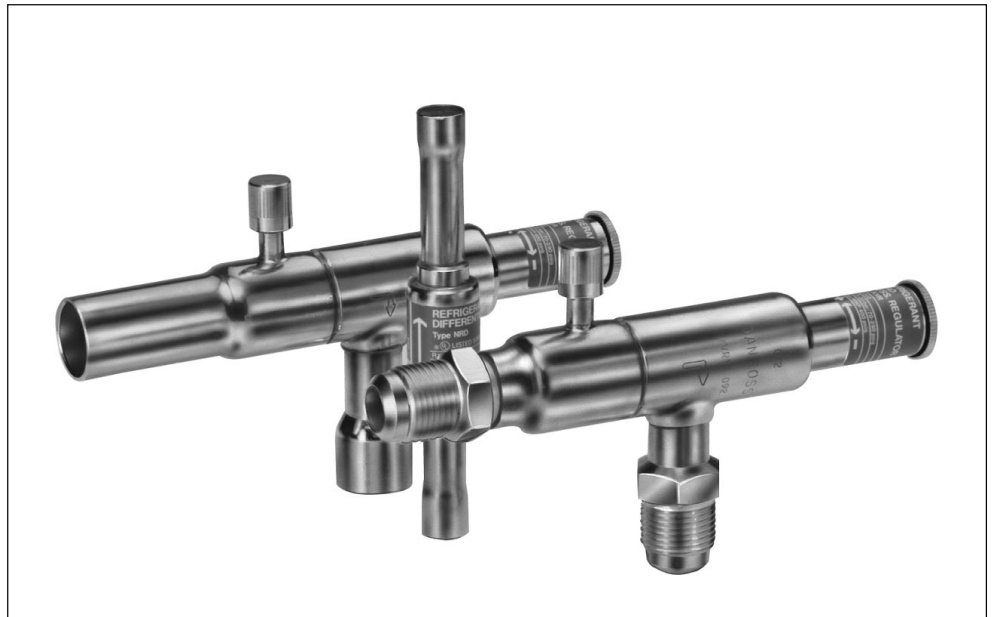


Condensing pressure regulator type KVR and NRD

Introduction



Regulator system KVR and NRD is used to maintain a constant and sufficiently high condenser and receiver pressure in refrigeration and air conditioning plant with air-cooled condensers.

Features

- Pulsation damping design
- Durable, all brazed construction
- 1/4 in. access valve for pressure testing
- Capacities up to 72 kW (R 22)
- Can be used as a high pressure to suction side relief valve
- For R 22, R 134a, R404A, R 12, R 502 and other fluorinated refrigerants

Approvals

DSRK, Deutsche Schiffs-Revision und -Klassifikation, Germany

Technical data

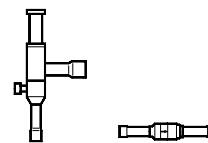
Type	Refrigerants ¹⁾	Regulating range (start of opening) bar	Opening diff. pressure Δp bar		Max. temperature °C	Max. working pressure PB bar	Max. test pressure p' bar
			Start of opening	Fully open			
KVR 12, 15, 22	R 22, R134a, R 404A, R 12, R 502	5 → 17.5			+130 ²⁾	28	31
KVR 28, 35		5 → 17.5			+130 ²⁾	28	31
NRD			1.4	3.0	+135	28	36

¹⁾ Other fluorinated refrigerants can be used at the stated temperatures and pressures.

²⁾ Provided that the access valve is removed and that the connector is sealed with a seal cap and nut – otherwise +105°C.

Condensing pressure regulator, type KVR and NRD

Ordering



Type	Rated liquid capacity ¹⁾ (evaporator capacity) kW					Rated hot gas capacity ¹⁾ (evaporator capacity) kW					Flare connection ²⁾		Code no.	Solder connection		Code no.							
	R 22	R 134a	R 404A	R 12	R 502	R 22	R 134a	R 404A	R 12	R 502	in.	mm		in.	mm								
KVR 12	28.1	26.5	20.5	21.7	19.0	7.4	6.3	6.8	5.3	6.1	1/2	12	34L0091	1/2	12	34L0093							
KVR 15											5/8	16		34L0092	5/8		16	34L0097					
KVR 22																							
KVR 28	71.7	67.6	52.3	54.4	48.4	19.1	16.4	17.6	13.8	15.8				1 1/8		34L0095							
KVR 35																						28	34L0099
NRD																							1 3/8
														1/2		20-1132							
															12	20-1136							

¹⁾ Specified at evaporating temperature $t_e = -10^\circ\text{C}$, condensing temperature $t_c = +30^\circ\text{C}$, pressure drop across valve $\Delta p = 0.2$ bar for liquid capacity and $\Delta p = 0.4$ bar for hot gas capacity, offset = 1.5 bar.

