



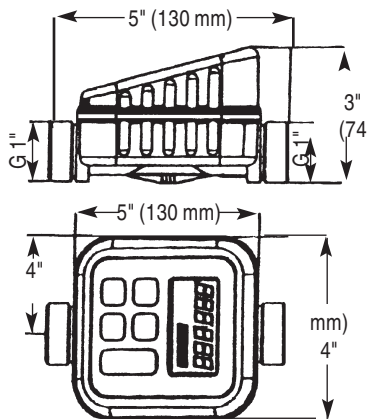
VOLUMETRIC FLOW METER/ BATCH CONTROL

OPERATION AND
SERVICE GUIDE
O-174
APRIL 2001

! Before operating this equipment, the operator should thoroughly read and understand all instructions and safety warning labels including the manufacturer's instructions on the material being pumped.

SECTION 1: GENERAL FLOW METERS (CE)

1. Flammable or combustible liquids are prohibited from being pumped through the flow meters as this may cause injury, fire or death.
2. All federal, state and local safety codes should be followed.
3. Check chemical resistance chart to be sure of compatibility.
4. Never use the flow meters on lines above the designated safety pressures.
5. Make sure the flow rates are within the meter parameters.
6. The operator should wear suitable protective clothing including: face mask, safety shield or goggles, gloves, apron and safety shoes.
7. All connections must be properly in place and tightened securely. Clamps are required on all hoses and must be properly tightened.
8. Liquids should be clean and not carry any suspended particles.
9. Never leave the unit unattended during operation.
10. Flow meters can be used in conjunction with all SERFILCO LTD. pump ends. They can also be used in systems where SERFILCO flow meters parameters are met.
11. If there are any questions regarding safety procedures - STOP - Do not start the meter. Check with your safety engineer or SERFILCO Sales Department before starting.



TYPE	UNIT	430
Principle of Measurement		Radial turbine
Material of Construction		PP or PVDF
Flow Capacity	GPM (lpm)	4-30 (15-120)
Operating Pressure	PSI (bar)	58 (4)
Bursting Pressure	PSI (bar)	145 (10)
Measurement Accuracy	%	+/-1
Accuracy of Repeating	%	+/-0.8
Temperature Range	°F (°C)	14 to 104 (-10 to 40)
Connection Thread		1" external thread - NPT
Line 1 Indication Line		6 digit, 1/2" (12 mm) high
Line 2 Indication Line		6 digit, 1/4" (6 mm) high
Maximum Viscosity	CPS	20 CPS

SECTION 2: FLOW METER CONNECTION

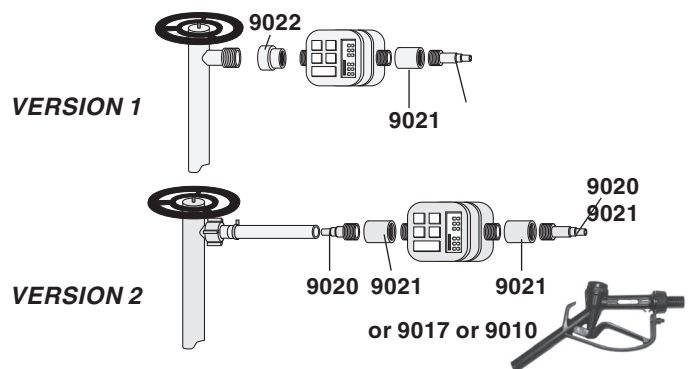
Accessories included with all Inline Flow Meters

PP units

Description	Qty.	Part No.
SS hose clamp	(2)	9004
PP 1" (25.4 mm) hose barb	(2)	9020 PP
PP 1" x 1" (25.4 mm x 25.4 mm) coupling	(2)	9021 PP
PP 1.25" x 1" (31.75 mm x 25.4 mm) coupling	(1)	9022 PP
No. 5 Rectorseal® pipe thread sealant	(1)	9023

PVDF units

Description	Qty.	Part No.
SS hose clamp	(2)	9004
PVDF 1" (25.4 mm) hose barb	(2)	9020 PVDF
PVDF 1" x 1" (25.4 mm x 25.4 mm) coupling	(2)	9021 PVDF
PVDF 1.25" x 1" (31.75 mm x 25.4 mm) coupling	(1)	9022 PVDF
No. 5 Rectorseal® pipe thread sealant	(1)	9023



