1 YEAR
WARRANTY

OMEGA®

User's Guide

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FP-5750 SERIES
Flow Totalizer

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Customer Service: 1-800-622-2378 (USA & Canada only)
Engineering Service: 1-800-872-9436 (USA & Canada only)
Tel: (203) 359-1660 Fax: (203) 359-7700
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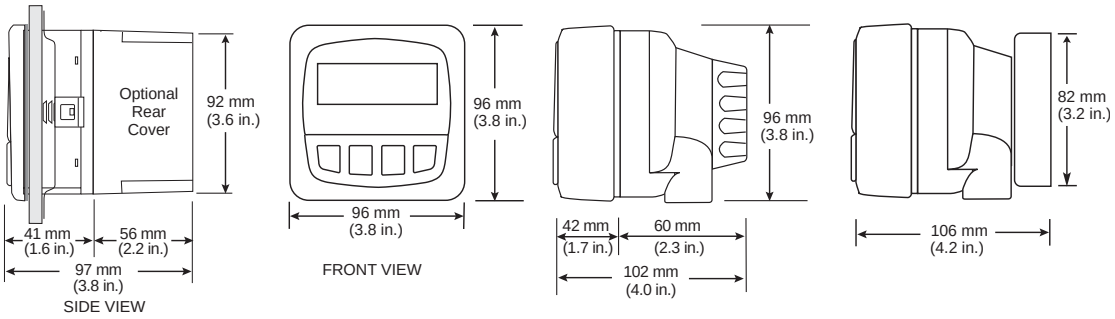
OMEGA FPM-5750 Flow Totalizer Instructions

1. Description

The OMEGA FP-5750 Flow Totalizer is a battery-powered instrument capable of providing uninterrupted flow and total volume information for 4 years and beyond. Unique features of the FPM-5750 include:

- Easy setup and display selection with 4-button keypad
- User selectable security access to prevent unwanted programming changes.
- Displays flow rate from 0.001 to 9999 engineering units with an auto-ranging decimal point.
- Three totalizers, one permanent and two that are independently resettable.
- Displays elapsed time between operating periods.
- Integral mount and panel mount options.
- 3.6 V Lithium batteries last 4 years nominal in most applications.
- Non-volatile memory stores all programming and totalizer values even when batteries are removed.

Dimensions



Panel Mount | Integral Mount | Universal Mount

2. Specifications

General

Compatibility: OMEGA FP-8501, FP-5200, FP-5000 Series sensors
Input Frequency Range: 1 to 400 Hz
Accuracy: ±0.5% of reading

Enclosure:

- Rating: NEMA 4X/IP65 (front panel)
- Dimensions: 1/4 DIN (96 mm x 96 mm x 50 mm) (3.8 in. x 3.8 in. x 2.0 in.)
- Case material: PBT resin
- Keypad material: Sealed 4-key silicon rubber

Display: LCD type

- 4-digit upper line: Flow rate
- 8-digit lower line: Three totalizer options:
  Permanent Totalizer for life of instrument
  Totalizer 1: resettable from keypad or remote 30 m (100 ft)
  Totalizer 2: resettable with security code only
- Display Contrast: Automatic

Electrical:

- Battery: Two 3.6V Lithium thionyl chloride, AA-size (Use SAFT LS14500 Lithium Batteries or Equivalent Only)
- Sensor power output: +3.6 VDC @ 20 µA
- Battery life: 4 years nominal @ 50 °C (122 °F)
- Low Battery indication: Battery symbol on LCD display

Environmental:

- Operating Temperature: -10 °C to 65 °C (14 °F to 149 °F)
- Storage Temperature: -40 °C to 100 °C (-40 °F to 212 °F)
- Relative Humidity: 0 to 95% Non-condensing

Shipping Weight: 0.5 kg (1.1 lbs.)

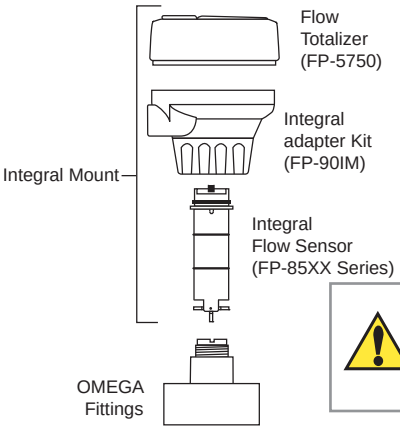
Quality Standards:

- CE
- Manufactured under ISO 9001 for Quality, ISO 14001 for Environmental Management and OHSAS 18001 for Occupational Health and Safety.

FC Declaration of Conformity according to FCC Part 15
This device complies with Part 15 of the FCC rules.
Operation is subject to the following two conditions:
(1) This device may not cause harmful interference, and,
(2) This device must accept any interference received, including interference that may cause undesired operation.

3. Installation

3.1 Integral Installation with Field Mount Totalizer

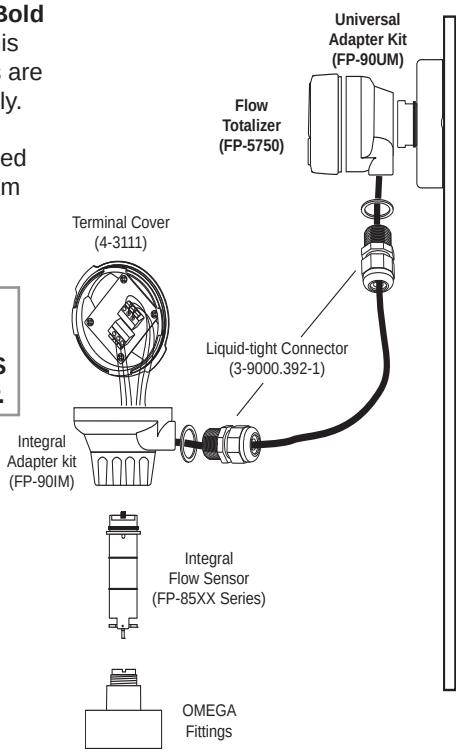


HAND-TIGHTEN THE THREADED NUT ONTO THE INSTALLATION FITTING. DO NOT USE TOOLS! DO NOT USE THREAD SEALANT OR LUBRICANTS ON THE FITTING THREADS OR THE SENSOR CAP.

3.2 Remote Field Mount On Wall

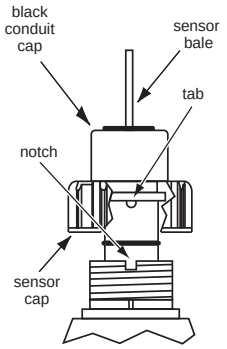
The parts identified in **Bold type** are required for this installation. Other parts are shown for reference only.

Use 2-conductor shielded cable no more than 30 m (100 ft.) long.



3.3 Plastic Sensor Installation Tips

- Lubricate O-rings with a non-petroleum based, viscous lubricant (grease) compatible with the system.
- Using an alternating/twisting motion, lower the sensor into the fitting, making sure the installation arrows on the black cap are pointing in the direction of flow.
- Engage one thread of the sensor cap then turn the sensor until the alignment tab is seated in the fitting notch.

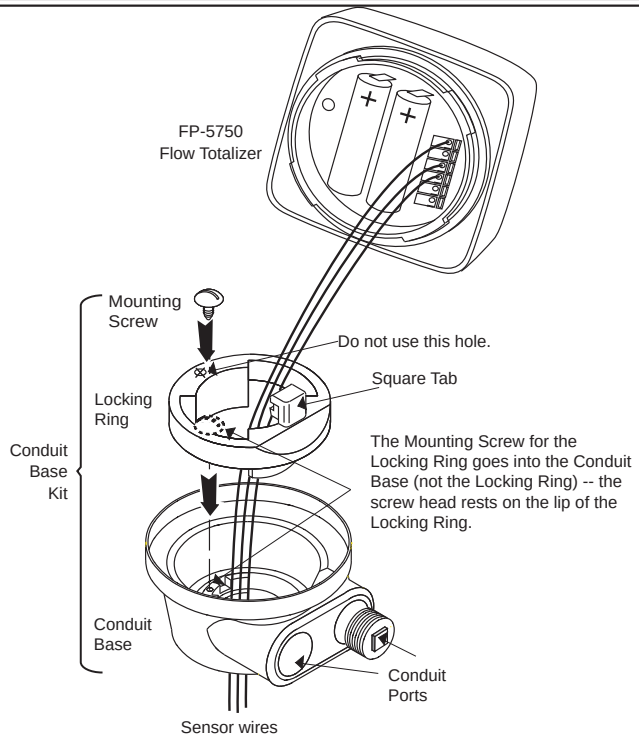


Chemical Compatibility Warning

The retaining nuts of paddlewheel sensors and Magmeters are not designed for prolonged contact with aggressive substances. Strong acids, caustic substances and solvents or their vapor may lead to failure of the retaining nut, ejection of the sensor and loss of the process fluid with possibly serious consequences, such as damage to equipment and serious personal injury. Retaining nuts that may have been in contact with such substances e.g. due to leakage or spilling, must be replaced.

3.4 Conduit Base Assembly Detail

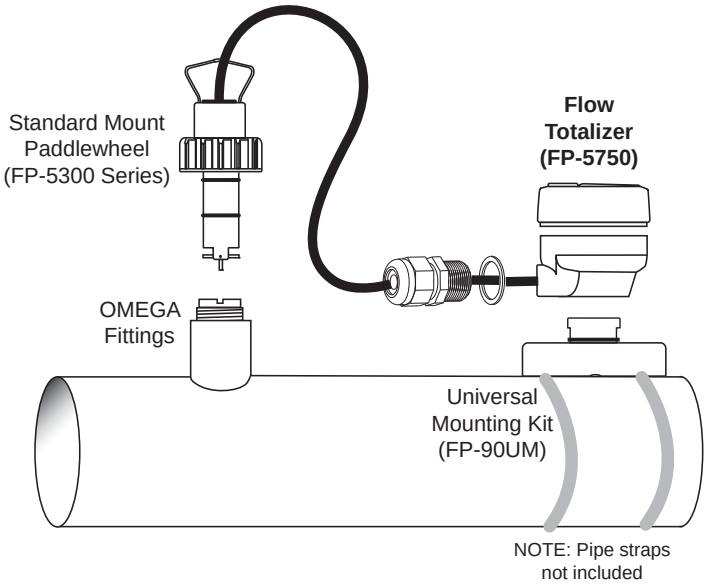
1. Insert the wires from the sensor through the yellow conduit base and locking ring.
2. Insert the locking ring into the conduit base, aligning it so that the square tab is close to the conduit ports.
3. Insert the mounting screw into the conduit base so the head of the screw presses down on the locking ring when tightened.
4. Connect sensor wires to the terminal connections on the integral totalizer or terminal cover.
5. Remove the plastic pull tabs protecting the batteries, this will cause the totalizer unit to power up.
6. For remote assembly, connect output wires to terminal cover output.
7. Route the output wires through the conduit port in the conduit base. Use a liquid-tight connector or conduit connector to prevent moisture from entering the assembly.
8. Place totalizer or cover onto conduit base and twist to lock in place.



