ENGINEERING TOMORROW

Data sheet

Crankcase pressure regulator
Type KVL

KVL crankcase pressure regulator are used to protect the compressor motor against overload experienced during startup after long off periods or just after defrost periods.
They are installed in the suction line of refrigeration systems.

Features

- Accurate, adjustable pressure regulation
- Wide capacity and operating range
- Pulsation damping design
- Stainless steel bellows
- Compact angle design for easy installation in any position
- "Hermetic" brazed construction
- Available with flare and ODF solder connections
- KVL 12-22: Compliant with ATEX hazard zone 2

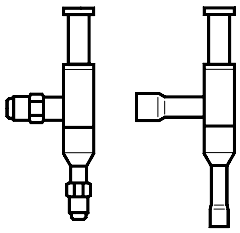
Approvals

UL LISTED, file SA7200
EAN

Technical data

Refrigerants	HCFC, HFC and HC: KVL 12-22	
	HCFC and non-flammable HFC: KVL 28-35	
Regulation range	3 – 87 psig	
	Factory setting = 29 psig	
Maximum working pressure	KVL 12 – 35	MWP = 261 psig
Maximum test pressure	P_e = PS × 1.1 = 287 psig	
Medium temperature range	-75 – 266 °F	
Maximum P-band	KVL 12 – 22: 29 psi	
	KVL 28 – 35: 22 psi	

Ordering



Type	Rated capacity [1] [TR]				Flare connection [2]	Code no.	Solder connection	Code no.
	R22	R134a	R404A/ R507	R407C	[in.]		[in.]	
KVL 12	1.2	0.8	1.0	1.1	1/2	**034L0041**	1/2	**034L0043**
KVL 15	1.2	0.8	1.0	1.1	5/8	**034L0042**	5/8	**034L0049**
KVL 22	1.2	0.8	1.0	1.1	–	–	7/8	**034L0045**
KVL 28	4.1	2.6	3.4	3.8	–	–	1 1/8	**034L0046**
KVL 35	4.1	2.6	3.4	3.8	–	–	1 3/8	**034L0052**

[1]) Rated capacity is based on:
Maximum suction pressure p_s = 70 psig
Suction temperature t_s = 10 °F
Condensing temperature t_c = 100 °F
Pressure drop across regulator Δp = 2 psi

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

Note:
The connection dimensions chosen must not be too small, as gas velocities in excess of 130 ft / s at the inlet of the regulator can result in flow noise.

Metric conversions
1 psi = 0.07 bar
5/9 (t_1 °F - 32) = t_2 °C
1 TR = 3.5 kW
1 in. = 25.4 mm

Capacities

Maximum regulator capacity Q_e [1]) at condensing temperature t_c = 100 °F

R22

Type	Pressure drop in regulator Δp	Maximum suction pressure p_s	Capacity Q_e [TR] at suction temperature t_s after the regulator [°F]								
	[psi]	[psi]	-30	-20	-10	0	10	20	30	40	50
KVL 12 KVL 15 KVL 22	2	10	0.3	–	–	–	–	–	–	–	–
	2	20	0.7	0.6	0.3	–	–	–	–	–	–
	2	30	0.8	0.9	0.9	0.5	–	–	–	–	–
	2	40	0.8	0.9	1.0	1.0	0.7	–	–	–	–
	2	50	0.8	0.9	1.0	1.1	1.2	0.8	–	–	–
	2	60	0.8	0.9	1.0	1.1	1.2	1.3	0.6	–	–
	2	70	0.8	0.9	1.0	1.1	1.2	1.4	1.4	0.2	–
	2	80	0.8	0.9	1.0	1.1	1.2	1.4	1.5	1.3	–
	2	90	0.8	0.9	1.0	1.1	1.2	1.4	1.5	1.6	0.9
KVL 12 KVL 15 KVL 22	3	10	0.4	–	–	–	–	–	–	–	–
	3	20	0.9	0.8	0.4	–	–	–	–	–	–
	3	30	0.9	1.1	1.0	0.7	–	–	–	–	–
	3	40	0.9	1.1	1.2	1.3	0.9	–	–	–	–
	3	50	0.9	1.1	1.2	1.3	1.5	0.9	–	–	–
	3	60	0.9	1.1	1.2	1.3	1.5	1.6	0.8	–	–
	3	70	0.9	1.1	1.2	1.3	1.5	1.7	1.7	0.3	–
	3	80	0.9	1.1	1.2	1.3	1.5	1.7	1.8	1.6	–
	3	90	0.9	1.1	1.2	1.3	1.5	1.7	1.8	2.0	1.1
KVL 12 KVL 15 KVL 22	4	10	0.5	–	–	–	–	–	–	–	–
	4	20	1.0	0.9	0.4	–	–	–	–	–	–
	4	30	1.1	1.2	1.2	0.8	–	–	–	–	–
	4	40	1.1	1.2	1.4	1.5	1.0	–	–	–	–
	4	50	1.1	1.2	1.4	1.6	1.7	1.1	–	–	–
	4	60	1.1	1.2	1.4	1.6	1.7	1.9	0.9	–	–
	4	70	1.1	1.2	1.4	1.6	1.7	1.9	2.0	0.3	–
	4	80	1.1	1.2	1.4	1.6	1.7	1.9	2.1	1.9	–
	4	90	1.1	1.2	1.4	1.6	1.7	1.9	2.1	2.3	1.3

