

### DESCRIPTION

Models MUR and MDR right angle meters have a standard coating of fusion-bonded epoxy.

These models are manufactured to comply with the applicable provisions of the American Water Works Association Standard No. C704-02 for propeller type flowmeters.

As with all McCrometer propeller flowmeters, standard features include a magnetically coupled drive, instantaneous flowrate indicator and straight-reading, six-digit totalizer. and since no change gears are used, models MUR and MDR can be field-serviced without the need for factory recalibration.

### FEATURES

#### Impellers

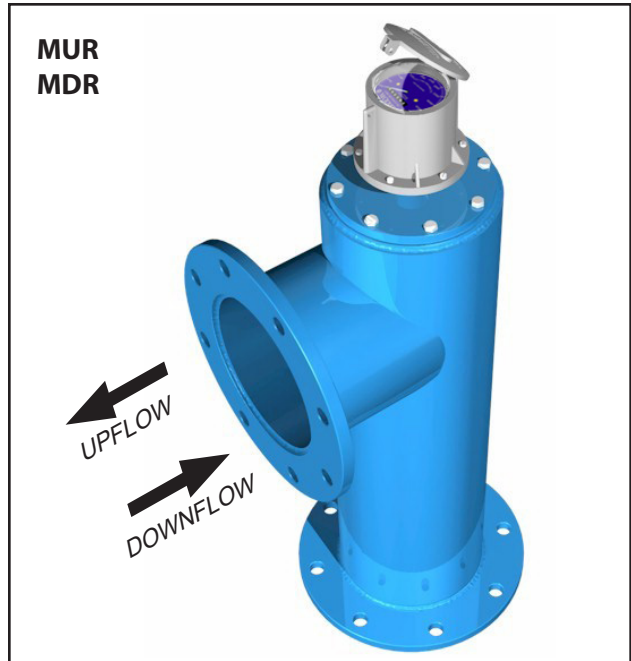
- Impellers are manufactured of high-impact plastic, capable of retaining their shape and accuracy over the life of the meter.
- Each impeller is individually calibrated at the factory to accommodate the use of any standard McCrometer register,

#### Bearings

- Factory lubricated stainless steel bearings are used to support the impeller shaft.
- The sealed bearing design limits the entry of materials and fluids into the bearing chamber providing maximum bearing protection.

#### Register

- The instantaneous flowrate indicator is standard and available in gallons per minute, cubic feet per second, liters per second and other units.
- The register is driven by a flexible steel cable encased within a protective vinyl liner.
- The register housing protects both the register and cable drive system from moisture while allowing clear reading of the flowrate indicator and totalizer.



### Typical Applications

The McCrometer propeller meter is the most widely used flowmeter for municipal and wastewater treatment applications as well as agricultural and turf irrigation measurement.

Typical applications include:

- Water and wastewater management
- Center pivot systems
- Sprinkler irrigation systems
- Drip irrigation systems
- Golf course and park water management
- Gravity turnouts from underground pipelines
- Commercial Nurseries

### INSTALLATION

Meter may be mounted in any convenient position compatible with the balance of the system, as long as a full pipeline is assured. Specify direction of flow when ordering. Model MUR for up flow and model MDR for down flow.

### DESCRIPTION

Fabricated epoxy-coated steel top plate assembly, drilled to match ANSI B16.5 150 PSI standard steel flanges with stainless steel drop pipe to be used with customer-supplied cast iron tee is supplied with brass bearing housing, stainless steel bearings, polypropylene impeller, straightening vanes, magnetic drive, instantaneous flow indicator and straight reading six-digit totalizer.

