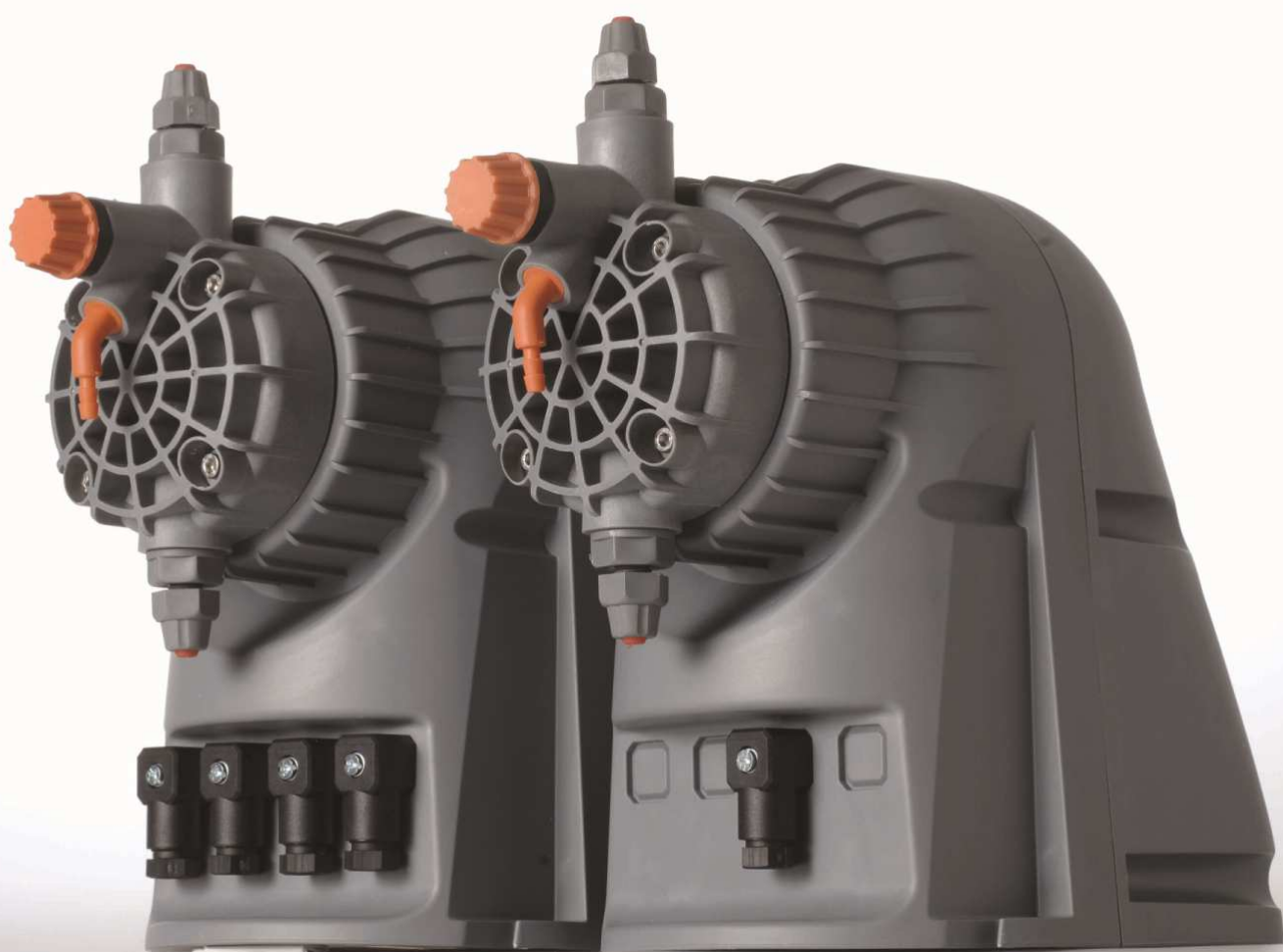


# FWMT<sup>®</sup>

fluid and water technology



## SOLENOID DRIVEN DOSING PUMPS FX series

[www.fwtsystems.it](http://www.fwtsystems.it)

## Welcome to FWT SOLENOID DRIVEN DOSING PUMPS

**FWT (Fluid and Water Technology)** is a company formed with specialised experts with over twenty years of experience in liquid handling dosing systems and measuring systems. All the staff has been operating in these fields covering all key positions concerning technical and customer service, research and development, trading and production activities.

