HYGRADE WATER INFRASTRUCTURE

SINGER® a MUELLER brand

Singer Single Point Insertion Flow Metering Valve

This cost effective flow meter option is available for valve sizes from 3" (80mm) to 36" (900mm) inches. The flow sensor comes pre-calibrated from McCrometer's NIST traceable Calibration Lab and requires no recalibration in the field.



TECHNICAL GUIDE: **AVH13.4**

Applications

- Potable water
- Pressure systems
- Municipal
- Mining Applications
- Irrigation Applications

Product Attributes

- +/- 2% of rate accuracy, NIST traceble
- No recalibration required
- No maintenance or wearing parts
- Usable in any 1"tapping port

Approvals/Standards

IP68 rating

Quality/Environment/Health & Safety

Hygrade management systems are certified to ISO 9001:2015, 45001:2015, and 14001:2018 Standards

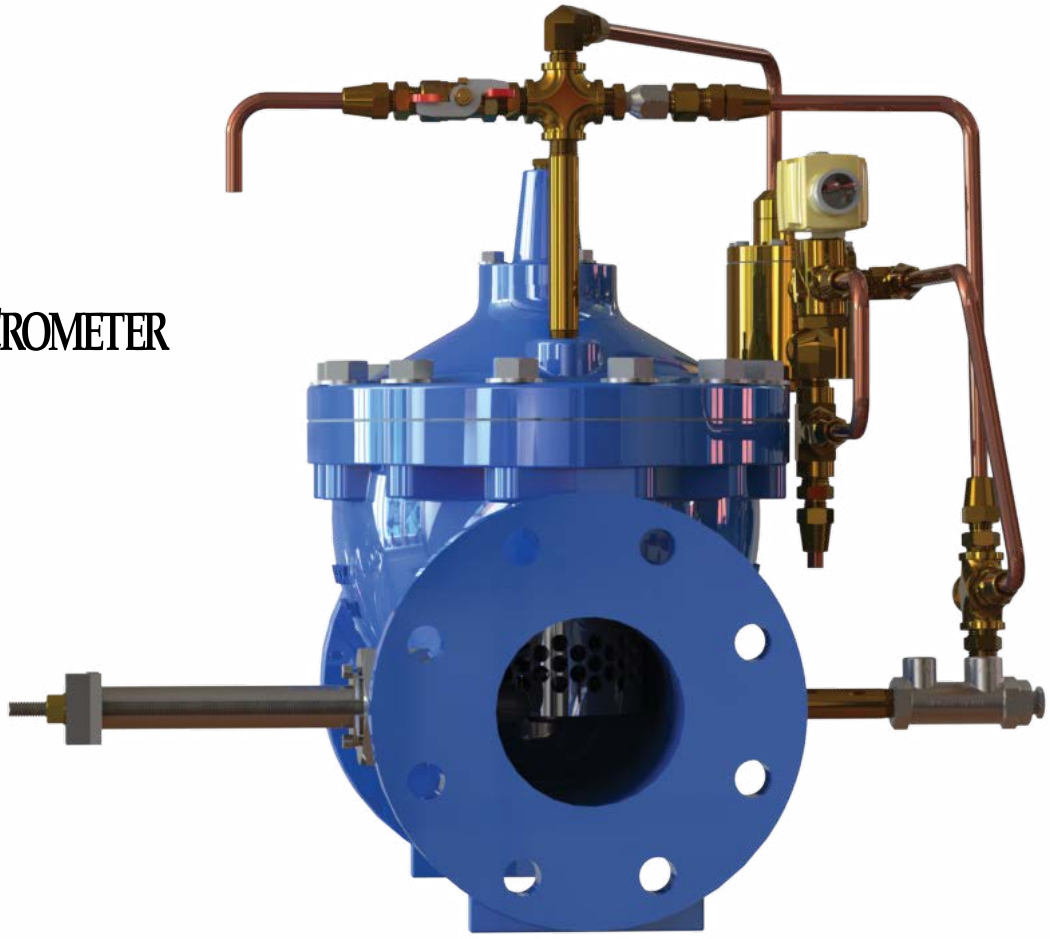
Using McCrometer's proven Single Insertion Meter technology along with the reliability of a Singer® valve, it allows users to have both a flow meter solution along with any function of control valve. Whether it is pressure reducing, level control, or sustaining - all can be installed now with a very accurate flow meter solution.

