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A Siemens Business

**WALLACE & TIERNAN**

**VAREA-METER®**

**FLOW MEASUREMENT**

# PRODUCT OVERVIEW

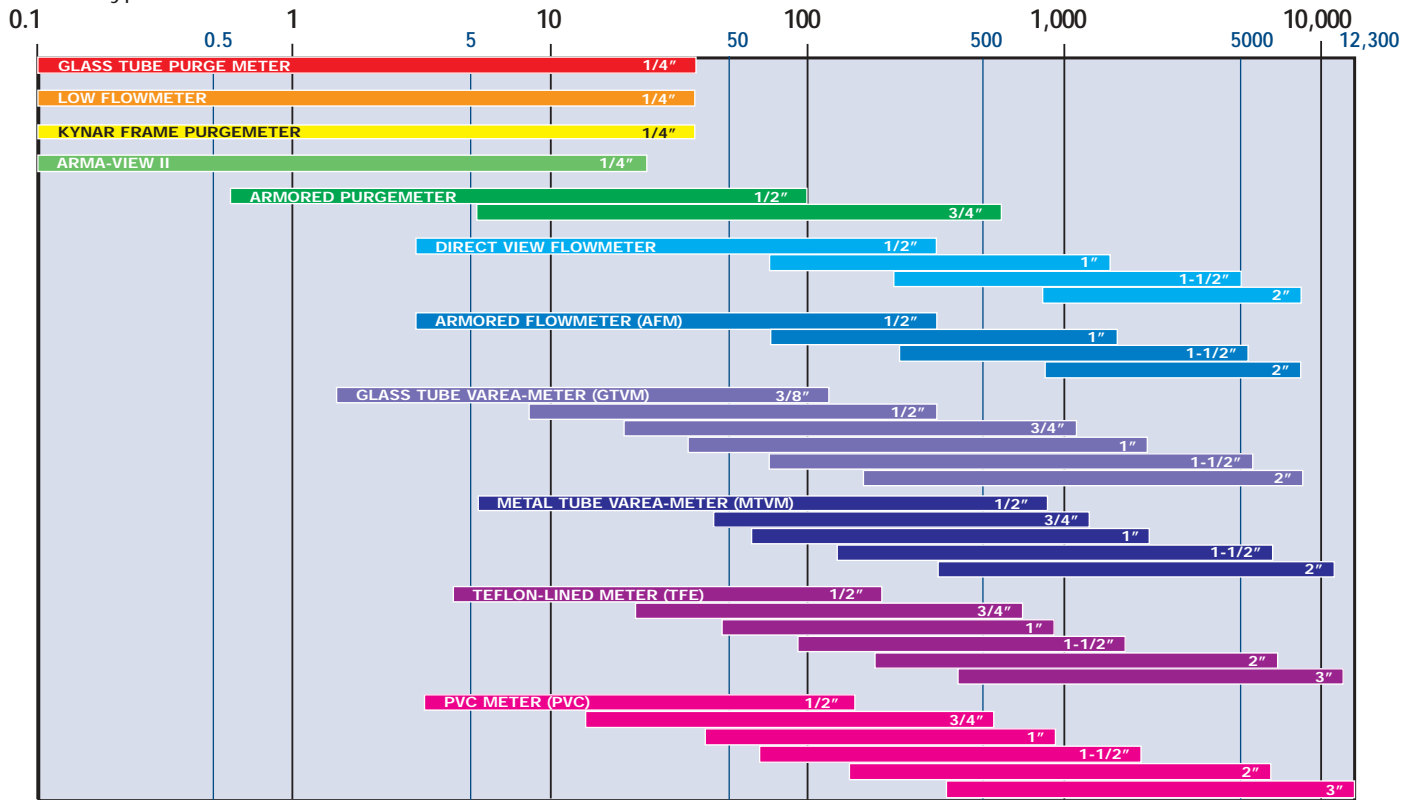
WALLACE & TIERNAN VAREA-METERS			Accuracy ±Full Scale (10:1 Range)	Connections	Maximum Operating Pressure	Maximum Operating Temperature	Page Number
<b>GLASS-TUBE PURGE METERS</b>		Stainless-Frame General purpose measurement of low volume flows.	10%	Horizontal 1/4 in. FNPT	250 psi	250°F	4
		Kynar®-Frame Measures low volume flows in corrosive atmospheres.	10%	Horizontal 1/4 in. FNPT	150 psi	200°F	4
<b>LOW FLOW METERS</b>		Stainless-Frame For accurate measurement of low and very low flows.	2%	Horizontal 1/4 in. FNPT	250 psi	250°F	4
<b>ARMORED PURGE METERS</b>		Arma-View® II Measures extra low volume flows of aggressive fluids at high pressure.	5%	Horizontal 1/4 in. FNPT	1500 psi	400°F	5
		Metal-Body Measures low volume flows of aggressive fluids at high pressure and temperatures.	10%	Horizontal 1/2, 3/4, in. FNPT	1500 psi	800°F	5
<b>DIRECT-VIEW FLOWMETERS</b>		Glass-Tube Type For flow measurements of fluids in applications where a glass tube is acceptable.	5%	Vertical 1/2, 1, 1 1/2, 2 in. FNPT	200 psi	200°F	6
