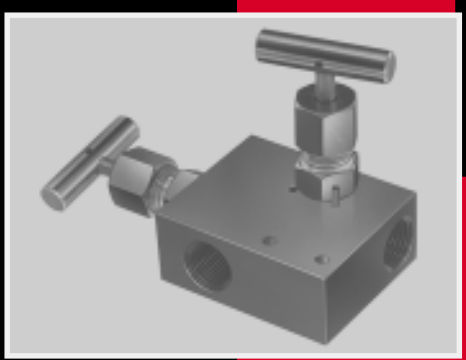


Instrument Valve Manifolds



In 1983, Richards Industries added the Hex Valve Division, a line of instrument manifolds, orifice block valves, gauge valves, needle valves and block and bleed valves to its line of industrial products. Hex Valve is known for supplying high quality products, with quick deliveries, to the petrochemical, chemical, petroleum, pulp & paper, food processing and primary metal industries. Hex Valve has a readily available selection of exotic alloys such as Hastelloy®, Monel®, Alloy 20, Titanium and Zirconium, as well as products that meet the requirements of ANSI B31.1, ANSI B31.3 and NACE MR-01-75.

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Bonnet Assembly Design

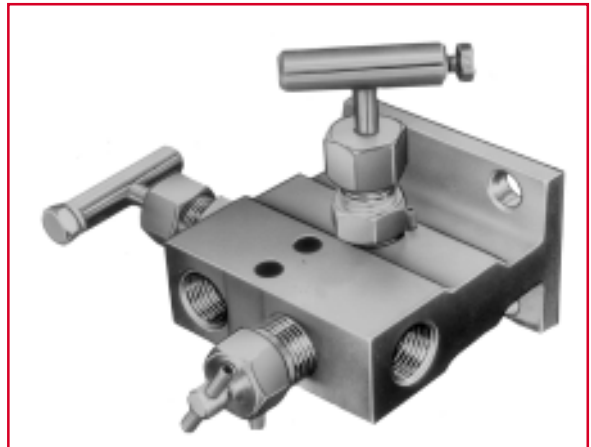
Hex Valve is the leader in the gauge, block and bleed instrument industry with its unique bonnet assembly design. Compared with competitive manufacturers' designs, Hex offers a time-tested, metal-to-metal body/bonnet seal with the largest stem diameter in the industry. Hex offers a proven Chevron design multipoint packing and Graphite/Grafoil/Graphite wiper ring arrangement.

Benefit	Feature	Advantage
Our stems will provide longer service life, particularly under adverse conditions	Minimum diameter of the Hex stem is larger than any competitor	Our stem is less likely to break under normal and excessive rotational torque
Hex valves are less likely to leak (emissions) than the competitors' standard design, minimizing emission auditing costs	Packing: four rings of Teflon Chevron for low to medium temperature. High temp packing is Grafoil packing sandwiched between two braided graphite rings	Our packing sets offer a better seal; Hex Valve standard packing sets meet EPA 1998 leak point standards.
Our stem tip design will last longer than competitors	Non-Rotating Tip Stem (NRT)	Offers tight, repeatable shutoff without the galling or cross-scoring that occurs on ball-type stems. The NRT conical stem tip stops rotating when it contacts the seat so further torque turns the stem, not the tip. Furthermore, the conical stem tip seats in the same place every time — the more often the valve is seated, the better mated it becomes with the seat. By contrast, the ball-type tip does not seat in the same place every time, as the ball tip has no consistent axis of rotation. Therefore, every time the valve seats, a new seat mark is scored on the ball tip, creating multiple potential leak paths.
Packing is adjustable, with less possibility of bonnet/body leaks	Metal-to-metal non-adjustable body-to-bonnet seal	Some bonnet designs have soft, elastomer or plastic seal rings increasing the possibility of stem leakage if excesses in temperature or pressure occur. Secondly, these other inferior designs require you to rotate the body-bonnet connection in order to access or adjust the packing. The Hex Valve body/bonnet connection is static and non-adjustable.

Two Valve Manifolds — Static Pressure

Hex static pressure manifolds combine block, vent, calibration or secondary instrument mounting into a single compact valve assembly. Choose from line-mounted or single flanged to match your application requirements.

- **HM50:** a single flanged static pressure manifold that incorporates a primary block valve, a bleed valve and a secondary shutoff valve into a single valve assembly. The secondary shutoff and bleed valve also allows the gauge and transmitter to be removed or bled without requiring additional valving. The HM50 provides separate instrument bleed and a calibration entry port to allow for fast, accessible zeroing and calibration of gauge pressure transmitters. With the installation of a tube fitting/cap or a quick connect coupling, zeroing and calibration can be performed without a wrench with a substantial reduction in the time required to perform this procedure. The HM50 features a threaded inlet and flanged outlet, allowing the transmitter to bolt directly to the manifold. This design results in quick installation and allows a technician to remove the transmitter for service without disassembling the associated piping.



- **HM59:** a line-mounted two valve manifold that functions as a shutoff and bleed valve for static pressure instrumentation. Compared to traditional piping methods that use an arrangement of nipples, pipes, elbows and tees, and gate valves, the HM59 Series will provide a low cost, easy-to-install unit that performs the same functions traditionally performed by a number of piping components. The use of the HM59 Series also reduces the number of threaded connections, resulting in fewer potential leak points.

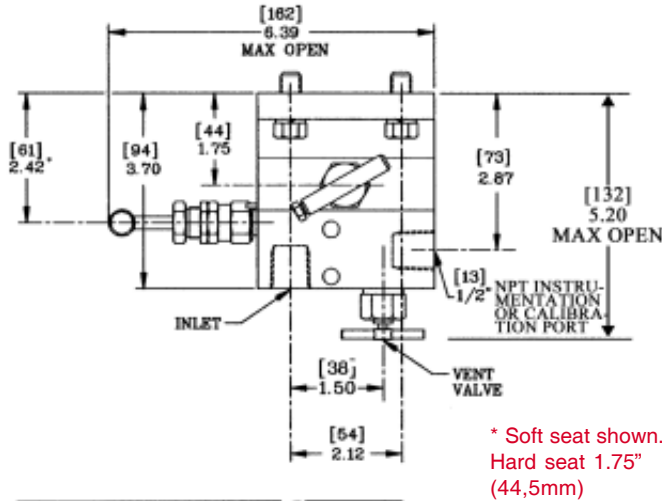


Two Valve Manifolds — Static Pressure

Dimensions

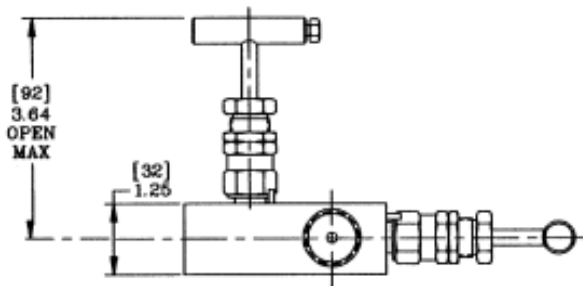
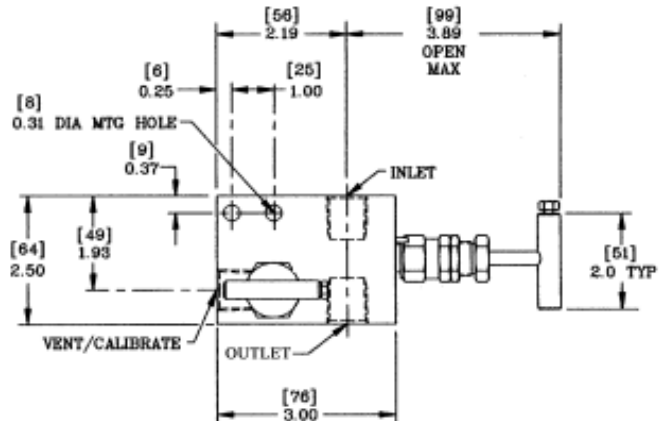
HM50

Orifice Size: 0.19"
Weight: 4.7#



HM59

Orifice Size: 0.15
Weight: 3.0#



Features and Benefits

■ Reduce Costs & Installation Time

Use Hex static pressure manifolds in place of the conventional arrangement of nipples, pipes, elbows, tees and gate valves for a lower cost, easier to install valve assembly.

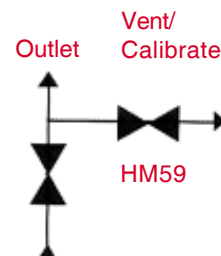
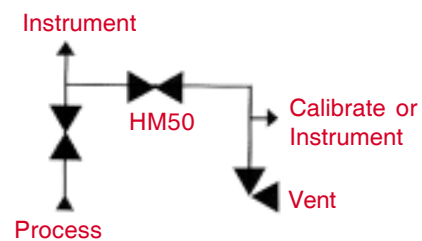
■ Non-Rotating Tip (NRT) Stem

Provides tight, repeatable shutoff without the galling or cross scoring that occurs on ball type stems.

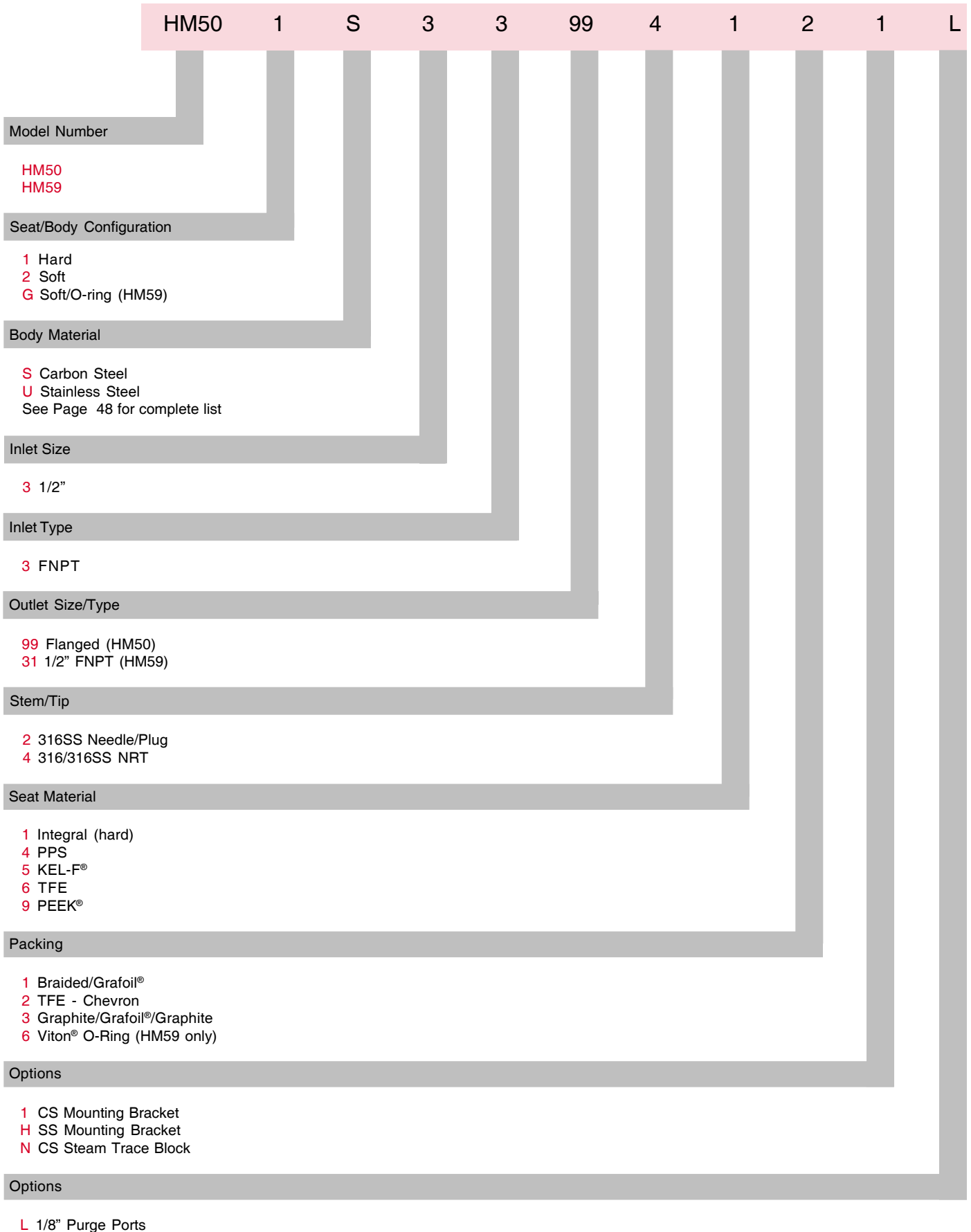
■ Fully Backseated Bonnets

Prevent accidental stem removal and blowout. Unique design minimizes emissions.

Flow Schematic

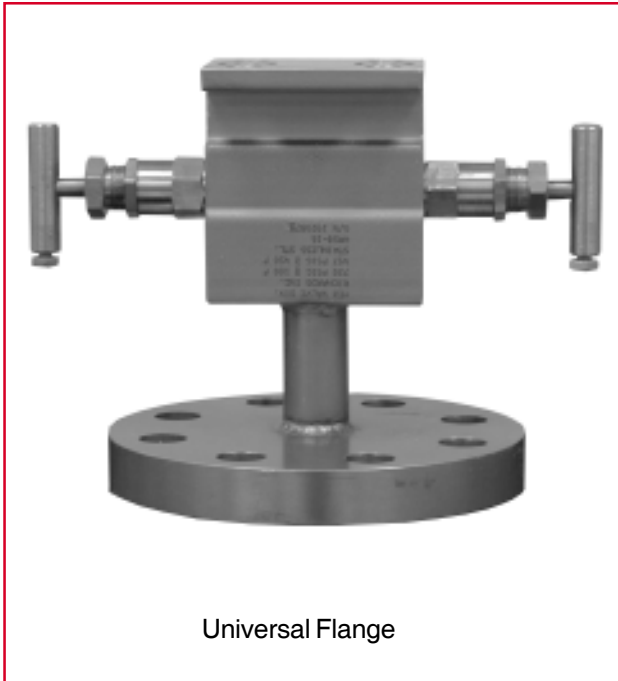


Model Numbers — Product Availability



Two Valve Manifolds — Level

HM58 Level Manifold: A simplified, lower cost alternative to D/P level installations, the HM58 allows the user to construct a level installation with minimal components. This method eliminates the need for tubing, fittings, instrument pipe stands and their associated installation costs.



Universal Flange



Standard Flange

Features and Benefits

■ Minimize Material & Installation Time

The HM58 eliminates the need for instrument pipe stands along with the tubing, fittings and problems associated with remote tubed installations.

■ Flexible Universal Design

With a universal design, the HM58 can be used for vented or closed tank, bottom or top side-mounted installations or for tank top mounted bubbler installations.

■ Purge Ports Available

Eliminates requirement for signal line tubing, tees or fittings for purge media. With optional purge ports, the purge media is tubed directly into the ports on the bottom of the manifold.

■ VOC Emissions Compliance

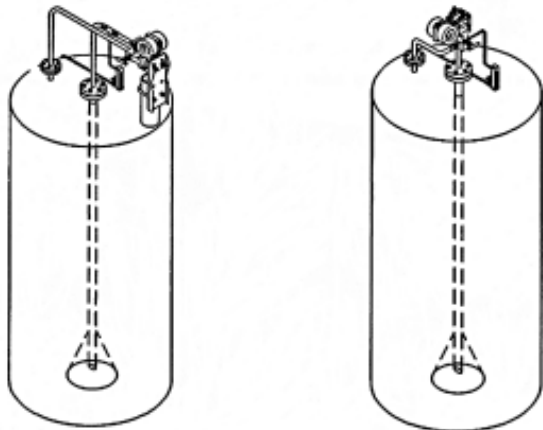
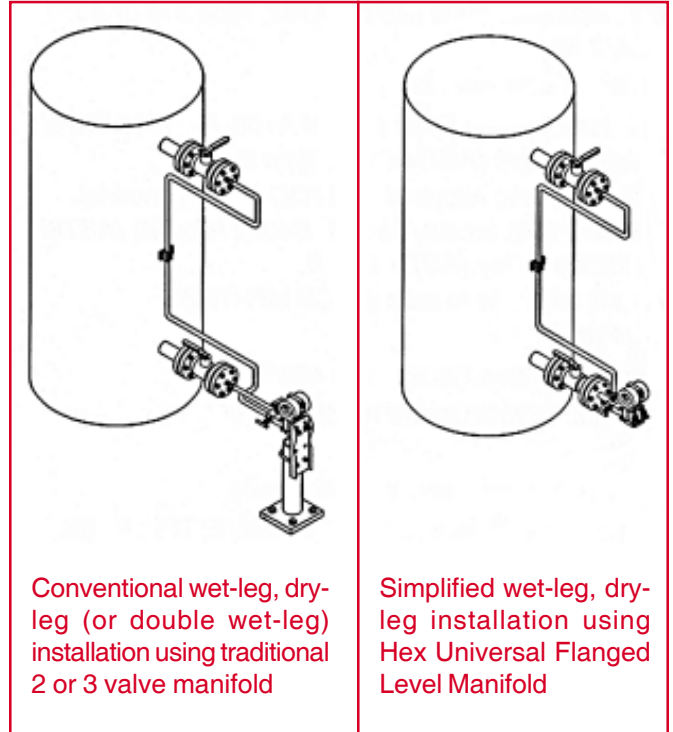
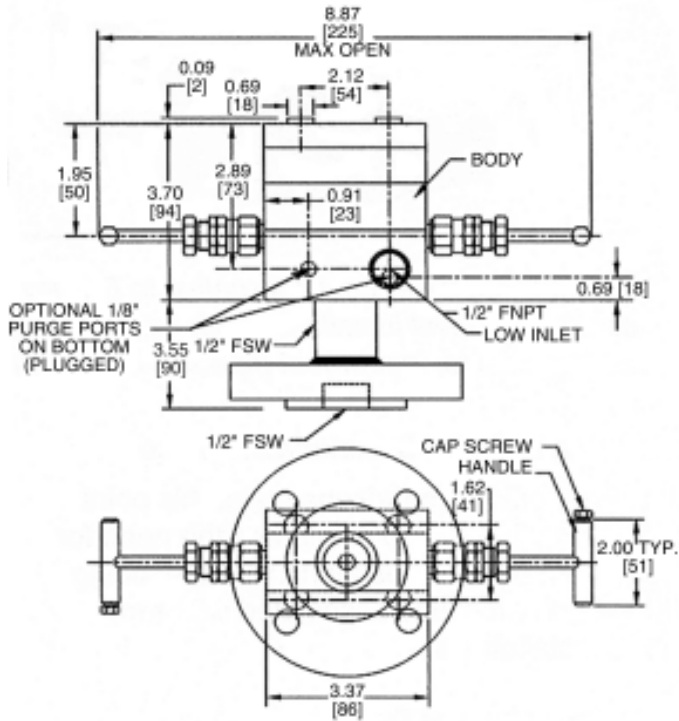
Standard bonnets with unique TFE-Chevron and high temperature 1625G/Grafoil®/1625G packing designs have been certified to meet and exceed the 100 ppm EPA 1998 Emission Standards.

