

## SERIES 55-200

### ARMORED FLOWMETER



*The Series 55-200 Armored Flowmeter is a low cost, 5% accuracy, all metal meter for high-pressure and temperature flow applications. Its plug and orifice design, overall simplicity, and minimal parts add up to an economical meter. Size for size, USFilter's Wallace & Tiernan Products (USF/W&T) Armored Flowmeters give high capacities, reliable indication or transmission of flow, and dependable service.*

#### FEATURES

##### **Low Cost**

The plug and orifice design, overall simplicity, and minimum parts add up to an economical meter.

##### **High Capacities**

Size for size, USF/W&T Armored Flowmeters give high capacities: The plug and orifice concept yields capacities often double that of other designs.

##### **Compact**

The self-guiding float requires no rods. The meter is shorter than other designs, which saves space.

##### **High Pressure and Temperature Gas Service**

Limits are 1500 psi and 200°F for gas; 1500 psi and 400°F for liquids.

##### **Reliable Gas Measurement**

Readings steady out quickly. A special polypropylene float gives stable readings. It minimizes violent reactions to flow surges, especially at start-up.

##### **Reversible, Dual Scale**

A reversible scale with gpm water on one side and percent of maximum flow on the other is standard for easy readout changes.

##### **Reliable Operation**

Rotation of the flow switch and indicator magnets is almost frictionless. This and their powerful bond with the float magnet means reliable indicating and flow switching.

##### **Easy to Change Read Outs**

The standard read out is in a magnetically coupled indicator unit. The indicator may be replaced by an indicating electronic transmitter. The electronic transmitter is available in a two-/four-wire general purpose model and a two-wire model Factory Mutual approved for service in hazardous locations.

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#### TECHNICAL DATA

**Accuracy** – 5% of full scale.

**Range** – 10 to 1.

**Pipe Connections** – NPT female.

**Mounting** – Vertical, in-line.

**Scales** – Reversible scale calibrated 0-100% of full flow on one side and gpm water on the other. Scale length is six inches. Special scales optional.

#### Materials of Construction

Metering tube, end fittings, and orifice are 316 stainless steel. For liquid service, float is 316 stainless with 301 stainless steel guide; for gas, polypropylene body with 301 stainless steel guide. Alarm and indicator housings are cast aluminum finished with special baked-on enamel paint for corrosion resistance. Write for TI 500.001, which is a detailed listing of meter compatibility with a wide range of fluids.

#### Over Viscosity Ceiling

For liquids, special calibration is required where the liquid's viscosity exceeds the viscosity ceilings.

#### ELECTRONIC TRANSMITTER

##### FEATURES

#### Factory Mutual Approved

The transmitter model is Factory Mutual approved as intrinsically safe for hazardous locations and dust-ignition proof.

#### Reliable Magnetic Coupling

A powerful magnetic coupling exists between the vertically moving float magnet and the rotating transmitter magnet. There is only one possible position of the transmitting mechanism for any float position. Transmission and indication are reliable, even under sudden flow surges.

#### 400°F Operating Temperature

When used with appropriate Float and "O" Ring, these USF/W&T Electronic Transmitters handle process fluids to 400°F (Viton) and 200°F (Buna N) with no loss of accuracy. Mounting on the meter tube leaves an air space to impede heat transfer; heat shields are not required. Careful selection of materials and non-lubricated bearings throughout improve high-temperature performance.

#### Separate Flow Indication

The scale-and-pointer readout is independent of the transmitting mechanism. The pointer indicates flow rate even if the transmitting element is removed or if power fails.

#### Easy Addition in Field

Any model can be ordered mounted on a new meter or can be easily added to an already-installed meter. Field installation does not require modification, removal,

or even recalibration of the meter. A sliding internal bracket simplifies final zero adjustment.

#### Two-Wire or Four-Wire, Battery Back-up

Two-wire or four-wire operation is achieved by changing wiring connections. The transmitter is easily wired to an external stand-by battery.

