

In-Line Electronic Flow Switches



IM Series

Ameritrol Inc.
Instruments and Controls

Industries

Petrochemical
Refining
Oil Production
Water Treatment
Pharmaceutical
Food and Beverage
Pulp and Paper
Power Production
Gas Processing
Mining
Biotechnology
Semiconductor
Ships/Marine
Defense Contractors
Pipelines

Features

- No Moving Parts
- 316L Stainless Steel
- Temperatures to +250F
- Pressures to 2000 PSIG
- Low Flow Rate Detection
- ¼” Tubing Connection
- Reliable and Cost Effective
- Simple Easy Field Calibration



IM 2525



IM 2525 with ¼” MNPT Adapter Fittings



IM 2525 with Optional Housing

Specifications

Sensor Head

Material of Construction:	316L Stainless Steel Standard
Operating Temperature:	-50 to +250F (-46 to +177C) Standard
Operating Pressure:	Vacuum to 2000 PSIG (275 Bar)
Response Time:	From 1 Second
Repeatability:	+/-0.5% of Range at Constant Conditions
Process Connection:	¼” Tubing Inlet and Outlet
Body Length:	6” Standard, Options Available
Cable Length:	10’ standard, Option Specify Length

Electronics

Housing:	Standard: No housing (includes circuit board mounting hardware) Option Nema4X housing with 1” FNPT Electrical Connections
Temperature:	-50 to +150F (-46 to +65C)
Power Input:	90-132 VAC, 50/60 Hz, 4 Watts; Option 24 VDC/VAC, 200-240VAC 12 VDC
Relay Output:	SPDT 3 Amps Resistive Option DPDT and 10 Amps Res. Dual Set Points
Shipping Weight:	2 lbs

Operation

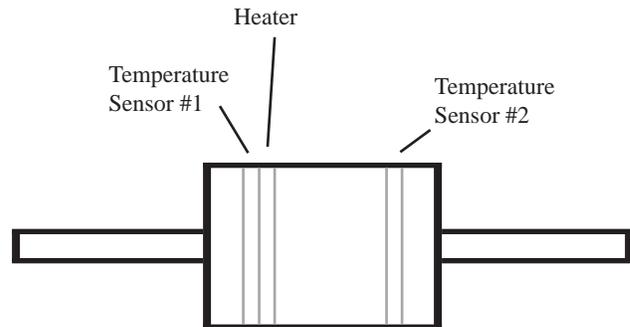
The IM series in-line flow switch is designed to easily adapt to 1/4" tubing. Please refer to the IX or FX series for larger line sizes. These switches offer an extremely reliable and repeatable instrument for industrial process control and feature no moving parts exposed to the product being monitored.

The device operates by measuring a temperature differential between a heated and a reference temperature sensor. Within the body of the sensor head are the four tubes as shown in figure 1. The temperature differential is greatest at no flow and changes as flow is achieved across the sensor. This allows use in applications requiring a simple flow/no flow detection and for set-points at a predetermined flow rate. Many different flow ranges are shown in the set-point range section. A conversion table is also provided to convert different engineering units.

Extremely low flow rates can be detected with a typical turn down ratio of 300:1. The principle of operation allows this flow switch to be used in practically all liquids, gases and slurries.

The electronics are available with single or dual switch points. The instrument can be easily field programmed to detect an increase or decrease of flow.

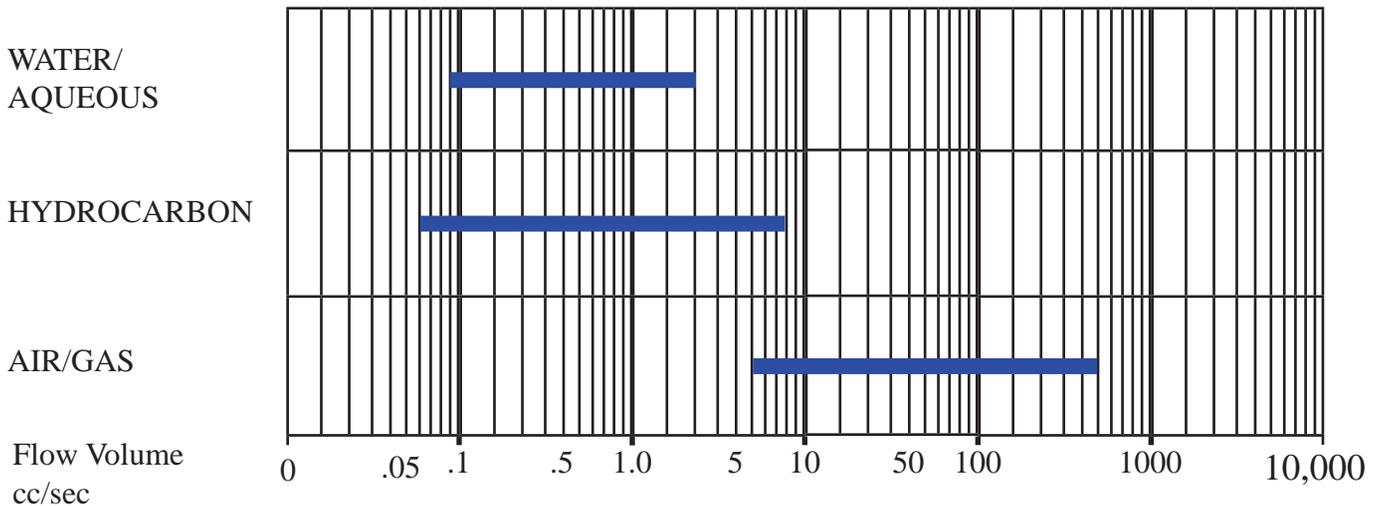
Relay outputs are standard and are offered with several different configurations and contact ratings.



