

MODULE

MF - MFD



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SAFETY RULES

To avoid personal or enviromental 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 those recommendations and warnings explicitly detailed. In addition, specific instructions for the chemical products to be dosed should be followed.



1-GENERAL DESCRIPTION

MI or MID injection module allows the modular ampliation of MULTIFERTIC electrical injector. It is possible to assemble up to 4 independently regulated injection modules. From 25 to 250 l/h for model MF1, from 50 to 500 l/h for model MF2 , from 25 to 150 l/h for model MFD1 and from 50 to 300 l/h for model MFD2.

There are two models of piston injection module (MI1 or MI2), and two models for diaphragm injection module (MID1 or MID2) independently from the used MULTIFERTIC pump.

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:

- Base injection module model MI
- Mesh filter for the suction of the product to be dosed
- Non-return valve
- 6 stainless steel clamps
- Extractor
- Oil
- 4 M8 X 103 screws for second module
- 4 M8 X 110 screws for the third and fourth module
- Handbook

NOTE: Anti-syphon valve is not provided, therefore in case it is needed, it must be explicitly ordered.

3.-TECHNICAL FEATURES

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



MFD 1

MFD 2

MODULE	FLOW l/h (GPH)	PRESSURE Bars.
MID1-25	25 (7)	10
MID1-50	50 (13)	10
MID1-100	100 (26)	6
MID1-150	150 (39)	4

MODULE	FLOW l/h (GPH)	PRESSURE Bars.
MID2-50	50 (13)	10
MID2-100	100 (26)	10
MID2-200	200 (53)	6
MID2-300	300 (79)	4

1 MPa = 10 Bar

MATERIALS:(MF) Piston: P.E.U.A.P.M. / Ceramic
 (MFD) Diaphragm: Elastometer base strengthened with fiber and P.T.F.E clothing

Shaft : P.E.T.P.

Cylinder: P.P. / PVDF / AISI 316

Valves(body) :P.P. / PVDF / AISI 316

Valves(ball) : glass/ borosilicate glass / Ceramic

Ring gear: BRONZE .

Pinion: F-154 CEM.

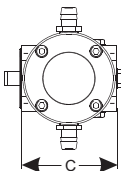
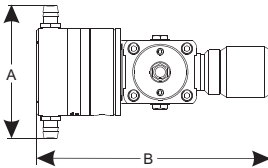
Block :ALUMINIUM FOUNDRY

Eccentric: F-154 CEM

Oil : SAE 80 W 90

(MF) Retention: FPM

DIMENSIONS



		A	B	C	WEIGHT
MI1-25	MI2-50	162mm 6.3 in	271mm 10.6 in	102mm 4 in	2.5 Kg 5.5 Lb
MI1-50	MI2-100				
MI1-100	MI2-200				
MI1-150	MI2-300				
MI1-250	MI1-500	195mm 7.6 in	270mm 10.6 in	120mm 4.7 in	2.7 Kg 6 Lb
MID1-25	MID2-50	162mm 6.3 in	230mm 9 in	102mm 4 in	2.5 Kg 5.5 Lb
MID1-50	MID2-100				
MID1-100	MID2-200				
MID1-150	MID2-300				

4.-OPERATION



The maximum pressure of an **MF** or **MFD** dosing pump when combined with one or more additional modules **MI** 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** with two piston modules, a **MI300**, and the other **MI200**, and with a diaphragm module **MID100**.*

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

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

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

5.-INSTALLATION

In the same injector different injection modules can be assembled (MI1,MI2, MID1, MID2) as long as they belong to the same injection model: **MF1-MFD1** or **MF2-MFD2**.

Modules must be assembled in the positions shown in figure 5.1, being the highest flow modules the ones that are assembled nearer the motor.

Modules MI1-250 and MI2-500 have a bigger diameter, and thus they can only be assembled one on each side of the motor.

STAND POSITION



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.

