

Instruction Sheet

PA-00192
June 2013

TRAE Thermal Expansion Valve

TRAE Thermal Expansion Valve

TRAE Thermal Expansion Valves are designed to meet the specific demands of refrigerated display cases, reach-in & walk-in coolers and freezers, and commercial applications ranging from medium (+50°F) temperature, with proper charge. Designed for R-12, R-22, and R-502.

TRAE NOMENCLATURE

Example: TRAE 15HW100

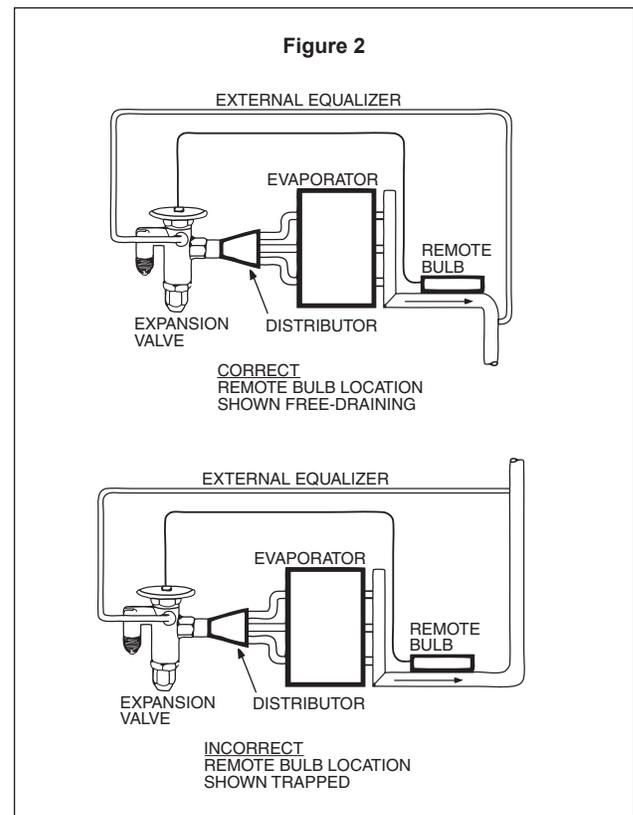
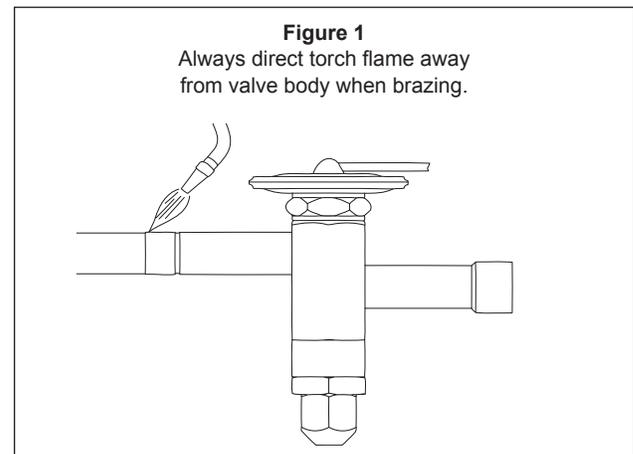
TRAE	15	H	W	100
Valve Series	Capacity (Nominal Rating in tons)	Refrigerant Code F = R-12 H = R-22 R = R-502	Charge Code	MOP (optional)

SAFETY INSTRUCTIONS

1. Read Installation Instructions thoroughly. Failure to follow instructions may result in valve failure, system damage or **personal injury**.
2. 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.
3. Protect against excessive vibration, which may cause the bulb tube to break, resulting in valve failure or malfunction.
4. Foreign matter in the expansion valve may cause diaphragm failure, flooding, or starving. Use of a liquid line filter-drier is strongly recommended.
5. 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.
6. Be sure the valve is installed with the flow arrow on the valve body corresponding to the flow direction through the system piping.
7. On valves with solder connections, remove the power assembly, cage assembly and gaskets prior to brazing.
8. Use back-up wrench on all wrench flats. Over-torquing may result in valve body damage.
9. Proper valve sizing is important. An oversized valve may result in erratic control. An undersized valve may considerably reduce system capacity.
10. Do not exceed the valve's maximum working pressure of 450 psig-if exceeded, internal valve pressure could cause damage to the diaphragm, resulting in valve malfunction.
11. Do not exceed maximum working temperature. Excess temperatures could cause internal damage, resulting in valve malfunction.

