

ZZ Take-A-Part Thermal Expansion Valve

ZZ Take-A-Part Thermal Expansion Valves are designed for use on low temperature applications with evaporator temperature ranges of -40°F and below. Take-A-Part ZZ series thermal expansion valves have 3 component parts: power assembly, cage assembly and flange. There are no working parts in the flange. It is not necessary to break the line connections to service the valve.

SAFETY INSTRUCTIONS

1. **WARNING:** Before opening any system, make sure the pressure in the system is brought to and remains at atmospheric pressure. Failure to comply may result in system damage and/or personal injury.
2. Read Installation Instructions thoroughly. Failure to follow instructions may result in valve failure, system damage or personal injury.
3. Do not use on service conditions or fluids not specifically cataloged without prior approval of the Emerson Climate Technologies Flow Controls Division Applications Engineering Department. Use of thermal expansion valves on applications not specifically cataloged can result in personal injury, valve failure and/or system damage.
4. Protect against excessive vibration, which may cause the bulb tube to break, resulting in valve failure.
5. Foreign matter in the thermal expansion valve may cause diaphragm failure, flooding, or starving. Use of a liquid line filter-drier is strongly recommended.
6. Valves are factory-set to a specific superheat. If adjustment is needed, refer to superheat adjustment instructions for proper procedure. Improper adjustment may result in valve malfunction and/or system damage.
7. Proper valve sizing is important. An oversized valve may result in erratic control. An undersized valve may considerably reduce system capacity.
8. Do not exceed the valve's max. working pressure of 450 psig if exceeded, internal valve pressure could cause damage to the diaphragm, resulting in valve malfunction.
9. Do not exceed max. working temperature of 250°F - excess temperatures could cause internal damage, resulting in valve malfunction.

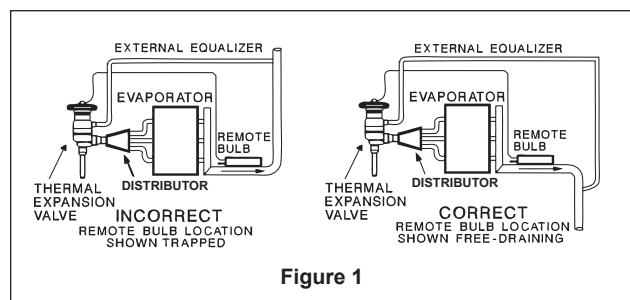


Figure 1

INSTALLATION INSTRUCTIONS

1. Valves may be installed in any position, but should be located as close as possible to the distributor or evaporator inlet. Refer to dimensional diagrams for valve roughing-in dimensions.
2. Be sure valve is installed with its flow arrow corresponding to the flow direction thru the piping.
3. Install line connections to valve. On valves with solder connections, remove the power assembly, cage assembly and gaskets prior to brazing. Use back-up wrench on all wrench flats.
4. When reassembling the valve, follow the service instructions. Tighten cap screws to torque specification.
5. Attach the remote bulb to the suction line as close to the evaporator as possible. Position the bulb at the 4 or 8 o'clock position. See figures 1 & 3. Clean the surface of the suction line where the remote bulb is to be attached, then securely fasten the bulb. If the remote bulb can be affected by the surrounding ambient, then the bulb should be insulated with a material that will not absorb water.
6. Connect one end of the external equalizer line to the valve. Connect the other end to the suction line, slightly downstream from the remote bulb location, and positioned so that it cannot siphon oil from the suction line. See figure 1.
7. Check for leaks, sufficient system refrigerant, and be sure no flash gas is present.

