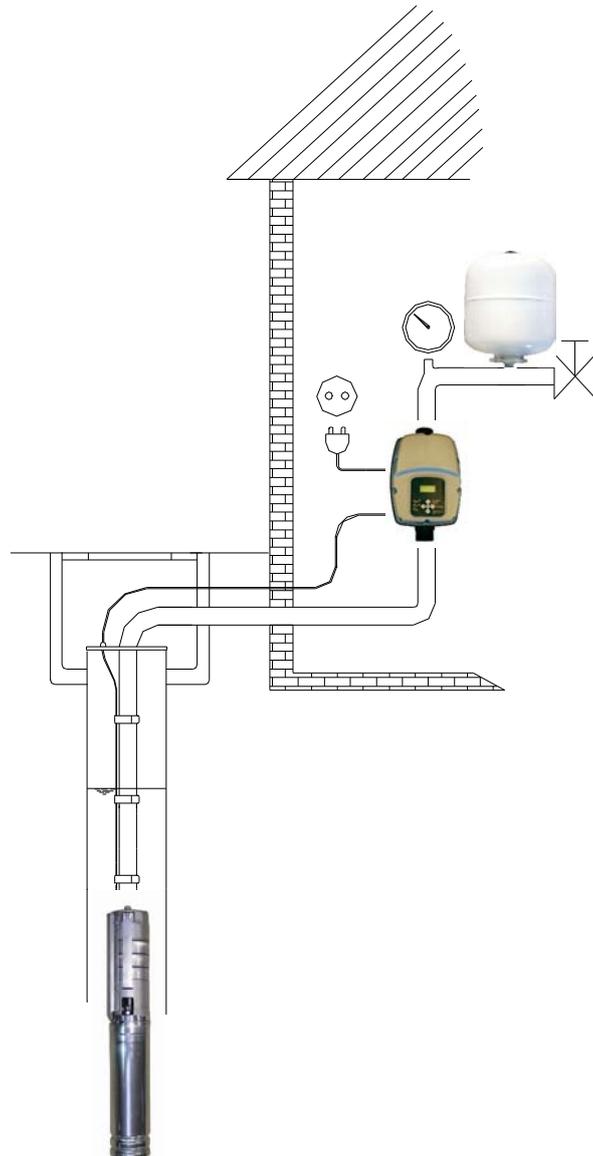




3" WPS[®] Constant Pressure Pumping System

Installation and Operation Instructions



WP/JVG/1.4/01.06

ATTENTION

Before installation of the unit, the technical data quoted on the nameplates of pump and motor has to be copied onto the following table.

Nameplate of the pump	
Pump	Type: 3"WPS-CP _____
	Serial Nr.: _____
	Q _n : _____ m ³ /h
	H _n : _____ m
	Frequency: _____ Hz
Motor	P _n : _____ kW
	T: _____ V
	I _n : _____ A

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1. GENERAL

1.1. Applications

Submersible motor pumps are designed to pump clean or slightly contaminated water in general water supply systems, irrigation and sprinkling systems, in ground water lowering and in heat pump installations. Other applications include pressure raising, air conditioning, fountains, ... Especially suitable for installation in narrow deep wells.

1.2. Product details

The unit series and size, the most important operating data and the serial number are marked on nameplates on both pump and motor. We recommend that, before installation of the unit, the technical data quoted on the nameplates are copied onto the second page of this operating instructions.

1.3. Sound pressure level

The sound pressure level of 3"WPS-CP pumps is lower than 70 dB(A)

2. SAFETY

This operating instruction gives basic instructions, which are to be observed during installation, operation and maintenance. It is therefore imperative that these operating instructions be read and understood by both the service fitter and the responsible personnel / operator prior to erection and commissioning, and it shall at all times be available on the site of the machine.

2.1. Marking of safety instructions in the operating instructions.

Safety instructions given in these operating instructions whose non-observance may cause a hazard to persons, are specifically marked by the following symbols:



In case of general warning
(acc. To ISO 3864-B.3.1)



In case of warning of electrical voltage
(acc. To ISO 3864-B.3.6)



For safety instructions whose non-observance may cause a danger
to the machine and its function

Non-compliance with safety instructions can jeopardise the safety of personnel, the environment and the machine itself. Non-compliance with these safety instructions will also lead to forfeiture of any and all rights to claims for damages.

In particular, non-compliance can, for example, result in:

- Failure of important machine/unit functions,
- Failure of prescribed maintenance and servicing practices,
- Hazard to persons by electrical, mechanical and chemical affects.

For installation of the power supply, we recommend to use a high sensitivity residual current device with $\Delta=30\text{mA}$ (class A or AS)

To improve immunity to the possible noise radiated on other equipments, we recommend to power the control panels with a separate wire. In some cases an extra noise filter must be mounted.