### FEATURES

#### Impellers

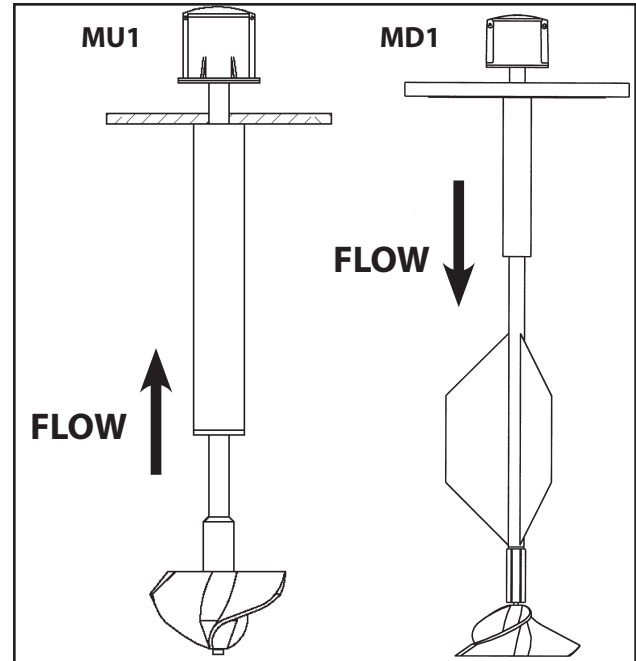
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- Each impeller is individually calibrated at the factory to accommodate the use of any standard McCrometer register, and since no change gears are used, the MU1 and MD1 can be field-serviced without the need for factory recalibration.

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### INSTALLATION

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### Part Numbers, Digital Registers

<b>M</b>										
<b>Vertical Flow Direction</b>										
Up Flow (W)	U									
Down Flow (M)	D									
<b>Configuration Type</b>										
Right Angle Vertical Flow Tube with Top Plate	R									
Top Plate for MC Right Angle Tube (Top Plate only)	1									
Vertical Flow Top Plate (For Customer tubes only)	C									
<b>Meter Size</b>										
										<b>MODEL SIZES OFFERED:</b>
3" Top Plate Meter	03									MUR MDR MU1 MD1 MUC MDC
4" Top Plate Meter	04									x x x x
6" Top Plate Meter	06									x x x x x x
8" Top Plate Meter	08									x x x x x x
10" Top Plate Meter	10									x x x x x x
12" Top Plate Meter	12									x x x x x x
14" Top Plate Meter	14									x x x x x x
16" Top Plate Meter	16									x x x x x x
<b>Assembly Component Options</b>										
Standard Configuration	A									
Non Standard Configuration	X									
<b>Bearing</b>										
Standard	1									
Marathon	2									
SS316	3									
SS316 Marathon	4									
SS316 Ceramic	5									
<b>Register Options</b>										
Flowcom (FC200)	F									
Flow Connect (FC Smart Part on 2nd Line)	T									
<b>Output Options</b>										
No Outputs										
Open Collector Pulse	1									
4-20mA Analog Only	2									
4-20mA Analog + Open Collector Pulse	3									
<b>Pulse Cable Length Options</b>										
No Outputs										
6 ft	C1									
15 ft	C2									
25 ft	C3									
50 ft	C4									
75 ft	C5									
100 ft	C6									
150 ft	C8									

continued on next page

### Part Numbers, Digital Registers (cont.)

Smart Output Protocol / Telemetry Options					
No AMI Outputs/Telemetry Options					
Sensus Protocol (6ft Open End Cable)	SEN				
Itron 6 digit Protocol (6ft Open End Cable)	IT6				
Itron 9 digit [100W] Protocol (6ft Open End Cable)	IT9				
Neptune Protocol (6ft Open End Cable)	NEP				
SmartTrax On-Board (Integrated Telemetry on FlowCom)	STX				
2 ft SmartTrax Standalone Unit ExactRead Cable	S02				
6 ft SmartTrax Standalone Unit ExactRead Cable	S06				
25 ft SmartTrax Standalone Unit ExactRead Cable	S25				
50 ft SmartTrax Standalone Unit ExactRead Cable	S50				
Register Remote and Extension Options					
Meter Mount (Standard)					
6 ft Cable Remote Mount (Flowcom only)	R06				
25 ft Cable Remote Mount (Flowcom only)	R25				
50 ft Cable Remote Mount (Flowcom only)	R50				
6" Long Extension	006				
1" Increments for Extensions Lengths	XXX				
150" Maximum extension length	150				
SPECIAL OPTIONS					
No Special Options					
High Temp Prop and Seals		H			
No Batteries, Battery Tray Options					
Includes Batteries (Standard)					
No Batteries (Alkaline Tray)					NBA
No Batteries (Lithium Tray)					NBL





