Pioneering for You

Operating Instruction Manual

WROX

1. GENERAL

Equipment described in this manual complies with provisions of ELECTROMAGNETIC COMPATIBILITY" European standards EN 809

1.1 APPLICATIONS

Pumps aimed at Water Treatment, Ultra–filtration system (UF), Reverse osmosis system (RO) Softening, ionising, demineralizing (DM) system, Distillation system & Separator

1.2 TECHNICAL CHARACTERISTICS

Maximum operating pressure

Pump casing PN 25 :25 bar (50Hz – 2 poles)

Pump casing PN 16 :16 bar (50Hz – poles)

Maximum suction pressure : 10 bar.

Temperature range

Standard versions EPDM"O" rings and mechanical seal
: – 15°C to + 120° C.

Versions for aggressive water (Viton "O" ring and Mechanical seal) : – 15°C to +90°C

Ambient temperature : +40°C

2. SAFETY

Read this instruction carefully before installing and starting up. Pay special attention to the points concerning the safety of the equipment as regards the intermediate or final user.

2.1 SYMBOLS USED IN THE INSTRUCTION

Security instruction : non respect can induce injury.

Electrical security : non respect can induce injury.

CAUTION! Security instruction: non respect can be induce material damages.

3. TRANSPORT, HANDLING AND STORAGE

When receiving the material, check that there has been no damage during the transport. If any defect has been stated, take the required steps with the carrier within the allowed time.

CAUTION!

If the delivered material is to be installed later on, store it in a dry place and protect it from impacts and any outside influences (humidity etc.).

Due to high position of centre of gravity and small ground surface of this type of pumps, beware of unstability during handling to avoid any falling down and take necessary means to avoid injuries or damaging.

Handle the pump carefully so as not to alter the geometry and the alignment of the hydraulic unit.

4. PRODUCTS AND ACCESSORIES

4.1 TYPICAL INSTALLATION (Not the standard of scope of supply)

1– Strainer – foot valve
2– Pump suction valve
3– Pump discharge valve
4– Non – return valve
5– Venting and filling plug
6– Drain – priming plug
7– Pipe supports

8 – Strainer

9 – Storage tank

10 – Town water supply.

11 – Motor overload

12 – Lifting hook

13 – Foundation block

HA : Maximum suction head

HC : Minimum inlet pressure

4.2 PUMP

- Vertical multi–stage pump (2 to 24 stages) non self – priming, with ports in line on the same axis at the bottom part.
- Shaft sealing with standard mechanical seal.
- Flanges :

  Round for pump casing PN 16 & PN 25 : pump delivered without gaskets, bolts and counter–flange (accessories as option)

4.3 MOTOP

Cage induction motor with standardized flange and shaft end for vertical operation.

Motor–pump linked by a coupling with safety guards.

Voltage Range: 180–240V (1~230V, 50 Hz)
Degree of protection : IP 55
Insulation class: F
Built–in Thermal protector : Single phase

Standard voltage motors : tolerance on network ± 10 % in 50 Hz for 3 phase and +6/–15% for 1phase

ATTENTION !

5. INSTALLATION

Two standard cases:

Fig. 1 : Pump in suction

Fig. 2: Pump under pressure on storage tank (9) or town water supply (10) with dry-running protection system.

5.1 INSTALLATION

Install the pump in a place easy to reach, as close as possible from the drawing point.

For heavy pumps provide a point of attachment (lifting hook) in the pump axis (12) to facilitate removal.

Install the pump on a concrete block (at least 10 cm high) (13) and fix with anchor bolts.

Use an isolating material under the concrete block (cork or reinforced rubber) to avoid any noise and vibration transmission into the installation.

Before final tightening of anchor bolts, ensure that the pump axis is vertical: use shims if necessary.

Bear in mind that the altitude of the installation place and water temperature may reduce the suction head of the pump.

