

CE



IRIONDO
Soluciones en bombeo

**Instructions manual
Exterior electropumps**



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1. General information

1.1. User information

This operating manual includes important instructions on how to use the electropump correctly and safely. It is therefore essential that the technician in charge of installing it reads and understands these instructions before commissioning. These instructions must also be kept safe and available for consultation in the place of operation at all times.

The manual does not include legislation, rules and regulations in the country where the electropump is sold. The technician is in charge of ensuring compliance with these regulations.

If you have any questions, please keep the details shown on the electropump's nameplate to hand: model, motor power and serial number.

1.2. Instructions

This electropump should only be used in accordance with its original specifications and the instructions manual.

The manufacturer is not liable for any injury or damage caused by improper use.

1.3. Warranty

See the general sale terms and conditions to apply the electropump's warranty.

The warranty includes the replacement or repair, free of charge, of all defective parts acknowledged by the manufacturer. This would be cancelled in the following cases:

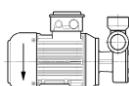
- If use does not comply with the instructions described in this manual (see 2.2).
- In the event of any modification or manipulation of the electropump or its parts without the manufacturer's authorisation.
- In the event of lack of maintenance.

2. Description of the electropumps

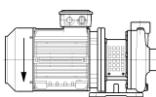
2.1. General description

The electropumps consist of an asynchronous three-phase motor (single-phase motor option in the BPX model) and a centrifugal or peripheral pump, forming a compact unit.

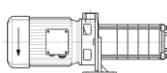
We offer a range of electropumps in accordance with their field of use, all of which are described below.

BPX Electropump

Exterior monoblock peripheral electropump.
Motor power 0.75 kW
Flow rates between 10 - 60 l/min.
Working pressure between 2 - 30 metres.
Fitted with mechanical seal.

BCX Electropump

Exterior monoblock centrifugal electropump.
Motor power between 0.75 - 5.50 kW.
Flow rates between 100 - 700 l/min.
Working pressure between 5 - 35 metres.
Fitted with mechanical seal.

BCM SV or SH Electropump

Horizontal (SH) or vertical (SV) exterior multicellular centrifugal electropump.
Motor power between 1.10 – 4,00 kW.
Flow rates between 40 - 150 l/min.
Working pressure between 20 - 110 metres.
Fitted with mechanical seal.

2.2. Proper use of the electropump

C.M.I. electropumps are designed to work with clean, non-corrosive, explosive or flammable liquids, without any abrasive parts that will attack their materials.

It is very important that the liquid to be pumped is within the following values;

	Cooling emulsion, cutting oil or cooling oil.
Kinematic viscosity	1 – 40 mm ² /s
Temperature	0 – 80 °C

Please ask us if the liquid conditions are different to those in the table.

2.3. Misuse of the electropump

Any use other than that described in point 2.2. or that exceeds the mentioned limits will be considered non-compliant and will not be covered by the warranty.

3. Safety instructions**3.1. General information**

All safety regulations and laws in the country and/or company where the pumps will be used must be followed.

The following symbols will be used in this manual to draw your attention to hazards.



CAUTION! Danger of injury.
Mechanical hazard warning.



CAUTION! Danger of injury.
Electrical hazard warning.

INFORMATION

i Indications and warnings for correct handling.

- It is essential that the technician in charge of installing it reads and understands these instructions before commissioning.

These instructions must also be kept safe and available for consultation in the place of operation at all times.

- Do not remove or modify the electropump plates. The arrow showing turning direction must be kept clearly legible at all times.
- Electrical equipment must only be installed and maintained by a qualified electrician.
- The electropump is designed to work in ventilated places protected from the weather, remembering that the maximum ambient temperature without loss of power in the electric motor is 40 °C.

4. Transport, storage and installation

Electropumps are packed tightly in specially made boxes for shipping, in order to keep them in optimal condition. The heaviest, bulkiest electropumps are usually mounted on a pallet for easier transport.



Check that the packaging has not been damaged during shipping.

Loading other goods on top is not allowed.

4.1. Transport

The motor eyebolts are designed to carry only the weight of the motor. Only lift the electropump with lifting and loading equipment that is in a perfect condition and can withstand the load.

4.2. Storage

The electropump must be stored in an environment which is dry, with constant temperature, is well ventilated and free of vibrations, even during short storage periods.

The bearings must be relubricated or replaced after long periods of storage (over 2 years).

4.3. Installation

The customer must ensure that the electropump's installation site complies with section 3.1 General information.

Installing and commissioning in areas with a potentially explosive atmosphere is strictly forbidden unless the electropump is ATEX certified.

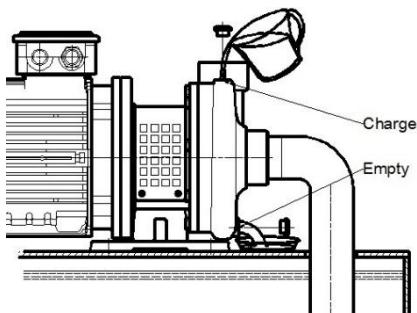
4.3.1 Charging and emptying the electropump

When using for the first time, be sure to fill the suction pipe once the pump is connected. The way charging is carried out will depend on whether it is installed above liquid level (negative suction) or below liquid level (positive suction).