3.5 Remote Field Mount on Pipe

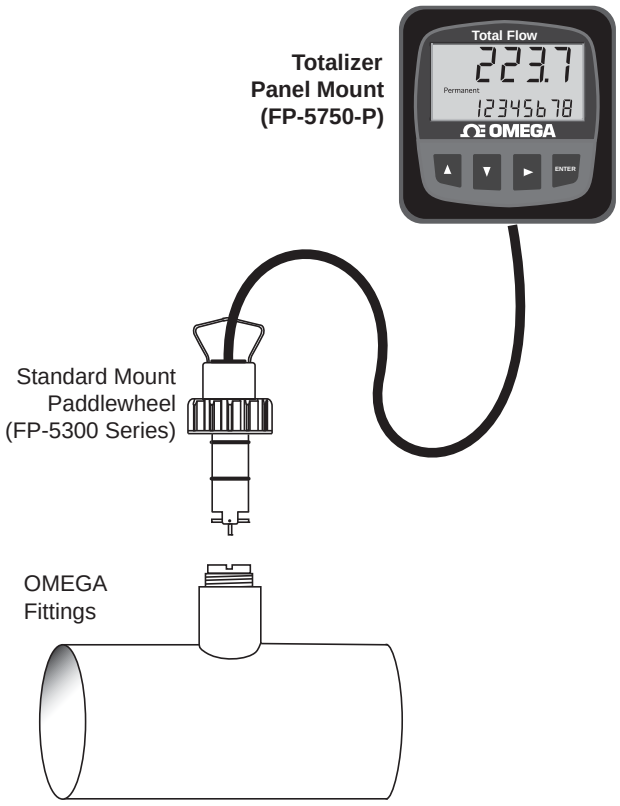
The parts identified in **Bold type** are required for this installation. Other parts are shown for reference only.

Use 2-conductor shielded cable no more than 30 m (100 ft.) long.



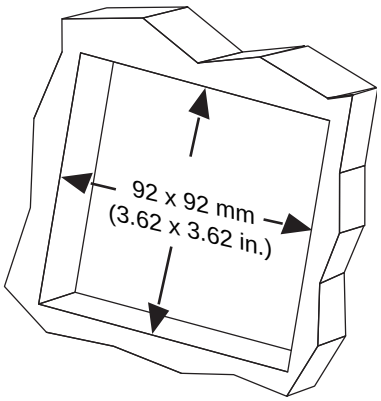
3.6 Remote Installation with Panel Mount Totalizer

The parts identified in **Bold type** are required for this installation. Other parts are shown for reference only.

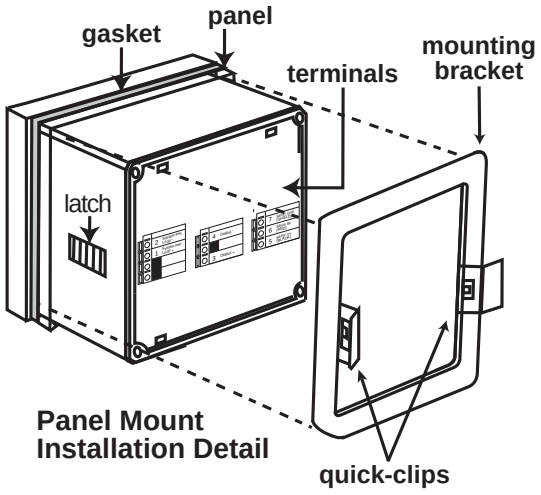


3.7 Panel Mount Installation Detail

- The FP-5750-P Panel-mount Totalizer is a standard 1/4 DIN package. Use a 92x92 mm punch tool to make the panel cutout.
- Minimum spacing of 25 mm (1 in.) between panel units is recommended.



Panel cutout



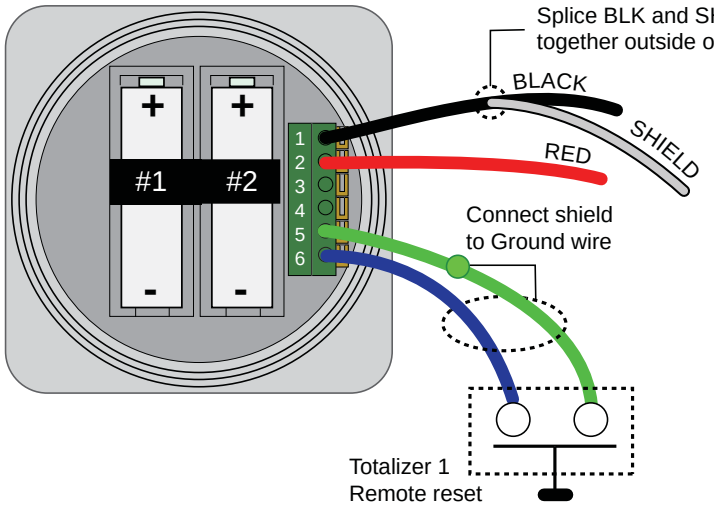
4. Wiring

- The wiring is identical for the panel mount and the field mount versions of the totalizer.
- Only one wire should be inserted into a terminal. Splice double wires outside the terminal.
- **External Reset for Total #1:** Use no more than 30 m (100 ft.) of 2-conductor twisted-pair cable connected to a dry contact (for example, an ordinary door-bell button or relay contact).
- Only Totalizer #1 can be reset by the external connection.
- Total #1 will not be displayed unless it is the standard totalizer selection.

Instructions

1. Remove 10 mm (3/8 in.) of insulation from sensor cable conductors.
2. Press down on orange lever to open terminal.
3. Insert wire into terminal until it hits bottom.
4. Release the lever to secure wire.

Sine wave Input Wiring
Use this wiring scheme for OMEGA models FP-8501, FP-5200, and FP-5000 Series sensors.

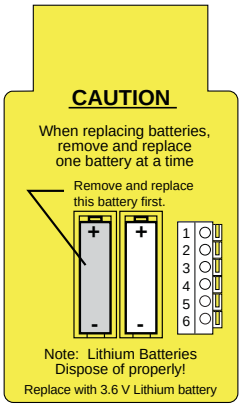


Terminal	Function
1	Signal Ground
2	Sensor signal
3	Open Collector Signal
4	DC Power to sensor
5	Ground
6	Ext. Reset

5. Battery Installation and Replacement

Two **3.6V Lithium thionyl chloride** batteries, AA-size are installed in with the totalizer.
NOTE: The FP-5750 WILL NOT OPERATE with standard 1.5 V alkaline batteries.
USE 3.6 V SAFT LS14500 LITHIUM BATTERIES OR EQUIVALENT ONLY!

- Remove pull tabs from the batteries to power up the FP-5750.
- **Observe polarity!** Note that both batteries face the same direction.
- When the “low battery” indicator appears on the display, both batteries should be replaced within 90 days.
- Remove and replace battery #1 first, then remove and replace battery #2.
  This ensures that all settings and totalizer values are saved.
- If the low battery symbol reappears for more than 10 seconds after installing new batteries, one battery is reversed, or battery #2 was installed before battery #1.
- Secure the batteries by fastening the hook-and-loop straps.



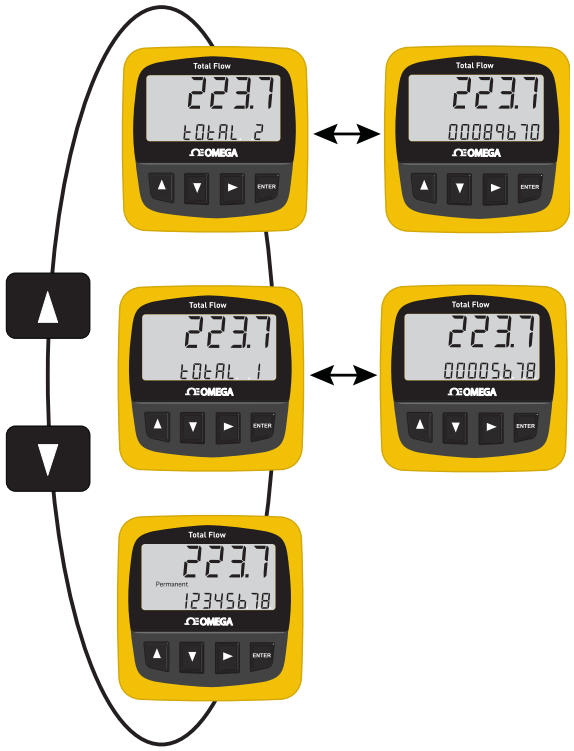
Shipping Notice:
If the battery pull tabs have been removed, remove the batteries from the totalizer prior to shipping.
Dispose of the batteries in accordance with the local regulations.

DISPOSE OF EXPENDED BATTERIES PROPERLY!
Lithium batteries contain hazardous chemicals. Dispose of batteries according to local regulation.

6. Operation

The FPM-5750 display shows the flow rate in large numerals and a totalizer value in smaller numerals. Any one of three different totalizers can be selected as the standard display (See section 8 for detailed information on the totalizers).

Press the UP or DOWN keys to scroll through the totalizer values during normal operation.



6.1 No Flow and ELAPSED TIME Display

If the flow stops, the Totalizer displays the number of hours since flow was last detected. This display will alternate with the normal FLOW RATE and standard TOTAL display every five seconds. Any movement of the rotor in the pipe will reset the ELAPSED TIME display.

Illustrated: No flow for 3 hours

6.2 Standard Menu Settings

Totalizers are shipped from the factory with these standard settings:

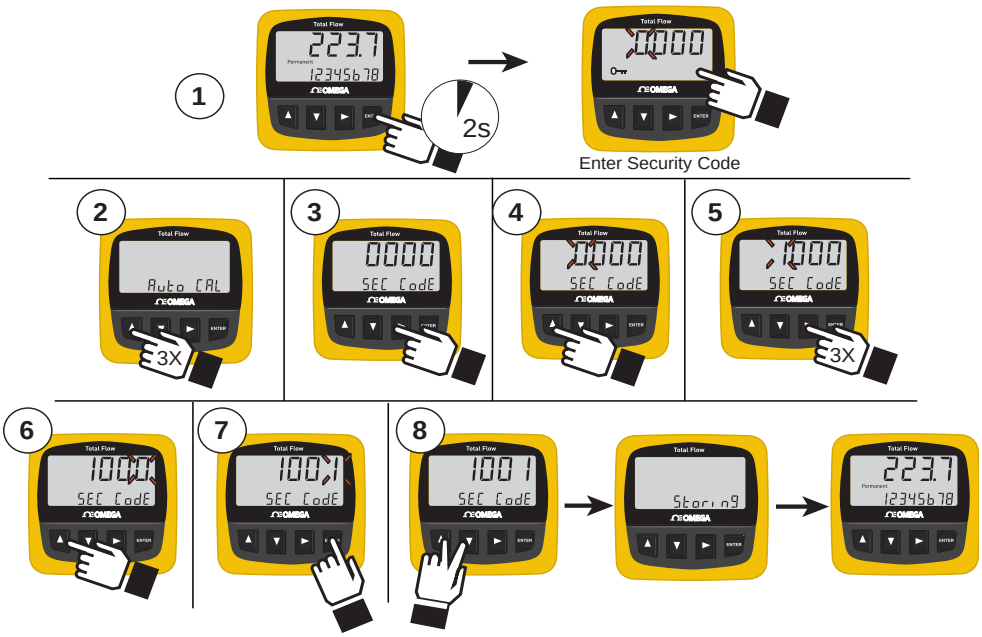
Function:	Factory set:	Description:
AUTO CALIBRATION		No setting; See section 9 for detailed information.
FLOW K-Factor	60	Number of sensor pulses per volumetric unit; Refer to sensor manual.
TOTAL K-Factor	1	Set the number of volumetric units per totalizer count; see section 11.
TIMEBASE	Minutes	Select flow rate in seconds, minutes, hours or days. Section 12.
DECIMAL	XXX.X	Set the maximum decimal resolution. Section 13.
SPEED	30 s	Zero to 120 seconds averaging stabilizes readings in erratic flow conditions. Section 14.
SENSITIVITY	6	Momentarily overrides SPEED when flow rate changes significantly. Section 15.
SECURITY CODE	0-0-0-0	Set a private code to prevent tampering. Section 7.
DEFAULT TOTALIZER	Permanent	Select from three totalizer options. Section 8.
TOTALIZER #2 RESET		Reset Totalizer #2 after entering the security code. Section 8.3.