²⁾ KVR are delivered without flare nuts. Separate flare nuts can be supplied: 1/2 in./12 mm, code no. **11L1103**; 5/8 in./16 mm, code no. **11L1167**.

Do not select connection dimensions which are too small since gas velocities higher than 40 m/s at the inlet of the regulator can cause flow noise.

Capacity

Type	Condensing temperature t_c °C	Offset 1.5 bar					Offset 3 bar				
		Pressure drop Δp bar					Pressure drop Δp bar				
		0.1	0.2	0.4	0.8	1.6	0.1	0.2	0.4	0.8	1.6

Liquid capacity Q_e kW (evaporator capacity)

R 22

KVR 12 KVR 15 KVR 22	10	23.7	33.5	47.4	67.0	94.8	42.5	60.2	85.1	120.4	170.5
	20	21.8	30.8	43.6	61.7	87.3	39.2	55.4	78.4	110.9	157.0
	30	19.8	28.1	39.7	56.2	79.4	35.6	50.4	71.3	100.9	142.9
	40	17.8	25.2	35.6	50.4	71.3	32.0	45.3	64.0	90.6	128.3
	50	15.7	22.2	31.4	44.4	62.9	28.2	39.9	56.4	79.9	113.1
KVR 28 KVR 35	10	60.5	85.6	121.1	171.2	242.3	108.9	154.0	217.8	308.2	436.2
	20	55.7	78.8	111.4	157.6	223.0	100.2	141.8	200.6	283.8	401.7
	30	50.7	71.7	101.4	143.4	202.9	91.2	129.0	182.5	258.2	365.5
	40	45.9	64.3	91.0	128.7	182.1	81.9	115.8	163.9	231.8	328.2
	50	40.1	56.8	80.3	113.6	160.7	72.2	102.1	144.4	204.4	289.3

Liquid capacity Q_e kW (evaporator capacity)

R 134a

KVR 12 KVR 15 KVR 22	10	22.8	32.3	45.6	64.6	91.3	40.7	57.5	81.4	115.0	163.0
	20	20.8	29.4	41.6	58.8	83.2	37.1	52.5	74.2	105.0	149.0
	30	18.7	26.5	37.4	53.0	74.9	33.4	47.3	66.9	94.7	134.0
	40	16.6	23.5	33.2	47.0	66.5	29.7	42.0	59.4	84.1	119.0
	50	14.5	20.5	29.0	41.0	58.0	25.9	36.6	51.8	73.3	104.0
KVR 28 KVR 35	10	58.3	82.4	117.0	165.0	233.0	104.0	147.0	208.0	295.0	418.0
	20	53.1	75.1	106.0	150.0	213.0	94.9	134.0	190.0	269.0	361.0
	30	47.8	67.6	95.7	135.0	191.0	85.5	121.0	171.0	242.0	343.0
	40	42.5	60.0	84.9	120.0	170.0	76.0	108.0	152.0	215.0	305.0
	50	37.0	52.3	74.0	105.0	148.0	66.3	93.7	133.0	188.0	266.0

The capacities are based on 0 K subcooling, evaporating temperature $t_e = -10^\circ\text{C}$ and 0 K superheat. For other evaporating temperatures, see the correction table next page.

Condensing pressure regulator, type KVR and NRD

Capacity (cont.)

Type	Condensing temperature t_e °C	Offset 1.5 bar					Offset 3 bar				
		Pressure drop Δp bar					Pressure drop Δp bar				
		0.1	0.2	0.4	0.8	1.6	0.1	0.2	0.4	0.8	1.6

Liquid capacity Q_e kW (evaporator capacity)

R 404A

KVR 12 KVR 15 KVR 22	10	18.4	25.9	36.8	52.0	73.5	32.9	46.4	65.6	92.9	131.3
	20	16.4	23.2	32.9	46.5	65.7	29.4	41.6	58.8	83.2	117.6
	30	14.5	20.5	29.0	41.0	58.0	25.9	36.6	51.8	73.3	103.7
	40	12.9	17.6	25.0	35.4	50.1	22.4	31.6	44.7	63.3	89.7
	50	10.5	14.9	21.0	29.7	42.1	18.8	26.6	37.6	53.2	75.4
KVR 28 KVR 35	10	46.9	66.3	93.8	132.3	188.0	84.0	118.7	168.0	237.3	337.1
	20	42.0	59.3	83.9	118.7	168.0	75.2	106.1	150.2	213.2	301.4
	30	37.0	52.3	73.9	104.6	148.1	66.3	93.7	132.3	188.0	265.7
	40	31.9	45.2	63.8	90.3	128.1	57.2	81.0	114.5	161.7	228.9
	50	26.9	37.9	53.7	75.9	107.0	48.1	68.0	96.2	136.5	193.2

The capacities are based on 0 K subcooling, evaporating temperature $t_e = -10^\circ\text{C}$ and 0 K superheat. For other evaporating temperatures, see the correction table.