Two Valve Manifolds — Level

Dimensions

HM58 with Flange Inlet

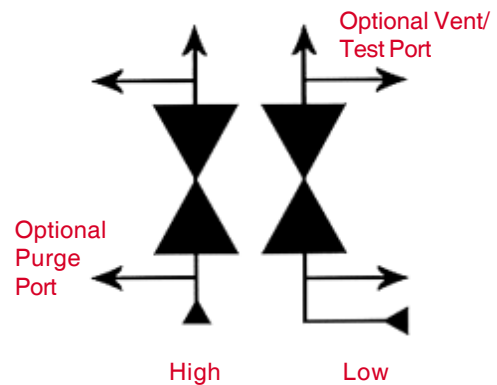
Orifice Size: 0.315"
Weight: 4.31#



Conventional tank-top bubbler installation using 3-valve manifold

Simplified tank-top bubbler installation using Hex Universal Flanged Level Manifold.

Flow Schematic



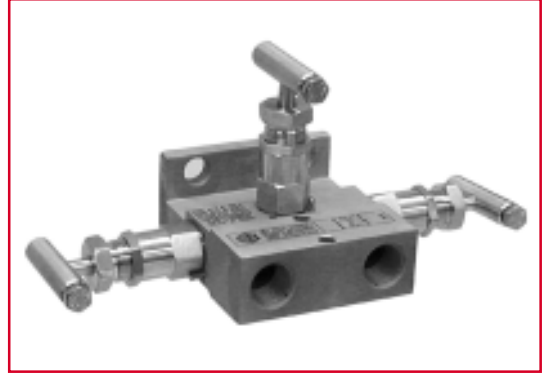
Model Numbers — Product Availability

	HM58	1	S	5	C	99	4	1	2	0	L
Model Number	HM58										
Seat/Body Configuration	1										
	<ul style="list-style-type: none"> 1 Hard 2 Soft 										
Body Material	S										
	<ul style="list-style-type: none"> S Carbon Steel U Stainless Steel See Page 48 for complete list										
Inlet Size	5										
	<ul style="list-style-type: none"> 3 1/2" (FNPT) 5 1" 6 1-1/2" 7 2" 8 3" 9 4" 										
Inlet Type	C										
	<ul style="list-style-type: none"> 3 FNPT C 150# ANSI RF Flange D 300# ANSI RF Flange 										
Outlet Size/Type	99										
	<ul style="list-style-type: none"> 31 1/2" FNPT 99 Flanged 										
Stem/Tip	4										
	<ul style="list-style-type: none"> 2 316 Needle/Plug 4 316/316SS NRT 										
Seat Material	1										
	<ul style="list-style-type: none"> 1 Integral (hard) 4 PPS 5 KEL-F® 6 TFE 9 PEEK® 										
Packing	2										
	<ul style="list-style-type: none"> 1 Braided/Graphoil® 2 TFE-Chevron 3 Graphite/Grafoil®/Graphite 										
Options	0										
	<ul style="list-style-type: none"> 0 No Selection 5 Safety Handle J SS Mounting Hardware (Transmitter) 										
Options	L										
	<ul style="list-style-type: none"> K 1/8" Purge Ports L 1/8" Purge Ports 										

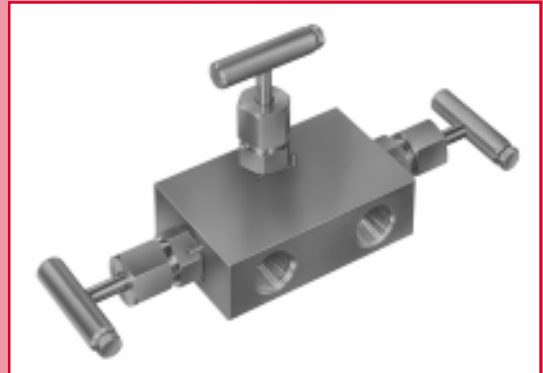
Three Valve Manifolds

Hex three valve manifolds perform the block, equalizing and vent requirements of differential pressure applications by providing one compact valve assembly.

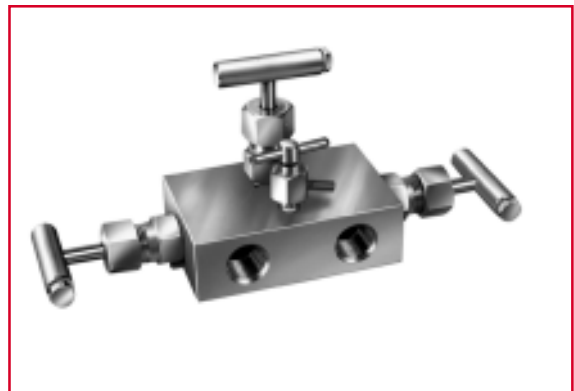
- **HM53 Single Flanged Three Valve Manifold:** The HM53 is a three valve instrument manifold used to perform the block, equalizing and vent requirements of a differential pressure transmitter applications. Of importance in this design is the inclusion of a single mounting flange that allows the transmitter to bolt directly to the manifold which eliminates the piping of excess tubing and nipples. A mounting kit may also be specified to allow for installation to a pipe stand.



- **HM45 In-Line Three Valve Manifold:** A general purpose instrument manifold designed for connecting differential pressure transmitters or flow records to impulse line tubing. Connections are 1/2" NPT on industry standard 2-1/8" center-to-center dimensions (models for 2-3/16" & 2-1/4" center-to-center dimensions are also available).

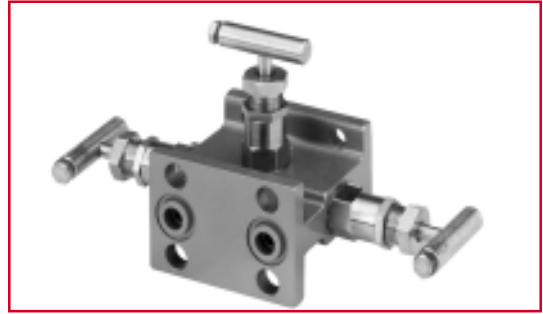


- **HM46 In-Line Three Valve Manifold with Vent:** The same design as the HM45, but also incorporating a vent valve allowing a technician to perform instrument bleed or blowdown procedures. Both models provide one compact valve assembly to perform the block and equalizing functions required to calibrate your instruments. They feature backseated, inside rising stem construction to prevent accidental stem removal and to isolate the packing from the process. For added protection, the bonnets are pinned to prevent inadvertent removal.



Three Valve Manifolds

- **HM54 Double Flanged Three Valve Manifold:** A double flanged instrument manifold that is used to perform the block, equalizing and vent requirements of differential pressure transmitters. For compact, close-coupled installations, the manifold bolts directly to the instrument and can be mated directly to the orifice flange using futbol flanges and short nipples. For remote installation, tube adaptors are used with the futbol, making the installation similar to the HM53.



Features and Benefits

- **VOC Emissions Compliance**

Unique TFE-Chevron and high temperature 1625G/ Grafoil/1625G packing designs have been certified to meet and exceed the 100 ppm EPA 1998 Emission standards.

- **Non-Rotating Tip (NRT) Stem**

Provides tight, repeatable shutoff without the galling or cross-scoring that occurs on ball type stems. The NRT conical stem tips stops rotating when it contacts the seat, so further torque turns the stem, but not the tip, preventing damage to the tip.

- **New Minimum Emission Flange**

New outlet flange face protrusion mates transmitter inlet cavity, providing a gasket ID barrier that offers maximum protections against gasket cold flow and fugitive emissions.

- **New Removable Bracket Option**

Specify our removable bracket option and mount the manifold, not the transmitter.

- **Fully Backseated Bonnets**

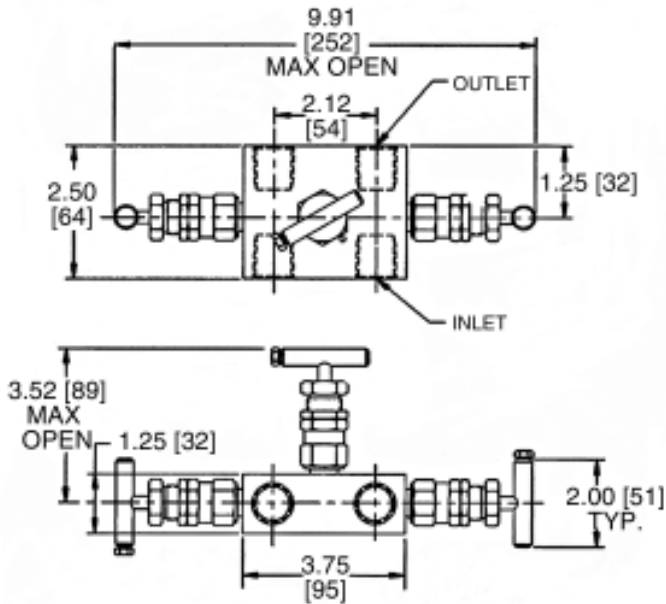
Prevent accidental stem removal and blowout. Unique design minimizes emissions while offering easy access to the packing.

Three Valve Manifolds

Dimensions

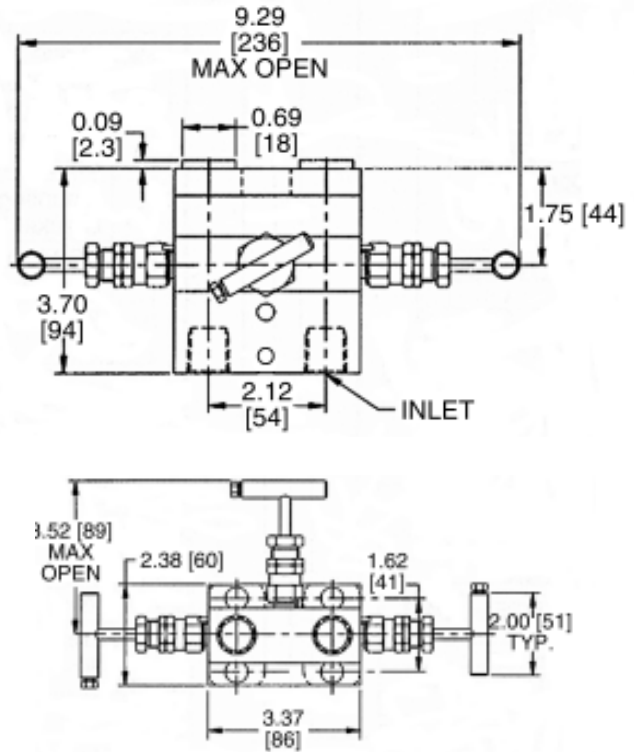
HM45/46

Weight: 4.5#



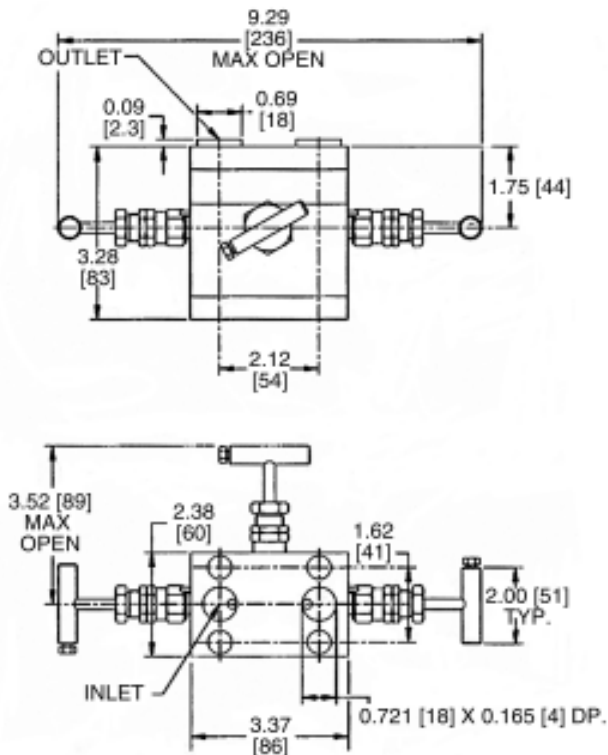
HM53

Weight: 4.85#

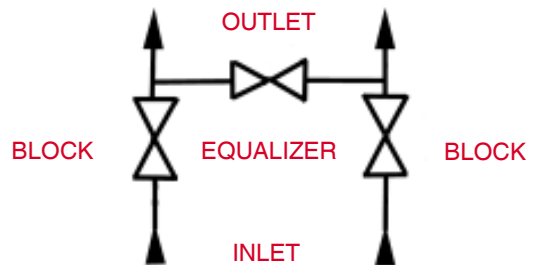


HM54

Weight: 4.9#



Flow Schematics



Notes:

- Orifice size: 0.19"; orifice on HM46 bleed valve: 0.127"; smallest passageway in HM45 is 0.158".
- Bonnet position will vary from hard seated valves to soft seated valves. If bonnet location is critical to your application, consult factory for precise location on your specific valve model.

Model Numbers — Product Availability

HM54 1 U 9 9 9 9 4 1 1 0 L

Model Number

HM45 HM53
HM46 HM54

Seat/Body Configuration

- 1 Hard
- 2 Soft
- 3 Soft/O-ring (HM45/46)

Body Material

- S Carbon Steel
- U Stainless Steel
- See Page 48 for complete list

Inlet Size

- 3 1/2"
- A 1/2" Single Ferrule Integral Tube Nut
- B 1/2" Double Ferrule Integral Tube Nut
- 9 Flanged (HM54 only)

Inlet Type

- 3 FNPT
- A Tube Nut
- 9 Flanged (HM53/54)

Outlet Size

- 3 1/2"
- A 1/2" Single Ferrule Integral Tube Nut
- B 1/2" Double Ferrule Integral Tube Nut
- 9 Flanged (HM53/54)

Outlet Type

- 1 FNPT
- 8 Tube Nut (HM45/46)
- 9 Flanged (HM53/54)

Stem/Tip

- 2 316 SS Needle/Plug
- 4 316/316SS NRT

Seat Material

- 1 Integral (hard)
- 4 PPS
- 5 KEL-F®
- 6 TFE
- 9 PEEK

Packing

- 1 Braided/Grafoil®
- 2 TFE-Chevron
- 3 Graphite/Grafoil®/Graphite
- 6 Viton® O-ring (HM59 only)

Options

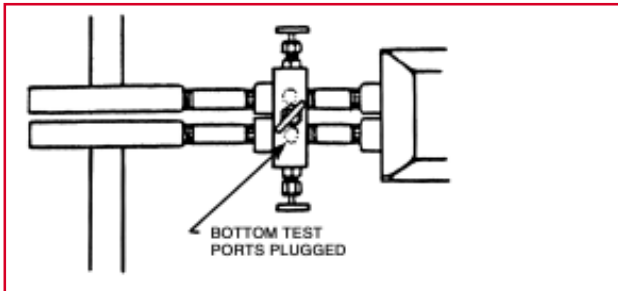
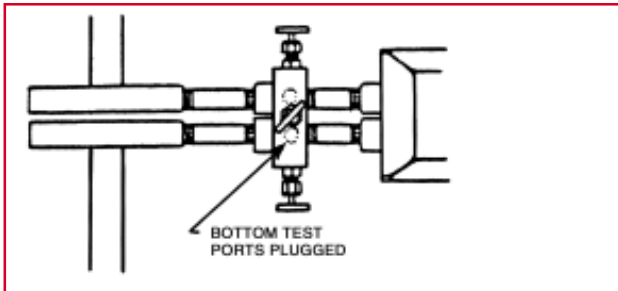
- 0 No Selection
- 1 CS Mounting Bracket Kit (HM53/54)
- 5 Safety Handle
- H SS Mounting Bracket Kit (HM53/54)
- J SS Mounting Hardware (HM53/54)

Options

- K 1/8" Test Ports
- L 1/8" Purge Ports

Three Valve Manifolds

- The **HM88** Three Valve Direct Mount Manifold is designed for close-coupled mounting of a differential pressure transmitter to an orifice flange. The rugged body of this heavy-duty manifold has two sets of outlets allowing versatility in mounting and convenient access for transmitter calibration.



