ENGINEERING
TOMORROW

Data sheet

# Crankcase pressure regulator
## Type KVL

Crankcase pressure regulator type KVL is fitted in the suction line ahead of the compressor.

KVL protects the compressor motor against overload during start-up after long standstill periods or after defrost periods (high pressure in evaporator).

**Features**

- Accurate, adjustable pressure regulation
- Wide capacity and operating ranges
- Pulsation damping design
- Stainless steel bellows
- Compact angle design for easy installation in any position
- "Hermetic" brazed construction
- Available in a wide size range of flare and ODF solder types
- KVL 12 – KVL 22: may be used in the following EX range: Category 3 (Zone 2)

## Approvals

UL LISTED, file SA7200
EAN

## Technical data

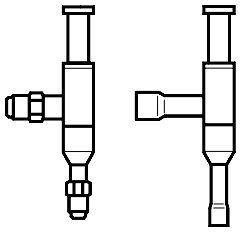
| | |
|---|---|
| **Refrigerants** | R22, R1270*, R134a, R290*, R404A, R407A, R407C, R407F, R448A, R449A, R450A, R452A, R507A, R513A, R600*, R600a*<br>* KVL 12 – KVL 22 only |
| **Regulating range** | 0.2 – 6 bar |
| | Factory setting = 2 bar |
| **Maximum working pressure** | PS/MWP = 18 bar |
| **Maximum test pressure** | Pe = 19.8 bar |
| **Medium temperature range** | -60 – 130 °C |
| **Maximum P-band** | KVL 12 – 22: 2 bar |
| | KVL 28 – 35: 1.5 bar |
| **$K_v$-value[1]) with maximum P-band** | KVL 12 – 22: 3.2 $m^3$ / h |
| | KVL 28 – 35: 8.0 $m^3$ / h |

[1]) The $K_v$ value is the flow of water in [$m^3$ / h] at a pressure drop across valve of 1 bar, ρ = 1000 kg / $m^3$.

This product (KVL 12 – KVL 22) is evaluated for R290, R600, R600a, R1270 by ignition source assessment in accordance with standard EN13463-1.

For complete list of approved refrigerants, visit www.products.danfoss.com and search for individual code numbers, where refrigerants are listed as part of technical data.

## Ordering



| Type | Rated capacity [1]) [kW] | | | | Flare connection [2]) | | Code no. | Solder ODF | | Code no. |
|---|---|---|---|---|---|---|---|---|---|---|
| | R22 | R134a | R404A/ R507 | R407C | [in] | [mm] | | [in] | [mm] | |
| KVL 12 | 7.1 | 5.3 | 6.3 | 6.4 | 1/2 | 12 | **034L0041** | 1/2 | – | **034L0043** |
| | 7.1 | 5.3 | 6.3 | 6.4 | – | – | – | – | 12 | **034L0048** |
| KVL 15 | 7.1 | 5.3 | 6.3 | 6.5 | 5/8 | 16 | **034L0042** | 5/8 | 16 | **034L0049** |
| KVL 22 | 7.1 | 5.3 | 6.3 | 6.5 | – | – | – | 7/8 | 22 | **034L0045** |
| KVL 28 | 17.8 | 13.2 | 15.9 | 16.4 | – | – | – | 1 1/8 | – | **034L0046** |
| | 17.8 | 13.2 | 15.9 | 16.4 | – | – | – | – | 28 | **034L0051** |
| KVL 35 | 17.8 | 13.2 | 15.9 | 16.4 | – | – | – | 1 3/8 | 35 | **034L0052** |

[1]) Rated capacity is the regulator capacity at:
suction temperature $t_s$ = -10 °C
condensing temperature $t_c$ = 25 °C
pressure drop in regulator Δp = 0.2 bar
To select the product for other conditions or refrigerants, use Danfoss Coolselector®2.

[2]) KVL supplied without flare nuts. Separate flare nuts can be supplied:
1/2 in / 12 mm, code no. 011L1103
5/8 in / 16 mm, code no. 011L1167

The connection dimensions chosen must not be too small, as gas velocities in excess of 40 m / s at the inlet of the regulator can result in flow noise.

## REACH requirements

All Danfoss products fulfill the requirements in REACH.
One of the obligations in REACH is to inform customers about presence of Candidate list substances if any, we hereby inform you about one substance on the candidate list: an O-ring used in this product contains Diisopentylphthalat (CAS no: 605-50-5) in a concentration above 0.1% w/w.