[1]) The capacities are based on Liquid temperature t_l = 100 °F

Metric conversions
1 psi = 0.07 bar
$^5/_9$ (t_1 °F - 32) = t_2 °C
1 TR = 3.5 kW

Correction factors for liquid temperature t_l

t_l [°F]	50	60	70	80	90	100	110	120
R22	0.82	0.85	0.88	0.92	0.96	1.0	1.05	1.10

System capacity × correction factor = table capacity

Capacities (continued)

Maximum regulator capacity Q_e [1]) at condensing temperature t_c= 100 °F

R22

Type	Pressure drop in regulator Δp	Maximum suction pressure p_s	Capacity Q_e [TR] at suction temperature t_s after the regulator [°F]								
	[psi]	[psi]	-30	-20	-10	0	10	20	30	40	50
KVL 28 KVL 35	2	10	0.8	1.6	–	–	–	–	–	–	–
	2	20	2.0	2.7	0.7	–	–	–	–	–	–
	2	30	2.5	2.9	2.3	1.2	–	–	–	–	–
	2	40	2.5	2.9	3.2	3.0	1.6	–	–	–	–
	2	50	2.5	2.9	3.2	3.6	3.5	1.8	–	–	–
	2	60	2.5	2.9	3.2	3.6	4.1	3.8	1.4	–	–
	2	70	2.5	2.9	3.2	3.6	4.1	4.5	3.9	0.4	–
	2	80	2.5	2.9	3.2	3.6	4.1	4.5	5.0	3.4	–
	2	90	2.5	2.9	3.2	3.6	4.1	4.5	5.0	5.5	2.0
KVL 28 KVL 35	3	10	0.9	–	–	–	–	–	–	–	–
	3	20	2.4	1.9	0.8	–	–	–	–	–	–
	3	30	3.1	3.4	2.8	1.5	–	–	–	–	–
	3	40	3.1	3.5	4.0	3.6	2.0	–	–	–	–
	3	50	3.1	3.5	4.0	4.5	4.3	2.2	–	–	–
	3	60	3.1	3.5	4.0	4.5	5.0	4.7	1.8	–	–
	3	70	3.1	3.5	4.0	4.5	5.0	5.5	4.7	0.5	–
	3	80	3.1	3.5	4.0	4.5	5.0	5.5	6.1	4.2	–
	3	90	3.1	3.5	4.0	4.5	5.0	5.5	6.1	6.7	2.5
KVL 28 KVL 35	4	10	1.1	–	–	–	–	–	–	–	–
	4	20	2.8	2.2	0.9	–	–	–	–	–	–
	4	30	3.6	3.9	3.3	1.8	–	–	–	–	–
	4	40	3.6	4.1	4.6	4.2	2.3	–	–	–	–
	4	50	3.6	4.1	4.6	5.2	4.9	2.5	–	–	–
	4	60	3.6	4.1	4.6	5.2	5.8	5.4	2.0	–	–
	4	70	3.6	4.1	4.6	5.2	5.8	6.4	5.5	0.6	–
	4	80	3.6	4.1	4.6	5.2	5.8	4.5	7.1	4.8	–
	4	90	3.6	4.1	4.6	5.2	5.8	4.5	7.1	7.7	2.9

[1]) The capacities are based on Liquid temperature t_l = 100 °F

Metric conversions
1 psi = 0.07 bar
$^5/_9$ (t_1 °F - 32) = t_2 °C
1 TR = 3.5 kW

Correction factors for liquid temperature t_l

t_l [°F]	50	60	70	80	90	100	110	120
R22	0.82	0.85	0.88	0.92	0.96	1.0	1.05	1.10

System capacity × correction factor = table capacity

Capacities (continued)