2.2. Personnel qualification and training



The personnel employed in operating, maintaining, inspecting and erecting the machine must be adequately qualified for this job. Responsibility, authority and supervision of the personnel must be exactly defined by the user. In the event of the personnel lacking the necessary knowledge, they should be trained and instructed. Moreover, the user should ensure that the intent of the operating instructions is fully understood by the personnel.

2.3. Safety instructions for maintenance, inspection and installation work

The user shall see that the above-mentioned work is performed by authorized and qualified specialists that have adequately acquainted themselves with the matter by thoroughly studying these operating instructions. As a general principle, work on the machine should be carried out only when the machine is at rest. It is imperative that the procedure for shutting down the machine as described in these operating instructions be followed.

Upon completion of the work, all safety and protection devices shall be re-installed and made operative again. Prior to re-commissioning, note the points mentioned in item «Commissioning».

2.4. Unauthorised modifications and manufacture of spare parts

Conversion work and alteration to the machine is permitted only upon consultation with the manufacturer. Using spare parts and accessories authorized by the manufacturer is in the interest of safety. Use of other parts exempts the manufacturer from any liability.

3. DECLARATION OF CONFORMITY

The company EBARA ESPAÑA BOMBAS, S.A. under its own exclusive responsibility declares that the products 3"WPS®-CP comply with:

Directive on Electromagnetic Compatibility and subsequent modification CEs 2004/108 .

Directive on Low Voltage and subsequent modifications 2006/95 CE.

RoHS Directives 2002/95/CE

WEEE directives 2002/96/CE

Machinery Directives 2006/42 CE

Conformity to the following CE regulations :

CE EN 292, CE EN 55014-1 (2001/11), CEI EN 55014-2 (1998/10), CE EN 61000-3-2 (2002/04), CEI EN 61000-3-3 (1997/06), CE EN 60335-1 (2004/04), CE EN 60335-1 (2004/04)

4. TRANSPORT AND INTERIM STORAGE



It is also pointed out in particular for horizontal transport (e.g. with a fork-lift), that the weight distribution of the pump and motor unit is very uneven. The heaviest point is usually in the area of the motor. If units are stored or placed vertically, secure properly against falling over.



When opening the package and when handling the unit, always ensure that the electrical connection cables are not damaged! In particular the electrical cables should never be pulled!.

Any transport and handling of the unit must be carried out correctly. The motor pump 3"WPS®-CP is supplied in packaging, which prevents flexing or other damage during transport and shelf storage. Prior to and during unpacking, please check that the packaging is not damaged or moist.

When the unit is temporarily stored it must be stored so that any flexing is avoided. The pump, motor and controller may be stored and transported without risk at temperatures down to -30°C.

5. DESCRIPTION OF PRODUCT, ACCESSORIES AND INSTALLATION DATA

5.1. Introduction

The 3" WPS®-CP pumping system is a residential water supply system that uses advanced electronics based on inverter-based technology, to enhance the performance of the pump. The controller is installed downstream of the pump and regulates a constant pressure by means of speed regulation of the motor, resulting in notable energy savings over time. Moreover, depending on the conditions and usage needs of the hydraulic system, the pump is turned on or off and malfunction conditions are managed.

In addition, the reduced tank size (8 litre) allows installation in small spaces.

Key features:

- Constant water pressure with a wide range of settings (1,5 up to 7 bar)
- Considerable energy saving that can exceed 40% in comparison with a common on/of system.
- Small pressure tank can be used (8 litre)
- Gradual pump start and stop reduces hammering, no in-rush current
- Digital pressure display
- Remote connection for remote control or double set-point
- Extractable terminals to facilitate wiring
- Protection features:
 - Dry well conditions, with automatic reset
 - Over current
 - Open motor circuit, short circuit
 - Internal overheating of the controller
 - Low line voltage (activation at approximately 200Volt)
 - High line voltage (activation at approximately 260Volt)
 - Phase failure

5.2. Designation (Example)

3" WPS®-CP 3 - 80



Nominal pressure in m
 Nominal flow in m³/h
 Stainless steel constant pressure submersible pump

5.3. Technical features

	3" WPS®-CP with 600W motor	3" WPS®-CP with 900W motor	3" WPS®-CP with 1500W motor
Power supply voltage	230 V single phase toll: +/- 10% - 50/60Hz	230 V single phase toll: +/- 10% - 50/60Hz	230 V single phase toll: +/- 10% - 50/60Hz
Minimum voltage	185 V	185 V	185 V
Maximum voltage	260 V	260 V	260 V
Pump motor type	600W, 3x220V, 140Hz	900W, 3x220V, 140Hz	1500W, 3x220V, 140Hz
Maximum current to the motor	3,4 A	4,9 A	7,4 A
Maximum line absorption	16 A	16 A	16 A
Set pressure range	From 1,5 to 8,0 bar	From 1,5 to 8,0 bar	From 1,5 to 8,0 bar
Maximum pressure	8 bar		
Maximum fluid temperature	30°C		
Inlet of the pump	1 ¼" female		
Hydraulic inlet of electronic	1 ¼" male		
Hydraulic outlet of electronic	1 ¼" male		
Degree of protection of the controller	IP X5		
EMC class	3C		
Dimensions of the kit	65x32x22 cm	65x32x22 cm	65x32x22 cm
Total weight of the kit	11,0 kg	12,9 kg	14,2 kg

5.4. Installation data

5.4.1. Location details

The 3"WPS®-CP motor pump is ideal for vertical installation in small dimension deep wells or basins, vessels and shafts. Because it is maintenance-free and should only be operated when fully submersed, it does not require any special adaptation of buildings or rooms.

