

# Signet 2551 Magmeter Flow Sensor



Available in a variety of wetted materials and ideal for pipe sizes up to DN300 (12 in.)



## Description

The Signet 2551 Magmeter is an insertion style magnetic flow sensor that features no moving parts. The patented\* sensor design is available in corrosion-resistant materials to provide long-term reliability with minimal maintenance costs. Material options include PP with stainless steel, PVDF with stainless steel, PVDF with Hastelloy-C, or PVDF with Titanium. Utilizing the comprehensive line of Signet installation fittings, sensor alignment and insertion depth is automatic. These versatile, simple-to-install sensors deliver accurate flow measurement over a wide dynamic range in pipe sizes ranging from DN15 to DN300 (0.5 to 12 inches), satisfying the requirements of many diverse applications.

Signet 2551 Magmeters offer many output options of frequency/digital (S<sup>3</sup>L), 4 to 20 mA or relays which are available on both the blind and display versions. The frequency or digital (S<sup>3</sup>L) sensor output can

be used with Signet's extensive line of flow instruments while the 4 to 20mA output can be used for a direct input to PLCs, chart recorders, etc. Both the 4 to 20 mA output and digital (S<sup>3</sup>L) sensor interface is available for long distance signal transmission of up to 1,000 ft. An additional benefit is the empty pipe detection which features a zero flow output when the sensors are not completely wetted. Also, the frequency output is bi-directional while the 4 to 20mA output can be set for uni- or bi-directional flow using the display or the RS232 set-up tool which connects to PCs for programming capabilities.

In addition the display version of the 2551 Magmeter is available with relays and features permanent and resettable total values which can be seen on the display. Also, the display contains multi-languages with English, Spanish, German, French, Italian and Portuguese menu options.





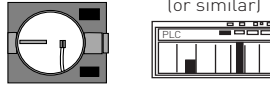








## Features

- Patented Magmeter technology
- No moving parts
- Bi-directional flow
- Empty pipe detection
- Installs into pipe sizes DN 15 to DN 300 (0.5 to 12 in.)
- Flow rate range 0.05 to 10 m/s (0.15 to 33 ft/s)
- Accurate measurement even in dirty liquids
- Blind 4 to 20 mA, digital/frequency, relay output
- No pressure drop
- Corrosion resistant materials; PP or PVDF with SS, Hastelloy C, or Titanium
- Multi-language display menu available

## Applications

- Chemical Processing
- Demineralization Regeneration
- Water and Waste Water Monitoring
- Metal Recovery and Landfill Leachate
- Commercial Pools, Spas, and Aquariums
- HVAC
- Irrigation
- Scrubber Control
- Neutralization Systems
- Industrial Water Distribution

## System Overview

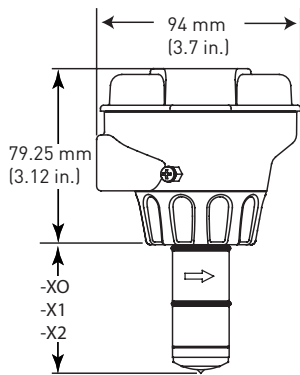
|   |   |  |   |
|---|---|--|---|
| <p><b>Stand-Alone</b></p> <p>Signet 2551 Magmeter</p>  | <p><b>Panel Mount</b></p> <p>Signet Flow Instrument (sold separately)</p> <p>8900 8550<br/>5075 5500<br/>5600</p>  | <p><b>Pipe, Tank, Wall Mount</b></p> <p>Signet 8550 Flow Instrument (sold separately)</p>  <p>Signet Universal Adapter Kit (3-8050) (sold separately)</p>  | <p><b>4 to 20 mA Input</b></p> <p>Chart Recorder OR Programmable Logic Controller (or similar)</p>  |
|    | <p>Signet 2551 Magmeter</p>    | <p>Signet 2551 Magmeter</p>   | <p>Signet 2551 Magmeter</p>   |
| <p>Signet Fittings (sold separately)</p>              |    |   |   |



