

## MANUAL VALVE SERIES

10V  
10VRMM  
MV/MVE  
SW  
10P/15P  
10SM/20SM  
30VM  
30VRMM  
60VM  
60VRMM  
100VM



# Manual Valves

## Operation and Maintenance Manual

Catalog: 02-0024ME

January 2013

aerospace  
climate control  
electromechanical  
filtration  
fluid & gas handling  
hydraulics  
pneumatics  
process control  
sealing & shielding



ENGINEERING YOUR SUCCESS.

Model # \_\_\_\_\_

Order # \_\_\_\_\_

Serial # \_\_\_\_\_

Mfg. Date \_\_\_\_\_

Drawing # \_\_\_\_\_

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### Section 1.0 Installation

No adjustments are necessary prior to installation. Refer to Parker Autoclave Engineers' Valve, Fitting and Tubing Catalog (Installation Section) for proper tubing connection installation.

**Note:** The minimum and maximum temperature limits of the connection style and materials listed in the Valve, Fitting and Tubing Catalog.

is not available, tighten the packing gland approximately 1/16 turn.

5. Pressurize the valve to the maximum operating pressure and check for leaks.
6. If the packing still leaks, relieve all pressure in the valve and repeat steps 4 and 5. If the packing does not seal after several attempts, it needs replaced (refer to Section 3.0).
7. Reinstall the packing gland locking device.

### Section 2.0 Packing Adjustment

If the valve packing starts to leak, follow the steps listed below to reseal the valve stem.

**Note:** The minimum and maximum temperature limits of the appropriate packing listed in the Valve, Fitting and Tubing Catalog.

1. Relieve all pressure from the valve and remove it from the system.
2. Turn valve stem to full open position.
3. Loosen the packing gland locking device.
4. While holding the valve body secure, use a torque wrench to tighten the packing gland to the value shown on the attached Installation Summary Chart. If a torque wrench

### Section 3.0 Packing or Stem Replacement

#### CAUTION

**If stem removal is necessary on a MicroMetering (VRMM series) valve, it must be returned to the factory as precise adjustments are necessary after assembly to achieve minimum flow capability of the valve.**

1. Relieve all pressure from the valve and remove it from the system.
2. Turn valve stem to full open position.
3. Remove the packing gland locking device.

- While holding the valve body (or housing for HT and LT valves) secure, unthread and remove the packing gland. The packing will stay on stems that have a larger stem tip below the packing (see Fig. 3: SW8, 10/20SM9, 10/20SM12, 10/20SM16).

**Note:** For HT and LT valves, the housing must be removed where the stem tip is larger than the body cone ring ID (SW6, SM12 and SM16 valves). Remove the housing locking device and unscrew the housing from the valve body.

- Autoclave Engineers manual valves have three different type of stems; one piece non-rotating (figure 2), two piece pinned non-rotating (figure 4) and rotating (figure 5). Follow steps 6-9 for one piece non-rotating stems, steps 10-11 for two piece pinned non-rotating stems and step 12 for rotating stems.

