PRIUS D

PVDF PUMP HEAD

PP PUMP HEAD

SS PUMP HEAD

MOTOR DRIVEN DIAPHRAGM METERING PUMP

SPRING RETURN MECHANISM

EN

OPERATING MANUAL

THIS OPERATING INSTRUCTIONS CONTAINS SAFETY INFORMATION THAT IF IGNORED CAN ENDANGER LIFE OR RESULT IN SERIOUS INJURY.

READ THESE INSTRUCTIONS **CAREFULLY** BEFORE USE AND KEEP THEM FOR FUTURE REFERENCE. THE ORIGINAL INSTRUCTION IS IN ITALIAN. ALL NON-ITALIAN INSTRUCTIONS ARE TRANSLATIONS OF THE ORIGINAL INSTRUCTION.
INFORMATION AND SPECIFICATIONS ON THIS MANUAL COULD BE UNCORRECT OR COULD HAVE PRINTING ERRORS.
SPECIFICATIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE.

Version: R1-07-17

NORME CE
EC RULES (STANDARD EC)
NORMAS DE LA CE

Direttiva Bassa Tensione
Low Voltage Directive
Directiva de baja tensión
} **2014/35/UE**

Direttiva EMC Compatibilità Elettromagnetica
EMC electromagnetic compatibility directive
EMC directiva de compatibilidad electromagnética
} **2014/30/UE**

Norme armonizzate europee nell'ambito della direttiva
European harmonized standards underdirective
Las normas europeas armonizadas conforme a la directiva
} **2006/42/CE**

SUMMARY

GENERAL SAFETY GUIDELINES

Operating, installing, or maintaining the unit in any way that is not covered in this manual could cause death, serious personal injury, or damage to the equipment.

ICON

This manual use the following safety message icon:

Danger!
Indicates a hazardous situation which, if not avoided, will result in death or serious injury.

Warning!
Indicates a hazardous situation which, if not avoided, could result in death or serious injury

Important - A practice not related to personal injury or additional information.

METERING PUMP IS INTENDED FOR CHEMICAL DOSING.

Use of this pump with radioactive chemicals is forbidden!

Keep the pump protected from sun and water. Avoid water splashes.

In emergencies the pump should be switched off immediately! Disconnect the power cable from the power supply!

When using pump with aggressive chemicals observe the regulations concerning the transport and storage of aggressive fluids!

When installing always observe national regulations!

Manufacturer is not liable for any unauthorized use or misuse of this product that may cause injury, damage to persons or materials.

Pump must be accessible at all times for both operating and servicing. Access must not be obstructed in any way!

Feeder should be interlocked with a no-flow protection device.

Pump and accessories must be serviced and repaired by qualified and authorized personnel only!

Before any operation:

- **always read chemical Material Safety Data Sheet (MSDS);**
- **always wear protective clothing;**
- **always discharge the liquid end before servicing the pump!**
- **empty and rinse the liquid end before work on a pump which has been used with hazardous or unknown chemicals!**

1. DESCRIPTION

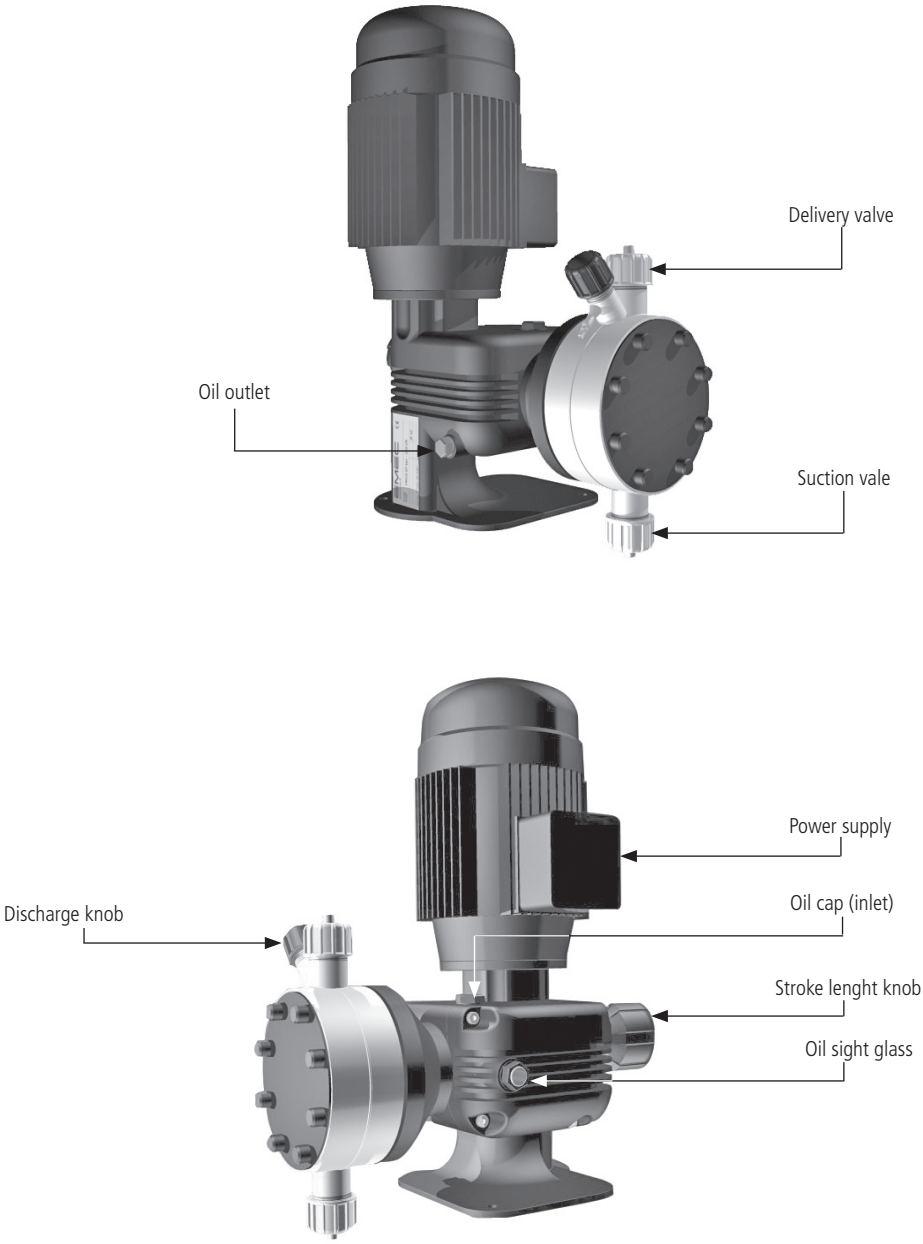
1.1 PRIUS Series

PRIUS series is a motor-driven diaphragm series pumps with spring return mechanism.
The mechanical diaphragm produces the flow thanks to the suction and delivery valves on the pump head
PRIUS is a constant dosing pump.
Flow rate is determined by the stroke length. The stroke length is adjustable from 0 to 100% using the stroke length adjustment knob.

