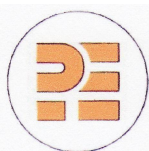


Instrument Valve

Needle Valve, Manifold, Check and Proportional Relief Valve



**PNEUMOIDRAULICA
ENGINEERING**

VEE-LOK[®]
valve & fitting

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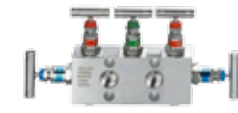
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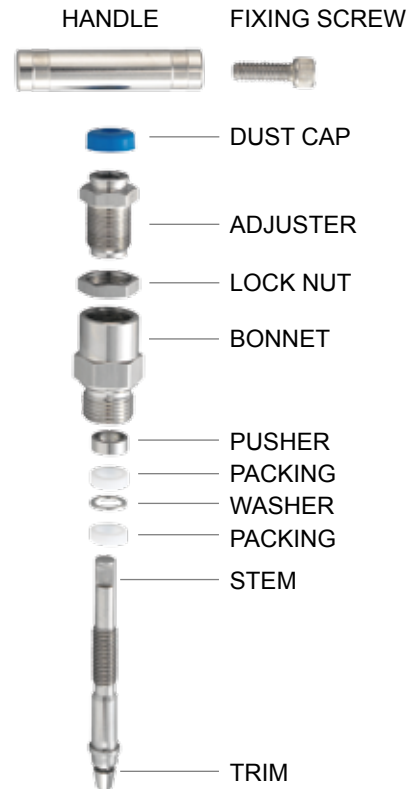
Hexagonal Bar Stock Needle Valve HBNV Series



Features

- Maximum working pressure:
 - 6000 psi (414bar) at 100°F (38°C)
 - 10000 psi (690bar) at 100°F (38°C)
- Working temperature:
 - 65°F (-54°C) to 464°F (240°C)
 - 65°F (-54°C) to 842°F (450°C)
- Teflon[®] packings can be adjusted to extend the valve life.
- Non rotating stem design to reduce the galling and provide excellent seal on seat.
- Stem threads are rolled and lubricated to prevent galling and reduce operating torque.
- Sealing area below the threads protects from the contaminant by process and prevents lubricant washout.
- Safety back seating seal in fully open position to perform a secondary stem seal.
- Body to bonnet seal creates metal to metal constant and reliable compression.
- Bonnet lock pin prevents accidental removal while in service.
- Optional sour gas service conforms to NACE MR0175.
- Hydro test performed with pure water at 1.5 times of working pressure
- 100% factory test
- Material traceability

Material of Construction

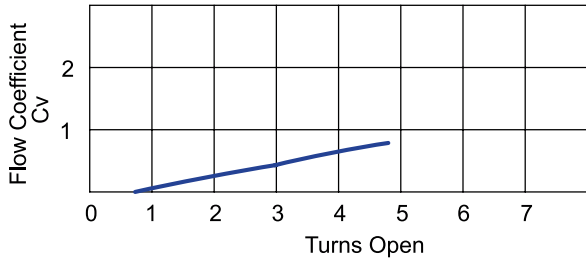


Component	Valve Body Material	
	316L S.S.	Carbon Steel
Body	316L S.S./A479	Carbon Steel /A108
Bonnet	316L S.S./A479	Carbon Steel /A108
Stem	316L S.S./A276	304 S.S./A276
Adjuster	316L S.S./A276	Carbon Steel /A108
Lock Nut	316L S.S./A276	Carbon Steel /A108
Handle	303 S.S./A276	Carbon Steel /A108
Fixing Screw	302 S.S.	Zinc plated steel
Packing	Teflon ^{® 1}	Teflon ^{® 1}
Washer	316 S.S./A276	316 S.S./A276
Pusher	316 S.S./A276	316 S.S./A276
Dust Cap	NBR	NBR
Lock Pin	303 S.S./A276	303 S.S./A276
Bleed Screw ²	316 S.S./A276	316 S.S./A276

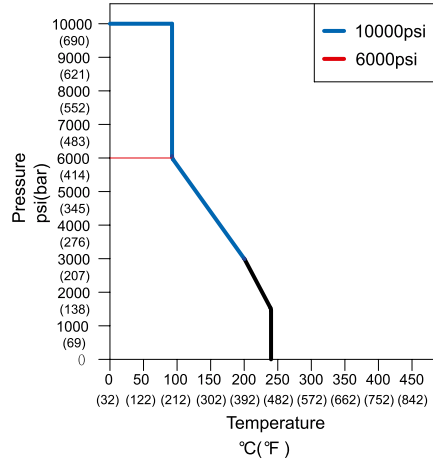
Note:

1. Packing is optional with graphite for high temperature to 450°C.
2. Optional with bleed screw

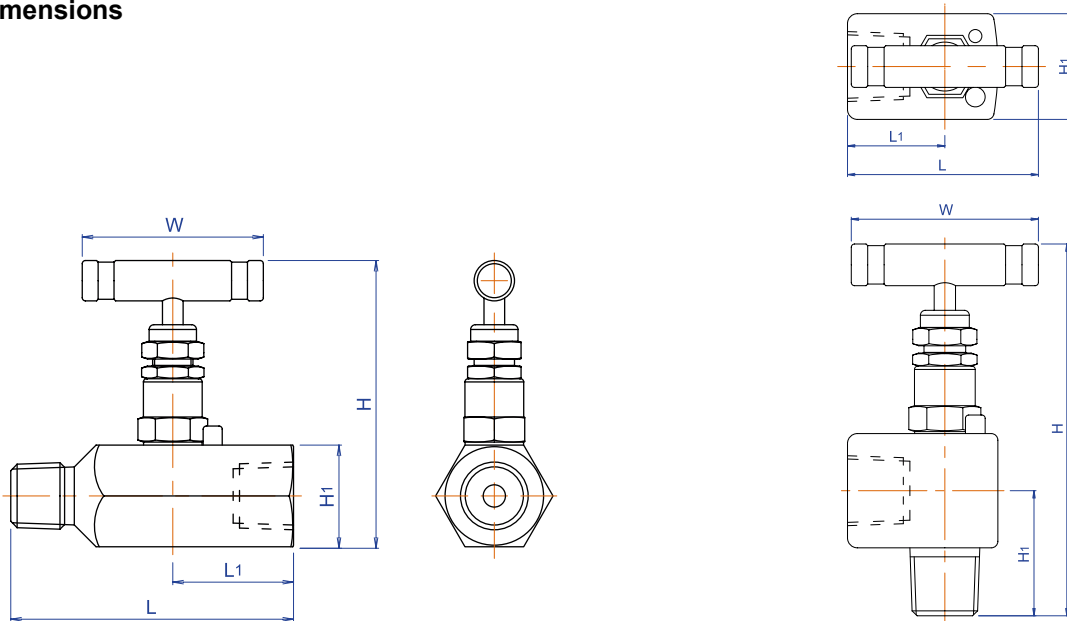
Flow Characteristics



Pressure Vs. Temperature



Dimensions



Ordering No.	End Connection		Orifice (bore)	Dimensions (mm)				
	Inlet	Outlet		L	L1	H	H1	W
HBNV□8MF	1/2"NPT male	1/2"NPT female	6	89	38	90	32	57
HBNV□8FF	1/2"NPT female	1/2"NPT female	6	76	38	90	32	57
HBNV□3412MF	3/4"NPT male	1/2"NPT female	6	89	38	90	32	57
HBNV□12MF	3/4"NPT male	3/4"NPT female	6	89	38	93	35	57
HBNV□12FF	3/4"NPT female	3/4"NPT female	6	76	38	93	35	57
HBNV□16MF	1"NPT male	1"NPT female	6	94	42.5	99	41	57
HBNV□16FF	1"NPT female	1"NPT female	6	85	42.5	99	41	57
HBNV□8MF90	1/2"NPT male	1/2"NPT female	6	-	-	121.3	37.5	57

All dimensions shown are for reference and subject to change without prior notice.

Sizes listed are standard. Other sizes and end types are available upon request. Refer to ordering information.

Standard Material

Valve	Body	Bonnet	Stem	Packing	Trim
316L SS	316-A479	316-A479	316-A276	Teflon [®]	316-A276
Carbon Steel	A108	A108	304-A276	Teflon [®]	304-A276

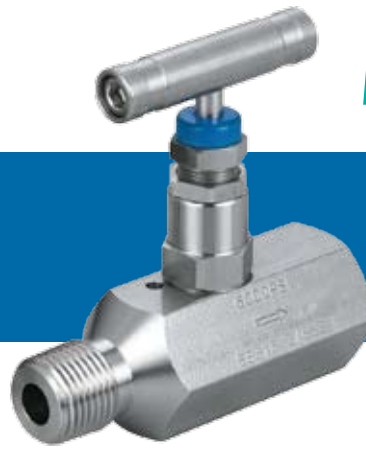
Ordering Information

HBNV	S		8		MF		10 B	
Series	Body Material		Size		End Connection		Optional	
HBNV	S	316L S.S.	4	1/4"	M	Male	90	Angle pattern
	C	Carbon Steel	6	3/8"	F	Female	10	10,000 psi
			8	1/2"			B	Bleeding screw
			12	3/4"			G	Graphite
			16	1"			BSPT	BSPT thread

Note:

1. Viton[®], Teflon[®] and Delrin[®] are all registered trademarks of DuPont. Refer to chemical resistance guide and choose suitable elastomer for your application.
2. Carbon steel valves are yellow zinc plated to resist corrosion.

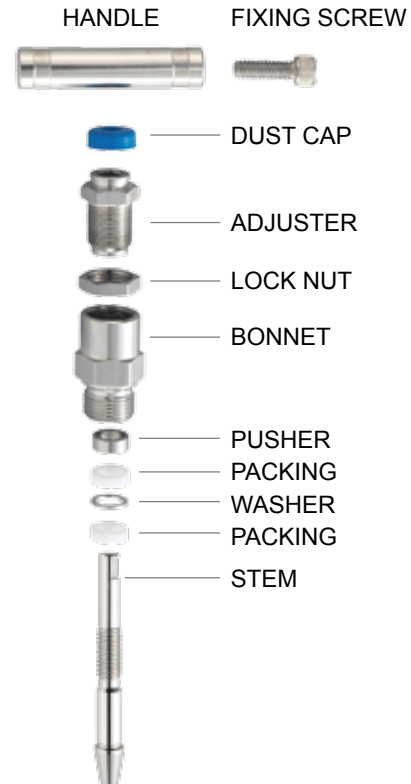
Hexagonal Bar Stock Needle Valve SNV Series



Features

- Maximum working pressure:
6000 psi (414bar) at 100°F (38°C)
- Working temperature:
Delrin[®] Seat: -20°F (-28°C) to 200°F (93°C)
PEEK Seat: -20°F (-28°C) to 400°F (204°C)
- Straight-through design provides high capacity with bi-directional flow and is roddable for easy cleaning.
- Teflon[®] packings can be adjusted to extend the valve life.
- Stem threads are rolled and lubricated to prevent galling and reduce operating torque.
- Sealing area below the threads protects from the contaminant by process and prevents lubricant washout.
- Safety back seating seal in fully open position to perform a secondary stem seal.
- Bonnet lock pin prevents accidental removal while in service.
- Optional sour gas service conforms to NACE MR0175.
- Hydro test performed with pure water at 1.5 times of working pressure
- 100% factory test
- Material traceability

Material of Construction

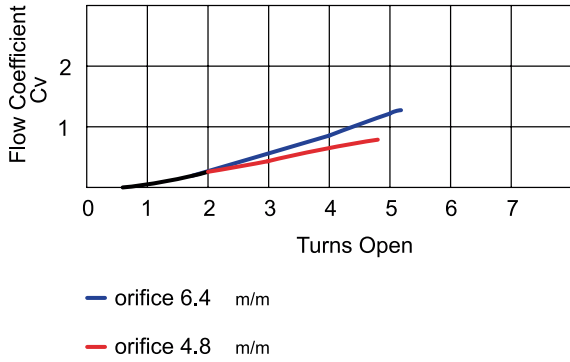


Component	Valve Body Material	
	316L S.S.	Carbon Steel
Body	316L S.S./A479	Carbon Steel/A108
Bonnet	316L S.S./A479	Carbon Steel/A108
Stem	316L S.S./A276	304 S.S./A276
Adjuster	316L S.S./A276	Carbon Steel/A108
Lock Nut	316L S.S./A276	Carbon Steel /A108
Handle	303 S.S./A276	Carbon Steel/A108
Fixing Screw	302 S.S.	Zinc plated steel
Packing	Teflon [®]	Teflon [®]
Washer	316 S.S./A276	316 S.S./A276
Pusher	316 S.S./A276	316 S.S./A276
Dust Cap	NBR	NBR
Lock Pin	303 S.S./A276	303 S.S./A276
Seat	Delrin [®]	Delrin [®]

