

**Water Specialties VFUR**  
**150 psi Vertical Upflow Tee Tube Meter**  
**Sizes 4" to 20"**

**Configurable for Mechanical or Digital Register**

### DESCRIPTION

**MODEL VFUR VERTICAL UPFLOW TEE TUBE METERS** are designed to meet AWWA specifications. The flanged end tee design permits use in a wide range of applications with up to 150 psi working pressure. The base and side outlets are 150 lb. AWWA class D flat face steel flanges. Fabricated steel meter tubes have straightening vanes and are protected internally and externally with 12-15 mils of NSF approved, fusion epoxy resin.

### FEATURES

**PROPELLER** is magnetically coupled with the drive mechanism through the sealed separator assembly. This completely eliminates water entering the meter assembly, as well as the need for any packing gland. The propeller is a conical shaped three bladed propeller, injection molded of thermoplastic material resistant to normal water corrosion and deformity due to high flow velocities.

**BEARING** in propeller is a water lubricated ceramic sleeve and spindle bearing system with a ceramic/stainless steel spindle. Dual ceramic thrust bearings, standard on all meters, handle flows in both forward and reverse directions. The bearing design promotes extended periods of maintenance free propeller operation. Bearings within the sealed meter mechanism are shielded precision stainless steel bearings and are factory lubricated for the life of the meter.

**CHANGE GEARS** may be easily exchanged in the field when changing the dial, or when recalibrating for different pipe sizes. It is not necessary to remove pressure from the line for these changes.

**O-RING SEALS** are used at the meter head and all points where seals are required, making the

*Upflow  
Flow Meter*



meter mechanism completely immune to any of the corrosive effects of atmospheric moisture or the liquids measured by the meter assembly.

**TOTALIZER** is O-ring sealed and magnetically coupled with the driving mechanism, and features a six digit totalizer with a full 3" diameter, 100 division, center sweep dial that permits extremely accurate readings for timing purposes in determining flow rates. The totalizer dial can be furnished in gallons, cubic feet, acre feet or any standard liquid measuring units. The bonnet, with padlock hasp, can be positioned in four different directions for the easiest possible reading when the meters are mounted in unusual positions.

**INDICATOR-TOTALIZER** is mechanically driven by the meter mechanism and features a full 4" diameter, 250 degree sweep dial with a six digit, straight reading type totalizer and sweep test hand. The indicator drive mechanism is temperature compensated so the indicator will be accurate at all points on the dial when operated between 32° and 140° F. The indicator dial can be furnished in GPM, CFS, MGD or any standard liquid measuring units with choice of standard totalizer measuring units. The bonnet, with padlock hasp, is O-ring sealed to the meter head.

**DIGITAL INDICATOR-TOTALIZER** has a non-volatile EEPROM memory to store totalizer count (updated hourly while running). Features a large two line display. Five digit top line indicates flow rate, and eight digit bottom line provides volumetric



## Specification Sheet VF Series Vertical Flow Meter

flow data. Indicator is available in 22 different units, including GPM, CFS, MGD. Totalizer is available in 20 different units, including Gallons, AF, CF. Units of measurement are user-selectable. Battery life is 6 to

10 years. Housing is NEMA 4X rated. Available with optional outputs: 4-20mA, pulse, Sensus, Itron, and Neptune.

### Water Specialties Models VFU1 VFUC VFDC

#### 150 psi Vertical Upflow and Downflow Tee Tube Top Plate Assemblies Sizes 4" to 20"

Configurable for Mechanical or Digital Register

### DESCRIPTION

**MODELS VFU1, VFUC, AND VFDC** meet AWWA specifications and are designed for mounting in tees with up to 150 PSI working pressure. The bolt-on design permits use in a wide range of applications with up to 150 psi working pressure. The mounting flange conforms to ANSI class 125 drilling. It is necessary, upon ordering, to furnish the I.D. dimension of the pipe the meter is to be mounted on for calibration purposes.

