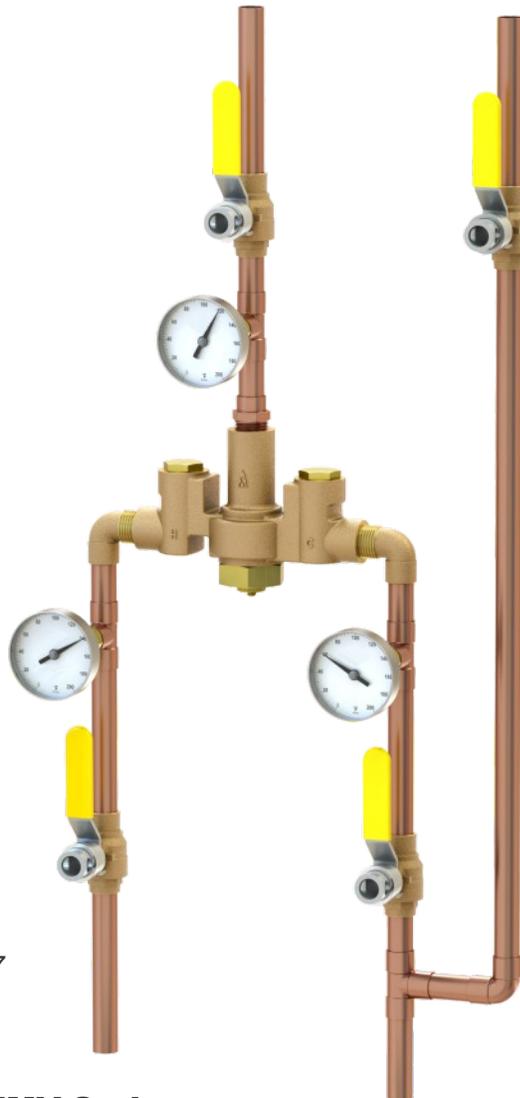




MGI CONTROLS®
42 Sherwood Terrace, Suite #5
Lake Bluff, IL 60044
Phone: (847) 604-4773
www.mgicontrols.com

INSTALLATION, OPERATION AND MAINTENANCE INSTRUCTIONS

SFMV THERMOSTATIC MIXING VALVE SUPPLY FIXTURE



Patent #9,898,017

Model SFMV Series

FOR TECHNICAL ASSISTANCE

1-(847)-604-4773



NOTES TO THE INSTALLER:

- 1. Please leave this documentation with the owner of the fixture when finished.**
- 2. Please read this entire booklet before beginning the installation.**
- 3. Check your installation for compliance with plumbing and other applicable codes.**



WARNING:

You are required to thoroughly read all installation instructions and product safety information before beginning the installation of this product.

FAILURE TO READ AND FOLLOW PROPER INSTALLATION AND MAINTENANCE INSTRUCTIONS MAY RESULT IN PRODUCT FAILURE WHICH CAN CAUSE PROPERTY DAMAGE, PERSONAL INJURY AND/OR DEATH.

MGI CONTROLS® is not responsible for damages resulting from improper installation and/or maintenance. Installation of this valve shall be in accordance with *Uniform Plumbing Code*.

TO ENSURE ACCURATE AND RELIABLE OPERATION OF THIS PRODUCT, IT IS ESSENTIAL TO:

- Properly design the system to minimize pressure and temperature variations.
- Implement an annual maintenance program to ensure proper operation and temperature setting of valve(s).
- This valve is factory preset. However, it can be adjusted. It is the responsibility of the installer and or facility maintenance personnel to make sure valve outlet temperature is properly set.

SUPPLIES REQUIRED:

(Not provided by **CONTROLS®**)

1. Wall anchors, screws, nuts and washers as required.
2. Lead-free solder and flux for sealing water connections.
3. Pipe fittings.
4. Wrench and an Allen wrench.



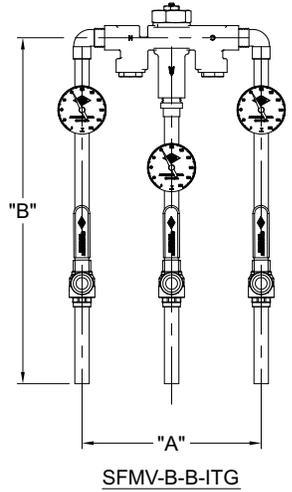
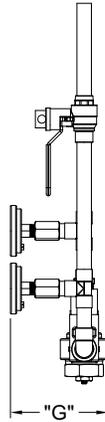
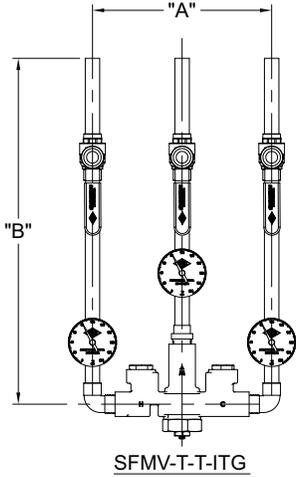
IMPORTANT

- Flush supply lines of all foreign material such as pipe dope, chips or solder prior to connecting to mixing valve.
- To ensure proper installation review the manual thoroughly to verify rough-ins before beginning any work.
- Installation and field adjustment are the responsibility of the installer.
- Maximum water pressure is 125 PSI (8.62 bar). Maximum inlet hot water temperature is 180°F (82°C). Temperature adjustment range* is 100°F-160°F (38°C-71°C). Valve assembly must be drained prior to being subjected to freezing temperatures. Valve includes integral check valves.

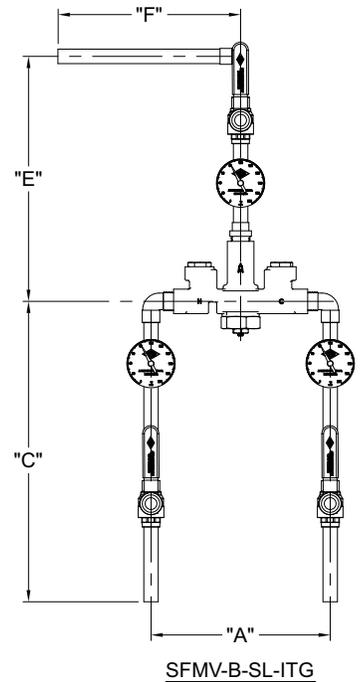
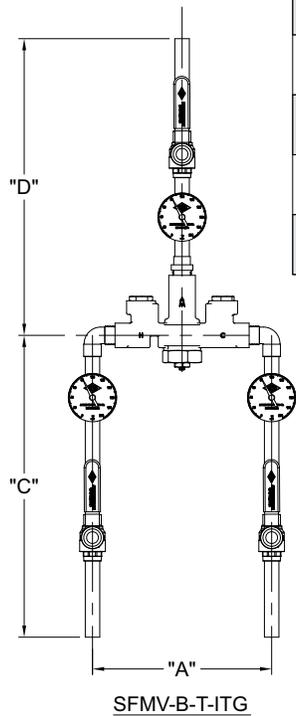
**Under Normal Operating Conditions*

	PRESSURE DROP PSID (kPa)	CV	5 (34)	10 (69)	15 (103)	20 (138)	30 (207)	45 (310)	60 (414)
MV17-1 15 GPM (56.8 LPM)	FLOW RATE GPM (LPM)	2.2	5 (19)	7 (26.7)	8.7 (32.8)	10 (37.9)	12.3 (46.4)	15 (56.8)	17.3 (65.6)
MV17-2 45 GPM (170 LPM)	FLOW RATE GPM (LPM)	6.7	15 (56.8)	21.2 (80.3)	26 (98.4)	30 (113.6)	36.7 (139)	45 (170.3)	52 (196.7)
MV17-3 90 GPM (341 LPM)	FLOW RATE GPM (LPM)	13.4	30 (113.6)	42.4 (160.6)	52 (196.7)	60 (227.1)	73.5 (278.2)	90 (340.7)	104 (393.4)
MV17-4 150 GPM (568 LPM)	FLOW RATE GPM (LPM)	22.4	50 (189)	70.7 (167.7)	86.6 (327.8)	100 (378.5)	122.5 (463.6)	150 (567.8)	173.2 (655.7)
MV17-5 225 GPM (852 LPM)	FLOW RATE GPM (LPM)	33.5	75 (284)	106 (401.5)	130 (491.7)	150 (567.8)	183.7 (695.4)	225 (851.7)	259.8 (983.5)

ROUGH-IN DIMENSIONS:

