

FLS M9.50

BATCH CONTROLLER



SAFETY INSTRUCTIONS

General Statements

- Do not install and service the product without following the Instruction Manual.
- This item is designed to be connected to other instruments which can be hazardous if used improperly. Read and follow all associated instrument manuals before using with it.
- Product installation and wiring connections should only be performed by qualified staff.
- Do not modify product construction.

Installation and Commissioning Statements

- Remove power to the instrument before wiring input and output connections.
- Do not exceed maximum specifications using the instrument.
- To clean the unit, use only chemical compatible products.

PACKING LIST

Please verify that the product is complete and without any damage.
The following items must be included:

- M9.50 batch controller
- Instruction Manual for M9.50 batch controller

DESCRIPTION

The new FLS M9.50 is a electronic device dedicated to control accurately batching or blending of different liquids. A 4" wide full graphic display shows measured values clearly and a lot of other useful information. Moreover, thanking to a multicolor display plus a powerful backlight, batching status can be determined easily from afar also. A tutorial software guarantees a mistake-proof and fast set up of every settings. Few advanced options are available to increase precision as well as timing of batch. Possibility of setting different volumes (up to 10 batches) correlated to specific calibration factors maximizes system flexibility guaranteeing highest level of accuracy. A proper package of outputs grants to control and to monitor the batching system remotely.

CONNECTIONS TO INSTRUMENTS

	F3.00	F3.20	F6.30	F3.10	F3.05	F6.60	F6.61	F111
M9.50	X	X	-	X	-	X	X	X

	ULF	F3.80	pH/ ORP200	pH/ ORP400	pH/ ORP600	pH/ ORP800	C150/ 200	C100/ C300	C6.30
M9.50	X	X	-	-	-	-	-	-	-

TECHNICAL DATA

General

- Associated sensors: FLS hall effect flow sensors with frequency output or FLS F6.60 flow magmeter family
- Materials:
 - Case: ABS
 - Display window: PC
 - Panel & Wall gasket: silicone rubber
 - Keypad: 5-button silicone rubber
- Display:
 - LC full graphic display
 - Backlight version: 3-colors
 - Backlight activation: User adjustable with 5 levels of timing
 - Update rate: 1 second
 - Enclosure: IP65 front
- Flow input range (frequency): 0÷1500Hz
- Flow input accuracy (frequency): 0,5%

Electrical

- Supply Voltage: 12 to 24 VDC \pm 10% regulated
- Maximum current consumption: 300 mA
- FLS hall effect flow Sensor power:
 - 5 VDC @ < 20 mA
 - Optically isolated from current loop
 - Short circuit protected
- 2 x Solid State Relay output:
 - Optically isolated, 50 mA MAX sink, 24 VDC MAX pull-up voltage
 - Max pulse/min: 300
 - Hysteresis: user selectable
 - User selectable as: Two-stage shutdown, Source Solution Volume Warning, overrun or missing signal alarm
- 2 x Relay output:
 - Mechanical SPDT contact
 - Expected mechanical life (min. operations): 10^7
 - Expected electrical life (min. operations): 10^5 N.O./N.C. switching capacity 5A/240VAC
 - Max pulse/min: 60
 - Hysteresis: User selectable
 - User selectable as:
 - OUT1 - Option: Two-stage shutdown, Source Solution Volume Warning, overrun or missing signal alarm
 - OUT2 - Batch: Batch in progress indication

Environmental

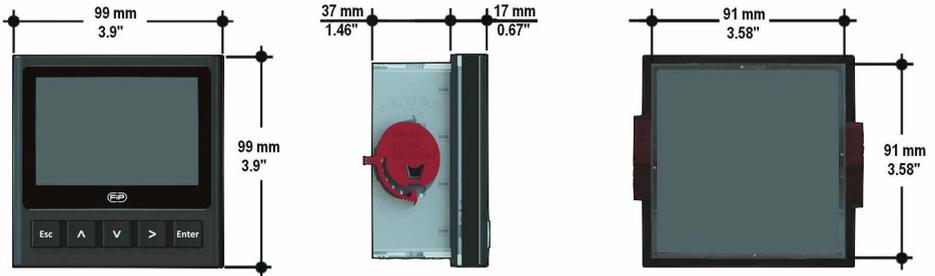
- Operating temperature: -20 to +70°C (-4 to 158°F)
- Storage temperature: -30 to +80°C (-22 to 176°F)
- Relative humidity: 0 to 95% not condensing

