DANFOSS

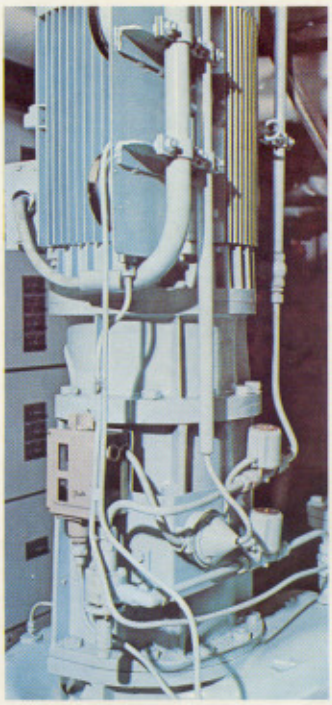
Danfoss

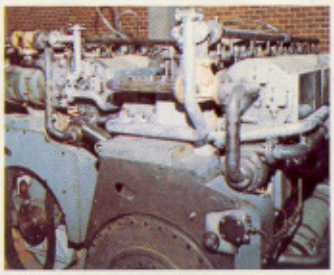
Automatic controls for Marine Applications

Product Line: Industrial Automatics and Automatic Controls for Refrigeration Plant

SB.00.A1.02

Application examples of industrial automatics on board ship

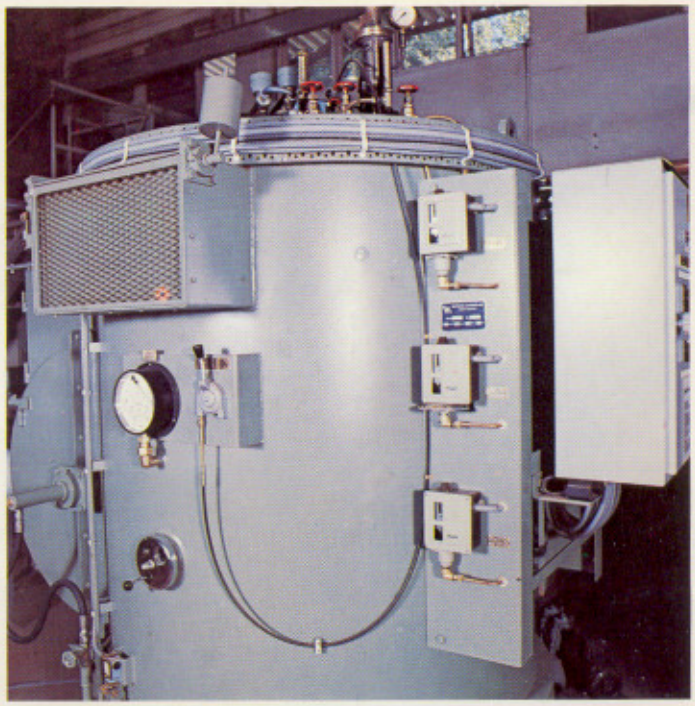


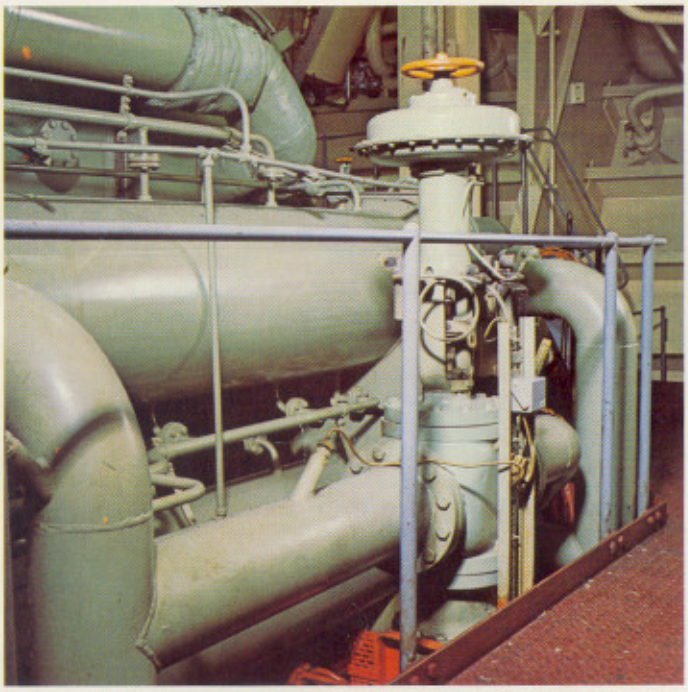


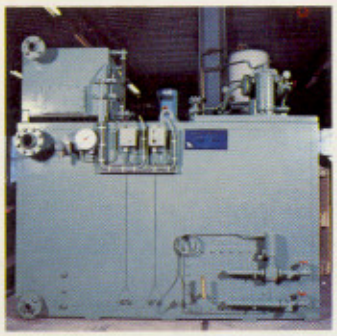
▲ Type RT pressure controls and thermostats on a ship's diesel engine. The units are used to monitor the temperature and pressure of the cooling water and lubricating oil.

◀ RT pressure controls and EVJD solenoid valves are part of the automatic auxiliary services on ships' pumps.

A KPS thermostat monitors lubricating oil temperature in a ship's main engine. ▼

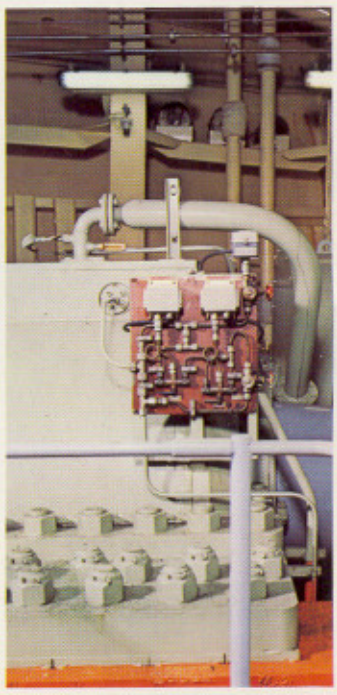


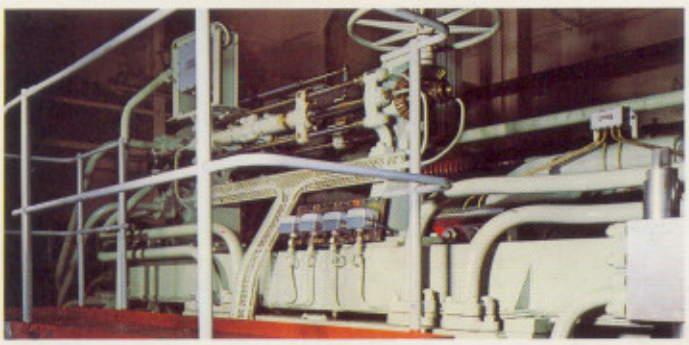




▲ The top right illustration shows an incinerator equipped with RT thermostats and pressure controls to monitor temperature and pressure. The thermostatic steam valve (IVT + IVR) regulates temperature in the oil preheater.

