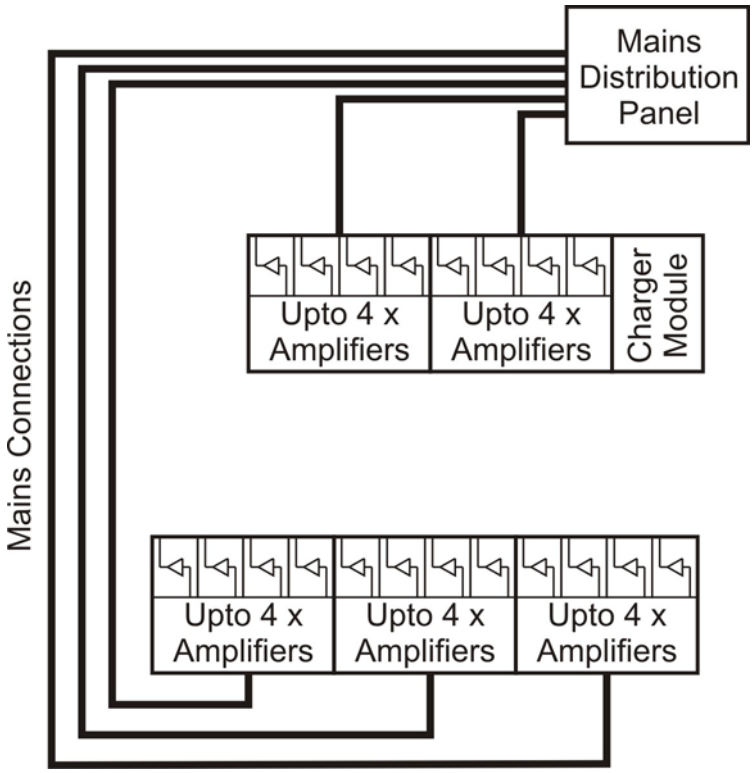


Figure 2.3 — Vigil 3 Amplifier Mains Connections



NOTE: Vigil 3 amplifier mains connections should be independantly fused at 6A

2.2 BVMBC Rear Panel Connection Detail

Figure 2.4 — BVMBC Rear Panel Detail

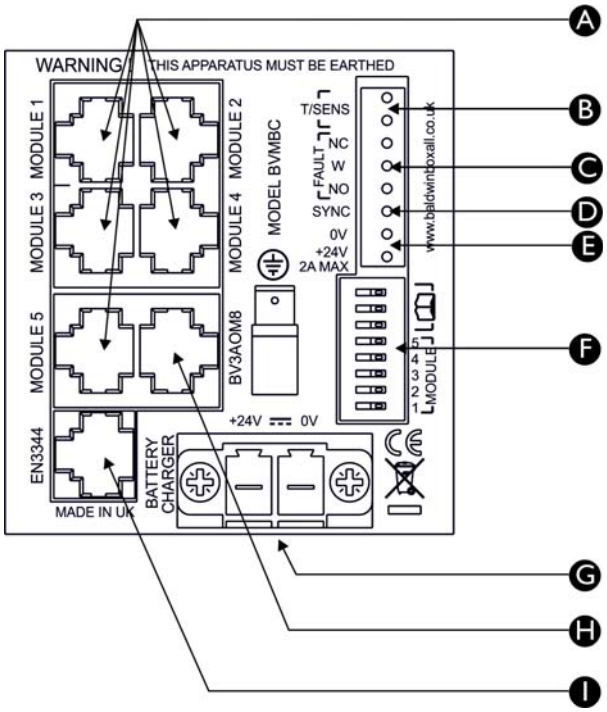


Table 2.1 — BVMBC Rear Panel Details

	Connection	**Connection Details**
A	Module	VIGIL3 amplifier module connections
B	T/Sens	Connect to UP1070 temperature sensor *
C	Fault	Fault Relay (100V 1A Max)
D	Sync	Do not connect ****
E	0V / 24V	DC Aux Output (2A Max)**
F	Dip Switch	See section configuration ***
G	Battery	Battery connection
H	BV3AOM8	Connection to BV3AOM8
I	Prog	Do not connect - factory use only

NOTE:

** Refer to "Temperature Compensation" on page 11 for more detail.*

*** If greater than 1A is required for auxillary devices do not use the 0V connection, return the 0V back to the battery negative terminal (chassis connection).*

**** Refer to "BVMBC Configuration" on page 9 for more detail.*

***** Only 1 BVMBC can be connected to a battery bank.*

2.3 BVMBC CONFIGURATION

The BVMBC must be configured before use. This is performed via the DIP Switches on the rear panel, (Item F, as shown in figure 2.4).

