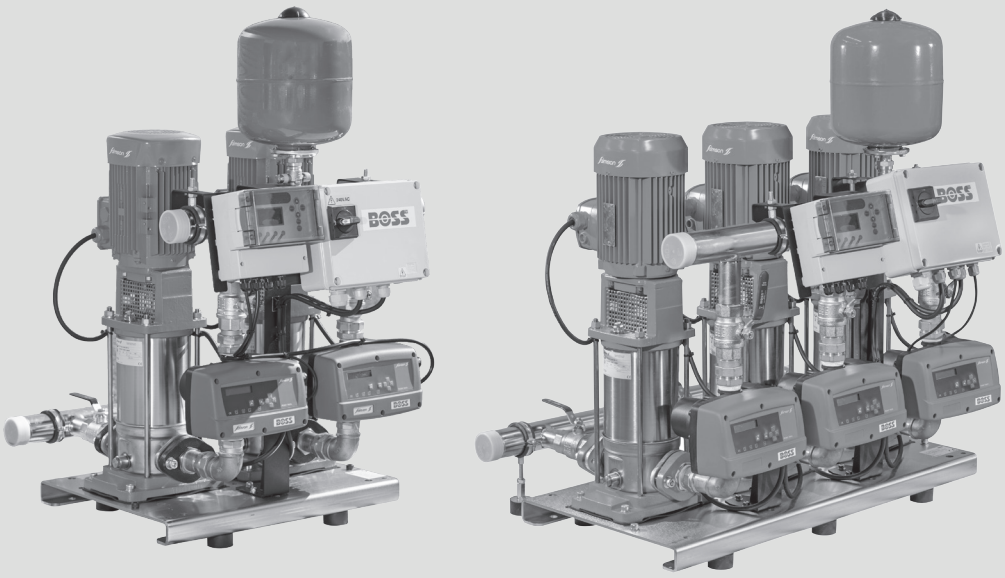


BOSS™ Multi V 2 & Multi V 3 Pump Sets

With Volt Free Connection

EN Installation and operating instructions

for models:

BOSS-2 MULTI V 204/EC-VFC-1PH - 80460368
BOSS-2 MULTI V 206/EC-VFC-1PH - 80460379
BOSS-2 MULTI V 404/EC-VFC-1PH - 80460390
BOSS-2 MULTI V 406/EC-VFC-1PH - 80460409
BOSS-2 MULTI V 804/EC-VFC-1PH - 80460420
BOSS-2 MULTI V 806/EC-VFC-1PH - 80460431
BOSS-3 MULTI V 204/EC-VFC-1PH - 80460294
BOSS-3 MULTI V 206/EC-VFC-1PH - 80460302
BOSS-3 MULTI V 404/EC-VFC-1PH - 80460313
BOSS-3 MULTI V 406/EC-VFC-1PH - 80460324
BOSS-3 MULTI V 804/EC-VFC-1PH - 80460353
BOSS-3 MULTI V 806/EC-VFC-1PH - 80460346

