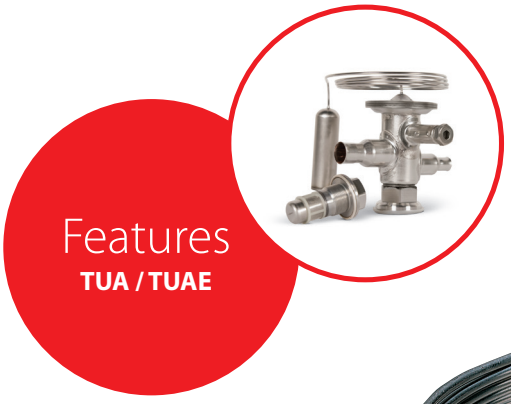
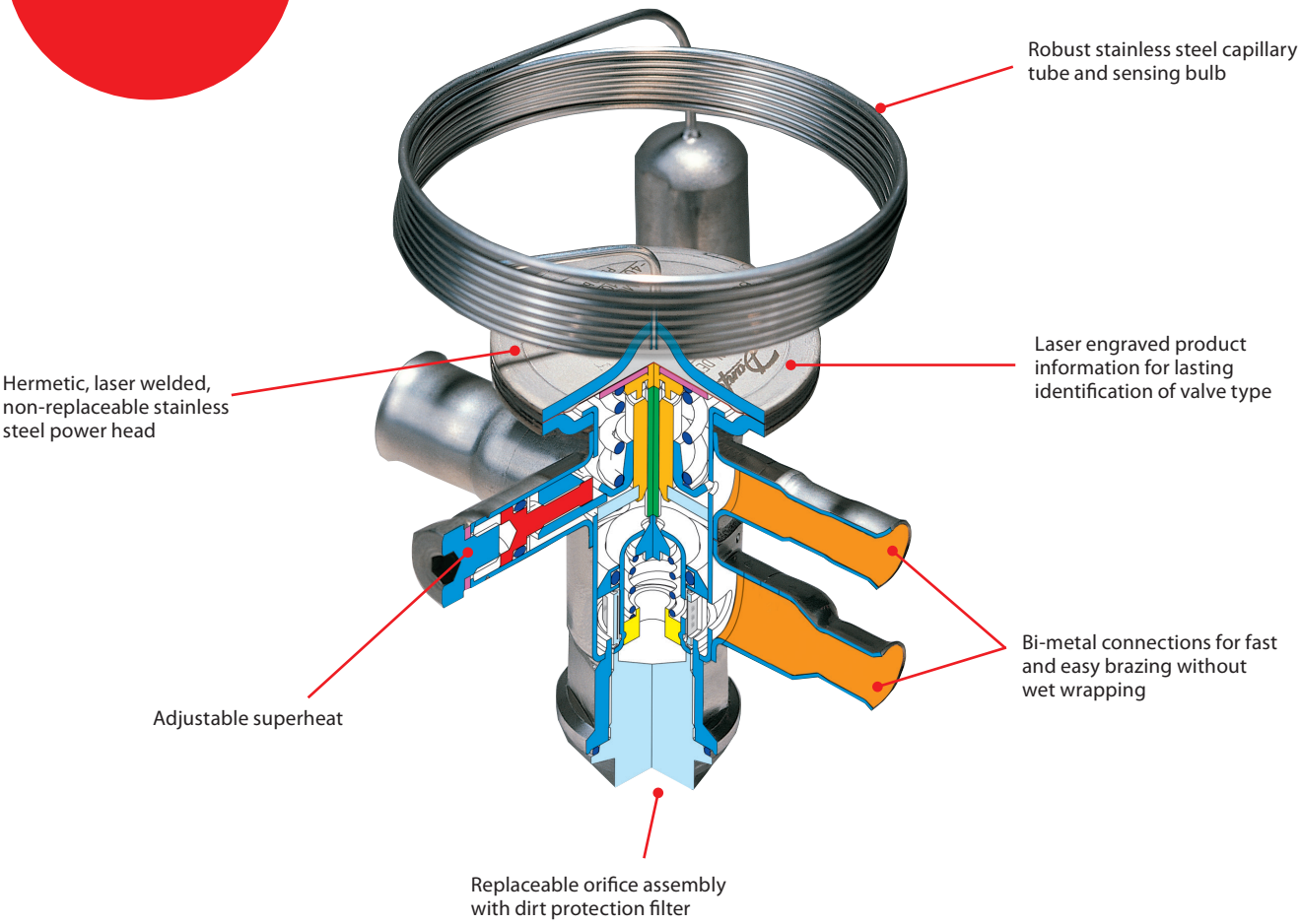
# TUA / TUAE - Thermostatic Expansion Valves