KPS pressure controls monitor ▶ the oil pressure in the main bearings of a 300 000 ton tanker. An EMP pressure transmitter converts oil pressure to an electric signal which it transmits to the control panel on the bridge.





◀ Pressure transmitter EMP monitors pressure in the various hydraulic circuits in a steering engine. The pressures are registered on a panel in the bridge.

The thermostatic steam valve (IVT ▶ + IVF) automatically regulates the sypply of steam to a heat exchanger for the fuel oil preheater in a ferry.

Product information
Danfoss shall not be responsible for misleading or erroneous information which might occur in catalogues, instructions, drawings, technical data or other specifications supplied by Danfoss. It shall not be possible to base any legal proceedings whatever on such material.

Product alterations
Danfoss reserves the right to alter its products without notice; also products already ordered.

Automatic controls for ships

Further information on Danfoss automatic controls can be obtained by ordering the relevant part catalogue.

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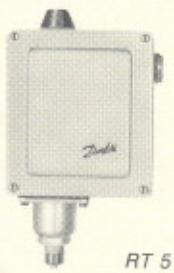
Pressure Controls Type RT

Technical data and code Nos.

RT 113

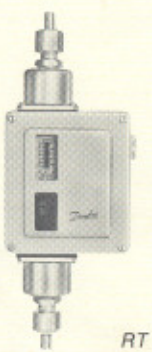
RT 112

RT 110



RT 5

RT 117



RT 262A

Pressure controls

Regulation range p_e bar	Adjustable mechanical differential bar	Reset	Max. test pressure p_e bar	Line connection	Materials for parts in contact with media	Code Nos. With knob and cover with windows	Code Nos. With seal cap and cover without windows	Type
−1 to 0	0.08-0.4		7	3/8 in BSP ext.	B	17-5215		RT 121
0 to 0.3	0.01-0.05		0.5	3/8 in BSP ext.	B	17-5196		RT 113
0.1 to 1.1	0.03-0.16		7	3/8 in BSP ext.	B	17-5191	17-5193	RT 112
0.2 to 3	0.05-0.25		7	3/8 in BSP ext.	B	17-5291	17-5292	RT 110
−0.8 to 5	0.5-1.6		25	1/4 in flare	A	17-5245		RT 1
−0.8 to 5	fixed approx. 0.5	min.	25	1/4 in flare	A	17-5246		RT 1
−0.8 to 5	0.3-1.3		25	3/8 in BSP ext. + ø6/ø10 mm welding nipple	A	17-5001		RT 1A
−0.8 to 5	fixed approx. 0.3	min.	25		A	17-5002		RT 1A
−0.8 to 5	1.3-2.4		25		A	17-5007		RT 1A
0.2 to 6	0.2-1.2		25	3/8 in BSP ext.	B	17-5237	17-5240	RT 200
1 to 10	0.2-1.3		25	3/8 in BSP ext.	B	17-5203	17-5200	RT 116
4 to 17	1-4		25	3/8 in BSP ext.	B	17-5255	17-5253	RT 5
4 to 17	1-4		25	1/4 in flare	A	17-5250		RT 5
4 to 17	fixed approx. 1	max.	25	1/4 in flare	A	17-5251		RT 5
4 to 17	1-4		25	3/8 in BSP ext. + ø6/ø10 mm welding nipple	A	17-5046		RT 5A
4 to 17	fixed approx. 1	max.	25		A	17-5047		RT 5A
10 to 30	0.6-4		35	3/8 in BSP ext.	B	17-5295	17-5296	RT 117

p_e = effective pressure

Differential pressure controls

Adjustable regulation range bar	Operating range for low pressure side LP p_e bar	Mechanical differential bar	Max. test pressure p_e bar	Discharge line connection	Material of parts in contact with media	Code Nos.	Type
0.1 to 1.5	−1-6	0.1	12	3/8 in BSP ext. + ø6/ø10 mm welding nipple	A	17D0025	RT 262A
0.5 to 4	−1-12	0.3	25		A	17D0021	RT 260A

p_e = effective pressure

Materials:

A = Bellows housing and bellows ring: deep-drawn plate, material No. 1.0524 (DIN 1624)
Bellows: stainless steel, material No. 1.4306 (DIN 17.440)

B = Bellows housing: brass, material No. 2.0404 (DIN 17.660)
Bellows ring: brass, material No. 2.0321 (DIN 17.660)
Bellows: stainless steel as "A"

Switch: Single-pole changeover (SPDT)

Contact load
Ohmic: 10A 380V
Inductive: 4A 380V (full load current)
30A 380V (starting current)
Direct current: 12W 220V

Enclosure: IP 66 in accordance with IEC 144

Approvals

RT 1	RT 1A	RT 5	RT 5A	RT 110	RT 112	RT 113	RT 116	RT 117	RT 121	RT 200	RT 260A	RT 262A
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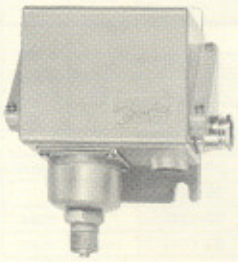
Ⓓ Demko, Denmark
Nemko, Norway
△ VDE, W. Germany (Prüfkl. II)
Ⓢ SEV, Switzerland
Sähkötarkastuslaitos, Finland
Det norske Veritas
Lloyds Register of Shipping
Ⓖ Germanischer Lloyd
Ⓖ Germanischer Lloyd
DDR-Schiffs-Revision und -Klassifikation
Bureau Veritas
Registro Italiano Navale
Polski Rejestr Statkow
USSR Register of Shipping

Pressure Controls Type KPS

Technical data and code Nos.



KPS 33

Regulation range p_e bar	Differential bar	Discharge line connection BSP	Test pressure p_e bar	Material of parts in contact with media	Code No.	Type
0-3.5	fixed 0.2	3/8" ext.	10	A	060-3103	KPS 33
0-8	0.4-1.5		12	B	060-3100	KPS 35
6-18	0.75-2.5		22	B	060-3101	KPS 37
10-35	1.8-6		45	B	060-3102	KPS 39

p_e = effective pressure

Materials

A = Bellows housing: deep-drawn plate, material No. 1.0524 (DIN 1624)
Bellows: stainless steel, material No. 1.4306 (DIN 17.440)

B = Bellows housing: brass, material No. 2.0405 (DIN 17.660)
Bellows: stainless steel as "A"

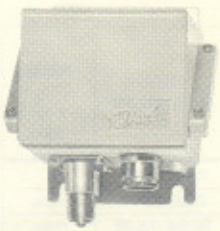
Switch: single-pole changeover (SPDT)

Contact load: 10(6)A, 440V~
12W, 220V⎓

Enclosure: IP67 in accordance with IEC 144; P55 (DIN 40050)