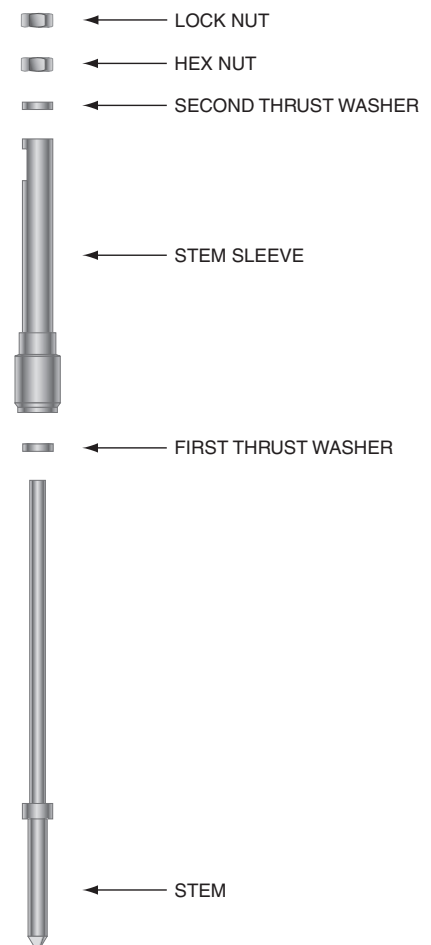
#### One piece non-rotating stem

- For stems without a larger stem tip, remove the bottom washer, packing and packing washer in the body. Place the bottom washer, packing and packing washer in the body. If the stem does not require replacement, screw the packing gland back into the body and tighten the packing gland to the value in the Installation Summary Chart.
- Remove the handle by loosening the set screw(s) located in the larger hole of the handle (use a 5/32 hex wrench for the 3" long handle, a 3/16 hex wrench for the 4" and 10-1/4" long handle) and remove it from the stem sleeve. Unscrew the stem from the packing gland. Remove the two nuts and thrust washer from the top of the stem assembly. Remove the stem from the stem sleeve. Remove the bottom thrust washer from the stem. For SW8, 10SM9 and 20SM9 valves, remove the stem collar by unscrewing it clockwise. For stems with a larger stem tip, remove the packing washer and packing from the stem.
- Clean thrust washers and all surfaces which mate with thrust washers with a clean cloth. Apply non-hardening lubricant (Jet-Lube SS-30<sup>1</sup> or similar) lightly to both faces of the thrust washer and the sleeve threads.
- For stems with a larger stem tip, place the bottom washer, packing and packing washer on the stem (remove the bottom washer from from the old stem if the stem is being replaced). For SW8, 10SM9 and 20SM9 valves, place the stem collar on the stem by threading it counter-clockwise. Place first thrust washer on the stem and slide stem into stem sleeve. Place second thrust washer on the stem sleeve. Replace hex nut lightly against the upper thrust washer and thread the stem assembly fully into the packing gland. Screw the packing gland into the body and tighten

to the value in the Installation Summary Chart. Open the valve completely, then close it one turn to remove the play. Finger tighten the hex nut, then use a wrench to tighten it approximately 1/8 of a turn. Install the lock nut and finger tighten it in place. While holding the lock nut secure, loosen the hex nut from the top washer and tighten it against the lock nut approximately 1/16 of a turn. Replace the handle by lining the hex socket set screw up against the flat spot on the stem sleeve and tighten it in place (DO NOT OVERTIGHTEN). In order to have a nonrotating stem, a slight amount of free play must exist between the stem sleeve and shaft. The handle should have a 10 degree maximum free play for "backlash". If the free play is excessive, it will be necessary to remove the handle and loosen the lock nut and tighten the hex nut further against the thrust washer. Tighten the lock nut as indicated above and check for free play. When the desired "backlash" is achieved, replace the handle as described above. Re-install the locking device.

#### Two piece pinned non-rotating stems

- For high and low temperature valves that have two piece non-rotating stems, remove the groove pin holding



**Figure 1:** Two-Piece Non-rotating Stem Assembly (Exploded)

the upper and lower stem together by driving it out with a rigid small diameter rod and pulling it out with a pair of pliers. Remove the packing washer and packing from the stem. If a new lower stem is required, remove the housing and cone ring from the old stem and place the cone ring and housing over the new lower stem. Place the bottom washer, packing and packing washer on the stem. Insert the lower stem into the upper stem so that the groove pin holes line up. Drive the groove pin into the hole until it is flush with the outside diameter of the upper stem.

