

Signet 2551 Magmeter w/Display FAQ's

Q. Can blind units be used with a REMOTE mount 2551 display module?

A. No, the unit was not designed to be remotely mounted. You can use the 3-8550-xx instead.

Q. Are the relays on the Display Magmeter isolated?

A. Yes, both the solid-state and dry-contact relays are isolated.

Q. What is the Mirror Relay 1 function?

A. The Mirror Relay 1 function, only available for the Frequency/Digital (S3L) versions, allows full relay functionality via the Frequency/Digital (S3L) output lines. This means that you can have exactly 1 output with the Display Magmeter without relays and you can have exactly 4 (Mirror + 3 relay) outputs with Display Magmeter with relays.

Q. Does Window Mode used for relays refer to the span outside the window or inside the window?

A. The Window mode refers to the span inside the window. If you need the span outside the window, you need to use the normally closed (NC) contact rather than the normally open (NO) contact.

Q. Can the 2551 Display Magmeter electronics be damaged if the clear plastic lid is not used?

A. Yes, moisture intrusion can damage the electronics.

Q. Is it okay to leave the screw off the lid and module?

A. No, it is required to meet the UL Standard.

Q. Can I screw the clear display lid on the module without using an o-ring?

A. No, it will not comply with the UL Standard and may incur moisture intrusion.

Q. Can I use the clear display lid if there is crack on the lid?

A. No, it will not comply with the UL Standard and may incur moisture intrusion.

Q. How does the Sensitivity feature work?

A. If the input values are changing by a large amount, this sensitivity feature determines how quickly to adopt these input values. This feature has a greater effect for longer averaging times.

Q. Do I still need the Magmeter Setup Tool to configure the unit?

A. No, it cannot be done. All of the sensor configuration can be accomplished via the built-in user interface.

Q. Is there a way to tell which output option (i.e. Frequency/Digital or 4-20mA) I have with my 2551 Magmeter?

A. Yes, there is a label on the output board that specifies the output type such as, Freq, Digital (S3L), or 4-20mA).

Q. What is the warranty on the new Signet 2551 Magmeter?

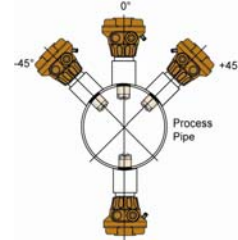
A. All Signet products, including the 2551 Magmeter, are under warranty for two years from date of purchase. [Click here to see a copy of the George Fischer Signet, Inc. warranty statement.](#)

Q. What is the price of a 2551 Magmeter compared to other magmeters on the market?

A. A 2551 Magmeter costs about half as much as full bore magmeters, and they are competitively priced relative to other insertion magmeters.

Q. Is there a limitation to mounting angles for the 2551 Magmeter?

A. No, the 2551 will operate at any angle. Normal installation issues like air bubbles and sediments must be considered.



Q. Is the flow range of the 2551 Magmeter better than a paddlewheel?

A. Yes, significantly better:

- The Signet 515 Paddlewheel Flow Sensor has an operating range of 1 ft/s to 20 ft/s.
- The 2551 Magmeter operating range is 0.15 ft/s to 33 ft/s.

[Click here to see the full specifications of the 2551 Magmeter.](#)

Q. What is the minimum Reynolds number that the 2551 can be used in?

A. The 2551 requires a Reynolds value of 4500 or greater for optimum performance. This is not difficult to achieve if the basic guidelines for installation and flow rates are observed, and if the fluid is similar to water.

Q. Why does the sensor have a minimum conductivity requirement of 20 µS?

A. Magmeter technology is based on Faradays law, which says that the movement of a conductor through a magnetic field will result in a voltage output that is proportional to the speed at which the conductor is moving. The lower the conductivity of the fluid, the more difficult the voltage is to measure. Signet has set 20 µS as the threshold for the 2551 Magmeter.



Signet fittings control the location of the sensor inside the pipe, and are critical to the performance of the Magmeter.

