

Data Sheet

Liquid level regulating valves
Type **PMFL / PMFH** and **SV**

For modulating liquid level control in refrigeration,
freezing and air conditioning plant



For modulating liquid level control in refrigeration, freezing and air conditioning plant, a system comprising a liquid level regulating valve type PMFL or PMFH, controlled by a pilot float valve type SV, is used.

PMFL and SV systems are used on the evaporator side. PMFH and SV systems are used on the condenser side.

The system is suitable for use with ammonia or fluorinated refrigerants. The PMFL and PMFH can be used in liquid lines to or from

- evaporators
- separators
- intermediate coolers
- condensers
- receivers

Modulating liquid level regulation provides liquid injection that is proportional to the actual capacity. This gives a constant amount of flashgas, thus ensuring stable regulation and economic operation because variations in pressure and temperature are held to a minimum.

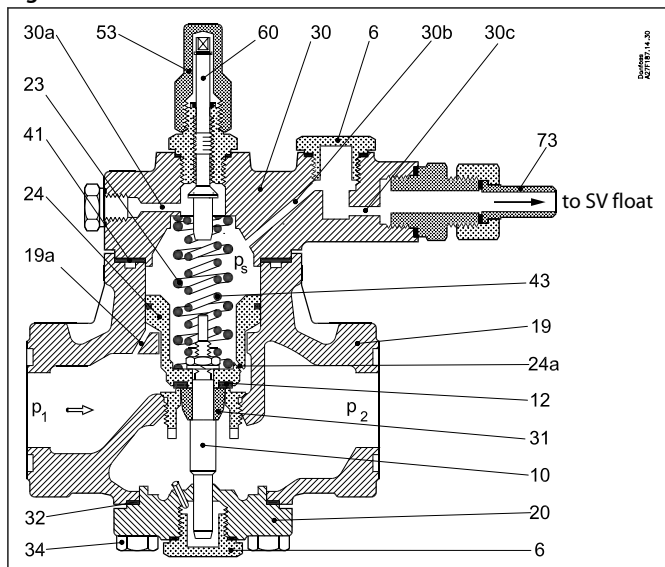
Features

- Applicable to HCFC, HFC and R717 (Ammonia)
- PMFL / PMFH are based on PM valve family housings
- Same flange programme as for PM valve series
- Valve housing in low temperature cast iron (spherical) - EN GJS 400-18-LT
- Manual operation possible
- Position indicator available
- Pressure gauge connection to monitor inlet pressure
- Simple installation
- Main valve top cover can be located in any position without affecting the function
- Classification: DNV, CRN, BV, EAC etc. To get an updated list of certification on the products please contact your local Danfoss Sales Company

Functions

PMFL

Figure 1: PMFL



When the liquid level inside the float drops, the float orifice opens. This relieves the higher pressure, p_s , acting on the servo piston to the low pressure side causing the PMFL to open. Variations in liquid level will result in variations in pressure over the piston and variation in the amount of liquid injected. It is important to choose the correct spring set when designing the plant. The spring set should be selected from the table below:

Table 1: Subcooling

Subcooling		Pressure difference over main valve			
		bar	psi	bar	psi
K	F	4 – 15	58 – 218	1.2 – 4.0	17 – 58
0 – 8	0 – 14	Normal spring set		Weak spring set	
8 – 40	14 – 72	Strong spring set			

The setting spindle, pos. 60, has not been set from factory. It is imperative that the setting spindle is adjusted before the valve is put into operation. The outer spring, pos. 23, is preset and the inner spring, pos. 43, is adjusted when turning the spindle. The following tables shows the adjustment of the inner spring in number of turns of the spindle as a function of valve size, spring type and pressure difference:

Table 2: PMFL

PMFL	C/w normal (factory mounted) spring set, subcooling 0 – 8 K ~ 0 – 14 F				
	Pressure difference (Dp) over PMFL in bar or psi				
	< 5 bar	5 – 8 bar	8 – 10 bar	10 – 12 bar	> 12 bar
	< 72 psi	72 – 116 psi	116 – 145 psi	145 – 174 psi	> 174 psi
80	No tension	2 – 3	3 – 4.5	4.5 – 6	ca. 7
125	No tension	3 – 5	5 – 7	7 – 9	ca. 10
200	No tension	3 – 5	5 – 7	7 – 9	ca. 10
300	No tension	4 – 6	6 – 9	9 – 12	ca. 14

Table 3: PMFL

PMFL	C/w strong spring set, subcooling 8 – 40 K ~ 14 – 72 F	
	Pressure difference (Dp) over PMFL in bar or psi	
	6 – 9 bar	> 9 bar
	87 – 131 psi	> 131 psi
80	4	Max. tension
125	6	Max. tension

