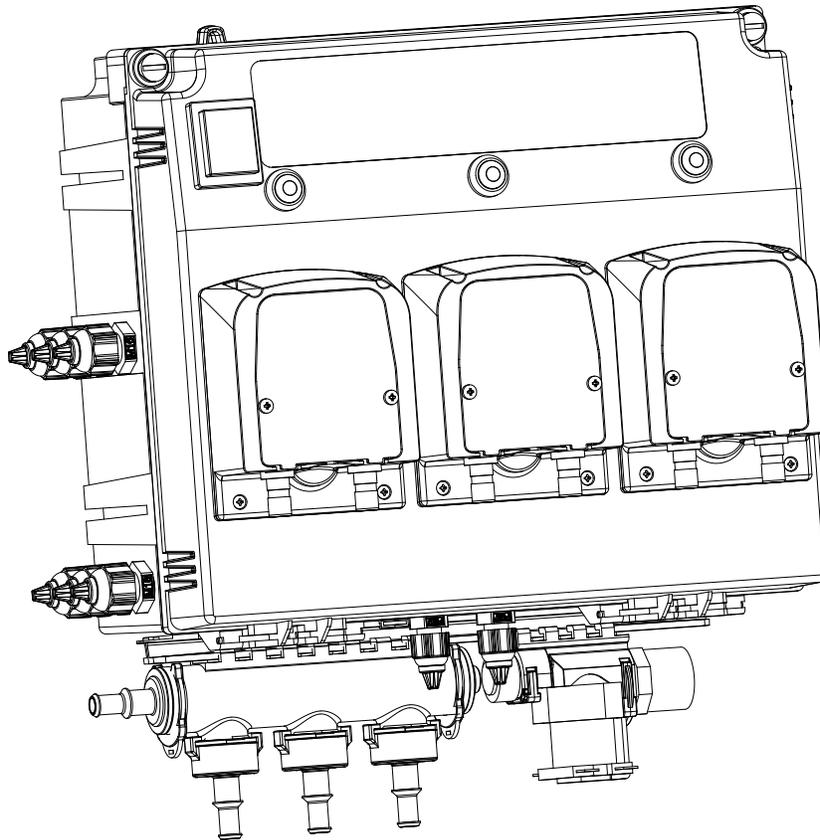
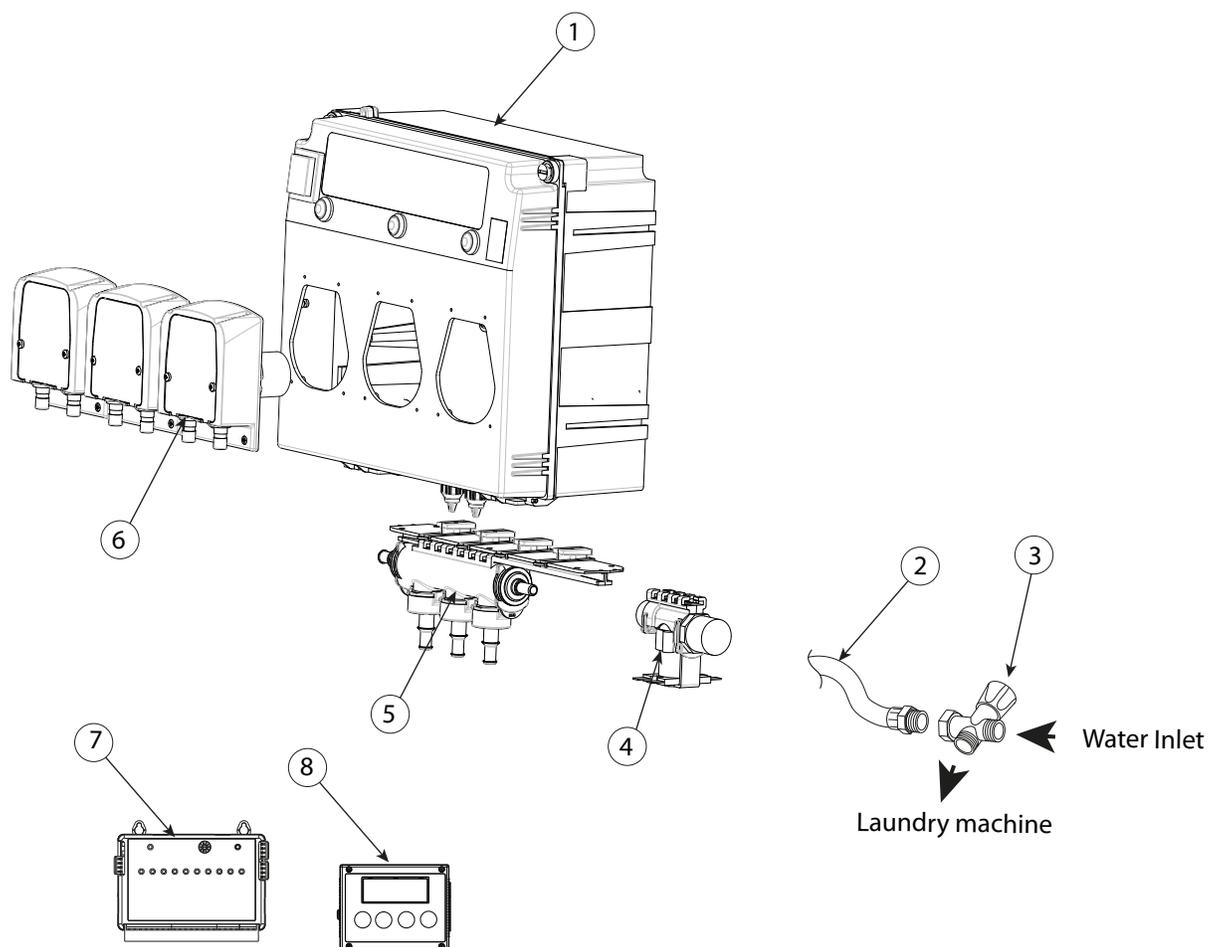


