

MULTIFERTIC

MF



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SAFETY RULES

To avoid personal or environmental damages and to guarantee a proper operation of the equipment, the staff in charge of the installation, set up and maintenance of the equipment must follow the instructions of this manual, specially recommendations and warnings explicitly detailed. In addition, specific instructions for the chemical products to be dosed should be followed.



1.- GENERAL DESCRIPTION

MULTIFERTIC MF dosing pumps are heavy duty, high precision electric piston pumps for dosing liquid products.

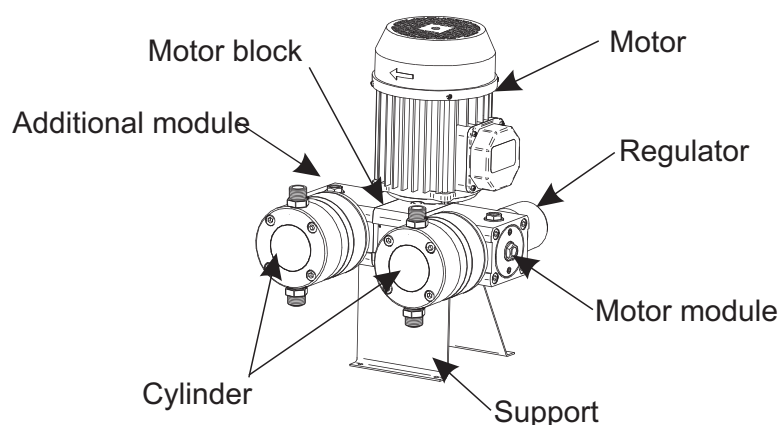
They are made up of one driving module and 1 to 4 injection modules for 25 to 300 l/h. Injection modules consist of one 50, 100, 200, 300, or 500 l/h piston for **MULTIFERTIC MF** injectors of series **MF2**, and of one 25, 50, 100, 150, 300 l/h for the **MULTIFERTIC MF** injectors of series **MF1**, independently regulated by means of a system of **POSITIVE RETURN**, exclusive to **I.T.C.**

In the same injector can be connected several injection modules to apportion different products (**INDEPENDENT INJECTION**) or to increase the injection flow. The design of this dosing pump allows the combination of MF piston modules with MFD diaphragm modules in the same pump. By increasing the number of modules in the same injector, a higher flow regularity is obtained, whereby in the 4 module model an actually continuous flow is obtained. Injection modules may be connected in the factory or added later when the injector is in place.

MULTIFERTIC MF dosing pumps are manufactured with materials that can resist the existing agrochemical products, even acids. It is designed for all sorts of processes where it is necessary to dose a product into a hydraulic network, such as: food, textile, chemical industry, water treatments, etc. (See materials in Technical Features). In case there is any doubt about compatibility of materials with the products to be used please contact with ITC S.L. Technical Service.

Dosing flow of each module is adjustable independently with no need to stop

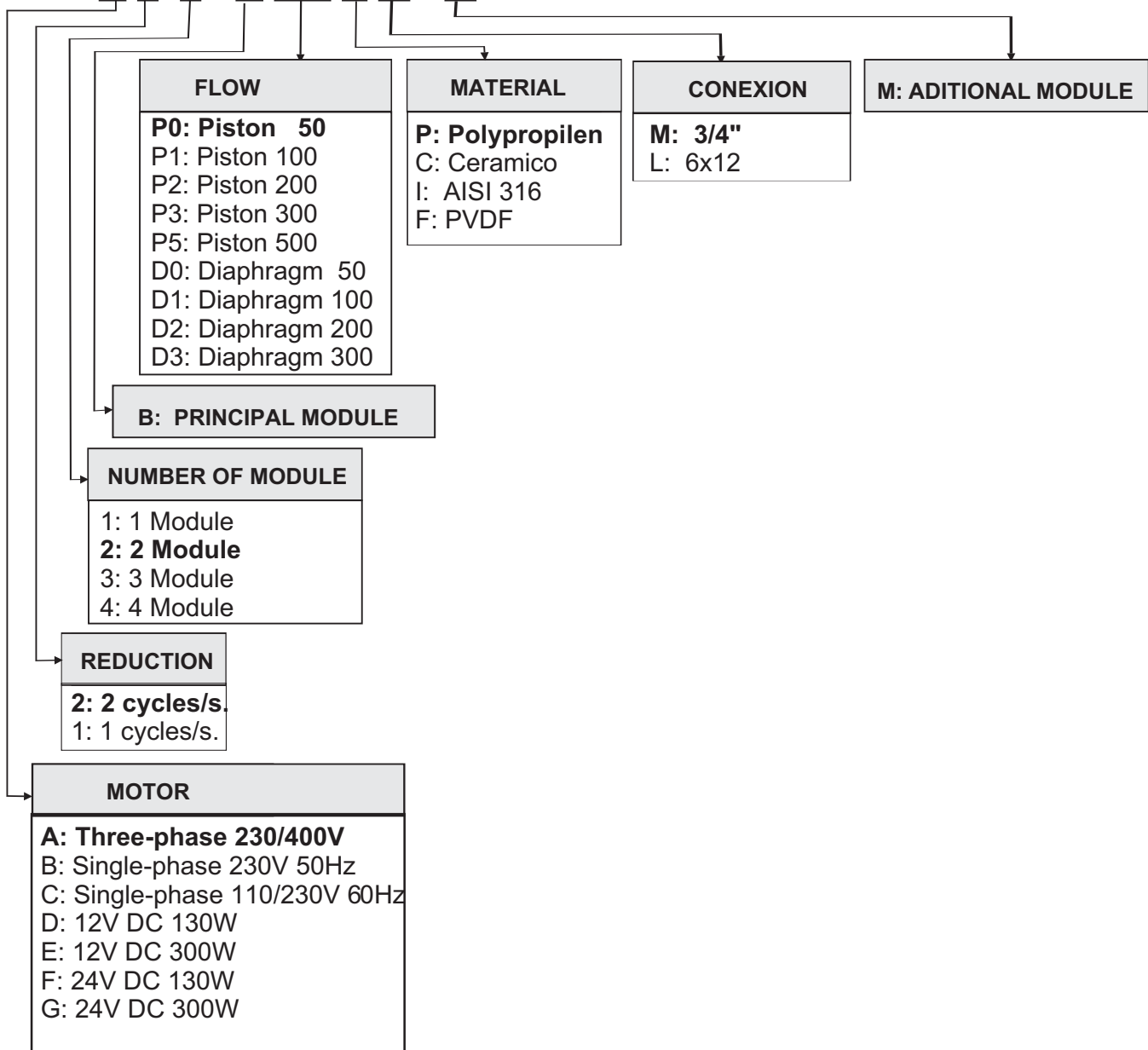
It is made up as follows:





Codes formulation

62 - A 2 2 - B P 0 P M - M P 0 P M



2.- CARRIAGE AND MAINTENANCE

The original packing is prepared so that carriage and storing of the product do not cause any damage to the product, as long as this is done far from heat sources and in dry, ventilated spaces.