Screwed cable entry: 1 × Pg 13.5

Vibration resistance: 0-30 Hz, amplitude 1.12 mm
30-300 Hz, acceleration 4g



KPS 35, 37, 39

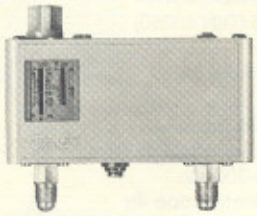
Approvals

KPS 33	KPS 35	KPS 37	KPS 39	
×	×	×	×	Demko, Denmark
×	×	×	×	Nemko, Norway
×	×	×	×	VDE, W. Germany (Prüfkl. II)
×	×	×	×	SEV, Switzerland
				Sähkötarkastuslaitos, Finland
×	×	×	×	Det norske Veritas
×	×	×	×	Lloyds Register of Shipping
×	×	×	×	Germanischer Lloyd
				Germanischer Lloyd
×	×	×	×	DDR-Schiffs-Revision und -Klassifikation
×	×	×	×	Bureau Veritas
×	×	×	×	Registro Italiano Navale
×	×	×	×	Polski Rejestr Statkow
×	×	×	×	USSR Register of Shipping

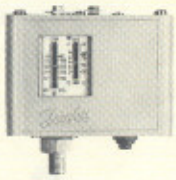
Danfoss Pressure Controls Type KP

Technical data and code Nos.

KP 1

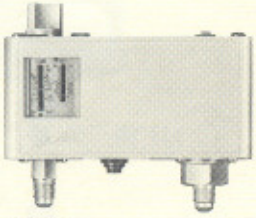


KP 15



KP 5A

KP 7W



KP 17W

	Low pressure (LP)		High pressure (HP)			Code No.		Reset Type	
	Range p_e bar	Differential Δp bar	Range p_e bar	Differential Δp bar	Max. test pressure p_e bar	Discharge line connection ¼ in flare	Discharge line connection 1 m capillary tube	LP	HP
Refrigerants: R 12, R 13B1, R 22, R 114, R 500, R 502									
KP 1	–0.2 to +7.5	0.7-4				60-1101	60-1100		
	–0.9 to +7	fixed 0.7				60-1103	60-1102	min.	
KP 2	–0.2 to +5	0.4-1.5				60-1120	60-1121		
KP 5			6 to 32	1.8-6	33	60-1171	60-1170		
			10 to 32	fixed 3		60-1173	60-1172		max.
KP 15	–0.2 to +7.5	0.7-4	6 to 32	fixed 4	33	60-1241	60-1240		
	–0.2 to 7.5	0.7-4	6 to 32	fixed 4		60-1243	60-1242		max.
	–0.9 to +7	fixed 0.7	6 to 32	fixed 4		60-1245	60-1244	min.	max.
Refrigerants: R 717(NH_3), R 12, R 13B1, R 22, R 114, R 500, R 502									
KP 1A	–0.2 to +7.5	0.7-4					60-1160		
	–0.9 to +7	fixed 0.7					60-1161	min.	
KP 5A			6 to 32	1.8-6	33		60-1230		
			10 to 32	fixed 3			60-1231		max.
KP 15A	–0.2 to +7.5	0.7-4	6 to 32	fixed 4			60-1285		
	–0.2 to +7.5	0.7-4	6 to 32	fixed 4	33		60-1286		max.
	–0.9 to +7	fixed 0.7	6 to 32	fixed 4			60-1287	min.	max.

TÜV tested and approved units)*
Refrigerants: R 12, R 13B1, R 22, R 114, R 500, R 502

Type **)	Low pressure (LP)		High pressure (HP)			Code No.	TÜV approval No.	Reset
	Range p_e bar	Differential Δp bar	Range p_e bar	Differential Δp bar	Max. test pressure p_e bar	Discharge line connection ¼ in flare		HP
KP 7W			6-32	4-10		60-1190	DWK-75-33	
KP 7B			10-32	fixed 3		60-1191	DBK-75-34	max.
KP 7S			10-32	fixed 3	33	60-1192	SDBK-75-35	max.
KP 7BS			B: 6-32	fixed 4		60-1200	DBK-SDBK 75-39	B: max.
			S: 10-32	fixed 4				S: max.
KP 17W	–0.2 to +7.5	0.7 to 4	6-32	fixed 4	33	60-1267	DWK-75-36	
KP 17B	–0.2 to +7.5	0.7 to 4	6-32	fixed 4		60-1268	DBK-75-37	max.

*) Fulfils the requirements in VBG 20 regarding safety equipment for over-pressures.
**) W: with automatic reset, B: with manual reset, S: with manual reset by means of tools.
Regulating bellows failure will cause the refrigeration compressor to stop. With failure of the outer bellows, the cutout pressure of the unit will fall to approx. 3 bar under the set value.

Approvals

KP 1	KP 2	KP 5	KP 15	KP 1A	KP 5A	KP 15A	KP 7W	KP 7B	KP 7S	KP 7BS	KP 17W	KP 17B
×	×	×	×	×	×	×	×	×	×	×	×	×
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Ⓓ DEMKO, Denmark
NEMKO, Norway
Ⓢ SEV, Switzerland
Sähkötarkastuslaitos, Finland
Ⓖ Germanischer Lloyd
TÜV Technischer Überwachungs Verein, W. Germany
DSRK, DDR-Schiffs-Revision und -Klassifikation
PRS, Polski Rejestr Statków
DnV, Det norske Veritas
RINA, Registro Italiano Navale

Differential Pressure Controls Type KP

Technical data and code Nos.

KP 55A

Type	Code No.	Release time of timing relay s	LP function range p_e bar	Differential Δp bar
KP 54	60U3055	60	−0.5 to +10	fixed 0.7
	60U3056	60		
	60U3053	120		
	60U3054	120		
KP 55	60U3057	45	−0.5 to +10	0.4-4.5
	60U3058	60		
	60U3061	60		
	60U3059	90		
	60U3050	120		
	60U3051	120		
KP 55A	60U3062	45	−0.5 to +10	0.4-4.5
	60U3063	60		

Refrigerants:
R 12, R 22, R 502, etc. The KP 55A can also be used in plants with R 717 (NH_3)

Approvals

KP 54	KP 55	KP 55A
×	×	×
×	×	×
×	×	×
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Ⓓ DEMKO, Denmark
NEMKO, Norway
Ⓢ SEV, Switzerland
DSRK, DDR-Schiffs-Revision und -Klassifikation
Sähkotarkastuslaitos, Finland

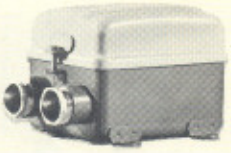
Pressure and Temperature Transmitters Types EMP, EMT

Technical data and code Nos.