The maximum installation depth is 150 m, with respect to the stationary water level Hh and the lower edge of the motor. The water level in the well is usually determined with an electrical plumb line.

- | | | |
|----|------------------|----------------------------|
| 1. | submersible unit | D. I.D. of well |
| 2. | riser pipe | T. depth of well |
| 3. | support clamp | He. Installation depth |
| 4. | electric cable | Hh. Stationary water level |
| | | Ht. Operating water level |

Note: $H_e - H_t \geq 0,5m!$

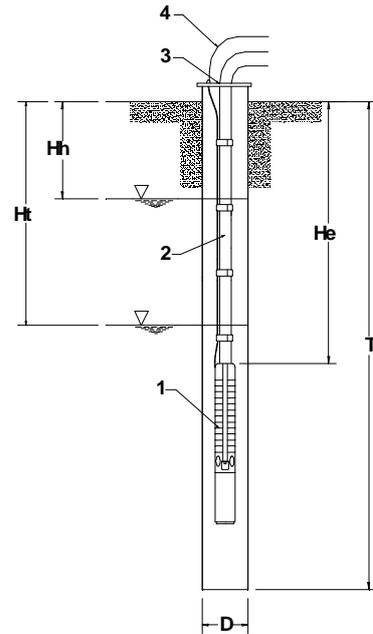


fig. 1: Vertical installation (e.g.: deep well)

This also applies to horizontal installation, mounted in cooling sleeve with supports, which we can also supply. Because pump and motor are delivered as a unit ready for installation, it is not necessary to align pump and motor at installation location. The foundation soil must be plane and must have a sufficient bearing capacity.

1. Submersible unit with cooling sleeve and supports
2. expansion joint
3. spring loaded non return valve
4. shut-off valve
5. drop cable

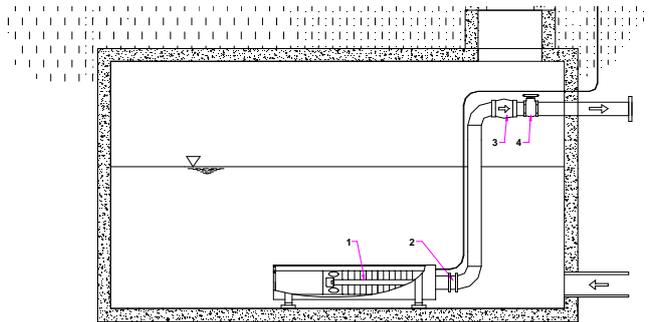


Figure 2: Horizontal installation (e.g.: tank or pit)



When the 3"WPS®-CP pump is installed in a horizontal position, an extra spring loaded check valve must be mounted (see fig 2). In fact controller starts and stops the pump in a 'soft mode'. This way the internal check valve of the pump will not always close properly.

ATTENTION

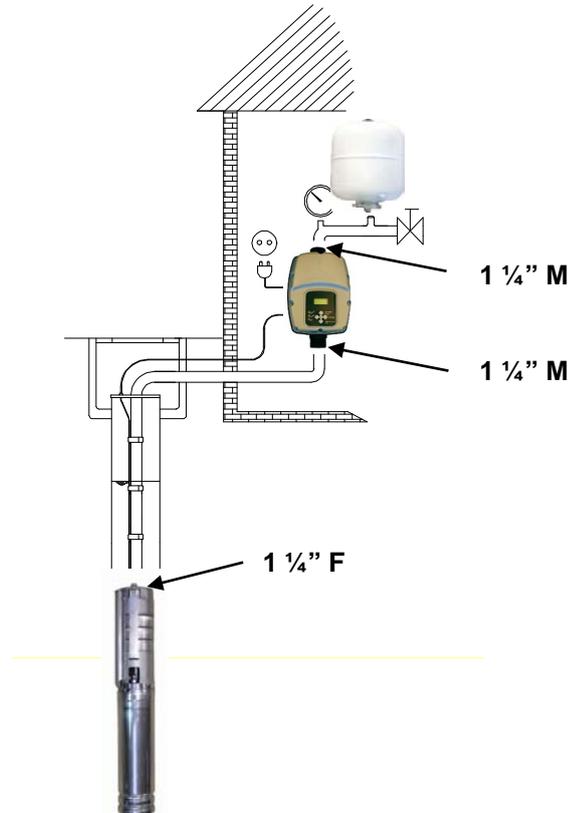
The 3"WPS®-CP system works at constant pressure. This regulation is appreciable if the hydraulic system downwards from the controller is correctly installed. Systems made with too narrow pipes cause pressure losses which the appliance cannot compensate; the result is that the pressure is constant on the 3"WPS®-CP controller but not on the user.