7. Security Code

The security code prevents unauthorized tampering with calibration and operational settings in the FP-5750 Series. The factory standard code is 0-0-0-0. Change the code to any 4-digit number by following these steps:

Example: Change the security code from the factory standard <u>0-0-0-0</u> to custom setting <u>1-0-0-1</u>

NOTE:
Record and store your security code in a safe place!



1. Hold the ENTER key for 2 seconds, then enter the current SECURITY CODE.
   If working with a new unit, press the ENTER key again. The display shows the first menu item (Auto CAL)
2. Press the UP key three times to scroll to Sec Code.
3. Press RIGHT ARROW to edit the code.
   The leading digit on the display will flash.
4. Press the UP key one time to scroll the flashing digit to 1.
5. Press the RIGHT key three times to advance the flashing element to the last digit.
6. Press the UP key one time to scroll the flashing digit to 1.
7. Press the ENTER key to complete the edit process.
8. Press the UP and DOWN keys together to exit the Calibrate menu, store the new settings and return to normal operation.

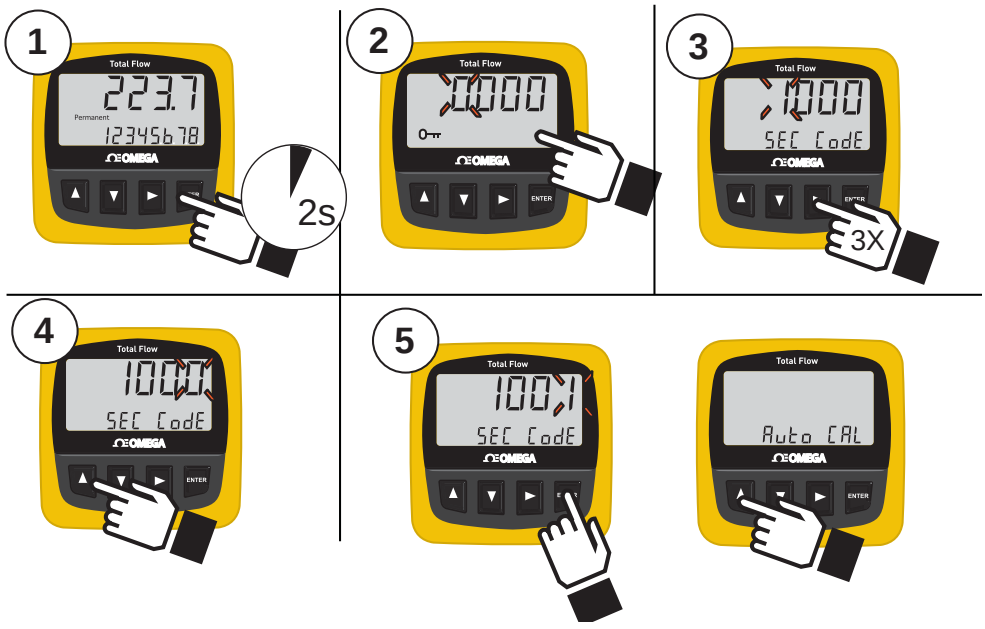
7.1 Using the Security Code

A numerical code (0-0-0-0 to 9-9-9-9) must be entered before any of the menu selections can be modified.

- The code is set at 0000 from the factory. To change the code, see section 7.1.
- To use the factory setting, complete step 1 and then step 9.

Example: Enter security code of 1001:

1. Hold the ENTER key for 2 seconds. The display shows factory standard access code of 0000, with the first zero flashing.
2. Press the UP key one time to scroll the flashing zero to 1.
3. Press the RIGHT key three times to advance the flashing character to the last place value.
4. Press the UP key one time to scroll the flashing zero to 1.
5. Press the ENTER key. The display now shows the first item in the EDIT MENU.



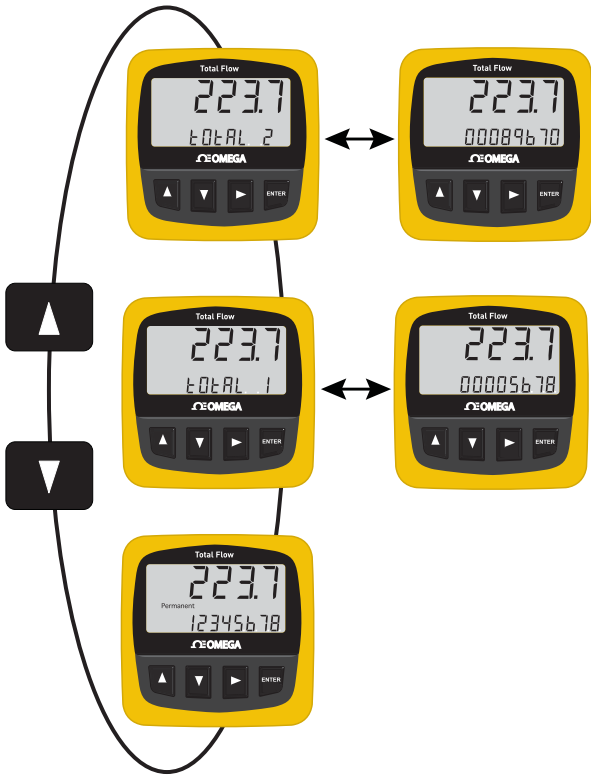
8. Totalizer Setup and Operation

During normal operation the FP-5750 displays the flow rate and one selected totalizer value. Any one of the three totalizers can be set as the standard display: The other two totalizers can be viewed by pressing the keypad. The display will automatically return to the standard selection after five minutes.

The **PERMANENT** Totalizer is identified directly on the LCD.
- This totalizer records all input from the time of manufacture.
- The permanent totalizer cannot be reset.
- Application: The permanent totalizer should be selected as the standard if the system is monitored and the total recorded regularly.

Total 1 (tot1) can be reset from the keypad or from the external RESET (see Wiring, section 4) without the security code.
- **Total 1** is identified by a flashing display every six seconds.
- Application: Use Total 1 to measure water usage for a recurring period, as for a daily discharge volume.

Total 2 (tot2) can be reset only by entering the security code in the calibration menu.
- **Total 2** is identified by a flashing display every six seconds.
- Application: Use Total 2 for extended measurement periods, as for a monthly discharge volume.

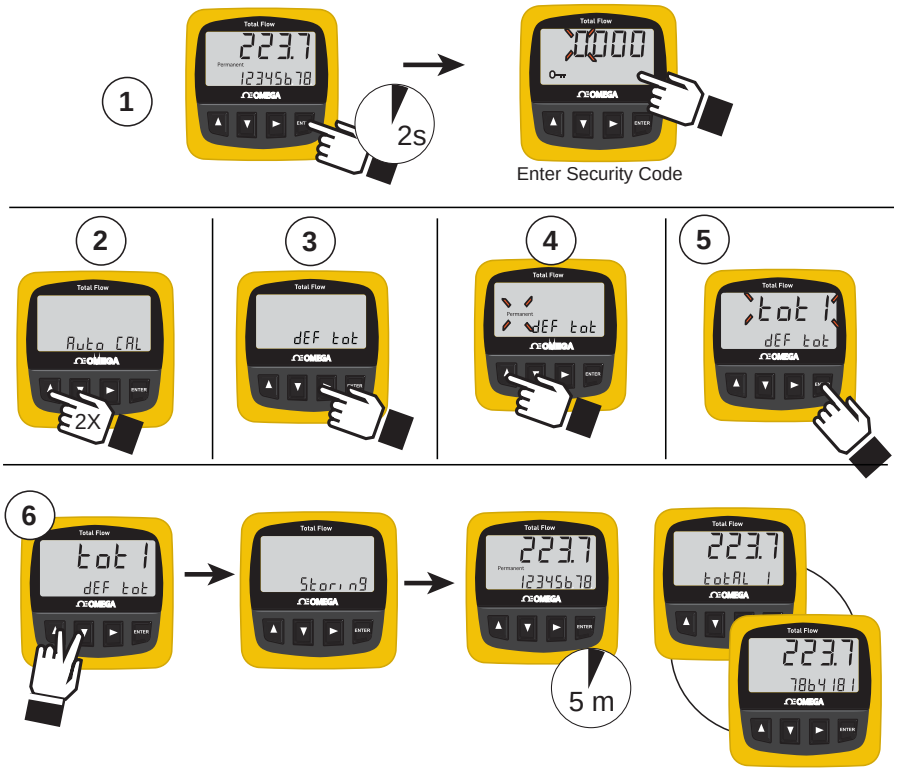


8.1 Define the Standard Totalizer

Any of the three totalizer functions can be set as the standard display, or select SCROLL to display all three totalizers in sequence. The PERMANENT totalizer is the factory standard selection.

Example: Change the standard Totalizer from PERMANENT to Totalizer #1

1. Press ENTER key for 2 seconds. (Display shows security key symbol and 0-0-0-0. Set security code and press ENTER key.)
2. Press UP key two times. Display shows "def tot" and the "PERMANENT" label.)
3. Press RIGHT ARROW key. (PERMANENT label begins to flash.)
4. Press UP key one time. Display changes to flashing "tot 1".
5. Press ENTER key to complete the edit process.
6. Press UP and DOWN keys together to store new value in the memory. The display will show "Storing" for a few seconds, then return to normal operation. **NOTE:** The new totalizer selection will appear after a 5 minute delay.

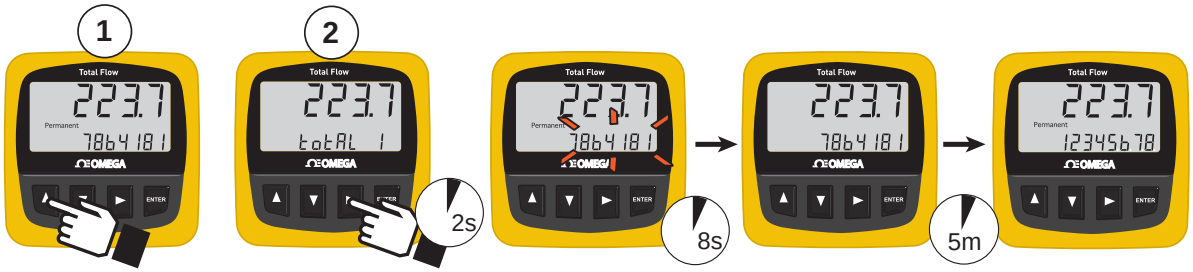


8.2 Resetting Totalizer 1

1. Press UP key to scroll to **"total 1"** display.
2. Press and hold the RIGHT arrow key until the display shows **"rst tot1"**.
   The totalizer will flash for 8 seconds and then it will automatically reset to 00000000.

- Press the ENTER key while the display is flashing to reset immediately.
- While the total value is flashing, you can cancel the reset by pressing UP and DOWN keys together.
- Totalizer #1 will be displayed for 5 minutes after the reset, then the standard totalizer selection will return.
- Press the UP or DOWN key to scroll back to the standard display immediately.