4168505 -Ed.1-03/12

Fig. 2

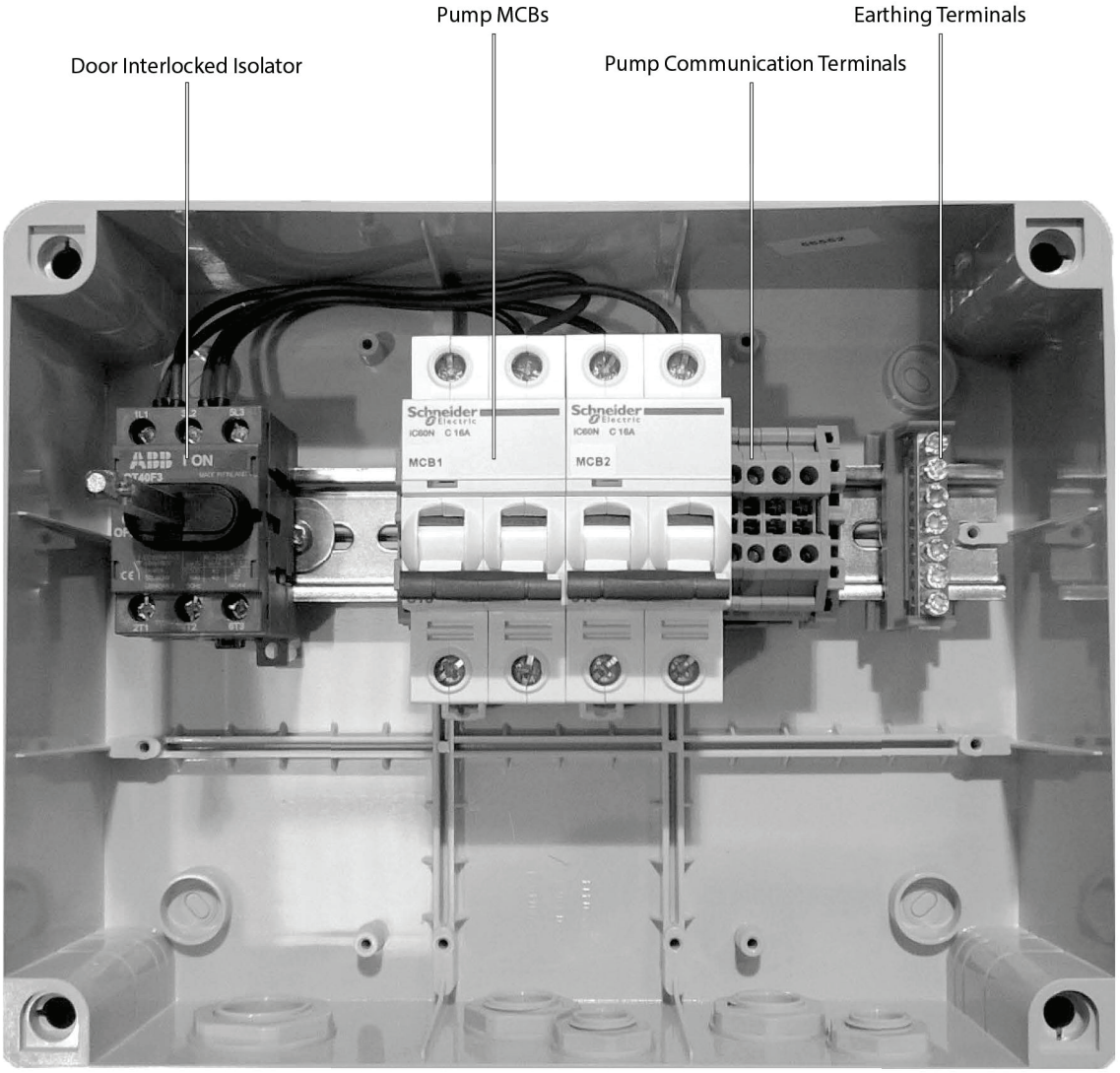

Door Interlocked Isolator
Pump MCBs
Pump Communication Terminals
Earthing Terminals
MCB1
MCB2