Pressure transmitter type EMP

Pressure range p_e	Test pressure p_e	Bursting pressure p_e	Code Nos.	
			EMP2(4–20mA)	EMP3(0–20mA)
0 to 1.6 bar	3.2 bar	100 bar	084G0001	084G0006
0 to 2.5 bar	5 bar	100 bar	084G0011	084G0016
0 to 4 bar	8 bar	100 bar	084G0012	084G0017
0 to 6 bar	12 bar	200 bar	084G0002	084G0007
0 to 10 bar	20 bar	200 bar	084G0013	084G0018
0 to 16 bar	32 bar	400 bar	084G0003	084G0008
0 to 25 bar	50 bar	400 bar	084G0014	084G0019
0 to 40 bar	80 bar	400 bar	084G0015	084G0020
0 to 60 bar	120 bar	400 bar	084G0004	084G0009
0 to 160 bar	260 bar	400 bar	084G0005	084G0010
0 to 1.6 kp/cm²	3.2 kp/cm²	100 kp/cm²	084G0031	084G0041
0 to 2.5 kp/cm²	5 kp/cm²	100 kp/cm²	084G0032	084G0042
0 to 4 kp/cm²	8 kp/cm²	100 kp/cm²	084G0033	084G0043
0 to 6 kp/cm²	12 kp/cm²	200 kp/cm²	084G0034	084G0044
0 to 10 kp/cm²	20 kp/cm²	200 kp/cm²	084G0035	084G0045
0 to 16 kp/cm²	32 kp/cm²	400 kp/cm²	084G0036	084G0046
0 to 25 kp/cm²	50 kp/cm²	400 kp/cm²	084G0037	084G0047
0 to 40 kp/cm²	80 kp/cm²	400 kp/cm²	084G0038	084G0048
0 to 60 kp/cm²	120 kp/cm²	400 kp/cm²	084G0039	084G0049
0 to 160 kp/cm²	260 kp/cm²	400 kp/cm²	084G0040	084G0050

p_e = effective pressure



Temperature transmitter type EMT

Temperature range	For sensor type	Code Nos.	
		EMT2(4–20mA)	EMT3(0–20mA)
−10 to +150°C	Ni 100 Ω	084G0021	084G0026
−10 to +150°C	Pt 100 Ω	084G0022	084G0027
0 to +250°C	Pt 100 Ω	084G0023	084G0028
0 to +450°C	Pt 100 Ω	084G0024	084G0029
0 to +650°C	Pt 100 Ω	084G0025	084G0030

Pressure transmitter type EMP converts liquid, vapour or gas pressure into an electric signal.

Temperature transmitter type EMT is a unit that through a resistance sensor converts a temperature to an electric signal.

Additional data

Additional data		Pressure transmitter EMP	Temperature transmitter EMT
Full scale accuracy		±1%	±1%
Temperature dependency:	zero shift	±0.06%/°C	±0.03%/°C
	amplific.	+0.06%/°C	
Media temperature		−40/+100°C	Dependent on range
Media pressure		See range	Dependent on sensor
Supply voltage; d.c.		13.5-36V, two-wire 19.2-36V, three-wire	13-36V, two-wire 19-36V, three-wire
Voltage dependence		±0.005%/V	±0.005%/V
Load		0 to 1000 Ω	0 to 1000 Ω
Vibration resistance		3-30 Hz, amplitude 1.13 mm and 30-700 Hz, acceleration 4 g	3-30 Hz, amplitude 1.13 mm and 30-1000 Hz, acceleration 4 g
Enclosure		IP 65	IP 65

Approvals

EMP	EMT
×	*)
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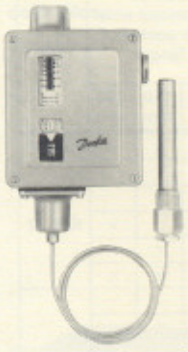
*) Approval non-obligatory

Det norske Veritas
Lloyds Register of Shipping
GL Germanischer Lloyd, W. Germany
DDR-Schiffs-Revision und -Klassifikation
Bureau Veritas
Registro Italiano Navale
Polski Rejestr Statkow
USSR Register of Shipping

Danfoss Thermostats Type RT

Technical data and code Nos.

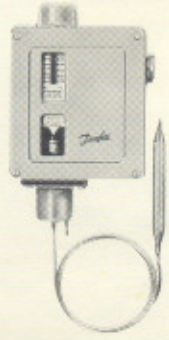


RT 106

RT 107

RT 120

RT 123



RT 124

Regulation range °C	Differential at min. temp. setting °C	Differential at max. temp. setting °C	Max. permissible bulb temp. °C	Bulb type	Capillary tube length m	Code No. With knob and cover with windows	Code No. With seal cap and cover without windows	Type
−25 to +15	1.5-7.5	0.8-3	150	cylindrical	2	17-5014		RT 3
−25 to +15	5-18	6-20	150	cylindrical	2	17-5008		RT 2
−25 to +15	2-7	2-9.5	150	cylindrical	2	17-5053		RT 7
− 5 to +30	1.5-7	1.5-8	150	cylindrical	2	17-5099		RT 14
−45 to −15	1-5	0.8-2	70	rigid coiled capillary tube	–	17-5117		RT 17
−25 to +15	1.4-8.5	1.4-10	70			17-5118		RT 34
− 5 to +30	1-7	0.6-3	70			17-5036		RT 4
+15 to +45	1.5-12	1.5-12	70			17-5155		RT 103
+15 to +45	1.5-9	1,5-11	240	coiled capillary tube on mounting flange	2	17-5236		RT 140
+25 to +90	2-10.5	3-23	300	1.1 m, 4 mm capillary tube	2	17-5147		RT 102
+25 to +90	2-16	3-24	300	cylindrical bulb with pocket	2	17-5126		RT 101
+20 to +90	5-20	1.5-7	120	cylindrical bulb with pocket	2	17-5162	17-5161	RT 106
+70 to +150	5-30	1.5-10	215	cylindrical bulb with pocket	2	17-5166	17-5185	RT 107
					3	17-5167		
					5	17-5168	17-5186	
					8	17-5169		
					10	17-5170		
+120 to +215	5-30	1.5-10	260	cylindrical	2	17-5208	17-5210	RT 120
					5	17-5209		
+150 to +250	5-30	1.5-10	300	cylindrical	2	17-5220	17-5225	RT 123
					5	17-5222		
					8	17-5223		
+200 to +300	5-30	1.5-10	350	cylindrical	2	17-5227		RT 124
					5	17-5229		

Material of parts in contact with media:
Sensor: tinned Cu, material No. 2.0090 (DIN 1787); except the RT 124 where the sensor is of stainless steel, material No. 1.4301 (DIN 17440)

Bulb pocket: see KPS thermostats on next page.