### FEATURES

**PROPELLER** is magnetically coupled with electronic sensor through the sealed separator assembly. This completely eliminates water entering the meter assembly, and eliminates all moving parts except for the propeller. The propeller is a conical shaped three bladed propeller, injection molded of thermoplastic material resistant to normal water corrosion and deformity due to high flow velocities.

**BEARING** in propeller is a water lubricated ceramic sleeve bearing that rides on a ceramic coated stainless steel spindle. Dual ceramic thrust bearings, standard on all meters, handle flows in both forward and reverse directions. The bearing design promotes extended periods of maintenance free propeller operation. Bearings within the sealed meter mechanism are shielded precision stainless steel bearings and are factory lubricated for the life of the meter.

*Upflow*



*Downflow*



**DIGITAL REGISTER** has a non-volatile EEPROM memory to store totalizer count (updated hourly while running). Features a large two line display. Five digit top line indicates flow rate, and eight digit bottom line provides volumetric flow data. Indicator is available in 22 different units, including GPM, CFS, MGD. Totalizer is available in 20 different units, including Gallons, AF, CF. Units of measurement are user-selectable. Battery life is 6-10 years. Housing is NEMA 4X rated.

Available with optional outputs: 4-20mA, pulse, Sensus, Itron, and Neptune.



## DESCRIPTION OF VFUR

### Performance

<b>Accuracy</b>	Plus or minus 2% of actual flow within the range specified for each meter size
<b>Pressure Range</b>	Up to 150 PSI maximum working pressure
<b>Temperature Range</b>	140° F Maximum. Consult factory for special construction for higher temperatures.
<b>Flow Ranges</b>	<p>See Min-Max-Int Flow Ranges column in the table of meter specifications on page 10.</p> <ul style="list-style-type: none"><li>• Size and construction are rated for continuous operation.</li><li>• Min and max flow ranges will vary according to meter size and construction.</li><li>• Min flow will be higher when auxiliary equipment is added.</li><li>• Intermittent flow is rated for 10%-15% of the total time the meter is operating.</li><li>• Consult factory for high velocity construction when intermittent flows are higher than shown in the table of meter specifications on page 10 and/or when longer operating periods are required.</li></ul>

### Materials

Materials used in construction are chosen to minimize the corrosive effects of the liquids measured by the meter assembly.

<b>Magnets</b>	Anticorrosive aluminized barrier coated magnets; Everlube 6155
<b>Interior Bearings</b>	Shielded stainless steel
<b>Propeller Bearing</b>	Ceramic sleeve type
<b>Propeller Spindle</b>	Ceramic coated stainless steel
<b>Propeller</b>	Injection molded thermoplastic
<b>Drop-Pipe</b>	Stainless steel
<b>Separator</b>	Stainless steel
<b>Shafts and Bolts</b>	Stainless steel
<b>Meter Head</b>	Cast iron, NSF approved, fusion epoxy coated
<b>Meter Tube</b>	Fabricated steel with 12-15 mils of NSF approved, fusion epoxy resin

### Optional Equipment

- A meter mounted forward and reverse totalizer
  - Totalizer extensions
  - Remote mounting kit with up to 50 feet of cable
  - A wide range of controls and instruments for indicating, totalizing, and recording flow data for each meter
- Special constructions and materials are available upon request.

FCC CERTIFICATION: The digital indicator-totalizer has been tested and found to comply with the limits for Class A digital device pursuant to Part 15 of the FCC Rules.



