

Smith Meter™/Sening™ Truck Meter Packages are versatile because of their modular design and arrangement flexibility. Depending on the applications (heating fuel delivery / pressure system; service station delivery / gravity system) and their specific requirements, truck meter packages are made by combining various components. These consist of a meter, air eliminator / strainer, valve, electronic counter and printer.

The primary functions of metering product and registering volume are performed by a Rotary Vane Positive Displacement Meter and Electronic Counter. Other modular features can be easily added as simple bolt on items to meet customer requirements.

The air elimination feature will sense slugs of air approaching the meter and vent them through a vent line attached to the air eliminator. This will keep the meter packed with fluid, preventing erroneous measurement. A strainer is an integral part of the air eliminator which will remove contaminants from the line.

The valve that starts and stops flow is incorporated with the electronic counter/preset to automatically deliver and shut off the delivered batch.

A ticket printer will provide receipt of the registered quantity delivered.

Features

- Transmitter built into the cover of the meter
- A wide range of products from gasoline to kerosene to fuel oils can be metered.
- Compact, versatile design can be readily fit into nearly all installations.
- Ability to remote mount the electronics in the cab of a truck.
- Low pressure drop meter results in low meter slippage and thus superior meter accuracy.
- Responsive air release and air check prevents metering of air on split compartment deliveries.
- Simple, rugged electronics, easily sealed to prevent unauthorized tampering.
- Weatherproof (A3) or Explosion proof (A1) construction.
- Flow direction detection.
- High-capacity, low pressure drop strainer built into the air eliminator with easy accessibility for cleaning.



T-11J Truck Meter

Individual Component Descriptions

The Smith/Sening positive displacement truck meters are rotary vane single-case, angle-type meters. A single-case outer housing forms part of the measuring chamber. The angle-type meter has the inlet 90 degrees from the outlet. Blades that function as part of an internal rotor extends and retracts from the rotor as it turns about a fixed cam. The extended blades isolate and measure exact amounts of volume of product passing through the meter. Neither blades nor rotor contact the stationary walls of the measuring chamber, resulting in low pressure drop and long life.

Electronic Counter

The MultiFlow has been developed according to the latest state of the art technology, incorporating many years of experience in the application of electronic metering.

Due to standardization of electronic metering devices within the United States and the European Union development of the MultiFlow has taken place strictly to the latest regulations for the approval of meters for Weights and Measures regulated applications around the world. This guarantees that the MultiFlow will fulfill the present

and also future legal requirements for meters for applications subject to Weights and Measures inspection.

The MultiFlow is available in two versions the A3 version (heating oil, diesel) or in the A1 version (gasoline).

The A3 version is available as a complete electronics control and operating device package in one housing. The supply voltage, printer connection and the sensors are connected directly in the device on plugin connectors secured with screws. The connectors can be simply pulled off for test purposes and a test adapter can be plugged into the terminal strip. All device functions can be checked easily.

The A1 version of the MultiFlow control electronics is mounted in a flameproof enclosure which is supplied with voltage in an intrinsically safe manner from the operating device. The connection of the non-intrinsically safe inputs and outputs is made in a terminal box with increased safety features. Due to the pull-spring terminal technique, there is no need to tighten wire ends in the terminals. Loose terminal connections are a thing of the past. Furthermore, installation is substantially simplified due to the improved access to the terminals.

Additional Features of the MultiFlow Include:

- The electronic Weights and Measures seal (soft seal). In order to change parameters which are subject to Weights and Measures protection, it is not necessary to open the MultiFlow housing to change a Weights and Measures switch or plug a jumper. Recalibration is carried out simply by breaking the electronic Weights and Measures seal. Once the calibration parameters have been changed, the electronic Weights and Measures seal is easily reset.
- The printer interface is set to the desired type (EIA-232, EIA-422 or EIA-485) of connection by software.
- All outputs are electronically protected against short circuit. The affected output becomes operational again once the short circuit is removed. It is not necessary to change any fuses.
- An economical data interface from the vehicle to the office is provided by the use of an industry compatible chip-card reader. The reading device conforms to IP65 class of protection and is implemented in the intrinsically safe type of explosion protection. The reader can therefore also be used in explosion proof areas without special protective measures.
- The MultiFlow has four intrinsically safe inputs for the connection of switches for use in explosion proof areas without special protective measures..
- The MultiFlow communicates to external devices via the CANbus system which has become standard on motor vehicles.
- The printer can be connected without a special interface
- Compact design which saves installation costs and weight.
- Program can be changed by simply transferring from a Personal Computer to the MultiFlow via the printer interface.