FWT offers a wide range of accessories and sensors to guarantee a complete service. All products are accompanied by single product Data sheet. If you are interested to receive our complete catalogue and price list, please contact our International sales department.



### PUMPS MAIN FEATURES

Power supply: **230 Vac (±10-15%) - 1 phase - 50/60 Hz**  
 Reproducibility under standard conditions: **± 5%**  
 Plastic housing and support: **PP reinforced, IP65 (IP56)**  
 Connectors: **4 pole**  
 Upon request: **110 Vac/60 Hz; 12-24 Vdc** (limited range)  
 Ambient working temperature: **45°C**  
 Voltage working range: **min.207V + Max 253 V**  
 Voltage Peak: **Max 270 V**

Pumps are provided with **Standard Accessories Kit**:

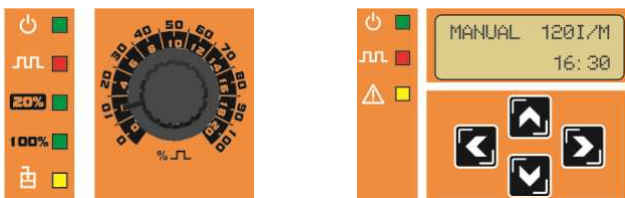
- 1 - Injection valve;
- 2 m - Discharge Hose PE semi-rigid (white);
- 2 m - Suction Hose PVC flexible (transparent);
- 1,5 m - Air Bleed Hose PVC flexible (transparent);
- 1 - Foot Valve / Filter

Pumps are also provided upon request with **Level control switch** (except C/A models)

All the products are manufactured according **CE regulations**

### FX SERIES CONTROLS

FX series operations are guaranteed by stroke frequency and stroke length adjustment:



#### STROKE FREQUENCY ADJUSTMENT

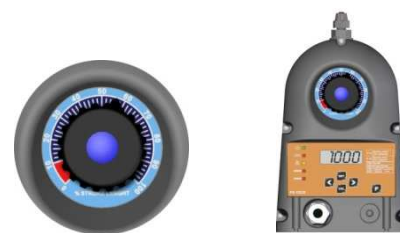
FX series control operations feature two operating controls versions:

- Analog with L.E.D. indicators
- Digital with display and L.E.D.



#### FXS series WITHOUT stroke adjustment

FXS series available without stroke adjustment (on request). Recommended for WALL mounting applications where the competitive price is the most important requirement.



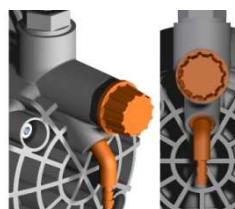
#### STROKE LENGTH ADJUSTMENT

It varies the single stroke volume displacement offering the advantage of double flow rate regulation: pulse frequency adjustment and stroke length allowing accurate dosing operations.

Recommended stroke adjustment rate: 20%÷100%



Connectors: **4 pole IP65**



**Air bleed (manual) pump head**  
 A available automatic air bleed pump head

## MOUNTING MODES

FX is "all round" series combining great quality at interesting price allowing to choose between the two most common mounting versions:

- **Foot mounting**
- **Wall mounting** (support upon request)