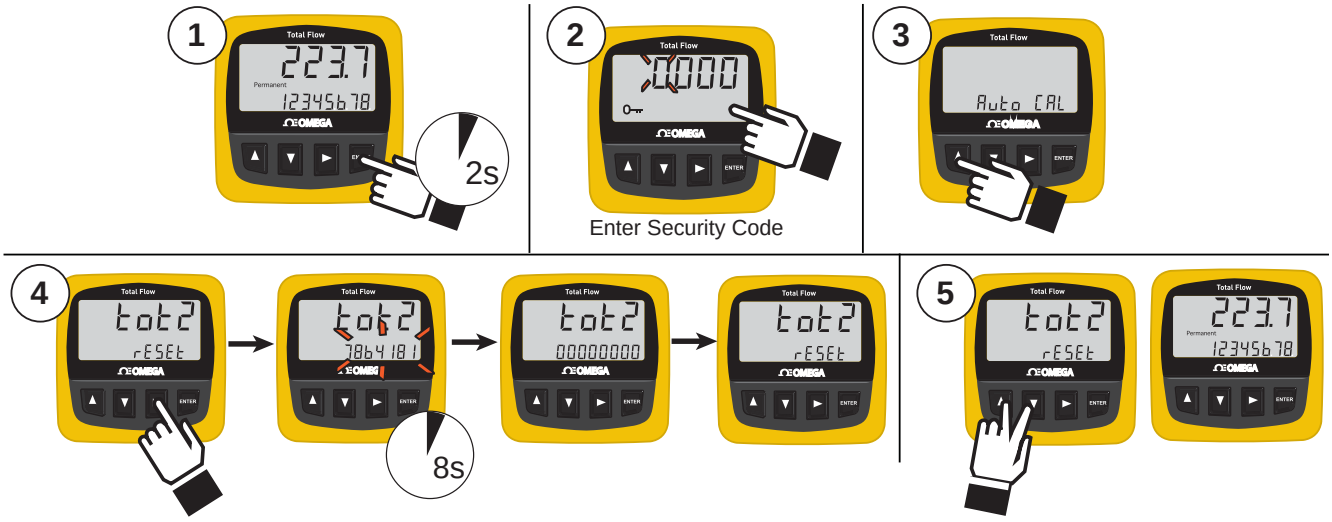
External Reset: See section 4: Wiring for information on resetting Totalizer #1 remotely from up to 30 meters distance. **NOTE:** When Total #1 is reset from an external switch, the display will not show totalizer #1 unless it has been set as the standard totalizer.



8.3 Resetting Totalizer 2

Totalizer #2 can be reset ONLY by entering the security code.

1. Press ENTER key for 2 seconds. (Display shows security key symbol and 0-0-0-0)
2. Set the security code in the flashing display and then press the ENTER key.
3. Press UP key one time. (Display shows "tot2 reset")
4. Press RIGHT ARROW key. The totalizer value will begin flashing.
   The totalizer will automatically reset to 00000000 in 8 seconds.
   While the display is flashing, you can cancel the reset by pressing UP and DOWN keys together.
5. Press UP and DOWN keys together to return to normal operation.



8.4 Saving Totalizer Values

To conserve battery life, totalizer values are stored in the memory every 12 hours. If both batteries are removed from the unit, the totalizers retain the last saved values, so the unit may lose several hours of data.

To prevent this loss, enter the security code, then enter any menu item and store the setting.
Whenever the FP-5750 stores a setting, it also stores all current totalizer data:

1. Enter the security code.
2. Press the UP key to scroll to the last item in the menu (DEFAULT TOTALIZER)
3. Press the RIGHT key to enter the edit mode (flashing display mode)
4. Press the ENTER key to retain the current settings.
5. Press the UP and DOWN keys simultaneously to initiate the "Storing" function.
   The batteries can now be removed and replaced without losing any totals.

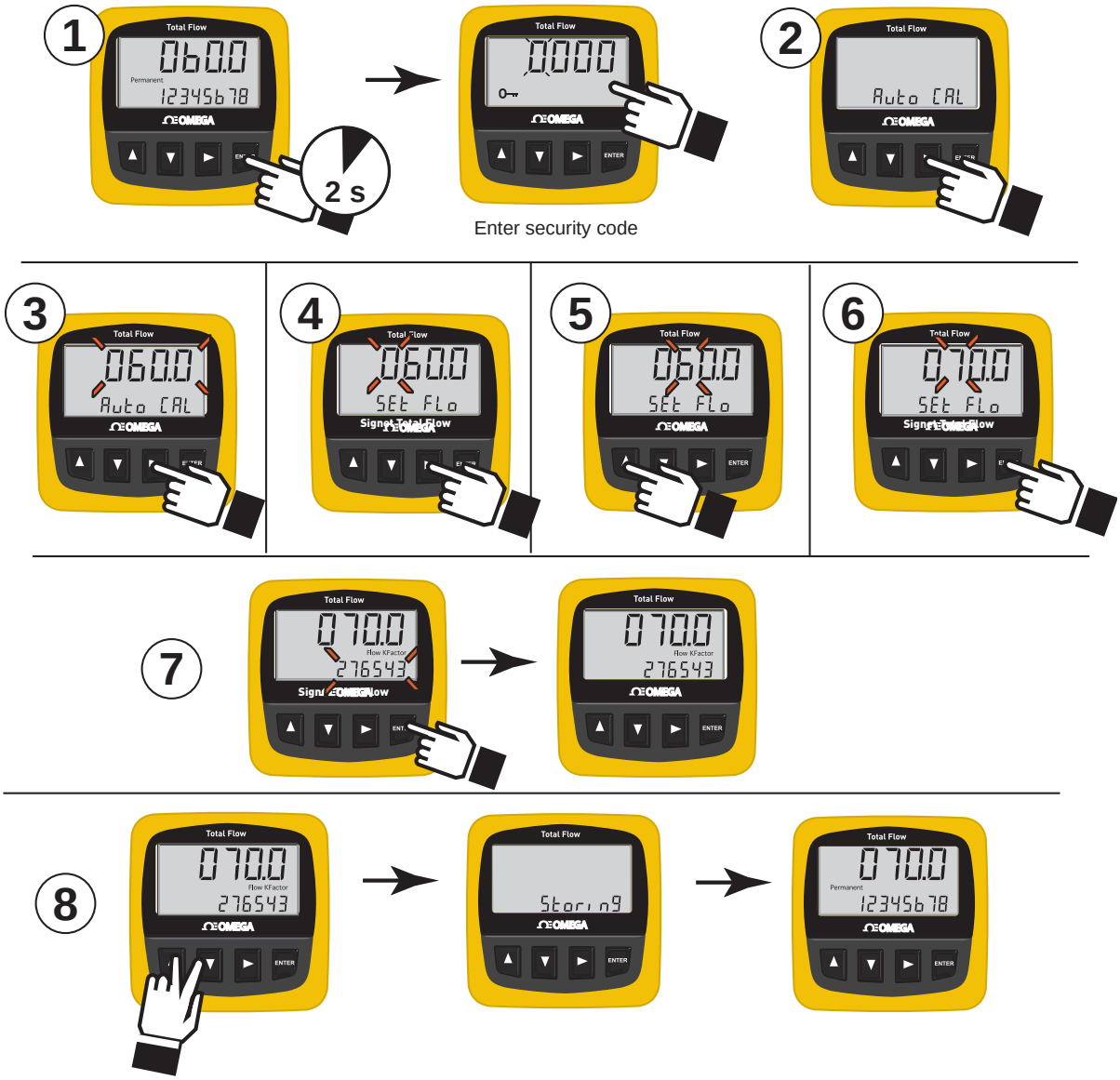
9. AutoCAL Calibration

The AutoCAL feature allows theTotalizer to be adjusted to match the flow rate to any external reference.

- Flow in the pipe should be as stable as possible for best results.
- If the flow rate display is erratic, set the SPEED (section 14) to 120 seconds during the AutoCAL procedure.
- The timebase on the reference meter must be the same as the FP-5750 Totalizer.

Example: **The Totalizer flow rate shows 60 GPM, while an external reference indicates a true flow rate of 70 GPM. Change the flow rate from 60 GPM to 70 GPM using AutoCAL.**

1. Hold the ENTER key for 2 seconds, then enter the SECURITY CODE.
   AutoCAL is the first item in the menu.
2. Press the RIGHT key to select the AutoCAL function.
   The display will show AutoCAL and the current flow rate will be flashing.
3. Press the RIGHT key again to change the flow rate. The display shows "Set Flo" and the first digit of the flow rate will begin flashing.
5. Press the RIGHT key to advance the flashing element to the "6".
5. Press the UP key one time to change the "6" to "7".
6. Press the ENTER key to complete the automatic calibration process.
   The display shows a new K-Factor with the first digit flashing. This K-Factor is based on the change in flow rate.
7. Press the ENTER key again to accept the new value.
   NOTE: If the display shows **"ERR SetFlo"** the procedure was unsuccessful because the calculated K-Factor is less than 0.001 or greater than 999999. Verify the flow rate and start the AutoCAL procedure from step 1.
8. Press UP and DOWN keys together to store the new value in the memory.
   The display will show "storing" for a few seconds, then return to normal operation.

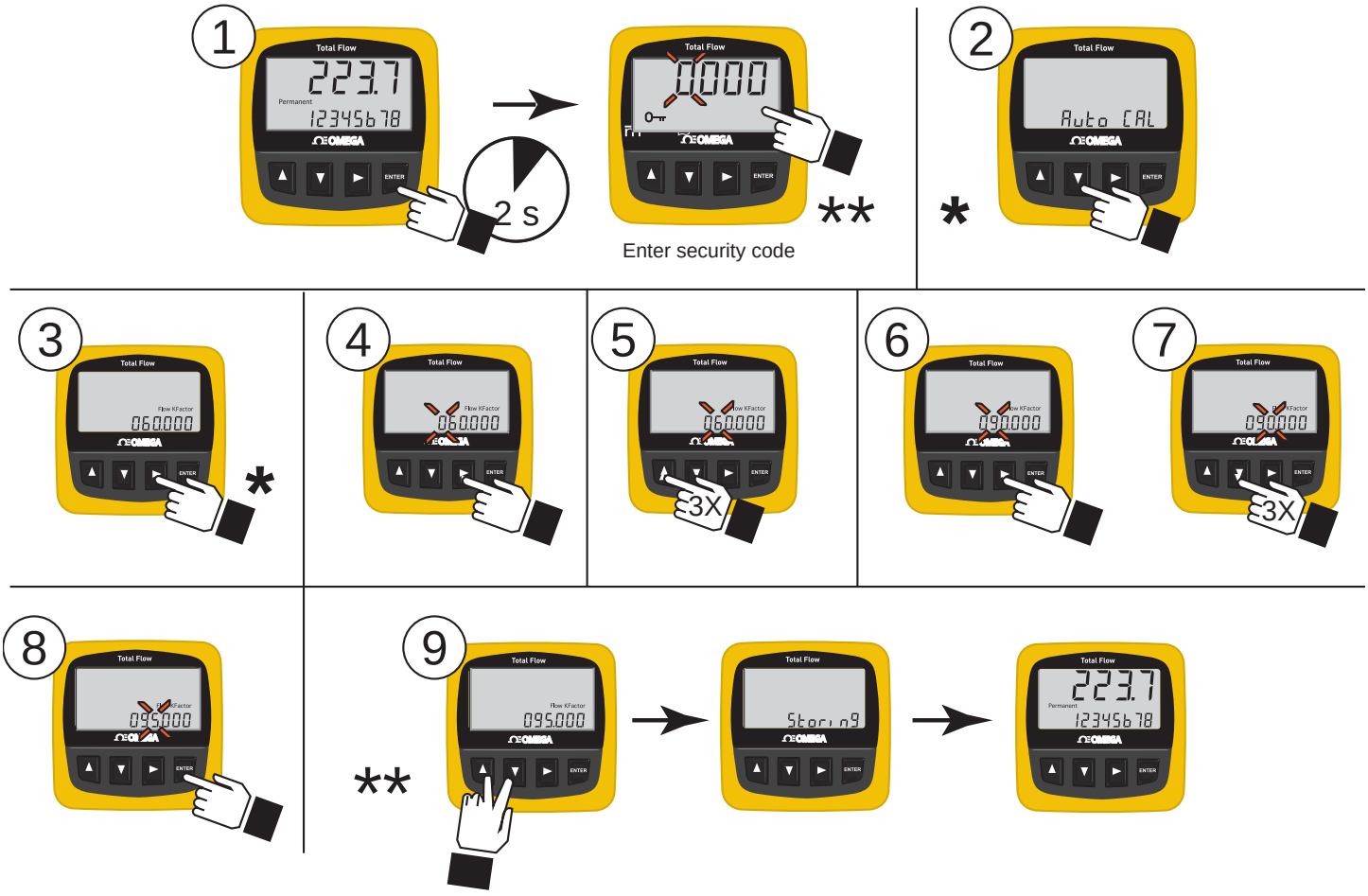


10. Flow K-Factor

The K-Factor is the number of pulses generated by the flow sensor for each measure of water that moves past the sensor.
Your flow sensor manual contains K-Factor data in terms of U.S. gallons and liters.
Locate the K-Factor that matches your pipe size and material.
If necessary, the K-Factor can be converted into other units of measure.
The minimum K-Factor value is 0.001, maximum value is 999999.