Inside packing we include:

- MF dosing pump
- Support
- Accessories bag
- Instructions manual



3.- TECHNICAL FEATURES

There are two models of **MULTIFERTIC MF** injector

MULTIFERTIC MF1: 1 injection per second

MULTIFERTIC MF2: 2 injections per second

MF 1			MF 2		
MODULE	FLOW l/h (GPH)	PRESSURE BARS	MODULE	FLOW l/h (GPH)	PRESSURE BARS
MI1-25	25 (7)	15	MI2-50	50 (13)	15
MI1-50	50 (13)	15	MI2-100	100 (26)	15
MI1-100	100 (26)	8	MI2-200	200 (53)	8
MI1-150	150 (39)	5	MI2-300	300 (79)	5
MI1-250	250 (65)	3	MI2-500	500 (132)	3

1 MPa = 10 Bar

ELECTRIC CURRENT: As indicated in the motor plate

POWER: 0.37 KW (0.5 CV)

PROTECTION : IP-55

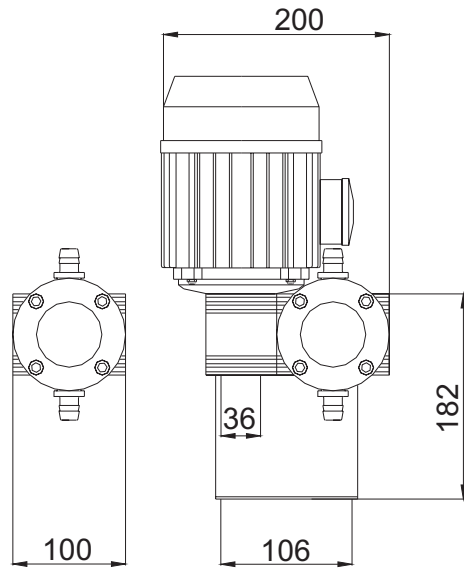
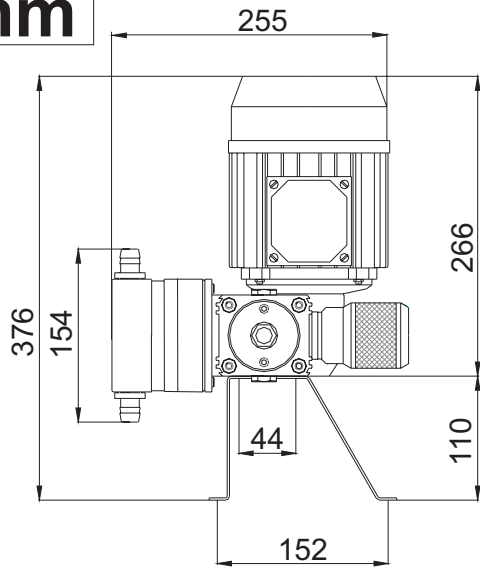
MATERIALS:

Piston: P.E.U.A.P.M. / Ceramic
 Shaft: P.E.T.P.
 Cylinder: P.P. / PVDF / AISI 316
 Valves(body): P.P / PVDF / AISI 316
 Valves(ball): glass / glass borosilicato / Ceramic
 Ring Gear : BRONZE .
 Pinion: F-154 CEM.
 Block : Aluminium foundry
 Eccentric: F-154 CEM
 Oil: SAE 80 W 90
 Retention: FPM

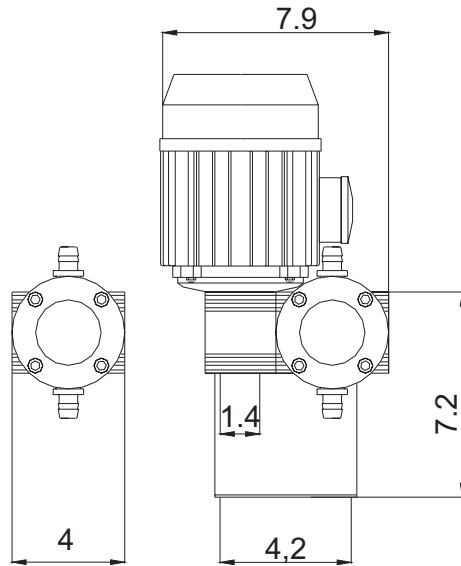
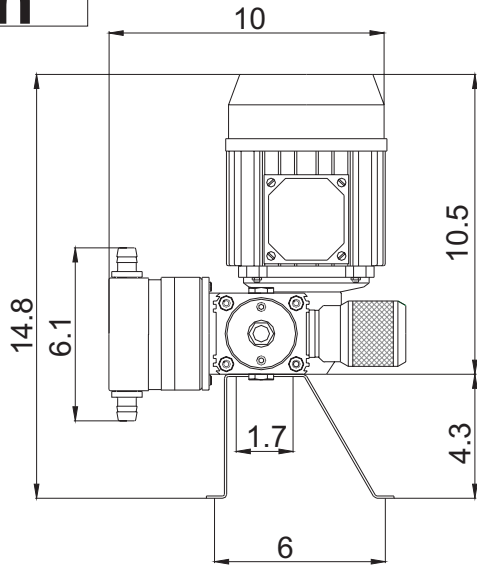
NOISE LEVEL dB(A): minor than 70



mm

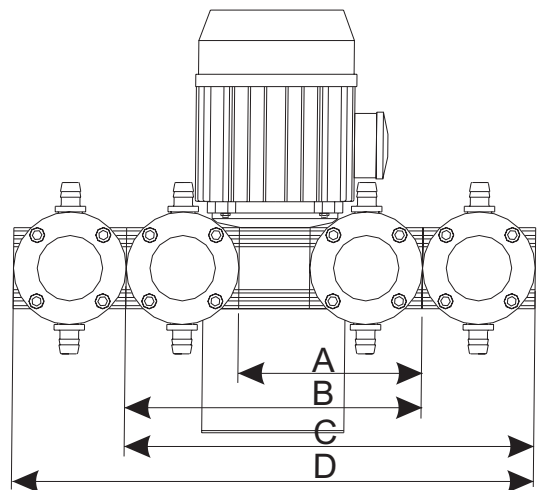


in



INJECTION MODULES

		DIMENSIONS		WEIGHT	
		mm	in	Kg	lb
1	A	200	7.9	12	26.5
2	B	265	10.5	14.5	32
3	C	365	15	17	37.6
4	D	465	18.3	19.5	43





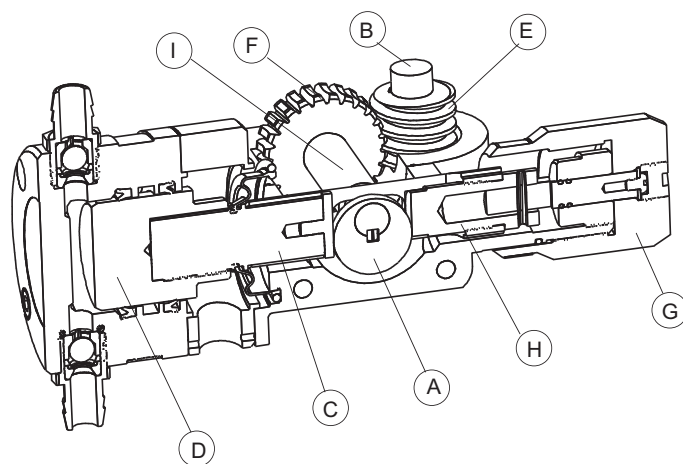
4.- OPERATION

The electric motor (**B**) transmits its power by means of a reducer, made up of a pinion (**E**) and a ring gear (**F**) solidary to an axis (**I**) and an eccentric (**A**) that alternatively pushes and draws a shaft (**C**) threaded to a piston (**D**).

