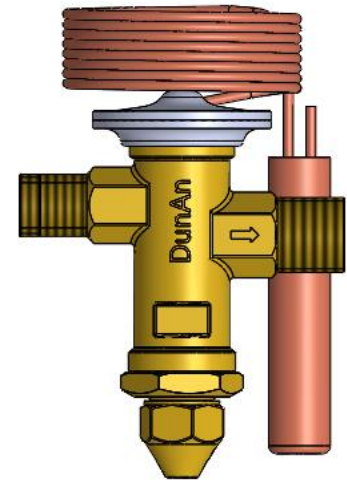


Thermostatic Expansion Valve

TSBE Series

Application

TSBE thermostatic expansion valves are used to adjust the supply of refrigerant in evaporator by controlling the superheat. The sensor bulb is placed at the outlet of the evaporator. TCE/TCBE thermostatic expansion valves are applicable for commercial refrigeration, transportation air conditioning system, heat pump, and water chillers.



Features

- Straightway design;
- Bleed function;
- Bi-Flow design;
- Adjustable superheat;
- Laser welding of power element, long lifetime of diaphragm;
- Available with MOP(MOP15°C);

Approvals

Declaration according to PED

Technical Data

Applicable Refrigerants: R134a, R404A, R507, R407C, and R410A

Max. Sensor Bulb Temperature: 100°C

Max. Valve Body Temperature: 110°C

Max. Operating Pressure: 4.6 MPa

Max. Test Pressure: 5.1 MPa

External Balance Connection: 1/4 in.

Capillary Lengths: 1500 mm

Identification



Refrigerant

Z: R407C L: R410A N: R134a

S: R404A/R507

K: R448A/R449A

Example

| | |
|-----------------------------|---------------------------------|
| TSBEN | = Type (N=R134a) |
| 3 TR | = Nominal Capacity in Tons |
| 10 kW | = Nominal Capacity in kW |
| R22/R407C | = Refrigerant |
| -25/+10°C | = Evaporating Temperature Range |
| MOP 15°C | = Max. Evaporating Pressure |
| BP15 | = Bleed 15% |
| 440031002000 | = Code Number |
| PS 46bar/MWP 667psig | = Max. Working Pressure |
| EF2300001 | = Date Marking |

MOP Options

| Refrigerant | Range N -40°C ~ +10°C | Range K -25°C ~ +10°C MOP 15°C |
|-------------|--------------------------|--------------------------------------|
| R404A/R507 | (Without MOP) | 8.3 bar |
| R407C | (Without MOP) | 6.6 bar |
| R134a | (Without MOP) | 3.8 bar |

Code numbers listed above refer to standard series. For other requirements, please contact DunAn

Nominal Capacity

| Model | Orifice No. | R134a | | R404A/R507 | | R407C | | R410A | | R32 | | R290 | |
|-------|-------------|-------|-----|------------|-----|-------|-----|-------|-----|-----|----|------|----|
| | | kW | TR | kW | TR | kW | TR | kW | TR | KW | TR | KW | TR |
| TSBE | 3.5 | 6 | 1.5 | 7 | 2 | 9 | 2.5 | 12 | 3.5 | 18 | 5 | 10 | 3 |
| | 4.5 | 8 | 2.5 | 9 | 2.5 | 13 | 3.5 | 16 | 4.5 | 24 | 7 | 14 | 4 |
| | 6.5 | 12 | 3.5 | 14 | 4 | 19 | 5 | 24 | 6.5 | 35 | 10 | 19 | 5 |
| | 9 | 17 | 4.5 | 18 | 5 | 25 | 7 | 32 | 9 | 47 | 13 | 25 | 7 |
| | 11 | 20 | 5.5 | 21 | 6 | 30 | 8.5 | 37 | 11 | 54 | 15 | 32 | 9 |
| | 13 | 24 | 7 | 26 | 7.5 | 36 | 10 | 45 | 13 | 68 | 19 | 36 | 10 |
| | 14 | 29 | 8 | 31 | 9 | 39 | 11 | 50 | 14 | 74 | 21 | 44 | 12 |
| | 15 | 29 | 8 | 31 | 9 | 42 | 12 | 54 | 15 | 81 | 23 | 44 | 12 |
| | 19 | 37 | 10 | 39 | 11 | 53 | 15 | 68 | 19 | 102 | 29 | 54 | 15 |
| | 23 | 44 | 12 | 45 | 13 | 62 | 18 | 79 | 23 | 120 | 34 | 63 | 18 |

