

Anderson Greenwood Instrumentation Manifolds - Three Valve

Differential pressure manifolds with two main block valves and an equalizing valve for direct or remote mounting at pressures to 6000 psig (414 barg).

General Application

The M4A is designed for mounting on differential pressure transmitters with 2 1/8" (54 mm) center-to-center connections. The M4T is used in applications where direct coupling to orifice flanges is not desired.

TECHNICAL DATA

Materials:

CS, 316 SS, Monel®, Hastelloy®

Seats:

Metal or soft

Connections:

Instrument: Flanged

Process: Flanged or 1/2" NPT

Pressure (max):

6000 psig (414 barg) standard

Temperature range (min/max):

-313°C to 1000°F

(-192°C to 538°C)

*Hastelloy® is a registered trademark of Haynes International, Inc
Monel® is a registered trademark of Special Metals Corporation.*



Features

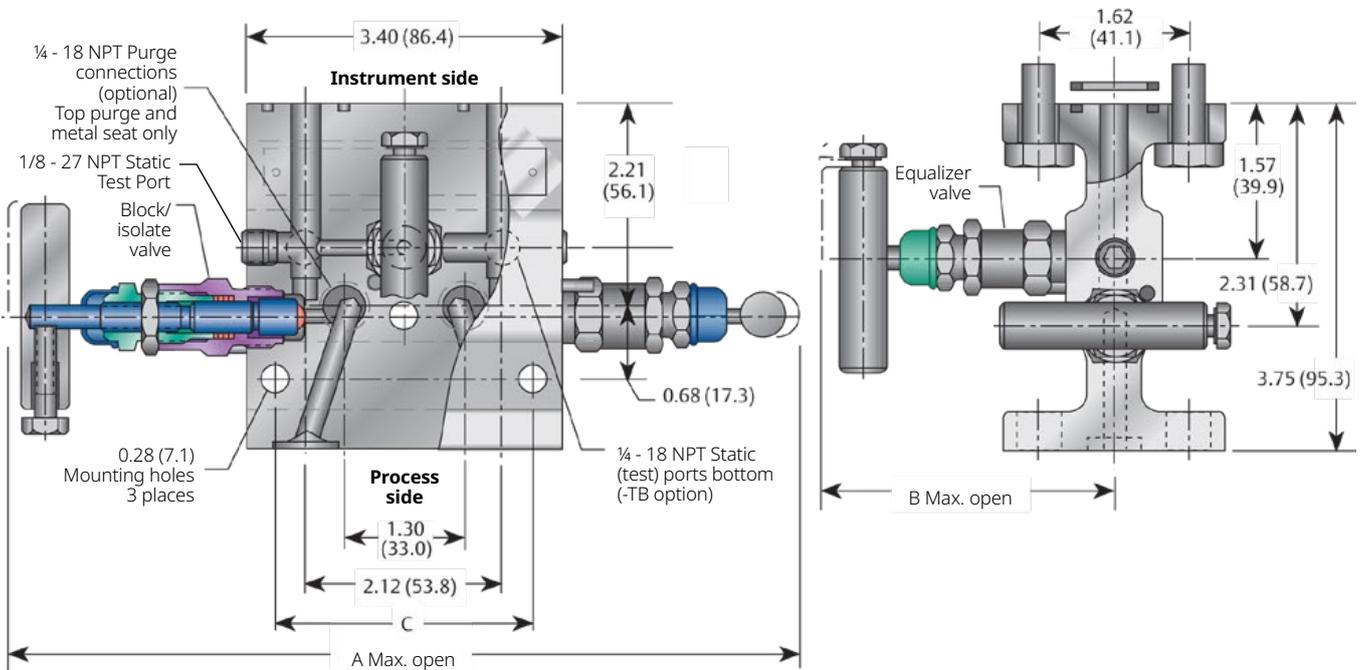
- Cost savings of 20-30% when utilizing the manifold by eliminating several parts used in conventional methods of 'piping up'.
- Roddable soft seats simplify maintenance and ensure accuracy.
- Back seat stem design eliminates stem blowout or accidental removal while in operation.
- Fewer leak points reduce the chances of leakage.
- Soft seat design enables field replacement without valve removal.
- Rolled stem threads provide a stronger, more durable thread area, increasing valve life.
- Mirror stem finish in the packing area ensures smooth operation and extends packing life.
- Constant compression metal-to-metal bonnet-to-body seal below bonnet threads prevents corrosion, eliminates tensile breakage and creates a reliable seal point.
- Easily adjustable stem packing decreases downtime and provides long service life.
- PTFE-packed design's bonnet cap protects against atmospheric contamination; reduces thread galling by containment of stem lubricant and increases valve life.
- AGI Mount option provides installation ease and maintenance benefits.
- Stem caps color coded to easily identify valve operational purpose.