As a spring is not necessary for the return of the piston (**POSITIVE RETURN**), the motor transmits all its power both to the injection and to the suction, saving energy, avoiding breakdowns, and ensuring a perfect and high precision dosing.

The micrometric regulator (**G**) increases or diminishes the stroke of the shaft and the piston by means of a threaded pipe coupling (**H**), modifying the injection flow. The dosing flow is adjustable from a 0% to a 100%.

To regulate flow by means of an inverter is possible varying proportionally the dosed flow by the frequency supplied by an electric motor. The dosing flow is adjustable from, a 10% to a 100%.



INJECTION MODULES

In the same injector can be connected several injection modules to apportion different products as long as they belong to the same serie: **MF1-MFD2** or **MF2-MFD2**.

The maximum pressure of an **MF** dosing pump when combined with one or more additional modules - **MI** or **MID** - can be limited. It will be the result of dividing 2.300 (for model **MF1-MFD1**) or 4.600 (for model **MF2-MFD2**) by the total sum of the flows of the different installed modules, *as long as this is not superior to the one specified for each module*. For this calculation we must use the flow of the diaphragm modules multiplied by 2.

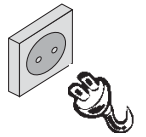
*Example: Model **MF2-300/3 + MI2-300 + MI2-200 + MID2-100**.*

Dosing pump of two injections per second, three-phase motor, with two additional modules of 300l/h piston, one of 200l/h piston and one diaphragm module of 100l/h.

$$300 + 300 + 200 + 2 \times 100 = 1000$$

The maximum resulting pressure will be: $4.600/1000 = 4,6 \text{ bar}$

5.- INSTALLATION

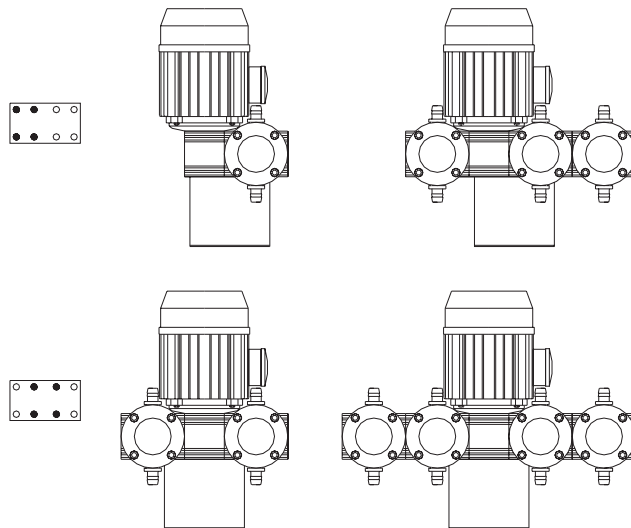


GENERALITIES

To install this pump it is advisable to choose places protected from water, away from heat sources and with renovation of air.

Place the pump vertically over a totally horizontal rigid surface to achieve a proper lubrication of all inner elements. Anticipate which will be the room you will need to comfortably do the basic maintenance and install/desinstall the pump.

Tack the pump to the provided stand, and the stand to the chosen even surface. The special stainless steel stand has eight holes in its upper part for fastening the dosing pump, of which four will be used. In the one and three module pumps the four side holes are used, and in the two and four module middle holes are used. (See drawing).



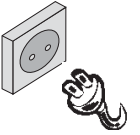
ELECTRIC CONECTION



The electric protection of the motor must be installed and adjusted following its nominal intensity (overloaded switch disjuntor). (See wiring)

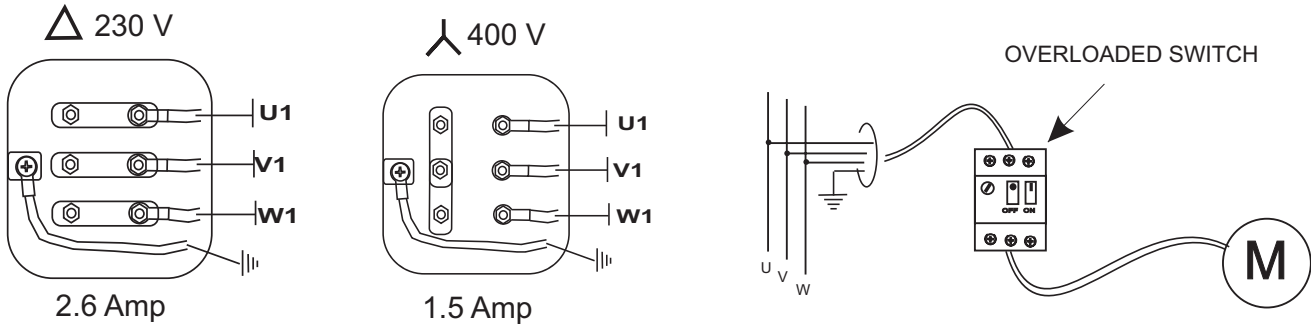
A disconnection dispositive must be installed in case of emergency.

The equipment must be protected to avoid untimely sudden starts.



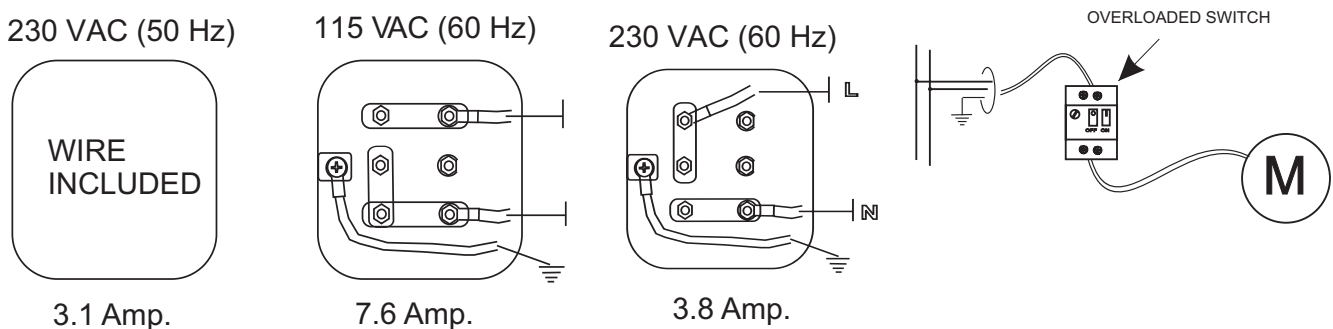
THREE-PHASE CONNECTION (50/60 Hz)

To work at 230 V we will plug the motor in triangle.
To work at 400 V it will be a star connection.