## ORDERING INFO

Meters must be specified by the customer and includes:

- Meter size
- Model number
- Serial number of the meter it is replacing
- Minimum & maximum flow ranges
- Temperature of meter environment
- Indicator scale & units
- Totalizer dial units
- Type of materials and construction
- Optional equipment desired



## SPECIFICATIONS FOR VFU1 VFUC VFDC

### Performance

<b>Accuracy</b>	Plus or minus 2% of actual flow within the range specified for each meter size.
<b>Pressure Range</b>	Up to 150 PSI maximum working pressure.
<b>Temperature Range</b>	140° F Maximum. Consult factory for special construction for higher temperatures.
<b>Flow Ranges</b>	<p>See Min-Max-Int Flow Ranges column in the table of meter specifications on page 11.</p> <ul style="list-style-type: none"><li>• Size and construction are rated for continuous operation.</li><li>• Min and max flow ranges will vary according to meter size and construction.</li><li>• Min flow will be higher when auxiliary equipment is added.</li><li>• Intermittent flow is rated for 10%-15% of the total time the meter is operating.</li><li>• Consult factory for high velocity construction when intermittent flows are higher than shown in the table of meter specifications on page 11 and/or when longer operating periods are required.</li></ul>

### Materials

Materials used in construction are chosen to minimize the corrosive effects of the liquids measured by the meter assembly.

<b>Magnets</b>	Anticorrosive aluminized barrier coated magnets; Everlube 6155
<b>Interior Bearings</b>	Shielded stainless steel
<b>Propeller Bearing</b>	Ceramic sleeve type
<b>Propeller Spindle</b>	Ceramic coated stainless steel
<b>Propeller</b>	Injection molded thermoplastic
<b>Drop-Pipe</b>	Stainless steel
<b>Separator</b>	Stainless steel
<b>Shafts and Bolts</b>	Stainless steel
<b>Meter Head</b>	Cast iron or fabricated steel, fusion epoxy coated.

### Optional Equipment

- A meter mounted forward and reverse totalizer
  - Totalizer extensions
  - Remote mounting kit with up to 50 feet of cable
  - A wide range of controls and instruments for indicating, totalizing, and recording flow data for each meter
- Special constructions and materials are available upon request.

FCC CERTIFICATION: The digital indicator-totalizer has been tested and found to comply with the limits for Class A digital device pursuant to Part 15 of the FCC Rules.



### ORDERING INFO

Meters must be specified by the customer and includes:

- Meter size
- Model number
- Serial number of the meter it is replacing
- Minimum & maximum flow ranges
- Temperature of meter environment
- Indicator scale & units
- Totalizer dial units
- Type of materials and construction
- Optional equipment desired



# Specification Sheet VF Series Vertical Flow Meter

## Part Numbers, Digital Registers

VF	XX					-	-	-	-
Vertical Flow Direction									
Up Flow with WS Tee Tube- VF29/VF30/VF30D	UR								
Up Flow for WS Tee Tube (Top Plate Only)- VFT1/VFI1/VFI1D	U1								
Up Flow for Customer Tee Tube (Top Plate Only)- VF28D	UC								
Down Flow for Customer Tee Tube (Top Plate Only)- VF32D	DC								
METER SIZE									
4" Vertical Flow Meter	04								
6" Vertical Flow Meter	06								
8" Vertical Flow Meter	08								
10" Vertical Flow Meter	10								
12" Vertical Flow Meter	12								
14" Vertical Flow Meter	14								
16" Vertical Flow Meter	16								
18" Vertical Flow Meter	18								
20" Vertical Flow Meter	20								
Tube Options									
Standard Flange Body / Drop Pipe	A								
Non Standard	X								
Propeller Options									
Standard	1								
High Velocity	2								
Register Options									
Flowcom	D								
Flowcom Non Programmable	N								
Flowconnect (FC Smart Part on 2nd line)	T								
Output Options									
No Outputs	-								
Open Collector Pulse(Flowcom 01)	1								
Opto Isolated Pulse & 4-20 Analog (Flowcom 02)	2								
Dry Contact Pulse & 4-20 Analog (Flowcom-03)	3								
Sensus Only (Flowcom 06)	6								
OC Pulse & Sensus (Flowcom-07)	7								
Opto Isolated Pulse & 4-20 Analog & Sensus (Flowcom-08)	8								
Dry Contact Pulse & 4-20 Analog & Sensus (Flowcom-09)	9								
Output Cable Options									
No Outputs	-								
6 ft	C1								
15 ft	C2								
25 ft	C3								
50 ft	C4								
75 ft	C5								
100 ft	C6								
125 ft	C7								
150 ft	C8								
7 pin Female pigtail Telemetry ready (Output Option 1 Only [Flowcom-05])	T1								
7 pin Male 25ft Telemetry ready (Output Option 1 Only)	T2								
7 pin Male 50ft Telemetry ready (Output Option 1 Only)	T3								