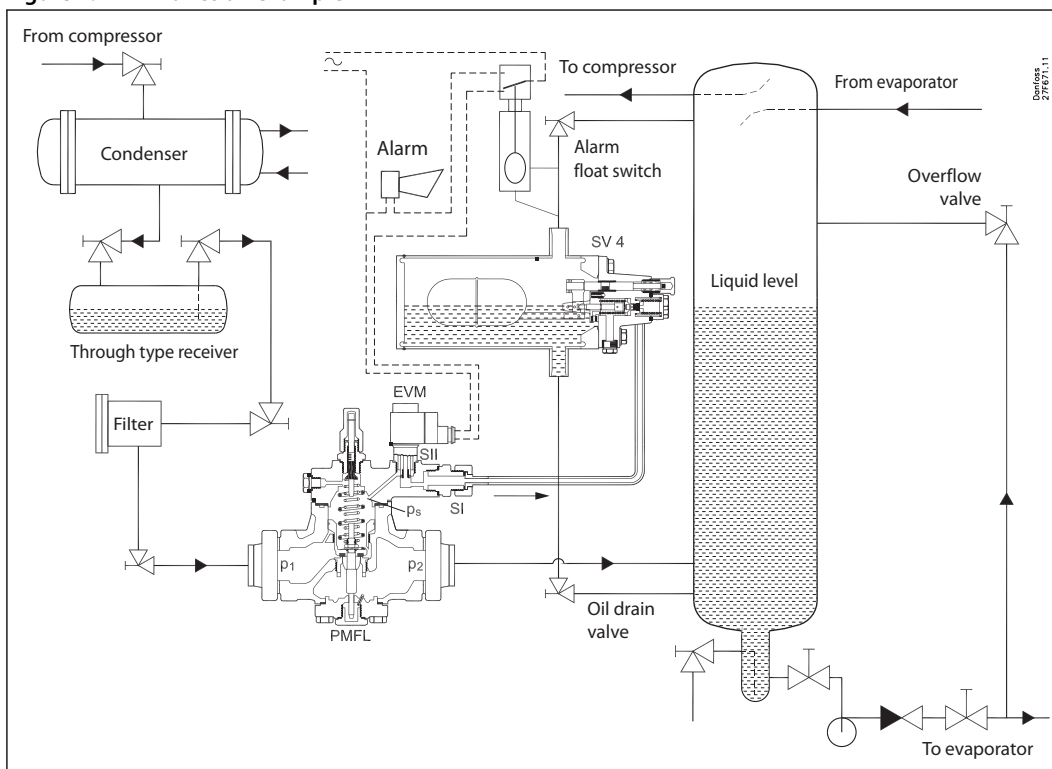
Table 4: PMFL

PMFL	C/w strong spring set, subcooling 8 – 40 K ~ 14 – 72 F
	Pressure difference (Dp) over PMFL in bar or psi
	6 – 16 bar
	87 – 232 psi
300	Spring must always be set to max. tension

Table 5: PMFL

PMFL	C/w weak spring set, low pressure plants			
	Pressure difference (Dp) over PMFL in bar or psi			
	1.2 – 1.8 bar	1.8 – 2.5 bar	2.5 – 3 bar	3 – 4 bar
	17 – 26 psi	26 – 36 psi	36 – 43 psi	43 – 58 psi
80	No tension	3 – 4	4 – 6	Max. tension
125	No tension	4 – 6	6 – 8	Max. tension
200	No tension	4 – 6	6 – 8	Max. tension
300	No tension	5 – 7	5 – 7	Max. tension

Figure 2: PMFL function example



The values for spindle turns are an indication for an initial setting only. If a position indicator is used, a more precise modulation can be achieved when fine tuning the valve setting. If the PMFL is not opening fully, the spring tension must be reduced. If the PMFL is operating in a ON / OFF function, the spring tension should be increased. The condenser pressure will have an effect on the fine tuning and large variations in condensing pressure might call for readjustment. The subcooling is measured just before the PMFL and the pressure difference is for the valve only excluding piping and armatures.

The PMFL can be used together with SV 4 as a pilot valve.

The orifices determines the K_v (C_v) value of the pilot and the following table can be used as an initial selection guide:

Table 6: PMFL

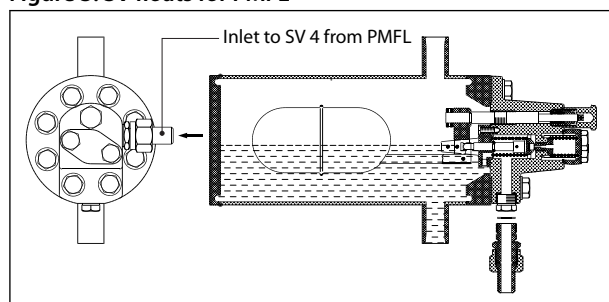
PMFL	SV 4 – 6	
	Ø 2.5	Ø 3 (SV 4)
80	X	
125	X	
200	X	
300		X

The final choice of orifice may vary depending on refrigerant and pressure levels. Smaller pressure levels needs a bigger orifice. Pressure difference levels below 3 bar (43 psi) need SV 4 – 6 with Ø3 mm orifice.

SV floats for PMFL

SV 4 can be used for PMFL low pressure control system. The float must be connected as shown.

Figure 3: SV floats for PMFL

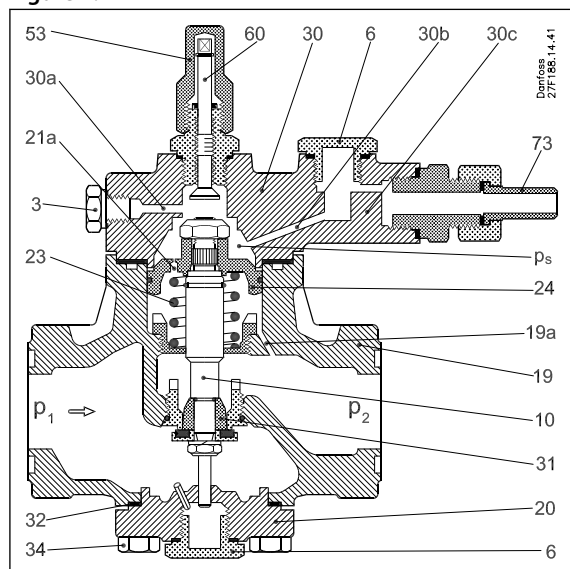


NOTE:

Only one inlet connection possible for SV 4.