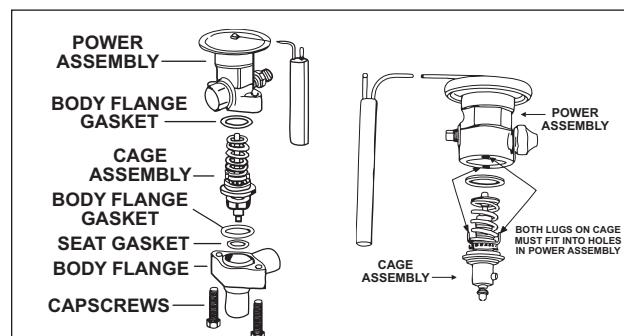


Figure 2

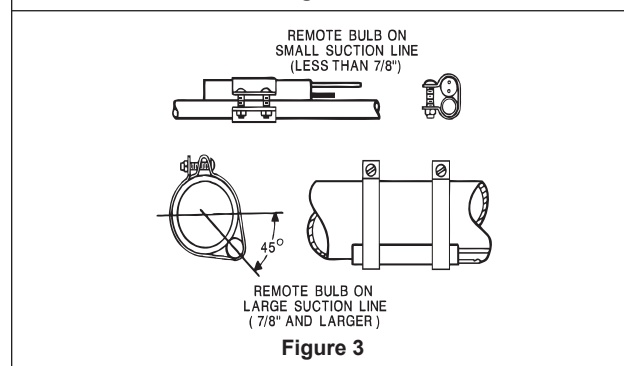


Figure 3

SERVICE INSTRUCTIONS

WARNING: Before opening any system, make sure the pressure in the system is brought to and remains at atmospheric pressure. Failure to comply may result in system damage and/or personal injury. To inspect, clean, or replace parts of the thermal expansion valve:

1. Disconnect equalizer line.
2. Remove the cap screws.
3. Carefully lift off the power assembly.
4. Remove cage assembly and gaskets.
5. Lightly oil gasket with refrigeration oil.

NOTE: Good service practice requires replacing all gaskets whenever a valve is opened.

6. Assemble in the same order as disassembled.
7. When putting the power assembly on, make sure the cage assembly lugs line up with the slots inside the power assembly (see figure 2).

8. Tighten cap screws evenly and torque to 300±25 inch pounds.

NOTE: For proper sealing of all gasket surfaces, the torque must be applied evenly. The following recommended procedure must be followed:

- 1) Tighten both cap screws finger tight.
- 2) Alternately tighten each cap screw at 50 in-lb increments until the 300 in-lb spec is obtained on each.

IMPORTANT: Failure to follow these instructions can result in a valve that has excessive internal leakage, leading to "flooding", if a new valve floods on initial start-up, it is recommended that all gaskets be replaced and the valve be re-installed carefully following the proper torque instruction noted above.

NOTE: Over-torquing may result in body damage.

9. Check for leaks.

REMOTE BULB WELL

When it becomes desirable to increase the sensitivity of the remote bulb to a change in the refrigerant gas temperature leaving the evaporator, it may be necessary to use a remote bulb well. This is particularly true for short-coupled installations with large suction lines (2-1/8" OD or larger). Remote bulb wells should be used:

- (1) when very low superheats are desired, and (2) where convected heat from a warm room can influence the remote bulb. (See Figure 4.)

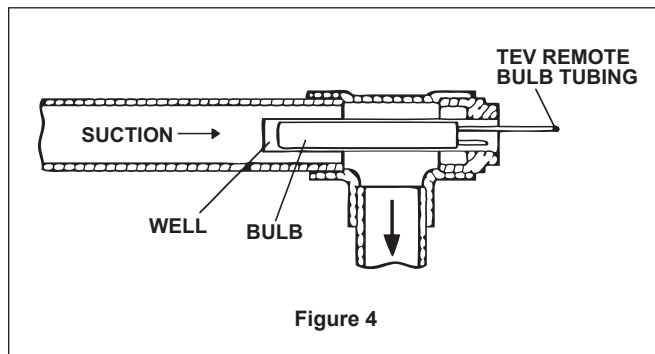


Figure 4

SUPERHEAT ADJUSTMENT

ZZ Thermal Expansion Valves are factory-set for a static superheat. However, the superheat should be adjusted for the application. Improper superheat adjustment may result in system malfunction. To properly adjust the thermal expansion valve to other superheat settings:

1. Remove seal cap on side of valve.
2. Turn the adjusting stem in a clockwise direction to increase the superheat, and counterclockwise to decrease superheat (approximately 1/2°F per turn, R22 applications).

Note: Allow adequate time between adjustments for system to stabilize before checking superheat.

3. When the desired superheat setting is achieved, reinstall the seal cap.

RAPID RESPONSE BULB AND WELL

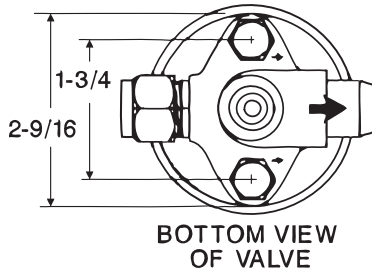
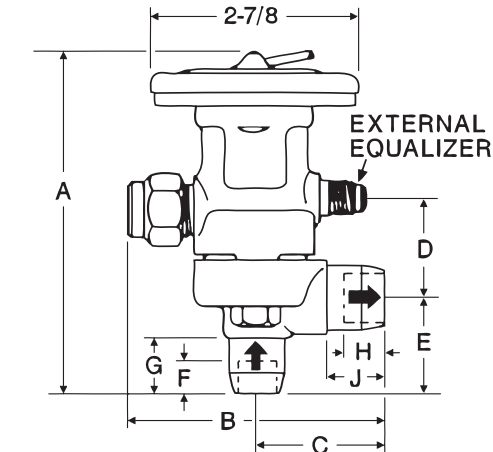
One of the problems encountered in the average refrigeration system is the return of liquid refrigerant to the compressor (known as flood-back). Proper application of the *rapid response remote bulb* and matching well will minimize this problem. Due to reduced thermal mass, the rapid response bulb and well respond to changes in suction gas superheat far more rapidly than the larger standard remote bulbs applied either as a "strap-on" type or inserted in the standard remote bulb well.

