

Materials: PVC, CPVC, Natural Polypropylene, & PVDF

Marquest Scientific's complete line of TUFF GUARD gauge and instrument isolators are engineered to provide total isolation of all instruments from corrosive and ultra pure fluids while offering a design with the most rugged and complete features in the industry.

Features & Benefits

- Provides a compatible, protective barrier between process fluids and instruments
- Adds system reliability by eliminating instrument failures
- SS reinforcement of the instrument connection to prevent fracturing associated with metal to plastic threads. Integrally molded into port
- Integral wrench provisions for field service
- Diaphragms in Modified PTFE, Viton®, EPDM, and Composite PTFE/FKM for each application
- Displacement capacity for up to 4" diameter gauges and large fill volume sensors
- Self-venting, 1/4" & 1/2" female NPT instrument connections with Viton® O-ring instrument seal

Specifications

Instrument Connection: Venting 1/4" & 1/2" Female NPT

Process Connections: 1/4" & 1/2" Fem NPT, Soc "Slip"

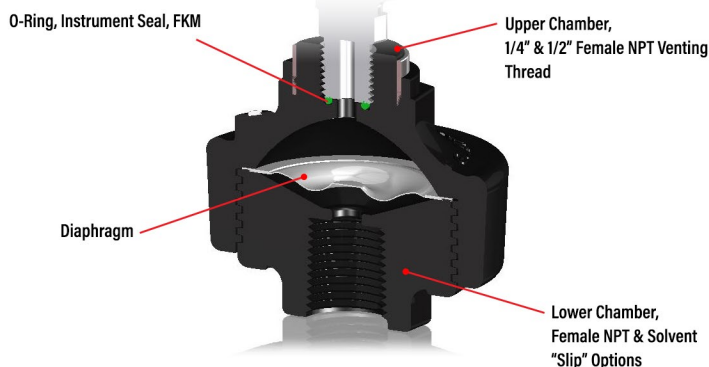
Materials of Construction:

Housing: PVC, CPVC, Polypropylene, & PVDF

Diaphragm: Modified PTFE, Viton®, EPDM, & Composite PTFE/FKM

Working Pressure: 0 - 250 psi at 70 Deg Fahrenheit

Codes & Standards: ARRA Section 1605 "Buy American" Compliant. ASME A112.18.1M



SERIES TG-25XXX-CPV

NO GAUGE INSTALLED
1/4" Vent x 1/2" Fem NPT Inlet
CPVC Body



SERIES TG-25S-PVC

2.5" ECONOMY GAUGE
1/2" Fem NPT Inlet
PVC Body



SERIES TG-25SB-PPR

2.5" STAINLESS/BRASS GAUGE
1/2" Fem NPT Inlet
Polypropylene Body



SERIES TG-25SS-PVD

2.5" ALL STAINLESS GAUGE
1/2" Fem NPT Inlet
PVDF Body



(1) Please see backside of data sheet for ordering info, including configuration & material options.

Markets / Applications

- Wastewater Treatment
- Semiconductor Manufacturing
- Chemical Plants
- Chemical Feed Systems
- Food & Beverage
- Desalination Plants
- Wet Processing
- Chemical Odor Control
- PCB Manufacturing
- Pharmaceutical Processing
- Alternative Fuel



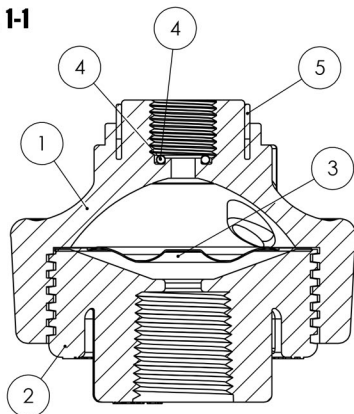
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Fluid Handling Products

Dimensional Data / Parts List

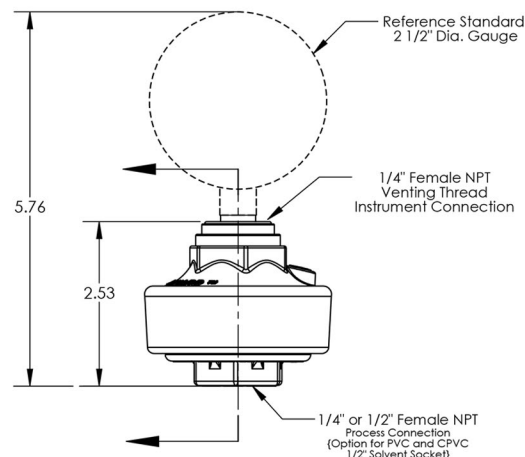
Fig. 1-1



ITEM NO.	DESCRIPTION	QTY
1	Upper Chamber	1
2	Lower Chamber	1
3	Diaphragm	1
4	O-Ring, Instrument Seal, FKM	1
5	Ring, Reinforcing 316 SS	1

*Dimensions in inches

(1) Model TG-25 shown to the right with 2.5" diameter case \ dimension. Optional 1/2" instrument connections available (See instrument port ordering info below).