## SPECIFICATIONS

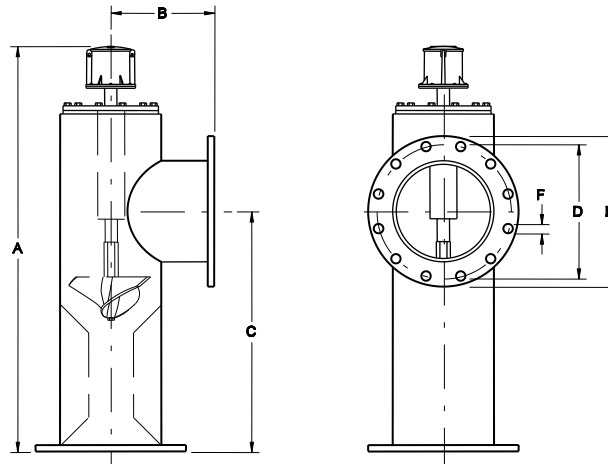
	MUR MDR	MU1 MD1 MUC MDC
<b>Performance</b>		
<b>Accuracy / Repeatability</b>	±2% of reading guaranteed throughout range	<ul style="list-style-type: none"> <li>• ±2% of reading guaranteed throughout full range</li> <li>• ±1% over reduced range</li> <li>• Repeatability 0.25% or better</li> </ul>
<b>Range</b>	3" to 24"	3" to 16"
<b>Maximum Temperature</b>	(Standard Construction) 160°F constant	(Standard Construction) 160°F constant
<b>Pressure Rating</b>	150 psi. Consult factory for special applications.	150 psi. Consult factory for special applications.

<b>Materials</b>		
<b>Top Plate</b>	Stainless steel (2" to 4") or fusion-bonded epoxy coated carbon steel (6" and larger)	Stainless steel (2" to 4") or fusion-bonded epoxy coated carbon steel (6" and larger)
<b>Drop Pipe</b>	304 stainless steel	n/a
<b>Spool</b>	Carbon steel standard, stainless steel optional	n/a
<b>Coating</b>	Fusion-bonded epoxy	n/a
<b>Body</b>	Epoxy-coated carbon steel pipe conforming to A.S.A pipe schedules	n/a
<b>Bearing Assembly</b>	Impeller shaft is 316 stainless steel. Ball bearings are 440C stainless steel.	Impeller shaft - 316 stainless steel. Ball bearings - 440C stainless steel
<b>Bearing Housing</b>	<ul style="list-style-type: none"> <li>• For models 2" to 16": 304 stainless steel standard, 316 stainless steel optional</li> <li>• For models 18" and larger: Brass standard, 316 stainless steel optional</li> </ul>	<ul style="list-style-type: none"> <li>• For models 2" to 16": 304 stainless steel standard, 316 stainless steel optional</li> <li>• For models 18" and larger: Brass standard, 316 stainless steel optional</li> </ul>
<b>Magnets</b>	(Permanent type) Alnico	Permanent type; cast or sintered alnico
<b>Register</b>	An instantaneous flowrate indicator and six-digit straight-reading totalizer are standard. The register is hermetically sealed within a die cast aluminum case. This protective housing includes a domed acrylic lens and hinged cover with locking hasp.	An instantaneous flowrate indicator and six-digit straight-reading totalizer is standard. The register is hermetically sealed within a die cast aluminum case. This protective housing includes a domed acrylic lens and hinges cover with locking hasp.
<b>Impeller</b>	Impellers are manufactured of high-impact plastic, retaining their shape and accuracy over the life of the meter.	Impellers are manufactured of high-impact plastic, retaining their shape and accuracy over the life of the meter.