Hot gas capacity Q_e kW (evaporator capacity)

R 22

KVR 12 KVR 15 KVR 22	10	3.3	4.6	6.4	8.8	11.8	6.0	8.4	11.8	16.3	22.2
	20	3.5	5.0	6.9	9.6	13.0	6.3	8.9	12.5	17.4	23.9
	30	3.7	5.3	7.4	10.3	14.4	6.6	9.4	13.2	18.4	25.4
	40	3.9	5.5	7.8	10.9	15.0	6.9	9.8	13.7	19.3	26.7
	50	4.1	5.7	8.1	11.3	15.7	7.1	10.1	14.2	20.0	27.7
KVR 28 KVR 35	10	8.5	11.9	16.6	22.8	30.3	15.8	22.2	31.1	43.2	58.7
	20	9.1	12.8	17.9	24.8	33.5	16.7	23.5	33.1	46.1	63.1
	30	9.7	13.6	19.1	26.6	36.3	17.6	24.8	34.9	48.7	67.2
	40	10.2	14.3	20.1	28.1	38.7	18.3	25.9	36.4	51.0	70.6
	50	10.5	14.9	20.9	29.2	40.4	18.9	26.6	37.5	52.6	73.2

Hot gas capacity Q_e kW (evaporator capacity)

R 134a

KVR 12 KVR 15 KVR 22	10	2.9	4.0	5.6	7.6	9.7	5.4	7.6	10.7	14.7	19.6
	20	3.1	4.3	6.0	8.2	10.8	5.6	7.9	11.1	15.4	20.8
	30	3.2	4.5	6.3	8.8	11.7	5.8	8.2	11.6	16.1	21.9
	40	3.4	4.7	6.6	9.2	12.5	6.0	8.5	11.9	16.6	22.8
	50	3.4	4.8	6.8	9.5	13.0	6.1	8.6	12.1	16.9	23.3
KVR 28 KVR 35	10	7.5	10.5	14.5	19.6	25.0	14.4	20.2	28.2	38.8	51.8
	20	7.9	11.1	15.5	21.2	27.8	15.0	21.0	29.5	40.8	55.0
	30	8.4	11.8	16.4	22.6	30.2	15.5	21.8	30.6	42.5	57.9
	40	8.7	12.2	17.1	23.7	32.1	15.9	22.4	31.5	43.9	60.3
	50	8.9	12.5	17.6	24.5	33.5	16.1	22.7	32.0	44.7	61.7

Hot gas capacity Q_e kW (evaporator capacity)

R 404A

KVR 12 KVR 15 KVR 22	10	3.2	4.5	6.3	8.6	11.7	5.8	8.1	11.3	15.8	21.6
	20	3.4	4.7	6.6	9.2	12.4	6.1	8.4	11.8	16.5	22.7
	30	3.5	4.9	6.8	9.5	13.0	6.1	8.5	12.0	16.8	23.2
	40	3.5	4.9	6.8	9.6	13.1	6.1	8.6	12.1	16.9	23.2
	50	3.5	4.9	6.8	9.6	13.1	6.1	8.6	12.1	16.9	23.2
KVR 28 KVR 35	10	8.3	11.7	16.2	22.3	30.0	15.4	21.5	30.2	42.0	57.1
	20	8.7	12.2	17.1	23.7	32.2	16.0	22.2	31.3	43.7	60.0
	30	8.9	12.5	17.6	24.4	33.5	16.2	22.7	31.9	44.5	61.5
	40	9.0	12.6	17.8	24.8	33.0	16.1	22.7	31.9	44.7	61.5
	50	9.0	12.6	17.8	24.8	33.5	16.1	22.7	31.9	44.7	60.5

The capacities are based on 0 K subcooling, evaporating temperature $t_e = -10^\circ\text{C}$ and 0 K superheat. For other evaporating temperatures, see the correction table. Hot gas temperature ahead of valve $t_h = +60^\circ\text{C}$ for R 134a and R 404A and $+90^\circ\text{C}$ for R 22.