Fig. 3

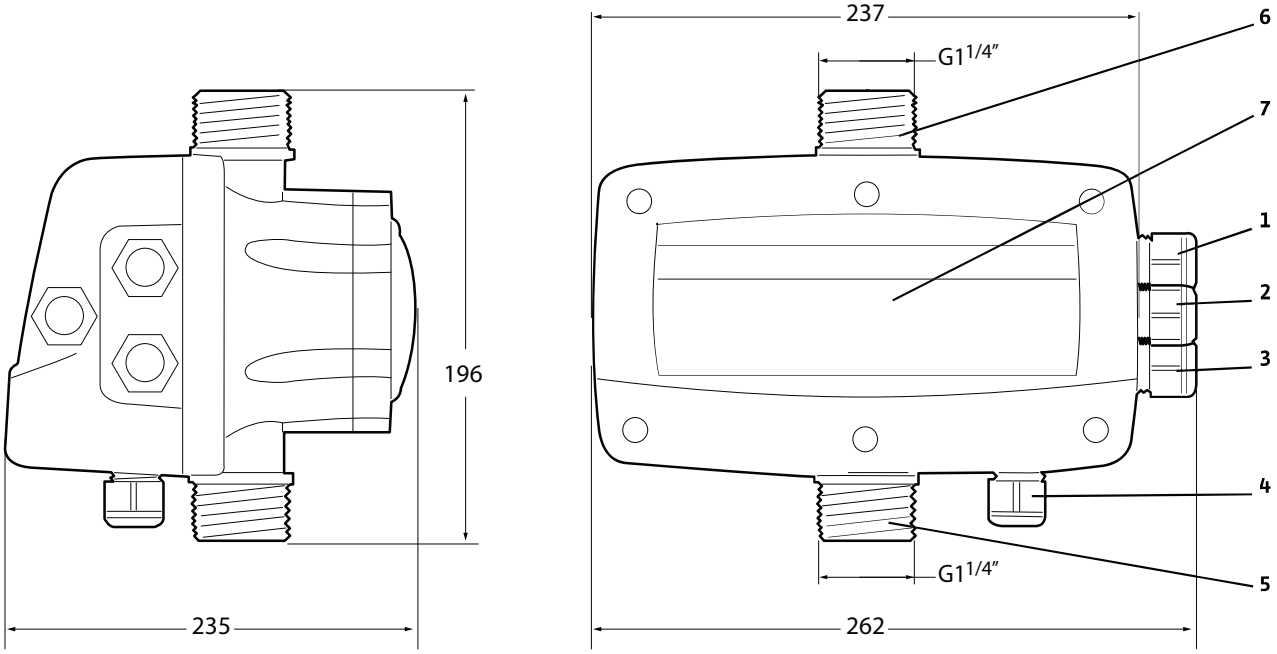

237
G1 1/4"
6
7
1
2
3
4
5
G1 1/4"
196
235
262

Fig. 4

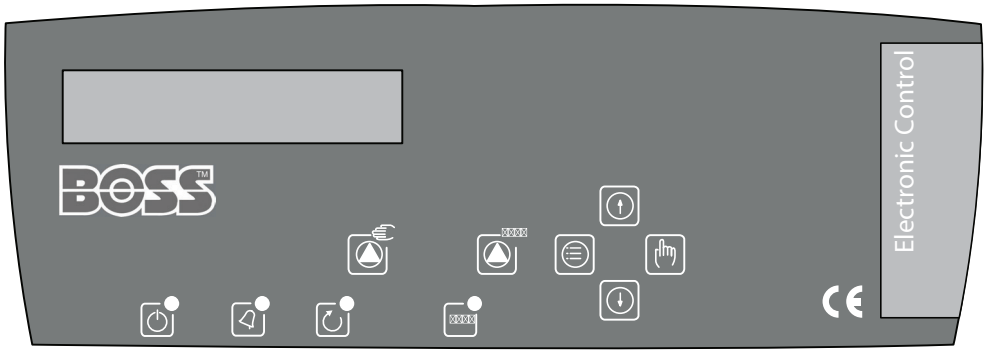


Fig. 5

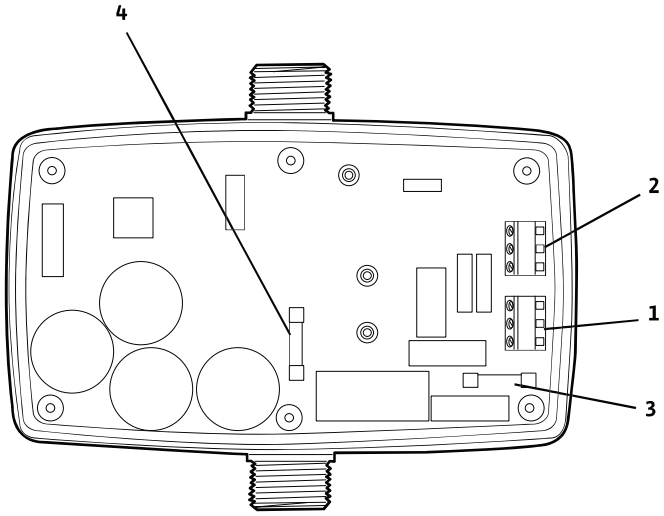


Fig. 6

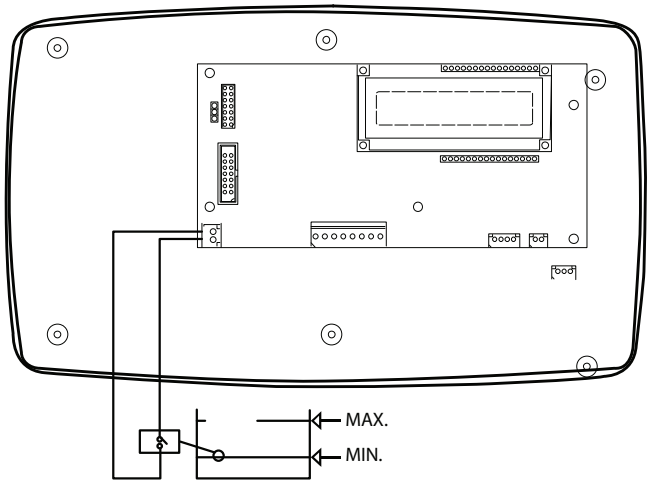
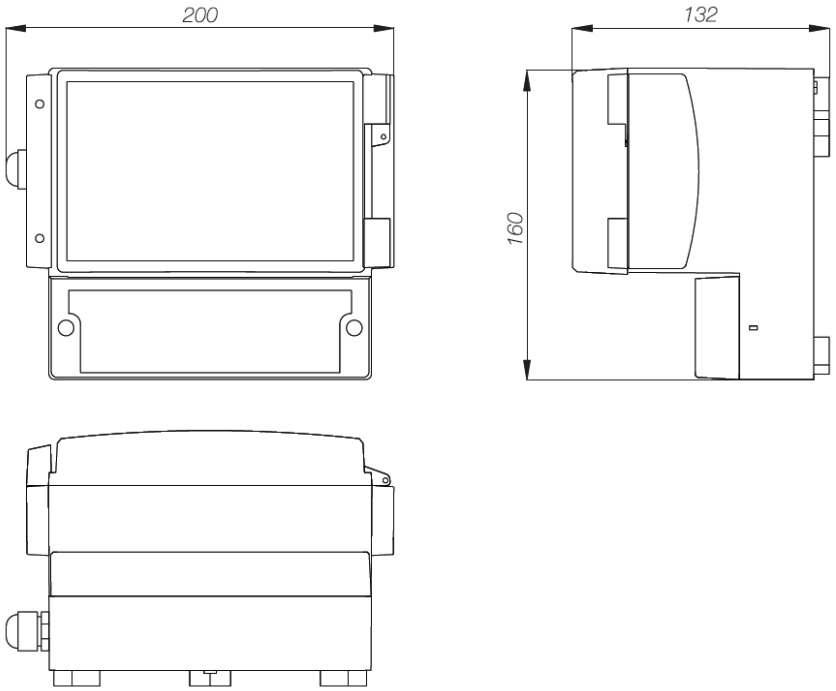


Fig. 7 (Speedcentre)



Please see back of manual for wiring diagrams

1. General

The installation and operating instruction is an integral part of the product and must be kept readily available near the place where the product is installed. Strict adherence to these instructions is a precondition for the installation and proper use of the product. The installation and operating instruction corresponds to the relevant version of the product and the underlying safety standards valid at the time of going to print.

2. Safety

This instruction contains important information which must be followed when installing and operating. For this reason, this operating instruction must, without fail, be read by the service technician and the responsible operator before installation and commissioning.
Both the general safety instructions in the "Safety precautions" section and those in subsequent sections indicated by danger symbols should be carefully observed.