Switch: Single-pole changeover (SPDT)

Contact load:
Ohmic 10A 380V
Inductive 4A 380V (full load current)
30A 380V (starting current)
Direct current 12W 220V

Enclosure: IP 66 in accordance with IEC 144

Approvals

RT 2	RT 3	RT 4	RT 7	RT 14	RT 17	RT 34	RT 101	RT 102	RT 103	RT 106	RT 107	RT 120	RT 123	RT 124	RT 140
×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×
×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×
×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×
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	×		×	×			×								
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										×	×	×	×	×	
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				×			×	×		×	×	×	×	×	

Ⓓ Demko, Denmark
Nemko, Norway
VDE, W. Germany (Prüfkl. II)
SEV, Switzerland
Sähkötarkastuslaitos, Finland
Det norske Veritas
Lloyds Register of Shipping
Ⓖ Germanischer Lloyd
Ⓖ Germanischer Lloyd
DDR-Schiffs-Revision und -Klassifikation
Bureau Veritas
Registro Italiano Navale
Polski Rejestr Statkow
USSR Register of Shipping

Thermostats Type KPS

Technical data and code Nos.

KPS 77
with cylindrical bulb

KPS 79
With plain capillary tube

KPS 83
With armoured capillary tube

Regulation range °C	Mechanical differential (self-differential) °C	Max. permissible temperature on bulb °C	Capillary tube length m	Without capillary tube for bulb pocket of length 75 mm	110 mm	160 mm	With capillary tube plain	armoured	Can be combined with bulb pocket of length 75 mm	110 mm	160 mm	Type
−10 to +30	3-10	80	2				060L3112	060L3113	×	×	×	KPS 76
+20 to +60	3-14	130	0	060L3118					×			KPS 77
			0		060L3100					×		
			0			060L3136					×	
			2				060L3101	060L3102	×	×	×	
			5				060L3119	060L3120		×	×	
+50 to +100	4-16	200	0	060L3121					×			KPS 79
			0		060L3103					×		
			0			060L3137					×	
			2				060L3104	060L3105	×	×	×	
			5				060L3122	060L3123		×	×	
			8				060L3124	060L3125		×	×	
+70 to +120	4.5-18	220	0	060L3126					×			KPS 80
			0		060L3127					×		
			0			060L3138					×	
			2				060L3128	060L3129	×	×	×	
			5				060L3130	060L3131		×	×	
			8				060L3132	060L3133		×	×	
+80 to +150	5-25	250	2				060L3106	060L3107	×	×	×	KPS 81
			5				060L3134	060L3135		×	×	
+100 to +200	6.5-30	300	2				060L3108	060L3109	×	×	×	KPS 83

Bulb pockets

L mm	Brass	Stainless steel 18/8
75	060L3326	060L3328
110	060L3330	060L3331
160	060L3327	060L3329

Materials:
Bulb pocket: brass, material No. 2.0265 and 2.0405 (DIN 17660). Soldering is free of cadmium.
Bulb pocket: stainless steel 18/8, material No. 1.4305 (DIN 17.440)

Switch: Single-pole changeover (SPDT)

Contact load: 10(6)A, 440V~
12W, 220V⎓

Enclosure: IP 67 in accordance with IEC 144; P 55 (DIN 40050)

Screwed cable entry: 1 × Pg 13.5

Vibration resistance: 0-30 Hz, amplitude 1.12 mm
30-300 Hz, acceleration 4g

Approvals

KPS 76	KPS 77	KPS 79	KPS 80	KPS 81	KPS 83
×	×	×	×	×	×
×	×	×	×	×	×
×	×	×	×	×	×
×	×	×	×	×	×
×	×	×	×	×	×
×	×	×	×	×	×
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×	×	×	×	×	×
×	×	×	×	×	×
×	×	×	×	×	×
×	×	×	×	×	×

Ⓓ Demko, Denmark
Nemko, Norway
VDE, W. Germany (Prüfkl. II)
Ⓢ SEV, Switzerland
Sähkötarkastuslaitos, Finland
Det norske Veritas
Lloyds Register of Shipping
Ⓖ Germanischer Lloyd
DDR-Schiffs-Revision und -Klassifikation
Bureau Veritas
Registro Italiano Navale
Polski Rejestr Statkow
USSR Register of Shipping

Danfoss Electronic Thermostats Type EKT

Technical data and code Nos.

For the on-off regulation and monitoring of temperature in refrigeration, heating, industrial and marine installations.

- large temperature regulation range
- optimum temperature stability throughout the ambient temperature range
- temperature and differential (and also neutral zone in the EKT 30 and EKT 300) can be set independently of each other
- a high grade of enclosure (IP54) with a 96 × 96 mm thermostat housing to DIN standards for both panel and wall mounting
- easily removable thermostatic unit with plug-in connection
- fail-safe function in the EKT 200
- sensor can be located 150 m from the thermostat

EKT 20

EKT 300

Regulation range °C	Output switch	Type		Code No.	Code No. 24 V⎓ version
−60 to 0	SPDT	EKT 20	(for Ni-sensor)	084F2017	
	2 × SPDT	EKT 30	(for Ni-sensor)	084F2015	
−30 to +30	SPDT	EKT 20	(for Ni-sensor)	084F2013	
	2 × SPDT	EKT 30	(for Ni-sensor)	084F2011	
25 to 150	SPDT min.	EKT 200 min.	(for Ni-sensor)	084F2021	084F2027
	SPDT max.	EKT 200 max.	(for Ni-sensor)	084F2019	084F2025
	2 × SPDT	EKT 300	(for Ni-sensor)	084F2023	084F2029
0 to 150	SPDT min.	EKT 200 min.	(for Pt-sensor)	084F2041	084F2047
	SPDT max.	EKT 200 max.	(for Pt-sensor)	084F2039	084F2045
	2 × SPDT	EKT 300	(for Pt-sensor)	084F2043	084F2049

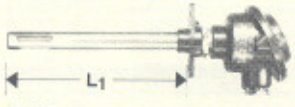
EKT 20: *Two-position thermostat for ranges −60 to 0°C and −30 to +30°C.*

EKT 30: *Three-position thermostat for ranges −60 to 0°C and −30 to +30°C.*

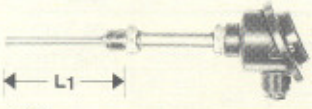
EKT 200: *Two-position thermostat for ranges +25 to +150°C (with Ni sensor) and 0 to +150°C (with Pt sensor).*

EKT 300: *Three-position thermostat for ranges +25 to +150°C (with Ni sensor) and 0 to +150°C (with Pt sensor).*

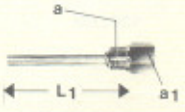
Sensors and sensor pockets



ESD



ESW



Pockets

Sensors and pockets for EPT 60	Regulation range °C	Code No. Length 100 mm	160 mm	250 mm	400 mm	Thread a	Thread a_1
ESD duct sensor	−60 to +110		84N0031	84N0032	84N0033		
ESW pocket sensor	−60 to +180	84N0061	84N0062	84N0063	84N0064	1/2 BSP Tr	
ESW pocket sensor	−60 to +180	84N0091	84N0092	84N0093	84N0094	1/2 NPT	
Pocket for ESW		84N0252	84N0253	84N0254	84N0255	1/2 BSP Tr	1/2 BSP
Pocket for ESW		84N0246	84N0247	84N(248	84N0249	1/2 NPT	1/2 NPT

Switch: Single-pole changeover (SPDT)