M4A SERIES

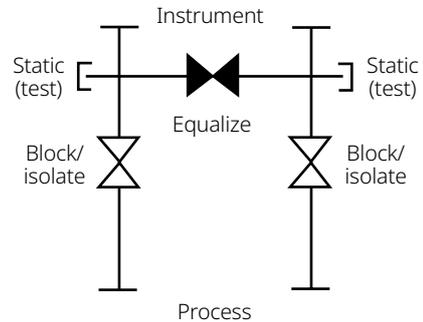
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M4A Dimensions

M4A Metal Seat (soft seat available) Dimensions, inches [mm]



Color of Cap	Type of Valve
Blue	Block / Isolate
Green	Equalize



Dimensions, inches (mm)

Valve ⁽¹⁾	A	B	C
Soft seat - PTFE packed	8.7(221)	3.18(80.8)	1.06 (27)
Metal seat - PTFE packed	8.7 (221)	3.18 (80.8)	2.80 (71)
Metal seat - Graphite packed	8.7 (221)	3.18 (80.8)	2.80 (71)

Note

Approximate valve weight	4.7 lb (2.1 kg)
Metal seat	0.156-inch (4.0 mm) diameter orifice
Valve C _v	0.36 maximum
Soft seat	0.187-inch (4.8 mm) diameter orifice
Valve C _v	0.83 maximum