Maximum regulator capacity Q_e [1]) at condensing temperature t_c= 100 °F

R134a

Type	Pressure drop in regulator Δp	Maximum suction pressure p_s	Capacity Q_e [TR] at suction temperature t_s after the regulator [°F]										
	[psi]	[psi]	-30	-20	-10	0	10	20	30	40	50	60	70
KVL 12 KVL 15 KVL 22	2	10	0.4	0.5	0.4	0.3	–	–	–	–	–	–	–
	2	20	0.4	0.5	0.6	0.6	0.4	–	–	–	–	–	–
	2	30	0.4	0.5	0.6	0.7	0.7	0.6	–	–	–	–	–
	2	40	0.4	0.5	0.6	0.7	0.8	0.9	0.7	–	–	–	–
	2	50	0.4	0.5	0.6	0.7	0.8	0.9	1.0	0.8	–	–	–
	2	60	0.4	0.5	0.6	0.7	0.8	0.9	1.0	1.1	1.0	–	–
	2	70	0.4	0.5	0.6	0.7	0.8	0.9	1.0	1.1	1.3	1.2	–
	2	80	0.4	0.5	0.6	0.7	0.8	0.9	1.0	1.1	1.3	1.4	1.5
	2	90	0.4	0.5	0.6	0.7	0.8	0.9	1.0	1.1	1.3	1.4	1.5
KVL 12 KVL 15 KVL 22	3	10	0.5	0.6	0.6	0.4	–	–	–	–	–	–	–
	3	20	0.6	0.6	0.7	0.7	0.5	–	–	–	–	–	–
	3	30	0.6	0.6	0.7	0.8	0.9	0.7	–	–	–	–	–
	3	40	0.6	0.6	0.7	0.8	1.0	1.0	0.8	–	–	–	–
	3	50	0.6	0.6	0.7	0.8	1.0	1.1	1.2	1.0	–	–	–
	3	60	0.6	0.6	0.7	0.8	1.0	1.1	1.2	1.4	1.3	–	–
	3	70	0.6	0.6	0.7	0.8	1.0	1.1	1.2	1.4	1.5	1.5	–
	3	80	0.6	0.6	0.7	0.8	1.0	1.1	1.2	1.4	1.5	1.7	1.8
	3	90	0.6	0.6	0.7	0.8	1.0	1.1	1.2	1.4	1.5	1.7	1.9
KVL 12 KVL 15 KVL 22	4	10	0.6	0.7	0.6	0.5	–	–	–	–	–	–	–
	4	20	0.7	0.8	0.8	0.8	0.6	–	–	–	–	–	–
	4	30	0.7	0.8	0.9	1.0	1.0	0.8	–	–	–	–	–
	4	40	0.7	0.8	0.9	1.0	1.1	1.2	1.0	–	–	–	–
	4	50	0.7	0.8	0.9	1.0	1.1	1.3	1.4	1.2	–	–	–
	4	60	0.7	0.8	0.9	1.0	1.1	1.3	1.4	1.6	1.5	–	–
	4	70	0.7	0.8	0.9	1.0	1.1	1.3	1.4	1.6	1.8	1.8	–
	4	80	0.7	0.8	0.9	1.0	1.1	1.3	1.4	1.6	1.8	2.0	2.1
	4	90	0.7	0.8	0.9	1.0	1.1	1.3	1.4	1.6	1.8	2.0	2.2

[1]) The capacities are based on Liquid temperature t_l = 100 °F

Metric conversions
1 psi = 0.07 bar
$^5/_9$ (t_1 °F - 32) = t_2 °C
1 TR = 3.5 kW

Correction factors for liquid temperature t_l

t_l [°F]	50	60	70	80	90	100	110	120
R134a	0.79	0.82	0.86	0.90	0.95	1.0	1.06	1.13

System capacity × correction factor = table capacity

Capacities (continued)

