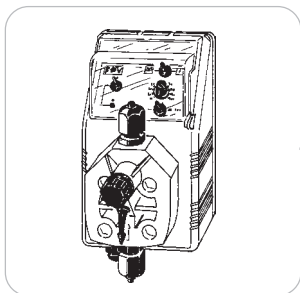




This operating instructions contains safety information that if ignored can endanger life or result in serious injury. They are indicated by this icon.



Use of this pump with radioactive chemicals is forbidden!



OPERATING INSTRUCTIONS MANUAL FOR “F” and “FA” PUMPS

Please read it carefully!



English language

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GENERAL INFORMATIONS

Series “F” and “FA” magnetic diaphragm dosing pumps fits small dosing amounts of liquid products. They are constituted of the following main assemblies:

Box
Electronic Circuitry
Electrical Driven Magnet
Diaphragm
Pump Head

Normally the pump doesn't dose continuously: each time a pulse is given to the magnet it in turn pushes a piston. A diaphragm fixed on the piston head compresses the liquid in the pump head. The liquid exits the pump head through the delivery valve while the suction valve stays closed. When the pulse ends, a spring moves back the piston, and the diaphragm. The vacuum created by the diaphragm back movement brings the liquid inside the pump head from the suction valve while the delivery valve is closed. The pump capacity is proportional to the number of piston strokes and to the pump head internal volume (Single Stroke Injection Quantity).

Box

Series “F” and “FA” dosing pumps are assembled in IP65 (PP) plastic material boxes. Installation is vertical with two screws at a distance of 63mm.

Electronic Circuit

The electronic circuit is made of proven quality. It provides the necessary electrical pulses to the magnet.

Electro-Magnet

The electro-magnet with class H (180°C) copper winding, driven by the electronic circuit, gives the necessary push to the piston and the diaphragm. The piston displacement range's from 0.7mm to 1.7mm

Diaphragm

PTFE diaphragms used in the series “F” and “FA” pumps assure good chemical compatibility and mechanical resistance.

Pump Head

The pump head works as a dosing chamber, the suction valve, delivery and manual outgassing valves are included in it. The purpose of the manual outgassing valve is to help the priming of the pump during installation.

INSTALLATION

The pump arrives with all the materials needed for the installation. To start up the series “F” and “FA” pump, first mount it on a wall or any other vertical surface in a well areated and easily accessible environment. The distance between the pump head and the suction filter should not be more then 1.5m. Connect the suction pipe (transparent one) to the suction fittings (bottom pump head valve). Be sure the o-ring in the suction valve is in place. Use the hands to tight the fitting nut. Place the suction filter on the bottom of the product tank. The suction pipe should be as short as possible in vertical position without any bendes to avoid air bubbles. Install the injection valve. Connect one end of the delivery pipe (opaque one) to the delivery fitting on the top of the pump head and the other end to the injection valve previously installed. Please refer to pages 15-17 for setup diagrams.



To avoid delivery pipe breaking be sure it doesn't touch any other object.

Always install the injection valve at the end of the rigid delivery hose. The injection valve should never be installed lower than the product tank to avoid that injection valve breaking lets the product flow freely into the system. It is recommended to use an anti-syphon valve (code 108.0136.1) on the delivery side if the only way to install the injection valve is lower than the tank. This valve prevents vacuum on the pump. Feeder should be interlocked with a no-flow protection device to automatically shut-off the pump when there is no flow. Check on a regular basis the delivery valve and immediately change it when inoperable. Do not install tanks with chemical beneath the pump to avoid the vapors damaging the pump.

PRIMING (Only "F" series pumps)



Carefully read and understand the safety data sheet and all the information about the chemical product to be dosed before to startup. Take all the needed precautions to avoid personal injuries.

Proceed as follows with pump priming. Avoid direct product contact:

- connect a transparent hose to the outgassing in the pump head and insert the other end of the hose in the product tank;
- open the outgassing valve by turning counter clockwise the closing knob;
- let the pump work at 50% of capacity.

Air in the pump head will escape through the outgassing fitting. Close the outgassing valve turning clockwise the closing knob on the pumphead when the products starts to flow in to the outgassing fitting. Viscous product priming can be helped using a 20 cc syringe.

"FA" series pumps are equipped with automatic venting heads and doesn't need priming procedure.

METERING

The series "F" and "FA" pump characteristics are located in a label on the pump box. They include: power supply, working counterpressure (Kpa/bar) and pump capacity in liter per hour (l/h). All the dosing information is withwith water at a 20 °C temperature, at the maximum counterpressure reported in the label, using the injection valve and the % knob set to the maximum. Dosing accuracy is $\pm 5\%$ l/h at constant maximum counterpressure and 1 cps flow (**max viscosity : 60 cps**). Warning: Counterpressure changes or viscosity changes at the same stroke number may change the single stroke injection quantity. Check capacity charts for further informations. **For recommended chemicals for swimming-pools and SPAs please refer to page 28.**

ELECTRICAL WIRING

Electrical plug provided is "SCHUKO". Proceed with followings before make the electrical connections:



- **check and verify ground system;**
- **install a 0.03 A breaker to prevent current peeks due to ground system malfunctions;**
- **Check and ensure supplied power is as requested in the pump label;**
- **connect ground before proceeding with others electrical connections;**

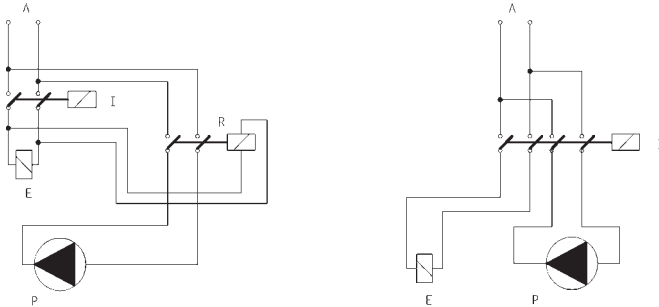
Electrical features:

Power supply range for 230 V models	198÷242 VAC
Power supply range for 115 V models	99÷121 VAC
Power supply range for 24 V models	20÷27 VAC



Do not connect the pump in parallel to an inductance load, like motors, to prevent electronic circuitry damages. Always use a connector to cut off spikes due to other devices switching.

Dosing pump in parallel connection with inductive loads



P - Metering Pump
R - Relay
I - Connector or Multi-Pole Safety Device
E - Inductance Load
A - Power Supply

ELECTRICAL PROTECTION

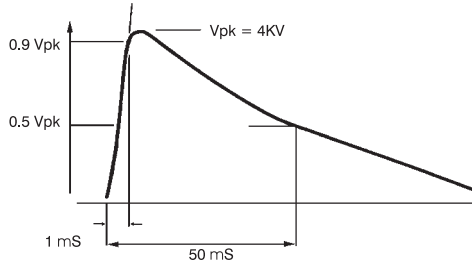
Internal circuitry is protected with a fuse located beneath the back cover of the pump. Proceed with following to replace the fuse:

- **REPAIRS MUST BE PERFORMED BY AUTHORIZED PERSONNEL ONLY**
- **Unplug power supply**
- **remove the 6 screws on the back cover of the pump**
- **replace fuse, use only approved fuses reported in table below**
- **put back cover in place, take care of seal position**

Each pump type fuse (5x20) T(delaied) can be found in table below:

<i>Model</i>	<i>Consumption at 230 and fuse</i>	<i>Consumption at 115 and fuse</i>	<i>Consumption at 24</i>
Fxx 12 1,5	230 VAC / 630 mA 16W	115 VAC / 315 mA 11W	24 VAC / 2 A
Fxx 10 2,2	FAxx 10 1,4 230 VAC / 630 mA 16W	115 VAC / 315 mA 11W	
Fxx 07 03	FAxx 07 2,2 230 VAC / 630 mA 16W	115 VAC / 315 mA 11W	24 VAC / 2 A
Fxx 07 05	FAxx 07 3,5 230 VAC / 800 mA 16W	115 VAC / 500 mA 13W	
Fxx 05 05	FAxx 05 3,5 230 VAC / 630 mA 16W	115 VAC / 315 mA 11W	24 VAC / 2 A
Fxx 06 06	FAxx 06 4,5 230 VAC / 800 mA 16W	115 VAC / 500 mA 13W	
Fxx 05 07	FAxx 05 05 230 VAC / 800 mA 16W	115 VAC / 500 mA 13W	
Fxx 01 07	FAxx 01 05 230 VAC / 630 mA 16W	115 VAC / 315 mA 11W	24 VAC / 2 A
Fxx 01 09	FAxx 01 6,5 230 VAC / 800 mA 16W	115 VAC / 500 mA 13W	
Fxx 10 05	230 VAC / 800 mA 16W	115 VAC / 500 mA 13W	
Fxx 05 10	230 VAC / 800 mA 16W	115 VAC / 500 mA 13W	
Fxx 05 0,2	230 VAC / 630 mA 16W	115 VAC / 315 mA 11W	

Pump “F” and “FA” series pumps are equipped with overvoltage protection (working voltages: 300 V, 150V, 39V), and a voltage peek protection up to 4 KV, 50 μ sec against pulses like in fig.