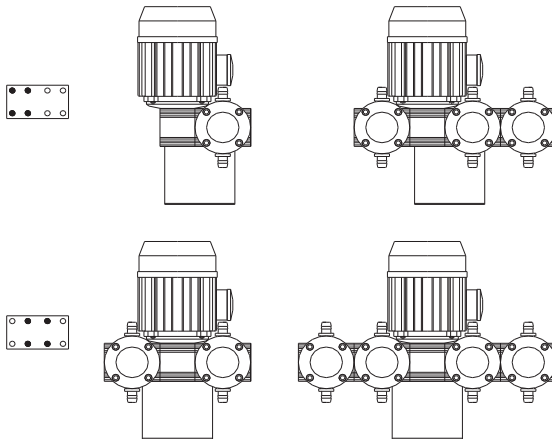


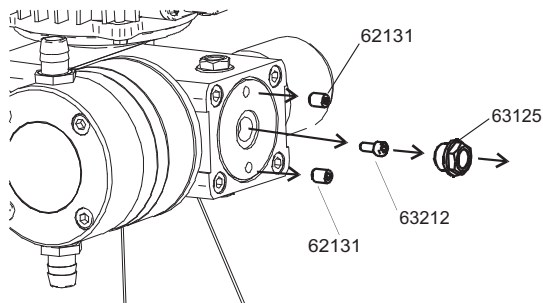
Fig.5.1

ASSEMBLING



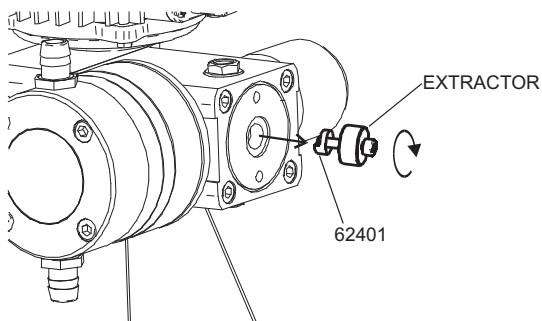
Empty up the oil of the modules before assembling

①

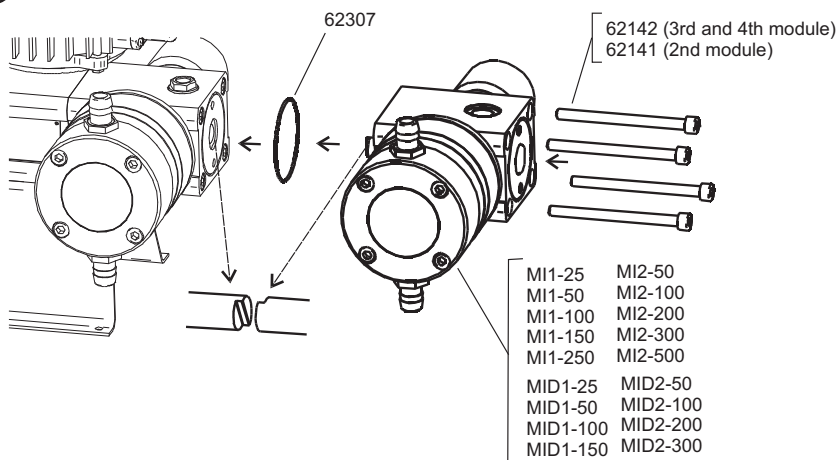




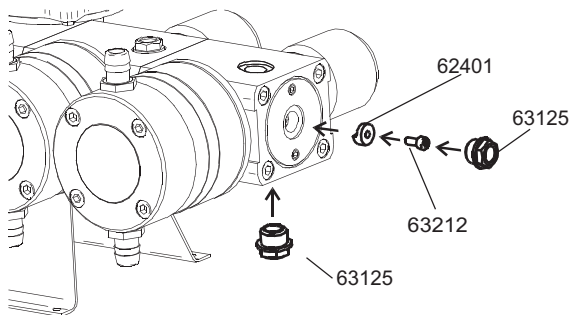
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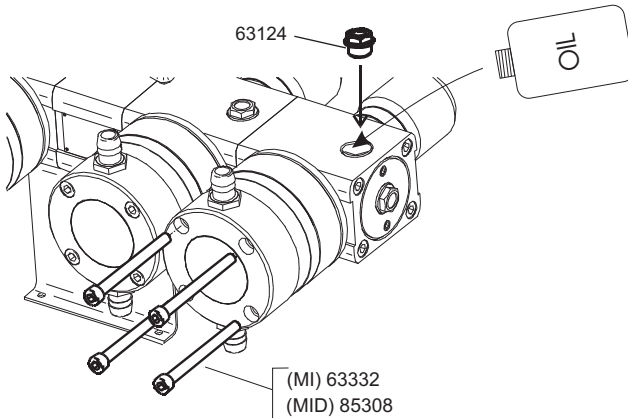
3



4



5



Fix the cylinder, taking into account that the front number of flow indication is placed vertically.
If regulator graduation (in red) does not coincide with that of the module, stick in its place the served graduation sticker, having in mind that the zero of the sticker (**0**) must coincide with the ten of the module (**10**).

HYDRAULIC CONNECTION



To evacuate leaks through the detector hole placed in the lowest part of the cylinder, connect a pipe or a hose of a compatible material, 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 over 3m, 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 that 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 liquid to a safe place.



