

a. How do you know the pump is pumping? / What is a PosiFlow® Sensor?

1. The PosiFlow Feed Verification Sensor can help you identify whether the pump is pretending to pump or actually pumping chemical into the application.
2. The PosiFlow detects the flow of liquid output by the pump with no moving parts. The standard flow path of the pump is preserved so the liquid does not go through gears or move a magnet to actuate a pulse in the sensor, eliminating plugging or jamming concerns.
3. The PosiFlow sends out a signal with every stroke as long as there is liquid flow against pressure. The PosiFlow output signal will stop if the pump loses prime, is in a dead-head condition, or if the pump loses pressure due to a broken discharge line. An input device can be configured to interpret the signal in any way imaginable – totalization, no-flow alarms, drum re-fill notification, etc.

b. What chemicals can I pump with the PosiFlow®?

1. The PosiFlow sensor is available in 4 materials matching those of the E-Series pumps (follow the liquid end of the matching pump for best chemical suitability):
 - a. FCP-1VC (PVC & FKM)
 - b. FCP-1VE (PVC & EDPM)
 - c. FCP-1PC (GFRPP & FKM)
 - d. FCP-1PE (GFRPP & EDPM)

c. How does the PosiFlow® work?

1. You install the PosiFlow in-line on the discharge side of the pump – typically threaded right into the Manual Air Vent knob location. When the pump strokes, a small pressure spike is sent into and through the discharge line. The PosiFlow monitors the pressure changes and only if the pressure change is adequate, will register it as a legitimate stroke of chemical. Every time this happens, the PosiFlow sends a pulse (dry contact) through its wires. One shot of chemical produces one pulse from the PosiFlow.

d. What can I do with this pulse from the PosiFlow®?

1. You can wire the PosiFlow directly into the control module of an EWN-Y pump and use one of the three built-in programs to monitor and detect when the pump loses prime. The EWN-Y constantly monitors the stroking of the solenoid and compares it to the pulses from the PosiFlow. When the PosiFlow fails to send contacts (number of missed contacts is configurable in the programming) but the solenoid continues to stroke, one or both relays in the pump can be programmed to close sending an alarm, starting a back-up pump, triggering a empty drum, etc.
2. You can also interface the PosiFlow, in conjunction with a pump, to a Walchem controller equipped for the input. Similar to the programming built

into the EWN-Y, the controller monitors the when the pump is on and compares it to the signals from the PosiFlow. Superior to the pump alone, in this set-up, you can calibrate, monitor and display the amount of chemical being pumped, in addition to triggering an alarm if the pump loses prime, and/or start a backup pump.

3. A PLC is the third most common interface with a PosiFlow. The connection and use is virtually the same as the Walchem controller, however the signal from the PosiFlow can be integrated into the PLC programming in whatever way suits the needs of the system.

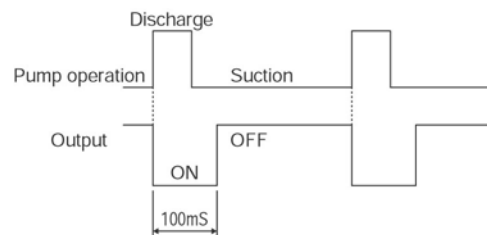
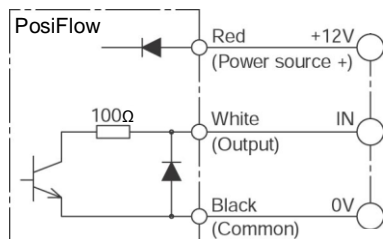
e. How do I order/specify the PosiFlow®?

1. Select the best materials of construction for the application based on the pump liquid end and choose from the (4) models:
 - a. FCP-1VC (PVC & FKM)
 - b. FCP-1VE (PVC & EDPM)
 - c. FCP-1PC (GFRPP & FKM)
 - d. FCP-1PE (GFRPP & EDPM)