Features and Benefits

- **Flexibility in Mounting**

An extra set of plugged outlet ports allows the transmitter to be mounted opposite (in-line with) the inlet flange, or 90° below the manifold as space dictates.

- **Test Ports**

The additional outlets are easily accessible for use as test ports. Transmitter calibration can be further simplified with the addition of needle valves.

- **Non-Rotating Tip (NRT) Stem**

Provides tight, repeatable shutoff without the galling or cross-scoring that occurs on ball type stems. Because the NRT conical stem tip stops rotating when it contacts the seat, further torque turns the stem, but not the tip, protecting the stem tip from damage.

- **Fully Packed Bonnets**

With four rings of Teflon®-Chevron packing for greater protection against fugitive emissions. Braided or Graphite packing available for higher temperature service.

- **Fully Backseated Bonnets**

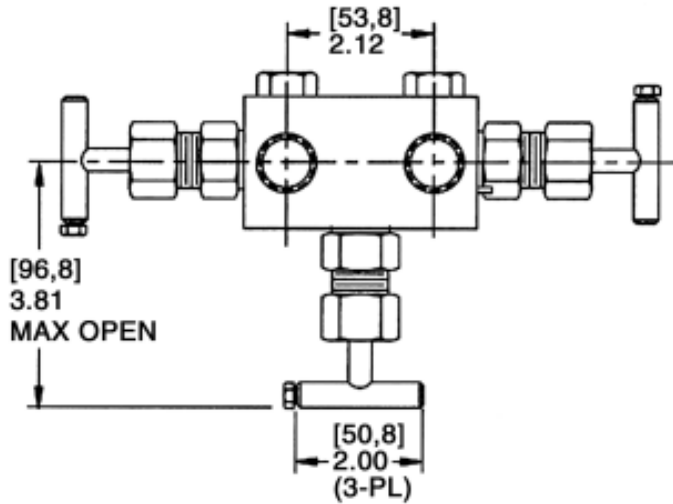
Prevent accidental stem removal and blowout. Unique design minimizes emissions while offering access to the packing.

Three Valve Manifolds

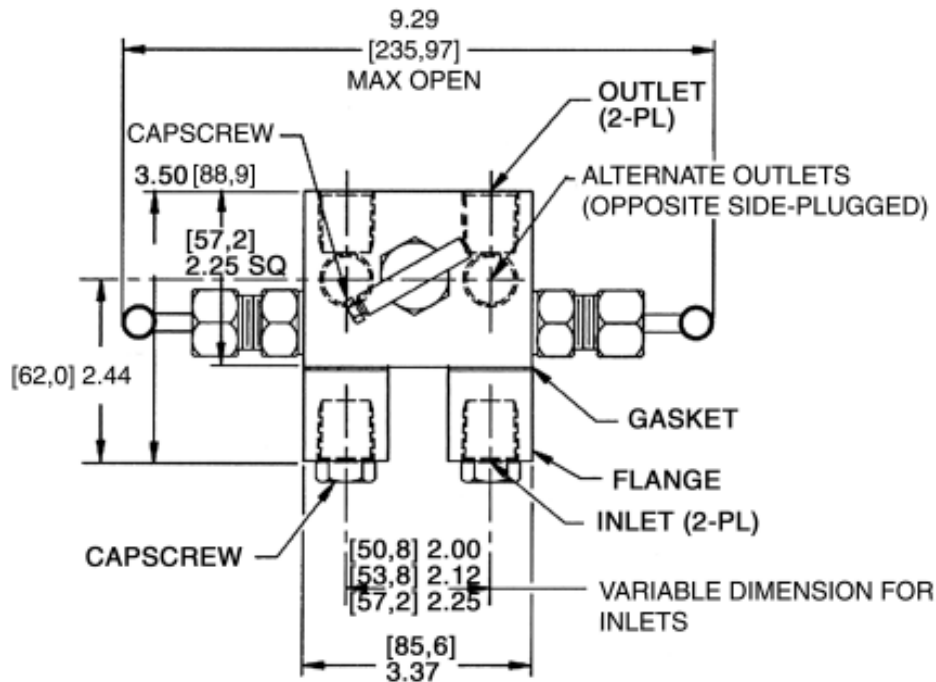
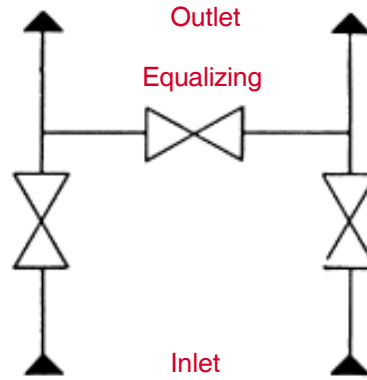
Dimensions

HM88

Weight: 7.5#
Orifice Size: 0.19" (shutoff); 0.16" (equalizer)



Flow Schematics



Model Numbers — Product Availability

	HM88	1	S	3	3	31	4	1	2
Model Number									
HM88									
Seat/Body Configuration									
1 Hard									
2 Soft									
Body Material									
S Carbon Steel									
U Stainless Steel									
See Page 48 for complete list									
Inlet Size									
3 1/2"									
Inlet Type									
3 FNPT									
Outlet Size/Type									
31 1/2" FNPT									
Stem/Tip									
2 316SS Needle/Plug									
4 316/316SS NRT									
Seat Material									
1 Integral Hard Seat									
4 PPS									
5 KEL-F®									
6 TFE									
9 PEEK®									
Packing									
1 Braided/Grafoil									
2 TFE-Chevron									
3 Graphite®									

Five Valve Manifolds — Blowdown

Blowdown Manifolds

For differential pressure applications, the Hex five valve blowdown manifold performs the block and equalizing functions of a standard three valve manifold and provides two additional block valves to be used for blowdown purposes. To blow down the impulse lines, the block valves on the manifold are closed, and the two blowdown valves are opened, allowing the impulse lines to be blown out through the ports on the lower side of the blowdown valves.

The design of the **HM56** allows the user to install just one compact assembly that eliminates eight nipples, four tees, and two shutoff valves that are required for a conventional blowdown valve installation. In addition, the HM56 incorporates a single flange, which enables the installer to mount the transmitter directly to the mounting flange, thereby eliminating the installation of even more tubing and nipples.

The **HM55** is identical to the HM56 except both the process and instrument connections are threaded for in-line installations.



HM56 Line-Mounted Blowdown Manifold

Features and Benefits

■ Reduce Costs & Installation Time

Use a five valve blowdown manifold in place of the conventional arrangement of nipples, pipes, elbows, tees, and gate valves for a single compact, low cost, easy-to-install valve assembly.

■ Your Choice of Mounting Options

Choose from line-mounted (HM55) or single flanged (HM56) to match your specific requirements. Also available with Rigid Mount option for ease of instrument mounting.

■ Non-Rotating Tip (NRT) Stem

Provides tight, repeatable shutoff without the galling or cross-scoring that occurs on ball type stems. Because the NRT conical stem tip stops rotating when it contacts the seat, further torque turns the stem, but not the tip, protecting the stem tip from damage.

■ Inside Rising Stem/Backseated Bonnets

Prevents accidental stem removal and isolates the packing from the process.

Five Valve Manifolds — Blowdown

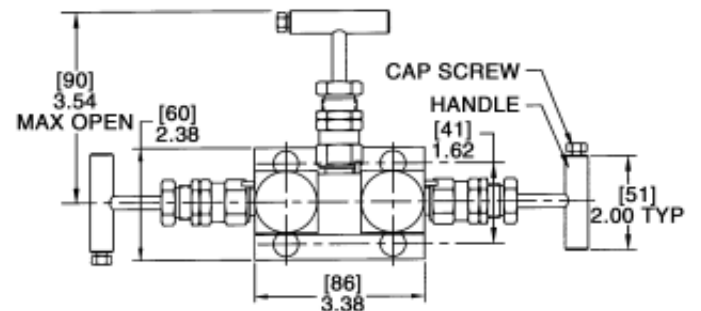
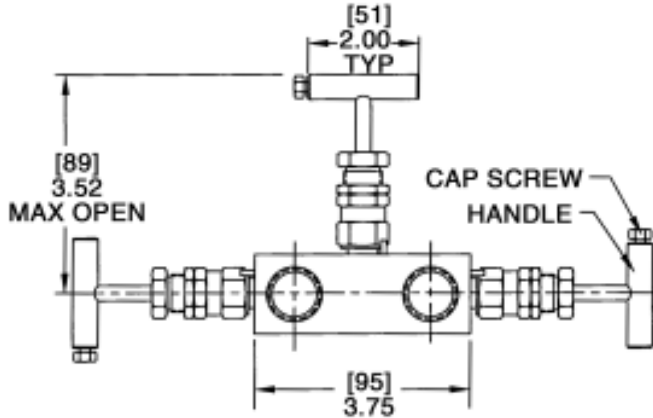
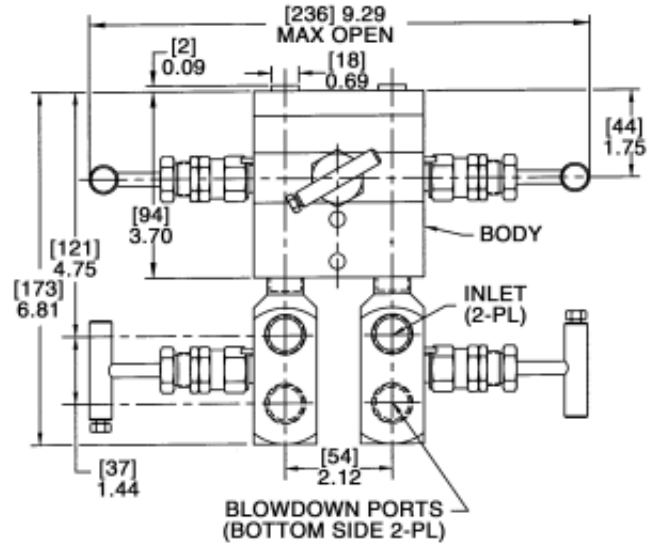
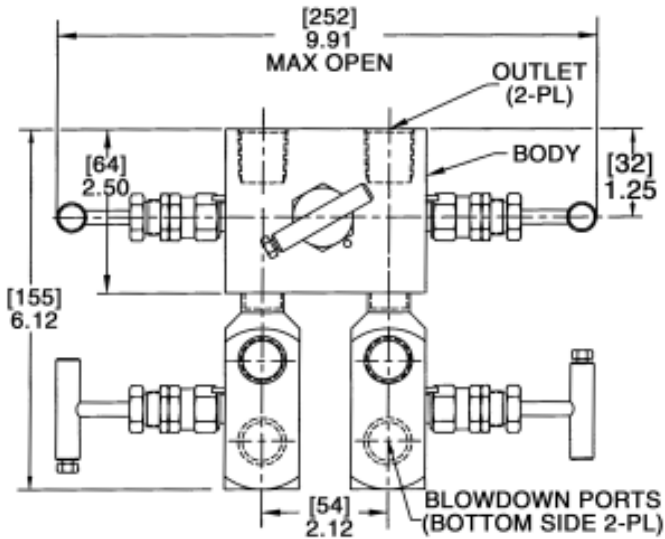
Dimensions

HM55

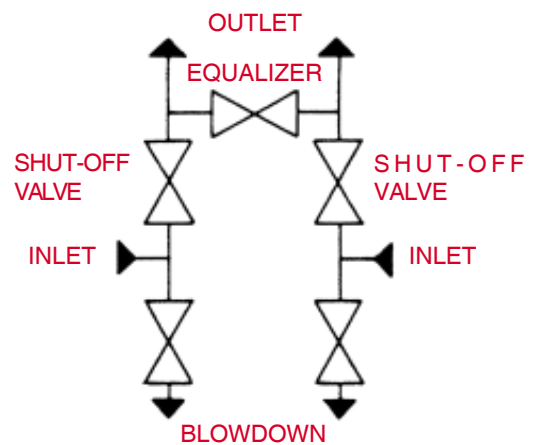
Weight: 8.0#

HM56

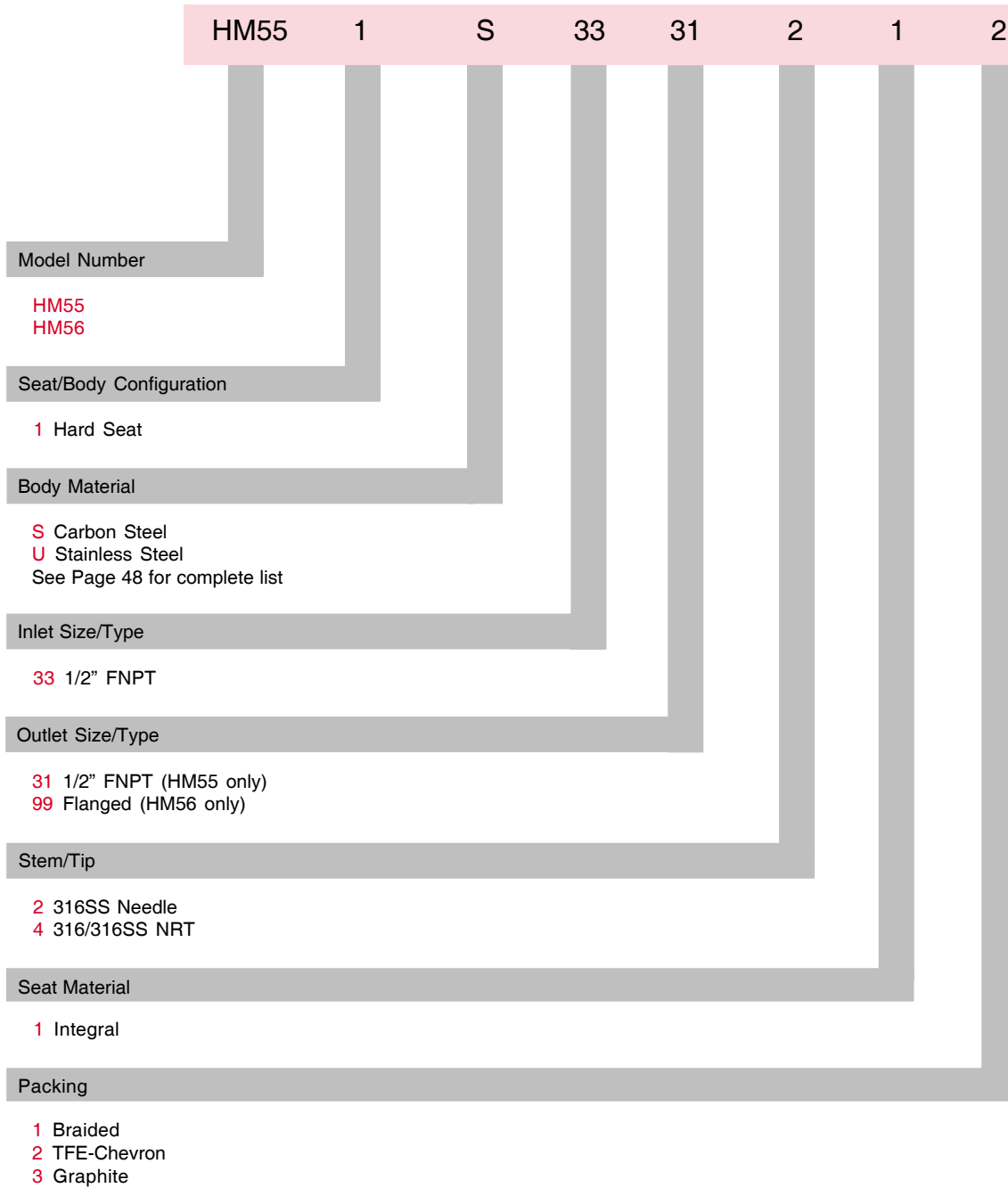
Weight: 8.25#



Flow Schematic



Model Numbers — Product Availability



Five Valve Manifolds — Metering

Metering Manifolds

The **HM57** Five Valve Manifold combines two shutoff valves, two equalizing valves, and a vent/calibration valve into a single, compact assembly. The double equalizing arrangement insures against measurement error that can occur from equalizer leakage between high and low pressure connections, making the HM57 ideal for custody transfer applications.

When expensive liquid or gas changes ownership, precise measurement is critical. The smallest leakage from the high side of the manifold to the low side of the manifold can lead to lost revenue due to inaccurate measurement. Therefore, when dealing with custody transfer or other critical flows, a five valve manifold should be used to achieve more accurate measurement. The number of threaded connections is greatly reduced when using the HM57 instead of needle valves, piping and tees, and, with fewer connections, there are fewer potential leak points and reduced risk of fugitive emissions.

The **HM77** is similar to the HM57 except for the use of a larger 3/8" bore and with soft seats. This larger bore reduces pulsation induced spikes to the transmitter. Note: ratings are 1500 psig @ 100°F and 50 psig @ 200°F.