Wall mounting



Foot mounting

## LIQUID ENDS

WETTED PARTS	STANDARD VERSION	UPON REQUEST
Pump head	PP <sup>MEMO1 - MEMO2</sup>	PVDF; PMMA <sup>MEMO3/NOTE</sup> ; AISI316
Diaphragm	PTFE	-----
Ball check valve	CERAMIC	AISI 316
Pump head Nipples / Hose-nut	PP	PVDF; AISI 316
Seals / O-rings	FPM (Viton ®)	EPDM (Dutral®); NBR; SILICON
Injection Fitting	PP	PVDF ; AISI 316; PTFE
Injection No-Return Valve (sleeve)	FPM (Viton ®)	EPDM (Dutral®); NBR; SILICON
Foot "Lip" type check valve	FPM (Viton ®)	EPDM (Dutral®); NBR; SILICON
Filter body / Filtering media	PP / GLASSWOOL	PVDF; AISI 316
Suction Hose / Air Bleed hose 4x6mm	PVC flexible	PVDF; PTFE
Discharge Hose 4x6mm	PE semi-flexible	PVDF; PTFE
OTHER OPTIONS AND SPECIAL CONFIGURATIONS UPON REQUEST:		
Reed type "Lip" Valve	FPM (Viton ®)	EPDM (Dutral®); NBR; SILICON
Hastelloy spring foot ball valve/Fitting	HASTELLOY/CERAMIC/ PP-PVC	PVDF; AISI 316
Hastelloy spring injection valve/Fitting	HASTELLOY / PYREX / PP-PVC	PVDF; AISI 316
Automatic autobleed pump head	PVDF AUTO BLEED <sup>NOTE</sup>	-----
Aggressive chemicals configuration	PVDF aggressive chemicals <sup>MEMO4</sup>	-----

**MEMO 1:** pump head type 03-20 and 22-02 do not feature air bleed valve • **MEMO 2:** type 03-20 mounts PVC pump head  
**MEMO 3:** polymer viscous liquid configuration • **MEMO 4:** aggressive chemical configuration

**NOTE** Using AUTO-BLEED or Polymer PMMA configuration, pump pressure performance decreases of about 50%

PP Standard 1 ÷ 15 l/h	PP Standard 20 l/h	PVDF Autobleed 1 ÷ 15 l/h	PVDF 1 ÷ 15 l/h	PVC 3 l/h – 20 bar	AISI 316L 1 ÷ 15 l/h	PMMA 1 ÷ 20 l/h

## TECHNICAL CHARACTERISTICS

Pump type	Max Flow / Max Pressure	Start up* performance	Output per stroke	Stroke length	Pump head type	Power / Current consumption
	l/h bar	l/h bar				
1,5-10	1,5 10	1,5 10	0,21 cc (ml)	0,80 mm	PP 3/8"	37 watts/0,16 Amp
2,5-15	2,5 15	2,5 15	0,34 cc (ml)	0,80 mm	PP 3/8"	37 watts/0,16 Amp
03-20	3 20	3,6 20	0,49 cc (ml)	1,00 mm	PVC20b3/8"	58 watts/0,25 Amp
5,5-07	5,5 7	6 7	0,77 cc (ml)	1.00 mm	PP 3/8"	37 watts/0,16 Amp
05-12	6 12	6,2 12	0,84 cc (ml)	1.00 mm	PP 3/8"	58 watts/0,25 Amp
08-09	8 9	7,5 9	1,10 cc (ml)	1.40 mm	PP 3/8"	58 watts/0,25 Amp
14-04	14 4	17,6 4	1,96 cc (ml)	2.20 mm	PP 3/8"	58 watts/0,25 Amp
22-02	22 2	23 2	3,08 cc (ml)	2.20 mm	PP 20L3/8"	58 watts/0,25 Amp

Max strokes frequency: 120 per min

Hose size: 4 x 6 mm (available 6x8 fittings)

Power supply: 230Vac – single phase 50-60 Hz

Max suction lift: 2 m

**AVAILABLE:** 12Vdc -24Vdc are available only with following models: C/A, C/AL, MF- types up to 08-09 type

**\*NOTE:** "Start up" refer to pump starting performances; such performances are constant only if duties are not for continuous working and/or for time periods not over than 30/40 min. continuously and with at least 15 minutes rest.