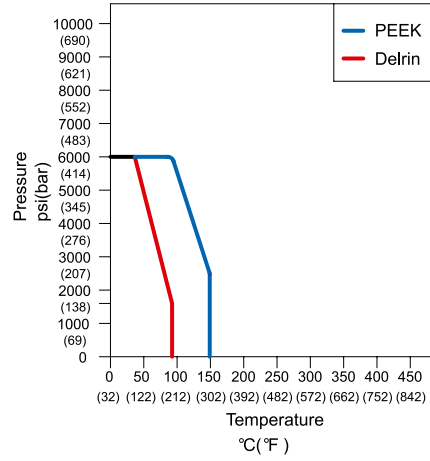
Note:

1. Optional PEEK seat is available.

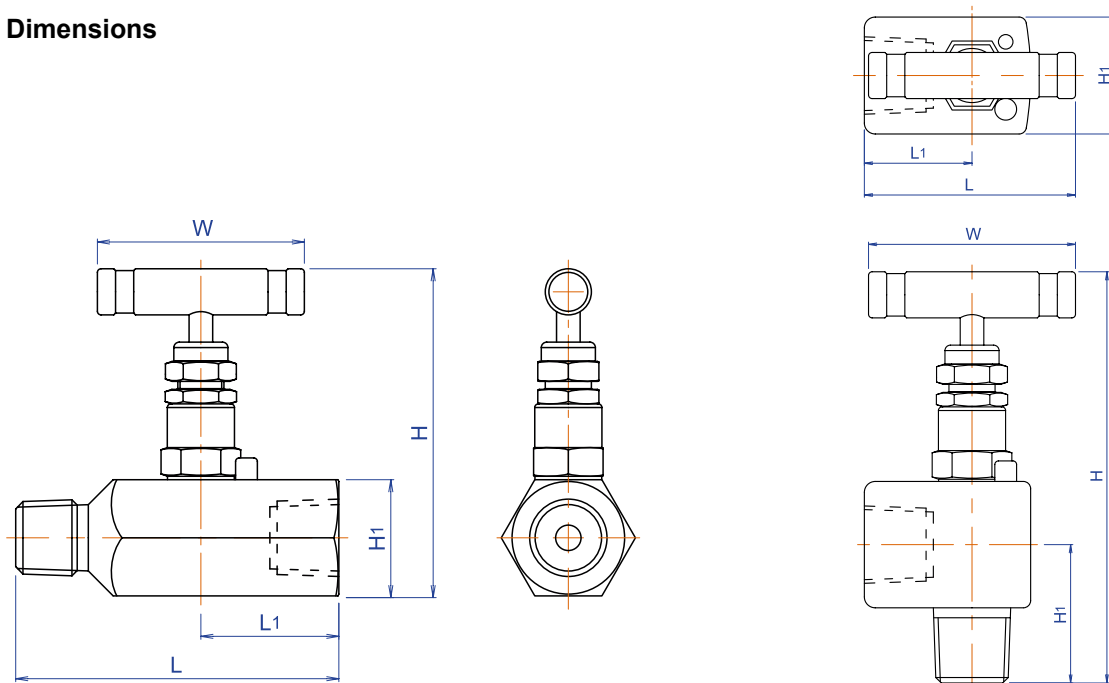
Flow Characteristics



Pressure Vs. Temperature



Dimensions



Ordering No.	End Connection		Orifice (bore)	Dimensions (mm)				
	Inlet	Outlet		L	L1	H	H1	W
SNV□8MF	1/2"NPT male	1/2"NPT female	4.8	89	38	94	32	57
SNV□8FF	1/2"NPT female	1/2"NPT female	4.8	76	38	94	32	57
SNV□12MF	3/4"NPT male	3/4"NPT female	6.4	89	38	96	35	57
SNV□12FF	3/4"NPT female	3/4"NPT female	6.4	76	38	96	35	57
SNV□16MF	1"NPT male	1"NPT female	7	94	42.5	101	41	57
SNV□16FF	1"NPT female	1"NPT female	7	85	42.5	101	41	57
SNV□8MF90	1/2"NPT male	1/2"NPT female	4.8	-	-	121.3	37.5	57

All dimensions shown are for reference and subject to change without prior notice.

Sizes listed are standard. Other sizes and end types are available upon request. Refer to ordering information.

Standard Material

Valve	Body	Bonnet	Stem	Packing	Seat
316L SS	316-A479	316-A479	316-A276	Teflon® or Viton® Oring with Teflon® backup ring	Delrin®
Carbon Steel	A108	A108	304-A276	Teflon® or Viton® Oring with Teflon® backup ring	Delrin®

Ordering Information

SNV	S		8		MF		90	
Series	Body Material		Size		End Connection		Optional	
SNV	S	316L S.S.	4	1/4"	M	Male	PK	PEEK seat
	C	Carbon Steel	6	3/8"	F	Female	VT	Viton® O-ring with Teflon® back-up rings
			8	1/2"			90	Angle pattern
			12	3/4"			BSPT	BSPT thread
			16	1"				

Note:

1. Valves are standard with Delrin® soft seat and Teflon® packings.
2. Viton®, Teflon® and Delrin® are all registered trademarks of DuPont. Refer to chemical resistance guide and choose suitable elastomer for your application.
3. Carbon steel valves are yellow zinc plated to resist corrosion.

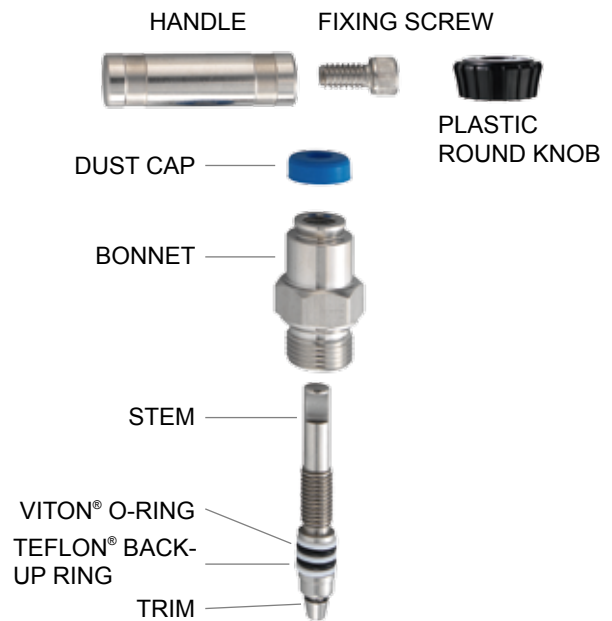
Square Bar Stock Needle Valve BNV Series



Features

- Maximum working pressure:
6000 psi (414bar) at 100°F (38°C)
- Working temperature:
-22°F (-30°C) to 392°F (200°C)
- Compact design provides economical and long service life.
- Non rotating stem design to reduce the galling and provide excellent seal on seat.
- Stem threads are rolled and lubricated to prevent galling and reduce operating torque.
- Sealing are below the threads protects from the contaminant by process and prevents lubricant washout.
- Safety back seating seal in fully open position to perform a secondary stem seal.
- Body to bonnet seal is metal to metal in constant compression, creating a reliable seal point to eliminate possible tensile breakage of bonnet and isolate bonnet threads from process fluid corrosion.
- Bonnet lock pin prevents accidental removal while in service.
- Hydro test performed with pure water at 1.5 times of working pressure
- 100% factory test
- Material traceability

Material of Construction



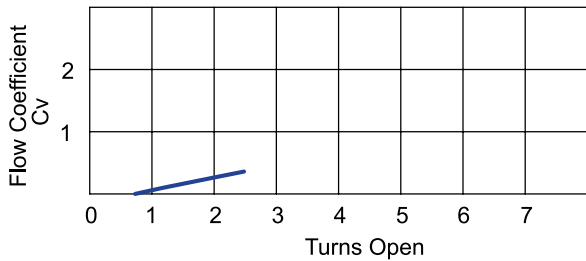
Component	Valve Body Material	
	316L S.S.	Carbon Steel
Body	316L S.S./A479	Carbon Steel/A108
Bonnet	316L S.S./A479	Carbon Steel/A108
Stem	316L S.S./A276	304 S.S./A276
Handle	303 S.S./A276	Carbon Steel/A108
Fixing Screw	302 S.S./A276	Zinc plated steel
Lock Pin	303 S.S./A276	303 S.S./A276
O-Ring	Viton®	Viton®
Back-Up Ring	Teflon®	Teflon®
Dust Cap	NBR	NBR

Note:

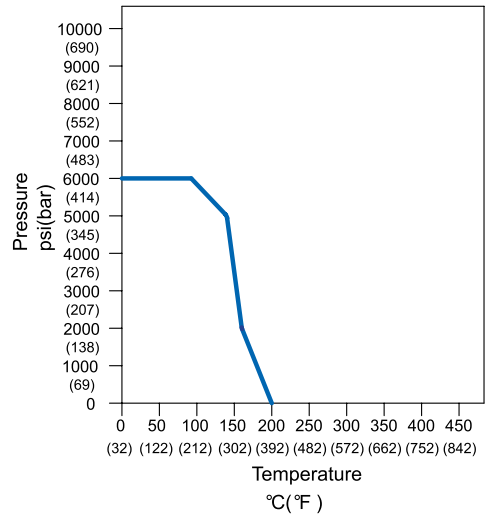
Optional with

1. VEE-LOK twin ferrule tube end
2. panel mountable nuts
3. bleeding screw
4. black plastic round knob

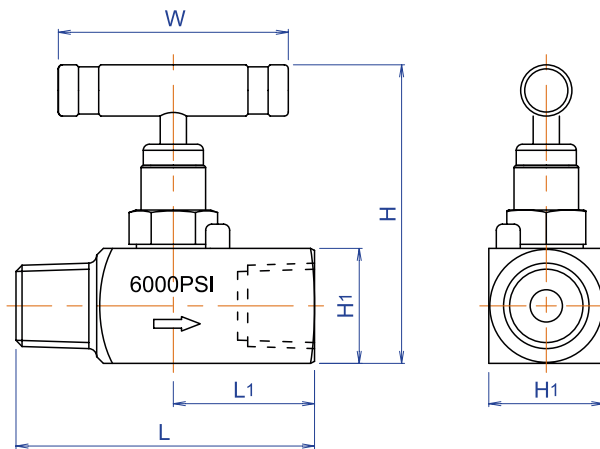
Flow Characteristics



Pressure Vs. Temperature



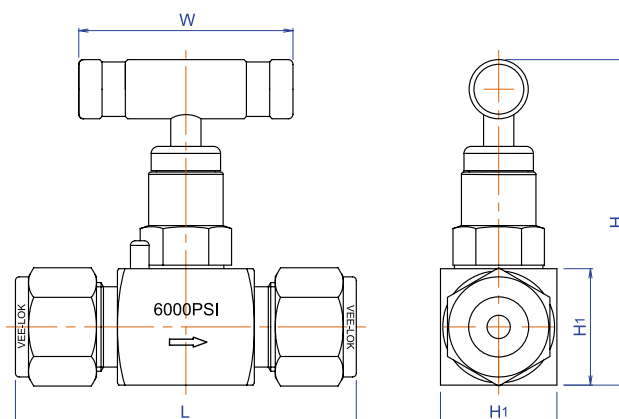
Dimensions



Ordering No.	End Connection		Orifice (bore)	Dimensions (mm)				
	Inlet	Outlet		L	L1	H	H1	W
BNV□2MF	1/8"NPT male	1/8"NPT female	4.8	57	27	64	19	46
BNV□2FF	1/8"NPT female	1/8"NPT female		57	28.5	64	19	46
BNV□4MF	1/4"NPT male	1/4"NPT female		57	27	64	19	46
BNV□4FF	1/4"NPT female	1/4"NPT female		57	28.5	64	19	46
BNV□6MF	3/8"NPT male	3/8"NPT female		65	31	70.5	25.4	57
BNV□6FF	3/8"NPT female	3/8"NPT female		62	31	70.5	25.4	57
BNV□8MF	1/2"NPT male	1/2"NPT female		74	35	74	29	57
BNV□8FF	1/2"NPT female	1/2"NPT female		70	35	74	29	57

All dimensions shown are for reference and subject to change without prior notice.

Sizes listed are standard. Other sizes and end types are available upon request. Refer to ordering information.