Some functions described into this manual may need accessories not included into the pump packaging.

PLEASE DO NOT TRASH PACKAGING. IT CAN BE USED TO RETURN THE PUMP.

Fig. 1. PRIUS pump



1.3 Features

Power supply..... 220-240/380-420 V - 50 Hz 3-PHASE
..... 220/380 V - 60 Hz 3-PHASE
..... 440/480 V - 60HZ 3-PHASE
..... 220-240 V - 50 Hz SINGLE-PHASE
Aluminium enclosure
Spring return mechanism
Environment temperature: -10 - 40°C (14 - 104°F)
Chemical temperature with PVDF pump head: -10 - 65°C (14 - 149°F)*
Chemical temperature with SS pump head: -10 - 90°C (14 - 194°F)*
Chemical temperature with PP pump head: -10 - 40°C (14 - 104°F)
Installation class II
Audible noise.....78 dbA (± 5 dB)
Protection degree.....IP 55
Max suction height.....3 m
Oil capacity.....0,3 lt (Refer to "Lubricant type" table)

* The specified temperature can be exceeded temporarily (max 15') for sterilization or flushing with hot water.

Tab. 1. Diaphragm replacement

LIQUID ENDS				
CODE	Pump head	O-ring	Valve	Chemical temperature
			Balls	
K	PVDF	FKM B or EPDM	Ceramic	0-65°C (32-149°F)
S	SS	FKM B or EPDM	Stainless steel	0-90°C (32-164°F)
P	PP	FKM B or EPDM	Ceramic	0-40°C (32-104°F)

1.3.1 Diaphragm

To prevent damages due to diaphragm rupture, replace the diaphragm according to the use as on the table below.

SUGGESTED REPLACEMENT FOR 24H WORKING PUMP	
PTFE	10.000 operating hours (24h)

Tab. 2. Reduction factor for different site altitudes.

Site altitude above sea level	Site altitude above sea level coolant temperature		
m	<30 °C	30 °C ... 40 °C	45 °C
1000	1,07	1	0,96
1500	1,04	0,97	0,93
2000	1	0,94	0,9
2500	0,96	0,9	0,86
3000	0,92	0,86	0,82
3500	0,88	0,82	0,79
4500	0,82	0,77	0,74

Tab. 3. PRIUS D- 50 Hz; Power supply 220-240/380-420 V - Δ/Y

PRIUS D 50Hz										
PRIUS D 50Hz	**Pressure bar**	**Capacity l/h**	**stroke length**	**Stroke/1'**	**Motor**	**HOSES CONNECTION**			**pump head**	**ACCESSORIES**
						PVDF	**AISI 316L**	**PP**		
010060	10	60	3 mm	175	0,18 kW	1/2" 13 mm (i.d.)	R1/2" G1/2"	1/2" 13 mm (i.d.)	NM	**A**
010030		30		94						
010024		24		70						
010012		12		35						
010016	10	16	4 mm	35	0,18 kW	1/2" 13 mm (i.d.)	R1/2" G1/2"	1/2" 13 mm (i.d.)		**A**
010105	10	105	3 mm	175	0,37 kW	3/4" 13 mm (i.d.)	R3/4" G3/4"	3/4" 13 mm (i.d.)	TM	**A**
010056		56		94						
010042		42		70						
010021		21		35						
007160	7	160	4 mm	175	0,37 kW	3/4" 13 mm (i.d.)	R3/4" G3/4"	3/4" 13 mm (i.d.)		**A**
007086		86		94						
007064		64		70						
007032		32		35						
005240	5	240	6 mm	175	0,37 kW	3/4" 18 mm (i.d.)	R3/4" G3/4"	3/4" 18 mm (i.d.)		**B**
005128		128		94						
005096		96		70						
005048		48		35						
005350	5	350	4 mm	175	0,37 kW	G1-1/2" 30 mm (i.d.)	R1"	G1-1/2" 30 mm (i.d.)	UM	**C**
005188		188		94						
005140		140		70						
005070		70		35						
005440	5	440	5 mm	175	0,37 kW	G1-1/2" 30 mm (i.d.)	R1"	G1-1/2" 30 mm (i.d.)		
005236		236		94						
005176		176		70						
005088		88		35						
005530	5	530	6 mm	175	0,37 kW	G1-1/2" 30 mm (i.d.)	R1"	G1-1/2" 30 mm (i.d.)		
005284		284		94						
005212		212		70						
005106		106		35						
005M00	5	1000	10 mm	175	0,55 kW	G1-1/2" 30 mm (i.d.)	R1"	G1-1/2" 30 mm (i.d.)		
005520		520		94	0,37 kW					
005750	5	750	8 mm	175	0,55 kW	G1-1/2" 30 mm (i.d.)	R1"	G1-1/2" 30 mm (i.d.)		
002M00	2	1000	10 mm	175	0,37 kW	G1-1/2" 30 mm (i.d.)	R1"	G1-1/2" 30 mm (i.d.)		
004520	4	520		94						
005390	5	390		70						
005180		180		35						
003750	3	750	8 mm	175	0,37 kW	G1-1/2" 30 mm (i.d.)	R1"	G1-1/2" 30 mm (i.d.)		
005380	5	380		94						
005290		290		70						
005140		140		35						

Tab. 4. PRIUS D- 60 Hz three-phase motor - Power supply 220/380 V Δ /Y or 440/480 V Y