## Capacity

### Max. regulator capacity $Q_e$ [1])

**R22**

| Type | Pressure drop in regulator Δp | Maximum suction pressure PS | Capacity $Q_e$ in [kW] at suction temperature $t_s$ after the regulator [°C] | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | [bar] | [bar] | -35 | -30 | -25 | -20 | -15 | -10 | -5 | 0 | 5 | 10 | 15 |
| KVL 12<br>KVL 15<br>KVL 22 | 0.1 | 1 | 1.9 | 1.2 | – | – | – | – | – | – | – | – | – |
| | 0.1 | 2 | 3.0 | 3.3 | 3.1 | 2.1 | 0.2 | – | – | – | – | – | – |
| | 0.1 | 3 | 3.0 | 3.3 | 3.7 | 4.1 | 4.0 | 2.2 | – | – | – | – | – |
| | 0.1 | 4 | 3.0 | 3.3 | 3.7 | 4.1 | 4.6 | 5.0 | 3.9 | 0.1 | – | – | – |
| | 0.1 | 5 | 3.0 | 3.3 | 3.7 | 4.1 | 4.6 | 5.0 | 5.5 | 5.2 | 1.0 | – | – |
| | 0.1 | 6 | 3.0 | 3.3 | 3.7 | 4.1 | 4.6 | 5.0 | 5.5 | 6.0 | 6.2 | 1.3 | — |
| | 0.2 | 1 | 2.6 | 1.7 | – | – | – | – | – | – | – | – | – |
| | 0.2 | 2 | 4.2 | 4.7 | 4.4 | 3.0 | 0.2 | – | – | – | – | – | – |
| | 0.2 | 3 | 4.2 | 4.7 | 5.3 | 5.9 | 5.6 | 3.1 | – | – | – | – | – |
| | 0.2 | 4 | 4.2 | 4.7 | 5.3 | 5.9 | 6.5 | 7.1 | 5.5 | 0.1 | – | – | – |
| | 0.2 | 5 | 4.2 | 4.7 | 5.3 | 5.9 | 6.5 | 7.1 | 7.8 | 7.3 | – | – | – |
| | 0.2 | 6 | 4.2 | 4.7 | 5.3 | 5.9 | 6.5 | 7.1 | 7.8 | 8.5 | 8.7 | 1.9 | – |
| | 0.3 | 1 | 3.2 | 2.0 | – | – | – | – | – | – | – | – | – |
| | 0.3 | 2 | 5.2 | 5.8 | 5.4 | 3.7 | 0.3 | – | – | – | – | – | – |
| | 0.3 | 3 | 5.2 | 5.8 | 6.5 | 7.2 | 6.9 | 3.8 | – | – | – | – | – |
| | 0.3 | 4 | 5.2 | 5.8 | 6.5 | 7.2 | 8.0 | 8.8 | 6.7 | 0.2 | – | – | – |
| | 0.3 | 5 | 5.2 | 5.8 | 6.5 | 7.2 | 8.0 | 8.8 | 9.6 | 9.0 | 1.7 | – | – |
| | 0.3 | 6 | 5.2 | 5.8 | 6.5 | 7.2 | 8.0 | 8.8 | 9.6 | 10.5 | 10.7 | 2.3 | – |
| KVL 28<br>KVL 35 | 0.1 | 1 | 4.1 | 2.6 | – | – | – | – | – | – | – | – | – |
| | 0.1 | 2 | 7.4 | 7.9 | 7.0 | 4.6 | 0.4 | – | – | – | – | – | – |
| | 0.1 | 3 | 7.4 | 8.3 | 9.3 | 10.3 | 8.9 | 4.7 | – | – | – | – | – |
| | 0.1 | 4 | 7.4 | 8.3 | 9.3 | 10.3 | 11.4 | 12.3 | 8.5 | 0.2 | – | – | – |
| | 0.1 | 5 | 7.4 | 8.3 | 9.3 | 10.3 | 11.4 | 12.6 | 13.8 | 11.6 | 2.2 | – | – |
| | 0.1 | 6 | 7.4 | 8.3 | 9.3 | 10.3 | 11.4 | 12.6 | 13.8 | 15.1 | 13.9 | 2.8 | — |
| | 0.2 | 1 | 5.8 | 3.6 | – | – | – | – | – | – | – | – | – |
| | 0.2 | 2 | 10.6 | 11.2 | 9.8 | 6.5 | 0.5 | – | – | – | – | – | – |
| | 0.2 | 3 | 10.6 | 11.8 | 13.2 | 14.7 | 12.5 | 6.6 | – | – | – | – | – |
| | 0.2 | 4 | 10.6 | 11.8 | 13.2 | 14.7 | 16.2 | 17.5 | 12.0 | 0.3 | – | – | – |
| | 0.2 | 5 | 10.6 | 11.8 | 13.2 | 14.7 | 16.2 | 17.8 | 19.6 | 16.4 | 3.1 | – | – |
| | 0.2 | 6 | 10.6 | 11.8 | 13.2 | 14.7 | 16.2 | 17.8 | 19.6 | 21.4 | 19.6 | 4.0 | – |
| | 0.3 | 1 | 7.0 | 4.4 | – | – | – | – | – | – | – | – | – |
| | 0.3 | 2 | 13.0 | 13.8 | 12.1 | 8.0 | 0.6 | – | – | – | – | – | – |
| | 0.3 | 3 | 13.0 | 14.6 | 16.3 | 18.0 | 15.4 | 8.1 | – | – | – | – | – |
| | 0.3 | 4 | 13.0 | 14.6 | 16.3 | 18.0 | 19.9 | 21.5 | 14.7 | 0.3 | – | – | – |
| | 0.3 | 5 | 13.0 | 14.6 | 16.3 | 18.0 | 19.9 | 21.9 | 24.1 | 20.0 | 3.7 | – | – |
| | 0.3 | 6 | 13.0 | 14.6 | 16.3 | 18.0 | 19.9 | 21.9 | 24.1 | 26.3 | 24.1 | 4.9 | – |

[1]) The values in the capacity tables refer to the evaporator capacity and are based on liquid temperature $t_l$ = 25 °C