Contact load: Max. 4A/250V (ohmic)
1.5A/250V (inductive)

Enclosure: IP54 in accordance with IEC 144

Vibration resistance: 4g, 0-1000 Hz

Approvals

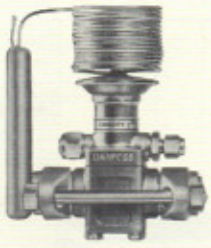
EKT 20, 30; 200; 300	
×	Ⓓ Demko, Denmark
×	Nemko, Norway
	VDE, W. Germany (Prüfkl. II)
×	SEV, Switzerland
×	Sähkötarkastuslaitos, Finland
	Det norske Veritas
	Lloyds Register of Shipping
×	Germanischer Lloyd
×	DDR-Schiffs-Revision und -Klas.
	Bureau Veritas
	Registro Italiano Navale
×	Polski Rejestr Statkow
	USSR Register of Shipping

Thermostatic Expansion Valves Types T/TE/PHT

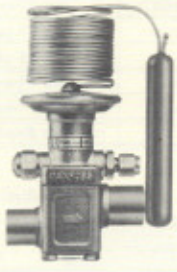
Technical data and code Nos.

TE 2

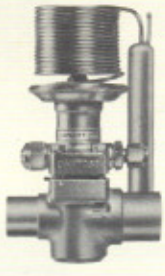
TE 5



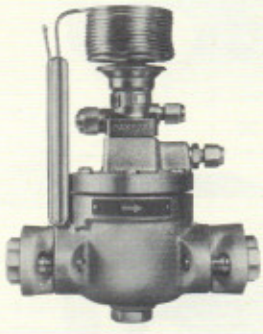
TE 12



TE 20



TE 55



PHT 85

Footnotes

1) The orifice assembly No. 0 for T/TE 2 can be obtained under code No. 68–2003.
   Rated capacity for range N, R 12: 600 kcal/h.
   for range N, R 22: 900 kcal/h
   for range B, R 22 and R 502: 600 kcal/h
2) The rated capacity is the capacity of the valve at the following evaporating temperatures t_o and condensing temperatures t_k
   for range N: $t_o = +5°C$, $t_k = +32°C$,
   for range B: $t_o = -30°C$, $t_k = +32°C$.
   The rated capacity is based on 4°C subcooling ahead of valve.
3) int. = internal; ext. = external.
4) Strainer with bolts, nuts, and gaskets for TE 12 with flanges, code No. 6–0040.
5) Bracket for T 5/TE 5, code No. 68B0425,
   for TE 12 and TE 20, code No. 68B0350.
6) Separate power element

for TF 5,	range N, code No.	68B3241		
for TEF 5,	range N, code No.	68B3244		
for TX 5,	range N, code No.	68B3247		
for TEX 5,	range N, code No.	68B3250;	range B, code No.	68B3251
for TY 5,	range N, code No.	68B3254		
for TEY 5,	range N, code No.	68B3257;	range B, code No.	68B3258
for TEF 12,	range N, code No.	68B3204		
for TEF 20,	range N, code No.	68B3270		
for TEF 55,	range N, code No.	68G3201		
for PHTF 85,	range N, code No.	68B0148		
for TEX 12,	range N, code No.	68B3210;	range B, code No.	68B3211
for TEX 20,	range N, code No.	68B3274;	range B, code No.	68B3276
for TEX 55,	range N, code No.	68G3205;	range B, code No.	68G3207
for PHTX 85,	range N, code No.	68B0149		
for TEY 12,	range N, code No.	68B3218;	range B, code No.	68B3219
for TEY 20,	range N, code No.	68B3280;	range B, code No.	68B3282
for TEY 55,			range B, code No.	68G3213

   When ordering a separate power element for range NM, or NL, please state the code No. of the assembled valve for which the power element is required.
7) Pilot orifice assembly for PHT 85, code No. 68B2089.
8) Inlet 1/4 in or 6 mm consists of, respectively, a 3/8 in × 1/4 in or 10 mm × 6 mm reducer.
9) ODF × ODF. In addition to the solder straightway, solder angleway and solder flange valves are available.
10) ODF × ODM.
11) The valve can be obtained both with ODF × ODF and ODM × ODF. The table states ODF × ODF. The dimensions of ODM × ODM are in this case 1/4 in larger.
    ODF = inside diameter of connection.
    ODM = outside diameter of connection.
    A solder connection can be used.
12) When ordering the flare design with mm connection, please state both the code No. and the mm size required.
13) Range B for TE 12, TE 20 and TE 55: −55°C to −25°C.
    For MOP-valves in other designs than those specified, contact your Danfoss distributor.

Thermostatic Expansion Valves Types T/TE/PHT

Technical data and code Nos.

