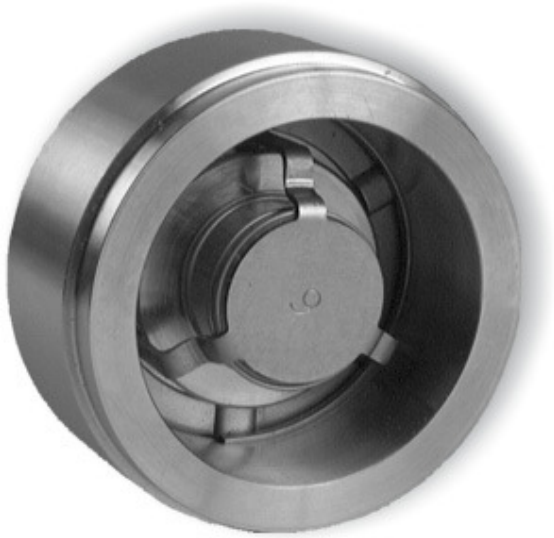
Refrigeration and Air Conditioning Controls

Technical leaflet

Check valve for EVRA, EVRAT and PM valves in liquid lines

Type NRVS



REFRIGERATION AND AIR CONDITIONING

Technical leaflet **Check valve for EVRA, EVRAT and PM valves in liquid lines, type NRVS**

Introduction

NRVS

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 all common non flammable refrigerants including R 717 and non corrosive gases/liquids dependent on sealing material compatability.

Technical data

Temperature of medium:
–50 °C → +140 °C

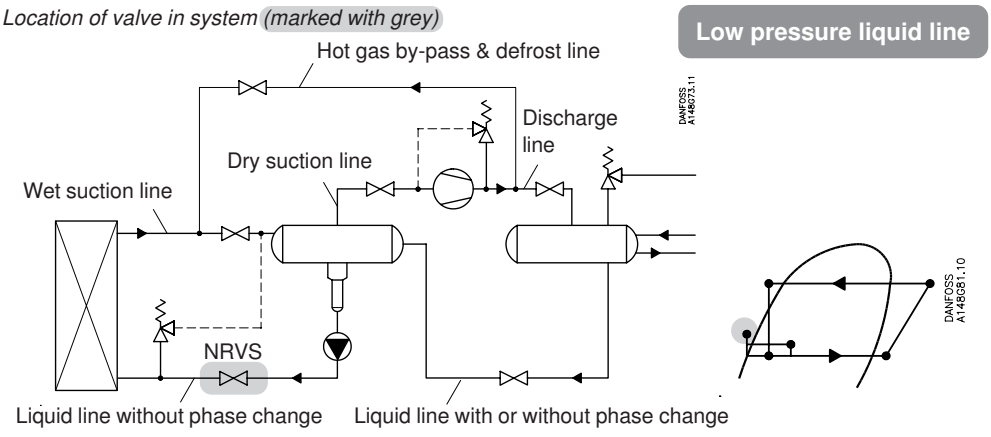
Maximum working pressure
PB = 28 bar/406 psig

Materials

- Valve housing made of Stainless Steel
- Gaskets are non-asbestos

Capacities

Location of valve in system (marked with grey)



Valve combination	EVRA/EVRAT 10 + NRVS 15	EVRA/EVRAT 15 + NRVS 15	EVRA/EVRAT 20 + NRVS 25	EVRA + NRVS 25
k_v (m^3/h)	1.4	2.2	4.1	7.0

Evaporating temperature T_e	Pressure Δp (bar)	Capacities (kW) Q_0 at circulation rate 1 R 717			
–40 °C	0.15	172	270	504	960
	0.25	222	349	650	1110
	0.30	243	382	713	1216
	0.40	281	441	823	1405
	0.50	314	493	920	1570
–30 °C	0.15	167	262	489	835
	0.25	215	338	631	1078
	0.30	236	371	691	1180
	0.40	273	428	798	1363
	0.50	305	479	893	1524
–20 °C	0.15	161	254	473	808
	0.25	208	327	610	1042
	0.30	228	359	669	1142
	0.40	264	414	772	1319
	0.50	295	463	863	1475
–10 °C	0.15	156	245	456	780
	0.25	201	316	589	1005
	0.30	220	346	645	1102
	0.40	254	399	745	1271
	0.50	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.