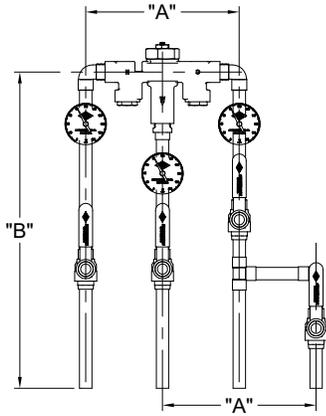


	INLET	OUTLET	"A"	"B"	"C"	"D"	"E"	"F"	"G"
SFMV-1	1/2" NCT	1/2" NCT	7-3/4" (197)	15" (381)	13" (330)	12-7/8" (327)	10-5/8" (270)	7-7/8" (200)	4-1/2" (114)
SFMV-2	3/4" NCT	1" NCT	10-3/4" (273)	18-5/8" (473)	15-5/8" (397)	17" (432)	15-3/4" (400)	9-5/8" (244)	5-1/4" (133)
SFMV-3	1" NCT	1-1/4" NCT	16-3/4" (425)	23" (584)	17-1/2" (445)	19-7/8" (505)	18-3/4" (476)	12-5/8" (321)	6-3/4" (171)
SFMV-4	1-1/4" NCT	1-1/2" NCT	23-1/4" (591)	17-1/4" (438)	17-7/8" (454)	23-1/4" (591)	22-1/4" (565)	13" (330)	7" (178)
SFMV-5	1-1/2" NCT	2" NCT	18-5/8" (473)	25-1/2" (648)	19-1/4" (489)	23" (584)	23" (584)	13-5/8" (346)	7-1/2" (190)

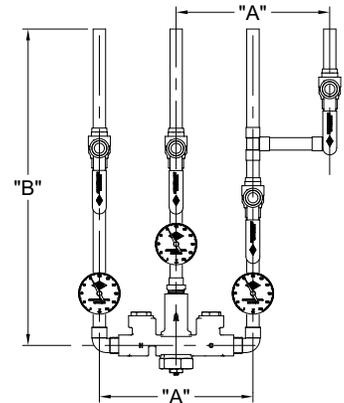
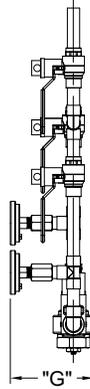


NOTE;
ALL DIMENSIONS ARE IN INCHES (MM).

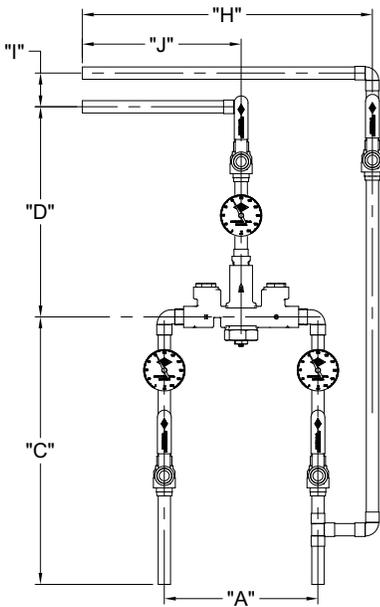
ROUGH-IN DIMENSIONS:



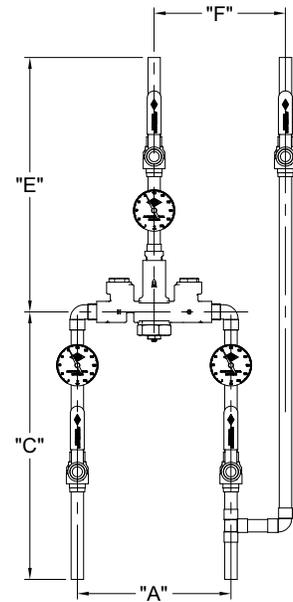
SFMV-B-OB-CWB-ITG



SFMV-T-OT-CWB-ITG



SFMV-B-OSL-CWB-ITG

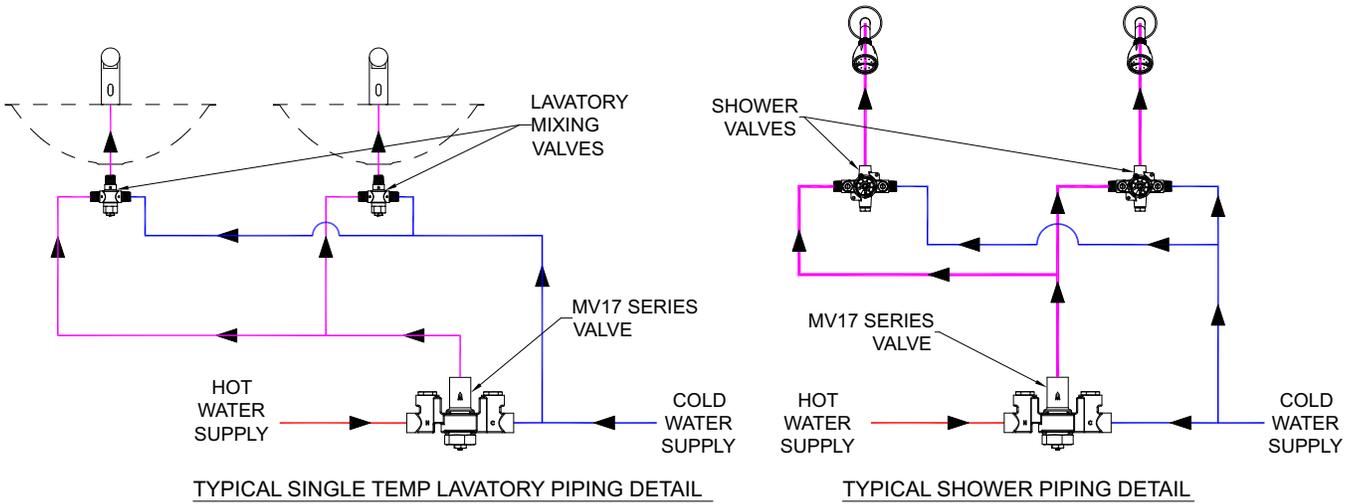


SFMV-B-OT-CWB-ITG

	INLET	OUTLET	"A"	"B"	"C"	"D"	"E"	"F"	"G"	"H"	"I"	"J"
SFMV-1 -CWB	1/2" NCT	1/2" NCT	7-3/4" (197)	16" (406)	13-1/2" (343)	10-5/8" (270)	12-7/8" (327)	6-5/8" (168)	4-1/2" (114)	14-5/8" (371)	1-3/4" (44)	8" (203)
SFMV-2 -CWB	3/4" NCT	1" NCT	10-3/4" (273)	21-3/8" (543)	17-3/8" (441)	15-3/4" (400)	17" (432)	8-7/8" (225)	5-1/4" (133)	18-1/2" (470)	2" (51)	9-5/8" (244)
SFMV-3 -CWB	1" NCT	1-1/4" NCT	16-3/4" (425)	24" (610)	19" (483)	18-3/4" (476)	20" (508)	12-7/8" (327)	6-3/4" (171)	25-3/8" (645)	2-3/4" (70)	15-5/8" (397)
SFMV-4 -CWB	1-1/4" NCT	1-1/2" NCT	17-1/4" (438)	25-3/8" (645)	22-3/8" (568)	22-1/4" (565)	23" (584)	13-1/2" (343)	7" (178)	26-5/8" (676)	3-1/2" (89)	13-1/4" (337)
SFMV-5 -CWB	1-1/2" NCT	2" NCT	18-5/8" (473)	28-1/4" (718)	23-3/8" (594)	23" (584)	23" (584)	15-5/8" (397)	7-1/2" (190)	29-5/8" (752)	3-1/4" (83)	14" (356)

NOTE;
ALL DIMENSIONS ARE IN INCHES (MM).

PIPING DETAILS:



Valve Specifications:

Maximum Operating Pressure: 125 PSI (861 kPa)
 Maximum Hot Water Supply Temp: 180°F (82°C)
 Outlet Temp. Range: 100°F-160°F (38°C-71°C)
 Minimum Hot Water Supply* 5°F (3°C)
 Above Set Point

Flow Rate at 45 PSI (310 kPa) differential:

MV17-1: 15 GPM (56.8 LPM)
 MV17-2: 45 GPM (170 LPM)
 MV17-3: 90 GPM (341 LPM)
 MV17-4: 150 GPM (568 LPM)
 MV17-5: 225 GPM (852 LPM)

Valve Specifications Continues:

Minimum Flow Rate per ASSE 1017*:
 MV17-1: 0.5 GPM (1.9 LPM)
 MV17-2: 1 GPM (3.8 LPM)
 MV17-3: 2 GPM (7.6 LPM)
 MV17-4: 3 GPM (11.4 LPM)
 MV17-5: 4 GPM (15.1 LPM)

NOTE:

ASSE 1017 performance based on actual demand or recirculation pump flow rate or a combination of both. See FEATURES regarding control performance at ZERO GPM user demand.

TROUBLESHOOTING:

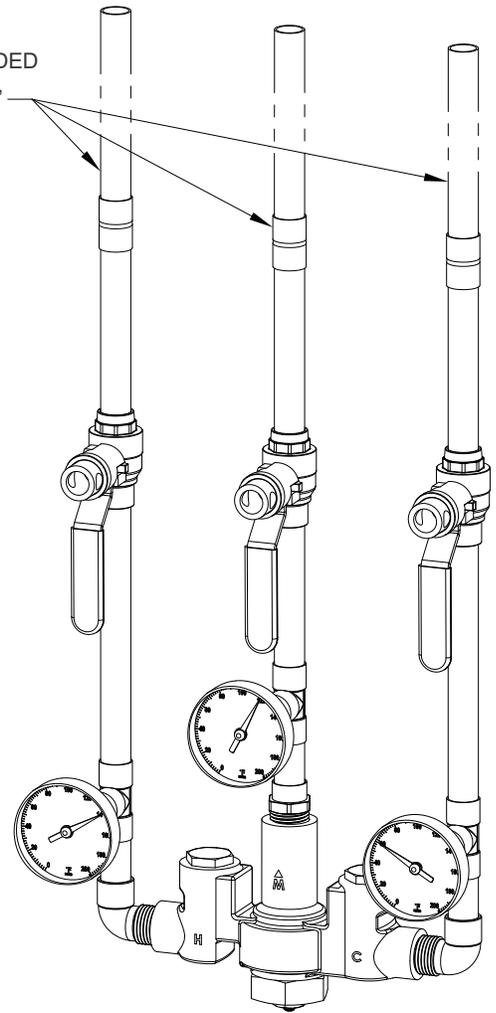
*Under Normal Operating Conditions.