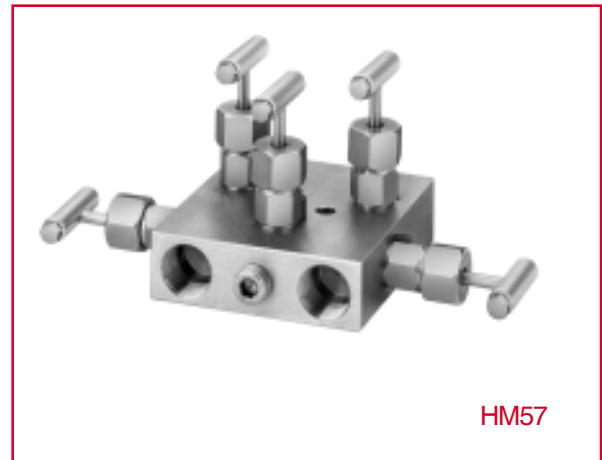
Features and Benefits

■ Reduce Costs & Installation Time

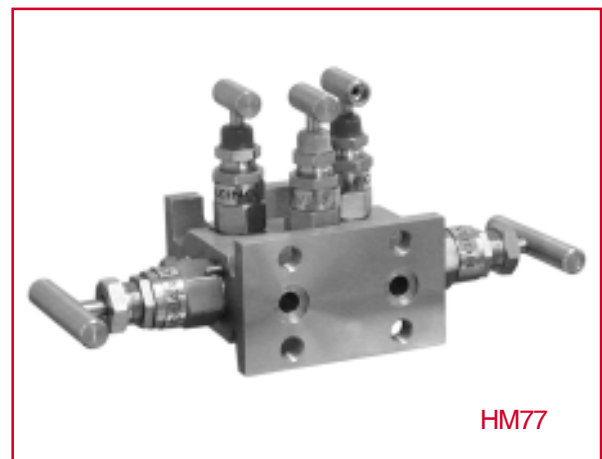
Using Hex five valve manifolds in place of the conventional arrangement of five individual needle valves, piping and tees provides a streamlined, low cost, easy to install assembly.

■ Integral Vent/Calibration Valve

Shutoff, equalizing and vent/calibration functions are provided in one compact valve body weighing only 3.75 pounds (1,7 Kg). Technicians can perform zeroing and calibration procedures at the manifold location with a minimum of tools.



HM57



HM77

■ Fewer Leak Points

The number of threaded connections are greatly reduced when using the HM57/HM77 in lieu of needle valves, piping and tees. With fewer connections, there are fewer potential leak points and reduced risk of fugitive emissions.

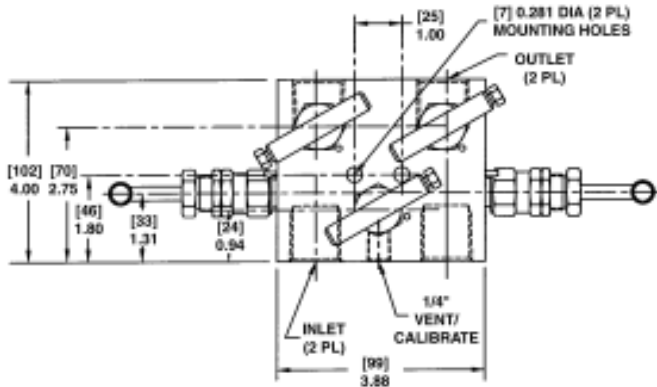
■ Your Choice of Mounting Styles

Available with threaded by threaded, threaded by flanged, or flanged by flanged connections to meet a variety of mounting requirements.

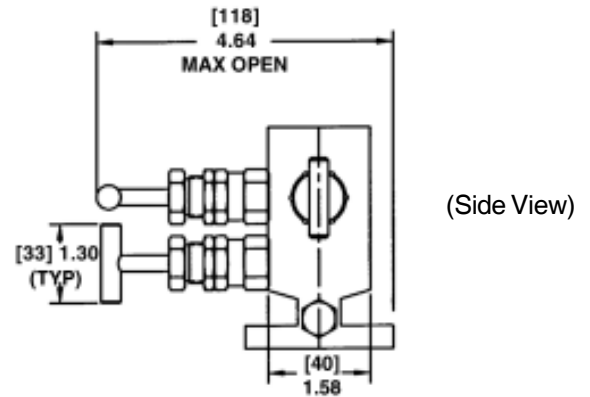
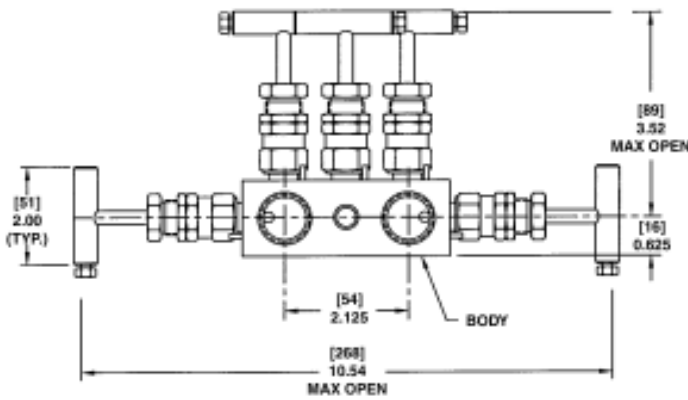
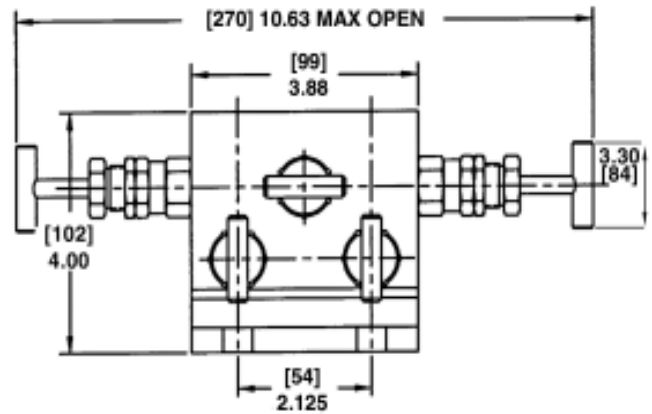
Five Valve Manifolds — Metering

Dimensions

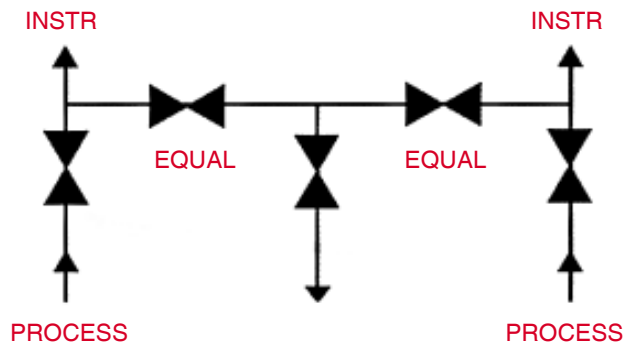
HM57



HM77



Flow Schematic



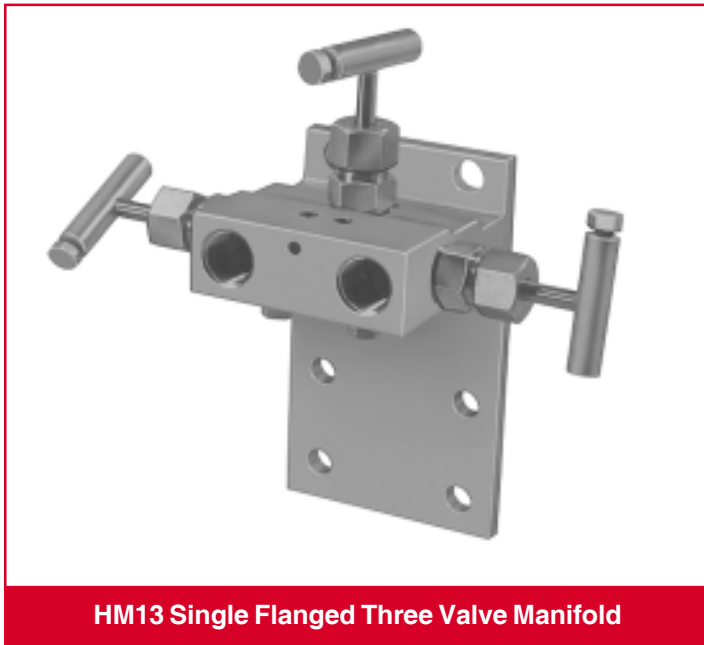
Model Numbers — Product Availability

	HM57	1	S	3	3	3	1	2	1	2
Model Number	HM57 HM77									
Seat/Body Configuration		1 2 G								
Body Material			S U							
Inlet Size				3 9						
Inlet Type					3 9 A					
Outlet Size						3 9 A B				
Outlet Type							1 8 9			
Stem/Tip								2 4		
Seat Material									1 B 6	
Packing										2 3 6

Rigid Mount Manifolds

Hex Rigid Mount Manifolds mount directly to the pipe stand securing the impulse lines so the transmitter can be installed or removed independently of the piping. They feature a “standard” two or three valve manifold or a blowdown manifold with an integral, welded mounting plate. The secure, welded design allows for fast and easy installation of gauge and differential pressure transmitters on vertical or horizontal pipe stands. Choose from five models to meet your instrumentation requirements:

- HM10: Single Flanged Static Pressure Manifold for Gauge Pressure Instrumentation
- HM13: Single Flanged Three Valve Manifold for Differential Pressure Transmitters
- HM14: Double Flanged Three Valve Manifold for Differential Pressure Transmitters
- HM16: Single Flanged Manifold featuring independent blowdown valves
- HM18: Single Flanged Two Valve Manifold for use with Level Instrumentation



HM13 Single Flanged Three Valve Manifold



HM16 Single Flanged Blowdown Manifold

Features and Benefits

■ Non-Rotating Tip (NRT) Stem

Provides tight, repeatable shutoff without the galling or cross-scoring that occurs on ball type stems. Because the NRT conical stem tip stops rotating when it contacts the seat, further torque turns the stem, but not the tip, protecting the stem tip from damage.

■ Your Choice of Mounting Options

Choose from single flanged or double flanged designs, and three or five valve assemblies to match your application needs and to mate with your specific transmitter.

■ Fully Packed Bonnets

Four rings of Teflon®-Chevron packing.

Rigid Mount Manifolds

A side-by-side comparison shows the advantages of the Hex Rigid Mount approach to transmitter installation . . .

Conventional Mounting



The conventional method for supporting remote mounting pressure transmitters has been to bracket the transmitter directly to the pipe stand.

This often causes delays and problems during initial installation because the system can not be piped until the instruments have been delivered. Instrument maintenance is more difficult because the transmitter can't be removed without disconnecting the piping and leaving impulse lines unsupported.

Problems encountered with conventional transmitter mounting:

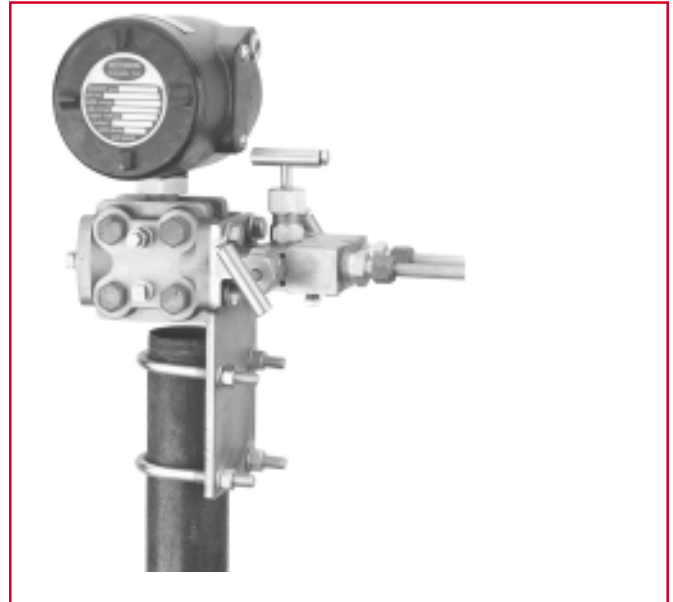
■ Multiple bracket components.

- lengthy installation time, component loss.
- increase repair and reinstallation costs.
- piping delayed until instruments arrive.

■ Impulse lines are unsupported during transmitter downtime.

- increased risk of accidents.
- greater potential for product loss.
- creates potential source of fugitive emissions.

Hex Rigid Mount Solution



The Hex Rigid Mount takes the common sense approach to transmitter installation . . . the *manifold*, not the transmitter, supports the piping.

On new installations, all piping can be done prior to the arrival of the instruments to save time and money — the transmitter simply bolts to the manifold. Instrument maintenance is easier because the transmitter can be removed and replaced without disturbing any of the piping.

Simplify and improve your installation with the Hex Rigid Mount:

■ Lower costs on installation and repairs

- simple one piece installation — no parts lost.
- simplified removal of instruments for maintenance.
- piping can be completed before instrument arrives.

Model Numbers — Product Availability

	HM10	1	U	3	3	9	9	4	1	2	N	L
Model Number												
HM10	HM16											
HM13	HM18											
HM14												
Configuration												
1 Hard												
2 Soft												
Body Material												
S Carbon Steel												
U Stainless Steel												
See Page 48 for complete list												
Inlet Size												
3 1/2"												
A 1/2" Single Ferrule Integral Tube Nut or Fitting												
B 1/2" Double Ferrule Integral Tube Nut or Fitting												
C Swagelok™ Tube Fitting/Flange												
9 Flanged (HM14 only)												
Inlet Type												
3 FNPT												
A Tube Nut												
B Tube Fitting/Flange												
9 Flanged (HM14 only)												
Outlet Size												
9 Flanged												
Outlet Type												
9 Flanged												
Stem Tip												
2 316 SS Needle/Plug												
4 316/316SS NRT												
Seat Material												
1 Integral (hard)												
4 PPS												
5 KEL-F®												
6 TFE												
9 PEEK®												
Packing												
1 Braided/Grafoil®												
2 TFE												
3 Graphite												
Options												
N Steam Trace Block												
U Grafoil Flange Gasket												
Options												
K 1/8" Test Ports												
L 1/8" Purge Ports												

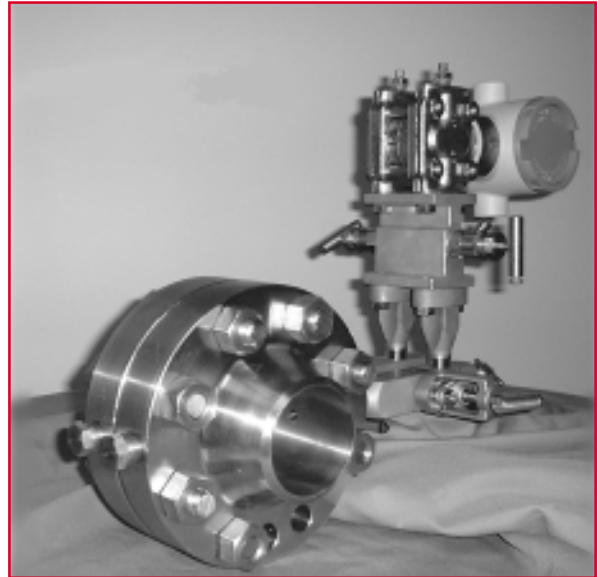
Close-Coupled System

Close-Coupled System Components

Hex Valve has developed a Close-Coupled System which incorporates standard valving in special configurations as a solution to your piping problems. Studies have shown that when transmitters are installed close to the orifice flange, users obtain higher levels of transmitter performance and measurement system reliability. Traditionally, remote mounting required long impulse lines which were used to provide access to the transmitter. However, long impulse lines resulted in high maintenance costs and reduced accuracy due to the prevalence of freezing, leaking, plugging or hydrostatic errors.

The Hex Valve Close-Coupled System provides a solution to these traditional piping problems. By offering a variety of components including root isolation valves, futbols, and manifolds, in addition to optional accessories including bleed plugs and tees, Hex Valve can provide custom mounting configurations for all differential pressure transmitters.

Our system reduces installation and maintenance costs while improving performance in comparison to traditional remote mounting designs and installation methods. The Hex Valve Close-Coupled System is ideal for direct mounting your transmitter for any differential pressure measurements.



