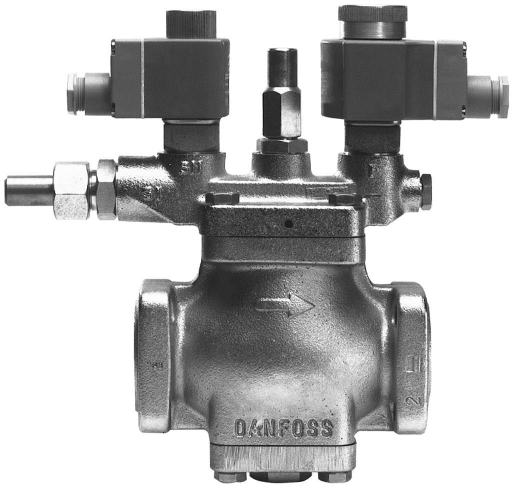
Data sheet

Solenoid valve type PML

Introduction



PML valves are servo-operated main valves with screwed-on pilot solenoid valves. PML valves use an external pressure source for opening (which means that no differential pressure across the PML valve is required). This makes the valve especially suitable for low-pressure suction lines).

The valves can be used in all types of refrigeration systems:
- Direct expansion
- Pump recirculation
- Natural circulation

Within their specified pressure and temperature ranges PML valves can be used for fluorinated refrigerants (R 22, R 134a, R 404A, R 12, R 502, etc.) or ammonia (R 717).

PML pilot-operated solenoid valves can be installed in:
- Suction lines
- Return lines (liquid/vapour)
- Pressure-equalising lines
- Bypass lines

Features

- Inexpensive and simple installation
- Screw thread pilot valve fitting
- Only one signal required for both pilot solenoid valves
- Especially suitable for systems where low pressure drop is required
- PML remains open even though the pressure drop across the valve is 0 bar

Materials

Gaskets are non-asbestos

PML can be supplied in GG-25 and GGG-40.3 materials in accordance with TAA. (Sicherheitstechnische Anforderung an Kälteanlagen mit Ammoniak).

Technical data

Type	Size	Refrigerants 1)	Opening differential pressure Δp bar			Temperature of media °C 4)	Max. working pressure PB bar 3)	Max. test pressure p' bar
			Min.	Max. (MOPD) 10 W a.c.	Max. (MOPD) 20 W d.c.			
PML	32	R 717 (NH_3), R 22, R 134a, R 404A, R 12, R 502	0 2)	21	14	–50 → +120	28	42
	40							
	50							
	65							
	80							
	100							
	125							

1) Besides the refrigerants specified, other fluorinated refrigerants can be used within the pressure or temperature range of the valves.
2) The external pilot pressure must be at least 1 bar higher than the inlet pressure.
3) Max. working pressure is limited to PB = 21 bar at media temperatures below –20°C for valves made of GGG-40.3 and –10°C for valves made of GG-25.
4) For lower temperature applications (–50°C to –60°C), bolts in flanges and on top and bottom covers must be changed to stainless steel type A4 quality 80 (see spare part catalogue for ordering).

Rated capacity

Valve size	Rated suction vapour capacity in kW ²)						k_v-value	Flange connection
	R 22	R 134a	R 404A	R 12	R 502	R 717	m³/h ¹)	in.
PML 32	54	47	48	36	44	140	25.5	1¹/₄ - 1¹/₂
PML 40	73	56	59	49	59	190	33.5	1¹/₂ - 2
PML 50	100	80	93	70	85	280	50.0	2 - 2¹/₂
PML 65	170	125	153	110	140	460	81.0	2¹/₂ - 3
PML 80	370	285	327	250	300	960	188.0	4
PML 100	510	388	458	340	420	1330	269.0	5
PML 125	810	615	730	540	670	2100	427.0	6

¹) The k_V-value is the water flow in m³/h at a pressure drop across valve of 1 bar, p = 1000 kg/m³

²) The rated suction vapour capacities are based on evaporating temperature t_e = –10°C, liquid temperature t_l = 25°C and a pressure drop across the valve Δp = 0.14bar, and superheat 10 K.