Danfoss TUA/TUAE stainless steel thermostatic expansion valves feature solder inlet and outlet connections. By pairing one valve body with one of ten replaceable orifices, a contractor can satisfy applications from –40 °F to + 50 °F and up to 4 ½ tons capacity (see capacity chart for specifics).




## Facts

Applications:

- Traditional refrigeration
- Self-contained refrigerators
- Transport refrigeration
- Supermarket refrigeration

- Temperature range: –40 °F to +50 °F
- Capacity range: 1/30 to 4 ½ tons (varies by refrigerant)
- Refrigerants: R-22, R-407C, R-134a, R-404A
- Functional valve consists of valve body and orifice

# Product Selection

## 1. Select Valve Body

| Equalization | R-22 | R-407C | R-404A | R-134a |
|---|---|---|---|---|
| Internal | 068U2235 | | 068U2285 | 068U2205 |
| External | 068U2237 | | 068U2287 | 068U2207 |

All valves above have ⅜ in. × ½ in. solder ODF connections and are designed for evaporator temperatures –40 °F to +50 °F (N charge). Other variations available, please contact your local Danfoss authorized wholesaler.

## 2. Select Orifice

TUA/TUAE valve capacities are based on the installed orifice.
To select the correct size, use one of the two methods below:

A. System characteristics: Select the orifice using appropriate refrigerant, evaporator temperature, and system capacity.
OR
B. Nominal capacity of the installed valve: Use the nominal capacity of the originally installed valve and match with the nominal capacity in chart (3rd column from left).

# Technical data and ordering

## TUA and TUAE (IF EXACT CAPACITY CANNOT BE FOUND, USE NEXT LARGER ORIFICE)

| R-22 / R-407C | | | Evaporator temperature (°F) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Orifice size | Danfoss Code No. | Nominal capacity of installed valve[1] (tons) | –40 | –30 | –20 | –10 | 0 | 10 | 20 | 30 | 40 | 50 |
| | | | Rated capacity[2] (tons) | | | | | | | | | |
| 0 | 068U1030 | 1/6 | 1/15 | 1/15 | 1/15 | 1/10 | 1/8 | 1/8 | 1/6 | 1/6 | 1/6 | 1/5 |
| 1 | 068U1031 | 1/5 | 1/10 | 1/8 | 1/8 | 1/6 | 1/6 | 1/5 | 1/5 | 1/5 | 1/4 | 1/4 |
| 2 | 068U1032 | 1/4 | 1/10 | 1/8 | 1/8 | 1/6 | 1/5 | 1/4 | 1/4 | 1/4 | 1/3 | 1/3 |
| 3 | 068U1033 | 1/3 | 1/8 | 1/6 | 1/5 | 1/4 | 1/4 | 1/3 | 1/3 | 1/3 | 1/3 | 1/3 |
| 4 | 068U1034 | 1/2 | 1/4 | 1/4 | 1/4 | 1/3 | 1/3 | 1/2 | 1/2 | 1/2 | 3/4 | 3/4 |
| 5 | 068U1035 | 3/4 | 1/3 | 1/3 | 1/3 | 1/2 | 1/2 | 3/4 | 3/4 | 3/4 | 1 | 1 |
| 6 | 068U1036 | 1 1/2 | 1/2 | 1/2 | 1/2 | 3/4 | 3/4 | 1 | 1 1/4 | 1 1/3 | 1 1/2 | 1 1/2 |
| 7 | 068U1037 | 2 | 1/2 | 3/4 | 3/4 | 1 | 1 | 1 1/3 | 1 1/2 | 1 3/4 | 2 | 2 |
| 8 | 068U1038 | 2 3/4 | 1 | 1 | 1 1/3 | 1 1/2 | 1 3/4 | 2 | 2 1/3 | 2 1/2 | 3 | 3 |
| 9 | 068U1039 | 4 | 1 1/3 | 1 1/2 | 1 3/4 | 2 | 2 1/2 | 2 3/4 | 3 1/4 | 3 1/2 | 4 | 4 1/2 |