Smart EVO

Laundry system for automated dosing applied to industrial laundry machines controlled by microprocessor.



Assembly drawing of the Smart EVO System



1	Smart EVO boxes
2	Delivery tube 20 Bar (2m)
3	Water-faucet for water delivery
4	Solenoid valve
5	Flush kit
6	Peristaltic pump
7	SIM signal for connect the signal from laundry machine
8	Formula selector

1 Preliminary information...

1.1 WELCOME

With the Smart EVO system for industrial laundry machines, our company supplies a high-quality product suitable for all applications, simple to use.

➔ Pay special attention to the warnings and to the precautions pointed out in the manual.

1.2 CONTENTS OF THE PACKAGE

Before starting, check the contents of the package:

SMART EVO PLUS
Flushing manifold
Formula selector
2 off anti-tampering seals
Instruction manual
4 off anchor bolts $\varnothing=6$ mm, 2 off brackets for securing the pump unit in place
15 off plastic clamps for the hydraulic connections
Tube fitting $\varnothing 16$ mm for output from flush kit
2m of 20-wire cable (for connection of signals coming from the laundry machine).
5m of cable (for connection of power supply)
5m of 4-wire (for connection between Smart CPU and SIM Signal)
water-intake kit: water-faucet, delivery tube 2 m F3/4-F3/4 (optional 3-4-5 m).
1 off Sekobril tube for Surfactants

TECHNICAL SPECIFICATIONS

Power-supply requirements	85-230 Vac switching		
Maximum current absorption	60W (mod. H)	30W (mod. S)	9W (mod. P)
Flow rate of pumps	30/60/90/120 L/h	25 L/h (mod. S)	18 L/h (mod. P)
Voltage on SIM signal inputs	100÷240V Vac or 12÷36V, selectable for each signal		
Number of SIM signal inputs	10, opto-insulated		
Alarm output (optional)	Relay-type contact NC in an alarm condition, 250V 8A max		

1.4 WARNINGS

- ✎ Read this manual carefully before proceeding with the installation and starting up the SMART EVO System.
 - ✎ The dosing unit should be connected to the power supply by means of a single-pole breaker having an opening distance equal to or greater than 3 mm.
 - ✎ Check the model of the equipment purchased for the reference information contained in this manual for installing, setting and programming it.
- ✎ For all connections, refer to the diagram of the control circuit contained in this manual.
- ⚠ **CAUTION:** Always follow the appropriate safety procedures, including the use of suitable means for protecting the eyes, face, hands and clothing.
 - ⚠ **CAUTION:** Always disconnect the equipment from the power supply before carrying out the installation or any maintenance work on it.
- ➡ The factory is working constantly to improve all its products, and reserves the right to make changes at any time without prior notice.
 - ➡ Failure to comply with the instructions contained in this manual could cause damage to property or personal injury, prejudice proper functioning of the equipment or damage it.

1.5 MATERIAL REQUIRED FOR INSTALLATION

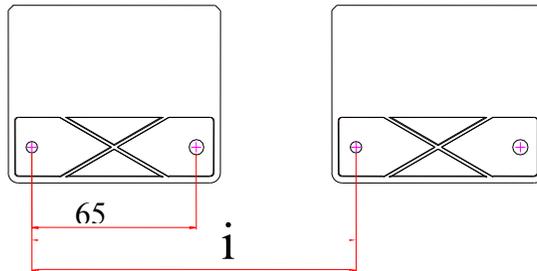
- Plastic clamps of various sizes for securing the tubes and cables in place
 - Adhesive plates for securing the clamps
 - PVC tube (for connecting the flush kit to the laundry machine)
- ➡ Other installation material is also available (see chapter 4, Maintenance and Accessories).

2 Installation

CAUTION: Do not install the equipment where it would be directly exposed to chemical vapours or fumes. DO not place it close to the sources of heat.