Range: N, NM and NL

Refrigerant: R 12

[1] [2] Type and rated capacity tons (TR)	[7] Rated capacity kcal/h	[3] Pressure equalization	Connection in inches (inlet × outlet)			[4] [5] [6] [7] Code No. of assembled valve			Connection in mm (inlet × outlet)		[4] [5] [6] [7] [12] Code No. of assembled valve			[1] Code No. of separate orifice assembly
			flare	[9] solder connections	weld flanges	range N −40°C to +10°C	[13] range NM (MOP) −40°C to −5°C	[13] range NL (MOP) −40°C to −15°C	[12] flare	[9] solder connections	range N −40°C to +10°C	[13] range NM (MOP) −40°C to −5°C	[13] range NL (MOP) −40°C to −15°C	
			[8] angle-way	straight-way					[8] angle-way	straight-way				
T 2/TE 2														
TF 2-0.3	900	int.	1/4 × 1/2			68-6014	68-5001	68-5013	6 × 12		68-6014	68-5001	68-5013	No. 1: 68-2004
TEF 2-0.3	900	ext.	1/4 × 1/2			68-6021	68-5007	68-5019	6 × 12		68-6021	68-5007	68-5019	
TF 2-0.5	1500	int.	1/4 × 1/2			68-6015	68-5002	68-5014	6 × 12		68-6015	68-5002	68-5014	No. 2: 68-2005
TEF 2-0.5	1500	ext.	1/4 × 1/2			68-6022	68-5008	68-5020	6 × 12		68-6022	68-5008	68-5020	
TF 2-1	3000	int.	1/4 × 1/2			68-6016	68-5003	68-5015	6 × 12		68-6016	68-5003	68-5015	No. 3: 68-2006
TEF 2-1	3000	ext.	1/4 × 1/2			68-6023	68-5009	68-5021	6 × 12		68-6023	68-5009	68-5021	
TF 2-1.5	4500	int.	3/8 × 1/2			68-6017	68-5004	68-5016	10 × 12		68-6017	68-5004	68-5016	No. 4: 68-2007
TEF 2-1.5	4500	ext.	3/8 × 1/2			68-6024	68-5010	68-5022	10 × 12		68-6024	68-5010	68-5022	
TF 2-2	6000	int.	3/8 × 1/2			68-6018	68-5005	68-5017	10 × 12		68-6018	68-5005	68-5017	No. 5: 68-2008
TEF 2-2	6000	ext.	3/8 × 1/2			68-6025	68-5011	68-5023	10 × 12		68-6025	68-5011	68-5023	
TF 2-3	9000	int.	3/8 × 1/2			68-6020	68-6006	68-6010	10 × 12		68-6006	68-6006	68-6010	No. 6: 68-2009
TEF 2-3	9000	ext.	3/8 × 1/2			68-6071	68-6008	68-6012	10 × 12		68-6071	68-6008	68-6012	
T 5/TE 5														
TF 5-2	6000	int.	3/8 × 5/8			68B6218			10 × 16		68B6218			No. 1: 68B2086
TEF 5-2	6000	ext.	3/8 × 5/8			68B6227			10 × 16		68B7162			No. 1: 68B2089
TEF 5-2	6000	ext.		1/2 × 5/8		68B6230				12 × 16	68B7165			No. 1: 68B2089
TF 5-3	9000	int.	3/8 × 5/8			68B6219			10 × 16		68B6219			No. 2: 68B2087
TEF 5-3	9000	ext.	3/8 × 5/8			68B6228			10 × 16		68B7163			No. 2: 68B2090
TEF 5-3	9000	ext.	1/2 × 5/8			68B6231				12 × 16	68B7166			No. 2: 68B2090
TF 5-5	15000	int.	1/2 × 5/8			68B6220			12 × 16		68B6220			No. 3: 68B2088
TEF 5-5	15000	ext.	1/2 × 5/8			68B6229			12 × 16		68B7164			No. 3: 68B2091
TEF 5-5	15000	ext.		1/2 × 7/8		68B6232				12 × 22	68B7167			No. 3: 68B2091
TE 12														
TEF 12-3	9000	ext.		[9] 5/8 × 7/8		68B5017				[9] 16 × 22	68B6071			No. 1: 68B2005
TEF 12-5	15000			[9] 5/8 × 7/8		68B5018				[9] 16 × 22	68B6072			No. 2: 68B2006
TEF 12-8	24000			[10] 7/8 × 1 1/8		68B5019				[10] 22 × 28	68B6073			No. 3: 68B2007
TEF 12-12	36000			[10] 7/8 × 1 1/8		68B5020				[10] 22 × 28	68B6074			No. 4: 68B2008
TE 20														
TEF 20-20	60000	ext.		[10] 7/8 × 1 1/8		68B8100				[10] 22 × 28	68B8102			68B2170
TE 55														
TEF 55-33	99000	ext.		[11] 7/8 × 1 1/8		68G5001				[11] 22 × 28	68G5005			68G2001
TEF 55-55	165000			[11] 7/8 × 1 1/8		68G5002				[11] 22 × 28	68G5006			68G2002
PHT 85														
PHTF 85-20	60000	ext.			1 × 1	26H1400								No. 1: 26H1101
PHTF 85-33	99000				1 × 1	26H1403								No. 2: 26H1102
PHTF 85-55	165000				1 × 1	26H1406								No. 3: 26H1103
PHTF 85-85	255000				1 × 1	26H1408								No. 4: 26H1104

Footnotes, see page 10

Code Nos. for separate TE 12 filter, mounting bracket, separate power element, PHT 85 pilot orifice assembly, are given in footnotes 4), 5), 6) and 7).

Approvals: DSRK, DDR-Schiffs-Revision und -Klassifikation. PRS, Polski Rejestr Statków

Thermostatic Expansion Valves
Types T/TE/PHT

Technical data and code Nos.

Range: N, NM and NL

Refrigerant: R 22

[1] [2] Type and rated capacity tons (TR)	[2] Rated capacity kcal/h	[3] Pressure equalization	Connection in inches (inlet × outlet)			[4] [5] [6] [7] Code No. of assembled valve			Connection in mm (inlet × outlet)		[4] [5] [6] [7] [12] Code No. of assembled valve			[1] Code No. of separate orifice assembly
			flare	[9] solder connections	weld flanges	range N −40°C to +10°C	[13] renge NM (MOP) −40°C to −5°C	[13] rangeNL (MOP) −40°C to −15°C	[12] flare	[9] solder connections	range N −40°C to +10°C	[13] range NM (MOP) −40°C to −5°C	[13] range NL (MOP) −40°C to −15°C	
			[8] angle-way	straight-way					[8] angle-way	straight-way				
T 2/TE 2														
TX 2-0.5	1 500	int.	1/4 × 1/2			68-6040	68-5025	68-5037	6 × 12		68-6040	68-5025	68-5037	No. 1: 68-2004
TEX 2-0.5	1 500	ext.	1/4 × 1/2			68-6047	68-5031	68-5043	6 × 12		68-6047	68-5031	68-5043	
TX 2-0.8	2 400	int.	1/4 × 1/2			68-6041	68-5026	68-5038	6 × 12		68-6041	68-5026	68-5038	No. 2: 68-2005
TEX 2-0.8	2 400	ext.	1/4 × 1/2			68-6048	68-5032	68-5044	6 × 12		68-6048	68-5032	68-5044	
TX 2-1.5	4 500	int.	1/4 × 1/2			68-6042	68-5027	68-5039	6 × 12		68-6042	68-5027	68-5039	No. 3: 68-2006
TEX 2-1.5	4 500	ext.	1/4 × 1/2			68-6049	68-5033	68-5045	6 × 12		68-6049	68-5033	68-5045	
TX 2-2.3	6 900	int.	3/8 × 1/2			68-6043	68-5028	68-5040	10 × 12		68-6043	68-5028	68-5040	No. 4: 68-2007
TEX 2-2.3	6 900	ext.	3/8 × 1/2			68-6050	68-5034	68-5046	10 × 12		68-6050	68-5034	68-5046	
TX 2-3	9 000	int.	3/8 × 1/2			68-6044	68-5029	68-5141	10 × 12		68-6044	68-5029	68-5041	No. 5: 68-2008
TEX 2-3	9 000	ext.	3/8 × 1/2			68-6051	68-5035	68-5047	10 × 12		68-6051	68-5035	68-5047	
TX 2-4.5	13 500	int.	3/8 × 1/2			68-6078	68-6028	68-6032	10 × 12		68-6078	68-6028	68-6032	No. 6: 68-2009
TEX 2-4.5	13 500	ext.	3/8 × 1/2			68-6085	68-6030	68-6034	10 × 12		68-6085	68-6030	68-6034	
T 5/TE 5														
TX 5-3	9 000	int.	3/8 × 5/8			68B6272			10 × 16		68B6272			No. 1: 68B2086
TEX 5-3	9 000	ext.	3/8 × 5/8			68B6281			10 × 16		68B7180			No. 1: 68B2089
TEX 5-3	9 000	ext.		1/2 × 5/8		68B6284	68B0185			12 × 16	68B7183	68B0194		No. 1: 68B2089
TX 5-4.5	13 500	int.	3/8 × 5/8			68B6273			10 × 16		68B6273			No. 2: 68B2087
TEX 5-4.5	13 500	ext.	3/8 × 5/8			68B6282			10 × 16		68B7181			No. 2: 68B2090
TEX 5-4.5	13 500	ext.		1/2 × 5/8		68B6285	68B0186			12 × 16	68B7184	68B0195		No. 2: 68B2090
TX 5-7.5	22 500	int.	1/2 × 5/8			68B6274			12 × 16		68B6274			No. 3: 68B2088
TEX 5-7.5	22 500	ext.	1/2 × 5/8			68B6283			12 × 16		68B7182			No. 3: 68B2091
TEX 5-7.5	22 500	ext.		1/2 × 7/8		68B6286	68B0187			12 × 22	68B7185	68B0196		No. 3: 68B2091
TE 12														
TEX 12-4.5	13 500	ext.		[9] 5/8 × 7/8		68B5135	68B4176			[9] 16 × 22	68B6103	68B4224		No. 1: 68B2005
TEX 12-7.5	22 500			[9] 5/8 × 7/8		68B5136	68B4177			[9] 16 × 22	68B6104	68B4225		No. 2: 68B2006
TEX 12-12	36 000			[10] 7/8 × 1 1/8		68B5137	68B4178			[10] 22 × 28	68B6105	68B4226		No. 3: 68B2007
TEX 12-18	54 000			[10] 7/8 × 1 1/8		68B5138	68B4179			[10] 22 × 28	68B6106	68B4227		No. 4: 68B2008
TE 20														
TEX 20-30	90 000	ext.		[10] 7/8 × 1 1/8		68B8116	68B8120			[10] 22 × 28	68B8118			68B2172
TE 55														
TEX 55-50	150 000	ext.		[11] 7/8 × 1 1/8		68G5033	68G5041			[11] 22 × 28	68G5037			68G2005
TEX 55-85	255 000			[11] 7/8 × 1 1/8		68G5034	68G5042			[11] 22 × 28	68G5038			68G2006
PHT 85														
PHTX 85-30	90 000	ext.			1 × 1	26H1410								No. 1: 26H1101
PHTX 85-50	150 000				1 × 1	26H1413								No. 2: 26H1102
PHTX 85-85	255 000				1 × 1	26H1416								No. 3: 26H1103
PHTX 85-135	405 000				1 × 1	26H1418								No. 4: 26H1104