| R-404A | | | Evaporator temperature (°F) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Orifice size | Danfoss Code No. | Nominal capacity of installed valve[1] (tons) | –40 | –30 | –20 | –10 | 0 | 10 | 20 | 30 | 40 | 50 |
| | | | Rated capacity[2] (tons) | | | | | | | | | |
| 0 | 068U1030 | 1/8 | 1/20 | 1/20 | 1/15 | 1/15 | 1/10 | 1/10 | 1/8 | 1/8 | 1/8 | 1/8 |
| 1 | 068U1031 | 1/5 | 1/15 | 1/15 | 1/10 | 1/8 | 1/8 | 1/6 | 1/6 | 1/5 | 1/5 | 1/5 |
| 2 | 068U1032 | 1/4 | 1/15 | 1/15 | 1/10 | 1/8 | 1/6 | 1/5 | 1/5 | 1/4 | 1/4 | 1/4 |
| 3 | 068U1033 | 1/3 | 1/10 | 1/8 | 1/8 | 1/6 | 1/5 | 1/4 | 1/4 | 1/3 | 1/3 | 1/3 |
| 4 | 068U1034 | 1/2 | 1/6 | 1/5 | 1/4 | 1/4 | 1/3 | 1/3 | 1/2 | 1/2 | 1/2 | 1/2 |
| 5 | 068U1035 | 3/4 | 1/5 | 1/4 | 1/3 | 1/3 | 1/2 | 1/2 | 1/2 | 3/4 | 3/4 | 3/4 |
| 6 | 068U1036 | 1 1/4 | 1/3 | 1/3 | 1/2 | 1/2 | 3/4 | 3/4 | 1 | 1 | 1 | 1 1/3 |
| 7 | 068U1037 | 1 1/2 | 1/3 | 1/2 | 1/2 | 3/4 | 1 | 1 | 1 1/3 | 1 1/2 | 1 1/2 | 1 3/4 |
| 8 | 068U1038 | 2 1/3 | 1/2 | 3/4 | 1 | 1 | 1 1/3 | 1 1/2 | 2 | 2 | 2 1/3 | 2 1/2 |
| 9 | 068U1039 | 3 1/3 | 3/4 | 1 | 1 1/3 | 1 1/2 | 2 | 2 1/4 | 2 1/2 | 3 | 3 1/2 | 3 3/4 |

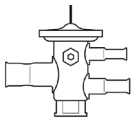
| R-134a | | | Evaporator temperature (°F) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Orifice size | Danfoss Code No. | Nominal capacity of installed valve[1] (tons) | –40 | –30 | –20 | –10 | 0 | 10 | 20 | 30 | 40 | 50 |
| | | | Rated capacity[2] (tons) | | | | | | | | | |
| 0 | 068U1030 | 1/8 | 1/30 | 1/20 | 1/20 | 1/20 | 1/15 | 1/15 | 1/10 | 1/10 | 1/8 | 1/8 |
| 1 | 068U1031 | 1/6 | 1/20 | 1/15 | 1/15 | 1/10 | 1/10 | 1/8 | 1/8 | 1/6 | 1/6 | 1/5 |
| 2 | 068U1032 | 1/5 | 1/15 | 1/15 | 1/15 | 1/10 | 1/8 | 1/6 | 1/6 | 1/5 | 1/5 | 1/5 |
| 3 | 068U1033 | 1/4 | 1/15 | 1/10 | 1/8 | 1/8 | 1/6 | 1/5 | 1/5 | 1/4 | 1/4 | 1/4 |
| 4 | 068U1034 | 1/3 | 1/8 | 1/6 | 1/5 | 1/5 | 1/4 | 1/4 | 1/3 | 1/3 | 1/3 | 1/2 |
| 5 | 068U1035 | 1/2 | 1/5 | 1/5 | 1/4 | 1/4 | 1/3 | 1/3 | 1/2 | 1/2 | 1/2 | 1/2 |
| 6 | 068U1036 | 3/4 | 1/4 | 1/4 | 1/3 | 1/3 | 1/2 | 1/2 | 3/4 | 3/4 | 1 | 1 |
| 7 | 068U1037 | 1 1/4 | 1/3 | 1/3 | 1/2 | 1/2 | 3/4 | 3/4 | 1 | 1 | 1 1/4 | 1 1/2 |
| 8 | 068U1038 | 1 3/4 | 1/2 | 1/2 | 3/4 | 3/4 | 1 | 1 1/4 | 1 1/2 | 1 3/4 | 2 | 2 |
| 9 | 068U1039 | 2 1/2 | 3/4 | 1 | 1 | 1 1/3 | 1 1/2 | 1 3/4 | 2 | 2 1/3 | 2 3/4 | 3 |