Ordering No.	End Connection		Orifice (bore)	Dimensions (mm)			
	Inlet	Outlet		L	H	H1	W
TBNV□2OD	1/8" O.D.	1/8" O.D.	4.8	63.6	46	19	46
TBNV□4OD	1/4" O.D.	1/4" O.D.		65	46	19	46
TBNV□6OD	3/8" O.D.	3/8" O.D.		68	57	25.4	57
TBNV□8OD	1/2" O.D.	1/2" O.D.		73.2	57	25.4	57
TBNV□M6OD	6mm O.D.	6mm O.D.		65	46	19	46
TBNV□M12OD	12mm O.D.	12mm O.D.		73.2	57	25.4	57

Dimensions shown are Vee-Lok twin ferrule tube nuts finger-tightened and subject to change without prior notice. Sizes listed are standard. Other sizes and end types are available upon request. Refer to ordering information.

Standard Material

Valve	Body	Bonnet	Stem	Packing	Trim
316L SS	316-A479	316-A479	316-A276	Viton [®]	316-A276
Carbon Steel	A108	A108	304-A276	Viton [®]	304-A276

Ordering Information

BNV		S		4		MF			
Series	Body Material	Size		End Connection		Optional			
BNV	S	316L S.S.	2	1/8"	M	Male	PN	Panel mountable	
TBNV	C	Carbon Steel	4	1/4"	F	Female	B	M6 bleeding screw	
			6	3/8"	OD	VEE-LOK twin ferrule tube fittings	R	Plastic round knob	
			8	1/2"			BSPT	BSP Taper	
			M6	6mm			BSPP	BSP parallel	
			M12	12mm					

Note:

1. Viton[®], Teflon[®] and Delrin[®] are all registered trademarks of DuPont. Refer to chemical resistance guide and choose suitable elastomer for your application.
2. Carbon steel valves are yellow zinc plated to resist corrosion.

Mini Valves

MNV Series

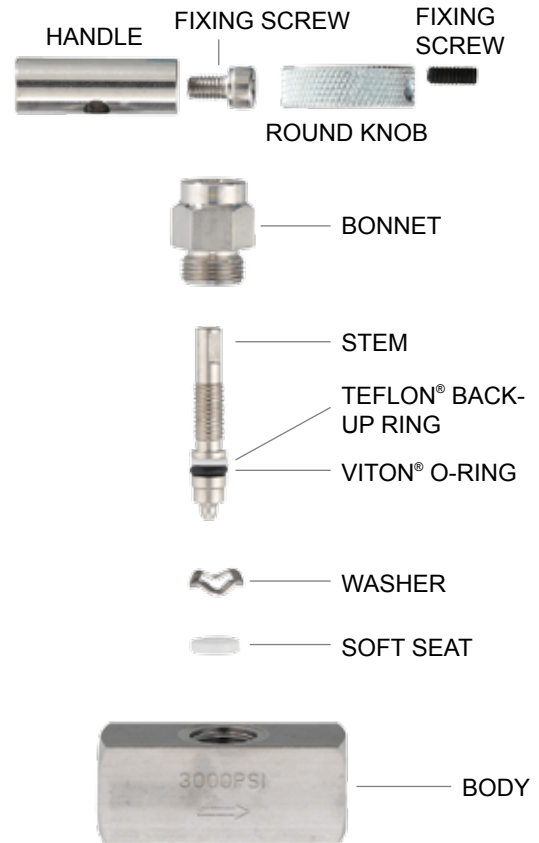
MSNV Series



Features

- Maximum working pressure:
3000 psi (207bar) at 100°F (38°C)
- Working temperature:
-22°F (-30°C) to 392°F (200°C)
- Mini valves facilitate safe, compact and economical installations.
- Valve seating is interchangeable between “Hard” or “Soft” without changing the bonnet assembly. When soft seat becomes damaged, it can be removed and leave a metal seated valve to extend service life.
- Orings below threads prevents lubricant washout, thread corrosion and keep thread from process contamination.
- Chrome plating of 316 SS stem on 316 SS valve to reduce galling or freezing of stem threads when similar metals mate. Carbon steel valves use 316 SS stem.
- Hydro test performed with pure water at 1.5 times of working pressure
- 100% factory test
- Material traceability

Material of Construction

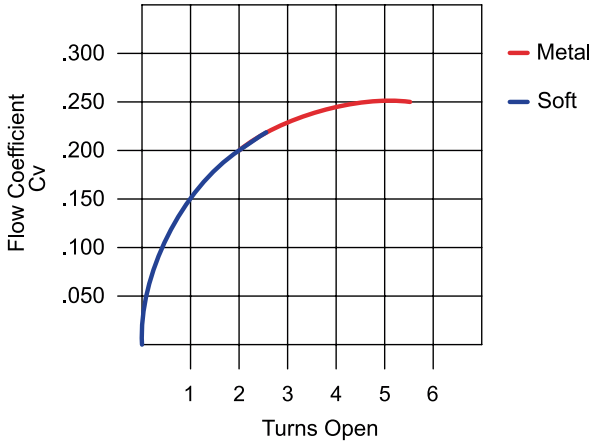


Component	Valve Body Material	
	316L S.S.	Carbon Steel
Body	316L S.S./A479	Carbon Steel/A108
Bonnet	316L S.S./A479	Carbon Steel/A108
Stem	316L S.S./A276	316L S.S./A276
Handle	303 S.S./A276	Carbon Steel/A108
Fixing Screw	302 S.S./A276	Zinc plated steel
O-Ring	Viton [®]	Viton [®]
Back-Up Ring	Teflon [®]	Teflon [®]
Washer	316 S.S./A479	316 S.S./A479
Soft Seat	Delrin [®]	Delrin [®]

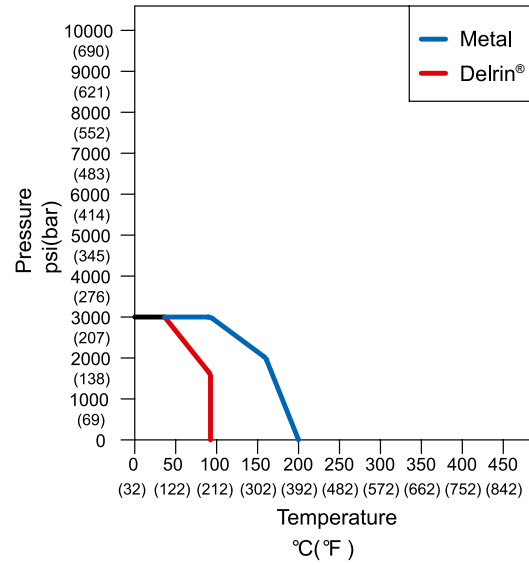
Note:

1. Hard seat valves installed with 303 SS Tee handles.
2. Soft seat valves with CS round handle.

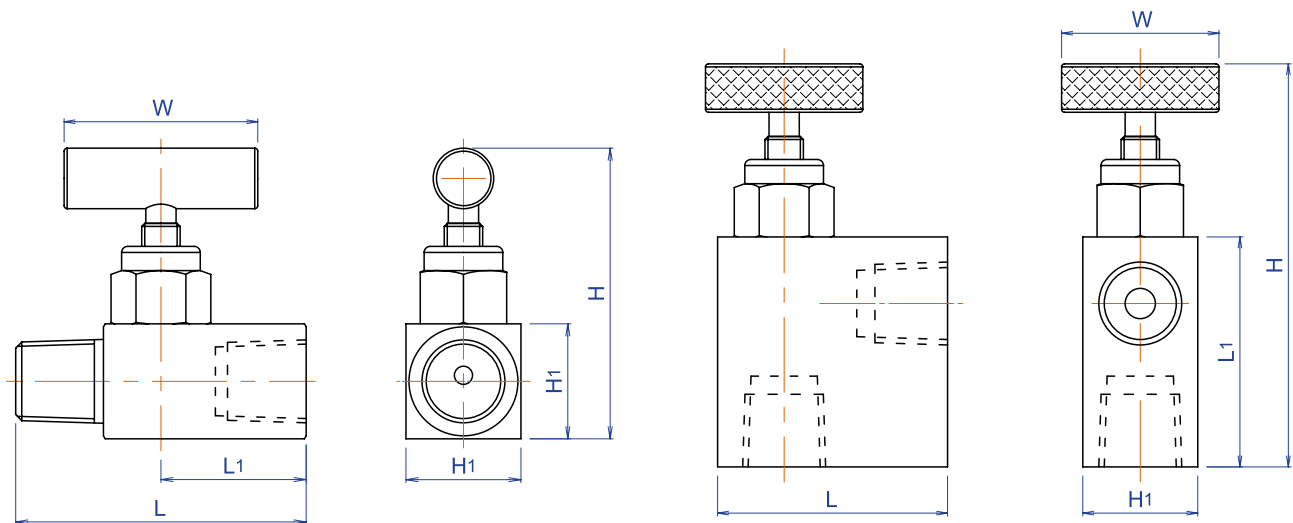
Flow Characteristics



Pressure Vs. Temperature



Dimensions



Ordering No.	End Connection		Orifice (bore)	Dimensions (mm)				
	Inlet	Outlet		L	L1	H	H1	W
MNV□4MF	1/4"NPT male	1/4"NPT female	3	48	24	48.5	19	32
MNV□4FF	1/4"NPT male	1/4"NPT female		48	24	48.5	19	32
MNV□4FF90	1/4"NPT female	1/4"NPT female		38	38	66.5	19	32
MSNV□4MF	1/4"NPT male	1/4"NPT female		48	24	47.5	19	26
MSNV□4FF	1/4"NPT female	1/4"NPT female		48	24	47.5	19	26
MSNV□4FF90	1/4"NPT female	1/4"NPT female		38	38	66.5	19	26

All dimensions shown are for reference and subject to change without prior notice.

Sizes listed are standard. Other sizes and end types are available upon request. Refer to ordering information.

Standard Material

Valve	Body	Bonnet	Stem	Packing	Seat
316L SS	316-A479	316-A479	Chrome Plating316-A276	Viton [®]	Delrin [®]
Carbon Steel	A108	A108	316-A276	Viton [®]	Delrin [®]

Ordering Information

MNV		S		4		MF			
Series		Body Material		Size		End Connection		Optional	
MNV	Hard Seat	S	316L S.S.	2	1/8"	M	Male	90	Angle pattern
MSNV	Soft Seat	C	Carbon Steel	4	1/4"	F	Female		

Note:

1. Viton[®], Teflon[®] and Delrin[®] are all registered trademarks of DuPont. Refer to chemical resistance guide and choose suitable elastomer for your application.
2. Carbon steel valves are yellow zinc plated to resist corrosion.

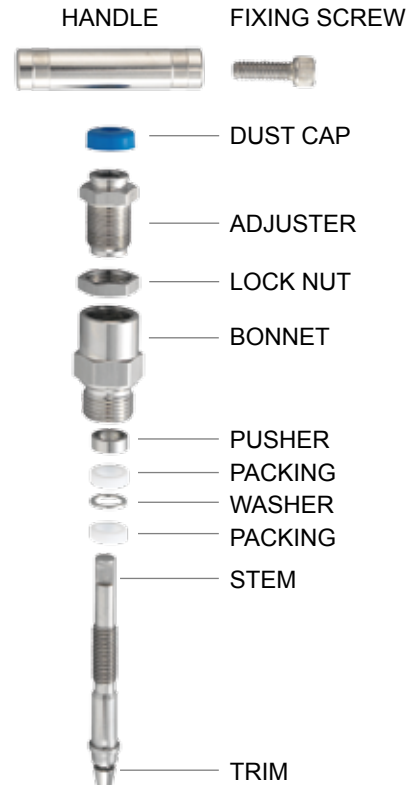
Multiport Gauge Valve MPGV Series



Features

- Maximum working pressure:
 - 6000 psi (414bar) at 100°F (38°C)
 - 10000 psi (690bar) at 100°F (38°C)
- Working temperature:
 - Metal Seat: -65°F (-54°C) to 464°F (240°C)
 - Delrin[®] Seat: -20°F (-28°C) to 200F (93°C)
- Multiport gauge valves allow the versatile positioning of gauges or pressure switches without requiring additional penetration of the main piping.
- Standard configuration has a male 1/2" NPT or 3/4" male inlet and three 1/2" NPT female outlet ports.
- Available with metal seats or soft seats operating in dirty service with repetitive bubble tight shutoff.
- Compact design requires minimum space for operation and installation and realizes cost savings to reduce the numbers of components and decrease possible leak points.
- TEFLON[®] packings can be adjusted to extend the valve life.
- Non rotating stem design to reduce the galling and provide excellent seal on seat
- Stem threads are rolled and lubricated to prevent galling and reduce operating torque.
- Sealing area below the threads protects from the contaminant by process and prevents lubricant washout.
- Safety back seating seal in fully open position to perform a secondary stem seal.
- Body to bonnet seal creates metal to metal constant and reliable compression.
- Bonnet lock pin prevents accidental removal while in service.
- Optional sour gas service conforms to NACE MR0175.
- Hydro test performed with pure water at 1.5 times of working pressure
- 100% factory test
- Material traceability