The nominal capacity is based on:

1. Evaporating Temperature $T_e=4.4^\circ\text{C}$; 2. Liquid Temperature Before Valve $T_l=37^\circ\text{C}$;
3. Condensing Temperature $T_c=38^\circ\text{C}$; 4. Static Superheat $SS=4\text{K}$; 5. Opening Superheat $OS=4\text{K}$.

Thermostatic Expansion Valve

Ordering

R134a: Opening Superheat = 4K, Range N

| Model | Orifice No. | Connection SAE | Code No. |
|-------|-------------|-------------------------------------|--------------|
| | | Inlet x Outlet x Equalization [in.] | |
| TSBEN | 3.5 | 1/2 × 5/8 × 1/4MIO | 440080005200 |
| | 4.5 | 1/2 × 5/8 × 1/4MIO | 440080005300 |
| | 4.5 | 3/8 × 1/2 × 1/4 MIO | 440080005500 |
| | 4.5 | 1/2 × 5/8 × 1/4F | 440080004300 |
| | 4.5 | 3/8 × 1/2 × 1/4F | 440080004800 |
| | 6.5 | 3/8 × 1/2 × 1/4 MIO | 440080005600 |
| | 6.5 | 1/2 × 5/8 × 1/4F | 440080004400 |
| | 6.5 | 3/8 × 1/2 × 1/4F | 440080004900 |
| | 9 | 1/2 × 5/8 × 1/4F | 440080004300 |
| | 9 | 1/2 × 5/8 × 1/4MIO | 440080005400 |
| | 9 | 3/8 × 1/2 × 1/4F | 440080005000 |
| | 9 | 5/8 × 3/4 × 1/4MIO | 440080005800 |
| | 11 | 1/2 × 5/8 × 1/4MIO | 440080036300 |
| | 13 | 3/8 × 1/2 × 1/4F | 440080005100 |
| | 13 | 5/8 × 3/4 × 1/4MIO | 440080005900 |
| | 14 | 3/8 × 1/2 × 1/4 MIO | 440080036400 |
| | 15 | 5/8 × 3/4 × 1/4MIO | 440080006000 |
| | 19 | 5/8 × 3/4 × 1/4F | 440080006100 |
| | 19 | 5/8 × 3/4 × 1/4MIO | 440080004100 |
| | 23 | 5/8 × 3/4 × 1/4MIO | 440080006300 |

Code numbers listed above refer to standard series. For other requirements, please contact DunAn

Ordering

R134a: Opening Superheat = 4K, Range K

| Model | Orifice No. | Connection SAE | Code No. |
|-------|------------------|--|--------------|
| | | Inlet x Outlet x Equalization [in.] | |
| TSBEN | 4.5 | 3/8 × 1/2 × 1/4F | 440080006500 |
| | 4.5 | 3/8 × 1/2x1/4MIO | 440080007200 |
| | 4.5 | 1/2 × 5/8 × 1/4MIO | 440080007000 |
| | 6.5 | 3/8 × 1/2 × 1/4F | 440080006600 |
| | 6.5 | 1/2 × 5/8 × 1/4F | 440080006800 |
| | 6.5 | 1/2 × 5/8 × 1/4 MIO | 440080007400 |
| | 9 | 3/8 × 1/2 × 1/4F | 440080006700 |
| | 9 | 1/2 × 5/8 × 1/4F | 440080006900 |
| | 9 | 5/8 × 3/4 × 1/4F | 440080007700 |
| | 9 | 3/8 × 1/2x1/4MIO | 440080007300 |
| | 9 | 1/2 × 5/8 × 1/4MIO | 440080007100 |
| | 9 | 5/8 × 3/4 × 1/4MIO | 440080007500 |
| | 11 | 3/8 × 1/2x1/4MIO | 440080036500 |
| | 13 | 5/8 × 3/4 × 1/4F | 440080007800 |
| | 13 | 5/8 × 3/4 × 1/4MIO | 440080007600 |
| | 14 | 1/2 × 5/8 × 1/4F | 440080036600 |
| | 15 | 5/8 × 3/4 × 1/4F | 440080007900 |
| | 15 | 5/8 × 3/4 × 1/4MIO | 440080008200 |
| | 19 | 5/8 × 3/4 × 1/4F | 440080006200 |
| | 19 | 5/8 × 3/4 × 1/4MIO | 440080004200 |
| 23 | 5/8 × 3/4 × 1/4F | 440080008100 | |