11. Lubricate stem sleeve threads with Jet-Lube SS-30<sup>1</sup> or similar lubricant. Thread the stem sleeve all the way into the packing gland or the insert so that the stem is in the full open position. While holding the housing in a vice, torque the packing gland to the value in the Installation Summary Chart and tighten the locknut. Apply silicone grease or similar lubricant to the sealing surfaces of the cone rings. Apply Jet-Lube SS-30<sup>1</sup> or similar lubricant to the threads. Screw the housing into the valve body and torque the housing to the value in the Installation Summary Chart. Replace the housing locking device.

### Rotating Stem

12. Remove the handle from the stem. Unthread the stem from the packing gland. Apply Jet-Lube SS-30<sup>1</sup> or similar lubricant to the threads of the new stem and thread the new stem all the way into the packing gland. Line the set screw on the stem up with the flat spot on the stem and tighten the set screw. With the bottom washer, packing and packing washer installed in the body, screw in the packing gland and torque it to the value in the Installation Summary Chart. Reinstall the packing gland locking device.

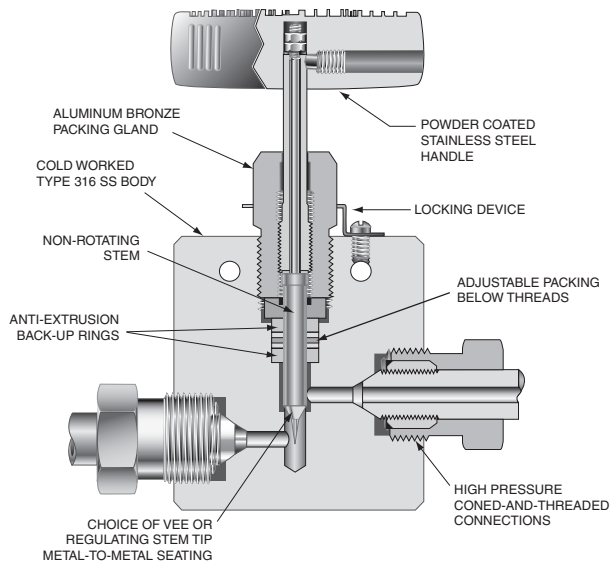


Figure 2: Typical Valve Assembly

## Section 4.0 Seat Replacement

(see Fig. 3)

1. Relieve all pressure from the valve and remove it from the system. Turn the valve stem to the full open position.
2. While holding the body secure, unscrew the seat retainer.
3. Remove old seat and replace if necessary.
4. Apply silicone grease or similar lubricant to sealing surfaces of seat. Apply Jet-Lube SS-30<sup>1</sup> or similar lubricant to the seat retainer threads.
5. Replace seat and seat retainer. Make certain that the seat stays flat against the valve body. Tighten seat retainer to the torque specified in the Installation Summary Chart.

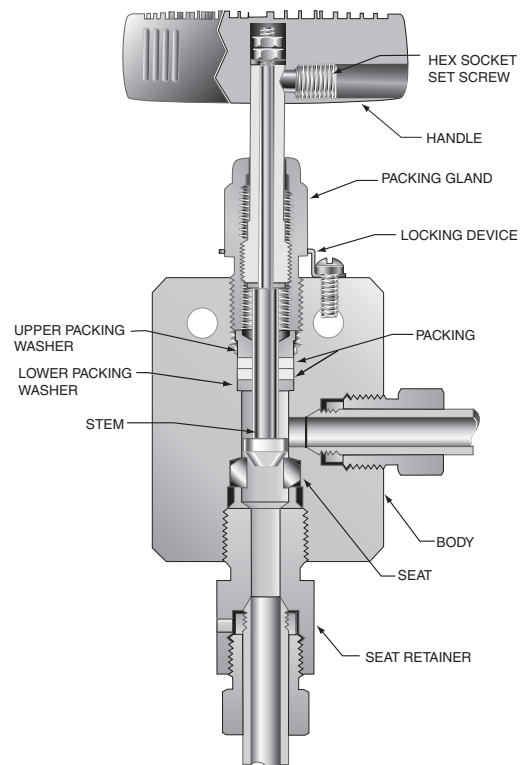


Figure 3: Valve with Replacement Seat

## Section 5.0 Service

For service contact the Parker Autoclave Engineers' Representative in your area or FAX Parker Autoclave Engineers' Support Services at 1-814-860-5703.