2.1 Symbols used in this operating instruction

Symbols

General symbol for danger.

Warning of electrical danger.

REMARK: ....

Signals

DANGER! Extremely dangerous situation. The non-observance could cause death or serious injuries.

WARNING! The user may suffer from injuries (serious). The mention «Warning» involves that personal (serious) injuries may happen when precautions are not observed.

ATTENTION! Damage could be caused to the pump or installation. The mention «Attention» is used to indicate that by ignoring the relevant safety instructions, damage could be caused to the pump or its operation.

REMARK! Useful remark for product handling. Any possible difficulty is mentioned.

2.2 Staff training

The personnel installing the pump must have the appropriate qualifications for this work.

2.3 Risks incurred by failure to comply with the safety precautions

Failure to comply with the safety precautions could result in personal injury or damage to the pump or installation. It could also invalidate any claims for warranty.
In particular, lack of care may lead to problems such as:

- failure of important pump or machinery functions,
- failure of the maintenance and repairing process recommended,
- danger to persons due to electrical, mechanical and bacteriol influences,
- material damages.

2.4 Safety precautions for the operator

Existing regulations for the prevention of accidents must be followed.
Dangers caused by electrical energy are to be excluded. Local or general rules issued by the IEC, VDE, etc. as well as the local electricity supply companies are to be observed.

2.5 Safety information for inspection and assembly

The user must ensure that all inspection and installation works are carried out by authorised and qualified specialists who have carefully studied these instructions.
Works on the pump or installation should only be carried out when the machine has stopped and is fully isolated.

2.6 Unauthorized modification and manufacture of spare parts

Alterations to the pump or installation may only be carried out with prior manufacturer's consent. The use of original spare parts and accessories authorized by the manufacturer will ensure safety. The use of any other parts may invalidate claims invoking the liability of BOSS™ for any consequences.

2.7 Unauthorized operating methods

The operating safety of the pump or installation supplied can only be guaranteed if it is used in accordance with chapter 4 of the operating instruction. The limiting values given in the catalogue or data sheet must neither be exceeded nor allowed to fall below those specified.

3. Transport and storage

The booster is supplied on a pallet and is film-wrapped to protect it against moisture and dust.

- The equipment must be transported by means of authorised load devices.
- Transport straps must be placed round the steel base frame.
- The manifolds will not withstand loads and should not be used to secure loads in transit.

ATTENTION! Loading the pipes in transit can result in leaks.

When the product is delivered, check it for any damage in transit. If any defect is found, inform your BSS agent.

ATTENTION!
If the product is installed later on, store it in a dry place. Protect it from impacts and any outside influences (moisture, frost, etc.).

Handle the product with care.

4. Application

The booster is designed for boosting and maintaining the pressure when the water supply network is not sufficient for required use.
It is used for water supply in high-rise apartments, offices and industrial buildings.
Non aggressive clear fluids (potable water, water containing glycol...).
A control box is used to control, monitor and protect the boosting system.
The booster is either supplied from a mains collection tank.

5. Product data

5.1 Type key

BOSS$_{TM}$ – 2 MULTI V – 404 – EC VFC

- Booster name
- 2 : number of pumps
- MULTI V : Type of pump
- 404 : nominal output and number of stages (4 m³/h 4 stages)
- EC : Electronic Control
- Volt free connection

5.2 Technical data

– Maximum operating pressure:	8 bars
– Maximum ambient temperature:	0 to +40°C
– Maximum water temperature:	+40°C
– Single-phase supply voltage:	230V (±10%) 50Hz
– Nominal current:	see type plate

5.3 Scope of delivery

– Booster.
– Installation and operating instruction of the booster.

5.4 Accessories

included

– Diaphragm pressure tank
– Stainless Steel Endcap

as option

– Flexible connection

6. Description and operation

6.1 General description

The booster is a compact installation that is supplied completely piped-up and ready to connect. The only connections that have to be made are for suction and delivery pipe and also the power mains.
The relevant instructions or standards must be observed for the connection to the public water supply mains. Regulations from the water companies must be included when appropriate.

6.2 Product description

6.2.1 Control box

- Ensure complete automatic operation of the booster.
- Tightness, protection class IP 55.
- External safety and starting switch of the booster.

Inside (Fig. 2)

Main switch with power supply connection terminals.
Miniature circuit-breaker.

6.2.2 Description of the ElectronicControl (Fig. 3)

1. Cable gland of the ElectronicControl power supply
2. Cable gland of the pump power supply
3. Cable gland of the dry running protection
4. Cable gland of the series connection (as option)
5. Suction
6. Discharge
7. User interface

6.2.3 Speedcentre Control panel Option (Fig. 7)

Control panel with LCD screen, warning LED-lights, push buttons for configuration & manual start/stop. It is electrically supplied directly through pump inverter communication cables.