#### Two-Wire/Four-Wire Transmitter

The transmitter is a low energy, high output load device. When used with an approved energy-limiting barrier, it is Factory Mutual approved as intrinsically safe in hazardous locations\*. Position of the pointer and cam is achieved by a powerful magnetic linkage to the float. The cam has a captive follower that positions the mechanical arm of a differential capacitance bridge sensor. Any change in the bridge causes a proportional change in the transmitter's 4-20 mA output and in the bridge feedback voltage. The change in feedback voltage is used to rebalance the bridge. Zero and span adjustment are included.

- For stand-by operation, the transmitter is easily connected to operate from a battery system.
- A gasketed NEMA 4 enclosure protects the mechanism outdoors or in dusty or corrosive atmosphere.

#### Choice of Arrangements

The transmitter is available in a Two-wire/Four-wire general purpose housing that, when used with an approved energy-limiting barrier, is Factory Mutual approved as intrinsically safe\* for

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hazardous locations. It is also available in an explosion proof dust-ignition proof\* arrangement.

The transmitter gives reliable linear flow-proportional milliampere signals, but other characterizations are available. The transmitter is interchangeable with any other readout and may be used with a flow switch. Local readout is on a six-inch scale; standard calibration is percent of maximum flow. Calibration in custom units is optional.

*\*As defined by NEC.*

#### TWO-WIRE/FOUR-WIRE TRANSMITTER

##### TECHNICAL DATA

**Accuracy** – Combined meter and transmitter accuracy is 5% of full scale.

**Sensitivity** – 0.2% of full scale.

**Linearity** – 0.4% of full scale.

**Repeatability** – 0.3% of full scale.

**Operating Range** – 10 to 1.

#### **Speed of Response**

Complete response to a flow-rate change from 10% to 90% of full scale in 0.5 seconds.

#### **Output Signals**

4-20 mA DC flow proportional.

#### **Electrical Requirements**

*Available from USF/W&T are:* a 24 VDC supply for general purpose, intrinsically safe (with the appropriate electronic barriers), and explosion proof arrangement.

*Current Consumption:* 5 mA - signal current.

#### **Allowable Loop Resistance**

0 ohms for 12 VDC supply, 500 ohms for a 22 VDC supply (maximum allowable for intrinsically safe operation); 600 ohms for a 24 VDC supply; 900 ohms for a 33 VDC supply.

#### **Output Load Effect**

Output independent of load.

#### **Temperature Range**

Maximum fluid temperature is 400°F with Viton "O" Rings; ambient range is -13 to 140°F.

#### **Temperature Effect**

Output changes less than 0.036% of full scale per degree F change from -13 to 140°F.

#### **Electrical Classification**

*General Purpose Arrangement:* In NEMA 4 general purpose enclosure, the transmitter is Factory Mutual approved as intrinsically safe for Class I, Division 1, Group A, B, C, and D hazardous locations when installed according to instruction manual drawing 520.209.110.011. FM entity parameters:  $V_{max} = 30$  V;  $I_{max} = 160$  mA;  $C_i \leq 10$  nF;  $L_i = 50\mu$  H.

*Examples of electronic barriers acceptable under the entity system are:* Pepperl & Fuchs transmitter converter KMD 2-cr-1.P:30300 or Zener barrier #Z728 or Z828; MTL #706 + 20 and FM approved as dust-ignition proof for Class II, Division 1 and 2, Group E and G and suitable for Class III.

*Explosionproof Arrangement:* In an explosionproof enclosure, the transmitter is FM approved as explosionproof for Class I, Division 1, Group A, B, C, and D hazardous locations; and FM approved as dust-ignitionproof for Class II, Division 1, Group E, F and G hazardous locations suitable for Class III, Division 1.

#### **Electrical Connections**

½" conduit connection; Transmitter to receiver, unshielded wires.

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### FLOW SWITCH



#### FEATURES

This compact option gives reliable high and/or low flow switching. The USF/W&T Flow Switch contains a powerful rotating magnet that responds linearly to float position. Its switches are long life, hermetically sealed reed types. Almost frictionless rotation of the switch magnet and its powerful bond with the float magnet give a dependable magnetic coupling. Even under sudden flow surges switching remains reliable. The switch is available in a UL listed, hazardous location\* arrangement (Series 5500) and a general purpose arrangement (Series 5600) in NEMA 4 enclosure. Easily added in the field with the meter in the line. No extension rod, no interference with vertical piping. Can set switches to open or close on increasing or decreasing flow. In the general purpose model, this is done without removing the cover. A screwdriver adjustment sets each switch independently over 0 to 100% of the flow range.

