Flow Line Options

MEMFlo Flo-Sentry™ Alarm Systems Manual

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INTRODUCTION

Please read this instruction and enclosed forwmeter instruction(s) an data sheets completely before installation and startup. Pay particular attention to the safety precautions and operating limits. MEMFlo Flo-Sentry™ Alarm Systems are designed for industrial enviornments, and by taking a few moments to review the instructions you will be assured long, trouble-free service.

BASIC OPERATION

MEMFlo Flo-Sentry Alarm Systems consist of two main parts- the MEMFlo Flowmeter and the Flo-Sentry Alarm. There are two Flo-Sentry formats- one for the single alarm function an a dual alarm version. In the standard single alarm model dipicted in Figure 1, three or four reed switches are wired in parallel to form a switch bank that covers the entire normal flow span. Under normal flow conditions, a magnet on the flowmeter float will close one or more of the parallel-wired switches (which are typically connectd to a SPDT relay), completing a closed loop circuit. A flow change that causes that float to move the magnetic field away from the switches opens the circuit, causing the alarm condition (alarm condition is also caused by a broken wire power failure).

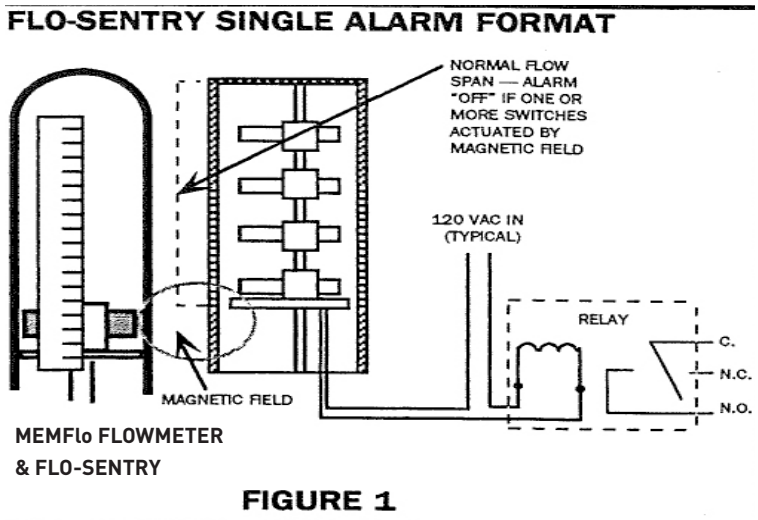

FIGURE 1

In Figure 1, the alarm condition would exist as the magnetic field has just fallen below the bottom reed switch. This opens the circuit loop, de-energizing the relay coil. The relay contacts toggle over to the opposite position, triggering any device wired to the alarm.

Flo-Sentry Alarms can also be provided for dual (such as high and low) alarm signaling. In this format, two reed switches per alarm point are provided- one switch to activate the alarm and one to deactivate it. This version, shown in Figure 2, requires connecting the Flo-Sentry to MEMFlo's Guardalarm™.

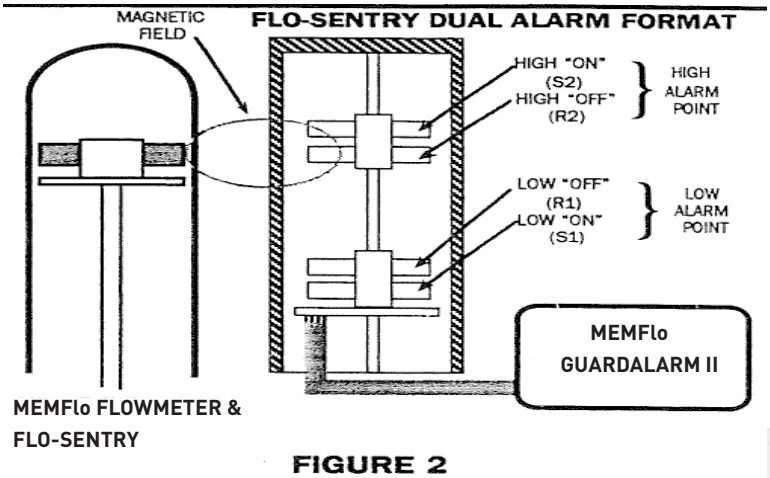

FIGURE 2

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In Figure 2 above, the magnetic field is triggering both the "high on" and the "high off" switches - the logic of the Guardalarm (or a programmable controller) is set to trigger the alarm device during this condition. Only when the magnetic field hits the "high off" solely as the flow is corrected and the meter float moves downward will the alarm cease.