Pressure / Temperature Data

MAX WORKING PRESSURES PSI (water, non-shock)

WEIGHTS

Material	10°C 50°F	20°C 68°F	30°C 86°F	40°C 104°F	50°C 122°F	60°C 140°F	70°C 158°F	80°C 176°F	90°C 194°F	100°C 212°F	120°C 248°F	Net Weights Pounds*
PVC	200	250	250	220	140	135	---	---	---	---	---	0.387
CPVC	230	250	250	230	200	200	150	120	60	---	---	0.40
PP	200	240	240	210	145	125	75	60	---	---	---	0.318
PVDF	240	250	250	250	250	230	220	200	160	140	80	0.45

Temperature Ranges: PVC: 14 to 140°F (10 to 60°C), CPVC: 50 to 194°F (10 to 90°C), PP: 46 to 176°F (8 to 80°C), PVDF: -22 to 248°F (-30 to 120°C). *Weights are for unfilled 1/4" Female NPT x 1/2" Female NPT without gauge.



CALIBRATION CERTIFICATES AVAILABLE
Please Contact Marquest

How to Order Tuff Guard

Part No: **TG - 2 5 T 060 SS - PVC**

DIAPHRAGM MATERIAL

- T = Modified PTFE
- V = Viton®
- E = EPDM
- C = Composite PTFE/FKM

MODEL	INSTRUMENT PORT	PROCESS INLET PORT	GAUGE PRESSURE RANGE*	GAUGE INSTALLED	BODY MATERIAL
Tuff Guard	2 = 1/4" Vented Female NPT 5 = 1/2" Vented Female NPT (1) Viton FKM O-ring seal is used for sealing instrument to thread. Zero pressure build during instrument install.	2 = 1/4" Female NPT 5 = 1/2" Female NPT 2S = 1/4" Solvent Soc 5S = 1/2" Solvent Soc	XXX = No Gauge Installed H030 = 0-30 in Hg Vacuum 015 = 0-15 PSI 030 = 0-30 PSI 060 = 0-60 PSI 100 = 0-100 PSI 160 = 0-160 PSI 200 = 0-200 PSI 300 = 0-300 PSI	LEAVE BLANK = No Gauge S = Standard 2.5" Black Painted Steel Case, Marquest, Dry Case, 2-3-2% Accuracy SB = Stainless Case / Brass Internals 2.5" Wika 212.53, Glycerin Filled Case, 2.5% Accuracy SS = All Stainless 2.5" Ashcroft 1008s, Glycerin Filled Case, 1.5% Accuracy	PVC = Polyvinyl Chloride CPV = CPVC, Chlorinated Polyvinyl Chloride PPR = Reinforced, Glass Filled Polypropylene PVD = 100% HP Virgin PVDF

Example: TG-25T060SS-PVC (Gauge Installed)

PVC Tuff Guard Isolator, 1/2" Female NPT Inlet, Modified PTFE Diaphragm, 0-60 PSI All Stainless 2.5" Dia. Ashcroft 1008s Glycerin Filled Gauge Installed, Assembly Tested.

Example: TG-22CXXX-PVDF (No Gauge Installed)

PVDF Tuff Guard Isolator, 1/4" Vented Female NPT x 1/4" Female NPT Inlet, PTFE/FKM Composite Diaphragm, No Gauge Installed

(1) Assemblies with gauge installed have an Aqueous Glycerin (70% USDA 99.5% Glycerin / 30% Distilled Water) internal fill in the upper chamber and gauge stem internals. Silicone, Halocarbon, and Glycol fills available. Units ordered with out an instrument, need to be filled per installation instructions.

(1) Only specify pressure range when ordering with a gauge installed. When ordering a unit with no gauge installed, please place "XXX".

(2) We offer both dual scale and compound pressure ranges. Please contact factory.