SINGLE-PHASE CONNECTION

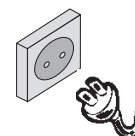
To work at 230 V single-phase at 50 Hz we will connect directly the motor wire to the adequate protection. To work at 60 Hz we will connect the connection box plates as shown in the drawing.



HYDRAULIC CONNECTION



To evacuate leaks by the hole of the diaphragm breakage detector in the inferior part of the cylinder, we will take off the security bolt disassembling the cylinder and connecting a hose or a pipe of a material compatible with the product to be dosed, and collect the liquid in a safe place.



SUCTION

It is essential to fit in the suction of the dosing liquid the filter of 100 mesh supplied with the dosing pump.

Couple the suction pipe to the lower connector of the cylinder, putting the mesh filter in between. The stuff at the bottom of the tank must never be suctioned, to avoid taking up undiluted particles.

The piping must be stiff enough so that it does not lose its shape when there is suction.

To help suction the piping must be as short as possible, the pipe diameter must be in keeping with that of the valve. For pipes of over 3 m the diameter must be increased.

INJECTION

Fix the check valve supplied with the pump at the input of the water network, as shown in the drawing, and couple the injection hose to the upper connector of the cylinder.

To protect the piping from the pressure variations or to achieve a continuous flow, we suggest fitting a pulsation damper as near as possible to the pump.

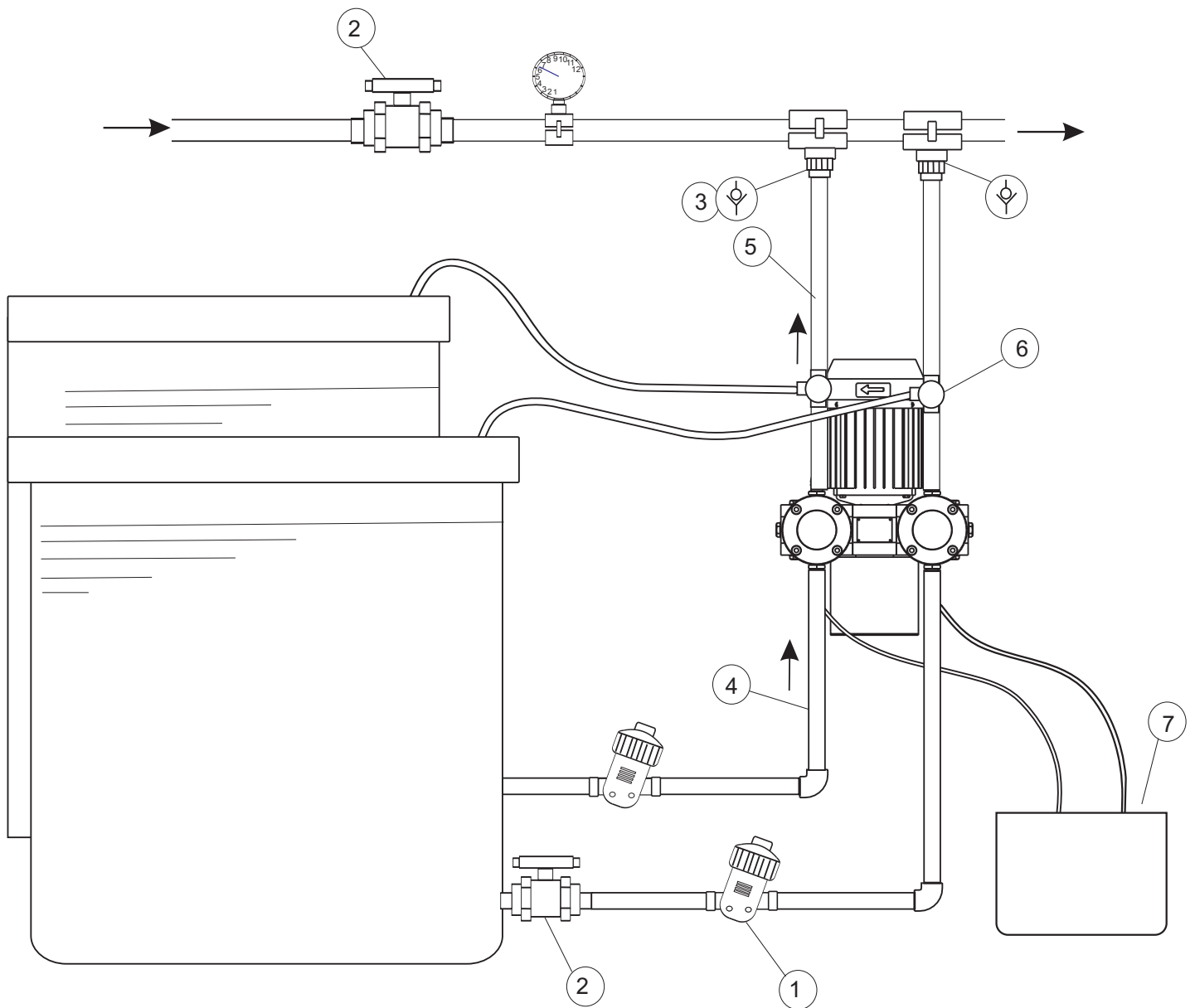
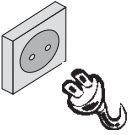
In order to make priming easier, we suggest fitting a priming valve. You should anticipate an adequate dispositive in order to collect the liquid than can get out when priming, and derive it where it can not be harmful.

The pipe diameter will have to be the same as the valve diameter. For pipes over 15m length the diameter shall be increased. Do never insert a shutoff valve.



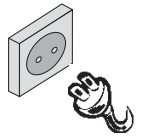
Install a safety valve in a derivation as near as possible from the pump , in order to protect it and the whole installation from possible over-pressures. This derivation Must derive the liquid to a safe place.