ATTENTION

It is important to ensure that the unit is installed such that it doesn't sit on the base of the well and that the sanding and sludging cannot occur in the vicinity of the submersible motor. This would disrupt heat dissipation from the motor, possibly dangerously!

5.4.2. Hydraulic connections

The following picture shows the scheme of the correct hydraulic connection.



The hydraulic connection between the pump and the controller must not have any derivation and the pressure vessel should be installed after the controller.

Ice/frost danger: Pay attention to the environment conditions where the controller will be installed and to the hydraulic connections in the cold months. Two types of usage precautions should be observed in case the environment temperature drops below 0 °C.

- if the unit is working, it is absolutely necessary to protect it adequately from the cold and to keep it constantly fed.
- If the unit is not working the controller should be disconnected both from the power supply and from the pipes and any water inside should be removed. To ease this procedure a quick release coupling is advisable. Please note that removing pressure from the pipeline is not enough, since after doing that some water still remains in the controller.

Foreign bodies in the pipeline: the presence of dirt inside the fluid can obstruct the duct or stop the flow valve, thus jeopardizing correct operation of the system. In case that the controller is installed on a pipeline through which foreign bodies (e.g. gravel, sand, ...) can transit, it is necessary to install a special filter between the pump and the controller. A coarse porosity one (100 µm) will be suitable as well.

5.4.3. Water characteristics

The pump WPS is designed for use with water with the following characteristics:

- Temperature: up to + 35°C (for higher temperatures, please contact the producer),
- Aggressiveness: normal and slightly above.

5.4.4. Pump fluid requirements.

ATTENTION

EBARA Submersible pumps are designed for pumping clear, cold water; free of air or gasses. Decreased pump performance and life expectancy can occur if the water is not cold, clear or contains air or gasses.

Ensure that the requirement for minimum flow of 8 cm/s past the motor is met. Also see the table below.

Minimum flow required for motor cooling in water up to 30°C.	
Casing or sleeve I.D. [mm (inches)]	3" motor, cooling flow 8 cm/sec [m ³ /h]
78 (3")	0,2
102 (4")	1,1
127 (5")	2,4
152 (6")	4,0

In case a minimum flow of 8 cm/s past the motor is not feasible, a range of cooling shrouds are available to ensure the correct cooling. Please contact EBARA ESPAÑA BOMBAS, S.A. for more information.

6. ERECTION / INSTALLATION AT SITE

ATTENTION

During all installation procedures any open wells/vessels/basins/shafts must be secured to prevent falls!

6.1. Installation tools and Accessories

Proper installation of the 3"WPS®-CP pump requires lifting gear (e.g. a derrick). The capacity of the gear must be greater than the weight of the pump unit plus pump riser pipes filled with water and the cable.

6.2. Extending the electrical cable to the pump



Use of the cable connector delivered by us in swimming pools and garden ponds and their vicinity is only admissible if they are built in acc. with the current rule IEC 64 (CO) 124.

If necessary the short electrical cable lead can be extended using a waterproof cable connector, which we can supply on request. The connection must be executed in accordance with the instructions of the cable connector. When the extension cable is fitted special care must be taken to ensure that conductor colours are properly matched. Live-phase conductors are black (U), brown (V) and blue (W). The earth conductor is Green / Yellow.

ATTENTION

The electrician is solely responsible for choosing and dimensioning the cable. The minimum cross-section is specified in table below.

Maximum cable length for specific cable section:

Motor size	1,5 mm ²	2,5 mm ²	4 mm ²	6 mm ²
600 W	100 m	150 m*	-	-
900 W	70 m	115 m	175 m*	-
1500 W	45 m	75 m	120 m*	170 m*

*extra filter required

ATTENTION

In case the total length of the electrical power cable between controller and motor exceeds 120m, an extra filter to protect the motor from burning is required. For more information please contact EBARA ESPAÑA BOMBAS, S.A.

6.3. Protection against electric shock



Concerning the protection against electric shock (earthen) it must be observed the national rules if using any machines with live electric power.

The submersible motor has internal earthen as standard. The earth conductor is connected internally with the stator at the factory. A four conductor short cable with integrated earthen conductor protrudes from the motor. It is the responsibility of the user to ensure that the earthen conductor is properly connected in the cable connector and is extended to the switching unit. IEC stipulates this type of earthen protection for accessible plant as a compulsory measure.