<b>ARMORED FLOWMETERS</b>		Stainless-Body Low cost, all metal meter for flow indication and flow switching of aggressive fluids at higher pressures and temperatures.	5%	Vertical 1/2, 1, 1 1/2, 2 in. FNPT	1500 psi	200°F air 400°F water	7
<b>GLASS TUBE VAREA-METERS</b>		Stainless-Frame For accurate flow measurements of fluids in applications where a glass tube is acceptable.	2% 1% (OPT)	Vert. or Horiz. 1/2, 1, 1 1/2, 2 in. FNPT or Flange	300 psi	200°F	8
<b>STRAIGHT- THROUGH VAREA-METERS</b>		Metal-Tube Type Meters aggressive fluids accurately at high pressures and temperatures.	2% 1% (OPT)	Vertical 1/2, 1, 1 1/2, 2 in. 150, 300, or 600 lb. Flange	1200 psi	600°F	9
		TFE-Lined Metal Tube Combines chemical resistance of TFE with stainless tubes and flanges for measuring aggressive fluids at high pressures and temperatures.	2%	Vertical 1/2, 1, 1 1/2, 2, 3 in. 150 lb. Flange	275psi	300°F	10
		PVC-Tube Type Measures aggressive chemicals at low to moderate pressures and temperatures	2%	Vertical 1/2, 1, 1 1/2, 2, 3 in. 150 lb. Flange	200 psi	150°F	10
<b>BY-PASS VAREA-METERS</b>		Glass-Tube Type Measures flow through any large- diameter pipeline which can be fitted with a differential-producing device.	4%	Horizontal 1/2, 3/4, 1 in. FNPT or Flange	300 psi	200°F	11
		Metal-Tube Type Measures flow through any large- diameter pipeline which can be fitted with a differential-producing device.	4%	Vertical 1 in. 150, 300 lb. Flang	1200 psi	600°F	11