PMFH

Figure 4: PMFH



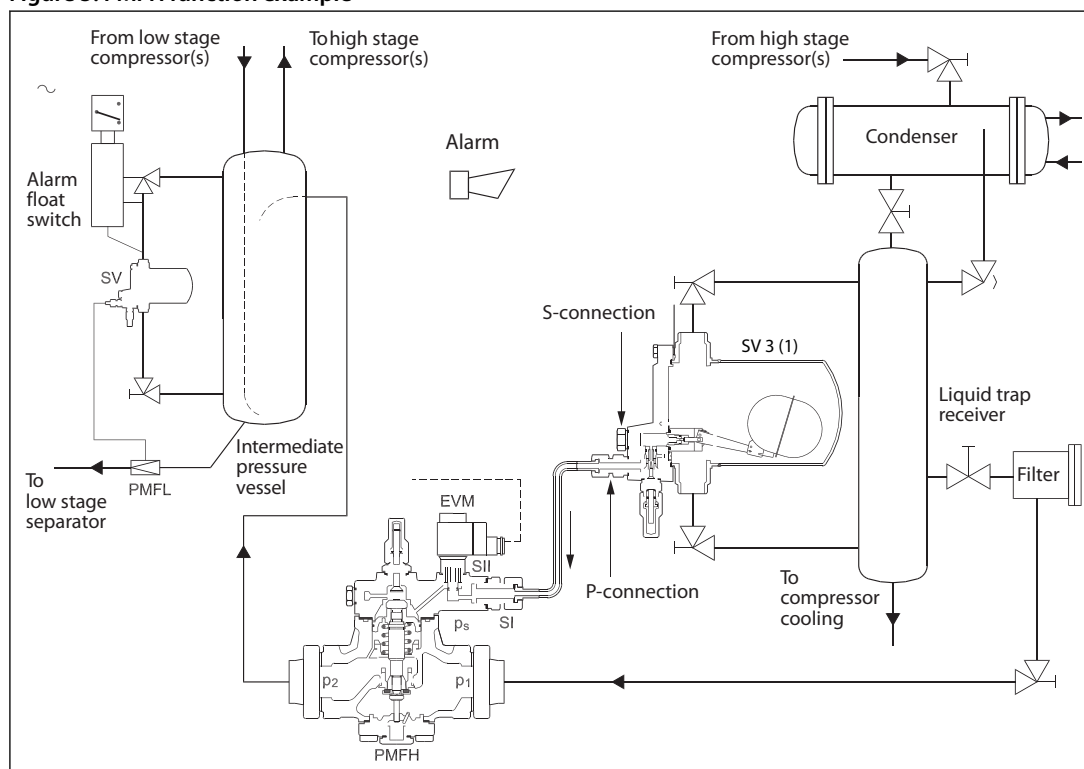
If the liquid level inside the SV float rises, the float orifice opens and relieves pressure through the pilot line to the top of the PMFH, increasing the pressure, p_s , moving the pushrod downwards and opening the PMFH. The pilot line is connected in the topcover at SI. Override of the pilot signal can be made by using an EVM valve at SII. It is important to choose the correct spring set when designing the plant. The spring set should be selected from the table below:

Table 7: spring set selection

Pressure difference over main valve			
bar	psi	bar	psi
0 – 4.5	0 – 65	> 4.5	> 65
Weak spring set		Normal spring set	

The PMFH can be used together with either SV 1 or 3 with the SV mounted with the bleed valve downwards, refer to the drawing below. This reverses the opening so that rising float opens the orifice.

Figure 5: PMFH function example



i NOTE:

High pressure float system (for explanatory purposes only)

SV 1 - 3

SV 1 – 3 float has 2 different pilot connections: S-port (series connection with PMFH) or P-port (parallel connection with the PMFH).

P-port:

When using the P-port, it is possible to force open the PMFH valve to a fully open position. This is practical for service purposes or to confirm if the float has sufficient capacity for the PMFH and the operating conditions. However, when P-port connection is used it is possible to overfill a system due to constant bleeding or unauthorised tampering. In this case, it is advisable to introduce a shut off when the liquid level reaches a preset point. Shut off can be done via an electrical switch if an EVM valve is mounted in the SII port in the top of the PMFH. It is only advisable to use the P-port at low pressure difference.

S-port:

The S-port offers the advantage of a preorifice which divides the pressure drop and any wear possibility due to cavitation. S-port connection must be used at high pressure differences, $dp > 10$ bar (145 psi). The K_V (C_V) value of the SV is higher using P-port than using S-port. A higher P-band can thus be obtained.

Media

Refrigerants

Applicable to HCFC, HFC and R717 (Ammonia).

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/, or by contacting your local Danfoss representative.

Product specification

Pressure and temperature

Table 8: Pressure and temperature data

Description	Values
Max. working pressure	PMFL / H: MWP = 28 bar SV: MWP = 28 bar
Max. test pressure	PMFL / H: Max. test pressure = 42 bar SV: Max. test pressure = 42 bar
Temperature of media	-60 °C – 120 °C

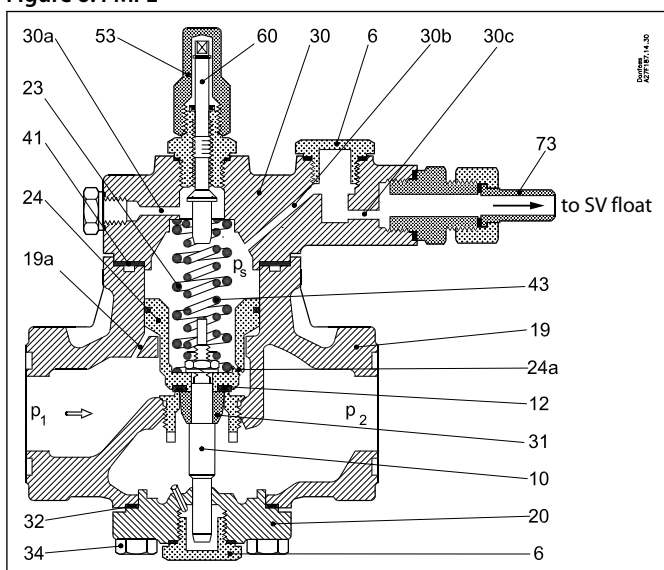
NOTE:

Max. working pressure is limited to
MWP = 21 bar when media temperatures are:
below -20 °C for valves made of GGG-40.3 and
below -10 °C for valves made of GG-25.

Material specification

PMFL

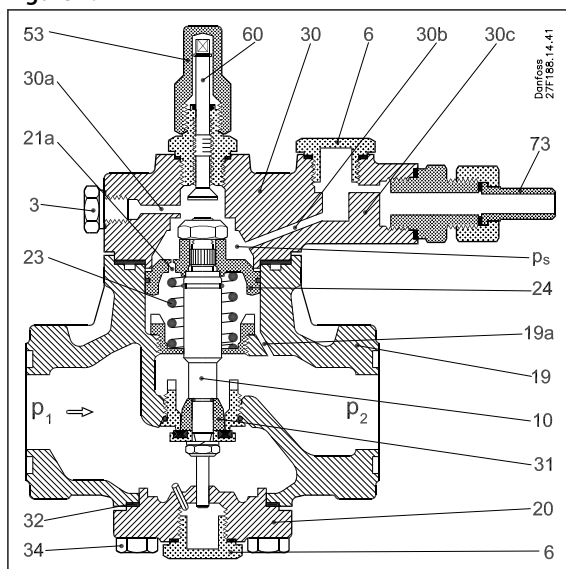
Figure 6: PMFL



6	Seal plug	23	Main spring	43	Supplementary spring
10	Valve spindle	24	Servo piston	44	Manometer connection
12	Valve seat	24a	Channel in servo piston	53	Spindle cap
19	Valve body	30	Top cover	60	Setting spindle
19a	Channel in valve body	30a.b.c	Channels in top cover	73	Pilot connection
20	Bottom cover	31	Valve cone		