\* U.S. Patent No: 7,055,396 B1

## Dimensions

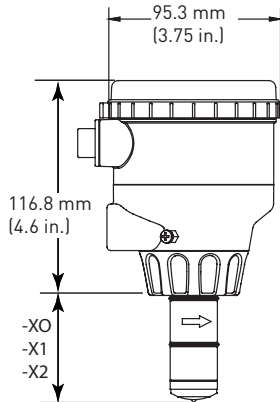
### Blind Version



Pipe Range  
 1/2 to 4 in. -X0 = 58 mm (2.3 in.)  
 5 to 8 in. -X1 = 91 mm (3.6 in.)  
 10 to 12 in. -X2 = 167 mm (6.6 in.)

X = Sensor Body P, T, V, or W

### Display Version



Pipe Range  
 1/2 to 4 in. -X0 = 58 mm (2.3 in.)  
 5 to 8 in. -X1 = 91 mm (3.6 in.)  
 10 to 12 in. -X2 = 167 mm (6.6 in.)

X = Sensor Body P, T, V, or W

## Specifications

### General

Pipe size range: DN15 to DN 300 (0.5 in. to 12 in.)

Flow Range

- Minimum: 0.05 m/s (0.15 ft/s)
  - Maximum: 10 m/s (33 ft/s)
- Linearity:  $\pm 1\%$  reading plus 0.01m/s (0.033 ft/s)  
 Repeatability:  $\pm 0.5\%$  of reading @ 25°C (77°F)  
 Minimum Conductivity: 20  $\mu\text{S/cm}$

### Wetted Materials:

Sensor body/Electrodes and Grounding ring:

- -P0, -P1, -P2: Polypropylene/316LSS
- -T0, -T1, -T2: PVDF/Titanium
- -V0, -V1, -V2: PVDF/Hastelloy-C
- -W0, -W1, -W2: PVDF/316LSS

O-rings:

- FPM (standard)
- EPDM, Kalrez (optional)

Case: PBT

Display Window: Polyamide

Protection rating: NEMA 4X/IP65

### Electrical

Power Requirements

- 4 to 20 mA: 21.6 to 26.4 VDC, 22.1 mA max.
- Frequency: 5 to 26.4 VDC, 15 mA max.
- Digital (S<sup>3</sup>L): 5 to 6.5 VDC, 15 mA max.
- Auxiliary (only required for units with relays): 9 to 24 VDC, 0.4A max

Reverse polarity and short circuit protected

Current output (4 to 20 mA):

- Loop Accuracy: 32  $\mu\text{A}$  max. error (25°C @ 24 VDC)
- Isolation: Low voltage < 48 VAC/DC from electrodes and auxiliary power
- Maximum cable: 300 m (1000 ft.)
- Error condition: 22.1 mA
- Max. Loop Resistance: 300 $\Omega$
- Compatible with PLC, PC or similar equipment

Frequency output:

- Output modes: Freq., Freq $\div$ 10, or Mirror Relay
- Max. Pull-up Voltage: 30 VDC
- Max. Current Sink: 50 mA, current limited
- Maximum cable: 300 m (1000 ft.)
- Compatible with Signet Model 5075, 5500, 5600, 8550, 8900

Digital (S<sup>3</sup>L) Output:

- Serial ASCII, TTL level 9600 bps
- Compatible with Model Signet 8900 instrument

### Relay Specifications

- #1, #2 Type: Mechanical SPDT  
 Rating: 5A @ 30 VDC max.,  
 5A @ 250 VDC max.
- #3 Type: Solid State  
 Rating: 50mA @ 30 VDC,  
 50mA @ 42 VAC

Hysteresis: User adjustable, plus timer delay  
 Trigger Delay: Adjustable (0 to 9999.9 sec.)