Code numbers listed above refer to standard series. For other requirements, please contact DunAn

Thermostatic Expansion Valve

Ordering

R404A/R507: Opening Superheat = 4K, Range N

| Model | Orifice No. | Connection SAE | Code No. |
|-------|---------------------|-------------------------------------|--------------|
| | | Inlet x Outlet x Equalization [in.] | |
| TSBES | 3.5 | 1/2 × 5/8 × 1/4 MIO | 440080004500 |
| | 4.5 | 3/8 × 1/2 × 1/4 MIO | 440080008300 |
| | 4.5 | 3/8 × 1/2 × 1/4 MIO | 440080008600 |
| | 4.5 | 1/2 × 5/8 × 1/4 F | 440080008900 |
| | 4.5 | 3/8 × 1/2 × 1/4 F | 440080009100 |
| | 6.5 | 3/8 × 1/2 × 1/4 MIO | 440080008700 |
| | 6.5 | 1/2 × 5/8 × 1/4 F | 440080009000 |
| | 6.5 | 3/8 × 1/2 × 1/4 F | 440080009200 |
| | 9 | 1/2 × 5/8 × 1/4 MIO | 440080008500 |
| | 9 | 3/8 × 1/2 × 1/4 MIO | 440080008800 |
| | 9 | 3/8 × 1/2 × 1/4 F | 440080009300 |
| | 11 | 1/2 × 5/8 × 1/4 MIO | 440080036700 |
| | 13 | 3/8 × 1/2 × 1/4 F | 440080009400 |
| | 13 | 5/8 × 3/4 × 1/4 MO | 440080009600 |
| | 14 | 3/8 × 1/2 × 1/4 MIO | 440080036800 |
| | 15 | 5/8 × 3/4 × 1/4 MIO | 440080009700 |
| | 19 | 5/8 × 3/4 × 1/4 F | 440080010000 |
| | 19 | 5/8 × 3/4 × 1/4 MIO | 440080009800 |
| 23 | 5/8 × 3/4 × 1/4 MIO | 440080009900 | |

Code numbers listed above refer to standard series. For other requirements, please contact DunAn

Ordering

R404A/R507: Opening Superheat = 4K, Range K

| Model | Orifice No. | Connection SAE | Code No. |
|-------|------------------|--|--------------|
| | | Inlet x Outlet x Equalization [in.] | |
| TSBES | 4.5 | 3/8 × 1/2 × 1/4F | 440080010100 |
| | 4.5 | 3/8 × 1/2x1/4MIO | 440080010800 |
| | 4.5 | 1/2 × 5/8 × 1/4MIO | 440080010600 |
| | 6.5 | 3/8 × 1/2 × 1/4F | 440080010200 |
| | 6.5 | 1/2 × 5/8 × 1/4F | 440080010400 |
| | 6.5 | 1/2 × 5/8 × 1/4 MIO | 440080011000 |
| | 9 | 3/8 × 1/2 × 1/4F | 440080010300 |
| | 9 | 1/2 × 5/8 × 1/4F | 440080010500 |
| | 9 | 5/8 × 3/4 × 1/4F | 440080011800 |
| | 9 | 3/8 × 1/2x1/4MIO | 440080010900 |
| | 9 | 1/2 × 5/8 × 1/4MIO | 440080010700 |
| | 9 | 5/8 × 3/4 × 1/4MIO | 440080011600 |
| | 11 | 3/8 × 1/2x1/4MIO | 440080036900 |
| | 13 | 5/8 × 3/4 × 1/4F | 440080011900 |
| | 13 | 5/8 × 3/4 × 1/4MIO | 440080011700 |
| | 14 | 1/2 × 5/8 × 1/4F | 440080037000 |
| | 15 | 5/8 × 3/4 × 1/4F | 440080011300 |
| | 15 | 5/8 × 3/4 × 1/4MIO | 440080011100 |
| | 19 | 5/8 × 3/4 × 1/4F | 440080011400 |
| | 19 | 5/8 × 3/4 × 1/4MIO | 440080011200 |
| 23 | 5/8 × 3/4 × 1/4F | 440080011500 | |