NOTE: Do not use glass-tube Varea-Meters, flowmeters or purge meters for fluids which are toxic, hazardous, or which attack glass. Use metal-tube meters for such applications. Write for catalog number 500.001, which is a detailed listing of meter compatibility with a wide range of fluids.

# CAPACITY CAPABILITIES

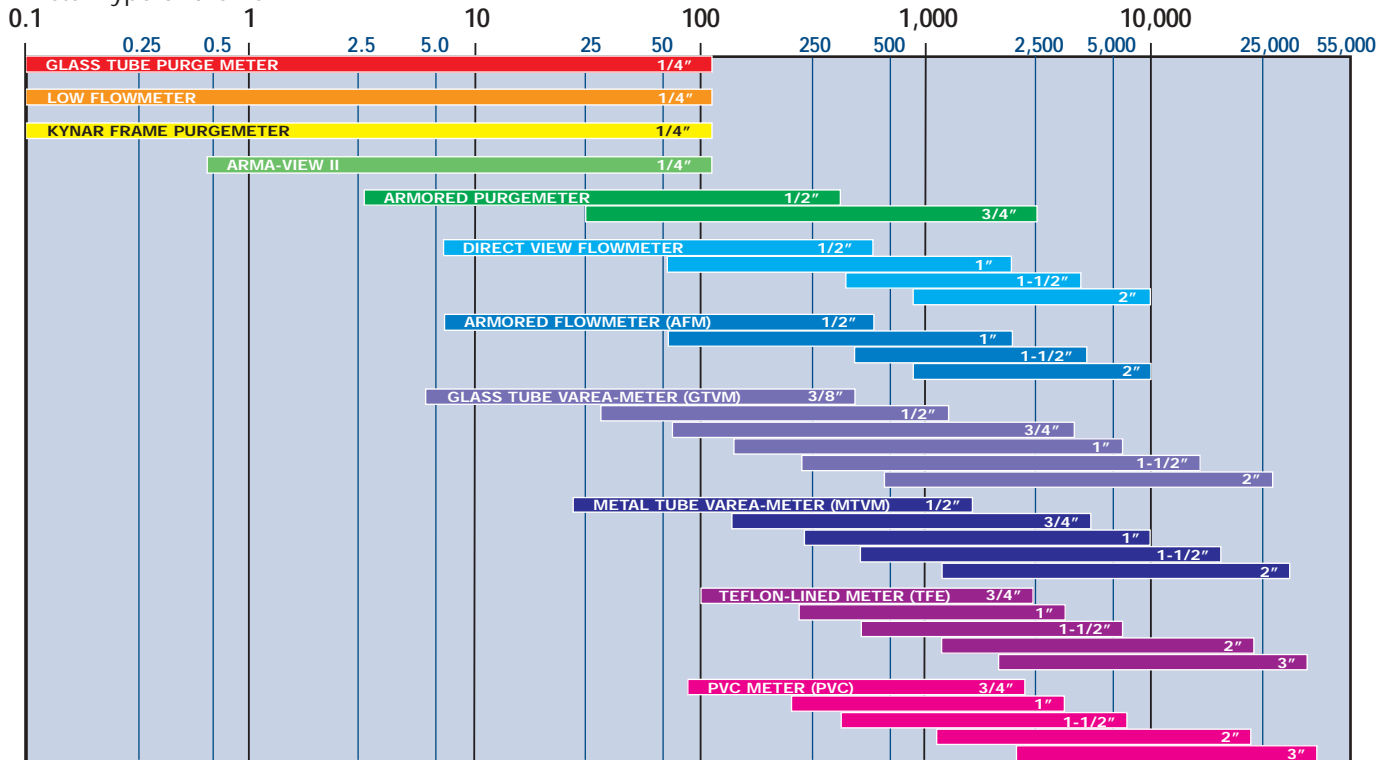
## LIQUID CAPACITY CHART - GPH CAPACITIES

Meter Type and Size



## GAS CAPACITY CHART - SCFH CAPACITIES

Meter Type and Size



# GLASS-TUBE PURGE METERS AND LOW-FLOW METERS

Wallace & Tiernan glass-tube purge and low-flow meters are available with stainless steel, or Kynar® (purge meter only) frames. Standard calibrations are in ccm, gph, sccm, scfh, and percent. Calibration in other units and for liquid viscosities other than one centistoke is available.

All meters feature an optional built-in flow-control valve, horizontal inlet and outlet connections, and an external threaded tube-locking plug for easy tube removal and integral backcheck. (See pages 2 and 3 for specifications.)