PRIUS D 60 Hz / 3-PHASE										
PRIUS D 60 Hz	Pressure bar	Capacity l/h	stroke length	stroke/1'	Motor	HOSE CONNECTION			PUMP HEAD	ACCESSORIES FOR INSTALLATION
						PVDF	SS	PP	Model	
010055	10	55	3 mm	175	0,18 kW (220/380 V) or 0,21 kW (440/480 V)	1/2" 13 mm (i.d.)	R1/2" G1/2"	1/2" 13 mm (i.d.)	NM	A
010027		27		87						
010014		14		44						
010100	10	100	3 mm	175	0,37 kW (220/380 V) or 0,43 kW (440/480 V)	3/4" 13 mm (i.d.)	R3/4" G3/4"	3/4" 13 mm (i.d.)	TM	A
010050		50		87						
010025		25		44						
007150	7	150	4 mm	175	0,37 kW (220/380 V) or 0,43 kW (440/480 V)	3/4" 13 mm (i.d.)	R3/4" G3/4"	3/4" 13 mm (i.d.)		A
007075		75		87						
007037		37		44						
005230	5	230	6 mm	175	0,37 kW (220/380 V) or 0,43 kW (440/480 V)	3/4" 18 mm (i.d.)	R3/4" G3/4"	3/4" 18 mm (i.d.)		B
005115		115		87						
005057		57		44						
005335	5	335	4 mm	175	0,37 kW (220/380 V) or 0,43 kW (440/480 V)	G1-1/2" 30 mm (i.d.)	R1"	G1-1/2" 30 mm (i.d.)	UM	C
005165		165		87						
005084		84		44						
005420	5	420	5 mm	175	0,37 kW (220/380 V) or 0,43 kW (440/480 V)	G1-1/2" 30 mm (i.d.)	R1"	G1-1/2" 30 mm (i.d.)		C
005210		210		87						
005105		105		44						
005505	5	505	6 mm	175	0,37 kW (220/380 V) or 0,43 kW (440/480 V)	G1-1/2" 30 mm (i.d.)	R1"	G1-1/2" 30 mm (i.d.)		C
005250		250		87						
005126		126		44						
003950	3	950	10 mm	175	0,37 kW (220/380 V) or 0,43 kW (440/480 V)	G1-1/2" 30 mm (i.d.)	R1"	G1-1/2" 30 mm (i.d.)	UM	C
003713		713	8 mm	175						

ACCESSORIES
A. INSTALLATION KIT INCLUDED (ON SOME MODELS ONLY)
1/2" foot filter with 13 mm (int. diam.) hose fitting
3/4" injection valve
PVDF delivery hose
PVC suction hose

B. INSTALLATION KIT (OPTION)
1 1/2"foot filter with 18 mm (int. diam.) hose fitting (G1 1/2" - 18 mm)
1 1/2" injection valve

C. INSTALLATION KIT (OPTION)
1 1/2"foot filter with 30 mm (int. diam.) hose fitting (G1 1/2" - 30 mm)
1 1/2" injection valve

Stainless Steel pump does not fit accessories

Tab. 5. PRIUS - 50 Hz single-phase motor - Power supply 220-440 V - Δ/Y

PRIUS D 50 Hz / SINGLE-PHASE MOTOR										
PRIUS D 50 MON	Pressure bar	Capacity l/h	Stroke length	stroke/1'	Motor	HOSE CONNECTION			PUMP HEAD	ACCESSORIES FOR INSTALLATION
						PVDF	SS	PP	Model	
010060	10	60	3 mm	175	0,37 kW	1/2" 13 mm (i.d.)	R1/2" G1/2"	1/2" 13 mm (i.d.)	NM	A
010030		30		94						
010024		24		70						
010012		12		35						
010105	10	105	3 mm	175	0,37 kW	3/4" 13 mm (i.d.)	R3/4" G3/4"	3/4" 13 mm (i.d.)	TM	A
010056		56		94						
010042		42		70						
010021		21		35						
007160	7	160	4 mm	175	0,37 kW	3/4" 13 mm (i.d.)	R3/4" G3/4"	3/4" 13 mm (i.d.)		A
007086		86		94						
007064		64		70						
007032		32		35						
005240	5	240	6 mm	175	0,37 kW	3/4" 18 mm (i.d.)	R3/4" G3/4"	3/4" 18 mm (i.d.)		B
005128		128		94						
005096		96		70						
005048		48		35						
005350	5	350	4 mm	175	0,55 kW	G1-1/2" 30 mm (i.d.)	R1"	G1-1/2" 30 mm (i.d.)	UM	C
005188		188		94						
005140		140		70						
005070		70		35						
005440	5	440	5 mm	175	0,55 kW	G1-1/2" 30 mm (i.d.)	R1"	G1-1/2" 30 mm (i.d.)		C
005236		236		94						
005176		176		70						
005088		88		35						
005530	5	530	6 mm	175	0,55 kW	G1-1/2" 30 mm (i.d.)	R1"	G1-1/2" 30 mm (i.d.)		C
005284		284		94						
005212		212		70						
005106		106		35						

ACCESSORIES

A. INSTALLATION KIT INCLUDED (ON SOME MODELS ONLY)
- 1/2" foot filter with 13 mm (int. diam.) hose fitting
- 3/4" injection valve
- PVDF delivery hose
- PVC suction hose

B. INSTALLATION KIT (OPTION)
- 1 1/2"foot filter with 18 mm (int. diam.) hose fitting (G1 1/2" - 18 mm)
- 1 1/2" injection valve

C. INSTALLATION KIT (OPTION)
- 1 1/2"foot filter with 30 mm (int. diam.) hose fitting (G1 1/2" - 30 mm)
- 1 1/2" injection valve

Stainless Steel pump does not fit accessories

Tab. 6. PRIUS D HIGH PRESSURE- Power supply 220-240 V

Stainless Steel pump does not fit installation kit.