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 dipstick. Approximate capacity: 100cm³ per module.

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 ENERGEGEAR HT 80W-90
CASTROL HYPOYC
GULF GEAR MP SAE 80W 90
ELF TRANSGEAR HD 80W-90



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



CHECKING THE PUMP: Check visually / auditorily the proper working of the pump.



PRIMING: To prime the pump easily, especially for not very important flows and if we 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 flow.



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

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 diaphragm every 3 months or 1000 hours. (MFD)

Check the piston every 3 months or 1000 hours.(MF)

Check the seals every 3 months or 1000 hours.(MF)

Check the oil bellows every 3 months or 1000 hours.

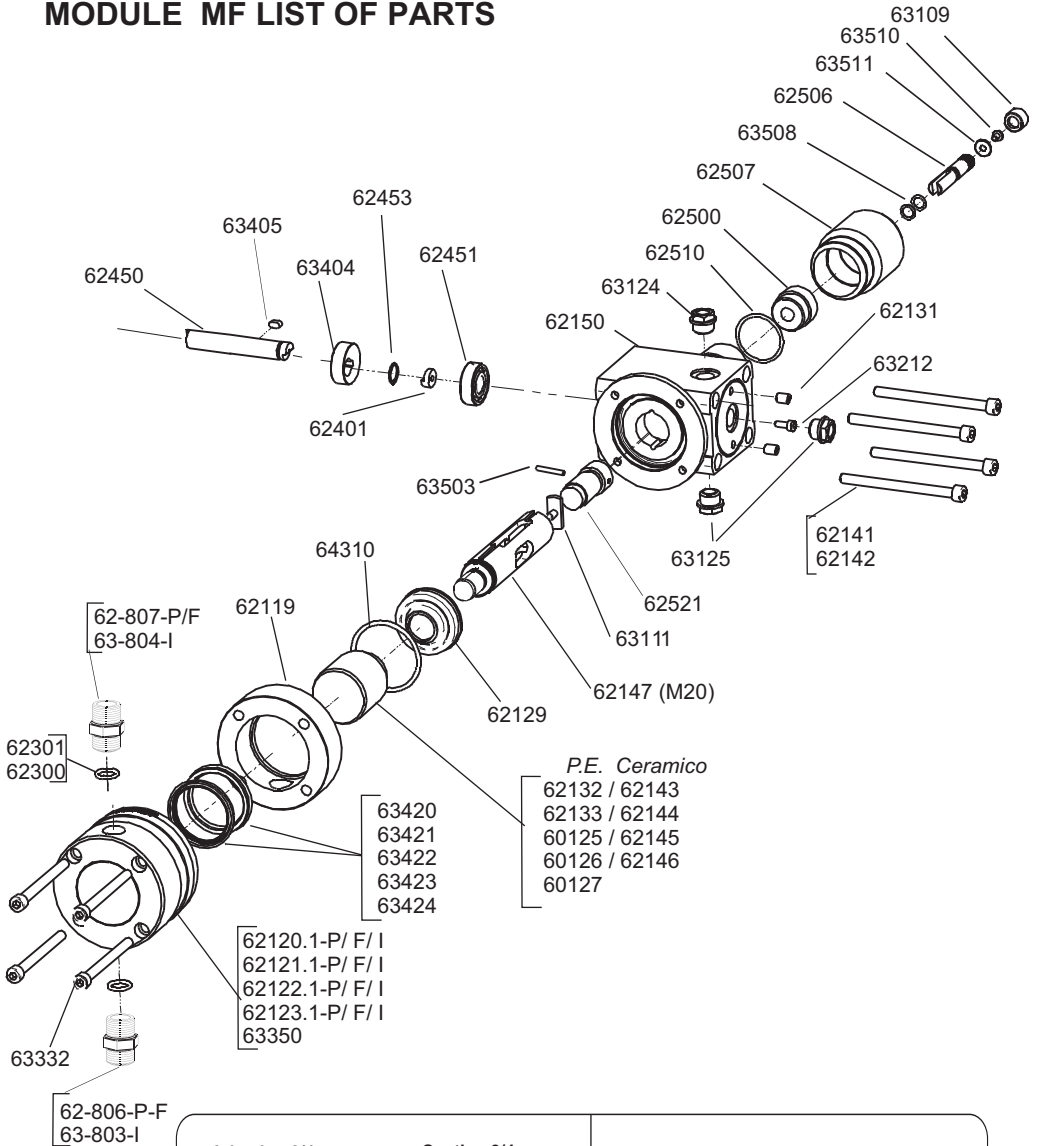
Check the suction filter once a month.

























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 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.