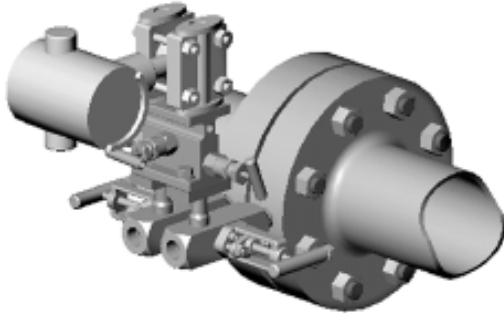
Product Offering

The Hex Close-Coupled System consists of the following basic components:

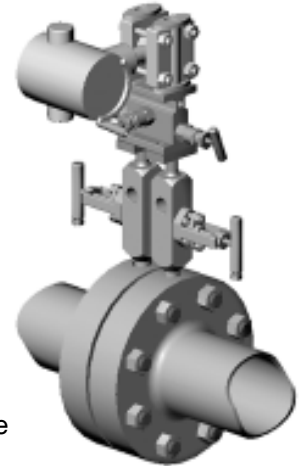
- Two Root Isolation Valves (Model HG47 or HG65 — both valves meet ANSI B31.3, utilize OS&Y bonnets, have been designed with internals that can be maintained without removal from the line, and provide a stable platform for the installation).
 - Model HG47 is a metal seated, roddable valve
 - Model HG65 is a metal seated valve
- Two Futbols (MSW x Flange)
- One Instrument 3-Valve Manifold (Model HM54) with flanged process and instrument connections. Use Model HM53, with thread x flange ends if tubing is used in lieu of futbolts.
- Options
 - Bleed Plugs or Tees
 - Provision for external pressure gauge
 - Provision for second transmitter or gauge pressure transmitter
 - Contact factory for other customizations

Close-Coupled System

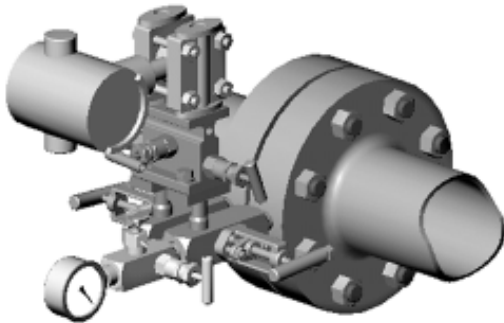
Typical System Configurations



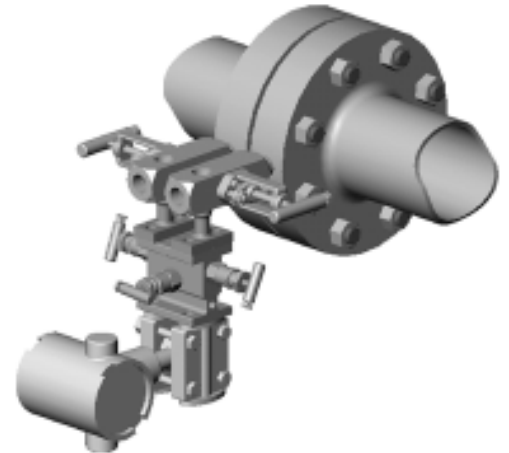
- Model HG47 orifice valve
- Futbol flanges
- Model HM54, 3-valve manifold



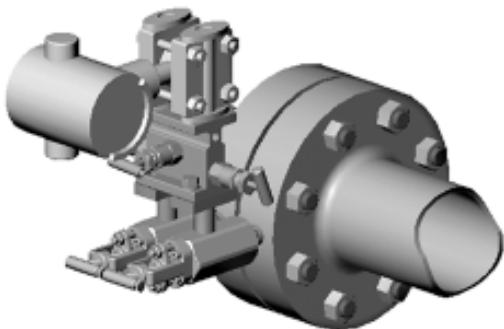
- Model HG47 orifice valve
- Futbol flanges
- Model HM54, 3-valve manifold



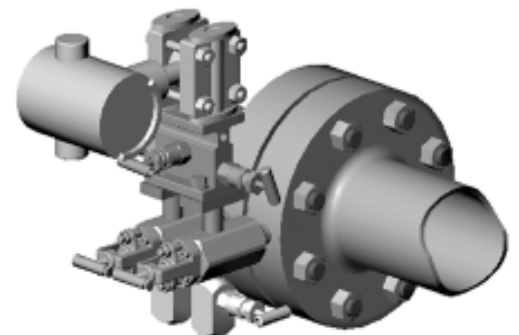
- Model HG47 orifice valve
- Futbol flanges
- Model HM54, 3-valve manifold
- HB50 block and bleed valve



- Model HG47 orifice valve
- Futbol flanges
- Model HM54, 3-valve manifold



- Model HG65 orifice valve
- Futbol flanges
- Model HM54, 3-valve manifold



- Model HG65 orifice valve
- Futbol flanges
- Model HM54, 3-valve manifold
- HN49 needle valve for blowdown

Model Numbers — Product Availability

	HE44	1	U	3	3	99	2	1	2
Model Number									
	HE40 HE44								
Seat/Body Configuration									
		1 Hard							
Body Material									
			S Carbon Steel U Stainless Steel						
Inlet Size									
				3 1/2" (HE40) 9 Flange (HE44)					
Inlet Type									
					3 FNPT (HE40) 9 Flange (HE44)				
Outlet Size/Type									
						99 Flanged			
Stem/Tip									
							2 316SS Needle/Plug 4 316/316SS NRT		
Seat Material									
								1 Integral	
Packing									
									1 Braided/Grafoil 2 TFE-Chevron 3 Graphite/Grafoil/Graphite

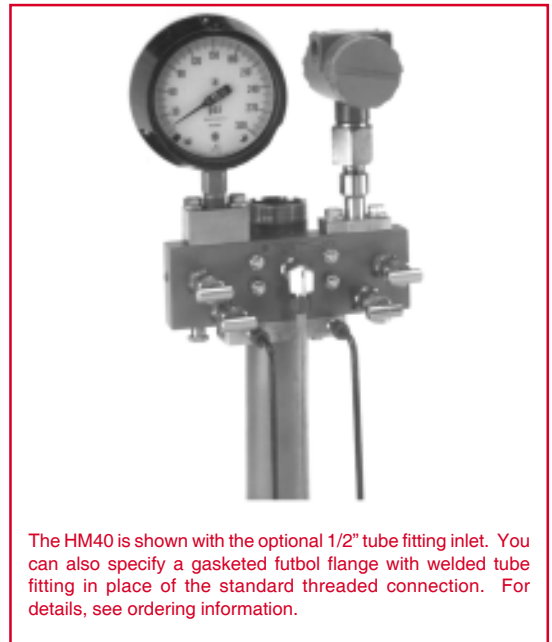
Specialty Manifolds

Instru-Mount Manifolds

Instrument piping practice often calls for the installation of a pressure gauge at or near the static pressure instrument when these instruments are remote mounted.

This required two separate pipe taps, root valve assemblies, and/or separate block & bleed valves at each instrument. This conventional installation is very costly, both in terms of materials and installation labor, and provides greater risk for fugitive emissions due to the many threaded connections.

- **HM40:** is a double instrument-mount manifold that allows two instruments to be mounted on one assembly. The HM40 reduces the number of components and leak points associated with conventional static pressure instrument piping. The piping configuration is simplified by combining the functions of block and bleed, as well as providing vent/calibration access in a single, remote mounted block style manifold. The HM40 requires only one pipe tap even though two sets of block and bleed valves are provided. The HM40 is a static pressure manifold that provides two sets of block and bleed valves for the independent operation of two static pressure instruments such as gauges, transmitter or switches.



The HM40 is shown with the optional 1/2" tube fitting inlet. You can also specify a gasketed futbol flange with welded tube fitting in place of the standard threaded connection. For details, see ordering information.

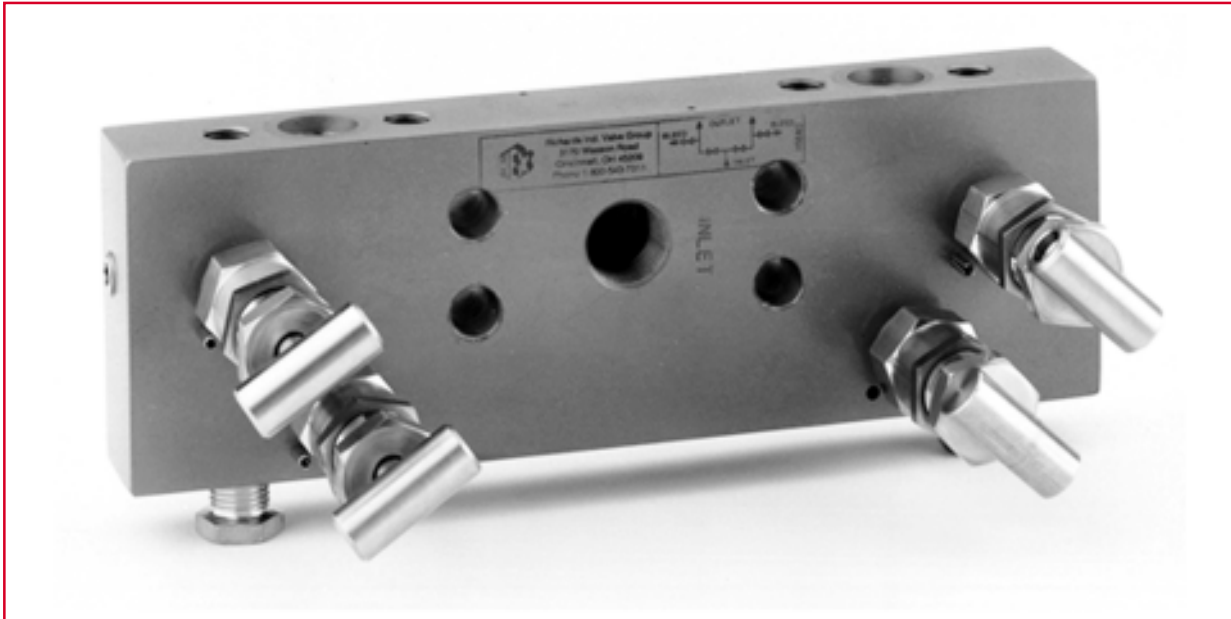
- **HM20:** Instru-Mount is designed exclusively for single, remote mounted pressure transmitter, switch, or gauge installations. In the past, these instruments were often mounted on conventional valve and fitting assemblies with gate, globe, or ball valves, and offered minimal instrument support with high risk of fugitive emissions.

The HM20 Series manifold combines shutoff and bleed functions, along with calibration access into one compact, well supported unit that can be mounted on a 2" pipestand. Emissions are reduced because all valves are integral to the barstock body, thereby eliminating externally threaded bleed valves as supplied on other manifold designs.



U-bolt mounting is integral to the design of the HM20, providing support and allowing you to mount the manifold instead of mounting the instrument.

Specialty Manifolds



Hex uses the best available technology to reduce the number of components and leak points associated with conventional static pressure instrument piping. The piping configuration is simplified by combining the functions of block and bleed, as well as providing vent/calibration access in a single, remote mounted block style manifold.

Features and Benefits

■ Reduce Costs & Installation Time

Use the Instr-Mount manifold in place of the traditional arrangement of nipples, pipes, elbows, tees, and gate valves for a lower cost, easy-to-install valve assembly.

■ Your Choice of Mounting Options

Choose from single or double instrument mounts to match your application needs and specific instruments.

■ Easy to Insulate

Prefabricated instrument enclosures fit neatly over the compact, one piece valve assemblies. Enclosures are currently marketed that accommodate these valves.

■ Non-Rotating Tip (NRT) Stem

Provides tight, repeatable shutoff without the galling or cross-scoring that occurs on ball type stems. Because the NRT conical stem tip stops rotating when it contacts the seat, further torque turns the stem, but not the tip, protecting the stem tip from damage.

■ Integral Tube Nut or Inlet Flanges Available

Reduces risks and emissions by eliminating threaded process connections.

■ Fully Packed, Backseated Bonnets

Prevents accidental stem removal and blowout. Unique design minimizes emissions while offering easy access to the packing. Four rings of Teflon®-Chevron packing are standard.

Specialty Manifolds

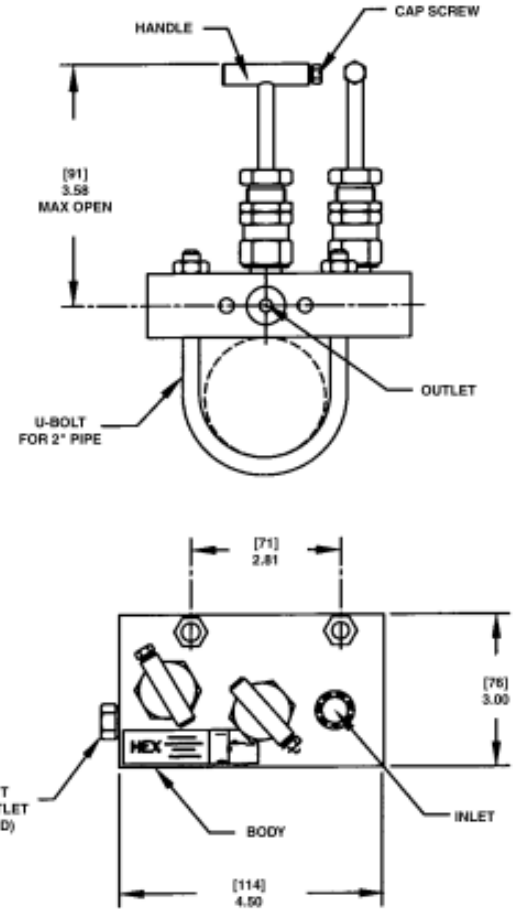
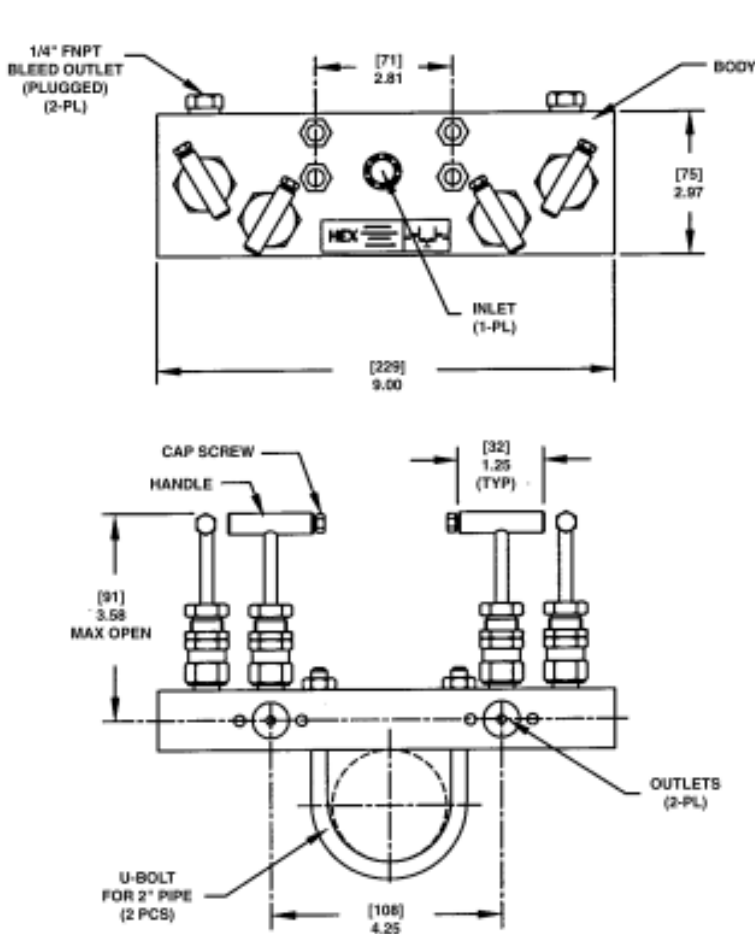
Dimensions

HM40

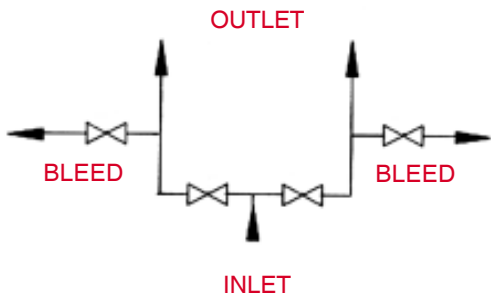
Weight: 11.3#

HM20

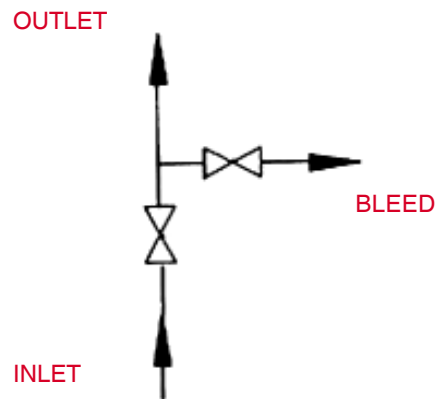
Weight: 5.8#



Flow Schematic



Flow Schematic



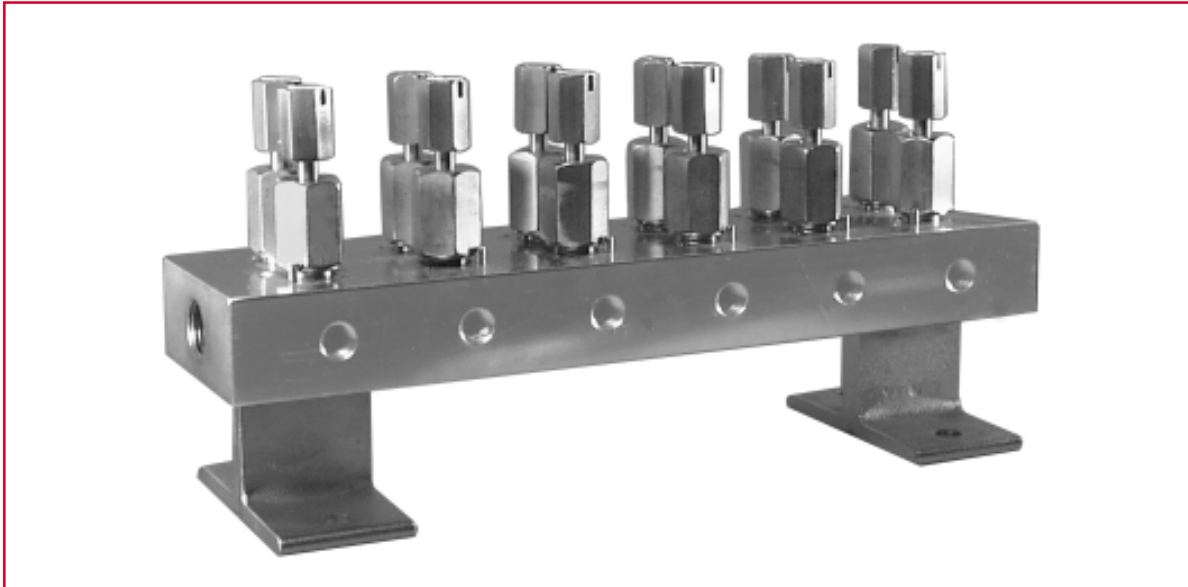
Model Numbers — Product Availability

	HM40	1	U	3	3	99	4	1	2	N
Model Number	HM40 HM20									
Seat/Body Configuration		1 Hard								
Body Material			S Carbon Steel U Stainless Steel See Page 48 for complete list							
Inlet Size				3 1/2" A 1/2" Single Ferrule Integral Tube Nut or Fitting B 1/2" Double Ferrule Integral Tube Nut or Fitting C Swagelok™ Tube Fitting/Flange						
Inlet Type					3 FNPT A Integral Tube Nut B Tube Fitting/Flange 9 Flanged					
Outlet Size/Type						99 Flanged				
Stem/Tip							4 316/316SS NRT			
Seat Material								1 Integral		
Packing									2 TFE - Chevron 3 Graphite/Grafoil®/Graphite	
Options										N Steam Trace Block

Note: 1/2" FNPT futbols for inlet or outlet must be ordered separately. To order CS 1/2" FNPT outlet futbol flange (1), order part # 10007-9010; to order SS 1/2" FNPT outlet futbol flange (1), order part # 10007-9011

Specialty Manifolds

Distribution Manifolds



The **HA Series** is a soft seated multi-valve manifold that allows you to connect one air/gas source to the inlet for distribution to up to 12 separate work stations; if additional work stations are required, simply attach another HA06 with nipples. The HA Series is used in place of conventional methods for the distribution of plant air and purge gases and feature o-ring seals and backseated bonnets to insure against stem leakage when the valves are fully open.