### Options

<ul style="list-style-type: none"> <li>• Can be fitted with any flange standard including common international standards</li> <li>• Register extensions available</li> <li>• High temperature construction</li> <li>• Extended warranty</li> <li>• All stainless steel construction</li> <li>• A complete line of flow recording/control instrumentation</li> <li>• “Over Run” bearing assembly for higher than normal flowrates</li> <li>• Certified calibration test results</li> <li>• Digital register available in all sizes of this model</li> <li>• Marathon bearing assembly for higher than normal flowrates 4” and above</li> <li>• Canopy boot</li> <li>• SmartTrax on Board integrated telemetry for digital register option</li> </ul>	<ul style="list-style-type: none"> <li>• Can be fitted with any flange standard including common international standards</li> <li>• Register extensions available</li> <li>• High temperature construction</li> <li>• Extended warranty</li> <li>• All stainless steel construction</li> <li>• A complete line of flow recording/control instrumentation</li> <li>• “Over Run” bearing assembly for higher than normal flowrates</li> <li>• Certified calibration test results</li> <li>• Digital register available in all sizes of this model</li> <li>• Marathon bearing assembly for higher than normal flowrates 4” and above</li> <li>• Canopy boot</li> <li>• SmartTrax on Board integrated telemetry for digital register option</li> </ul>
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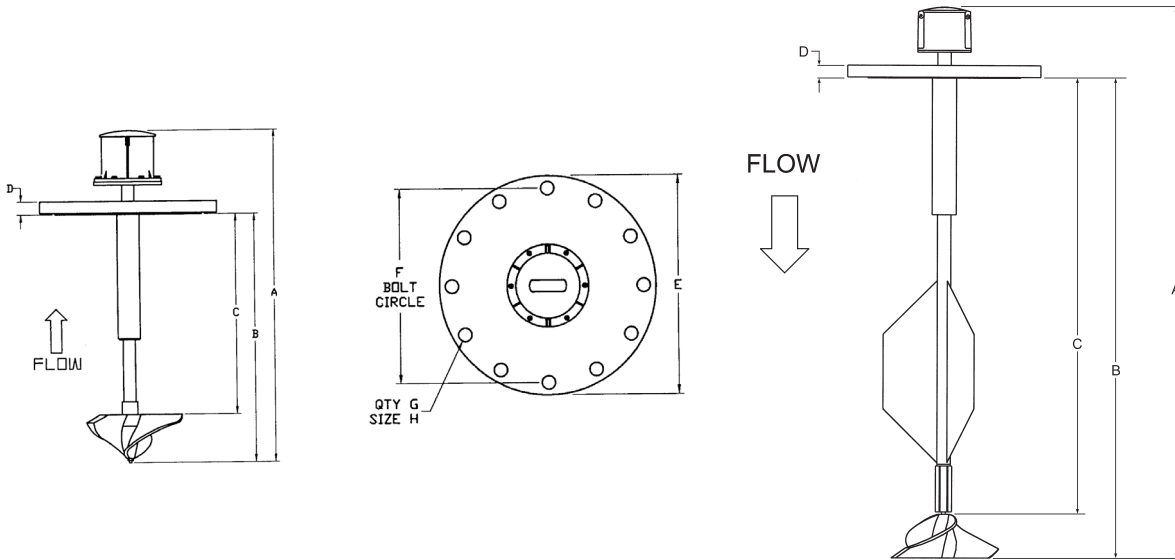
### DIMENSIONS - MUR MDR