LEVEL ALARM

CL, IS, IC, PV, TE and PVM type pump are provided with a liquid level alarm to indicate product tank empty. The level probe is connected to the extreme right BNC plug in the bottom panel of the pump. The level probe output is a N.O. reed contact (10VA, 1A max., 230Vac max.) closed by a floating magnet located in a (PP) plastic case. When the product level goes below the minimum level defined by the probe position the float with the magnet closes the reed contact. The pump stops and the red LED on the front panel indicates the alarm status.

PUMP TYPES

-FCO -

Constant dosing pump with capacity adjustment between 0 and 100% of indicated capacity (see label on pump type).The capacity electronic adjustment sets the injection per minute. The % marked knob sets the pump capacity, changing linearly the magnet stroke number per minute. It is strongly suggested to not operate the pump in the range from 0 to 10%, since there is not a linear correlation with the pump capacity in that range. This pump is specially designed for dosing rates that doesn't change in time. This pump can be ON/OFF driven by an IPH instrument or an ICD instrument. To set 2.5 l/h against 5 bar on a FCO 0505 the % marked knob should be set to 50%. FCOF have a divider (x- 0,1) to reduce ten times the pump capacity dividing by ten the pump stroke speed.

-RFCO-


Constant dosing pump with capacity adjustment between 0 and 100% of indicated capacity (see label on pump type).The capacity electronic adjustment and the 20% - 100% switch sets the injection per minute. 20% - 100% switch to 100 % sets the maximum capacity of the pump, 20% - 100% switch to 20% sets the maximum capacity to be a 1/5 of the pump maximum capacity. This pump doesn't have an ON/OFF switch, power supply present is shown by a green LED on.

-FCL -

Constant dosing pump with level alarm, is provided with a floating magnetic sensor probe. A red led indicates that the pump stopped dosing because the product tank is empty. This pump has the same characteristics and adjustments of the CO type pump. The capacity electronic adjustment sets the injection per minute.



-FIC -

Proportional/constant pump driven by current signal. Setting the switch on the front panel in the *constant* position the pump has the same characteristics and adjustments og the CL pump. The

capacity electronic adjustment sets the injection per minute. Setting the switch on the front panel in the *proportional*  position the pump capacity is setted proportionally to a given analog current signal; a given signal linear changing will be followed by a linear changing of capacity. The current signal accepted range is 0÷20 mA (it can be changed upon demand). The maximum pump capacity requested by the maximum input signal is setted by the % marked knob. The IC pumps can be driven by every electronic device (such as pH-meter, redox-meter, etc etc) that gives an analog current signal output. This signal must be applied to the bipolar cable provided with the pump, already internal connected, taking care of connections:



- brown wire : *positive (+)*
- blue wire : *negative (-)*

-FIS -

Proportional/constant pump driven by a digital signal. Setting the switch on the front panel in the *constant*  position, the pump has the same characteristics and adjustments of the CL pump. The capacity electronic adjustment sets the injection per minute. Setting the switch on the front panel in the *proportional*  position, the pump gives a magnet stroke each external free of voltage pulse command. The position of the % marked knob does NOT affect the pump capacity when proportional working is setted. IS pump proportional dosing can be driven by every external device (PCs, PLCs, etc etc) that can outputs a digital signal. This signal (N.O. contact) must be applied to the cable provided with the pump, already internal connected. If a 0-5 ; 0-12 Vdc input signal option is requested take care of connections:

- brown wire : *positive (+)*
- blue wire : *negative (-)*

- FPV -

Proportional/constant pump driven by a water meter digital signal. Setting the switch on the front panel in the *constant*  position, the pump has the same characteristics and adjustments of the CL pump. It is furthermore possible to divide the maximum magnet strokes per minut by 1, 10 and 100 using the switch on the front panel. The capacity electronic adjustment sets the injection per minute. Setting the switch on the front panel in the *proportional*  position, the pump gives a stroke each external pulse sensed. This pump can be driven by a CTFI or CWF1 series water meters. This pump can also be driven by a digital signal coming from a free of voltage contact. Driving signal is applied on the BNC plug on the left of the bottom pump cover. Dividing factor (N) value is obtained multiplying the indicated value on the adjustment knob by the multipling switch (x1, x10, x100) value.

Capacity definition for “FPV” and “FAPV” pump

Once given the water m³ to be treated and the product quantity to be dosen in p.p.m. the minimum capacity of the pump to be used can be found using the following formula:

$$\frac{\text{ppm} \times K \times \text{m}^3}{1000} = \text{l/h}$$

- l/h* - minimum pump capacity required
- ppm* - product quantity to be dosen in p.p.m. (gr/m³)
- k* - dosen product dilution factor (pure chemical k=1)
- m³* - maximum capacity of the system to be treaten in m³/h.

Dividing factor (N) to be set on tha adjusting knob is given by the following:



$$\left(\frac{\text{imp/l} \times \text{cc}}{\text{ppm}} \right) \times 1000 = N$$

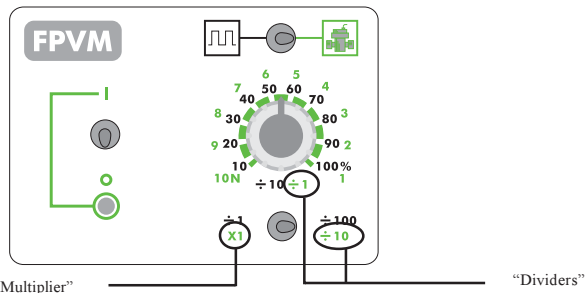
N - is the number the external pulses are divided by to be setted on the adjustment knob
imp/l- pulse per liter given by the water meter
cc - pump's single stroke dosing quantity (in cc). Refer to following table
ppm - product quantity to be dosen in p.p.m. (gr/m³)

Fxx	cc	FAxx	cc
12 1,5	0,17	10 1,4	0,16
10 2,2	0,25	07 2,2	0,25
07 03	0,34	07 3,5	0,39
07 05	0,56	05 3,5	0,39
05 05	0,56	06 4,5	0,5
06 06	0,67	05 05	0,56
05 07	0,78	01 05	0,56
01 07	0,78	01 6,5	0,73
01 09	1,25		
10 05	0,56		
05 10	1,10		
05 0,2	0,25		


Whenever the dividing factor (*N*) calculated with the above formula is <1 a pump with higher single stroke dosing quantity is required, or the water meter needs to be changed with one that gives higher number of pulses per liter, or using an “FPVM” or “FAPVM” pump. In some application this issue can be solved reducing the dosen product dilution factor. In case that dosen quantity is higher than needed the setted dividing factor (*N*) can be increased.

- FPVM -

Proportional/constant pump driven by a water meter digital signal. Setting the switch on the front panel in the *constant*  position, the pump has the same characteristics and adjustments of the CL pump. It is furthermore possible to divide the maximum magnet strokes per minute by 1 (÷1), 10 (÷10) and 100 (÷100) using the switch on the front panel. The capacity electronic adjustment sets the injection per minute. Setting the switch on the front panel in the *proportional*  position, the pump gives a stroke each 10 external pulses sensed (knob n=10 and switch to x1). Setting the pump to divide (switch ÷1 or ÷10), the pump gives at maximum a stroke each external pulse sensed (knob n=1, switch ÷1) and at maximum a stroke each 100 pulses sensed (knob n=10, switch ÷10). This pump can be driven by a CTFI or CWFI series water meters. This pump can also be driven by a digital signal coming from a free of voltage contact. Driving signal is applied on the BNC plug on the left of the bottom pump cover. “FPVM” and “FAPVM” capacities are defined by the same formulas used for “FPV” and “FAPV”.



-FTE-

Timered/constant dosing pump. Setting the switch on the front panel in the *constant* position, the pump has the same characteristics and adjustments of the CL pump. Setting the switch on *timered*  , the pump starts work when an external pulse is provided. Working active time for each external pulse is set on the adjustment knob in the range between 0 and 60 seconds (different time are available upon demand). The capacity can be also changed adjusting the stroke per minute, operating the % marked knob, at the same time. The double parameter adjustment (strokes and time) allows the use of this pump in big capacity systems, where the pulses are not enough to drive a PV type pump. TE pump is provided of a coaxial cable (RG58) with BNC plug to connect the command signal.

Use following formula to evaluate the knob adjustment:

$$\frac{3600}{\text{imp/h}} = \text{sec.}$$

imp/h - water meter output pulse per hour
sec - time in seconds to be set on time knob

Maximum tag capacity can be decreased 10 or 100 times in the “F” and “FA” pumps using the 1/10/100 switch (where available). In that case the % marked knob will work on the maximum set capacity.