Table 2.2 — BVMBC DIP Switch Settings

Switch	Setting	Default
1	Amplifier Module 1 Enable - Set to On if VIGIL3 amplifier connected	On
2	Amplifier Module 2 Enable - Set to On if VIGIL3 amplifier connected	Off
3	Amplifier Module 3 Enable - Set to On if VIGIL3 amplifier connected	Off
4	Amplifier Module 4 Enable - Set to On if VIGIL3 amplifier connected	Off
5	Amplifier Module 5 Enable - Set to On if VIGIL3 amplifier connected	Off
6	High Resistance Fault Threshold *	Off
7	High Resistance Fault Threshold *	Off
8	Do Not Use	Off

*NOTE: * Refer to "Battery Resistance" on page 9 for more detail.*

2.4 BATTERY RESISTANCE

The BVMBC can detect an increase in battery resistance of 22mΩ, an increase in battery resistance indicates an ageing battery that must be replaced.

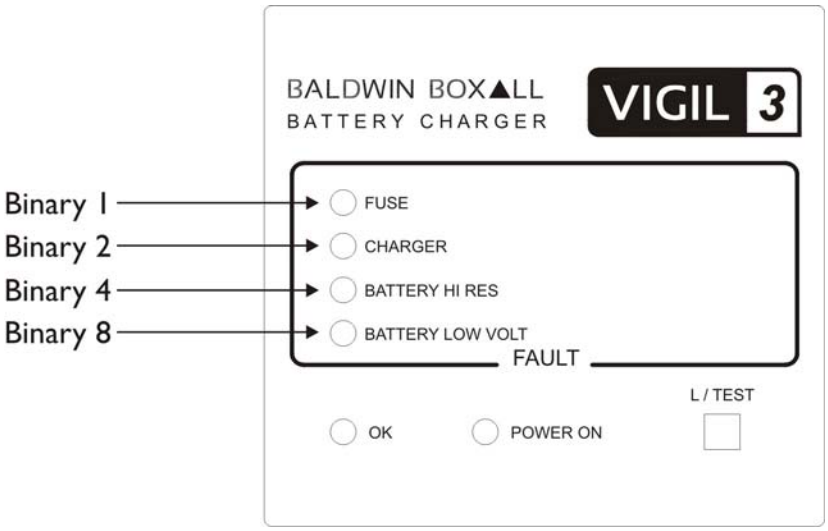
The as new resistance of a given battery will depend on the manufacturer, capacity and cabling from the BVMBC to the battery.

Therefore the BVMBC Battery Hi Res fault threshold must be configured for the batteries chosen and the installation.

The BVMBC has a built in "diagnostic mode" that is accessed by pressing and holding the L/Test button for 10 seconds.

The Fault LED's then indicate the measured battery resistance as shown below;

Figure 2.5 — BVMBC measured resistance indication



The measurement is shown as a binary representation of the measured resistance e.g.

Fuse - On & Charger - On = 3

Fuse - On & Charger - On & Battery Hi Res - On = 7

Briefly pressing the lamp test button displays the threshold that has currently been configured in the same way. If the measured resistance is greater than the threshold set then a Battery Hi Res fault will be indicated.

NOTE: It is normal for the measured reading to change slightly every 10 seconds. Therefore it is recommended to record the measured resistance readings for a period of 1 minute before deciding upon the the Hi Res Fault threshold.

The Battery Hi Res fault threshold is configured using Switch 6 and 7 of the DIP switches on the rear panel (see item F, as shown in figure 2.4 and Table 2.2).