Standards & Approvals

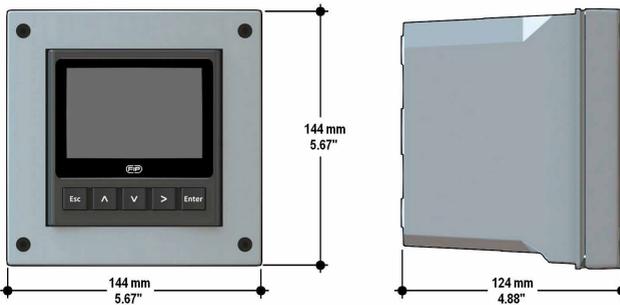
- Manufactured under ISO 9001
- Manufactured under ISO 14001
- CE
- RoHS Compliant
- EAC

DIMENSIONS

PANEL MOUNTING



WALL MOUNTING

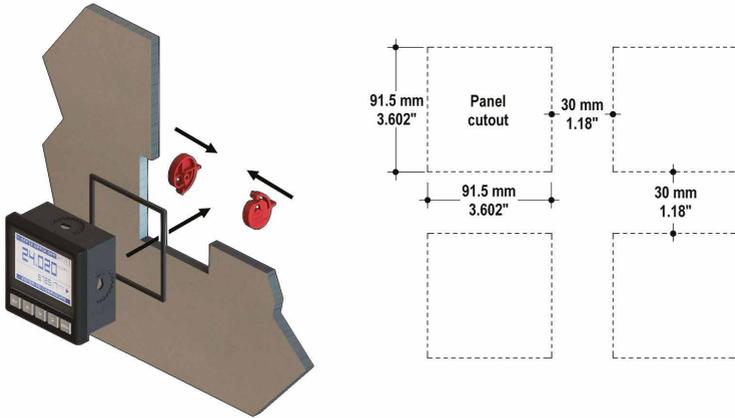


INSTALLATION

Mechanical installation

The Batch Controller M9.50 is available just in one packaging for panel or wall installation. The panel version is installed using the panel mounting kit (M9.SN1), while the wall mounting version is got fixing the panel mounting version on the wall mounting kit (M9.KWX). The mounting kits can be ordered directly connected to the monitor or separately and then simply installed on it.

Panel installation



Fix instrument on the panel rotating by hand the fixing snails (M9.SN1).

Wall installation

Use the panel mounting kit (M9.SN1) to fix the M9.50 on the dedicated frontal cutout of the wall mounting kit (M9.KWX).



Tighten front screws of box and waterproof connectors of cables, internally mount caps on screw sites to get a IP65 watertight installation.

WIRING

General recommendation

Always ensure the power supply is switched off before working on the device. Make wiring connections according to wiring diagrams.

- Terminals accept 26 to 12 AWG (0.08 to 2.5 mm²)
- Strip around 10 mm (0.4") of insulation from the wire tips and tin bare ends to avoid fraying.
- Ferrules are suggested when connecting more than one wire to a single terminal.

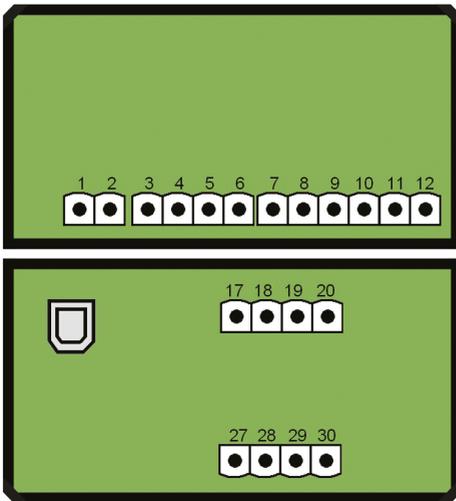


- Remove the upper part of the terminals for an easy cabling.
- Insert wire tip or ferrule completely into the terminal and fix with the screw until finger tight.
- Do not route the sensor and DC power, cables in conduit containing AC power wiring. Electrical noise may interfere with sensor signal.
- Routing the sensor cable in grounded metal conduit can help prevent electrical noise and mechanical damage.
- Seal the cable entry points to prevent moisture damage.
- In case of malfunctioning of the instrument due to radio interferences, use shielded cables and on the DC power cable is suggested to apply the ferrite producing two opposite (180 °) coils on both wires (positive and negative)

