

Water Specialties Model ML04
150 psi Tube Meter
Sizes 2" to 48"

Flanged Tube Meter
Sealed Meter Mechanism
Magnetic Drive
Indicator-Totalizer

DESCRIPTION

MODEL ML04 FLANGED TUBE METERS are manufactured to the highest standards. Materials used on all meters and flow ranges for the low velocity meter meet or exceed AWWA standard C704-02. The flanged end tube design permits use in a wide range of applications with up to 150 psi working pressure. Flanged ends 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 oil filled gearbox. 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.

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.

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

Water Specialties Model ML04D 150 psi Tube Meter Sizes 2" to 48"

Flanged Tube Meter
Solid State Electronic Propeller Meter
Digital Indicator-Totalizer

DESCRIPTION

MODEL ML04D FLANGED TUBE METERS are manufactured to the highest standards. Materials used on all meters and flow ranges meet, or exceed, AWWA standard C704-02. The flanged end tube design permits use in a wide range of applications with up to 150 psi working pressure. Flanged ends 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 bonded epoxy resin.

FEATURES

PROPELLER is magnetically coupled with the electronic sensor through the sealed gearbox. 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 and spindle bearing system with a ceramic/stainless 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.



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 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.



ML04 SPECIFICATIONS

Performance

Accuracy	Plus or minus 2% of actual flow within the range specified for each meter size
Pressure Range	Up to 150 PSI maximum working pressure
Temperature Range	140° F Maximum. Consult factory for special construction for higher temperatures.
Flow Ranges	<p>See Min-Max-Int Flow Ranges column in the table of meter specifications on page 6.</p> <ul style="list-style-type: none">• Size and construction are rated for continuous operation.• Min and max flow ranges will vary according to meter size and construction.• Min flow will be higher when auxiliary equipment is added.• Intermittent flow is rated for 10%-15% of the total time the meter is operating.• Consult factory for high velocity construction when intermittent flows are higher than shown in the table of meter specifications on page 6 and/or when longer operating periods are required.

Materials

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

Magnets	Anticorrosive aluminized barrier coated magnets; Everlube 6155
Interior Bearings	Shielded stainless steel
Propeller Bearing	Ceramic sleeve type
Propeller Spindle	Ceramic coated stainless steel
Propeller	Injection molded thermoplastic
Gearbox	Stainless steel
Separator	Stainless steel
Shafts	Stainless steel
Meter Head Bolts	2" - 20": Stainless steel 24"-48": Plated steel
Meter Head	Cast iron or fabricated steel, NSF approved, fusion bonded epoxy coated
Meter Tube	Fabricated steel with straightening vanes and coated, inside and out, with 12-15 mils of NSF approved, fusion bonded epoxy by the fluidized bed method.

Optional Equipment

Equipment	Optional equipment is available upon request, including totalizer extensions, special construction or materials and a wide range of controls and instruments for indicating, totalizing and recording flow data.
Warranty	A five-year guarantee is available for 2" - 36" meters.



ML04D SPECIFICATIONS

Performance

Accuracy	Plus or minus 2% of actual flow within the range specified for each meter size.
Pressure Range	Up to 150 PSI maximum working pressure.
Temperature Range	140° F Maximum. Consult factory for special construction for higher temperatures.
Flow Ranges	<p>See Min-Max-Int Flow Ranges column in the table of meter specifications on page 6.</p> <ul style="list-style-type: none">• Size and construction are rated for continuous operation.• Min and max flow ranges will vary according to meter size and construction.• Min flow will be higher when auxiliary equipment is added.• Intermittent flow is rated for 10%-15% of the total time the meter is operating.• Consult factory for high velocity construction when intermittent flows are higher than shown in the table of meter specifications on page 6 and/or when longer operating periods are required.

Materials

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

Magnets	Anticorrosive aluminized barrier coated magnets; Everlube 6155
Propeller Bearing	Ceramic sleeve type
Propeller Spindle	Ceramic coated stainless steel
Propeller	Injection molded thermoplastic
Gearbox	Stainless steel
Separator	Stainless steel
Shafts	Stainless steel
Meter Head Bolts	2" - 20": Stainless steel 24"-48": Plated steel
Meter Head	Cast iron or fabricated steel, NSF approved, fusion bonded epoxy coated
Meter Tube	Fabricated steel with straightening vanes and coated inside and out with 12-15 mils of NSF approved, fusion epoxy by the fluidized bed method.

Optional Equipment

Equipment	Remote mounting kit with up to 50 feet of cable, totalizer extensions, digital transmitter, and 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.
Warranty	A five-year guarantee is available for 2" - 36" meters.