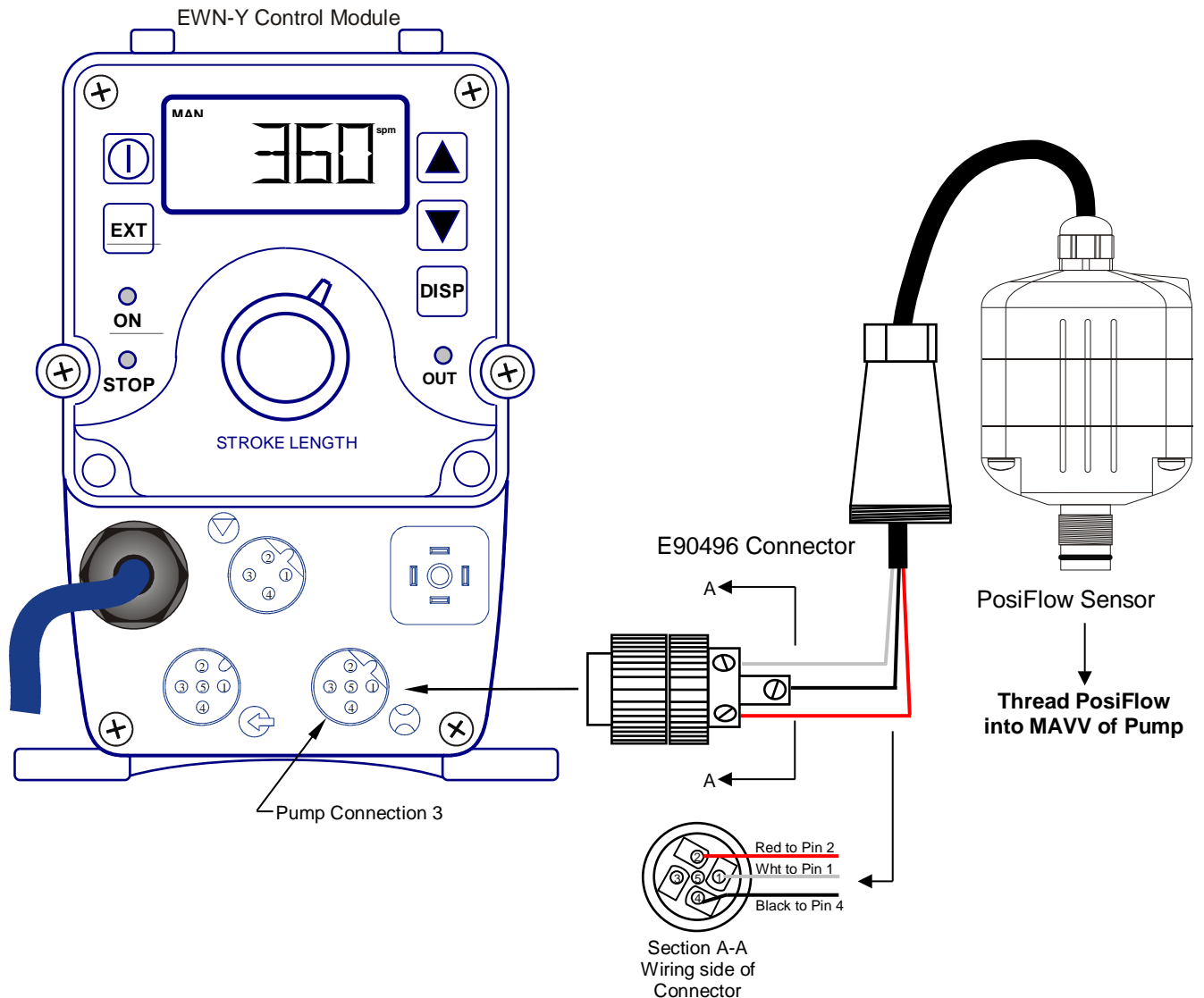
Wiring, Programming & Installation Setup

- a. The PosiFlow requires a nominal 12 VDC power supply. When connecting directly to the EWN-Y series pumps, the power is supplied from the pump. VDC is also available in the Walchem controllers as well.
- b. Installation of the sensor itself is directly into the Manual Air Vent Valve (MAVV) of E Series pump. It simply replaces the knob used to open and close the valve. Turning the sensor replaces the function of the knob. The PosiFlow can also be used to replace the knob in the MFV as this is the same knob.
 1. Older and non-E Series pumps will not accept the PosiFlow directly. In this case, an in-line tubing adapter (P/N E90599/E90600) can be used to place the PosiFlow into the discharge tubing. NOTE: Keep the tubing adapter to within 6" of the pump discharge.
 2. Similarly, using the PosiFlow with pumps that use the first generation Auto Air Vent Valve (AAVV) also require a tubing adapter (P/N E90599) as the knob in this valve is different and is used for the gas venting feature.

- a. Wiring of the PosiFlow sensor is simple. The BLACK wire is for common, the RED wire is for the 12 VDC power supply, and the WHITE wire is the signal wire. Below is a brief schematic of the signal.



A drawing of wiring the PosiFlow to the EWN-Y pump is below:



Looking at the back of the connector, the pin layout is the same as on the back of the pump – and while the connector does have tiny numbers molded in next to the screws, it is usually easier to put the connector onto the pump and then wire to the pins based on location as shown above and in the manual. The PosiFlow cable is supplied with fork terminals and when wiring to the EWN-Y connector, they will need to be cut off short and wired as shown.

- b. Programming the EWN-Y pump for use with the PosiFlow sensor:
The PosiFlow Sensor program is turned OFF by default and will have to be turned on. Details of this programming is found in the EWN-Y Quick Start Programming Guide: PosiFlow & FCM Flow Checker Programming.

NOTE: Do NOT turn on the PosiFlow Sensor program unless a PosiFlow is attached and plugged into the pump. The pump will always error out and stop without the sensor.