Material of Construction

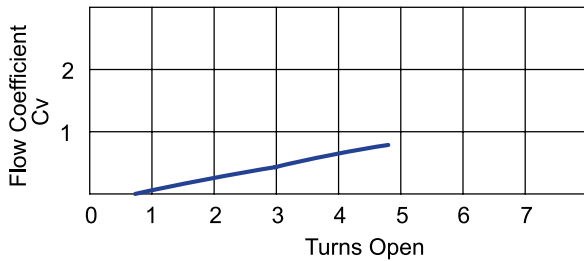


Component	Valve Body Material	
	316L S.S.	Carbon Steel
Body	316L S.S./A479	Carbon Steel/A108
Bonnet	316L S.S./A479	Carbon Steel/A108
Stem	316L S.S./A276	304 S.S./A276
Adjuster	316L S.S./A276	Carbon Steel/A108
Lock Nut	316L S.S./A276	Carbon Steel/A108
Handle	303 S.S./A276	Carbon Steel/A108
Fixing Screw	302 S.S.	Zinc plated steel
Packing	Teflon ^{®1}	Teflon ^{®1}
Washer	316 S.S./A276	316 S.S./A276
Pusher	316 S.S./A276	316 S.S./A276
Dust Cap	NBR	NBR
Lock Pin	303 S.S./A276	303 S.S./A276

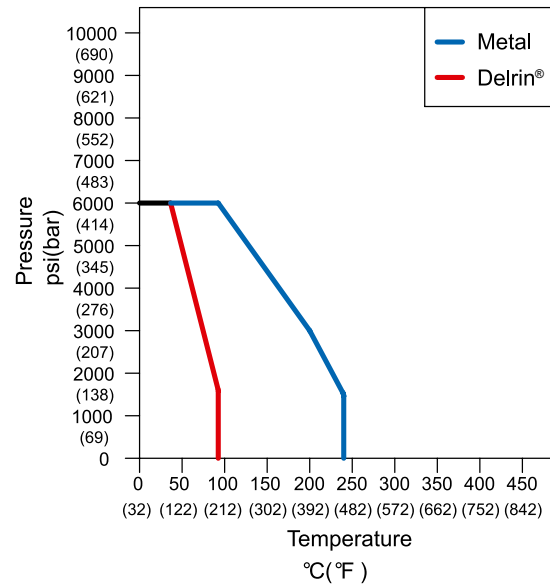
Note:

1. Packing is optional with graphite for high temperature to 450°C.
2. Delrin[®] soft seat limits working temperature to 93°C (200°F) maximum.
3. Optional accessories: plug and bleed valve.

Flow Characteristics



Pressure Vs. Temperature



Optional Accessories

Bleed valves can be used on gauge valves to bleed pressure before the removal of an instrument.

Bleed valves and plugs are purchased separately.

Bleed Valve



Component	Valve Body Material	
	316L S.S.	Carbon Steel
Body	316L S.S./A479	Carbon Steel/A108
Stem	316L S.S./A276	316L S.S./A276

Ordering No.	Size
BV□4	1/4" NPT male
BV□8	1/2" NPT male

Plugs



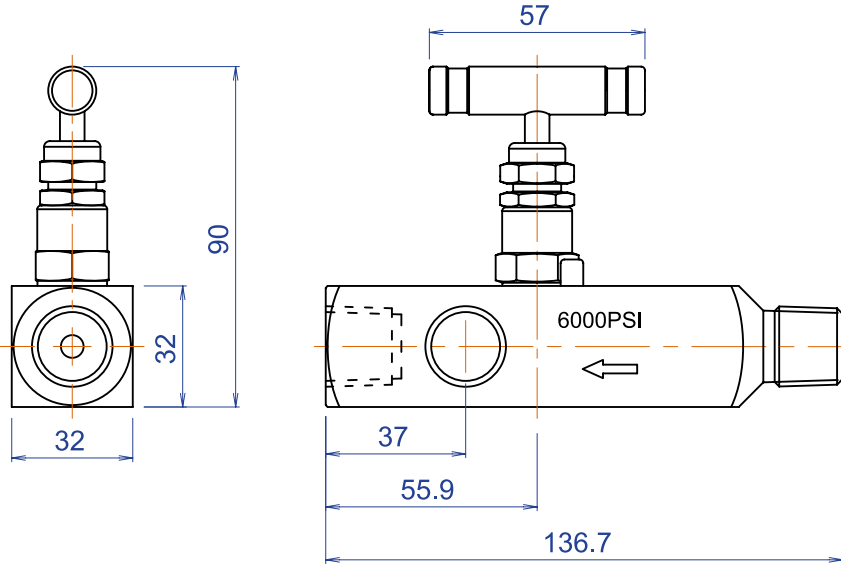
Component	Valve Body Material	
	316L S.S.	Carbon Steel
Body	316L S.S./A276	Carbon Steel/A108

Ordering No.	Size
PP□4	1/4" NPT male
PP□8	1/2" NPT male

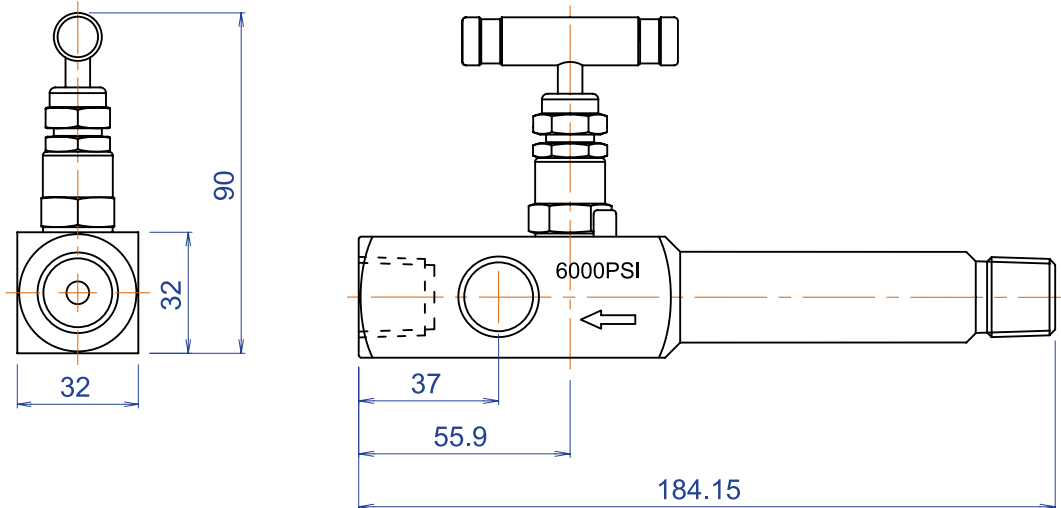


When venting out the pressure, open the valve slowly and direct the vent hole away from the operator for safety.

Dimensions



Ordering No.	End Connection			Orifice (bore)
	Inlet/Process	Outlet/Instrument	Test/Vent	
MPGV□8	1/2"NPT male	1/2"NPT female	1/2" NPT female	6
MPGV□128	3/4"NPT male	1/2"NPT female	1/2" NPT female	6



Ordering No.	End Connection			Orifice (bore)
	Inlet/Process	Outlet/Instrument	Test/Vent	
MPGV□8LB	1/2"NPT male	1/2"NPT female	1/2" NPT female	6
MPGV□128LB	3/4"NPT male	1/2"NPT female	1/2" NPT female	6

All dimensions shown are for reference and subject to change without prior notice.

Sizes listed are standard. Other sizes and end types are available upon request. Refer to ordering information.

Standard Material

Hard Seat

Valve	Body	Bonnet	Stem	Packing	Trim
316L SS	316-A479	316-A479	316-A276	Teflon [®]	316-A276
Carbon Steel	A108	A108	304-A276	Teflon [®]	304-A276

Soft Seat

Valve	Body	Bonnet	Stem	Packing	Seat
316L SS	316-A479	316-A479	316-A276	Teflon [®]	Delrin [®]
Carbon Steel	A108	A108	304-A276	Teflon [®]	Delrin [®]

Ordering Information

MPGV		S		12		8		LB	
Series		Body Material		Inlet		Outlet & Vent		Optional	
MPGV	Hard Seat	S	316L S.S.	8	1/2"	8	1/2"	LB	Long body
SMPGV	Soft Seat	C	Carbon Steel	12	3/4"			VT	Viton [®] O-rings with Teflon [®] backup rings
								G	Low Emission Graphite
								BSPT	BSPT thread

Note:

1. Viton[®], Teflon[®] and Delrin[®] are all registered trademarks of DuPont. Refer to chemical resistance guide and choose suitable elastomer for your application.
2. Carbon steel valves are yellow zinc plated to resist corrosion.

Valve Manifolds

Features

Metal Seated Bonnet Assembly

The metal-seated bonnet assembly is designed with a non rotating stem with a conical trim to provide a repetitive shutoff and extend service life. Stem threads are rolled and lubricated to prevent galling and reduce operating torque. Stem seal is standard with Teflon[®] packings that can be adjustable in service. Stem packings below the threads intend to protect from the contaminant by process and prevent lubricant washout. Safety back seating in fully open position provides a secondary stem seal. An NBR dust cover is capped to contain stem lubricant and keep from particles or contaminants. All bonnets are fitted with a locking pin to prevent accidental removal while in service.

10,000 psi bonnet assembly utilizes a reinforced stem with mirror finish in packing area to enable smooth stem operation and benefit packing life.

High temperature bonnet assembly is furnished with similarly designed stem and bonnet and uses low emission graphite packings serving to 450°C maximum. Bonnet is fitted with a larger size T-bar handle for easy operation.

Soft Seated Bonnet Assembly

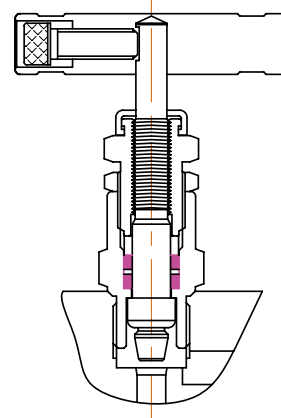
The soft-seated bonnet assembly has a one piece rotating stem and plug. The stem threads are rolled and lubricated to prevent galling and reduce operating torque. Stem seal is standard with Teflon[®] packings that can be adjustable in service. Stem packings below the threads intend to protect from the contaminant by process and prevents lubricant washout. Safety back seating in fully open position provides a secondary stem seal. An NBR dust cover is capped to contain stem lubricant and keep from particles or contaminants. All bonnets are fitted with a locking pin to prevent accidental removal while in service. Delrin[®] seat is standard.

Mini Soft-Seated Bonnet Assembly

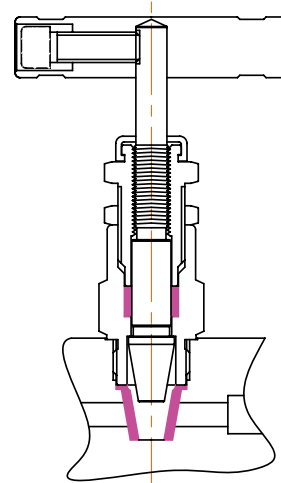
The mini soft-seated bonnet assembly is designed with a one-piece rotating stem having a "Vee" tip with a shoulder to be assembled as a metal or soft seated valve.

Bonnets on Manifolds

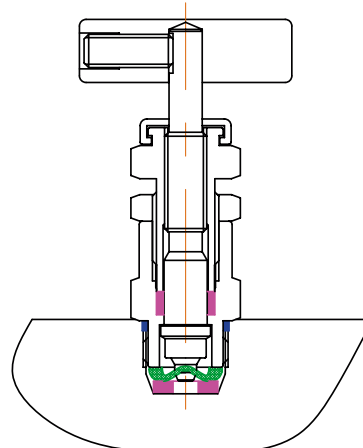
Metal Seated Bonnet



Soft Seated Bonnet



Mini Soft Seated Bonnet



Features

Valve manifolds are functionally installed to control, measure, isolate, equalize, calibrate, drain or differentiate the pressure of liquids and gases. Bonnets and dust covers are color coded to identify the functions of valves.

- BLUE : ISOLATE
- RED : VENT
- GREEN : EQUALIZE

2,3,5 valves in remote mounting (pipe to pipe) and direct mounting (pipe to flange & flange to flange) to the instrument on 54mm center.

Standard valve on manifolds has a 4.8mm orifice size, Cv 0.52 max.

