

## Idaho Department of Water Resources List of Approved Closed Conduit Flow Meters

The tables below list flow meters that have been independently tested and subsequently approved by the Idaho Department of Water Resources (IDWR) for use in closed conduit measurement applications. The approved flow meters were tested by the Utah Water Research Laboratory at Utah State University using NIST\* traceable instrumentation and subject to IDWR testing standards. Meters on this list performed at or above the IDWR minimum acceptable standards for accuracy of  $\pm 2\%$  of flow rate when installed in long-run and short-coupled pipe configurations specified by IDWR. More details on IDWR minimum acceptable standards can be at the following URL:

<https://idwr.idaho.gov/files/water-measurement/Measuring-Devices-Minimum-Acceptable-Standards.pdf>

Please note that this approved meter list is *model* specific, not manufacturer specific. Prior to selecting and purchasing a meter, consult the manufacturer's installation requirements to ensure that all installation specifications for the specific model can be achieved. The list below is subject to change as additional meters are added or removed. The most current list can be found here:

<https://idwr.idaho.gov/files/water-measurement/approved-flow-meter-list.pdf>

**Straight Pipe Length** - The minimum length of unobstructed pipe free of flow disturbers, immediately above and below the meter sensors, spool, or flow tube.

**Flow Disturber** - Any fitting or irregularity in the piping above or below the measuring device sensor location that affects flow patterns through the device or sensor location. Disturbers may include but are not limited to: pump discharges, elbows, check or chemigation valves, butterfly or gate valves, pipe reducers.

***IDWR Installation Requirements:***

***Approved full profile magnetic flow meters and spooled ultrasonic flow meters must be installed with a minimum straight pipe length equivalent of three (3) pipe diameters upstream and two (2) pipe diameters downstream from the center of the meter spool. Approved clamp-on and wetted ultrasonic flow meter transducers must be located with a minimum straight pipe equivalent of ten (10) pipe diameters upstream and five (5) pipe diameters downstream of the nearest transducer. Manufacturer specifications for upstream and downstream straight pipe requirements may be greater or less than the IDWR requirements. All other manufacturer installation specifications must be met.***

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\* NIST - National Institute of Standards and Technology

<b>Approved Full Profile Magnetic Flow Meters</b>				
<b>Manufacturer</b>	<b>Model/Specifications</b>	<b>Power Supply</b>	<b>IDWR-accepted Pipe Applications (Nominal Pipe Size)</b>	<b>NOTES</b>
ABB	WaterMaster	AC	3/8" to 96"	See note 1, page 4
ABB	AquaMaster 3 w/ FER Series Transmitter	DC	½" to 24"	See note 1, page 4
Badger	M2000 Amplifier w/ M2000 Detector	AC	1/4" to 54"	See note 1, page 4
Burkert	8054/8055 w/ Magflow Transmitter	AC	1" to 80"	See note 1, page 4
Endress+Hauser	ProMag L400	AC	1" to 90"	See note 1, page 4
Endress+Hauser	ProMag W400	AC	2" to 78"	See note 1, page 4
FloCat	MFE	AC	¾" to 24"	See note 1, page 4
Growsmart by Lindsay	IM3000	DC	4" to 12"	See note 1, page 4
Khrone	Enviromag 2100 C	AC	3/8" to 80"	See note 1, page 4
Khrone	Waterflux 3100 C/F	AC	1" to 24"	See note 1, page 4
McCrometer	Ultra Mag w/ M-Series Converter	AC	2" to 48"	See note 1, page 4
Rosemount	8705 w/ 8732E Transmitter	AC	1/2" to 36"	See note 1, page 4
Seametrics	AG 2000 (retired)	DC	<del>4" to 10"</del>	See note 2, page 4

<b>Approved Full Profile Magnetic Flow Meters (continued)</b>				
<b>Manufacturer</b>	<b>Model/Specifications</b>	<b>Power Supply</b>	<b>IDWR-accepted Pipe Applications (Nominal Pipe Size)</b>	<b>NOTES</b>
Seametrics	AG 3000	DC	4" to 12"	See notes 1 and 3, page 4
Seametrics	iMag 4700	DC	4" to 12"	See notes 1 and 3, page 4
Siemens	Sitrans Mag5100W w/ Mag5000 Transmitter	AC	1" to 78"	See note 1, page 4
Siemens	Sitrans Mag8000	DC	1" to 24"	See note 1, page 4
Sensus	iPerl	DC	5/8" to 1"	See note 1, page 4
Sparling	TigermagEP – FM656 (Flanged)	AC	3/8" to 48"	See notes 1 and 7, page 4
Valmont	Valley 3000	DC	4" to 12"	See notes 1 and 3, page 4
<b>Approved Spooled Ultrasonic Flow Meters</b>				
Badger	E-Series	DC	3/4" to 2"	See note 4, page 4
Master Meter	Octave	DC	2" to 10"	See note 4, page 4
Netafim	Octave	DC	2" to 12"	See note 4, page 4
<b>Approved Clamp-on and Wetted Transducer Ultrasonic Flow Meters</b>				
Fuji	Time Delta C w/ 1MHz Transducers	AC	14"+	See notes 5 and 6, page 4
GE Panametrics	AT868 w/ 1MHz Transducers	AC	14"+	See notes 5 and 6, page 4
Siemens	Sitrans FUS1010 w/ High Precision Sensor (type H)	AC	14"+	See notes 5,6, and 8, page 4

**Notes:**

1. Installation of approved full profile magnetic flow meters require a minimum straight pipe length of 3 pipe diameters upstream and 2 pipe diameters downstream from the center of the meter spool.
2. Removed from approved list 10/2016 (retired by manufacturer). Seametrics AG 2000 meters currently installed may continue to be used until meter no longer meets IDWR minimum accuracy standards, or the meter becomes inoperable for any reason at which time it must be replaced by a meter on the approved list. This unit is no longer in production and has been replaced by the AG 3000.
3. Seametrics AG 3000, iMag 4700, and Valmont Valley 3000 must be installed with AC power supply and a working battery must remain in the unit.
4. Installation of approved spooled ultrasonic flow meters require a minimum straight pipe length of 3 pipe diameters upstream and 2 pipe diameters downstream from the center of the meter spool.
5. Ultrasonic flow meter transducers must be located with a minimum straight pipe equivalent of ten (10) pipe diameters upstream and five (5) pipe diameters downstream of the nearest transducer.
6. Meters in the Approved Clamp-on and Wetted Transducer Ultrasonic class may not be used on pipe smaller than 14 inches unless a variance is approved by IDWR.
7. Sparling FM HT-hot tap model was not tested and is **not included** with the approved models.
8. Sitrans High Precision sensor selection is based on pipe wall thickness and may be used on steel pipe only.