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VSD - B Inverter

OPERATION AND MAINTENANCE MANUAL

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OPERATION & MAINTENANCE
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General
Information

These instructions are to assist in the installation of the flowcon VSD - B Inverter please follow them carefully.

If, having read this Operation & Maintenance Manual, there is any doubt about any aspect of the installation please don't hesitate to contact our technical team.

Definitions of Safety Warnings and Precautions

WARNING!

Indicates a potentially hazardous situation which, if not avoided, can result in serious injury or death.

CAUTION!

Indicates a potentially hazardous situation which, if not avoided. Can result in minor to moderate injury, or serious damage to the product.

Safety

Information

It is essential that correct and safe working practices are adhered to at all times when installing, operating and/or maintaining any piece of equipment. Always consult safety data sheets, operating and maintenance manuals, Health & Safety legislation and recommendations and specific requirements of any equipment manufacturer, site controller, building manager or any other persons or organisation relating to the procurement, installation, operation and/or maintenance of any piece of equipment associated or in conjunction with any product provided by **flow**tech Water Solutions.

This document is intended for ALL installers, operators, users and persons carrying out maintenance of this equipment and must be kept with the equipment, for the life of the equipment and made available to all persons at all times. Prior to carrying out any work associated with the set it is essential that the following sheets are read, fully understood and adhered to at all times.

Equipment must only be installed, operated, used, and/or maintained by a competent person. A competent person is someone who is technically competent and familiar with all safety practices and all of the hazards involved.

Any damage caused to any equipment by misapplication, mishandling or misuse could lead to risk of Electrocution, Burns, Fire, Flooding, death or injury to people and/or damage to property dependent upon the circumstances involved. **flow**tech Water Solutions accepts no responsibility or liability for any damage, losses, injury, fatalities or consequences of any kind due to misapplication, mishandling or misuse of any equipment, or as a result of failure to comply with this manual.

Failure to install, operate, use or maintain the equipment in accordance with the information contained within this document could cause damage to the equipment and any other equipment subsequently connected to it, invalidating any warranties provided by **flow**tech Water Solutions to the buyer.

Safety Warnings &

Precautions

These instructions should be read and clearly understood before working on the system. Please read this manual carefully and all of the warning signs attached before installing or operating the equipment keep this manual handy for your reference. This equipment should be installed, adjusted and serviced by trained and qualified personnel. Failure to observe this precaution could result in bodily injury.

WARNING! - Install an emergency stop key separately from the isolator. Rotating shafts can be hazardous.

WARNING! - This equipment has a high leakage current and must be permanently fixed to earth.

WARNING! - Do not attach or remove wiring or connectors when the power is applied. Do not check signals during operation. When the power is turned on and the running command is on, the motor will start rotating. The stop key is only effective when the function is set. If there is a power failure and an operation instruction is given the unit may start automatically when the power is reinstated.

WARNING! - Make sure that the input voltage is correct. Be sure to install the unit in a room that is not exposed to direct sunlight and is well ventilated.

Avoid environments which have a high ambient temperature, high humidity or excessive condensation. Avoid dust. Corrosive gas, explosive gas, inflammable gas, grinding-fluid mist and salt damage, etc.

WARNING! - Do not connect the power source to any terminals except power connectors.

WARNING! - Motor control equipment and electronic controllers are connected to hazardous line voltages. When servicing drives and electronic controllers, you may be exposed to components at or above the line potential. Extreme care should he taken to protect against shock. Dangerous voltage may exist after the power light is off.

Wait more than 5 minutes after turning off the power supply before performing maintenance or inspection. Hazard of electric shock. Disconnect incoming power before working on this unit.

WARNING! - The inverter should be protected separately against ground fault.

Observe the regional regulations for electrical installation!

CAUTION! - It is strongly recommended that all electrical equipment conforms to National Electrical Codes and local regulations. Only qualified personnel should perform installation, alignment and maintenance. The manufacturer reserves the right to alter the technical data in order to make improvements or update information.

CAUTION! - Failure to observe these rules will render the guarantee invalid. The same applies to repair jobs and/or replacement. Your legal rights are not affected.

CAUTION! - The manufacturer declines all responsibility in the event of damage or injury caused as a result of tampering with the equipment.

CAUTION! - Do not switch on/off power supply to run/stop the motor/system! Start the unit only by using run button or external run command.

Customer / Contractor RESPONSIBILITIES

It is the responsibility of the customer and/or the contractor:

- To ensure that anyone working on the equipment is wearing all necessary protective gear and/or clothing.
- Is aware of appropriate health & safety warnings.
- Has read the information in this section of the manual.

Warranty

The manufacturer guarantees this product for a period of 24 months as of the date of sale; the device must be returned together with this instruction manual, with the date of installation and programmed parameters noted in the last page of this document.
The guarantee will be rendered null and void if the device is tampered with, disassembled, or damaged due to causes attributable to incorrect use and/or improper installation, if it is used for purposes other than as specified, if it is installed in unsuitable environmental conditions or if it is connected to an electrical installation that does not comply with current standards.
The manufacturer declines all liability in the event of damage to objects and/or physical injury caused by failure to install the necessary electrical safety devices up line of the device, or due to an unprofessional installation.
Installation and maintenance of this device must be performed by specialist personnel, able to fully understand the contents of this instruction manual.
All operations performed with the device cover removed must be performed with the power mains disconnected.
As there are no concrete reasons for removal of the electronic board, take into account that some of the board parts remain live for a few minutes also after disconnecting the device from the mains.
The manufacturer declines all liability in the event of damage to objects and/or physical injury caused by failure of an internal protection device, with the exception of the refund of the device, if still covered by the guarantee. **This device complies with the directive ROHS 2002/95/EC.**