### Correction factors for liquid temperature $t_l$

| $t_l$ [°C] | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 |
|---|---|---|---|---|---|---|---|---|---|
| R22 | 0.90 | 0.93 | 0.96 | 1.0 | 1.05 | 1.10 | 1.13 | 1.18 | 1.24 |

Plant capacity × correction factor = the values in the table

## Capacity (continued)

### Max. regulator capacity $Q_e$ [1])

**R134a**

| Type | Pressure drop in regulator Δp | Maximum suction pressure PS | Capacity $Q_e$ in [kW] at suction temperature $t_s$ after the regulator [°C] | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | [bar] | [bar] | -30 | -25 | -20 | -15 | -10 | -5 | 0 | 5 | 10 | 15 | 20 |
| KVL 12<br>KVL 15<br>KVL 22 | 0.1 | 1 | – | – | 1.8 | 1.2 | – | – | – | – | – | – | – |
| | 0.1 | 2 | – | – | 2.9 | 3.3 | 3.1 | 2.2 | 0.3 | – | – | – | – |
| | 0.1 | 3 | – | – | 2.9 | 3.3 | 3.7 | 4.1 | 4.1 | 2.4 | – | – | – |
| | 0.1 | 4 | – | – | 2.9 | 3.3 | 3.7 | 4.1 | 4.6 | 5.1 | 4.2 | 0.7 | – |
| | 0.1 | 5 | – | – | 2.9 | 3.3 | 3.7 | 4.1 | 4.6 | 5.1 | 5.6 | 5.6 | 1.8 |
| | 0.1 | 6 | – | – | 2.9 | 3.3 | 3.7 | 4.2 | 4.6 | 5.1 | 5.6 | 6.2 | 6.7 |
| | 0.2 | 1 | – | – | 2.6 | 1.6 | – | – | – | – | – | – | – |
| | 0.2 | 2 | – | – | 4.2 | 4.7 | 4.4 | 3.1 | 0.4 | – | – | – | – |
| | 0.2 | 3 | – | – | 4.2 | 4.7 | 5.3 | 5.9 | 5.8 | 3.4 | – | – | – |
| | 0.2 | 4 | – | – | 4.2 | 4.7 | 5.3 | 5.9 | 6.5 | 7.2 | 5.9 | 0.9 | – |
| | 0.2 | 5 | – | – | 4.2 | 4.7 | 5.3 | 5.9 | 6.5 | 7.2 | 7.9 | 8.0 | 2.6 |
| | 0.2 | 6 | – | – | 4.2 | 4.7 | 5.3 | 5.9 | 6.5 | 7.2 | 7.9 | 9.5 | 8.7 |
| | 0.3 | 1 | – | – | 3.2 | 2.0 | – | – | – | – | – | – | – |
| | 0.3 | 2 | – | – | 5.2 | 5.8 | 5.5 | 3.8 | 0.5 | – | – | – | – |
| | 0.3 | 3 | – | – | 5.2 | 5.8 | 6.5 | 7.2 | 7.1 | 4.2 | – | – | – |
| | 0.3 | 4 | – | – | 5.2 | 5.8 | 6.5 | 7.2 | 8.0 | 8.9 | 7.3 | 1.1 | – |
| | 0.3 | 5 | – | – | 5.2 | 5.8 | 6.5 | 7.2 | 8.0 | 8.9 | 9.8 | 9.8 | 3.2 |
| | 0.3 | 6 | – | – | 5.8 | 6.5 | 7.2 | 8.0 | 8.9 | 9.8 | 10.7 | 10.7 | 11.7 |
| KVL 28<br>KVL 35 | 0.1 | 1 | – | – | 4.0 | 2.5 | – | – | – | – | – | – | – |
| | 0.1 | 2 | – | – | 7.3 | 7.8 | 6.9 | 4.8 | 0.6 | – | – | – | – |
| | 0.1 | 3 | – | – | 7.3 | 8.2 | 9.3 | 10.3 | 9.1 | 5.2 | – | – | – |
| | 0.1 | 4 | – | – | 7.3 | 8.2 | 9.3 | 10.3 | 11.5 | 12.7 | 9.2 | 1.4 | – |
| | 0.1 | 5 | – | – | 7.3 | 8.2 | 9.3 | 10.3 | 11.5 | 12.7 | 14.0 | 12.6 | 3.9 |
| | 0.1 | 6 | – | – | 7.3 | 8.2 | 9.3 | 10.3 | 11.5 | 12.7 | 14.0 | 15.4 | 15.3 |
| | 0.2 | 1 | – | – | 5.6 | 3.5 | – | – | – | – | – | – | – |
| | 0.2 | 2 | – | – | 10.5 | 11.1 | 9.8 | 6.7 | 0.9 | – | – | – | – |
| | 0.2 | 3 | – | – | 10.5 | 11.8 | 13.2 | 14.7 | 12.9 | 7.3 | – | – | – |
| | 0.2 | 4 | – | – | 10.5 | 11.8 | 13.2 | 14.7 | 16.3 | 18.1 | 13.1 | 2.0 | — |
| | 0.2 | 5 | – | – | 10.5 | 11.8 | 13.2 | 14.7 | 16.3 | 18.1 | 19.9 | 17.8 | 5.6 |
| | 0.2 | 6 | – | – | 10.5 | 11.8 | 13.2 | 14.7 | 16.3 | 18.1 | 19.9 | 21.9 | 21.7 |
| | 0.3 | 1 | – | – | 6.9 | 4.3 | – | – | – | – | – | – | – |
| | 0.3 | 2 | – | – | 12.9 | 13.7 | 12.1 | 8.2 | 1.1 | – | – | – | – |
| | 0.3 | 3 | – | – | 12.9 | 14.5 | 16.2 | 18.1 | 15.8 | 9.0 | – | – | – |
| | 0.3 | 4 | – | – | 12.9 | 14.5 | 16.2 | 18.1 | 20.1 | 22.2 | – | – | – |
| | 0.3 | 5 | – | – | 12.9 | 14.5 | 16.2 | 18.1 | 20.1 | 22.2 | 24.5 | 21.9 | 6.8 |
| | 0.3 | 6 | – | – | 12.9 | 14.5 | 16.2 | 18.1 | 20.1 | 22.2 | 24.5 | 26.9 | 26.6 |