Ordering

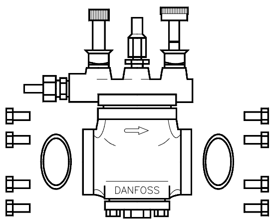
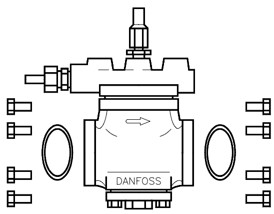
Complete valves

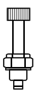
The code nos. for PML 32-65 include:
Main valve, external pilot connection, flange gaskets, flange bolts and NC/NO pilot valves.

The code nos. for PML 80, 100 and 125 also includes flanges.

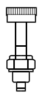
If PML valves with other combinations of pilot valves are required (e.g. NC/NC or NO/NO) please order the main valve (PML without valves) and the pilot valves separately.

Coils are ordered separately according to coil voltage and frequency.
For EVM (NC), code no. **027B1120**, 10 or 12 watt a.c. coils are used.
For EVM (NO), code no. **027B1130**, 12 watt a.c. coils or 20 watt d.c. coils, type I, are used.

	PML with NC / NO pilot valves		PML without pilot valves with external pilot connection and damping orifice	
				
Valve size	GG-25	GGG-40.3	GG-25	GGG-40.3
PML 32	**027F1150**	**027F3020**	**027F1141**	**027F3028**
PML 40	**027F1151**	**027F3021**	**027F1142**	**027F3029**
PML 50	**027F1152**	**027F3022**	**027F1143**	**027F3030**
PML 65	**027F1153**	**027F3023**	**027F1144**	**027F3031**
PML 80	-	**027F1284**	-	**027F1286**
PML 100	-	**027F1289**	-	**027F1291**
PML 125	-	**027F1294**	-	**027F1296**



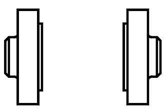
EVM-NC



EVM-NO

Description	**Code no.**
Pilot valve EVM-NC	**027B1120**
Pilot valve EVM-NO	**027B1130**

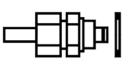
Flange kit for PML ²)



Valve flange	Flange type	Weld flange		Solder flange			
		in.	**Code no.** ¹)	in.	**Code no.** ¹)	in.	**Code no.** ¹)
PML 32	10	1¹/₄ 1¹/₂	**027N2332** **027N2340**	1³/₈	**027L2335**	35	**027L2335**
PML 40	11	1¹/₂ 2	**027N2440** **027N2450**	1⁵/₈	**027L2441**	42	**027L2442**
PML 50	12	2 2¹/₂	**027N2550** **027N2565**	2¹/₈	**027L2554**	54	**027L2554**
PML 65	13	2¹/₂ 3	**027N2665** **027N2680**	2⁵/₈	**027L2666**	76	**027L2676**

¹) Code nos. apply to one flange set consisting of an inlet and an outlet flange.
²) Dimensioned sketch, see spare parts catalogue.

Accessories



Description	**Code no.**
External pilot connection for PML 32 → PML 65 (incl. damping orifice, D: 1.0 mm)	**027F1048**
External pilot connection for PML 80 → PML 125 (incl. damping orifice, D: 1.8 mm)	**027F1049**
Damping orifice for EVM, 10-off, for PML 32 → PML 65 (D: 1.0 mm)	**027F0664**
Damping orifice for EVM, 10-off, for PML 80 → PML 125 (D: 1.8 mm)	**027F0176**
Accessory bag with gasket and O-ring for pilot valve	**027F0666**

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

Capacities

kW

Type	Press.drop across valve Δp bar	Suction vapour capacity Q_o kW at evaporating temperature t_e °C												
		−50	−45	−40	−35	−30	−25	−20	−15	−10	−5	0	5	10