### Notes:

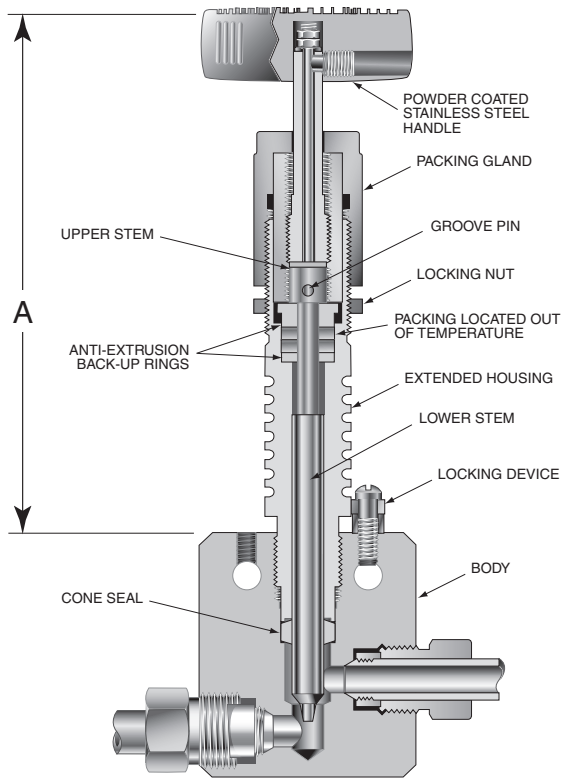
HT - (high temperature extended stuffing box option).

LT - (cryogenic extended stuffing box option).

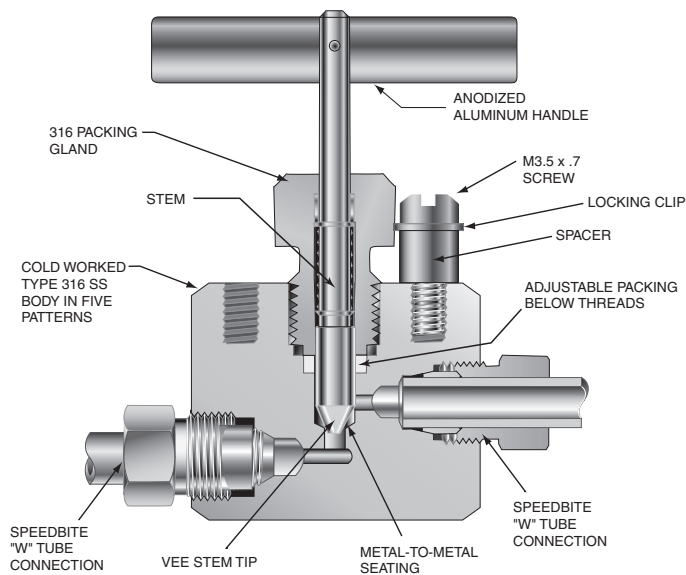
<sup>1</sup>SS30 is a registered trademark of Jet-Lube, Inc.

## Section 6.0 Installation Summary Chart

Please see Installation Summary Chart on pages 6 & 7.