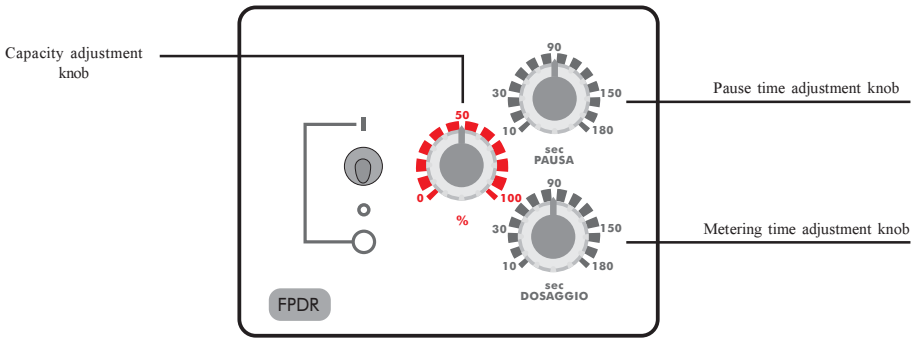
-FPDR-

Intermittent constant metering pump with adjustable pause and work times.

Metering is set using three knobs on the front panel:

- (%) knob (red coloured range) sets speed stroke
- (10 ÷ 180 seconds) Pause knob sets time between one metering and the next
- (10 ÷ 180 seconds) Work knob sets metering time

Once powered the pump it always start its working cycle metering for the set time. A N.O. (1A / 230Vac) service contact is active while metering. If the level input is active while the service contact is active pump stops and service contact gets back to N.O. *Service contact is available through a bipolar cable out of the pump.* Once refilled the tank or recovered the level input the pump starts to dose for the remaining time missing to complete the set work time once stopped. Level alarm is showed on the front panel with a red LED on.



MAINTENANCE

Before proceed with maintenance or service of the pump:



- **wear the used chemical's safety data sheet suggested protections (glasses, gloves, etc)**
- **unplug power supply**
- **unload delivery pipe and vent it to ATM pressure**
- **unload suction pipe. and vent it to ATM pressure**

Remove blocking screws and turn upside down the pump to let the product inside the pump head flow out. To avoid damages and injuries flow the pump head with fresh water. For repair shipping pls bridge the suction valve and the delivery valve with a pipe.



Follow chemical safety data sheet (provided by the chemical manufacturer) when entering in direct contact with it.

“F” and “FA” type pump needs small maintenance: clear once per year all the valves and the foot filter. If high chrySTALLIZING products are used perform maintenance once per month and after long non operation times clean all the valves and the foot valve. To remove chrystal depositions follow below procedure:

- unscrew the injection valve connection and dip delivery pipe and foot valve in water;
- prime the pump with water and let the pump work with water for 5 min;
- replace water with a chrystal solvent product and let the pump work with it for 10 min;
- let the pump work with water again for 5 min;
- put back in place injection valve connection and prime the pump.

It's important to tight the pipe blocking nuts to avoid chemical product leaks that can damage the pump. If it happens tight the pipe blocking nuts and rinse the pump with fresh water.

Whenever is needed the power supply cable replacement use only original cable, cod. 063.0001.1.



Verify electrical wiring reported in page 13 and follow safety tips at the section beginning when replacing electronic PCBs.

QUICK TROUBLESHOOTING GUIDE

If...pump doesn't work and the green led is off:

- check and verify power supply;
- verify provided power supply is the same reported in the pump tag;
- check fuse integrity and eventually replace it;
- replace electronic PCB.

If...pump doesn't work and the red led is on:

- check and ensure product tank is not empty;
- check level probe floater, replace it if blocked down;
- remove eventual chrystallized product that can block the level probe floater.

If...pump doesn't work and the magnet strokes:

- check and verify foot filter is not obstructed with inpurities and chemical chrystals;
- some air can be in the pump head remove it as described in the PRIMING section;
- check and ensure suction and delivery valves are not obstructed with product chrystals;
- check and verify valves o-ring are not swell or damaged, it's a clear evidence of chemical incompatibility with used products. (see "o-rings" section).

If...pump blows fuse after working a while:

- check and ensure supplied power is the same reported in pump tag;
- check electronic circuitry connecting it to a lamp(of the righ voltages) insthead of the magnet. Since all connections are quick lock it's a quick test to perform, if the lamp doesn't light intermittently the electronic PCB needs to be replaced.;
- check and ensure magnet impedance is ($\pm 5\%$)the tag one. If not replace it.

O-RINGS

The valve sealings are provided in 5 different materials to satisfy different chemical compatibility issues. The elastomer that will best fit the requested needings can be found on the "EMEC Fluid Compatibility Table". Get in touch with customer support if needed.The elastomer used for the o-rings equipping the "F" pumps are characterized by different suction/delivery valve colors.

<i>Elastomer</i>	<i>ISO Code</i>	<i>EMEC Code</i>	<i>Valve Color</i>
Fluorocarbon	FPM	FP	black
Ethylenepropylene	EPDM	EP	gray
Polytetrafluoroethylene	PTFE	PTFE	blue
Nytril	NBR	WAX	green
Sylicon	MVQ	SI	yellow

TECHNICAL FEATURES

<i>Pump strokes per minute:</i>	0 ÷ 150 pulse for minute
<i>Max suction pipe lenght</i>	1,5 meter
<i>Environment temperature:</i>	0 ÷ 45°C (32 ÷ 113°F)
<i>Chemical Temperature:</i>	0 ÷ 50°C (32 ÷ 122°F)
<i>Installation Class:</i>	II
<i>Pollution Level:</i>	2
<i>Packaging and transporting temperature:</i>	-10÷50°C
<i>Audible noise:</i>	74dba

Single stroke injection dose:

Fxx

12 1,5 10 2,2 07 03 07 05 05 05 06 06 05 07 01 07 01 09 10 05 05 10 05 0,2
cc
0,17 0,25 0,34 0,56 0,56 0,67 0,78 0,78 1,25 0,56 1,10 0,25

FAxx

10 1,4 07 2,2 07 3,5 05 3,5 06 4,5 05 05 01 05 01 6,5
cc
0,16 0,25 0,39 0,39 0,5 0,56 0,56 0,73

CONSTRUCTION MATERIALS

Case:	PP
Pump Head :	PP/PVDF (upon demand)
Diaphragm :	PTFE
Valve Balls:	GLASS, PTFE (upon demand)
Suction pipe:	PVC
Delivery pipe:	PE/PVDF (upon demand)
Valve body :	PP/PVDF (upon demand)
O-ring:	as requested (FP, EP, WAX, SI, PTFE)
Injection connector:	PP V-706 (glass ball, HASTELLOYS C276 spring).
Level Probe:	PP/PVDF (upon demand)
Level Probe cable:	PE
Foot Filter:	PP/PVDF (upon demand)

PROVIDED ACCESSORIES

n.2	Dibbles $\varnothing 6$
n.2	Screws 4,5 x 40
n.1	Fuse 5 X 20 delayed
n.1	Foot filter/valve assy
n.1	Injection valve
n.1	Level probe (not included in model CO, RxCO and PDR)
m 2	Delivery hose in white opaque polyethylene
m 2	PVC or PE suction hose
m 2	Transparent PVC outgassing hose
n.1	Instruction manual



All metering pumps with 230 VAC and 115 VAC power supply with FP o-rings are listed NSF 50 (except for 10 05, 05 10 and 05 0,2 models).



All metering pumps supplied with 115 VAC are available with certification CSA.

“CE” referring norms

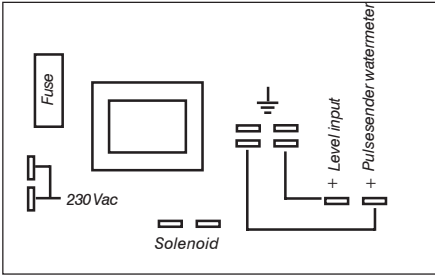


All metering pumps are “CE” marked and they are consistent to the following european norms:

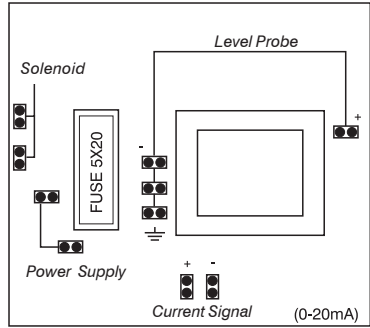
EN60335-1 : 1995, EN55014, EN50081-1/2, EN50082-1/2, EN6055-2, EN60555,3