R 22

Dry suction line capacities

Type	Δp bar	−50	−45	−40	−35	−30	−25	−20	−15	−10	−5	0	5	10
PML 32	0.02	8.4	9.6	10.9	12.3	13.8	15.5	17.2	19.1	21	23	25	28	30
	0.06	14.1	16.2	18.5	21	24	27	30	33	36	40	44	48	52
	0.1	17.7	20	23	27	30	34	38	42	47	52	56	62	67
	0.14	20	24	27	31	35	40	45	50	55	61	67	73	79
PML 40	0.02	11.6	13.2	15	17	19	21	24	26	29	32	35	38	42
	0.06	19	22	26	29	33	37	41	46	50	55	61	66	72
	0.1	24	28	32	37	42	47	52	58	65	71	78	85	93
	0.14	28	33	38	43	49	55	62	69	76	84	92	101	110
PML 50	0.02	16	19	21	24	27	30	34	38	41	46	50	54	59
	0.06	28	32	36	41	47	52	58	65	72	79	86	94	103
	0.1	35	40	46	53	59	67	75	83	92	101	111	121	132
	0.14	40	47	54	61	70	78	88	98	108	119	131	143	156
PML 65	0.02	26.7	30	35	39	44	49	55	61	67	74	81	88	96
	0.06	44.9	52	59	67	75	85	95	105	116	128	140	153	166
	0.1	56	65	75	85	96	109	121	135	150	165	180	197	215
	0.14	65	76	87	100	113	127	142	158	175	193	213	233	253
PML 80	0.02	56	65	73	83	94	105	117	129	143	157	172	188	204
	0.06	95	110	125	142	160	180	201	223	246	271	297	324	353
	0.1	120	139	159	181	205	230	257	286	316	348	382	417	455
	0.14	138	161	185	212	240	270	302	336	372	410	450	492	537
PML 100	0.02	78	89	101	115	129	145	161	178	197	217	237	259	282
	0.06	132	151	173	196	221	248	277	307	340	374	410	447	487
	0.1	165	191	220	250	283	318	355	395	437	481	527	576	628
	0.14	190	222	256	292	332	373	418	465	514	567	622	680	741
PML 125	0.02	125	143	163	185	208	232	259	287	317	348	382	417	453
	0.06	212	244	278	316	356	399	446	494	546	601	659	720	784
	0.1	267	308	354	403	455	512	571	635	702	773	848	926	1009
	0.14	307	357	412	471	534	601	672	747	827	911	1000	1093	1191

R 134a

Dry suction line capacities

Type	Δp bar	−50	−45	−40	−35	−30	−25	−20	−15	−10	−5	0	5	10
PML 32	0.02	6.3	7.2	8.3	9.4	11	12	13	15	16	18	20	22	24
	0.06	10	12	14	16	18	20	23	25	28	31	34	38	41
	0.10	13	15	17	20	23	26	29	32	36	40	44	48	53
	0.14		17	20	23	27	30	34	38	42	47	52	57	62
PML 40	0.02	8.7	9.9	11	13	15	16	18	20	23	25	27	30	33
	0.06	14	17	19	22	25	28	31	35	39	43	47	52	57
	0.10	18	21	24	28	32	36	40	45	50	55	61	67	73
	0.14		24	28	32	37	42	47	52	58	65	71	78	86
PML 50	0.02	12	14	16	18	21	23	26	29	32	35	39	43	47
	0.06	20	24	27	31	35	40	45	50	55	61	67	74	81
	0.10	25	30	34	40	45	51	57	64	71	78	86	95	104
	0.14		34	40	46	52	59	67	75	83	92	101	111	122
PML 65	0.02	20	23	26	30	34	38	42	47	52	58	63	69	76
	0.06	33	39	44	51	57	65	73	81	90	99	109	120	131
	0.10	41	48	56	64	73	83	93	103	115	127	140	154	169
	0.14		55	64	74	85	96	108	121	135	149	164	181	198
PML 80	0.02	42	49	56	63	72	80	90	100	111	122	135	147	161
	0.06	70	82	94	108	122	138	154	172	190	210	231	254	277
	0.10	86	102	119	136	155	176	196	220	244	270	298	326	357
	0.14		116	137	157	180	204	230	258	286	317	350	384	421
PML 100	0.02	58	67	77	88	99	111	124	138	153	169	186	203	222
	0.06	97	113	130	148	169	190	212	237	262	291	319	350	383
	0.10	120	140	164	188	214	242	271	303	336	373	410	450	492
	0.14		160	188	218	249	282	318	356	396	438	482	530	580
PML 125	0.02	94	109	124	141	160	179	200	222	246	271	298	326	357
	0.06	156	182	210	239	271	306	342	381	423	466	513	563	616
	0.10	193	227	263	303	344	389	437	488	542	599	659	724	792
	0.14		259	303	351	401	454	511	571	636	705	776	853	934