MODULE 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
 63913	 62810-P/F	 63914	 63903-I
 62810-P/F	 62355	 63912-I	 62356
 62355	 62812-P/F	 63816	
 62812-P/F	 62356	 63914	
	 62813-P/F	 63903-I	

LIST OF PARTS MF MODULE



CODE	DESCRIPTION	QUANTITY
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
62300	O'RING 19x3 FPM	2
62301	O'RING 19x3 NBR	2
262307	O'RING 61x2	1
62401	AXIS EXTENSION	2
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
63211	2 STROKES PINION F 154 CEM	1
63212	ALLEN SCREW 5x12 DIN912	3
63213	WASHER 18x5x25	1
63214	1 STROKE PINION F 154 CEM	1
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



CODE	DESCRIPTION	QUANTITY
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

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 8X 12 DIN933A2	4
62019	STOPPER	4

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

LIST OF PARTS MFD MODULE



CODE	DESCRIPTION	QTY
62129	OIL BELOWS	1
62131	8X10 DIN 913 ALLEN SCREW	4
62141	8.8 8X103 D.91 SCREW	4
62142	8X110 ALLEN SCREW	4
62150	MULTIFERTIC MODULE	1
62300	O'RING 19x3 FPM	2
62301	O'RING 19x3 NBR	2
62307	61X2 O'RING	1
62401	SUPPLEMENT AXIS	2
62450	MODULE AXIS	1
62451	6202 2Z BEARING	2
62453	DIN 471 15 RETAINING WASHER	2
62500	GUIDE ROD	1
62506	MULTIFERTIC ROD	1
62507	MULTIFERTIC REGULATOR	1
62510	37X2.5 O'RING	1
63109	REGULATEUR 3/8" PLUG	1
63111	BRAKE	1
63124	3/8" FILLER PLUG	1
63125	3/8" PLUG	1
63212	5X12 DIN 912 ALLEN SCREW	1
63405	DIN 6885 5X5X10 WEDGING	1
63503	4X24 ELASTIC BOLT	1
63508	8,73X1,78 O'RING	1
63510	5X6 DIN 912 I SCREW	1
64310	55.5X3.5 O'RING	1
66333	14X3 NBR O'RING	2
67100	DIAPHRAGM D69	1
67103	ROD	1
67104-P/F/I	DIAPHRAGM BASE D69	1
67105.1-P/F/I	DIAPHRAGM CYLINDER D69	1
67108	ECCENTRIC 10	1
67109	ECCENTRIC 5	1
67110	REGULATOR BUMPER MULTIFERTIC 5	1
67111	REGULATOR BUMPER MULTIFERTIC 10	1
67114	DIAPHRAGM D95	-
67115-P/F/I	DIAPHRAGM CYLINDER D95	1
67116	DIAPHRAGM BASE D95	1
67117	DIAPHRAGM BRIDLE D95	1
67117-I	DIAPHRAGM BRIDLE D95 INOX	1
67118	DIAPHRAGM D115	1
67119-P/F/I	DIAPHRAGM CYLINDER D115	1
67121	DIAPHRAGM BRIDLE D115	1
67121-I	DIAPHRAGM BRIDLE D115 INOX	1
67123	DIAPHRAGM BASE D115	1
67300	M8x40 DIN 912 I ALLEN SCREW	4
67301	M8x10 ISO 7380 I SCREW	4
85308	M8X50 DIN 912 ALLEN SCREW	4

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

PROBLEM	CAUSE	SOLUTION
MOTOR RUNS BUT PUMP DOES NOT INJECT OR INJECTION IS INFERIOR THAN NOMINAL ONE	<p>PUMP HAS NOT BEEN PRIMED</p> <p>SUCTION / IMPULSION VALVES ARE DIRTY OR DAMAGED</p> <p>SUCTION FILTER IS DIRTY</p> <p>AIR COMES INTO SUCTION PIPE</p> <p>CAVITATION IN SUCTION</p>	<ul style="list-style-type: none"> - 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	<p>DAMAGED SEALS(MF)</p> <p>DAMAGED PISTON(MF)</p> <p>DAMAGED DIAPHRAGM (MFD)</p>	<ul style="list-style-type: none"> - Change seals - Change piston - Change diaphragm
PUMP TRICKLES OIL THROUGH INFERIOR CYLINDER HOLE	DAMAGED BELLOWS	- Change bellows
PUMP LEAKS OIL THROUGH REGULATOR	DAMAGED REGULATOR O'RINGS	- Change o'rings



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 equipment.

MODEL

SERIAL #

Sales date and shop stamp

DATE:

Ed:01/03/07-An



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