continued on next page



# Specification Sheet VF Series Vertical Flow Meter

## Part Numbers, Digital Registers

VF	XX						-		-		-
Register Remote and Extension Options											
Meter Mount (Standard)											
6 ft Cable Remote Mount (Flowcom only)											
25 ft Cable Remote Mount (Flowcom only)											
50 ft Cable Remote Mount (Flowcom only)											
6" Long Extension (Mech or Dlgital)											
7" Long Extension (Mech or Dlgital)											
8" Long Extension (Mech or Dlgital)											
1" Increments for Extensions Lengths											
150" Maximum extension length											
High Temp Option											
High Temp Prop and Seals											
										H	
										\$999	

\* High temperature range is 140° - 250° F. High temperature prop meters must have at least a 12" register extension (included in price).



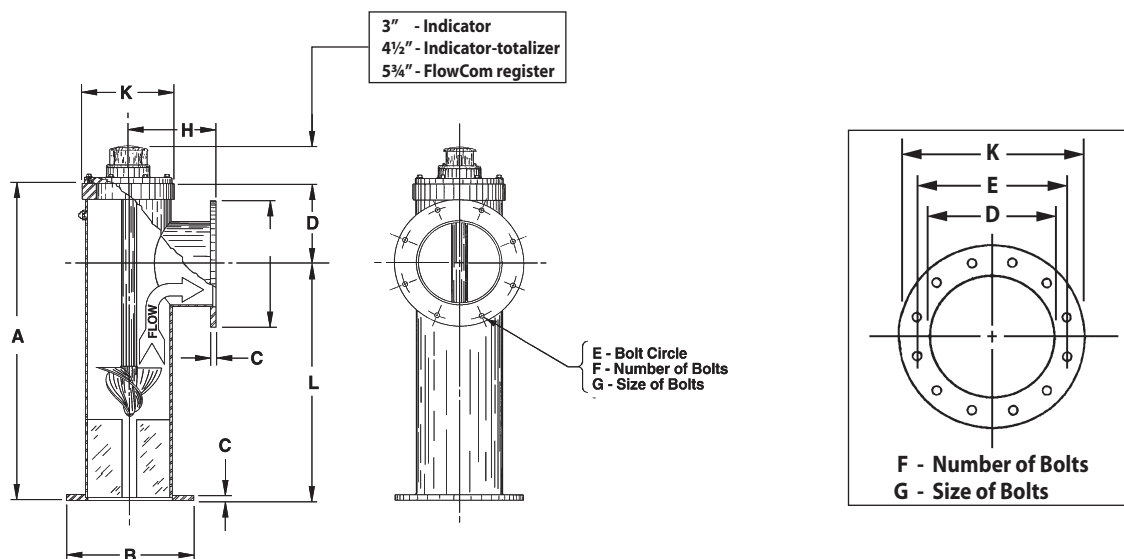


# Specification Sheet VF Series Vertical Flow Meter

## Part Numbers, Mechanical Registers

VF	XX									
<b>Vertical Flow Direction</b>										
Up Flow with WS Tee Tube- VF29/VF30/VF30D	UR									
Up Flow for WS Tee Tube (Top Plate Only)- VFT1/VFI1/VFI1D	U1									
Up Flow for Customer Tee Tube (Top Plate Only)- VF28D	UC									
Down Flow for Customer Tee Tube (Top Plate Only)- VF32D	DC									
<b>METER SIZE</b>										
4" Vertical Flow Meter	04									
6" Vertical Flow Meter	06									
8" Vertical Flow Meter	08									
10" Vertical Flow Meter	10									
12" Vertical Flow Meter	12									
14" Vertical Flow Meter	14									
16" Vertical Flow Meter	16									
18" Vertical Flow Meter	18									
20" Vertical Flow Meter	20									
<b>Tube Options</b>										
Standard Flange Body / Drop Pipe	A									
Non Standard	B									
<b>Propeller Options</b>										
Standard	1									
High Velocity	2									
<b>Register Options</b>										
Totalizer	1									
Indicator/Totalizer	2									
<b>Output Options</b>										
No Outputs	-									
4-20 Analog Only (TR15/TR16)	A									
Dry Contact Pulse & 4-20 Analog (TR04/TR12 + TR15/TR16)	B									
Dry Contact Pulse (TR04/TR12)	C									
<b>Extension Options</b>										
Meter Mount (Standard)	-									
6" Long Extension (Mech or Digital)	006									
7" Long Extension (Mech or Digital)	007									
8" Long Extension (Mech or Digital)	008									
1" Increments for Extensions Lengths	XXX									
144" Maximum extension length	144									
<b>High Temp Option</b>										
High Temp Prop and Seals	H									

