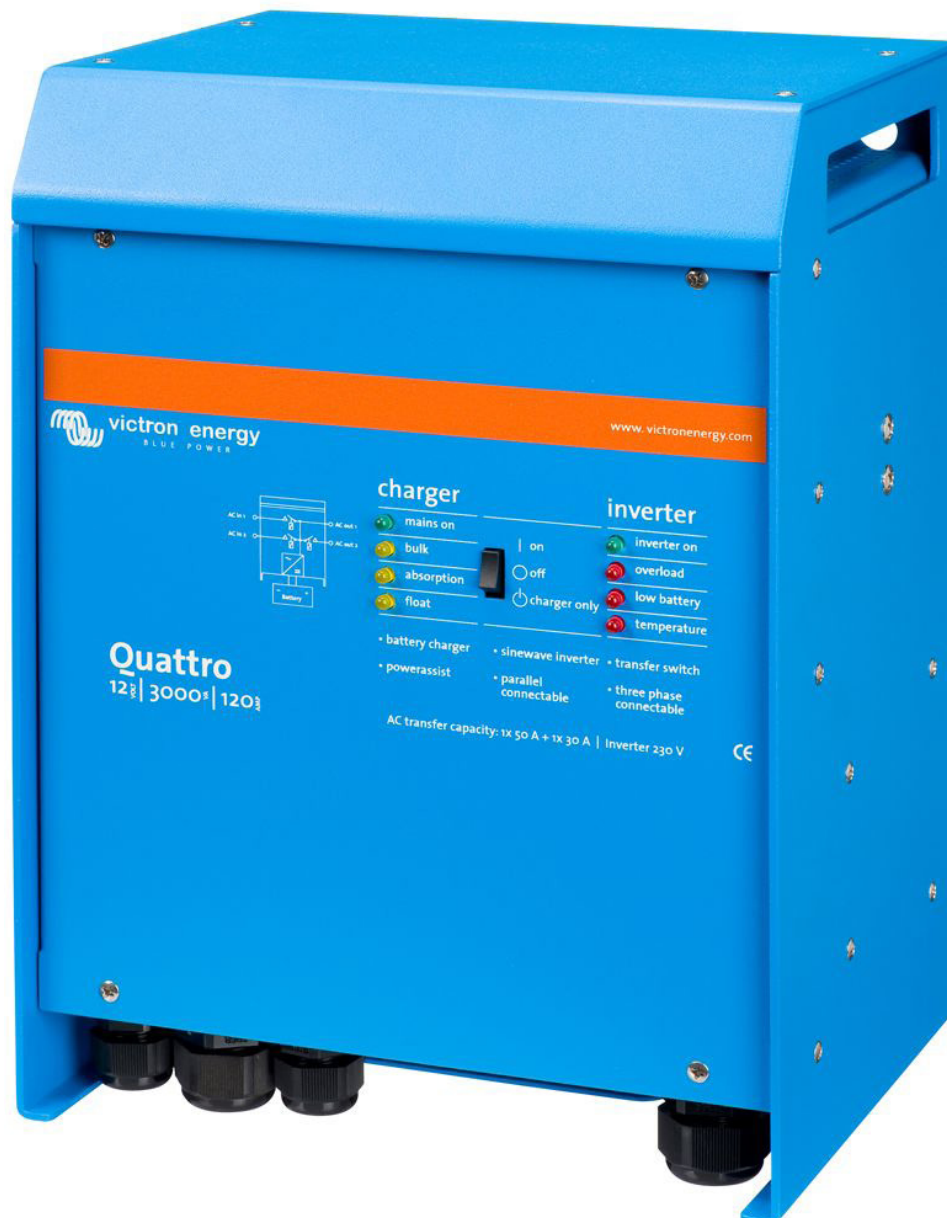


System Sump and Pump
VICTRON QUATTRO
12/3000/120 - Advanced Battery Backup System



The [Victron](#) range of Inverter/Chargers provide advanced solutions to ensure that Newton Pumping Systems continue pumping during power interruption by inverting 12V DC power from a battery (or multiple batteries) to clean and efficient 230V power.

The Quattro is an extremely powerful pure sine wave inverter, a sophisticated battery charger and automatic switch in a compact casing that features adaptive charge technology and a high-speed AC transfer switch.

WARRANTY STATEMENT

The Victron Inverter/Chargers are covered by a 5-year warranty. Warranty includes next-day on-site replacement (delivery and collection, not decommission and installation) of the Inverter/Charger units by a temporary replacement of the same model. If the warranty claim is upheld, this temporary unit will be exchanged with a new unit. If the warranty claim is not upheld, the client must decide the course of action, which will include purchase of a new replacement unit, purchase of the temporary replacement unit or return of the original unit.

Limited Product Warranties. 5-year limited product warranty from date on delivery note or invoice to the customer.

WHAT IS COVERED BY THIS LIMITED HARDWARE WARRANTY?

This limited warranty covers replacement (Newton Waterproofing Systems) only for defects in materials and workmanship.

WHAT IS NOT COVERED BY THIS LIMITED HARDWARE WARRANTY?