If the pump is above liquid level, loosen the appropriate screw and fill until the liquid overflows.

If the pump is below suction level, charging would be carried out by slowly opening the shut-off valve to the maximum.

Emptying the pump is advisable if the equipment is to remain inactive for a long period of time or there is a danger of frost; this can be done by simply opening the drain screw and allowing the liquid to escape freely.



Never turn the pump without any liquid, and follow the turning direction shown.

4.3.2 Installing pipes

Perfect operation of the electropump depends directly and largely on proper assembly, both in terms of suction and delivery.

It is essential to ensure the pump's suction inlet is completely clean and free when installing.

- Suction pipe

The suction pipe must be at least equivalent to the diameter of the pump inlet whenever it is below suction level, and of the same diameter when elevating a specific pressure height. Installing a foot valve at the end of the suction pipe is essential if the electropump is above suction level.

In the case of complete emptying of the tank and pipe, charge the pump before starting up again.

Installing a shut-off valve in suction is recommended, allowing the pump to be taken down without further inconvenience.

A filter must be installed in the pump's suction connection point if the liquid to be pumped contains solid particles. This filter should be sufficiently sized, given the resistance it implies for suction pressure.

- Delivery

It is very important for the delivery pipe's diameter to match the diameter of the pump's outlet. Shut-off should be as close as possible to the end of the circuit if we want to keep the pump's pressure and flow characteristics as stable as possible.

Apart from installing a pressure gauge, fitting a shut-off valve is recommended in order to regulate flow and pressure.

4.3.3 Installing the tank



Always respect the maximum and minimum liquid levels.

Leaving a minimum distance of 20 - 50 mm between the bottom of the tank and the suction inlet is recommended, depending on the volume of flow that the pump can decant.

A proportional filtering system should be fitted if the liquid to be pumped contains a lot of solid particles or these particles are large in size.

4.3.4 Electrical installation

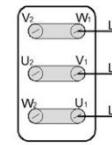
Electrical connections must be made by a qualified person or company and in compliance with local regulations.

Good electrical installation is vital to electropump assembly, making it essential to check that the line section from the machine's electrical equipment through to the pump motor is enough to maintain the voltage required by the motor without any oscillations.

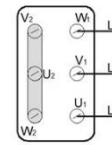
The electropump must also be installed with suitable thermal protection i.e. with a motor protection relay or magnetothermic switch, to ensure it stops in the event of overload or phase failure.

 There must be no foreign bodies, dirt or moisture in the junction box. Hermetically seal the junction box to prevent the ingress of water and dust, but without blocking the unused cable inputs.

The connection must comply with the following layout in both triangle and star configuration, depending on whether the motor pump connection is three-phase type:



Three phase connection Δ
(low voltage)



Three phase connection \wedge
(high voltage)

- Checking turning direction

The motor's turning direction must match the arrow direction on the motor hood. To check, turn on and off quickly (not exceeding 10 seconds).

If turning direction is incorrect, change either of the two phases L1, L2 or L3 in the motor's terminal box.

5. Commissioning

5.1. First start-up

Make sure the requirements below are met before starting up for the first time.

1. The motor's electrical connection is correct and meets all safety requirements.
2. There is sufficient liquid level in the tank.
3. Charge the pump if necessary.
4. The suction mouth is clean and all sealing devices are open in the suction part.
5. The pump shaft turns freely.

Pay special attention to the following points:

- The temperature of the liquid must never exceed the temperature shown in the specifications.
- To avoid a large temperature increase in the motor and excessive stress on the electropump, the motor starting frequency should not exceed the following reference figures.

Motor power [kW]	Maximum starting frequency per hour
Up to 3,00	20
From 4,00 to 11,00	15

- To avoid overloading the motor, the viscosity of the liquid must match the data shown in the specifications (see point 2.2.).



The electropump must be turned off immediately if any shaft vibrations, noise, leaks, etc. are observed.

6. Maintenance and repair

The electropump must be monitored carefully during operation, paying particular attention to the following points.

- The electropump must turn without any vibrations, jerks or strange noises.
- The exterior electropumps, since they are fitted with a sliding mechanical seal, must always work with refrigerant liquid, and a level probe must be fitted in the tank in order to shut down the pump whenever the liquid drops below a minimum level. All pumps with a mechanical seal must always turn in the direction indicated by the arrow on the motor.
- Regularly check that current consumption at working pressure does not exceed the values shown on the nameplate.
- Check that the thermal relay is set to 125% of the consumption shown on the nameplate.
- Regularly inspect and clean the filters and/or other dirt separators installed in the system, and regularly check the watertight integrity of the output shaft.
- Renew the grease in the bearings every 5000 operating hours, removing the remaining grease, cleaning, and introducing new lithium grease.

The most common causes of failure or malfunction are detailed below, as well as their solutions.

