



# IRIONDO

*Soluciones en bombeo*

## Instructions manual 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:

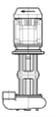
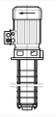
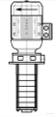
- If use does not comply with the instructions described in this manual (see 2.2.).
- In the event of any modification or manipulation of the electropump or its parts without the manufacturer's authorisation.
- In the event of lack of maintenance.

**2. Description of the electropumps**

2.1. General description

The electropumps consist of an asynchronous three-phase motor and a centrifugal or peripheral pump, forming a compact unit.

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

	<p><b>MB Electropump</b></p> <p>Open impeller vertical immersion centrifugal electropump.                  Motor power between 0,08 – 1,10 kW.                  Flow rates between 30 - 200 l/min.                  Working pressure between 2 - 30 metres.                  Allows dry working.</p>
	<p><b>BC Electropump</b></p> <p>Closed impeller vertical immersion centrifugal electropump.                  Motor power between 0,75 – 7,50 kW.                  Flow rates between 100 - 1200 l/min.                  Working pressure between 5 - 40 metres.                  Allows dry working.</p>
	<p><b>BCT Electropump</b></p> <p>Vertical immersion centrifugal electropump for decanting.                  Motor power between 1,50 – 2,20 kW.                  Flow rates between 100 - 600 l/min.                  Working pressure between 2 - 15 metres.                  Allows dry working.</p>
	<p><b>BCM Electropump</b></p> <p>Multicellular immersion 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.</p>
	<p><b>BCM-2 Electropump</b></p> <p>Multicellular immersion centrifugal electropump.                  Motor power between 2,20 – 11,00 kW.                  Flow rates between 40 - 300 l/min.                  Working pressure between 20 - 240 metres.                  Fitted with mechanical seal.</p>
	<p><b>EBP Electropump</b></p> <p>Multicellular immersion peripheral electropump.                  Motor power between 0,55 – 4,00 kW.                  Flow rates between 10 - 80 l/min.                  Working pressure between 5 - 140 metres.</p>

**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 <sup>2</sup> /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  
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

The electropumps are packaged in specially made boxes to guarantee optimal shipping conditions. The heaviest, bulkiest electropumps are 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 is suitable. The environment where it is installed must comply with the requirements set out in 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 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

In immersion pumps, the pump vacates the liquid from the submerged part. It is therefore necessary to ensure that the impeller (or the lowest one, if several are fitted) is completely covered when starting up the pump. Once the pump has started up, this generates a suction capacity corresponding to the NPSH level in each case.

The models with a threaded lower cover include the option to fix a pipe in order to extend suction beyond the pump's physical limit, reaching the bottom of the tank whenever necessary. The pump can be started up beyond its impeller limit position if a foot valve is applied to the bottom of this pipe.

If the aim is for the pump to completely empty the tank, a pipe can be added in order to reach the end.

##### - 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.

##### 4.3.2 Installation in 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.

##### 4.3.3 Electrical installation

The electrical connection must be completed by a qualified company or person, always following local regulations.

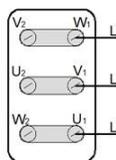
Good electrical installation is vital to electropump operation, making it essential to check that the line section from the machine's electrical equipment through to the pump motor is enough to maintain the voltage required by the motor without any oscillations.

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

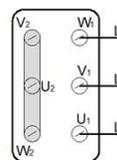


There must be no foreign bodies, dirt or moisture in the junction box. Hermetically seal the junction box to prevent the ingress of water and dust, but without blocking the unused cable inputs.

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 Y (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. Observations before commissioning

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. The suction mouth is clean and all sealing devices are open in the suction part.
4. The pump shaft turns freely.

Pay special attention to the following points:

- The temperature of the liquid must never exceed that specified.
- To avoid an excessive temperature increase in the motor, 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.
- Allowing the electropump to work without liquid is not recommended, although most can do so without any problems since they do not have mechanical seals.
- BCM, BCM-2 and EBP-7 Type electropumps, since they are fitted with a sliding mechanical seal, must always work with refrigerant liquid; if there is any risk of a lack of refrigerant liquid, a level probe must be fitted in the tank in order to shut down the electropump whenever the liquid drops below a preset level. Pumps fitted with a mechanical seal must always turn in the direction indicated by the arrow on the motor, in order to prevent damage to the spring.
- Regularly check that current consumption does not exceed the value shown on the nameplate.
- Check that the thermal relay is set to 125% of the consumption shown on the nameplate.
- 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 motor doesn't turn.	No power to the motor.	Check the condition of the electrical equipment that supplies the motor.
The electropump works but does not deliver any flow.	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.
	The motor turns in the opposite direction to the arrow.	Interchange 2 of the 3 motor power phases.
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. A certain loss of liquid in the bottom is normal in some models (those which allow work without liquid), since they do not have sealing joints.

**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:

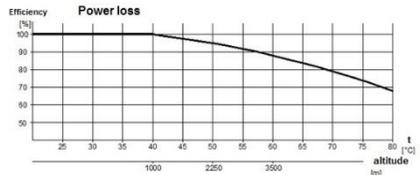
- Before disposing of the machine: collect the pump fluid and dispose of it separately according to local regulations.
- Separate the plastic and rubber parts, and deliver them to a specialist centre for treatment.
- Scrap the metal parts.

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 in the following table:

Accessory	GAS					
	1"	1 1/4"	1 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:

**MB, BC, BCT, BCM, BCM-2 and EBP type 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**.
- 2005/32/EC** Council Directive on **Ecodesign for Electric Motors**.

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 electropumps 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

A handwritten signature in black ink, appearing to read 'Ignacio Iriondo'.

Ignacio Iriondo Saint-Gerons  
Technical Director  
Construcciones Mecánicas Iriondo S.A.

**Construcciones Mecánicas Iriondo S.A.**

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