Maximum regulator capacity Q_e [1]) at condensing temperature t_c= 100 °F

R134a

Type	Pressure drop in regulator Δp	Maximum suction pressure p_s	Capacity Q_e [TR] at suction temperature t_s after the regulator [°F]										
	[psi]	[psi]	-30	-20	-10	0	10	20	30	40	50	60	70
KVL 28 KVL 35	2	10	1.3	1.3	1.1	0.7	–	–	–	–	–	–	–
	2	20	1.5	1.7	1.7	1.5	1.0	–	–	–	–	–	–
	2	30	1.5	1.7	2.0	2.2	1.9	1.3	–	–	–	–	–
	2	40	1.5	1.7	2.0	2.3	2.6	2.5	1.7	–	–	–	–
	2	50	1.5	1.7	2.0	2.3	2.6	3.0	3.1	2.1	–	–	–
	2	60	1.5	1.7	2.0	2.3	2.6	3.0	3.3	3.7	2.7	–	–
	2	70	1.5	1.7	2.0	2.3	2.6	3.0	3.3	3.7	4.2	3.4	–
	2	80	1.5	1.7	2.0	2.3	2.6	3.0	3.3	3.7	4.2	4.7	4.1
	2	90	1.5	1.7	2.0	2.3	2.6	3.0	3.3	3.7	4.2	4.7	5.2
KVL 28 KVL 35	3	10	1.6	1.5	1.4	0.9	–	–	–	–	–	–	–
	3	20	1.9	2.1	2.1	1.8	1.2	–	–	–	–	–	–
	3	30	1.9	2.1	2.5	2.7	2.4	1.6	–	–	–	–	–
	3	40	1.9	2.1	2.5	2.8	3.2	3.1	2.1	–	–	–	–
	3	50	1.9	2.1	2.5	2.8	3.2	3.6	3.8	2.6	–	–	–
	3	60	1.9	2.1	2.5	2.8	3.2	3.6	4.1	4.6	3.3	–	–
	3	70	1.9	2.1	2.5	2.8	3.2	3.6	4.1	4.6	5.1	4.1	–
	3	80	1.9	2.1	2.5	2.8	3.2	3.6	4.1	4.6	5.1	5.7	5.1
	3	90	1.9	2.1	2.5	2.8	3.2	3.6	4.1	4.6	5.1	5.7	6.3
KVL 28 KVL 35	4	10	1.8	1.8	1.6	1.0	–	–	–	–	–	–	–
	4	20	2.2	2.4	2.4	2.1	1.4	–	–	–	–	–	–
	4	30	2.2	2.5	2.9	3.1	2.8	1.8	–	–	–	–	–
	4	40	2.2	2.5	2.9	3.3	3.7	3.5	2.4	–	–	–	–
	4	50	2.2	2.5	2.9	3.3	3.7	4.2	4.4	3.0	–	–	–
	4	60	2.2	2.5	2.9	3.3	3.7	4.2	4.7	5.3	3.8	–	–
	4	70	2.2	2.5	2.9	3.3	3.7	4.2	4.7	5.3	5.9	4.8	–
	4	80	2.2	2.5	2.9	3.3	3.7	4.2	4.7	5.3	5.9	6.6	5.9
	4	90	2.2	2.5	2.9	3.3	3.7	4.2	4.7	5.3	5.9	6.6	7.3

[1]) The capacities are based on Liquid temperature t_l = 100 °F

Metric conversions
1 psi = 0.07 bar
$^5/_9$ (t_1 °F - 32) = t_2 °C
1 TR = 3.5 kW

Correction factors for liquid temperature t_l

t_l [°F]	50	60	70	80	90	100	110	120
R134a	0.79	0.82	0.86	0.90	0.95	1.0	1.06	1.13

System capacity × correction factor = table capacity

Capacities (continued)

Maximum regulator capacity Q_e [1]) at condensing temperature t_c= 100 °F

R404A/R507

Type	Pressure drop in regulator Δp	Maximum suction pressure p_s	Capacity Q_e [TR] at suction temperature t_s after the regulator [°F]							
	[psi]	[psi]	-30	-20	-10	0	10	20	30	40
KVL 12 KVL 15 KVL 22	2	10	–	–	–	–	–	–	–	–
	2	20	0.5	0.3	–	–	–	–	–	–
	2	30	0.6	0.6	0.5	–	–	–	–	–
	2	40	0.6	0.7	0.8	0.6	–	–	–	–
	2	50	0.6	0.7	0.8	0.9	0.7	–	–	–
	2	60	0.6	0.7	0.8	0.9	1.0	0.7	–	–
	2	70	0.6	0.7	0.8	0.9	1.0	1.1	0.5	–
	2	80	0.6	0.7	0.8	0.9	1.0	1.1	1.1	–
	2	90	0.6	0.7	0.8	0.9	1.1	1.2	1.3	1.1
KVL 12 KVL 15 KVL 22	3	10	–	–	–	–	–	–	–	–
	3	20	0.6	0.3	–	–	–	–	–	–
	3	30	0.8	0.8	0.6	–	–	–	–	–
	3	40	0.8	0.9	0.9	0.7	–	–	–	–
	3	50	0.8	0.9	1.0	1.1	0.8	–	–	–
	3	60	0.8	0.9	1.0	1.1	1.2	0.8	–	–
	3	70	0.8	0.9	1.0	1.1	1.3	1.4	0.6	–
	3	80	0.8	0.9	1.0	1.1	1.3	1.5	1.5	–
	3	90	0.8	0.9	1.1	1.2	1.3	1.5	1.6	1.3
KVL 12 KVL 15 KVL 22	4	10	–	–	–	–	–	–	–	–
	4	20	0.7	0.4	–	–	–	–	–	–
	4	30	0.9	0.9	0.7	–	–	–	–	–
	4	40	0.9	1.0	1.1	0.9	–	–	–	–
	4	50	0.9	1.0	1.1	1.3	1.0	–	–	–
	4	60	0.9	1.0	1.1	1.3	1.4	1.0	–	–
	4	70	0.9	1.0	1.1	1.4	1.5	1.7	0.7	–
	4	80	0.9	1.0	1.1	1.4	1.5	1.7	1.7	–
	4	90	0.9	1.1	1.2	1.4	1.5	1.7	1.9	1.5