Features and Benefits

■ Reduce Costs & Installation Time

Use a distribution manifold in place of conventional field-fabricated assemblies of 2" pipe, nipples and needle valves for a lower cost, easier to install valve assembly.

■ Reduces Potential Leakage

The bubble-tight shutoff provided by the soft seats minimizes the potential for leakage. In addition, the integral valve design reduces the number of threaded connections for fewer potential leak points.

■ Integral Mounting Plates

Bolts directly to work station, or mounts with U-bolts to a two inch pipe.

■ Fully Backseated Bonnets

Prevents accidental stem removal and blowout. Bonnets are pinned to further prevent inadvertent removal.

■ Anti-Tamper Handles

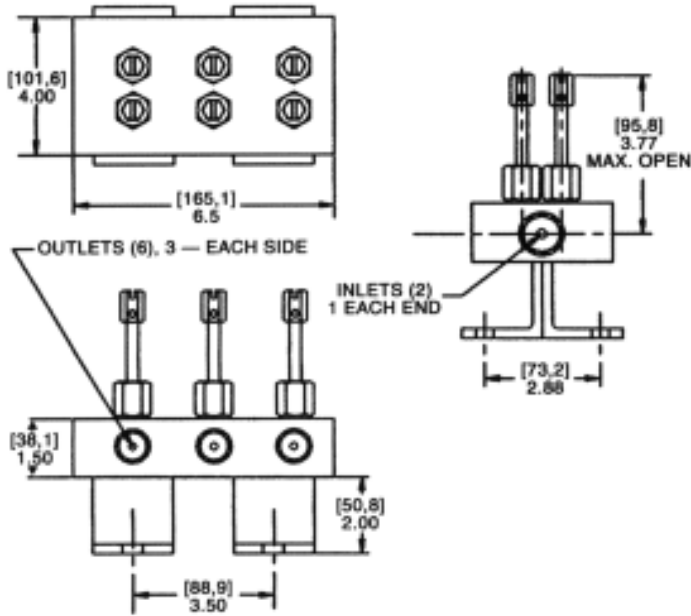
The HA Series features anti-tamper safety handles that are operated with standard maintenance tools.

Speciality Manifolds

Dimensions

HA06

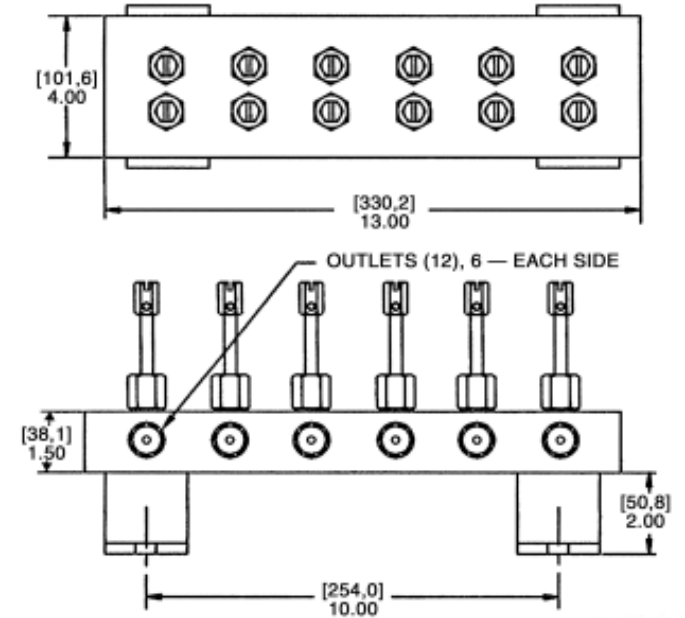
Weight: 13#
Orifice Size: 0.19"



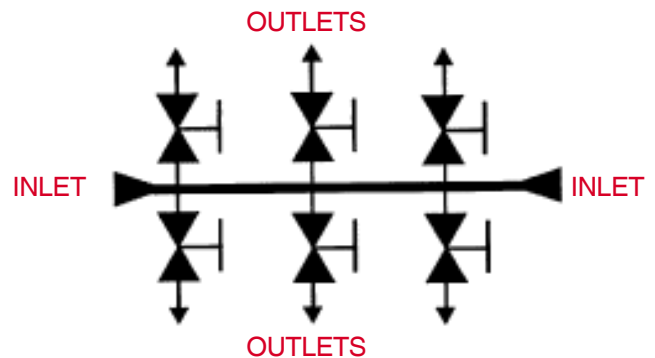
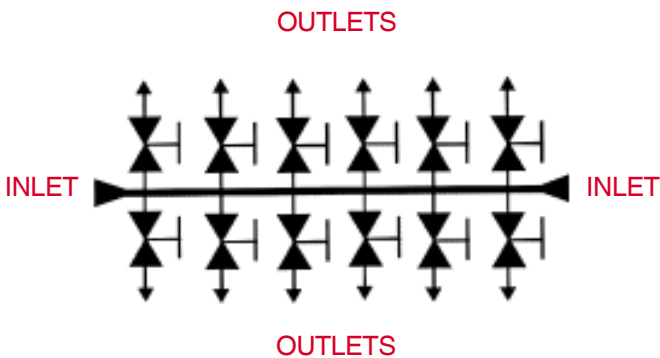
HA12

Bolt hole placement and open bonnet dimensions match those of HA06

Weight: 24#
Orifice Size: 0.19"



Flow Schematic



Specialty Manifolds

Distribution Manifolds



The **HA162** Series is a line of soft seated multi-valve manifolds that are used for the distribution of plant air, instrument air, or purge gases. The HA162 incorporates up to twelve shutoff valves into one integral valve assembly to provide a gas/air source for up to twelve working stations. When additional work stations are required, simply connect another HA162 using nipples.

The HA162 is typically used as a routing station with the primary source of gas piped into the inlet and distributed through lines connected to the six outlets. It can be used in place of the conventional field-fabricated assemblies of 2" pipe, nipples, and needle valves for a lower cost, easy-to-install valve assembly. For convenient installation, it can be bolted to a work station or mounted with U-bolts to a 2" pipe.

Features and Benefits

■ Reduce Costs & Installation Time

Use a distribution manifold in place of conventional field-fabricated assemblies of 2" pipe, nipples and needle valves for a lower cost, easier to install valve assembly.

■ Reduces Potential Leakage

The bubble-tight shutoff provided by the soft seats minimizes the potential for leakage. In addition, the integral valve design reduces the number of threaded connections for fewer potential leak points.

■ Integral Mounting Plates

Bolts directly to work station, or mounts with U-bolts to a two inch pipe.

■ Fully Backseated Bonnets

Prevents accidental stem removal and blowout. Bonnets are pinned to further prevent inadvertent removal.

■ Anti-Tamper Handles

The HA Series features anti-tamper safety handles that are operated with standard maintenance tools.

Model Numbers — Product Availability

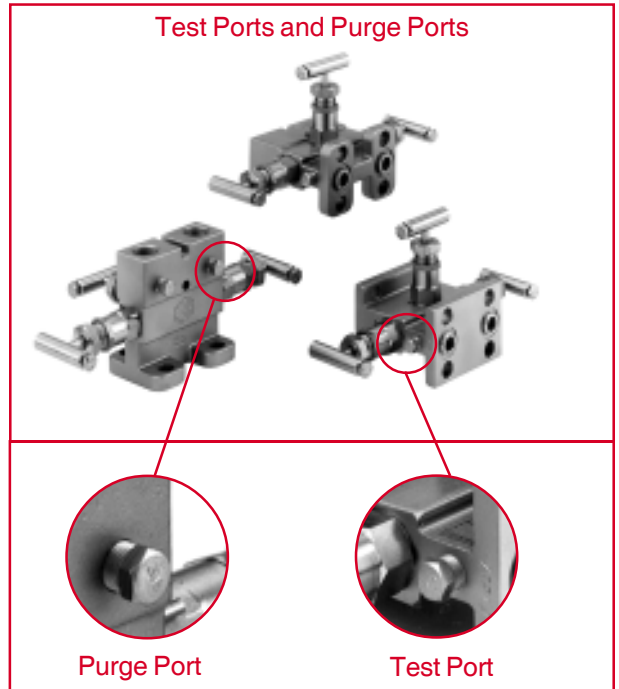
	HA	G	S	3	3	11	2	5	6
Model Number									
	HA06 HA12 HA162								
Seat/Body Configuration									
		G Soft Seat/O-ring 2 Soft Seat (HA162)							
Body Material									
			S Carbon Steel U Stainless Steel See Page 48 for complete list						
Inlet Size									
				3 1/2" 4 3/4" (HA162)					
Inlet Type									
					3 FNPT				
Outlet Size/Type									
						11 1/4" FNPT 31 1/2" FNPT (HA162)			
Steam/Tip									
							2 316/316SS Needle		
Seat Material									
								4 PPS 5 KEL-F® 6 TFE 9 PEEK®	
Packing									
									1 Braided (HA162) 2 TFE-Chevron (HA162) 3 Graphite (HA162) 6 Viton® O-ring (HA06 & HA12)

Options and Accessories

Purge/Drain Ports

Purge ports are 1/8" FNPT plugged access ports on the inlet side of the shutoff valves on all Hex manifolds (except HM93/94). They allow for easy draining of impulse lines or the introduction of a purge gas or liquid seal without requiring additional tees and fittings. **To order, specify '0L' in option spaces 14 & 15 of the Hex model number.**

Hex 1/8" *Test Ports* allow transmitter vent/test access, and are located on the outlet side of the manifold (usually behind the shutoff valves). **To order, specify '0K' in option spaces 14 & 15 of the Hex model number. (Note: not available on HM93).**

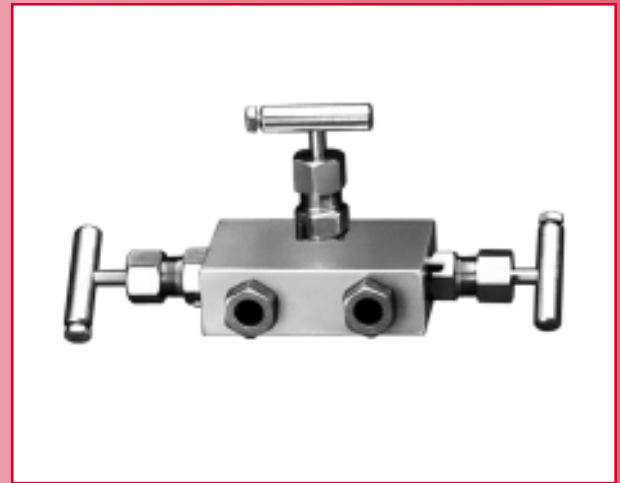


Integral Tube Fittings

If you use tubing with your instrument valves, you can save time and installation labor by specifying your Hex valves with the *integral tube fitting option*. Installation is quick and easy. An inverted nut and ferrule is preassembled into the valve so you simply insert the tubing and tighten.

They are available in single ferrule and double ferrule designs in Carbon Steel (ASTM A108) or 316 Stainless Steel (ASTM A479) to correspond with the valve body material.

The integral tube fitting option is available on Hex models HM10, HM13, HM18, HM45, HM50, HM53, HM57, HM58, and HN49.



Hex Head Plugs

Barstock hex head plugs are available in Stainless Steel or Carbon Steel in the following sizes:

Part Number	Size
10019-000-**-**	1/8"
10020-000-**-**	1/4"
10021-000-**-**	3/8"
10022-000-**-**	1/2"
10023-000-**-**	3/4"

Insert material code:

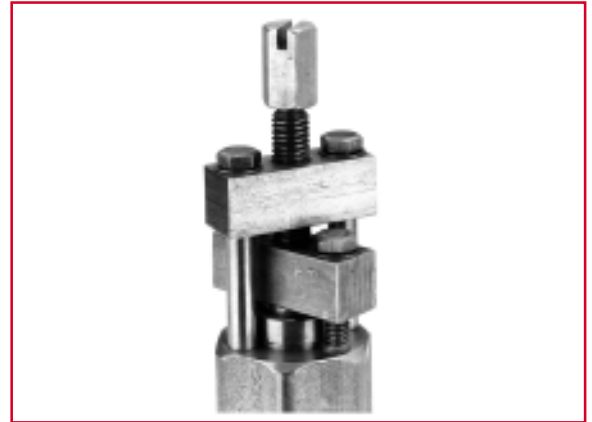
S1 for Carbon Steel, **T1** for 316 Stainless Steel, or **M1** for Monel®



Options and Accessories

■ Safety Handles

Safety Handles are utilized when there are concerns for safety, tampering or space limitations. A simple alternative to conventional T-handles, a tool (wrench or screwdriver) is required to open or close the valve. The compact design also prevents accidental valve actuation due to clothing snags or bumps. **To order, add a '5' in option space 14 of the model number.**



■ Gauge Mounting Kit

The Hex **HK11** Universal Gauge Mounting Kit provides rigid mounting of a gauge while allowing simple maintenance and calibration. It enables horizontal or vertical mounting while providing additional support for the gauge. It also reduces the installation radius and number of components used, eliminating much of the cost associated with the large number of parts required for conventional gauge mounting.

The Hex method consists only of a bracket and tubing with connectors, and provides stable support of the gauge while eliminating the need for field fabrication. **To order, build a model number by selecting a digit from each of the boxes on the following page.**

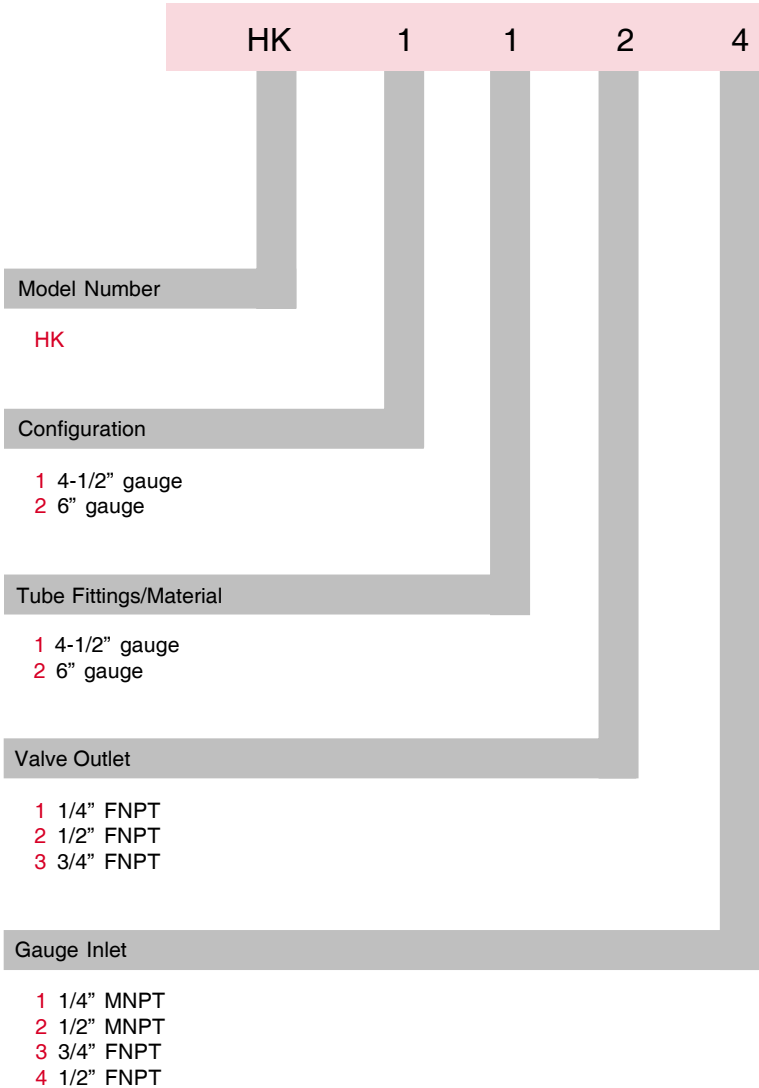
Gauge Mounting



Hex Mounting Kit Components



Model Numbers — Product Availability



Options and Accessories

Winterization/Steam Heating

Hex Valve offers simple solutions for the winterization or heating requirements of your process instrumentation, including both differential pressure and gauge pressure instruments, as well as maintaining temperature on sampling applications.