- Products the supplier has not received payment for
- Normal wear & tear
- Failure to follow product installation instructions and user instructions
- Usage that is not in accordance with the product instructions
- Servicing not authorised by the manufacturer
- Problems caused by connecting devices not supplied or authorised by the manufacturer



WARRANTY INFORMATION

This warranty gives you specific legal rights, and you may also have other rights which may vary from area to area (or jurisdiction to jurisdiction). The manufacturer's responsibility for malfunctions and defects in the product is limited to repair and replacement as set forth in this warranty statement. All expressed and implied warranties for the product, including but not limited to any implied warranties and conditions of merchantability and fitness for a particular purpose, are limited in time to the term of the limited warranty which is the 2-year period reflected on your delivery note or invoice. No warranties, whether expressed or implied, will apply after the limited warranty period has expired.

We do not accept liability beyond the remedies provided for in this limited product warranty or for consequential or incidental damages, including without limitation, any liability for third-party claims against you, for damages for products not being available for use. Our liability will be no more than the amount you paid for the product that is the subject of a claim. This is the maximum amount for which we are responsible. Newton Waterproofing Systems reserve the right to change the product specification at any time.

	PAGE
INFORMATION	4
DIMENSIONS	4
SAFETY INSTRUCTIONS	4
INVERTER SIZING	5
TYPICAL DETAILS	5
INSTALLATION	6 - 9
QUICK INSTALL GUIDE	9
OPTIONAL CONNECTIONS	10
CONFIGURATION	10
BATTERY SELECTION	10
OPERATION	11
MAINTENANCE	11
TECHNICAL DATA	12
TROUBLESHOOTING	12

This Operational Manual is written by Newton Waterproofing Systems specifically for the use of the Victron Inverter/Charger units used with Newton Pumping Systems to ensure continued pumping during power outages. The original Victron installation manual may be used for reference but contains no specific information on the use of the unit as a Newton Battery Backup System. It mention uses that are not applicable to the Newton System, therefore may be confusing when read in isolation.

DIMENSIONS

362 mm high x 258 mm wide x 218 mm deep.
Weight - 18kg.

SAFETY INSTRUCTIONS

GENERAL

Please familiarise yourself with the safety features and instructions by first reading this document before using the equipment. This product has been designed and tested in accordance with international standards. The equipment must be used exclusively for the purpose for which it was designed.

WARNING: ELECTRIC SHOCK HAZARD

The product is used in conjunction with wall mains, a permanent energy source (battery). Input and/or output terminals may still be dangerously energized, even when the equipment is switched off. ALWAYS SWITCH OFF THE AC IN SUPPLY AND DISCONNECT FROM MAINS AND BATTERY WHEN INSTALLING, MAINTAINING OR SERVICING THIS SYSTEM. The product has no internal user-serviceable components. Do not remove the front plate or operate the product if any panels have been removed. All servicing must be undertaken by qualified personnel.

Never use the product where there is a risk of gas or dust explosions. Consult the battery manufacturer’s information to ascertain that the product is intended for use in conjunction with the battery. Always comply with the battery manufacturer’s safety instructions.

WARNING: DO NOT LIFT HEAVY LOADS WITHOUT ASSISTANCE

INSTALLATION

Read these installation instructions in full before installing the equipment. This is a Safety Class I product (supplied with a protective grounding terminal for safety purposes). Uninterrupted protective grounding must be provided at the AC input and/or output terminals. Alternatively the grounding point located externally on the product may be used. Whenever it is likely that the grounding protection has been damaged, the product must be turned off and secured against unintended operation; please contact qualified service staff.

Ensure that the connection cables are fused and fitted with circuit breakers. Never replace a safety component with a different type.

Before applying power, ensure that the available power source matches the configuration settings of the product. This manual is to be used with the Victron Quattro 12/3000/120. 12/xxxx/xxx denotes the charging volts - use with 12V batteries only. xx/3000/xx denotes the AC output capacity in VA. xx/xxxx/120 denotes the charging current in Ah.

Ensure that the equipment is used under the correct ambient conditions (refer to Data Sheet for unit temperature operating parameters). Never operate the product in a wet or dusty environment. Ensure there is adequate free space for ventilation around the product and check that the ventilation vents are not blocked.

TRANSPORT AND STORAGE

Ensure that the mains power and battery leads have been disconnected before storing or transporting the product.

No liability can be accepted for any transport damage if the equipment is shipped in non-original packaging.

Store the product in a dry environment; the storage temperature must be between -20°C and 60°C.

Consult the battery manufacturer’s manual in respect of transport, storage, charging, recharging and disposal of the battery(s) and ancillary products.