[1]) The values in the capacity tables refer to the evaporator capacity and are based on liquid temperature $t_l$ = 25 °C

### Correction factors for liquid temperature $t_l$

| $t_l$ [°C] | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 |
|---|---|---|---|---|---|---|---|---|---|
| R134a | 0.88 | 0.92 | 0.96 | 1.0 | 1.05 | 1.10 | 1.16 | 1.23 | 1.31 |

Plant capacity × correction factor = the values in the table

## Capacity (continued)

### Max. regulator capacity $Q_e$ [1])

**R404A/R507**

| Type | Pressure drop in regulator Δp | Maximum suction pressure PS | Capacity $Q_e$ in [kW] at suction temperature $t_s$ after the regulator [°C] | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | [bar] | [bar] | -35 | -30 | -25 | -20 | -15 | -10 | -5 | 0 | 5 | 10 | 15 |
| KVL 12<br>KVL 15<br>KVL 22 | 0.1 | 1 | 0.9 | – | – | – | – | – | – | – | – | – | – |
| | 0.1 | 2 | 2.5 | 2.4 | 1.7 | 0.3 | – | – | – | – | – | – | – |
| | 0.1 | 3 | 2.5 | 2.9 | 3.2 | 3.2 | 1.9 | – | – | – | – | – | – |
| | 0.1 | 4 | 2.5 | 2.9 | 3.2 | 3.6 | 4.0 | 3.4 | 0.5 | – | – | – | – |
| | 0.1 | 5 | 2.5 | 2.9 | 3.2 | 3.6 | 4.0 | 4.5 | 4.5 | 1.5 | – | – | – |
| | 0.1 | 6 | 2.5 | 2.9 | 3.2 | 3.6 | 4.0 | 4.5 | 4.9 | 5.5 | 2.1 | – | – |
| | 0.2 | 1 | 1.3 | – | – | – | – | – | – | – | – | – | – |
| | 0.2 | 2 | 3.6 | 3.4 | 2.5 | 0.4 | – | – | – | – | – | – | – |
| | 0.2 | 3 | 3.6 | 4.0 | 4.6 | 4.5 | 2.7 | – | – | – | – | – | – |
| | 0.2 | 4 | 3.6 | 4.0 | 4.6 | 5.1 | 5.7 | 4.8 | 0.8 | – | – | – | – |
| | 0.2 | 5 | 3.6 | 4.0 | 4.6 | 5.1 | 5.7 | 6.3 | 6.4 | 2.2 | – | – | – |
| | 0.2 | 6 | 3.6 | 4.0 | 4.6 | 5.1 | 5.7 | 6.3 | 7.0 | 7.8 | 2.9 | – | – |
| | 0.3 | 1 | 1.6 | – | – | – | – | – | – | – | – | – | – |
| | 0.3 | 2 | 4.4 | 4.2 | 3.0 | 0.4 | – | – | – | – | – | – | – |
| | 0.3 | 3 | 4.4 | 5.0 | 5.6 | 5.6 | 3.3 | – | – | – | – | – | – |
| | 0.3 | 4 | 4.4 | 5.0 | 5.6 | 6.3 | 7.0 | 5.9 | 1.0 | – | – | – | – |
| | 0.3 | 5 | 4.4 | 5.0 | 5.6 | 6.3 | 7.0 | 7.8 | 7.8 | 2.6 | – | – | – |
| | 0.3 | 6 | 4.4 | 5.0 | 5.6 | 6.3 | 7.0 | 7.8 | 8.6 | 9.6 | 3.5 | – | – |
| KVL 28<br>KVL 35 | 0.1 | 1 | 2.0 | – | – | – | – | – | – | – | – | – | – |
| | 0.1 | 2 | 5.9 | 5.4 | 3.7 | 0.5 | – | – | – | – | – | – | – |
| | 0.1 | 3 | 6.2 | 7.1 | 8.0 | 7.2 | 4.2 | – | – | – | – | – | – |
| | 0.1 | 4 | 6.2 | 7.1 | 8.0 | 9.1 | 10.0 | 7.4 | 1.2 | – | – | – | – |
| | 0.1 | 5 | 6.2 | 7.1 | 8.0 | 9.1 | 10.0 | 11.2 | 10.1 | 3.3 | – | – | – |
| | 0.1 | 6 | 6.2 | 7.1 | 8.0 | 9.1 | 10.0 | 11.2 | 12.4 | 12.4 | 4.4 | – | – |
| | 0.2 | 1 | 2.7 | — | – | – | – | – | – | – | – | – | – |
| | 0.2 | 2 | 8.4 | 7.6 | 5.4 | 0.9 | – | – | – | – | – | – | – |
| | 0.2 | 3 | 8.9 | 10.1 | 11.4 | 10.3 | 5.9 | – | – | – | – | – | – |
| | 0.2 | 4 | 8.9 | 10.1 | 11.4 | 12.9 | 14.3 | 10.6 | 1.7 | – | – | – | – |
| | 0.2 | 5 | 8.9 | 10.1 | 11.4 | 12.9 | 14.3 | 15.9 | 14.4 | 4.6 | – | – | – |
| | 0.2 | 6 | 8.9 | 10.1 | 11.4 | 12.9 | 14.3 | 15.9 | 17.5 | 17.6 | 6.3 | – | – |
| | 0.3 | 1 | 3.4 | – | – | – | – | – | – | – | – | – | – |
| | 0.3 | 2 | 10.4 | 9.3 | 6.5 | 1.1 | – | – | – | – | – | – | – |
| | 0.3 | 3 | 10.9 | 12.5 | 14.0 | 12.5 | 7.2 | – | – | – | – | – | – |
| | 0.3 | 4 | 10.9 | 12.5 | 14.0 | 15.8 | 17.6 | 13.0 | 2.1 | – | – | – | – |
| | 0.3 | 5 | 10.9 | 12.5 | 14.0 | 15.8 | 17.6 | 19.6 | 17.7 | 5.6 | – | – | – |
| | 0.3 | 6 | 10.9 | 12.5 | 14.0 | 15.8 | 17.6 | 19.6 | 21.6 | 21.7 | 7.7 | – | – |