## COMMON CHARACTERISTICS TO ALL FX RANGE

- Ceramic ball check valves
  - Plastic housing PP reinforced
  - IP65 rating (when using connectors IP56)
  - Standard accessories
  - “Sleeve” type no-return injection valve FPM (avail. EPDM)
  - PTFE diaphragm
  - Air Bleed valve for priming (except 20 l/h type)
  - Stroke adjustment injected volume (FX series)
- 
- Reed “LIP” type valves: Viton (options EPDM, NBR) available upon request.
  - Hastelloy Spring return Injection and Foot ball Valve: also available AISI 316 spring

## CONSTANT-ON/OFF MODE - ANALOG CONTROLS

### FX C/A • FXS C/A

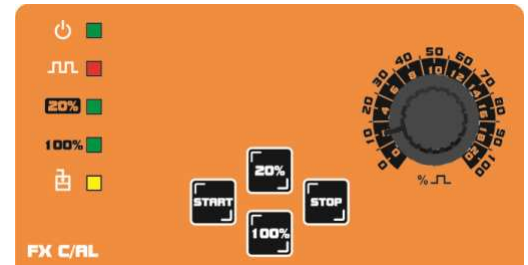
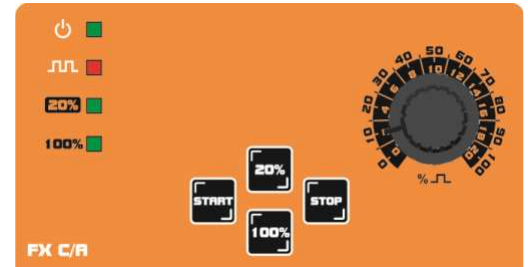
CONSTANT-ON/OFF pumps for those application where a simple pump at low cost is required but keeping maximum reliability.

Pump flow rate is obtained by adjusting pulse frequency percentage (%). It also features reduction frequency scale range 1/5 reducing range from 100% to 20%.

- Constant flow rate / ON-OFF mode (also called Manual mode)
- Strokes frequency adjustment 0÷100%
- Stroke length adjustment for injected volume regulation (only FX)
- Frequency reduction ratio 100%÷20%
- Analog controls
- 2 LED display status: power and pulses

### FX C/AL • FXS C/AL

- Constant flow rate – ON/OFF (Manual) with level control
- Provided with level control connector and floating level switch
- Other characteristics as above FX-FXS C/A
- 3 LED display status: power, pulses and level alarm
- Available with double level control

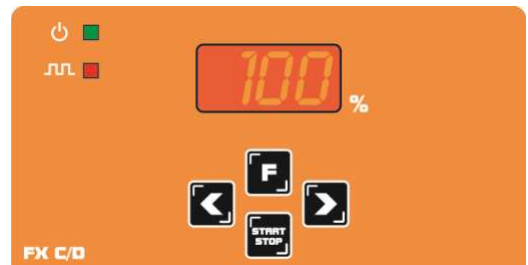


## CONSTANT MODE - DIGITAL CONTROLS - MICROPROCESSOR TECHNOLOGY

### FX C/D • FXS C/D

Pump flow rate is obtained by adjusting pulse frequency percentage (%) by digital controls.

- Digital Constant flow rate / ON-OFF mode (Manual)
- Frequency adjustment 0÷100%; imp/min; imp/hour; imp/day
- Stroke length adjustment for injected volume regulation (only FX)
- Microcontroller technology
- Digital controls and display
- Level control (Level switch upon request)
- Available with double level control



## MULTIFUNCTIONS DOSING MODE PUMP

### FX MF/D • FXS MF/D

- Multifunction dosing pumps including most of dosing operations modes
- Microcontroller technology, display LCD and digital controls
- Proportional to external digital pulses: divider n : 1; multiplier 1xN
- Proportional to external analog signal 0...4 mA÷20mA or reverse
- PPM dosing mode
- Constant mode with digital adjustment : imp/min; imp/hour; imp/day
- Stroke length adjustment for injected volume regulation (only FX)
- Digital timer, weekly and daily programming
- Sequence strokes/ injection with flow sensor (sensor on request)
- Level alarm output contact: NO/NC
- Level control (Level switch upon request)
- Available with double level control



## PROPORTIONAL TO EXTERNAL DIGITAL CONTACT

### FX P/D • FXS P/D

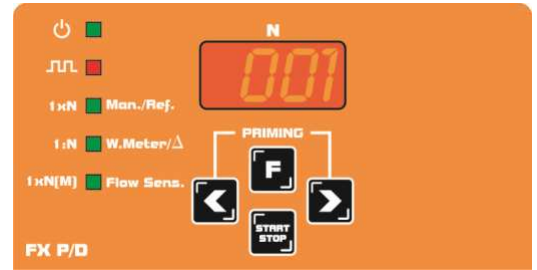
Proportional dosing pump to external digital pulses, (e.g.pulse water meters or equipment releasing voltage free pulse contacts).

