

- The pump operated dry or in cavitation
- Solid extraneous particles are found in the pump
- Evident signs of over pressure are observed compared to the values reported in the data sheet or in the specifications provided by the customer and accepted by Fluid-o-Tech
- The pump has been utilized for an application for which it was not intended to be used where the operating conditions and/or the pumped liquid were incompatible with the pump itself. Furthermore the pump was not explicitly approved by Fluid-o-Tech for such an application

- The operating pressure results to be less than 3 bar below the bypass valve setting.

The adjustment or replacement of defective parts made under this warranty will not extend the original warranty period.

Responsability of Purchaser/User is the proper disposal or recycling of product at end of service life or use.

### CERTIFICATIONS

NSF standard 169 listed pumps (PMFREP series).  
NSF 169 listed pumps that meet the requirements of the low lead American law AB 1953.



# INSTRUCTION MANUAL

## PMFR SERIES WITH BODY IN PPS



### INSTALLATION

The pump has to be installed exclusively by skilled personnel with proper equipment.

#### WARNING

**For food applications the pumps (even when NSF listed or WRAS approved) need to be sanitized by circulating water at 80 °C (176 F) for at least 20 minutes. The water used for this operation must not be reused, either during the sterilization or later. The circuit should be carefully flushed before connecting the pump. This product is not designed to pump dangerous fluids, including flammable or toxic fluids. It is recommended not pulling out the two protection sponge caps placed on the inlet and outlet of the pump before mounting the fittings and connecting the pipes,**

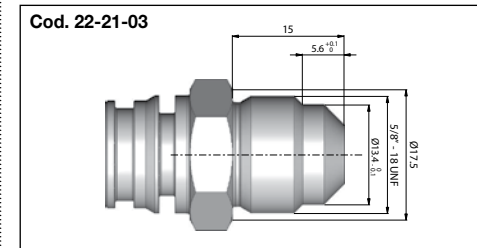
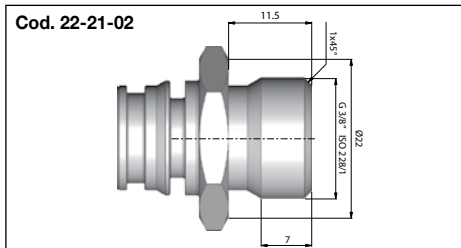
to avoid the incidental entrance of any solid extraneous object which might damage the internal components of the pump. Model numbers of this product are available with optional features, materials and performance. Choice of the model should be appropriate to its intended use. Attention should be paid when installing a service pump, including matching the model numbers. Changing the pump with a model of different capacity may damage the system, the motor and the pump itself. If continuous operation is needed, the unit has to be mounted in an airy space in order to dissipate the heat produced by the motor. To avoid noise and vibrations of mechanical parts, it's advisable to mount the motor on rubber shockabsorbing supports. We recommend using fittings with internal diameter bigger than 4 mm. Should any warning or limitation not be understood, please contact an engineer at Fluid-o-Tech for clarification or explanation.

### WIRING THE MOTOR TO THE POWER SUPPLY

- The power supply must be consistent with the electrical data printed on the motor plate, with particular regard to voltage, frequency and current. The power supply needs to be switched off during installation.
- The motor rotation must be clockwise (looking the motor in front). If operated counter-clockwise, the

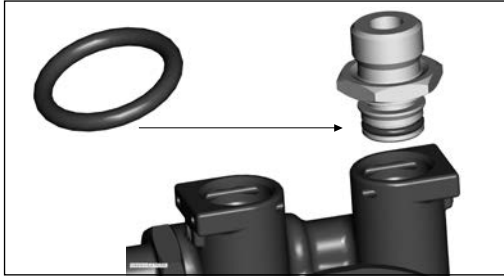
pump won't work. In case the rotation is counter-clockwise, proceed according to the scheme generally enclosed in the electrical wiring box.

- If the pump fails or some estraneous object enters it, the pump-motor unit may stop or work in critical conditions; for this reason the motor should have a thermal protection to avoid overheating or a current protection to avoid overloading.



## WIRING THE FITTINGS TO THE PIPES

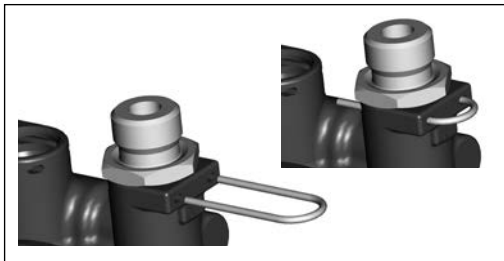
- 1 Place the tubes on the fittings. It is necessary to use, on the suction duct of the pump, pipes and connections of diameter adapted to the capacity of the pump itself (10 mm).
- 2 Insert the O-r D 11.11 1.78 T, if provided, in its slot as shown in the figure below. We recommend lubricating the O-r with a grease suitable for food contact, to facilitate the insertion in the pump body.



- 3 Insert the fittings, if provided, into the holes of the inlet and outlet of the pump to bring them beat on the body. **While inserting the fittings do not use the motor as a pump support**, in order to avoid a possible damage to itself. When inserting the fittings do not hold the pump with a wrench to prevent damage to itself.



- 4 Block the fittings supplied with the forks, as shown in the figure below. The forks must be used only once. In case of disassembly they must be replaced with new ones.