Description

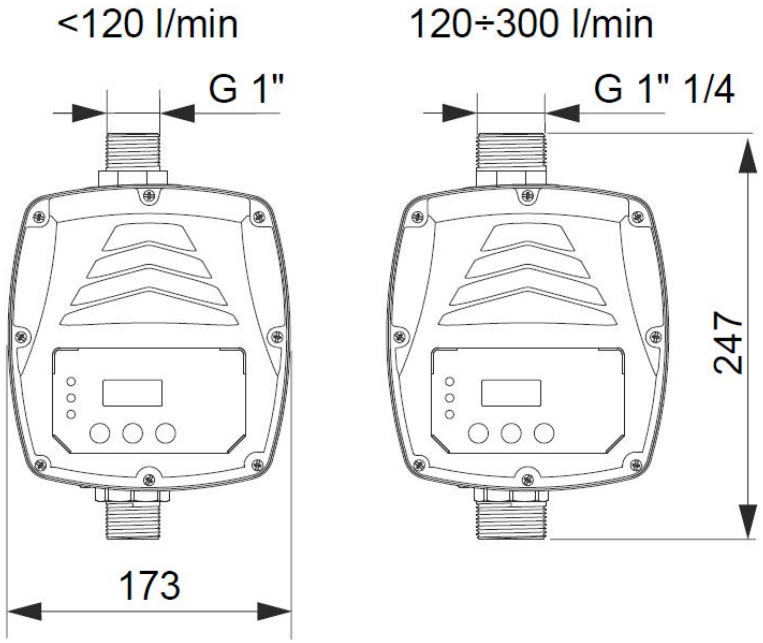
Flowcon VSD - B Inverter is an electronic control device for single phase electric pumps which enables automatic start-up and shutdown of the pump, protecting it in the event of adverse operating conditions (failure of water supply, motor overload, risk of ice).
The Flowcon VSD - B Inverter can operate on various systems:
- with a single electric pump,
- in a twin pump system in which the two alternate automatically

Flowcon VSD - B Inverter inverter is programmable to operate on the basis of two different principles:
- mode P+F (pressure + flow) = in this mode, the pump is started up following a fall in pressure, when the minimum set threshold is reached (Pmin); the pump operates until the water supply runs out and there is zero flow through the device. In this condition the resulting pressure in the system will correspond to the maximum pump head.

- mode P+P (pressure + pressure) = in this mode the pump operating mode is controlled within two pressure levels (Pmin e Pmax); when the lower pressure threshold is reached (Pmin) the pump is started up, while it is stopped when the upper pressure threshold (Pmax) is reached.
In this configuration, the use of an expansion vessel is essential, sized according to the system requirements and type of pump.

In both operating modes, the device protects the pump from dry running in the absence of water on intake, by means of a combined control on flow and pressure.Operation of twin pumping units is admissible only in "P+P" mode.

Dimensions



Technical Data

Mains power:	single phase 115-230Vac ±10% - 50/60Hz
Motor output:	single phase 230V~
Maximum motor power:	2200W – 3Hp
Maximum motor phase current:	16A
Maximum admissible pressure:	1000 kPa (10 bar)
Maximum liquid temperature:	30°C
Max. ambient temperature:	35°C
Pressure drop:	0.7 bar at 100 l/min
Hydraulic connection:	1” M-M (1”F inlet; rotary on request)
Protection rating:	IP 65
Weight:	0.7 kg
Dimensions:	225x150x115 mm
Type of action	1.C (according to EN 60730-1)

The remote connector is insulated from the network power by a “main” type insulation (basic insulation according to EN 60730-1). Any circuit which will be connected to this terminal, will acquire the same insulation grade from the network power. For this reason the connection must be carried out using a cable type that can guarantee the additional insulation.

Functions

- Automatic start-up and shutdown of the pump.
- Operation with twin units operating alternately.
- Easy and precise control of working pressures via the display.
- Protection against dry running with automatic reset
- Installable in both horizontal and vertical positions
- Digital indicator of pressure and absorbed current on display
- Operating status indicator LED'S (mains, error, pump running)
- Digital input for float or remote control connection
- Configurable relay output
- Removable electrical terminals to facilitate wiring.
- Alarm log

Protections

- Dry Running
- Motor current control protection
- Overpressure cut-out
- Anti-freeze protection
- Prevention of mechanical pump part seizure