**Figure 4:** Extended Housing Valve Assembly with Two Piece Pinned Non-Rotating Stem



**Figure 5:** One Piece Rotating Stem

## Section 4.0 Installation Summary Chart

Valve** Series	Packing Gland Hex Size		Packing Gland Torque ~		Tube Gland Hex Size	Tube Gland Torque	Packing P/W			Replaceable Seat Retainer Hex Size		Replaceable Seat Retainer Torque		Extended Housing Hex in. (mm)	Extended Housing Torque ft.-lbs (mm)	Extended Housing Torque (N·m)	Packing Gland Hex Size (w/ext. housing)		Packing Gland Torque ~ (w/ext. housing)		Hex and Lock Nut Sizes			
	in.	(mm)	ft.-lbs	(N·m)			TFE (qty.)	TG (qty.)	GY (qty.)	in.	(mm)	ft.-lbs	(N·m)				in.	(mm)	ft.-lbs	(N·m)	in.	(mm)	ft.-lbs	(N·m)
MV1/ MV2	1/2	(12.7)	12.5	(17.1)	.393	(10.0)	*	-	-	P-0825 (1)	-	-	-	-	-	-	-	-	-	-	-	-		
MVE1/ MVE2	1/2	(12.7)	12.5	(17.13)	3/8	(7.57)	*	-	-	P-0825 (1)	-	-	-	-	-	-	-	-	-	-	-	-		
10V2/ SW2	1/2	(12.7)	12	(16.3)	1/2	(12.7)	*	-	-	P-0825 (2)	P-8926 (1)	1/2	(12.7)	10	(13.6)	5/8	(15.9)	10	(13.6)	1/2	(12.7)	12	(16.3)	
10V4	13/16	(20.6)	40	(54.2)	13/16	(20.6)	*	-	-	P-0128 (1)	P-0466 (1)	1	(25.4)	15	(20.4)	15/16	(23.8)	20	(27.2)	13/16	(20.6)	40	(54.4)	
10V6	13/16	(20.6)	40	(54.2)	13/16	(20.6)	*	-	-	P-0128 (1)	P-0466 (1)	1	(25.4)	10	(13.6)	15/16	(23.8)	15	(20.4)	13/16	(20.6)	40	(54.4)	
10V8	13/16	(20.6)	30	(40.7)	15/16	(23.8)	*	-	-	P-0686 (1)	P-1211 (1)	1	(25.4)	15	(20.4)	15/16	(23.8)	20	(27.2)	13/16	(20.6)	30	(47.6)	
SW4	5/8	(15.9)	30	(40.7)	5/8	(15.9)	*	-	-	P-0685 (2)	P-1691 (2)	3/4	(19.1)	20	(27.2)	13/16	(20.6)	35	(47.6)	1-13/16	(30.2)	25	(34.0)	
SW6	5/8	(15.9)	40	(54.2)	3/4	(19.1)	*	-	-	P-0686 (2)	P-1211 (2)	3/4	(19.1)	15	(20.4)	13/16	(20.6)	35	(47.6)	1-13/16	(30.2)	30	(40.8)	
SW8	13/16	(20.6)	50	(67.8)	15/16	(23.8)	*	-	-	P-0677 (2)	P-0776 (2)	1	(25.4)	50	(68.0)	1	(25.4)	35	(47.6)	1-1/2	(38.1)	20	(27.2)	
15P4	5/8	(15.9)	40	(54.2)	-	-	-	-	-	P-0685 (2)	P-1691 (2)	-	-	-	-	-	-	-	-	-	-	-	-	
15P6	5/8	(15.9)	40	(54.2)	-	-	-	-	-	P-0685 (2)	P-1691 (2)	-	-	-	-	-	-	-	-	-	-	-	-	
15P8	13/16	(20.6)	80	(108)	-	-	-	-	-	P-0677 (2)	P-0776 (2)	-	-	-	-	-	-	-	-	-	-	-	-	
10P12	15/16	(23.8)	+	-	-	-	-	-	-	P-1758 (2)	P-1759 (2)	-	-	-	-	-	-	-	-	-	-	-	-	
10P16	1-3/8	(34.9)	20	(27.2)	-	-	-	-	-	P-1733 (2)	P-1775 (4)	-	-	-	-	-	-	-	-	-	-	-	-	
20SM4	5/8	(15.9)	40	(54.2)	1/2	(12.7)	20	(27.1)	20	(27.1)	P-0685 (2)	P-1691 (2)	3/4	(19.1)	35	(47.6)	13/16	(20.6)	35	(47.6)	1-13/16	(30.2)	25	(34.0)
20SM6	5/8	(15.9)	40	(54.2)	5/8	(15.9)	30	(40.7)	30	(40.7)	P-0685 (2)	P-1691 (2)	3/4	(19.1)	35	(47.6)	13/16	(20.6)	35	(47.6)	1-13/16	(30.2)	25	(34.0)
20SM9	13/16	(20.6)	80	(108)	15/16	(23.8)	55	(74.6)	55	(74.6)	P-0677 (2)	P-0776 (2)	1	(25.4)	125	(170)	1	(25.4)	100	(136)	1-1/2	(38.1)	100	(136)
20SM12	15/16	(23.8)	+	-	1-3/16	(30.2)	90	(122)	90	(122)	P-1758 (2)	P-1759 (2)	1-3/8	(34.9)	140	(190)	1-3/8	(34.9)	120	(163.2)	1-3/4	(44.5)	+	-
20SM16	1-3/8	(34.9)	++	-	1-3/8	(34.9)	150	(203)	150	(203)	P-1733 (2)	P-1775 (4)	1-3/4	(44.5)	150	(203)	1-3/4	(44.5)	170	(231.2)	1-3/4	(44.5)	++	-