Relay Modes: Off, Low, High, Window, and Proportional Pulse  
 Relay Source: Flow Rate, Resettable Totalizer  
 Error Condition: Selectable; Fail Open or Closed

### Display

Characters: 2 x 16  
 Contrast: User-set in four levels  
 Backlighting (only on relay versions): Requires external 9-24 VDC, 0.4 mA max.

### Environmental Requirements

Storage Temperature:  
 -20° to 70°C (-4° to 158°F)  
 Relative Humidity :  
 0 to 95% (non-condensing)  
 Operating Temperature  
 • Ambient: -10° to 70°C (14° to 158°F)  
 • Media: 0° to 85°C (32° to 185°F)  
 Max. operating pressure:  
 10.3 bar @ 25°C (150 psi @ 77°F)  
 1.4 bar @ 85°C (20 psi @ 185°F)

See Temperature and Pressure Graphs for more information

### Standards and Approvals

- CE
- UL, CUL (for display versions with relays)
- NEMA 4X / IP65 Enclosure (with cap installed)
- EMC: EN55011: 1998 +A1:99+A2:02 Class B Emissions  
 EN61326: 1997 +A1:98+A2:01  
 EN61000-6-2:2001
- Safety: EN61010-1:2001
- U.S. Patent No. 7,055,396 B1

## Ordering Information

|   |   |
|---|---|
| Sensor Part No.   |   |
| <b>3-2551</b>   |   |
| Sensor Body (Transducer) and electrodes/grounding ring materials - Choose one |   |
| <b>-P</b>   | Polypropylene and 316L SS   |
| <b>-T</b>   | PVDF and Titanium   |
| <b>-V</b>   | PVDF and Hastelloy C  |
| <b>-W</b>   | PVDF and 316L SS  |
| Pipe size - Choose one  |   |
| <b>0</b>  | DN15 to DN100 (1/2 to 4 in.)  |
| <b>1</b>  | DN125 to DN200 (5 to 8 in.)   |
| <b>2</b>  | DN250 to DN300 (10 to 12 in.)   |
| Display Options - Choose One  |   |
| <b>-1</b>   | No Display  |
| <b>-2</b>   | With Display, two SPDT relays, one solid state relay                                      |
| <b>-4</b>   | With Display  |
| Output options - Choose One   |   |
| <b>1</b>  | Frequency, Digital (S <sup>2</sup> L) out, [Frequency÷10, Mirror Relay* (open collector)] |
| <b>2</b>  | 4 to 20 mA output   |
| <b>3-2551</b>   | <b>-P 0 -2 2 Example Part Number</b>  |

### Application Tips:

- Note minimum process liquid conductivity requirement is 20 µs/cm
- Install sensor using standard Signet installation fittings for best results
- Sensor is capable of retrofitting into existing 515 and 2536 fittings.

\*This option is a programmable open collector output that is available with display versions only.