5.2 HYDRAULIC CONNECTIONS

- Pump with round flange pump casing : with tube to weld or to screw in the counter flanges (counter-flanges, available as option). If counter flange in steel, by counter flange in stainless steel to screw (as option).

- The diameter of the pipe must never be smaller than the one of the counter flange.

  Rotation of direction is indicated on the identification label of the pump.

  Limit the length of the suction pipe and avoid all features that cause losses of head (bends, valves, tapers). Connections has to correctly sealed: No air entrance is allowed on the suction pipe which is showing a mounting declivity (2%). See figure 1.

  Use rigid supports so that the pump does not bear the weight of the pipes.

- Pump under pressure : connect the non-return valve to the pump discharge to protect it from hammer blow effects.

Note : To pump water with a large content of air or hot water, we recommend installing the by-pass kit.

5.3. ELECTRICAL CONNECTIONS

The electrical connections and the inspections have to be done by a qualified electrician and comply with the applicable local standards.

The electrical characteristics (frequency, voltage, nominal current) of the motor are mentioned on the name plate : check if it complies with the mains supply used.

otors must be protected by a circuit-breaker set to the current mentioned on the name plate of the motor.

Provide a fuse disconnecting switch to protect the mains supply.

Supply network

- Use an electrical cable of a reputed make.

- Three-phase : 4 conductors (3 phases + earth)

The position of the termin box can be changed a quarter turn by removing the motor attachment screws (if necessary, remove the coupling guards) and turning the motor to desired position.

Refit the attachment screws of the motor and the coupling guards.

If necessary, cut an opening in the terminal box, fit the cable gland stuffing box and connect the motor as shown by the diagram inside the cover of the terminal box (or see figure 4).Do not forget the connection to earth.

A connection error would damage the motor. The power cable must never touch the pipe or the pump; make sure that it is sheltered form any humidity.

DO NOT FORGET TO CONNECT TO EARTH.

6. STARTING UP

6.1 PRIOR CLEANING

An hydraulic test is carried out for each pump in our factory. If some water stays inside them. It is recommended for hygien reasons to clean the pump before using it with potable water supply.

6.2 FILLING – DEGASSING

CAUTION!

Never operate the pump dry, even briefly.

Pump under pressure (see fig. 2)
- Close the discharge valve (3).
- Open the venting plug (5) and the suction valve (2) and completely fill the pump.

Close the venting plug only after water flows out and complete air exit.

⚠ In hot water, a stream of water may escape from the venting port. Take all required precautions as regards persons and motor.

Pump – ve suction : Two possible cases –

1st case (see fig. 5.1)
- Close the discharge valve (3), open the suction valve (2).
- Remove the venting plug (5).
- Unscrew the bottom drain-priming plug (6) located on the pump casing 4 to 5 turns.
- Put a funnel into the venting plug port and completely fill the pump and the suction pipe.
- After water flows out and total air exit, filling is complete.
- Screw the venting plug and the bottom drain-priming plug back in.

2nd case (see fig. 5.2)

Filling can be made easier by fitting on the Suction pipe of the pump, a vertical pipe fitted with a 0 1/2" stopcock and a funnel.

CAUTION!

The length of the pipe must be at least 50 mm taller than the venting level.

- Close the discharge valve (3), open the suction valve (2).
- Open the stopcock and the venting plug.
- Unscrew 4 to 5 turns the drain-priming plug (6).
- Fill the pump and the suction pipe completely until water flows out of the venting plug (5).
- Close the stopcock (which can be left in place), remove the pipe and close the bleed device (5) and screw again the drain-priming plug (6).

Dry-running protection

To ensure that the pump is always primed, we recommend to protect it with a pressure switch or a float switch.

6.3 CHECK THE FREENESS & ERECTION OF ROTATION OF MOTOR

Remove the coupling guards.

Turn the coupling by hand to make sure that the pump turns freely without sticking.

Then set again the coupling guards.

THREE PHASE MOTOR

Switch on the motor by briefly pressing the circuit-breaker and check that it turns in the direction indicated by the arrow located on the lantern or on the identification label of the pump.