## STAINLESS FRAME TYPE



These glass-tube meters have a rugged stainless steel frame, available in 1 1/2-inch and 3-inch scale lengths. Uses a high-stability float for accurate, repeatable performance. Meters can be supplied with flow controllers and

plastic bezels for flush mounting (not available with 1 1/2-inch scale purgometer.) Write for Catalog File 510.100.

## KYNAR® FRAME TYPE



These glass-tube purgometers have a one-piece molded Kynar® frame and end fittings for long life in highly corrosive atmospheres. An optional

Kynar® flow control valve is available. Scales are 3 inches long. Write for Catalog File 510.105.

## LOW FLOW METERS



Low flow meters are available with stainless steel frame type construction. They have 6-inch (150 mm) scales and provide outstanding 2% f.s. accuracy over a 10:1 range. An optional flow

controller can be supplied to maintain a constant flow rate. Write for Catalog File 510.150 (stainless steel frame).

# ARMORED PURGE METERS

## ARMA-VIEW® II PURGE METER



### FEATURES

#### EASY READABILITY

State-of-the-art technology in a variable-area design provides easy visual readout.

#### TRUE MAGNETIC COUPLING

A powerful magnet encapsulated in the float forms a linkage with the follower magnets of the indicating mechanism. The indicator finds correct position in relationship to the float. Intelligent coupling between the float and follower prevent separation if sudden flow surges occur. Variations in flow are indicated on the calibrated scale.

#### VERSATILITY AND CONVENIENCE

Inlet and outlet connections are horizontal. An optional inlet control valve provides smooth manual control of flow rate. The characterized valve stem assures dependable control.

#### RUGGED CONSTRUCTION

The meter body is 316L stainless steel unibody construction. Except for O-rings and stop spring, all wetted parts, tube, float, and valve stem are 316L stainless steel. Standard O-rings are Viton®. Buna-N, EPR, TFE, or Kalrez® are also available.

#### TRANSMITTER AVAILABLE

An optional FM-approved hazardous location 4-20 mA transmitter provides remote indication of flow rate.

#### VERSATILE FLOW CONTROLLER

An optional purge type flow controller keeps flow constant regardless of pressure variations. It is offered in 316 stainless steel constructions, for inlet and outlet configurations. It can be assembled to the meter or as a standalone in the process line. Write for catalog file 510.350.

## ARMORED PURGE METER



This armored purge meter operates over a 10:1 range. Scales are 1 1/4 inches long. The 1/2-inch meter has a gph or scfh scale; the 3/4-inch meter, a gpm or scfm scale. Each has a percent scale also. Construction of meter body is 316 stainless steel with Buna-N, TFE, and 321 stainless trim to give maximum corrosion resistance. Write for Catalog File 510.200

#### HIGH TEMPERATURE AND PRESSURE OPERATION

Heavy-duty stainless steel construction assures proper operation to 1500 psi and 800°F. At no time is the glass scale tube exposed to the process fluid. A stainless steel sheath encloses the O-ring sealed glass tube.

#### EASY MAINTENANCE

An O-ring at the top of the metering plug acts as an anti-backflow device, eliminating the need for check valves. A bottom port makes cleaning easy.

#### FLOW SWITCH AVAILABLE

This optional magnetically coupled switch gives reliable high and/or low switching. It is easily set to open or close on increasing or decreasing flow. Available in a general or a UL listed hazardous-location arrangement. See page 12 for additional information.