Example: Change the Flow K-Factor from 060.000 to 095.000

1. Hold the ENTER key for 2 seconds, then enter the SECURITY CODE (factory default is 0-0-0-0).
   The display shows the first item in the menu (AutoCAL).
2. Press the DOWN key to scroll to the Flow K-Factor. (The display shows the current K-Factor setting.)
3. Press the RIGHT key to select the Flow K-Factor for editing. (The first element of the K-Factor will begin flashing.)
4. Press the RIGHT key 1 time to advance the flashing element to the "6".
5. Press the UP key three times to change the "6" to "9".
6. Press the RIGHT key to advance the flashing element to the "0."
7. Press the DOWN key five times to change the "0" to "5".
8. Press the ENTER key to return to the CALIBRATE menu.
9. Press UP and DOWN keys together to store the new value and return to normal operation.



*** Exit Without Changing?**

As long as any element is flashing, you can abort the change and return to the original value by pressing UP and DOWN keys simultaneously.

**** Finished Editing?**

Press the UP and DOWN keys simultaneously from the main menu to return to normal operation.

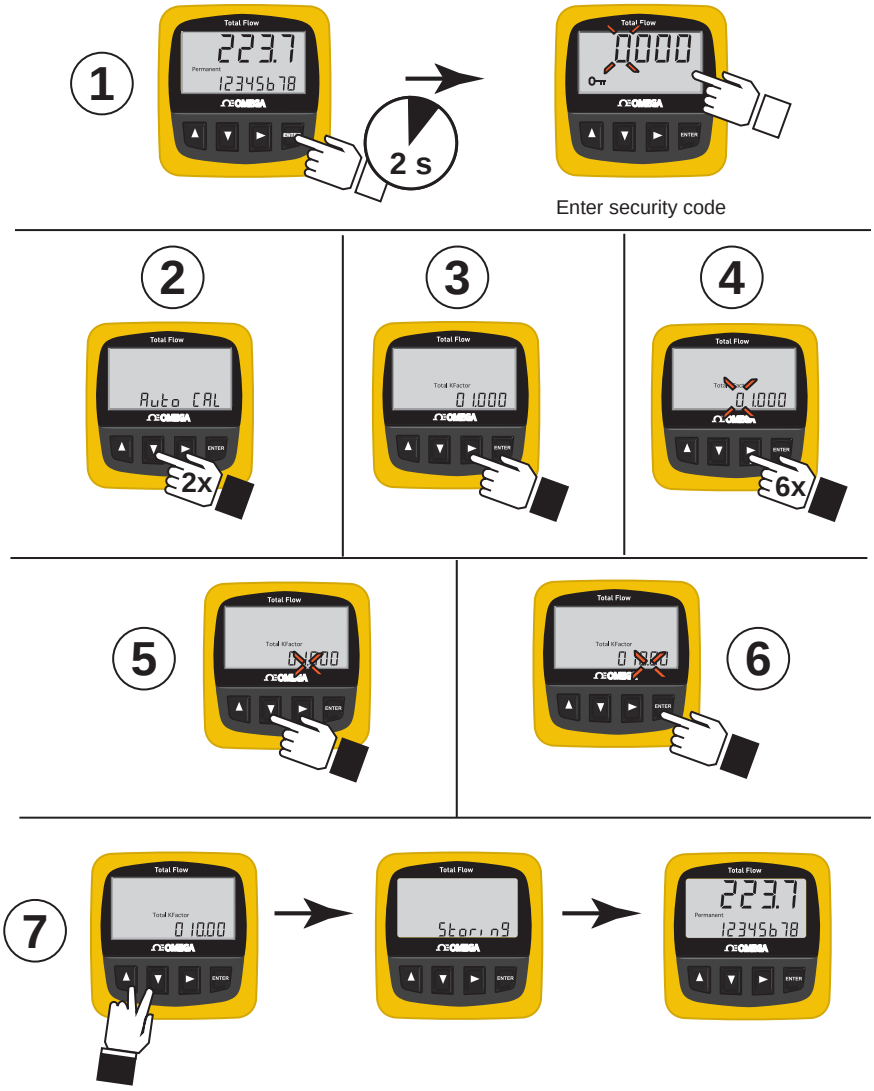
11. Total K-Factor

The TOTAL K-Factor is a multiple of the FLOW K-Factor. Use it to program the incremental count size of the totalizer.

For example, if the flow RATE registers in liters per minute, the totalizer may be set to 1 (factory standard), so it counts in 1-liter increments, or it may be set to 1000, so it counts in 1 kiloliter ($1m^3$) increments.
By converting the Flow K-Factor, the totalizer can also be set to count in other engineering units.
See sec. 17: "Flow and Total K-Factor selection" for additional information about Total K-Factor adjustments.

Example: Change the totalizer from 1-kilolitre increments to count in 10-kilolitre increments.

1. Hold the ENTER key for 2 seconds, then enter the SECURITY CODE.
   The display shows the first item in the menu, AutoCAL.
2. Press the DOWN key two times to scroll to the Total K-Factor.
3. Press the RIGHT key to select the Total K-Factor for editing.
   The first element of the Total K-Factor will begin flashing.
4. Press the RIGHT key six times to advance the flashing element to the decimal point.
5. Press the DOWN key one time to move the decimal point one position to the right.
6. Press the ENTER key to return to the menu.
7. Press UP and DOWN keys together to exit the menu and return to normal operation.
   The display shows "Storing" for a few seconds, then returns to the normal operating display.



11.1 Adjusting the Flow K-Factor

If the Totalizer yields a consistent error, make corrections by either using the AutoCal function (section 9) or by manually adjusting the Flow K-Factor by the percentage of error.
A smaller K-Factor increases the flowrate, while larger K-Factors reduce the flow rate.

Example:

- The Flow K-Factor is set at 480.19 pulses per gallon.
- The totalizer registers 10 gallons when the actual volume is known to be 11 gallons.
- The error is 1 gallon divided by 10 gallons , or -10%. (The totalizer is counting 10% low, and the flow rate is reading 10% slow.)
- Reduce the Flow K-Factor by 10%: 480.19 - 10% = 432.17.
- Change the Flow K-Factor to 432 pulses per gallon.

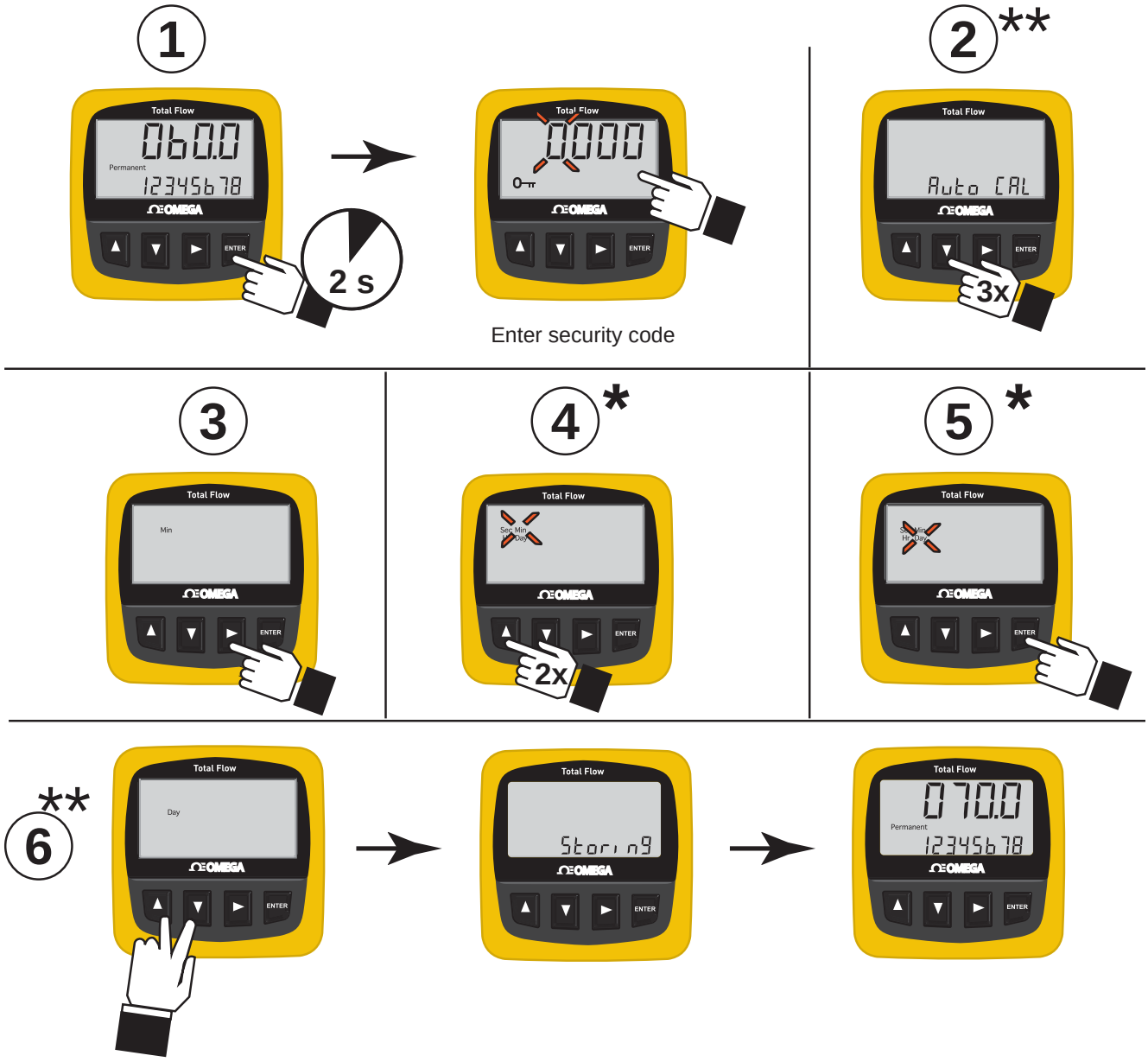
The result: The totalizer must count 10% fewer pulses from the flow sensor to register one Gallon, so both the totalizer and the flow rate will increase by 10%.

12. Time Base

Select the timebase for the flow rate. The available selections are seconds, minutes, hours or days.