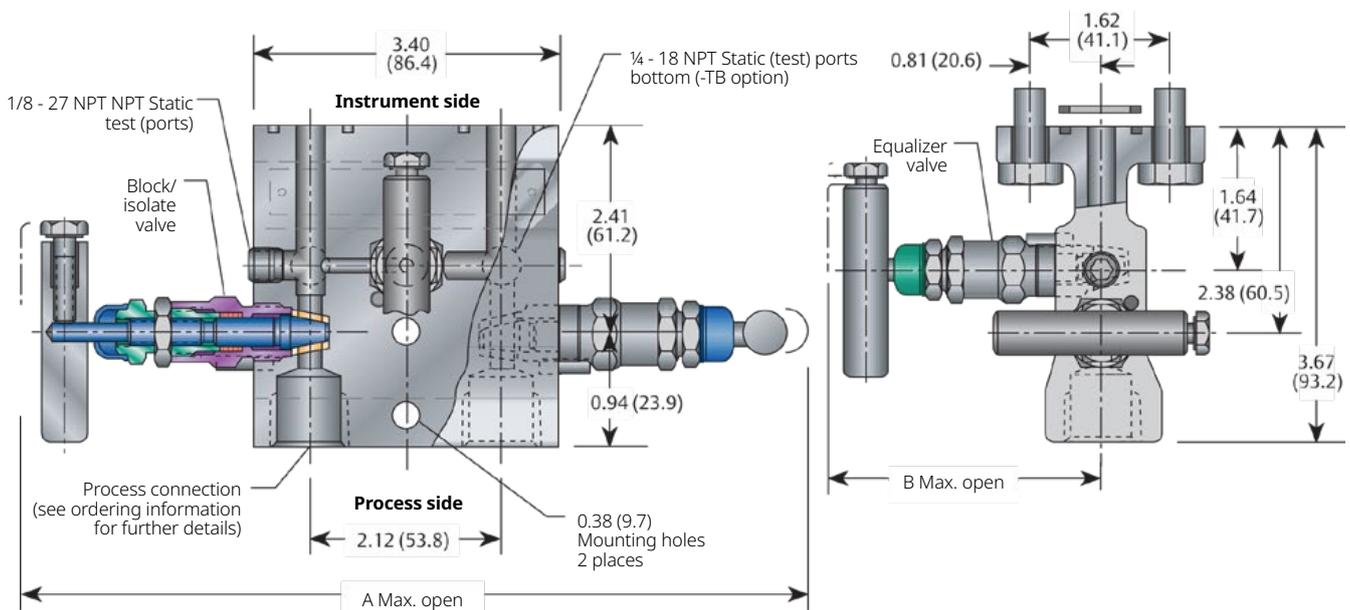
Mounting

The M4A mounts either directly at the orifice flange union or to a 2" pipe stand using the AGCO Mount kit. For direct or remote mounting, it enables the transmitter's futbol flanges to connect the process signal lines to the manifold directly, with either 1/2" pipe or tubing connections.

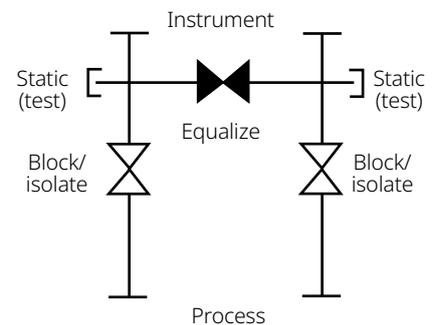
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M4T Dimensions

M4T Soft Seat (Metal Seat available) Dimensions, inches [mm]



Color of Cap	Type of Valve
Blue	Block / Isolate
Green	Equalize



Dimensions, inches (mm)

Valve ⁽¹⁾	A	B
Soft seat - PTFE packed	8.7(221)	3.18(80.8)
Metal seat - PTFE packed	8.7 (221)	3.18 (80.8)
Metal seat - Graphite packed	8.7 (221)	3.18 (80.8)

Note

Approximate valve weight	4.5 lb (2.0 kg)
Metal seat	0.187-inch (4.8 mm) diameter orifice
Valve C _v	0.36 maximum
Soft seat	0.187-inch (4.8 mm) diameter orifice
Valve C _v	0.83 maximum

M4A/M4T SERIES

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Bonnet Assembly Options

The M4A and M4T offer the option of metal or roddable soft seats.

All stem threads are ENC plated, rolled and lubricated to prevent galling and reduce operating torque. The stem seal is a PTFE or Graphite packing gland which is adjustable in service. All bonnets are assembled with a bonnet locking pin to prevent accidental removal while in service and a protective dust cap is fitted to contain stem lubricant and prevent the influx of contaminants.

Optional Soft-seated Bonnet Assemblies

The soft-seated bonnet assemblies have a one-piece rotating stem and plug. In addition to the adjustable PTFE packing gland, the bonnets are available with a FKM O-ring and PTFE back-up ring.

Metal-seated Bonnet Assemblies

The metal-seated bonnet assemblies have a rotating stem with free swivel ball-type seat for long service life. The specially hardened ball seat is ideal for both gas and liquid service.

Standard Materials

Metal seat				
Valve	Body ^[1]	Bonnet	Stem	Ball
CS ^[2]	A576-1018	A108 CS	A276-316	17-4 PH
CS ^[1] PTFE/Graphite	A105	A108/ ASTM 479 316SS	A276-316	17-4 PH
316 SS	A479-316	A479-316	A276-316	316 SS
SG ^[3]	A479-316	A479-316	Monel [®] 400	Monel [®] K500
SG3 ^[4]	Hastelloy [®] C276	Hastelloy [®] C276	Hastelloy [®] C276	Elgiloy [®]
Monel [®]	Monel [®] 400	Monel [®] R405	Monel [®] 400	Monel [®] K500
Hastelloy [®]	Hastelloy [®] C276	Hastelloy [®] C276	Hastelloy [®] C276	Elgiloy [®]

Soft Seat				
Valve	Body	Bonnet	Stem	Seat ^[4]
CS ^[2]	A576-1018	A108 CS	A276-316	Delrin [®]
316 SS	A479-316	A479-316	A276-316	Delrin [®]
SG ^[3]	A479-316	A479-316	Monel [®] 400	Delrin [®]
SG3 ^[4]	Hastelloy [®] C276	Hastelloy [®] C276	Hastelloy [®] C276	Delrin [®]