In the contrary case cross the two phase wires on the motor terminal block or on the motor overload release.

6.4 SINGLE PHASE MOTOR

The direction of rotation is adjusted when assembling the product and is independent of the electrical connection.

STARTING UP

Depending on conveyed fluid and running of pump, surface temperature can exceed 68°C. Take necessary means to avoid injuries.

CAUTION!

The pump must not operate at zero flow (closed discharge valve) for more than 10 minutes with cold water (T < 40° C) and more than 5 minutes above 60° C.

We recommend to ensure a minimum flow of about 10 % of the nominal flow of the pump to avoid the formation of a vapour lock at the top of the pump.

Keep the discharge valve closed.

Start the pump.

Open venting plug to drain air. If no water leaks within 20 seconds, close the plug and stop the pump, then wait 20 seconds to allow air to settle.

Start again the pump.

If necessary (particularly it the suction height exceeds 5 m) repeat these operations.

If water leaks at draining plug (it means the pump delivers its pressure), slowly open the discharge valve.The pump has to be primed.

Check pressure stability at discharge with a pressure gauge, if instability, perfect air draining.

In case of failure, do the filling in again and start the operation again.

To perfect air draining, close the discharge valve and the draining plug [Ref Fig. 1 (5)], then stop the pump 20 seconds, start the pump again and open the draining plug. Do it as long as air comes out

Open the discharge valve in order to have the wished working point.

Check that the current input does not exceed the value indicated on the motor name plate.

7. MAINTENANCE

Before any operation, switch off the pump (s).

No special maintenance in operation.

Keep the pump and the motor perfectly clean.

In case of prolonged stopping, it is best not to drain the pump.

The bearing holding the coupling is lubricated for its total lifetime and does not require any lubrication.

It is recommended to grease the motor shaft end as well as the coupling boring with a high adhering grease (type D321 R Molikote or 8191 Loctite for example) to facilitate any further diassembling.

Bearings are lubricated for their lifetime and do not require any lubrication.

Mechanical seals

The mechanical seal does not require any maintenance in operation. It must never operate dry.

8. OPERATING DEFAULTS

Before any operation SWITCH OFF the pump.

DEFAULTS/CAUSES	REMEDIES
1) Pump rotates but no delivery	
a) The internal parts are obstructed by particles.	a) Dismantle the pump and clean it
b) Suction pipe obstructed	b) Clean all the pipes
c) Air in suction pipes	c) Check tightness of the whole pipe up to the pump and make it tight.
d) Pump is not primed.	d) Fill the pump to prime again. Check foot valve is tight.
e) Suction pressure is too low, it causes cavitation noise.	e) Too high loss of head on suction or suction (check the NPSH of the pump installed and of the installation).
f) The supply voltage of the motor is too low	f) Check the voltage on the terminals of the motor and the cross– section of the conductors.
2) The pump vibrates	
a) Loose on its foundation	a) Check and tighten completely the nuts of the stud bolts.
b) Particles obstructing the pump	b) Dismantle the pump and clean it.
c) Difficult rotation of the pump	c) Check the pump rotate freely with out abnormal sticking.
d) Bad electrical connection of motor	d) Check the connections to the pump
3) The motor overheats	
a) Voltage too low	a) Check voltage on terminals of the motor, it should be within ±10% in 50 Hz rated voltage for 3 phase and +6/–15% for 1 phase

b) Pump obstructed by particles	b) Dismantle the pump and clean it
c) Wrong connections in the terminal box	c) Be in conformity with the motor plate and see figure

4) The pump delivers insufficient pressure

a) The motor fails to run at its normal Speed	a) Dismantle the pump and solve the defect
b) The motor is defective	b) Replace the motor/Repair
c) Bad filling of the pump	c) Open the bleeding device and drain until there are no more air bubbles
d) The motor rotates in wrong direction	d) Reverse the sense of rotation by interchanging (three-phase motor) two phase wires on the motor terminal box
e) The drain-priming plug is not correctly tightened	e) Check it and screw it again
f) The supply voltage of the motor is too low.	f) Check the voltage on the terminals of the motor and cross-section of the conductors.