$$\text{Temperature Differential} = \text{Temperature Sensor \#1} \text{ Minus Temperature Sensor \#2}$$

Figure 1

Flow Switch Set-Point Range



Conversion Table

Convert to cc/sec on above chart

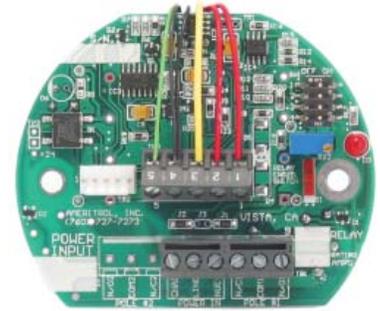
FROM	MULTIPLY BY:	FROM	MULTIPLY BY:
GAL/MIN	63.1	LITERS/HR	0.0278
GAL/HR	1.05	LITERS/DAY	0.0116
GAL/DAY	0.0438	CUBIC FT/MIN	471.95
LITERS/MIN	16.7	CUBIC MTR/HR	278.0

Circuit Board Options

Standard Single Switch Point Electronics

- SPDT relay output with 3 or 10 amp contacts
- DPDT relay option with 3 or 10 amp contacts
- Wide selection of power inputs including 12 VDC, 24 VAC or VDC, 120 VAC, or 240 VAC

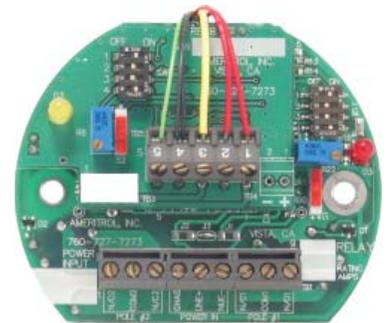
This circuit board is the standard used in the IM series flow switches. The electronics offer constant current sensor excitation, precision signal amplification, and highly repeatable switching circuitry for reliable operation in even the most demanding applications.



Optional Dual Switch point Electronics

- Two separately adjustable switch points
- SPDT relay output for each set point with 3 or 10 amp contacts
- Power inputs include 12 VDC, 24 VAC or VDC, 120 VAC, or 240 VAC

The optional dual switch point electronics provide two independently adjustable switch points that can be used to detect any two combinations of decreasing and/or increasing flow.



Single Switch Point Electronics with Additional Temperature Switch

- Temperature switch point available from -50F to +350F
- SPDT relay output for flow and temperature with 3 or 10 amp contact rating
- Customer specified power inputs include 12 VDC, 24 VAC or VDC, 120 VAC, or 240 VAC

This optional circuit board monitors two process variables, flow and temperature, with one instrument. Cost savings are realized by the user since the instrument has only one process connection and one conduit run. Applications include monitoring cooling water and all other applications shown on page 5 of this brochure.



Optional Calibrator

Flow Switch Calibrator Model MC-5

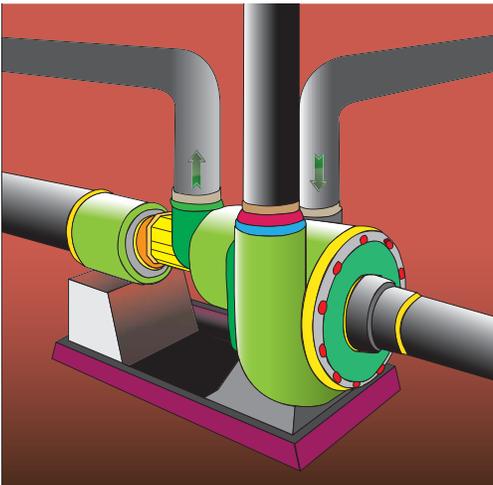
- Displays mV output which is proportional to flow
- Induces signal to electronics for setting specified switch point
- Allows periodic switch point verification

This tool is not needed for a vast majority of users. It is useful when a user has large quantity of units and requires periodic verification of switch point calibrations.

This easy to use hand held, self powered instrument can be used in conjunction with all single or dual switch point circuit boards. By simply plugging this instrument into the circuit board, the user can interrogate all functions of the flow switch.



Flow Switch Applications



- Pump Protection: Automatic shut down on low or no flow
- Bearing Lubrication: Detects loss of lubricant flow
- Seal Leakage: Verifies positive seal flow or detects excessive leakage indicating maintenance requirement
- Chemical Feed and Metering Pumps: Indicates low or no flow of chemical additives to process

- Spray Nozzles: Detects nozzle blockage in coating applications
- Relief Valve/Rupture Disks: Alarms on flow or leakage of safety relief valves or rupture disks
- Chiller Lines: Automatic shut down of chillers on low or no flow
- Analyzer/ Gas Chromatographs: Confirms continuous sample flow to instruments