NOTES

- Instrument mounting kit furnished with the M4 includes (4) A193-B7 bolts and (2) PTFE or Graphite flange gaskets to match bonnet packing.
- CS parts are zinc TCP plated to prevent corrosion.
- SG (Sour Gas) meets the requirements of NACE MR0175/ISO 15156 (for Chloride conditions ≤ 50 mg/l [ppm]) and NACE MR0103.
- SG3 (Sour Gas) meets the requirements of NACE MR0175/ISO 15156 (for Chloride conditions > 50 mg/l [ppm]).
- 316 SS bolts lower pressure ratings to a maximum of 4500 psi [310 barg]. Consult factory for full rating with 316 SS bolts.

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Pressure and Temperature

Pressure and Temperature Ratings

Metal seat		
Valve	Packing	Ratings ^[5]
CS ^[1]	PTFE	6000 psig at 200°F (414 barg at 93°C)
		4000 psig at 500°F (276 barg at 260°C)
CS ^[1]	Graphite	6000 psig at 200°F (414 barg at 93°C)
	Graphite	4000 psig at 600°F (276 barg at 316°C)
316 SS	PTFE	6000 psig at 200°F (414 barg at 93°C)
		4000 psig at 500°F (276 barg at 260°C)
316 SS	Graphite	6000 psig at 200°F (414 barg at 93°C)
	Graphite	1500 psig at 1000°F (103 barg at 538°C)
SG ^[2] or SG3 ^[3]	PTFE	6000 psig at 200°F (414 barg at 93°C)
		4000 psig at 500°F (276 barg at 260°C)
SG ^[2] or SG3 ^[3]	Graphite	6000 psig at 200°F (414 barg at 93°C)
		1500 psig at 1000°F (103 barg at 538°C)
Monel [®]	PTFE	5300 psig at 200°F (360 barg at 93°C)
		4200 psig at 500°F (290 barg at 260°C)
Hastelloy [®]	PTFE	6000 psig at 200°F (414 barg at 93°C)
		4000 psig at 500°F (276 barg at 260°C)
Hastelloy [®]	Graphite	6000 psig at 200°F (414 barg at 93°C)
		4200 psig at 800°F (290 barg at 426°C)

Soft seat		
Valve	Packing	Ratings
CS ^[1]	PTFE	6000 psig at 200°F (414 barg at 93°C)
316 SS	FKM O-ring with PTFE back up ring	
SG ^[2] or SG3 ^[3]	PTFE	6000 psig at 200°F (414 barg at 93°C)

Minimum Temperature

Carbon steel	-20°F (-29°C)
316 SS O-ring seal	-20°F (-29°C)
316 SS, Monel [®] , Hastelloy [®]	-70°F (-57°C)
PTFE packed Delrin [®] Seats	-40°F (-40°C)
316 SS, Hastelloy [®] Graphite packed	-70°F (-57°C)