By adding dual solenoid control to the pilot system and utilizing the Singer MCP Multi Channel PLC Controller, we now have a fully automated control system able to control to any input required and all able to function within your existing SCADA system.

Product Features

- Accurate flow metering, combined with control valve to save space / cost
- Supplied with Flow Converter for local display with 4-20mA output measurement or can be combined with PLC-based control panel for flow control applications
- +/- 2% of rate accuracy, NIST traceable

McCROMETER



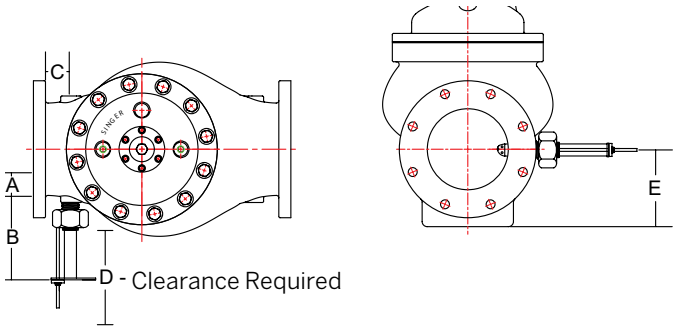
Magnetic Flow Meter

- The valve shall be installed with a 1" (25mm) Single Point Insertion Magnetic Flow Meter in one of the inlet body tappings.
- Unit will be factory installed and programmed with correlative factors for Main Valve body flow profile.
- The flow meter shall consist of two components: an electromagnetic sensor and a converter.
- The 1" (25mm) electromagnetic sensor shall be capable of operating in valves from 4" (100mm) to 36" (900mm).
- The flow meter shall determine the volumetric flow rate by means of the Continuity Equation where flow rate "Q" equals mean velocity "V" times cross sectional area "A" (Q = V x A). The velocity measurement must be taken at a known location, then, through empirically established equations, the sensed velocity will be converted to a mean velocity.
- The flow meter converter shall be microprocessor based with a keypad for instrument set up and LCD displays for totalized flow, flow rate engineering units and velocity. The converter shall power the flow-sensing element and provide a galvanically isolated Dual 4-20mA output.
- It shall be possible, in the test mode; to easily set the converter outputs to any desired value within the range. The 4-20mA scaling, time constants, pipe size, flow proportional output, engineering units and test mode values shall be easily set via the keypad and display.
- Four separate fully programmable alarm outputs shall be provided to indicate empty pipe, forward / reverse, polarity (normally open / close), analog over-range, fault conditions, high / low flow rates, percentage of range, and pulse cutoff. The converter shall periodically perform self-diagnostics and display any resulting error messages. All set up data and totalizer values may be protected by a password.
- The flow-sensing element shall be of an electromagnetic single point type design and factory calibrated to traceable standards, such as NIST. The sensor shall be made of a polyurethane with pure carbon electrodes exposed to flow.
- To eliminate erroneous readings due to pipe wall effects, the sensor must have its electrodes located at least 3/16" from pipe wall and be designed with a curved tip shape, so as not to collect debris while in the operating position. Flat tipped or Doppler sensors shall not be acceptable.
- The sensor cable is 20 feet (6m) of multi-conductor, abrasive resistant, PVC jacketed submersible cable flexible to -400F/C. The sensor cable shall be permanently bonded to the sensor. Additional sensor cable, up to 200 feet (61m), shall be available as an option.
- The insertion tube and restraining rods assembly shall be provided for the smooth installation and operation of the velocity sensor and shall be of sufficient length to allow a full profile of the flow conduit. The stainless steel insertion tube shall be rated for 250 psi (1,724 Kpa) @ 1600 F (710C).
- Hardware must allow sensor to be secured by bolts when sensor is being inserted and retracted. A stainless steel compression seal assembly shall also be supplied.
- No flow meters with accuracies expressed as a percentage of full scale will be accepted and flow meter must be NIST Traceable.