Air Eliminator/Strainer (2" T2A, 3" T3A, 4" T4A)

The air eliminator, located upstream of the meter, allows air to collect and then discharge it to provide accurate liquid registration. As the air collects, an internal float drops, signaling an air vent to open and a butterfly or back-pressure valve to reduce or stop the flow of liquid during the venting. The T2A air eliminator utilizes (depending upon the application) either a separate back-pressure valve or one which is integral with the faucet. For the T3A and T4A, linkage connects the float and a butterfly in the eliminator outlet. As the air is driven out of the vessel, the float rises with the liquid, closing the vent and increasing the flow back to its normal rate.

A strainer is part of the air eliminator assembly. A 40 mesh screened basket removes particles in the product. The strainer basket is removable for cleaning.

XR2 – Back Pressure Valve

A separate back pressure valve can be used with the T-11 meter/T2A air eliminator combination, or one which is an integral part of the MP2S and SP2S faucets. In either case, it slows the product flow to allow the air eliminator to release trapped air. The piston in this valve is operated by the air present in the T2A eliminator. Once the air has been vented, the piston allows the flow through the meter to return to normal. Only used on pressure systems.

2 ½" Air Sense Back Pressure Valve

This optional back pressure valve can be used to enhance air elimination efficiency with T20/T3A pressure systems. Only used on pressure systems.

Faucets/Valves

Faucets/Valves are used to start and stop the delivery of product. Manually operated faucets require the handle to be moved to start and stop the flow of product. Electric or Pneumatic Actuated set stop valves that are controlled by the Electronic Counter are started by an electronic signal(s) from the counter to the solenoid valve(s) which start and stop the flow of product through the valve. The shut down procedure is either a single stage or a two stage shut down depending on how many solenoids are mounted on the valve. If only a single solenoid valve is used it is a single stage shutdown, if the valve has two solenoids it would be a two stage shutdown where the valve goes into a low flow on the signal from the electronic counter and then on the second signal would shut the valve down.



**T-11J Meter with T-2A Air Eliminator, Set Stop Valve
Electronic Preset Counter and Printer not shown
Model T-11J-ZE**

General Operating Specifications

Maximum Viscosity: 50 mPAs (250 SSU)
 Temperature: -20° F to 150° F (-29° C to 65° C)
 Maximum Flow Rate: See tables for flow rates
 Maximum Pressure:
 T-11 and T-20: 150 PSIG (1034 kPa)
 T-40: 75 PSIG (517 kPa)

Typical Flow Range and Linearity for Various Products

T11 Meter with Standard Clearances				
Linearity	Product and Viscosity			Units (mPas)
	Gasoline 0.7	Kerosene/Diesel 2.0	Fuel Oil >10	
+/-0.15%	20-100	10-100	5-100	(GPM)
	75-375	38-375	9-375	(LPM)
+/-0.25%	15-100	7-100	3-100	(GPM)
	57-375	26-375	11-375	(LPM)
T11 Meter with Low Flow Clearances				
+/-0.15%	10-100	5-100	2-100	(GPM)
	38-375	19-375	8-375	(LPM)
+/-0.25%	8-100	4-100	1-100	(GPM)
	30-375	15-375	4-375	(LPM)