[1]) The capacities are based on Liquid temperature t_l = 100 °F

Metric conversions
1 psi = 0.07 bar
$^5/_9$ (t_1 °F - 32) = t_2 °C
1 TR = 3.5 kW

Correction factors for liquid temperature t_l

t_l [°F]	50	60	70	80	90	100	110	120
R404A/R507	0.71	0.75	0.80	0.85	0.92	1.0	1.10	1.24

System capacity × correction factor = table capacity

Capacities (continued)

Maximum regulator capacity Q_e [1]) at condensing temperature t_c= 100 °F

R404A/R507

Type	Pressure drop in regulator Δp	Maximum suction pressure p_s	Capacity Q_e [TR] at suction temperature t_s after the regulator [°F]							
	[psi]	[psi]	-30	-20	-10	0	10	20	30	40
KVL 28 KVL 35	2	10	–	–	–	–	–	–	–	–
	2	20	1.2	0.6	–	–	–	–	–	–
	2	30	2.0	1.7	1.1	–	–	–	–	–
	2	40	2.0	2.3	2.2	1.5	–	–	–	–
	2	50	2.0	2.4	2.7	2.8	1.7	–	–	–
	2	60	2.1	2.4	2.7	3.1	3.2	1.6	–	–
	2	70	2.1	2.4	2.7	3.1	3.4	3.3	1.1	–
	2	80	2.1	2.4	2.7	3.1	3.4	3.9	3.2	–
	2	90	2.1	2.4	2.7	3.1	3.5	3.9	4.3	2.6
KVL 28 KVL 35	3	10	0.1	–	–	–	–	–	–	–
	3	20	1.4	0.7	–	–	–	–	–	–
	3	30	2.5	2.1	1.3	–	–	–	–	–
	3	40	2.6	3.0	2.9	1.9	–	–	–	–
	3	50	2.6	3.0	3.2	3.4	2.1	–	–	–
	3	60	2.6	3.0	3.2	3.8	3.9	2.1	–	–
	3	70	2.6	3.0	3.2	3.9	4.3	4.2	1.3	–
	3	80	2.6	3.0	3.2	3.9	4.3	4.8	4.0	–
	3	90	2.6	3.1	3.3	3.9	4.3	4.8	5.4	3.3
KVL 28 KVL 35	4	10	0.1	–	–	–	–	–	–	–
	4	20	1.7	0.8	–	–	–	–	–	–
	4	30	2.8	2.5	1.5	–	–	–	–	–
	4	40	3.0	3.4	3.3	2.1	–	–	–	–
	4	50	3.0	3.4	3.9	4.0	2.4	–	–	–
	4	60	3.0	3.4	3.9	4.3	4.4	2.4	–	–
	4	70	3.0	3.4	4.0	4.4	4.9	4.8	1.7	–
	4	80	3.0	3.4	4.0	4.4	4.9	5.5	4.6	–
	4	90	3.1	3.5	4.0	4.4	4.9	5.6	6.2	3.7

[1]) The capacities are based on Liquid temperature t_l = 100 °F

Metric conversions
1 psi = 0.07 bar
$^5/_9$ (t_1 °F - 32) = t_2 °C
1 TR = 3.5 kW

Correction factors for liquid temperature t_l

t_l [°F]	50	60	70	80	90	100	110	120
R404A/R507	0.71	0.75	0.80	0.85	0.92	1.0	1.10	1.24

System capacity × correction factor = table capacity

Capacities (continued)