**Based to CEE 73/23 c 93/68 (DBT Low voltage normative)
and to 89/336/CEE (EMC Electromagnetic comatibility)**

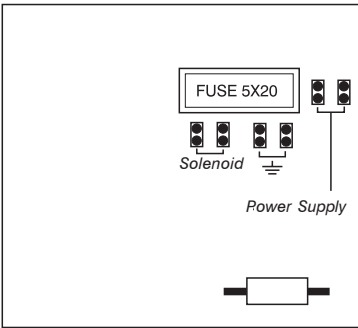
Printed Circuit Board Connection



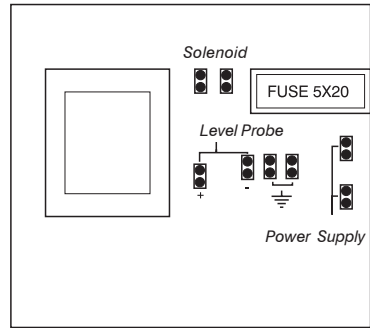
Mod. FPV/FPVM



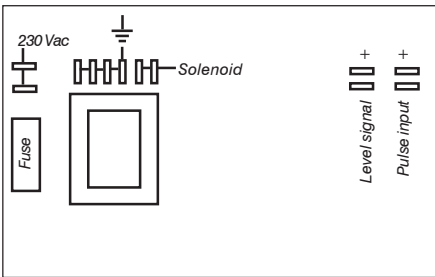
Mod. FIC



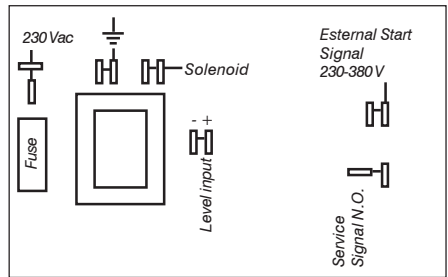
Mod. FCO



Mod. FCL



Mod. FTE



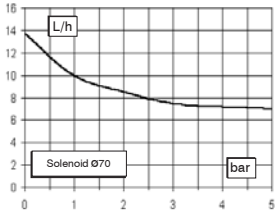
Mod. FPDR

Capacity charts

Pump Head PCS

05 07

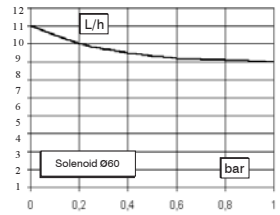
L/h 07
bar 05



Pump Head PCS

01 09

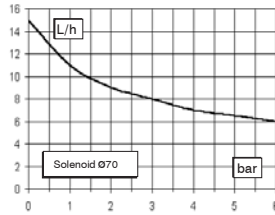
L/h 09
bar 01



Pump Head PCS

06 06

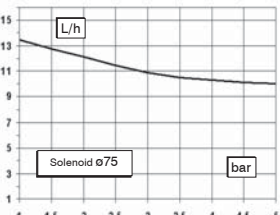
L/h 06
bar 06



Pump Head 32

05 10

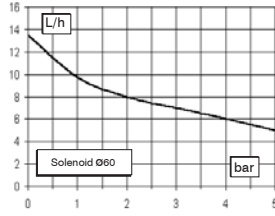
L/h 10
bar 05



Pump Head PCS

05 05

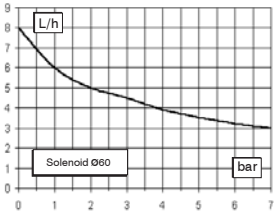
L/h 05
bar 05



Pump Head PCS

07 03

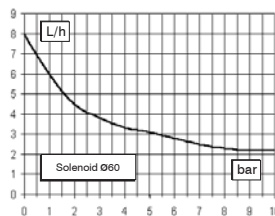
L/h 03
bar 07



Pump Head PCS

10 2.2

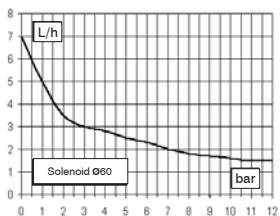
L/h 2.2
bar 10



Pump Head PCS

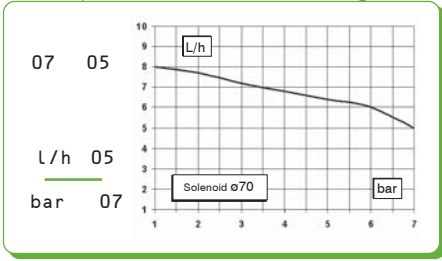
12 1.5

L/h 1.5
bar 12

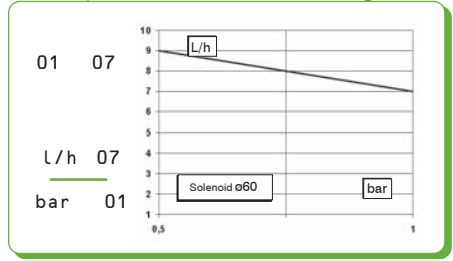


Capacity charts

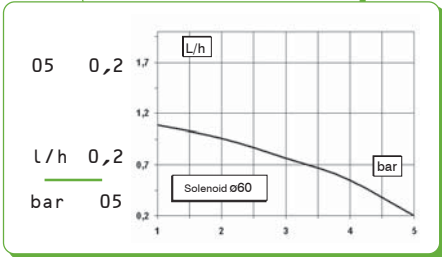
Pump Head PCS



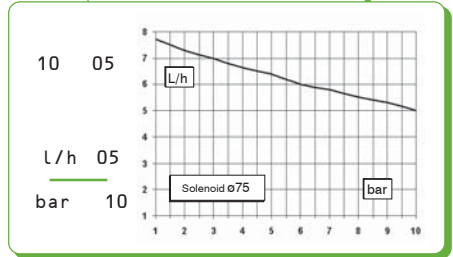
Pump Head PCS



Pump Head PCS

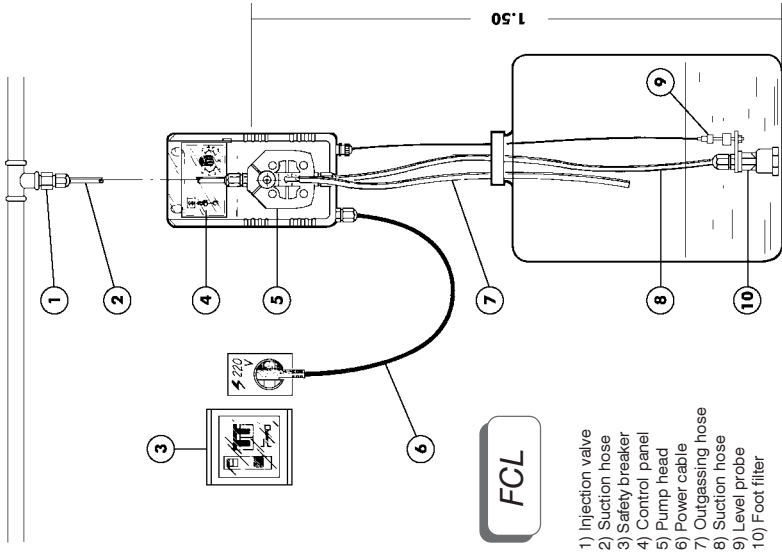


Pump Head PCS

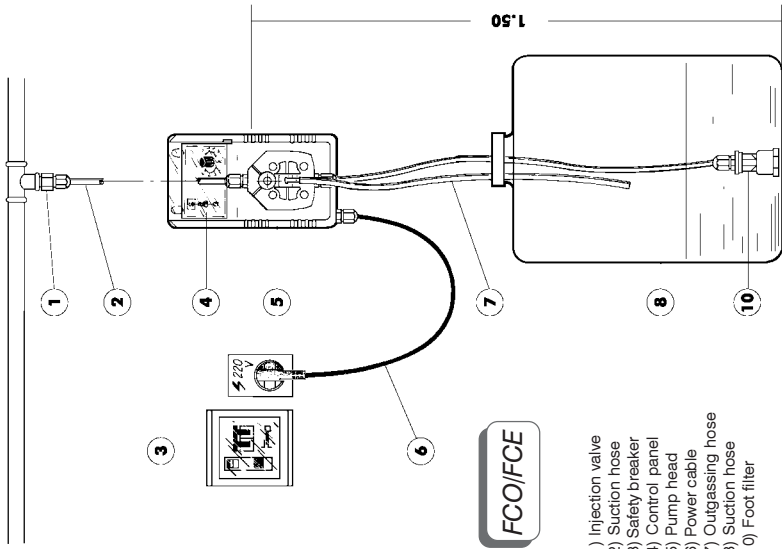


Flow rate indicated is for H₂O at 20 °C at the rated pressure. Dosing accuracy ± 5% at constant pressure ± 0,5 bar.