T20 Meter with Standard Clearances				
Linearity	Product and Viscosity			Units (mPas)
	Gasoline 0.7	Kerosene/Diesel 2.0	Fuel Oil >10	
+/-0.15%	40-200	20-200	10-200	(GPM)
	151-757	76-757	38-757	(LPM)
+/-0.25%	30-200	15-200	6-200	(GPM)
	114-757	57-757	23-757	(LPM)
T20 Meter with Low Flow Clearances				
+/-0.15%	20-200	10-200	4-200	(GPM)
	76-757	38-757	15-757	(LPM)
+/-0.25%	15-200	8-200	2-200	(GPM)
	57-757	30-757	8-757	(LPM)

T40 Meter with Standard Clearances				
Linearity	Product and Viscosity			Units (mPas)
	Gasoline 0.7	Kerosene/Diesel 2.0	Fuel Oil >10	
+/-0.15%	80-400	40-400	20-400	(GPM)
	303-1514	151-1514	76-1514	(LPM)
+/-0.25%	60-400	28-400	12-400	(GPM)
	227-1514	106-1514	45-1514	(LPM)
T40 Meter with Low Flow Clearances				
+/-0.15%	40-400	20-400	8-400	(GPM)
	151-1514	76-1514	30-1514	(LPM)
+/-0.25%	32-400	16-400	4-400	(GPM)
	121-1514	60-1514	15-1514	(LPM)

Materials of Construction

Model	Housing	Internals	Seals
T11-J (2"), T20-J(3") Meter	Cast Iron	Iron, Steel, Stainless Steel, Aluminum, Bronze	Buna*, Viton
T-40J(4") Meter	Cast Iron	Iron, Steel, Stainless Steel, Aluminum	Buna*, Viton
T2A, T3A & T4A Air Eliminator/Strainer (40 mesh)	Aluminum with Cast	Steel, Stainless Steel, Iron Flange	Buna N*, Viton Aluminum
XR-2 & 21/2" Air Back Pressure Valve	Cast Iron	Cast Iron, Steel, Stainless Steel, Aluminum	Viton, Buna
2" Faucets	Cast Iron	Steel, Cast Iron, Aluminum	Buna N*, Viton
3" & 4" Faucets	Aluminum	Steel, Iron, Aluminum	Buna N*, Viton
2", 3" & 4" Flow Control Valve	Cast Steel	Bronze, Stainless Steel, Carbon Steel, Ductile Iron	LS Buna N*, Viton