PROBLEM	CAUSE	SOLUTION
1. SET POINT DIFFICULT TO SET OR CANNOT BE REACHED	<ul style="list-style-type: none"> SUPPLY TEMPS NOT WITHIN SPECIFIED LIMITS HOT AND COLD SUPPLIES ARE REVERSED 	<ul style="list-style-type: none"> CHECK DIFFERENTIAL TEMPERATURE BETWEEN SUPPLIES AND OUTLET REINSTALL VALVE WITH SUPPLIES CONNECTED TO MARKED INLETS
2. DOES NOT MAINTAIN OUTLET TEMPERATURE OR CHANGES OVER TIME	<ul style="list-style-type: none"> FLUCTUATION IN SUPPLY PRESSURES CHECK VALVE/FILTERS BLOCKED WITH DEBRIS 	<ul style="list-style-type: none"> CHECK DIFFERENTIAL TEMPERATURE BETWEEN SUPPLIES AND OUTLET CLEAN CHECK VALVES/FILTERS
3. DISCHARGE TEMPERATURE TOO HOT OR TOO COLD	<ul style="list-style-type: none"> VALVE NOT ADJUSTED PROPERLY 	<ul style="list-style-type: none"> READJUST VALVE TEMPERATURE PER INSTALLATION INSTRUCTIONS
4. CROSS FLOW	<ul style="list-style-type: none"> CHECK VALVES FOULED 	<ul style="list-style-type: none"> CLEAN CHECK VALVES/FILTERS
5. NO FLOW FROM VALVE	<ul style="list-style-type: none"> HOT OR COLD SUPPLY FAILURE OR SHUTOFFS CLOSED CHECK VALVE/FILTERS BLOCKED WITH DEBRIS 	<ul style="list-style-type: none"> OPEN SHUTOFFS OR RESTORE HOT AND COLD SUPPLIES CLEAN CHECK VALVES AND FILTERS

INSTALLATION:

1. Locate mixing valve in a suitable place accessible for servicing and adjusting. Valve should be as close as possible to point of use.
2. Thoroughly flush supplies.
3. Connect Hot and Cold supplies to mixing valve inlets and outlet to fixture(s). Supply lines by others.
4. Turn on supplies and inspect for leaks. Tighten connections if leak(s) detected.
5. Turn on fixture and allow to run until water temperature stabilizes. Measure water temperature. If water is not at desired temperature adjust as needed, (refer to adjustment section below).

INSTALLER PROVIDED
1/2" NCT RISER,
SUPPLIES AND
CONNECTIONS

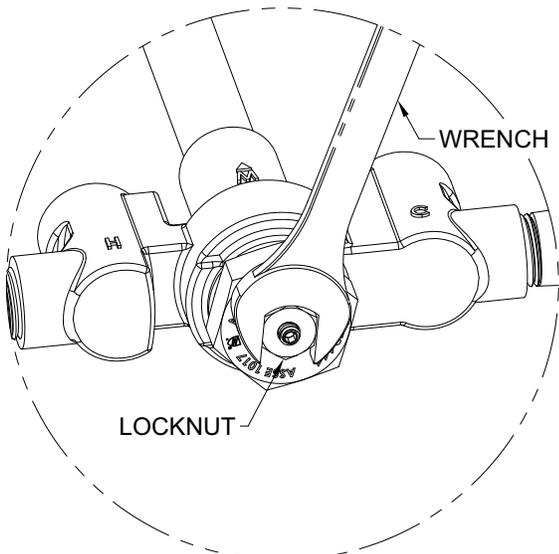


TYPICAL INSTALLATION

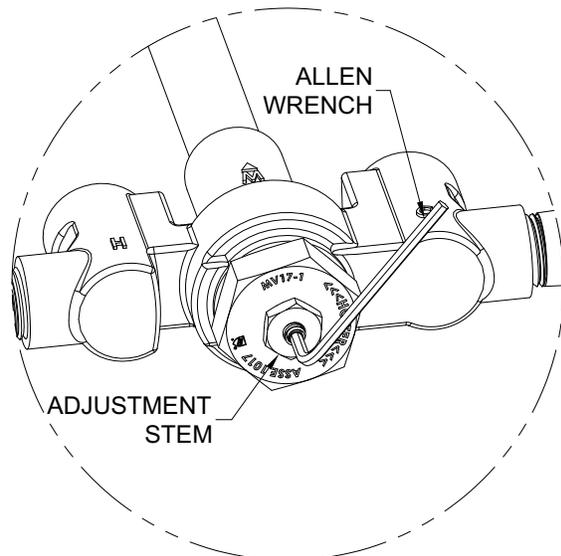
TEMPERATURE ADJUSTMENT:

1. Loosen locknut. *Detail A*
2. Turn on fixture so temperature can stabilize.
3. Using Allen wrench turn adjustment stem counter-clockwise for hotter or clockwise for colder outlet temperature. *Detail B*
4. Tighten locknut to prevent any unauthorized or accidental temperature adjustment.
5. Re-check temperature.

! IMPORTANT
Upon completion of installation check all points of connection for leakage.