GENERAL INSTALLATION

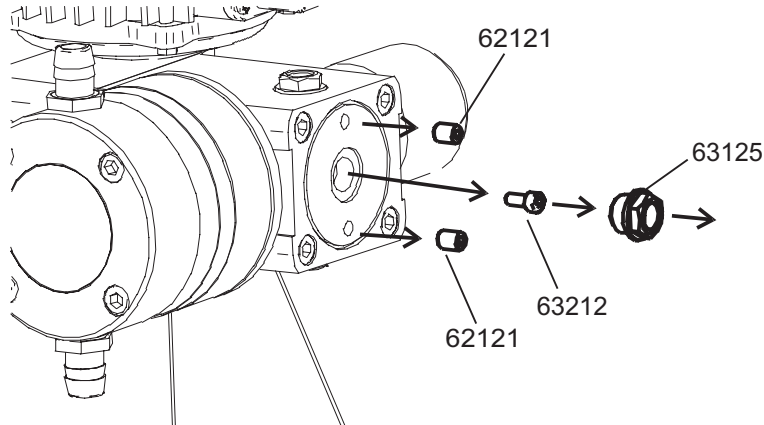


1. FILTER
2. VALVES
3. NON-RETURN VALVE
4. SUCTION
5. IMPULSION
6. SAFETY VALVE
7. SMALL DEPOSIT TO COLLECT LIQUID IN CASE OF BREAKOUT

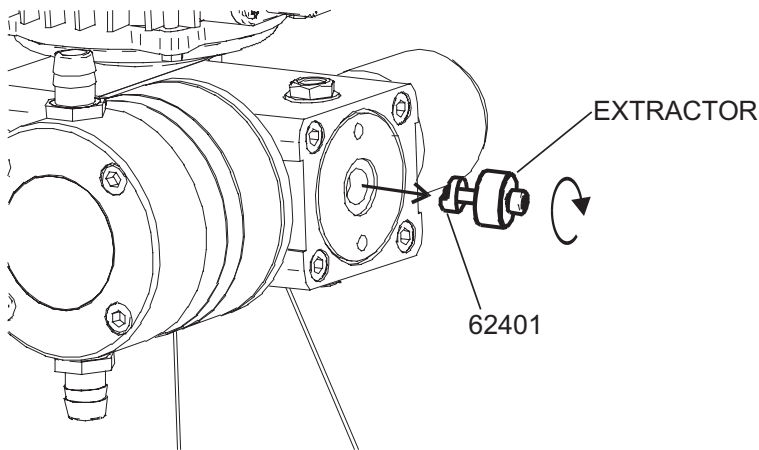
INSTALLATION ADDITIONAL MODULE



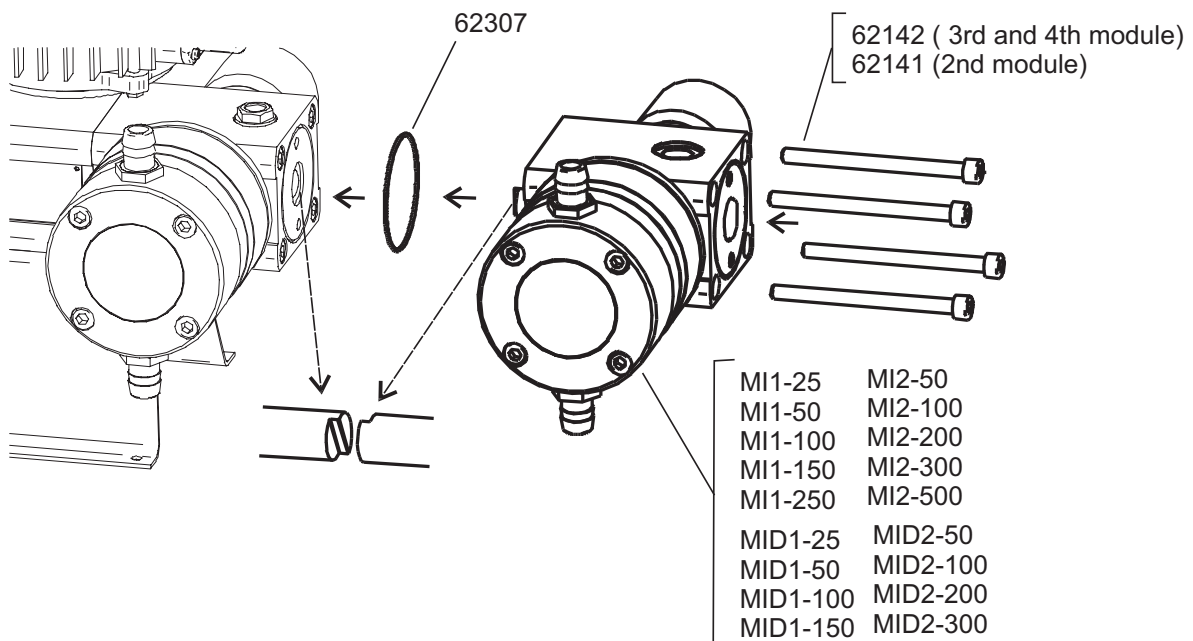
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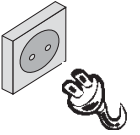


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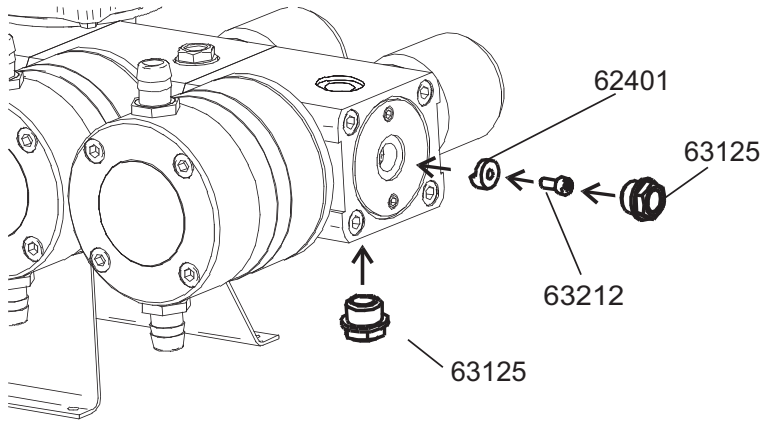


3

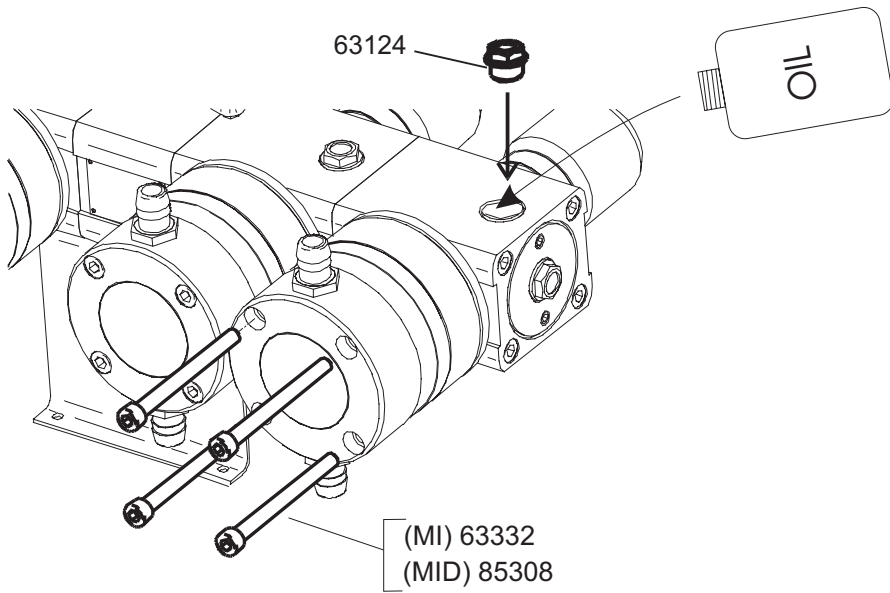




4



5





6.- START UP AND REGULATION



STAND: Check that the pump is properly installed in its stand.