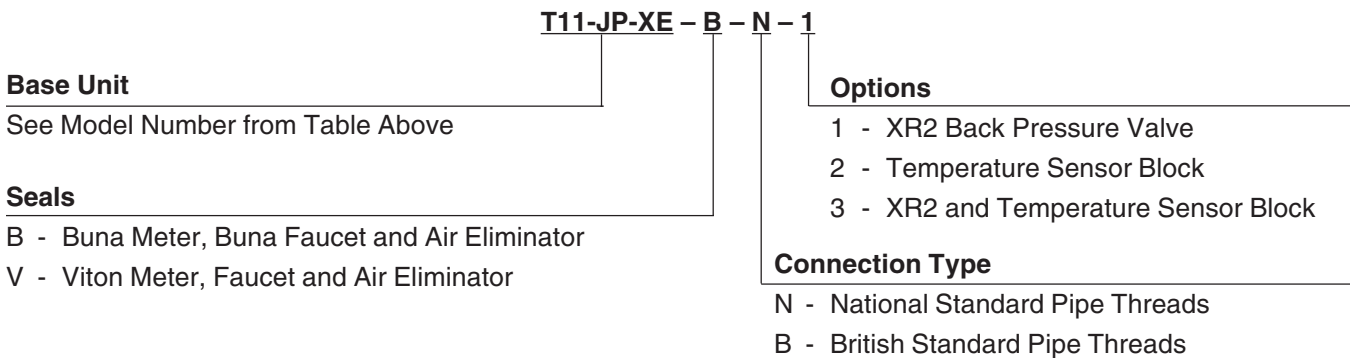
*Standard

T11-J Meter Package Selection Guide

			Package Configuration	Model
Pressure System	No Faucet	MultiFlow & TP	T11-J/T2A	T11-JP-XE
		MultiFlow	T11-J/T2A	T11-JP-RE
	Manually Operated Faucet	MultiFlow & TP	T11-J/T2A-MP2S	T11-JP-VE
		MultiFlow	T11-J/T2A-MP2S	T11-JP-PE
	Set Stop Valve Electric	MultiFlow & TP	T11-J/T2A-ESSV	T11-JP-ZE
		MultiFlow	T11-J/T2A-ESSV	T11-JP-TE
	Set Stop Faucet Pneumatic	MultiFlow & TP	T11-J/T2A-PSSV	T11-JP-ZEP
		MultiFlow	T11-J/T2A-PSSV	T11-JP-TEP
Gravity System	No Faucet	MultiFlow & TP	T-11-J/T3A	T11-JG-XE
		MultiFlow	T-11-J/T3A	T11-JG-RE
	Manually Operated Faucet	MultiFlow & TP	T11-J/T3A/MPG2	T11-JG-VE
		MultiFlow	T11-J/T3A/MPG2	T11-JG-PE
	Set Stop Valve Electric	MultiFlow & TP	T11-J/T3A/ESSV	T11-JG-ZE
		MultiFlow	T11-J/T3A/ESSV	T11-JG-TE
	Set Stop Valve Pneumatic	MultiFlow & TP	T11-J/T3A/PSSV	T11-JG-ZEP
		MultiFlow	T11-J/T3A/PSSV	T11-JG-TEP

TP = Ticket Printer

Modeling Code T11-J



T20-J Meter Package Selection Guide

			Package Configuration	Model
Pressure or Gravity System	No Faucet	MultiFlow & TP	T20-J/T3A	T20-J-XE
		MultiFlow	T20-J/T3A	T20-J-RE
	Manually Operated Faucet	MultiFlow & TP	T20-J/T3A-MPG3	T20-J-VE
		MultiFlow	T20-J/T3A-MPG3	T20-J-PE
	Set Stop Valve Electric	MultiFlow & TP	T20-J/T3A-ESSV	T20-J-ZE
		MultiFlow	T20-J/T3A-ESSV	T20-J-TE
	Set Stop Faucet Pneumatic	MultiFlow & TP	T20-J/T3A-PSSV	T20-J-ZEP
		MultiFlow	T20-J/T3A-PSSV	T20-J-TEP

TP = Ticket Printer

Modeling Code T20-J

T20-J-XE - V - N - 1

Base Unit

See Model Number from Table Above

Seals

B - Buna Meter, Buna Faucet and Air Eliminator

V - Viton Meter, Faucet and Air Eliminator

Options

- 1 - 2-1/2 Back Pressure Valve
- 2 - Temperature Sensor Block
- 3 - 2-1/2 Back Pressure Valve and Temperature Sensor Block