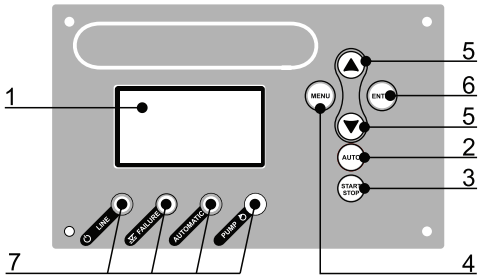
6.2.4 Description of the electronic board (Fig. 5)

1. Input terminal of the ElectronicControl.
2. Input terminal of the motor.
3. Protection fuse of the ElectronicControl input (I: 20A, type: gG, U: 500Vac, breaking capacity I1: 120kA, size: 10 x 38mm).
4. Protection fuse of the motor input (I: 20A, type: high speed, U: 690Vac, breaking capacity I1: 100kA, size: 10 x 38mm).

6.2.5 Diameter of the manifolds

BOSS 2 Multi V series : threaded manifolds 2" BSP
BOSS 3 Multi V series : threaded manifolds 2" or 2½" BSP

6.3 Speed Centre Controls



6.3.1 Speed Centre

1. LCD screen. Shoes the set pressure in operating mode.
2. **AUTO** pushbutton. It allows to change from AUTOMATIC to transition mode or vice versa. In manual mode the AUTOMATIC led is lit.
3. **START–STOP** pushbutton. Use it for switching from transition mode to manual mode. In manual mode it starts and stops the previously selected pump by means of the push buttons ▲▼(5)
4. **MENU** pushbutton. Use it to enter or to leave the configura tion menu. Also to leave manual mode.
5. Pushbuttons for changing configuration data shown in the LCD screen and for selecting the pump in manual mode.
6. **ENTER** pushbutton. Use it for saving the programmed values. Every press is suceeded by a new field of the CONFIGURATION MENU. Whenever you want to quit the configuration sequence press **MENU** (4)
7. LED lights:

LINE (green): electric supply. Bright when connected
FAILURE (red): bright or flashing depending on type of failure
PUMP (yellow): when it is bright it means there is at least a pump operating. It is lit with all the pumps stopped or when the device is not connected.
AUTOMATIC (green): bright in automatic mode, lit in manual and transition mode.

6.3.2 Setup

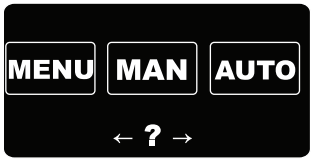
Before proceeding with the Speedcentre configuration it must be verified the installation of each electro controller by following the steps described in the users manual of the ectro controller – CONFIGURATION section. A correct installation implies:

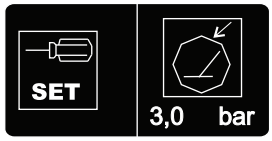
- Max. current intensity selection for each pump
- Rotation sense verification for each pump
- Minimum speed selection for each pump
- Set all the devices as SWITCHER (electro controller booklet / configuration / step12 / serial control: master, slave or switcher)

All the values are changed using ▲▼and pressing **ENTER** to memorise changes. After each **ENTER**, there will be showed consecutively the different screens that constitute the configuration sequence. We can escape from the configuration sequence by pressing **MENU**, being saved the data modified.

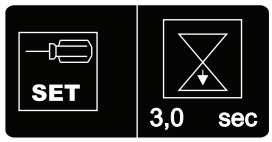
Please follow next steps:

Press **MENU** to start the Setup process

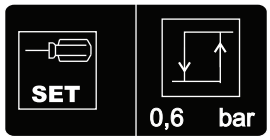




This will be the working pressure. Use the arrow ▲▼ keys for modifying the default value. Once selected press **ENTER** to save.



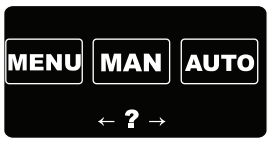
Run on timer setting. Using the keys ▲▼ we can modify the initial value. Once selected press **ENTER** to save



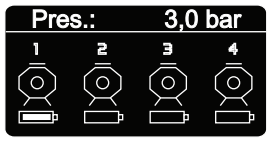
Start pressure differential. Use the keys for modifying the initial value. It is recommended to maintain this value between 0.3 and 0.6 bar. Example:

- Input pressure: 2 bar
- Differential start: 0.3 bar
- Final start pressure: 2 – 0.3 = 1.7 bar

Once selected press **ENTER** to save.



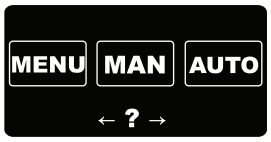
The device is ready to operate. Press **AUTO**



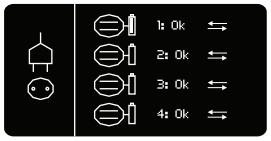
During automatic operation, the screen will show the number of active pumps, the set pressure and the next pump to start when there is not demand.

6.3.3 Hand / Manual Mode

The speedcentre allows the manual activation of a pump in order to carry out any type of varification or test. The sollowing process should be followed.



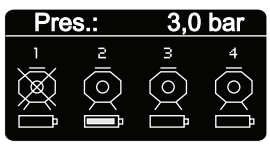
If we are in transition mode press **START/STOP**. If we are in automatic mode press **AUTO** and then **START/STOP**.



Using the arrow keys ▲▼ we can select the pump. Press **START/STOP** to start and stop the pump. Press **MENU** to escape, returning to transition mode.

6.3.4 Alarms management

The speedcentre detects if a pump has undergone some failure or problem. It reacts by activating the alarm led light, showing in screen the affected pump or pumps and trying to restore the damaged device. After a number of attempts it will remove that pump from sequence. The information about the type of failure is shown on the screen of the relevant elctro controller.