6.4. Installation at site

ATTENTION

During the entire installation procedure the electrical cable must be protected to prevent mechanical damage.

6.5. Fixing the electric cable to the riser pipe

During the installation into the well the electric cable should be fixed step by step to the riser pipe at appreciatively 3 meters intervals by a cable clip, immediately before or after the flanges or couplings of the pipe. The cable clips must be tightened to ensure that the electric cable cannot slip downwards by its own weight.

6.6. Electrical connection



DANGER! Electrical shock risk.

Before carrying out any installation or maintenance operation, the WPS®-CP Controller should be disconnected from the power supply and one should wait at least 5 minutes before opening the appliance.

During the electric installation all pertinent national stipulations or IEC 64 should be observed.

6.6.1. Connection to the power supply line. (between power supply and controller)

ATTENTION

The personnel installing the system must be adequately qualified for this job.

The WPS®-CP Controller must be connected with a power cord to connect the device to a 230V 50/60Hz single phase power supply.

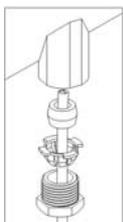


Connection to the power line must include a ground line. The total grounding resistance must not exceed 150 mOhm.

The WPS-CP Controller already provides internal over current protection. If a thermal magnetic circuit breaker is installed, its current must be of 16A.

In case you want a longer electrical cable, you must check the cable section following the table below. Maximal cable length for specific cable sections:

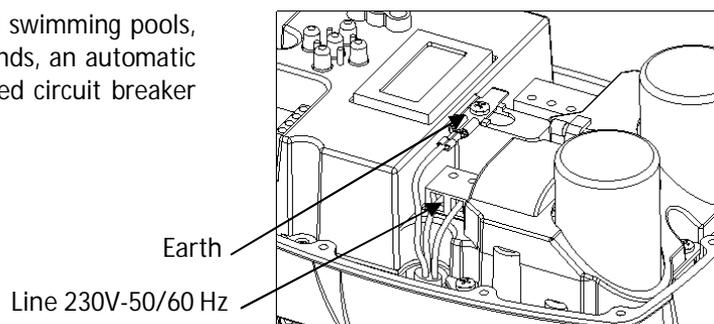
Motor Power	2.5 mm ²	4 mm ²	6 mm ²	10 mm ²
600 W	50 m	80 m	120 m	200 m
900W	40 m	60 m	90 m	150 m
1500W	30 m	45 m	70 m	110 m



Fit the electric wires into the relative wire clamps, making sure the correct assembly order is maintained for all the components. Secure the threaded nuts tightly enough to prevent the wires being pulled or turned from the outside. The wire clamp for the remote control is a blind fastener: if you wish to insert a remote control wire, it is best to remove the said nut from the unit, then break open the plastic nut with a screwdriver. For Cable section more than 2,5mm² a separate jointion box has to be mounted close to the controller. The cable between controller and jointion box must be 2,5mm².

ATTENTION

If the system is used in swimming pools, fountains or garden ponds, an automatic residual current operated circuit breaker (with I_{Δn}=30mA) must always be fitted.



To make the electrical connection, remove the green bipolar terminal marked "LINE" and connect the device's two power wires, then fit the terminal back onto its seat and proceed by attaching the earth wire to one end of the earth faston. The faston terminals must be crimped by specially trained personnel, using proper crimping pliers.

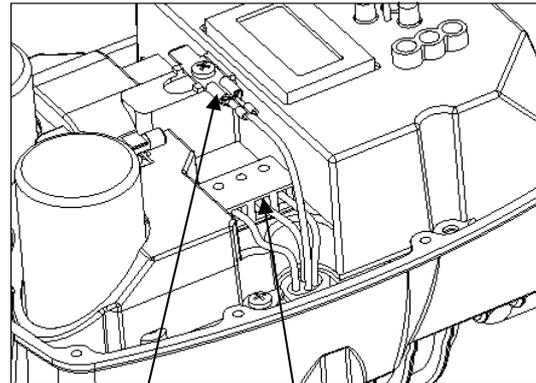
6.6.2. Electrical connection to the pump.

The WPS-CP Motor is a special high speed submersible motor able to run at a maximum speed of 140 Hz with a supply voltage of 3x220V.

For extra cable length to the motor, check point 6.2. of this manual for the correct cable section. This cable must be a 4-wire cable (3 phases + ground).

To make the electrical connection, extract the green three-pole terminal marked "MOTOR" and connect the three pump motor power wires; then fit the terminal back onto its seat and proceed by attaching the earth wire to one end of the double earth faston. The faston terminals must be crimped by specially trained personnel, using proper crimping pliers.

For cable lengths longer than 120m an extra filter has to be installed. For more information, please contact EBARA ESPAÑA BOMBAS, S.A.