Correction factors t_e

t_e °C	-40	-30	-20	-10	0	+10
R 22	0.91	0.94	0.97	1.0	1.03	1.05
R 134a	0.88	0.92	0.96	1.0	1.04	1.08
R 404A	0.86	0.88	0.93	1.0	1.03	1.07

Plant capacity \times correction factor = table capacity.

Condensing pressure regulator, type KVR and NRD

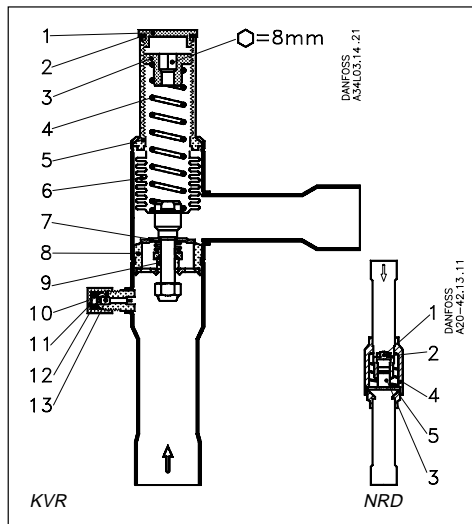
Design Function

KVR

1. Seal cap
2. Gasket
3. Setting screw
4. Main spring
5. Valve body
6. Equalizing bellows
7. Valve plate
8. Valve seat
9. Damping device
10. Manometer connection
11. Cap
12. Gasket
13. Insert

NRD

1. Piston
2. Valve plate
3. Piston guide
4. Valve body
5. Spring



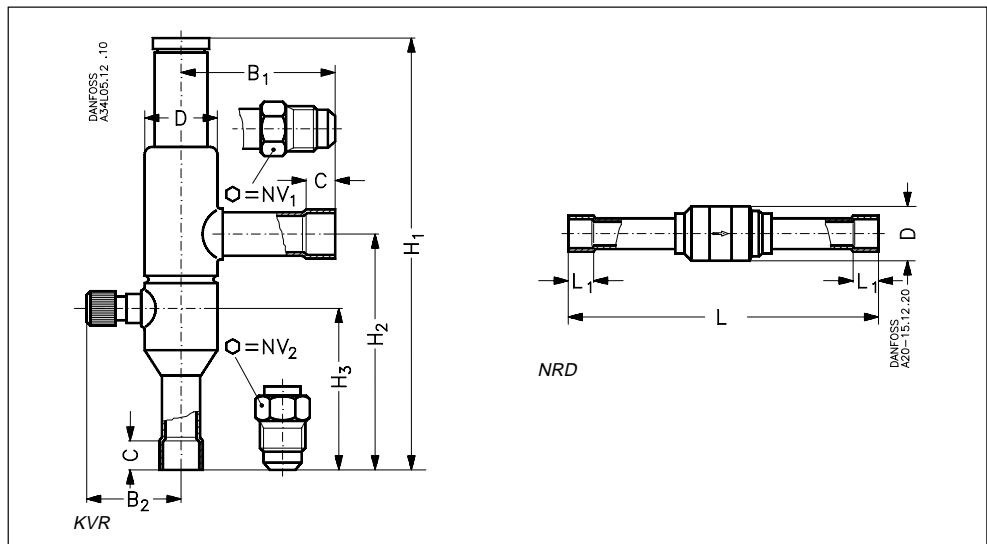
Regulator type KVR opens upon a rise in pressure on the inlet side, i.e. when the pressure in the condenser reaches the set value. KVR regulation is dependent only on the inlet pressure. Pressure variations on the outlet side of the regulator do not affect the degree of opening, since type KVR has an equalizing bellows (6). The effective area of this bellows corresponds to that of the valve seat.

In addition, the regulator is equipped with an effective damping device (9) to safe-guard against pulsations which can normally occur in refrigeration plant.

The damping device contributes to ensuring a long working life for the regulator without impairing regulation accuracy.

Differential valve type NRD begins to open when the pressure drop in the valve is 1.4 bar, and is fully open when the pressure drop is 3 bar.

Dimensions and weight



Type	Connection				NV ₁	NV ₂	H ₁	H ₂	H ₃	L	L ₁	B ₁	B ₂	C Solder	∅ D	Weight
	Flare		Solder ODF													
	in.	mm	in.	mm												
KVR 12	1/2	12	1/2	12	19	24	179	99	66			64	41	10	30	0.4
KVR 15	5/8	16	5/8	16	24	24	179	99	66			64	41	12	30	0.4
KVR 22			7/8	22			179	99	66			64	41	17	30	0.4
KVR 28			1 1/8	28			259	151	103			105	48	20	43	1.0
KVR 35			1 3/8	35			259	151	103			105	48	25	43	1.0
NRD										131	10				22	0.1