This Operational Manual is for the Victron Quattro Inverter/Charger unit 12/3000/120. The maximum pump size that can be connected to these units is 750W:

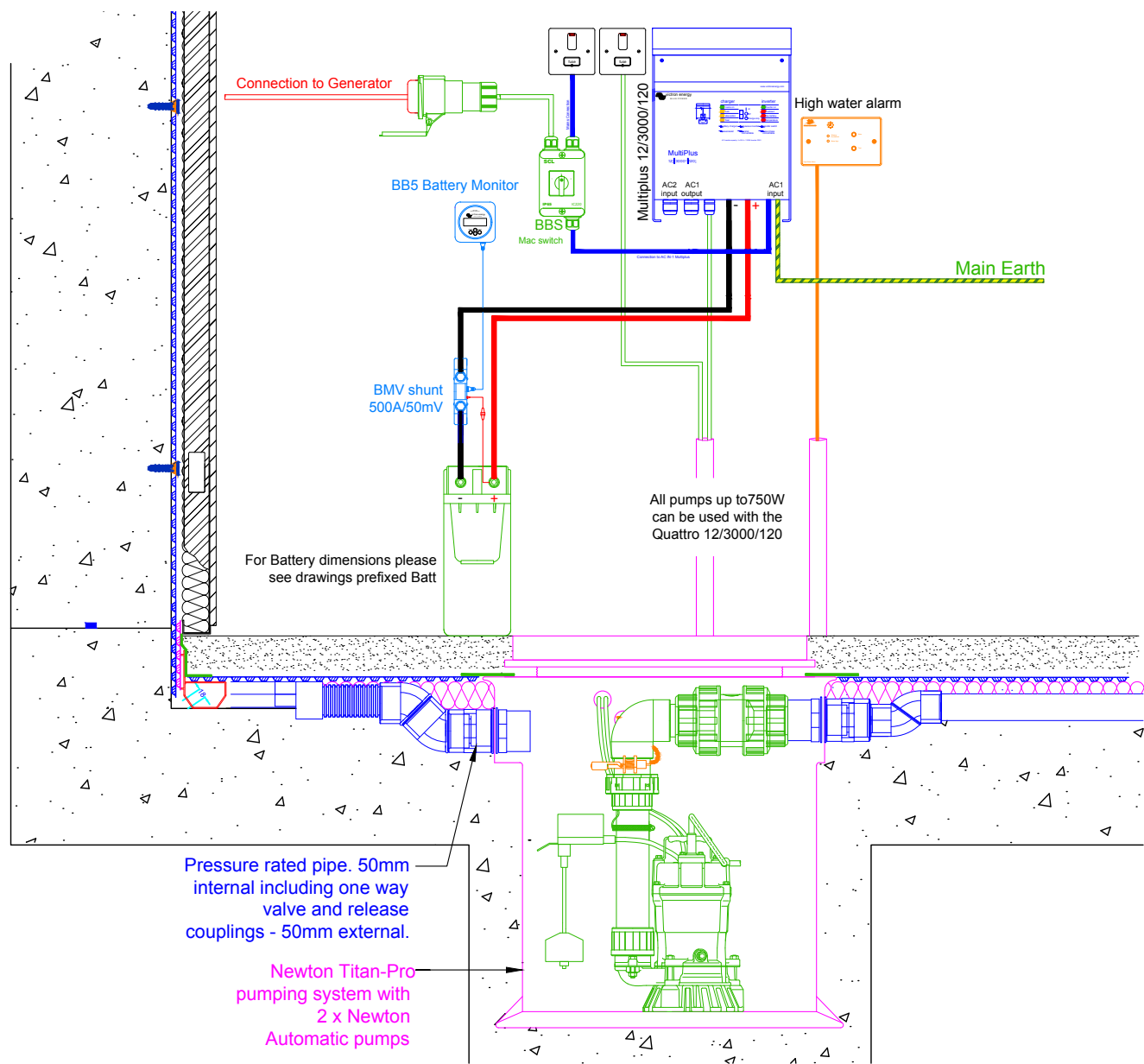
- [Newton CP750](#)
- [Newton NP750](#)
- [Newton SP750 Cutter](#)

Pumps of 150, 250 & 400W can also be used with this unit when generator connection is required - smaller MultiPlus Compact Inverter/Chargers are also available for less powerful pumps. For confirmation of the correct size of Inverter for the Newton pump being used please refer to the Victron Inverters Data Sheet.

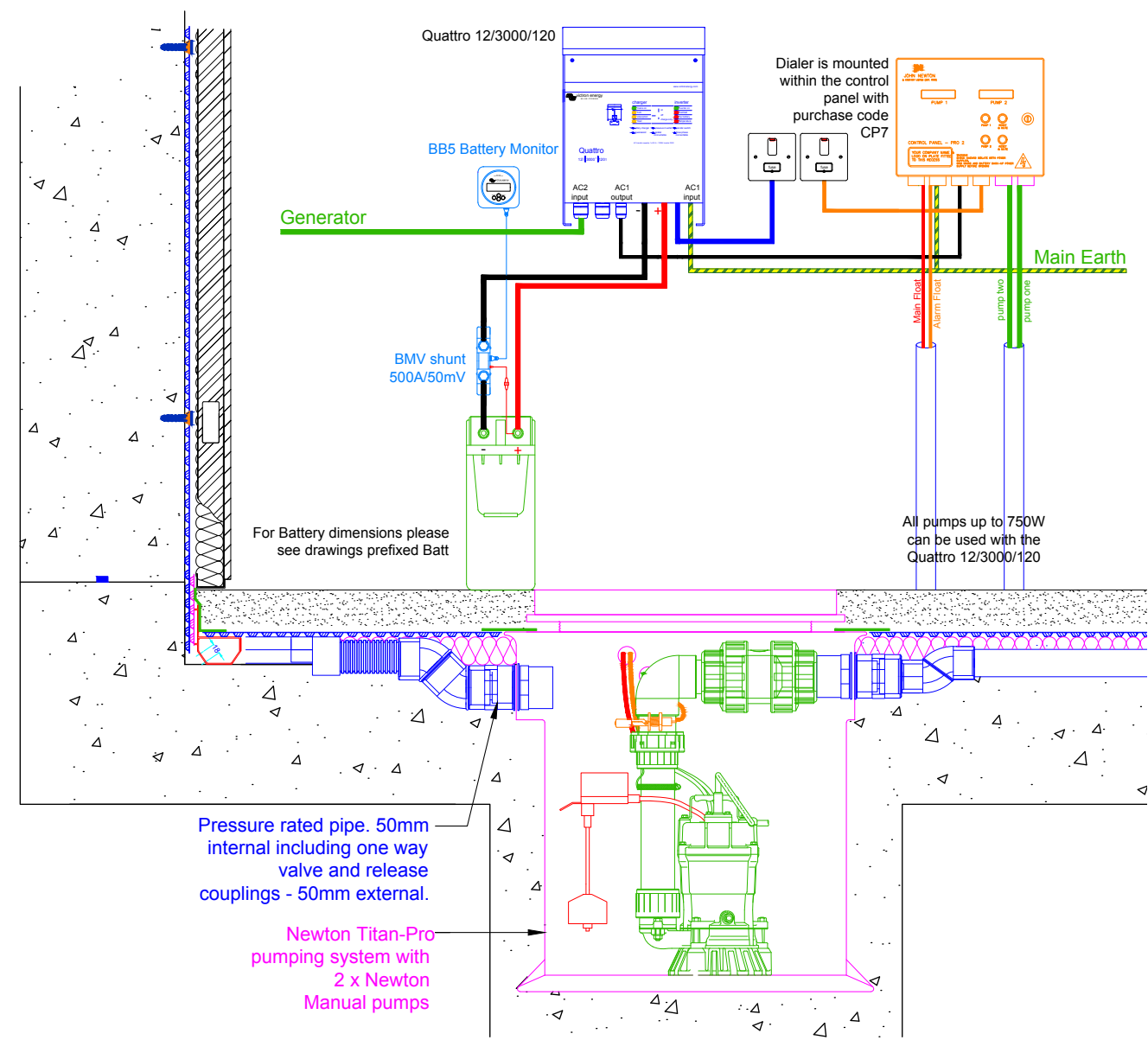
TYPICAL DETAILS

Below are three typical setups showing the Quattro being used as part of a Newton System 500 waterproofing system, also showing the connection to the 6KVA generator. The three examples can be used as a quick install schematic.

Example 1 - 2 x Automatic Pumps - No Pump Control Panel - No Inverter/Charger Control Panels



Example 2 - 2 x Manual Pumps - Pump Control Panel - No Inverter/Charger Control Panels



INSTALLATION

The Inverter/Charger units are mains powered and should be installed by persons who are electrically competent by way of appropriate training to either fit a fused plug or wire directly to a fused spur. Knowledge of DC input by battery and the connection of DC batteries leads to both the battery(s) and the Inverter/Charger is required.

The product must be installed in a dry and well-ventilated area, as close as possible to the batteries. There should be a clear space of at least 100 mm around the appliance for cooling.