The rapid response bulb and well provide the extra quick closing action necessary for positive protection against liquid flood-back as well as the smooth control necessary for optimum system performance. Figure 4 illustrates the proper method of installation. The rapid response bulb may be used in either horizontal or vertical suction lines.

Since a definite remote bulb volume is required for any type of charge other than gas, the rapid response bulb is available only with the "G" (gas) charge. To designate the rapid response bulb, suffix the charge symbol in the valve type or power assembly number with the letter "S", i.e. TCL1-FGS55 or X7726-FGS55 1A.

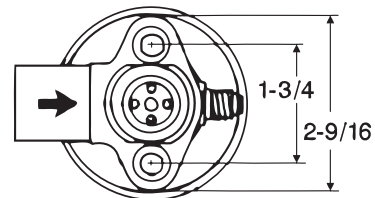
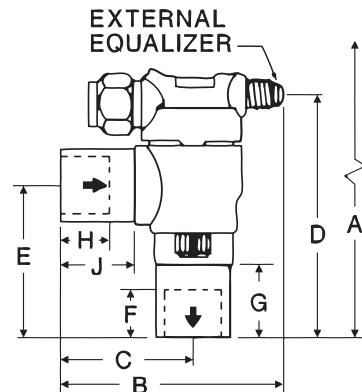
Do not under any circumstances locate either type of remote bulb in a location where the suction line is trapped. (See Figure 1.) If the liquid refrigerant collects at the point of the remote bulb location, the thermal expansion valve operation will be erratic and possibly the valve thought to be defective. Large fluctuations in superheat in the suction gas are usually the result of trapped liquid at the remote bulb location. Even on properly designed suction lines, it is sometimes necessary to move the remote bulb a few inches either way from the original location to obtain best valve action. **Always locate the remote bulb on the evaporator side of the heat exchanger.**

ZZ DIMENSIONAL DIAGRAMS AND TABLE



BOTTOM VIEW
OF VALVE

ZZC ANGLE



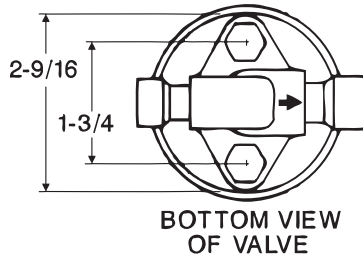
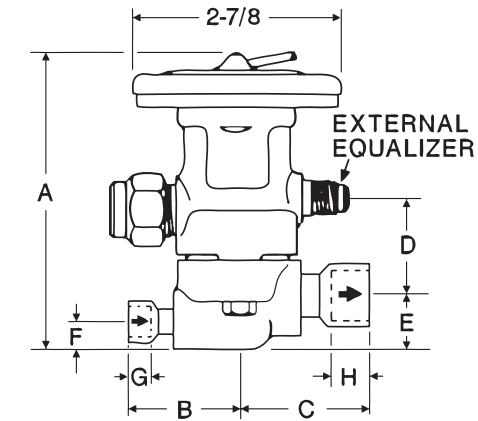
BOTTOM VIEW
OF VALVE

ZZJR, ZZER, ZZIR ANGLE

ZZ VALVE ANGLE	LINE CONNECTIONS INLET x OUTLET	A	B	C	D	E	F	G	H	J
ZZC	1/4 x 3/8 SAE	4-1/16	2-15/16	1-3/8	1-1/4	1	-	-	-	-
	3/8 x 1/2 SAE	4-3/16	3-1/16	1-1/2		1-1/8				
	3/8 x 5/8 SAE	4-3/16	3-3/16	1-5/8		1-1/8				
	1/2 x 5/8 SAE	4-7/16	3-3/16	1-5/8		1-3/8				
	1/4 x 3/8 ODF	4	2-15/16	1-3/8	1-1/4	15/16	7/16	-	9/16	-
	1/4 x 1/2 ODF	4	3-1/16	1-1/2		15/16	7/16		11/16	
	3/8 x 1/2 ODF	4-1/8	3-1/16	1-1/2		1-1/16	9/16		11/16	
	3/8 x 5/8 ODF	4-1/8	3-3/16	1-5/8		1-1/16	9/16		13/16	
	1/2 x 5/8 ODF	4-1/4	3-3/16	1-5/8		1-3/16	11/16		13/16	
	5/8 ODF – 7/8 ODM x 7/8 ODF – 1-1/8 ODM	4-7/8	3-9/16	2	1-3/8	1-11/16	13/16	1-1/16	1	1-1/8
ZZJR	7/8 ODF – 1-1/8 ODM x 7/8 ODF – 1-1/8 ODM	5-1/2	3-7/16	2	3-11/16	2-5/16	3/4	1-1/8	3/4	1-1/8
ZZER	7/8 ODF – 1-1/8 ODM x 7/8 ODF – 1-1/8 ODM									
ZZIR	7/8 ODF – 1-1/8 ODM x 7/8 ODF – 1-1/8 ODM	6			4-3/16	2-13/16	3/4		3/4	