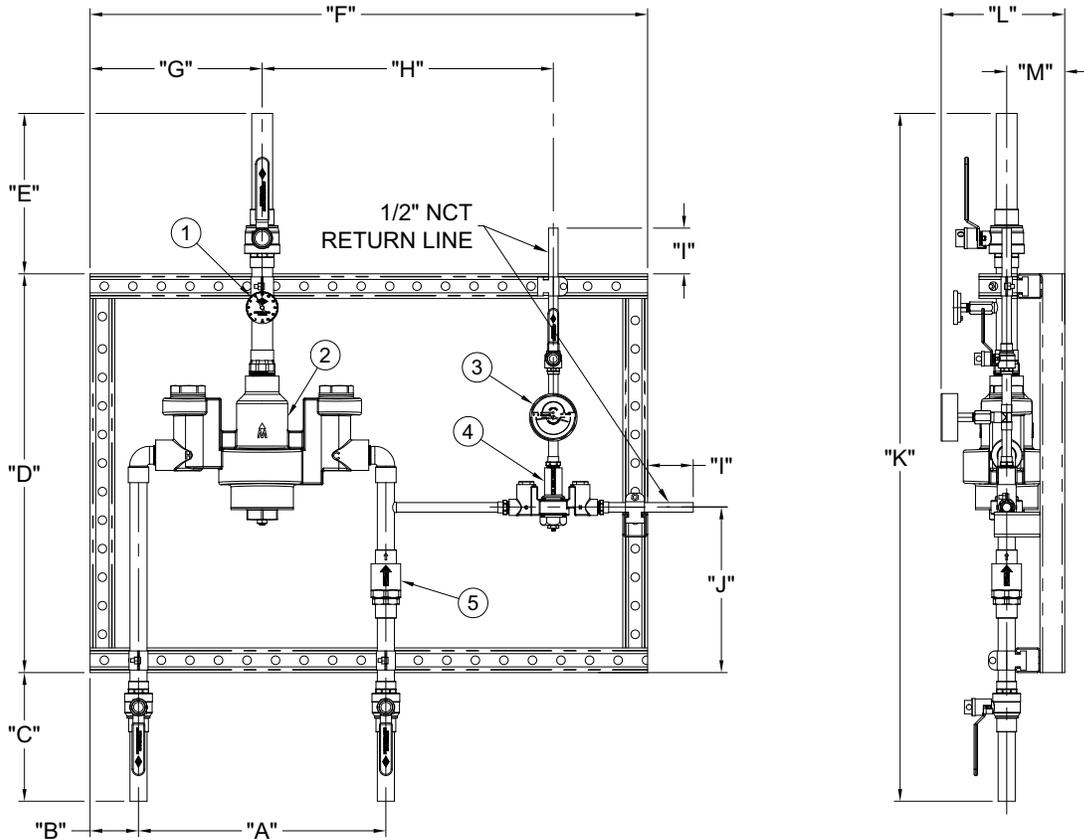


DETAIL A



DETAIL B

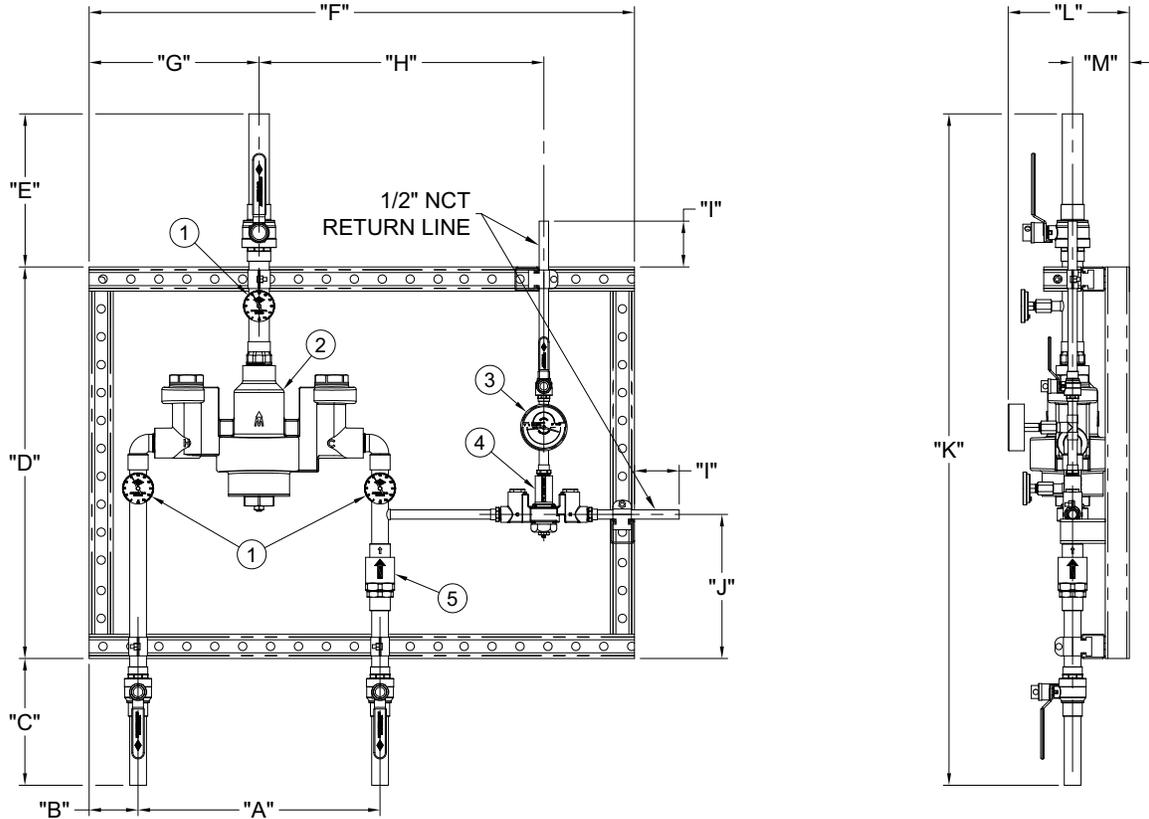
ROUGH-IN DIMENSIONS FOR OPTIONAL -TBV



- ① TEMPERATURE GAUGE
- ② MIXING VALVE
- ③ TEMPERATURE/PRESSURE GAUGE
- ④ -TBV THERMOSTATIC BALANCING VALVE
- ⑤ CHECK VALVE

	INLET	OUTLET	"A"	"B"	"C"	"D"	"E"	"F"	"G"	"H"	"I"	"J"	"K"	"L"	"M"
SFMV-1 -CWB	1/2" NCT	1/2" NCT	7-3/4" (197)	2-3/4" (70)	6-1/2" (165)	24" (610)	3" (76)	26" (660)	6-5/8" (168)	13-5/8" (346)	3" (76)	8-7/8" (225)	33-1/2" (851)	5-1/4" (133)	2" (51)
SFMV-2 -CWB	3/4" NCT	1" NCT	10-3/4" (273)	3" (76)	9" (229)	24" (610)	9-1/4" (235)	26" (660)	8-3/8" (213)	11-5/8" (295)	3" (76)	8" (203)	41-3/4" (1060)	5-1/4" (133)	2-1/4" (57)
SFMV-3 -CWB	1" NCT	1-1/4" NCT	16-1/4" (413)	2-7/8" (73)	8-1/2" (216)	26-1/4" (667)	10-1/2" (267)	36-5/8" (930)	11-1/4" (286)	19" (483)	3" (76)	10-7/8" (276)	45-1/4" (1149)	8-1/2" (216)	3-3/4" (95)
SFMV-4 -CWB	1-1/4" NCT	1-1/2" NCT	17-1/4" (438)	3-1/4" (82)	9-1/2" (241)	26-1/4" (667)	12" (305)	36-5/8" (930)	12" (305)	18-3/8" (467)	3" (76)	11" (279)	48" (1219)	7-3/8" (187)	4" (102)
SFMV-5 -CWB	1-1/2" NCT	2" NCT	18-5/8" (473)	4-1/8" (105)	9-3/4" (248)	26-1/4" (667)	13-3/8" (340)	36-5/8" (930)	13-1/2" (343)	17" (432)	3" (76)	10-1/4" (260)	49-3/8" (1254)	8-1/4" (210)	4-1/4" (108)

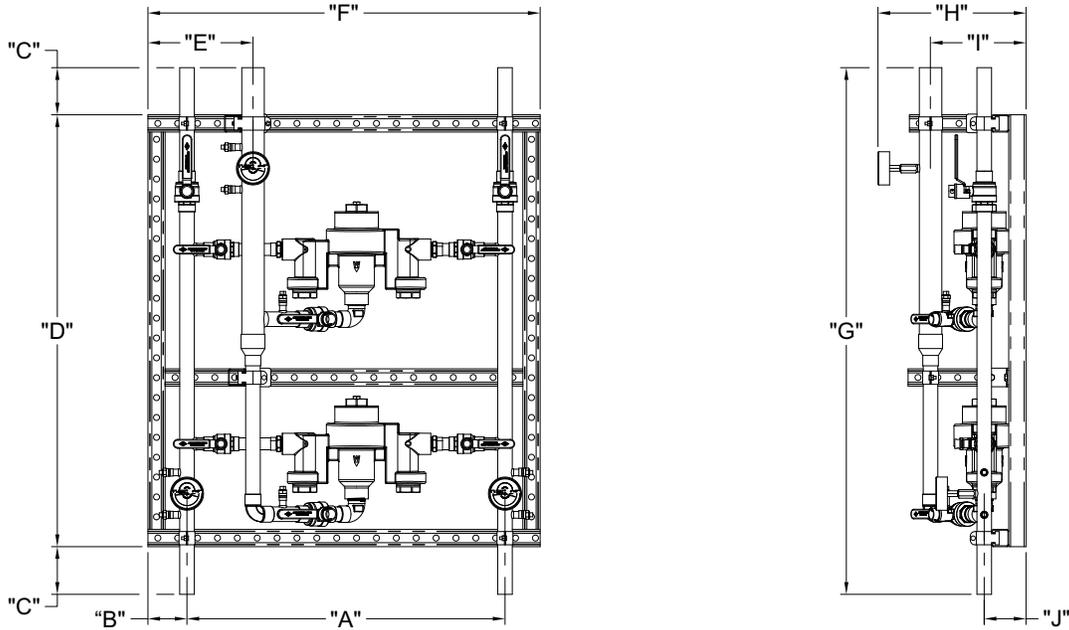
ROUGH-IN DIMENSIONS FOR OPTIONAL -TBV WITH OPTIONAL -ITG INLET TEMPERATURE GAUGES



- ① TEMPERATURE GAUGE
- ④ -TBV THERMOSTATIC BALANCING VALVE
- ② MIXING VALVE
- ⑤ CHECK VALVE
- ③ TEMPERATURE/PRESSURE GAUGE

	INLET	OUTLET	"A"	"B"	"C"	"D"	"E"	"F"	"G"	"H"	"I"	"J"	"K"	"L"	"M"
SFMV-1 -CWB	1/2" NCT	1/2" NCT	7-3/4" (197)	2-3/4" (70)	6-1/2" (165)	24" (610)	3" (76)	26" (660)	6-5/8" (168)	13-1/2" (343)	3" (76)	6" (152)	32" (813)	6-1/4" (159)	2" (51)
SFMV-2 -CWB	3/4" NCT	1" NCT	10-3/4" (273)	3" (76)	7-5/8" (194)	24" (610)	8-3/8" (213)	26" (660)	8-1/2" (216)	12-5/8" (321)	3" (76)	10" (254)	39" (991)	6-1/2" (165)	2-1/4" (57)
SFMV-3 -CWB	1" NCT	1-1/4" NCT	16-3/4" (425)	2-7/8" (73)	8-1/2" (216)	26-1/4" (667)	10-1/4" (260)	36-5/8" (930)	11-1/2" (292)	19" (483)	3" (76)	9-5/8" (245)	45" (1143)	8-1/4" (210)	3-3/4" (95)
SFMV-4 -CWB	1-1/4" NCT	1-1/2" NCT	17-1/4" (438)	3-1/4" (82)	9-1/2" (241)	26-1/4" (667)	12-1/8" (308)	36-5/8" (930)	12-1/4" (311)	18-1/2" (470)	3" (76)	9-5/8" (245)	47-1/2" (1207)	8-1/4" (210)	4" (102)
SFMV-5 -CWB	1-1/2" NCT	2" NCT	18-5/8" (473)	4-1/8" (105)	9-3/4" (428)	26-1/4" (667)	14-3/8" (365)	36-5/8" (930)	13-3/4" (349)	17" (432)	3" (76)	9-1/2" (241)	50-3/8" (1280)	8-5/8" (219)	4-1/4" (108)