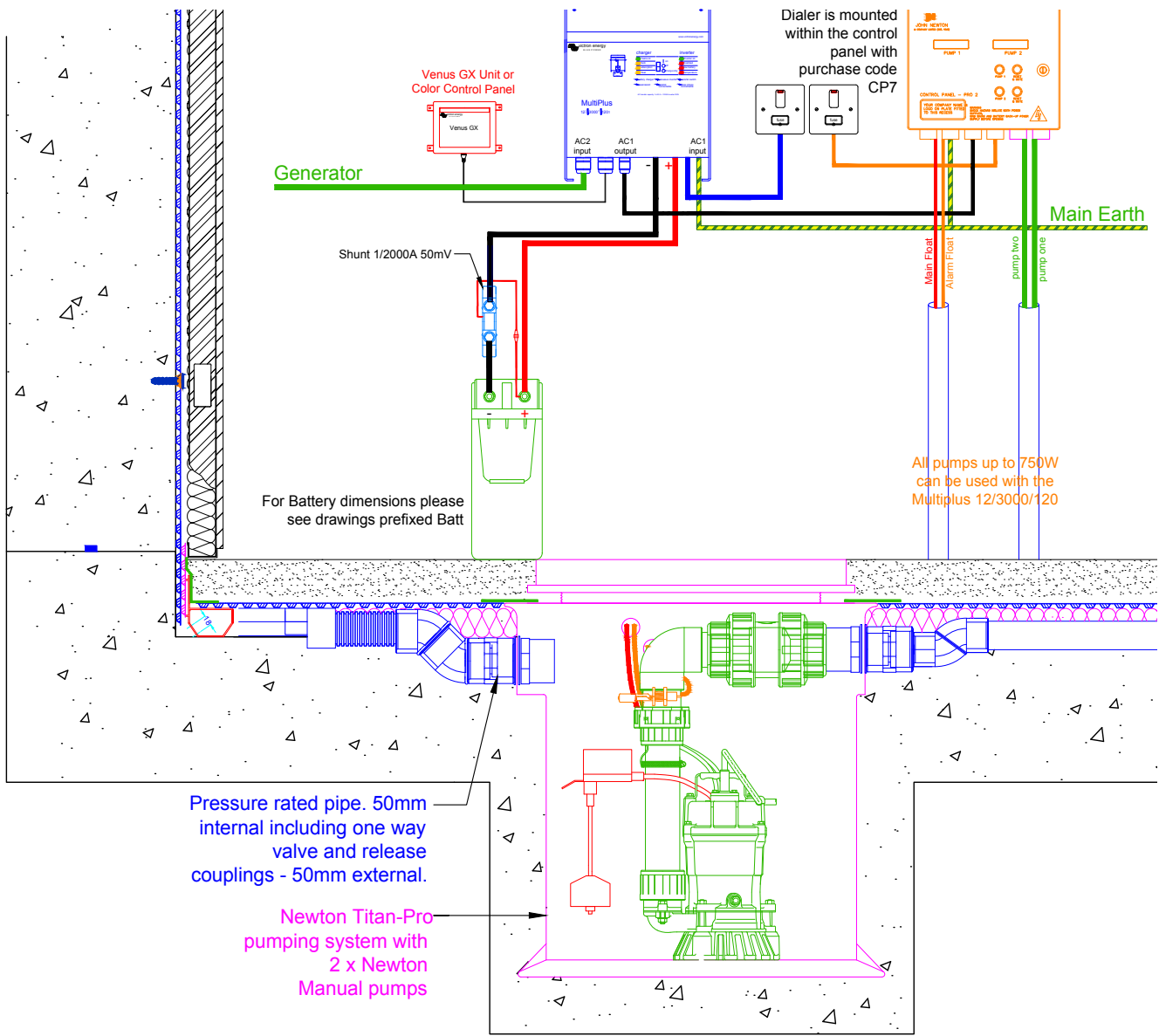
Excessively high ambient temperature will result in the following:

- Reduced service life
- Reduced charging current
- Reduced peak capacity, or shutdown of the inverter

The unit must be installed in a vertical position. Never mount the appliance directly above the batteries.

The Quattro has no internal DC fuse. The fuse should be installed outside the Quattro.

Example 3 - 2 x Automatic Pumps - 1 x Pump Control Panels - 1 x Inverter/Charger Control Panels - 1 x Battery Monitor Module



POSITIONING

NOTE: ALL POWER INVERTERS NEED TO BE INSTALLED INTERNALLY IN A DRY AND WELL VENTILATED SPACE

- The product is suitable for wall mounting
- Do not place the battery directly below the Victron Quattro
- The appliance can be mounted horizontally as well as vertically; vertical mounting is preferable. The vertical position offers optimum cooling
- Please note: All aspects of the installation must be done without AC being connected to mains until all components of the system have been installed
- The interior of the product must remain accessible after installation
- Use only the DC cables supplied with the unit to minimize cable voltage losses
- For safety purposes, this product should be not be installed close to chemicals, synthetic components, curtains or other textiles, etc