(1) We offer a variety of other gauge & instrument options from Ashcroft, Wika, & US Ametek including 3.5", 4" Dial Sizes. The Tuff Guard is also perfectly suited for a variety of pressure sensors. Please contact factory.

Marquest Scientific, Inc.
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www.marquestscientific.com | www.GaugeGuards.com



MARQUEST SCIENTIFIC
Fluid Handling Products

Materials: PVC, CPVC, Natural Polypropylene, PVDF

Marquest Scientific's complete line of Mini gauge and instrument isolators are engineered to provide total isolation of all instruments from corrosive and ultra pure fluids in an ultra compact size.

Features & Benefits

- Provides a compatible, protective barrier between process fluids and instruments
- Adds system reliability by eliminating instrument failures.
- Ultra compact size for limited space applications
- Extremely low cost for O.E.M. integration
- Replaceable composite PTFE/FKM diaphragm
- Integral wrench provisions
- Diaphragm safety features
- Displacement capacity for up to 2 1/2" diameter gauges
- Self-venting, 1/4" female NPT instrument connection



SERIES MTG-22FS-PVC 2" ECONOMY GAUGE 1/4" Fem NPT Inlet PVC Body	SERIES MTG-22SB-PPR 2.5" STAINLESS/BRASS GAUGE 1/4" Male NPT Inlet Nat Polypro Body	SERIES MTG-25SS-PVD 2.5" ALL STAINLESS GAUGE 1/2" Male NPT Inlet PVDF Body
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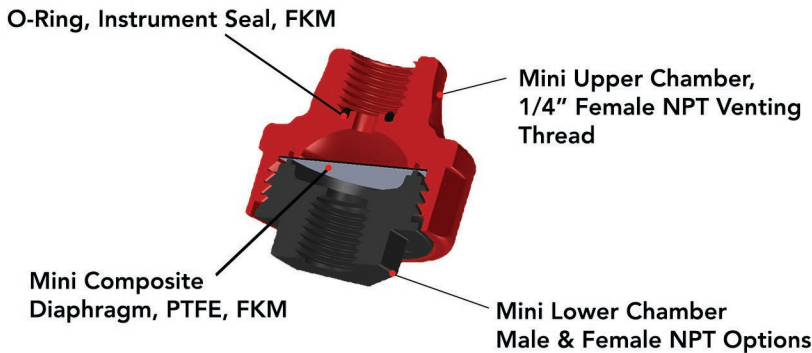
(1) Please see backside of data sheet for ordering info, including configuration & material options.

Specifications

Instrument Connection: Venting 1/4" Female NPT
Process Connections: 1/4" & 1/2" MNPT, 1/4" Female NPT
Materials of Construction:
Upper Housing: PVC, CPVC, Natural Polypro, PVDF
Lower Housing: PVC, CPVC, Natural Polypro, PVDF
Composite Diaphragm: PTFE, System / Process Side
 FKM, Instrument Side
Working Pressure: 0 - 250 psi at 70 Deg F.
Codes & Standards: ARRA Section 1605 "Buy American"
 Compliant. ASME A112.18.1M

Markets / Applications

- Wastewater Treatment
- Semiconductor Manufacturing
- Chemical Plants
- Chemical Feed Systems
- Food & Beverage
- Wet Processing
- Chemical Odor Control
- PCB Manufacturing
- Pharmaceutical Processing

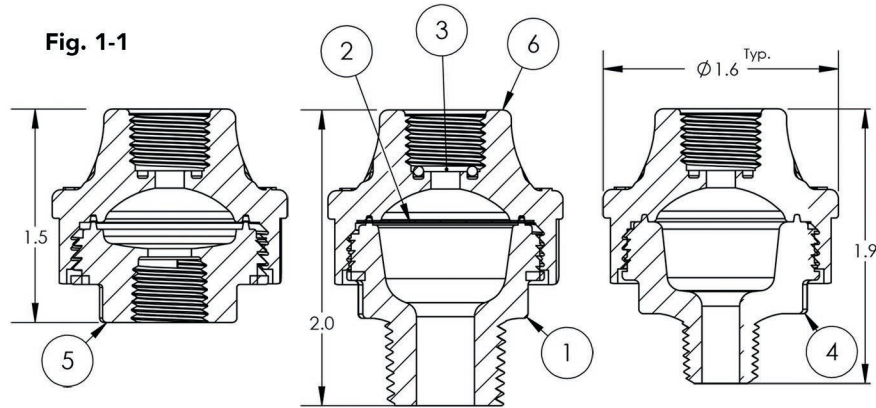


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Dimensional Data / Parts List