OIL: Take off re-filling lid and fill the pump with the provided oil: SAE 80 W 90 or equivalent. If the pump has several modules oil must be spread to all filling holes.

Lubricants list:

CEPSA SAE 80W 90

REPSOL EP 80W/90

SHELL SPIRLAX HD OIL 80W/90

ESSO GEAR OIL 80W/90

AGIP ROTRA MP 80W-90

MOBILUDE HD 80W-90

BP ENERGEAR HT 80W-90

CASTROL HYPOYC

GULF GEAR MP SAE 80W 90

ELF TRANSGEAR HD 80W-90

Check the oil level with the provided dipstick.
Aproximate oil capacity: 100 cm³ per module.
When carrying change filling lid for working lid.



CHECKING OF HYDRAULIC CIRCUIT: Check that all valves are opened and that escapes from priming valves derive the liquid to a proper receptacle.



ROTARY DIRECTION: Start up the pump to check that the rotary direction coincides with the one shown by the arrow. To change rotary direction invert two phases in the motor terminals box.



CHECKING OF PUMP: Check visually/auditorilly the proper working of the pump.



PRIMING: To prime the pump easily, especially for not very important flows and we if do not have priming valve, we suggest to lower pressure up to the minimum injection point. If that is not possible, fill up the cylinder and the suction pipe with liquid..



OVER-PRESSURE PROTECTION: Adjust the safety valve over-pressure or relief to the wished pressure to protect the installation without exceeding the pump nominal pressure.

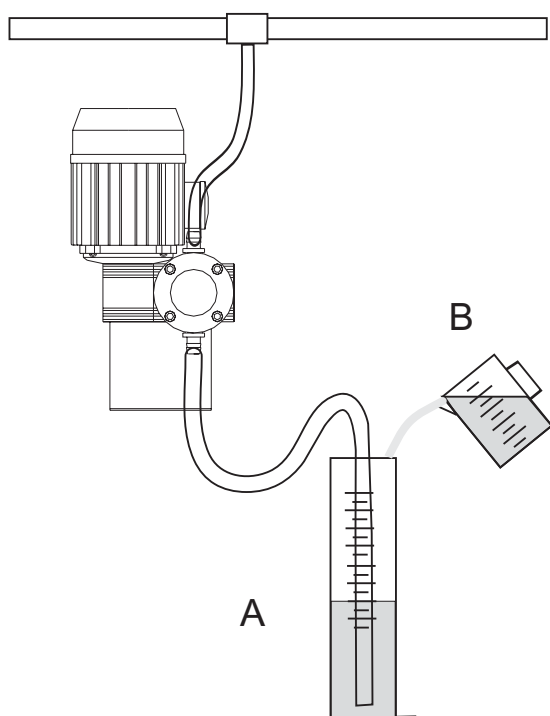


ELECTRIC PROTECTION: Adjust the electric dispositive of electric protection to the motor nominal current.

DOSING FLOW

Through the micrometric regulator ,we will adjust the dosing flow from 0 to 100% depending on the wished value. It is not advisable a regulation under 10%.

In order to check the dosing flow:



- 1.- Prime the pump immersing the suction pipe in a graduated receptacle (A).
- 2.- Mark in the receptacle the liquid level.
- 3.- Start up the pump and pour a known volume (V) of measured liquid in a second receptacle (B).
- 4.- Measure the time (t) that goes between the start up of the pump and the precise instant in which the liquid reaches the level of the mark of receptacle A.
- 5.- The dosed flows corresponds to:

$$Q(l/h) = V \text{ (liters)} / t \text{ (seconds)} \times 3600$$

7.- MAINTENANCE



Before any maintenance operation we will check:

That the pump is stopped and disconnected from the electric supply.

There is no pressure neither inside the head nor in the impulsion pipe. It is advisable to empty the head before opening it.

The staff in charge of the maintenance will use the adequate protection means in order to manipulate the dosed liquid.

PERIODICAL MAINTENANCE:

Change oil after the first 500 hours. Next changes will be every 2000 hours (minimum once a year).

Check the piston every 3 months or 1000 hours.

Check the bellows every 3 months or 1000 hours.

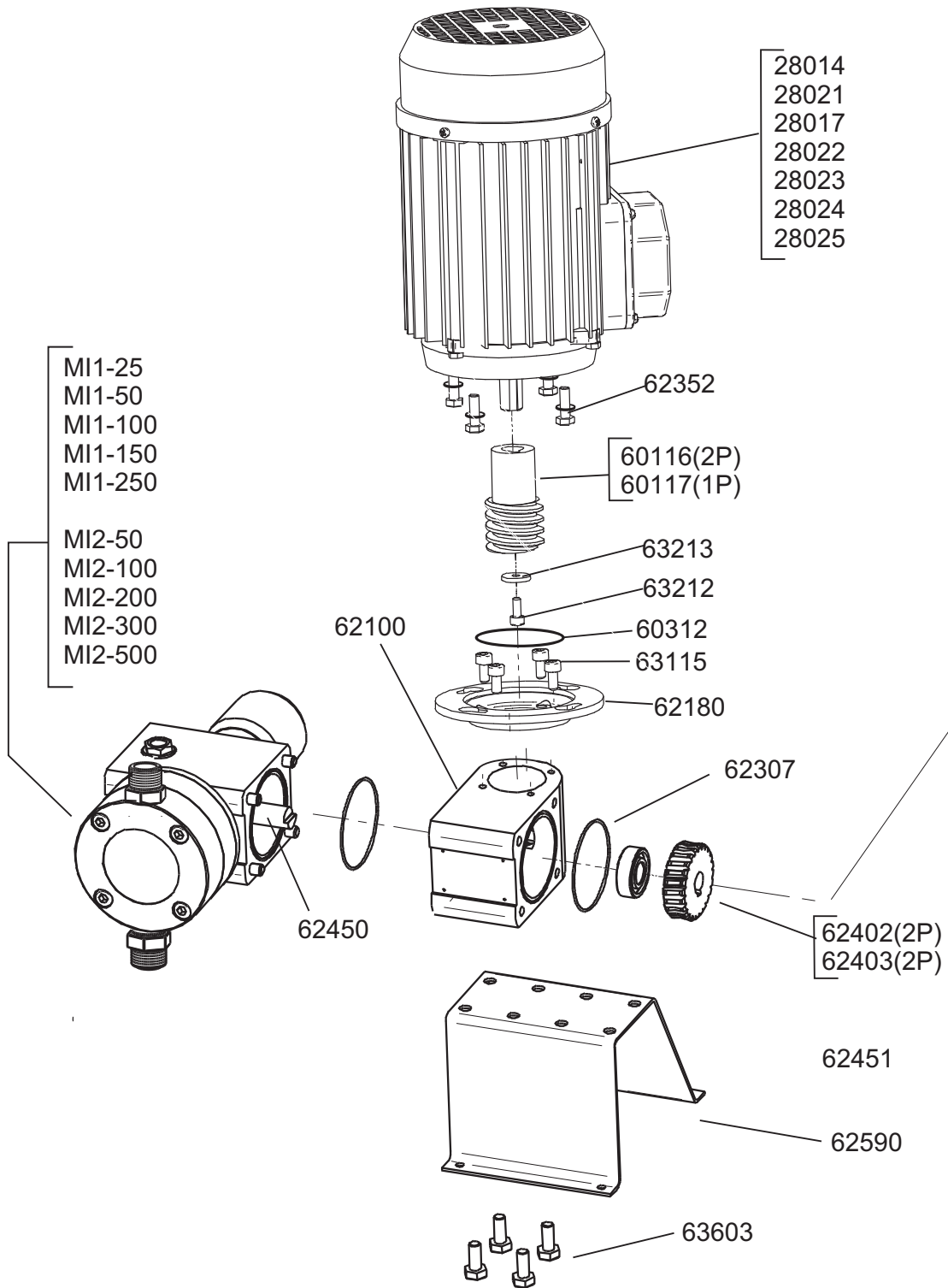
Check the suction filter once a month.