## DIRECT-VIEW FLOWMETER



This is an inexpensive, 5% accuracy flowmeter for liquids or gases. It gives accurate and repeatable indication; an optional flow switch gives reliable high and/or low flow rate switching. Meter sizes are 1/2, 1, 1-1/2, and 2 inches with capacities to 130 gpm water and 150 scfm air @ STP. Operating range is 10:1. (See page 2 for pressure and temperature limits.) Scales are 2 to 4 inches long and calibrated in gpm and percent for liquids, percent for gases, or special calibrations. Scales are fused on the tubes or detached and plotted on aluminum. The cast aluminum frame offers 316 stainless or brass end fittings. Front and rear tube shields of strong, clear polycarbonate are standard. All other wetted parts are: borosilicate glass; Buna-N, Viton® or EPR O-rings; stainless steel, brass, beryllium copper or polypropylene float materials. Write for Catalog File 550.100.

### FLOW SWITCH AVAILABLE

This optional, magnetically coupled switch gives reliable high and/or low flow switching. It is easily set to open or close on increasing or decreasing flow. It is compact and easily mounted on the meter. Available in a general purpose or a UL listed hazardous-location arrangement. See page 12 for additional information.

### HIGHER CAPACITIES

Size for size, this meter gives higher capacities; the tapered-float design passes volumes of fluids often double that of other designs.

### CONVENIENT TO USE

The tube and float can be removed without tools and without disturbing connections. The meter is designed for easy flush or surface panel mounting.

# ARMORED FLOWMETER



This inexpensive, 5% accuracy flowmeter gives reliable flow indication of aggressive fluids at high temperatures and pressures. (See page 2 for pressure and temperature limits.) Available options include a 4 - 20 mA output flow signal and high/low alarm switch. Meter sizes (pipe connections) are 1/2, 1, 1-1/2, and 2 inches with capacities to 130 gpm water and 150 scfm air at STP. Operating range is 10:1. Mounting is vertical in the line with NPT female connections.

The magnetically coupled indicating unit has a 6-inch scale calibrated 0 to 100%. A reversible scale with gpm water on one side and percent of maximum flow on the other is standard. Special scale calibrations are optional. All wetted parts are stainless steel (except polypropylene float in gas service); Buna-N, Viton or EPR O-rings. The float has an encapsulated alnico magnet. Write for catalog file 550.200.

## TRANSMITTER AVAILABLE

An optional FM-approved hazardous location 4-20 mA transmitter provides remote indication of flow rate.

## FLOW SWITCH AVAILABLE

This optional magnetically coupled switch gives reliable high and/or low switching. It is easily set to open or close on increasing or decreasing flow. Available in a general purpose or a UL listed hazardous-location arrangement. See page 12 for additional information.

## HIGHER CAPACITIES

Size for size, this meter gives higher capacities; the tapered float design passes volumes of fluids often double that of other designs.

## RELIABLE & REPEATABLE

Almost frictionless rotation of the indicator or flow switch magnets and their polarity relationship with the float magnet make for reliable and repeatable indication transmission and flow switching.

## GLASS-TUBE

### VAREA-METERS®



These rotameters have a wide range of capacities and tube sizes. Metering accuracy is 2% of full scale (1% with custom calibration) over a 10:1 range (see page 2 for pressure and temperature limits.) Beaded-guide tubes are available with 5- or 10-inch scales. End fittings for vertical and horizontal connections come in both threaded and flanged types. Choice of such wetted parts materials as brass, carbon steel, 316 stainless, PVC, TFE, Kynar®, Buna-N, Viton®, and EPR give a good balance between cost and maximum corrosion resistance. Write for Catalog File 520.100.

#### ONE-PIECE FRAME

Varea-Meter frames are welded, heavy-gauge 302 stainless steel. This one-piece, deep-formed frame protects the tube from pipe strains, makes for design simplicity, minimizes parts, easy assembly. Front and rear tube shields are standard.

#### POSITIVE, CONVENIENT TUBE SEALING

An external clamp exerts a firm force on a tube retainer. There is no packing, no spring in the flow stream. Tubes are held securely, yet are easily removed. Tubes and retainers are sealed by same-size O-rings.