Example: failure in pump 1 and pump 2 is operating

6.3.5 Description of the user interface (Fig. 4)

	Green led	ElectronicControl
	Red led	Blinking : current error Fix : final error
	Yellow led	Pump is working
	Green led	ON : Automatic mode OFF : Manual mode

The ElectronicControl protects the pump against (§ 10.2):

- dry running,
- over currents,
- too high water temperatures,
- frost,
- short-circuits,
- over voltages,
- Under voltages.

In case of defect (such as dry running, overvoltage ...), the led  flashes and the ElectronicControl will try to start the pump regularly. After many trials the ElectronicControl finally stops and the led  is ON but does not blink anymore.

7. Installation

7.1 Local

Install the booster in a room that provides an easy access, well ventilated and frost-proof.
Be sure that the dimension of the technical room door is adequate to enter a booster.
Adequate space must be provided for maintenance work. An easy access to the installation shall be ensured from at least two sides.

7.2 Hydraulic connection

ATTENTION! Observe the requirements from the water supply companies and the local rule into force.

- The connection of the suction and delivery manifolds can be made either on the right or left hand sides of the installation. It is recommended to close the ports that are not used with thread caps.
- Valves must be fitted on the manifolds to easily separate the booster if need be.
- The installation must be fitted with the supplied diaphragm pressure tank to be assembled on the delivery manifold.

- The existing pipes must be installed free from stresses. Flexible connecting pipes are recommended for this purpose in order to avoid stresses on the pipe connections and minimise the transmission of vibrations to the building installation.

Connection on load to a tank
Be sure the installation can withstand the maximum pump pressure at zero flow plus the public water mains pressure. Otherwise connect the pressure relief valve to the booster outlet behind the tank.

7.3 Electrical connection

WARNING! The electrical connection must be performed according to the local regulations by an electrical installation engineer approved by the local utility.

To make the electrical connection, the corresponding installation and operating instructions and attached electrical circuit diagrams must be observed. General points to be considered are listed below:

- the type of current and voltage of the mains connection must comply with the data on the type plate and the circuit diagram of the control unit.
- as protection measure, the booster must be earthed according to the regulations (i.e. according to the local regulations and circumstances); the connections intended for this purpose are identified accordingly (see circuit diagram).

Power supply cable
The electric supply cable shall be correctly dimensioned according to the total booster power (see type plate).
Connecting the control box on a voltage different from the one mentioned in the description is not possible (see chapter 5.2. technical data).

NOTA: for any further details an electric diagram is available inside the control box.

ATTENTION! Do not forget to connect the earth terminal.

Lack of water protection
An input ON/OFF (250v 2A) (Fig. 6) protects the booster against lack of water, a pressure switch (Normally Open) or a float switch shall be connected to this input.

ATTENTION! Do not apply external voltage to the terminals.

8. Commissioning

ATTENTION! Never let the booster run as dry over a few seconds. Dry running may damage the mechanical seal.

Before switching on for the first time, check that the customer's wiring has been done correctly, particularly the earthing.

ATTENTION! Tighten all the supply terminals before starting the booster.

When switching on the ElectronicControl immediately carries out a diagnosis that lasts 10 seconds and will display the model type and software version. The led is on.

In case of a pump at suction, the priming of the pump shall be done manually (manual mode). During the priming step (see operating instruction of the pump) it may drive the pump at its maximum speed.

As soon as the pump is priming on, the ElectronicControl can be switched on Automatic mode.

8.1 Filling – Cleaning

Connection to public water supply or on load to a tank

- Check the water supply origin (adequate water level in the tank).
- Open the booster supply valve to get water inside.
- Open the filling plugs (Fig. 1, pos. 5) of the pumps and wait as long as water is getting inside before closing them again.
- Keep the switch on "HAND" to check priming. If need be test the pumps one after the other.

8.2 Motor sense of rotation

The electric connection of the pumps to the control box is performed in the factory.

8.3 Setting description

Float switch for connection to a tank

Set the float switch in order to keep a minimum water level about 40 cm over the booster inlet port.

Be sure the electric connection is right by activating the float switch by hand to generate a dry running fault.

8.4 Start

The maximum operating pressure in the installation is equal to the pressure at zero flow of the pumps plus the water supply pressure at booster inlet if need be.

On the ElectronicControl position the button of the pumps on “Auto“.

The control box now ensures the automatic operating of the booster.

ATTENTION! Do not let the pump operate with delivery valve closed.

9. Maintenance

- No particular maintenance is recommended for the booster when operating.
- Motor bearings are greased for life-time.
- No maintenance for the mechanical seal when operating.
- In long period of frost and stop of the pump, it is recommended to drain the pump by screwing off the bottom plug.

ATTENTION! Fill in the pump before any new start.