Problem	Possible cause	Solution
The electropump works but does not deliver any flow.	No power to the motor.	Check the condition of the electrical equipment that supplies the motor.
	Insufficient minimum liquid level.	Fill the tank with refrigerant liquid until the indicated minimum level is exceeded.
	Suction mouth and/or internal organs of the electropump blocked.	Make sure the suction inlet is clean. Take down the electropump and clean the impeller and other elements where there is dirt or solid particles.
	Excessive total pressure height.	Review and check the geometric heights, pipe runs, bends and other accessories in the facility.
	Excessive suction pressure height.	Lower the pump to a level closer to the liquid. Maximum suction height is 6-7 mWC, which is influenced by the temperature of the liquid and the height above sea level.
	The motor turns in the opposite direction to the arrow.	Interchange 2 of the 3 motor power phases.
	Formation of air pockets in the pipe.	Make sure the suction pipe is kept constant, without any syphoning, and ensure no air enters at any point.
The multicellular electropump doesn't deliver enough pressure.	Impellers in bad condition or obstructed.	Take down the pump and check the condition of the impellers and diffusers. Changing them, if they are in a poor condition.
Strange noise or vibration in the shaft.	Wear in the electropump's internal parts.	Take down the pump and check the fitting of the worn parts, changing them if necessary.
Pump leaks.	Poor watertight integrity.	Meticulously check the watertight integrity of the pump's seals and the joints to other sleeves and accessories. Replace any seals in a poor condition.

Problem	Possible cause	Solution
	The electropump loses liquid through the seal.	Monitor the degree of dirt in the refrigerant liquid. Liquids with solid particles in suspension can easily scratch and wear the faces of the mechanical seal. Never turn the electropump without refrigerant liquid.

7. Spare parts

7.1. Part order

The following information must be provided when ordering spare parts for the electropump

- Electropump model.
- Motor details such as voltage and working frequency.
- References of the parts to be replaced and their quantities.

The electropump model is shown on the nameplate on the motor's fan cover.

This information makes it easier for us to deliver the right spare parts for your electropump.

7.2. Factory repair

Whenever the pump is returned to the factory for repair or modification, be sure to include precise information about all the faults observed and details of the fluid pumped in the electropump.

7.3. Parts view

See the exploded view sheet. Ask your supplier if you don't have one.

8. Appendix

8.1. Disposing of the electropump

The electropump must be disposed of in accordance with local rules and regulations when it is so damaged or deteriorated that it cannot be repaired.

The procedure to be followed would be as follows:

- Before disposing of the machine: collect the outgoing pump fluid and dispose of it separately according to local regulations.
- Separate the plastic and rubber parts, and deliver them to a specialist centre for treatment.
- Scrap the metal parts.

Electropump components must not be disposed of into the environment.

8.2. Loss of motor power.

The motors installed in C.M.I. electropumps are suitable for working within the characteristic curves of each model.

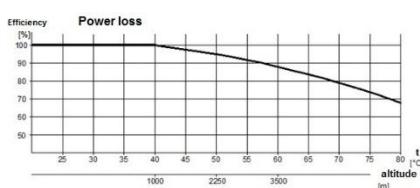
Motor power is calculated to work at sea level with an ambient temperature of 20°C. This may be reduced at temperatures above 40°C or at an altitude above 1000 m due to low air density.

8.3. Loss of pressure.

Flow resistance is calculated using the equivalent pipe length method, according to the following table:

Accessory	GAS					
	1"	1/4"	1/2"	2"	2 1/2"	3"
Equivalent pipe length [m]						
45° bend	0,2	0,2	0,4	0,4	0,6	0,6
90° bend	0,4	0,6	0,9	1,1	1,3	1,5
90° gentle bend	0,4	0,4	0,4	0,6	0,9	1,1
Check valve	1,1	1,5	1,9	2,4	3,0	3,4

The table is validated with Hazen-Williams coefficient C=100 (cast iron pipe). For steel pipes, multiply the values by 1,41. For stainless steel, copper and cast iron coated pipes, multiply the values by 1,8.





EC Declaration of Conformity

The company **Construcciones Mecánicas Iriondo S.A.**, holder of VAT number A-20076857, located in Mendarozabal, 15 - 20850 Mendaro (Gipuzkoa), declares that it is solely liable for the following elements manufactured by it:

BPX, BCX and BCM SH and SV ELECTROPUMPS

Comply with the following directives:

2006/42/EC Council Directive on **Machinery Safety**.

2006/95/EC Council Directive on **Low Voltage**.

2004/108/EC Directive on **Electromagnetic Compatibility**.

The following standards were checked to ensure compliance with the safety requirements set out in EC directives.

EN ISO 12100-1

EN 61000-6-2

EN 809

EN ISO 14121-1

EN ISO 12100-2

EN 61000-6-3

EN 60034-1

Starting up these machines before the machine they will be part of has been declared compliant with the provisions of the Machinery Safety Directive is forbidden.

Pay attention to the instructions and specifications in the pump's installation manual before and during commissioning and also in subsequent maintenance.

The EC Declaration of Conformity was issued in/on:

Mendaro, 22nd July 2019



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