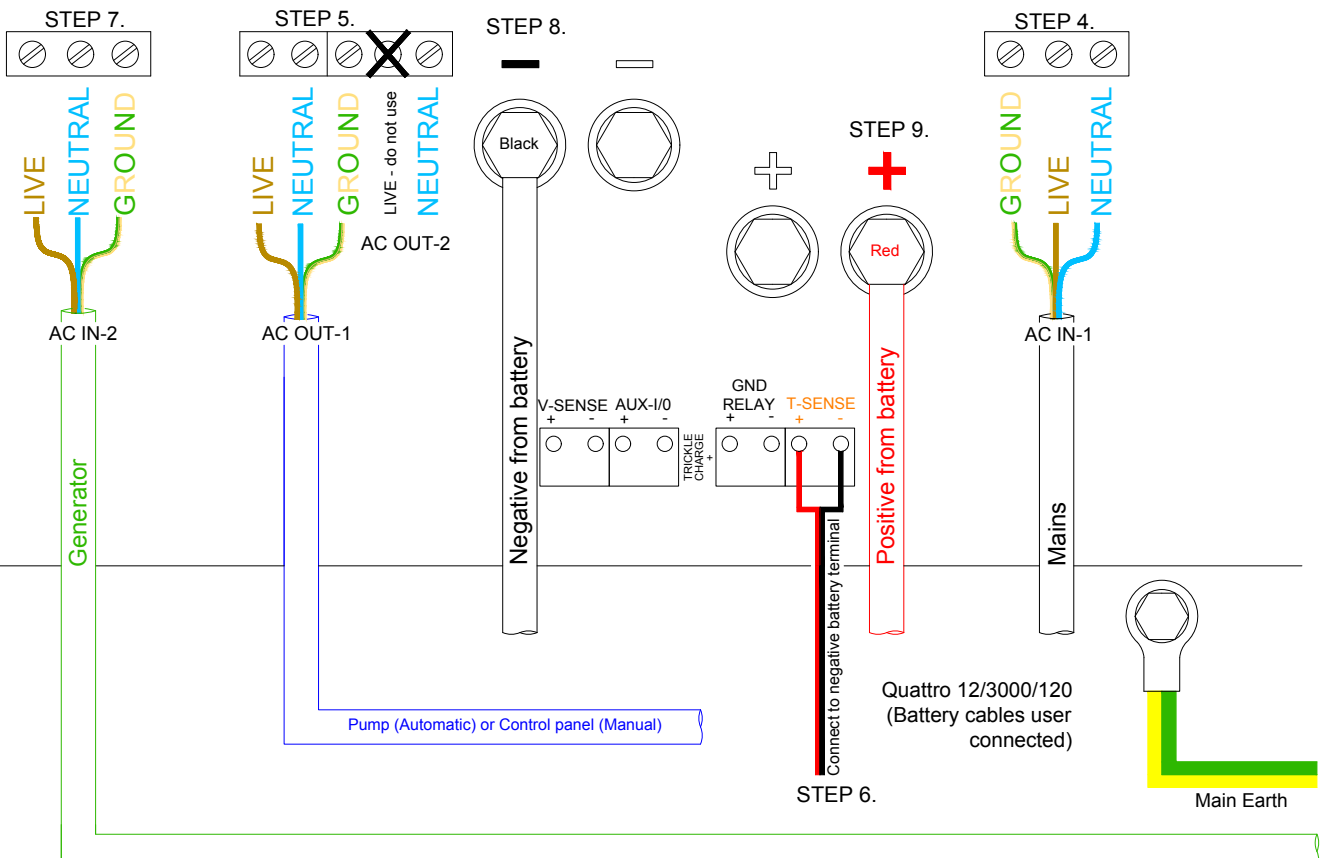
FIXING TO THE WALL

Fix the provided blue top fixing bracket to the wall via the 3 pre-drilled holes. Screws are provided. It is important to fix the bracket level. Attach the Quattro to the top support bracket using the lugs on the rear of the unit. Complete the fix by screwing the bottom of the Quattro to the wall via the bottom 2 holes using the screws provided. Carefully mark out the hole centres then take the Quattro off the wall to drill the holes.

Note: Rawl plugs will be required for the screws for certain wall types (not supplied).

CONNECTION OF BATTERY CABLES

- 1. Use an insulated box spanner in order to avoid shorting the battery. Avoid shorting the battery cables
- 2. Connect the battery cables: the + (red) and the - (black), to the battery. Reverse polarity connection (+ to - and - to +) will cause damage to the product and will void the warranty
- 3. Secure the nuts tightly in order to reduce the contact resistance as much as possible



CONNECTION OF THE AC CABLING

This is a Safety Class I product (supplied with a protective grounding terminal). Uninterrupted protective grounding must be provided at the AC input and/or output terminals and/or chassis grounding point located externally on the product.

The Quattro is provided with a ground relay that automatically connects the Neutral output to the chassis if no external AC supply is available. If an external AC supply is provided, the ground relay H will open before the input safety relay closes. This ensures the correct operation of an earth leakage circuit breaker that is connected to the output. An uninterrupted grounding can also be secured by means of the grounding wire of the AC input. Otherwise the casing must be grounded.

The mains input & output terminal connector can be found on the bottom of the Quattro. The mains cable must be connected to the connector with a three-wire cable via the terminal blocks found on the printed circuit board. Use a three-wire cable with a flexible core and a cross section of 2.5 mm².

PROCEDURE

Proceed as follows to connect the AC cables:

AC-in-1

- If AC voltage is present on these terminals, the Quattro will use this connection. The wall mains should be connected to AC-in-1.
- The AC input 1 (mains) cable (from mains) is connected to the terminal block "AC-in". From left to right: "PE" (earth), "N" (neutral) and "L" (phase). The AC input must be protected by a fuse or magnetic circuit breaker rated at 50A or less, and cable cross-section must be sized accordingly. If the input AC supply is rated at a lower value, the fuse or magnetic circuit breaker should be down sized accordingly.

AC-in-2

- If AC voltage is present on these terminals, the Quattro will use this connection, unless voltage is also present on AC-in-1. The Quattro will then automatically select AC-in-1. The generator should be connected to AC-in-2.
- The AC input 2 (generator) cable (from mains) is connected to the terminal block "AC-in". From left to right: "PE" (earth), "N" (neutral) and "L" (phase). The AC input must be protected by a fuse or magnetic circuit breaker rated at 50A or less, and cable cross-section must be sized accordingly. If the input AC supply is rated at a lower value, the fuse or magnetic circuit breaker should be down sized accordingly.
- The AC output cable can be connected directly to the terminal block "AC-out". With its PowerAssist feature the Quattro can add up to 3kVA (that is 3000 / 230 = 13A) to the output during periods of peak power requirement. Together with a maximum input current of 50A this means that the output can supply up to 50 + 13 = 63A. An earth leakage circuit breaker and a fuse or circuit breaker rated to support the expected load must be included in series with the output, and cable cross-section must be sized accordingly. The maximum rating of the fuse or circuit breaker is 63A. Please refer to the figure on page 8.

