

Data Sheet

# Check valve Type **NRVS**

For industrial refrigeration in liquid line applications



Check valve type NRVS has no damping feature and therefore can only be used for liquid line applications. NRVS is designed to be mounted directly to PM or solenoid valves EVRA/EVRAT.

**Features:**

- Ensures correct direction of flow
- Applicable to HCFC, HFC and R717 (Ammonia)
- Classification: DNV, CRN, BV, EAC etc.
- To get an updated list of certification on the products please contact your local Danfoss Sales Company

**Portfolio overview**

Table 1: NRVS variants



Table 2: Portfolio overview

Description	NRVS 15	NRVS 25
<b>Refrigerants</b>	R134a, R22, R401A, R402A, R404A, R407A, R407B, R407C, R407F, R409A, R410A, R421A, R502, R507, R717	R134a, R22, R401A, R402A, R404A, R407A, R407B, R407C, R407F, R409A, R410A, R421A, R502, R507, R717
<b>Used for product</b>	EVRA 10 - 15 EVRAT 10 - 15	EVRA 20 - 25 EVRAT 20 - 25 PM 15 - 25
<b>Application</b>	Liquid line applications	Liquid line applications
<b>Media temperature range</b>	-50 °C – 140 °C (-58 °F - 284 °F)	-50 °C – 140 °C (-58 °F - 284 °F)
<b>MWP [bar/psig]</b>	28 bar/406 psig	28 bar/406 psig
<b>k<sub>v</sub> (m<sup>3</sup>/h)</b>	1.4 for EVRA/EVRAT 10 2.2 for EVRA/EVRAT 15	4.1 for EVRA/EVRAT 20 7.0 for EVRA 4.0 for PM 15 6.0 for PM 20 7.5 for PM 25
<b>Packing format</b>	Multi pack (12 pcs)	Multi pack (10 pcs)

## Media

### **Refrigerants**

Applicable to HCFC, HFC and R717 (Ammonia). Flammable hydrocarbons are not recommended. The valve is only recommended for use in closed circuits. For further information please contact Danfoss ([store.danfoss.com/en/](https://store.danfoss.com/en/)).

### **New refrigerants**

Danfoss products are continually evaluated for use with new refrigerants depending on market requirements.

When a refrigerant is approved for use by Danfoss, it is added to the relevant portfolio, and the R number of the refrigerant (e.g. R513A) will be added to the technical data of the code number. Therefore, products for specific refrigerants are best checked at [store.danfoss.com/en/](https://store.danfoss.com/en/), or by contacting your local Danfoss representative.

**Product specification**

**Pressure and temperature data**

Table 3: Pressure and temperature data

Temperature of medium	-50 °C – 140 °C (-58 °F - 284 °F)
Maximum working pressure	PS = 28 bar/406 psig

**Design**

Table 4: Design

Materials	Valve housing made of Stainless Steel Gaskets are non-asbestos
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**Capacity tables**