5) The circuit-breaker device is tripping

a) The setting of the thermal relay is not adequate (too low)	a) Check the current with an ammeter or set the value of the current rating on the motor name plate.
b) The voltage is too low	b) Check the adequate cross-section of the conductors of the electrical cable.
c) Phase is cut	c) Check it and change the electrical cable if necessary
d) The thermal relay of the circuit - breaker is defective	d) Replace it
e) A fuse is burnt.	e) Replace it

6) The flow is irregular

a) The suction head (Ha) is not adequate	a) Study again the installation conditions and the recommendations described in this instruction.
b) The suction pipe has a lower than the one of the pump	b) The Suction Pipe must have the than same diameter as suction pump port
c) The strainer and the suction pipe are partially obstructed.	c) Remove and clean.

If the liquid is toxic, corrosive or dangerous for human being, WILO must be informed or the qualified person in charge of the repairing. In this case, clean the pump to ensure a complete safety to the repairing man.

FIG.1

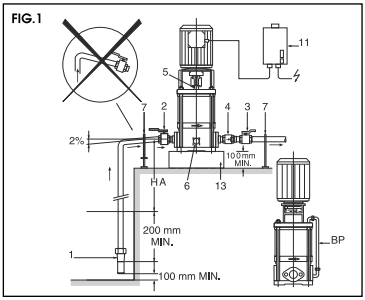
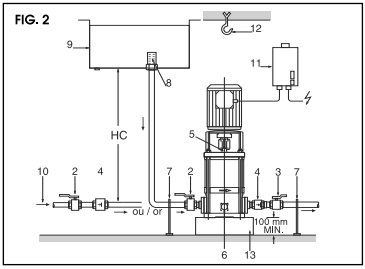


FIG. 2



Wire connection based on motor type

FIG. 4

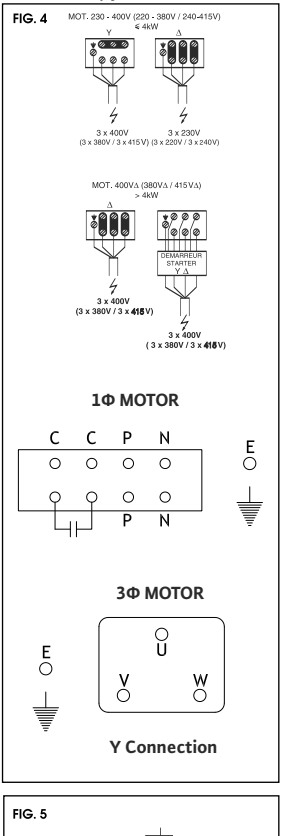
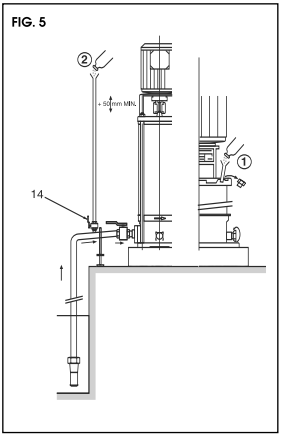


FIG. 5



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Wilo Mather and Platt Pumps Pvt. Ltd.
Mumbai-Pune Road,
Chinchwad, Pune – 411019.
Maharashtra (India)
T + 91 20 27442100
F + 91 20 27442111

Sales Office:
WILO Mather and Platt Pumps Pvt. Ltd.
1st Floor, "One Elpro Park",
Elpro Compound, CTS No.4270,
Chinchwad, Pune – 411033.
Maharashtra (India)
T +91 20 67347100
F +91 20 67347112

Service Toll Free: 1800 266 8866

www.wilo.in
sales.in@wilo.com

www.facebook.com/WiloIndia