“F” and “FA” series pump installation drawings

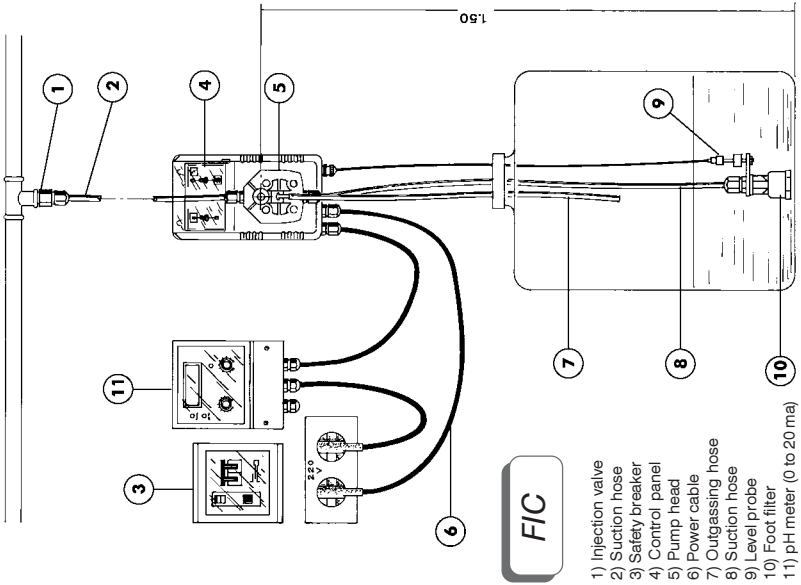


- 1) Injection valve
- 2) Suction hose
- 3) Safety breaker
- 4) Control panel
- 5) Pump head
- 6) Power cable
- 7) Outgassing hose
- 8) Suction hose
- 9) Level probe
- 10) Foot filter



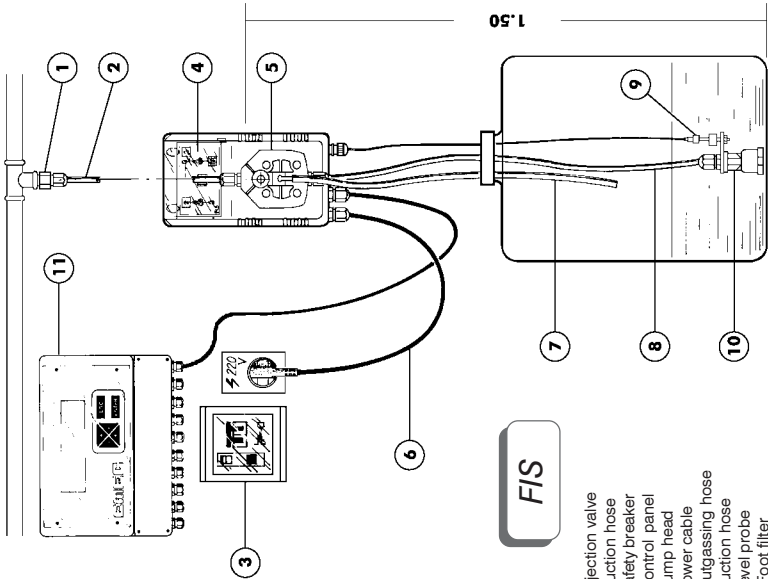
- 1) Injection valve
- 2) Suction hose
- 3) Safety breaker
- 4) Control panel
- 5) Pump head
- 6) Power cable
- 7) Outgassing hose
- 8) Suction hose
- 10) Foot filter

"F" and "FA" series pump installation drawings



FIS

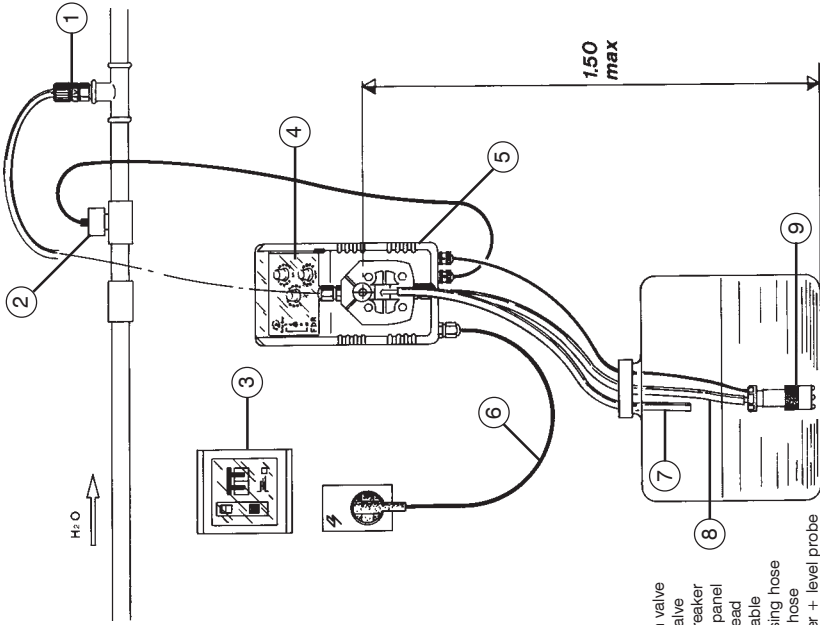
- 1) Injection valve
- 2) Suction hose
- 3) Safety breaker
- 4) Control panel
- 5) Pump head
- 6) Power cable
- 7) Outgassing hose
- 8) Suction hose
- 9) Level probe
- 10) Foot filter
- 11) pH meter (0 to 20 ma)



FIS

- 1) Injection valve
- 2) Suction hose
- 3) Safety breaker
- 4) Control panel
- 5) Pump head
- 6) Power cable
- 7) Outgassing hose
- 8) Suction hose
- 9) Level probe
- 10) Foot filter
- 11) Computer / CCS instrument

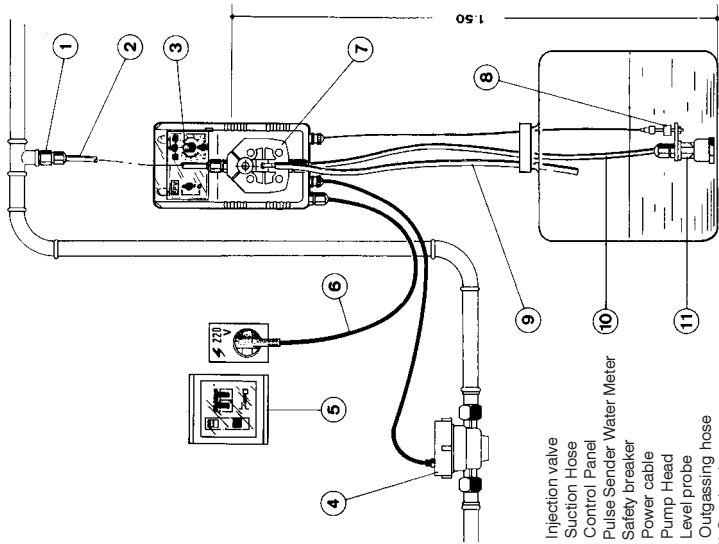
"F" and "FA" series pump installation drawings



FPV
FTE
FPVM

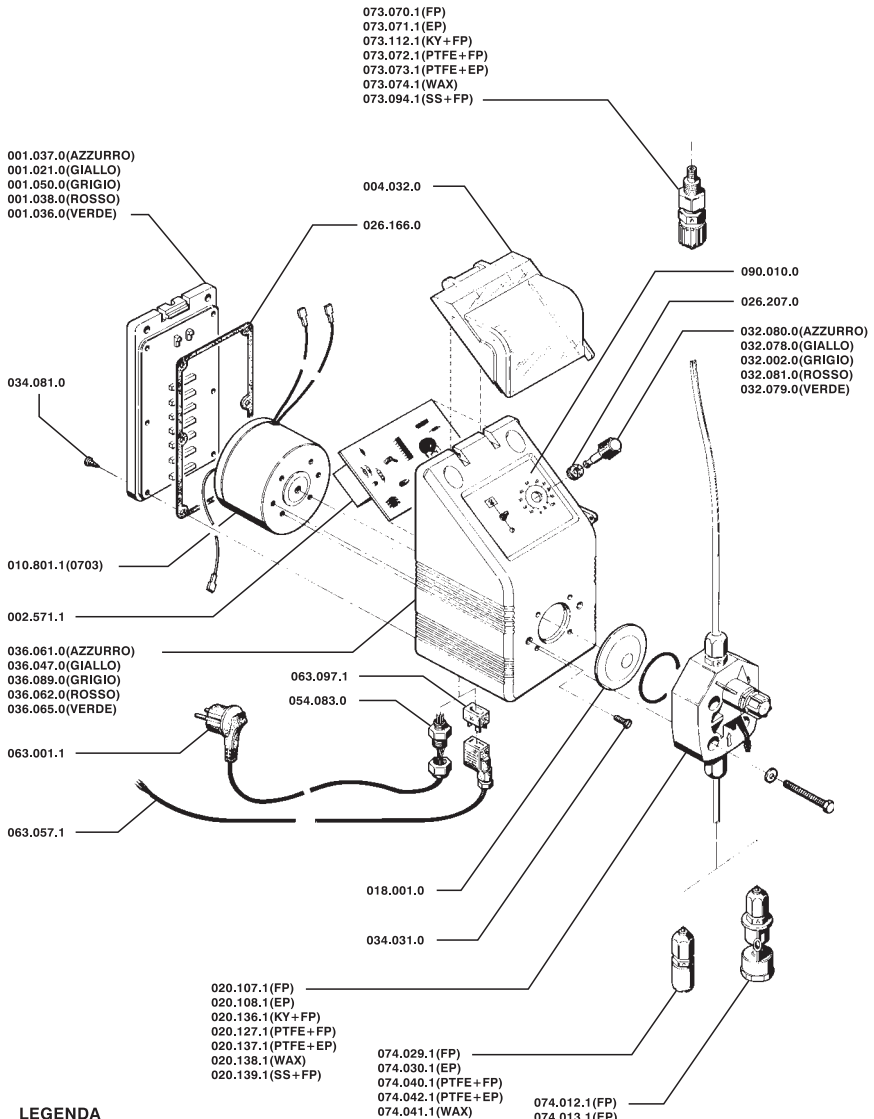
FDR

- 1) Injection valve
- 2) Electrovalve
- 3) Safety breaker
- 4) Control panel
- 5) Pump head
- 6) Power cable
- 7) Outgassing hose
- 8) Suction hose
- 9) Foot filter + level probe