Connection Type

N - National Standard Pipe Threads

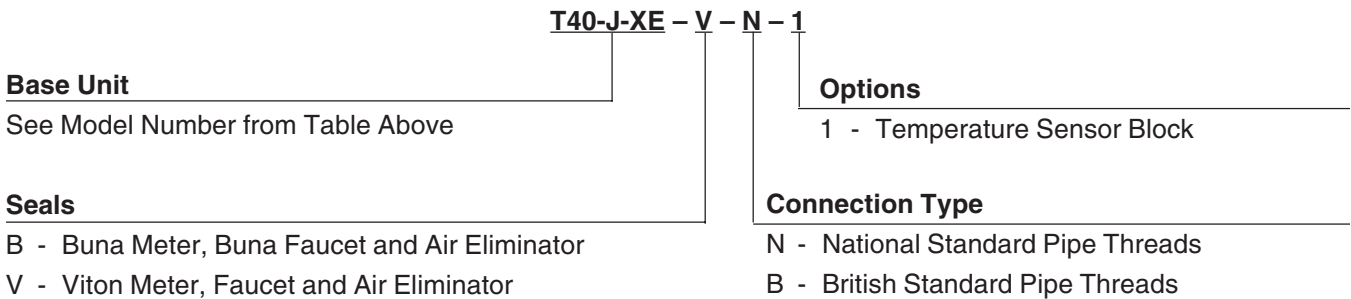
B - British Standard Pipe Threads

T40-J Meter Package Selection Guide

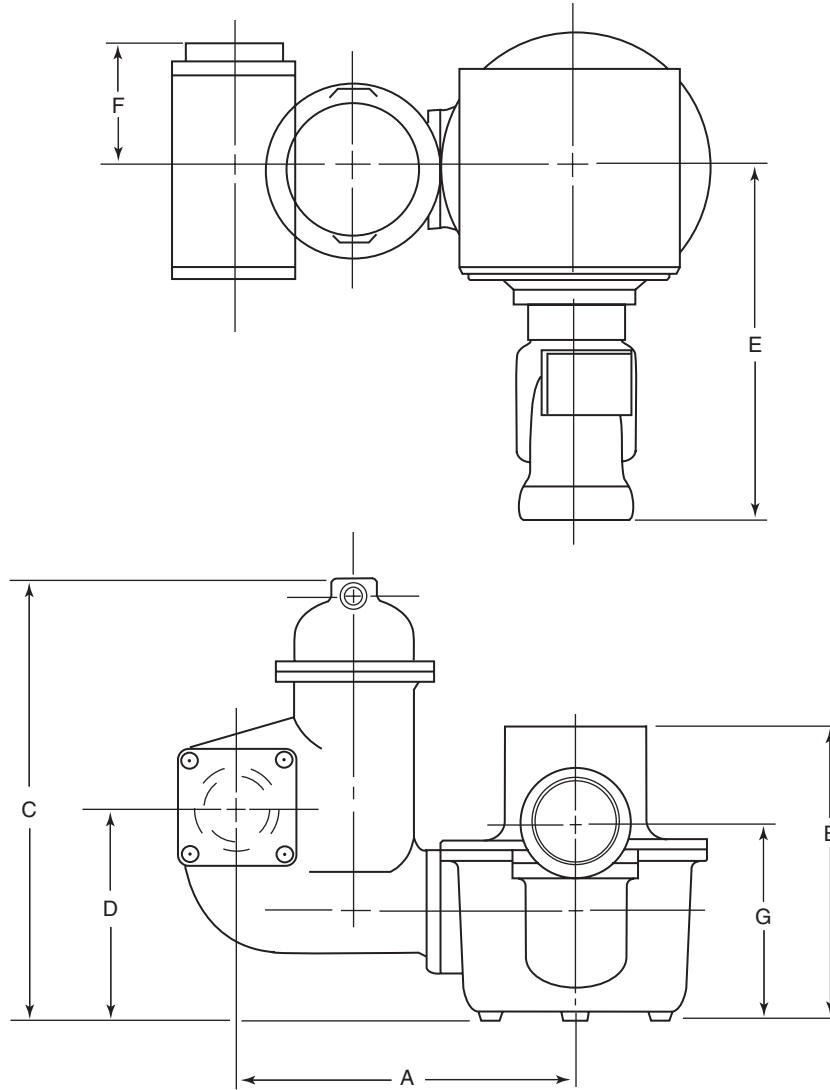
			Package Configuration	Model
Gravity Systems Only	No Faucet	MultiFlow & TP	T40-J/T4A	T40-J-XE
		MultiFlow	T40-J/T4A	T40-J-RE
	Manually Operated Faucet	MultiFlow & TP	T40-J/T4A-MPG4	T40-J-VE
		MultiFlow	T40-J/T4A-MPG4	T40-J-PE
	Set Stop Valve Electric	MultiFlow & TP	T40-J/T4A-ESSV	T40-J-ZE
		MultiFlow	T40-J/T4A-ESSV	T40-J-TE
	Set Stop Faucet Pneumatic	MultiFlow & TP	T40-J/T4A-PSSV	T40-J-ZEP
		MultiFlow	T40-J/T4A-PSSV	T40-J-TEP