PRIUS D AP 50Hz

PRIUS D AP 50Hz	Pressure bar	Capacity l/h	stroke length	Stroke/1'	Motor	HOSES CONNECTION	PUMP HEAD
						AISI 316L	AISI 316L
100004	100	4	1.5 mm	175	0,37 kW	3/8"	L1
100002		2		94			
1001,5		1,5		70			
050017	50	17	2 mm	175	0,37 kW	1/2"	M1
050009		9		94			
050005		5		70			
05002,5		2,5		35			
030028	30	28	2 mm	175	0,37 kW	1/2"	N
030014		14		94			
030010		10		70			
030005		5		35			
030076	30	76	4 mm	175	0,37 kW	1/2"	S
030041		41		94			
030030		30		70			
030015		15		35			
020146	20	146	6 mm	175	0,37 kW	3/4"	T
020078		78		94			
020057		57		70			
020028		28		35			

PRIUS D AP 60Hz

PRIUS D AP 60Hz	Pressure bar	Capacity l/h	stroke length	Stroke/1'	Motor	HOSES CONNECTION	PUMP HEAD
						AISI 316L	AISI 316L
100003	100	3	1.5 mm	175	0,37 kW (220/380 V) or 0,43 kW (440/480 V)	3/8"	L1
1001,5		1,5		70			
050014	50	14	2 mm	175	0,37 kW (220/380 V) or 0,43 kW (440/480 V)	1/2"	M1
050007		7		70			
0503,5		3,5		35			
030026	30	26	2 mm	175	0,37 kW (220/380 V) or 0,43 kW (440/480 V)	1/2"	N
030013		13		70			
030006		6		35			
030072	30	72	4 mm	175	0,37 kW (220/380 V) or 0,43 kW (440/480 V)	1/2"	S
030036		36		70			
030018		18		35			
020138	20	138	6 mm	175	0,37 kW (220/380 V) or 0,43 kW (440/480 V)	3/4"	T
020068		68		70			
020034		34		35			

DIMENSIONS (mm)			
	NM pump head (PVDF)	TM pump head (PVDF)	UM pump head (PP)
A	~ 320	~ 330	~ 350
B	~ 280	~ 315	~ 320
C	157	157	157
L	177	220	300
G	163	163	180
H	~ 190	~ 190	~ 190
I	97,5	110	150
F	~ 400	~ 460	~ 460
E	125,2	125,2	125,2
D	108,6	108,6	108,6
∅ fixing holes	8	8	8

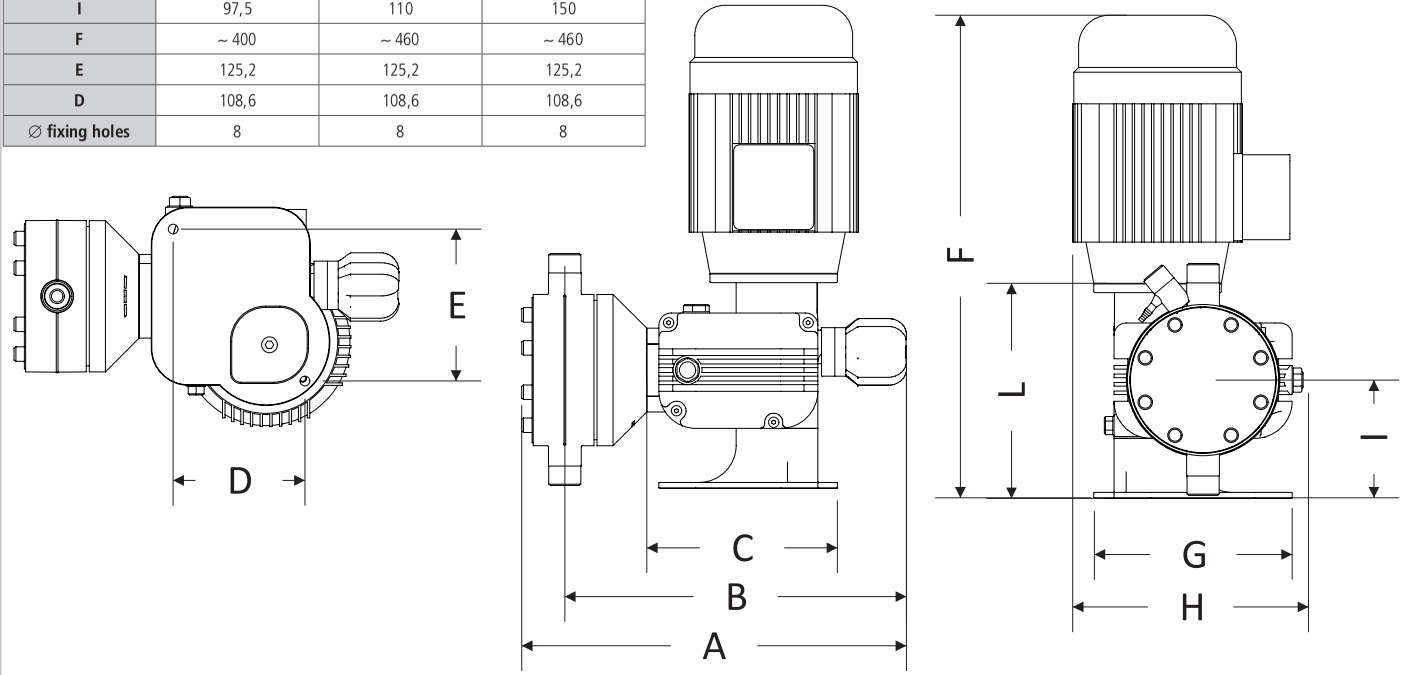
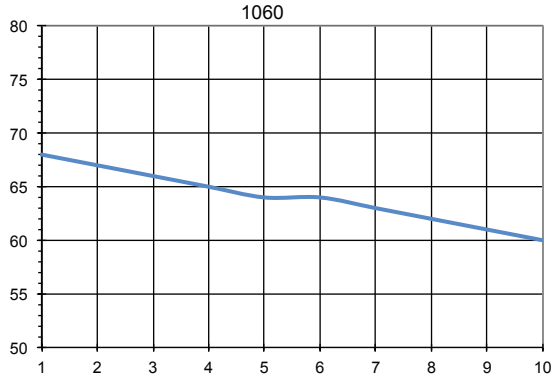
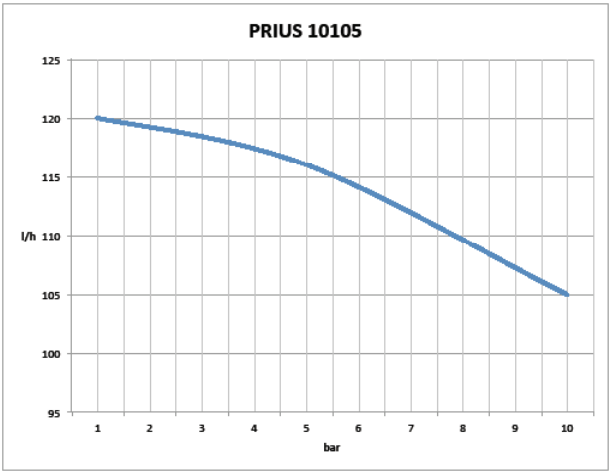