#### FLOAT DESIGN INCREASES CAPACITY

Varea-Meter floats have their metering discs between the upper and lower bodies. The short lower body results in less flow restriction and less pressure drop than with conventional floats. Along with high-taper tubes, these floats give higher capacities for a given tube size. Thus, it is often possible to select a smaller Varea-Meter for less cost.

#### FLOW SWITCH FOR GLASS-TUBE VAREA-METERS

This heavy-duty unit is designed for use with any 5-inch-scale Varea-Meter. Its rugged design and construction mean reliable operation, yet it is sensitive enough for critical applications. It consists of one to four reed switches, each encapsulated with a biasing magnet. Switches are activated by float position. The switches are rated at 50-volt amperes. For higher ratings, one to four double-pole, double-throw relays each handle 10 amperes at 115 volts are available. Repeatability is 0.031 inch. The switches are easy to remove and the relays are plug-in types. Components are in a heavy aluminum case with a vapor-tight cover. Write for Catalog File 520.100.

# STRAIGHT-THROUGH METAL TUBE VAREA-METER®



Available in a variety of tube sizes (1/2, 3/4, 1, 1-1/2 and 2 inches) and flange facings and ratings, these metal-tube rotameters give reliable flow measurement over a 10:1 range for aggressive fluids at high temperatures and pressures. (See page 2 for pressure and temperature limits.) Metering accuracy is 2% of full scale (1% with custom calibration). Available options include a 4-20 mA output flow signal and high/low alarm switch. Flanges available have ANSI 150-, 300-, and 600-lb. ratings. Flanges are raised, flat, large female, tongue-and groove, or ring-joint face. The standard tube-and-float material is 316 stainless steel. A Hastelloy C float is also available. The magnetic indicator has a 6-inch scale. Percent of maximum flow is the standard calibration; gpm water, scfm air, or special graduations are optional. Write for Catalog File 520.205.

## NON-FOULING FLOAT

The extra-long float magnet has reduced flux density and is located above the metering disk. This discourages accumulation of magnetic particles, especially on the disk edge where they can cause errors in indication and calibration drift.

## NO FLOAT EXTENSIONS

When the float is at rest, nothing projects beyond the flanges. Spool pieces are not required for installation,

eliminating a frequent cause of damage when removing meters from a line.

## GAS MEASUREMENT TO 0 PSIG

A unique dry snubber is standard on this Varea-Meter used for gas service. It stabilizes the float, gives reliable indication down to atmospheric pressure. It eliminates dashpots, offset piping, and horizontal connections.

## RELIABLE MAGNETIC COUPLING

Almost frictionless rotation of the instrument magnet and its powerful bond with the float magnet give a dependable magnetic coupling. A metal shield shunts stray magnetic fields around the coupling.

## TRANSMITTER AVAILABLE

An optional FM-approved hazardous location 4-20 mA transmitter provides remote indication of flow rate.

## FLOW SWITCH AVAILABLE

This optional, magnetically coupled switch gives reliable high and/or low flow switching. It is easily set to open or close on increasing or decreasing flow. It is compact and easily mounted on the meter. Available in a general purpose or a UL listed hazardous-location arrangement. See page 12 for additional information.

# STRAIGHT-THROUGH ROTAMETERS

for very aggressive chemicals

## PVC-TUBE VAREA-METER®



For moderate temperature and pressure applications — the PVC-tube Varea-Meter provides excellent service at a low initial cost. It mounts vertically in the line and mates with 150-lb ANSI flat-face flanges. The flow rate indicator has a 6-inch percent scale; its mechanism is protected by a gasketed aluminum housing (NEMA 4); gpm, scfm, and other calibrations optional. Write for Catalog File 520.215.

### LONG LIFE

The Type 1, Grade 1 PVC metering tube has long service life even with aggressive chemicals such as hydrochloric acid and hypochlorite solution.

### TRANSMITTER AVAILABLE

An optional FM-approved hazardous location 4-20 mA transmitter is available to provide remote indication of flow rate.