Measurement

Volumetric flow in valves 3" (80mm) to 36" (900mm) diameter utilizing insertable velocity sensor. Flow indication in English Standard or Metric units.

- Flow Measurement Method: Electromagnetic
- Accuracy: ffl2% of reading
- Velocity Range: +0.3 to +32 ft/s (+0.09 to +10 m/s) Has reverse flow indication.
- Conductivity: Minimum conductivity of 5µS/cm



Valve Size	A	B	C	D	E
3" (80mm)	0.38" (10mm)	7.64" (193mm)	1.3" (33mm)	8" (203mm)	4" (102mm)
4" (100mm)	0.5" (12.5mm)	7.5" (191mm)	1.8" (45.7mm)	8" (203mm)	4.7" (119mm)
6" (150mm)	0.75" (18.8mm)	7.25" (184mm)	2.4" (61mm)	8" (203mm)	6.1" (155mm)
8" (200mm)	1" (25mm)	7" (178mm)	2.5" (63.5mm)	8" (203mm)	7.5" (191mm)
10" (250mm)	1.25" (31.3mm)	6.75" (172mm)	3.6" (91.4mm)	8" (203mm)	8.4" (213mm)
12" (300mm)	1.5" (37.5mm)	6.5" (166mm)	4.5" (114mm)	8" (203mm)	10.5" (267mm)
16" (400mm)	2" (50mm)	6" (153mm)	5" (127mm)	8" (203mm)	11.8" (300mm)
20" (500mm)	2.5" (62.5mm)	7.5" (192mm)	5.5" (140mm)	10" (254mm)	14.4" (366mm)
24" (600mm)	3" (75mm)	7" (179mm)	5.5" (140mm)	10" (254mm)	17.1" (434mm)
28" (700mm)	3.5" (87.5mm)	6.5" (167mm)	6.5" (165mm)	10" (254mm)	18.6" (472mm)
36" (750mm)	4.5" (93.8mm)	7.5" (211mm)	8.5" (215mm)	12" (305mm)	25.5" (648mm)

SPI Probe

Environmental Rating

IP 68 Submersible Sensor
Up to 160°F (71°C) at 250 PSI (17.2 bar)

Materials

Sensor Head: Polyurethane
Probe Pipe Sleeve: 316 Stainless Steel Pipe
Electrodes: 580 Grade Carbon Rod
Nipple: 316 Stainless Steel
Compression Seal Assembly: 316 Stainless Steel
Compression Seal: Buna "N" O-Ring



Valve Size	Sensor Dia.	Total Sensor Length
3" (80mm)	1" (25mm)	8" (203mm)
4" (100mm)	1" (25mm)	8" (203mm)
6" (150mm)	1" (25mm)	8" (203mm)
8" (200mm)	1" (25mm)	8" (203mm)
10" (250mm)	1" (25mm)	8" (203mm)
12" (300mm)	1" (25mm)	8" (203mm)
16" (400mm)	1" (25mm)	8" (203mm)
20" (500mm)	1" (25mm)	10" (254mm)
24" (600mm)	1" (25mm)	10" (254mm)
28" (700mm)	1" (25mm)	10" (254mm)
36" (750mm)	1" (25mm)	12" (305mm)

SPI Converter

Overview

- CE Certified
- Pre-programmed
- Curve-fitting algorithm to improve accuracy
- Eight line graphical display
- Three key touch programming
- Galvanic separation to 50VDC between analog, pulse / alarm, and earth / ground

Digital Outputs

Four separate digital programmable outputs: open collector transistor usable for pulse, frequency, or alarm settings.