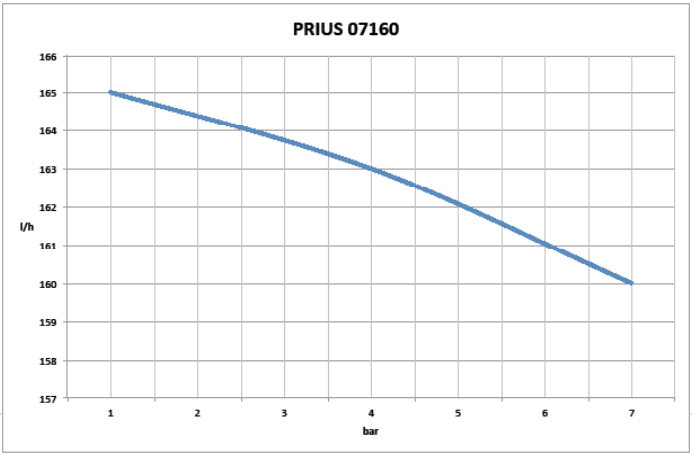
Fig. 2. Pump dimension

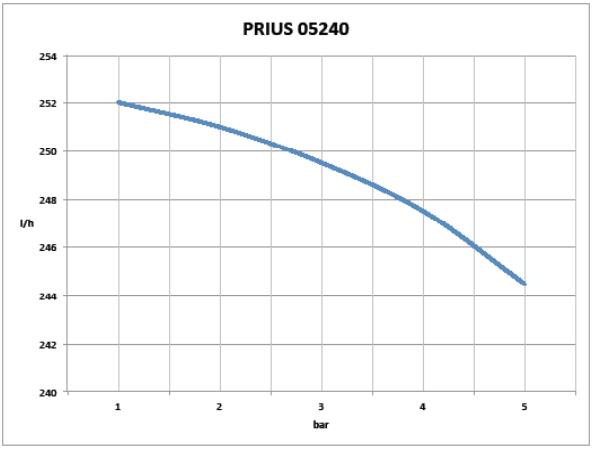
1.5 Delivery curves

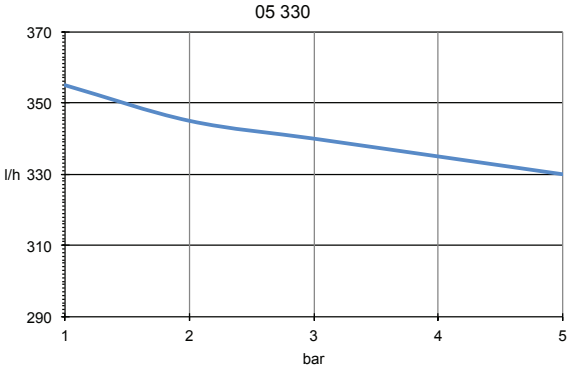
Flow rate indicated is for H_2O at 20°C at the rated pressure.
Dosing accuracy ± 5% at rated pressure.








PRIUS 05240
254
252
250
248
l/h
246
244
242
240
1
2
3
4
5
bar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l/h 330
310
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1
2
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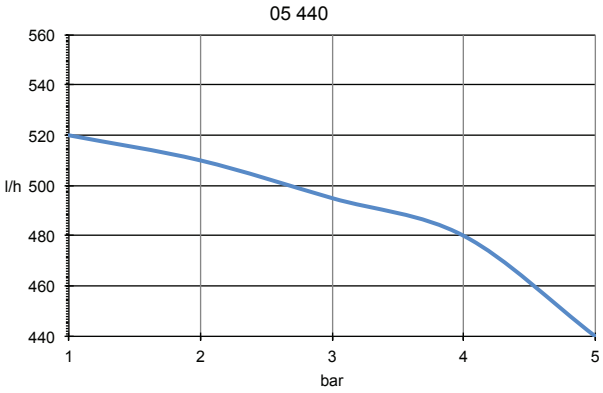
bar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480
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440
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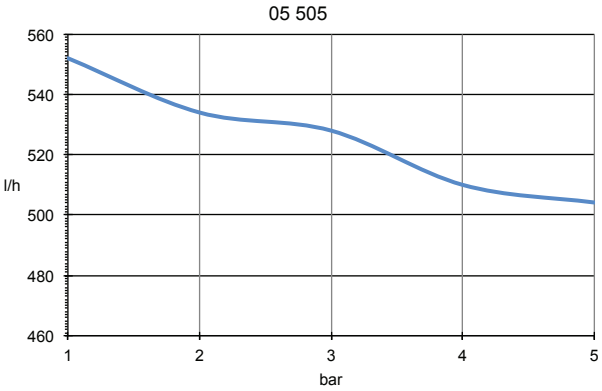
5
bar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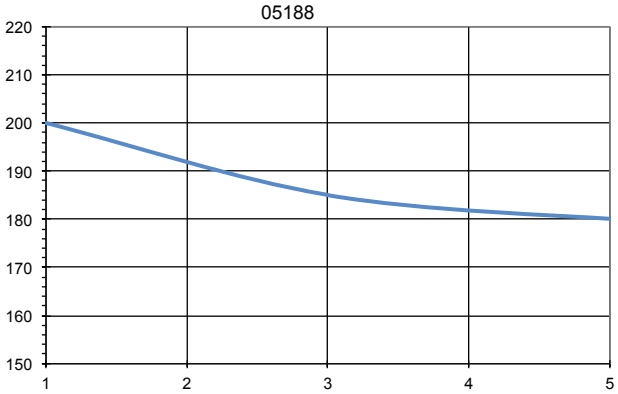
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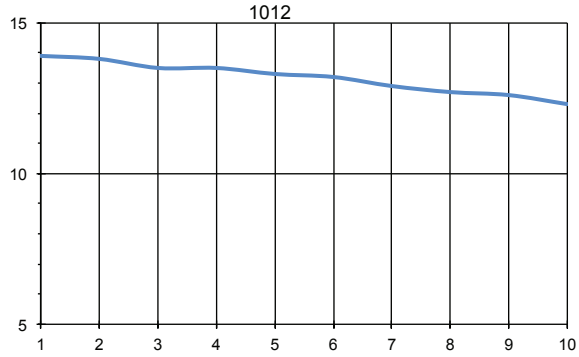
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7
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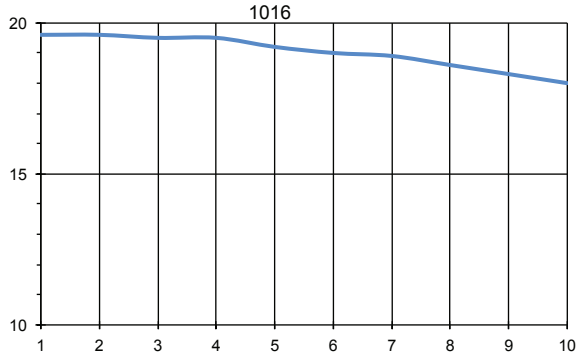
9
10