Installation Hydraulic Connection

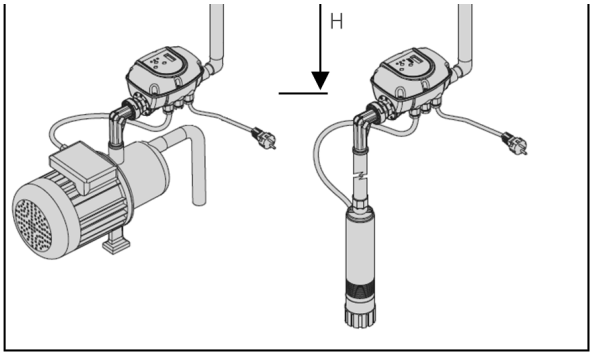
Flowcon VSD - B Inverter Inverter must be installed on the pump delivery in a horizontal or vertical position, in observance of the flow direction indicated by the arrow on the cover.
The water on the pump outlet passes through the device for subsequent distribution to the various utilities.
The water entering the Flowcon VSD - B Inverter Inverter must be free of impurities and/or other substances that could prevent movement of the check valve on the interior. To minimise this problem special filters should be fitted on the pump intake.
Install a small expansion vessel (1-2 litres) downline of the inverter, to limit restarts caused by small leaks, the presence of which is normal on most systems.
The pre-load valve of the expansion vessel must be suitable for the set pressure values.
This provision also helps to improve constant performance levels in the event of low water demands by the system (e.g. washing machines, WC flushes, etc.).
It is essential that no check valve is installed between the inverter and the electric pump or between the device itself and the utilities, as this may cause device malfunctions.
However, a check valve may be fitted in the electric pump intake line to avoid drainage at the time of shutdown.
The device should not be installed in pits or watertight enclosures where there is a strong risk of condensation.

CAUTION: when the pump stops the pipes might be still under pressure; therefore, before any intervention, it is advisable to discharge the system by opening a tap.

CAUTION: this device is not to be considered a mechanical pressure reducer and therefore all system parts must be sized according to the maximum supply pressure of the pump.

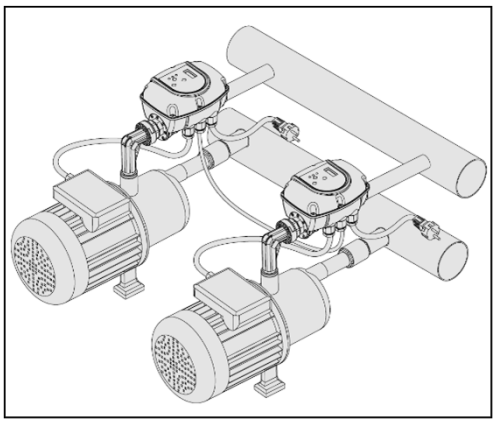
EXAMPLE OF INSTALLATION ON SINGLE ELECTRIC PUMP

Flowcon VSD - B Inverter can be fitted on submerged or surface pumps. Pressure settings must take into account the water column (H) on outlet from the device, considering 0.1 bar pressure per metre of water column.



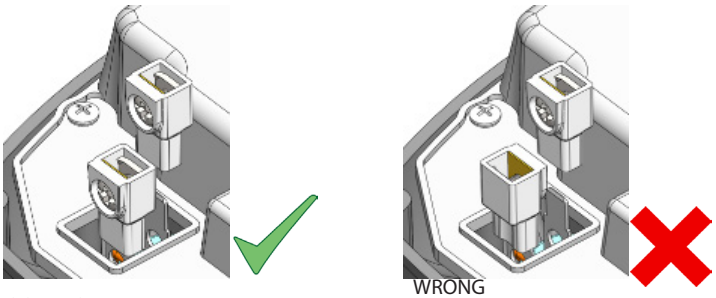
EXAMPLE OF INSTALLATION IN TWIN PUMP BOOSTER SETS

Connect the intake lines of the pumps to a common manifold and install one inverter on the delivery line of each electric pump. The device outlet couplings must be connected to a single delivery manifold, which must be connected to the expansion vessel.