For the valve combination of EVRA/EVRAT

Figure 1: For the valve combination of EVRA/EVRAT

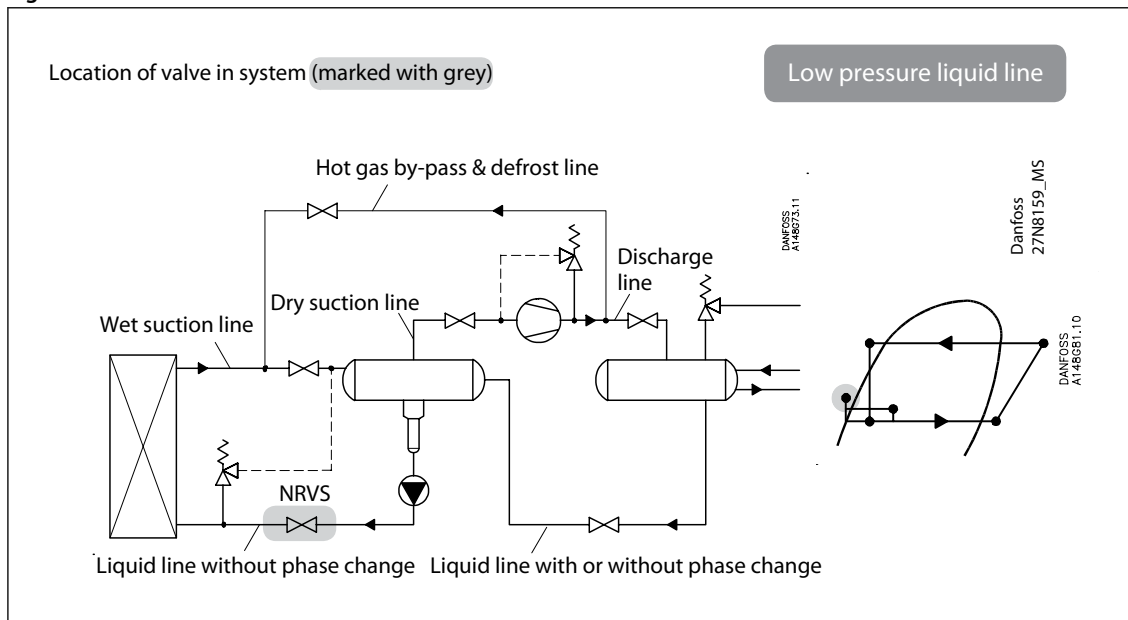


Table 5: For the valve combination of EVRA/EVRAT

Valve combination		EVRA/EVRAT 10 + NRVS 15	EVRA/EVRAT 15 + NRVS 15	EVRA/EVRAT 20 + NRVS 25	EVRA + NRVS 25
$k_v$ (m <sup>3</sup> /h)		1.4	2.2	4.1	7
Evaporating temperature $T_e$	Pressure $\Delta p$ (bar)	Capacities (kW) $Q_o$ at circulation rate 1 R717			
-40 °C	0.15	172	270	504	960
	0.25	222	349	650	1110
	0.3	243	382	713	1216
	0.4	281	441	823	1405
	0.5	314	493	920	1570
-30 °C	0.15	167	262	489	835
	0.25	215	338	631	1078
	0.3	236	371	691	1180
	0.4	273	428	798	1363
	0.5	305	479	893	1524
-20 °C	0.15	161	254	473	808
	0.25	208	327	610	1042
	0.3	228	359	669	1142
	0.4	264	414	772	1319
	0.5	295	463	863	1475

## Check valve, Type NRVS

Valve combination		EVRA/EVRAT 10 + NRVS 15	EVRA/EVRAT 15 + NRVS 15	EVRA/EVRAT 20 + NRVS 25	EVRA + NRVS 25		
$k_v$ (m <sup>3</sup> /h)		1.4	2.2	4.1	7		
Evaporating temperature $T_e$	Pressure $\Delta p$ (bar)	Capacities (kW) $Q_0$ at circulation rate 1 R717					
		-10 °C	0.15	156	245	456	780
			0.25	201	316	589	1005
			0.3	220	346	645	1102
			0.4	254	399	745	1271
			0.5	284	447	833	1422

**NOTE:**

The capacities in the table must be divided by the actual circulation rate, or the evaporator capacities must be multiplied with the actual circulation rate.

**Table 6: Minimum opening differential pressure**

EVRA/EVRAT 10 - 20 + NRVS	0.07 bar
EVRA/EVRAT 25 + NRVS	0.11 bar

**Table 7: Example**

An application has the following operating conditions	
Refrigerant	R717
Evaporating temperature	-30 °C
Evaporator capacity ( $Q_0$ )	290 kW
Circulation rate	4
Pressure	$\Delta p \leq 0.3$ bar