PMFH

Figure 7: PMFH



3	Manometer connection	20	Bottom cover	30a.b.c	Channels in top cover
6	Seal plug	21a	Channel in servo piston	31	Valve cone
10	Valve spindle	23	Main spring	53	Spindle cap
19	Valve body	24	Servo piston	60	Manual opening
19a	Channel in valve body	30	Top cover	73	Pilot connection

Sizing

Sizing example for PMFL

Table 9: Sizing example for PMFL

Description	Values
Refrigerant	R 717 (NH ₃)
Evaporator capacity	$Q_e = 600 \text{ kW}$
Evaporating temperature	$t_e = -10 \text{ °C}$ ($\sim p_e = 2.9 \text{ bar abs.}$)
Condensing temperature	$t_c = 30 \text{ °C}$ ($\sim p_c = 11.9 \text{ bar abs.}$)
Liquid temperature ahead of valve	$t_l = 20 \text{ °C}$ at max. capacity
Subcooling	$\Delta t_{\text{sub}} = t_c - t_l = 30 \text{ °C} - 20 \text{ °C} = 10 \text{ K}$ Calculations do not take into account pressure loss in pipelines.
Pressure drop across valve	$\Delta p = p_c - p_e = 11.9 - 2.9 \text{ bar} = 9 \text{ bar}$
Correction factor for 10 K subcooling	0.98
Corrected capacity	$600 \text{ kW} \times 0.98 = 588 \text{ kW}$

NOTE:

The corrected capacity can be found in the capacity table. It will be seen from the table that valve type PMFL 80-4 should be chosen. Referring to "ordering table", code number **027F0053** can be found. For details of flanges, accessories and pilot valve, see [Ordering](#) section.

Since $\Delta p = 9 \text{ bar}$ and $\Delta t_{\text{sub}} = 10 \text{ K}$, it will be seen from the "C/w strong spring set" for PMFL that a "STRONG" spring set must be used. The pilot line is connected to SV at connection S. In the ordering table the code number for the spring set can be found: **027F0118**.

Sizing example for PMFH

Table 10: Sizing example for PMFH

Description	Values
Refrigerant	R 717 (NH ₃)
Evaporator capacity	Q _e = 2200 kW
Evaporating temperature	t _e = -10 °C (~ p _e = 2.9 bar abs.)
Condensing temperature	t _c = 30 °C (~ 11.9 bar abs.)
Liquid temperature ahead of valve	t _l = 20 °C
Subcooling	Δt _{sub} = t _c - t _l = 30 °C - 20 °C = 10 K Calculations do not take into account pressure loss in pipelines.
Pressure drop across valve	Δp = p _c - p _e = 11.9 - 2.9 bar = 9 bar
Correction factor for 10 K subcooling	0.98
Corrected capacity	2200 kW × 0.98 = 2156 kW

NOTE:

The corrected capacity can be found in the capacity table. It will be seen from the table that valve type PMFH 80-7 should be chosen. In the ordering table the code number for the valve can be found: **027F3060** for CE-approved valve. For details of flanges, accessories and pilot valve, see [Ordering](#) section.

Correction factors

When dimensioning, multiply the evaporator capacity by a correction factor k dependent on the subcooling Δt_{sub} just ahead of the valve. The corrected capacity can then be found in the capacity table.

Table 11: R 717 (NH₃)

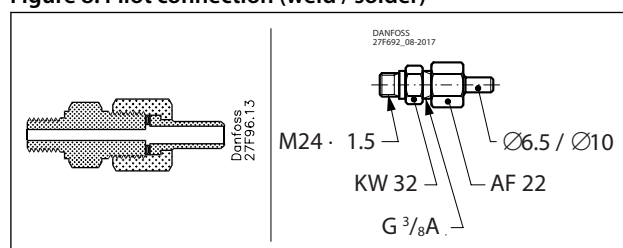
	R 717 (NH ₃)										
Δt K	2	4	10	15	20	25	30	35	40	45	50
k	1.01	1	0.98	0.96	0.94	0.92	0.91	0.89	0.87	0.86	0.85

Table 12: R 22

	R 22										
Δt K	2	4	10	15	20	25	30	35	40	45	50
k	1.01	1	0.96	0.93	0.9	0.87	0.85	0.83	0.8	0.78	0.77

Connections

Figure 8: Pilot connection (weld / solder)