TP = Ticket Printer

Modeling Code T40-J

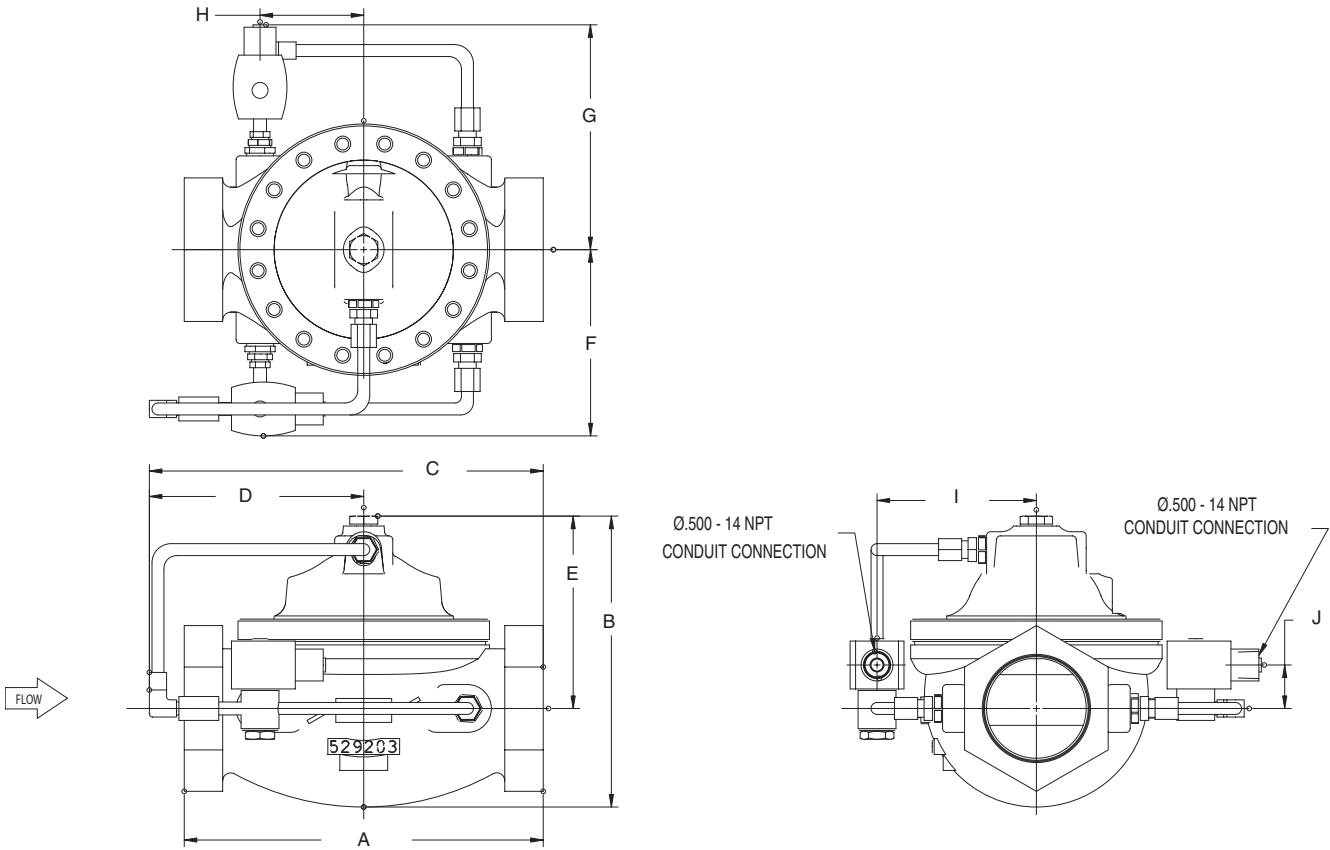


Meter Package Dimensions Less Electric Valve



	A		B		C		D		E		F		G	
	Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm
T-11	9.6	245	10.8	274	15.8	401	8.6	219	11.1	238	4.6	118	8.2	210
T-20	13.8	362	11.7	297	18.5	470	8.9	219	14.5	368	5.5	140	8.3	212
T-40	19.2	487	12.7	322	19.8	503	8.8	222	16.1	409	7.3	186	9.1	230