**Solution**

$$290 \times 4 = 1160 \text{ kW}$$

$$\text{EVRAT 25 + NRVS 25: } Q_0 = 1180 \text{ kW, at}$$

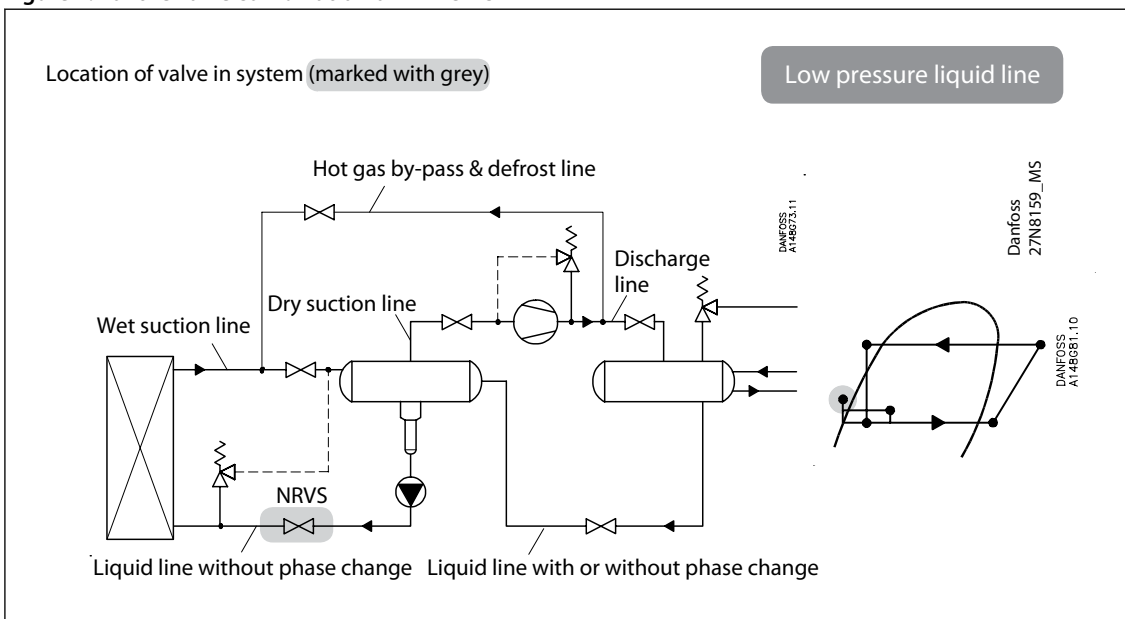
$$\Delta p = 0.3 \text{ bar is chosen}$$

**NOTE:**

Precise valve capacities can be calculated for various refrigerants by using the Danfoss Coolselector software.

**For the valve combination of PM 15-25**

**Figure 2: For the valve combination of PM 15-25**



## Check valve, Type NRVS

**Table 8: For the valve combination of PM 15-25**

Valve combination		PM 15	PM 20	PM 25
		NRVS 25	NRVS 25	NRVS 25
$k_v$ (m <sup>3</sup> /h)		4	6	7.5
Evaporating temperature $T_e$	Pressure $\Delta p$ (bar)	Capacities (kW) $Q_0$ at circulation rate 1 R717		
-50 °C	0.15	-	-	-
	0.25	653	979	1224
	0.3	715	1072	1340
	0.4	825	1238	1547
	0.5	923	1384	1730
-40 °C	0.15	-	-	-
	0.25	635	951	1188
	0.3	695	1043	1303
	0.4	803	1204	1506
	0.5	897	1346	1683
-30 °C	0.15	-	-	-
	0.25	615	922	1152
	0.3	675	1011	1265
	0.4	779	1169	1460
	0.5	871	1306	1632
-20 °C	0.15	-	-	-
	0.25	595	894	1114
	0.3	653	979	1224
	0.4	753	1130	1412
	0.5	852	1264	1580
-10 °C	0.15	-	-	-
	0.25	575	862	1075
	0.3	629	944	1180
	0.4	727	1090	1362
	0.5	812	1219	1523

**NOTE:**

The capacities in the table must be divided by the actual circulation rate, or the evaporator capacities must be multiplied with the actual circulation rate.

**Minimum opening differential pressure:**

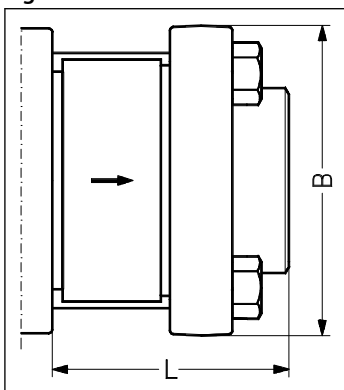
PM + NRVS will be fully open at  $\Delta p = 0.25$  bar.