2.1 WALL MOUNTING

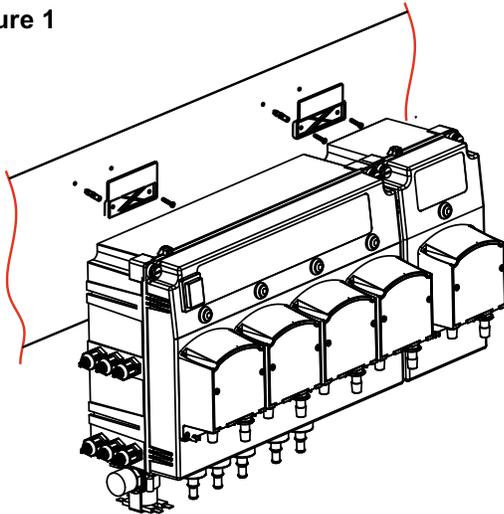
- Use the diagram shown below to define the distance between centres for drilling the holes, depending on the total length of the boxes.
- It is advisable to install the system at a height of about 1.5 metres from the ground, and in any case in the vicinity of the tanks.
- Fix the mounting brackets to the wall by means of the anchor bolts $\varnothing=6$ mm (**Picture 1**).
- After securing the brackets in place, hang the SMART EVO System from them, as shown in the Picture (**Picture 2**).



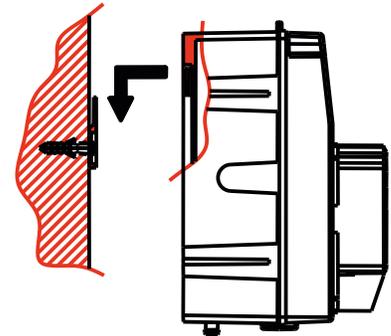
Long box L=375mm	Short box L=285mm
Key to distance between centers for drilling the holes	
1 long box.....	i= 190 mm
1 long box + 1 short box.....	i= 425 mm
2 long boxes.....	i= 564 mm
2 short boxes	i= 285 mm
1 long box + 2 short boxes.....	i= 659.5 mm

Take care to secure the brackets to the wall correctly, since any errors in centring them would make it difficult to mount the SMART EVO equipment.