1016
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2. INSTALLATION

2.1 Installation warning

Before start installation, the operator must be aware of safety precautions to prevent physical injury.

OPERATOR PROTECTION

Use safety equipment according to the company regulations.
Use this safety equipment within the work area during installation, service and when handling chemicals:

- **protective mask**
- **protective gloves**
- **safety goggles**
- **ear plugs or hear muffs**
- **further security device, if necessary.**

POWER SUPPLY DISCONNECTION

Always disconnect power to the motor before you perform any installation or maintenance tasks. Failure to disconnect power will result in serious physical injury.

INSTALLATION PUMP GUIDELINES

Install the pump
- in a safety place and fixed to the table / wall to avoid vibration problems;
- in an easy accessible place;
- in horizontal position.

Use only hoses compatibles with product to dose.

See "8.1 Chemical compatibility table" page 29.
If dosing product is not listed please consult full compatibility table or contact chemical's manufacturer.

2.2 Commissioning steps

5 steps of installation procedure:

1. Pump location
2. Oil filling
3. Piping connection
4. Electric wiring
5. Start-up

2.2.1 Pump location

Pump must be installed on a flat base at max **3 m** height from tank's bottom.
Fasten the pump by clamping screws.

Injection point must be higher of tank to avoid accidental chemical injection.

Otherwise, connect a **multifunction valve** on delivery pipeline.

2.2.2 Oil filling

Pumps are shipped WITH OIL AND WITH A BLIND CAP.
At the job site you must replace the blind cap with the one supplied. Keep the blind cap for further shipping.

Fill the oil reservoir through oil inlet ("Fig. 1. PRIUS pump" page 6).
The required amount of oil is 0,30 lt. For acceptable lubricants see the table below.
Check oil level regularly. Change the oil every 8.000-10.000 operating hours.

You must never start the pump without oil.

Tab. 7. Acceptable oil for lubricating

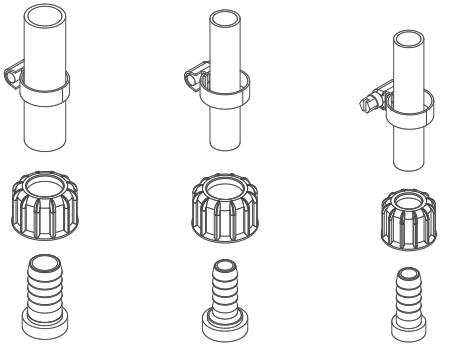
BRAND	LUBRICANT TYPE
MOBIL	MOBILGEAR 632
SHELL	OMALA OIL 320
BP	ENERGOL GR-XP 320
IP	MELLANA OIL 320
ESSO	SPARTAN EP 320
AGIP	BLASIA 320

2.2.3 Piping connection

Never operate any pumping system with a blocked suction and discharge. Operation, even for a brief period under these conditions, can cause motor to overheat. You must take all necessary measures to avoid this condition.

Suction piping should be as short as possible and installed in vertical position to avoid air bubbles suction.

Fig. 3. Hose connections



Suction and delivery valves must be installed in vertical position.

Hand-tighten the nuts firmly.
Do not use tongs or any other tool.

Delivery hose must be firmly fixed to avoid suddenly movements that could damage near objects

2.2.4 Pump head

Pump head has got manual venting by opening discharge knob.

For priming procedure see "5. PRIMING" page 25.

It's allowed to lightly bend discharge hose.

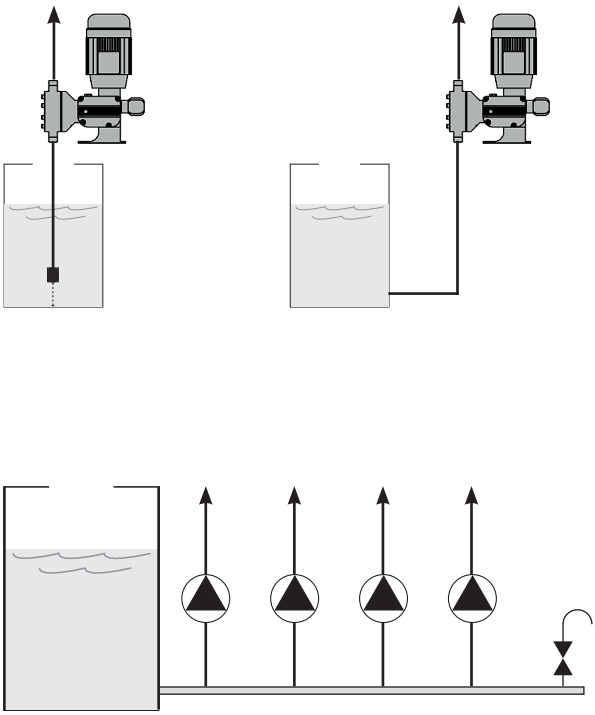
During calibration procedure ("TEST") insert discharge hose into BECKER test-tube.