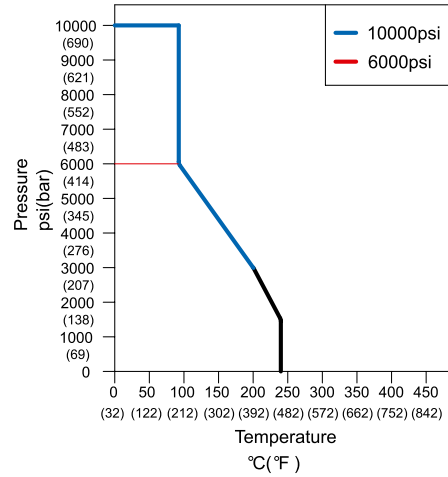
Specifications meet MSS-SP-105. Flange design meets the requirements of MSS SP-99.

Material selection for sour gas service conforming to NACE MR0175 is optional at request. Material of valve body is traceable.

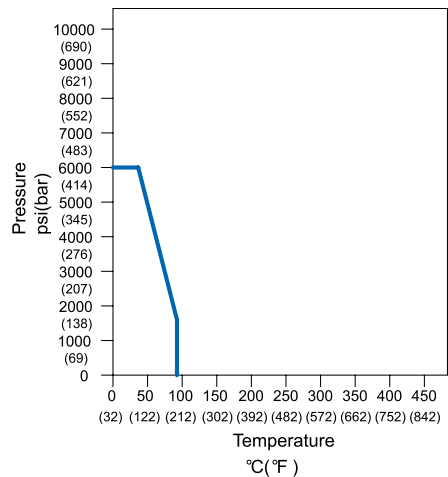
Seat and stem seal are hydro tested with pure water at 1.5 times of working pressure and perform to a requirement of no detectable leakage. Nitrogen test at 1000 psi for seat and stem seal is conducted with a maximum allowable leak rate of 0.1 std cm³/min.

Pressure Vs. Temperature

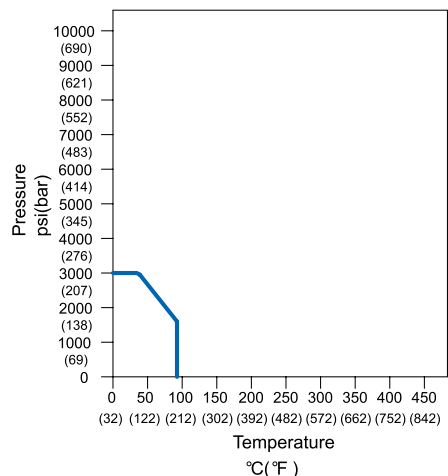
Metal-seated



Soft-seated



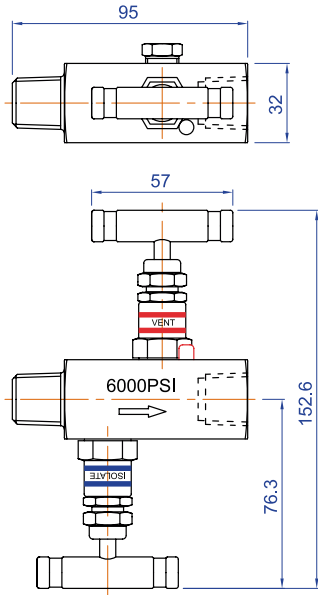
Mini Soft-seated



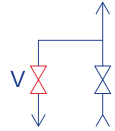
Graphs are based on 316 SS valves with Teflon[®] stem packings.

2 Valve Manifolds

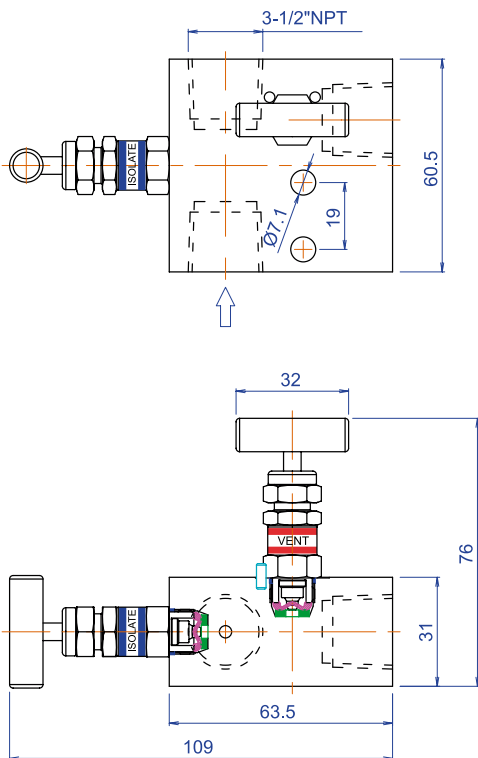
Ordering No.	End Connection			Valve Seat	Max. W.P. at 38°C (100°F)
	Inlet/Process	Outlet/Instrument	Vent/Test		
2VM01S4MF	1/4"NPT male	1/4"NPT female	1/4"NPT female	Metal	6000 psi
2VM01S4FF	1/4"NPT female	1/4"NPT female	1/4"NPT female	Metal	6000 psi
2VM01S8MF	1/2"NPT male	1/2"NPT female	1/4"NPT female	Metal	6000 psi
2VM01S8FF	1/2"NPT female	1/2"NPT female	1/4"NPT female	Metal	6000 psi



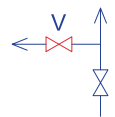
FLOW DIAGRAM



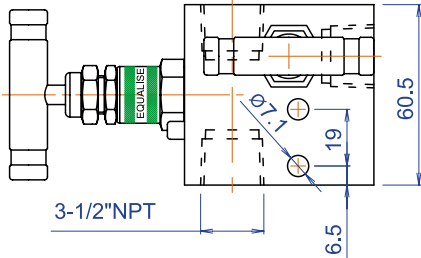
Ordering No.	End Connection			Valve Seat	Max. W.P. at 38°C (100°F)
	Inlet/Process	Outlet/Instrument	Vent/Test		
2VM02S	1/2"NPT female	1/2"NPT female	1/2"NPT female	Delrin [®]	3000 psi



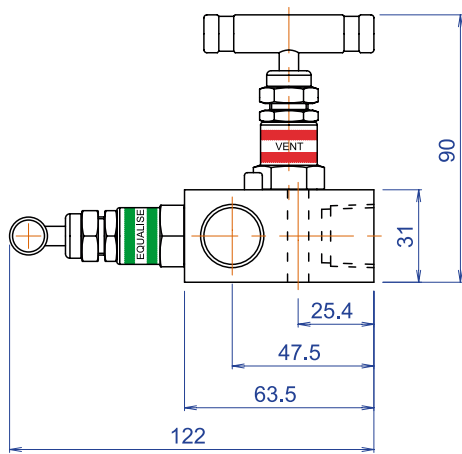
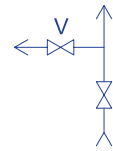
FLOW DIAGRAM



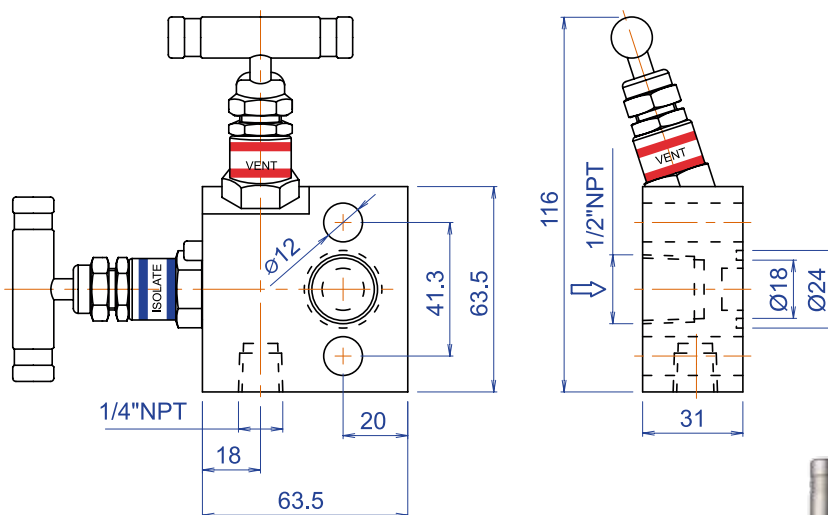
Ordering No.	End Connection			Valve Seat	Max. W.P. at 38°C (100°F)
	Inlet/Process	Outlet/Instrument	Vent/Test		
2VM02SH	1/2"NPT female	1/2"NPT female	1/2"NPT female	Metal	6000 psi



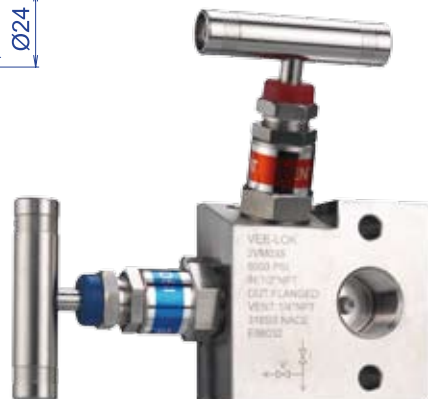
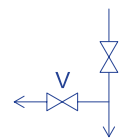
FLOW DIAGRAM



Ordering No.	End Connection			Valve Seat	Max. W.P. at 38°C (100°F)
	Inlet/Process	Outlet/Instrument	Vent/Test		
2VM03S	1/2"NPT female	Flange	1/4"NPT female	Metal	6000 psi

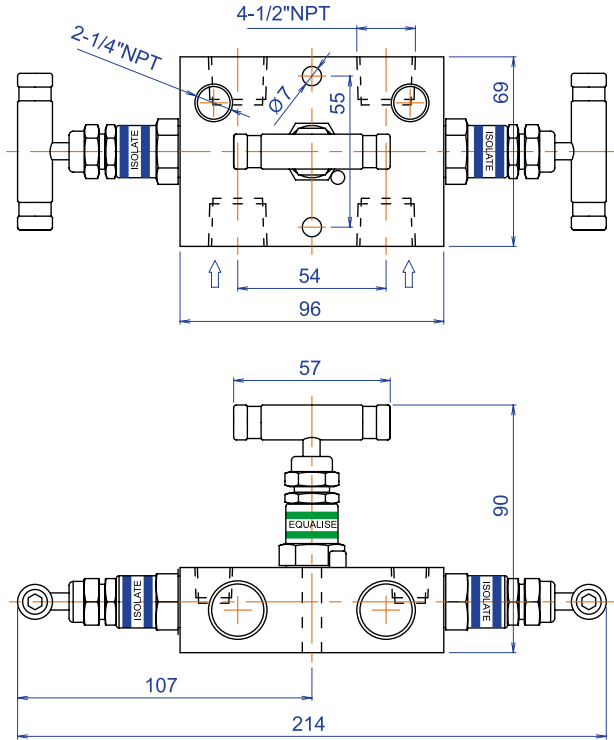


FLOW DIAGRAM

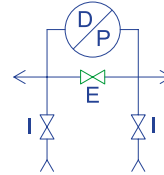


3 Valve Manifolds

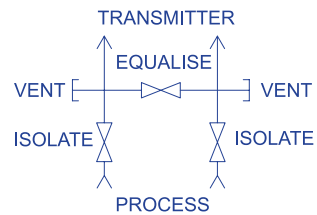
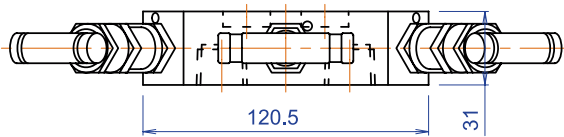
Ordering No.	End Connection			Valve Seat	Max. W.P. at 38°C (100°F)
	Inlet/Process	Outlet/Instrument	Vent/Test		
3VM01S	1/2"NPT female	1/2"NPT female	1/4"NPT female	Metal	6000 psi



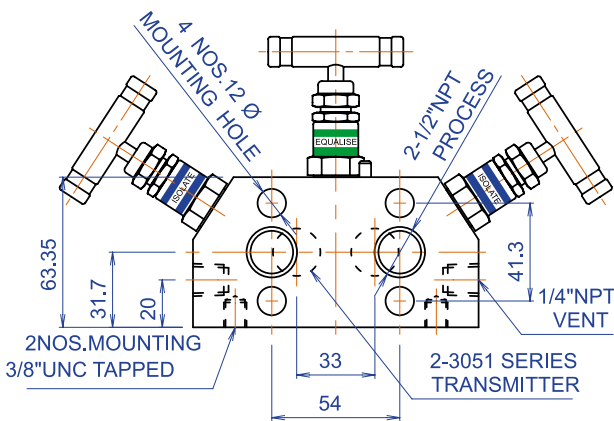
FLOW DIAGRAM



Ordering No.	End Connection			Valve Seat	Max. W.P. at 38°C (100°F)
	Inlet/Process	Outlet/Instrument	Vent/Test		
3VM02S	1/2"NPT female	For pressure transmitter model 3051	1/4"NPT female	Metal	6000 psi