Wall Installation

Pull the electrical cables through liquid tight connectors.
 Use electrical cables with the proper external diameter for the liquid tight connector.
 PG11/PG9: external diameter between 2-7 mm (0.079-0.276")

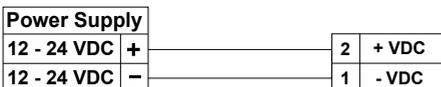
REAR TERMINAL VIEW



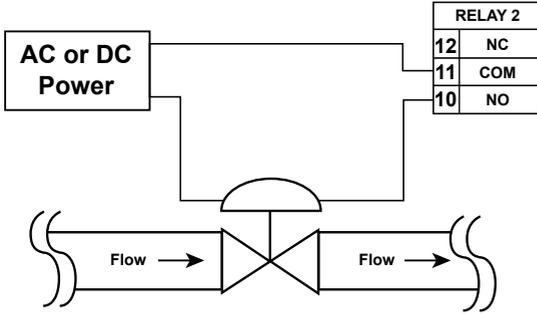
1	-VDC	Power Supply
2	+VDC	
3	NO	SSR2
4	COM	
5	NO	SSR1
6	COM	
7	NO	RELAY1
8	COM	
9	NC	RELAY2
10	NO	
11	COM	
12	NC	
17	GND	Remote control
18	RESUME	
19	START	
20	STOP	
27	+V	Flow Sensor
28	FREQ IN	
29		
30	GND	

Refer to dedicated sensor manual for its wiring.

POWER WIRING DIAGRAM



RELAY2 - BATCH RELAY WIRING DIAGRAM

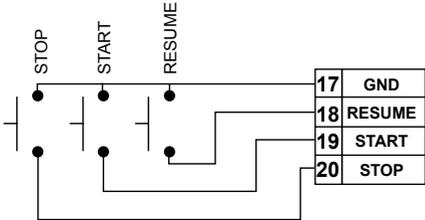


RELAY 2	
12	NC
11	COM
10	NO

- Max voltage rating: 5A @ 240 VAC resistive load.
- To reduce the possibility of noise interference, do not route signal cables together with AC power cable.

REMOTE CONTROL WIRING DIAGRAM

Rear START, STOP and RESUME terminals are use for remote batch control using one of next methods:



Mechanical switch contact (like in the drawing)

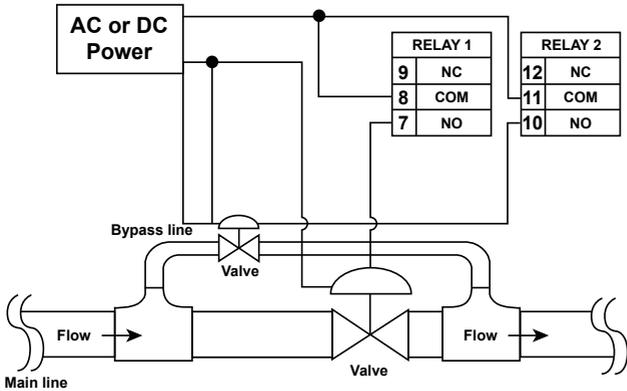
17	GND
18	RESUME
19	START
20	STOP

USB PORT

A USB port (type B) is available on the M9.50 PCB. The USB connection allows the updating of device software. To do updating it is necessary to have: USB cable (M9.KUSB); the interface software "FLS Calibration System" and the new updating software for M9.50 which are both freely downloadable from FLS website (www.flsnet.it) on product profile.

RELAY1 - OPTION RELAY WIRING DIAGRAM

A. Two Stage Shutdown Option

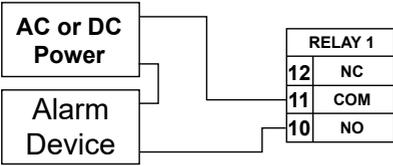


RELAY 1	
9	NC
8	COM
7	NO

RELAY 2	
12	NC
11	COM
10	NO

- Max voltage rating: 5A @ 240 VAC resistive load.
- To reduce the possibility of noise interference, do not route signal cables together with AC power cable.