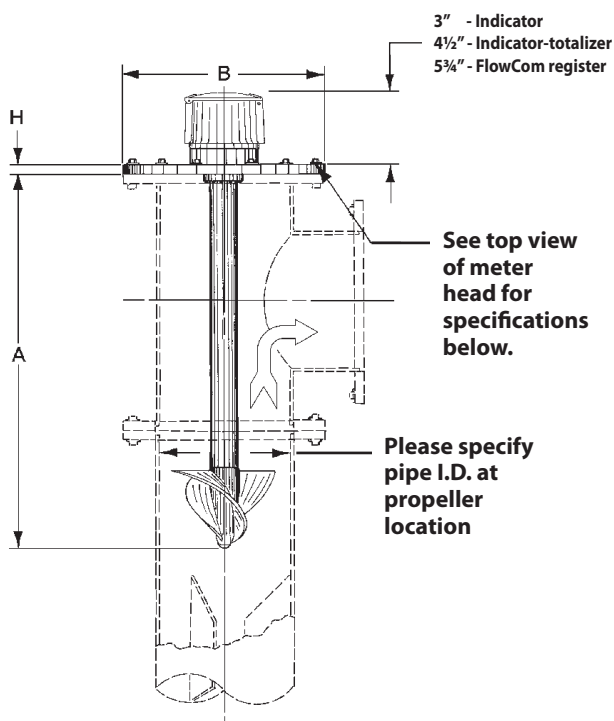
### DIMENSIONS OF VFUR



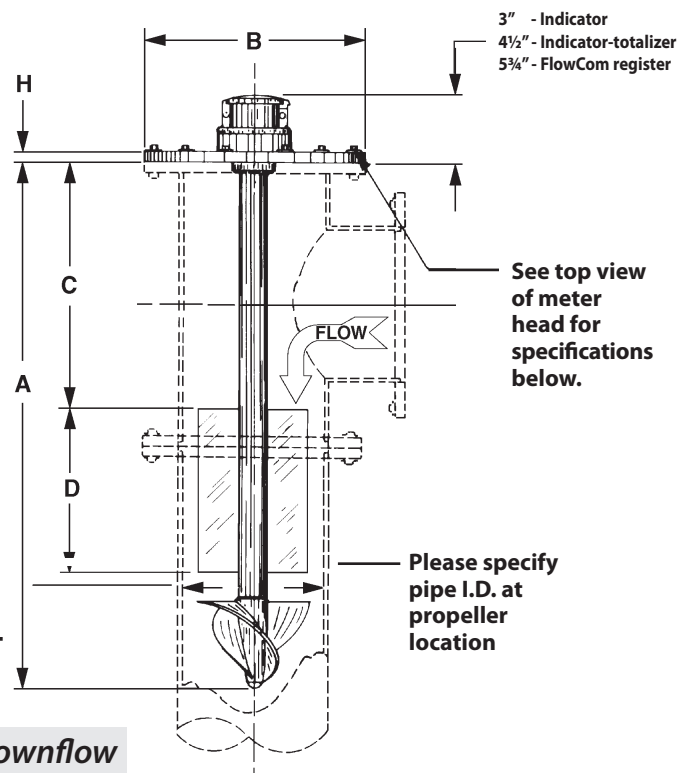
Meter & Pipe size (inches)	Flow Ranges, GPM Min - Max - Int	Standard Dial Face (GPM/Gal.)	Dimensions										Est. Shipping Weight (lbs.)
			A	B	C	D	E	F	G	H	K	L	
4	55 - 500 - 700	500/100	18	9	5/8	4 ½	7 ½	8	5/8	5	6	13 ½	180
6	130 - 1200 - 1500	1200/1000	40	11	1 1/16	10	9 ½	8	¾	9	11	30	190
8	170 - 1500 - 2000	1500/1000	40	13 ½	1 1/16	10	11 ¾	8	¾	10	11	30	240
10	200 - 2000 - 3000	2000/1000	40	16	1 1/16	10	14 ¼	12	7/8	11	11	30	330
12	220 - 3000 - 3500	3000/1000	40	19	1 3/16	10	17	12	7/8	12	11	30	440
14	320 - 4000 - 4500	4000/1000	46	21	1 5/16	10	18 ¾	12	1	14	11	36	520
16	420 - 5000 - 6000	5000/1000	54	23 ½	1	11 ½	21 ¼	16	1	15	11	42 ½	620
18	720 - 6000 - 7500	6000/1000	60	25	1 1/16	12	22 ¾	16	1 1/8	18	11	48	720
20	870 - 8000 - 9000	8000/10000	66	27 ½	1 1/8	14	25	20	1 1/8	20	11	52	820