## GENERAL SAFETY ADVICE

- 1 The pump is powered by DC motors with brushless and no moving parts. Do not use these units in potentially explosive atmospheres.
- 2 After prolonged use the surfaces of the pump and the motor could be hot and potentially cause injury to skin or burns. After disconnecting the power supply, wait for the pump to cool down before touching it.
- 3 Do not place the pump near materials with low auto-ignition temperature/flammable materials. The outer surfaces of the unit can reach high temperatures. Install the unit in a dry area protected from dust, splashes and condensation.
- 4 We recommend installing the unit in areas where maximum and adequate ventilation is ensured. As an indication, the minimum distance from the walls around the unit should be at least 50 mm. Do not wrap the unit with insulation material and do not install it near hot surfaces. Do not use the pump in environments or with fluids at temperatures higher than those reported in the catalogue.
- 5 Check the compatibility with the fluid used beforehand. Do not use or allow the pump to come in contact with chemicals that could damage the unit.
- 6 An inadequate circuit could cause excessive pressure or overheating. Make sure the unit is used in accordance with to the curves in the catalogue. Install the hydraulic circuit with adequate safety margins, both in terms of pressure and temperature.
- 7 The installer is responsible for making sure current regulations, closely associated with the final application, are complied with.
- 8 Insert a filter of a suitable size upstream of the pump to prevent solid particles with a diameter greater than 10µm from entering inside. The surface of the filter must be sized in relation to the flow rate and type of circuit in order to prevent excessive drops in pressure. This filter must be cleaned periodically
- 9 If the units are connected in circuits fitted with solenoid valves, make sure these always act with a certain delay after the motor shuts down. Solenoid valves with early or simultaneous closure can cause excessive pressure or cavitation and damage the unit and/or the hydraulic circuit.
- 10 We recommend inserting a fuse of a suitable size in the unit's power supply circuit to avoid damage to the unit and/or electrical circuit.

- 11 Make sure the electrical connections can ensure the necessary seal and insulation. Inadequate connections could cause damage.

## USEFUL TIPS FOR A LONG LASTING LIFE OF THE ROTOFLOW PUMPS

This product is designed for indoor use or enclosures designed to exclude weather. The Rotoflow pump is designed to handle clean fluids only. It is necessary for this reason to install before the pump a 10 µm filter with a filtering area big enough, so as not to cause flow-pressure losses in the circuit. Place the filter at least 50 cm before the inlet port of the pump in order to avoid cavitation. It is also important to check periodically the filter cartridge. In order to keep the filter under control, it is advisable to install a vacuum gauge before and after the filter.

In case the vacuum increases more than 0.1 bar, the cartridge should be cleaned or changed. A dirty filter, which doesn't allow enough flow of liquid through it, causes cavitation and fast wear of the pump. For the pump with a built-in filter it's recommended the periodic cleaning of the filter with alcohol and compressed air. If the filter is external it's necessary to clean it or to replace it periodically. The rotary vane pumps are self-priming, but the dry running may cause overheating and failure of the mechanical seal and internal components and therefore possible leaks.

Before operation it is advisable to pour little water into the pump to keep the seal area wet in the first seconds of operation.

If the line is subject to scarce pressure or flow it is necessary to fit a low pressure switch before the pump in order to switch the motor off in case of water shortage. In order to avoid cavitation, if the tank is at atmospheric pressure, do not install the pump more than 1 m above the maximum liquid level of the tank. It is also necessary to protect the system from incidental overpressures with safety devices such as a pressure relief valve or a pressure switch connected to the motor. If possible it's advisable to install the unit as close as possible to the tank.

The bypass valve is a relief valve to protect circuit from peaks of pressure beyond its set values and must not be used as a flow regulator. If used as a flow regulator, the water in excess will recirculate inside the pump heating and accelerating the deposit of limestone on the pump components. The maximum differential pressure should be at

least 3 bar (43 psi) lower than the bypass valve setting in order to avoid operation with the bypass valve open. The maximum differential pressure must not exceed 7 bar (101.5 psi).

Thanks to the magnetic coupling the pump does not need a mechanical seal in order to prevent leakage. This eliminates the problems connected to the use of a mechanical seal. Being the transmittable torque limited by the magnet, the coupling between the motor and the pump is not guaranteed and therefore the pump might stop. In order to re-establish the coupling it is sufficient to stop the motor, wait until complete stop and then restart the motor again. The sum of the inlet and outlet pressure must not exceed 7 bar (101.5 psi) in any case.

This product has the potential for the shaft to lock. Consideration should be given or countermeasures taken to avoid damage to the motor.

A few drops of water from the drain holes of the pump are normal during the first hours of operation. In case the leaking persists, contact Fluid-o-Tech. The rotary vane pumps maintenance, and the replacement of the parts subject to wear has to be done by Fluid-o-Tech or a repair center authorized by Fluid-o-Tech.

## WARRANTY

Every new pump manufactured by Fluid-o-Tech is guaranteed to be free of defects in workmanship and material when leaving the factory for a period of 12 months from the production date stamped on the pump's housing, plus a period of 3 months to cover the warehouse and transit time, or for a period of maximum 15 months from the purchasing date to the product use. In no event shall this period exceed 15 months from date of original invoice.

Warranty remedy is limited to repair or replacement of defective product at Fluid-o-Tech own judgement. Fluid-o-Tech's responsibility under this warranty is limited to the repair or replacement of defective equipment returned to us on a D.A.P. basis, providing that our analysis discloses that such part or parts were defective at the time of sale.

The warranty is not recognized if:

- The directions on how to handle, install or operate the pump are disregarded
- The pump has been disassembled or modified by anyone other than a Fluid-o-Tech (or authorized by Fluid-o-Tech) engineer or repaired with non original components