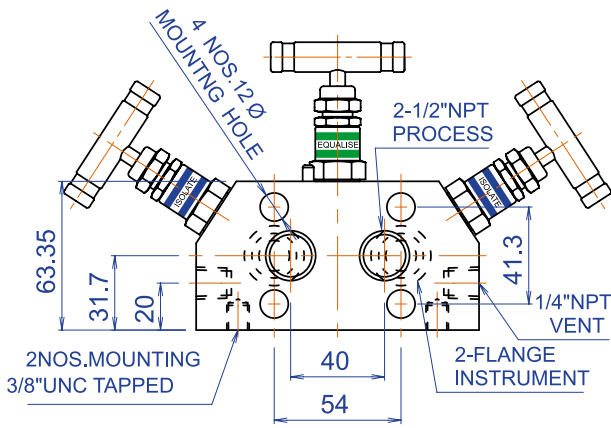
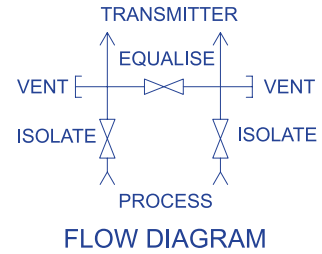
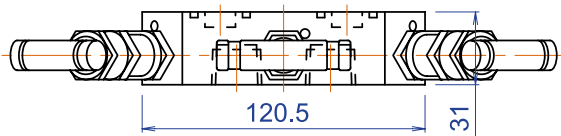


FLOW DIAGRAM



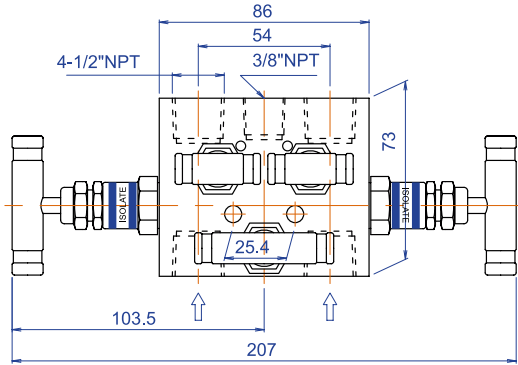
Ordering No.	End Connection			Valve Seat	Max. W.P. at 38°C (100°F)
	Inlet/Process	Outlet/Instrument	Vent/Test		
3VM03S	1/2"NPT female	Flange	1/4"NPT female	Metal	6000psi

Manifold is supplied with two Teflon[®] sealing rings on instrument ports.

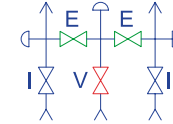


5 Valve Manifolds

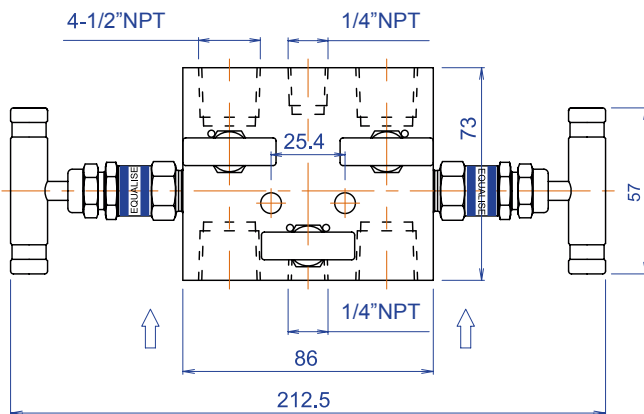
Ordering No.	End Connection			Valve Seat	Max. W.P. at 38°C (100°F)
	Inlet/Process	Outlet/Instrument	Vent/Test		
5VM01S	1/2"NPT female	1/2"NPT female	1/4"NPT female	Metal	6000psi



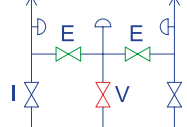
FLOW DIAGRAM



Ordering No.	End Connection			Valve Seat	Max. W.P. at 38°C (100°F)
	Inlet/Process	Outlet/Instrument	Vent/Test		
5VM02S	1/2"NPT female	1/2"NPT female	1/4"NPT female	Delrin [®]	6000psi

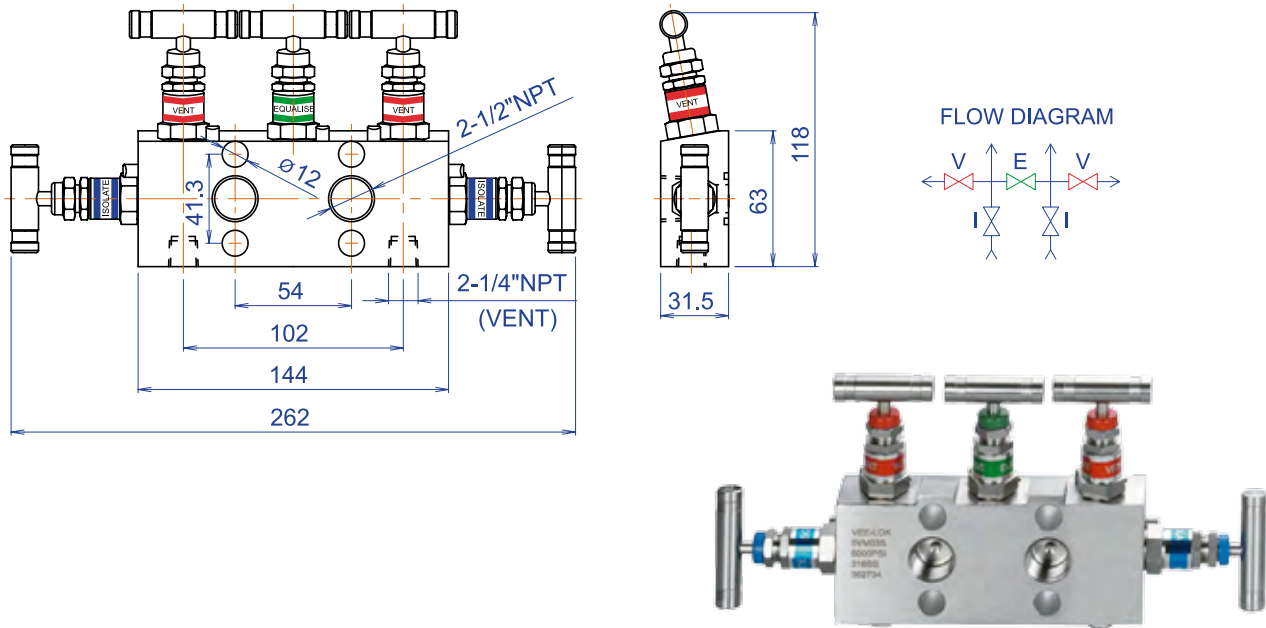


FLOW DIAGRAM

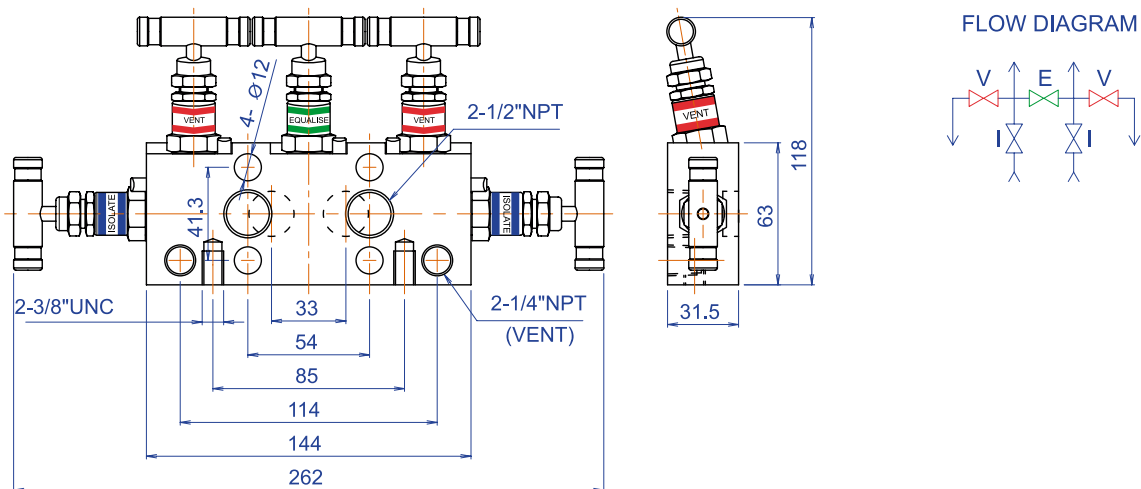


Ordering No.	End Connection			Valve Seat	Max. W.P. at 38°C (100°F)
	Inlet/Process	Outlet/Instrument	Vent/Test		
5VM03S	1/2"NPT female	Flange	1/4"NPT female	Metal	6000psi

Manifold is supplied with two Teflon[®] sealing rings on instrument ports.



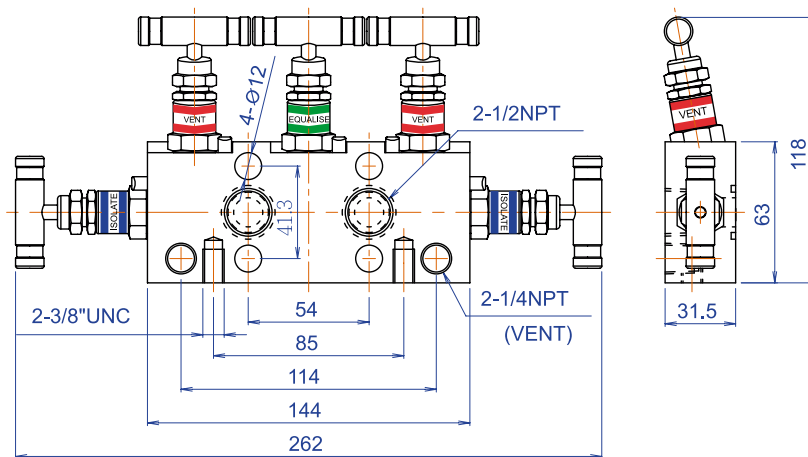
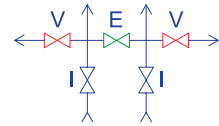
Ordering No.	End Connection			Valve Seat	Max. W.P. at 38°C (100°F)
	Inlet/Process	Outlet/Instrument	Vent/Test		
5VM05S	1/2"NPT female	For pressure transmitter model 3051	1/4"NPT female	Metal	6000psi



Ordering No.	End Connection			Valve Seat	Max. W.P. at 38°C (100°F)
	Inlet/Process	Outlet/Instrument	Vent/Test		
5VM06S	1/2"NPT female	Flange	1/4"NPT female	Metal	6000psi

Manifold is supplied with two Teflon[®] sealing rings on instrument ports.

FLOW DIAGRAM



Proportional Relief Valves

RV01 Series



Overview

Valves OPEN when system pressure reaches the set pressure to release system pressure. Valves CLOSE when the system pressure falls below the set pressure. Proportional relief valves open gradually as the pressure increases. There is no limit for relieving capacity. Therefore, valves should be selected carefully to conform to system requirements.

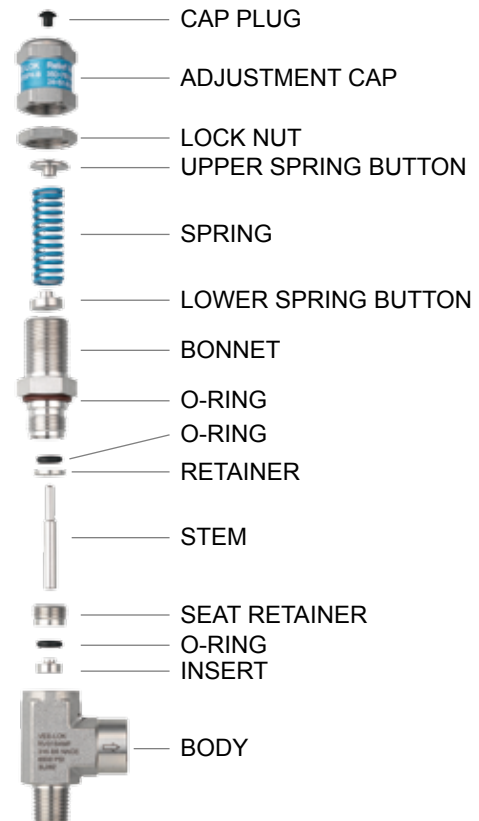
Features

- **Set Pressure:**
RV01 Series: color coded springs available for a wide range of set pressure
50 to 6000 psig @70°F (3.4 to 414 bar @20°C)
- **Orifice Size:**
3.60mm
- **Back Pressure:**
The effect of system back pressure is minimized by the design of these high pressure valves.
- **Variety of end connections**
- **Adjustable bonnet cap and adjustable set pressure**
- **Lock wire to secure cap to maintain set pressure adjustment.**
- **Label identifies set pressure range**



For valves not actuated for a period of time, initial relief pressure may be higher than the set pressure.