- Proportional dosing pump to external digital pulses
- Constant modes operations
- Strokes frequency adjustment 0÷100%
- Stroke length adjustment for injected volume (only FX)
- Microcontroller technology, display and digital controls
- 3 LED display status: power, pulses and level
- Level control (Level switch upon request)
- Available upon request PPM dosing mode

For available **pulse water meters**, contact FWT sales office.

### FX P/D+ • FXS P/D+

- Sequence strokes/ injection with flow sensor (latter on request)
- Other characteristics as above FX-FXS P/D



#### PROPORTIONAL MODES:

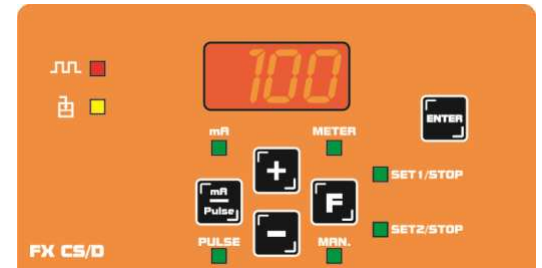
Divider n:1 (n= pulses received /1= injection)  
Multiplier 1xN (1=pulse received \*N= injections)  
Multiplier 1xN M (1=pulse received with Memory)  
Pacing 1:1 (1 pulse received/1 injections)

## PROPORTIONAL TO REMOTE CURRENT SIGNAL mA

### FX CS/D • FXS CS/D

- Proportional dosing pump to remote mA signal
- Selection range 0/4...÷20mA or reverse
- Constant modes operations
- Strokes frequency adjustment 0÷100%
- Stroke length adjustment for injected volume regulation (only FX)
- Microcontroller technology, display and digital controls
- 3 LED display status: power, pulses and level
- Level control (Level switch upon request)

PROPORTIONAL MODES: Direct Or Reverse



## DOSING PUMPS WITH BUILT-IN CONDUCTIVITY PROPORTIONAL CONTROLLER

### FX CD/D • FXS CD/D

Dosing pumps with built-in conductivity controller, all in one enclosure.

Conductivity range: **0÷10mS** = 10.000μS (resolution 0,1mS);

Available ranges: **0÷1mS** = 1000 μS • **0÷100mS** = 100.000 μS

- Proportional and ON/OFF control modes
- Microcontroller technology, display and digital controls
- Direct or Reverse mode
- Delay working time
- Hysteresis regulation
- Strokes frequency adjustment 0÷100%
- Stroke length adjustment for injected volume regulation (only FX)
- Level control (Level switch upon request)



FWT dosing pumps with built-in CD controllers are provided with conductivity probe according to the controller measuring range. Please contact FWT sales office for conductivity probes characteristics.

## DOSING PUMPS WITH BUILT-IN PH-RX PROPORTIONAL CONTROLLER

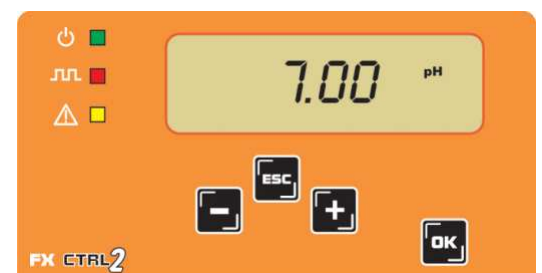
### FX CTRL2 • FXS CTRL2

These series includes is a simple and economic version of above CTRL3 unit which features two parameters all in one enclosure: PH or RX (ORP). **BENEFITS:** reducing stock value against a versatile economic solution.

⇒ **pH:** measuring range 0÷14,00 pH (resolution 0,01pH)

⇒ **RX:** measuring range: -1000÷ +1400 mV (resolution 1mV)

- Microcontroller, back-lit LCD graphic display, digital controls
- ON-OFF and Proportional modes
- Injection frequency adjustment, Stroke length adjustment (only FX)
- Level control (Level switch upon request)



CTRL2 is NOT provided with electrodes and sensors which are available upon request. Please contact FWT sales office for these items characteristics.