Capacity

Table 13: Capacity in kW

Type	R 717 (NH ₃)					Type	R 717 (NH ₃)				
	Evaporat- ing tem- perature t _e °C	Rated capacity in kW at pressure drop across valve Δp bar					Evaporat- ing tem- perature t _e °C	Rated capacity in kW at pressure drop across valve Δp bar			
		0.8	1.2	1.6	2			4	8	12	16
PMFL 80-1	10	50	60	69	76	PMFL 80-1	10	104	140	161	
	0	51	62	71	79		0	107	142	165	176
	-10	53	64	73	81		-10	110	143	166	178
	-20	54	65	74	82		-20	111	143	166	179
	-30	55	66	75	83		-30	111	143	165	179
	-40	56	67	79	86		-40	111	142	162	177
	-50	56	67	75	82		-50	109	140	160	175
PMFL 80-2	10	80	97	111	123	PMFL 80-2 PMFH 80-2	10	167	224	257	
	0	83	101	115	127		0	172	227	264	281
	-10	85	103	118	130		-10	176	228	265	284
	-20	86	105	119	132		-20	177	238	264	285
	-30	88	106	120	133		-30	177	227	262	284
	-40	89	107	120	132		-40	175	225	258	281
	-50	90	106	119	131		-50	173	222	253	277
PMFL 80-3	10	127	154	176	194	PMFL 80-3 PMFH 80-3	10	264	353	404	
	0	131	159	182	201		0	271	356	414	440
	-10	134	163	186	205		-10	276	357	416	444
	-20	137	164	188	207		-20	278	356	413	445
	-30	139	167	188	207		-30	276	353	407	443
	-40	140	166	187	205		-40	272	349	400	438
	-50	139	164	184	201		-50	267	343	393	431
PMFL 80-4	10	206	250	286	316	PMFL 80-4 PMFH 80-4	10	427	571	651	
	0	214	259	295	327		0	438	573	664	704
	-10	219	264	301	333		-10	444	572	665	709
	-20	222	267	303	334		-20	445	568	657	709
	-30	224	267	301	330		-30	439	561	647	704
	-40	223	263	295	323		-40	429	552	635	696
	-50	219	257	288	315		-50	420	543	624	685
PMFL 80-5	10	325	394	449	496	PMFL 80-5 PMFH 80-5	10	667	887	1010	
	0	336	406	463	511		0	679	883	1020	1080
	-10	344	413	470	518		-10	685	874	1020	1080
	-20	347	414	468	514		-20	680	864	1000	1080
	-30	345	407	458	502		-30	666	852	984	1070
	-40	338	396	444	486		-40	649	837	966	1060
	-50	327	383	429	470		-50	632	823	948	1040
PMFL 80-6	10	565	682	773	851	P MFL 80-6 PMFH 80-6	10	1130	1490	1670	
	0	584	700	792	869		0	1130	1460	1690	1780
	-10	591	705	795	871		-10	1130	1430	1670	1780
	-20	587	692	777	850		-20	1110	1410	1640	1770
	-30	571	666	746	816		-30	1080	1380	1610	1760
	-40	546	636	712	781		-40	1050	1360	1570	1730
	-50	520	608	684	751		-50	1020	1340	1540	1710
PMFL 80-7	10	881	1060	1190	1300	PMFL 80-7 PMFH 80-7	10	1690	2220	2480	
	0	909	1080	1210	1310		0	1670	2150	2500	2610
	-10	910	1070	1190	1300		-10	1660	2090	2470	2610
	-20	887	1030	1150	1250		-20	1630	2050	2410	2610
	-30	844	975	1090	1190		-30	1580	2010	2350	2590
	-40	794	921	1030	1130		-40	1530	1970	2300	2550
	-50	750	875	984	1080		-50	1490	1940	2250	2510

Liquid level regulating valves, Type PMFL / PMFH and SV

Type	R 717 (NH ₃)					Type	R 717 (NH ₃)				
	Evaporat- ing tem- perature t _e °C	Rated capacity in kW at pressure drop across valve Δp bar					Evaporat- ing tem- perature t _e °C	Rated capacity in kW at pressure drop across valve Δp bar			
		0.8	1.2	1.6	2			4	8	12	16
PMFL 125	10	1400	1690	1910	2100	PMFL 125 PMFH 125	10	2770	3650	4100	
	0	1450	1730	1950	2140		0	2770	3570	4140	4350
	-10	1460	1740	1950	2140		-10	2770	3500	4090	4350
	-20	1450	1700	1930	2080		-20	2720	3430	4010	4340
	-30	1400	1630	1820	1990		-30	2650	3370	3920	4300
	-40	1330	1550	1730	1900		-40	2570	3320	3840	4240
	-50	1260	1480	1660	1830		-50	2490	3260	3770	4180
PMFL 200	10	2250	2710	3060	3360	PMFL 200 PMFH 200	10	4410	5810	6530	
	0	2320	2770	3120	3420		0	4420	5680	6590	6920
	-10	2340	2780	3120	3410		-10	4400	5550	6510	6920
	-20	2310	2710	3030	3310		-20	4330	5450	6370	6900
	-30	2220	2590	2890	3160		-30	4210	5360	6240	6830
	-40	2110	2480	2750	3020		-40	4080	5260	6110	6740
	-50	2000	2340	2630	2900		-50	3960	5170	5990	6640
PMFL 300	10	3420	4110	4650	4990	PMFL 300 PMFH 300	10	6690	8810	9880	
	0	3530	4210	4740	5180		0	6690	8600	9980	10500
	-10	3560	4210	4730	5170		-10	6660	8400	9850	10500
	-20	3500	4100	4590	5010		-20	6550	8240	9650	10400
	-30	3370	3910	4370	4780		-30	6360	8100	9430	10300
	-40	3190	3710	4160	4560		-40	6170	7960	9240	10200
	-50	3030	3540	3980	4380		-50	5990	7820	9050	10000
						PMFH 500	10	10700	14100	15800	
							0	10700	13700	15900	16700
							-10	10600	13400	15700	16700
							-20	10400	13100	15400	16700
							-30	10100	12900	15000	16500
							-40	9830	12700	14700	16300
							-50	9540	12400	14400	16000

Capacity

Table 14: Capacity in kW

Type	R 22					Type	R 22				
	Evaporat- ing tem- perature t _e °C	Rated capacity in kW at pressure drop across valve Δp bar					Evaporat- ing tem- perature t _e °C	Rated capacity in kW at pressure drop across valve Δp bar			
		0.8	1.2	1.6	2			4	8	12	16
PMFL 80-1	10	11	13	15	17	PMFL 80-1	10	22	28	31	32
	0	12	14	16	18		0	23	29	32	33
	-10	12	15	17	18		-10	24	30	32	34
	-20	12	15	17	19		-20	25	30	32	34
	-30	13	15	17	19		-30	25	30	32	33
	-40	13	16	18	19		-40	25	30	32	32
	-50	13	16	18	19		-50	24	29	31	32
PMFL 80-2	10	18	22	25	27	PMFL 80-2 PMFH 80-2	10	36	46	51	52
	0	19	23	26	29		0	38	47	52	53
	-10	20	24	27	30		-10	39	48	52	54
	-20	20	24	28	30		-20	40	48	52	54
	-30	21	25	28	31		-30	40	48	52	53
	-40	21	25	28	31		-40	40	48	51	52
	-50	21	25	28	31		-50	39	47	49	51