Standard construction will be supplied for all main line meters unless special flow range, materials, or construction are required.

### DIMENSIONS OF VFU1 VFUC VFDC

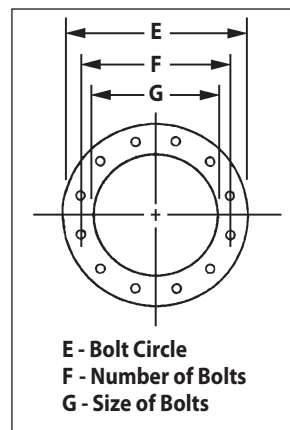


**Upflow**



**Downflow**

Meter & Pipe size (inches)	Flow Ranges, GPM Min - Max - Int	Standard Dial Face (GPM/Gal.)*	Dimensions						Est. Shipping Weight (lbs.)
			A	B	E	F	G	H	
4	55 - 500 - 700	500/100	28	9	7½	8	5/8	5/8	60
6	130 - 1200 - 1500	1200/1000	28	11	9½	8	3/4	11/16	75
8	170 - 1500 - 2000	1500/1000	28	13½	11¾	8	3/4	11/16	90
10	200 - 2000 - 3000	2000/1000	28	16	14¼	12	7/8	11/16	110
12	220 - 3000 - 3500	3000/1000	28	19	17	12	7/8	13/16	140
14	320 - 4000 - 4500	4000/1000	30	21	18¾	12	1	15/16	175
16	420 - 5000 - 6000	5000/1000	34	23½	21¼	16	1	1	200
18	720 - 6000 - 7500	6000/1000	36½	25	22¾	16	11/8	11/16	230
20	870 - 8000 - 9000	8000/10000	40½	27½	25	20	11/8	11/8	260