[1]) The values in the capacity tables refer to the evaporator capacity and are based on liquid temperature $t_l$ = 25 °C

### Correction factors for liquid temperature $t_l$

| $t_l$ [°C] | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 |
|---|---|---|---|---|---|---|---|---|---|
| R404A/R507 | 0.84 | 0.89 | 0.94 | 1.0 | 1.07 | 1.16 | 1.26 | 1.40 | 1.57 |

Plant capacity × correction factor = the values in the table

## Capacity (continued)

### Max. regulator capacity $Q_e$ [1])

**R407C**

| Type | Pressure drop in regulator Δp | Maximum suction pressure PS | Capacity $Q_e$ in [kW] at suction temperature $t_s$ after the regulator [°C] | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | [bar] | [bar] | -35 | -30 | -25 | -20 | -15 | -10 | -5 | 0 | 5 | 10 | 15 |
| KVL 12<br>KVL 15<br>KVL 22 | 0.1 | 1 | 1.6 | 1.0 | – | – | – | – | – | – | – | – | – |
| | 0.1 | 2 | 2.5 | 2.8 | 2.7 | 1.9 | 0.2 | – | – | – | – | – | – |
| | 0.1 | 3 | 2.5 | 2.8 | 3.2 | 3.6 | 3.6 | 2.0 | – | – | – | – | – |
| | 0.1 | 4 | 2.5 | 2.8 | 3.2 | 3.6 | 4.1 | 4.6 | 3.6 | 0.1 | – | – | – |
| | 0.1 | 5 | 2.5 | 2.8 | 3.2 | 3.6 | 4.1 | 4.6 | 5.1 | 4.9 | 1.0 | – | – |
| | 0.1 | 6 | 2.5 | 2.8 | 3.2 | 3.6 | 4.1 | 4.6 | 5.1 | 5.6 | 6.0 | 1.3 | – |
| | 0.2 | 1 | 2.2 | 1.5 | – | – | – | – | – | – | – | – | – |
| | 0.2 | 2 | 3.5 | 4.0 | 3.8 | 2.7 | 0.2 | – | – | – | – | – | – |
| | 0.2 | 3 | 3.5 | 4.0 | 4.6 | 5.3 | 5.0 | 2.9 | – | – | – | – | – |
| | 0.2 | 4 | 3.5 | 4.0 | 4.6 | 5.3 | 5.9 | 6.5 | 5.1 | 0.1 | – | – | – |
| | 0.2 | 5 | 3.5 | 4.0 | 4.6 | 5.3 | 5.9 | 6.5 | 7.3 | 6.9 | – | – | – |
| | 0.2 | 6 | 3.5 | 4.0 | 4.6 | 5.3 | 5.9 | 6.5 | 7.3 | 8.0 | 8.4 | 1.8 | – |
| | 0.3 | 1 | 2.7 | 1.7 | – | – | – | – | – | – | – | – | – |
| | 0.3 | 2 | 4.4 | 5.0 | 4.7 | 3.3 | 0.3 | – | – | – | – | – | – |
| | 0.3 | 3 | 4.4 | 5.0 | 5.7 | 6.4 | 6.2 | 3.5 | – | – | – | – | – |
| | 0.3 | 4 | 4.4 | 5.0 | 5.7 | 6.4 | 7.2 | 8.1 | 6.2 | 0.2 | – | – | – |
| | 0.3 | 5 | 4.4 | 5.0 | 5.7 | 6.4 | 7.2 | 8.1 | 8.9 | 8.5 | 1.6 | – | – |
| | 0.3 | 6 | 4.4 | 5.0 | 5.7 | 6.4 | 7.2 | 8.1 | 8.9 | 9.9 | 10.3 | 2.2 | – |
| KVL 28<br>KVL 35 | 0.1 | 1 | 3.4 | 2.2 | – | – | – | – | – | – | – | – | – |
| | 0.1 | 2 | 6.2 | 6.8 | 6.1 | 4.1 | 0.4 | – | – | – | – | – | – |
| | 0.1 | 3 | 6.2 | 7.1 | 8.1 | 9.2 | 8.0 | 4.3 | – | – | – | – | – |
| | 0.1 | 4 | 6.2 | 7.1 | 8.1 | 9.2 | 10.3 | 11.3 | 7.9 | 0.2 | – | – | – |
| | 0.1 | 5 | 6.2 | 7.1 | 8.1 | 9.2 | 10.3 | 11.6 | 12.8 | 10.9 | 2.1 | – | – |
| | 0.1 | 6 | 6.2 | 7.1 | 8.1 | 9.2 | 10.3 | 11.6 | 12.8 | 14.2 | 13.3 | 2.7 | – |
| | 0.2 | 1 | 4.9 | 3.1 | – | – | – | – | – | – | – | – | – |
| | 0.2 | 2 | 8.9 | 9.6 | 8.5 | 5.8 | 0.2 | – | – | – | – | – | – |
| | 0.2 | 3 | 8.9 | 10.1 | 11.5 | 13.1 | 11.3 | 6.1 | – | – | – | – | – |
| | 0.2 | 4 | 8.9 | 10.1 | 11.5 | 13.1 | 14.6 | 16.1 | 11.2 | 0.3 | – | – | – |
| | 0.2 | 5 | 8.9 | 10.1 | 11.5 | 13.1 | 14.6 | 16.4 | 18.2 | 15.4 | 3.0 | – | – |
| | 0.2 | 6 | 8.9 | 10.1 | 11.5 | 13.1 | 14.6 | 16.4 | 18.2 | 20.1 | 18.8 | 3.9 | – |
| | 0.3 | 1 | 5.9 | 3.8 | – | – | – | – | – | – | – | – | – |
| | 0.3 | 2 | 10.9 | 11.9 | 10.5 | 7.1 | 0.5 | – | – | – | – | – | – |
| | 0.3 | 3 | 10.9 | 12.6 | 14.2 | 16.0 | 13.9 | 7.5 | – | – | – | – | – |
| | 0.3 | 4 | 10.9 | 12.6 | 14.2 | 16.0 | 17.9 | 19.8 | 13.7 | 0.3 | – | – | – |
| | 0.3 | 5 | 10.9 | 12.6 | 14.2 | 16.0 | 17.9 | 20.1 | 22.4 | 18.8 | 3.6 | – | – |
| | 0.3 | 6 | 10.9 | 12.6 | 14.2 | 16.0 | 17.9 | 20.1 | 22.4 | 24.7 | 23.1 | 4.8 | – |