Maximum regulator capacity Q_e [1]) at condensing temperature t_c= 100 °F

R407C

Type	Pressure drop in regulator Δp	Maximum suction pressure p_s	Capacity Q_e [TR] at suction temperature t_s after the regulator [°F]								
	[psi]	[psi]	-30	-20	-10	0	10	20	30	40	50
KVL 12 KVL 15 KVL 22	2	10	0.2	–	–	–	–	–	–	–	–
	2	20	0.6	0.5	0.3	–	–	–	–	–	–
	2	30	0.7	0.8	0.8	0.4	–	–	–	–	–
	2	40	0.7	0.8	0.9	0.9	0.6	–	–	–	–
	2	50	0.7	0.8	0.9	1.0	1.1	0.7	–	–	–
	2	60	0.7	0.8	0.9	1.0	1.1	1.2	0.6	–	–
	2	70	0.7	0.8	0.9	1.0	1.1	1.3	1.3	0.2	–
	2	80	0.7	0.8	0.9	1.0	1.1	1.3	1.4	1.2	–
	2	90	0.8	0.9	0.9	1.0	1.1	1.3	1.4	1.5	0.9
KVL 12 KVL 15 KVL 22	3	10	0.3	–	–	–	–	–	–	–	–
	3	20	0.8	0.7	0.3	–	–	–	–	–	–
	3	30	0.8	1.0	0.9	0.6	–	–	–	–	–
	3	40	0.8	1.0	1.1	1.2	0.8	–	–	–	–
	3	50	0.8	1.0	1.1	1.2	1.4	0.8	–	–	–
	3	60	0.8	1.0	1.1	1.2	1.4	1.5	0.7	–	–
	3	70	0.8	1.0	1.1	1.2	1.4	1.6	1.6	0.3	–
	3	80	0.8	1.0	1.1	1.2	1.4	1.6	1.7	1.5	–
	3	90	0.9	1.0	1.1	1.2	1.4	1.6	1.7	1.9	1.0
KVL 12 KVL 15 KVL 22	4	10	0.4	–	–	–	–	–	–	–	–
	4	20	0.9	0.8	0.3	–	–	–	–	–	–
	4	30	1.0	1.0	1.0	0.7	–	–	–	–	–
	4	40	1.0	1.1	1.3	1.4	0.9	–	–	–	–
	4	50	1.0	1.1	1.3	1.4	1.5	1.0	–	–	–
	4	60	1.0	1.1	1.3	1.5	1.6	1.7	0.8	–	–
	4	70	1.0	1.1	1.3	1.5	1.6	1.8	1.8	0.3	–
	4	80	1.0	1.1	1.3	1.5	1.6	1.8	2.0	1.8	–
	4	90	1.0	1.1	1.3	1.5	1.6	1.8	2.0	2.2	1.2

[1]) The capacities are based on Liquid temperature t_l = 100 °F

Metric conversions
1 psi = 0.07 bar
$^5/_9$ (t_1 °F - 32) = t_2 °C
1 TR = 3.5 kW

Correction factors for liquid temperature t_l

t_l [°F]	50	60	70	80	90	100	110	120
R407C	0.78	0.81	0.85	0.89	0.94	1.0	1.07	1.15

System capacity × correction factor = table capacity

Capacities (continued)

Maximum regulator capacity Q_e [1]) at condensing temperature t_c= 100 °F

R407C

Type	Pressure drop in regulator Δp	Maximum suction pressure p_s	Capacity Q_e [TR] at suction temperature t_s after the regulator [°F]								
	[psi]	[psi]	-30	-20	-10	0	10	20	30	40	50
KVL 28 KVL 35	2	10	0.7	–	–	–	–	–	–	–	–
	2	20	1.7	2.3	0.6	–	–	–	–	–	–
	2	30	2.2	2.5	2.0	1.0	–	–	–	–	–
	2	40	2.2	2.6	2.9	2.7	1.4	–	–	–	–
	2	50	2.3	2.6	2.9	3.2	3.2	1.6	–	–	–
	2	60	2.3	2.6	2.9	3.3	3.7	3.5	1.3	–	–
	2	70	2.3	2.7	2.9	3.3	3.8	4.1	3.6	0.4	–
	2	80	2.3	2.7	3.0	3.4	3.8	4.2	4.7	3.2	–
	2	90	2.4	2.7	3.0	3.4	3.9	4.2	4.7	5.2	1.9
KVL 28 KVL 35	3	10	0.7	–	–	–	–	–	–	–	–
	3	20	2.0	1.6	0.7	–	–	–	–	–	–
	3	30	2.7	3.0	2.4	1.3	–	–	–	–	–
	3	40	2.8	3.1	3.6	3.2	1.8	–	–	–	–
	3	50	2.8	3.2	3.6	4.1	3.9	2.0	–	–	–
	3	60	2.8	3.2	3.6	4.1	4.6	4.3	1.6	–	–
	3	70	2.9	3.2	3.7	4.1	4.6	5.1	4.3	0.5	–
	3	80	2.9	3.3	3.7	4.2	4.7	5.1	5.7	3.9	–
	3	90	2.9	3.3	3.8	4.2	4.7	5.2	5.7	6.3	2.4
KVL 28 KVL 35	4	10	0.9	–	–	–	–	–	–	–	–
	4	20	2.4	1.9	0.8	–	–	–	–	–	–
	4	30	3.1	3.4	2.9	1.6	–	–	–	–	–
	4	40	3.2	3.7	4.1	3.7	2.1	–	–	–	–
	4	50	3.2	3.7	4.1	4.7	4.4	2.3	–	–	–
	4	60	3.3	3.7	4.2	4.7	5.3	4.9	1.8	–	–
	4	70	3.3	3.8	4.2	4.8	5.3	5.9	2.1	0.6	–
	4	80	3.4	3.8	4.3	4.8	5.4	6.0	6.6	4.5	–
	4	90	3.4	3.9	4.3	4.9	5.5	6.0	6.7	7.2	2.7