MW800 (UP FLOW) MM800 (DOWN FLOW)	DIMENSIONS												
Meter Size	inches	3	4	6	8	10	12	14	16	18	20	24	
	mm	76	102	152	203	254	305	356	406	457	508	610	
Minimum Flow	GPM	40	50	90	100	125	150	250	275	400	475	700	
	LPS	2.5	3.2	5.7	6.3	7.9	9.5	15.8	17.3	25.2	30.0	44.2	
Maximum Flow	GPM	250	600	1200	1500	1800	2500	3000	4000	5000	6000	8500	
	LPS	15.8	37.9	75.7	94.6	113.6	157.7	189.3	252.4	315.5	378.5	536.3	
Maximum Flow w/ Marathon Bearing	GPM		900	1800	2250	2700	3750	4500	6000	7500	9000	12750	
Approx. Head Loss in Inches at Max. Flow	inches	29.50	23.00	17.00	6.75	3.75	2.75	2.00	1.75	1.50	1.25	1.00	
	mm	749	584	432	171	95	70	51	44	38	32	25	
Standard Dial Face*	GPM/ Gal		800/ 100	1300/ 100	2500/ 100	3K/ 1K	4K/ 1K	6K/ 1K	8K/ 1K				
Approx. Shipping Weight, lbs.	lbs	50	87	128	182	272	370	519	601	814	976	1293	
	kg	23	39.5	58.1	82.6	123.4	167.8	235.4	272.6	369	443	586	
A	inches	22.5	27.875	39.875	36.375	42.375	48.375	54	60	66	72.5	84.5	
	mm	572	708	1013	924	1076	1229	1372	1524	1676	1842	2146	
B	inches	22.5	27.875	39.875	36.375	42.375	48.375	54	60	66	72.5	84.5	
	mm	572	708	1013	924	1076	1229	1372	1524	1676	1842	2146	
C	inches	12.25	16.625	18	23	28	33	38	43	48	53.5	63.5	
	mm	311	422	457	584	711	838	965	1092	1219	1359	1613	
D	inches	6	7.5	9.5	11.75	14.25	17	18.75	21.25	22.75	25	29.5	
	mm	152	191	241	298	362	432	476	540	578	635	749	
E	inches	7.5	9	11	13.5	16	19	21	23.5	25	27.5	32	
	mm	191	229	279	343	406	483	533	597	635	699	813	
F	inches	.75	.75	.875	.875	1	1	1.125	1.125	1.25	1.25	1.375	
	mm	19	19	22	22	25	25	29	29	32	32	35	
No. of Bolts Per Flange			4	8	8	8	12	12	12	16	16	20	20

\*Indicates the dial face range and multiplier  
 Flanges in accordance with A.S.A. B16.5, A.S.T.M. A181 Grade I.  
 Larger flowmeters on special order.  
 Contact the factory for MM800 (downflow) meter dimensions.