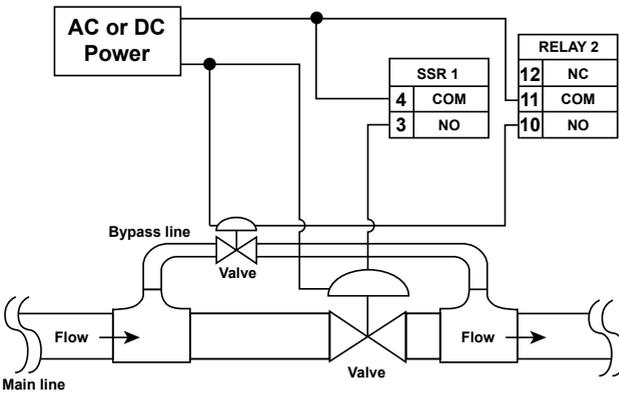
B. NO Signal Alarm OR Overrun Alarm Option



- Max voltage rating: 5A @ 240 VAC resistive load.
- To reduce the possibility of noise interference, do not route signal cables together with AC power cable.

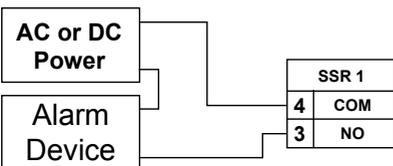
SOLID STATE RELAY 1 OR 2 - OPTION RELAY WIRING DIAGRAM

A. Two Stage Shutdown Option



- Optically isolated, 50 mA MAX sink, 24 VDC MAX pull-up voltage.
- To reduce the possibility of noise interference, do not route signal cables together with AC power cable.
- Same connections for SSR 2.