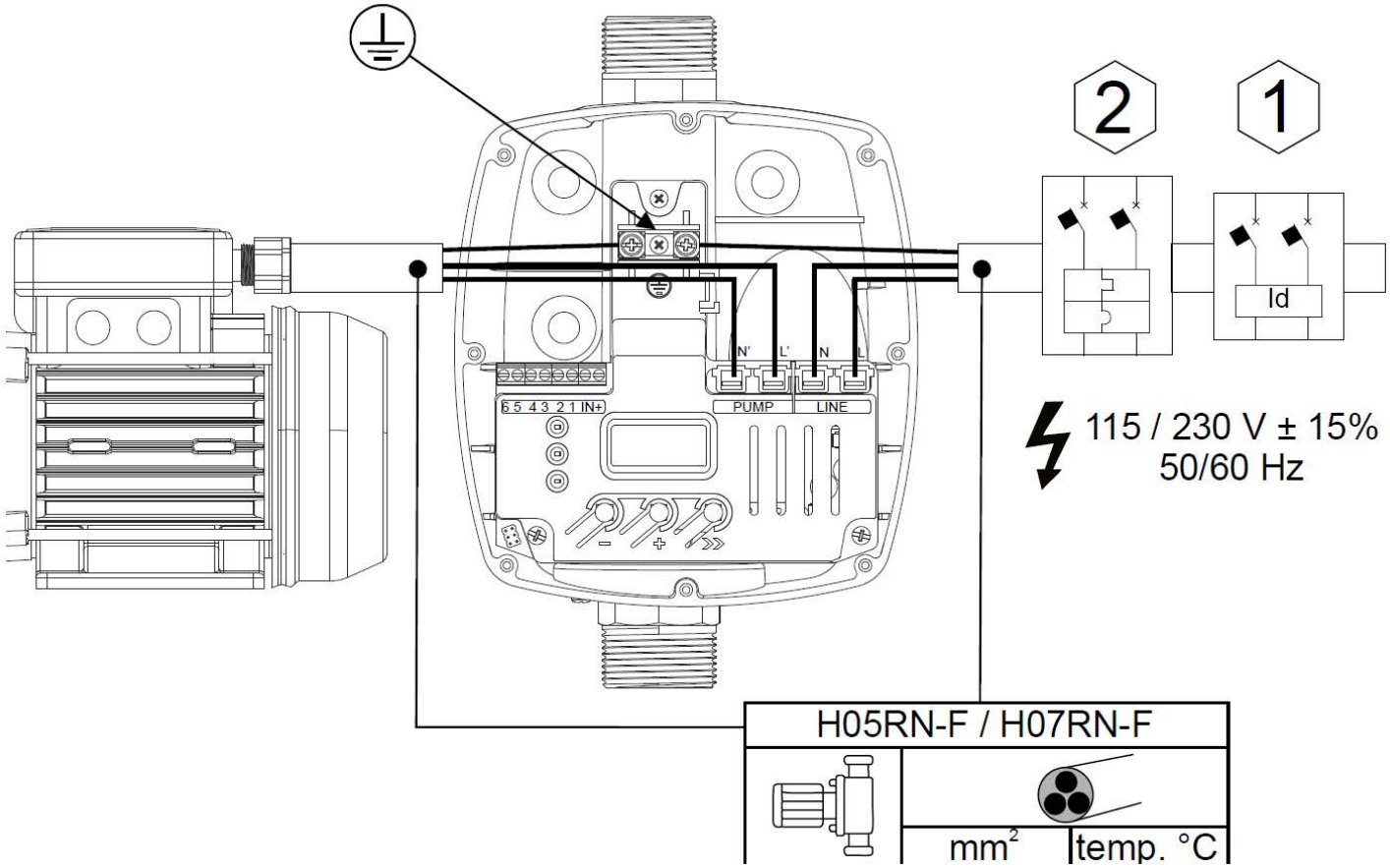
Electrical Connection

Insert the electric wires in the cable clamps, observing the correct order of assembly for all components Tighten down the threaded nuts to avoid traction and rotation of the cables from the exterior. The central cable clamps for the auxiliary contact is blank; if you wish to insert a wire for remote control (or electric float), pierce the plastic nut by means of a screwdriver after removing the nut from the unit. For electrical connections use the terminals supplied with the device.



CORRECT WRONG

CAUTION: Insert the terminals, positioning them so that the cable tightening screws are not adjacent!



Line Connection

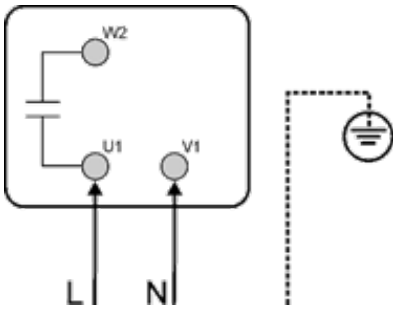
The device power supply is single phase at 115-230 Volt 50/60Hz. The electrical system to which the device is connected must comply with current standards and must therefore be fitted with:
- automatic thermal magnetic circuit breaker with high breaking power and trip current in proportion to the power of the pump installed.
- earthing connection with total resistance in conformity with local standards and in any event no more than 100mΩ.

If the device is used in swimming pools, fountains, or garden ponds, a residual current circuit breaker type "A" must be installed, with IΔn=30mA.
If the device is not equipped with a power cable and plug, install another device that ensures omnipolar disconnection from the mains with a contact opening gap of at least 3 mm.
If the terminals supplied are not used, the faston terminals must be crimped by specialist personnel using special pliers.

The recommended cable section is 1.5mm2, compatible with electric pumps up to 16A.
The type of electric cable must correspond to the conditions of use (use in domestic rooms, dry or wet, for installation indoors or outdoors).

Pump Connection

Flowcon VSD - B Inverter can be installed on single phase pumps with 230Vac power supply, already fitted with capacitor. Therefore at the time of electrical connections, ensure that the terminals in the electrical compartment of the motor are connected according to the instructions of the electric pump manufacturer. The figure alongside shows a typical example of connection.

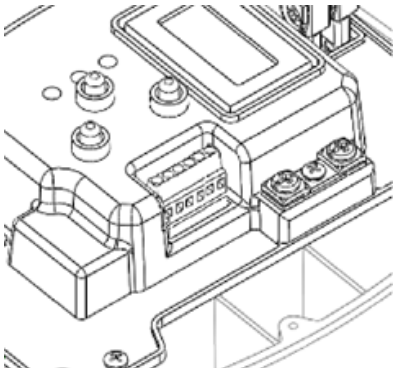


If the terminals supplied are not used, the faston terminals must be crimped by specialist personnel using special pliers.
The recommended cable section is 1.5mm2.
The type of electric cable must correspond to the conditions of use (use in domestic rooms, dry or wet, for installation indoors or outdoors).
Also observe the installation limits as declared by the manufacturer of the electric pump connected to the inverter.

CAUTION:
- all electrical connections must be made by specialised personnel
- incorrect connections of the electric motor can cause damage to the device or the pump motor itself.
- failure to observe the instructions in this section can cause serious damage and/or physical injury and releases the manufacturer from all liability.
- in the event of damage to the power cable or the cable between the inverter and the electric pump, it must be replaced exclusively by the device manufacturer or assigned and suitably qualified personnel, to prevent risks to objects and persons.