The capacities are based on liquid temperature t_l = +25°C ahead of the evaporator.
The table values refer to the evaporator capacity and are tabulated as a function of the evaporating temperature t_e and the pressure drop Δp across the valve.
The capacities are based on dry, saturated vapour ahead of the valve.
Under operation with superheated vapour ahead of the valve the capacities are reduced by 4% for every 10 K superheat.

Correction factors
When selecting, the evaporator capacity is to be multiplied by a correction factor depending on the liquid temperature t_l ahead of the evaporator. The corrected capacity can then be found from the table.

t_v °C	−10	0	10	20	25	30	40	50
R 22/ R 134a	0.76	0.81	0.88	0.96	1	1.05	1.16	1.31

Capacities
(continued)

kW

Dry suction line capacities

R 404A

Type	Press. drop across valve Δp bar	Suction vapour capacity Q_o kW at evaporating temperature t_e °C												
		−50	−45	−40	−35	−30	−25	−20	−15	−10	−5	0	5	10
PML 32	0.02	7.2	8.3	9.5	11	12	14	15	17	19	21	23	25	28
	0.06	12	14	16	19	21	24	27	30	33	36	40	44	48
	0.10	15	18	21	24	27	30	34	38	42	47	51	56	61
	0.14	18	21	24	28	32	36	40	45	50	55	61	66	73
PML 40	0.02	10	12	13	15	17	19	21	24	26	29	32	35	38
	0.06	17	20	22	26	29	33	37	41	45	50	55	60	66
	0.10	21	25	29	33	37	42	47	53	58	64	71	78	85
	0.14	25	29	33	38	44	49	55	62	69	76	84	92	100
PML 50	0.02	14	16	19	21	24	27	30	34	37	41	45	50	54
	0.06	24	28	32	37	42	47	52	58	65	71	78	86	94
	0.10	30	35	41	47	53	60	67	75	83	92	101	110	121
	0.14	35	41	48	55	62	70	79	88	98	108	119	131	143
PML 65	0.02	23	27	30	35	39	44	49	55	61	67	73	80	88
	0.06	39	45	52	59	68	76	85	95	105	116	127	139	152
	0.10	49	57	66	76	86	97	109	122	135	149	164	179	195
	0.14	57	67	77	89	101	114	127	143	159	176	193	212	231
PML 80	0.02	49	56	64	73	83	93	104	117	129	141	156	171	187
	0.06	83	96	110	126	143	161	179	200	222	245	269	295	322
	0.10	105	122	140	161	183	206	231	257	285	315	347	380	415
	0.14	121	143	164	189	214	242	272	303	337	372	409	448	490
PML 100	0.02	67	78	89	101	114	129	144	160	177	195	215	235	257
	0.06	114	133	152	174	197	221	248	276	307	338	372	407	445
	0.10	145	168	194	222	252	284	319	355	394	435	478	525	573
	0.14	167	197	227	260	296	334	375	418	464	513	565	619	676
PML 125	0.02	108	125	144	163	185	207	232	258	285	315	347	379	414
	0.06	184	214	245	280	316	356	400	445	492	544	598	656	715
	0.10	233	271	312	357	406	457	513	571	634	700	770	843	921
	0.14	270	315	365	419	476	538	604	673	747	825	908	996	1088

Dry suction line capacities

R 717(NH_3)