NOTES

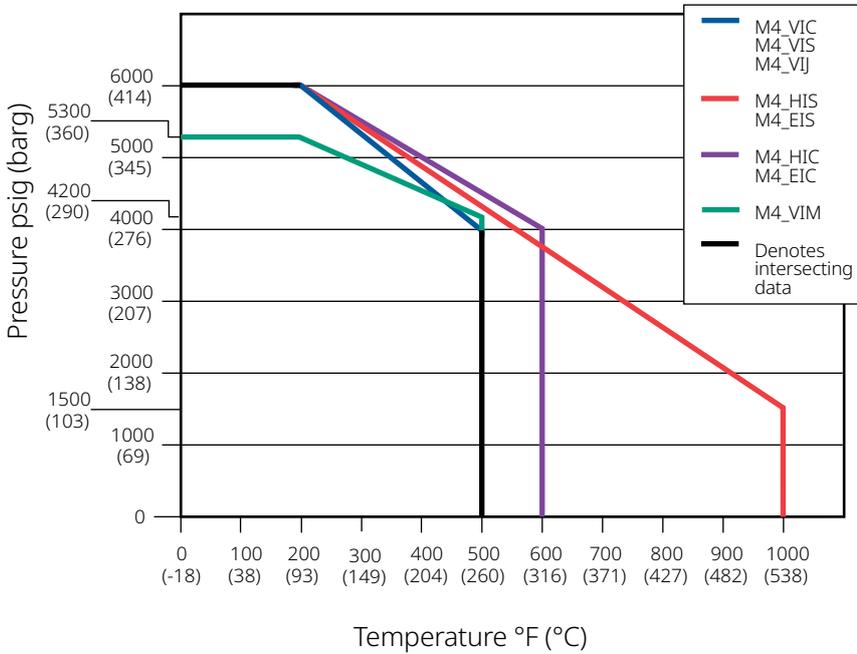
1. CS parts are zinc TCP plated to prevent corrosion.
2. SG (Sour Gas) meets the requirements of NACE MR0175/ISO 15156 (for Chloride conditions ≤ 50 mg/l [ppm]) and NACE MR0103.
3. SG3 (Sour Gas) meets the requirements of NACE MR0175/ISO 15156 (for Chloride conditions > 50 mg/l [ppm]).
4. Minimum temperature -70°F (-57°C). Carbon Steel and O-ring -20°F (-29°C), Delrin[®] 316SS seat -40°F (-40°C). 316SS integral metal seat minimum temperature (-313°F (-192°C) @ 2500 psi (172 bar)

M4A/M4T SERIES

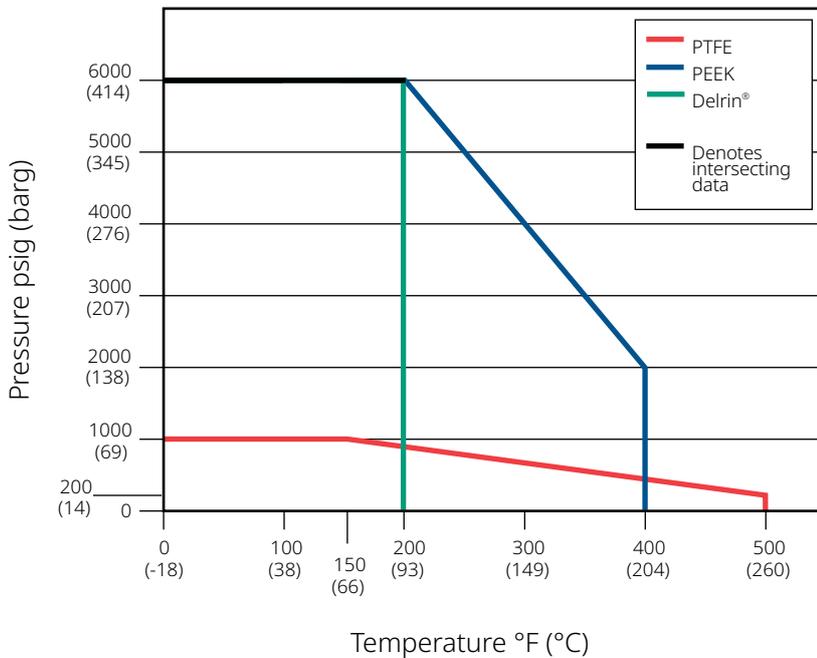
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Pressure vs. Temperature