**NOTE:**

Precise valve capacities can be calculated for various refrigerants by using the Danfoss Coolselector software.

### Dimensions and weights

Figure 3: NRVS on valve



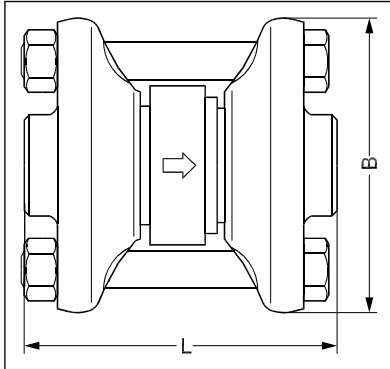
## Check valve, Type NRVS

**Table 9: NRVS on valve**

Type	L [mm]	B [mm]	Weight <sup>(1)</sup> kg
NRVS 15	47.5	78	0.1
NRVS 25	60.5	96	0.25

<sup>(1)</sup> NRVS without flanges and bolts

**Figure 4: NRVS stand alone**



**Table 10: NRVS stand alone**

Type	L [mm]	B [mm]	Weight <sup>(2)</sup> kg
NRVS 15	78	80	0.1
NRVS 25	98	96	0.25

<sup>(2)</sup> NRVS without flanges and bolts

## Ordering

**Table 11: NRVS 15-25 Ordering**

Check valve	For valve type	Flanges, gasket and bolts <sup>(1)</sup>	Flanges, gaskets and bolts for NRVS stand alone <sup>(3)</sup>	Flange type

**Table 12: NRVS 15-25 Ordering**

Valve type	Code. no.	For valve type	Code no.	Weight <sup>(2)</sup> [kg]	Flange type	Connection size
<b>Check valve</b>			<b>Flanges, gasket and bolts <sup>(1)</sup></b>			
<b>NRVS 15</b>	<b>020-2032</b>	EVRA/T 10, EVRA/T 15	<b>027N1255</b>	0.7		¾ in.
<b>NRVS 25</b>	<b>020-2033</b>	EVRA/T 20, EVRA/T 25, PM 15, PM 20, PM 25	<b>027N1254</b>	1.1		1 in.
			<b>Flanges, gaskets and bolts for NRVS stand alone <sup>(3)</sup></b>			
			<b>Code no.</b>	<b>Weight <sup>(2)</sup> [kg]</b>	<b>Flange type</b>	<b>Connection size</b>
			<b>027N1256</b>	0.256		¾ in.
			<b>027N1257</b>	0.443		1 in.

<sup>(1)</sup> Consists of one standard and one special flange, one gasket and 2 bolts

<sup>(2)</sup> Flange and bolts only

<sup>(3)</sup> Consist of flanges, gaskets, bolts and nuts. One standard flange and one special flange, two gasket, 2 bolts and 2 nuts.

**NOTE:**

One standard flange and one special flange, two gasket, 2 bolts and 2 nuts.



## Certificates, declarations, and approvals

The list contains all certificates, declarations, and approvals for this product type. Individual code number may have some or all of these approvals, and certain local approvals may not appear on the list.

Some approvals may change over time. You can check the most current status at [danfoss.com](https://danfoss.com) or contact your local Danfoss representative if you have any questions.

**Table 13: Valid Approvals**

File name	Document type	Document topic	Approval authority
11-1-0310-2012	Explosive - Safety Certificate	–	GPN
UA.089.D.00188-17	UA Declaration	PED	LLC CDC EURO TYSK
UA.TR-089.0993-17	Pressure - Safety Certificate	PED	LLC CDC EURO TYSK
033F0691.AD	Manufacturers Declaration	RoHS	Danfoss
033F0686.AG	Manufacturers Declaration	PED	Danfoss
033F0453.AD	Manufacturers Declaration	ATEX	Danfoss
RU Д- FR.Б/108.В.03804	EAC Declaration	Machinery & Equipment	EAC

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