Picture 1

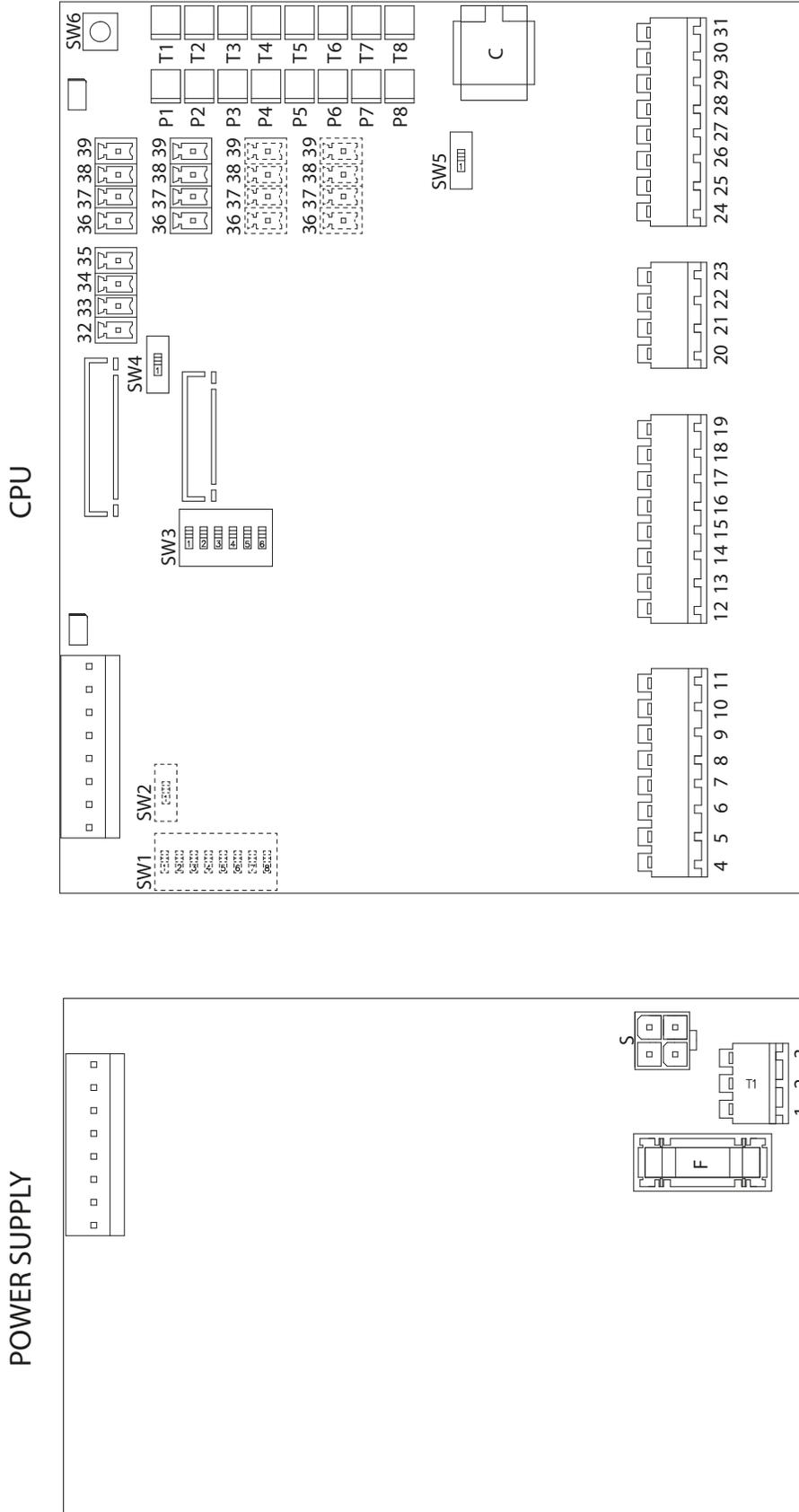


Picture 2



IF THE SURFACE OF THE WALL IS NOT PERFECTLY FLAT, MAKING IT DIFFICULT TO MOUNT THE BRACKETS, IT IS POSSIBLE TO SECURE THE BOX DIRECTLY TO THE WALL, DRILL THROUGH THE BREAKING LINES INSIDE EACH BOX AND FIX THE BOX TO THE WALL USING ANCHOR BOLTS $\varnothing=6$ MM. IN ORDER TO NOT PREJUDICE THE IP PROTECTION DEGREE, IT IS ADVISABLE TO APPLY SILICONE TO THE SCREWS INSIDE THE BOX.

2.2.1 POWER-SUPPLY UNIT AND CONTROL CIRCUIT DIAGRAM



ID	FEATURES	DESCRIPTION
1	POWER SUPPLY (L)	Power supply 100÷240 Vac
2	POWER SUPPLY (N)	
3	GROUND (GND)	
4	MOTOR 1 (V+)	Output voltage motor 1
5	MOTOR 1 (V-)	
6	MOTOR 2 (V+)	Output voltage motor 2
7	MOTOR 2 (V-)	
8	MOTOR 3 (V+)	Output voltage motor 3
9	MOTOR 3 (V-)	
10	MOTOR 4 (V+)	Output voltage motor 4
11	MOTOR 4 (V-)	
12	MOTOR 5 (V+)	Output voltage motor 5
13	MOTOR 5 (V-)	
14	MOTOR 6 (V+)	Output voltage motor 6
15	MOTOR 6 (V-)	
16	MOTOR 7 (V+)	Output voltage motor 7
17	MOTOR 7 (V-)	
18	MOTOR 8 (V+)	Output voltage motor 8
19	MOTOR 8 (V-)	
20	SOLENOID VALVE 1 (V+)	Output voltage solenoid valve 1 (solenoid valve of flushing manifold)
21	SOLENOID VALVE 1 (V-)	
22	SOLENOID VALVE 2 (V+)	Output voltage solenoid valve 2 (solenoid valve of flushing manifold)
23	SOLENOID VALVE 2 (V-)	
24	FLUX 1 (V+) – 5V	Input flow sensor 1
25	FLUX 1 – Signal	
26	FLUX 1 (V-) - GND	
27	FLUX 2 (V+) – 5V	Input flow sensor 2
28	FLUX 2 – Signal	
29	FLUX 2 (V-) - GND	
30	RELAY (COM)	Output alarm relay
31	RELAY (NO)	
32	COM BUS (V+)	Input / Output Upper Modbus communication
33	COM BUS (T+R+)	
34	COM BUS (T-R-)	
35	COM BUS (V-)	
36	COM BUS (V+)	Input / Output Lower Modbus communication (Input SIM Signal) (2 terminals available on S version, 4 terminals on H version)
37	COM BUS (T+R+)	
38	COM BUS (T-R-)	
39	COM BUS (V-)	
P1....P8	PRIME	Input priming switch for pump 1...8
T1....T8	TBA	Input Tube Break Alarm control (pump 1...8)
SW1	FLOWRATE SWITCH	Not used (used only for Smart-R version with pump H)
SW2	SETTINGS FLOWRATE SWITCH	Not used (used only for Smart-R version)
SW3	FLUSHING AND MODE SWITCH	Not used (used only for Smart-R version)
SW4	HIGH MODBUS IMPEDANCE MATCHING	Not used in standard installations
SW5	LOW MODBUS IMPEDANCE MATCHING	Not used in standard installations
SW6	RE-START	System reset button
C	CONSOLE	Input Programmer
S	SWITCH	Main switch
F	FUSE	Replace fuse with same type and value

☛ Leave the SWITCHES SW4 and SW5 on the “1” position. These switches are intended to improve the communication and to reduce noise in installations with very long cables (>50m). If you have long cables and are facing communication problems, you can try to solve the problem, sliding the IMPEDANCE MATCHING SWITCH to the “ON” position only for the first and the last device present on the bus. (i.e. the two devices farther away from each other). Leave instead the IMPEDANCE MATCHING SWITCH on the “1” position for all the other intermediate devices along the bus.

2.3 WIRING CONNECTIONS

⚠ CAUTION: Always disconnect the SMART EVO System and the laundry machine from the power supply before making any connections.

🔧 All the wiring connections to the SMART EVO System should be checked using a multimeter. Incorrect connections could seriously damage the unit and invalidate the warranty. Refer to the wiring diagram contained in this manual for all signalling and power-supply connections.