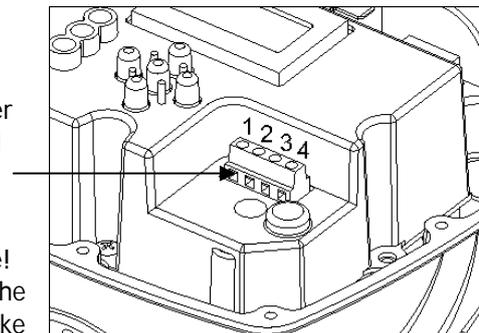
Earth Motor 3X220V

6.6.2. Electrical connection of the auxiliary connection.

The controller is fitted with a special connector for an auxiliary contact so that additional functions can be exploited by interfacing the device with external equipment. The function of the auxiliary contact depends on the setting of the "Auxiliary Contact" parameter described in the paragraph on programming. The three operational modes, relevant functions and connection methods are described below.

ATTENTION

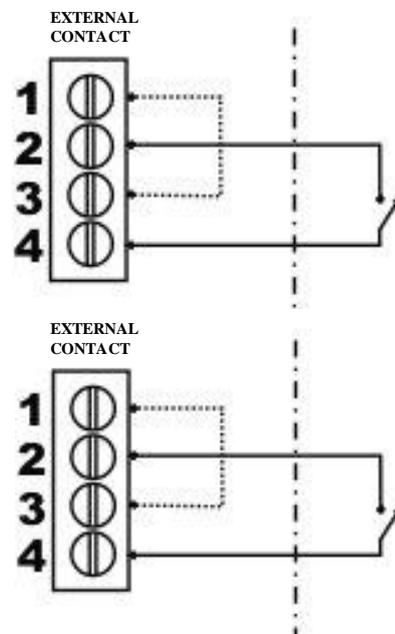
the remote control connector is not extractable! if the remote control terminals short-circuit, the internal safety fuse may blow, resulting in damage to the unit. Take care when wiring up.



6.6.2.1. Setting of auxiliary contact 1 – work stand alone (factory preset)

6.6.2.2. Setting of auxiliary contact 2 – Remote on/off control function

When the auxiliary contact parameter is set on "2" the controller is set to be switched on and off by remote control according to the system requirements. This function is useful when there is the need to programme the start of the motor pump at the same time as other devices connected to one same control unit, for example in irrigation systems where the pump is switched on only when the irrigation control unit activates one or more of the system's solenoid valves. Connect the device according to the wiring diagram shown here, bearing in mind that when the external contact is open the controller shall not start the pump even if the system reaches the Pmin value, while when the external contact is closed the device shall operate according to the values set.



6.6.2.3. Setting of auxiliary contact 3 – Second set-point (Pmax2) function

When the "auxiliary contact parameter is set on "3" the controller is set to adjust the rotations of the motor pump in accordance to the Pmax2 pressure value. This function is useful when the device must temporarily work at a different pressure to the one set in the Pmax parameter, for example if distributors requiring different pressures are used. Connect the device according to the wiring diagram shown here bearing in mind that when the external contact is open the controller shall adjust the pump rotations according to the Pmax pressure value, while when the external contact is closed the device shall adjust the pump speed according to the Pmax2 value.

7. COMMISSIONING, START UP/SHUTDOWN

7.1. Commissioning

7.1.1. The keypad and the display of the WPS-CP Controller

Once all the electrical connections have been made and checked to ensure they are correct, close the unit's cover and switch on the power.

ATTENTION

When the unit is put under supply for the first time, automatically the maximum amp setting is asked. Standard it is set to 0.5A.

Check the motor power from your pump and introduce the maximum amps as in table below by pushing on the "+" and/or "-" button:

600W, 3x220V, 140Hz 3,6 A	900W, 3x220V, 140Hz 5,1 A	1500W, 3x220V, 140Hz 7,6 A
------------------------------	------------------------------	-------------------------------

When the maximum amps are introduced, push on the "on-off" button to confirm.

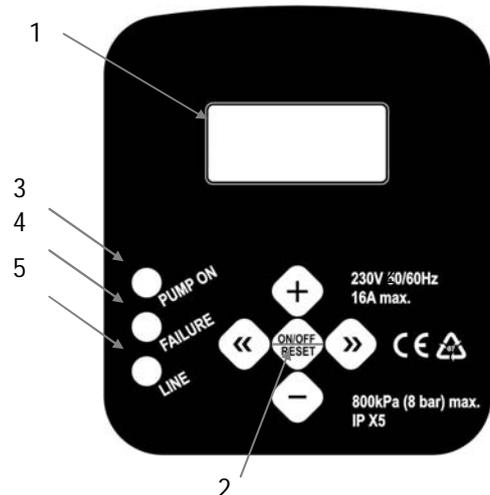
The controller is now in stand-by; in this mode (pump stationary) all the various parameters are preset.