For the discontinued 20SV and 20SC Series use SM valves

### Notes:

- \*\* Valve series and connection size in sixteenth's of an inch are indicated.
- + Finger tight, then 3/4 turn with wrench (TFE only). 175 ft. - lbs. (238.9) N-m with TG packing. 120 ft.-lbs. (162.7) N-m with GY packing.
- ++ Finger tight, then 3/4 turn with wrench (TFE only). 325 ft. - lbs. (443.8) N-m with TG packing. 140 ft.-lbs. (189.8) N-m with GY packing.
- ~ Unless otherwise noted, torque values are for TFE packing. For TG packing add 10% and for GY packing add 25% to these values.
- \* Torque wrench not required for AE Speedbite tube connections. Tighten gland until sleeve begins to grip tubing the 1-1/4 turns.



## Installation Summary Chart - con't

Valve* Series	Packing Gland Hex Size		Packing Gland Torque ~		Tube Gland Hex Size	Tube Gland Torque	^^ TFE (qty.)	Packing P/N		Replaceable Seat Retainer Hex Size		Replaceable Seat Retainer Torque		Extended Housing Hex in.	Extended Housing Torque ft-lbs	Packing Gland Hex Size (w/ext. housing)		Packing Gland Torque ~ (w/ext. housing)		Hex and Lock Nut Sizes			
	in.	(mm)	ft-lbs	(Nm)				TG (qty.)	GY (qty.)	in.	(mm)	ft-lbs	(Nm)			in.	(mm)	ft-lbs	(Nm)	in.	(mm)	ft-lbs	(Nm)
30VM4	13/16	(20.6)	60	(81.3)	5/8	(15.9)	P-0128 (1)	P-0466 (1)	P-8932 (1)	3/4	(19.1)	35	(47.6)	15/16	(23.8)	50	(67.8)	13/16	(20.6)	60	(81.3)	7/32	(5.56)
30VM6	13/16	(20.6)	60	(81.3)	13/16	(20.6)	P-0128 (1)	P-0466 (1)	P-8932 (1)	1	(25.4)	35	(47.6)	15/16	(23.8)	50	(67.8)	13/16	(20.6)	60	(81.3)	7/32	(5.56)
30VM9	13/16	(20.6)	60	(81.3)	1-3/16	(30.2)	P-0128 (1)	P-0466 (1)	P-8932 (1)	1-3/8	(34.9)	35	(47.6)	15/16	(23.8)	50	(67.8)	13/16	(20.6)	60	(81.3)	7/32	(5.56)
60VM4	13/16	(20.6)	60	(81.3)	5/8	(15.9)	P-0864 (1 set)	P-8713 (2)	P-8933 (1)	13/16	(20.6)	45	(61.2)	15/16	(23.8)	65	(88.1)	13/16	(20.6)	60	(81.3)	7.32	(5.56)
60VM6	13/16	(20.6)	60	(81.3)	13/16	(20.6)	P-0864 (1 set)	P-8713 (2)	P-8933 (1)	1	(25.4)	45	(61.2)	15/16	(23.8)	65	(88.1)	13/16	(20.6)	60	(81.3)	7/32	(5.56)