The switches in both versions are mounted on field adjustable carriers, and can be moved without disassembling the flowmeter. NEMA type 12 and 4X enclosers are offered, as is a NEMA 7/9 enclosure for explosion-proof areas. Flo-Sentry Alarms are adaptable to most MEMFlo Flowmeters, and can be supplied with the switches only or with the relay or Guardalarm in a second, remote enclosure.

While Flo-Sentry Alarms cannot be used in areas with very strong magnetic fields, they offer distinct advantages over meters with mechanically actuated switching. Flo-Sentry alarms have absolutley no effect of flowmeter accuracy, repeatability, longevity, or the ability to disassembly the flowmeter in the pipeline for cleaning.

FLO-SENTRY WIRING

Please refer to the wiring diagrams (Figures 4 & 5) in this instruction manual. The switches in the Flo-Sentry enclosure on the meter are pre-wired with leads ready to connect to the desired relay package, Guardalarm, or control equipment.

ALARM POINT ADJUSTMENT

Alarm points may be adjusted without removing the flowmeter from the pipeline and without interrupting flow. However, it may be easier to sest inital alarm points prior to meter installation. MEMFlo also can preset alarm points for an additional charge.

CAUTION: ALWAYS SHUT OFF AND DISCONNECT POWER TO THE FLO-SENTRY BEFORE OPENING THE SWITCH ENCLOSURE AND MAKING ADJUSTMENTS!

To access the reed switches, remove the screw at the top of the enclosure. The cover may now be lifted straight up, exposing the switches. On explosion-proof enclosures, remove the bolts and front cover to access switches.

Each switch is held by a spring clip (Figure 3) on a carrier block locked into position on the vertical post by a set screw. Loosening this set screw allows vertical post by a set screw. Loosening this set screw allows vertical adjustment of the switch. On dual alarm models, there are two switches per carrier block, each held by its own spring clip.

The vertical adjustment is normally the only change required to alter switch points. If necessary or desired, the switch can be repositioned within the spring clip, either closer to or farther away from th float magnet.

IMPORTANT- THE POSITION OF THE SWITCH RELATIVE TO THE FLOWMETER SCALE DOES NOT DETERMINE THE ALARM POINT. ALARM POINTS ARE DETERMINED BY THE MAGNETIC FIELD ACTUATING THE REED SWITCH, AND THE MAGNET, SWITCH, AND SCALE WILL NOT NECESSARILY BE ALIGNED (as depicted in Figure 1).

ADJUSTING SINGLE ALARM POINT MODELS

Using a VOM or similar device connected to the leads of the junction circuit board, check for circuit closure by moving the flowmeter float throughout its entire range. Because the reed switches are wired in parallel, circuit closure should be constant throughout the normal flow range. The circuit should open at the desired alarm point. To adjust this alarm point, move the switches up or down with the float indicator opposite the desired flow alarm point on the scale.

EXAMPLE: To set a 70 SCFM flowmeter fow low flow alarm at 5 SCFM, position the float so that the top edge of the float disk (or center of the ball indicator on magnetic indication meteres) is opposite the 5 SCFM mark on the scale. Move the lowest reed switch carrier down until circuit closure is indicated, and then upward very slowly until the circuit opens. Snug the set screw at this point, and then adjust all the other switches so that they are equally spaced above the lowest. Move the float throughout the entire meter range. If all switches are properly set, the circuit should show closure in all normal flow areas, and open only at and below the low flow alarm point (5 SCFM in this example).

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SWITCH DIFFERENTIAL

A certain degree of differential- the difference between the "on" and "off" points of a single reed switche - will be observed at the alarm point. For instance, in the example above, while the alarm circuit opens at 5 SCFM, it will not close again until a flow of about 5.5 SCFM or more is achieved. This differential is desireable as it prevents rapid on-off cycling which couyld damage electrical components. Some small adjustment of the amount of differential may be possible by moving the reed switches in or out within the spring clips. This will probably necessitate readjustment of the set points.