FEATURES

- Bar stock body – ODF connections
- External equalizer
- Corrosion-resistant materials
- Interchangeable with currently available TXVs



INSTALLATION 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 can result in system damage and/or personal injury.
2. Valves may be installed in any position, but should be located as close as possible to the distributor or evaporator inlet.
3. Be sure valve is installed with its flow arrow corresponding to the flow direction thru the piping.
4. Install line connections to valve. On valves with solder connections, wrap wet cloths around the valve to prevent valve damage while brazing. Direct torch away from valve (see Figure 1). Use backup wrench on all wrench flats.
5. Attach the *remote* bulb to the suction line as close to the evaporator outlet as possible on a horizontal run. Position the bulb at the 4 or 8 o'clock position. Clean surface of suction line where the *remote* bulb is to be attached, and then securely fasten the bulb with straps provided. 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. See figure 2.
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.
7. Check for leaks, sufficient system refrigerant charge, and be sure no flash gas is present before attempting to check valve operation.
8. The expansion valve must be *free* of all contaminants - install a liquid line filter-drier before the valve.
9. **SAE Connection:** Use special care to not over tighten fittings. Use back-up wrench on all wrench flats.

MEASURING SUPERHEAT

1. Determine the suction pressure with an accurate gauge at the evaporator outlet (**see P in figure 3**).
On self-contained systems, the suction pressure may be read at the compressor suction connection.
2. From refrigerant pressure-temperature tables, determine saturation temperature at observed suction pressure ($TEMP_p$).
3. Measure temperature of suction gas at thermal expansion valve remote bulb location ($TEMP_T$).
4. Subtract saturation temperature (read from tables in step 2) from temperature measured in step 3, the difference is the superheat of the suction gas.

APPLICATION AND OPERATION

The TRAE valve is currently replacing conventional TEV's on air conditioning and refrigeration systems with any combination of the following system operating conditions: 1) Widely varying evaporator loads; 2) Widely varying head pressures; 3) Widely varying pressure drop available across the thermostatic expansion valve and refrigerant distributor; or, 4) Fluctuating or extremely low liquid temps.

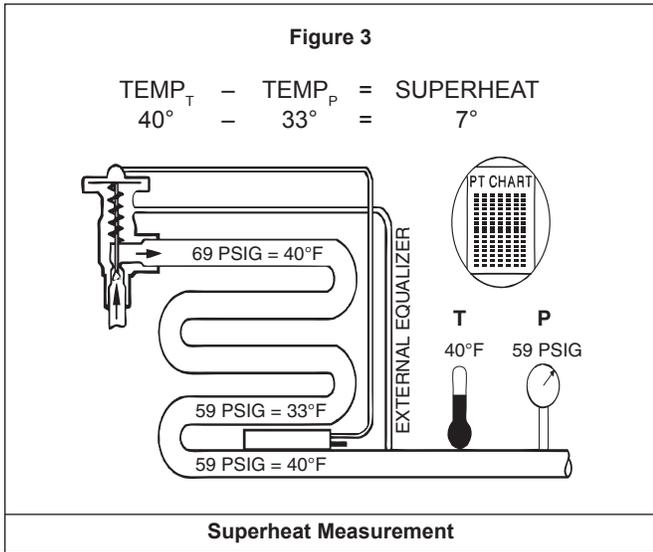
Severe conditions are those which drastically increase a conventional expansion valve's maximum capacity: high head pressures for example, also, low liquid temperatures that would be experienced on a system with mechanical subcoolers during summer operation. TRAE high system performance is possible because the large diaphragm allows the valve to operate with the valve pin controlling very close to the seat. This provides stable control at minimum changes in stroke, enabling a large port to handle small loads. Compared to a standard TEV, the TRAE's larger port will improve system pull-down.

Problems can occur with refrigeration systems during both high and low ambient conditions when the condensing temperature is allowed to follow the ambient. As the evaporator temperature remains reasonably constant, this results in extreme pressure drop changes across the valve. These pressure drop changes can result in a conventional valve not maintaining a constant superheat at the evaporator outlet. These superheat changes can result in the evaporator starving in low ambient conditions and flooding in the higher ambient, depending on the valve design. Another variable factor for this situation is how low the head pressure is allowed to decrease. This of course depends on whether heat reclaim is utilized for heating purposes, or if hot gas will be used for evaporator defrost.