[1]) The values in the capacity tables refer to the evaporator capacity and are based on liquid temperature $t_l$ = 25 °C

### Correction factors for liquid temperature $t_l$

| $t_l$ [°C] | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 |
|---|---|---|---|---|---|---|---|---|---|
| R407C | 0.88 | 0.91 | 0.95 | 1.0 | 1.05 | 1.11 | 1.18 | 1.26 | 1.35 |

Plant capacity × correction factor = the values in the table

## Sizing

For optimum performance, it is important to select a KVL valve according to system conditions and application.

The following data must be used when sizing a KVL valve:

- Refrigerant
- Evaporator capacity: $Q_e$ in [kW]
- Liquid temperature ahead of expansion valve: $t_l$ in [°C]
- Suction temperature ahead of compressor: $t_s$ in [°C]
- Maximum suction pressure after the regulator: PS in [bar]
- Connection type: flare or solder
- Connection size in [in.] or [mm]

## Valve selection

**Example**
When selecting the appropriate valve it may be necessary to convert the actual evaporator capacity using a correction factor.
This is required when your system conditions are different than the table conditions.

The selection is also dependant on the acceptable pressure drop across the valve.

The following example illustrates how this is done:

- Refrigerant: R404A
- Evaporating capacity: 4.0 kW
- Liquid temperature ahead of expansion valve: 35 °C
- Suction temperature ahead of compressor: -25 °C
- Maximum suction pressure after the regulator: 3.8 bar ~ -7 °C
- Connectiontype: solder
- Connection size: 5/8 in.

**Step 1**
Determine the correction factor for liquid temperature $t_l$ ahead of expansion valve.

From the correction factors table (see below) the correction factor for a liquid temperature at 35 °C (R404A) corresponds to a factor of 1.16.