■ Steam Blocks

Simple modular method of steam heating field instruments and eliminating the tubing loops used for traditional tracing.

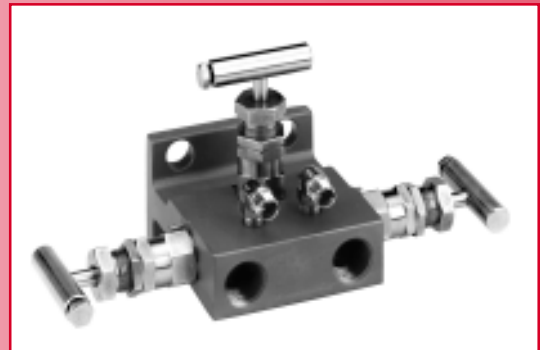
With the block directly attached to the manifold, heat transfer is consistent, reliable, and the instrument is left free for simple removal for maintenance.

The steam block's compact design allows easy insulation through the use of a variety of commercially available enclosures.



■ Integral Steam Tracing

Valves with built-in steam passages are available for critical temperature maintenance of gauge pressure, sampling or differential pressure applications that require greater heat transfer rates.



■ Steam Jacketed Sample/Drain Valve

Integrally-traced sample valves are available for use on sampling systems that require high temperatures to ensure a consistent liquid sample.



Options and Accessories

Steam Trace Block

The steam trace block option is specified for processes that can thicken or solidify at ambient temperatures as is common with many chemical and petroleum products. It is also used on field-mounted transmitters and instruments to prevent weather conditions from affecting operation.

The steam block has a 1/4" NPT opening on each end and is attached to the underside of the manifold with two bolts located on a 1" center-to-center dimension. It is available as an option on the following models:

- HM10 • HM13 • HM14 • HM16 • HM18
- HM20 • HM40 • HM45 • HM50 • HM53
- HM54 • HM55 • HM56 • HM57 • HM58
- HM56

How To Order

Hex steam trace block option is easy to order. From the options shown below, add the appropriate digits to the end of your specific valve model number.

- Steam Block: add "N"
- Steam Block & Mounting Bracket: add "7"

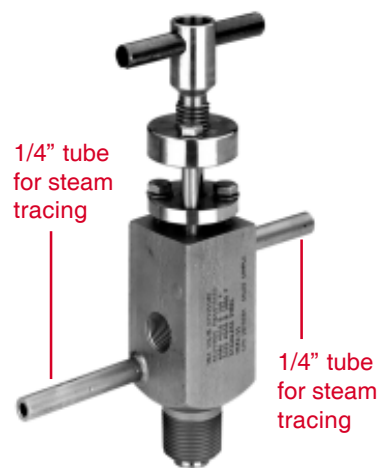
Integral Steam Tracing

Integrally steamed trace manifolds are available for those critical temperature, gauge pressure, or differential pressure instruments where greater heat transfer is required. These manifolds features built-in steam passages within the manifold body to ensure maximum heat transfer capabilities. **For drawings or ordering information, please contact our factory.**

Steam Jacketed Sample Valve

The steam jacketed HS31 sample valve is a solution to routine or difficult sampling problems. It is used to extract a fresh sample while providing tight shutoff, high pressure and temperature capabilities, and a reciprocating stem that unplugs the sample section as it opens.

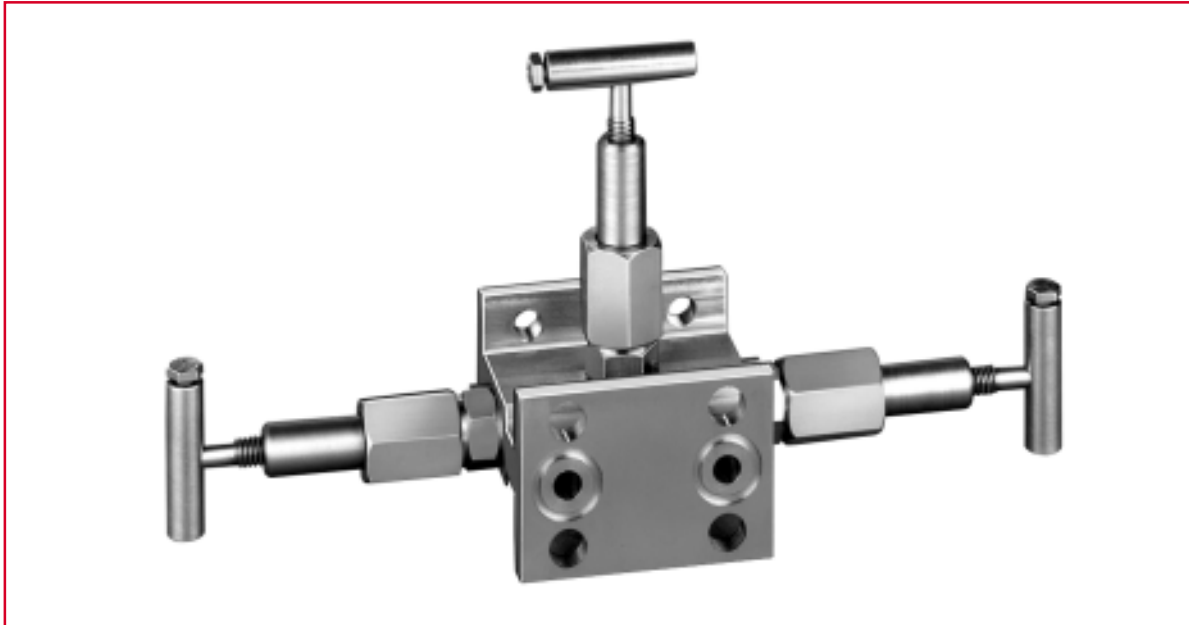
The steam-jacketed option is typically used on viscous liquids, slurries and products that tend to solidify when cooled or exposed to normal ambient conditions. For drawings or ordering information, please contact our factory.



Options and Accessories

■ Bellows Stem Seal Option

Hex Valve offers a bellows stem seal option for use on primary (root) valves as well as instrument valves for use with VOC's, hazardous materials, or any application where leakage and containment are primary considerations.



Features and Benefits

■ Non-Rotating Tip (NRT) Stem

Provides tight, repeatable shutoff without the galling or cross-scoring that occurs on ball type stems. The NRT conical stem tip stops rotating when it contacts the seat, so further torque turns the stem, but not the tip, preventing damage to tip.

■ Optional Seal Welding

Fillet welds covering all joined external components can be specified as an option.

■ Back-Up Sealing

Secondary sealing for greater protection against leakage than provided by single seal designs. Available with o-ring or packed seal on hard seated models.

■ Bellows Option Available on a Wide Selection of Models

The bellows stem seal option can be provided on Hex instrument valves, primary gauge or block valves, bleed valves, three and five valve manifolds, and static pressure manifolds.

Options and Accessories

Bellows Stem Seal Option

Ordering Information

The Hex Bellows Stem Seal option provides a bellows produced in 316L Stainless Steel or Monel®. The bellows option is available on these Hex Valve models:

- HM45
- HM50
- HM53
- HM54
- HM55
- HM56
- HM58
- HM59
- HM88
- Rigid Mount Models

How to Order

Hex Bellows Stem Seal valves are easy to order. From the bellows options shown below, add the appropriate digits to the end of your specific valve model number.

- Multi-ply bellows: add “RD”
- Multi-ply, seal-welded assembly: add “RE” (Note: seal-welded assemblies are available only on hard-seated models.)

Pressure/Temperature Ratings

The ratings shown are for 316L SST bellows only, and assumes 15,000 to 30,000 cycle life. Individual valve ratings should be considered in final evaluation, and can be found on the Hex Pressure/Temperature Charts in this catalog.

Temperature, °F	Pressure, PSIG
-20 to 100	1500
200	1410
300	1320
400	1245
500**	1170
600**	1110
650**	1075***
700**	1050
800**	990
900**	930
1000**	900

** Requires high temperature secondary seal.

*** Carbon Steel temperature limit.

Pressure/Temperature Chart

Determining Hex Valve Pressure and Temperature Ratings

1. From the chart on the right, determine the proper curve to use based on:

- Carbon Steel or Stainless Steel body material
- Hard Seat or Soft Seat

2. What stem packing is required?

The stem packing will determine the maximum service temperature in hard seated valves. The shaded areas of the curve indicate the maximum service temperature for the various packings. (With soft seated valves, the soft seat material determines the maximum service temperature).

3. Determine the initial ratings.

Refer to tables on Page 46. The column headed by the curve letter (determined in step 1) will show the maximum pressure at 100°F (37,78°C) and following the column down to the maximum temperature (determined in step 2) will show the pressure rating at this maximum temperature.

4. Check the notes on page 46 to see if any modification may be necessary due to:

Valves made in special material or to specifications such as NACE MR-01-75 which may change the standard rating.

- Corrosion allowance
- Code limitations
- Buttweld end connections
- Flanges or unions having ratings less than the valve rating
- Materials for temperature over 1000°F (537,78°C).

5. Consult appropriate curve for precise pressure/temperature ratings.

6. The low temperature limits on the standard materials are:

- Carbon Steel: -20°F (-28,89°C)
- Stainless Steel: -450°F (-267,78°C)
- Grafoil® Seals: -400°F (-240,00°C)
- Teflon® Seals: -120°F (-84,44°C)
- Viton® Seals: -20°F (-28,89°C)

Hard Seated Valves

- Consult curve listed under material

Valve Model	Carbon Steel	Stainless Steel
HA162	B	C
HB241	B	C
HB251	B	C
HB261	B	C
HB501	B	C
HB521	B	C
HB591	B	C
HE361	B	C
HE401	B	C
HE441	B	C
HG121	B	C
HG461	B	C
HG481	A	C
HG651	B	C
HM131	B	C
HM141	B	C
HM401	B	C
HM451	B	C
HM461	B	C
HM501	B	C
HM531	B	C
HM541	B	C
HN551	B	C
HM561	B	C
HM571	A	C
HM581	B	C
HM591	B	C
HM881	B	C
HN491	B	C
HO251	B	C
HO501	B	C
HO521	B	C
HS311*	B	C
HS311**	F	G
HT011	—	C
HT031	—	C
HT101	—	C

*INTEGRAL SEAT

**HARD SEAT INSERT

Soft Seated Valves

- CTFE (KEL-F®), TFE Seats: use curve H
- PPS (Polyphenylene Sulfide): use curve J
- PEEK® (Polyetheretherketone): use curve K
- Acetal: use curve N

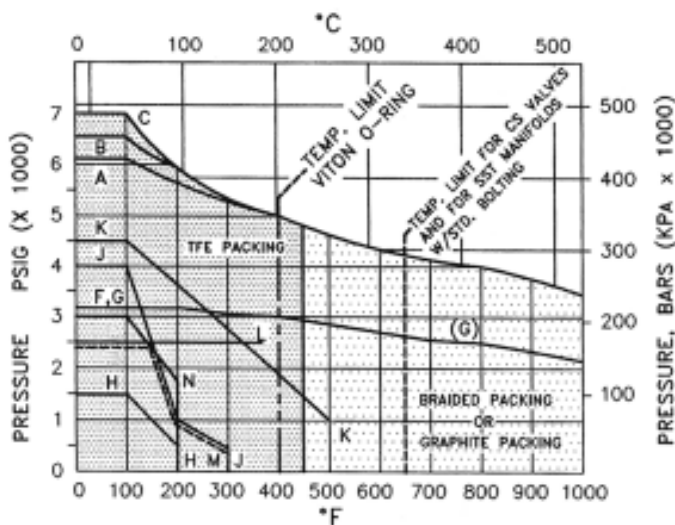
Pressure/Temperature Chart

Pressure-Temperature Chart, PSIG

Temperature	A	B	C	F	G	H	J	K
-20 to 100°F	6185	6580	6980	3100	3100	1500	4000	4500
200°F	5640	6000	6000	3050	3050	500	1000	3565
300°F	5300	5420	5420	3000	3000		500	2635
400°F	4975	4975	4975	2900	2900			1700
450°F	4800	4800	4800	2875	2875			1235
500°F	4630	4630	4630	2850	2850			1000 @
600°F	4370	4370	4370	2750	2750			475°F
650°F	4300	4300	4300	2700	2700			limit
700°F			4185		2550			
750°F			4095		2525			
800°F			4025		2500			
850°F			3860		2425			
900°F			3815		2350			
950°F			3745		2250			
1000°F			3525		2150			

To determine rating from curve:

- Refer to the table on Page 45 and determine corresponding curve for your specific model and body material.
- Enter the chart below at desired temperature and follow up to the appropriate curve.
- At intersection of curve and temperature, follow to left to maximum allowable pressure at selected temperature.









Notes

- Carbon Steel is 1018/1020 and ASTM A216, Gr. WCB. Stainless Steel is ASTM A479, Type 316 and ASTM A351, Gr. CF8M.
- For valves supplied to meet NACE MR-01-75, contact factory for rating.
- For other materials, contact factory.
- Rating basis is a factor of safety of 4:1 on pressure containing parts and 2:1 for packing or seal leakage.
- No corrosion allowance has been made.
- Consult codes, where applicable, on limits of tapered pipe thread connections.
- Ratings shown are for valves with pipe thread, socket weld or SAE straight thread inlets/outlets. For other end connections, consult factory for rating.
- Standard bolting for all manifold valve flanges is SAE Gr. 8, to 650°F. Contact factory for special bolting for higher temperatures.
- For services above 450°F, specify high temperature packing options. Grafoil flange gaskets are standard when high temperature packing is selected.
- For services above 1000°F, contact factory for special materials.

Stem/Seat Configurations

Seat and Tip Matrix

Model Number	Seat Selection					Stem Tips	
	Soft	Soft	Hard Insert	Hard Insert	Hard Integral	NRT	Needle
Roddable	No	Yes	Yes	No	No		
HE				X	X	X	X
HM10/50	X	X			X	X	X
HM13/53	X	X			X	X	X
HM14/54	X	X			X	X	X
HM16/56		X			X	X	X
HM18/58	X	X			X	X	X
HM20/40					X	X	
HM45/46	X	X			X	X	X
HM55					X	X	X
HM57		X			X		X
HM59	X	X			X	X	X
HM77		X					X
HM88	X	X			X	X	X
							

Stem/Seat Configurations

Body Material Matrix

Model Number	Carbon Steel	Stainless Steel	Monel®	Hastelloy® C	Hastelloy® B	Alloy 20	Carbon Steel, NACE	Stainless Steel, NACE	Inconel®	Incoloy
HE	1	2	3	8	4	5	X	X	6	7
HM10/50	9 or 10	11 or 13		8	4	5	X	X	6	7
HM13/53	1 or 10	2 or 11	12	8	4	5	X	X	6	7
HM14/54	1 or 10	2 or 11	12	8	4	5	X	X	6	7
HM16/56	1 or 10	2 or 11	12	8	4	5	X	X	6	7
HM18/58	1	2	3	8	4	5	X	X	6	7
HM20/40	1	2	3	8	4	5	X	X	6	7
HM45/46	1	2	3	8	4	5	X	X	6	7
HM55	1	2	3	8	4	5	X	X	6	7
HM57	1 or 9	2, 11, 13					X	X		
HM59	1 or 10	11 or 13	12	8	4	5	X	X	6	7
HM77	1 or 10	2 or 11					X	X		
HM88	1	2	3	8	4	5	X	X	6	7

Material Codes

Number	Material	Specification
1	Carbon	ASTM SA108, Gr. C1018/1020
2	Stainless	ASTM SA479, 31600
3	Monel®	ASTM B164
4	Hastelloy® B	ASTM B335
5	Alloy 20	ASTM B473
6	Inconel® 600	ASTM B166

Number	Material	Specification
7	Incoloy	ASTM B408
8	Hastelloy® C	ASTM B574
9	Carbon	ASTM SA105
10	Carbon	ASTM SA216, WCB
11	Stainless	ASTM SA351 CF8M, Gr. 316
12	Monel®	ASTM B164
13	Stainless	ASTM SA182, TYPE 316

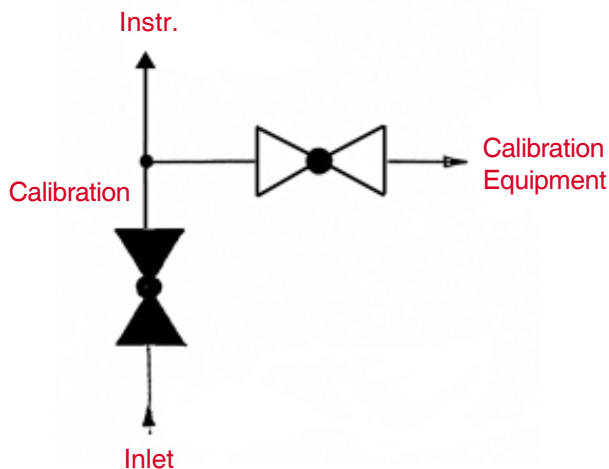
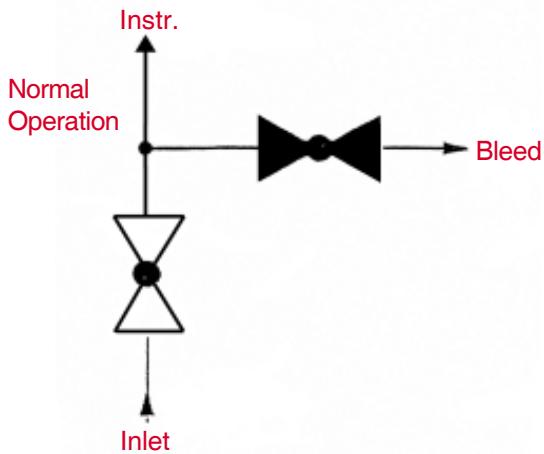
Notes:

1 NACE Valves in accordance with MR-01-75

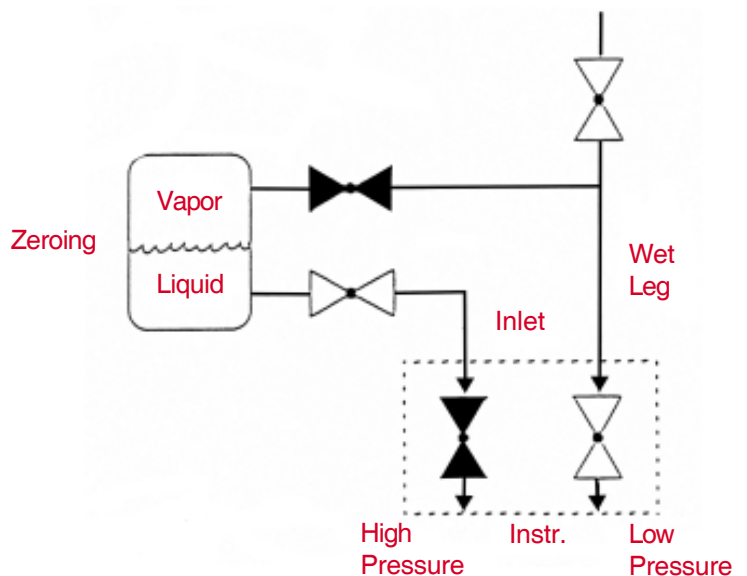
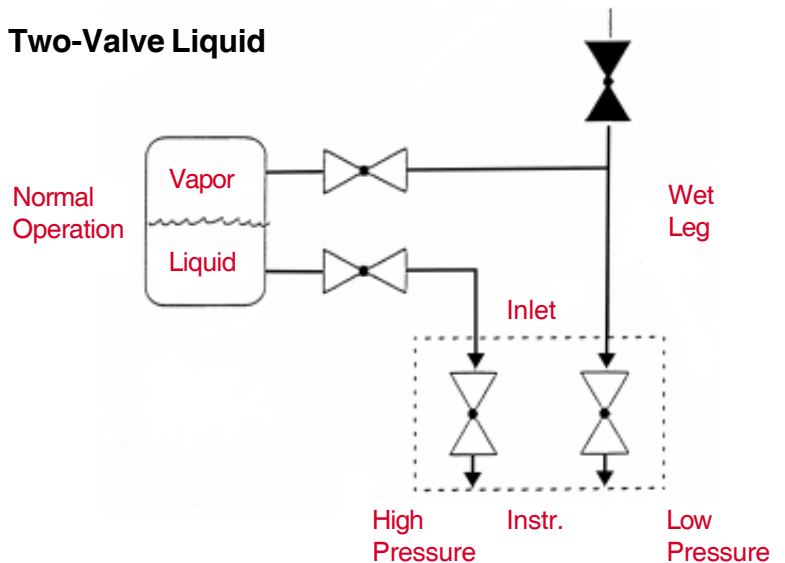
Two Valve Manifolds — Operation

- 2-Valve Manifolds (HM50 and HM59) for Static Pressure Transmitters** — In normal operation the block valve between the process and instrument ports will be open and the equalizing (or calibration) valve is closed. To check zero, close the block valve to isolate the transmitter pressure to the atmosphere. When fully vented, the transmitter should read zero output.
- 2-Valve Manifolds (HM58) for Liquid Level Transmitters** — In normal operation, the block valves are open. In zeroing the transmitter, the key consideration is the “wet leg” since the transmitter must be biased to cancel the offset of the wet leg. The transmitter must reach zero by equalizing between the top of the wet leg and the transmitter high side. This is performed by blocking the process pressure from the transmitter at the high side (manifold valve) and at the vessel or tank for the wet leg. The two sides of the transmitter are then vented to atmosphere, first at the top of the wet leg and then at the transmitter high side. The transmitter should read zero. To return the transmitter to service, close the transmitter high side block valve and the process valve to the low side of the wet leg.

Two-Valve Static Pressure



Two-Valve Liquid

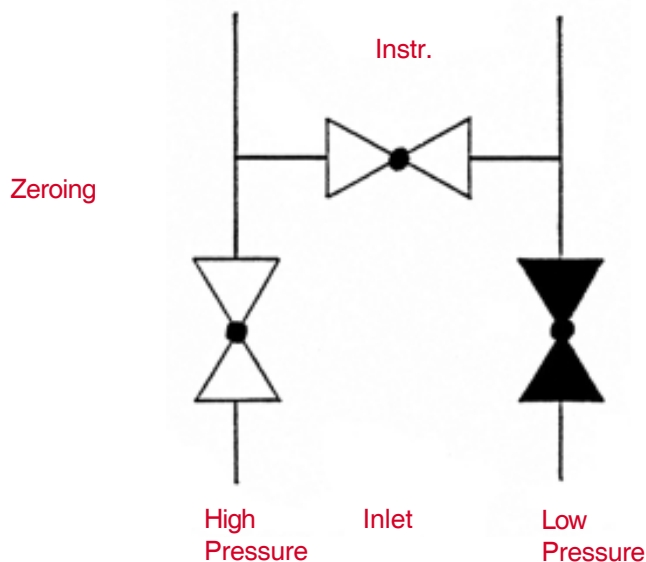
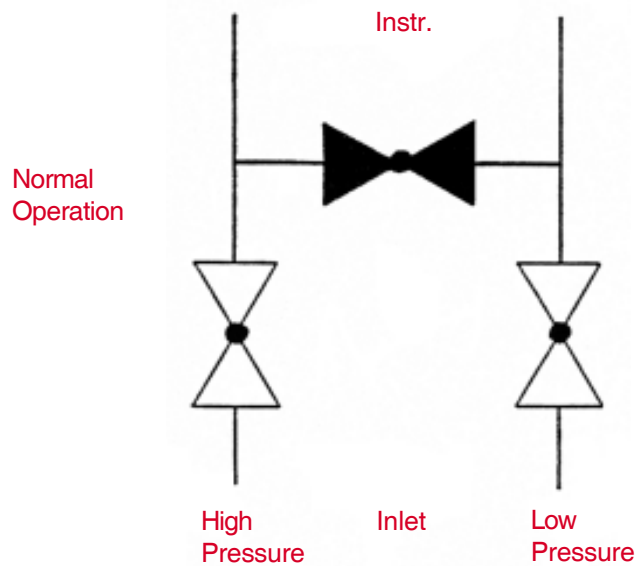


Three Valve Manifolds — Operation

■ 3- Valve Manifold Operation (HM45/HM53/HM54) for Differential Transmitters

In normal operation the two block valves between the process and instrument ports will be open and the equalizing (or calibration) valve is closed. To check zero, close the block valve to the low pressure (downstream side) of the transmitter and open the center valve (equalizing valve) to equalize the pressure on both sides of the transmitter.

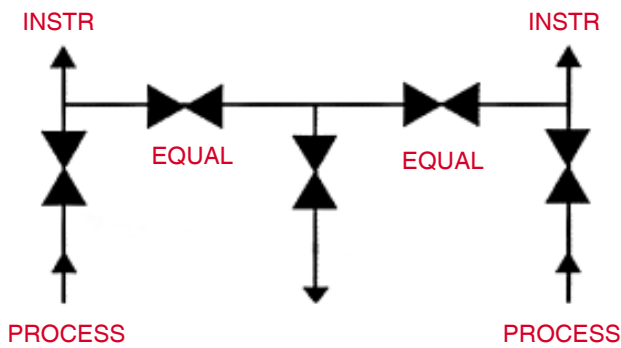
To return the transmitter to service, close the equalizing valve and open the block valve on the low pressure side of the transmitter.



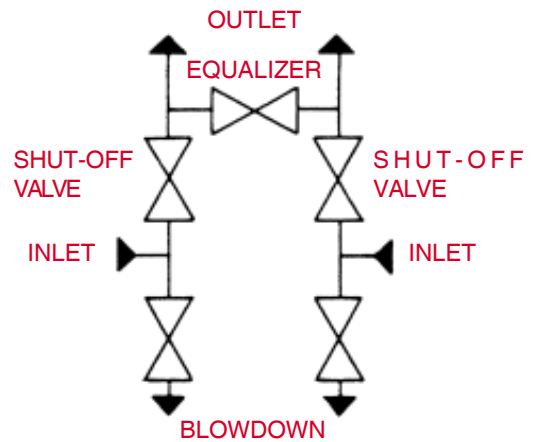
Five Valve Manifolds — Operation

Hex Valve manufactures three unique five valve manifolds: **PM75**, for the Power Industry, **HM57 & HM77** for Gas Metering Applications, and **HM55 & HM56** for plants that wish to blow down the instrument impulse lines just prior to the transmitter. All five valve manifolds are used with differential pressure transmitters. Please review the flow schematics below. The three models are not interchangeable. Because each manifold is unique, it is important to select the proper manifold for its intended service. The **PM75** is shown in our Power Catalog.

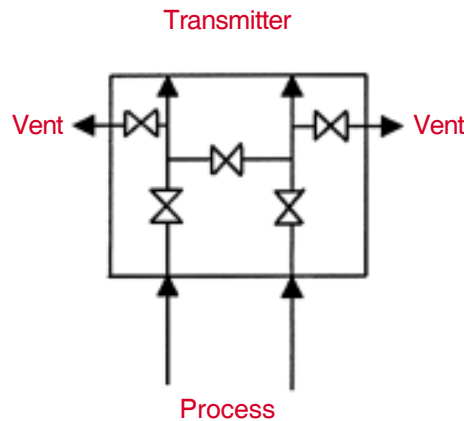
**Hex Model HM57 & HM77
Gas Metering Manifold**



**Hex Model HM55 & HM56
Blowdown Manifold**



**Hex Model PM75, PM76 & HM76
Power Manifold**



NACE Specifications

Sour service covers hydrocarbons, notably petroleum crudes and gases containing sulfur in the form of hydrogen sulfide (H₂S). The corrosion phenomenon causing concern is referred to as sulfide stress cracking (SSC). Most ferrous metals, when hardened by heat treatment or cold working to hardness above Rc22, are susceptible to sulfide stress cracking when exposed under stress to a sour environment.

Equipment used in instrument systems operating in sour gas service will require conformity to the NACE (National Association of Corrosion Engineers) Standard MR-01-75.

General Requirements:

- Carbon and low alloy steel shall not be harder than Rc22 in the finished condition, and must be either hot rolled, annealed, normalized, quenched and tempered, or stress relieved.
- Free machining steels shall not be used.
- Low and medium alloy steels containing less than 12% chromium and/or more than 1% nickel shall not be used.
- Inconel® shall not be harder than Rc35 in the finished condition.
- K-Monel® shall not be harder than Rc32 in the finished condition, and must be age hardened or solution annealed.
- Carbon Steel bolting shall conform to ASTM-A-193, grade B-7M, and ASTM A-194, grade 2HM specifications. Pressure-containing bolting shall conform to sour gas requirements specified in above points whether they contact the sour gas or not.

VOC Emissions

In evaluations by an independent valve testing laboratory, as witnessed by a major U.S. refinery, Hex Valve has certified that its valve stem packing designs now adhere to the stringent EPA requirements for VOC emissions of less than 100 ppm.

The tests were performed using EPA Reference Method 21 (reference: 40 CFR 60), BAAQMD Reg. 8, Rule 18, SCAQMD rules), and verify that Hex Teflon®-Chevron packing, 1625G/Grafoil®/1625G packing, and Graphaseal packing all experience VOC emission rates of less than 100 ppm.

Using these packing designs, you can trust Hex valves to do their part in helping you to adhere to the requirements of the Clean Air Act and state regulations.

Features and Benefits

■ Wide Selection of Packing Materials

Choose fully packed bonnets using Teflon® Chevron (service up to 450°F), 1625G/Grafoil®/1625G (service to 1000°F), or Graphaseal packing (service to 1000°F)

■ Valves Available for Special Needs

Models available to meet NACE MR-01-75 or as Power Valves to meet ANSI B31.1 or ANSI B31.3 specifications.

■ Backseated Bonnets with Packing Below the Stem Threads

Not only do our packing styles minimize emissions, the packing-below-the-threads design also eliminates potential thread contamination by the process media. The backseating further contributes to emissions reduction with a metal-to-metal backseat that also prevents accidental removal or stem blowout in operation.

VOC Emission Compliance

Applicable Models

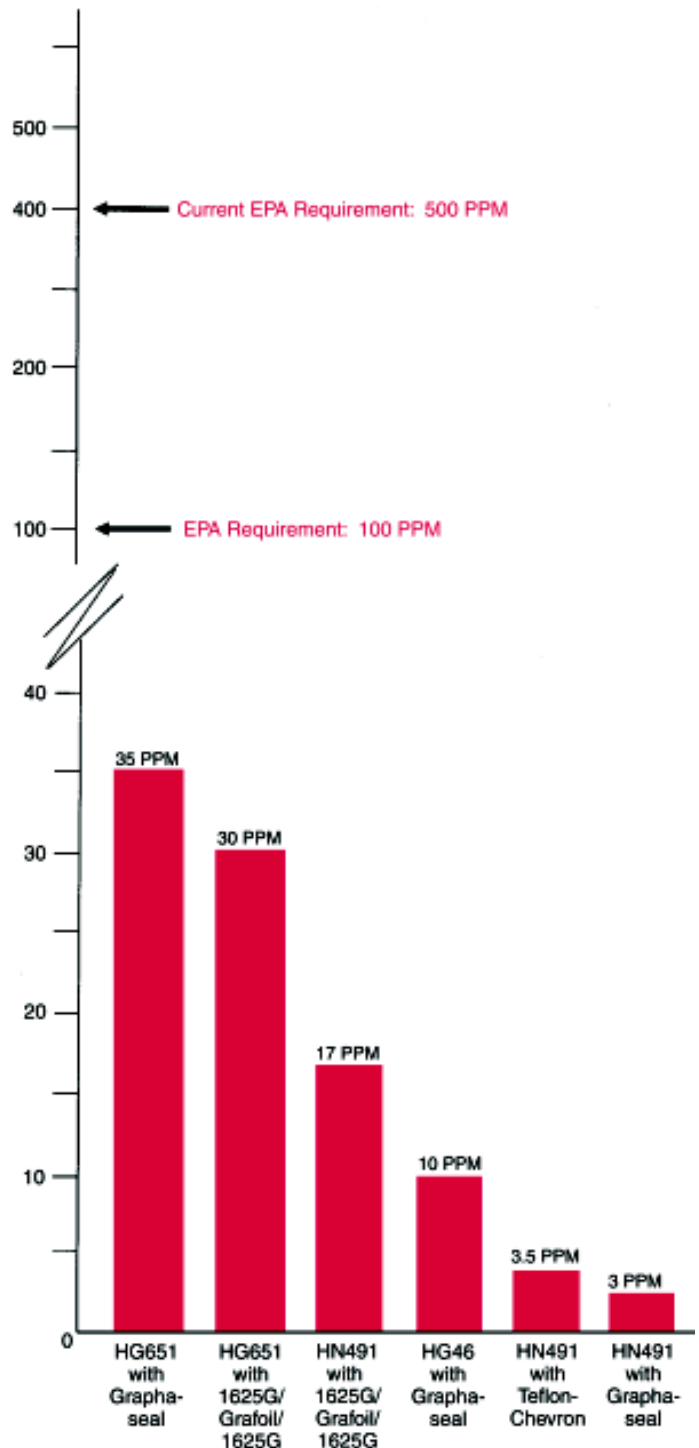
The following Hex Valve models are certified to meet the test standards:

- HG/PG651...413; ...418 Primary Orifice Block Valves
- HG/PG46...418 Primary Gauge/Block Valves
- HN49...412; ...413; ...418 Needle Valves
- HG48...412; ...413; ...418 Gauge Valves
- HB50/59...412; ...413; ...418 Differential Pressure Equalizing Valves
- HM20/40/50/59...412; ...413; ...418 Gauge Pressure Manifolds
- HM45/46/53/54...412; ...413; ...418 Differential Pressure 3-Valve Manifolds
- HM56...412; ...413; ...418 Differential Pressure Blowdown Manifolds
- HM58...412; ...413; ...418 Differential Pressure Liquid Level Manifold

Notes

- Test conducted in accordance with EPA Reference Method 21 (40 CFR 60)
- Valves cycled before and during test
- Hold/test time 2-5 minutes
- Glands adjusted as in field audits
- Test pressure 1,000 psi with 17% Methane test gas

Emission Rate in Parts Per Million (PPM)





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Grafoil® is a registered trademark of UCAR Carbon Technology Corporation
Hastelloy® is a registered trademark of Stellite Division, Nickel Company
Inconel® is a registered trademark of International Nickel Company
K-Monel® is a registered trademark of International Nickel Company
KEL-F® is a registered trademark of 3M Company
Monel® is a registered trademark of International Nickel Company
PEEK® is a registered trademark of VICTREX PLC Corporation
Stellite® is a registered trademark of Stoodly Deloro Stellite, Inc.
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Viton® is a registered trademark of E.I. Dupont de Nemours Co.



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