### FLOW SWITCH AVAILABLE

This optional, magnetically coupled switch gives reliable high and/or low flow switching. It is easily set to open or close on increasing or decreasing flow. It is compact and easily mounted on the meter. Available in a general purpose or a UL listed hazardous-location arrangement. See page 12 for additional information.

## TFE-LINED VAREA-METER®



This flow meter is designed to give long service with such chemicals as nitric or sulfuric acid, boiling caustic, or wet chlorine gas at high temperatures and/or pressures. (See page 2 for limits.)

Mounting is vertical with 150-lb. flanges and TFE flange gaskets. Flow rate indicator, transmitter, and flow switch are the same as for the PVC-tube Meter. Write for Catalog File 520.215.

### HANDLES AGGRESSIVE FLUIDS

For durability and reliability, the thermal and chemical resistant properties of TFE are combined with the pressure-containing properties of flanged, stainless steel meter bodies. This is not an adaptation of a standard metal-tube rotameter, it was specially designed as

a lined meter. All wetted parts are TFE with a choice of Tantalum, Hastelloy C, or Kynar® metering disks.

### TRANSMITTER AVAILABLE

An optional FM-approved hazardous location 4-20 mA transmitter provides remote indication of flow rate.

### FLOW SWITCH AVAILABLE

This optional, magnetically coupled switch gives reliable high and/or low flow switching. It is easily set to open or close on increasing or decreasing flow. It is compact and easily mounted on the meter. Available in a general purpose or a UL listed hazardous-location arrangement. See page 12 for additional information.

# BY-PASS VAREA-METERS®

## GLASS-TUBE TYPE



For indication, a 1/2-inch Glass Tube Varea-Meter is available with 5 or 10-inch scales, threaded or flanged horizontal connections, and in a variety of materials. For indication and an alarm extension, a 3/4 inch meter is available with 5-inch scale, a 1-inch threaded-flange inlet and a 3/4-inch threaded outlet. Write for Catalog File 520.300.

## EASY INSTALLATION

By-pass Varea-Meters are shipped with the orifice in place, ready to install. No mercury or bellows-type manometer required. Checking or snubbing devices can be omitted as over-ranging is harmless.

## METAL-TUBE TYPE



This straight-through meter is available in a 1/2-inch tube size with 316 stainless wetted parts. Flanges can be carbon steel, 316 stainless. Flange limits are 720 psi and 600 F. Can be supplied with a magnetic indicator, with optional 4-20 mA flow-rate

transmitter, and optional flow switch. When the metal tube meter's float is at rest, float extensions do not project beyond the flanges. Installation is simplified. No spool pieces required. Write for Catalog File 520.300.

# FLOW SWITCHES AND FLOW CONTROLLERS

## FLOW SWITCH FOR STRAIGHT-THROUGH METERS, FLOWMETERS, AND ARMORED PURGE METERS



This compact, inexpensive option gives reliable high and/or low flow switching. It contains a powerful rotating magnet which 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. Switches can be set to open or close on increasing or decreasing flow. The flow switch is available as Series 5600, a general purpose unit in a NEMA 4X enclosure and Series 5500, UL listed for hazardous locations.

## FLOW CONTROLLERS



There are three types of flow controllers: the General Purpose Flow Controller, the General Purpose Purge Type Controller and the Purge Flow Controller. Each is designed to maintain a constant set flow rate regardless of variations in the line pressure. All are suitable for gas and liquid service. The general purpose type is ideally suited for Wallace & Tiernan Armored Purge Meters, Armored Flow Meters, Direct-View

Flow Meters, glass-tube Varea-meters, and all Straight-through Varea-Meters and as a stand-alone controller with other meter types.

The purge-type flow controller is engineered specifically for use with Wallace & Tiernan Glass-tube Purge Meters and Low-flow Meters. Inlet and outlet connections match up for easy adaptation. For more information, write for Catalog file 570.100.



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