- 1) Injection valve
- 2) Suction Hose
- 3) Control Panel
- 4) Safety breaker
- 5) Pulse Sender Water Meter
- 6) Power cable
- 7) Pump Head
- 8) Level probe
- 9) Outgassing hose
- 10) Suction hose
- 11) Foot filter

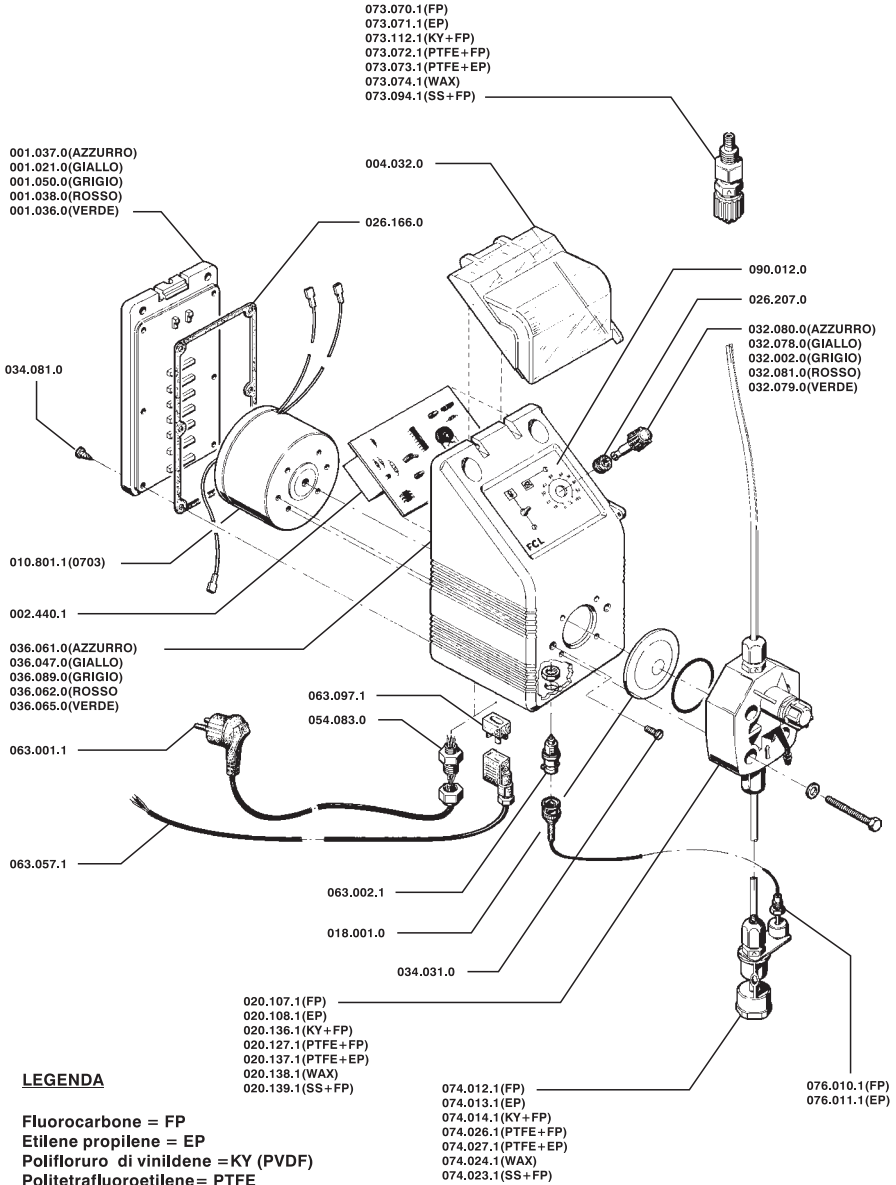
Mod. "FCO" Exploded view



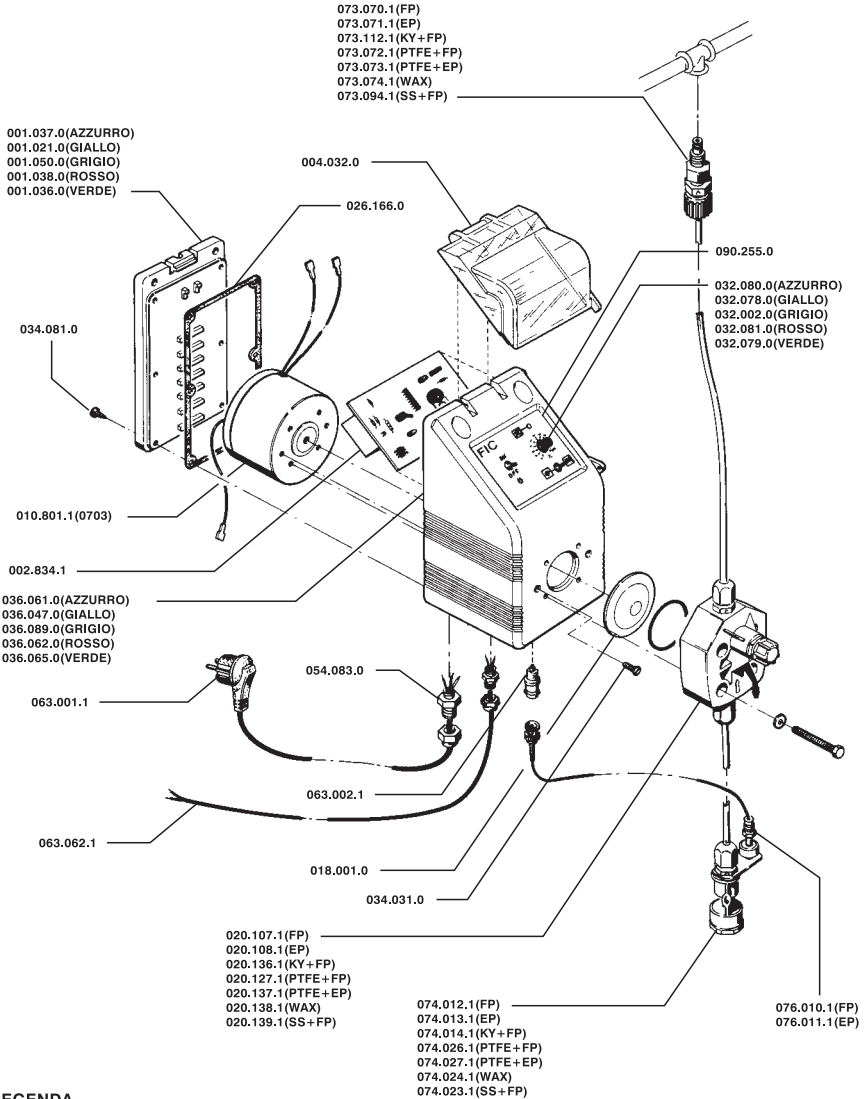
LEGENDA

Fluorocarbone = FP
Etilene propilene = EP
Polifloruro di vinilidene = KY (PVDF)
Politetrafluoroetilene = PTFE
acciaio inox = SS
nitrile = WAX