# DOSING PUMP WITH BUILD-IN PROPORTIONAL MULTIPARAMETER CONTROLLERS

## FX CTRL3a • FX CTRL3b

Three different controllers and a dosing pump into one enclosure with great advantage to stock only one model for 3 measuring parameters.

**pH:** measuring range 0÷14,00 pH (resolution 0,01pH)

**RX:** measuring range -1000÷ +1400 mV (resolution 1mV)

**Free chlorine\*:** range 0÷20,00 ppm (resolution 0,1ppm)

\*CL controller is suitable either with amperometric-potentiostatic membrane Chlorine sensors or open Chlorine cells (latter on request)

- Microcontroller technology, back-lit LCD display, digital controls
- Injection frequency adjustment
- Stroke length adjustment for injected volume regulation (only FX)
- Connectors: BNC for electrode and 4 pole IP65 for CL sensors
- 2 Reset modes: full reset - partial reset keeping calibration settings
- Level control (Level switch upon request).
- Proportional mode range value selection
- Delay adjustment - Delay at powering ON (electrodes polarization)
- Hysteresis regulation
- Password setting
- Calibration of mA output
- 4÷20 mA output for chart recorder
- Alarm functions:
  - Over dosing alarm value to prevent excess of chemical injection
  - Alarm for minimum or Maximum time for reaching set point
- Direct or Reverse mode (Alkaline or Acid, Oxidant or Reducing RX)
- Stand-by mode for cleaning electrodes and sensors or re-calibration

FX CTRL FEATURE TWO VERSIONS WITH TWO OPERATING MENUS:

### FX CTRL 3a (advanced)

ADVANCED MENU offers more measurements options and functions.

- Temperature measurement °C or °F
- Suitable for Temperature probe PT100
- Setting for proximity switch to stop operations in case of no water (in place of level control)
- Alarm functions and setting with relay output

### FX CTRL 3b (basic)

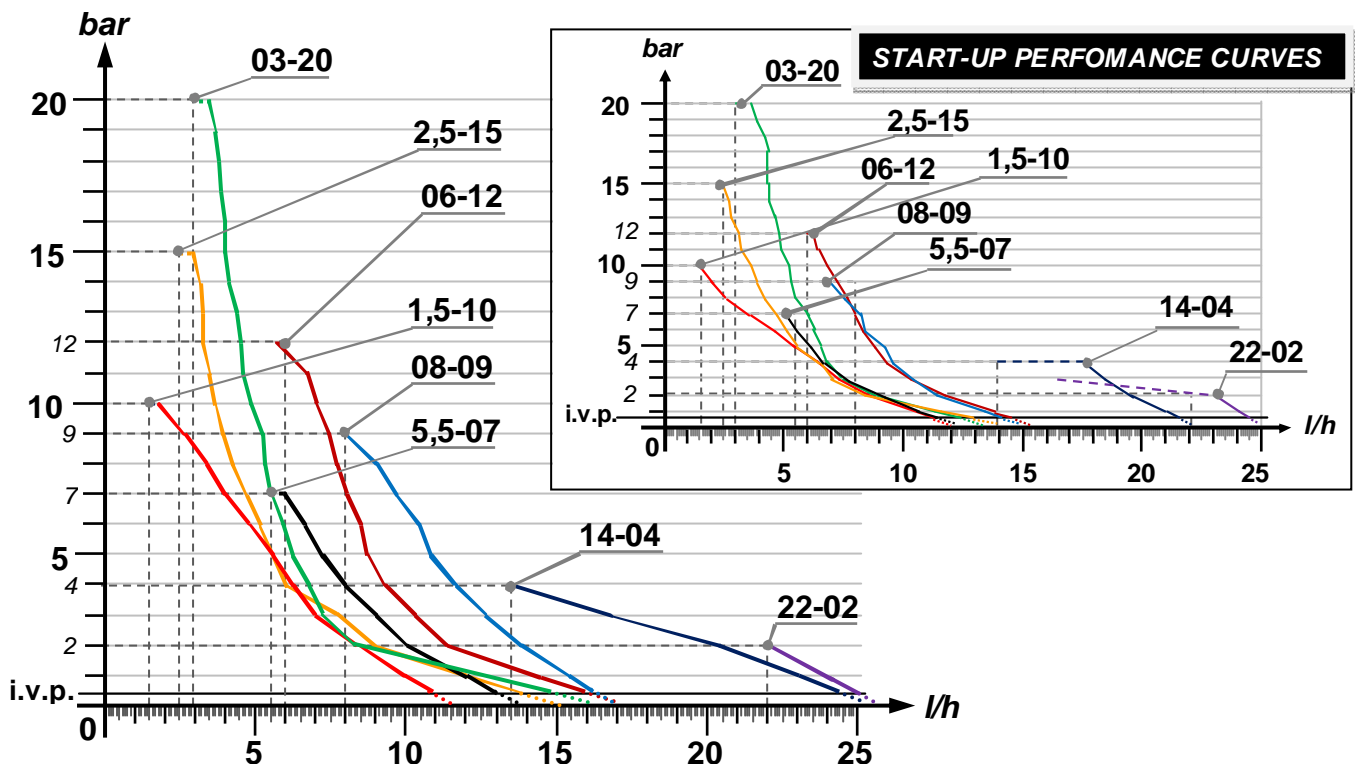
BASIC MENU for simple operations: without the functions listed in "advanced" operating menu.