*Dimensions in inches

ITEM NO.	DESCRIPTION	QTY
1	Mini Lower 1/2" Male NPT	1
2	Mini Composite Diaphragm PTFE / FKM	1
3	O-Ring, Instrument Seal, FKM	1
4	Mini Lower 1/4" Male NPT	1
5	Mini Lower 1/4" Female NPT	1
6	Mini Upper 1/4" Female NPT Venting Thread	3

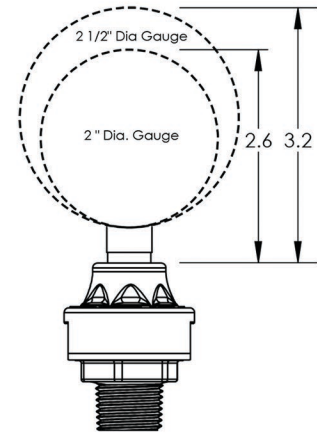
Pressure / Temperature Data

WORKING PRESSURES PSI

WEIGHTS

Material	10°C 50°F	20°C 68°F	30°C 86°F	40°C 104°F	50°C 122°F	60°C 140°F	70°C 158°F	80°C 176°F	90°C 194°F	100°C 212°F	120°C 248°F	Net Weights Pounds*
PVC	200	250	250	220	140	135	----	----	----	----	----	.13
CPVC	230	250	250	230	200	200	150	120	60	----	----	.14
PP	200	240	240	210	145	125	75	60	----	----	----	.12
PVDF	240	250	250	250	250	230	220	200	160	140	80	.16

Temperature Ranges: **PVC:** 14 to 140°F (10 to 60°C), **CPVC:** 50 to 194°F (10 to 90°C), **PP:** 46 to 176°F (8 to 80°C), **PVDF:** -22 to 248°F (-30 to 120°C). * Weights are for unfilled 1/4" Female NPT x 1/2" MNPT without gauges.



(1) Model MTG-25 shown above with 2" & 2.5" diameter case dimensions. Please combine dimensions from fig.1-1 to total full assembly height dimensions.

How to Order Mini Tuff Guard

Part No: **MTG - 2 5 060 SS - PVC**

MODEL	INSTRUMENT PORT	PROCESS INLET PORT		GAUGE INSTALLED	BODY MATERIAL
Mini Tuff Guard	2 = 1/4" Vented Female NPT <small>(1) Viton FKM O-ring seal is used for sealing instrument to thread. Zero pressure build during instrument install.</small>	5 = 1/2" Male NPT 2 = 1/4" Male NPT 2F = 1/4" Female NPT	LEAVE BLANK = No Gauge H030 = 0-30 in Hg Vacuum 015 = 0-15 PSI 030 = 0-30 PSI 060 = 0-60 PSI 100 = 0-100 PSI 160 = 0-160 PSI 200 = 0-200 PSI 300 = 0-300 PSI	LEAVE BLANK = No Gauge S = Standard 2" Black Painted Steel Case, Marquest, Dry Case, 2-3-2 % Accuracy SB = Stainless Case / Brass Internals 2.5" Wika 212.53, Glycerin Filled Case, 2.5% Accuracy SS = All Stainless 2.5" Ashcroft 1008s, Glycerin Filled Case, 1.5% Accuracy	PVC = Polyvinyl Chloride CPVC = Chlorinated Polyvinyl Chloride PPN = Natural Unpigmented Polypropylene PVDF = 100% HP Virgin PVDF
Example: MTG-25060SS-PVC (Gauge Installed) PVC Mini Tuff Guard Isolator, 1/2" Male NPT Inlet, PTFE/FKM Composite Diaphragm, 0-60 PSI All Stainless 2.5" Dia. Ashcroft 1008s Glycerin Filled Gauge Assembled & Tested.	Example: MTG-22-PVDF (No Gauge Installed) PVDF Mini Tuff Guard Isolator, 1/4" Vented Female NPT x 1/4" Male NPT Inlet, PTFE/FKM Composite Diaphragm, No Gauge Installed	(1) Assemblies with gauge installed have an Aqueous Glycerin (70% USDA 99.5% Glycerin / 30% Distilled Water) internal fill in the upper chamber and gauge stem internals. Silicone & Halocarbon fills available. Units ordered with out an instrument, need to be filled per installation instructions.	(1) Only specify pressure range when ordering with a gauge installed. When ordering a unit with no gauge installed (X), please leave section blank. (2) We offer both dual scale and compound pressure ranges. Please contact factory.	(1) We offer a variety of other gauge & instrument options from Ashcroft, Wika, & US Ametek including 1.5", 2", & 2.5" Dial Sizes. The Mini Tuff Guard is also perfectly suited for a variety of pressure sensors. Please contact factory.	