****DEFINITION OF POSIFLOW MODES:**

- A.MODE: The pump will stop, OUT 1 (and OUT 2) will close, and “FLOW” will be displayed once the pump has stroked the user-defined number of pulses without getting a signal from the PosiFlow sensor.
- B.MODE: Once the user defined number of pulses without a signal from the sensor has been reached, OUT 1 (and OUT 2) will close, but the pump will continue to run for another user-defined number of strokes. If there is still no signal from the PosiFlow, then the pump will stop and “FLOW” will be displayed.
- C.MODE: Once the user defined number of pulses without a signal from the sensor has been reached, the pump will continue to operate for another user-defined number of strokes. If there is no signal from the PosiFlow at that point, OUT 1 (and OUT 2) will close, the pump will stop and “FLOW” will be displayed.
- D.MODE: Once the pump detects no flow from the sensor, it begins to operate at the MAN speed setting for the FC.TIM setting. With still no signal, it will operate at full speed for the FC.PRM set time. If the pump senses continuous flow for the FC.RTN set time, it will reset, otherwise it will alarm out, “FLOW” will be displayed and the pump will stop.

Troubleshooting & Application requirements

- a. A minimum system pressure of 40-45 PSI is required for operation. This is usually not a problem as most installations are above 40 PSI. However if the application is less than 40 PSI or open discharge, there are a couple of solutions:
 1. Standard diaphragm style BP/AS (Back Pressure/Anti-Siphon) Valves. These come in a variety of styles and are available by several manufacturers. They are typically adjustable from 10-150 PSI. The BP/AS valves from Walchem are pre-set at 50 PSI and will work out-of-the box with the PosiFlow with any pump.
 2. An alternate solution specifically for the 11, 16 and 21 sized E-Series pumps is the E90375 spring option. This is a higher-pressure spring made to go in the 3/8" OD tubing Injection Valves to simulate an approximate backpressure to the pump and PosiFlow of 50 PSI. Instructions for installation are supplied with the spring. Note: Depending on the application, the spring may wear over time and its back pressure-producing ability may diminish, causing the PosiFlow to stop registering pulses. Replace the spring as necessary.

- b. Pressure limitations of some pumps will render use with a PosiFlow difficult. These include all pumps with a maximum pressure rating of 30 PSI:
 1. EZ/EW/EKB31 size Pumps
 2. EZ/EW/EKC36 size Pumps
 3. EHE56 size Pumps

Each of these pumps can pump up to 30 PSI, but not much (if any) more. Because the PosiFlow requires 40 PSI to operate reliably, operation with these pumps is not recommended.

- c. The PosiFlow is basically a pressure transducer with algorithms built in to determine if the pressure changes should be considered a pulse from moving chemical. Because of this, some pumps application/pump combinations may not work as well as others. In particular, small B11 pumps used with a PosiFlow may not work if the pump is turned down too low. Since the PosiFlow needs to see a pressure spike, if the Stroke Length is too small, the spike generated may not be large enough to register. Similarly, if the speed is turned down too low, it is very easy for the tiniest bubble or tubing to dampen out the small pulses. Reducing both the pump Stroke Length and speed for low outputs is the most difficult application for the PosiFlow, particularly for the smaller B11 pumps. Higher back pressure installations often will help this, but as the output reduces below 0.2GPH, adjustment of speed vs. stroke length may be required (forcing stroke length higher and slowing speed).

- d. My pump is pumping, but it isn't registering pulses from the PosiFlow.
 1. LED is OFF.
 - a. Double check the wiring in the connector or in the Walchem controller or device to ensure power is applied to the sensor.

- b. Check that the pump is primed or not in an air-lock condition. Re-prime the pump and make sure it is pumping against some backpressure.
- c. Check the model number of pump and if it is able to pump over 35 PSI.
- d. Double-check the pressure of the system – the requirements of the PosiFlow are 40-45 PSI. Use a separate backpressure valve or the high-pressure injection valve spring option to increase backpressure if system pressure is too low.
- e. Is the discharge line too long? Too much discharge tubing can dampen the pressure pulses in the line and the PosiFlow will not be able to see them. A solution is to put a backpressure valve in the discharge line shortly downstream from the sensor.
- f. Is the discharge line too large? If there is too much volume in the discharge line, this can also dampen the pulses – especially on smaller sized pumps – and the PosiFlow will not be able to see them. A solution is to put a backpressure valve in the discharge line shortly downstream from the sensor.
- g. Is there trapped air/gas in the discharge line? This acts a pulsation dampener and the PosiFlow will not be able to register the pulses if they are damped out. Purge the air/gas out of the line and/or add a backpressure valve just downstream from the sensor.

Note: The PosiFlow sensor does not work with any LKN or IX series pumps. Discharge line is too large and the diaphragm moves just a little too slow for the electronic algorithm to register.

2. LED is steady red:

- a. Abnormal pressure drops or rises cause the LED to turn red.
- b. Check the discharge tubing. Is it cut/broken or pumping to open atmosphere? Use a back pressure valve or the high pressure injection valve spring option to increase back pressure for the PosiFlow.
- c. Is the discharge line clogged or closed causing a dead head condition? Remove or relieve the closure from the discharge line for normal operation.

3. LED is Flashing green, but no pulses being received:

- a. Double check the wiring into the connector, Walchem controller or device.
- b. Check the programming of the pump or controller, ensuring they are set up for incoming pulses.