Mod. "FCL" Exploded view



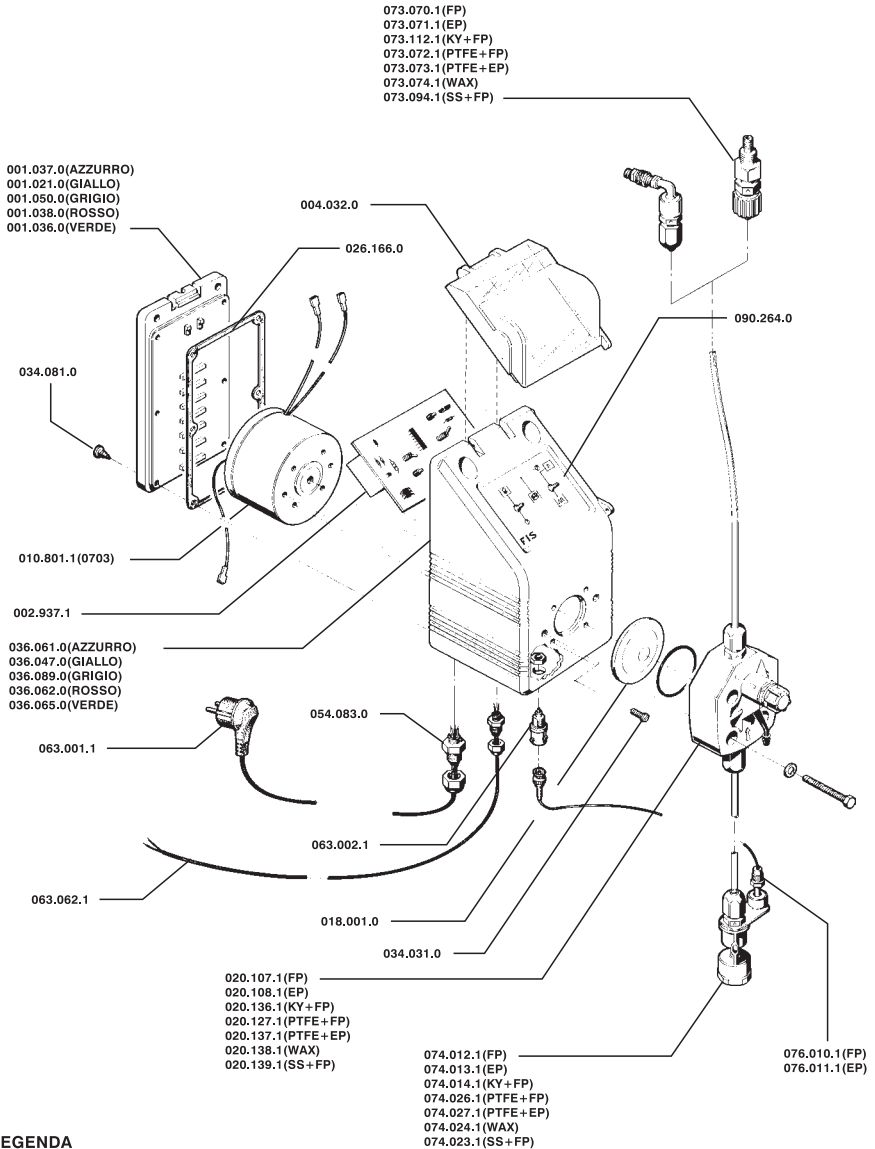
Mod. "FIC" Exploded view



LEGENDA

Fluorocarbone = FP
 Etilene propilene = EP
 Polifloruro di vinilidene = KY (PVDF)
 Politetrafluoroetilene = PTFE
 acciaio inox = SS
 nitrile = WAX

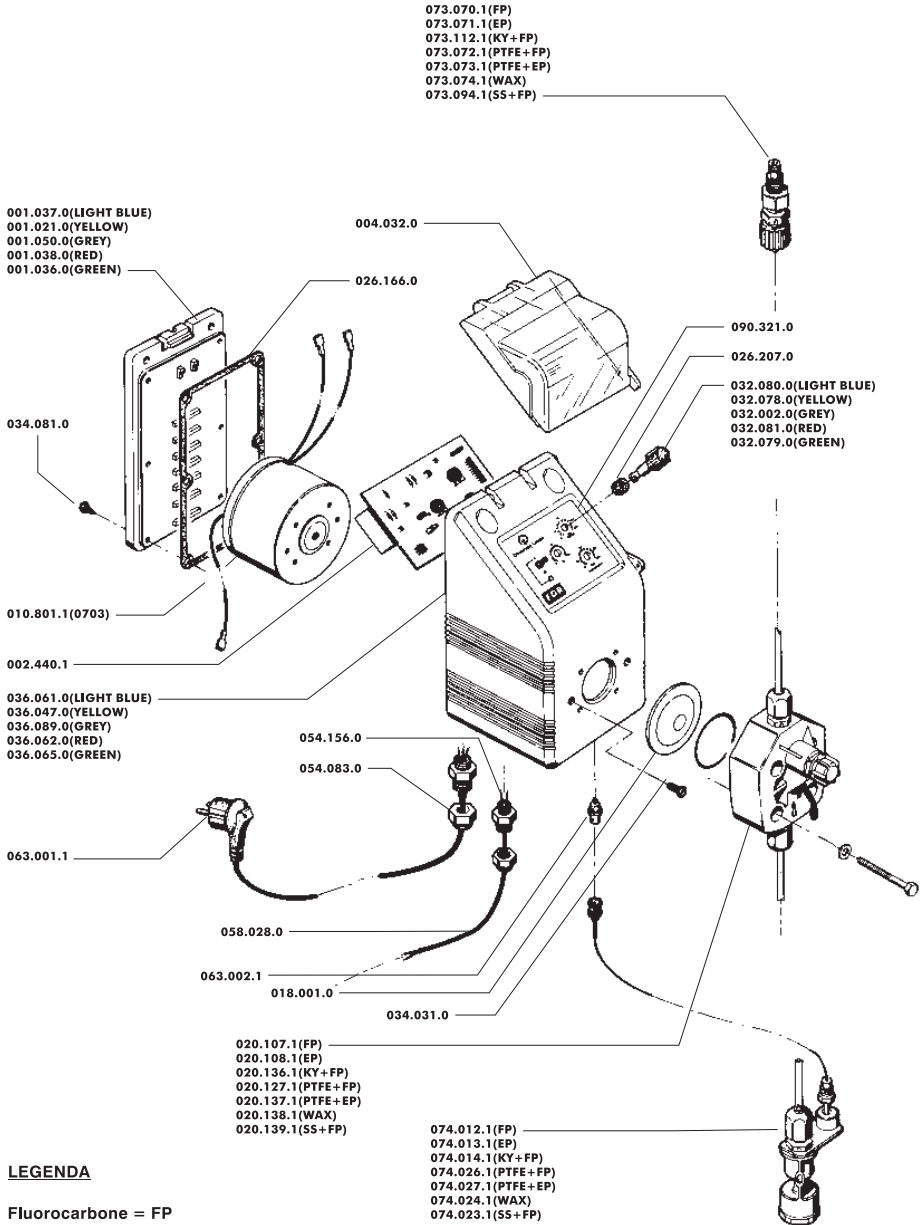
Mod. "FIS" Exploded view



LEGENDA

Fluorocarbone = FP
 Etilene propilene = EP
 Polifloruro di vinildene = KY (PVDF)
 Politetrafluoroetilene = PTFE
 acciaio inox = SS
 nitrile = WAX

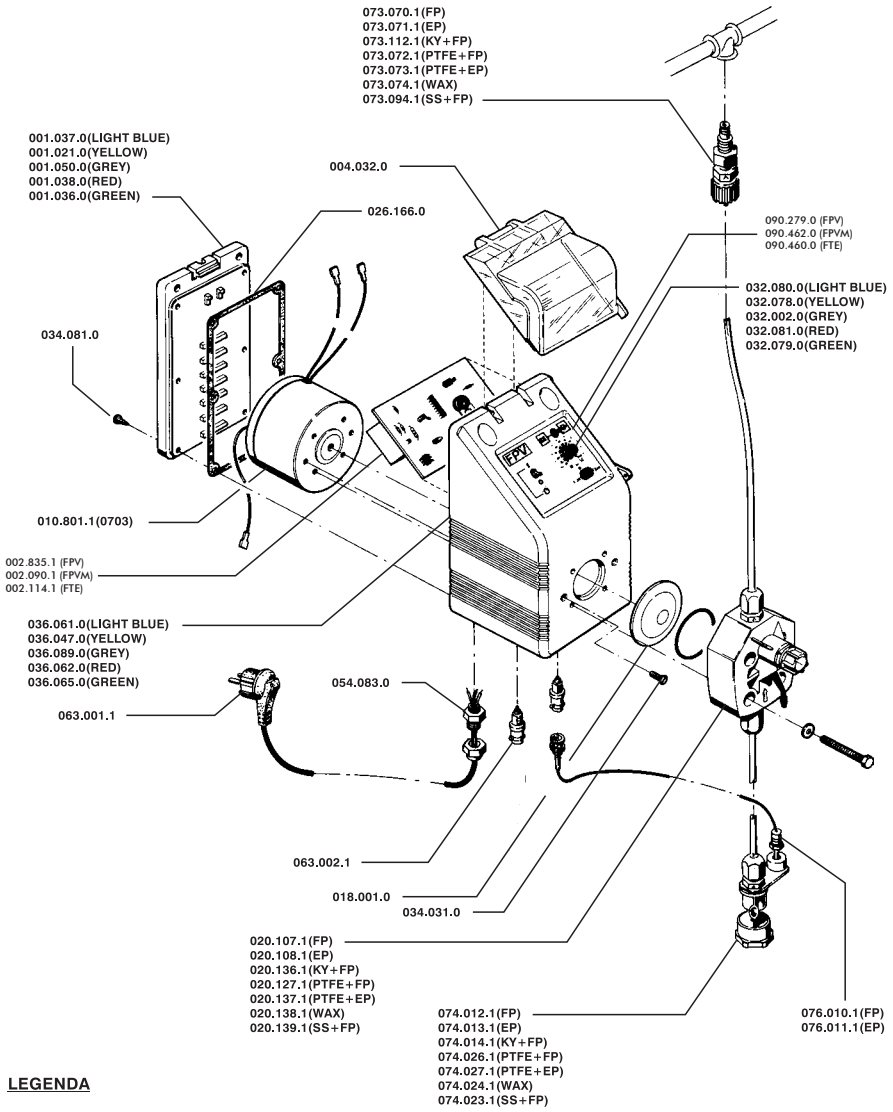
Mod. "FDR" Exploded view



LEGENDA

Fluorocarbene = FP
 Etilene propilene = EP
 Polifloruro di vinildene =KY (PVDF)
 Politetrafluoroetilene= PTFE
 acciaio inox = SS
 nitrile=WAX