To start up the pump, simply press the "on-off" button in the centre: The controller will quit the stand-by mode and the motor will start turning.

To facilitate priming of the pump, the "+" button on the main screen can be pressed to force the pump up to top speed without the dry running protection feature cutting in.

7.1.1.1 Key functionality

1. Digital display, showing pressure, errors and configuration menus.
2. Motor pump start, stop and programming buttons.
3. Yellow warning light to signal pump operation (PUMP ON)
4. Red warning light to signal error conditions (FAILURE)
5. Green warning light to signal line is live (LINE)

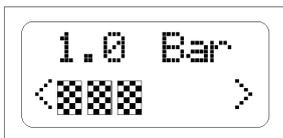


	Left-hand arrow: this scrolls back through the menu pages
	Right-hand arrow: this scrolls forwards through the menu pages
	On-Off/Reset: this switches the device from stand-by to operation mode and resets the unit in the event of alarms and/or errors.

	"+" button: this increases the value of the parameter currently shown on the display, it allows the pump to run at top speed under forced operation.
	"-" button: this decreases the value of the parameter currently shown on the display

7.1.1.2 Settings

User parameters:

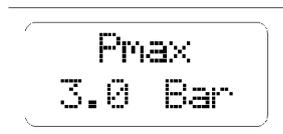


Main screen page: when the controller is in the standard operation mode, the first line on the display shows the instant pressure reading; the second line contains a bar chart showing the motor speed as a percentage. In this mode, the user can scroll through the various menus using the cursor buttons, or switch to stand-by by pressing the "on-off" button in the centre.

When the controller is in stand-by, the pump will not start up even if the pressure drops below the "Pmin" value set. To quit stand-by, press the button in the centre again.

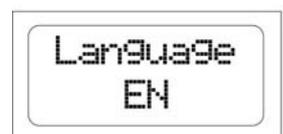
If the "+" button is held down, the pump is brought up to the maximum operating speed, overriding the dry running protection (use this function to fill the pump the first time it is switched on).

The following parameters are accessible by putting the controller in standby mode and pushing the "<<" and ">>" buttons.



Pmax: this parameter can be used to set the device pressure set-point. This is the constant pressure value the user wishes to set for the system (max. pressure). When it is operating, the controller regulates the motor pump speed to suit it to the actual output required by the user appliances, thereby keeping the system pressure constant. If the Pmax is set to higher than the

max. pump head, the motor will always stop when the cocks are closed as the controller switches off the pump when the flow rate of the water running through it drops below the minimum settings (approx. 2 litres/minute), regardless of the pressure reached in the system. Use the + and - buttons to alter the parameter setting. This parameter is factory preset at 3.0 bar.



Language: The language used for the menus and the alarm messages can be selected by the user. Use the + and - buttons to alter the parameter setting.

7.1.2. *Check direction of rotation*

In order to check the correct direction of rotation the three phases motor is run in both directions with the gate valve closed. The direction of rotation is changed by swapping two phases of the power supply cable to the motor. In this procedure a manometer will show two different pressures. The higher pressure indicates the correct direction of rotation.

7.1.3. *Notes on initial start up (sand pumping)*

In the case of new wells, the 3"WPS®-CP pump should be run for the first time 10 minutes with the gate valve only slightly open. This will ensure that no large amounts of sand are drawn in, which would overload the well and lead to increased wear of the pump. Then the gate valve can be opened slowly completely.

7.1.4 *Operating with closed gate valves*

The 3"WPS® pump should never be run for more than maximum 5 minutes against a closed gate valve. This would cause the water in the pump to warm up quickly and this heat would be transferred to the motor and hence to the motor winding and represents a hazard.

7.2. Operating limits

Operational safety requirements stipulate that the 3"WPS®-CP pump may only be operated continuously within the pump output and pump head limits specified on the technical documentation.

7.3. Storage and preservation

In principle the pump 3"WPS®-CP should be stored in vertical or horizontal position, dry and protected against direct sunlight, heat and dust. If not possible, the unit must be placed to avoid flexing. The unit must be suitably supported to avoid flexing especially at centre coupling position. In this process it must be taken measures to ensure that the cable at the outlet of cable guard is protected from folding / bending. It is not necessary to preserve the unit specially.

7.4. Returning to service after storage

In the case of recommissioning (restarting after longer stand still times or removal) check that the pump data are still within the values quoted on the name plate.

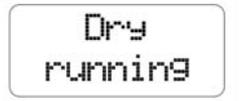
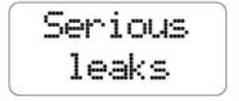
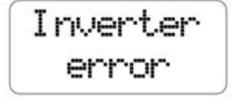
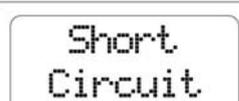
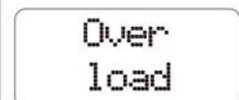
8. MAINTENANCE AND REPAIR

The 3"WPS®-CP unit is maintenance-free.