10. Faults, causes and remedies

Faults	Causes	Remedies
One or two pumps fail to prime	Air leak at suction	Check tightness of all suction pipe connections. Check if the tank suction strainer is covered with water
	Foot-valve strainer not tight or obstructed	Check tightness of the valve, replace it if necessary
	Large losses of head at suction	Calculate the losses of head and make sure they are compatible with the pump NSPH
	Suction head too high	Be sure that the minimum water level of the tank is compatible with the NPSH of the pumps
	Suction piping obstructed or valve on suction manifold closed	Check valve opening and clean the piping if necessary
One pump fails to run	Thermal relay tripped	The pump "fault" indicator on the control box must be lit. Check the setting of the current
	Magnetic circuit breaker tripped	Switch it again. If tripping recurs, check the output current of the motor concerned. If this current is much higher than the one mentioned on the motor type plate, the circuit breaker is defective and shall be replaced
	Pump shaft blocked	Switch off the electric supply of the control box and then check the shaft turns freely. If it is blocked, dismantle the pump
	Winding fault	Disconnect the terminal block of the motor concerned. Check the network at the terminals and the stator insulation. Replace the motor if necessary
No delivery pressure	Flow higher than booster capabilities	Plan to replace the booster by a more adequate one (do not forget to contact us in any case)
	One or two pumps not primed	Check that the suction strainer does not let air in or the tank filling point is too close from the strainer
	A pump is obstructed by particles	Have the pump dismantled and cleaned
	Voltage of the motors too low	Check the voltage on motor terminals
Voltage of the motors too low	Check the voltage on motor terminals	Reset it
	No air inside the tank	Pressurize the tank or replace the bladder
Tripping frequency of dry running safety	Setting of dry running pressure switch-too high	Set the pressure switch correctly
	Drop of the public water supply pressure when starting the pumps	Set the dry running pressure switch to the minimum value. If it recurs, the public water mains is inadequate, check the pressure with the pressure gauge when starting the pumps or contact the public water mains service
Operating automation device defective	Wires disconnected	Check all connections to the terminal block of the control box

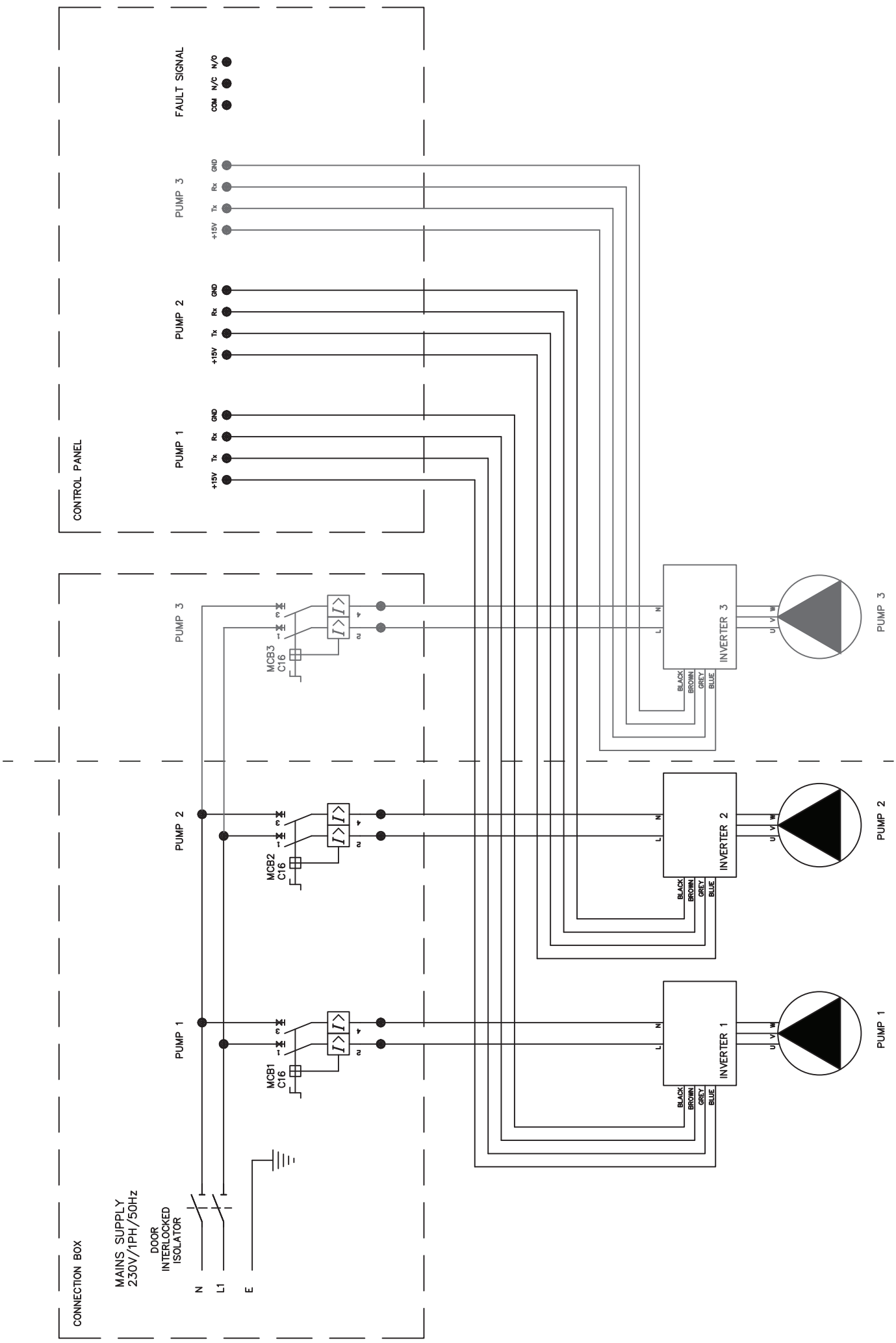
11. Spare parts

All spare parts must be ordered throu
Customer Services.
In order to avoid any mistakes, please
name plate data for orders.
Spare parts catalogue is available at
www.bssindustrial.co.uk