**Correction factors for liquid temperature $t_l$**

| $t_l$ [°C] | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 |
|---|---|---|---|---|---|---|---|---|---|
| R134a | 0.88 | 0.92 | 0.96 | 1.0 | 1.05 | 1.10 | 1.16 | 1.23 | 1.31 |
| R22 | 0.90 | 0.93 | 0.96 | 1.0 | 1.05 | 1.10 | 1.13 | 1.18 | 1.24 |
| R404A/R507 | 0.84 | 0.89 | 0.94 | 1.0 | 1.07 | 1.16 | 1.26 | 1.40 | 1.57 |
| R407C | 0.88 | 0.91 | 0.95 | 1.0 | 1.05 | 1.11 | 1.18 | 1.26 | 1.35 |

**Step 2**
Corrected evaporator capacity is:
$Q_e = 4.0 \times 1.16 = 4.64$ kW

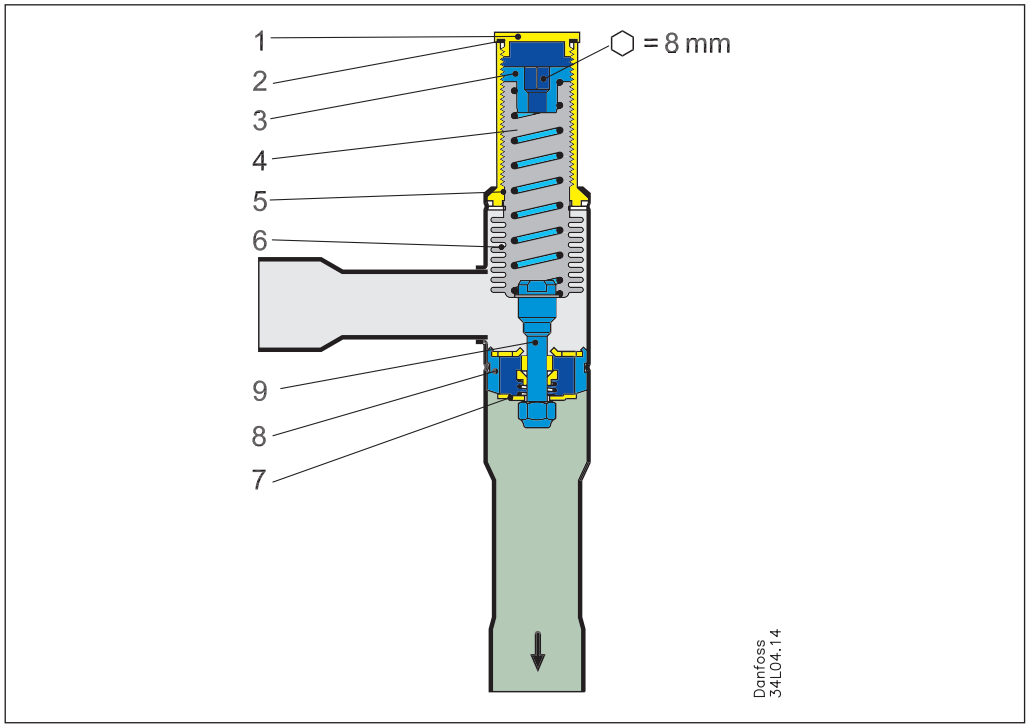
**Step 3**
Now select the capacity table for R404A and choose the column with a suction temperature of -25 °C.
Using the corrected replacement capacity, select a valve that provides an equivalent or greater capacity than required.

KVL 12 / KVL 15 / KVL 22 delivers a capacity of 4.6 kW at a pressure drop of 0.2 bar across the valve and 5.6 kW at a pressure drop of 0.3 bar across the valve. Based on the required connection size of 5/8 in. the KVL 15 valve is the proper selction for this example.

**Step 4**
KVL 15, 5/8 in. solder connection:
code no. **034L0049**, see ordering table.

## Design / Function

**KVL**




1. Protective cap
2. Gasket
3. Setting screw
4. Main spring
5. Valve body
6. Equalization bellows
7. Valve plate
8. Valve seat
9. Damping device

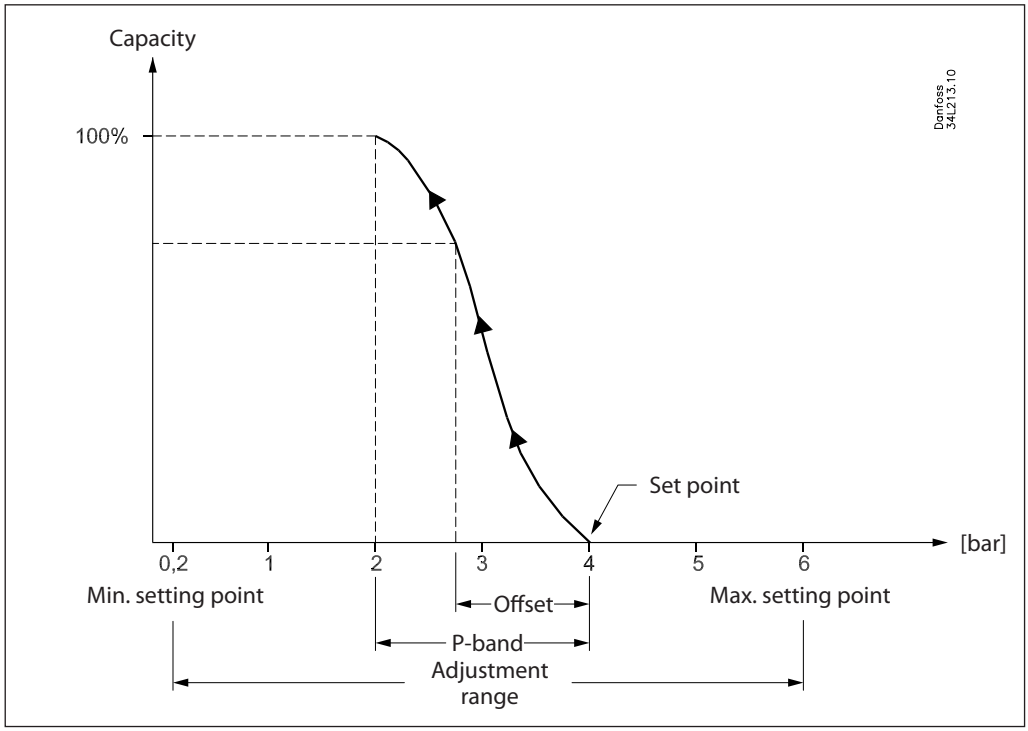
The Crankcase pressure regulator type KVL opens at pressure fall on the outlet side, i.e. when the suction pressure ahead of the compressor drops below the set value.