Liquid level regulating valves, Type PMFL / PMFH and SV

Type	R 22					Type	R 22				
	Evaporat- ing tem- perature t _e °C	Rated capacity in kW at pressure drop across valve Δp bar					Evaporat- ing tem- perature t _e °C	Rated capacity in kW at pressure drop across valve Δp bar			
		0.8	1.2	1.6	2			4	8	12	16
PMFL 80-3	10	29	35	39	43	PMFL 80-3 PMFH 80-3	10	57	72	80	82
	0	30	36	41	46		0	60	74	82	84
	-10	31	37	43	47		-10	62	76	82	85
	-20	32	39	44	48		-20	63	76	82	85
	-30	33	39	44	48		-30	63	76	81	83
	-40	34	40	45	49		-40	62	75	79	81
	-50	34	40	44	48		-50	61	73	77	79
PMFL 80-4	10	47	57	64	71	PMFL 80-4 PMFH 80-4	10	94	118	130	133
	0	49	59	67	74		0	98	121	133	136
	-10	51	61	70	77		-10	101	123	133	138
	-20	52	63	71	78		-20	102	123	132	137
	-30	54	64	72	78		-30	101	122	130	134
	-40	54	64	72	78		-40	99	120	127	131
	-50	55	64	71	77		-50	97	117	124	127
PMFL 80-5	10	74	89	102	112	PMFL 80-5 PMFH 80-5	10	147	184	202	206
	0	78	94	107	117		0	153	188	205	211
	-10	80	96	110	121		-10	157	190	205	212
	-20	83	99	112	122		-20	157	189	203	210
	-30	84	99	112	122		-30	156	187	199	206
	-40	84	99	110	120		-40	152	184	195	200
	-50	84	97	108	117		-50	148	179	189	194
PMFL 80-6	10	129	156	177	194	P MFL 80-6 PMFH 80-6	10	251	310	341	345
	0	135	162	184	202		0	260	314	343	352
	-10	140	167	188	206		-10	263	315	341	353
	-20	142	168	189	205		-20	262	313	335	348
	-30	143	167	186	202		-30	257	308	328	340
	-40	141	163	181	196		-40	249	302	320	331
	-50	137	158	175	189		-50	241	294	312	321
PMFL 80-7	10	202	242	273	299	PMFL 80-7 PMFH 80-7	10	381	466	510	515
	0	211	251	283	308		0	390	467	510	524
	-10	216	256	286	311		-10	393	465	504	523
	-20	218	255	283	307		-20	389	461	495	516
	-30	215	249	275	298		-30	378	454	483	503
	-40	209	240	265	286		-40	366	444	471	489
	-50	200	230	254	275		-50	353	433	458	473
PMFL 125	10	321	386	437	479	PMFL 125 PMFH 125	10	620	763	837	847
	0	336	402	455	498		0	639	770	842	864
	-10	346	412	464	507		-10	647	771	835	865
	-20	352	415	464	505		-20	643	767	821	853
	-30	352	410	455	494		-30	628	755	804	834
	-40	346	399	442	478		-40	609	739	784	810
	-50	335	386	426	461		-50	589	720	762	785
PMFL 200	10	515	618	700	767	PMFL 200 PMFH 200	10	990	1220	1330	1350
	0	538	645	728	796		0	1020	1230	1340	1380
	-10	555	660	742	810		-10	1030	1230	1330	1380
	-20	563	663	740	805		-20	1020	1220	1310	1360
	-30	561	653	725	786		-30	1000	1200	1280	1330
	-40	550	635	702	760		-40	969	1170	1250	1290
	-50	532	612	677	732		-50	937	1150	1210	1250

Liquid level regulating valves, Type PMFL / PMFH and SV

Type	R 22					Type	R 22				
	Evaporat- ing tem- perature t _e °C	Rated capacity in kW at pressure drop across valve Δp bar					Evaporat- ing tem- perature t _e °C	Rated capacity in kW at pressure drop across valve Δp bar			
		0.8	1.2	1.6	2			4	8	12	16
PMFL 300	10	782	940	1060	1170	PMFL 300 PMFH 300	10	1500	1850	2020	2050
	0	819	980	1110	1210		0	1550	1860	2030	2080
	-10	843	1000	1130	1230		-10	1560	1860	2010	2090
	-20	855	1010	1120	1220		-20	1550	1850	1980	2060
	-30	851	990	1100	1190		-30	1510	1820	1930	2010
	-40	833	961	1060	1150		-40	1470	1780	1890	1950
	-50	804	925	1020	1110		-50	1420	1730	1830	1890
						PMFH 500	10	2410	2950	3240	3270
							0	2480	2970	3250	3330
							-10	2500	2970	3210	3330
							-20	2480	2950	3160	3290
							-30	2420	2900	3090	3210
							-40	2340	2840	3010	3120
							-50	2260	2770	2930	3020

Dimensions and weights

Figure 9: PMFL / PMFH

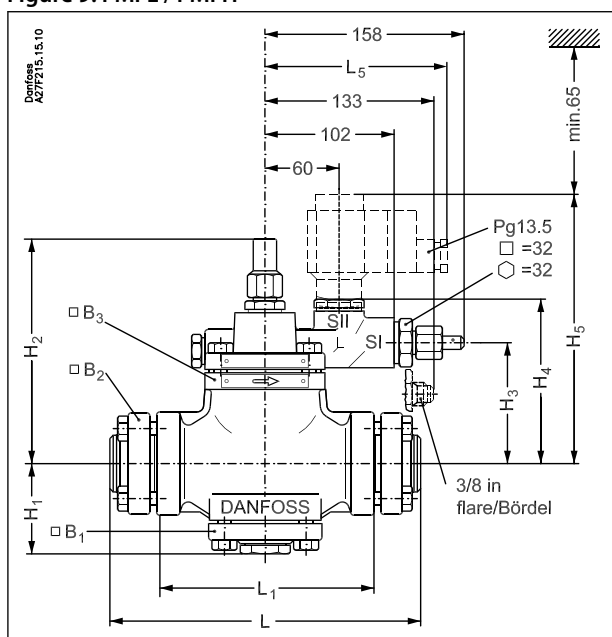


Table 15: Dimensions and weights

Type		H ₁ mm	H ₂ mm	H ₃ mm	H ₄ mm	H ₅ mm	L mm	L ₁ mm	L ₅ max.		B ₁ mm	B ₂ mm	B ₃ mm	Weight excl. solenoid valve kg
									10 W mm	20 W mm				
PMFL PMFH	80	66	162	79	113	176	177	106	130	140	75		87	7.0
	125	72	178	96	128	193	240	170	130	140	84	82	94	11.3
	200	79	187	105	138	202	254	170	130	140	94	89	102	14.2
	300	95	205	123	155	220	288	200	130	140	104	106	113	19.8
PMFH	500	109	227	146	176	242	342	250	130	140	127	113	135	28.3