Example: Change the Timebase from MINUTES (factory standard) to DAYS

1. Hold the ENTER key for 2 seconds, then enter the SECURITY CODE.
   The display shows the first item in the CALIBRATE menu, AutoCAL.
2. Press the DOWN key three times to scroll to the Timebase.
3. Press the RIGHT key to select the Timebase for editing.
4. Press the UP key two time to scroll from MIN to DAY.
5. Press the ENTER key to return to the menu.
6. Press UP and DOWN keys together to exit the menu and return to normal operation.
   The display shows "Storing" for a few seconds, then returns to the normal operating display.



* Exit Without Changing?

As long as any element is flashing, you can abort the change and return to the original value by pressing UP and DOWN keys simultaneously.

** Finished Editing?

Press the UP and DOWN keys simultaneously from the main menu to return to normal operation.

13. Decimal Point for Flow Display

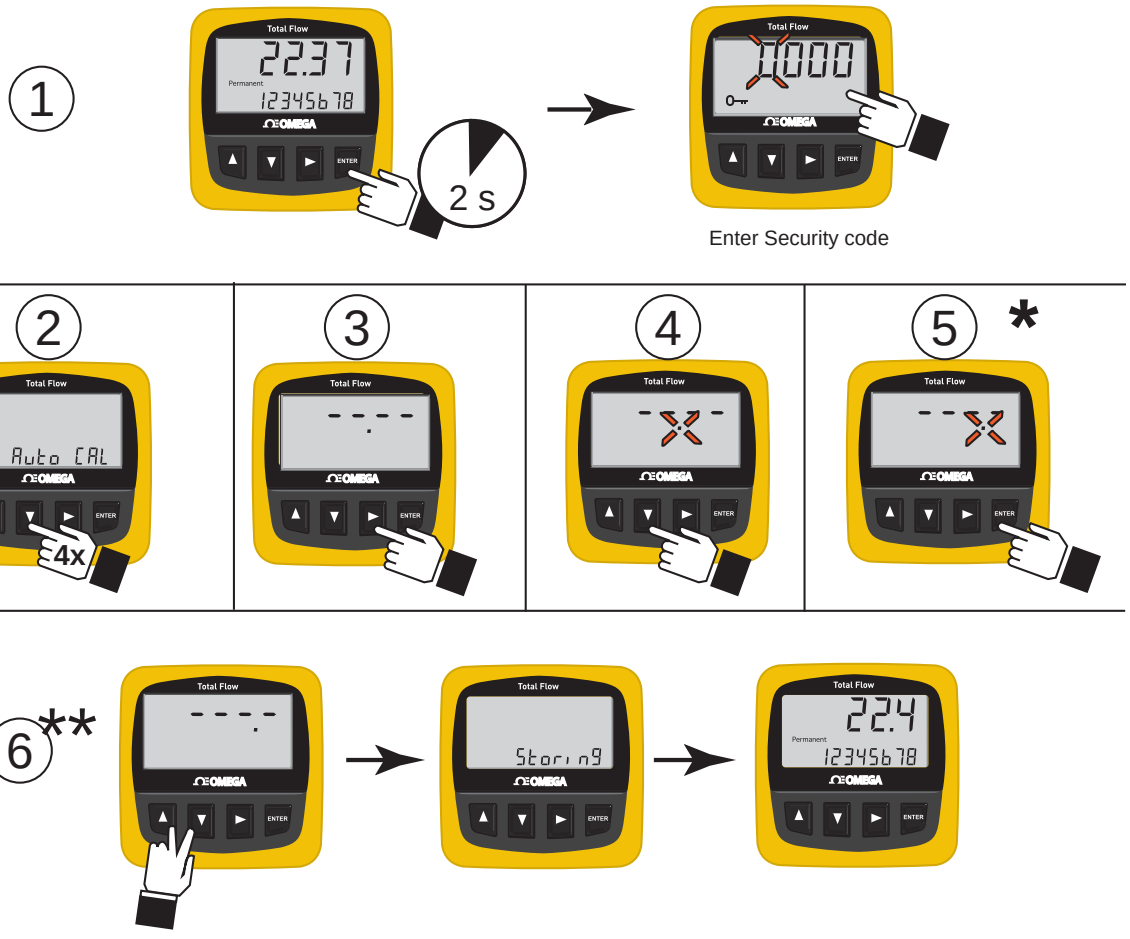
Select the maximum decimal resolution for the flow rate display. The available selections are hundredths (xx.xx), tenths (xxx.x) or whole numbers only (xxxx.). The decimal will auto-range down to this setting.

- If the decimal is set to whole numbers, the flow rate display will not auto-range.
- If the decimal is set to tenths, the flow rate display will show tenths up to 999.9, then the auto-range will switch to whole numbers (1000 to 9999.)
- If the decimal is set to hundredths, the flow rate display will show hundredths up to 99.99, then tenths from 100.1 to 999.9, then whole numbers to 9999.

Available Display Selections	Your Flow Rate	Will read on display as:
hundredths (XX.XX)	10.55	10.55
tenths (XXX.X)	10.55	10.6
whole numbers (XXXX.)	10.55	11

Example: Change the maximum decimal display from hundredths to tenths:

1. Hold the ENTER key for 2 seconds, then enter the SECURITY CODE.
   The display shows the first item in the menu, AutoCAL.
2. Press the DOWN key four times to scroll to the Decimal setting.
   The display shows four dashes and the current decimal setting.
3. Press the RIGHT key to select the decimal for editing.
   The decimal point will begin to flash.
4. Press the DOWN key one time to move the flashing decimal from hundredths to tenths.
5. Press the ENTER key to return to the menu.
   The decimal will stop flashing.
6. Press UP and DOWN keys together to exit the menu and return to normal operation.
   The display shows "Storing" for a few seconds, then returns to the normal operating display.



* Exit Without Changing?

As long as any element is flashing, you can abort the change and return to the original value by pressing UP and DOWN keys simultaneously.

** Finished Editing?

Press the UP and DOWN keys simultaneously from the main menu to return to normal operation.

14. Speed

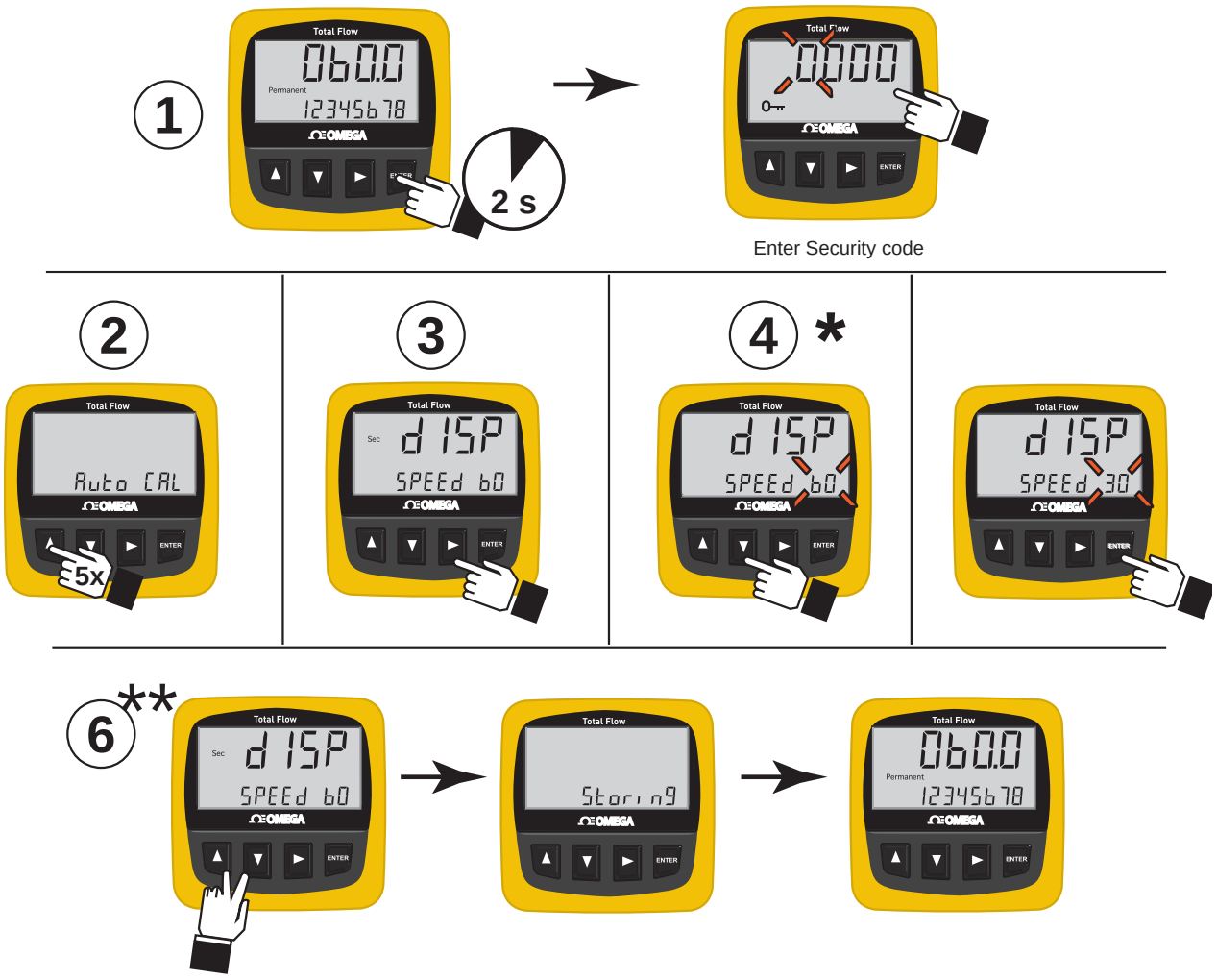
SPEED averaging serves to smooth out fluctuations in the flow rate that may be caused by inadequate straight pipe runs after pumps, valves, and elbows in the pipe. The selections are 0, 7, 15, 30, 60 and 120 seconds. The factory standard setting is 30 seconds.

- Use faster (0 s - 30 s) averaging for well-established, stable flow conditions.
- Use slower (60 s -120 s) averaging if the flow conditions are unstable.

Note: While the SPEED setting helps to smooth out the fluctuations caused by piping conditions, it also causes a delay in showing actual changes in flow rate. The SENSITIVITY function (section 15) is designed to help offset this effect.

Example: Change the SPEED setting from 60 seconds to 30 seconds.

1. Hold the ENTER key for 2 seconds, then enter the SECURITY CODE.
   The display shows the first item in the CALIBRATE menu, AutoCAL.
2. Press the DOWN key five times to scroll to DISP SPEED.
   The display shows DISP SPEED, the "sec" annunciator, and the current speed setting.
3. Press the RIGHT key to select the Display speed for editing.
   The current speed selection begins flashing.
4. Press the DOWN key one time to scroll from 60 seconds to 30 seconds.
5. Press the ENTER key to return to the menu.
6. Press UP and DOWN keys together to exit the menu and return to normal operation.
   The display shows "Storing" for a few seconds, then returns to the normal operating display.



*** Exit Without Changing?**

As long as any element is flashing, you can abort the change and return to the original value by pressing UP and DOWN keys simultaneously.

**** Finished Editing?**

Press the UP and DOWN keys simultaneously from the main menu to return to normal operation.

15. Sensitivity

The SENSITIVITY setting determines how the FPM-5750 responds to sudden surges in the flow rate. It "overrides" the SPEED function just long enough to allow an actual change in flow rate to be displayed, then resumes the averaging. The result is a smooth flow display and a quick response to large shifts in the flow rate.