ADJUSTING DUAL ALARM POINT MODELS

Switch action can be checked as in the single alarm procedure using a VOM, or by checking relay action from the Guardalarm.

CAUTION: IF SETTING SWITCH POINTS FROM THE RELAY CONNECTIONS OF THE GUARDALARM, USE EXTREME CARE NOT TO CONTACT THE POWER LEADS ON 110/220 VAC INPUT POWER MODELS!

Please note that there are two switches per alarm point- one to turn the alarm "on" and one to turn it "off". These dual switches are vertically adjusted on a single carrier.

To make the adjustment, position the flowmeter float at the desired alarm point and move the switches toward the magnet slowly until the alarm "on" switch closes. Snug the set screw at this point.

TYPICAL WIRING: FLO-SENTRY SINGLE ALARM FORMAT

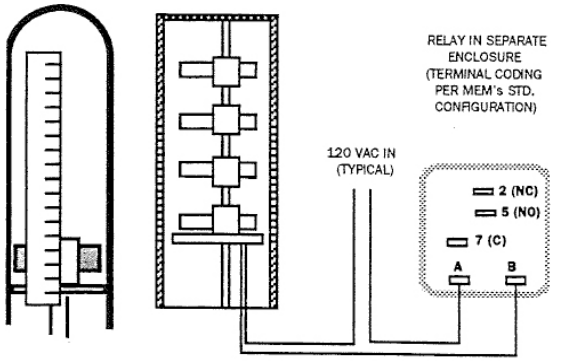


FIGURE 4

FLO-SENTRY GUARDALARM WIRING DIAGRAM

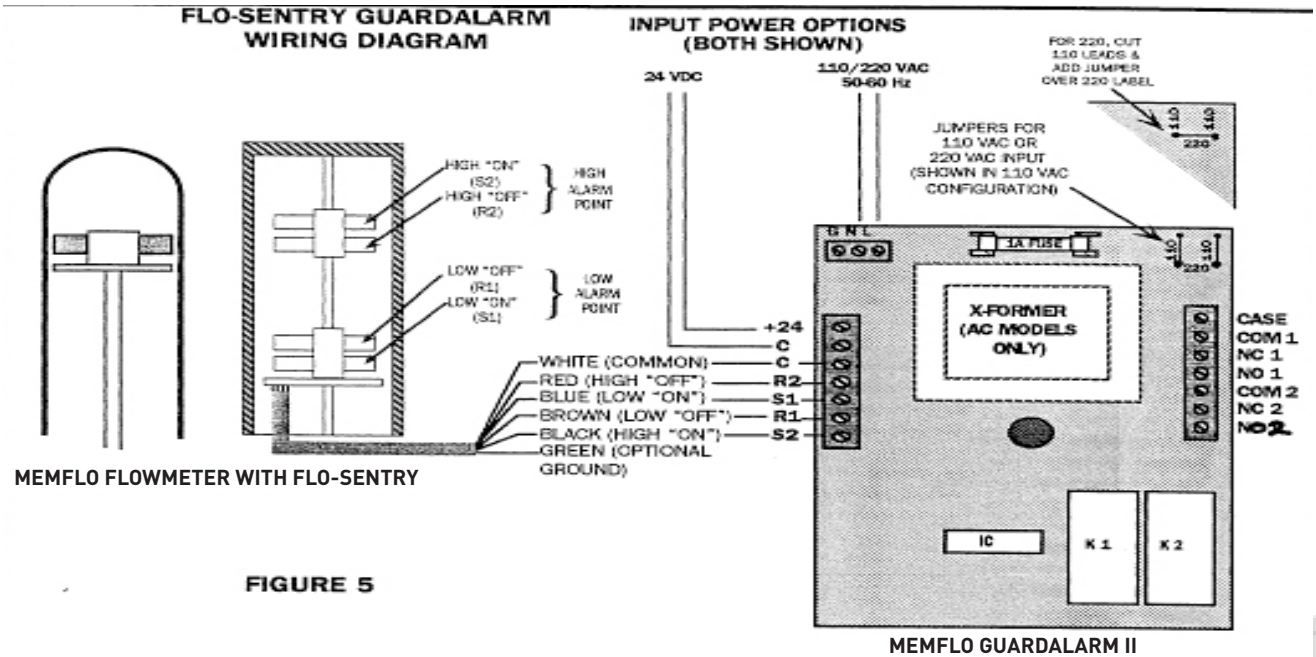
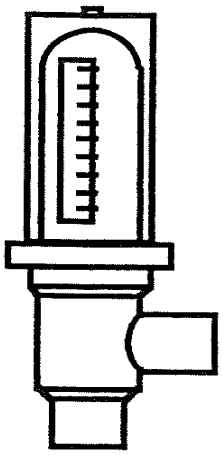