B. NO Signal Alarm OR Overrun Alarm Option

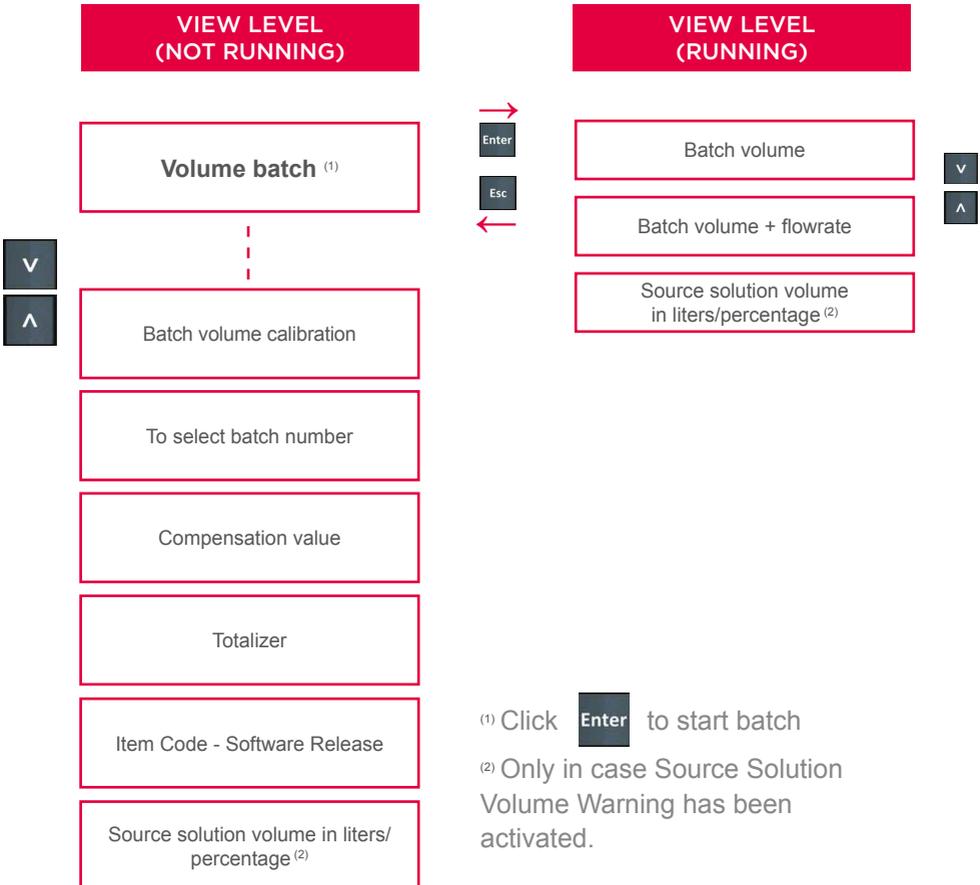


- Optically isolated, 50 mA MAX sink, 24 VDC MAX pull-up voltage.
- To reduce the possibility of noise interference, do not route signal cables together with AC power cable.
- Same connections for SSR 2.

OPERATIONAL OVERVIEW

The M9.50 batch controller features a full graphic display and a five-button keypad for system set-up, calibration and operation. Full graphic display has a white backlight during standard conditions, a red backlight in case a set alarm is activated (OVERRUN AND MISSING SIGNAL ALARM; always with priority), a green backlight during the batch performing. The SOURCE SOLUTION VOLUME WARNING doesn't affect the backlight color. The M9.50 is able to store 10 different batches with 10 different correlated k-factors.

BATCH PERFORMING



**VIEW LEVEL
(NOT RUNNING)**

Volume batch



Batch volume calibration ⁽³⁾

Compensation value

Totalizer ⁽⁴⁾

Item Code - Software Release

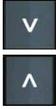
To select batch number ⁽⁵⁾

**Source solution volume
in liters/percentage** ⁽⁶⁾

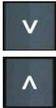


MENU DIRECTORY

Settings



Calibration



Outputs



Options



Setting view

⁽³⁾ Click  to enter the setting batch volume

⁽⁴⁾ Resettable totalizers can be reset using  on view level

⁽⁵⁾ Click  to choose the batch to be performed among set batches

⁽⁶⁾ Only in case Source Solution Volume Warning has been activated.

MENU LEVEL

▼	Installation Data
▲	Flow Unit
	Volume Unit
▼	Compensation ⁽⁷⁾
▲	Auto Calibration ⁽⁷⁾
	Custom K factor ⁽⁷⁾
	1 SSR
▼	2 SSR
▲	1 RELAY
	Test Output

	Language
	Filter
	Backlight
▼	Flow Rate Decimal Point
▲	Password ⁽⁸⁾
	Asec
	Counter
	Default Data
	Contrast
	Outputs Activation
	Software upgrade

▼	Sensor Type
▲	Pipe Parameter
	Pipe Diameter
	Internal Diameter
	K-factor ⁽⁹⁾

⁽⁷⁾ Click **>** to choose batch number which has to be fine-tuned

⁽⁸⁾ password combination:



⁽⁹⁾ in case of installation on PVCC pipes, the K factor values are referred to T fittings type TFIFXXDC/BC

EDIT LEVEL

PUSH BUTTON



to modify an item



to scroll right



to return to Menu without saving



to save new settings

OUTPUT MODE

The M9.50 Batch Controller features 2 solid state relays and 2 mechanical relays. 2 RELAY is dedicated only for managing of batch system.

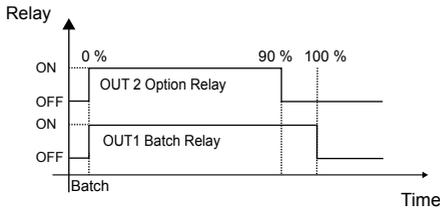
PROCEDURE FOR OUTPUTS SETTING

- go to the "Options" menu
- enter into the "Outputs activation" sub menu
- enable output(s)
- go to the "Outputs" menu
- set the operating mode for each enabled output

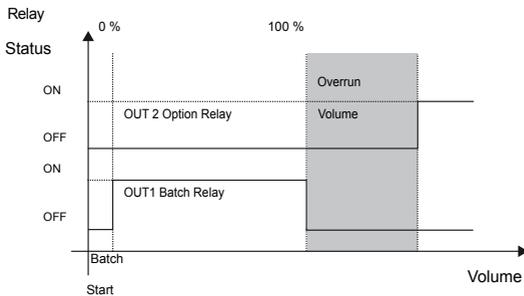
			
<p>Monitor without digital output activated</p>	<p>In case a digital output is enabled, a icon will appear</p>	<p>In case a digital output is set, icon reports the operating mode</p>	<p>In case set digital output is activated, the icon will turn to black (display turns green in case output is set to manage an external device, red to indicate a activated output as alarm)</p>