#### TECHNICAL DATA

**Repeatability** – 0.6% of full scale.

#### Electrical Ratings

*Series 5600 General Purpose:* one or two switches rated 250 mA at 48 volts DC or 120 volts AC resistive or 50 mA at 48 volts DC or 120 AC inductive; one or two single-pole, double-throw relays rated 10 amperes at 28 volts DC or 120 volts AC; coil supply 120 volts AC, 50/60 Hz.

*Series 5500 Hazardous Location:* One or two single-pole, double throw relays rated 10 amperes at 120 volts AC; coil supply 120 volts AC, 50/60 Hz. UL listed for Class I, Division 1 & 2 Groups C and D or Class II, Division 1 & 2 Group E, F, and G.

*\*As defined by NEC.*

#### Temperature Limits

Ambient, -20 to 120°F.

#### Actuating Time

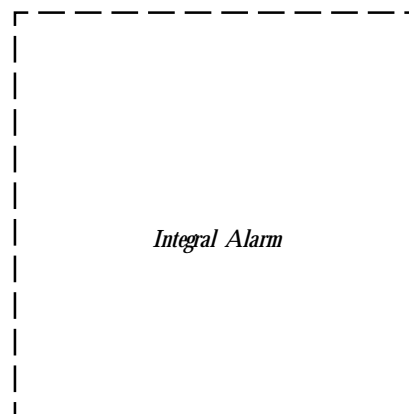
Reed switch opens in one millisecond.

#### Enclosures

Heavy cast aluminum (NEMA 4) with corrosion-resistant finish.

### Integral Alarm

This low-cost alarm is available as an accessory for use with the Armored Flow, Metal Tube, PVC, and TFE USF/W&T flowmeters. The switch mounts inside the meter's indicator and enables remote monitoring of either high or low set points. The switch is housed in the indicator, which is in a NEMA 4 enclosure. Write for TI 570.175 for further details on this switch.



### Shipping Weights (lbs)

Tube Size	½"	1"	1½"	2"
Indication or Transmitting	10*	15*	24*	40*
* Add 3 lbs. for G.P. Flow Switch, 4 lbs. for Haz. Loc. Flow Switch.				

### Dimensions

For complete dimensions, please refer to the following catalogs: CN 551.006 UA, CN 551.008, CN 551.010, CN 551.012, and CN 551.013.

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**SELECTION PROCEDURE**

Determine the capacity range, temperature and pressure capability, materials of

construction, and options required for each meter. (See Table A for pressure and temperature limits.)

**TABLE A - ORDERING NUMBERS FOR METER CAPACITY FOR WATER & AIR**

Pipe conn. NPT	CAPACITY					OPERATING LIMITS*			CAPACITY CODES	
	Water GPM	Press Drop IN. H <sub>2</sub> O	Air SCFM AT STP	Press Drop IN. H <sub>2</sub> O	Viscosity Ceiling CSS	Temperature		Press.	Water	Air
						Water	Air	Water & Air		
½"	0.5	23	1.2	9	3	Buna N O-Rings 250°	Buna N O-Rings 200°	1500 psi	02	01
	1.0	24	2.4	10	3				04	03
	2.4	30	6.5	13	4				06	05
	5.0	46	10.0	17	5				08	07
1"	--	--	12	9	--	Viton O-Rings 400°	Viton O-Rings 200°	1500 psi	--	09
	12	35	24	11	10				12	11
	24	52	40	16	10				14	13
1½"	35	54	--	--	21	EPR O-Rings 200°	EPR O-Rings 200°	1200 psi	16	--
	75	85	80	15	18				18	17
2"	130	100	150	18	65	O-Rings 200°	O-Rings 200°	1200 psi	22	21

*NOTE: For fluids with Specific Gravities other than 1.0 or viscosity other than the ceiling listed, consult your local USF/W&T distributor.*

*\* Warning Pressure and Temperature limits must not be exceeded under any circumstances.*