2.3.1 Power-supply input

Insert the cable included in the supply through the cable gland PG11 on the left-hand side of the box and make the connections of the wires, on the **Power-supply input** of the power-supply unit circuit (see point 2.2.1, **Diagram of power-supply unit circuit**).

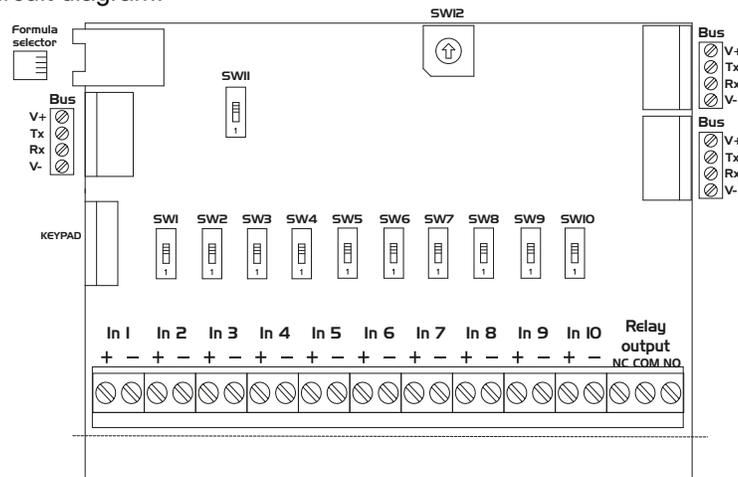
- **SMART EVO SWITCHING POWER-SUPPLY UNIT** (refer to the specific model purchased).

The system will accept power-supply voltages from 85 to 230 VAC, 50/60 HZ, two different power sizes available:

- 250W for H and S pumps
- 60W for P pump

2.3.2 Input signals and SIM signal

- Connect the wires of the 20-wire cable to the solenoid valves of the laundry machine.
- Connect the wires of the 4-wires cable to the Smart CPU in the ModBus terminal
- Observing the colour coding used, connect the outputs from the SIM Signal and the Smart CPU
- Observing the colour coding used, connect the outputs from the solenoid valves to SIM signal control inputs.
- Following the SIM Signal circuit diagram:



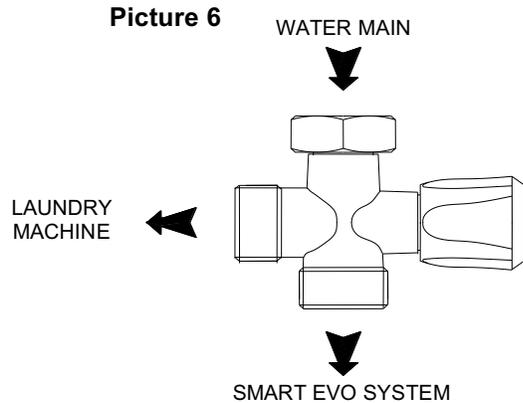
ID	DESCRIPTION
In1...In10	Input signal from solenoid valves of the laundry machine
Relay output	Relay output
Formula selector	Input formula selector controller
SW1...SW10	Sensitivity of input signal voltage switch: upward - 0 (100÷240V), downward - 1 (12÷36V)
SW11	Communication line impedance adaptation
SW12	Keep in the "0" position to a right communication with the system
Keypad	Input keypad
Bus (3 available)	Input/output ModBus communication (Connect one of the 3 terminals available of the SIM to one of the Lower ModBus terminals of the CPU).

🔧 If the signals from washing machine have the ground (GND) in common is enough to connect only one ground (GND) of one of the signals.

2.4 HYDRAULIC CONNECTIONS

2.4.1 Water-faucet

- Make the connection to the water main (cold water) by means of the water-faucet included in the supply, as shown in the diagram (**Picture 6**).



CAUTION: Look over the connections shown in the Picture. If the connections are made correctly, the valve will only control the flow rate of the water to the SMART EVO System. Delivery to the laundry machine will continue to be direct.

It is recommended to install the water-faucet included in the supply close to the main water-faucet. This will enable a good flow rate of water to the SMART EVO System even in the event of a low of pressure.

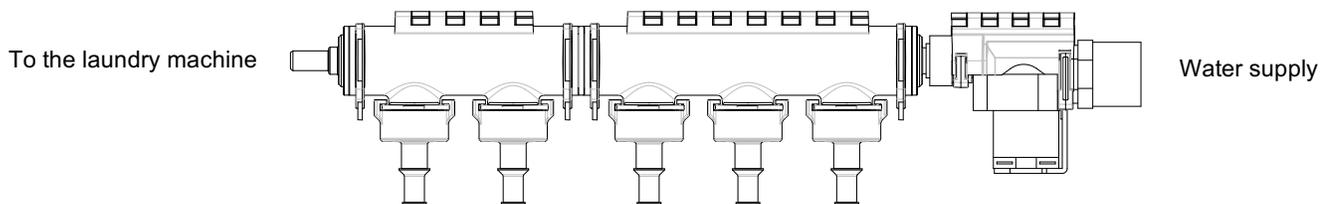
- Connect the delivery tube included in the supply (on “Plus” version only) from the output of the water-faucet to the solenoid valve of the SMART EVO System.
- Delivery tubes of other lengths are also available (see the section on Maintenance and Accessories).