Materials of Construction

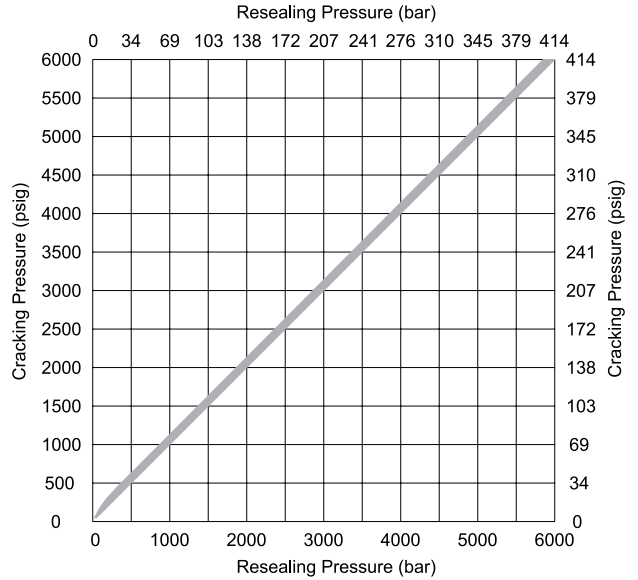


Component	Material Grade/ASTM specification
Cap Plug	Polypropylene
Adjustment Cap	316L SS/A479
Lock Nut	316L SS/A276
Upper Spring Button	316L SS/A276
Spring	17-7 PH SS/AMS 5678
Lower Spring Button	316 L SS/A276
Bonnet	316L SS/A479
O-Ring	Viton [®]
O-Ring	Viton [®]
Retainer	316L SS/A276
Stem	316L SS/A479
Seat Retainer	316L SS/A276
O-Ring	Viton [®]
Insert	316L SS/A276
Body	316L SS/A479

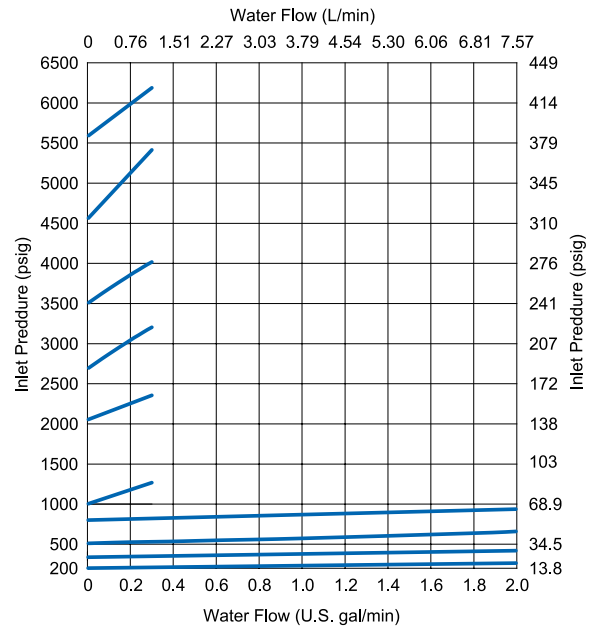
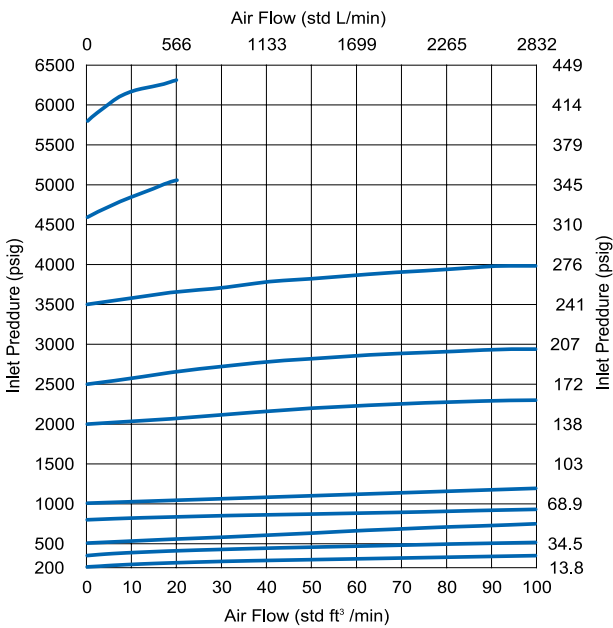
Set Pressure and Resealing Pressure

- Cracking pressure is the upstream pressure at which the first indication of flow occurs. The repeatability of the cracking pressure of each valve after initial relief is within $\pm 5\%$ at room temperature.
- Resealing pressure is the upstream pressure at which there is no indication of flow. Resealing pressure is always lower than set pressure.
- Back pressure: The pressure of the outlet of the valve. It increases the set pressure.

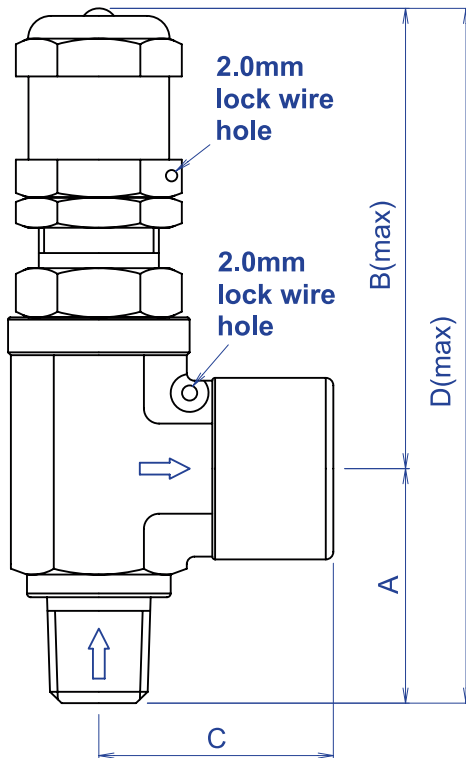
RV01 Series



Flow Characteristics RV01 Series



Dimensions



Ordering No.	End Connections		Dimensions, in. (mm)			
	Inlet	Outlet	A	B	C	D
RV01S4M4M	1/4"NPT male	1/4"NPT male	28.5	68	28.5	96
RV01S4M4F	1/4"NPT male	1/4"NPT female	28.5	68	27.5	96
RV01S4F4F	1/4"NPT female	1/4"NPT female	27.5	68	27.5	95
RV01S6M6M	3/8"NPT male	3/8"NPT male	28.5	68	28.5	96
RV01S4OD	1/4"O.D.	1/4"O.D.	28.5	68	28.5	96
RV01S6OD	3/8"O.D.	3/8"O.D.	28.5	68	28.5	96
RV01S8OD	1/2"O.D.	1/2"O.D.	28.5	68	28.5	96
RV01SM6OD	6mm O.D.	6mm O.D.	28.5	68	28.5	96
RV01SM8OD	8mm O.D.	8mm O.D.	28.5	68	28.5	96
RV01SM10OD	10mm O.D.	10mm O.D.	28.5	68	28.5	96
RV01SM12OD	12mm O.D.	12mm O.D.	28.5	68	28.5	96

All dimensions are for reference only and are subject to change without prior notice.

Optional Accessories

Spring Kits

Spring kits include spring, label, lock wire with seal, spring buttons and installation instructions.

Select a spring kit basic ordering number and add the spring designator for the desired set pressure range.

Example: RV01SPK-A

Ordering No.	Set Pressure Range		Spring Designator	Spring Color
	psig	bar		
RV01SPK-A	50 to 350	3.4 to 24	A	White
RV01SPK-B	350 to 750	24 to 51.6	B	Blue
RV01SPK-C	750 to 1500	51.6 to 103	C	Golden
RV01SPK-D	1500 to 2250	103 to 155	D	Black
RV01SPK-E	2250 to 3000	155 to 206	E	Green
RV01SPK-F	3000 to 4000	206 to 275	F	Yellow
RV01SPK-G	4000 to 5000	275 to 344	G	Brown
RV01SPK-H	5000 to 6000	344 to 413	H	Orang

Seal Materials

Viton is the standard seal materials and designated as basic ordering number as RV01SS.

Buna N, ethylene propylene and neoprene are available.

Ordering No.	O-ring Material	Temperature Ranges °F (°C)	Seal Designator
RV01SS	Viton [®] (standard)	25 to 250 (-4 to 121)	
RV01SS-BU	Buna N	0 to 250 (-17 to 121)	BU
RV01SS-NE	Neoprene	-10 to 3 00 (-23 to 148)	NE
RV01SS-EP	Ethylene Propylene	30 to 250 (-1 to 121)	EP

Factory-Set Valves

Valves are available with springs factory-set to a specified set pressure. Valves are set, tested, locked, and labeled with the set pressure.

To order, add-SET and a spring designator whose range includes the desired set pressure to the valve ordering number.

Example:

RV01S4M4F-SETC

Valve without spring installed

To order, do not specify spring designator on the ordering number.

Example:

RV01S4M4F

Valves with no spring are supplied without labels.

Factory Test

Valves are factory tested for cracking and resealing performance.



Proportional relief valves should never be used as code safety relief valves.



Safe Product Selection

When selecting a product, the total system design must be considered to ensure safe performance. Function, material compatibility, adequate ratings, proper installation, operation and maintenance are the responsibilities of the system designer and user.

Ordering Information

RV01	S		4		4F		BN		B	
Series	Body Material		Inlet		End Connection		Seal Material		Spring Kit Color	
RV01	S	316L S.S.	4	1/4"	M	Male		Viton [®]	A	White 50~350psig
			6	3/8"	F	Female	Bu	Buna N	B	Blue 350~750psig
			M6	6mm	OD	VEE-LOK twin ferrule tube fittings	NE	Neoprene	C	Golden 750~1500psig
			M10	10mm			EP	Ethylene propylene	D	Black 1500~2250psig
			M12	12mm					E	Green 2250~3000psig
									F	Yellow 3000~4000psig
									G	Brown 4000~5000psig
									H	Orange 5000~6000psig

CHECK VALVE

CV01 Series



Features

- Maximum working pressure:
6000psi (414 bar)
- Working temperature:
-23°C to 200°C (-10°F to 392°F)
- Cracking pressure:
1 to 25 psi
- Fixed cracking pressures

Pressure Vs. Temperature

Material		316 SS	
Temperature		Working Pressure	
°C	°F	Psi	Bar
38	100	6000	414
93	200	2500	172
121	250	1630	112
150	302	1545	106
200	392	1450	100

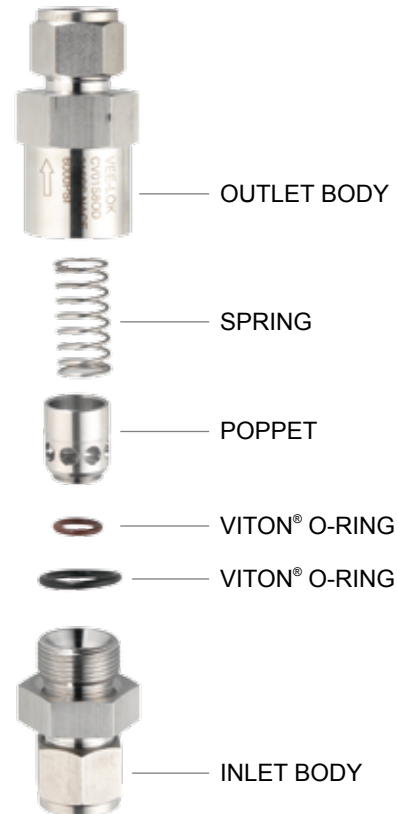
Cracking Pressure and Resealing Pressure

- Cracking pressure is the upstream pressure at which the first indication of flow occurs.
- Resealing pressure is the pressure at which there is no indication of flow.