Pressure vs. Temperature - Metal Seat



Pressure vs. Temperature - Soft Seat

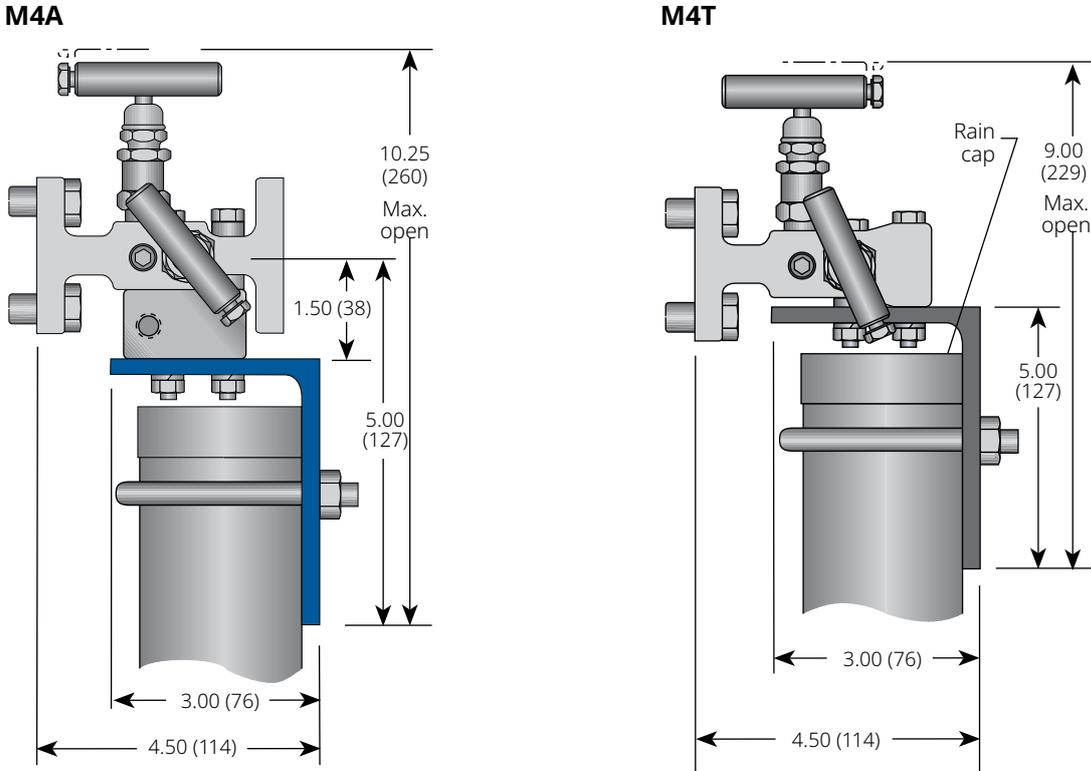


Minimum temperature -70°F (-57°C). Carbon Steel and O-ring -20°F (-29°C), Delrin® 316SS seat -40°F (-40°C). 316SS integral metal seat minimum temperature (-313°F (-192°C) @ 2500 psi (172 bar)

Anderson Greenwood Instrumentation Manifolds - Three Valve

M4A/M4T Dimensions

AGCO mount with M4 manifold dimensions, inches [mm]



Features and Benefits

- Lowers maintenance costs by simply removing four transmitter bolts, disconnecting signal leads and performing needed transmitter maintenance.
- Reduces potential environmental contamination and the possibility of signal-line damage.
- Reduces pipestand corrosion by using the bracket overhang and plastic rain hat to cover the pipestand.
- Optional steam heat block permits tracing the manifold and transmitter from a common connection.
- Shipped ready for assembly and installation; includes optional heat block and purge ports (if specified).
- AGI mount system is essentially free if you get credit from the transmitter company for the mounting bracket and futbol connectors.

Mounting

Manifold style	Material	Description
M4T ^[1] -AM	CS ^[2]	a. Standard kit b. For bottom purge c. With steam block
M4T ^[1] -AMS	316 SS	a. Standard kit b. For bottom purge c. With steam block
M4A ^[1] (hard seat)-AM	CS ^[2]	a. Standard kit b. With SS bolting c. With steam block d. With steam block and SS bolting
M4A ^[1] (hard seat)-AM	316 SS	a. Standard kit
M4A ^[1] (soft seat)-AMS	CS ^[2]	a. Standard kit b. With steam block

NOTES

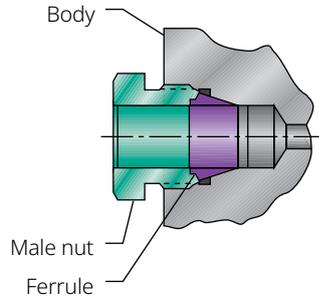
1. Vertical 2-way brackets are available.
2. Zinc TCP plated.