2.4.2 Flush kit

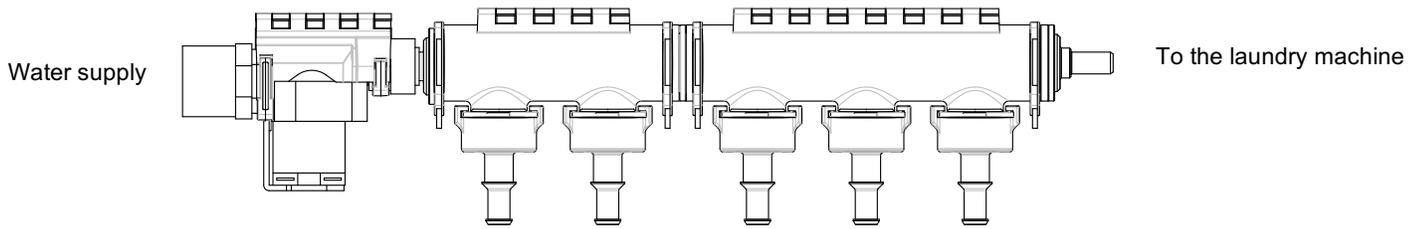
The flush kit factory-mounted under the SMART EVO System. It is, however, possible to install it separately, even in a vertical position, by means of the appropriate kit (see the section on Maintenance and Accessories). The flush kit is equipped with a valve for preventing return of the liquids, both towards the pumps and towards the solenoid valve.

- Connect the output end of the flush kit to the laundry machine by means of a tube with $\varnothing=8\text{mm}$ (it is also possible to make the connection with a tube with $\varnothing 16 \text{ mm}$, replacing the hose fitting with another provided as a kit, included in the supply). (**Picture7**)
Size of the output fitting from the flush kit, which can change depending on the models.

Picture 7



✎ It is possible to unmount the solenoid valve from one side of flushing manifold and to remount it on the other side depending on the position of the water supply on the wall. (left side or right side).



3 System Operation

3.1 Pump activation

The Smart EVO dosing system permits the use of a maximum of ten pumps plus flushing solenoid valve activation. Each input is independent of the others.

✎ Each input has a 1-second signal identification filter. This means that before the pump may be activated, the signal must remain active on the terminal board for a minimum time of 1 second.

✎ The SW3 dip-switch allows to select the functioning mode of the Smart and to program the flushing times. The first switch from the top allows to set the system as Normal or Relay, keep the switch in the left position (NORMAL NODE).



3.2 Pumps priming and tube loading

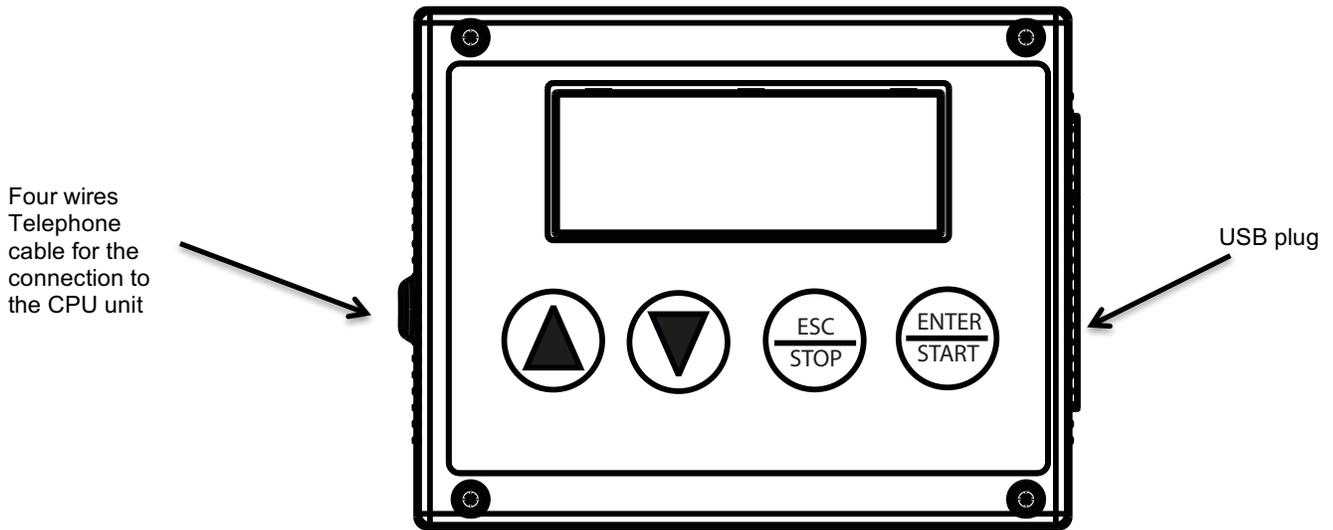
The buttons located above each pump are used for priming the related pump and also for loading a new peristaltic tube.