- Volumetric Pulse
- Directional Indication
- Flow Rate (Frequency)
- High / Low Flow Alarms
- Hardware Alarm
- Empty Pipe
- Range Indicator

Environmental Rating

- -4° to 140°F (-20°C to +60°C) Operating and storage temperature

Power Requirements

- AC: 90-265V 45-66 Hz (20W/25VA) (Standard)
- DC: 10-35V (21W) (Optional)

Dual 4-20mA Outputs

- Galvanically isolated and fully programmable for zero and full scale

Installation Details

- These units can be installed in modulation & non-modulation applications
- These units can be installed with Singer® AC (Anti-Cav) cages
- Sensor can be installed on either side of valve-inlet only

Choose a converter for your application

Local Converter (Standard)

- IP67 – Die Cast Aluminum
- 6.75" wide x 5.75" high x 6.7" deep (172mm wide x 146mm high x 170mm deep)

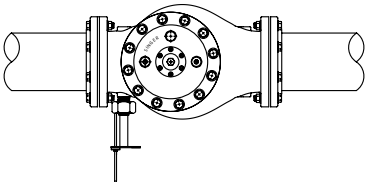


Panel Mount Converter (Optional)

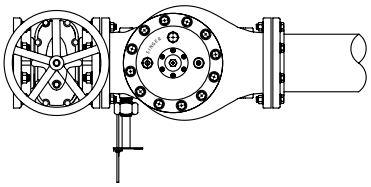
- IP65 – Plastic Composite
- 6.5" wide x 3.13" high x 7.25" deep (165mm wide x 80mm high x 184mm deep)



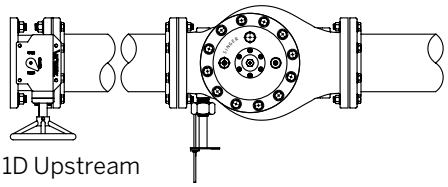
Installation Details



For most application you need 3 pipe diameters straight pipe upstream flange to flange from any in-line device, elbow, or tee.



Gate valve can be mounted next to Singer® valve.



1D Upstream

A vertical butterfly valve will need only one pipe diameter to the valve. Horizontal butterfly needs 3 pipe diameters.

106-SPI-mV	Flow Capacity										
Size (inches)	3"	4"	6"	8"	10"	12"	16"	20"	24"	28"	36"
Size (mm)	80 mm	100 mm	150 mm	200 mm	250 mm	300 mm	400 mm	500 mm	600 mm	700 mm	900 mm
Minimum (USGPM) Flat Diaphragm	5	10	20	40	-	-	-	-	-	-	-
Minimum (USGPM) Rolling Diaphragm	-	-	0.5	1	3	3	3	10	10	10	20
Minimum (L/s) Flat Diaphragm	0.3	0.6	-	-	-	-	-	-	-	-	-
Minimum (L/s) Rolling Diaphragm	-	-	0.03	0.06	0.2	0.2	0.2	0.6	0.6	0.6	1.3
Maximum Continuous (USGPM)	460	800	1,800	3,100	4,900	7,000	11,000	17,500	25,000	33,600	55,470
Maximum Continuous (L/s)	29	50	114	196	309	442	694	1,104	1,577	2,120	3,500

1. Usually operating in the continuous “C”, service range up to 20 ft/s (6 m/s) - refer to chart and/or performance curves.
2. Ensure the maximum working pressure rating of the valve exceeds the maximum operating pressure