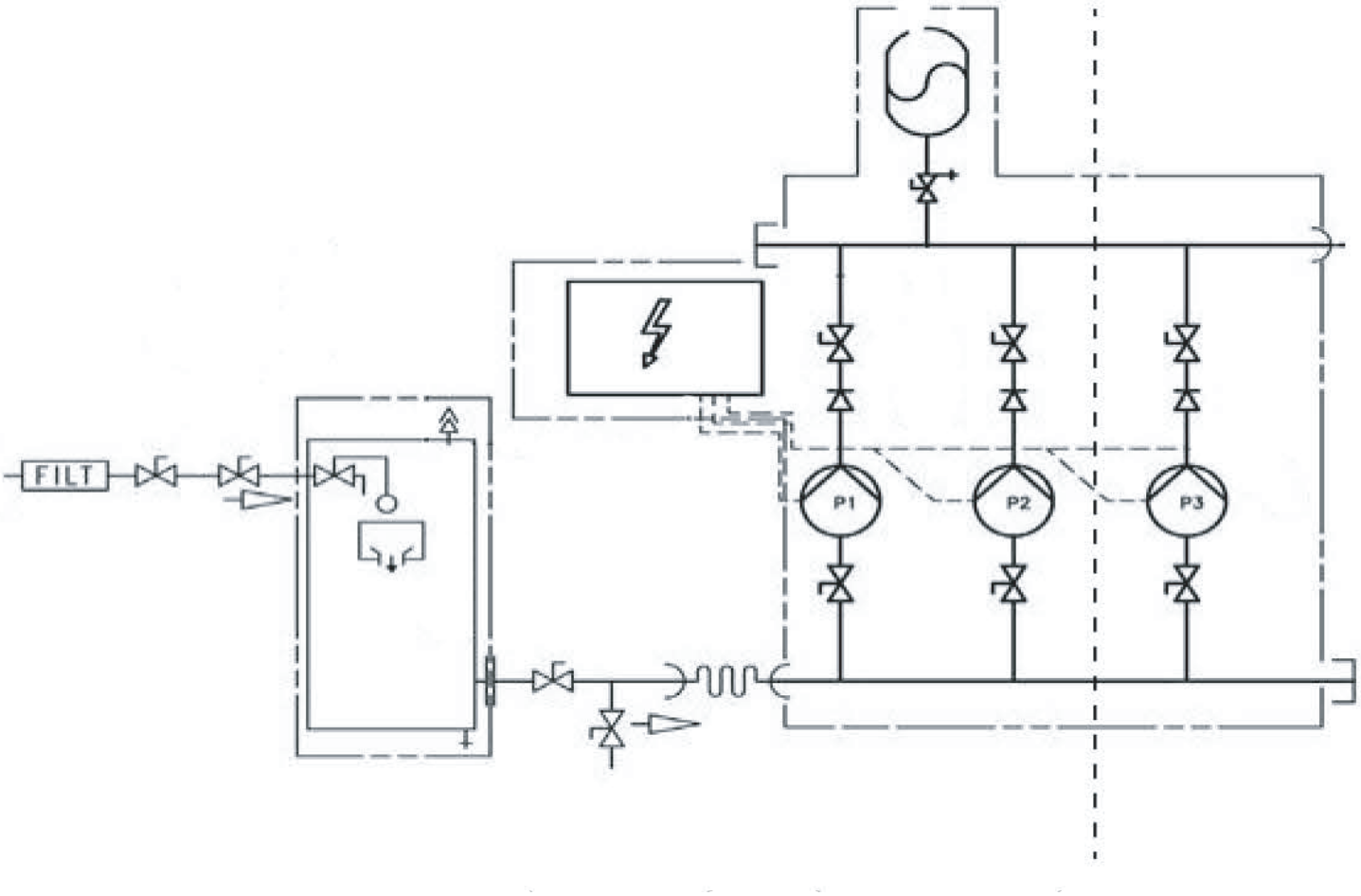
Notes:


AMS Aftersales
BSS | Specialists in Pump Aftersales & Spares
BSS offer a comprehensive range of aftersales services through the dedicated AMS Aftersales team based in Nottingham.
Commissioning
AMS Aftersales can arrange the commissioning of pressurisation products as part of any project. Customers can access this service by contacting AMS direct or via any BSS branch. Once commissioning has taken place, the AMS database will record the details.
Servicing and Service Contracts
For peace of mind and to help ensure the maximum efficiency and safety of customers installed pumping and pressurisation equipment, AMS has a comprehensive range of service packages ranging from routine annual checks to full extended warranty options.
For more information or a quote, please contact the AMS Aftersales team
Tel: 0870 850 3886 | Fax: 0870 850 4972 | Email: amsse@bssgroup.com

Multi Pump Booster Set - Wiring Diagram



Typical 2/3 Pump Booster Schematic



Notes:

Notes: