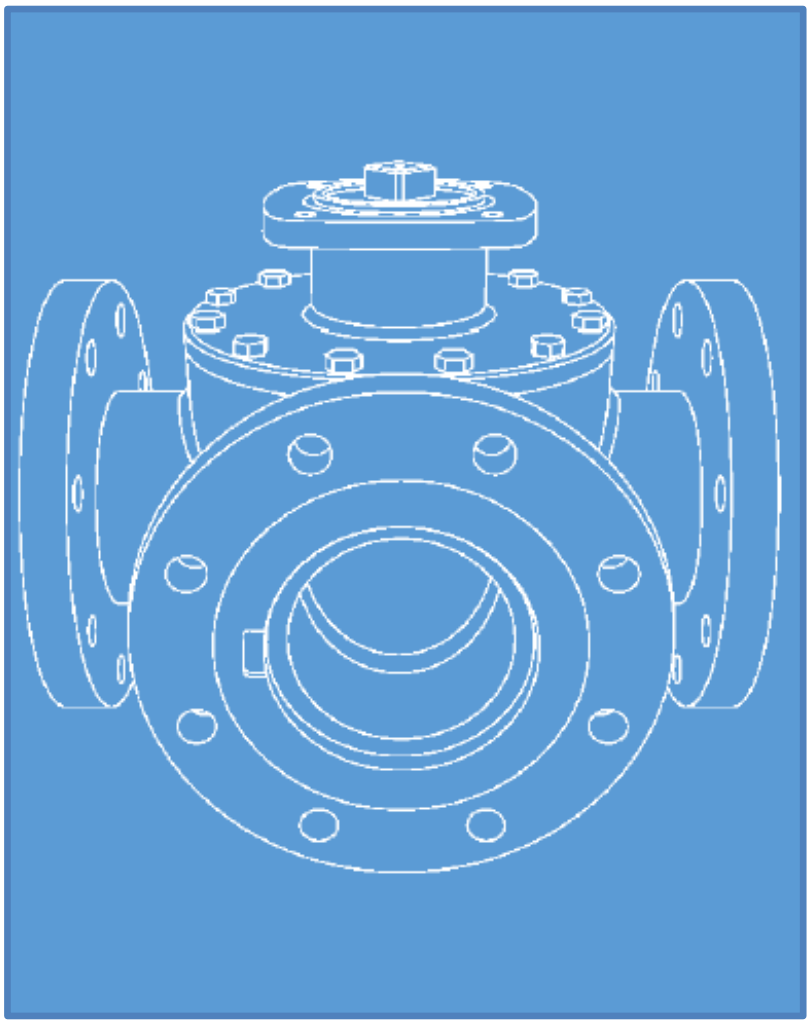
Emech®
Hot/Cold Water Mixing Valve
Model F8T100
Installation, Operation & Maintenance Manual



206-EN - CPAC0039

Please read and save these instructions

Armstrong®

CONTENTS

SECTION / DESCRIPTION **PAGE**

Armstrong International
221 Armstrong Blvd., Three Rivers, Michigan, 49093 - USA
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Introduction

Congratulations on selecting the Emech™ product from Armstrong. Armstrong devotes considerable care and attention to the design of its products. To obtain the best performance from them, the customer should read this manual from cover to cover. It contains important installation and operating instructions.

The customer must strictly adhere to the safety tips, trouble shooting advice, cautions and warnings appearing throughout this manual. Along with the warnings, instructions and procedures in this manual, the customer should also observe such other procedures generally applicable to equipment of the same type.

If the customer does not follow these and other such warnings, instructions and procedures, the product may not perform as expected. More seriously, it may cause property damage, personal injury, production down-time and other losses.

The customer should train its employees and contractors in the safe use of Armstrong products in relation to the customer's specific application. If the customer does not understand a point in this manual, contact Armstrong or its authorized representative.

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Hot/Cold Water Mixing Valve - Model F8T100 Datasheet

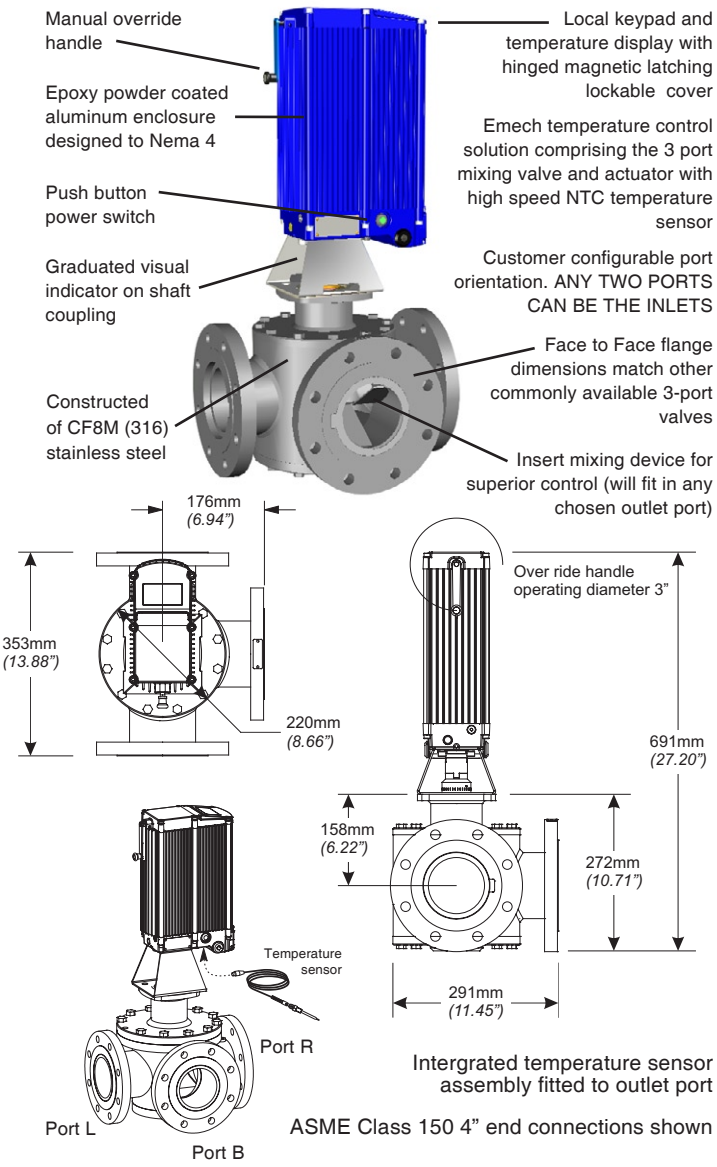
General Features
The 3 port valve utilizes a rotary turret style control geometry to provide high performance dynamic fluid mixing. Fitted with the electronic actuator and a temperature sensor inserted into the outlet pipe the system delivers high performance stand alone closed loop temperature control.

The temperature feedback signal in combination with the fast acting actuator provides temperature control accuracy to ± 2°F (± 1°C) over a 32°-212°F (0°-100°C) control range, capable of blending from 0 to 100% of either inlet temperature. Even with sudden changes of inlet pressure and temperature to the valve, the actuator controller aggressively minimizes outlet temperature variations, making the system ideal for use in industrial applications as a simple stand-alone or integrated mixing solution.
The F8T can also be used as a divert valve.

Valve Features
- ISO 5211, 5210 actuator flange mounting (F12)
- Main internal parts and valve body constructed of CF8M (316) stainless steel
- High flow capacity: 4" valve Flow Coefficient Cv (Kv): 329 (286)
- End Connection: 4" ASME B16.5 Class 150 standard.
- ANY TWO PORTS can be configured as the inlets
- NTC temperature probe assembly requires fitting into pipework 15.75" (400mm) downstream of the outlet port (fits into 1/4" NPT female thread)
- Elastomer seal material options are available to support NON water temperature control applications, e.g. glycol, hydraulic fluid.
- Top entry allows inline access to internal valve parts
- Operating temperature range: -13°F to 257°F (-25°C to 125°C)
- Rated pressure: 232 psi (16 bar) at 212°F (100°C)
- Seat leakage FCI 70-2-1998 CLASS IV (<0.01% of rated valve capacity)
- Design verification to ASME B16.34
- International patents pending
- Standard stroke: T-way mixing 180°, L-way mixing 90°

Electronic Actuator Features
- Analogue (4-20mA) input and output control signals for interfacing with SCADA control
- Software configurable control settings
- Very high resolution capability (0.03° rotational)
- External RS232 connection (cable supplied)
- Stand-alone closed loop temperature control, or remote analogue (4-20mA) control options
- Power: regulated 24Vdc 5 amp supply required
- Failsafe position feedback (non-contact absolute encoder)
- Keypad: 4 membrane switches with 'dual touch' safety features
- Display: 3.5 digit LCD display with back light
- Extra analogue input for interfacing ancillary devices (e.g. flow switch, level switch)
- 90° stroke time as low as 1.5 seconds for fast control action
- Gearbox: planetary, lifetime lubrication, low backlash
- 100% duty cycle rated actuator

Important Notes:
Consult the "Installation, Operation and Maintenance" Manual (IOM) to review key requirements, recommendations and considerations when planning your installation. Failure to do so may affect the performance of the product. A copy of the (IOM) is provided with the valve and is also available from the Emech™ website (www.emechcontrol.com).
- Illustration shows standard system format for actuator / valve orientation, installed NTC temperature probe.
- Hot and Cold input ports can be interchanged and alternative orientations of the actuator on the valve can be specified.
- Please consult with the Emech factory at time of order placement if you require non standard format product for your installation.



Intergrated temperature sensor assembly fitted to outlet port

ASME Class 150 4" end connections shown

Emech - Standard Model Codes

Valve Model Code- F8T100 Hot/Cold Water Mixing Unit Code - E100WR

Weight (Approximate)

Valve Only	lb (kg)	140 lbs (64)
Valve and Emech G13 Actuator	lb (kg)	170 lbs (78)

The Hot/Cold Water Mixing Units includes Valve, Actuator, Mounting Kit, Serial Cable, Temperature Sensor, Spanner and all relevant IOM's

Flow Capacity (*USgpm and Lpm*)

Port Connection Sizes (ASME B16.5 Class 150 flanges) Inlets x Outlet		Pressure Drop accross both inlet ports (psi) Model	5	10	15	20	25	30	35	40	45	50	Nominal Min. Flow *Note 6.*	Max. Flow	Flow Co-efficient (mixing)
4" x 4"	USgpm	F8T	740	1040	1275	1470	1645	1800	1950	2080	2210	2330	160	*Note 2.*	Cv = 329
Pressure Drop	(bar)		0.3	0.5	0.75	1.0	1.25	1.5	2.0	2.5	3.0	3.5			
4" x 4"	Lpm	F8T	2610	3370	4130	4770	5330	5840	6740	7540	8260	8920	600	*Note 2.*	Kv = 286

Note 1. Check valves **MUST** be installed prior to the inlets.
Note 2. Sensible pipeline velocities are the only limit to the F8 mixing valve flows.
Note 3. Emech's Engineering Team is available to assist you with Application Support and Component Selection.
Note 4. Ensure the sections of straight pipe to the valve are as long as practical.
Note 5. Elbows prior to inlet ought to be a long 'sweep' style and no closer than 6 pipe diameters from the inlet.
Note 6. The 'nominal recommended' Min. Flow is described as: "The minimum flow at which temperature control can be readily achieved for the given valve size with the Actuator set at STANDARD control gain setting." Contact the factory for applications where flow conditions are lower than those stated above.

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2.1 Exploded Assembly Drawing

Figure 2.1 below shows an exploded view of the Emech™ F8T100 Mixing Valve. Refer to section 2.2 for parts and material descriptions. For spares kits and other part numbers see section 2.3.

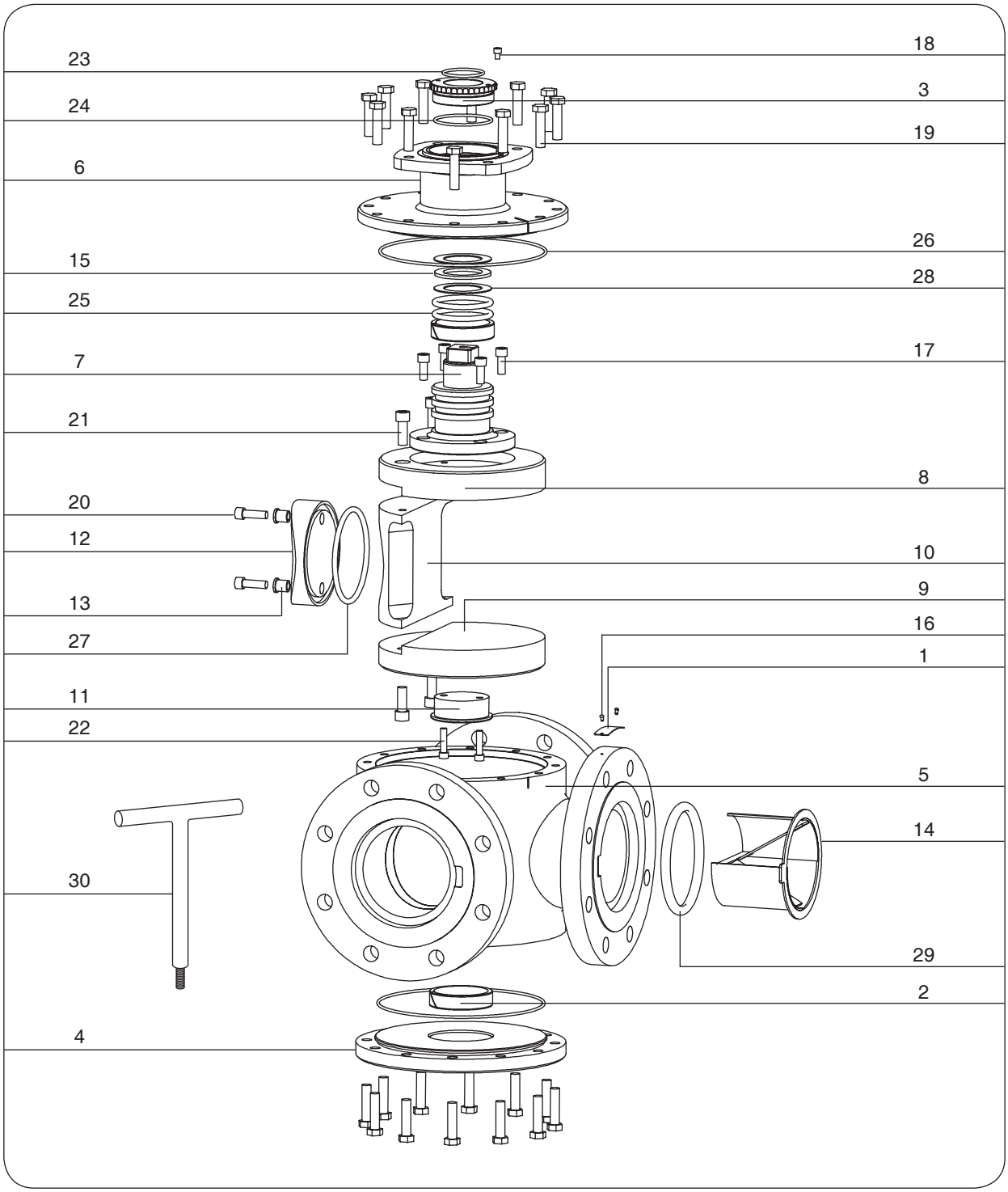


Figure 2.1 Exploded assembly drawing of the Emech™ F8T100 Mixing Valve.

2.2 List of Parts and Materials

Part	Description	Quantity	Material	Included in Seal and Bearing Kit
1	Nameplate	1	316 Stainless Steel	
2	Wear Ring	2	Carbon Reinforced PTFE	X
3	Gland Nut	1	316 L Stainless Steel	
4	Body Base Plate	1	316 L Stainless Steel	
5	Body	1	316 L Stainless Steel	
6	Bonnet	1	316 L Stainless Steel	
7	Spindle	1	316 L Stainless Steel	
8	Turret Top Plate Disc	1	316 L Stainless Steel	
9	Turret Lower Plate Disc	1	316 L Stainless Steel	
10	Turret Seal Support	1	316 L Stainless Steel	
11	Turret Trunnion	1	316 L Stainless Steel	
12	Turret Seal	1	Glass Reinforced PTFE	X
13	Turret Seal Bush	2	316 Stainless Steel	
14	Mixer Insert	1	316 L Stainless Steel	
15	Needle Roller Thrust Bearing	1	Cr-C Steel	X
16	U Hammer Drive Screw	2	316 Stainless Steel	
17	Spindle Cap Screw	4	316 Stainless Steel	
18	Gland Nut Locking Screw	1	316 Stainless Steel	
19	Bonnet/Base Plate/Body Bolt	24	316 Stainless Steel	
20	Turret Seal Cap Screw	2	316 Stainless Steel	
21	Turret Lower Plate Cap Screw	4	316 Stainless Steel	
22	Turret Trunnion Cap Screw	2	316 Stainless Steel	
23	O-Ring Gland External	1	EPDM 75	X
24	O-Ring Gland Internal	1	EPDM 75	X
25	O-Ring Spindle Seal	2	EPDM 75	X
26	O-Ring Body Seal	2	EPDM 75	X
27	O-Ring Turret Seat Seal	1	EPDM 75	X
28	Thrust Washer	2	C-Cr Steel	X
29	O-Ring Mixer Insert	1	EPDM 75	
30	Spindle Handle	1	316 Stainless Steel	

X Included in Seal and Bearing Spares Kits (see section 2.3)

2.3 Spares Kit Part Numbers

For ordering spares kits, mounting kits, and valves use table 2.1 to find the corresponding part number.

Table 2.1: Part Numbers.

Valve model:	F8T100
Seal and Bearing Spares Kit Part Number (1):	CPSK0080
Mounting Kit (includes bracket) Part Number:	CPMA0129
Temperature Sensor Assembly Part Number:	CPAC0064

(1) For non-standard material seals contact Armstrong International

3.0 Valve Installation

When installing the F8T100 valve assembly, be sure to use safe methods for handling heavy equipment. Slings and hoists are recommended (see section 3.4 for lifting instructions).

Considerations

Consider equipment operation and maintenance requirements when choosing the installation arrangement. Ensure there is access to:

- the actuator display and keypad.
- the actuator manual over-ride.
- the electrical connection terminals and power switch
- the temperature sensor. See image 4 for installation of the sensor.

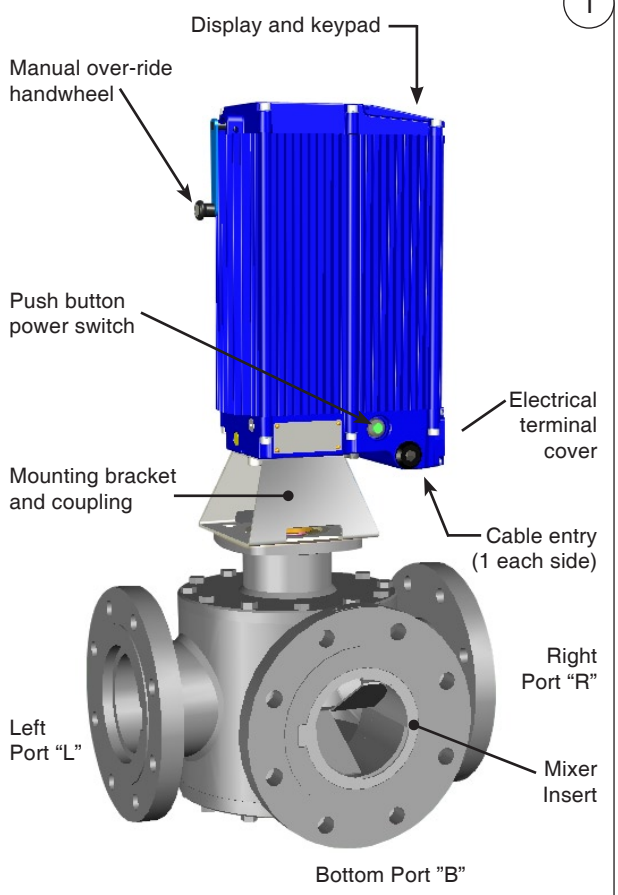
3.1 Port Configuration

For ease of installation the Emech™ F8T100 can have any port configured to be the outlet mixed port. All F8T100 and actuator assemblies are shipped to the customers requirements specified at time of purchase.

The standard configuration has Port L as the COLD inlet, Port R as the HOT inlet and Port B as the MIXED outlet (see image 1 for port labeling).

There are a number of other configurations possible as indicated in tables 3.1 & 3.2 on page 9. It is important to note the specific installation type for later actuator configuration via the Emech™ configuration software (see page 29 of CPAC0002)

1

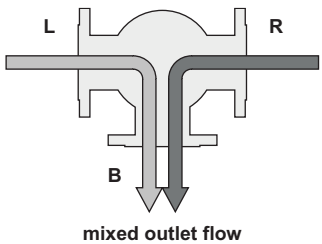


The Emech™ 3-Port Mixing Valve and Actuator - Model F8T.

Variety of configurations

There are two varieties of configurations; L-way and T-way. These are defined by the route taken by the fluids entering and leaving the valve body (image 2 and 3).

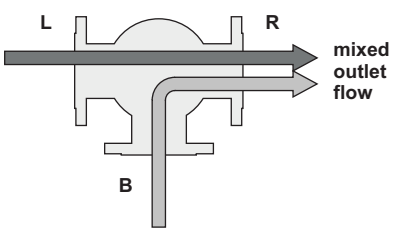
2



T-way mixing: When Port L and Port R are the inlets and Port B is the outlet.

L-way mixing: When Port B is an inlet and either Port L or Port R is the outlet.

3



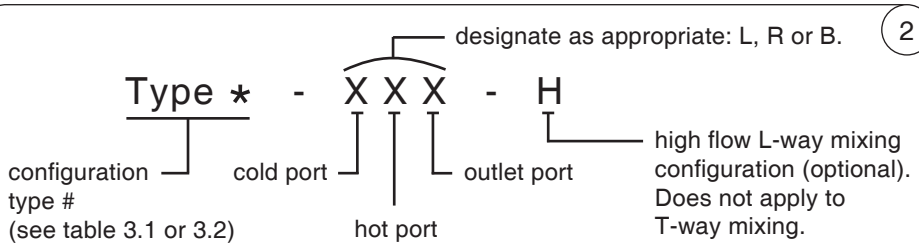
NOTE: For some L-way mixing applications one of the supply pressures may be higher than the other. Alternatively the required mixing temperature(s) maybe skewed towards one of the supply temperatures. For both cases if FLOW CAPACITY needs to be maximized, table 3.1, second column details the required configuration. (Contact your Armstrong representative if clarification is required).

Continued.....

3.2 Configuration Types Explained

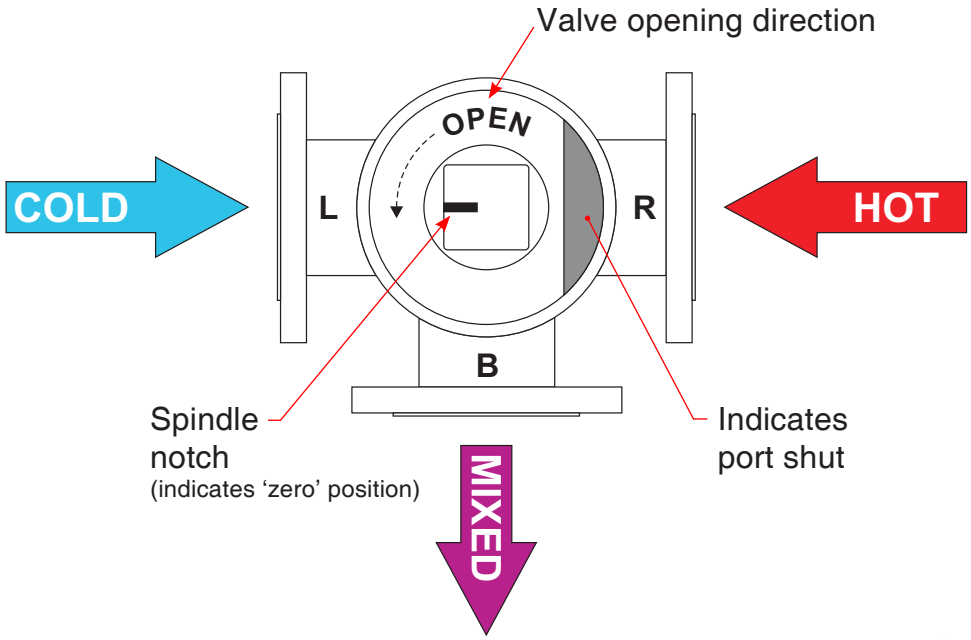
Example Port Configuration:

2



3

Valve Diagrams

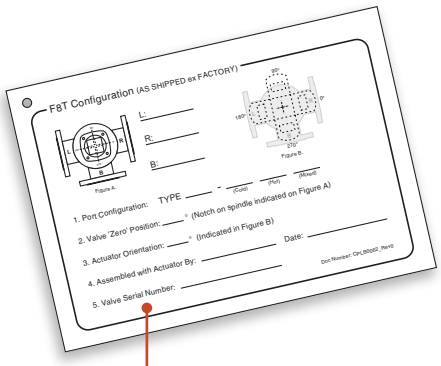


The actuated F8T100 assembly is ALWAYS delivered with the valve and actuators in the in the 'ZERO' position.

A 'configuration note' supplied with the assembly states the configuration type.

Abbreviations for the port configuration table (page 9):

'ZERO' position - 0% open (i.e. the nominal closed position)
CW - Clockwise stroke direction
CCW - Counter clockwise stroke direction
Stroke 100% - Degrees of operational rotation
HOT - Hot supply
COLD - Cold supply
MIXED - Mixed oultlet flow
L - Left port
R - Right port
B - Bottom port



Configuration note

Note: Each configuration has a different valve 'zero' position. This is defined as per table 3.1 and 3.2.

Continued....

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Table 3.1: Configuration type definition for T-way mixing.
NOTE: Diagrams shown in the 'zero' position (0% open).

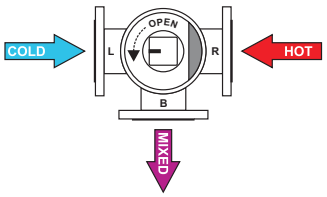
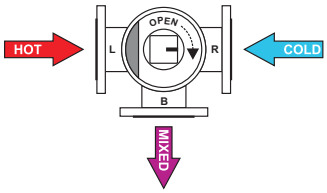
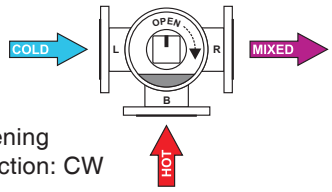
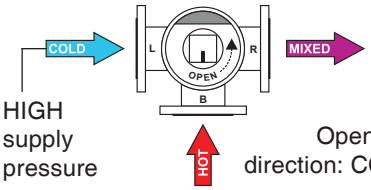
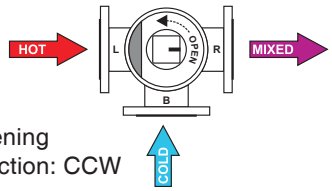
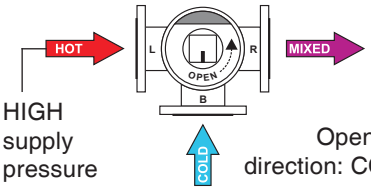
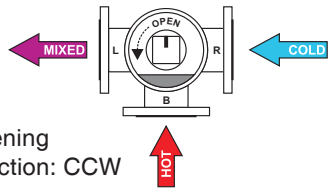
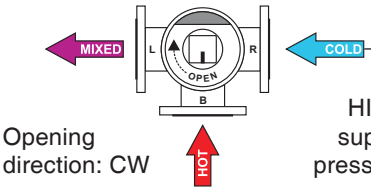
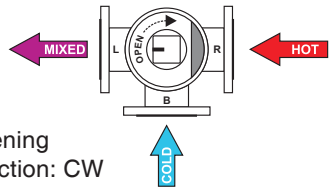
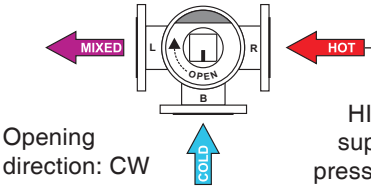
Standard configuration	Configuration Type	Opening direction	100% Stroke (° rotary)
	Type I - LRB	CCW	180°
	Type II - RLB	CW	180°

Table 3.2: Configuration type definition for L-way mixing.
NOTE: Diagrams shown in the 'zero' position (0% open).

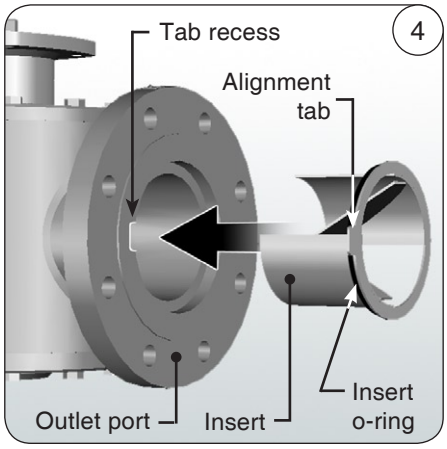
Standard configuration	Maximised flow capacity configuration	100% Stroke (° rotary)
Type III - LBR  Opening direction: CW	Type III - LBR - H  HIGH supply pressure Opening direction: CCW	90°
Type IV - BLR  Opening direction: CCW	Type IV - BLR - H  HIGH supply pressure Opening direction: CCW	90°
Type V - RBL  Opening direction: CCW	Type V - RBL - H  Opening direction: CW HIGH supply pressure	90°
Type VI - BRL  Opening direction: CW	Type VI - BRL - H  Opening direction: CW HIGH supply pressure	90°

Continued.....

3.3 Placing the Mixing Insert

Once the outlet port has been chosen, place the mixing insert into the outlet port as indicated in image 4 (ensure the insert o-ring is in place). Fit the alignment tab of the insert into the recess of the outlet port.

The valve can now be fitted to the pipe work. Follow the precautions outlined in section 3.4.

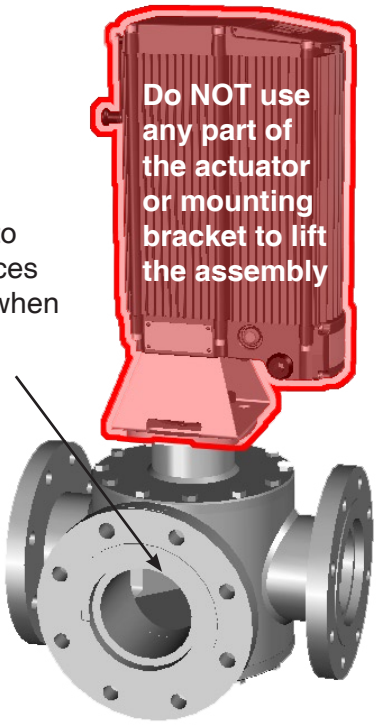


3.4 Lifting the Valve Assembly

When installing the F8T100 valve assembly, be sure to use safe methods for handling heavy equipment. Slings and hoists are recommended.

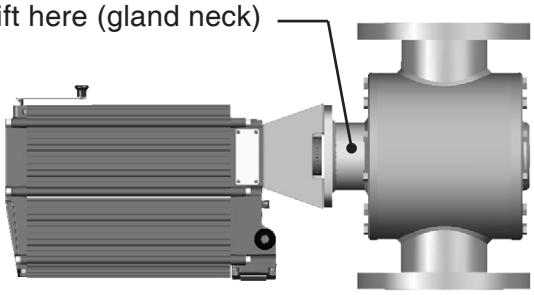
Position lifting straps and/or chains around the VALVE ONLY to lift the assembly into place. Do NOT use any part of the actuator or mounting bracket to lift the assembly.

IMPORTANT NOTE



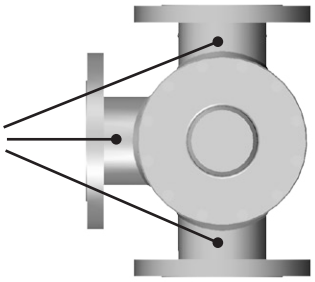
Take care not to damage the faces of the flanges when handling

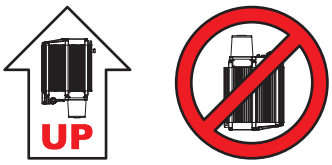
Lift here (gland neck)



! Fix straps or chains around valve ports, body and gland neck ONLY

Lift here (valve ports)





THE ACTUATOR MUST NOT BE INSTALLED USPSIDE DOWN

Continued.....

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3.5 Fitting Valve to Pipe Work

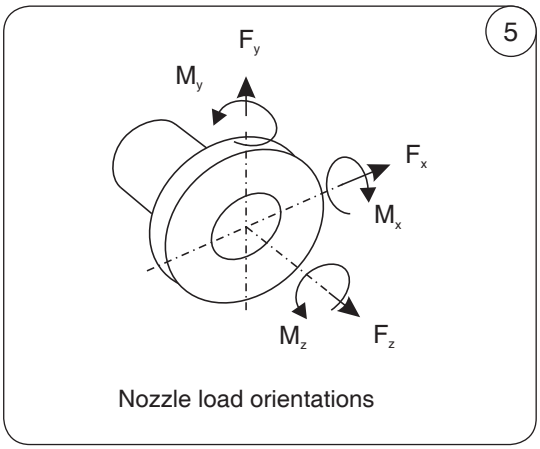
When installing the valve in line, be sure to follow good practice using appropriate flange gaskets and flange bolts at the joints.

The valve can only be connected to the pipe work with ASME Class 150 4" flanges. Tighten the flange bolts to the manufacturers recommended torques.

Ensure all equipment and pipework is appropriately supported.

Note: Be sure to consider the ease of removing the valve should this become necessary in the future.

Note: For valve maintenance, the bonnet bolts can be removed and full access to the internal components is possible.



Nozzle load orientations

CAUTIONS

- Prior to installation of the F8T100, the associated pipe lines ought to be flushed to ensure no debris or dirt damages the valve.
- Operating conditions where cavitation occurs are not recommended. Cavitation can lead to erosion of the valve and or pipework. In extreme cases this may lead to erosion through pressure retain ing parts.
- Ensure isolation valves and non-return valves are fitted 5 to 10 pipe diameters upstream of the F8T inlet ports.
- Ensure the sections of straight pipe to the F8T inlets are as long as practicable. Elbows prior to the inlet ought to be the long 'sweep' style, and no closer than 6 pipe diameters from the inlet.
- Take care not to damage the faces of the F8T flanges when handling.
- Use appropriate flange gaskets and flange bolts to meet the site standards.
- All pressure vessels (including pipe lines and valves) must be treated with caution! Maintenance of such equipment must only be carried out by persons with appropriate training! SEVERE personal injury, and damage to equipment may result from inappropriate action!

Table 3.2: Maximum Nozzle Forces and Moments

Force/ Moment Direction	**Load**	
Force - F_x F_y F_z	485 lbf.	*2150 N*
Moment - M_x M_y M_z	9650 lbf.in	*1090 Nm*

- Tighten the flange bolts to the manufacturers recommended torques.
- Ensure all equipment and pipework is appropriately supported.
- Ensure any flow meters that are installed down stream of the F8T100 valve are at least 50 pipe diameters from the outlet. There are strong rotational flows generated by the F8T100 to enhance fluid mixing. It is recommended that all flow meters are re-calibrated after installing the F8T100 upstream.
- Ensure nozzle loads (image 5) on the F8T valve do not exceed the values in the Table 3.2.
- After installation, both the inlet pipe lines ought to be flushed through the outlet pipe line.
- Ensure all personnel are safe from possible leaks of hot water! Prior to flushing the pipe lines, ensure all flange connections and pipe support fasteners are secure!
- Use safe working practices, including fitting of warning signs on pipe lines and the locking of isolation valves during installation or maintenance.

Continued.....

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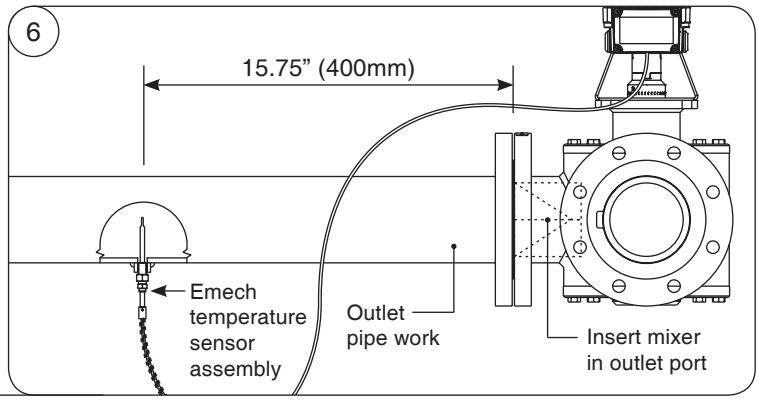
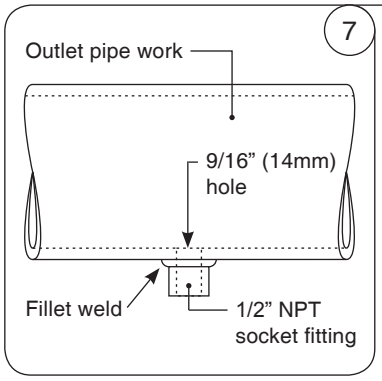
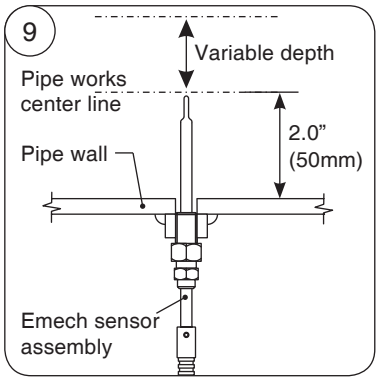
3.6 Temperature Probe Installation

The temperature probe assembly is adjustable to accommodate various pipe diameters.

Fit a 1/2” NPT socket fitting as shown in images 7 and 9.







The sensor probe tip should protrude into the fluid flow to approximately half the diameter of the pipe; e.g. 2.0” (50mm) for 4” (100mm) pipe lines (see image 9).

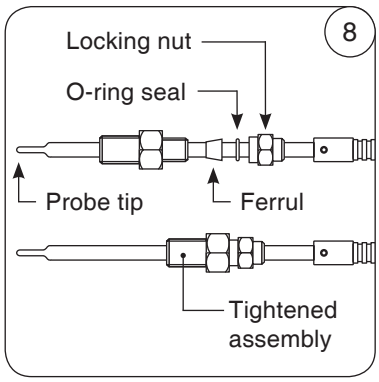
To adjust the insertion depth, loosen the locking nut and adjust the probe tip, then tighten the locking nut with a small wrench (image 8). Do not over tighten.

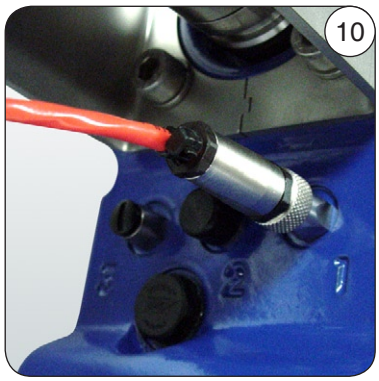
For best performence the temperature probe assembly should be fitted 15.75” (400mm) downstream of the F8T100 outlet flange.

Using a thread sealing tape or thread adhesive, screw the temperature sensor assembly into the socket fitting in the outlet pipe line (image 9).

Screw the M8 electrical connection plug on the sensor cable into the Emech™ actuator connection port labelled ‘1’ and tighten (image 10).

For further details on installation and operation of the Emech™ actuator, refer to section 6.0 of this manual and also the actuator Installation and Operation Manual.





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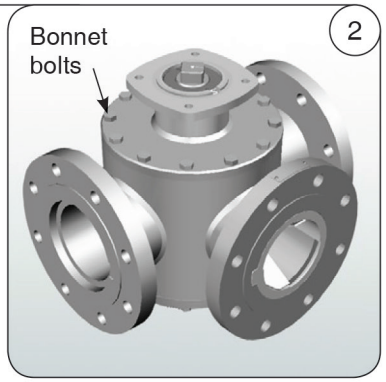
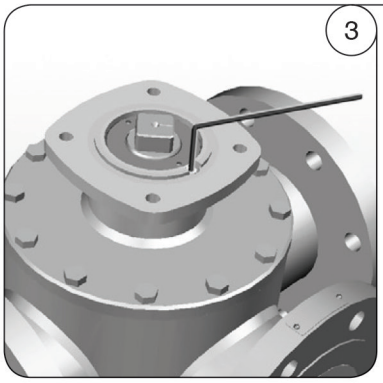
CAUTION!

- Before dismantling the Emech™ F8T valve, ensure all upstream and downstream pressurized pipe work is isolated appropriately.
- Ensure the pressure and fluids are drained from the valve and pipework.
- Ensure the valve is in the 0° position and isolate power from the actuator.
- Remove the temperature sensor cable plug from the actuator.
- Remove the actuator bracket bolts, and lift the actuator off the valve.
- Take care to retain the 3-piece actuator shaft coupling.
- Set and secure the actuator to one side.

1



2

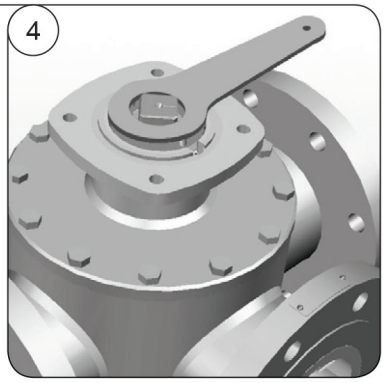


3

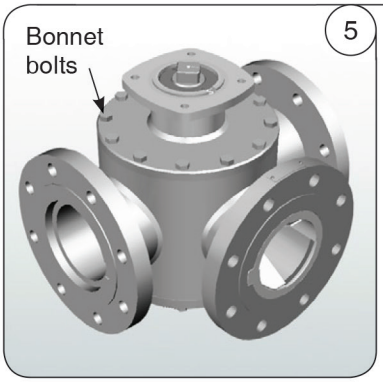
Remove the gland nut locking screw with an allen wrench (image 3).

Fit the gland nut wrench (supplied), and turn counterclockwise to remove the gland nut (image 4).

The thrust washer may come out with the gland nut, but if not it can be removed at the next step below.



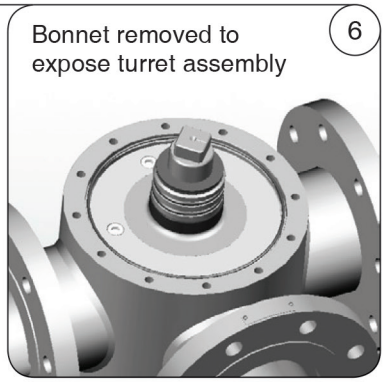
4



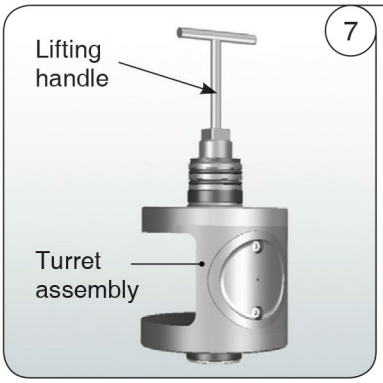
5

Remove all twelve bonnet bolts.

Remove and discard the top body seal from the underside of the bonnet as indicated in image 8.



6

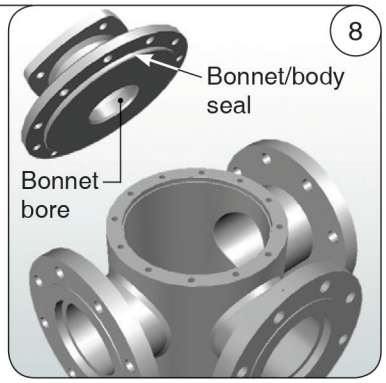


7

The turret assembly is best removed from the body by screwing in the lifting handle (supplied) into the top of the spindle and lifting upwards (image 7).

Remove the wear rings, o-rings, thrust bearing and washers from the turret spindle. Clean all grease and dirt from parts not being replaced.

Clean and examine the bonnet and inside of the body. Lightly grease the bonnet bore (image 8).



8

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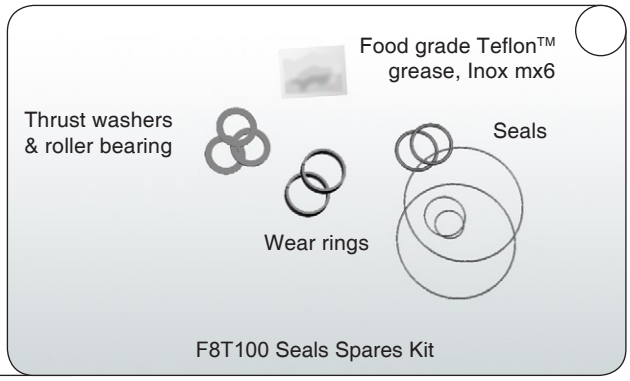
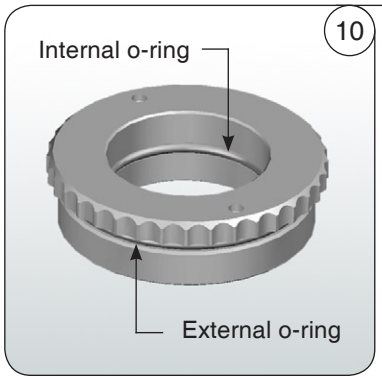
The seal kits have full descriptions, so ensure the correct seal materials are being fitted (image 9).

Remove the old seals from the gland nut. Clean the gland nut threads thoroughly. Insert the internal and external o-rings into the gland nut (image 10).

Apply grease to the o-rings and also to the thread and bottom surface of the nut.



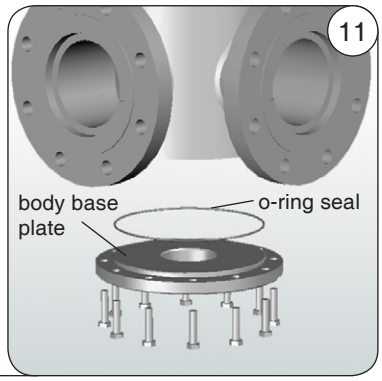
F8T100 Seals Spares Kit

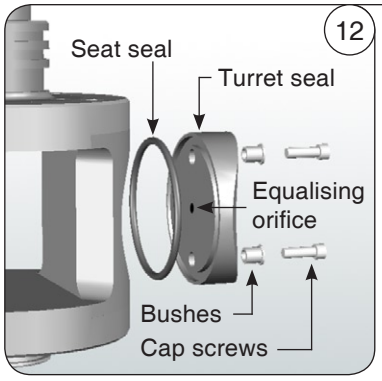


Lightly grease the seals and seal surfaces with the lubricant provided in the spares kit.

Fit the new bottom seal onto the body base plate. Carefully position the bottom plate over the seal and screw in the 11 hex bolts to retain the bottom plate.

Note: Ensure a liberal amount of an appropriate anti-seize lubricant is put on the bolt threads prior to fitting.



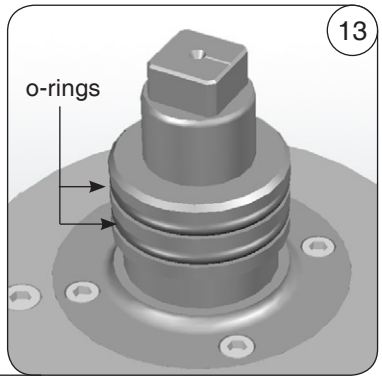


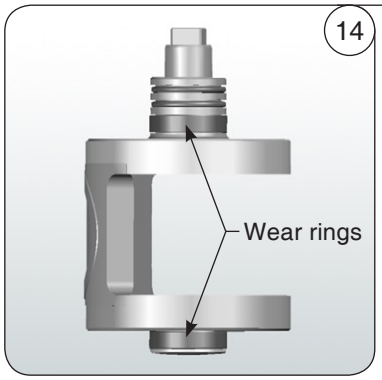
Inspect the turret seal on the turret assembly. If the face of the turret seal is free from damage, clean the components, and replace the seat seal (image 12). Lightly grease the seal and seal surfaces with the lubricant provided in the spares kit.

Replace the turret seal only if the face or seal grooves are badly worn or damaged.

Ensure the seal's equalising orifice is not blocked.

Tighten the cap screws to 90 in.lbf (10Nm) with Loctite 222. Do not over tighten!



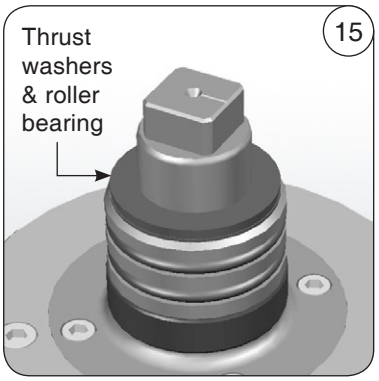


Fit the two o-rings to the spindle. Apply a light even coat of grease to the spindle bearing surfaces and the o-rings (image 13).

Fit the top and bottom wear rings to the spindle and turret trunnion respectively (image 14).

Lightly grease both sides of the thrust washer and place on the spindle.

Place on the needle roller bearing and apply further grease (approx. 60% of the void space). Lightly grease both sides of the second thrust washer and place on the bearing (image 15).



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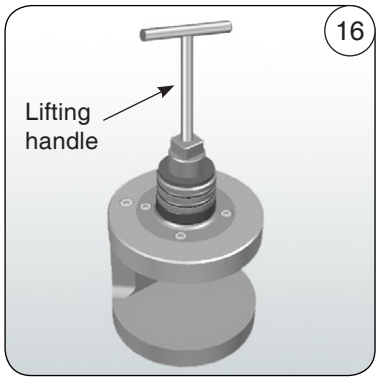


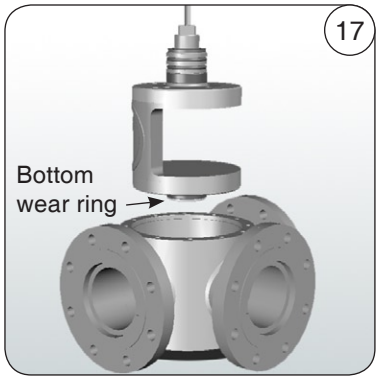
Gently slide the turret into the body using the lifting handle (image 16). Locate the bottom wear ring into the recess of the bottom plate (image 17).

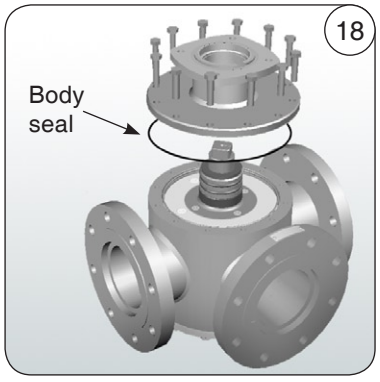
Apply a light even coat of grease to the bonnet seal o-ring and its groove. Place the o-ring in the bonnet groove.

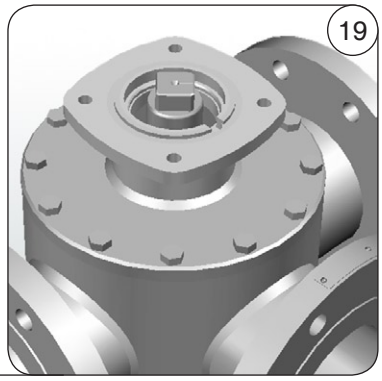
Gently lower the bonnet over the assembly (image 18).

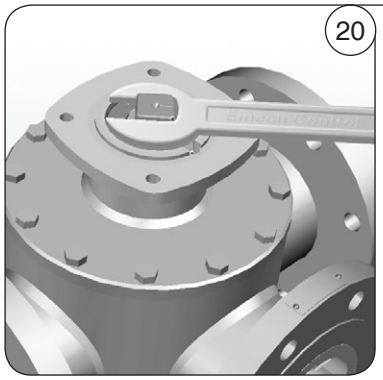
Fit the 12 bonnet bolts. Ensure a liberal amount of an appropriate anti-seize lubricant is put on the bolt threads prior to fitting.

Use a symmetrical tightening sequence, so that the bonnet bolts evenly clamp the bonnet flange down. Use a torque wrench to tighten the bolts to approximately 416 in.lbf (47 Nm) (image 19).





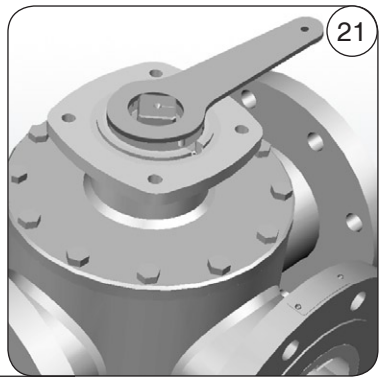


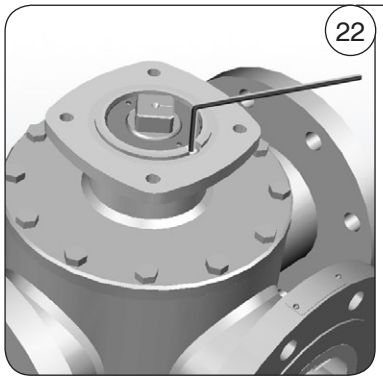


Screw the gland nut into the bonnet only a few turns. Rotate the spindle a few times (image 20).

Now turn the gland nut until it bottoms out (image 21). DO NOT APPLY EXCESSIVE TORQUE! Back the gland nut off 1 or 2 notches.

Ensure the spindle still rotates freely.





Apply a thread locking adhesive to the gland nut locking screw.

Fit the gland nut locking screw into the bonnet and tighten to 24 in.lbf (3 Nm) (image 22).

Again rotate the valve spindle. The actuation torque with no fluid pressure ought to be <70 in.lbf (8 Nm). If the torque is high, loosen then repeat the gland tightening process.

Continued.....

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Refit the Emech™ actuator taking care to assemble the coupling and spindle parts in the correct orientation (see Section 5 for mounting on to Emech™ valves).

Refit the M8 electrical connection plug on the sensor cable into the Emech™ actuator connection port labelled ‘1’ and tighten.

Review the installation to ensure it is correct. Remove warning signs and locks from the isolation valves. Open the isolation valves carefully to ensure any unexpected leaks can be observed.

Re-power the actuator, and confirm the installation is correct.

Table 4.1: Nominal Tightening Torques for Lubricated Stainless Steel Socket Head Cap Screws

Metric Screws			**UNC Screws**		
Size	Torque (Nm)	Torque (in.lbf)	Size	Torque (Nm)	Torque (in.lbf)
M3	1.3	12			
M4	2.9	26	#8-32	3	27
M5	5.7	50	#10-24	5.5	49
M6	10	89	1/4”	11	97
M8	25	221	5/16”	22	195
M10	47	416	3/8”	39	345
M12	82	726	1/2”	95	841

Table 4.2: Recommended Lubricants and Thread Adhesives

Description	**Manufacturer/Model Code**	**Used for:**
Food Safe Teflon Lubricant*	MX6INOX	O-rings; wear rings; bonnet bore lubrication; roller thrust bearing lubricant; stainless steel bonnet bolts

*Sachets of this lubricant are included in the Seal Kits.

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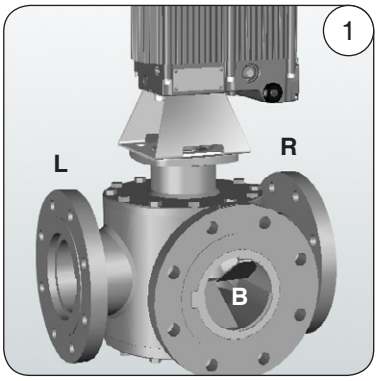


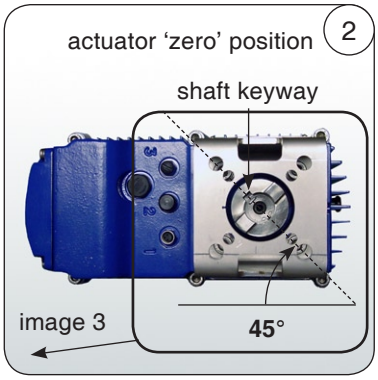
Note: The actuator may be mounted in any one of four positions.

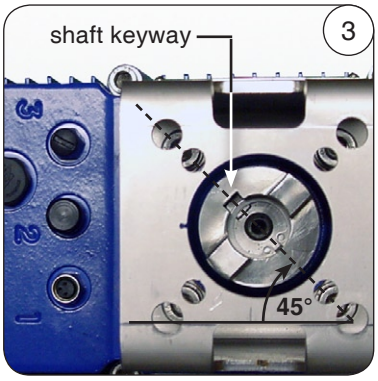
The instructions below explain how to mount the actuator in the standard orientation (LRB) with the actuator facing port R as per image 1.

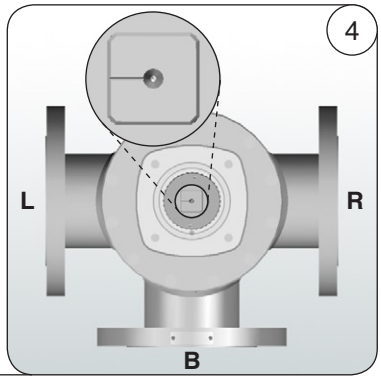
Set the actuator to the ‘zero’ position.

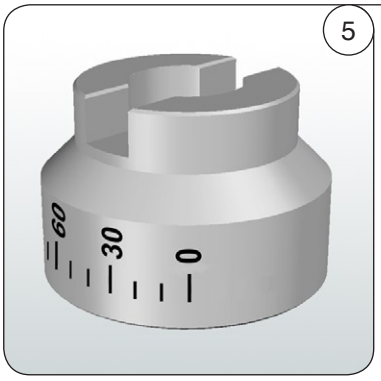
To ensure the actuator is in the ‘zero’ position, power on the actuator (a 24V DC regulated power supply is required). Set the actuator to Temperature Controller mode. Disconnect the temperature probe from the actuator. The actuator will move automatically to the ‘zero’ position and the keypad display will show “E2”.

Note: If there is no power available to ‘zero‘ the actuator it is possible to use the manual override handle. The actuator ‘zero‘ is achieved when the shaft keyway is at 45° as indicated in images 2 and 3.





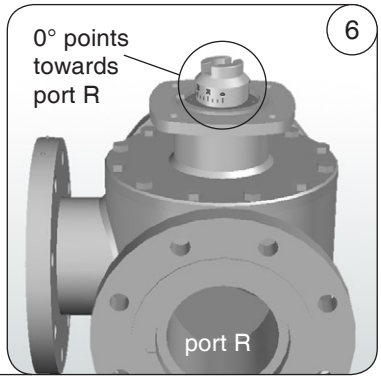


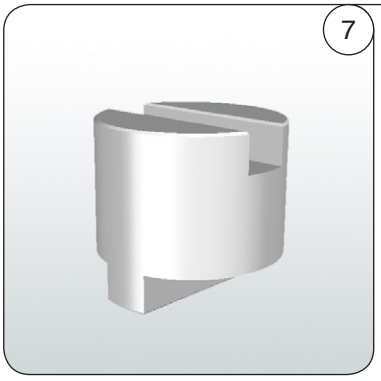


Rotate the valve spindle to the 0° position (image 4).

Note: The valve 0° position depends on the installation type outlined in table 3.1 on page 4. For a valve in the ‘LRB’ (standard) port orientation ensure the notch on the spindle points towards port L (image 4).

Place the graduated coupling (image 5) on the spindle & ensure that zero points to the port R (image 6).

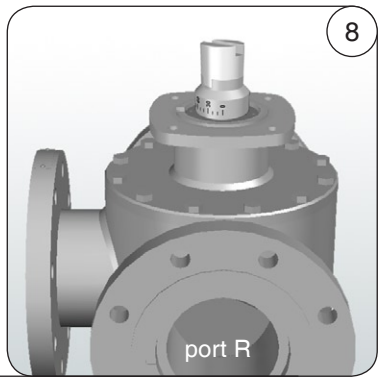




If the actuator is to be mounted in one of the other three positions, rotate the zero graduation to the desired position BEFORE placing on spindle.

Place the center coupling (image 7) on the graduated coupling (image 8).

Continued...



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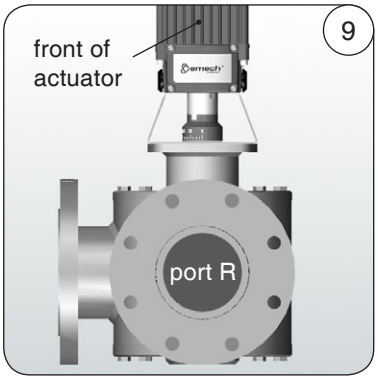
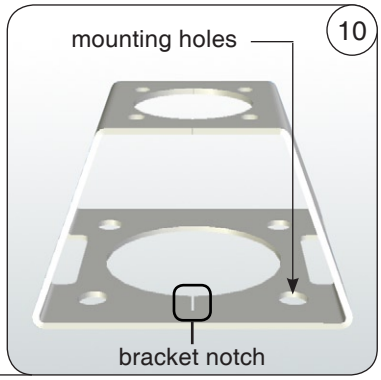


9

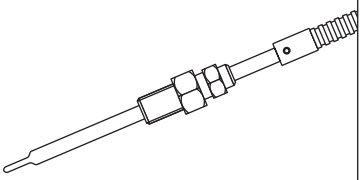
If the bracket has not been fitted to the actuator secure it onto the base of the actuator with the M8 cap screws and spring washers supplied. Fit these screws with Loctite 243 and tighten to 220 in.lbf (25 Nm). Do not over tighten!
Note: the bracket notch should be at the front of the actuator.

Place the actuator on the valve in the desired position (image 9). The zero mark on the coupling (image 5, page 13) should align with the notch on the bracket (image 10).

Insert one M12 X 20mm bolt into one of the mounting holes with a M12 spring washer and nut. Insert the remaining bolts and fasten.



10

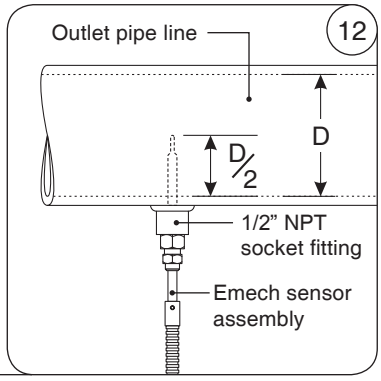


11

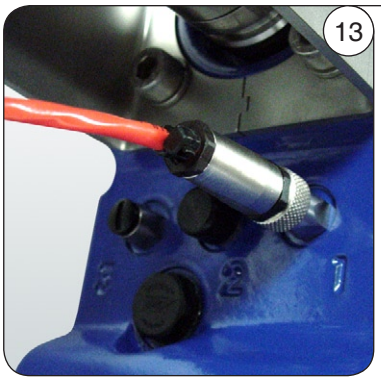
Emech temperature sensor assembly

Using a thread seal tape or thread sealing adhesive screw the temperature sensor assembly (image 11) into the socket fitting in the outlet pipe line (image 12).

(See page 12 for setting the probe depth)



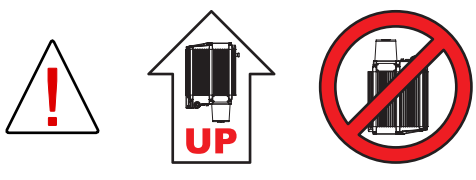
12



13

Plug the sensor connector into the actuator input port labeled "1" and tighten (image 13).

The actuator is now assembled correctly.
(See page 29 of CPAC0002 to check the actuator software)



THE ACTUATOR MUST NOT BE INSTALLED USPSIDE DOWN

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Hot/Cold Water Mixing Valve
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Installation, Operation & Maintenance Manual

Limited Warranty and Remedy

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