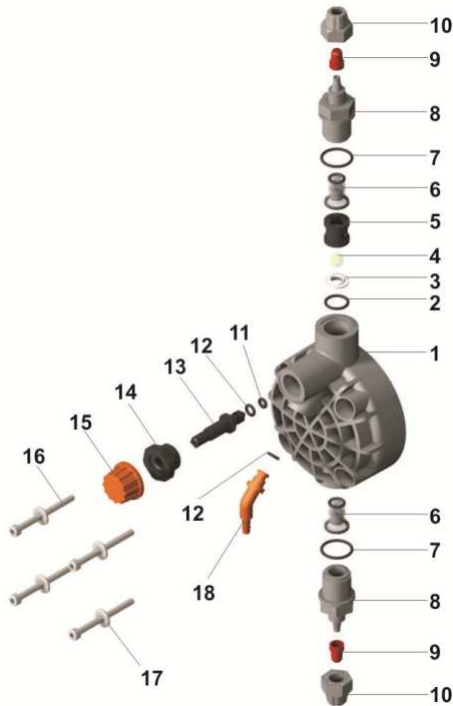
FX CTRL3 dosing pump with integral controller is NOT provided with electrodes and sensors which are available upon request. Please contact FWT sales office for these items.

## FX SERIES PERFORMANCE CURVES

Here in the following pages are shown FX series performance curves. Ratings can vary with a tolerance of 5÷10 % which must be taken into account when choosing the type of pump. Also variations occur when using a self-bleed or PMMA pump head (polymer dosing), pressure performances decreases consequently of about 50/65%. All flow rates indicated in the following diagrams are obtained testing the pump with medium hardness water at rated pressure, 1,5 m suction lift, room temperature. Diagrams indicate max metering pump flow variation in relation to working pressure in the plant; diagrams also include injection valve losses (I.V.P.).

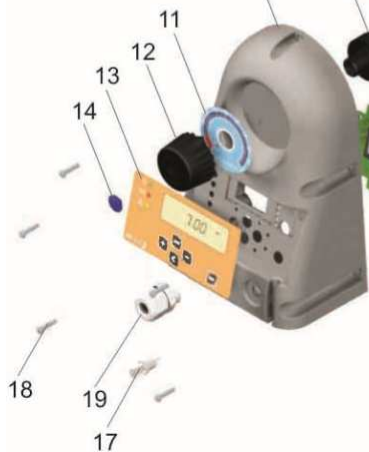


## EXPLODED VIEWS



**PUMP EXPLODED VIEW**

- 1. housing
- 2. solenoid
- 3/4/5/6/7/8/9. stroke adjustment assembly
- 10. back housing
- 11/12/14. stroke adjustment knob
- 13. front panel
- 17/18. back housing screws
- 19. power cable gland assembly