Auxiliary Connector Connection

The Flowcon VSD - B Inverter is equipped with a connector to make auxiliary contacts available for additional functions, interfacing the device with other external equipment.
The functions of each terminal depend on the settings of the parameter “Aux. Con.” According to the diagram below. Functions “1” and “4” are available only if the operating mode is set to “P+P” (pressure+pressure).
* Further information regarding the set-up of twin booster sets can be found at the end of this manual, in appendices A and B.



Setting Aux. Con.	Mode admitted	Associated function:
0	P+F / P+P	None, inputs and outputs disabled
1	P+P	Combination of two inverters in a twin pumping system with automatic alternation.
2	P+F / P+P	Availability of an input to enable operation (for example of an external float) and a relay output for alarm status signals.
3	P+F / P+P	Availability of an input to enable operation (for example of an external float) and a relay output for motor operation signals.
4	P+P	Combination of one B Inverter with an S inverter for the set-up of a constant pressure twin pumping system with a reserve pump.

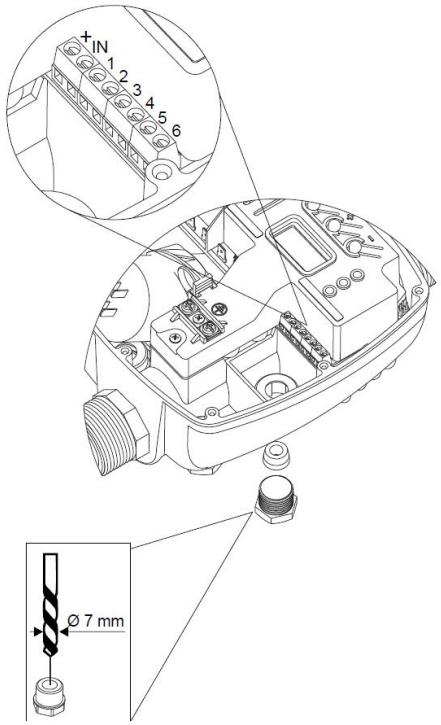
DESCRIPTION OF FUNCTIONS OF AUXILIARY CONTACTS:

Parameter "Aux. Con.” = 0

In this mode, all functions of the auxiliary contact are disabled.

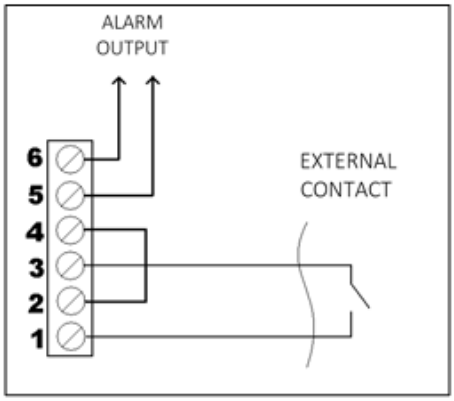
Parameter "Aux. Con.” = 1 – Operation in twin set mode with two inverters

In this mode two devices can be connected to operate in an alternating twin booster set. If pressure falls, the "master" pump is started up first, followed by the "slave" pump (when required); shutdown of the pumps is simultaneous when the maximum operating pressure is reached (Pmax). Terminals 1 to 4 are used for the connection of two devices while terminals 5 and 6 provide a relay output that is activated in the event of an alarm. The parameter "Aux. Con.” can only be set to “1” if the current operating mode is “P+P” (pressure+pressure).



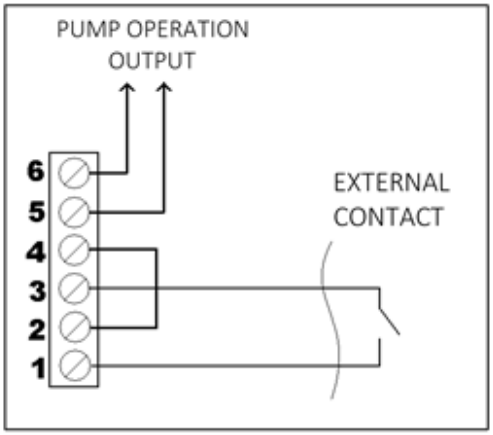
Parameter "Aux. Con." = 2 – External enable and alarm signal.

In this mode, an external electrical device (e.g. float, timer, switch, etc.) can be connected between terminals 1 and 3, to enable remote operation of the pump. In this mode the motor is only started up if the external contact between terminals 1 and 3 is closed.
Terminals 5 and 6 provide a relay output that is activated in the event of an alarm.
Jumpers must be wired onto terminals 2 and 4.



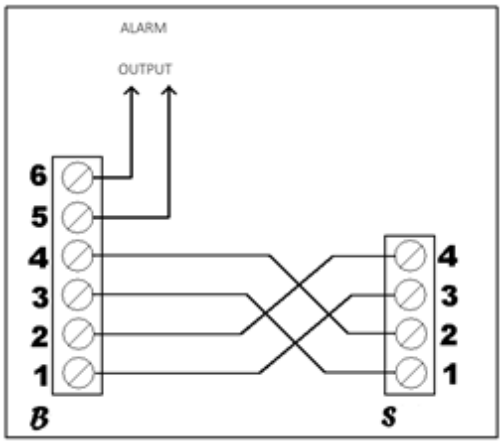
Parameter "Aux. Con." = 3 – External enable and pump operation signal.