2.2.5 Foot filter

Foot filter is always recommended.
Foot filter should be adequate to suction piping and installed al least 10 cm from the tank bottom.

2.2.6 Installation drawings

Fig. 4. Installation drawings



3. ELECTRICAL WIRING

3.1 Preliminary checks

⚠ The electrical wirings should be carried out by AUTHORIZED AND QUALIFIED PERSONNEL only in accordance with local regulations.

Before to proceed, verify the following steps:

1. **Verify the data on nameplate.**
   Make sure that the electrical data on the nameplate of the motor corresponds to the electrical supply.

2. **Verify the grounded power outlet.**
   The pump must be plugged to a grounded power outlet.

3. **Install a motor protection switch.**
   Pump must be connected to a motor protection switch (Residual Current Circuit Breaker - MCCB).

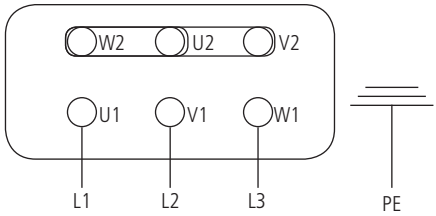
4. **Verify the cable.**
   Cable type and cross-section must be in accordance to motor data.

5. **Verify the motor rotation.**
   Start up the pump to check the motor's direction of rotation. It must comply with that indicated by the arrow marked on the motor fan cover. If the direction is reversed, rewire the motor power wires in accordance with the wiring diagram, refer to "3.2 Connection diagrams" page 22.

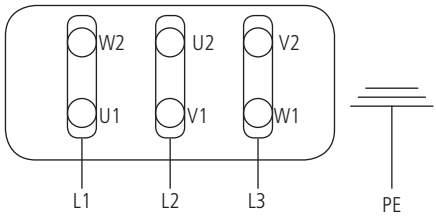
3.2 Connection diagrams

CONNECTION DIAGRAMS for 3~PHASE MOTOR 50 Hz

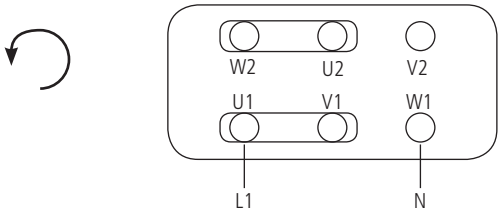
"Y" CONNECTION
380-420 Vac



"Δ" (DELTA) CONNECTION
220-240 Vac



⚠ MOTOR SUITABLE FOR INSERTIONS WITH RANGE OF AT LEAST 6" INTERVAL



4. START UP

4.1 Start up

All operation before described must be carried out before starting the pump.

1. Pump location
2. Oil filling
3. Piping connection
4. Electric wiring

Follow the **"GENERAL SAFETY GUIDELINES" PAGE 4**.

1. Start the pump at minimum pressure.
2. Turn the stroke lenght knob on 20%.
3. After 5 minutes, gradually increase the capacity until reaching the prescribed value for the operating condition.

⚠ **Control the pressure correspond to the one on the nameplate. If not, stop the pump immediatly.**

If the pump does not start to dose:
a) Stop the pump.
b) Prime the pump head ("5. PRIMING" PAGE 25)
c) Start the pump again.

4. Monitor periodically the pump functioning.

5. PRIMING

5.1 How to prime the pump

The first time and where use of the pump is suspended for a long period of time, priming may be necessary. It allows suction piping and pump head to fill with liquid before pumping against pressure.

1. Connect all pipings (suction, delivery and discharge).
2. Rotate discharge knob to open discharge valve.
3. Rotate stroke lenght knob on 100%;
4. Power the pump.
5. When the chemical starts to flow into discharge hose, close discharge knob.
6. Proceed to standard operating condition.

Priming the pump is also recommended when there is air into pump head or into suction pipe.

6. MAINTENANCE

6.1 Maintenance schedule

Before start maitenance, the operator must be aware of safety precautions to prevent physical injury.

OPERATOR PROTECTION
Use safety equipment according to the company regulations.
Use this safety equipment within the work area during installation, service and when handling chemicals:

- **protective mask**
- **protective gloves**
- **safety goggles**
- **ear plugs or hear muffs**
- **further security device, if necessary.**

POWER SUPPLY DISCONNECTION
Always disconnect power to the motor before you perform any installation or maintenance tasks. Failure to disconnect power will result in serious physical injury.

Installation and maintenance tasks should be carried out by AUTHORIZED AND QUALIFIED PERSONNEL only in accordance with local regulations.

Before starting any maintenance or before long downtimes, drain the chemical from pump head.

Use original spare parts.

6.2 Maintenance inspection

A maintenance schedule includes these types of inspections:

- Routine maintenance and inspoections
- Three-month inspections
- Annual inspections

Shorten the inspection intervals appropriately if the pumped chemical is abrasive or corrosive.

Routine maitenance and inspections

Perform these tasks whenever you perform routine maintenance:

- Inspect the seal. Ensure that there are no leaks from the mechanical seal.
- Check electrical wiring
- Check the level and condition of the oil through the sight glass
- Check for unusual noise and vibration (noise allowed 78 dbA; ± 5 dB).
- Check the pump and piping for leaks.
- Inspect the discharge pressure.
- Check temperature (motor temperature max 70°C; pump head max 40°C)
- Check for corrosion on parts of the pump and / or on hoses.

Three-month inspections

Perform these tasks every three months:

- Check that the bolts are tight.
- Check the mechanical seal if the pump has been left idle.

Annual inspections

Perform these inspections one time each year:

- Check the pump capacity (as per nameplate).
- Check the pump pressure (as per nameplate).
- Check the pump power (as per nameplate).
- Change the oil every year (8.000-10.000 operating hours).
- Change the oil more often if there are adverse conditions

If the pump performance does not satisfy your process requirements, and the process requirements have not changed, then perform these steps:

1. Disassemble the pump.
2. Inspect it.
3. Replace worn parts.

6.3 Shutdown

Shutdown the dosing pump before any maintenance operation or before long downtimes.
Disconnect power to the motor and ensure it cannot be restarted.
Drain the chemical from pump head.
Release the pressure and disconnect the disharge pipe from the discharge valve.
Rinse the pump head and clean all valves.