All capacity data is in accordance to ARI 750-2007 except where noted.
[1] Nominal capacity based on condensing temperature of 100 °F, a vapor free liquid temperature of 98 °F ahead of the expansion valve and an evaporator temperature of 40 °F.
[2] Capacity based on condensing temperature of 95 °F and a vapor free liquid temperature of 85 °F ahead of the expansion valve.

# Selection and Installation Instructions

**1. Select Valve Body**

Select the valve body based on refrigerant and need for internal or external equalization using the table on the previous page under "Select Valve Body."



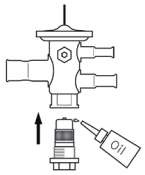
**2. Select Orifice**

1. Select one of ten orifices using the "Select Orifice" section on the previous page.
2. Prior to installing into system, verify that only mesh portions of the screen cover the orifice inlet.

**3. Assemble Valve**

1. Place one drop of refrigerant oil between the screen cage and the pushpin.
2. Verify that the metal gasket is seated on the base of the orifice.
3. Tighten orifice into valve (specification is 26–30 ft.-lbs.). In addition to eliminating leaks, proper torquing insures proper superheat control.

► Replace the metal washer/gasket that is mounted at the base of the orifice every time you change the orifice assembly or remove it from the valve body.




**4. Braze Valve into System**

1. Clean and insert copper tubing into appropriate connection on valve.
2. Direct torch at copper tubing until it begins to color (10–15 seconds).
3. Briefly direct torch on valve connection (2–5 seconds).
4. Apply brazing alloy until it flows.

Do not try to fill the ridge. Attempts to do so may clog the connector.

► Sweat connections using any common brazing alloy (minimum 5% silver, recommended 15% silver). As internal connector surface is copper, connections are copper to copper, and there is no need for use of high content silver solder or flux.

► *NO WET WRAP REQUIRED*

5. Secure sensing bulb with enclosed bulb strap to suction line. Bulb should be located between 1:00 and 4:00 on the tube, and the strap should be tight enough that no bulb movement is possible.
6. Wrap included insulation tape beginning one inch before the bulb and overlapping each wrap, finishing one inch beyond the bulb on the other end.

**5. Adjust Superheat**

1. Remove the cap with a 5⁄32 inch hex key.
2. Make superheat adjustments ¼ turn at a time (¼ turn ≈ 1 °F).
   - Turning clockwise increases superheat.
   - Turning counter-clockwise decreases superheat.
3. Reinstall the cap.

► Expansion valves on low temperature systems may require minor adjustment as the factory setting is for medium temperature systems.

| Easy to carry kits for truck stock | |
|---|---|
| All TUA/TUAE valve bodies and orifice featured on the next page and a hex key for superheat adjustment. | **068U7000** |
| Both TUA/TUAE valve bodies and orifices and T2/TE2 and orifices plus gaskets for TUA/TUAE and a hex key for superheat adjustment. | **068U7001** |

Kits are plastic cases with foam inserts, all valves and orifices, and instructions for selection and installation of the valves. Empty kits and foam available available upon request.

## Spare Parts and Accessories

| Description | Danfoss Code No. |
|---|---|
| Bulb strap | **068U3507** |
| Metal Gasket (24 pcs) | **068U0015** |
| Filter for orifices 0–4 (clear, 24 pcs) | **068U1706** |
| Filter for orifices 5–9 (blue, 24 pcs) | **068U0016** |