| Mfr. Part No. | Code               | Mfr. Part No. | Code               |
|---------------|--------------------|---------------|--------------------|
| 3-2551-P0-11  | <b>159 001 105</b> | 3-2551-V0-11  | <b>159 001 257</b> |
| 3-2551-P0-12  | <b>159 001 110</b> | 3-2551-V0-12  | <b>159 001 259</b> |
| 3-2551-P0-21  | <b>159 001 267</b> | 3-2551-V0-21  | <b>159 001 269</b> |
| 3-2551-P0-22  | <b>159 001 273</b> | 3-2551-V0-22  | <b>159 001 275</b> |
| 3-2551-P0-41  | <b>159 001 261</b> | 3-2551-V0-41  | <b>159 001 263</b> |
| 3-2551-P0-42  | <b>159 001 279</b> | 3-2551-V0-42  | <b>159 001 281</b> |
| 3-2551-P1-11  | <b>159 001 106</b> | 3-2551-V1-11  | <b>159 001 258</b> |
| 3-2551-P1-12  | <b>159 001 111</b> | 3-2551-V1-12  | <b>159 001 260</b> |
| 3-2551-P1-21  | <b>159 001 268</b> | 3-2551-V1-21  | <b>159 001 270</b> |
| 3-2551-P1-22  | <b>159 001 274</b> | 3-2551-V1-22  | <b>159 001 276</b> |
| 3-2551-P1-41  | <b>159 001 262</b> | 3-2551-V1-41  | <b>159 001 264</b> |
| 3-2551-P1-42  | <b>159 001 280</b> | 3-2551-V1-42  | <b>159 001 282</b> |
| 3-2551-P2-11  | <b>159 001 107</b> | 3-2551-V2-11  | <b>159 001 450</b> |
| 3-2551-P2-12  | <b>159 001 112</b> | 3-2551-V2-12  | <b>159 001 451</b> |
| 3-2551-P2-21  | <b>159 001 435</b> | 3-2551-V2-21  | <b>159 001 456</b> |
| 3-2551-P2-22  | <b>159 001 438</b> | 3-2551-V2-22  | <b>159 001 457</b> |
| 3-2551-P2-41  | <b>159 001 432</b> | 3-2551-V2-41  | <b>159 001 462</b> |
| 3-2551-P2-42  | <b>159 001 441</b> | 3-2551-V2-42  | <b>159 001 463</b> |
| 3-2551-T0-11  | <b>159 001 108</b> | 3-2551-W0-11  | <b>150 001 230</b> |
| 3-2551-T0-12  | <b>159 001 113</b> | 3-2551-W0-12  | <b>159 001 231</b> |
| 3-2551-T0-21  | <b>159 001 436</b> | 3-2551-W0-21  | <b>159 001 271</b> |
| 3-2551-T0-22  | <b>159 001 439</b> | 3-2551-W0-22  | <b>159 001 277</b> |
| 3-2551-T0-41  | <b>159 001 433</b> | 3-2551-W0-41  | <b>159 001 265</b> |
| 3-2551-T0-42  | <b>159 001 442</b> | 3-2551-W0-42  | <b>159 001 283</b> |
| 3-2551-T1-11  | <b>159 001 109</b> | 3-2551-W1-11  | <b>159 001 232</b> |
| 3-2551-T1-12  | <b>159 001 114</b> | 3-2551-W1-12  | <b>159 001 233</b> |
| 3-2551-T1-21  | <b>159 001 437</b> | 3-2551-W1-21  | <b>159 001 272</b> |
| 3-2551-T1-22  | <b>159 001 440</b> | 3-2551-W1-22  | <b>159 001 278</b> |
| 3-2551-T1-41  | <b>159 001 434</b> | 3-2551-W1-41  | <b>159 001 266</b> |
| 3-2551-T1-42  | <b>159 001 443</b> | 3-2551-W1-42  | <b>159 001 284</b> |
| 3-2551-T2-11  | <b>159 001 448</b> | 3-2551-W2-11  | <b>159 001 452</b> |
| 3-2551-T2-12  | <b>159 001 449</b> | 3-2551-W2-12  | <b>159 001 453</b> |
| 3-2551-T2-21  | <b>159 001 454</b> | 3-2551-W2-21  | <b>159 001 458</b> |
| 3-2551-T2-22  | <b>159 001 455</b> | 3-2551-W2-22  | <b>159 001 459</b> |
| 3-2551-T2-41  | <b>159 001 460</b> | 3-2551-W2-41  | <b>159 001 464</b> |
| 3-2551-T2-42  | <b>159 001 461</b> | 3-2551-W2-42  | <b>159 001 465</b> |