Check the valves every 3 months or 1000 hours.

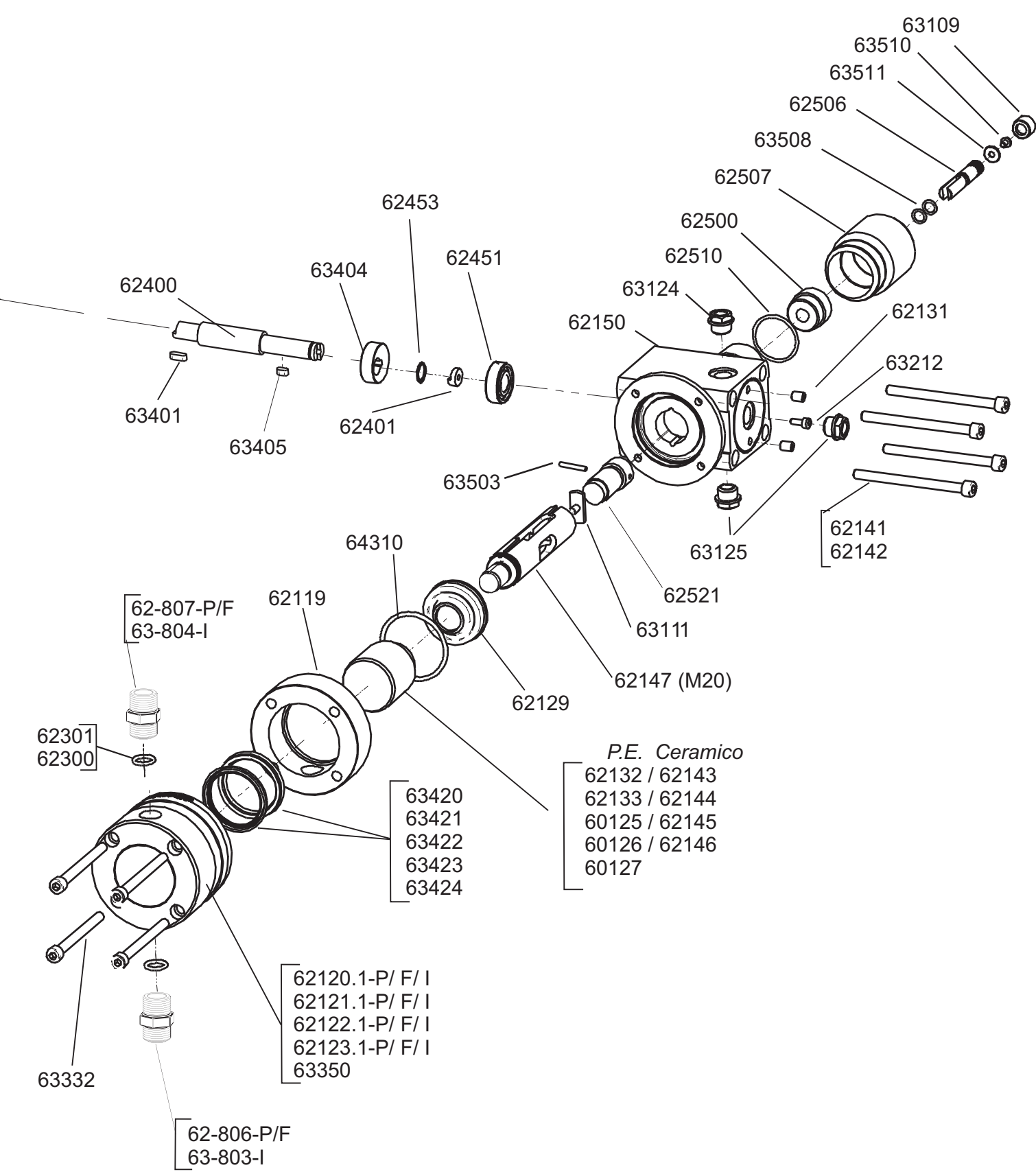
It is advisable to clean periodically the injector, letting clean water flow through it (We can make it coincide with the emptying out of the tank), to eliminate precipitated rests that can remain in the inner part of the cylinder or in suction / impulsion pipes.

If we are using highly corrosive liquids it is advisable to double the frequency of checkings.

MULTIFERTIC MF LIST OF PARTS



Injection 3/4 62-807-P/ F	Suction 3/4 62-806-P/ F	Injection 3/4 inox 63-804-I	Suction 3/4 inox 63-803-I
62813-P/ F	62811-P/F	63911-I	63912-I
62811-P/F	63913	63912-I	63816
62810-P/F	62810-P/F	63914	63903-I
62355	62355	63816	62356
62812-P/F	62812-P/F	63914	63911-I
62812-P/F	62356	63903-I	
	62813-P/F		



