ACORN ENGINEERING COMPANY
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UNITED STATES OF AMERICA
WWW.ACORNENG.COM

INSTALLATION, OPERATION AND MAINTENANCE INSTRUCTIONS

ET71 EMERGENCY FIXTURE THERMOSTATIC MIXING VALVE

ET711BVSOTG ✓



✓ **Model ET71-1**

Patent #9,879,658
Patent #9,898,017

Pb Federal Public Law 111-380 (No Lead)

FOR TECHNICAL ASSISTANCE
1.800.743.8259
fieldservice@acorneng.com

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.**

LIMITED WARRANTY
UNITED STATES AND CANADA

Acorn Controls warrants that its products are free from defects in material or workmanship under normal use and service for a period of one year from date of shipment. Acorn's liability under this warranty shall be discharged solely by replacement of repair of defective material, provided Acorn is notified in writing within one year from date of shipment, F.O.B. Industry, California.

This warranty does not cover installation or labor charges and does not apply to materials, which have been damaged by other causes such as mishandling or improper care or abnormal use. The repair or replacement of the defective materials shall constitute the sole remedy of the Buyer and the sole remedy of Acorn under this warranty. Acorn shall not be liable under any circumstances for incidental, consequential or direct charges caused by defects in materials, or any delay in the repair or replacement thereof. This warranty is in lieu of all other warranties expressed or implied. Product maintenance instructions are issued with each unit and disregard or non-compliance with these instructions will constitute an abnormal use condition and void the warranty.

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.

Acorn 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 does not exceed 95°F (35°C) or (†) 90°F (32°C) for the *ET71-4* after installation, maintenance or repair.
- Installer ***MUST VERIFY*** operation of the Cold Water By-Pass after completing installation and temperature adjustments. Simulate a hot water supply failure by closing the hot water supply ball valve or by other means available.
- In circumstances where chemical reaction is accelerated by flushing fluid temperature, a medical advisor should be consulted for the optimum temperature for each Application.
- Acorn's optional locking ball valves are the safe and acceptable method for supply shut-off to this product, unless installed in a lockable cabinet or other means to prevent unauthorized supply shut off. After initial set-up and after each ANSI and ASSE required testing of this product be CERTAIN to lock the Acorn or installer supplied ball valve open. If installing supply shut-off valves by others, you MUST follow *ANSI Z358* and *ASSE 1071* requirements that unauthorized supply shut off be prevented.
- Verify that no single emergency fixture supplied by this device has a minimum flow rate less than 1.5 GPM (5.7 LPM).

SUPPLIES REQUIRED:

(Not provided by Acorn)

1. Wall anchors, screws nuts and washers as required.
2. Teflon tape for sealing water connections.
3. Supply angle stops, ball valves optionally available.
4. Supply connections.
5. Wrench and an Allen wrench.

IMPORTANT

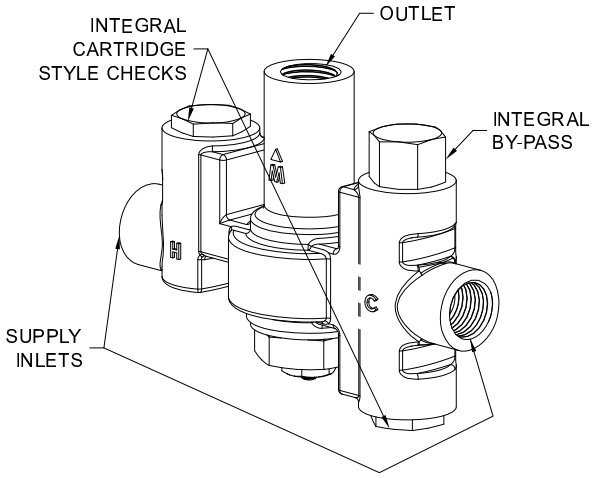
- Flush supply lines of all foreign material such as pipe dope, chips or solder prior to connecting to mixing valve.
- To ensure proper installation, review the Manual thoroughly to verify rough-ins before beginning any work.
- Installation and field adjustment are the responsibility of the installer.
- Maximum water pressure is 125 PSI (8.62 bars). Maximum inlet hot water temperature is 180°F (82°C). Temperature adjustment range is 60°F-95°F (15°C-35°C). Valve assembly must be drained prior to being subjected to freezing temperatures. Valve includes integral check valves.

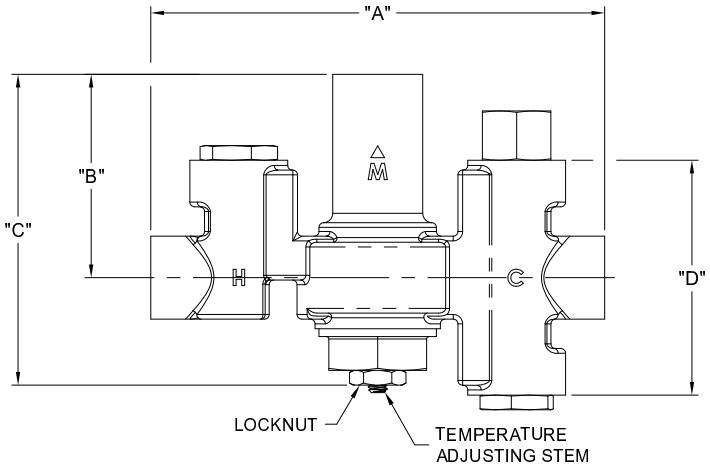
(†) For ET71-4 Only

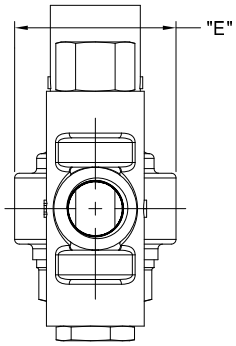
	PRESSURE DROP PSID (kPa)	Cv	5 (34)	10 (69)	15 (103)	20 (138)	30 (207)	45 (310)	60 (414)
ET71-1 12 GPM (45 LPM)	FLOW RATE GPM (LPM)	1.8	4 (15.1)	5.66 (21.4)	6.9 (26.1)	8 (30.2)	9.8 (37.1)	12 (45.4)	13.9 (52.6)
	COLD WATER BYPASS ONLY						6.5 (24.5)		
ET71-2 43 GPM (163 LPM)	FLOW RATE GPM (LPM)	6.4	14.3 (54.1)	20.3 (76.8)	24.8 (93.9)	28.7 (108.6)	35.1 (132.9)	43 (162.8)	49.7 (188)
	COLD WATER BYPASS ONLY						25 (94.6)		
ET71-3 86 GPM (325.5 LPM)	FLOW RATE GPM (LPM)	12.8	28.7 (108.6)	40.5 (153.3)	49.7 (188.1)	57.3 (217)	70.2 (265.7)	86 (325.5)	99.3 (375.9)
	COLD WATER BYPASS ONLY						60 (227)		
ET71-4 135 GPM (510 LPM)	FLOW RATE GPM (LPM)	20	45 (170)	63.5 (240.4)	78 (295)	90 (340)	110 (416.4)	135 (510)	156 (590)
	COLD WATER BYPASS ONLY						80 (302.8)		

ROUGH-IN DIMENSIONS:

	INLET	OUTLET	"A"	"B"	"C"	"D"	"E"
ET71-1	1/2" NPT	1/2" NPT	5-3/4" (146)	2-5/8" (67)	4" (102)	3" (76)	2" (51)
ET71-2	3/4" NPT	1" NPT	8-1/2" (216)	3" (76)	5-1/2" (140)	4-1/4" (108)	3" (76)
ET71-3	1" NPT	1-1/4" NPT	14" (356)	5-1/4" (133)	8-3/4" (222)	6-1/4" (159)	5-3/4" (146)
ET71-4	1-1/4" NPT	1-1/2" NPT	14" (356)	5-1/4" (133)	8-3/4" (222)	6-1/4" (159)	5-3/4" (146)





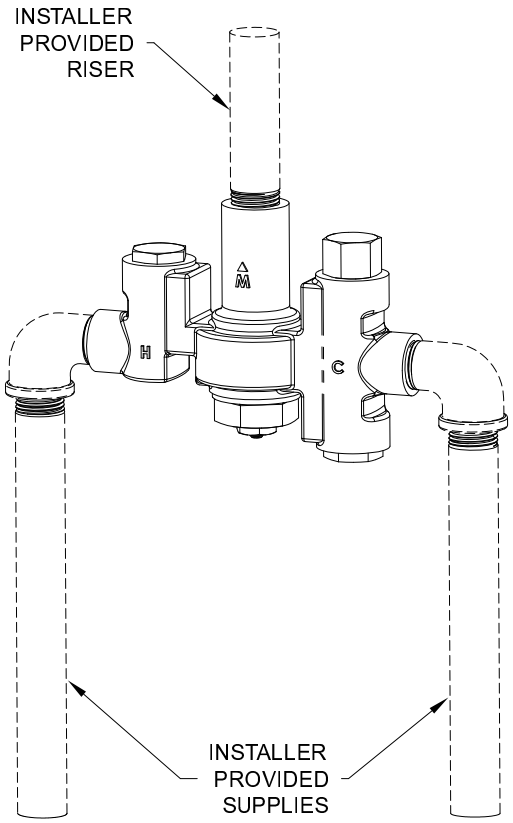


NOTE;
ALL DIMENSIONS ARE IN INCHES (MM).

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. Supply lines by others.
4. Turn on supplies and inspect for leaks. Tighten connections if leak(s) are 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). Maximum recommended outlet temperature is 95°F (35°C) or (†) 90°F (32°C) for the *ET71-4* .

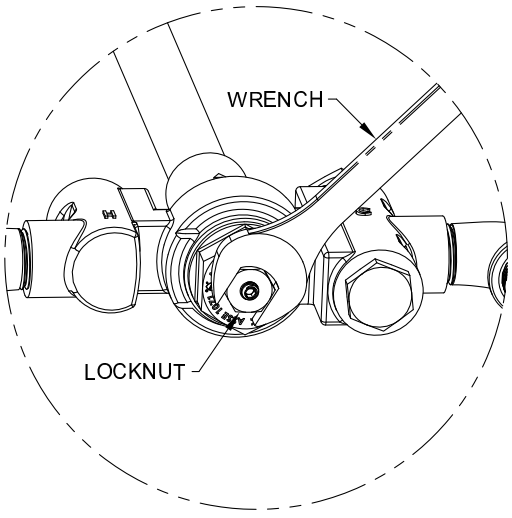
(†) For ET71-4 Only



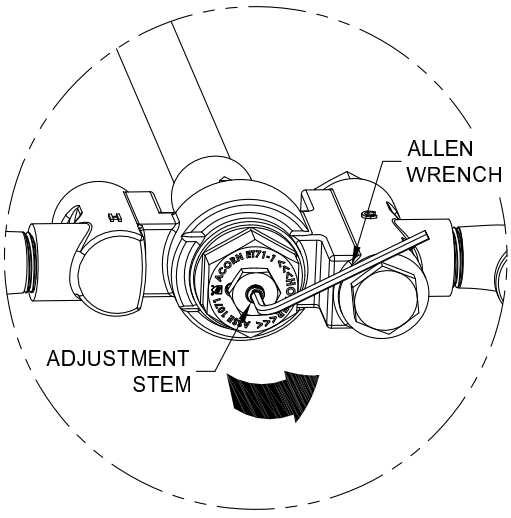
TYPICAL INSTALLATION

TEMPERATURE ADJUSTMENT:

1. Loosen locknut. *Detail A*
2. Turn on fixture so temperature can stabilize.
3. Using an 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.
6. In circumstances where chemical reaction is accelerated by flushing fluid temperature, a medical advisor should be consulted for the optimum temperature for each application.

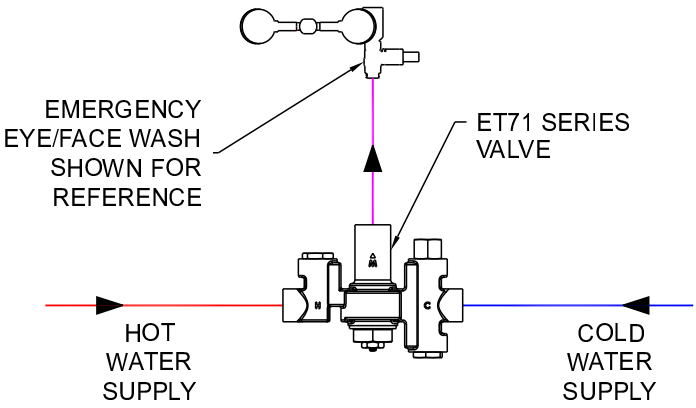


DETAIL A



DETAIL B

PIPING DETAILS:



TYPICAL PIPING DETAIL

Valve Specifications:

Maximum Operating Pressure: ..... 125 PSI (861 kPa)
Maximum Hot Water Supply Temp: ..... 180°F (82°C)
Outlet Temp. Range: ..... 60°F-95°F (15°F-35°C)
(ET71-4 Only)..... 60°F-90°F (15°C-32°C)
Minimum Hot Water Supply ..... 5°F (3°C) Above Set Point

Flow Rate at 45 PSI (310 kPa) differential:
ET71-1: ..... 12 GPM (45 LPM)
ET71-2: ..... 43 GPM (163 LPM)
ET71-3: ..... 86 GPM (326 LPM)
ET71-4: ..... 135 GPM (510 LPM)

Minimum Flow*:
ET71-1 ..... 1.5 GPM (5.7 LPM)
ET71-2 ..... 1 GPM (3.8 LPM)
ET71-3 ..... 2 GPM (7.6 LPM)
ET71-4 ..... 3 GPM (11.4 LPM)

Bypass Flow Rate Minimum*:
ET71-1: ..... 6.5 GPM (24.5 LPM)
ET71-2: ..... 25 GPM (95 LPM)
ET71-3: ..... 60 GPM (227 LPM)
ET71-4: ..... 80 GPM (303 LPM)

Cold Water Failure Maximum*:
ET71-1: ..... 0.5 GPM (1.9 LPM)
ET71-2: ..... 1 GPM (3.8 LPM)
ET71-3: ..... 1 GPM (3.8 LPM)
ET71-4: ..... 1 GPM (3.8 LPM)

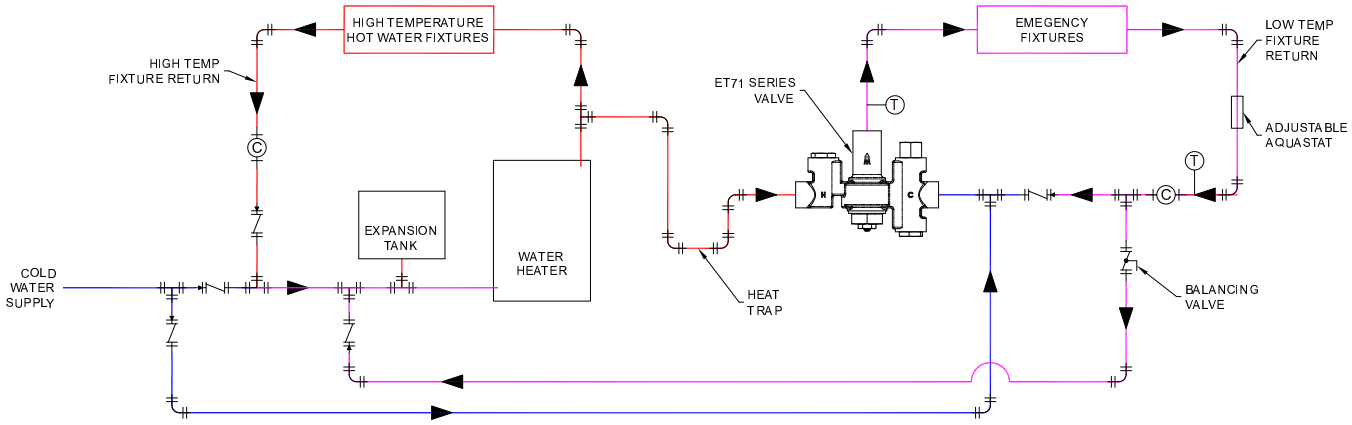
** In accordance with ASSE 1071*

TROUBLESHOOTING:

PROBLEM	CAUSE	SOLUTION
1. SET POINT DIFFICULT TO SET OR CANNOT BE REACHED	• SUPPLY TEMPS NOT WITHIN SPECIFIED LIMITS • HOT AND COLD SUPPLIES ARE REVERSED	• 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	• FLUCTUATION IN SUPPLY PRESSURES • CHECK VALVE/FILTERS BLOCKED WITH DEBRIS	• CHECK DIFFERENTIAL TEMPERATURE BETWEEN SUPPLIES AND OUTLET • CLEAN CHECK VALVES/FILTERS
3. DISCHARGE TEMPERATURE TOO HOT OR TOO COLD	• VALVE NOT ADJUSTED PROPERLY	• READJUST VALVE TEMPERATURE PER INSTALLATION INSTRUCTIONS
4. CROSS FLOW	• CHECK VALVES FOULED	• CLEAN CHECK VALVES/FILTERS
5 NO FLOW FROM VALVE	• HOT AND COLD SUPPLY FAILURE OR SHUTOFFS CLOSED • CHECK VALVE/FILTERS BLOCKED WITH DEBRIS	• OPEN SHUTOFFS OR RESTORE HOT AND COLD SUPPLIES • CLEAN CHECK VALVES AND FILTERS

PIPING DETAILS:

TYPICAL RECIRCULATION WITH AQUASTAT

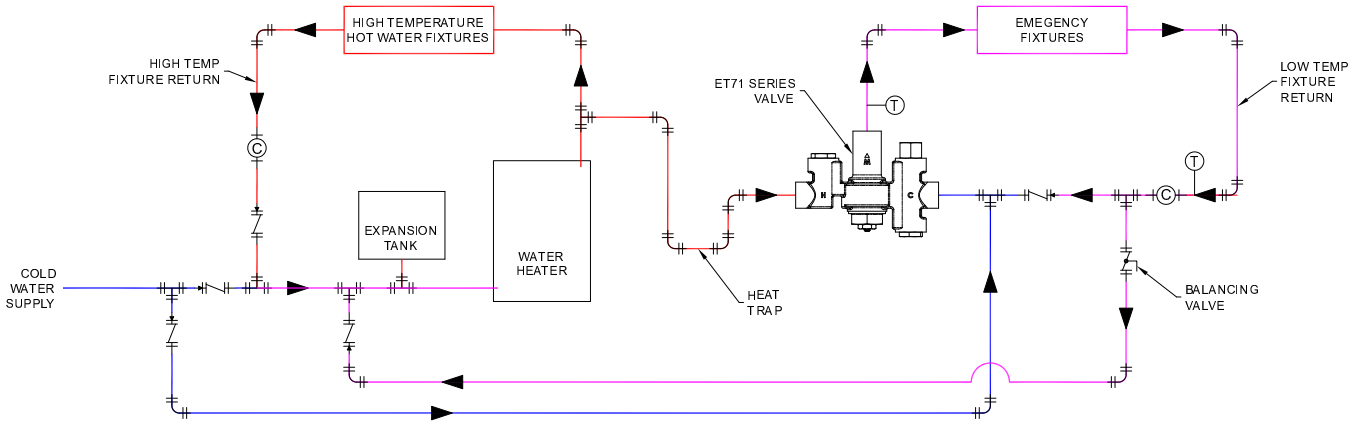


Ⓒ SELECT FLOW RATE NECESSARY TO ENSURE MIXING VALVE IS OPERATING AT AN ASSE 1017 MINIMUM CERTIFIED FLOW RATE. SEE LITERATURE.

NOTE: TO BALANCE THE SYSTEM, BEGIN WITH DIVERTING 80% OF THE RETURN WATER TO COLD SIDE OF THE TEMPERING VALVE (20% TO THE HOT WATER SOURCE). CONTINUE ADJUSTING UNTIL SYSTEM IS FULLY BALANCED.

- CHECK VALVE
- BALANCING VALVE
- Ⓣ TEMP/PRESSURE GAUGE
- Ⓒ CIRCULATOR
- FLOW DIRECTION

TYPICAL CONTINUOUS RECIRCULATION



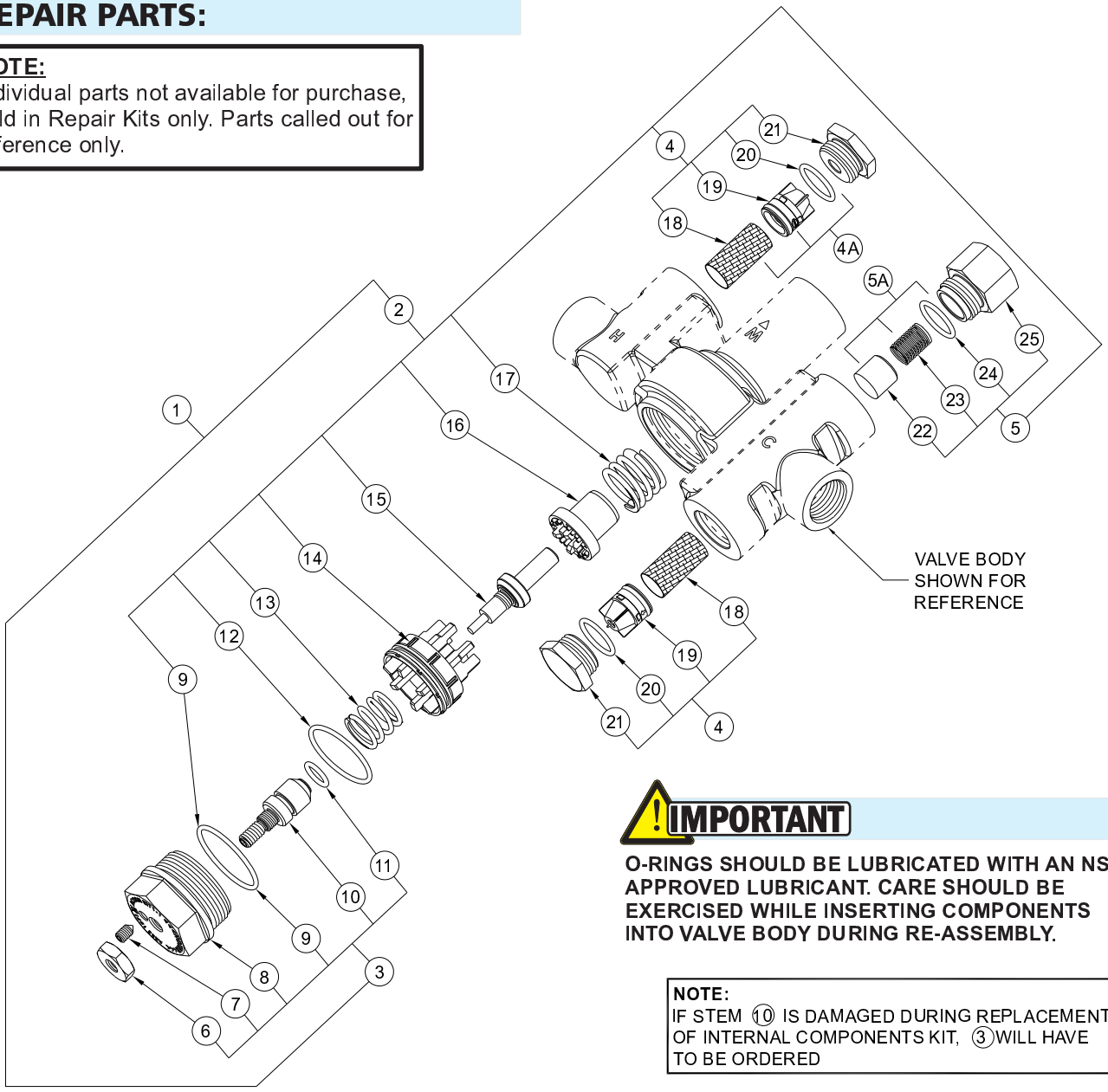
Ⓒ SELECT FLOW RATE NECESSARY TO ENSURE MIXING VALVE IS OPERATING AT AN ASSE 1017 MINIMUM CERTIFIED FLOW RATE. SEE LITERATURE.

NOTE: TO BALANCE THE SYSTEM BEGIN, WITH DIVERTING 80% OF THE RETURN WATER TO COLD SIDE OF THE TEMPERING VALVE (20% TO THE HOT WATER SOURCE). CONTINUE ADJUSTING UNTIL SYSTEM IS FULLY BALANCED.

- CHECK VALVE
- BALANCING VALVE
- Ⓣ TEMP/PRESSURE GAUGE
- Ⓒ CIRCULATOR
- FLOW DIRECTION

REPAIR PARTS:

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 ⑩ IS DAMAGED DURING REPLACEMENT OF INTERNAL COMPONENTS KIT, ③ WILL HAVE TO BE ORDERED

		ET71-1	ET71-2	ET71-3	ET71-4
ITEM	DESCRIPTION	KIT NUMBER	KIT NUMBER	KIT NUMBER	KIT NUMBER
1	COMPLETE REBUILD KIT	7801-500-001	7804-500-001	7808-500-001	7805-500-001
2	INTERNAL REPAIR KIT	7801-510-001	7804-510-001	7808-510-001	7805-510-001
3	BONNET / STEM REPLACEMENT	7801-502-001	7804-502-001	7808-502-001	7805-502-001
4	CHECK / STRAINER KIT	7801-503-001	7804-503-001	7808-503-001	7808-503-001
4A	CHECK/STRAINER KIT LESS BONNET	7801-503-002	7804-503-002	7808-503-002	7808-503-002
5	BYPASS REPAIR KIT	7801-504-001	7804-504-001	7808-504-001	7808-504-001
5A	BYPASS REPAIR KIT LESS BONNET	7801-504-002	7804-504-002	7808-504-002	7808-504-002

ITEM	DESCRIPTION	ITEM	DESCRIPTION	ITEM	DESCRIPTION
6	ADJUSTMENT STEM LOCKNUT	13	UPPER SPRING	20	CHECK VALVE BONNET O-RING (x 2)
7	HIGH TEMPERATURE LIMIT STOP	14	SHUTTLE	21	CHECK VALVE BONNET (x 2)
8	VALVE BONNET	15	THERMOSTATIC MOTOR	22	BYPASS POPPET
9	BONNET O-RING	16	FUNNEL	23	BYPASS SPRING
10	ADJUSTMENT STEM	17	LOWER SPRING	24	BYPASS BONNET O-RING
11	ADJUSTMENT STEM O-RING	18	INLET SCREEN (x 2)	25	BYPASS BONNET
12	SHUTTLE O-RING	19	CHECK VALVE (x 2)		