Type	Press. drop across valve Δp bar	−50	−45	−40	−35	−30	−25	−20	−15	−10	−5	0	5	10
PML 32	0.02	20	23	27	31	35	39	44	49	54	60	66	73	79
	0.06	37	39	45	52	59	67	76	85	94	104	115	126	137
	0.1	42	49	57	66	76	84	97	108	120	134	148	162	177
	0.14		56	66	77	88	101	113	127	142	157	174	191	209
PML 40	0.02	28	32	37	42	48	54	68	61	75	83	92	100	110
	0.06	46	54	63	72	82	93	117	105	130	144	158	174	190
	0.1	57	68	74	92	105	119	150	134	166	185	204	224	245
	0.14		78	92	107	122	139	176	157	196	217	241	264	289
PML 50	0.02	40	46	53	60	68	77	87	96	107	118	130	143	156
	0.06	66	77	90	103	117	132	149	167	185	205	225	247	270
	0.1	82	97	113	130	149	169	190	213	237	264	290	319	348
	0.14		111	131	152	174	198	223	250	279	309	343	376	412
PML 65	0.02	64	75	86	98	111	125	140	157	174	192	211	232	253
	0.06	107	126	145	167	190	214	242	270	300	332	366	401	438
	0.1	133	157	184	212	242	274	309	345	384	427	471	517	565
	0.14		180	212	246	282	321	362	406	452	502	553	610	668
PML 80	0.02	137	158	182	208	235	265	298	332	369	408	449	492	538
	0.06	228	267	309	354	403	455	512	572	636	703	775	850	930
	0.1	282	334	390	449	513	582	655	733	816	904	997	1095	1197
	0.14		383	450	522	599	681	769	862	961	1065	1175	1291	1413
PML 100	0.02	189	219	251	287	325	366	411	458	509	563	620	680	743
	0.06	314	368	426	488	556	628	706	789	877	971	1070	1174	1283
	0.1	389	461	538	620	708	803	904	1012	1127	1248	1376	1511	1653
	0.14		527	621	721	827	940	1061	1190	1326	1470	1623	1783	1951
PML 125	0.02	304	352	404	461	523	589	661	737	819	905	997	1093	1194
	0.06	506	592	685	786	894	1011	1136	1269	1411	1561	1720	1888	2064
	0.1	628	743	866	998	1140	1292	1455	1628	1812	2007	2213	2430	2658
	0.14		853	1002	1161	1332	1514	1708	1914	2133	2365	2610	2867	3137

The capacities are based on liquid temperature t_l = +25°C ahead of the evaporator.
The table values refer to the evaporator capacity and are tabulated as a function of the evaporating temperature t_e and the pressure drop Δp across the valve.
The capacities are based on dry, saturated vapour ahead of the valve.
Under operation with superheated vapour ahead of the valve the capacities are reduced by 4% for every 10 K superheat.

Correction factors
When selecting, the evaporator capacity is to be multiplied by a correction factor depending on the liquid temperature t_l ahead of the evaporator. The corrected capacity can then be found from the table.

t_l °C	−10	0	10	20	25	30	40	50
R 404A	0.70	0.76	0.84	0.94	1	1.07	1.24	1.47
R 717 (NH_3)	0.84	0.88	0.92	0.97	1	1.03	1.09	1.16

Flooded systems
Wet suction line capacities **kW** **R 22**

Type	Press. drop across valve Δp bar	Capacity in kW at a circulation rate of 4 at evaporating temperature t_e (°C)						
		−50	−40	−30	−20	−10	0	10
PML 32	0.02	7.8	9.6	12	14	15	17	19
	0.06	14	17	20	23	27	30	32
	0.1	18	22	26	30	34	38	42
	0.14	21	26	31	36	41	45	50
PML 40	0.02	10	13	15	18	20	23	25
	0.06	18	22	26	31	35	39	43
	0.1	23	28	34	40	45	50	55
	0.14	27	34	40	47	53	60	65
PML 50	0.02	15	19	23	26	30	34	37
	0.06	27	33	39	46	52	58	64
	0.1	34	42	51	59	67	75	82
	0.14	41	50	60	70	80	89	97
PML 65	0.02	25	31	37	43	49	54	60
	0.06	43	53	64	74	85	94	103
	0.1	56	68	82	96	109	122	133
	0.14	66	81	97	113	129	144	157
PML 80	0.02	58	71	85	99	113	126	138
	0.06	100	123	147	172	196	219	239
	0.1	129	159	190	222	253	282	309
	0.14	153	188	225	263	299	334	365
PML 100	0.02	83	102	122	142	162	181	198
	0.06	143	176	211	246	281	313	342
	0.1	185	227	272	318	362	404	442
	0.14	219	269	322	376	428	478	523
PML 125	0.02	131	161	193	226	257	287	314
	0.06	227	279	335	391	445	497	543
	0.1	293	361	432	504	575	641	701
	0.14	347	427	511	597	680	759	830