Ordering

Table 16: Rated capacity in kW (1 kW = 0.284 TR)

Valve type	R 717	R 22	R 134a	R 404A	R 12	R 502
PMFL/H 80-1	139	27.8	22.1	33	17.4	30
PMFL/H 80-2	209	41.8	35.3	49.7	27.8	45.2
PMFL/H 80-3	348	70	53.1	82.7	41.8	75.2
PMFL/H 80-4	558	105	88.9	124	70	113
PMFL/H 80-5	835	174	133	207	105	188
PMFL/H 80-6	1395	278	221	330	174	300
PMFL/H 80-7	2080	435	353	569	278	470
PMFL/H 125	3480	700	552	831	435	755
PMFL/H 200	5580	1050	889	1243	700	1130
PMFL/H 300	8350	1740	1333	2068	1050	1880
PMFL/H 500	13900	2780	2210	3300	1740	3000

NOTE:

The rated capacity is given at
Evaporating temperature $t_e = 5^\circ\text{C}$,
Condensing temperature $t_c = 32^\circ\text{C}$ and
Liquid temperature $t_l = 28^\circ\text{C}$.

Figure 10: Main valve

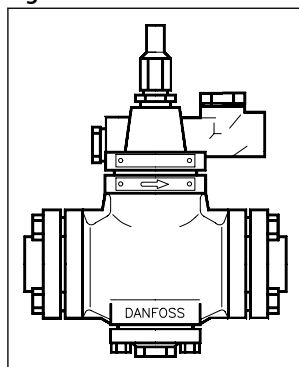


Figure 11: Main valve

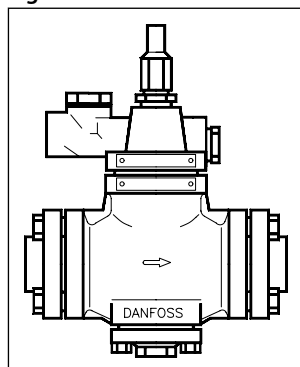


Table 17: Main valve

Valve type	Code no.		Valve type	Code no.
	EN GJS 400-18-LT			EN GJS 400-18-LT
PMFL 80-1	027F3054		PMFH 80-2	027F3065
PMFL 80-2	027F3055		PMFH 80-3	027F3066
PMFL 80-3	027F3056		PMFH 80-4	027F3067
PMFL 80-4	027F3057		PMFH 80-5	027F3068
PMFL 80-5	027F3058		PMFH 80-6	027F3069
PMFL 80-6	027F3059		PMFH 80-7	027F3070
PMFL 80-7	027F3060		PMFH 125	027F3071
PMFL 125	027F3061		PMFH 200	027F3072
PMFL 200	027F3062		PMFH 300	027F3073
PMFL 300	027F3063		PMFH 500	027F3074

NOTE:

The code nos. stated apply to main valves type PMFL or PMFH incl. flange gaskets, flange bolts, blanking plug and pilot connection with $\varnothing 6.5 / \varnothing 10$ mm weld nipple.

Spring set

Figure 12: Spring set

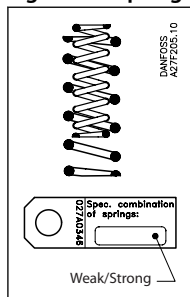


Table 18: Special spring set for PMFL

Subcooling Δtu K	Pressure drop Δp in PMFL		Pilot connection on SV 1 – 3 only	Pos.	Type PMFL	"WEAK"	"STRONG"
	4 – 15 bar	1.2 – 4 bar					
	Spring set					Code no.	
0 – 8	STANDARD	WEAK	P	23 + 43	80-1 – 80-7	027F0123	027F0118
8 – 40	STRONG		S	d	125	027F0124	027F0119
					200	027F0125	
					300	027F0126	027F0121

Table 19: Special spring set for PMFH

Pressure drop in PMFH Δp bar	Type	WEAK
		Code no.
1 – 4	PMFH 80.1 – 7	027F2190
	PMFH 125	027F2191
	PMFH 200	027F2192
	PMFH 300	027F2193

Flanges

Figure 13: Flanges

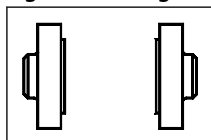


Table 20: Flanges

Valve type	Flange type	Weld flanges		Solder flanges			
		in.	Code no. ⁽¹⁾	in.	Code no. ⁽¹⁾	mm	Code no. ⁽¹⁾
PMFL 80 /PMFH 80	12	3/4	027N1220	7/8 1 1/8	027L1223 027L1229	22	027L1222
		1	027N1225			28	027L1228
		1 1/4	027N1230				
PMFL 125 / PMFH 125	23	1 1/4	027N2332	1 3/8	027L2335	35	027L2335
		1 1/2	027N2340				
PMFL 200 / PMFH 200	24	1 1/2	027N2440	1 5/8	027L2441	42	027L2442
		2	027N2450				
PMFL 300 / PMFH 300	25	2	027N2550	2 1/8	027L2554	54	027L2554
		2 1/2	027N2565				
PMFH 500	26	2 1/2	027N2665	2 5/8	027L2666	76	027L2676
		3	027N2680				

⁽¹⁾ Code no. applies to one flange set consisting of one inlet and one outlet flange

NOTE:

For dimension sketch of flange see spare part catalogue.

NOTE:

Stainless steel: flanges, bolts for flanges and top and bottom covers, see spare parts catalogue.