QUICK INSTALL GUIDE

The steps in **bold** are indicated on the figure on page 8:

- 1. Screw the top bracket to a suitably strong substrate using the screws provided. Rawl plugs will be required for the screws for certain wall types (not supplied)
- 2. Place unit onto the bracket using the lugs to the rear of the unit. Screw the bottom of the unit to the wall
- 3. Unscrew and remove the front panel. Note: All cables will pass up though the bottom of the unit prior to connections being made
- 4. **Wire AC IN with correctly rated mains cable. Add 3-pin mains plug or wire to a switched fused spare, both of which should be fitted with a 13amp fuse. Do not plug in or turn on at the spur at this stage**
- 5. **Wire AC OUT with correctly rated mains cable from either a Newton automatic pump, or from the 'pump 2' connection of the CP2 or CP9 control panel.**
- 6. **Wire the temperature sensor cable into the T-SENSE terminal**
- 7. **Wire the generator cable into AC-IN-2**
- 8. **Connect the black battery cable to the left Negative terminal**
- 9. **Connect the red battery cable to the right Positive terminal**
- 10. Connect the black battery cable and the temperature sensor cable to the negative terminal on the battery
- 11. Connect the red battery cable to the positive terminal on the battery
- 12. The system will start running off the batteries
- 13. Plug the AC IN into mains power or switch on the fused spur

DO NOT use AC output 2. Use three-core cable. The connection terminals are clearly encoded:

- PE: earth
- N: neutral conductor
- L: phase/live conductor

A number of optional connections are possible. Undo the four screws at the front of the enclosure and remove the front panel.

NOTE: ALL 230V & 12V POWER must be fully isolated and turned off prior to removing the cover of this unit. ONLY TECHNICALLY COMPETENT AND TRAINED technicians should alter and install any additional products features to the unit.

TEMPERATURE SENSOR

The temperature sensor supplied with the product may be used for temperature-compensated charging. The sensor is insulated and must be mounted on the batteries negative terminal. Default output voltages for Float and Absorption are at 25°C. In adjust mode temperature, compensation is disabled.

VICTRON BMV600S BATTERY MONITOR

The BMV600S provides real time information for the battery or bank of multiple batteries:

- Battery voltage
- Discharge current
- Capacity as a %

Please refer to product installation manual.

VICTRON BLUE POWER PANEL

The Blue Power Panel provides control and monitoring of the Victron Inverter/Charger. Features include on/off control of Quattro Inverter/Charger units and graphic illustration of system charge/discharge, capacity in % real time and time to go until discharged. Please refer to product installation manual.

VICTRON COLOR CONTROL PANEL

The Color Control Panel adds a number of extra features over the Blue Power Panel such as Ethernet or Sim Card internet capability with remote monitoring via web portal and data storage on SD card. Please refer to product installation manual.

CONFIGURATION

- Settings should be carried out by a competent person
- Carefully read the instructions before changes are made
- Batteries should be placed in a dry and well-ventilated area during charging and not directly below the Quattro
- Standard settings: ready for use

On delivery, the Quattro is set to standard factory values ready for use as part of a Newton Pumping System, with charging voltages set for the three batteries supplied by Newton Waterproofing Systems for use within power supplies of 230V input voltage and 50Hz frequency. Inverter output voltage is set to 230V AC. There is no need to change any of the default settings for use within the UK.

BATTERY SELECTION

The following batteries have been selected to be used with the Quattro Inverter/Charger units:

- NorthStar 60FT - 60Ah, 99.9% lead, extra long life battery - 12V - Purchase code BB20
- NorthStar 100FT - 100Ah, 99.9% lead, extra long life battery - 12V - Purchase code BB21
- NorthStar 190FT - 190Ah, 99.9% lead, extra long life battery - 12V - Purchase code BB22. This is the minimum battery size for the Quattro 12/3000/120 unit

Multiple batteries can be used in parallel to increase the charge of the 12V supply to the inverter. Please refer to the Data Sheet for further information. The maximum sized battery bank that can be used with each Quattro 12/3000/120 is 1200Ah.