CV01 Series

Nominal Cracking Pressure psi (bar)	Cracking Pressure Range psi (bar)	Resealing Pressure Range psi (bar)
1 (0.06)	Up to 4 (0.27)	Up to 6 (0.41) back pressure
5 (0.34)	3 to 9 (0.20 to 0.62)	Up to 2 (0.13) back pressure
10 (0.68)	7 to 15 (0.48 to 1.0)	3 (0.20) or higher upstream pressure
25 (1.7)	20 to 30 (1.3 to 2.0)	17 (1.1) or higher upstream pressure

Material of Construction

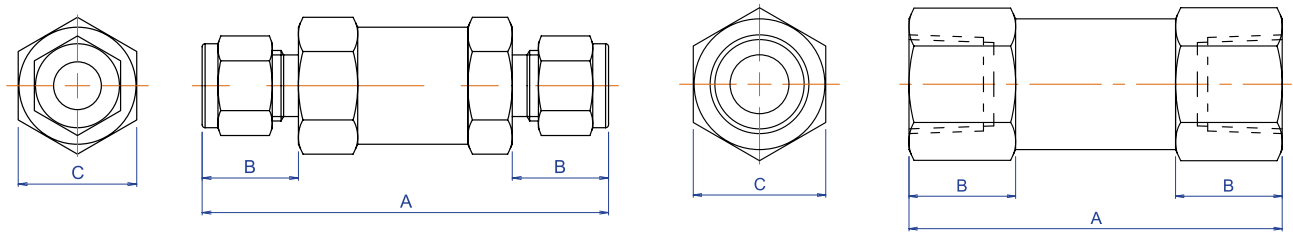


Component	Valve Body Material
	316 S.S.
Inlet Body	316L S.S./A479
O-Ring	VITON [®]
O-Ring	VITON [®]
Poppet	316L S.S./A479
Spring	302 S.S./A313
Outlet Body	316L S.S./A479



For valves not actuated for a period of time, initial cracking pressure may be higher than the set pressure.

Dimensions



Ordering No.	End Connection		Dimensions (mm)		
	Inlet	Outlet	A	B	C
CV01S2FF	1/8" NPT female	1/8" NPT female	55	14	17
CV01S4FF	1/4" NPT female	1/4" NPT female	62	16	22
CV01S6FF	3/8" NPT female	3/8" NPT female	72	20	24
CV01S8FF	1/2" NPT female	1/2" NPT female	80.5	23	28.58
CV01S12FF	3/4" NPT female	3/4" NPT female	85	22	41
CV01S16FF	1" NPT female	1" NPT female	97	23	47.6
CV01S2OD	1/8" O.D.	1/8" O.D.	65.5	15.5	17
CV01S4OD	1/4" O.D.	1/4" O.D.	73	17.5	20.63
CV01S6OD	3/8" O.D.	3/8" O.D.	80.5	19.5	24
CV01S8OD	1/2" O.D.	1/2" O.D.	90.5	22	28.58
CV01SM6OD	6mm O.D.	6mm O.D.	73	17.5	20.63
CV01SM12OD	12MM O.D.	12MM O.D.	90.5	22	28.58

All dimensions shown are for reference and subject to change without prior notice.

Ordering Information

CV01	S		4		FF	
Series	Body Material		Size		End Connection	
CV01	S	316L S.S.	2	1/8"	MF	NPT male-female
			4	1/4"	FF	NPT female-female
			6	3/8"	OD	VEE-LOK twin ferrule tube fittings
			8	1/2"		
			12	3/4"		
			16	1"		
			M6	6mm		
			M12	12mm		

High Pressure Ball Valve

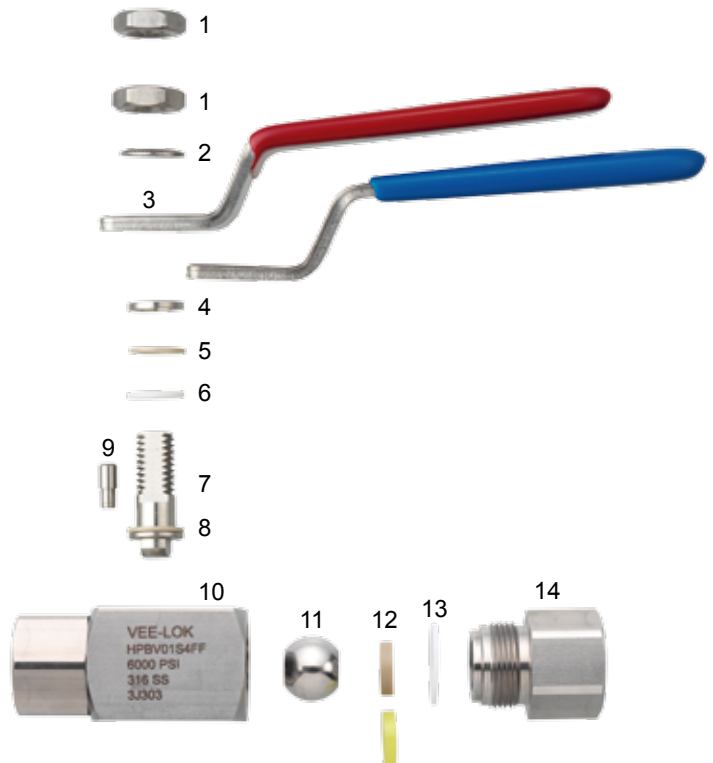
HPBV series



Features

- Maximum working pressure:
6000 psi (414bar) at 100°F (38°C)
- Working temperature:
-65°F (-54°C) to 392°F (200°C)
- 316 stainless steel handle covered with vinyl sleeve gives quarter turn rust-free operation.
- A robust pin is to create a positive stop.
- A one piece stem provides blowout proof design to maintain seal integrity at all pressure.
- Standard PEEK seat is tailored for high pressure.
- Devlon® V-API seat is available for option to provide lower operation torque and widen temperature ranges from -315°F (-193°C) to +392°F (200°C).
- Valves with PEEK seats are supplied with red sleeves on handles. Valves with Devlon® V-API seats have blue sleeves on handles for identification.
- Optional sour gas service conforms to NACE MR0175.
- Ball valves are hydrostatic tested at the full rated pressure and low pressure pneumatic at 70 psi.
- 100% factory test
- Material traceability

Material of Construction



No.	Component	Material Grade ASTM specification
1	Lock Nut	304 S.S.
2	Fixing Washer	304 S.S.
3	Handle	316 S.S./A276
4	Gland	316 S.S./A276
5	Back-up Ring	PEEK
6	Packing	Teflon®
7	Stem	316 S.S./A276
8	Gasket	PEEK
9	Pin	303 S.S.
10	Body	316 S.S./A479
11	Ball	316 S.S./A276
12	Seat	PEEK
13	Seal	Teflon®
14	End Connector	316 S.S./A479

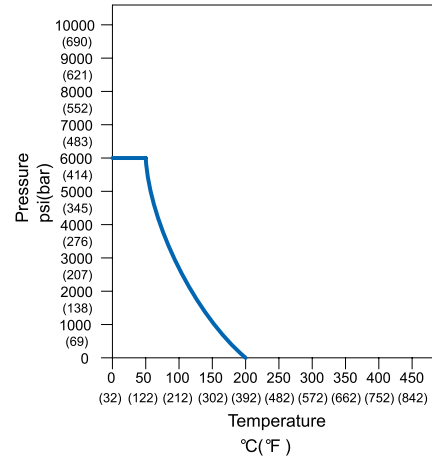
Note:

1. Devlon® V-API seat is optional. Ask sales representative for chemical resistance.
2. An optional blue sleeve identifies Devlon® V-API seat.

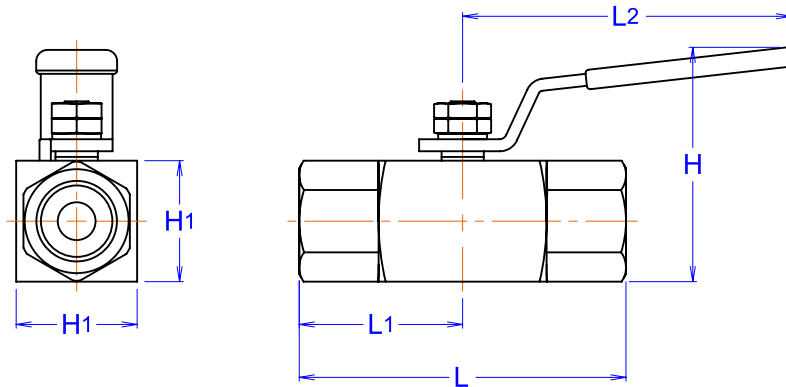
Operation

- Valves are designed to control fluids in full open or full closed position.
- Valves that have not been actuated for a period of time may require a higher initial actuation torque.
- Valve must be in open position during system test not to damage the valve seat.

Pressure Vs. Temperature



Dimensions



Ordering No.	End Connection		Bore	Dimensions (mm)				
	Inlet	Outlet		L	L1	H	H1	W
HPBVS4FF	1/4" NPT female	1/4" NPT female	9.52	62.4	31.2	61	32	87
HPBVS6FF	3/8" NPT female	3/8" NPT female	9.52	62.4	31.2	61	32	87
HPBVS8FF	1/2" NPT female	1/2" NPT female	9.52	86.5	43.25	61	32	87
HPBVS4OD	1/4" O.D.	1/4" O.D.	9.52	89.8	44.9	61	32	87
HPBVS6OD	3/8" O.D.	3/8" O.D.	9.52	93.4	46.7	61	32	87
HPBVS8OD	1/2" O.D.	1/2" O.D.	9.52	98.4	49.2	61	32	87

All dimensions shown are for reference and subject to change without prior notice.

Sizes listed are standard. Other sizes and end types are available upon request. Refer to ordering information.

Ordering Information

HPBV	S		4		FF	
Series	Body Material		Size		End Connection	
HPBV	S	316 S.S.	4	1/4"	FF	Female X Female
			6	3/8"	OD	VEE-LOK twin ferrule tube fittings
			8	1/2"		

Pressure Gauge Snubber

PGS series

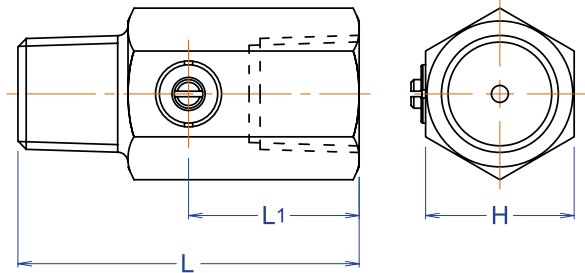


Features

- Maximum working pressure:
6000 psi (414bar) at 100°F (38°C)
- Working temperature:
25°F (-4°C) to 250°F (121°C)
- Utilized to protect pressure gauges from damage caused by pressure pulses and pressure peaks.
- Provided with an adjustable needle valve that enables the operator to restrict the flow when operating conditions may demand even when the snubber is in service.

Component	Material Grade
	ASTM specification
Body	316 S.S./A479
Bonnet	316 S.S./A276
Stem	316 S.S./A276
O-ring	Viton [®]

Material of Construction



Ordering No.	End Connection		Dimensions (mm)		
	Inlet	Outlet	L	L1	H
PGSS4MF	1/4"NPT male	1/4"NPT female	52	25	27
PGSS8MF	1/2"NPT male	1/2"NPT female	62	30	27

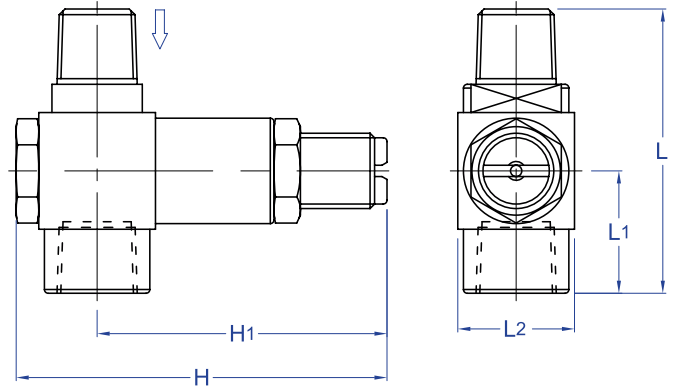
Adjustable Overload Protector
AOP series



Features

- Maximum working pressure:
6000 psi (414bar) at 100°F (38°C)
- Working temperature:
-13°F (-25°C) to 212°F (100°C)
- Used to protect pressure gauges and pressure switches from overpressure. When pressure exceeds the pre-set pressure, the device automatically shuts off the pressure to the instrument.
- Pressure adjustment can be done by manipulating an external adjusting screw and lock nut.

Material of Construction



Ordering No.	End Connection		Dimensions (mm)				
	Inlet	Outlet	L	L1	H	H1	L2
AOPS8	1/2"NPT male	1/2"NPT female	75.5	32.5	98.5	77	31



**PNEUMOIDRAULICA
ENGINEERING**

Via dell'Edilizia, 81/83 - 36100 Vicenza (Italy)
Tel. +39 0444 568014 - Fax +39 0444 569190
www.pneumoidraulica.com - info@pneumoidraulica.com