Flooded systems
Wet suction line capacities **kW** **R 134a**

Type	Press. drop across valve Δp bar	Capacity in kW at a circulation rate of 4 at evaporating temperature t_e (°C)						
		−50	−40	−30	−20	−10	0	10
PML 32	0.02	6.4	7.9	9.5	11	13	14	16
	0.06	11	14	16	19	22	25	27
	0.1	14	18	21	25	28	32	35
	0.14	17	21	25	29	34	38	42
PML 40	0.02	8	10	12	15	17	19	21
	0.06	15	18	22	25	29	33	36
	0.1	19	23	28	33	37	42	46
	0.14	22	27	33	39	44	50	55
PML 50	0.02	13	15	19	22	25	28	31
	0.06	22	27	32	38	43	49	54
	0.1	28	35	42	49	56	63	69
	0.14	33	41	49	58	66	74	82
PML 65	0.02	20	25	30	35	40	45	50
	0.06	35	43	52	61	70	79	87
	0.1	45	56	67	79	90	102	112
	0.14	54	66	80	93	107	120	133
PML 80	0.02	47	58	70	82	94	106	117
	0.06	82	101	121	142	162	182	202
	0.1	105	130	156	182	210	236	260
	0.14	125	154	185	216	248	280	308
PML 100	0.02	68	83	100	117	134	151	167
	0.06	117	144	173	203	233	262	289
	0.1	151	186	223	262	300	337	373
	0.14	179	221	264	310	355	400	442
PML 125	0.02	107	132	158	186	214	240	265
	0.06	186	229	275	322	370	415	458
	0.1	240	295	354	415	476	536	593
	0.14	283	350	420	492	564	635	701

Flooded systems
Wet suction line capacities **kW** **R 717 (NH_3)**

Type	Press. drop across valve Δp bar	Capacity in kW at a circulation rate of 4 at evaporating temperature t_e (°C)						
		−50	−40	−30	−20	−10	0	10
PML 32	0.02	17	22	27	33	38	44	50
	0.06	30	38	47	56	66	77	87
	0.1	38	49	60	73	86	99	112
	0.14	45	58	71	86	101	117	133
PML 40	0.02	23	29	35	43	50	58	66
	0.06	39	50	61	74	87	101	114
	0.1	51	64	79	96	113	130	148
	0.14	60	76	94	113	133	154	175
PML 50	0.02	34	43	53	64	75	87	99
	0.06	58	74	92	110	130	151	171
	0.1	75	96	118	142	168	194	220
	0.14	89	113	140	169	199	230	261
PML 65	0.02	55	69	86	103	122	141	160
	0.06	95	120	148	179	211	244	277
	0.1	122	155	191	231	272	315	357
	0.14	144	183	226	273	322	372	422
PML 80	0.02	127	161	199	240	283	327	371
	0.06	219	278	344	415	490	566	642
	0.1	283	359	444	536	632	731	829
	0.14	335	425	525	634	748	864	980
PML 100	0.02	181	230	284	343	404	468	530
	0.06	314	398	492	594	700	810	918
	0.1	405	514	635	766	904	1045	1186
	0.14	479	609	752	907	1070	1237	1403
PML 125	0.02	288	365	451	544	642	742	842
	0.06	498	632	781	942	1112	1285	1458
	0.1	643	816	1009	1217	1436	1659	1882
	0.14	761	966	1193	1440	1699	1963	2227

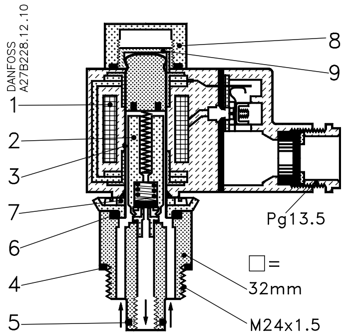
Correction factor for circulation degree