Pilot valves

Figure 14: Pilot valves SV 1 – 3

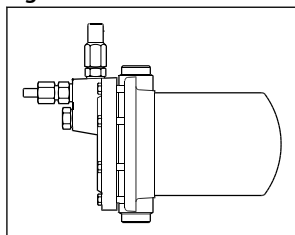


Table 21: Pilot valves SV 1 – 3

Type	Connection		Code no.	
	Balance tube liquid / vapour	Pilot line	SV 1: 027B2021 027B2021CE ⁽²⁾	SV 3: 027B2023 027B2023CE ⁽²⁾
Float pilot valve type SV	1 in. Weld	Ø 6.5 / Ø 10 mm weld ⁽³⁾		

⁽²⁾ Approved and CE-marked in accordance with Pressure Equipment Directive - 97/23/EC

⁽³⁾ 3/8 in. flare connection can be supplied under code no. **027B2033**.

Figure 15: Pilot valves SV 4

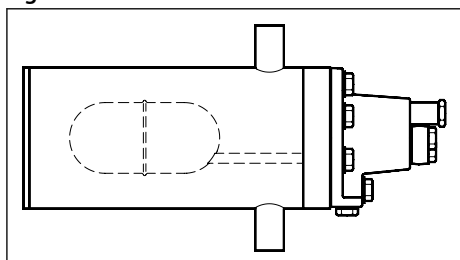


Table 22: Pilot valves SV 4

Valve type	Orifice diameter	Code no.	Code no. without housing ⁽⁴⁾
SV 4	Ø 3.0 mm	027B2024 ⁽⁵⁾	027B2014 ⁽⁵⁾

⁽⁴⁾ Flange for mounting without housing Code no. 027B2027

⁽⁵⁾ Approved and CE-marked in accordance with Pressure Equipment Directive - 97/23/EC

NOTE:

The code nos. stated apply to liquid level regulators type SV 4, SV 5 and SV 6 with two 1" weld connections for balance tubes and two 1/2" weld joints for liquid and evaporator connections respectively.

Spare parts and accessories

Smaller orifices for the SV 4 are available as spare parts.

Seal kit: 027B2070

Table 23: Special orifice code no. for SV 4

Orifice diameter	K _v	Code no. ⁽¹⁾
Ø 1.0 mm	0.026	027B2080
Ø 1.5 mm	0.06	027B2081
Ø 2.0 mm	0.1	027B2082
Ø 2.5 mm	0.16	027B2083
Ø 2.8 mm	0.2	027B2084

⁽¹⁾ The code no. includes orifice and all necessary gaskets

Figure 16: Pilot valve kits (EVM and coil)

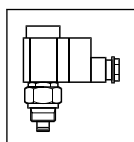


Table 24: Pilot valve kits (EVM and coil)

Coils, 10 W AC	AC: 027B1122xx where xx can be
110 V, 60 Hz	21
220 V, 50 Hz	31
220 V, 50 / 60 Hz	32
240 V, 50 Hz	33

NOTE:

Can be screwed on to the PMFL or PMFH instead of the blanking plug.

Figure 17: Optional accessories

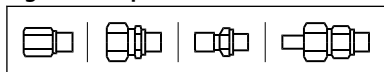


Table 25: Optional accessories

Description	Code no.
Pressure gauge connection Ø 6.5 / Ø 10 mm weld / solder	027B2035
Pressure gauge connection/in. flare (self-closing) (Must not be used in ammonia plant)	027B2041
Pressure gauge connection - 6 mm	027B2063
Cutting ring connection - 10 mm	027B2064
Pressure gauge connection - 1/4 NPT	027B2062
Manual operating unit for PMFL. Can be fitted in place of the regulator bottom plug	027F0128
1/2 in. flare pilot connection for SV	027B2033

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 or contact your local Danfoss representative if you have any questions.

Table 26: Valid approvals

Type	File name	Document type	Document topic	Approval authority
PMFH	Д-DK.БЛ08.В.03759	EAC Declaration	Machinery & Equipment	RU
PMFH/L	033F0685.AK	EU Declaration	EMCD/PED	Danfoss
	033F0686.AH	Manufacturers Declaration	PED	Danfoss
	033F0691.AE	Manufacturers Declaration	RoHS	Danfoss
	Д-DK.БЛ08.В.00189_18	EAC Declaration	EMC	RU
	Д-DK.БЛ08.В.00191_18	EAC Declaration	Machinery & Equipment	RU
	Д-DK.PA01.В.72054_20	EAC Declaration	PED	RU
	033F0474.AC	Manufacturers Declaration	ATEX	Danfoss
	0B22768.5267890YTN	Pressure - Safety Certificate	CRN	TSSA
	0045 202 1204 Z 00354 19 D 001(00)	Pressure - Safety Certificate	PED	TÜV
	SA7200	Mechanical - Safety Certificate		UL
SV	033F0685.AK	EU Declaration	EMCD/PED	Danfoss
	033F0691.AE	Manufacturers Declaration	RoHS	Danfoss
	Д-DK.БЛ08.В.01120_19	EAC Declaration	EMC	RU
	Д-DK.БЛ08.В.00191_18	EAC Declaration	Machinery & Equipment	RU
	Д-DK.PA01.В.72054_20	EAC Declaration	PED	RU
	UA.10146.D.00069-19	UA Declaration	PED	LLC CDC EURO-TYSK
	UA.TR-089.1112.01-19	Pressure - Safety Certificate	PED	LLC CDC EURO-TYSK
	033F0473.AD	Manufacturers Declaration	ATEX	Danfoss
	0045 202 1204 Z 00354 19 D 001(00)	Pressure - Safety Certificate		TÜV
	SA7200	Mechanical - Safety Certificate		UL
SV 1-3	SA7200	Mechanical - Safety Certificate		UL
SV 4-6	19.10327.266	Marine - Safety Certificate		RMRS

Table 27: Pressure Equipment Directive (PED)

	The PMFL / PMFH valves are approved and CE marked in accordance with Pressure Equipment Directive - 97/23/EC. For further details / restrictions - see Installation guide.
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Table 28: Compliance

PMFL / PMFH-valves ⁽¹⁾			
Nominal bore	DN ≤ 25 (1 in.)	DN 32-125 mm (1 ¼ - 5 in.)	DN 150 mm (6 in.)
Classified for	Fluid group I		
Category	Article 3, paragraph 3	II	III

⁽¹⁾ CE is only applicable to the EN GJS 400-18-LT

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