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 INFORMATION

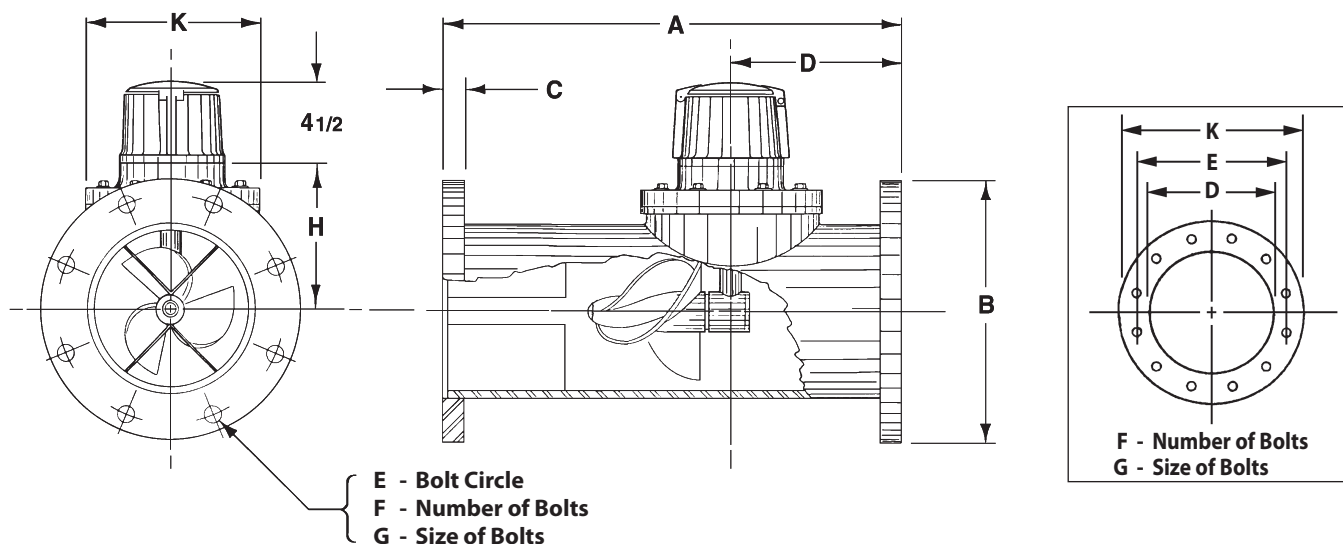
Meters must be specified by the customer and includes:

- 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
- Installation requirement - Horizontal or vertical

DIMENSIONS

ML04

ML04D



Meter & Pipe size (inches)	Flow Ranges, GPM		Dimensions									Est. Shipping Weight (lbs.)
	Standard Construction Min - Max - Int	High Velocity Construction Min - Max	A	B	C	D	E	F	G	H	K	
2	40-160-225	N/A	18	6	5/8	7	4 3/4	4	5/8	5 1/4	9	70
3	45-250-350	N/A	18	7 1/2	5/8	7	6	4	5/8	5 1/4	9	70
4	55-500-700	200-700	18	9	5/8	7	7 1/2	8	5/8	5 1/4	9	80
6	120-1200-1500	300-1500	22	11	11/16	9	9 1/2	8	3/4	6 1/4	9	150
8	150-1500-2000	400-2500	24	13 1/2	11/16	9	11 3/4	8	3/4	7 1/4	9	170
10	180-2000-3000	500-3500	26	16	11/16	10	14 1/4	12	7/8	8 1/2	11	230
12	200-3000-3500	800-5000	28	19	13/16	10	17	12	7/8	9 1/2	11	288
14	300-4000-4500	1000-6000	42	21	15/16	12	18 3/4	12	1	10 1/2	13 1/2	396
16	400-5000-6000	1200-7500	48	23 1/2	1	12	21 1/4	16	1	11 1/2	13 1/2	547
18	700-6000-7500	1500-9000	54	25	11/16	15	22 3/4	16	1 1/8	12 1/2	13 1/2	665
20	850-8000-9000	2000-12000	60	27 1/2	11/8	15	25	20	1 1/8	13 1/2	13 1/2	780
24	1000-10000-13500	3000-15000	72	32	1 1/4	18	29 1/2	20	1 1/4	17 1/2	21	1250
30	1800-15000-21000	4000-25000	84	38 3/4	1 3/8	18	36	28	1 1/4	20 1/2	21	2010
36	2000-20000-30000	5000-35000	96	46	1 5/8	20	42 3/4	32	1 1/2	23 1/2	21	2840
42	3000-30000-40000	6000-50000	96	53	1 3/4	24	49 1/2	36	1 5/8	28	32	4300
48	5500-35000-50000	7000-60000	96	59 1/2	1 7/8	24	56	44	1 5/8	31	32	4730