Refrigerant	Circulation degree				
	2	4	6	8	10
R 22	1.28	1.0	0.86	0.75	0.68
R 134a	1.28	1.0	0.86	0.76	0.69
R 717 (NH_3)	1.25	1.0	0.88	0.80	0.73

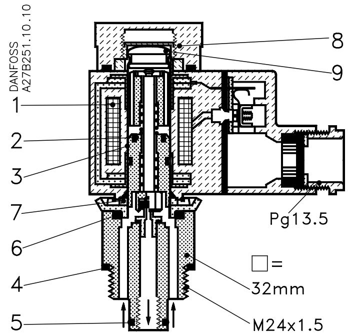
The evaporator capacity is to be multiplied by a correction factor.

Design
Function

1. Coil
2. Armature
3. Armature tube
4. Gasket
5. O-ring
6. Sealing ring
7. Spacing ring
8. Top nut
9. Lock button

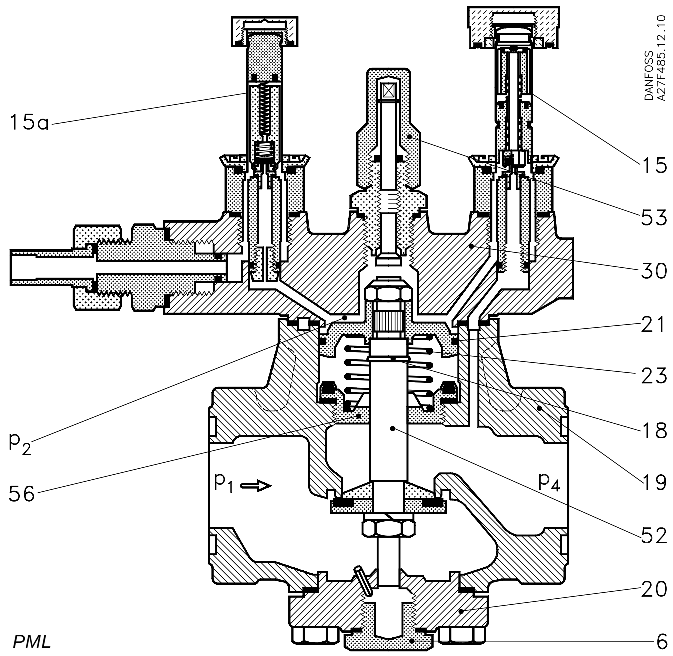


EVM-NC



EVM-NO

6. Drain plug
15 and 15a. Pilot valve
18. Locking ring
19. Valve body
20. Bottom cover
21. Piston
23. Compression spring
30. Cover
52. Pressure rod
53. Manual operation
56. Insert bush



PML

Solenoid valves PML
are servo-operated valves in which the differential pressure across the built-in servo piston is used to provide the necessary opening force.

The main valve is provided with two pilot solenoid valves, as well as a nipple for connection to external pilot pressure.

The external pilot pressure line must be connected to a system pressure (p2) which is at least 1 bar higher than the inlet pressure (p1) of the valve.

The PML is kept open when voltage is applied to the EVM pilot solenoid valves 15 and 15a.

The PML is kept closed when the EVM pilot solenoid valves 15 and 15a are de-energised.

EVM, 15, relieves the pilot pressure across the servo piston to the discharge side of the valve.

Function

Since the PML uses external pilot pressure, the valve will open even if the pressure drop across the valve is 0. This valve type is therefore very suitable for suction and return lines, especially at low evaporating pressures.

When the valve is open, the servo piston forms a seal against the built-in teflon ring, i.e. no refrigerant is able to flow from the pilot pressure side to the system side.

When, for example, the condensing pressure is used as pilot pressure, the system side will not be loaded with undesired hot gas injection.

PML function cannot be obtained by a PM 3 regulator fitted with two EVM solenoid valves and an external pilot connection, one of the reasons being that there are significant differences in the design of the two main valves PML and PM 3.