M4A/M4T SERIES

Anderson Greenwood Instrumentation Manifolds - Three Valve

M4T Option

Single ferrule 'bowing' design



AGCO-Tube:

Integral tube fitting design:

- Proven design performance.
- No tube twist on makeup.
- Low torque in assembly.
- Male nut:
 - Silver plated to prevent galling.
 - Threads are rolled for additional strength.
 - Gives superior tubing support for vibration resistance.
- Bubble-tight seal on make and remakes.
- Fitting will hold to the burst of the tubing.
- Makeup is industry standard 1¼ turns from finger tight.
- Remake is ½ turn from finger tight which brings you back to original position, then snug slightly to respring the ferrule(s) into a sealing position.

M4A and M4T Option

Bonnet lock (BL) (patented)

- Anderson Greenwood's Bonnet Lock prevents accidental loosening of the bonnet-to-body seal.
- A high-strength, short bonnet pin aligns a hex collar over the bonnet.
- Tests indicate the minimum torque required to break the collar loose is greater than the torque required to twist off handle.

NOTE

1. Standard on power plant manifolds.



BONNET LOCK⁽¹⁾

Anderson Greenwood Instrumentation Manifolds - Three Valve

Selection Guide - Soft Seat

M4T		V		D		S		-4		-SG	
BASIC SERIES		BONNET PACKING		SEAT		BODY MATERIAL		PROCESS CONNECTIONS (M4T ONLY)		OPTIONS	
M4A	3-Valve manifold, flange x flange	V	PTFE	D	Delrin®	C	CS ³¹ , A576-1018	4	1/2-inch FNPT	AM	AGI Mount kit for 2-inch pipe stand mounting of manifold (see table page 7)
		R	O-ring (FKM)	E	PEEK	S	SS, A479-316			AMS	AGI Mount kit for 2" pipe stand mounting of manifold 316SS Plate (see table page 7)
M4T	3-Valve manifold, FNPT x flange			V	PTFE	W	SS, A479-316L- maximum pressure 5000 psig (345 barg)			BL	Bonnet lock device
										BP	Accessory bracket - mount purge meters with -AM
										HD	Hydrostatic testing (100 percent) (MSS SP-61)
										MS	Monel® stem (standard on Monel and SG valves)
										OC00	Cleaned for oxygen service
										R3V	Add for use with Rosemount® model 3051C (SS 18-8 bolts)
										SB	Steam block (CS)
										SSA⁽¹⁾	SS flange bolt (grade 18-8) - maximum pressure rating 4500 psi (310 barg)
										-SSB⁽¹⁾	316 SS flange bolt (B8M Class 2) - will provide full pressure rating
										SSC⁽¹⁾	316 flange bolt (B8M) - maximum pressure rating 4500 psi (310 barg)
										SG	(Sour Gas) meets the requirements of NACE MR0175/ISO 15156 (for Chloride conditions ≤ 50 mg/l [ppm]) and NACE MR0103 (SS valves only) (not available for O-ring packed valves)
										SG	3 (Sour Gas) meets the requirements of NACE MR0175/ISO 15156 (for Chloride conditions > 50 mg/l [ppm])
										TB	Test ports - bottom of manifold (1/4-inch FNPT) (option not available for M4A with -AM)
										SS	All 316 SS material for non wetted components
										SST	316SS Circular Tag (10 Characters max)

NOTES

1. If SS flange bolts are requested, manifold ratings are downrated.
2. Integral tube fitting design, refer to page 8.
3. CS parts are zinc TCP plated to prevent corrosion.