7. TROUBLESHOOTING

Tab. 8. Guide to troubleshooting.

PROBLEM	CAUSE	REMEDY
Dosing pump not delivering or output too low	Suction valve leaking or blocked	Clean or replace suction valve
	Suction pipe leaking or blocked	Replace suction pipe
	Air bubbles into pump head or into suction pipe	Prime the pump as described in "5.1 How to prime the pump" page 25
	Viscosity too high	Increase the pipe diameter or contact manufacturer
	Suction lift too high	Decrease lift
	Foot filter obstruction	Clean the foot filter
Motor and pump head too hot	Wrong wiring or defecting contact	Check wiring
	Pressure too high	Install a valve
	Delivery pipe obstructed or blocked	Clean delivery pipe
	Low level oil	Refill oil
Liquid loss	Diaphragm rupture	Contact manufacturer for diaphragm replacement

If the problem can not be solved, please contac after-sales service or return the dosing pump to the manufacturer.

7.1 Repair service

Before return the dosing pump to the manufacturer Repair service, drain the chemical from pump head and rinse it.
If there is the possibility that residual corrosive liquid into pump head could cause damages, declare it on REPAIR FORM.

Remove oil and replace operating cap with the blind cap.

Complete the PRODUCT SERVICE REPAIR FORM and send it with the dosing pump.
Repair service is not accepted if PRODUCT SERVICE REPAIR FORM is missing.

8. COMPATIBILITY TABLE

8.1 Chemical compatibility table

Solenoid driven metering pumps are widely used to dose chemical fluids and it is important that the most suitable material in contact with fluid is selected for each application. This compatibility table serves as a useful help in this respect. All the informations in this list are verified periodically and believed to be correct on the date of issuance. All the informations in this list are based on manufacturer's data and its own experience but since the resistance of any material depends by several factors this list is supplied only as an initial guide, in no way manufacturer makes warranties of any matter respect to the informations provided in this list.

Tab. 9. Chemical compatibility table.

Product	Formula	Ceram.	PVDF	PP	PVC	SS 316	PMMA	Hastel.	PTFE	FPM	EPDM	NBR	PE
Acetic Acid, Max 75%	CH3COOH	2	1	1	1	1	3	1	1	3	1	3	1
Hydrochloric Acid, Concentrate	HCl	1	1	1	1	3	1	1	1	1	3	3	1
Hydrofluoric Acid 40%	H2F2	3	1	3	2	3	3	2	1	1	3	3	1
Phosphoric Acid, 50%	H3PO4	1	1	1	1	2	1	1	1	1	1	3	1
Nitric Acid, 65%	HNO3	1	1	2	3	2	3	1	1	1	3	3	2
Sulphuric Acid, 85%	H2SO4	1	1	1	1	2	3	1	1	1	3	3	1
Sulphuric Acid, 98.5%	H2SO4	1	1	3	3	3	3	1	1	1	3	3	3
Amines	R-NH2	1	2	1	3	1	-	1	1	3	3	1	1
Sodium Bisulphite	NaHSO3	1	1	1	1	2	1	1	1	1	1	1	1
Sodium Carbonate (Soda)	Na2CO3	2	1	1	1	1	1	1	1	2	1	1	1
Ferric Chloride	FeCl3	1	1	1	1	3	1	1	1	1	1	1	1
Calcium Hydroxide (Slaked Lime)	Ca(OH)2	1	1	1	1	1	1	1	1	1	1	1	1
Sodium Hydroxide (Caustic Soda)	NaOH	2	3	1	1	1	1	1	1	2	1	2	1
Calcium Hypochlor.(Chlor. ted Lime)	Ca(OCl)2	1	1	1	1	3	1	1	1	1	1	3	1
Sodium Hypochlorite, 12.5%	NaOCl + NaCl	1	1	2	1	3	1	1	1	1	1	2	3
Potassium Permanganate, 10%	KMnO4	1	1	1	1	1	1	1	1	1	1	3	1
Hydrogen Peroxide, 30% (Perydrol)	H2O2	1	1	1	1	1	3	1	1	1	3	3	1
Aluminium Sulphate	Al2(SO4)3	1	1	1	1	1	1	1	1	1	1	1	1
Copper-II-Sulphate (Roman Vitriol)	CuSO4	1	1	1	1	1	1	1	1	1	1	1	1

1 - Good resistance rating

2 - Fairly resistance rating

3- Not resistant

8.2 Materials

Polyvinyldene fluoride (PVDF) .....Pump heads, Valves, Fittings
Polypropylene (PP).....Pump heads, Valves, Fittings
Stainless steel (SS 316).....Pump heads, Valves
Polymethyl Metacrilate Acrylic (PMMA) ...Pump heads
Polytetrafluoroethylene (PTFE) .....Diaphragm
Fluorocarbon (FPM).....O-ring
Ethylene propylene (EPDM).....O-ring
Nitrile (NBR).....O-ring

PRODUCT SERVICE REPAIR FORM

ENCLOSE THE PRESENT FORM TO THE DELIVERY NOTE

DATE .....

SENDER

Company name.....

Address .....

Phone no. .....

Contact person.....

PRODUCT TYPE (see product label)

DEVICE CODE .....

S/N (serial number).....

OPERATING CONDITIONS

Location/installation description .....

.....

Chemical .....

Start-up (date) ..... Running time (approx. hours).....

REMOVE ALL THE LIQUID INTO THE PUMP HEAD AND DRY IT BEFORE PACKAGING IN ITS ORIGINAL BOX.

DESCRIPTION OF PROBLEM

☐ MECHANICAL

- Wear parts.....
- Brekage/other damages .....
- Corrosion.....
- Other.....

☐ ELECTRICAL

- Connections, connector, cables .....
- Operating controls (keyboard, display, etc.) .....
- Elettronics.....
- Other.....

☐ LEAKS

- Connections.....
- Pump head .....

☐ NOT OR INADEQUATE FUNCTION/OTHER

.....

.....

.....

I declare that the dosing pump is free of any hazardous chemical.

Signature of the compiler

Company stamp

When dismantling a pump please separate material types and send them according to local recycling disposal requirements.
We appreciate your efforts in supporting your local Recycle Environmental Program.
Working together we'll form an active union to assure the world's invaluable resources are conserved.