SMART FLOW METER

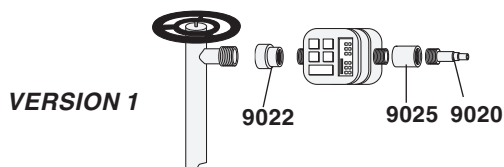
Included with all SMART Flow Meters

PP units

Description	Qty.	Part No.
SS hose clamp	(1)	9004
PP 1" (25.4 mm) hose barb	(1)	9020 PP
PP 1" x 1.25" (25.4 mm x 31.75 mm) coupling	(1)	9022 PP
No. 5 Rectorseal® pipe thread sealant	(1)	9023
PP 1" (25.4 mm) check valve	(1)	9025 PP

PVDF units

Description	Qty.	Part No.
SS hose clamp	(1)	9004
PVDF 1" (25.4 mm) hose barb	(1)	9020 PVDF
PVDF 1" x 1.25" (25.4 mm x 31.75 mm) coupling	(1)	9022 PVDF
No. 5 Rectorseal® pipe thread sealant	(1)	9023
PVDF 1" (25.4 mm) check valve	(1)	9025 PVDF



SERFILCO recommends using No. 5 Rectorseal pipe thread sealant. Apply thick, even coat to all male pipe threads. Hand tighten coupling. Then, torque 1/4 to 1/2 turn with a wrench so the threads seal. If leaks persists, tighten another 1/4 to 1/2 turn until threads seal.

The enclosed couplings allow either set-up labeled below. Version 1 is recommended for all SMART Flow Meters. The inline flow meters can be set up with Version 1 or Version 2. Note: The PP hand nozzle (9017 or 9010) can be used in conjunction with Version 2 in place of the PP hose barb (9020).

SECTION 3: INLINE FLOW METER (PP, PVDF) CE

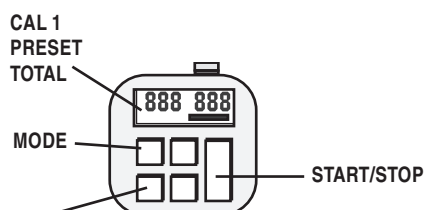
Authentication of the meter

STEP 1: Press **MODE + UP (directional) + START/STOP** keys. The display should show SP, INC. This ensures the correct electronics package is included.

Description of buttons

MODE key - changes between TOTAL and CAL.

Once in the CAL line, the MODE key will also switch between CAL 1 and CAL 2.



TOTAL key - switches between TOTAL 1, 2, 3

UP and DOWN directional arrows - changes desired quantities in the CAL line.

START/STOP key - illuminates the meter.

Descriptions of the functions

CALIBRATION - calibrates the viscosity and specific gravity. CAL 1 is set for water by the factory and cannot be changed. CAL 2 can be changed for liquids up to 20 cps.

TOTAL key - changes between the TOTALS, which show a running count of the volume transferred through the meter. These cannot be changed.

Calibration of the Inline Flow Meter (PP, PVDF) CE

STEP 1: Connect the meter to the appropriate adaptors or nozzle. See Section 3.

STEP 2: Press the **START/STOP** key. The display should illuminate.

STEP 3: Hold the **MODE** key until the lower left readout switches to CAL 1. Press **MODE** again to change to CAL 2. (*Remember that CAL 1 cannot be changed*) The display should read 0.00 on the top (large) and 1000 on the bottom (small) readout.

STEP 4: Turn the motor on and allow a liquid to pump into a vessel of known size. When the vessel is filled to the appropriate level; a) turn the motor off or b) close the hand nozzle, so liquid no longer passes through the meter.

STEP 5: Use the appropriate directional arrows so the bottom (smaller) readout equals the known vessel size. (Example, the lower readout should show 0005 to equal the 5 gallon bucket.)

STEP 6: Press the **TOTAL + START/STOP** keys to save this calibrated liquid in CAL 2 memory. Hold the **START** key for 3 seconds to activate the CAL factor indicated.

(The display will FLASH when the volume is saved in memory)

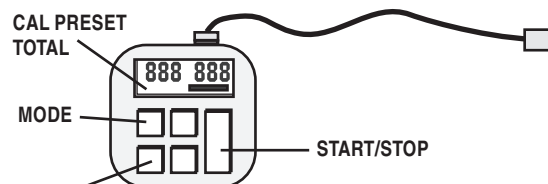
SECTION 4: SMART FLOW METER/BATCH CONTROL - (PP, PVDF) CE

Authentication of the meter

STEP 1: Press **MODE + UP (directional) + START/STOP** keys. Hold until the meter reads SP Inc. This ensures the correct electronics are in place.

Description of buttons

MODE key - changes between the **CAL, PRESET** and **TOTAL** lines.



TOTAL key - switches between TOTAL 1, 2, 3.

UP and DOWN directional arrows - changes settings to the desired quantity while in the Preset and Calibration lines.