### DIMENSIONS - MU1 MD1

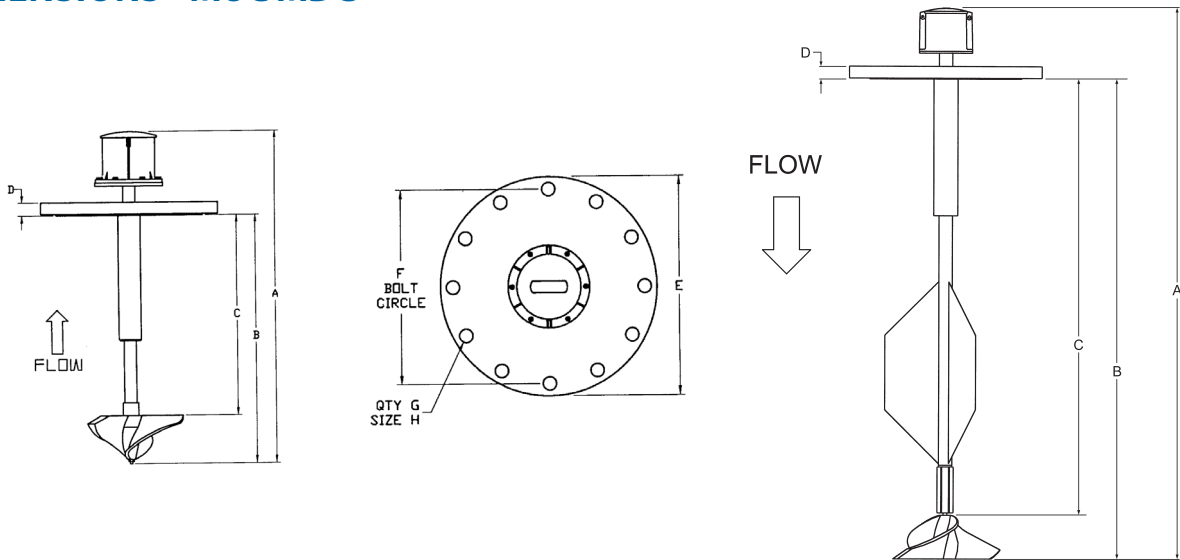


MWC00 (UP FLOW) / MWC00 (DOWN FLOW)	DIMENSIONS							
Meter and Nominal Pipe Size (inches)	3	4	6	8	10	12	14	16
Minimum Flow U.S. GPM	40	50	90	100	125	150	250	275
Maximum Flow U.S. GPM	250	600	1200	1500	1800	2500	3000	4000
Maximum Flow w/ Marathon Bearing		900	1800	2250	2700	3750	4500	6000
Approx. Head Loss in Inches at Max. Flow	29.5	23	17	6.75	3.75	2.75	2	1.75
Standard Dial Face (GPM/ Gal)		800/100	1300/100	2500/100	3K/1K	4K/1K	6K/1K	8K/1K
Approx. Shipping Weight- lbs.	50	87	128	182	272	370	519	601
A (inches)	24	24 3/4	27 1/2	27 1/2	34 1/2	34 1/2	40 1/2	44 3/4
B (inches)	16	16 3/4	19 1/2	19 1/2	26 7/8	28 3/4	40 1/2	44 3/4
C (inches)	12 1/4	12 1/2	13 1/8	13 1/8	20 1/8	22 1/2	26 1/4	40 3/4
D (inches)	15/16	15/16	1	1 1/8	1 3/16	1 1/4	1 3/8	1 7/16
E (inches)	7 1/2	9	11	13 1/2	16	19	21	23 1/2
F (inches)	6	7 1/2	9 1/2	11 3/4	14 1/4	17	18 3/4	21 1/4
G (no. of bolt holes)	4	8	8	8	12	12	12	16
H (inches)	3/4	3/4	7/8	7/8	1	1	1 1/8	1 1/8

Flanges in accordance with A.S.A., B16.5, A.S.T.M. A181 Grade I.

Larger flowmeters on special order.

### DIMENSIONS - MUC MDC



MMC00	DIMENSIONS							
Meter and Nominal Pipe Size (inches)	3	4	6	8	10	12	14	16
Minimum Flow U.S. GPM	40	50	90	100	125	150	250	275
Maximum Flow U.S. GPM	250	600	1200	1500	1800	2500	3000	4000
Maximum Flow w/ Marathon Bearing		900	1800	2250	2700	3750	4500	6000
Approx. Head Loss in Inches at Max. Flow	29.5	23	17	6.75	3.75	2.75	2	1.75
Standard Dial Face (GPM/ Gal)		800/100	1300/100	2500/100	3K/1K	4K/1K	6K/1K	8K/1K
Approx. Shipping Weight-lbs.	60	100	150	200	290	390	530	625
A (inches)	Per Customer Specifications							
B (inches)								
C (inches)								
D (inches)								
E (inches)	7.5	9	11	13.5	16	19	21	23.5
F (inches)	6	7.5	9.5	11.75	14.25	17	18.75	21.25
G (no. of bolt holes)	4	8	8	8	12	12	12	16
H (inches)	.75	.75	.875	.875	1	1	1.125	1.125

### INSTALLATION

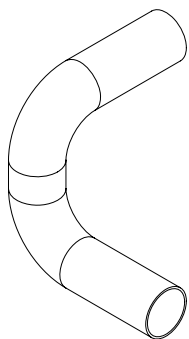
Standard installation is horizontal mount. If the meter is to be mounted in the vertical position, please advise the factory.