# Accessories and Replacement Parts

| Mfr. Part No.                         | Code               | Description  |
|---------------------------------------|--------------------|--|
| <b>O-Rings</b>                        |                    |  |
| 1220-0021                             | <b>198 801 186</b> | O-ring, FPM (Viton®)   |
| 1224-0021                             | <b>198 820 006</b> | O-ring, EPDM   |
| 1228-0021                             | <b>198 820 007</b> | O-ring, FFPM (Kalrez®)   |
| <b>Replacement Transducers</b>        |                    |  |
| 3-2551-P0                             | <b>159 001 211</b> | PP/316LSS, DN15 to DN100 (0.5 to 4 in.) pipe   |
| 3-2551-P1                             | <b>159 001 212</b> | PP/316LSS, DN125 to DN200 (5 to 8 in.) pipe  |
| 3-2551-P2                             | <b>159 001 444</b> | PP/316LSS, DN250 to DN300 (10 to 12 in.) pipe  |
| 3-2551-T0                             | <b>159 001 213</b> | PVDF/Titanium, DN15 to DN100 (0.5 to 4 in.) pipe                                       |
| 3-2551-T1                             | <b>159 001 214</b> | PVDF/Titanium, DN125 to DN200 (5 to 8 in.) pipe  |
| 3-2551-T2                             | <b>159 000 445</b> | PVDF/Titanium, DN250 to DN300 (10 to 12 in.) pipe                                      |
| 3-2551-V0                             | <b>159 001 376</b> | PVDF/Hastelloy-C, DN15 to DN100 (0.5 to 4 in.) pipe                                    |
| 3-2551-V1                             | <b>159 001 377</b> | PVDF/Hastelloy-C, DN125 to DN200 (5 to 8 in.) pipe                                     |
| 3-2551-V2                             | <b>159 000 446</b> | PVDF/Hastelloy-C, DN250 to DN300 (10 to 12 in.) pipe                                   |
| 3-2551-W0                             | <b>159 001 234</b> | PVDF/316LSS, DN15 to DN100 (0.5 to 4 in.) pipe   |
| 3-2551-W1                             | <b>159 001 235</b> | PVDF/316LSS, DN125 to DN200 (5 to 8 in.) pipe  |
| 3-2551-W2                             | <b>159 001 447</b> | PVDF/316LSS, DN250 to DN300 (10 to 12 in.) pipe  |
| <b>Replacement Electronics Module</b> |                    |  |
| 3-2551-11                             | <b>159 001 215</b> | Magmeter electronics, frequency or digital (S <sup>3</sup> L) output                   |
| 3-2551-12                             | <b>159 001 215</b> | Magmeter electronics, 4 to 20mA output   |
| 3-2551-21                             | <b>159 001 372</b> | Magmeter Display Electronics, frequency or digital (S <sup>3</sup> L) output           |
| 3-2551-22                             | <b>159 001 373</b> | Magmeter Display Electronics, 4 to 20mA output   |
| 3-2551-41                             | <b>159 001 374</b> | Magmeter Display Electronics, frequency or digital (S <sup>3</sup> L) output, w/relays |
| 3-2551-42                             | <b>159 001 375</b> | Magmeter Display Electronics, frequency or digital (S <sup>3</sup> L) output, w/relays |
| <b>Other</b>                          |                    |  |
| 7300-7524                             | <b>159 000 687</b> | 24VDC Power Supply 7.5W, 300mA   |
| 7300-1524                             | <b>159 000 688</b> | 24VDC Power Supply 15W, 600mA  |
| 7300-3024                             | <b>159 000 689</b> | 24VDC Power Supply 30W, 1.3A   |
| 7300-5024                             | <b>159 000 690</b> | 24VDC Power Supply 50W, 2.1A   |
| 7300-1024                             | <b>159 000 691</b> | 24VDC Power Supply 100W, 4.2A  |
| 3-8551.521                            | <b>159 001 378</b> | Clear plastic cap for display  |
| 1222-0042                             | <b>159 001 379</b> | O-ring for clear plastic cap, EPDM   |
| 3-0232                                | <b>159 000 865</b> | 4 to 20mA spanning CD with RS232 Converter   |

Please refer to Wiring, Installation, Accessories and Fittings sections for more information.