START/STOP key - used to start and stop the meter and motor and to illuminate the meter display.

Descriptions of the functions

CALIBRATION - calibrates the meter for specific gravity and viscosity. CAL 1 is set for water and cannot be changed. CAL 2 and CAL 3 can be changed for liquids with viscosity up to 20 cps.

PRESET - There are 3 presets and all can be set up to 9999.9 gallons. *Pump in this mode when a desired or preset volume needs to be transferred.*

TOTAL - There are 3 totals which show a sum of all liquid pumped through the meter while in the Total 1, Total 2 or Total 3 setting. These can never be changed or altered. Pump in this mode when there is NO desired volume. The pump will continue to run until it is shut off at the meter with the START/STOP key button or shut off at the motor handle switch.

The meter electronics work in a linear fashion.

Water	CAL 2	CAL 3
Preset 1	Preset 2	Preset 3
Total 1	Total 2	Total 3

(Remember the Calibration (CAL) for Total 1 and Preset 1 is set for water and cannot be changed)

CAL 1 or CAL 2 will work for any group of Presets and Totals.

Calibration of the SMART Flow Meter (PP, PVDF)

STEP 1: Connect meter to the discharge with appropriate adaptors. See Section 2, version 1. Connect meter to SMART motor with SMART connection.

STEP 2: Press the START/STOP key. *Make sure the motor switch is in the OFF position.* The display should illuminate.

STEP 3: (If the liquid to be metered is equivalent to water, then stay in TOTAL 1. Remember the Calibration cannot be changed in TOTAL 1 and PRESET 1.) Press the TOTAL key to switch to TOTAL 2. Hold the MODE key until the display switches to CAL 2. The display should read 0.00 on the large (top) display and 1000 on the bottom (small) display.

STEP 4: Switch the pump on at the motor handle. **(The motor should not switch on).** Press the START/STOP key. Transfer the desired liquid into a known vessel or container (for example, a 5 gallon bucket). When the container is filled to the proper line, switch off the pump by pressing the START/STOP key.

STEP 5: Use the appropriate directional arrows so the bottom (smaller) readout equals the known vessel size. (Example, the lower readout should read 0005 to equal the 5 gallon bucket.)

STEP 6: **Switch the motor OFF at the handle.** Hold the TOTAL key and press the START/STOP key to save the new volume in memory. (The display will FLASH when the volume is saved.) Now CAL 2 is calibrated for the new liquid.

Setting Preset volumes

STEP 1: Press the TOTAL key. The display should read

0.00 and Total 1, 2 or 3 should be displayed in the lower left corner.

STEP 2: Press the TOTAL key which changes between totals 1, 2, and 3. *(Go back to Total 1)*

STEP 3: Press the MODE key. This changes to the preset mode. Preset 1, 2, or 3 should be displayed in the lower left corner.

STEP 4: Press the TOTAL key. This changes between Preset 1, 2, and 3. *(Go back to Preset 1).*

STEP 5: Use the directional arrows UP or DOWN to determine the volume of liquid.

STEP 6: **(Turn the motor OFF at the handle.)** Hold the TOTAL key and press the START/STOP key to save the volume 1 memory. This volume will stay in memory until changed.

(Press the TOTAL key to switch to another preset. Repeat STEPS 5 & 6 to save a desired volume in Preset 2 and 3.)

Utilizing the Preset function

STEP 1: Utilize the MODE key to reach the Preset function 1, 2 or 3. (Which ever is holding the volume you require.)

STEP 2: With the motor switch in the ON position, press the START/STOP key. The motor will engage and transfer the preset volume. When that is reached, the motor automatically shuts off and the application is complete. (NOTE: you must be in the Preset function in order for the desired volume to be transferred.)

Pumping without the Preset

STEP 1: Turn meter on as above.

STEP 2: Make sure the meter is in any TOTAL function. Simply press the START/STOP key. The pump will engage and continue to run until turned off at the motor switch or START/STOP key.

SECTION 5: MAINTENANCE/BATTERY CHANGE

Little or no maintenance is required outside of a battery change. Check the structural integrity of the housing before each use, looking for cracks, holes or any damage. The life of the AA lithium battery is estimated at 4 years. Memory is not lost when a battery change becomes necessary. Simply unscrew the T-10 screws from the lower meter housing. The meter electronics are then lifted from the lower meter housing and the AA lithium battery is exposed. Pull the old battery from the holder and replace with a new battery.

SECTION 6: SERVICE

SERFILCO Flow Meters are developed for operation with a minimum of maintenance. Please use these meters as described in the operation manual. Contact SERFILCO LTD. in case of service questions.



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