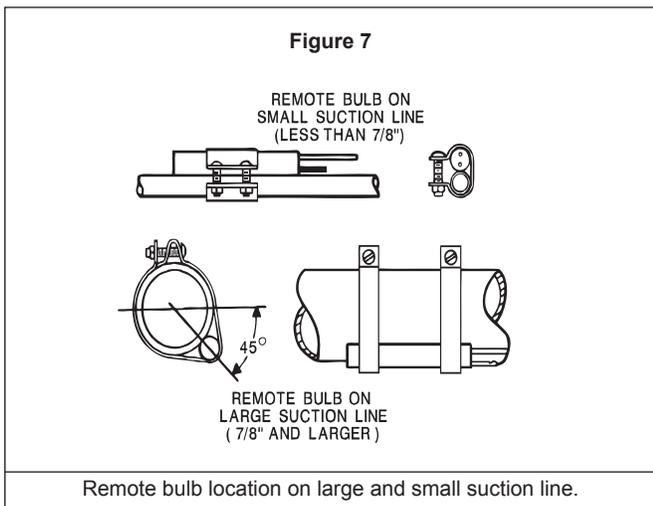
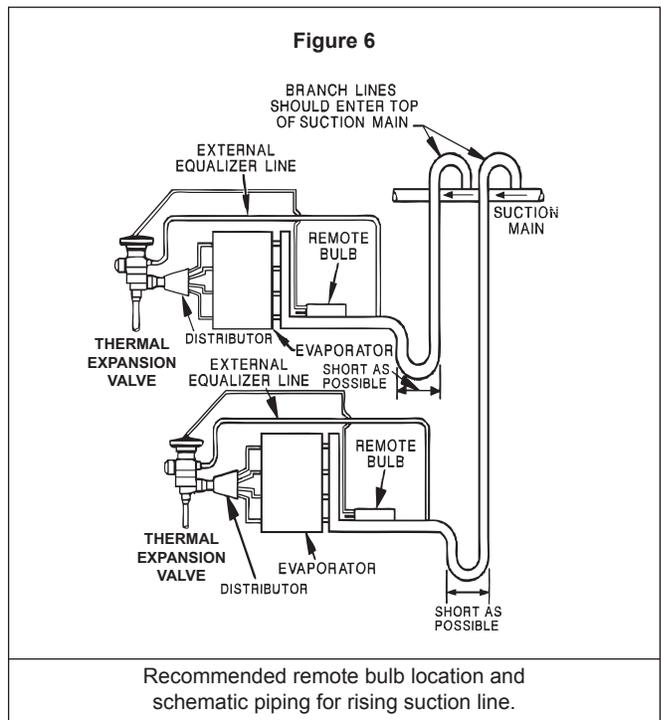
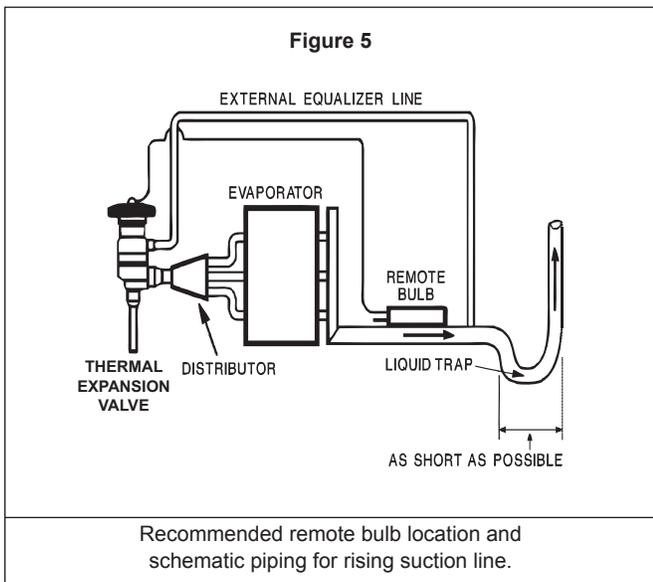
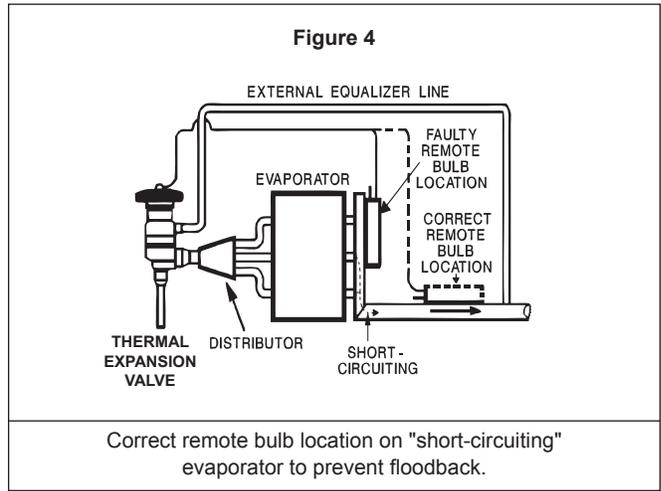
SUPERHEAT ADJUSTMENT