Code numbers listed above refer to standard series. For other requirements, please contact DunAn

Thermostatic Expansion Valve

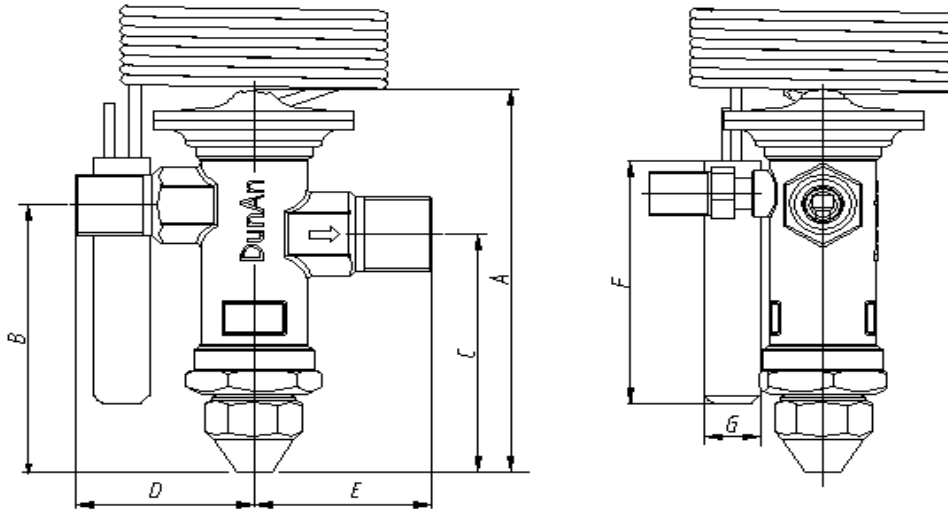
Ordering

R407C: Opening Superheat = 4K, Range N

| Model | Orifice No. | Connection SAE | Code No. |
|-------|-------------|-------------------------------------|--------------|
| | | Inlet x Outlet x Equalization [in.] | |
| TSBEZ | 4.5 | 1/2 x 5/8 x 1/4MIO | 440080035900 |
| | 6.5 | 1/2 x 5/8 x 1/4MIO | 440080036000 |
| | 9 | 5/8 x 3/4 x 1/4MIO | 440080036100 |
| | 13 | 5/8 x 3/4 x 1/4MIO | 440080036200 |

Code numbers listed above refer to standard series. For other requirements, please contact DunAn

Dimensions



| Model | Connection Inlet x Outlet SAE | Capillary Lengths | A | B | C | D | E | F | G | Weight |
|-------|-------------------------------|-------------------|-----|------|----|----|------|----|-------|--------|
| | in. | m | mm | mm | mm | mm | mm | mm | mm | Kg |
| TSBE | 3/8x1/2 | 1.5 | 97 | 67.5 | 60 | 40 | 40 | 62 | Φ12.7 | 0.48 |
| | 1/2x5/8 | 1.5 | | | | | | | | |
| | 5/8x3/4 | 1.5 | 107 | 74 | 65 | 40 | 44.5 | 75 | Φ19 | 0.62 |