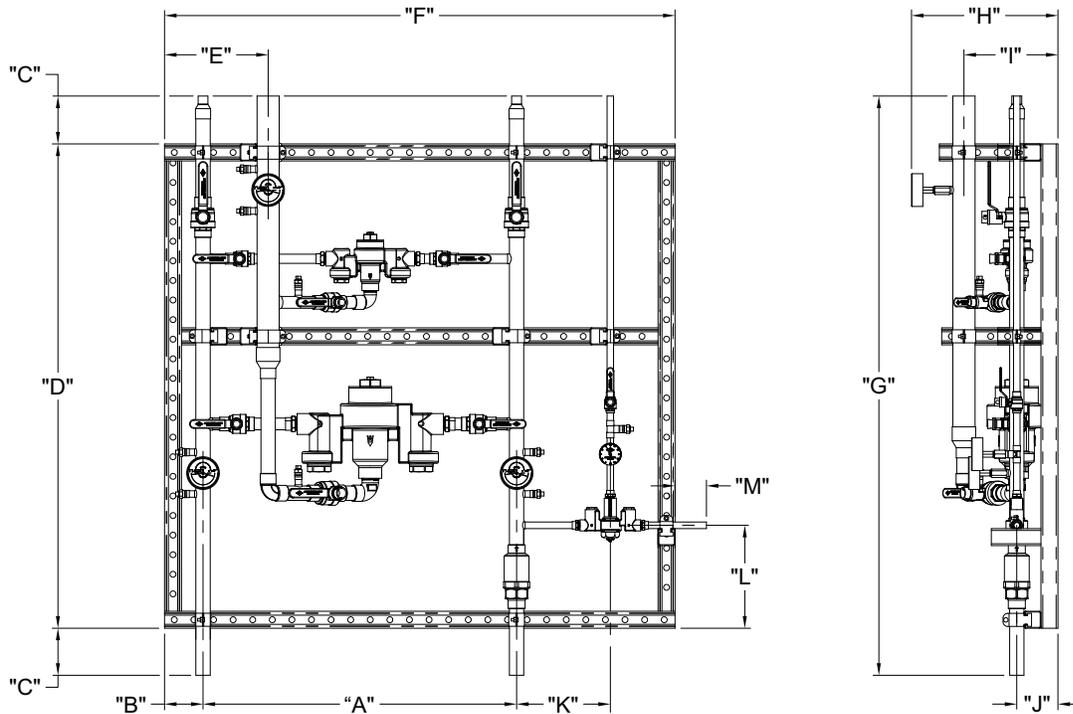
**ROUGH-IN DIMENSIONS FOR MULTI-VALVE
& OPTIONAL -CVS ASSEMBLIES**



#SFMMV-33-CWB-1-1/4"-HWB-1-1/4"
SHOWN FOR REFERENCE

	INLET	OUTLET	"A"	"B"	"C"	"D"	"E"	"F"	"G"	"H"	"I"	"J"
SFMMV-23	1-1/4" NCT	2" NCT	30" (762)	3-3/4" (95)	4-1/2" (114)	36-1/2" (927)	10" (254)	37" (940)	45-1/2" (1156)	14" (356)	9" (229)	4" (102)
SFMMV-24	1-1/2" NCT	2" NCT	30" (762)	3-1/2" (89)	4-1/2" (114)	36-1/2" (927)	8-3/4" (222)	37" (940)	45-1/2" (1156)	16-1/4" (413)	11-1/8" (283)	4" (102)
SFMMV-25	2" NCT	2-1/2" NCT	36" (914)	2-3/4" (70)	4-1/2" (114)	36-1/2" (927)	9-1/8" (232)	41-1/2" (1054)	45-1/2" (1156)	17-3/4" (451)	12-1/2" (318)	4-1/4" (108)
SFMMV-33	1-1/4" NCT	2" NCT	30" (762)	3-3/4" (95)	4-1/2" (114)	40-3/4" (1035)	10" (254)	37" (940)	49-3/4" (1264)	14" (356)	9" (229)	4" (102)
SFMMV-34	1-1/2" NCT	2-1/2" NCT	30" (762)	3-1/2" (89)	4-1/2" (114)	40-3/4" (1035)	7-3/4" (197)	37" (940)	49-3/4" (1264)	15-3/4" (400)	10-1/2" (267)	4" (102)
SFMMV-35	2" NCT	3" NCT	36" (914)	2-3/4" (70)	4-1/2" (114)	40-1/2" (1029)	8-7/8" (225)	41-1/2" (1054)	49-1/2" (1257)	17-1/2" (445)	12" (305)	4-1/4" (108)
SFMMV-44	1-1/2" NCT	2" NCT	30" (762)	3-1/2" (89)	4-1/2" (114)	40-3/4" (1035)	9-3/8" (238)	37" (940)	49-3/4" (1264)	16-1/4" (413)	11" (279)	4" (102)
SFMMV-45	2" NCT	3" NCT	36" (914)	2-3/4" (70)	4-1/2" (114)	41-1/2" (1054)	10" (254)	41-1/2" (1054)	50-1/2" (1283)	19" (483)	13-1/2" (343)	4-1/4" (108)
SFMMV-55	2" NCT	3" NCT	36" (914)	2-3/4" (70)	4-1/2" (114)	41-1/2" (1054)	10-1/8" (257)	41-1/2" (1054)	50-1/2" (1283)	19-1/4" (489)	13-1/4" (337)	4-1/4" (108)
SFMMV-555	3" NCT	4" NCT	36" (914)	2-3/4" (70)	4-1/2" (114)	60" (1524)	10-3/8" (264)	41-1/2" (1054)	69" (1753)	20-1/2" (521)	14-1/2" (368)	4-7/8" (124)

**ROUGH-IN DIMENSIONS FOR MULTI-VALVE
& OPTIONAL -CVS & -TBV ASSEMBLIES**

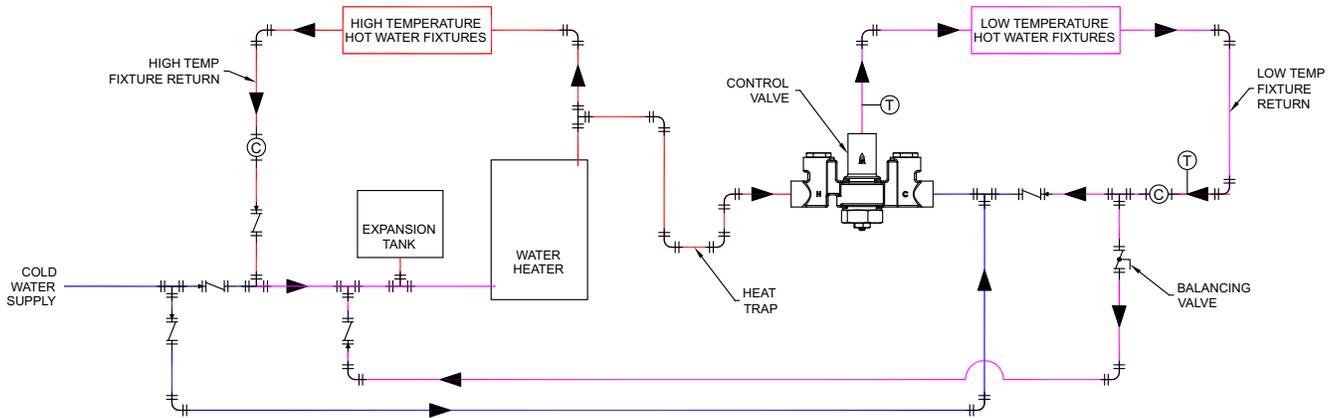


**#SFMMV-23-CWB-3/4"-HWB-3/4-TBV"
SHOWN FOR REFERENCE**

	INLET	OUTLET	"A"	"B"	"C"	"D"	"E"	"F"	"G"	"H"	"I"	"J"	"K"	"L"	"M"
SFMMV-23	1-1/4" NCT	2" NCT	30" (762)	3-3/4" (95)	4-1/2" (114)	46-1/2" (1181)	10" (254)	48-7/8" (1241)	55-1/2" (1410)	14" (356)	9" (229)	4" (102)	9" (229)	9-7/8" (251)	3" (76)
SFMMV-24	1-1/2" NCT	2" NCT	30" (762)	3-1/2" (89)	4-1/2" (114)	47-1/2" (1206)	8-3/4" (222)	48-7/8" (1241)	56-1/2" (1435)	16-1/4" (413)	11-1/8" (283)	4" (102)	9-1/4" (235)	10-7/8" (276)	3" (76)
SFMMV-25	2" NCT	2-1/2" NCT	36" (914)	2-3/4" (70)	4-1/2" (114)	48" (1219)	9-1/8" (232)	54-1/4" (1378)	57" (1448)	17-3/4" (451)	12-1/2" (318)	4-1/4" (108)	9-1/4" (235)	11" (279)	3" (76)
SFMMV-33	1-1/4" NCT	2" NCT	30" (762)	3-3/4" (95)	4-1/2" (114)	50-1/2" (1283)	10" (254)	48-7/8" (1241)	59-1/2" (1511)	14" (356)	9" (229)	4" (102)	9" (229)	9-7/8" (251)	3" (76)
SFMMV-34	1-1/2" NCT	2-1/2" NCT	30" (762)	3-1/2" (89)	4-1/2" (114)	50-1/2" (1283)	7-3/4" (197)	48-7/8" (1241)	59-1/2" (1511)	15-3/4" (400)	10-1/2" (267)	4" (102)	9-1/4" (235)	9-7/8" (251)	3" (76)
SFMMV-35	2" NCT	3" NCT	36" (914)	2-3/4" (70)	4-1/2" (114)	51-1/2" (1308)	8-7/8" (225)	54-1/4" (1378)	60-1/2" (1537)	17-1/2" (445)	12" (305)	4-1/4" (108)	9-1/4" (235)	11" (279)	3" (76)
SFMMV-44	1-1/2" NCT	2" NCT	30" (762)	3-1/2" (89)	4-1/2" (114)	51-1/2" (1308)	9-3/8" (238)	48-7/8" (1241)	59-1/2" (1511)	16-1/4" (413)	11" (279)	4" (102)	9-1/4" (235)	9-7/8" (251)	3" (76)
SFMMV-45	2" NCT	3" NCT	36" (914)	2-3/4" (70)	4-1/2" (114)	51-1/2" (1308)	10" (254)	54-1/4" (1378)	60-1/2" (1537)	19" (483)	13-1/2" (343)	4-1/4" (108)	9-1/4" (235)	11" (279)	3" (76)
SFMMV-55	2" NCT	3" NCT	36" (914)	2-3/4" (70)	4-1/2" (114)	51-1/2" (1308)	10-1/8" (257)	54-1/4" (1378)	60-1/2" (1537)	19-1/4" (489)	13-1/4" (337)	4-1/4" (108)	9-1/4" (235)	11" (279)	3" (76)

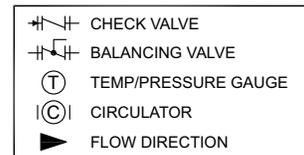
RECIRCULATING PIPING DIAGRAM:

TYPICAL CONTINUOUS RECIRCULATION



(C) SELECT FLOW RATE NECESSARY TO ENSURE MIXING VALVE IS OPERATING AT AN ASSE 1017 MINIMUM CERTIFIED FLOW RATE. SEE LITERATURE.

NOTE: TO BALANCE THE SYSTEM, BEGIN WITH DIVERTING 80% OF THE RETURN WATER TO COLD SIDE OF THE TEMPERING VALVE (20% OF THE HOT WATER SOURCE). CONTINUE ADJUSTING UNTIL SYSTEM IS FULLY BALANCED. A HEAT TRAP IS RECOMMENDED IF THE MIXING VALVE IS ABOVE THE WATER HEATER.



Recirculation System Settings: All balancing of the recirculation loop(s) should be done after the mixing valve is set and delivering the proper temperature to all fixtures. Ensure the final fixture on the longest loop has the proper setting. Depending which type of recirc system you have, please perform the balancing procedure outlined below. Ensure there is no system demand while making these adjustments as your settings will be affected if there is.

Mechanical Balancing (with Aquastat): To balance the system, begin with the circuit setter/mechanical balancing valve set to 20% open to the hot water source (80% closed). Turn on the recirculation pump and wait for tempered water to reach the recirc pump/temperature gauge. Give it enough time for the temperatures to stabilize. If the recirc pump is short cycling or if there are large temperature swings when the pump turns on, close the balancing valve another 20%. If the temperature starts to decrease you will need to open the balancing valve 20%. Continue balancing in this fashion until the system is stable. Verify the temperature setting again after 24 hours.

Mechanical Balancing (continuous pump operation): To balance the system, begin with the circuit setter/mechanical balancing valve set to 20% open to the hot water source (80% closed). Turn on the recirculation pump and wait for tempered water to reach the recirc pump/temperature gauge. Give it enough time for the temperatures to stabilize. If the return temperature is too high, close the balancing valve 20%. If the return temperature is too cold, open the balancing valve 20%. Continue balancing in this fashion until the system is stable. Verify the temperature setting again after 24 hours.

Optional Thermostatic Balancing Valve with or without continuous pump): The MV17 and the -TBV valves are factory set to 120°F and 110°F respectively. If the temperature of the mixing valve is not changed, the -TBV should be factory set to maintain your loop temp at 110°F. If the mixing valve has been adjusted up or down, the -TBV will need to be adjusted accordingly. Adjustments can be made in approximately 10°F increments/decrements by rotating the -TBV stem one full turn CCW or CW respectively. Be sure to allow enough time for the loop to change temperature and stabilize before readjusting.

Zone Valve(s): The TZV's are factory set to maintain a loop temperature of 110°F. Temperature adjustments can be made in approx. 5°F increments/decrements by rotating the -TBV stem one full turn CCW or CW respectively. Be sure to allow enough time for the loop to change temperature and stabilize before readjusting. If recirc pump deadheading is a concern, it is recommended to add a pump bypass valve or to manually adjust the TZV in the longest loop/zone to full hot. This can later be adjusted to a lower temperature as the system stabilizes and reaches an equilibrium point.

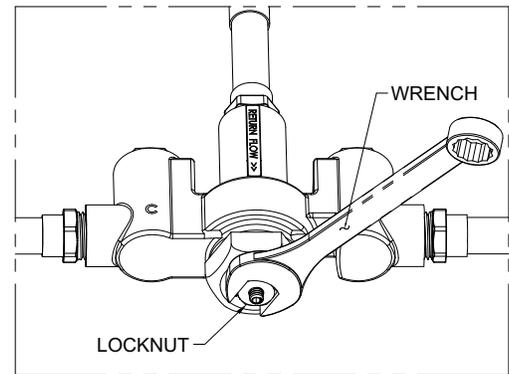
-TBV ADJUSTMENT:

If the valve gets out of adjustment and you're not sure what the current setting is, use the following instructions to reset.

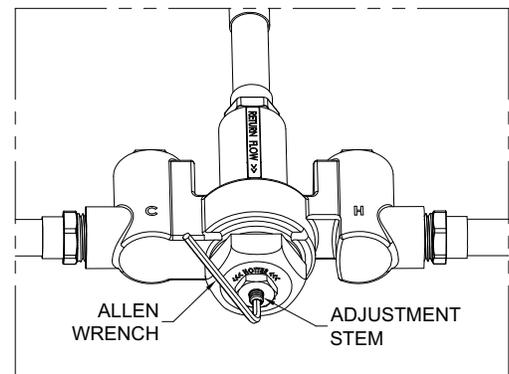
1. Set -TBV to full cold by turning locknut counterclockwise to loosen and using an Allen wrench turning adjustment stem clockwise. **DETAILS "A" and "B"**.
2. Make sure the master mixing valve is set and the final fixture is being supplied with the required temperature. After verifying the final fixture's temperature, turn off all fixtures. While adjusting the -TBV there should be little to no system draw/usage. This will provide the best results.
3. Open the ball valve shown in **DETAIL "C"** and turn on the re-circulation pump. Ensure the pump is sized to meet the minimum flow of the master mixing valve and to meet the heat loss of the re-circulation loop during periods of low/no system demand.
4. Monitor the thermometer shown in **DETAIL "C"**. Wait for tempered water to re-circulate through the facility and for the temperature to stabilize.
5. While holding boiler return pipe, slowly rotate adjustment screw counterclockwise until you feel the warm return water begin to flow through the return to boiler line. Stop rotating the screw. **DETAIL "C"**.
6. Monitor the return temperature allowing enough time for the return temperature to stabilize. If the return temperature is too hot or too cold, rotate the adjusting stem CW or CCW respectively. When making these adjustments, assume one revolution of the adjusting stem will change the set temperature by 10°F and wait for the gauge to show the changes. Ideally the return temperature should be set from 5° to 15°F less than that of the master mixer.

NOTE: The return temperature is affected by the master mixing valve outlet temperature. If the master mixer is not to operating temperature, controlling poorly or if the total system flow rate (pump flow and/or usage) is less than required by the master mixer, the performance of the -TBV will be affected and the observed return temperatures will fluctuate.

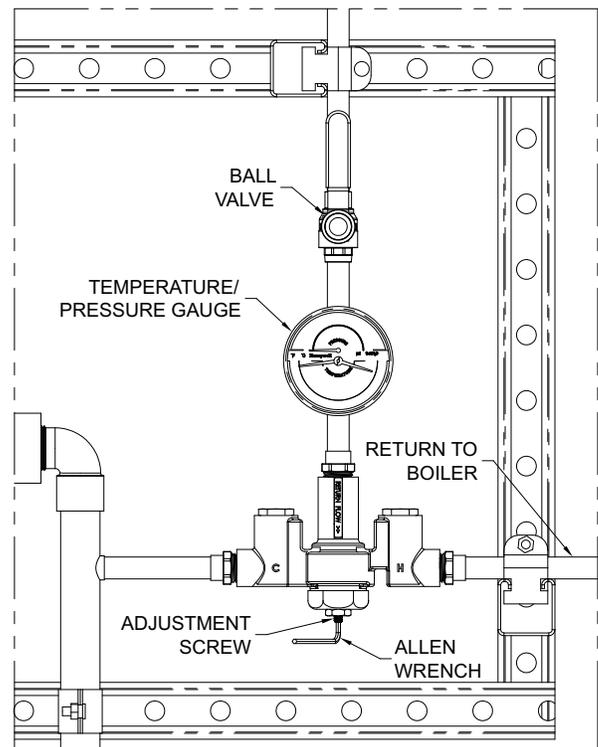
7. At this point -TBV is set. Secure adjustment screw by turning locknut clockwise until tight.
8. Over the next 24 hours monitor and ensure the return temperatures are being maintained under both low (typically nighttime, no/low usage) and normal system draw/demand.



DETAIL "A"



DETAIL "B"

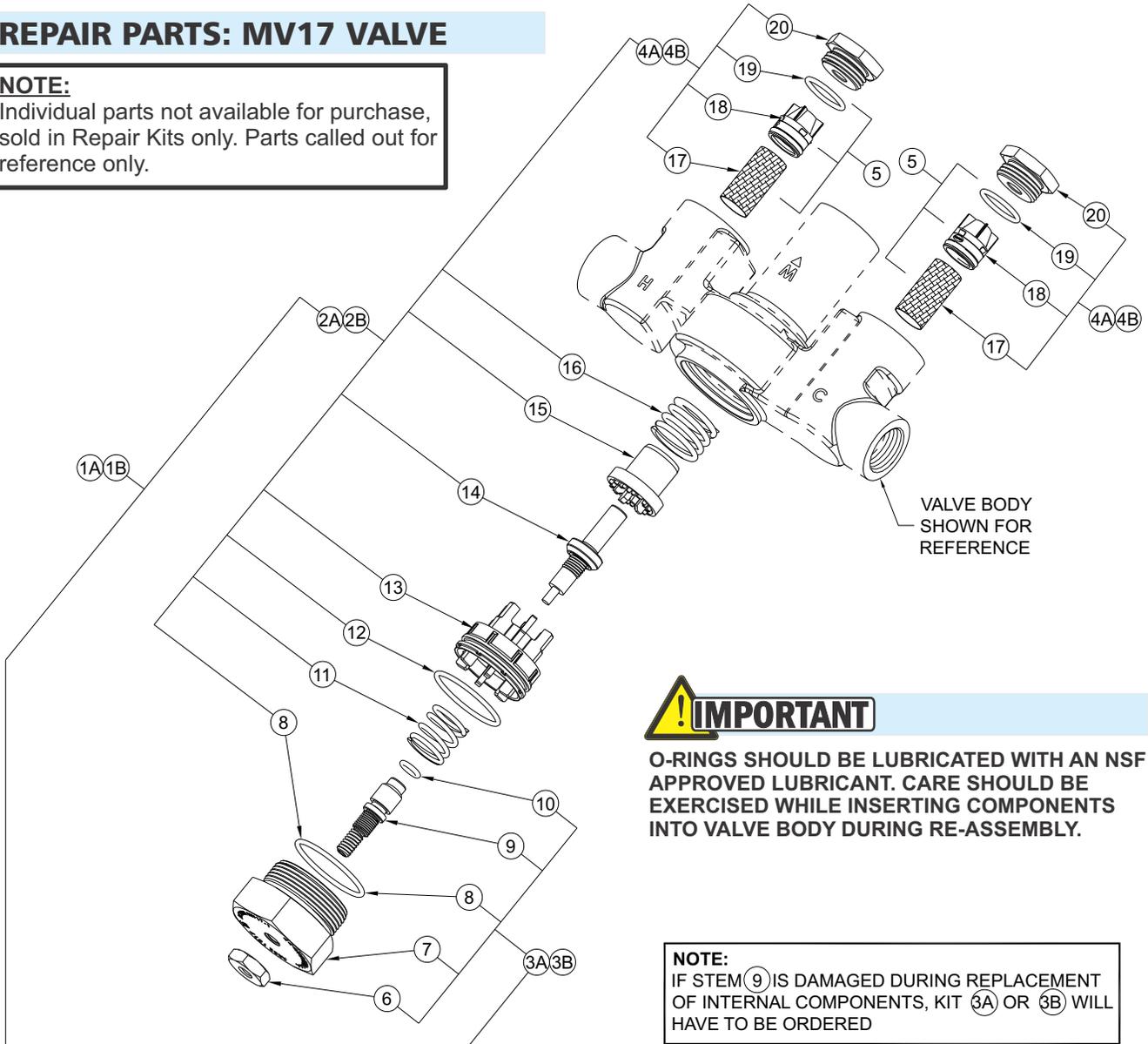


DETAIL "C"

REPAIR PARTS: MV17 VALVE

NOTE:

Individual parts not available for purchase, sold in Repair Kits only. Parts called out for reference only.

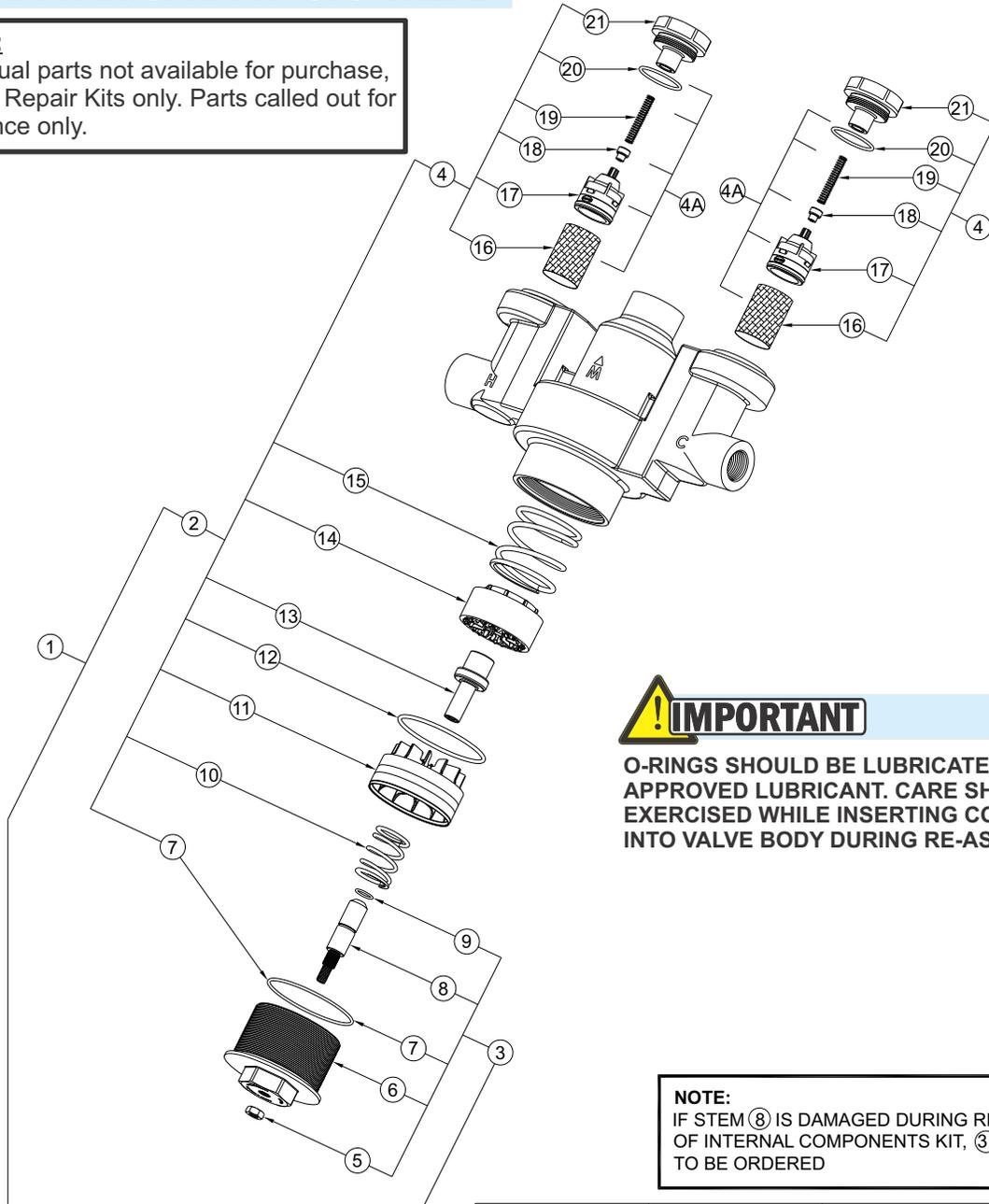


		MV17-1	MV17-2	MV17-3	MV17-4	MV17-5
ITEM	DESCRIPTION	KIT NUMBER				
1A	COMPLETE REBUILD KIT	7806-500-001	7812-500-001	7810-500-001	7809-500-001	7811-500-001
2A	INTERNAL REPAIR KIT	7806-510-001	7812-510-001	7810-510-001	7809-510-001	7811-510-001
3A	BONNET / STEM REPLACEMENT	7806-502-001	7812-502-001	7810-502-001	7809-502-001	7811-502-001
4A	CHECK / STRAINER KIT	7801-503-001	7804-503-001	7808-503-001	7808-503-001	7808-503-001
5	CHECK/STRAINER KIT LESS BONNET	7801-503-002	7804-503-002	7808-503-002	7808-503-002	7808-503-002
		MV17CP-1	MV17CP-2	MV17CP-3	MV17CP-4	MV17CP-5
ITEM	DESCRIPTION	KIT NUMBER				
1B	COMPLETE REBUILD KIT	7806-500-010	7812-500-010	7810-500-010	7809-500-010	7811-500-010
2B	INTERNAL REPAIR KIT	7806-510-010	7812-510-010	7810-510-010	7809-510-010	7811-510-010
3B	BONNET / STEM REPLACEMENT	7806-502-010	7812-502-010	7810-502-010	7809-502-010	7811-502-010
4B	CHECK-STOP / STRAINER KIT	7801-503-010	7804-503-010	7808-503-010	7808-503-010	7808-503-010
5	CHECK/STRAINER KIT LESS BONNET	7801-503-002	7804-503-002	7808-503-002	7808-503-002	7808-503-002

ITEM	DESCRIPTION	ITEM	DESCRIPTION	ITEM	DESCRIPTION
6	ADJUSTMENT STEM LOCKNUT	11	UPPER SPRING	16	LOWER SPRING
7	VALVE BONNET	12	SHUTTLE O-RING	17	INLET SCREEN (x 2)
8	BONNET O-RING	13	SHUTTLE	18	CHECK VALVE (x 2)
9	ADJUSTMENT STEM	14	THERMOSTATIC MOTOR	19	CHECK VALVE BONNET O-RING (x 2)
10	ADJUSTMENT STEM O-RING	15	FUNNEL	20	CHECK VALVE BONNET (x 2)

REPAIR PARTS: MV17-CVS VALVE

NOTE:
Individual parts not available for purchase, sold in Repair Kits only. Parts called out for reference only.



! IMPORTANT
O-RINGS SHOULD BE LUBRICATED WITH AN NSF APPROVED LUBRICANT. CARE SHOULD BE EXERCISED WHILE INSERTING COMPONENTS INTO VALVE BODY DURING RE-ASSEMBLY.

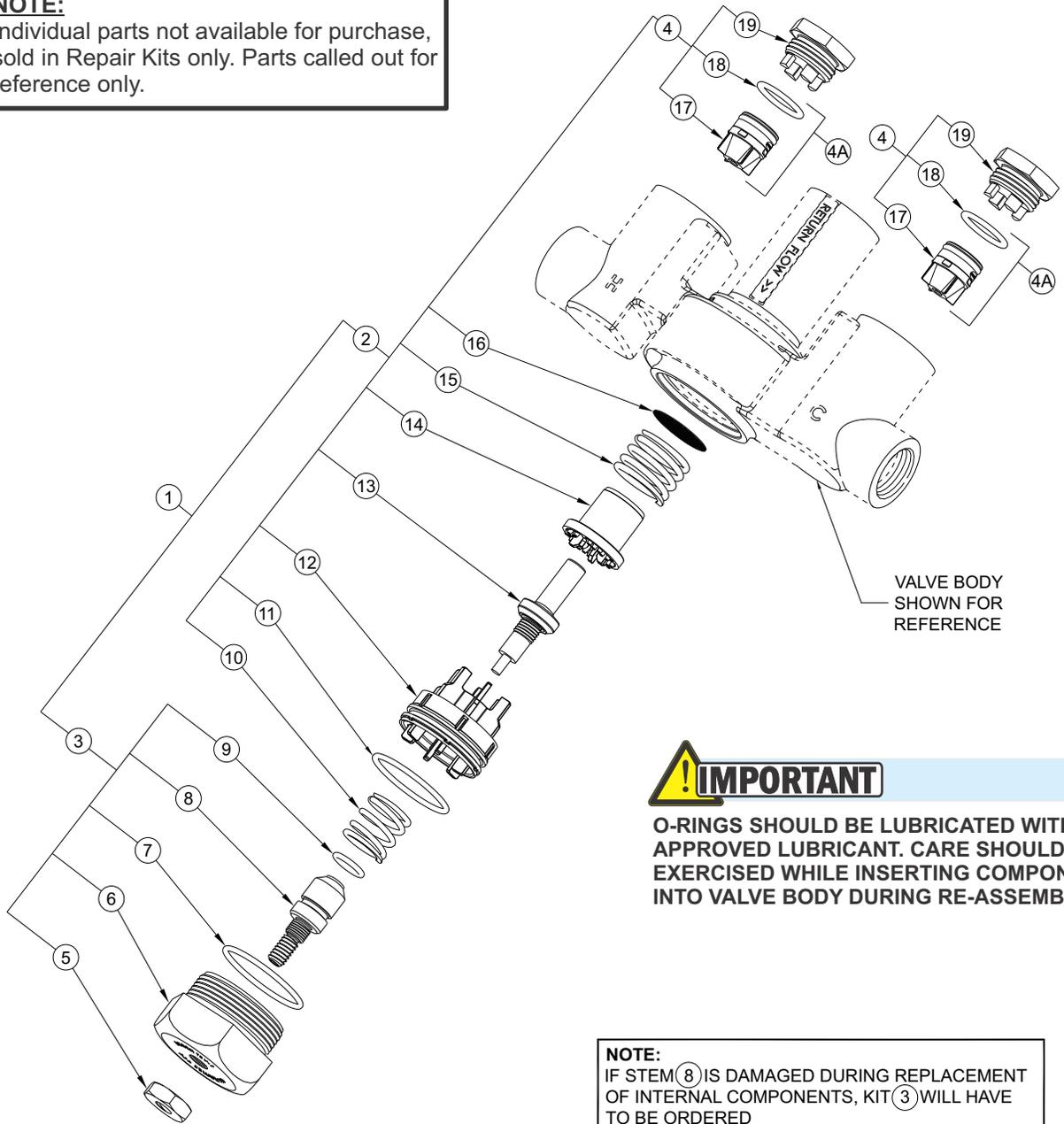
NOTE:
IF STEM (8) IS DAMAGED DURING REPLACEMENT OF INTERNAL COMPONENTS KIT, (3) WILL HAVE TO BE ORDERED

ITEM	DESCRIPTION	MV17-3-CVS KIT NUMBER	MV17-4-CVS KIT NUMBER	MV17-5-CVS KIT NUMBER
1	COMPLETE REBUILD KIT	7810-520-001	7809-520-001	7811-520-001
2	INTERNAL REPAIR KIT	7810-521-001	7809-521-001	7811-530-001
3	BONNET / STEM REPLACEMENT	7810-522-001	7802-522-002	7811-522-001
4	CHECK / STRAINER KIT	7808-523-001	7808-523-001	7808-523-001
4A	CHECK/STRAINER KIT LESS BONNET	7808-523-002	7808-523-002	7808-523-002

ITEM	DESCRIPTION	ITEM	DESCRIPTION	ITEM	DESCRIPTION
5	ADJUSTMENT STEM LOCKNUT	11	SHUTTLE	17	CHECK VALVE (x 2)
6	VALVE BONNET	12	SHUTTLE O-RING	18	SPRING CAP (x2)
7	BONNET O-RING	13	THERMOSTATIC MOTOR	19	CVS CHECK VALVE SPRING (x 2)
8	ADJUSTMENT STEM	14	FUNNEL	20	CHECK VALVE BONNET O-RING (x 2)
9	ADJUSTMENT STEM O-RING	15	LOWER SPRING	21	CHECK VALVE BONNET (x 2)
10	UPPER SPRING	16	INLET SCREEN (x 2)		

REPAIR PARTS: -TBV

NOTE:
Individual parts not available for purchase, sold in Repair Kits only. Parts called out for reference only.



! IMPORTANT
O-RINGS SHOULD BE LUBRICATED WITH AN NSF APPROVED LUBRICANT. CARE SHOULD BE EXERCISED WHILE INSERTING COMPONENTS INTO VALVE BODY DURING RE-ASSEMBLY.

NOTE:
IF STEM (8) IS DAMAGED DURING REPLACEMENT OF INTERNAL COMPONENTS, KIT (3) WILL HAVE TO BE ORDERED

ITEM	KIT NUMBER	DESCRIPTION	ITEM	KIT NUMBER	DESCRIPTION
1	7813-500-001	COMPLETE REBUILD KIT	4	7813-503-001	CHECK VALVE KIT
2	7813-501-001	INTERNAL REPAIR KIT	4A	7813-503-002	CHECK VALVE KIT LESS BONNET
3	7813-502-001	BONNET / STEM REPLACEMENT			

ITEM	DESCRIPTION	ITEM	DESCRIPTION	ITEM	DESCRIPTION
5	ADJUSTMENT STEM LOCKNUT	10	UPPER SPRING	15	LOWER SPRING
6	VALVE BONNET	11	SHUTTLE O-RING	16	INLET SCREEN
7	BONNET O-RING	12	SHUTTLE	17	CHECK VALVE (x 2)
8	ADJUSTMENT STEM	13	THERMOSTATIC MOTOR	18	CHECK VALVE BONNET O-RING (x 2)
9	ADJUSTMENT STEM O-RING	14	FUNNEL	19	CHECK VALVE BONNET (x 2)