In this mode, an external electrical device (e.g. float, timer, switch, etc.) can be connected between terminals 1 and 3, to enable remote operation of the pump. In this mode the motor is only started up if the external contact between terminals 1 and 3 is closed.
Terminals 5 and 6 provide a relay output that is activated when the pump is running; this signal enables the control of external devices that have to operated in conjunction with the electric pump (for example a batching system for chlorine, fertilizer, detergents etc.).
Jumpers must be wired onto terminals 2 and 4.



Parameter "Aux. Con." = 4 – Combination with S inverter device.

When the parameter "Aux. Aus." is set to 4 the B Inverter can be interfaced with an inverter in the S range to produce a hybrid pressurisation unit, i.e. a variable speed pump and a fixed speed pump that intervenes as a backup to the main pump only in the event of increased water demands by the system.
During routine operation, the system demands are normally met by the pump with the S inverter, which is always started up first. When the demand for water increases to such a point that the first pump is no longer sufficient, the fixed speed pump, installed together with the B Inverter is then started up. Terminals 1 to 4 are used for the connection of two devices while terminals 5 and 6 provide a relay output that is activated in the event of an alarm. The parameter "Aux. Con." can only be set to “4” if the current operating mode is “P+P” (pressure+pressure).



Start Up

CAUTION: On initial start-up, prime the pump before powering up the system!

After making all the electrical connections and ensuring the correct condition of all components, close the unit cover and power up the system.

The Flowcon VSD - B Inverter Inverter starts up the pump automatically to enable circuit filling.
If the pump does not start, or anomalous vibrations are detected, ensure correct connection of the pump and relative capacitor.

To facilitate filling of the electric pump, press and hold the “+” key on the main screen to override pump operation without intervention of the dry-running protection (“Manual” mode). After setting all data in the device, note them on the relative form found at the end of this manual for future reference and to maintain the guarantee.

Programming

Interface Description
1. Display with digital pressure indicator, error display, configuration menus.
2. Programming keys
3. Green mains power ON indicator light (LINE)
4. Red error indicator light (ERROR)
5. Yellow "pump running" indicator light (PUMP ON)

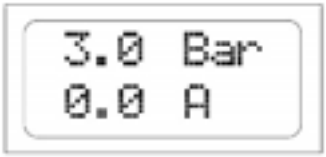
Key Description
Arrow/reset: scrolls forward through menus and performs unit reset in the event of alarms and/or errors

“+” key: increments the parameter value currently on display; enables device operation override (starts pump as an override command and temporarily disables the dry-running protection to facilitate loading on initial start-up).

“-” key: decreases the parameter value currently on display; shows the absorbed current (optional)

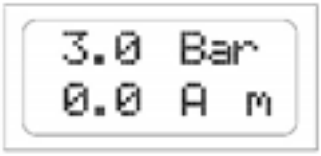
The menu is divided into two levels: the user level and the installer level. The user level is usually visible during normal operation and enables the user to control the system operating status, reset any errors and modify the language. To access the installer level, where the various operating parameters can be set, press "+" and "-" simultaneously for 5 seconds.

User Parameters

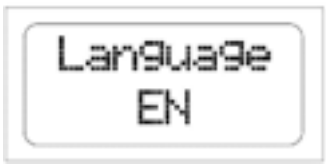


These parameters are normally accessible when the device is powered.

Main screen: during normal operation of the inverter, the display shows the device status. The top line displays the pressure measured in the system, while the bottom line shows the motor current absorption. In this screen, press and hold the key “+” to override pump operation also when there is no water, temporarily disabling the dry-running protection to enable the pump to be filled.



When the device is configured to operate as part of an alternating twin pumping unit, the bottom line shows the "master" or "slave" status by means of the letter "m" or "s".



Language: the language of the menus and alarm messages can be personalised as required. Use keys + and – to modify the parameter value.

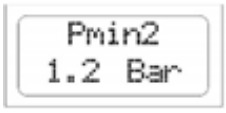
Installer Parameters

These parameters are located in concealed screens and are normally only modified during the installation phase. To access these pages, press and hold “+” and “-“simultaneously for 5 seconds. After accessing the concealed menu, use the arrow key “>>” to scroll through the screens and keys “+” and “-“to modify the parameters. To return to the main screen, press and hold keys “+” and “-“simultaneously for 5 seconds.

Operating mode: this parameter enables the user to set the operating mode implemented by the B Inverter to control pump start-up and shutdown. In mode P+F (pressure+flow) the pump is started up when the pressure falls below the value set in Pmin (start-up pressure) and is stopped when the water flow through the device is virtually zero. In this condition the resulting pressure in the system will correspond to the maximum head of the pump installed. In mode P+P (pressure+ pressure) the pump is started up at the value set in Pmin and is then stopped when the system pressure reaches the value Pmax (stop pressure). In this mode, the installation of an expansion vessel is essential, sized according to the system specifications.
In both operating modes, the dry-running protection is enabled, and trips when the water flow is zero and the system pressure is below the value Pmin.
Operation within twin booster sets is only admissible in mode P+P and consequently, the settings of the parameters “Aux. Con.”, “Pmax” and “Pmin2” depend on the pre-set operating mode.

Pmin: this parameter represents the minimum pressure at which the pump is started. The parameter can be set from 0.5 to 8.0 Bar. The factory setting is 1.5 bar. Use keys “+” and “-“to modify the set value.

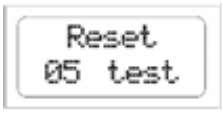
Pmax: this parameter is only available when the operating mode is set to P+P (pressure+pressure) and represents the electric pump stop pressure. The parameter can be set from 0.8 to 9.0 Bar and in any event at least 0.3 Bar higher than the set value of Pmin. Use keys “+” and “-“to modify the set value.