In order to pinpoint indications of potential damage early, we recommend that the current consumption and if possible the pump head are checked at regular intervals. It is not necessary to pull out the pump for regular inspection purposes.

9. TROUBLE SHOOTING

9.1. Error messages on the 3"WPS®-CP controller.

	Dry running: this message appears when the system is stopped following a pump intake water shortage. If the auto-reset function has been enabled, the controller will automatically make a series of attempts to test whether the water supply has returned. To clear the error status, press the "reset" button in the centre.
	Serious leakage: this message appears when the pump has been stopped following a closely spaced series of restarts caused by a possible leak in the system. To restore the system status once the cause of the alarm has been established, press the "reset" button in the centre.
	Inverter error: this alarm appears when the inverter is locked following a power surge or drop outside the limits or overheating with ensuing motor pump shutdown. Although the system is restored automatically approx. 3 minutes after the error condition has cleared, the message remains on the screen to warn the user that there might be a failure in the hydraulic and/or electric system. Every time this alarm appears, it is advisable to have the system checked by skilled personnel to prevent electrical damage. To clear the message from the display, simply press the "reset" button in the centre.
	Short Circuit: This message will appear on the screen when there is a short circuit at the inverter output. the short circuit may be caused by the incorrect connection of the electric motor, faulty electrical isolation of the cables that connect the motor pump to the devices or failure of the electric motor of the pump. When this error appears, the electrical system must be controlled by qualified personnel as soon as possible. The error can only be cleared by disconnecting the device from the electric power supply and solving the causes of the fault. <u>Attempting to start the inverter when there is an output short circuit may seriously damage the device and be dangerous for the user.</u>
	Overload: This alarm appears when the absorption of the motor pump is greater than the maximum current value set (I_{max}); this may be caused by extremely difficult working conditions for the motor pump, problems related to the motor winding , if the pump is restarted continuously at short intervals or following problems with the wiring of the motor to the controller . <u>If this alarm is often displayed the system should be checked by the installer.</u>



If the problems persist, we suggest to contact EBARA ESPAÑA BOMBAS, S.A.

9.2. The pump fails to deliver or delivers insufficient liquid.

Discharge valve is closed.	Check the discharge valve
Reverse rotation	Change over two of the phase leads of the power supply cable to the motor
Selection of the wrong pump	Pull the pump and install the correct one following the well characteristics
Defective or clogged raiser pipe	Repair the raiser pipe
Clogged strainer of suction interconnector	Clean strainer of pump
Clogged pump or check valve	Pull the pump and repair it
There are leaks in the installation	Check the installation for leaks
Broken shaft or coupling	Pull the pump and inspect, replace if necessary

9.3. The pump delivers insufficient head.

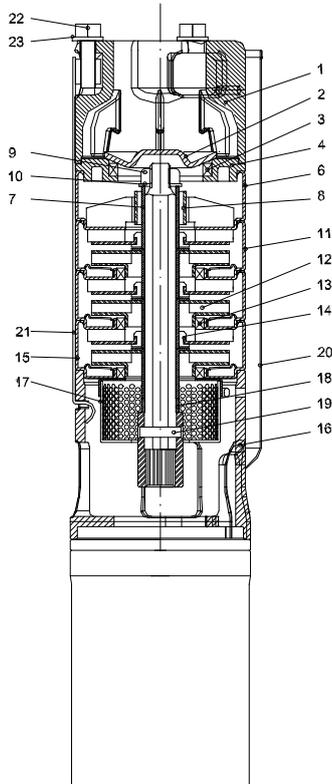
Low water level in the well	Pull the pump and install the correct one following the well characteristics. (never install the pump at the bottom of the well)
Pressure settings	Check settings on the pressure and change
Reverse rotation	Change over two of the phase leads of the power supply cable to the motor
There are leaks in the installation	Check the installation for leaks
Worn pump	Pull the pump and replace worn parts
Impellers are clogged	Pull the pump and inspect

9.4. The pump runs rough and noisily.

Clogged pump	Pull the pump and repair it
Excessive amount of air or gas in the liquid pumped	Relieve air or gas from the water
Defective motor thrust bearing	Change thrust bearing
Defective radial bearing in pump	Change bearings
Vibration caused by the installation	Check and change the installation

10. NOMENCLATURE

The pump



Part No.	Description
1	Discharge Camber
2	Valve Cone
3	Valve Seat
4	Retainer for Valve Seat
6	Top Diffusor
7	Spacer
8	Top Bearing
9	Self Locking Nut M8
10	Washer
11	Diffusor
12	Impeller
13	Neck Ring
14	Intermediate Bearing
15	Bottom Diffusor
16	Suction Interconnector
17	Strainer
18	Spacer
19	Shaft with coupling
20	Cable Guard
21	Strap
22	Bolt M6
22	Washer



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