**PUMP EXPLODED VIEW**

- 20. controls PCB (printed circuit board)
- 21/23. PCB fixing screws
- 22. housing gasket
- 24. power PCB
- 25. solenoid connecting wires
- 26/27/28. service connector internal assembly
- 29. service connector
- 30. piston flange
- 31. solenoid screws
- 32. PTFE diaphragm
- 33. diaphragm / pump head O-RING
- 34. pump head

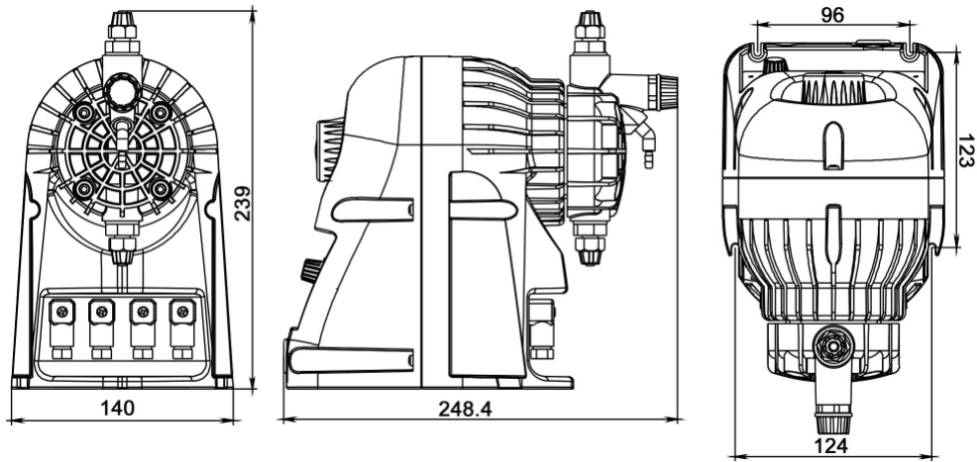
## FWT OTHER SOLENOID DRIVEN PUMP: MX SERIES



MX solenoid driven dosing pumps main characteristics are:

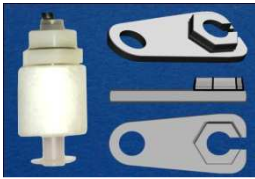
- **WALL MOUNTING HOUSING:** PP reinforced plastic housing, it includes a support bracket for easy quick mounting.
- **SMALL DIMENSIONS:** ready also for mounting into small cabinets and small environments.
- **PRICE AND QUALITY:** the new design allows a more competitive price but keeping the same quality of FX series.

## FX SERIES OVERALL DIMENSIONS (mm)



Approximate net weight **kg 2.3÷2.9**

### LEVEL SWITCH WITH FIXING BRACKET



### ACCESSORIES KIT

- ✓ 1 - Injection valve;
- ✓ 2 m - Discharge Hose PE semi-rigid;
- ✓ 2 m - Suction Hose PVC flexible;
- ✓ 1,5 m - Air Bleed Hose PVC flexible;
- ✓ 1 - Foot Valve/Filter

## FWT PRODUCTS AND ACCESSORIES

FWT offers also a wide range of accessories and sensors to guarantee a complete service such as:

- Safety relief/Anti-siphon valves • Pulsation dampeners • Suction and injection lances • Over voltage protection

### DOSING TANKS



### PULSE WATER METER



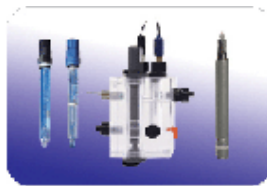
### MIXERS



### CONTROLLERS



### PROBES AND SENSORS



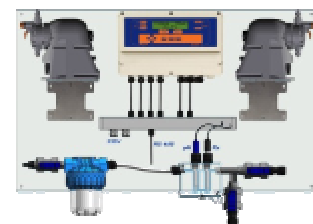
### PERISTALTICS



### MOTOR DRIVEN DOSING PUMPS



### COMPLETE DOSING / CONTROL PANELS



**FWT**  
fluid and water technology

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