Meter & Pipe size (inches)	Flow Ranges, GPM Min - Max - Int	Standard Dial Face (GPM/Gal.)*	Dimensions								Est. Shipping Weight (lbs.)
			A	B	C	D	E	F	G	H	
4	55 - 500 - 700	500/100	34	9	13 3/8	12	7 1/2	8	5/8	5/8	70
6	130 - 1200 - 1500	1200/1000	36 1/2	11	16	12	9 1/2	8	3/4	11/16	90
8	170 - 1500 - 2000	1500/1000	40 1/2	13 1/2	20	12	11 3/4	8	3/4	11/16	120
10	200 - 2000 - 3000	2000/1000	44	16	26 1/2	12	14 1/4	12	7/8	11/16	135
12	220 - 3000 - 3500	3000/1000	48	19	27 1/2	12	17	12	7/8	13/16	215
14	320 - 4000 - 4500	4000/1000	54	21	31 1/2	14	18 3/4	12	1	15/16	250
16	420 - 5000 - 6000	5000/1000	60	23 1/2	35 1/2	16	21 1/4	16	1	1	280
18	720 - 6000 - 7500	6000/1000	66	25	39 1/2	18	22 1/4	16	11/8	1 1/16	310
20	870 - 8000 - 9000	8000/10000	72	27 1/2	43 1/2	20	25	20	11/8	1 1/8	390

### INSTALLATION

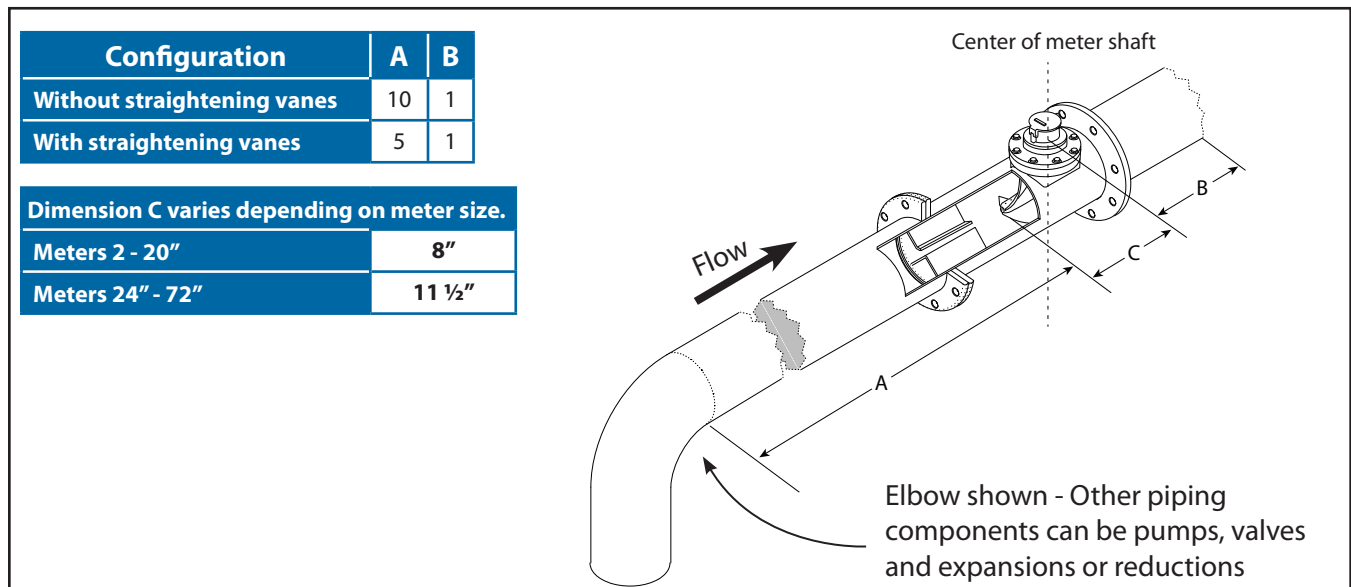
For new saddle installations, a hole is cut in the existing pipe line and the saddle is welded to the line. The meter head assembly can then be bolted to the saddle. For replacements or retrofits, the existing meter head assembly can be easily removed and replaced.