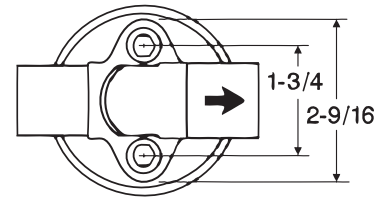
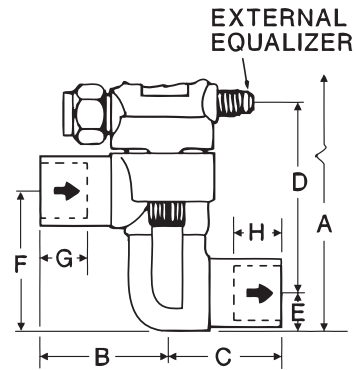
ALLOW 2-1/8" ABOVE VALVE FOR REMOVAL OF POWER ASSEMBLY. REMOTE BULB DIAMETER IS 3/4" AND LENGTH IS 4-7/8".

ZZ DIMENSIONAL DIAGRAMS AND TABLE



BOTTOM VIEW
OF VALVE

ZZC STRAIGHT-THRU



BOTTOM VIEW
OF VALVE

ZZJR, ZZER, ZZIR STRAIGHT-THRU

ZZ VALVE STRAIGHT-THRU	LINE CONNECTIONS INLET x OUTLET	A	B	C	D	E	F	G	H
ZZC	3/8 x 1/2 SAE	3-3/4	1-13/16	2	1-1/4	11/16	3/8	-	-
	3/8 x 5/8 SAE		1-13/16	2-3/16					
	1/2 x 5/8 SAE		2	2-3/16					
	1/4 x 5/8 ODF	3-3/4	1-7/16	1-5/8	1-1/4	11/16	3/8	5/16	1/2
	3/8 x 3/8 ODF			1-9/16					5/16
	3/8 x 1/2 ODF			1-9/16					3/8
	3/8 x 5/8 ODF			1-5/8					1/2
	3/8 x 7/8 ODF	3-13/16	1-7/16	1-15/16	1-5/16	11/16	3/8	3/8	3/4
	1/2 x 1/2 ODF	3-3/4		1-9/16	1-1/4				3/8
	1/2 x 5/8 ODF	3-3/4		1-5/8	1-1/4				1/2
	1/2 x 7/8 ODF	3-13/16		1-15/16	1-5/16				3/4
	1/2 x 1-1/8 ODF	3-3/4		2-3/8	1-1/4				15/16
	5/8 x 5/8 ODF	3-3/4	1-5/8	1-5/8	1-1/4	11/16	3/8	1/2	1/2
	5/8 x 7/8 ODF			1-15/16					3/4
	5/8 x 1-1/8 ODF			2-3/8					15/16
	5/8 x 1-3/8 ODF	3-13/16	1-5/8	2-9/16	1-1/4	3/4	3/8	1/2	1
	7/8 x 1-1/8 ODF	3-3/4	1-15/16	2-3/8	1-1/4	11/16	1/2	3/4	15/16
ZZJR	7/8 ODF – 1-1/8 ODM x 7/8 ODF – 1-1/8 ODM	5-7/16	2	1-13/16	2-15/16	9/16	2-3/16	3/4	3/4
ZZER	7/8 ODF – 1-1/8 ODM x 7/8 ODF – 1-1/8 ODM								
ZZIR	7/8 ODF – 1-1/8 ODM x 7/8 ODF – 1-1/8 ODM	5-1/2			3		2-1/4		

ALLOW 2-1/8" ABOVE VALVE FOR REMOVAL OF POWER ASSEMBLY. REMOTE BULB DIAMETER IS 3/4" AND LENGTH IS 4-7/8".