Priming: To prime a pump shortly press the button above the pump. The pump will be activated for 30 seconds. If you want stop the priming press again the same button.

Tube loading: If the button is pressed for more than 3 seconds the pump will start to move in steps to allow an easy loading of a new peristaltic tube. The function will be activated for 60 seconds. If you want stop the function press again the same button

✎ If present an input signal the Priming and Tube loading functions are disabled and pressing the button has no effects.

4 Formula selector



4.1 TECHNICAL SPECIFICATIONS

Power-supply	15VDC (supplied from the SIM or central unit)
Signal interface	RS-485
Length of connection cable	2 metres
Connector	4 wires telephone type (RJ11)
Weight	0.18 Kg
Class of protection	IP 65
Size	120x95x44 mm

4.2 DESCRIPTION OF THE OPERATIONS

The formula selector should be connected, using a phone cord, to the Smart's CPU or SIM card. Since the SIM and the Formula Selector are both close to the Washing Machine, normally the second solution is more convenient. The input for the phone cord is located on the left side of the system while on the right side is located the USB port for the Pen Drive used to download/upload the system files used to configure the apparatus and set the washing programs.

The system files can be created and downloaded to a USB Pen Drive using the programmer or the appropriate application software on your PC. For technical reasons, the capacity of the Pen Drive used must not exceed 8 GB.

Insert the Pen Drive containing the system files into the formula selector; the display will show the following message:

```
PEN INSERTED  
PSW: 0000
```

At this point, the formula selector will require the access password previously set with the programmer or with the software; press ▲ to modify the flashing digit then press ▼ to move to the next digit; once you have entered the correct password, press  to confirm. By default, the password is 0000.

4.2.1 PROGRAM WRITING: TRANSFER FROM THE PEN DRIVE TO THE SMART'S CPU

To download a system file into the Smart's CPU, you have to select the following option using the  key:

```
COMMANDS  
WRITE CPU
```

If the Pen Drive contains multiple files, select the appropriate file using the ▲ ▼ keys and then press the  key; the display will show the following confirmation message:

```
UPDATE AREA  
YES
```

Use ▲ or ▼ to choose whether to update the Smart's CPU using the selected file or not; if you confirm the operation, the file will start to load; the operation will take several seconds; the display will show the following message:

```
LOADING .DAT  
*****
```

When the file is completely loaded, the formula selector asks whether to overwrite the calibration parameters of the pumps too:

```
OVERWRITE CAL.  
NO?
```

Use ▲ or ▼ to choose whether to overwrite the pump's calibration parameters or not and then press  to confirm.

```
LOADING .DAT OK
```

When the file is completely loaded, press  to finish the operation.

4.2.2 PROGRAM READING: TRANSFER FROM THE SMART'S CPU TO THE PEN DRIVE

To read a system file into the Smart's CPU, you must first insert a Pen Drive into the formula selector and then select the following option using the  key:

```
COMMANDS  
READ CPU
```

The display will show the name of the file present into the Smart's CPU; press  to continue:

```
OVERWRITE AREA  
NO
```

Use  or  to choose whether to write on the Pen Drive or not; press  to confirm.

```
LOADING .DAT  
.....
```

After downloading the file on the Pen Drive, the formula selector asks whether to reset the statistics into the Smart's CPU or not:

```
RESET STATISTICS  
YES?
```

If you choose to reset the statistics, the formula selector will ask you to set the start date for the statistics that the Smart will memorize from now on; typically, this parameter should be set to today's date. Press  to modify the flashing item then press  to move to the next item. When finished, press  to confirm:

```
MODIFY DATA  
01.01.13
```

At the end, press again  to finish the operation.

4.2.3 STATISTICS READING: TRANSFER FROM THE SMART'S CPU TO THE PEN DRIVE

To read a statistic file into the Smart's CPU, you must first insert a Pen Drive into the formula selector and then select the following option using the  key:



```
COMMANDS
STATISTICS
```

The display will show the name of the file present into the Smart's CPU; press  to continue:

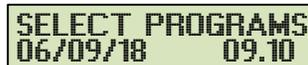


```
LOADING .STA
*****
```

4.3 OPERATING MODE

4.3.1 PROGRAM SELECTION USING THE MANUAL MODE

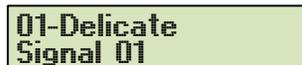
1. At system start-up the display shows the following message:



```
SELECT PROGRAMS
06/09/18 09.10
```

2. Press  or  to choose the washing program to start, according to the program name assigned by the programmer or software and press  to confirm; a Smart system can contain up to 50 different washing programs.

3. Once you have started a program, at the top of the display will flash the name of the selected washing program, while at the bottom of the display is shown the washing phase in progress: signals are expected to continue the washing or an indication of the dosage or of the waiting period in progress.



```
01-Delicate
Signal 01
```

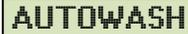
4. To pause the running program, press the  key. To reactivate it, press the  key.

5. If you press and hold down  for 2 seconds, the program execution is interrupted and the system returns to the home screen where you can select a new washing program from those available.