[1]) The capacities are based on Liquid temperature t_l = 100 °F

Metric conversions
1 psi = 0.07 bar
$^5/_9$ (t_1 °F - 32) = t_2 °C
1 TR = 3.5 kW

Correction factors for liquid temperature t_l

t_l [°F]	50	60	70	80	90	100	110	120
R407C	0.78	0.81	0.85	0.89	0.94	1.0	1.07	1.15

System capacity × correction factor = table capacity

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: HCFC, HFC and HC: KVL 12-22, HCFC and non-flammable HFC: KVL 28-35
- Evaporating capacity: Q_e in [TR]
- Liquid temperature ahead of expansion valve: t_l in [°F]
- Suction temperature ahead of compressor: t_s in [°F]
- Maximum suction pressure downstream regulator: p_s in [psig]
- Connection type: flare or solder
- Connection size in [in.]

Valve selection Example

When selecting the appropiate valve it may be necessary to convert the actual evaporator capacity using a correction factors. 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: $Q_e = 0.7$ TR
- Liquid temperature ahead of expansion valve: $t_l = 120$ °F
- Compressor suction temperature: $t_s = -20$ °F
- Maximum suction temperature after the regulator: $p_s = 30$ psig
- Connection type: solder
- Connection size: $^5/_8$ in.

Step 1

Determine the correction factor for liquid temperature tl ahead of the expansion valve.

From the correction factors table (see below) a liquid temperature of 120 °F, R404A corresponds to a factor of 1.24.

Correction factors for liquid temperature t_l

t_l [°F]	50	60	70	80	90	100	110	120
R22	0.82	0.85	0.88	0.92	0.96	1.0	1.05	1.10
R134a	0.79	0.82	0.86	0.90	0.95	1.0	1.06	1.13
R404A/R507	0.71	0.75	0.80	0.85	0.92	1.0	1.10	1.24
R407C	0.78	0.81	0.85	0.89	0.94	1.0	1.07	1.15

Metric conversions
1 psi = 0.07 bar
$^5/_9$ (t_1 °F - 32) = t_2 °C
1 TR = 3.5 kW

Step 2

Corrected evaporator capacity is
$Q_e = 1.24 \times 0.7 = 0.87$ TR

Step 3

Now select the appropriate capacity table and choose the column for a suction temperature $t_s = -20$ °F.
Using the corrected evaporator capacity, select a valve that provides an equivalent or greater capacity at an acceptable pressure drop.

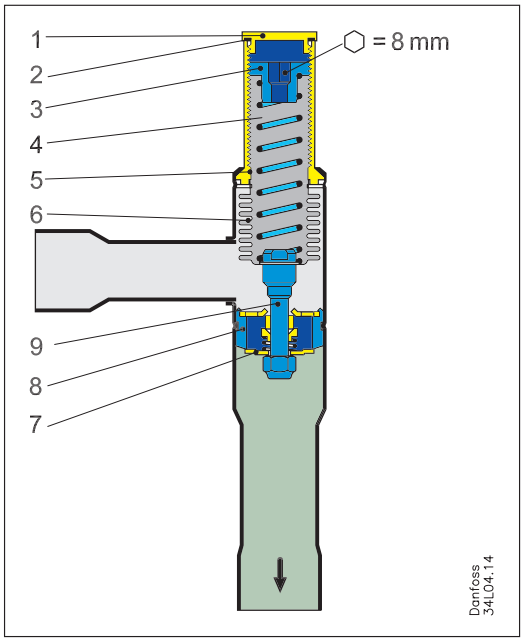
KVL 12, KVL 15, KVL 22 delivers an evaporator capacity up to 0.9 TR at a maximum suction pressure of 30 psig and a 4 psi pressure drop across the valve.
Based on the required connection size of $^5/_8$ in. ODF, the KVL 15 is the proper selection for this example.