Minimum opening differential pressure:

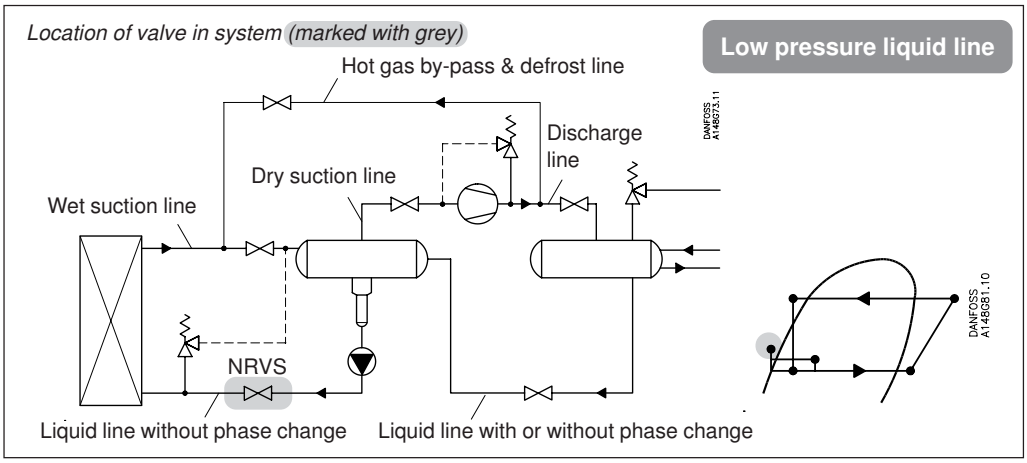
EVRA/EVRAT 10 - 20 + NRVS	0.07 bar
EVRA/EVRAT 25 + NRVS	0.11 bar

Example
An application has the following operating conditions:
Refrigerant: ..... R 717
Evaporating temperature: ..... –30 °C
Evaporator capacity (Q_0): ..... 290 kW
Circulation rate: 4
$\Delta p \leq 0.3$ bar

Solution
$290 \times 4 = 1160$ kW
EVRAT 25 + NRVS 25: $Q_0 = 1180$ kW, at $\Delta p = 0.3$ bar is chosen.

Precise valve capacities can be calculated for various refrigerants by using the “DIRcalc™” (Danfoss Industrial Refrigeration calculation programme).

Capacities
(continued)



Valve combination	PM 15	PM 20	PM 25
	NRVS 25	NRVS 25	NRVS 25
k_v (m³/h)	4.0	6.0	7.5

Evaporating-temperature T_e	Pressure Δp (bar)	Capacities (kW) Q_0 at circulation rate 1 R 717		
–50 °C	0.15	-	-	-
	0.25	653	979	1224
	0.30	715	1072	1340
	0.40	825	1238	1547
	0.50	923	1384	1730
–40 °C	0.15	-	-	-
	0.25	635	951	1188
	0.30	695	1043	1303
	0.40	803	1204	1506
	0.50	897	1346	1683
–30 °C	0.15	-	-	-
	0.25	615	922	1152
	0.30	675	1011	1265
	0.40	779	1169	1460
	0.50	871	1306	1632
–20 °C	0.15	-	-	-
	0.25	595	894	1114
	0.30	653	979	1224
	0.40	753	1130	1412
	0.50	852	1264	1580
–10 °C	0.15	-	-	-
	0.25	575	862	1075
	0.30	629	944	1180
	0.40	727	1090	1362
	0.50	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 Δp = 0.25 bar.

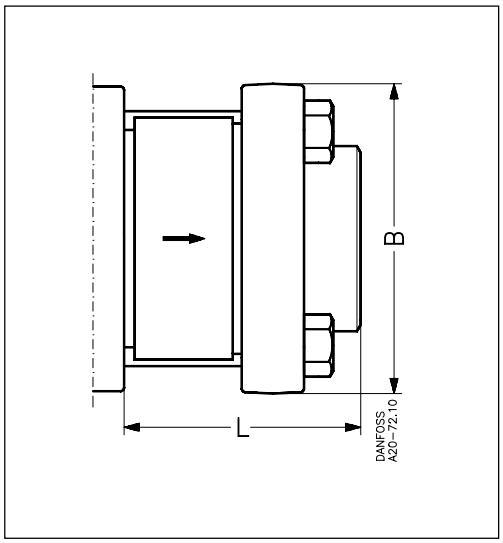
Precise valve capacities can be calculated for various refrigerants by using the "DIRcalc™" (Danfoss Industrial Refrigeration calculation programme).

Ordering

Check valve			Flanges, gaskets and bolts [1]			
Valvetype	**Code. no.**	For valve type	**Code. no.**	Weight [2] [kg]	Flange-type	Connection-size
NRVS 15	**020-2032**	EVRA/T 10, EVRA/T 15	**027N1255**	0.7		$^3/_4$ in.
NRVS 25	**020-2033**	EVRA/T 20, EVRA/T 25, PM 15, PM 20, PM 25	**027N1254**	1.1		1 in.

[1] Consists of one standard and one special flange, one gasket and bolts.
[2] Flange and bolts only.

Dimensions and weights



Type	L mm	B mm	Weight [1] kg
NRVS 15	47.5	78.0	0.1
NRVS 25	60.5	96.0	0.25

[1] NRVS without flanges and bolts