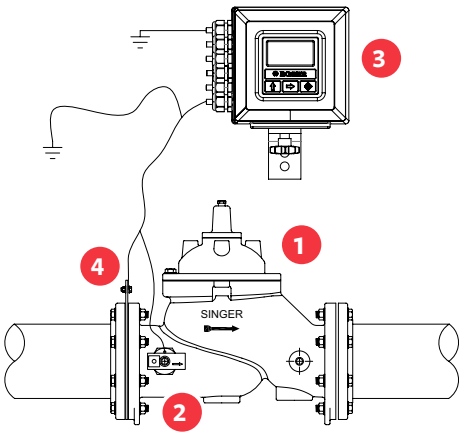
Ordering Requirements

At the time of ordering, please be prepared to provide the following information:

- Valve Size
- Pilot Orientation
- Converter Type
- Supply Voltage
- Cable Length

Schematic Drawing

No.	Description
1	Main Valve
2	SPI Probe
3	SPI Converter
4	Grounding Ring



Main Valve Body Specifications

- Valve(s) shall be a hydraulically operated globe valve. The inner valve assembly shall be top and bottom guided by means of easily replaceable bearing bushings. The inner valve assembly shall be the only moving part and shall be securely mounted on a 316 stainless steel stem. The stainless steel stem shall be provided with wrench flats on all valves 3" (75mm) to 8" (200mm), for ease of assembly and maintenance.
- All pressure containing components shall be constructed of ASTM A536-65/45/12 ductile iron. The flanges shall be designed to ANSI Class 150 or Class 300 standards. Flange drilling to ANSI shall be standard however British, ISO and other drillings shall be available upon request.
- Valve(s) shall have a protective fusion bonded epoxy coating internally and externally. The protective fusion bonded epoxy coating shall conform to the ANSI / AWWA C116 / A21.16 (current version) specification.
- 3" (75mm) Valve(s) shall provide smooth "frictionless" motion with actuation being achieved by the use of a flat style EPDM diaphragm. They shall be constructed of nylon fabric bonded with synthetic rubber. The diaphragms shall not be used as a seating surface. No lip seals or packing may be used to seal the actuator.
- Valve(s) 6" (150mm) and larger shall provide smooth "frictionless" motion and maximum low flow stability with actuation being achieved by the use of the Singer® rolling diaphragm technology. The diaphragms shall not be used as a seating surface. No lip seals or packing may be used to seal the actuator.
- The valve cover shall have a separate stem cap giving access to the stem for alignment check, spring installation and ease of assembly.
- On valve(s) 4" (100mm) and larger, bonnets shall be accurately located to bodies utilizing locating pins. Locating pins shall eliminate corrosion resulting from the use of uncoated ductile iron to ductile iron surfaces.
- Valve(s) 4" (100mm) and larger shall have the 316 stainless steel seat, bolted in place, utilizing "Spiralock" thread tapping technology. The 316 stainless steel seat ring shall be easily replaceable without special tools.
- The valve(s) shall form a drip tight seal between the stationary stainless steel seat ring and the resilient disc, which has a rectangular cross-section and is retained by clamping on three and one half sides. The resilient disc shall be constructed of Buna or EPDM for normal service conditions.
- All external fasteners shall be 18/8 stainless steel with 18/8 washers.
- All repairs and maintenance shall be possible without removing the valve from the line. To facilitate easy removal and replacement of the inner valve assembly and to reduce unnecessary wear on the guide, the stem shall be vertical when the valve is mounted in a horizontal line.
- Each valve shall be tested prior to shipment. The standard test shall include a pressure test and a full functional, operational test when pilots and accessories are fitted to suit a particular application.
- The valve(s) shall be covered by a minimum three year (3) warranty against defects in materials and workmanship. The stainless steel seat ring shall be covered by a lifetime replacement warranty.

Scan for more information

Disclaimer: While every effort has been made to ensure that the information in this document is correct and accurate, users of Hygrade Water Infrastructure product or information within this document must make their own assessment of suitability for their particular application. Product dimensions are nominal only, and should be verified if critical to a particular installation. No warranty is either expressed, implied, or statutory made by Hygrade Water Infrastructure unless expressly stated in any sale and purchase agreement entered into between Hygrade Water Infrastructure and the user.

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