FIGURE 5

FLO-SENTRY SWITCH ENCLOSURE POSITION OPTIONS

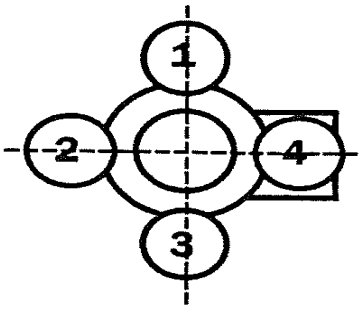
Figure 6 shows the possible positions of the Flo-Sentry reed switch housing on the flowmeter. Position 1 is considered standard, and is how the meter is shipped unless otherwise specified.

FIGURE 6



TYPICAL FRONT VIEW
Flowmeter with Flo-Sentry in standard Position 1

TOP VIEW
Positions 1 thru 4 possible on Thru View & All Metal meters; 1 thru 3 on PVC, CPVC, Series T, H



THE FLOAT MAGNET(S) MUST ALSO BE REPOSITIONED if the Flo-Sentry switch enclosure is moved to an alternate configuration. This may require flowmeter disassembly per the meter instructions. The basics of float magnet repositioning are tabulated below.

METER TYPE	BASIC MAGNET ROTATION METHOS
Thru View & All Metal Flowmeters; most RangeMasters	Positions 1 & 3 available without repositioning magnet. Positions 2 & 4 require removing magnet, loosening magnet holder screw, & rotating holder 90°
PVC & CPVC	Float must be rotated (magnets are encapsulated, & float top slotted at 90° increments for Positions 1 thru 3)
Series T & H	Similar to plastic meters; entire float must be rotated.

FLOWMETER INSTALLATION

Please refer to the "Installation" section of the flowmeter instruction manual, paying particular attention to the safety precautions.

MAINTENANCE

With no electical circutry in the media and no mechanical linkages, no regular maintenance of the alarm is required. All switches are rated for millions of cycles. Any flowmeter maintenance requirements are covered in the meter instruction.

STORAGE

The only storage or handling requirements for MEMFlo Flo-Sentry Alarm Systems are to keep them in a reasonably clean location away from excessive heat, chemicals, solvent fumes, or vapors not compatible with the materials of construction.

REPLACEMENT PARTS

Under proper care and normal service, there is no need to stock replacement parts. The reed switches are hermetically sealed and intrinsically safe. They cannot be repaired if damaged. If a switch is damaged, the entire junction board and reed switch assembly should be replaced.

SPECIFICATIONS

Reed Switches: 10 W, normally open, max 120 VAC or 100 VDC.

Relay (if ordered from Flow Line Options): Standard SPDT, 120 VAC, 50/60 Hz, 13 amp.

Enclosures: On metal flowmeters, anodeized aluminum standard, constructed per NEMA 12 requirements. For plastic meters, PVC enclosures built per NEMA 4X criteria. NEMA 7/9 (explosion-proof) available as a special option. Switch enclosures have ½ NPT conduit connectors.

MEMFlo GuardAlarm

Input Power: AC Version is 110/220 VAC, 50/60 Hz. DC input model 24 VDC.

Output to Flo-Sentry: 12 VDC, 150 microamp max. loading. Conforms to UL Class 2. Will function against line resistance up to 10K ohms.

Relay: Two SPDT, 10 A, 250 VAC/30 VDC relays.

Enclosure: NEMA 4X standard, NEMA 7/9 (explosion-proof) optional.

Internal Circuitry: CMOS circuit with arc suppression and noise filtering.