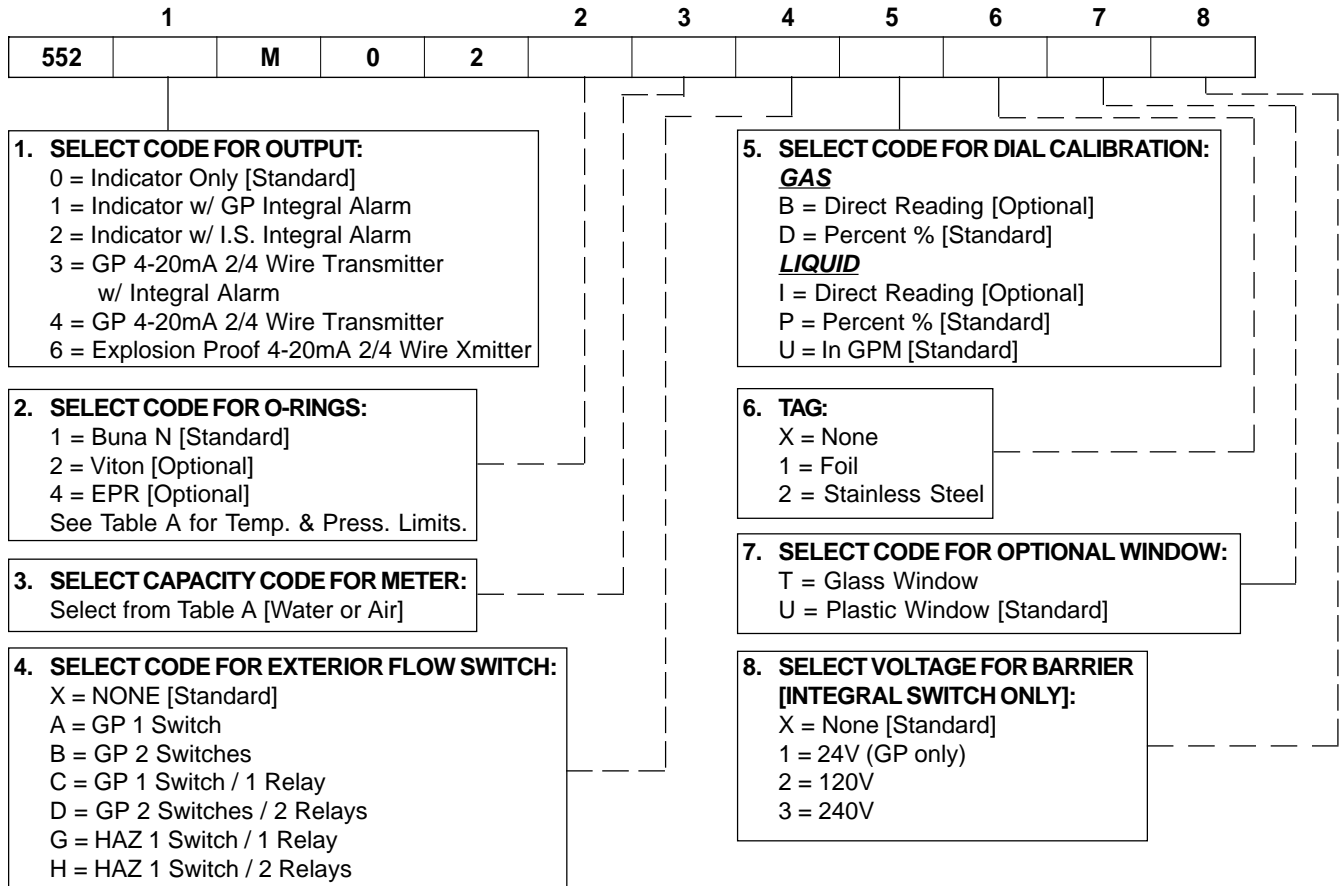
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**ORDERING PROCEDURE**

Example: To order a 1/2" Armored Flowmeter with indication and plastic

window, Viton O-rings, a capacity of 6.5 scfm air, standard % calibration, and no alarm, specify: **5520M02205XDXUX**



NOTE: Your order number should consist of 15 characters



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