The KVL only regulates based on the outlet pressure. Pressure variations on the inlet side of the regulator do not affect the degree of opening since the KVL is equipped with an equalization bellows (6).
This bellows has an effective area corresponding to that of the valve seat.

The regulator is also equipped with an effective damping device (9) against pulsations, which normally occur in a refrigeration plant.
The damping device helps to ensure long life of the regulator without impairing regulation accuracy.

## P-band and Offset

**Example with 4 bar setting**



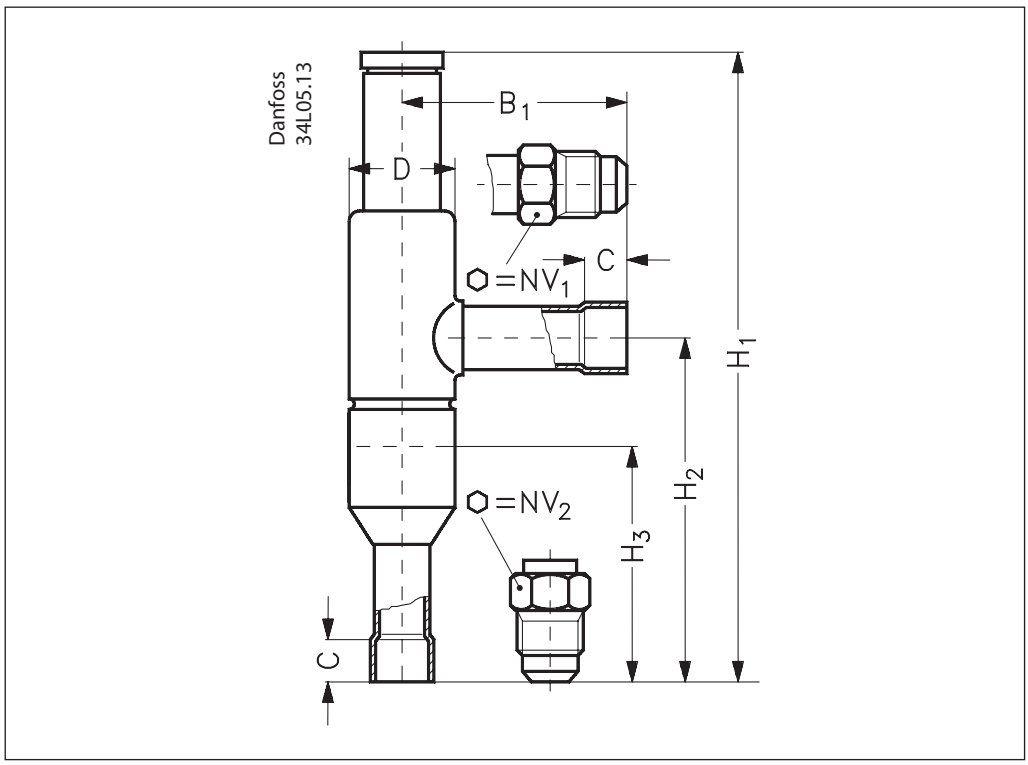

**Proportional band**
The p-band is defined as the difference between the pressure at which the valve plate starts to open (set point) and the pressure at which the valve is completely open.

**Example**
If the valve is set to open at 4 bar and the valve p-band is 2 bar, the valve will give maximum capacity when the outlet pressure reaches 2 bar.

**Offset**
The offset is defined as the difference between the pressure at which the valve plate starts to open (set point) and the pressure at which the valve reaches the necessary opening for the actual load.

**The offset is always a part of the p-band**
Because optimal function of a refrigeration plant is best reached with fully open KVL, the term offset is normally not used in connection with the KVL valve.

## Dimensions and weights




| Type | Connection | | | | $H_1$ | $H_2$ | $B^1$ | C solder | øD | Net weight |
|---|---|---|---|---|---|---|---|---|---|---|
| | Flare | | Solder ODF | | | | | | | |
| | [in.] | [mm] | [in.] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [Kg] |
| **KVL 12** | 1/2 | 12 | 1/2 | 12 | 179 | 99 | 64 | 10 | 30 | 0.4 |
| **KVL 15** | 5/8 | 16 | 5/8 | 16 | 179 | 99 | 64 | 12 | 30 | 0.4 |
| **KVL 22** | – | – | 7/8 | 22 | 179 | 99 | 64 | 17 | 30 | 0.4 |
| **KVL 28** | – | – | 1 1/8 | 28 | 259 | 151 | 105 | 20 | 43 | 1.0 |
| **KVL 35** | – | – | 1 3/8 | 35 | 259 | 151 | 105 | 25 | 43 | 1.0 |