Step 4

KVL 15, $^5/_8$ in. solder connection:
code no **034L0049**

Design / Function

KVL

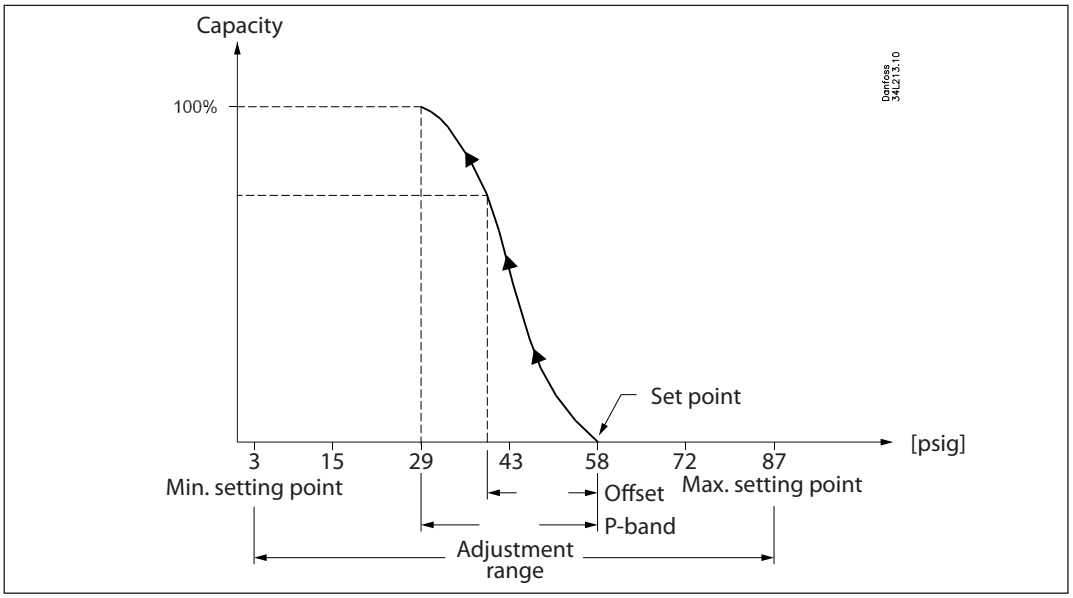


1. Protective cap
2. Gasket
3. Setting screw
4. Main spring
5. Valve body
6. Equalization bellows
7. Valve plate
8. Valve seat
9. Damping device

Crankcase pressure regulator type KVL opens on a fall in pressure on the outlet side, i.e. when the suction pressure falls below the set value.
Type KVL regulates on outlet pressure only.
Pressure variations on the inlet side of the regulator do not affect the degree of opening as the valve is equipped with equalization bellows (6).
The bellows has an effective area corresponding to that of the valve seat neutralizing any affect to the setting.
The regulator is also equipped with a damping device (9) providing protection against pulsations which can normally arise in a refrigeration system.
The damping device helps to ensure long life for the regulator without impairing regulation accuracy.

P-band and Offset

Example with 58 psig setting



Metric conversions
1 psi = 0.07 bar
$^5/_9$ (t_1 °F - 32) = t_2 °C

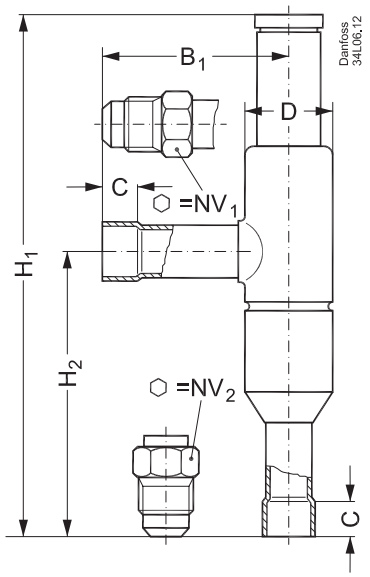
Proportional band
The p-band is defined as the difference between the pressure at which the valve plate starts to open (set point) and the pressure at which the valve is completely open.

Example
If the valve is set to open at 58 psig and the valve p-band is 29 psig, the valve will give maximum capacity when the outlet pressure reaches 29 psig.

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		H1	H2	B1	C solder	øD	Net weight
	Flare	Solder ODF						
	[in.]	[in.]	[in.]	[in.]	[in.]	[in.]	[in.]	[lbs]
KVL 12	1/2	1/2	7.047	3.898	2.520	0.375	1.181	0.9
KVL 15	5/8	5/8	7.047	3.898	2.520	0.5	1.181	0.9
KVL 22	—	7/8	7.047	3.898	2.520	0.625	1.181	0.9
KVL 28	—	1 1/8	10.197	5.945	4.134	0.875	1.693	2.0
KVL 35	—	1 3/8	10.197	5.945	4.134	1.0	1.693	2.0

Metric conversions
1 in. = 25.4 mm
1 lb = 0.454 kg