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MARQUEST SCIENTIFIC
Fluid Handling Products

Materials: PVC, CPVC, Polypropylene, & PVDF

Port Connections: 1/4", 3/8", & 1/2" Fem NPT and Solvent Socket "Slip". Universally adaptable to pipe and tube.

Marquest Scientific's complete line of Throttle Master Needle Valves provide precise flow control with fine adjustment of corrosive and high purity fluids. The developed metering chamber provides for the most reliable stabilization and linearity of flow. Ultimate cross sectional geometry allows the manufacturing process to attain full material property potentials for the most demanding applications.

Features & Benefits

- Produced in two styles: Globe (straight) and angle pattern.
- 24 Pitch metering thread. 20% finer metering control. Excellent linearity of flow.
- Needle finish, SPI/SPE No. 1. bubble tight, low torque shutoff for long term performance.
- All injection molded, rugged design and construction.
- Needle Stem is Modified PTFE sealed for excellent chemical resistance & high purity. Modified PTFE for resilient sealing.
- Integrally designed panel mounting, no fasteners required, mounts to panel thicknesses from 1/16" to 1/2".
- No elastomers (O-Rings), metals or lubricants. No corrosion, no contamination. Zero Dead Leg.



NA-250-PPR
1/4" Fem NPT x 1/4" Fem NPT
Angle Pattern
Polypropylene Body

NG-250-PVC
1/4" Fem NPT x 1/4" Fem NPT
Globe (Straight) Pattern
PVC Body

(1) Please see backside of data sheet for ordering info, including configuration & material options.

Specifications

Ports Connections: 1/4", 3/8", & 1/2" Fem NPT, Solvent Socket "Slip", Compression Tube Accessory Fittings

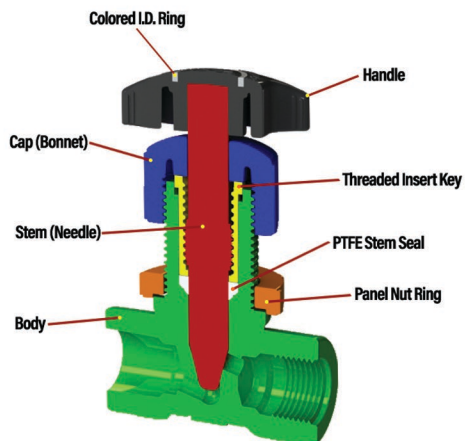
Materials of Construction:

Valve Body & Components: Injection molded in PVC, Glass & Mineral Reinforced Polypropylene, CPVC, and HP PVDF.

Stem Seal: Machined from 100% Virgin Modified PTFE

Working Pressure: 0 - 250 psi at 70° Deg Fahrenheit

Codes & Standards: ARRA Section 1605 "Buy American" Compliant. ASME A112.18.1M. ASTM D1599 & ASTM F610F 610M



Markets / Applications

- Wastewater Treatment
- Semiconductor Manufacturing
- Chemical Manufacturing
- Chemical Feed Systems
- Food & Beverage
- Desalination Plants
- Commercial Reverse Osmosis
- Farming & Agriculture
- Metal Plating
- Wet Processing
- Chemical Odor Control
- PCB Manufacturing
- Pharmaceutical Processing
- Alternative Fuel
- Photolithography
- Wet Bench & Fume Hoods
- NanoFluidics
- Many more..