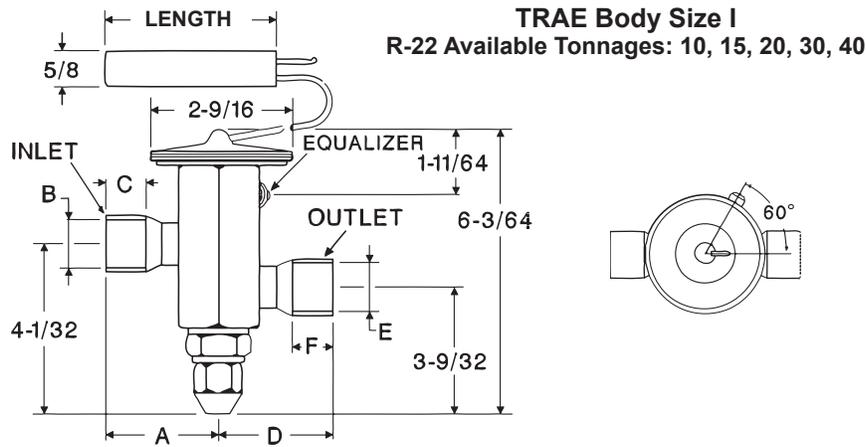
TXVs are factory *set* to a specific superheat - however, the superheat should be adjusted for the application. To adjust the valve to other superheat settings:

1. Remove the seal cap from bottom of valve.
2. Turn the adjustment screw clockwise to increase superheat and counterclockwise to decrease superheat. One complete 360° turn changes the superheat approximately 3-4°F, regardless of the refrigerant type. As much as 30 minutes may be required for the system to stabilize after the adjustment is made.
3. Replace and hand-tighten seal cap.

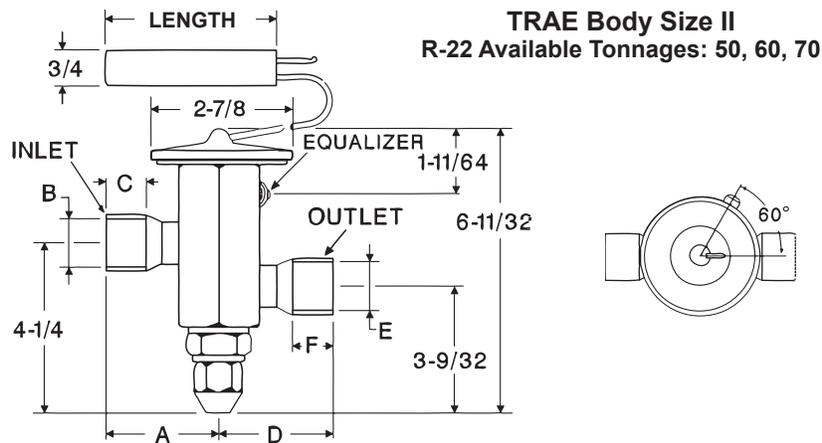


Figures 4-7 provide service hints for remote bulb location.





TRAE REMOTE BULB TABLE	
Remote Bulb Tubing Length	Length Dimensions
5 ft.	3-1/16
10 ft.	3-9/16
15, 20, 30 ft.	4-13/16
40, 50 ft.	6-3/16



TRAE REMOTE BULB TABLE	
Remote Bulb Tubing Length	Length Dimensions
5, 10, 15 ft.	4-7/8
20, 30 ft.	
40, 50 ft.	6-3/16

TRAE Rough-In Dimensional Table

TRAE VALVE TYPE	Nominal Sizes (ODF)		Inlet		Outlet	
	Inlet-B	Inlet-E	A	C	D	F
TRAE BODY SIZE I	5/8	7/8	1-21/32	17/32	1-31/32	3/4
		1-1/8			2-13/32	29/32
	7/8	7/8	1-31/32	3/4	1-31/32	3/4
		1-1/8			2-13/32	29/32
	1-1/8	1-3/8	2-13/32	29/32	2-19/32	31/32
		1-1/8			2-13/32	29/32
1-1/8	1-3/8	2-19/32	31/32	2-19/32	31/32	
	1-3/8	2-19/32	31/32	2-19/32	31/32	
TRAE BODY SIZE II	7/8	7/8	2-1/16	3/4	2-1/16	3/4
		1-1/8			2-1/2	29/32
		1-3/8			2-11/16	31/32
	1-1/8	1-1/8	2-1/2	29/32	2-1/2	29/32
		1-3/8			2-19/32	31/32
	1-3/8	1-3/8	2-11/16	31/32	2-19/32	31/32

EmersonClimate.com/FlowControls

Technical Support: 1-866-625-8416

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