M4A/M4T SERIES

Anderson Greenwood Instrumentation Manifolds - Three Valve

Selection Guide - Metal Seat

M4T		V	I	S	-4	-SG	
BASIC SERIES	BONNET PACKING	SEAT	BODY MATERIAL	PROCESS CONNECTIONS (M4T ONLY)	OPTIONS		
M4A 3-Valve manifold, flange x flange	V PTFE	I Integral (body material)	C CS ³ , A576-1018 (for Graphite bonnet assemble A105)	4 1/2-inch FNPT	AM AGI Mount kit for 2-inch pipe stand mounting of manifold (see table page 7)		
M4T 3-Valve manifold, FNPT x flange	H Graphite		S SS, A479-316			AT² Integral single ferrule tube fittings -A44T 1/2-inch, 316 SS	AMS AGI Mount kit for 2" pipe stand mounting of manifold 316SS Plate (see table page 7)
	E Low emissions graphite	M Monel [®] 400 (M4A and M4T only)	J Hastelloy [®]	BL Bonnet lock device			
		W SS, A479-316L - maximum pressure 5000 psig (345 barg)		BP Accessory bracket - mount purge meters with -AM			
				HD Hydrostatic testing (100 percent) (MSS SP-61)			
				MS Monel [®] stem (standard on Monel [®] and SG valves)			
				OC00 Cleaned for oxygen service			
				-R3V Add for use with Rosemount [®] model 3051C (SS 18-8 bolts)			
				SB Steam block (CS)			
				SSA¹ SS flange bolt (grade 18-8) - maximum pressure rating 4500 psi (310 barg)			
				SSB¹ 316 SS flange bolt (B8M Class 2) - will provide full pressure rating			
				SSC¹ 316 flange bolt (B8M) - maximum pressure rating 4500 psi (310 barg)			
				SG (Sour Gas) meets the requirements of NACE MR0175/ISO 15156 (for Chloride conditions < 50 mg/l [ppm]) and NACE MR0103 (SS valves only) (not available for O-ring packed valves)			
				SG 3 (Sour Gas) meets the requirements of NACE MR0175/ISO 15156 (for Chloride conditions > 50 mg/l [ppm])			
				TB Test ports - bottom of manifold (1/4-inch FNPT) (option not available for M4A with -AM)			
				TR68 Add for use with Rosemount [®] models 1151DP 6, 7, 8 and 1151HP 6, 7, 8 and any DP transmitter with bolt spacing between 2.125-inch (54 mm) and 2.281-inch (58 mm) (metal seat only)			
				SS All 316 SS material on non wetted components			
				T For large gasket area sealing			
				LT Low Temperature for integral seat 316SS -313°F (-192°C) @ 2500 psi (1782 bar) Must use with -SSB option and Integral Seats and Graphite packing 316SS			
				SST 316SS Circular Tag (10 Characters max)			

NOTES

1. If SS flange bolts are requested, manifold ratings are downrated.
2. Integral tube fitting design, refer to page 8.
3. CS parts are zinc TCP plated to prevent corrosion.

Anderson Greenwood Instrumentation Manifolds - Three Valve

Selection Guide - Power Industry Applications^[2]

M4THP		S	-4 -XP		-SSB	
BASIC SERIES	BODY MATERIAL	CONNECTIONS (PROCESS X INSTRUMENT X VENT) (M4T ONLY) ^[5]			OPTIONS	
M4AHP 3-Valve manifold, flange x flange	S SS, A479-316	4	½-inch FNPT x flange x ¼-inch FNPT		AM	AGI Mount kit for 2-inch pipe stand mounting of manifold (see table page 7)
M4THP 3-Valve manifold, FNPT x flange		4AT	½-inch AGCO tube x flange x ¼-inch FNPT		SSB	316 SS flange bolt (B8M Class 2) - will provide full pressure rating
		4B	½-inch pipe S.W. x flange x ¼-inch FNPT		SS	All 316 SS material for non wetted components
		4TB	½-inch tube S.W. x flange x ¼-inch FNPT		R3V	Add for use with Rosemount® model 3051C (with -XP B8M Class 2 SS bolts)
					XP	Meets the requirements of B31.1
					SST	316SS Circular Tag (10 Characters max)

NOTES

- Integral tube fitting design, refer to page 8.
- All manifolds come standard with Graphite packing, integral seats, bonnet locks, and are subjected to hydrostatic testing.
- Manifold ratings:
 - 316 SS 6000 psig at 100°F (414 barg at 38°C)
 - 3030 psig at 1000°F (209 barg at 538°C)
- Test bottom ports standard (TB ports).
- M4A connections are flange x flange x ¼ -inch FNPT.
- To ASME B31.1 or B31.3, meets MSS SP-105.
- Hastelloy® is a registered trademark of Haynes International, Inc.
- Elgiloy® is a registered trademark of Elgiloy Specialty Metals.
- Monel® is a registered trademark of the Special Metals Corporation.