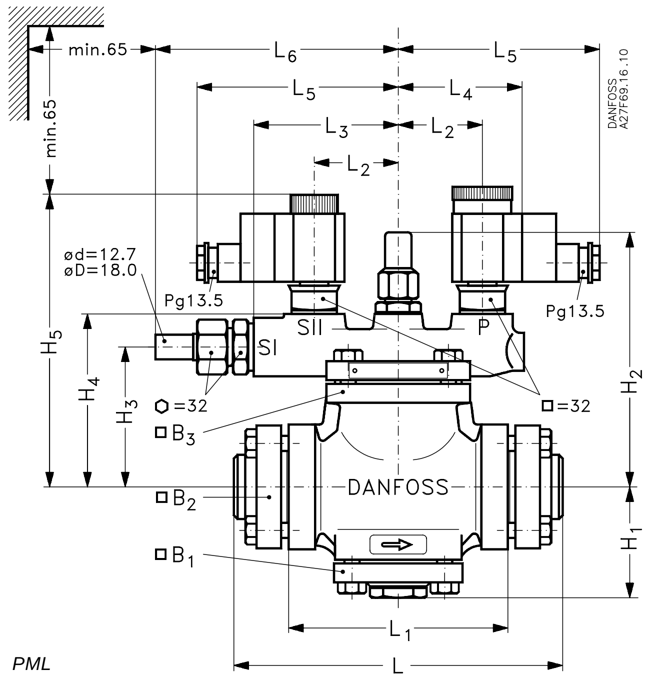
Important note for PML(X) valves
The PML(X) valve is kept in its open position by hot gas. The hot gas therefore condenses in the cold valve and creates liquid on top of the servo piston. When the pilot valves change status to close the PML(X), the pressure on the servo piston equalises with the suction pressure (p4) through the pilot valve (pos. 15). This equalisation takes time because condensed liquid is present in the valve. The exact time taken from when the pilot valves change position to complete closing of the PML(X) will depend on temperature, pressure, refrigerant and size of valve. Thus an exact closing time for the valves cannot be given but, in general, lower temperatures give longer closing times. Approximate closing times are given in the following table.

Valve	Appox. closing times in s at –40°C	
	R 22	R 717
PML 32	15	45
PML 40	25	75
PML 50	43	129
PML 65	85	255
PML 80	80	240
PML 100	130	390
PML 125	230	690

It is very important to take these closing times into consideration when hot gas defrost is performed on evaporators. Steps must be taken to ensure that the hot gas supply valve is not opened before the PML(X) in the suction line is completely closed. If the hot gas supply valve is opened before the PML(X) in the suction line is closed, considerable energy will be lost and potentially dangerous situations might arise because of “liquid hammer”.

In PMLX valves, the spring-loaded second stage might be induced to hammer by gas and liquid being forced through the valve at $\Delta p > 1.5$ bar across the PMLX. The final result could be severe damage to the valve.

Dimensions and weights



PML

Flange set for valve type	Weight kg
PML 32	1.5
PML 40	1.9
PML 50	2.8
PML 65	3.0

Type	H_1	H_2	H_3	H_4	H_5	L	L_1	L_2	L_3	L_4	L_5 max.		L_6	B_1	B_2	B_3	Weight
											10 W	20 W					
	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	kg
PML 32	72	178	96	118	208	240	170	52	94	82	122	132	160	84	82	94	12.6
PML 40	79	187	105	127	215	254	170	55	97	85	125	135	163	94	89	102	15.3
PML 50	95	205	123	144	234	288	200	55	97	85	125	135	163	104	106	113	21.1
PML 65	109	227	146	167	257	342	250	60	102	90	130	140	168	127	113	135	29.6
PML 80	152	365	214	238	325	437	310	69	115	119	141	151	182	190	235	210	80[1])
PML 100	173	396	246	269	356	489	350	83	125	133	155	165	192	226	270	243	120[1])
PML 125	208	453	301	325	412	602	455	99	151	155	171	181	218	261	300	286	170[1])

1) Weight with flanges and pilot valves.

DK-6430 Nordborg
Denmark