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

INSTALLATION

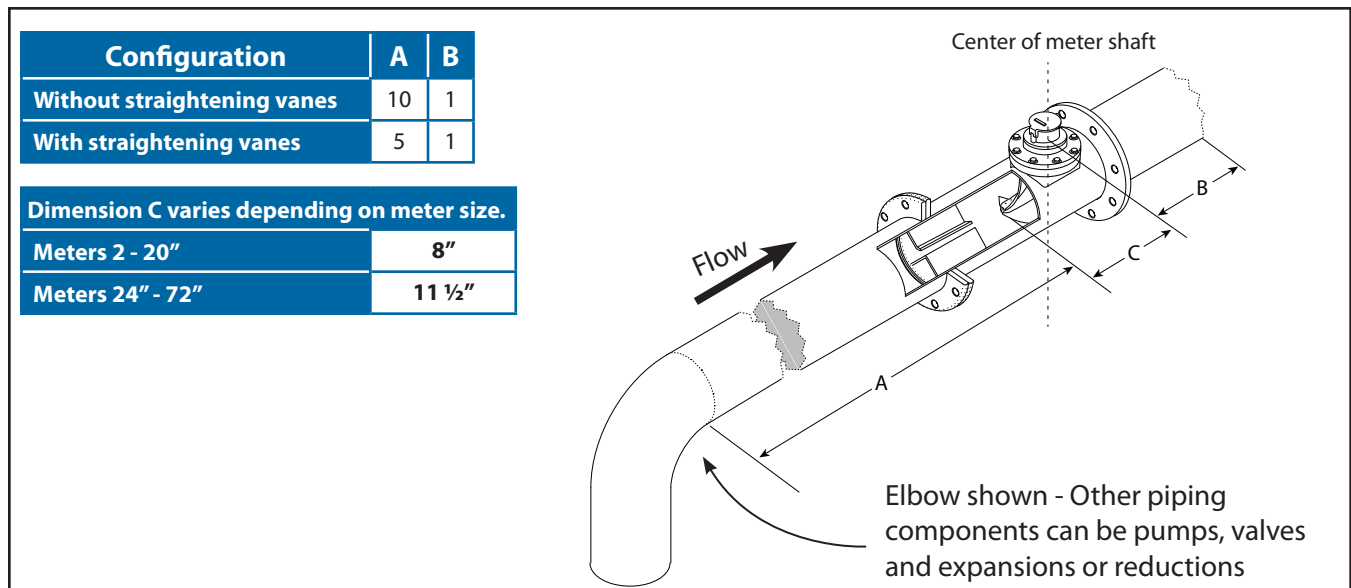
Flanged end meters: A tube is inserted into a section of open pipe and each flanged end is joined to the existing pipe using the provided gaskets and bolts.

Plain, grooved, or threaded end meters: A tube is inserted into a section of open pipe and each end is joined to the existing pipe as appropriate to its type.

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

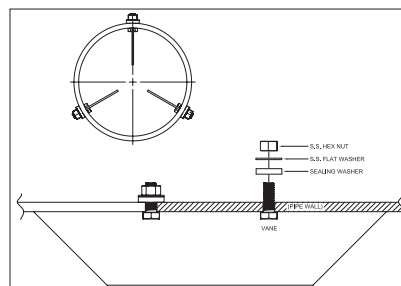
Fully opened gate valves, fittings or other obstructions that tend to set up flow disturbances should be a minimum of ten pipe diameters upstream and two pipe diameters downstream from the meter. Installations with less than ten pipe diameters of straight pipe require straightening vanes. Meters with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



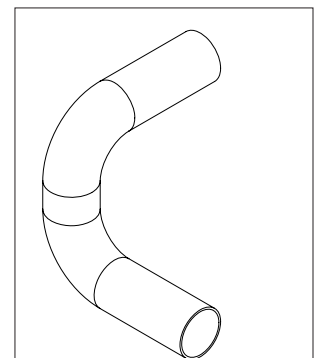
STRAIGHTENING VANES

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.



Bolt-in straightening vanes



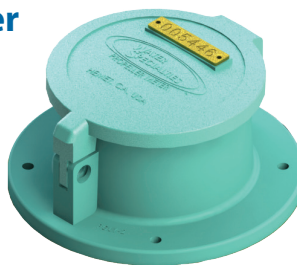
Elbows out of plane

REGISTERS AND TOTALIZERS

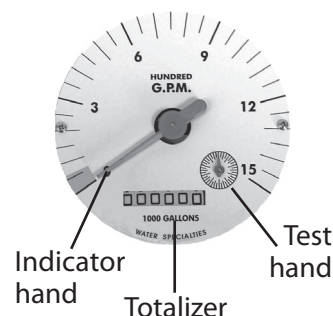
Mechanical Register and Indicator-Totalizer

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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