The meter can be installed horizontally, vertically, or inclined on suction or discharge lines. The meter must have a full flow of liquid for proper accuracy. Complete installation, removal, and reinstallation instructions can be found in the meter's Installation, Operation, and Maintenance Manual.

### PIPE RUN REQUIREMENTS

Fully opened gate valves, fittings, or other obstructions that tend to set up flow disturbances should be a minimum of ten pipe diameters upstream and two pipe diameters downstream from the meter. Installations with less than ten pipe diameters of straight pipe require straightening vanes. Meters with straightening vanes require at least five pipe diameters upstream and two pipe diameters downstream of the meter.

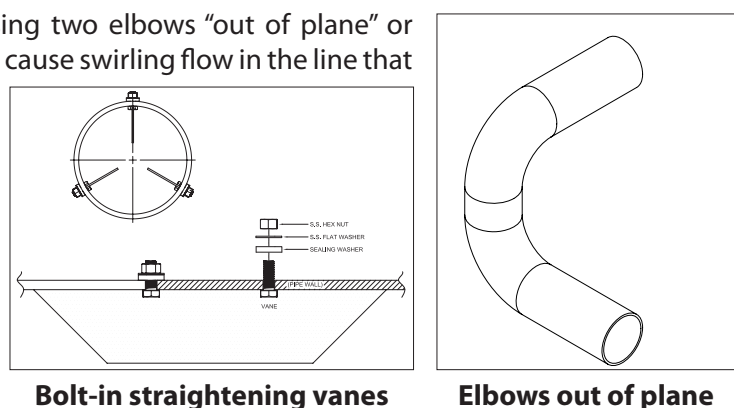
An optional remote mounting kit with up to 100 feet of cable is available to locate the indicator-totalizer at remote locations.



### 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 and bolt-in.

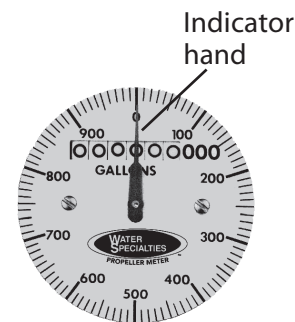


### REGISTERS AND TOTALIZERS

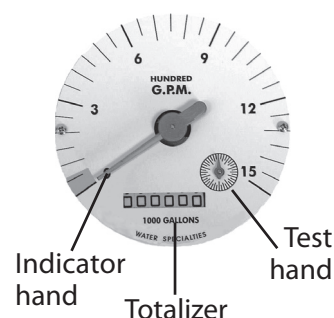
#### Mechanical Register and Indicator-Totalizer

The instantaneous flow rate indicator is standard and available in gallons per minute, cubic feet per second, liters per second and other units.

The register housing protects both the register and cable drive system from moisture while allowing clear reading of the flow rate indicator and totalizer.



Standard register

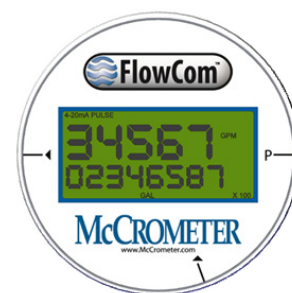


Indicator-totalizer

#### Digital Totalizer

The optional FlowCom register displays a flow meter's flow rate and volumetric total. Available are optional outputs: scaled pulse and/or industry standard 4-20mA signal. The FlowCom can be fitted to any new or existing McCrometer propeller flow meter.

Automated meter reading for the FlowCom register is available with the Smart Output transmitter option.



FlowCom register

#### Wireless Telemetry

The optional FlowConnect is designed specifically for wireless telemetry via either satellite or cellular data service. Manual meter reading is never required. It uses either the mechanical register or the digital register (both shown above).

You can determine how often readings are made and transmitted to the cloud database, which you can view on a PC or on a cell phone. The viewing utility provides data tools that can analyze flow rate, consumption, and possible anomalies in an irrigation system.



FlowConnect

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