Q. How does the 2551 Magmeter install into the pipe?

A. The 2551 Magmeter can be used with any ½ to 8 inch Signet installation fitting. These are the same fittings that are used on the Signet 515 and 2536 paddlewheel flow sensors. [Click here for a full list of fittings.](#)

Q. Can I replace a paddlewheel with a 2551 Magmeter?

A. Simply remove the paddlewheel and install the 2551 Magmeter. There are no special tools required; the 2551 uses the same fittings as the paddlewheel.

Q: Is the 2551 compatible with current Signet instruments?

A: Yes. The 2551 with FREQUENCY output is compatible with Signet's complete line of powered Flow Instruments. It is the first flow sensor from Signet that offers the serial data output (S3L) to enable using it with the 8900 MultiParameter Controller. For the first time, a Signet system can control SIX flow channels with one instrument!

Q. How many 2551 Magmeters can be used with the 8900 Multi-Parameter Controller?

A. Up to 6 Magmeter Digital (S3L) inputs can be used. See the 8900 manual for information related to cabling requirements and limitations.

[Click here for more information on the 8900 power requirements.](#)



Q. Other manufacturers charge a premium for test certificates. Is there an additional cost for a 2551 test certificate and is it NIST traceable?

A. All 2551 Magmeters are packaged with an NIST certificate from the factory. There is no charge for this certificate.

There is a fee for annual or periodic recertification.

[Click here for a sample copy of the test certificate.](#)

Q. How does the 2551 Magmeter compare to a full bore magmeter?

A. The technical specifications are similar, although full-bore magmeters do have an inherent technical advantage because the electrodes span the diameter of the pipe. An Insertion Magmeter like the Signet 2551 locates the electrodes close together to enable simpler installation, and to be able to install the sensor into a range of pipe sizes. When the practical advantages of insertion magmeters are compared to the technical advantages of a full-bore magmeter, the insertion technology is very attractive!

	2551	Full Bore magmeter
Initial Cost	\$\$	\$\$\$\$
Installation	Insertion	Flanged
Pipe range	½ inch thru 8 inch	Specify when ordering
Accuracy	±2% of Reading With custom calibration	Typical <±0.5% of Reading

Q. What is the difference between an insertion magmeter and insertion vortex?

A. These two technologies are very different in performance, in cost, and in application:

Feature	2551 Magmeter	7000/7001 Vortex Sensor
Moving parts	None	None
Installation	Insertion	In-Line
Linearity	Good	Better
Cost	\$\$	\$\$\$
Fluid requirements	conductive, dirty OK	Clean fluids only
Operating Range	0.05 m/s to 10 m/s	0.3 m/s to 4 m/s

Q. What is the accuracy of the 2551 Magmeter?

A. Signet does not publish an accuracy specification for the 2551.

ACCURACY refers the ability of a sensor to produce an output that matches the actual value. ACCURACY for a flow sensor, especially any insertion-type flow sensor, is dependent on more than just the sensor's performance. The location of the sensor relative to elbows and valves, the nature of the fluid, and especially the dimensions of the pipe, have an impact on the absolute accuracy of a measurement. Because the 2551 Magmeter is designed to be installed into a range of pipe sizes, Signet cannot control all of the critical factors that contribute to accuracy.

When properly installed and calibrated in place, the 2551 Magmeter can achieve an overall accuracy of approximately ±2% of Reading.

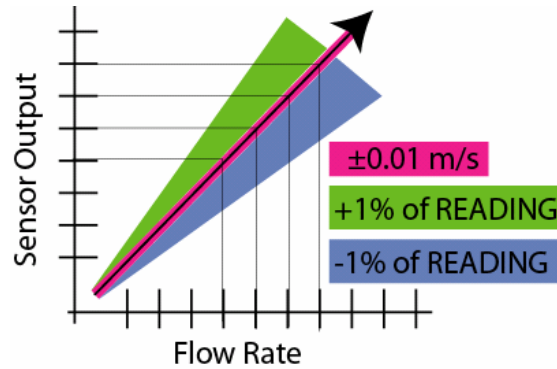
Signet defines the performance of the Magmeter in terms of LINEARITY and REPEATABILITY.