4.3.2 PROGRAM SELECTION USING AUTOWASH MODE

If the Smart has been configured in autowash mode with an appropriate system file, the operation and the Formula Selector display will be quite different.

1. At system start-up the display shows the following message:



AUTOWASH

Then the system waits for a combination of signals able to activate one of the washing programs, according to what is set into the system configuration.

2. Once the system recognizes a combination of signals from the washing machine, a valid combination to activate a washing program, at the top of the display will flash the name of the selected program, while at the bottom of the display is shown the washing phase in progress: signals are expected to continue the washing or an indication of the dosage or of the waiting period in progress:



01-Delicate
Signal 01

4.3.3 MENU UTILITY

Keep pressed for the least 3 seconds the  key to enter in the utility menu:



PSW: 0000

At this point, the formula selector will require the access password previously set with the programmer or with the software; press  to modify the flashing digit then press  to move to the next digit; once you have entered the correct password, press  to confirm. By default, the password is 0000.



MENU UTILITY
MODIFY DATE

Press  key to access at the date changing:



MODIFY DATE
06/09/18 09.10

Press  and  to modify the flashing item then press  to move to the next item. When finished, press  to confirm.



MENU UTILITY
RESET STATISTICS

Press  to reset the statistics.

5 Maintenance and Accessories

5.1 Maintenance

⚠ **CAUTION: Before carrying out any maintenance, always close the water delivery valve. If you need to access the circuits inside the box of the product, also disconnect the main power supply.**

Scheduled maintenance of the SMART EVO unit includes the following:

- Regular replacement of the peristaltic tube (every year at least) or whenever required in the event of chemical aggression.
- Cleaning of the filter of the solenoid valve.
- Cleaning of the bottom filters of the suction devices.

👉 **In order to avoid serious scaling, it is recommended that a few washing cycles should be carried out periodically, metering water only. This will eliminate any residues of product.**

5.1.2 Replacement of the peristaltic tubes

- Unscrew and remove the cover from the pump;
- Take out the peristaltic tube without disconnecting it from the connecting tubes in order to avoid any leak of product;
- Press for more than 3 seconds the button above the pump to activate the **Tube Loading functions** (see par. 3.3)
- Introduce the new tube (supplied already greased) into the pump and help it to get the right position, while the motor is moving in steps.
- When the tube is fully loaded, press again the button to stop the function.
- Put the front cover back into place and screw it.
- Proceeding very cautiously, disconnect the connecting tubes from the old tube and connect them to the new tube in the same positions;
- It will be advisable to prime the pump before starting the machine again. (see par. 3.3)

5.2 ACCESSORIES

The factory can supply a complete range of accessories for making the installation operations easier.

- Wall mounting kit for flush kit:
 - This is used to secure the flush kit to a wall, in a vertical position if required, so as to facilitate drainage of the liquids. The kit includes 2 mounting brackets, 2 anchor bolts - \varnothing 6 mm - and 5 metres of PVC piping \varnothing 8x12mm.
- Delivery tube, 20 bars. 3/4F-3/4F, available in the following lengths:
- 20-wire cable (different lengths available)
- PVC crystal piping \varnothing 8x12mm (different lengths available)
- anti-tampering seals

6 Alarm list

Alarm	Number of consecutive bip from buzzer	Message on the display during the alarm	Cause	Solving
Level alarm	1	ALM LL	Low level of chemical product	Restore the chemical product
Flushing alarm	2	ALM FL	Lack of water passage	Check the water supply
Tube break alarm	3	ALM TB	Tube breaking	Restore the tube in the peristaltic pump (in the meantime the pump is stopped)
Configuration failure alarm	4	ALM CF	Device disconnected	Check and connect the device disconnected (in the meantime the pump is stopped) otherwise press the switch SW6 to reset the system.
Motor failure alarm	5	ALM FM	Motor disconnected or under stress	1. Check if the motor is connected 2. Check if the chemical product is too viscous 3. Check if the peristaltic tube is hardened.

To mute the alarm buzzer press the  key, passed 1 minute the alarm buzzer sounds again.

7 Trouble-shooting guide

7.1 One or more pumps are not working:

If one or more pumps do not carry out the dosing during normal operation, check the following:

- Make sure that the pump is correctly connected to the circuit.
- Make sure that the Led dedicated to the related signal is lighted on the SIM.
- Make sure that the address selector on the SIM is set to 0.
- Make sure that the connections of the Lower Bus are well made (check the wire colours).

7.2 The pumps are running but the product is not dosed

- Check the suction tube for any kinks.
- Check the bottom valves of the suction devices to see if they are clogged.
- Check the peristaltic tube wear.

7.3 No Flushing

If there is no water flushing, check the following:

- Make sure that there is a proper flow of incoming water.
- Make sure that the water faucet is open.
- Make sure that automatic flushing has been correctly set with the related dip-switches.

7.4 The system is not working as expected

- Make sure that the system is set in R mode, using the related dip-switch.

7.5 No priming when pressing the button

Make sure that no signal from the washing machine is present. (Priming is disabled in this case).