No SPEED, no SENSITIVITY

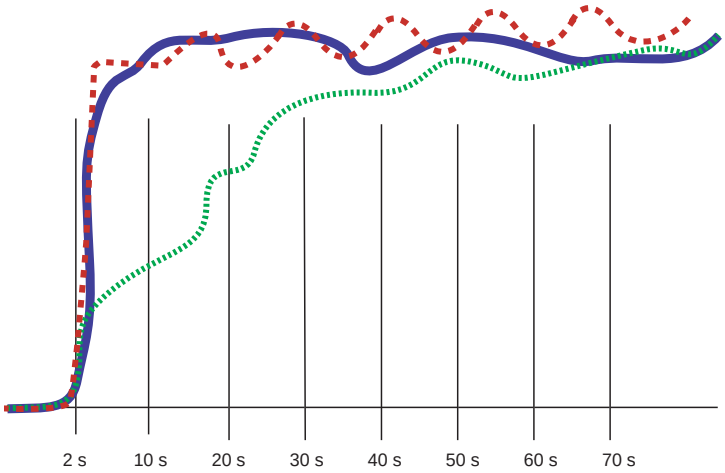
With SPEED averaging set to 0 (zero) and with SENSITIVITY set to zero, the flow rate may be very unstable. This line represents the actual output of the flow sensor as it responds to unstable flow conditions in the pipe.

SPEED only

With SPEED set to 60 seconds and SENSITIVITY still set to zero the flow rate is stabilized, but a sharp change in flow rate is not represented for 60 seconds or longer (dotted green line).

SPEED and SENSITIVITY

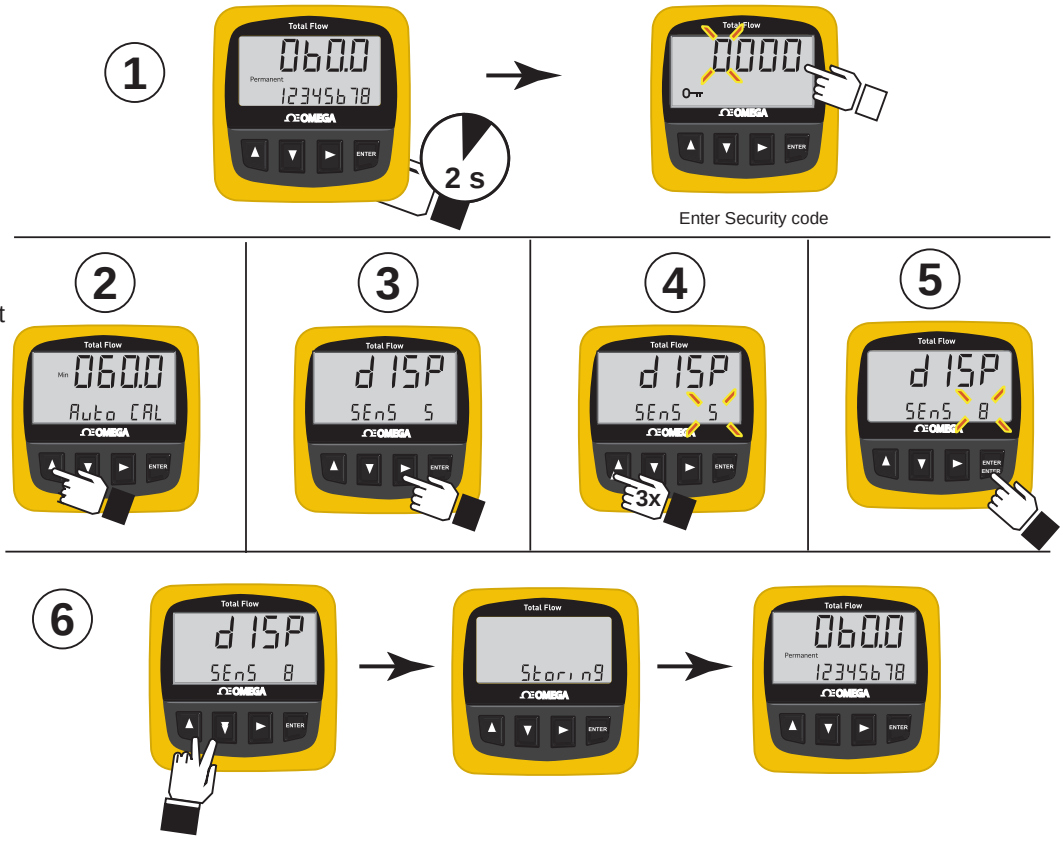
With SPEED at 60 seconds and SENSITIVITY set to 6, the flow rate is stabilized, while the sudden shift in flow is reflected very quickly (dotted blue line).



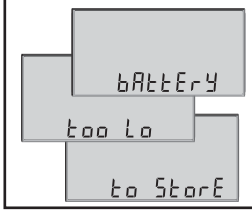
NOTE: The SENSITIVITY function is ineffective if the SPEED function is set to zero (seconds).

Example: Change the SENSITIVITY from 5 to 8

1. Hold the ENTER key for 2 seconds, then enter the SECURITY CODE. The display shows the first item in the menu, AutoCAL.
2. Press the UP key once to scroll to SENSITIVITY. The display shows DISP SENS and the current sensitivity setting.
3. Press the RIGHT key to select the SENSITIVITY for editing. The current SENSITIVITY setting begins flashing.
4. Press the UP key three times to scroll from 5 to 8.
5. Press the ENTER key to return to the menu.
6. Press UP and DOWN keys together to exit the menu and return to normal operation. The display shows "Storing" for a few seconds, then returns to the normal operating display.



16. Troubleshooting

Display Condition	Probable Cause	Suggested Solutions
	Batteries are dead or missing	Replace both batteries.
	Pull tabs have not been removed.	Remove plastic pull tabs protecting the batteries.
	The flow rate is greater than "9999"	1. Reduce the flow rate. 2. Change the Timebase to a smaller value. (Example: Change from "Day" to "Hour".) 3. Change the flow units to a larger measure. (Example: Change from "Liters" to "Gallons".) **NOTE:** If the Flow K-Factor is changed, be sure to make a corresponding change to the TOTAL K-Factor.
	FP-5750 is not receiving a signal from the flow sensor.	1. There is no flow in the pipe. 2. Flow sensor is not turning due to blockage or damage. 3. Sensor wiring is loose or incorrect.
	In AutoCal, the calculated K-Factor is outside the range of the FP-5750. (less than 0.001 or greater than 99999)	Press RIGHT key to start AutoCAL procedure again. Make sure that the flow rate entered is accurate.
The flow rate display is erratic and non-linear	Usually caused by inadequate straight pipe run upstream of sensor.	1. Correct piping layout to provide more straight pipe upstream of sensor. 2. Set the SPEED to higher setting to average out the fluctuations caused by piping conditions. (see Speed, section 14)
	Both batteries are too depleted to safely store settings.	Replace battery #1, then replace battery #2.

17. Flow and Total K-Factor Selection

Pages 17-19 provide K-Factors for the OMEGA FP-8501, FP-5200, and FP-5000 Series flow sensors. Use this table to convert the K-Factor to other units of measure, and to set the Total K-Factor.

NOTE:
- The maximum K-Factor is 999999.
- The minimum K-Factor is 0.001.

"If you want the FLOW RATE to read in:"	and you want the TOTALIZER to count in:	"Set the Flow K-Factor to:"	"and set the Total K-Factor to:"
Liters	Liters	K(Liter)	1
Liters	Kiloliters	K(Liter)	1000
Liters	cubic meters	K(Liter)	1000
cubic meters	cubic meters	K(Liter) x 1000	1
cubic meters	Megaliters	K(Liter) x 1000	1000
Kiloliters	Kiloliters	K(Liter) x 1000	1
Kiloliters	Megaliters	K(Liter) x 1000	1000
Megaliters	Megaliters	K(Liter) x 1 000 000	1
U.S. gallons	U.S. gallons	K(gal)	1
U.S. gallons	U.S. gallons x 1000	K(gal)	1000
U.S. gallons	cubic feet	K(gal)	7.4805
U.S. gallons	acre-inches	K(gal)	27154
U.S. gallons	acre-feet	K(gal)	325848
U.S. gallons	Kiloliters	K(gal)	264.2
acre-inches	acre-inches	K(gal) x 27154	1
acre-inches	acre-feet	K(gal) x 27154	12
acre-feet	acre-feet	K(gal) x 325848	1
acre-feet	acre-inches	K(gal) x 325848	0.083
cubic feet	cubic feet	K(gal) x 7.4805	1

18. K-Factor Charts

18.1 FP-8501 and FP-5000 Series Paddlewheel Flow Sensor

The following calibration data is reprinted for your convenience from the OMEGA FP-8501 and FP-5000 Series Flow sensor instruction manuals.

PIPE SIZE (IN.)	FITTING	FP-51XX, 53XX	
		U.S. GAL	LITERS
SCH 80 PVC TEES FOR SCH 80 PVC PIPE			
1/2	FP-5305M	520.12	137.42
3/4	FP-5307M	297.52	78.61
1	FP-5310M	172.07	45.46
1-1/4	FP-5312M	91.54	24.19
1-1/2	FP-5315M	62.22	16.44
2	FP-5320M	36.32	9.60
2-1/2	FP-5325	21.833	5.7683
3	FP-5330	13.541	3.5775
4	FP-5340	7.6258	2.0147
SCH 80 CPVC TEES FOR SCH 80 CPVC PIPE			
1/2	FP-5305CM	520.12	137.42
3/4	FP-5307CM	297.52	78.61
1	FP-5310CM	172.07	45.46
1-1/4	FP-5312CM	91.54	24.19
1-1/2	FP-5315CM	62.22	16.44
2	FP-5320CM	36.32	9.60
SCH 80 PVC SADDLES FOR SCH 80 PVC PIPE			
2	FP-5320S	32.480	8.5812
2-1/2	FP-5325S	21.833	5.7683
3	FP-5330S	13.541	3.5775
4	FP-5340S	7.6258	2.0147
6	FP-5360S	4.1623	1.0997
8	FP-5380S	2.3705	0.6263
10	FP-5310S	1.5300	0.4042
12	FP-5382S	1.0600	0.2801
SCH 80 PVC SADDLE ON SCH 40 PVC PIPE			
2	FP-5320S	27.350	7.2259
2-1/2	FP-5325S	18.874	4.9866
3	FP-5330S	12.638	3.3389
4	FP-5340S	6.7282	1.7776
6	FP-5360S	3.7297	0.9854
8	FP-5380S	2.1527	0.5688

PIPE SIZE (IN.)	FITTING	FP-51XX, 53XX	
		U.S. GAL	LITERS
CARBON STEEL TEES ON SCH 40 PIPE			
1/2	FP-5305CS	370.20	97.808
3/4	FP-5307CS	212.06	56.027
1	FP-5310CS	141.14	37.289
1-1/4	FP-5312CS	60.655	16.025
1-1/2	FP-5315CS	45.350	11.982
2	FP-5320CS	26.767	7.0717
STAINLESS STEEL TEES ON SCH 40 PIPE			
1/2	FMG-5305	358.96	94.838
3/4	FMG-5307	202.61	53.530
1	FMG-5310	127.14	33.590
1-1/4	FMG-5312	61.910	16.357
1-1/2	FMG-5315	40.410	10.676
2	FMG-5320	22.300	5.8917
GALVANIZED IRON TEES ON SCH 40 PIPE			
1	FP-5310G	104.54	27.619
1-1/4	FP-5312G	62.979	16.639
1 1/2	FP-5315G	46.688	12.335
2	FP-5320G	29.459	7.7832
BRONZE TEES ON SCH 40 PIPE			
1	FP-5310BR	104.54	27.619
1-1/4	FP-5312BR	62.979	16.639
1-1/2	FP-5315BR	46.688	12.335
2	FP-5320BR	29.459	7.7832
COPPER TEE FITTINGS ON COPPER PIPE SCH K			
1/2	FP-5305BR	443.21	117.10
3/4	FP-5307BR	212.16	56.052
1	FP-5310BR	127.18	33.600
1-1/4	FP-5312BR	88.218	23.307
1-1/2	FP-5315BR	56.962	15.049
2	FP-5320BR	29.370	7.7595
COPPER TEE FITTINGS ON COPPER PIPE SCH L			
1/2	FP-5305BR	414.41	109.49
3/4	FP-5307BR	191.09	50.485
1	FP-5310BR	119.84	31.662
1-1/4	FP-5312BR	85.451	22.576
1-1/2	FP-5315BR	55.160	14.573
2	FP-5320BR	28.605	7.5575