Q. Is linearity the same as accuracy?

A. No. Linearity is the extent to which output is directly proportional to input. The 2551 LINEARITY specification is $\pm 1\%$ of reading $+0.01$ m/s. Although not to scale, the graph shows what this means.

The black arrow represents the ideal linearity. The pink region is the fixed linearity error of 0.01 m/s.

The green and blue regions represent 1% of the reading.



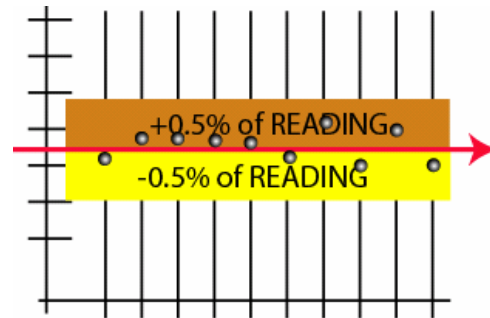
Q. Explain the repeatability specification.

A. Repeatability is the ability of a 2551 Magmeter to reproduce an output when the same input is applied repeatedly. So when you turn the pump on and the 2551 says the flow is 100 GPM today, when you do the same tomorrow, the 2551 will still say 100 GPM, ± 0.5 GPM.

The red line on the graph represents a constant flow rate in a pipe.

The yellow and brown regions represent 0.5% above and below the actual flow rate.

The black dots represent 10 different measurements of the flow rate at ten different times.



Q. What can interfere with the Magmeter performance?

A. Extremely dirty processes, such as waste streams, may coat the sensor. Air bubbles, electrical noise, improper installation (not enough up or downstream pipe runs), and low conductivity may also interfere with the performance.

Q. When does the Magmeter need to use the ground lug?

A. If the output is erratic or there is no output, the unit is in a noisy process liquid and should ground the Magmeter. [Click here for more information.](#)

DEFINITIONS

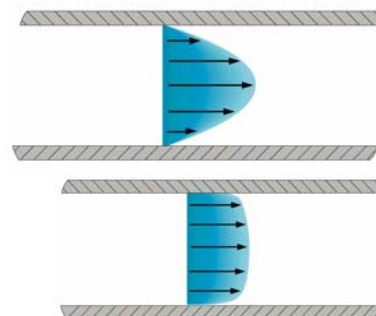
Q. What is a Reynolds number?

A: Reynolds number is a dimensionless number used to characterize the behavior of a fluid in a pipe. The formula is basically "Diameter x Velocity / Viscosity"

- Reynolds numbers less than 2000 are defined as LAMINAR flow.
- Reynolds numbers between 2000 and 4000 are transitional.
- Reynolds numbers greater than 4000 represent fully developed, turbulent flow.

Flow Profile: The "shape" of water flowing through a pipe, especially the three basic conditions listed here:

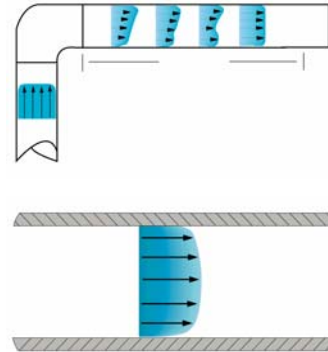
Laminar flow profile: The flow condition where the flow at the center of the pipe is moving substantially faster than the flow in the remaining area of the pipe. May be acceptable for insertion flow sensors, if other conditions are present.



Fully developed turbulent flow profile: The flow condition where the flow across the area of the pipe is the same, beyond the area immediately adjacent to the inside wall. This is the ideal flow condition for insertion flow sensors.

Transitional flow profile: The flow condition where the flow is changing from laminar to turbulent. Usually unstable and not useful for measurement with insertion flow sensors.

Insertion Flow Sensor: A type of flow measuring device that measures the velocity at a specific location inside the pipe, and uses that measurement to calculate the volumetric flow rate in the pipe.



K-Factor: The ratio of a flow sensor signal to the volume in a specific size pipe.

Linearity: The ability of a flow sensor to produce an output signal that is always directly proportional to the input.

Repeatability: The ability of a flow sensor to reproduce an output signal when the same input is applied repeatedly.

Accuracy: The degree to which a measured value matches the true value.