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Materials of Construction / Connections

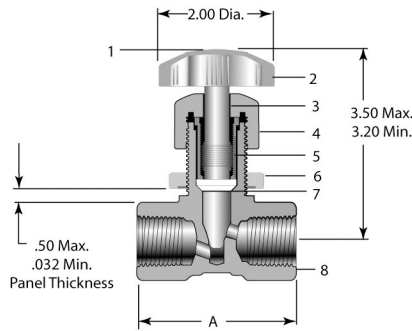
Body: PVC: Polyvinyl Chloride
 CPVC: Chlorinated Polyvinyl Chloride
 PPR: Polypropylene, unpigmented homopolymer, glass & mineral reinforced

Seal: Virgin Modified PTFE

Port Connections: 1/4", 3/8", & 1/2" Fem NPT
 3/8" & 1/2" Solvent Socket Slip
 16mm & 20mm Fusion Socket
 *BSP Threads

(1) Please contact factory for special connection requests

Dimensional Data / Parts List

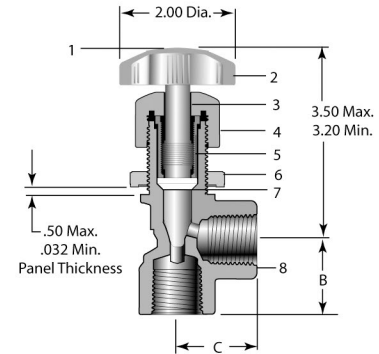


Dimensions (inches)

SIZE	A	B	C
1/4" Fem NPT	2.31	1.16	1.17
3/8" Fem NPT	2.39	1.19	1.21
1/2" Fem NPT	2.65	1.31	1.32

Parts List

- Colored Ring I.D. Insert
- Handle
- Needle (Stem)
- Cap (Bonnet)
- Threaded Insert
- Panel Nut
- Stem Seal (PTFE)
- Body



Pressure / Temperature Data

MAX WORKING PRESSURES PSI (water, non-shock)

Material	10°C 50°F	20°C 68°F	30°C 86°F	40°C 104°F	50°C 122°F	60°C 140°F	70°C 158°F	80°C 176°F	90°C 194°F	100°C 212°F	120°C 248°F	Net Weights Pounds*
PVC	200	250	250	220	140	135	----	----	----	----	----	0.387
CPVC	230	250	250	230	200	200	150	120	60	----	----	0.40
PP	200	240	240	210	145	125	75	60	----	----	----	0.318
PVDF	240	250	250	250	250	230	220	200	160	140	80	0.45

Temperature Ranges: PVC: 14 to 140°F (10 to 60°C), CPVC: 50 to 194°F (10 to 90°C), PP: 46 to 176°F (8 to 80°C), PVDF: -22 to 248°F (-30 to 120°C). * Weights are for unfilled 1/4" Female NPT x 1/2" Female NPT without gauge.

WEIGHTS

Flow Data

ORIFICE SIZES & Cv VALUES

SIZE	1/4" & 3/8"		1/2"	
	Globe Pattern	Angle Pattern	Globe Pattern	Angle Pattern
Inlet	0.187"	0.250"	0.218"	0.250"
Outlet	0.187"	0.187"	0.218"	0.218"
Cv	0.310	0.426	0.620	0.780

Flow Formula

$$Q = Cv \sqrt{\frac{\Delta P}{SG}}$$

Q = GPM (Gallons per Min)
 Cv = Flow Coefficient
 Δ P = Change in Pressure
 SG = Specific Gravity

How to Order Throttle Master

Part No: **NG - 500 - PVC**

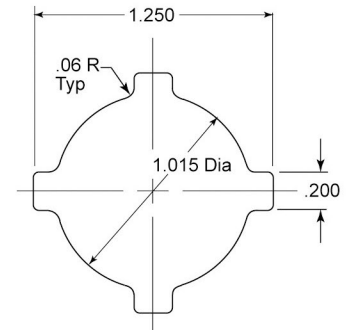
BODY STYLE	PORT CONNECTION	MATERIAL
NG = Globe (Straight)	250 = 1/4" Female NPT	PVC = Polyvinyl Chloride
NA = Angle (90 Deg)	375 = 3/8" Female NPT	CPVC = Chlorinated Polyvinyl Chloride
	500 = 1/2" Female NPT	PPR = Polypropylene, unpigmented glass & mineral reinforced
	375S = 3/8" Solvent Socket	PVD = 100% Virgin PVDF Polyvinylidene Fluoride
	500S = 1/2" Solvent Socket	

Example: NG-500-PVC

PVC Throttle Master Needle Valve, 1/2" Fem NPT Inlet x 1/2" Fem NPT Outlet, Globe (Straight) Pattern, Modified PTFE Stem Seal, .620 Cv Value

Mounting Template

When required, the template provides the outline of the hole and orientation slots for a panel or bracket mounting. The orientation slots may be cut in multiple positions to allow versatility in mounting the valve to accommodate the piping alignment requirements.



Marquest Scientific, Inc.

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