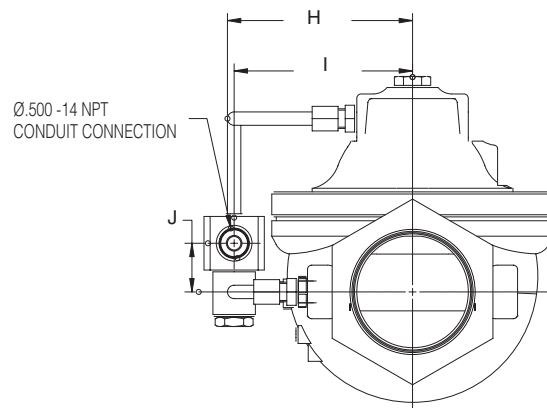
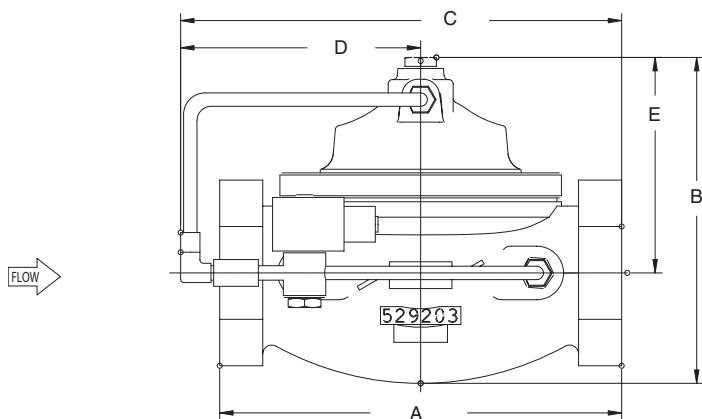
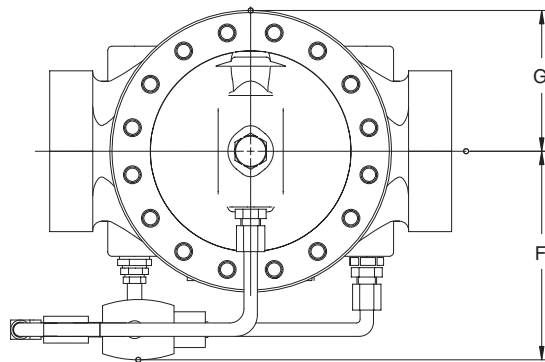
Two Stage Valve



2" Valve	A	B	C	D	E	F	G	H	I	J
mm	203	192	255	153	141	116	147	65	95	3.5
inch	8.0	7.5	10.0	6.0	5.5	4.6	5.8	2.6	3.7	1.4

3" Valve	A	B	C	D	E	F	G	H	I	J
mm	286	232	314	171	153	148	179	83	127	35
inch	11.3	9.1	12.3	6.7	6.0	5.8	7.1	3.2	5.0	1.4

Single Stage Valve



2" Valve	A	B	C	D	E	F	G	H	I	J
mm	203	192	255	153	141	118	71	101	96	3.5
inch	8.0	7.5	10.0	6.0	5.5	4.6	2.8	4.0	3.8	1.4

3" Valve	A	B	C	D	E	F	G	H	I	J
mm	286	232	314	171	153	148	100	132	127	35
inch	11.3	9.1	12.3	6.7	6.0	5.8	3.9	5.2	5.0	1.4

The specifications contained herein are subject to change without notice and any user of said specifications should verify from the manufacturer that the specifications are currently in effect. Otherwise, the manufacturer assumes no responsibility for the use of specifications which may have been changed and are no longer in effect.

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