OPERATION

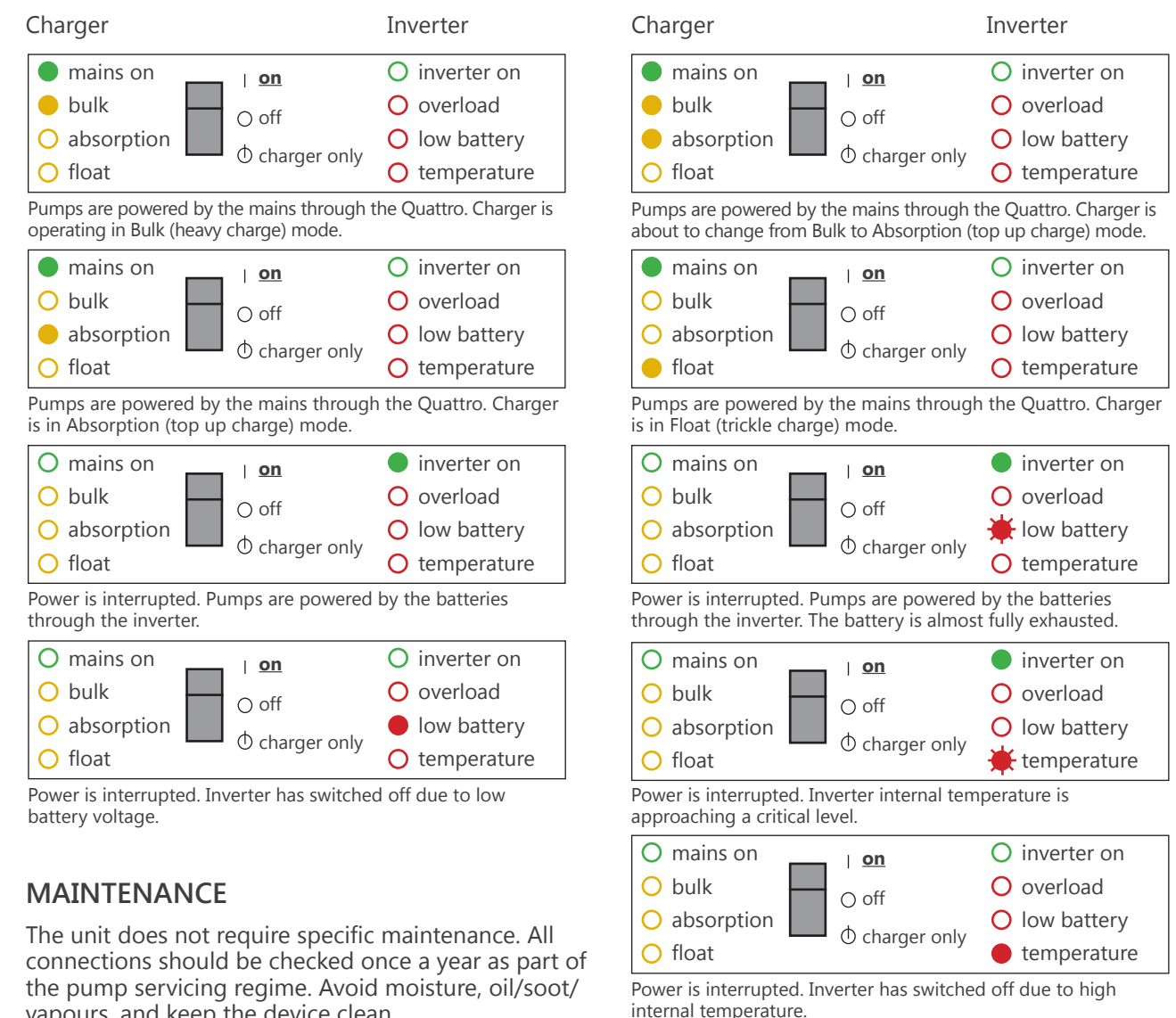
On/Off/Charger Only Switch

For all operation as a battery backup system, the switch should be in the “on”, position. This results in the product being fully functional, providing the pumps with thorough power during times of normal inverter power during power outage. When mains power is not interrupted, the unit will also charge the batteries.

Charge states (please also see LED Indications below):

- Bulk - Heavy and fast charge for batteries that are very or fully depleted
- Absorption - Final top up charge at a lower charge rate than Bulk
- Float - Trickle charge for when batteries are fully charged to replace charge that is lost over time. This ensures that the batteries are always fully charged
- If the voltage at the “AC-in” terminal is not within specifications, during a power outage, for example, the inverter will switch on, continuing power to the pumping system until the battery(s) is depleted
- There is no need to switch the unit to “charger only” mode

LED Indications - Standard operating parameters of inverter and charger



TECHNICAL DATA

All technical data is available on page 2 of the Data Sheet.

TROUBLESHOOTING

The table below provides a quick reference of the more common faults. Disconnect the battery(s) and pumping systems before diagnosing the fault. Consult Newton Waterproofing Systems if the fault cannot be resolved.

Problem	Cause	Solution
Inverter operation not initiated when switched on	The battery voltage is excessively high or too low. No voltage on DC connection	Ensure that the battery voltage is within the correct range
The charger is not functioning	Circuit breaker or fuse in the AC-in input is open as a result of overload	Remove overload or short circuit on AC-out-1 or AC-out-2, and reset fuse/breaker
	The battery fuse has blown	Replace the battery fuse
The charger does not operate. The "Bulk" LED flashes and "Mains on" LED illuminates	Quattro is in "Bulk protection" mode thus, the maximum bulk charging time of 10 hours is exceeded. Such a long charging time could indicate a system error (e.g. a battery cell short-circuit)	Check your batteries. The standard Quattro factory setting of the "Bulk protection" mode is switched on. The "Bulk protection" mode can be switched off with help of VEConfigure only
The battery is not completely charged	Poor battery connection	Check the battery connections
The battery is overcharged	Poor battery condition The battery temperature is too high (due to poor ventilation, excessively high environmental temperature, or excessively high charging current)	Replace the battery. Improve ventilation, install batteries in a cooler environment

Newton Waterproofing Systems Is A Trading Name Of

John Newton & Company Ltd.

Newton House, 17-20 Sovereign Way
Tonbridge, Kent TN9 1RH

T: +44 (0)1732 360095

E: tech@newtonwaterproofing.co.uk

W: www.newtonwaterproofing.co.uk