### PIPE RUN REQUIREMENTS

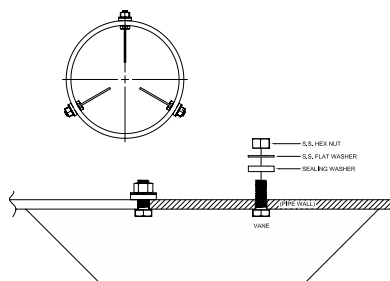
Configuration	A	B
Without straightening vanes	10	1
With straightening vanes	5	1
With FS100 Flow Straightener	1.5	1

### STRAIGHTENING VANES

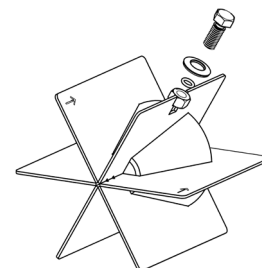
Special attention should be given to systems using two elbows “out of plane” or devices such as a centrifugal sand separator. These cause swirling flow in the line that affect propeller meters. Well developed swirls can travel up to 100 diameters downstream if unobstructed. Since most installations have less than 100 diameters to work with, straightening vanes become necessary to alleviate the problem. Straightening vanes will break up most swirls and ensure more accurate measurement. McCrometer actively encourages installing vanes just ahead of the meter. Straightening vanes are available in weld-in, bolt-in, and the FS100 Flow Straightener.



**Elbows out of plane**

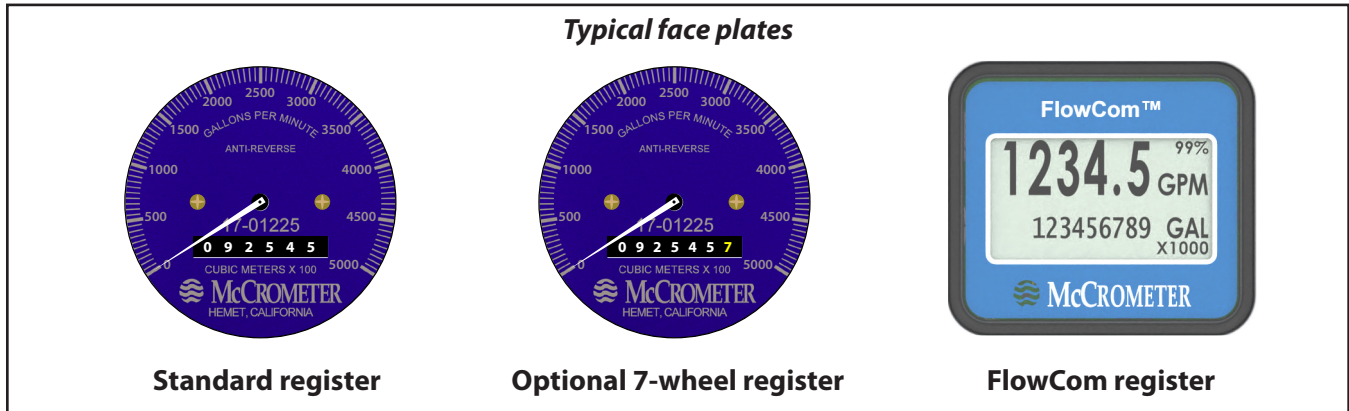


**Bolt-in straightening vanes**



**FS100 Flow Straightener**

## REGISTERS



### Mechanical Register

The instantaneous flowrate indicator is standard and available in gallons per minute, cubic feet per second, liters per second and other units. The register is driven by a flexible steel cable encased within a protective vinyl liner. The register housing protects both the register and cable drive system from moisture while allowing clear reading of the flowrate indicator and totalizer.



### Digital Register

The optional FlowCom digital register displays a flowmeter's flowrate and volumetric total. Available are four optional outputs: 4-20mA loop, open collector, optically isolated, and contact closure. Unique units of measurement for rate, total, 4-20mA, and pulse outputs. The FlowCom can be fitted to any new or existing McCrometer propeller flowmeter. The FlowCom also features a built-in data logger.



### SmartTrax on Board

In addition to features mentioned on the FlowCom digital register, SmartTrax On Board integrated telemetry provide a streamlined, all-in-one flow measurement and telemetry system allowing growers and districts to remotely monitor water usage and manage allocations across their territories. This affects input costs such as chemigation, fuel and electricity costs, and most importantly - your time! For natural resource districts and the like, SmartTrax on Board removes the need to manually collect flow data from each metered well, freeing up personnel time.

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