Digital outputs (1 RELAY, 1 SSR, 2 SSR) can be set in the following way:

TWO STAGE SHUTDOWN (green backlight) - (icon reports TWO)

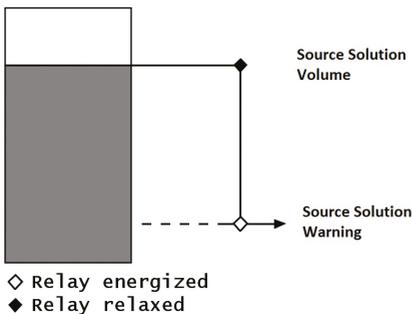


OVERRUN ALARM (red backlight) - (icon reports OVR)



SOURCE SOLUTION VOLUME WARNING (icon reports SSW)

The Source Solution Volume is the total volume of the main container from which system doses solution. Operator can set a warning (Source Solution Volume Warning) related to a critical remaining volume. Source Solution Warning doesn't stop the running Batch. At the end of the last Batch, monitor has to reset locally (no remote reset allowed).



NO SIGNAL ALARM (red backlight) - (icon reports NOS)

No flow detected during batch operation after a set timing period.

SOFTWARE UPDATING

In order to update the Instrument Software with a New Firmware Release follow the suggested procedures:

TO UPDATE INSTALLED UNITS

- Download the interface software "FLS Calibration System" and the Updated Software on www.flsnet.it
- Launch the software "FLS Calibration System" on the laptop
- Select OPTION and then UPGRADE FIRMWARE
- Confirm the "Firmware Upgrade" procedure by ENTER
- Connect M9.50 to the laptop by the USB cable
- Select the item (M9.XX) which appears on the "Navigation" area on the "FLS Calibration System" software
- Confirm FW UPGRADE and select the Updated Software

NOTE: At the end of the procedure restart the instruments in order to refresh M9.50 software (It takes 90 seconds to refresh the SW. Please do not interrupt the restarting process).

TO UPDATE NEW UNITS

- Download the interface software "FLS Calibration System" and the updated software on www.flsnet.it.
- Launch the software "FLS Calibration System" on the laptop
- Push together ENTER and ESC powering the monitor
- Connect M9.50 to the laptop by the USB cable
- Select the item (M9.XX) which appears on the "Navigation" area on the software "FLS Calibration System"
- Confirm FW UPGRADE and select the Updated Software

NOTE: At the end of the procedure restart the instruments in order to refresh M9.50 software (It takes 90 seconds to refresh the SW. Please do not interrupt the restarting process).

ORDERING DATA

Part No.	Description /Name	Power supply	Wire power Technology	Sensor Input	Output
M9.50.P1	Panel mount Batch controller	12 - 24 VDC	-	Flow (Frequency)	2*(S.S.R.), 2*(mech. relay)
M9.50.W1	Wall mount Batch controller	12 - 24 VDC	-	Flow (Frequency)	2*(S.S.R.), 2*(mech. relay)
M9.50.W2	Wall mount Batch controller	110 - 230 VAC	-	Flow (Frequency)	2*(S.S.R.), 2*(mech. relay)

ACCESSORIES

Part No.	Name	Description
M9.KW1	Wall mounting kit	144x144mm plastic box for wall installation of all panel mount monitors
M9.KW2	Wall mounting kit with power supply	144x144mm plastic box and 110/230VAC to 24 VDC power supply for wall installation of all panel mount monitors
M9.KUSB	USB cable for device interfacing	USB cable dedicated to FLS products, 1,5 meter long

SPARE PARTS

Part No.	Name	Description
M9.SN1	Fixing snails	2 fixing snails for panel installation of FLS monitors



FIP - Formatura Iniezione Polimeri S.p.A.

Loc. Pian di Parata
16015 Casella
Genova - Italy
Tel. +39 010 96211
Fax +39 010 9621209
www.flsnet.it