60VM9	13/16	(20.6)	60	(81.3)	1-3/16	(30.2)	P-0864 (1 set)	P-8713 (2)	P-8933 (1)	1-3/8	(34.9)	45	(61.2)	15/16	(23.8)	65	(88.1)	13/16	(20.6)	60	(81.3)	7/32	(5.56)
10VRMM2	5/8	(15.9)	20^	(27.1)	1/2	(12.7)	*	P-1654 (1)	P-0467 (1)	P-8934 (1)	5/8	(15.9)	25	(34.0)	5/8	(15.9)	15	(20.5)	5/8	(15.9)	20	(27.3)	N/A
30VRMM4	13/16	(20.6)	50^	(67.8)	5/8	(15.9)	P-1654 (1)	P-0467 (1)	P-8934 (1)	13/16	(20.6)	50	(67.8)	15/16	(23.8)	50	(67.8)	13/16	(20.6)	50	(67.8)	N/A	(5.56)
60VRMM4	13/16	(20.6)	50^	(67.8)	5/8	(15.9)	P-0864 (1) (1 set)	P-8713 (2)	P-8933 (1)	15/16	(23.8)	35	(47.6)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	7/32	(5.56)
60VRMM4	13/16	(20.6)	50^	(67.8)	13/16	(20.6)	P-0864 (1) (1 set)	P-8713 (2)	P-8933 (1)	1-3/8	(34.9)	35	(47.6)	15/16	(23.8)	55	(75.1)	13/16	(20.6)	75	(102.4)	7/32	(5.56)
100VM5	15/16	(23.8)	60	(81.3)	3/4	(19.1)	90368 (1) 90369 (2)			N/A		70	(95.2)	NA	NA	N/A	NA	NA	NA	N/A	15/16	(7.94)	
100VM4	15/16	(23.8)	60	(81.3)	3/4	(19.1)	90368 (1) 90369 (2)			1	(25.4)	70	(95.2)	NA	NA	N/A	NA	NA	NA	N/A	15/16	(7.94)	
100VM6	15/16	(23.8)	60	(81.3)	3/4	(19.1)	90368 (1) 90369 (2)			1	(25.4)	70	(95.2)	NA	NA	N/A	NA	NA	NA	N/A	15/16	(7.94)	

**Notes:**

- \*\* Valve series and connection size in sixteenths of an inch are indicated.
  - ^ Zero position of barrel or thimble must be changed.
  - ^^ 60VM and 60VRMM packing is nylon (P-0829), leather (P-0803) and nylon (P-0829).
  - + Finger tight, then 3/4 turn with wrench (TFE only). 175 ft. - lbs. (238.9) N-m with TG packing. 120 ft.-lbs. (162.7) N-m with GY packing.
  - ++ Finger tight, then 3/4 turn with wrench (TFE only). 325 ft. - lbs. (443.8) N-m with TG packing. 140 ft.-lbs. (189.8) N-m with GY packing.
  - ~ Unless otherwise noted, torque values are for TFE packing. For TG packing add 10% and for GY packing add 25% to these values.
  - \* Torque wrench not required for AE Speedbite tube connections. Tighten gland until sleeve begins to grip tubing the 1-1/4 turns.
- N/A Not Applicable

### **WARNING**

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