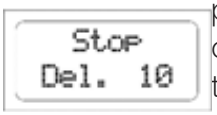
Pmin2: this parameter is only available when the operating mode is set to P+P and the parameter Aux. Con. is set to “1” to enable operation of twin booster sets. This parameter defines the secondary (slave) pump start-up pressure when the primary (master) pump can no longer meet the system demands. The parameter can be set from a minimum of 0.5 Bar to a maximum value equal to the pressure Pmin-0.2 Bar. The factory setting is 1.2 bar. Use keys “+” and “-“to modify the set value.

Auto-reset interval: during operation of the pump, if water supply on intake fails temporarily, the inverter shuts off the power supply to the motor to avoid any damage. This screen enables the user to set after how many minutes the device should auto-reset to check renewed availability of water on intake. If the attempt is successful, the inverter exits automatically from the error condition and system returns to operative status; otherwise another attempt is made after the same time interval. The maximum settable interval is 180 minutes (recommended interval: 60 min.). Use keys + and – to modify the parameter value.

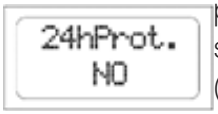
N° auto-reset tests: this parameter defines the number of attempts made by the inverter to try an resolve a shutdown caused by dry running conditions. When this limit is exceeded, the system shuts down and user intervention is required. The auto-reset is disabled if this value is set to zero. The maximum admissible number of attempts is 100. Use keys + and – to modify the parameter value.



Delay on stop: this parameter enables the user to define after how many seconds the electric pump is stopped following closure of all utilities in mode P+F. At low flow rates, if frequent pump start-ups and shutdowns occur, increase the shutdown delay to render operation more uniform. An increase to this parameter may also be useful to eliminate excessively frequent activation of the dry-running protection, especially in the case of submerged pumps or on those with self-priming problems. The factory setting is 10 seconds, and may be increased to a maximum of 120 seconds. Use keys "+" and "-"to modify the stop delay.



24H anti-seizure protection: this parameter enables the activation of a function that automatically starts up the pump after 24 hours of disuse. If this function is activated, and the pump is not started up for 24 hours, the B Inverter overrides to a cycle of 15 seconds to prevent system disuse from leading to mechanical seizure of parts (e.g. the seal), maintaining system efficiency.

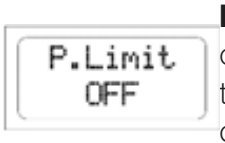


4°C ice protection: this parameter enables activation of a function that may help prevent damage due to lowering of ambient temperatures and the risk of ice formation. In particular, if the ambient temperature falls below 4°C, the B inverter starts up the pump every 30 minutes for a duration of 15 seconds, to avoid, when possible, the rapid freezing of the water inside the pump. CAUTION: although this function can reduce the risk of damage caused by ice, it is good practice not to use the inverter and the electric pump in environments where temperatures can fall below 4°C.
The activation of this function is not sufficient to guarantee operation and protection of the system if temperatures are close to or below 0°C!!

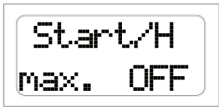
Imax: this optional parameter enables entry of the maximum current absorbed by the electric pump in routine conditions, to enable shutdown of the motor in the event of excessive absorption. The motor is also shut down event if the current read during operation is below 0.5 A following interruption of the connection between the motor and the inverter. The trip time of the current overload safety device is inversely proportional to the entity of the overload in progress; therefore a slight overload will lead to a more delayed trip time while a more significant overload will accelerate the trip time. The parameter is settable from 0.5 to 16 A by means of the keys "+" and "-". To deactivate the current control protection of the motor, press the key "-"until the text "OFF" appears on display. CAUTION: the factory setting is OFF and therefore a maximum current value must be set to activate the protection.

Auxiliary Contact: this parameter enables the user to assign a specific function to the auxiliary contacts available on the Flowcon VSD - B Inverter Inverter according to the scheme on next page:

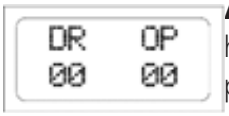
Aux Con.	Description
0	No function activated for auxiliary contacts
1	Enables comunication between two B inverter units within a twin booster set with automatic alternation of pumps
2	Sets up the auxiliary contact for an external enable signal ±(e.g. float, timer, irrigation controllor) and enables the relay output (terminals 5 and 6 on the terminal boared) for any error signals. The relay contact close in the event of an alarm.
3	Sets up the auxiliary contact for an external enable signal (e.g. float, timer, irrigation contrllor) and enables the relay output (terminals 5 and 6 on the terminal board) for pump opperation signals. The relay contact closes while pump is running.
4	Enables communication between B inverter unit the an inverter Sirio within a twin booster set.



Limit pressure: this parameter defines a pressure threshold over which the overpressure protection is activated. The factory setting is OFF, to indicate that the protection is disabled. To set a limit pressure, use keys “+” and “-“. To disable the function, press the "+" key until the text OFF is displayed.



Maximum starts per hour: sets the maximum start limit in on hour of the pump. To disable the protection, press the button - until the word "OFF" appears.



Alarm log “1”: in this screen the user can read the number of alarms that have tripped due to activation of the dry-running protection (DR) and the pressure overload device (OP). These data can be checked in the event of a malfunction.