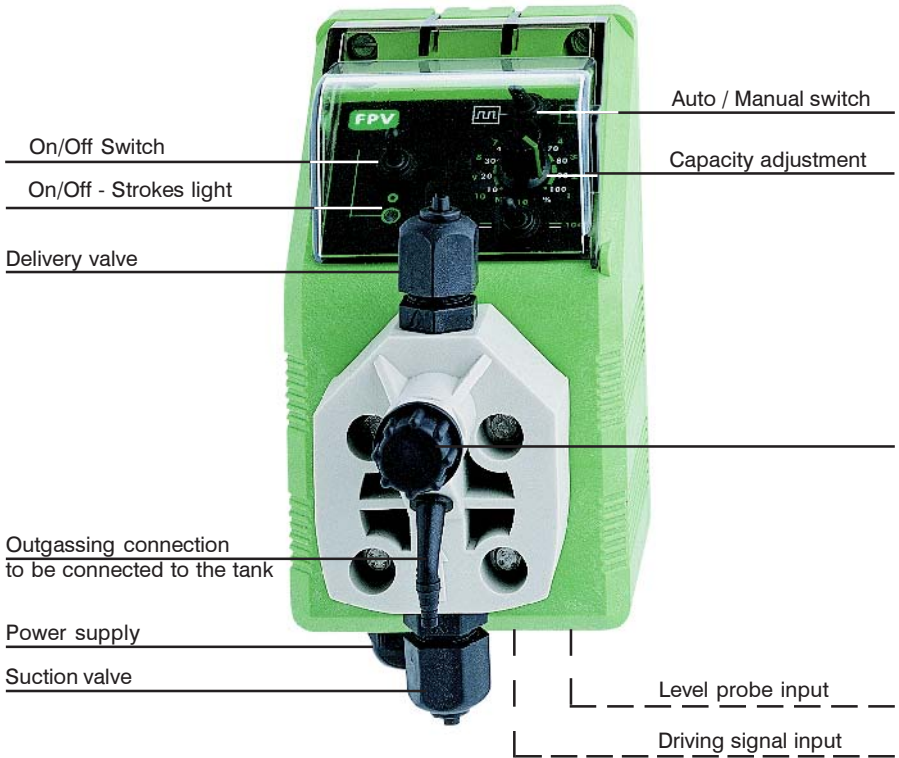
Mod. "FPV-FPVM-FTE" Exploded view



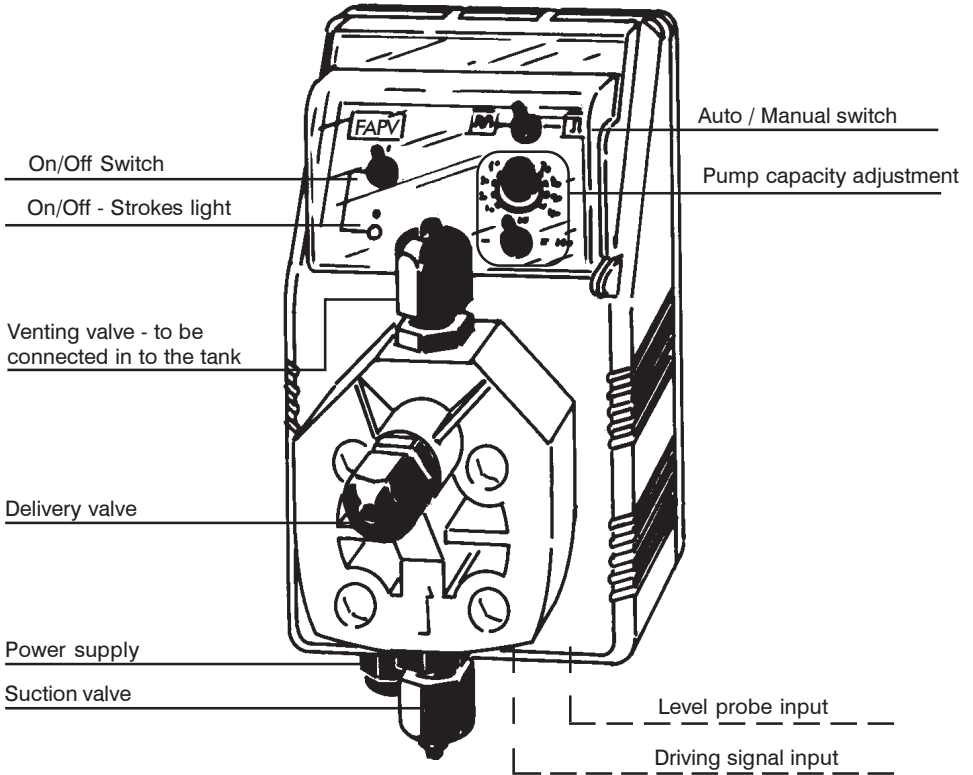
LEGENDA

- Fluorocarbene = FP
- Etilene propilene = EP
- Polifloruro di vinildene = KY (PVDF)
- Politetrafluoroetilene = PTFE
- acciaio inox = SS
- nitrile=WAX

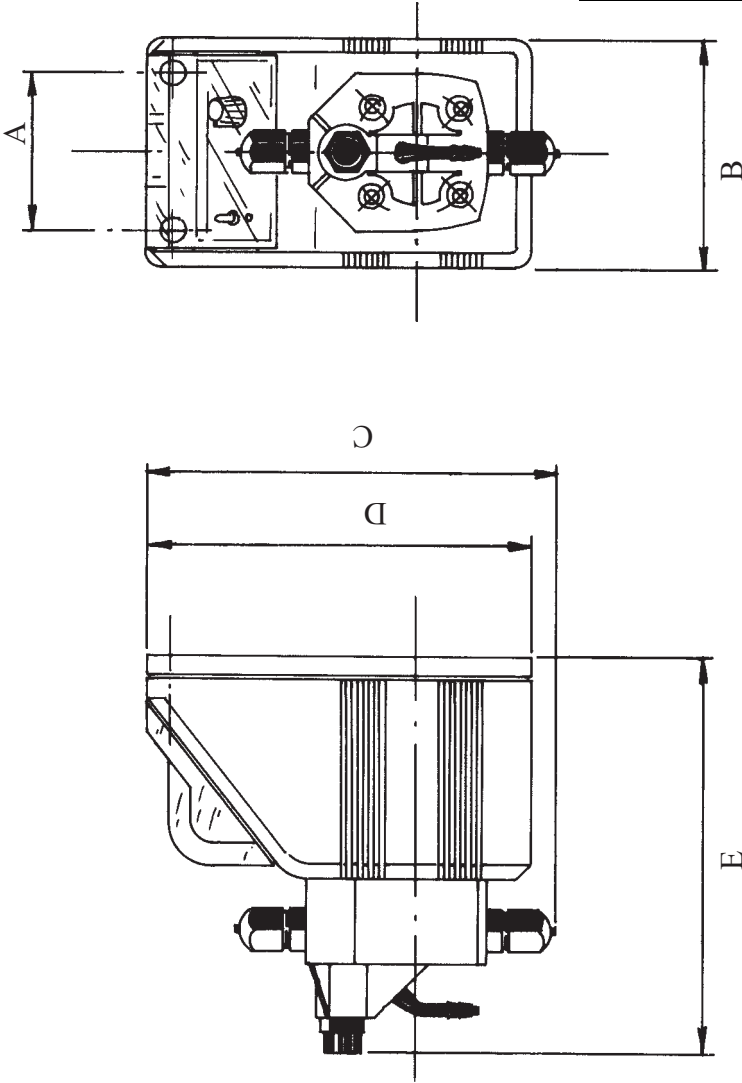
"F" Series Commands Description



"FA" Series Commands Description



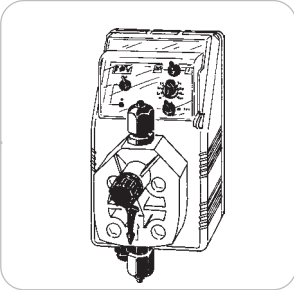
Dimensions



DIMENSIONS		
	mm	inches
A	63	2,48
B	91,5	3,60
C	168	6,61
D	153,5	6,04
E	160	6,29

Recommended Chemicals Table		
<i>Chemical Product</i>	<i>Formula</i>	<i>Maximum % Concentration</i>
Hydrochloric Acid	HCl	33%
Sulphuric Acid	H₂SO₄	96%
Sodium Bisulphate	NaHSO₄	37%
Sodium Chlorite	Na ClO₂	30%
Sodium Hypochlorite	Na OCl	13,5%
Calcium Hypochlorite	Ca (ClO)₂	2%
Dichloroisocyanuric Sodium	(CON)₃ Cl Na	4%
Alluminium Sulphate	Al₂ (SO₄)₃	18%
Ferric Chloride	Fe Cl₃	40%

NSF Listed units must be used with Sodium Hypo Chlorite.



*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.*