The threshold settings are as shown below;

Table 2.3 — Battery Hi Res Fault Threshold

SW6	SW7	Threshold
OFF	OFF	9
ON	OFF	11
OFF	ON	13
ON	ON	Battery resistance checking disabled

2.5 Temperature Compensation

The BVMBC is factory set for a charge voltage of 27.35V at 20°C with temperature compensation of -48mV/°C.

In order for the BVMBC to accurately monitor the battery temperature an external temperature sensor lead (UP1070) must be connected to the T/SENS input on the rear panel (see item B of Figure 2.4).

The temperature sensor must be attached to the battery negative cable as close to the batteries as possible.

NOTE: The charger will display a "Charger Fault" if the external temperature sensor (UP1070) is either not connected, faulty, or the wrong type.

3 Basic Fault Finding

The BVMBC Battery Charger front panels provide indicators to show the current status of the unit. The following sections provide basic Fault Finding information should these indicators show a fault condition.

3.1 Power On LED not illuminated

The Power On indication illuminates to indicate that either Battery or Mains power (via the VIGIL3 amplifiers) is present. If this indication is not illuminated and power is present then the BVMBC or connected VIGIL3 amplifiers have failed and must be returned to Baldwin Boxall for service.

3.2 OK LED not illuminated

The OK LED should be permanently illuminated green to show that there are no faults present. If the OK LED is not illuminated then there will be additional corresponding Fault LED indications. Please refer to Table 3.1 for fault finding information.

Should the OK LED not be permanently illuminated green please refer to Table 3.1 for fault finding information

Table 3.1 — Fault Finding

Fault LED	Fault	Check
FUSE	No supply from connected VIGIL3 amplifier(s) AC mains not connected to VIGIL3 amplifier(s) VIGIL3 amplifier(s) internal 12V supply failed VIGIL3 amplifier(s) internal 180V supply failed BVMBC Aux DC output failed	Check that DIP switch settings are correct for the number of connected VIGIL3 amplifiers. Check connections between VIGIL3 Amplifiers and BVMBC. Check status LED's on VIGIL3 amplifiers (refer to VIGIL3 Amplifier installation manual for fault finding if any LED's are flashing). Check mains connections to VIGIL3 amplifiers. Check for shorts on BVMBC Aux DC output.
CHARGER	VIGIL3 amplifiers (s) DC charging supply <28V Charge voltage >29V Charge voltage <21V	Check connections between VIGIL3 amplifiers and BVMBC. Disconnect batteries and check for Short Circuit on BVMBC charger output (cabling).
BATTERY HI RES	Battery resistance greater than set-point	Check age of batteries - if over 5 years old replace batteries. Check wiring and fuse connections for high resistance. Check batteries are capable of providing the full alarm current - if not replace batteries.
BATTERY LOW VOLT	BVMBC battery voltage <21V VIGIL3 amplifier(s) battery voltage <21V	Check battery connection to BVMBC. If VIGIL3 amplifier status LED's are flashing check battery connections to the amplifier. Check Fuses.

NOTE: The BVMBC will display a "Charger Fault" if the external temperature sensor (UP1070) is either not connected, faulty, or the wrong type.

3.3 Disassembly Procedures

There are no Disassembly Procedures for this unit.

Warning

The BVMBC Battery Charger output stages contain Hot Parts, High Voltages, and operate at High Frequencies.
Do not attempt to disassemble these units or operate them without the covers in place.

Caution

There are no user replaceable fuses inside the Vigil 3 amplifiers. Failed units should be returned to Baldwin Boxall for repair or replacement.

4 Maintenance

4.1 Maintenance Requirements of BS5839-8

When a BVMBC Battery Charger is installed in a Voice Alarm System then the system must be maintained according to the requirements of BS5839-8.

4.2 BVMBC Battery Charger Routine Maintenance

The BVMBC Battery Charger module does not require any routine maintenance.

NOTE: The Lead Acid batteries used with the BVMBC have a limited life expectancy and require replacement at specified intervals. Refer to the system documentation for replacement dates.