PIPE SIZE (IN.)	FITTING	FP-51XX, 53XX	
		U.S. GAL	LITERS
STAINLESS STEEL WELDOLETS ON SCH 40 PIPE			
2-1/2	FMG-5325	18.800	4.9670
3	FMG-5330	12.170	3.2153
4	FMG-5340	6.9600	1.8388
5	FMG-5350	5.2600	1.3897
6	FMG-5360	3.6900	0.9749
8	FMG-5380	2.1300	0.5627
CARBON STEEL WELDOLETS ON SCH 40 PIPE			
2-1/2	FP-5325CS	18.800	4.9670
4	FP-5340CS	6.9600	1.8388
5	FP-5350CS	5.2600	1.3897
6	FP-5360CS	3.6900	0.9749
10	FP-5381CS	1.3500	0.3567
12	FP-5382CS	0.9600	0.2536
COPPER/BRONZE BRAZOLETS ON SCH 40 PIPE			
2-1/2	FP-5325BR	18.800	4.9670
3	FP-5330BR	12.170	3.2153
4	FP-5340BR	6.9600	1.8388
5	FP-5350BR	5.2600	1.3897
6	FP-5360BR	3.6900	0.9749
8	FP-5380BR	2.1300	0.5627
SCH 80 IRON SADDLES ON SCH 80 PIPE			
2	FP-5320GI	32.360	8.5495
2-1/2	FP-5325GI	22.220	5.8705
3	FP-5330GI	13.420	3.5456
4	FP-5340GI	7.6600	2.0238
5	FP-5350GI	5.8600	1.5482
6	FP-5360GI	4.0900	1.0806
8	FP-5380GI	2.3300	0.6156
12	FP-5382GI	1.0600	0.2801
SCH 80 IRON SADDLE ON SCH 40 PIPE			
2	FP-5320GI	26.820	7.0859
2-1/2	FP-5325GI	18.800	4.9670
3	FP-5330GI	11.990	3.1678
4	FP-5340GI	6.8500	1.8098
5	FP-5350GI	5.3300	1.4082
6	FP-5360GI	3.7600	0.9934
8	FP-5380GI	2.1300	0.5627
10	FP-5381GI	1.3500	0.3567
12	FP-5382GI	0.9600	0.2536

18.1 FP-8501 and FP-5000 Series Paddlewheel Flow Sensor (continued)

PIPE SIZE	FITTING	FP-51XX, 53XX		
		U.S. GAL	LITERS	CODE
POLYPROPYLENE FITTINGS (DIN/ISO AND BS AND ANSI)				
DN 25	FP-5110PO	141.18	37.300	198.150.524
DN 40	FP-5115PO	51.265	13.544	198.150.526
DN 50	FP-5120PO	29.596	7.8193	198.150.527
DN 65	FP-5125PO	20.658	5.4579	198.150.560
DN 80	FP-5130PO	13.330	3.5218	198.150.561
DN 100	FP-5140PO	8.7077	2.3006	198.150.562
DN 125	FP-5150PO	5.0667	1.3386	198.150.563
DN 150	FP-5160PO	3.6892	0.9747	198.150.564
DN 200	FP-5180PO	2.0398	0.5389	198.150.565
PVDF FITTINGS (DIN/ISO AND BS AND ANSI)				
DN 15	FP-5105	420.87	111.19	198.150.529
DN 20	FP-5107	228.15	60.277	198.150.530
DN 65	FP-5125	18.067	4.7732	198.150.571
DN 80	FP-5130	12.357	3.2648	198.150.572
DN 100	FP-5140	8.0599	2.1294	198.150.573
DN 125	FP-5150	4.4312	1.1707	198.150.574
DN 150	FP-5160	3.2271	0.8526	198.150.575
DN 200	FP-5180	2.0360	0.5379	198.150.576

18.2 FP-5200 Series Flow Sensor

The following data is reprinted from the OMEGA FP-5200 Series Flow Sensor manual for your convenience.

SCH 40S STAINLESS STEEL PIPE PER ANSI B36.19		
PIPE SIZE	PULSES/ U.S. GAL	PULSES/ LITER
1/2.	873.03	230.66
3/4.	515.41	136.17
1.	266.17	70.322
1 1/4.	148.84	39.324
1 1/2.	107.98	28.528
2.	64.808	17.122
2 1/2.	44.685	11.806
3.	28.579	7.5506
4.	16.302	4.3070
5.	10.237	2.7046
6.	7.0057	1.8509
8.	3.9641	1.0473
10.	2.4690	0.6523
12.	1.6894	0.4463

Notes

19. Ordering Information

Mfr. Part No.	Description
FP-5750	Flow Totalizer
FP-5750-P	Flow Totalizer, Panel Mount

Parts and Accessories

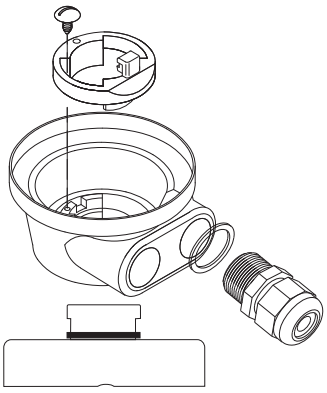
Mounting

FP-90IM	Integral Mounting Kit
FP-90UM	Universal mounting kit
FP-90-4X	Splashproof rear cover for panel mount totalizer
FPM-5000-MB	Surface mount bracket
FPM-5000-LTCK	Liquid tight connector kit (includes 3 connectors)

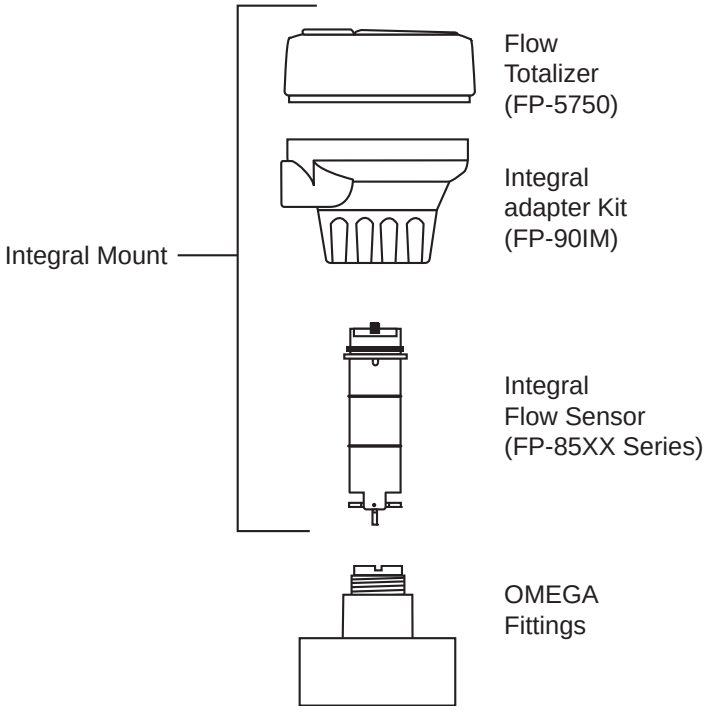
Replacement parts for integral mount units

FP-8501	Sensor, Integral, Polypropylene, Titanium Rotor Pin, PVDF Rotor (black), 1/2 to 4 Inch Pipe
FP-8502	Sensor, Integral, Polypropylene, Titanium Rotor Pin, PVDF Rotor (black), 5 to 8 Inch Pipe
FP-8503	Sensor, Integral, PVDF (natural), PVDF (natural) Rotor Pin, PVDF Rotor (natural), 1/2 to 4 In. Pipe
FP-5100	Sensor, PVDF (natural), Hastelloy-C Rotor Pin, PVDF Rotor (natural), 1/2 to 4 Inch Pipe
FP-5101	Sensor, PVDF (natural), Hastelloy-C Rotor Pin, PVDF Rotor (natural), 5 to 8 Inch Pipe
FP-5300	Sensor, Polypropylene, Titanium Rotor Pin, PVDF Rotor (black), 1/2 to 4 Inch Pipe
FP-5301	Sensor, Polypropylene, Titanium Rotor Pin, PVDF Rotor (black), 5 to 8 Inch Pipe
FP-5302	Sensor, Polypropylene, Titanium Rotor Pin, PVDF Rotor (black) 10 to 36 Inch Pipe
FMK-515-3P3	Sensor, Wet-Tap, Polypropylene, Titanium Rotor Pin, PVDF Rotor (black), 1/2 to 4 Inch Pipe
FMK-515-3P5	Sensor, Wet-Tap, Polypropylene, Titanium Rotor Pin, PVDF Rotor (black), 10 to 36 Inch Pipe
PH-31542-TC	Red Threaded Cap For In-Line Installations

Note: Use Saft LS14500 Lithium Batteries or equivalent ONLY.



FP-90UM
Universal mounting kit



WARRANTY/DISCLAIMER

OMEGA ENGINEERING, INC. warrants this unit to be free of defects in materials and workmanship for a period of **13 months** from date of purchase. OMEGA's WARRANTY adds an additional one (1) month grace period to the normal **one (1) year product warranty** to cover handling and shipping time. This ensures that OMEGA's customers receive maximum coverage on each product.

If the unit malfunctions, it must be returned to the factory for evaluation. OMEGA's Customer Service Department will issue an Authorized Return (AR) number immediately upon phone or written request. Upon examination by OMEGA, if the unit is found to be defective, it will be repaired or replaced at no charge. OMEGA's WARRANTY does not apply to defects resulting from any action of the purchaser, including but not limited to mishandling, improper interfacing, operation outside of design limits, improper repair, or unauthorized modification. This WARRANTY is VOID if the unit shows evidence of having been tampered with or shows evidence of having been damaged as a result of excessive corrosion; or current, heat, moisture or vibration; improper specification; misapplication; misuse or other operating conditions outside of OMEGA's control. Components in which wear is not warranted, include but are not limited to contact points, fuses, and triacs.

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RETURN REQUESTS/INQUIRIES

Direct all warranty and repair requests/inquiries to the OMEGA Customer Service Department. BEFORE RETURNING ANY PRODUCT(S) TO OMEGA, PURCHASER MUST OBTAIN AN AUTHORIZED RETURN (AR) NUMBER FROM OMEGA'S CUSTOMER SERVICE DEPARTMENT (IN ORDER TO AVOID PROCESSING DELAYS). The assigned AR number should then be marked on the outside of the return package and on any correspondence.

The purchaser is responsible for shipping charges, freight, insurance and proper packaging to prevent breakage in transit.

FOR **WARRANTY** RETURNS, please have the following information available BEFORE contacting OMEGA:

1. Purchase Order number under which the product was PURCHASED,
2. Model and serial number of the product under warranty, and
3. Repair instructions and/or specific problems relative to the product.

FOR **NON-WARRANTY** REPAIRS, consult OMEGA for current repair charges. Have the following information available BEFORE contacting OMEGA:

1. Purchase Order number to cover the COST of the repair,
2. Model and serial number of the product, and
3. Repair instructions and/or specific problems relative to the product.

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