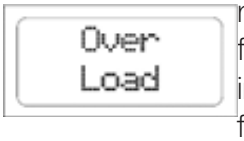
Alarm log “2”: in this screen the user can read the number of alarms that have tripped due to activation of the current overload protection (OL) and the ice protection (IP). These data can be checked in the event of a malfunction.

Hour counter: this screen displays the total operating hours of the inverter (in terms of the time for which the device has been connected to the electric power supply). If the key “+” is pressed on this page, the number of pump operating hours is displayed.

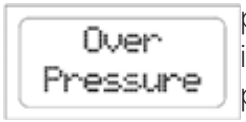
Alarms

Dry running: this message appears when the system is shut down following absence of water on pump intake. If the auto-reset function is enabled, the inverter automatically attempts to restart and check for renewed availability of water. To remove the error message from the display immediately, simply press the central key “reset”.

Current Overload: this alarm is displayed when electric pump absorption exceeds the maximum set current as entered in the parameter Imax; this may occur following intensive use of the electric pump, continuous restarts at close intervals, problems with the motor windings, seizure of the pump rotor or following problems with the electrical connection between the motor and inverter. If this alarm trips frequently, arrange for the system to be checked by the installer. To remove the error message from the display immediately, simply press the central key “reset”.



Overpressure: when this alarm trips, this means that the inverter has detected a system pressure value over the value set in the parameter “Plimit”. This may occur in applications with the pump under load conditions, i.e. when the pump pressure is added to the filling pressure on inlet. If the error occurs frequently, try to increase the parameter Plimit or contact the installer for assistance. To remove the error message from the display immediately, simply press the central key “reset”.



Troubleshooting

When one of the system valves is opened the pump does not start or starts only after a few seconds.
The set Pmin value is too low, or a check valve has been fitted downline of the device. Check the setting of the parameter Pmin.
If the parameter “Aux. Con.” is set to “2” or “3” and an electric float is used, check to ensure correct operation. If no electric float is used, check that the jumper is wired on the relative terminals.
Ensure correct connection between the inverter and the electric pump

The pump does not stop
The check valve inside the inverter may be blocked in the open position; ensure correct valve movement and remove any foreign bodies by means of compressed air if necessary.
The sensor reading the valve position is faulty; arrange for the device to be checked by the manufacturer.

On closure of the valves
The pump stops but restarts after a few seconds without any leaks from the system.
The difference between the values Pmin and Pmax is too small, and the pressure drop that occurs on pump shutdown is sufficient to enable restart. Increase the value Pmax or reduce the value Pmin. Increase the size of the expansion vessel installed.

The pump starts and stops continuously.
There are leaks from the system. Check the various hydraulic connections. Check on display if there are any pressure drops when the valves are closed. Check for the possible presence of dirt in the check valve of the inverter preventing total closure, and if necessary clean by means of a compressed air jet. Install a small expansion vessel on outlet from the inverter.

The device frequently signals dry running conditions.
The pump intake hose, during periods of system disuse, drains preventing pump filling and subsequent restart. Check sealing efficiency of the base valve (if fitted).

With very low water flow rates, pump operation is irregular.
The water flow rate is too low, and is thus not detected by the device, with consequent pump shutdown. Install a small expansion vessel (1-2 litres) to enhance system flexibility and reduce the number of restarts.

The system pressure has risen above the set value in Pmax.
If the ice protection or mechanical seizure protection devices have triggered, pressure may increase over the set values as the pump is operated in override for 15 seconds, regardless of the values set in Pmax and Pmin.

The device does not turn on
The electronic board may be damaged; arrange for the device to be checked by the manufacturer.

Maintenance

The Flowcon VSD - B Inverter Inverter has been designed to reduce maintenance requirements to a minimum. Always observe the following instructions to ensure prolonged efficiency of the device:
- Never allow the device to reach temperatures below 4° C; if this is not possible, ensure that all the water in the circuit is drained to prevent damage to the plastic housing of the device if ice forms;
- If the pump is equipped with filters on intake, check their condition periodically;
- Always ensure that the cover is closed properly to avoid the ingress of water from outside;
- Disconnect the power and drain water from the system when the system is not to be used for a prolonged period;
- Before using the device with liquids other than water, contact the manufacturer for further information;
- Never perform work with the device open;
- Before removing the device cover, wait for 3 minutes to enable discharge of the capacitors.

⚠ CAUTION: the device does not contain components that may be repaired or replaced by the final user. therefore do not remove the protection cover on the electrical board to avoid rendering the guarantee null and void.

Date of installation	…./…./…….	Installer	
Client			
Pump brand-model			
Serial N°			
FACTORY SETTINGS ON INSTALLATION			
Mode			
Pmin	Bar		
Pmin2	Bar		
Pmax	Bar		
Reset	Minutes		
Reset	Test		
Prot.24H			
Prot.4°C			
Stop delay	Seconds		
Imax	A		
Plimit	Bar		
Aux. Con.			
Deact. thresh.			
Notes			

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We place great emphasis on providing technical back up to support our Service Engineers in resolving some difficult operational and technical issues. We pride ourselves on completing a project on time, within budget and never leaving a problem unresolved, or a customer waiting. This quality of service has made us the first choice for our customers.

FOR FURTHER INFORMATION OR ASSISTANCE

contact us

Flowtech Water Solutions are experts in water services and water booster sets. We have continuously supplied a wide range of standard and custom products since being founded in 1996.

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