P.E. Ceramico
 62132 / 62143
 62133 / 62144
 60125 / 62145
 60126 / 62146
 60127



MULTIFERTIC MF LIST OF PARTS

CODE	DESCRIPTION	QUANTITY
60116	2 STROKES PINION D40	1
60117	1 STROKE PINION D40	1
60132	O'RING 68x1,5 FPM	1
62100	MOTOR BLOCK	1
62119	CYLINDER SEPARATOR	1
62120.1-P/F/I	CYLINDER 50/L-S 3/4	1
62121.1-P/F/I	CYLINDER 100/L-S 3/4	1
62122.1-P/F/I	CYLINDER 200/L-S 3/4	1
62123.1-P/F/I	CYLINDER 300/L-S 3/4	1
62129	FPM BELLOWS MF	1
62131	ALLEN SCREW M8x10 DIN913	2
62132	PISTON 50/L-S	1
62133	PISTON 100/L-S	1
60125	PISTON 200/L-S M20	1
60126	PISTON 300/L-S M20	1
60127	PISTON 500/L-S M20	1
62141	ALLEN SCREW M8x102,5 DIN 912	4
62143	CERAMIC PISTON 50/L-S	1
62144	CERAMIC PISTON 100/L-S	1
62145	CERAMIC PISTON 200/L-S	1
62146	CERAMIC PISTON 300/L-S	1
62147	BELLOWS SHAFT M20	1
62150	MECHANIZED MULTIFERTIC MODULE	1
62162	IDENTIFICACION PLATE	1
62180	FLANGE MOTOR B14	1
62300	O'RING 19x3 FPM	1
62301	O'RING 19x3 NBR	1
62307	O'RING 61x2	1
62352	SCREW M6x12 DIN 933 I	4
62400	AXIS MF	1
62401	AXIS EXTENSION	2
62402	RING GEAR 2 STROKES, MULTIFERTIC , BRONZE	1
62403	RING GEAR 1 STROKE, MULTIFERTIC, BRONZE	1
62450	MODULE AXIS MF	1
62451	BEARING 6202 2Z	2
62453	RETAINING RING DIN 471 15	1
62500	REGULATOR ROD GUIDE	1
62506	MULTIFERTIC ROD	1
62507	MULTIFERTIC REGULATOR	1
62510	O'RING 37x2,5	1
62521	MULTIFERTIC REGULATOR BUMPER	1
62590	MULTIFERTIC SUPPORT	1
63109	REGULATOR PLUG 3/8	1
63111	BRAKE	1
63115	ALLEN SCREW M6X12 DIN 912 8,8	4
63124	FILLER PLUG 3/8"	1
63125	DRAIN PLUG 3/8"	3
63212	ALLEN SCREW 5x12 DIN912	3
63213	WASHER 18x5x25	1



CODE	DESCRIPTION	QUANTITY
63331	ALLEN SCREW M8x20 DIN 912 I	4
63332	ALLEN SCREW M8x90DIN 912 I	4
63350	CYLINDER 500L/H	1
63351	ELECTRO FLANGE 500L	1
63401	WEDGING PIECE 5x5x15	1
63404	ECCENTRIC	1
63405	WEDGING PIECE DIN 6885 5x5x10	1
63420	COLLAR 50L	2
63421	COLLAR 100L	1
63422	COLLAR 200L	1
63423	COLLAR 300L	1
63424	COLLAR 500L	1
63503	BOLT 4x24	1
63508	O'RING 8,73x1,78	1
63510	SCREW M5x6 DIN912 I	1
63511	WASHER M5 DIN9021 A2	1
63603	SCREW M8X12 DIN 933 A2	4
64310	O'RING 55,5x3,5	2
66165	REMACHES 2X6	4
MOTORS		
28014	MOTOR 1/2HP THREE-PHASE T71 B14	1
28017	MOTOR 1/2HP BITENSION 60HZ	1
28021	MOTOR 1/2HP MONO	1
28022	MOTOR 130W 12V DC B14	1
28023	MOTOR 130W 24V DC B14	1
28024	MOTOR 300W 12V DC B14	1
28025	MOTOR 300W 24V DC B14	1
VALVES		
62-806-P/F	SUCTION CHECK VALVE 3/4	1
62-807-P/F	INJECTION CHECK VALVE 3/4	1
63-803-I	SUCTION CHECK VALVE 3/4 INOX	1
63-804-I	INJECTION CHECK VALVE 3/4 INOX	1
ACCESSORIES		
66402	CLAMP 16 X 25 STAINLESS STEEL	6
66110	FILTER 1/2"	1
62999	HANDBOOK	1
62590	MULTIFERTIC STAND	1
62007	MULTIFERTIC WALL STAND	1
66586	SCREW 6X40	4
63603	SCREW 8 X 12 DIN933 A2	4
62019	STOPPER	4

..-P= Polypropilen / ..-F= PVDF / ..-I= AISI 316



PROBLEM	CAUSE	SOLUTION
MOTOR DOES NOT RUN	THERE IS NO TENSION MOTOR PROTECTION HAS BLOWN UP	-Check with a voltmeter incoming tension · Check with ammeter that current is not superior than nominal one
MOTOR RUNS HOT	A PHASE IS FAILING (three-phase); WRONG INCOMING TENSION SUPERIOR CONSUME THAN NOMINAL ONE LOW WORK FREQUENCY (only with inverter)	· Check with voltmeter tension in motor terminals · Check that incoming tension coincides with motor one (-10% / +10%) · Check that injection pressure is not superior to the one specified in the module · Check with a voltmeter incoming tension · Increase working frequency with inverter
MOTOR RUNS BUT PUMP DOES NOT INJECT OR INJECTION IS INFERIOR TO NOMINAL ONE	PUMP HAS NOT BEEN PRIMED SUCTION / IMPULSION VALVES ARE DIRTY OR DAMAGED SUCTION FILTER IS DIRTY AIR COMES INTO SUCTION PIPE CAVITATION IN SUCTION	· Prime the pump injecting at zero pressure · Clean or change valves · Clean filter - Check sealing in connection points - Increase pipe diameter. - Reduce suction pipe length. - Reduce speed through an inverter. - Use a less viscous liquid.
PUMP TRICKLES LIQUID THROUGH INFERIOR CYLINDER HOLE	DAMAGED SEALS DAMAGED PISTON	-· Change seals -·Change piston
PUMP TRICKLES OIL THROUGH INFERIOR CYLINDER HOLE	DAMAGED BELLOWS	- Change bellows
PUMP LEAKS OIL THROUGH	DAMAGED REGULATOR O'RINGS	- Change o'rings

EC CONFORMITY DECLARATION



I.T.C S.L..
Mar Adriàtic, 1
Polígono Torre del Rector
08130 Santa Perpètua de Mogoda

Declares that all models of **MULTIFERTIC** products, identified by a serial number and year of manufacture, strictly fulfill 98/37/CE Governing Body, as long as installation, use and maintenance are carried out following the prevailing regulation and following the instructions contained in the handbook.

Josep Segura
Manager

WARRANTY



I.T.C. S.L. warrants the product specified in this document for a period of 1 year from the purchase date. This warranty obligation is limited to the free replacement of the damaged parts due to any material or manufacture defect. This warranty does not include periodic maintenance and damage resulting from misuse.

*The equipment must be sent to **I.T.C. S.L.** Service Center with prepaid transport charges, and will be sent back with transport charges for customer's account.*

The warranty document with sales date and shop stamp or an invoice copy must be sent with the equipment.

MODEL

SERIAL #

Date of sale and shop stamp

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