Footnotes, see page 10

Approvals:
DSRK, DDR-Schiffs-Revision und -Klassifikation.
PRS, Polski Rejestr Statków

Thermostatic Expansion Valves Types T/TE

Technical data and code Nos.

Range: N, NM and NL

Refrigerant: R 502

[1] [2] Type and rated capacity tons (TR)	[2] Rated capacity kcal/h	[3] Pressure equalization	Connection in inches (inlet × outlet)		[4] [5] [6] [7] Code No. of assembled valve			Connection in mm (inlet × outlet)		[4] [5] [6] [7] [12] Code No. of assembled valve			[1] Code No. of separate orifice assembly
			flare	[9] solder connections	range N −40°C to +10°C	[13] range NM (MOP) −40°C to −5°C	[13] range NL (MOP) −40°C to −15°C	[12] flare	[9] solder connections	range N −40°C to +10°C	[13] range NM (MOP) −40°C to −5°C	[13] range NL (MOP) −40°C to −15°C	
			[8] angle-way	straight-way				[8] angle-way	straight-way				
T 2/TE 2													
TY 2-0.3	900	int.	1/4 × 1/2		68-6065	68-5049	68-5061	6 × 12		68-6065	68-5049	68-5061	No. 1: 68-2004
TEY 2-0.3	900	ext.	1/4 × 1/2		68-6072	68-5055	68-5067	6 × 12		68-6072	68-5055	68-5067	
TY 2-0.5	1500	int.	1/4 × 1/2		68-6066	68-5050	68-5062	6 × 12		68-6066	68-5050	68-5062	No. 2: 68-2005
TEY 2-0.5	1500	ext.	1/4 × 1/2		68-6073	68-5056	68-5068	6 × 12		68-6073	68-5056	68-5068	
TY 2-1	3000	int.	1/4 × 1/2		68-6067	68-5051	68-5063	6 × 12		68-6067	68-5051	68-5063	No. 3: 68-2006
TEY 2-1	3000	ext.	1/4 × 1/2		68-6074	68-5057	68-5069	6 × 12		68-6074	68-5057	68-5069	
TY 2-1.5	4500	int.	3/8 × 1/2		68-6068	68-5052	68-5064	10 × 12		68-6068	68-5052	68-5064	No. 4: 68-2007
TEY 2-1.5	4500	ext.	3/8 × 1/2		68-6075	68-5058	68-5070	10 × 12		68-6075	68-5058	68-5070	
TY 2-2	6000	int.	3/8 × 1/2		68-6069	68-5053	68-5065	10 × 12		68-6069	68-5053	68-5065	No. 5: 68-2008
TEY 2-2	9000	ext.	3/8 × 1/2		68-6076	68-5059	68-5071	10 × 12		68-6076	68-5059	68-5071	
TY 2-3	9000	int.	3/8 × 1/2		68-6112	68-6036	68-6046	10 × 12		68-6112	68-6036	68-6046	No. 6: 68-2009
TEY 2-3	9000	ext.	3/8 × 1/2		68-6119	68-6038	68-5073	10 × 12		68-6119	68-6038	68-5073	
T 5/TE 5													
TY 5-2	6000	int.	3/8 × 5/8		68B7080			10 × 16		68B7080			No. 1: 68B2086
TEY 5-2	6000	ext.	3/8 × 5/8		68B7089			10 × 16		68B7089			No. 1: 68B2089
TEY 5-2	6000	ext.		1/2 × 5/8	68B7092		68B4061		12 × 16	68B7219		68B4070	No. 1: 68B2089
TY 5-3	9000	int.	3/8 × 5/8		68B7081			10 × 16		68B7081			No. 2: 68B2087
TEY 5-3	9000	ext.	3/8 × 5/8		68B7090			10 × 16		68B7090			No. 2: 68B2090
TEY 5-3	9000	ext.		1/2 × 5/8	68B7093		68B4062		12 × 16	68B7220		68B4071	No. 2: 68B2090
TY 5-5	15000	int.	1/2 × 5/8		68B7082			12 × 16		68B7082			No. 3: 68B2088
TEY 5-5	15000	ext.	1/2 × 5/8		68B7091			12 × 16		68B7091			No. 3: 68B2091
TEY 5-5	15000	ext.		1/2 × 7/8	68B7094		68B4063		12 × 22	68B7221		68B4072	No. 3: 68B2091
TE 12													
TEY 12-3	9000	ext.		[9] 5/8 × 7/8	68B5231		68B4200		[9] 16 × 22	68B6135		68B4248	No. 1: 68B2005
TEY 12-5	15000			[9] 5/8 × 7/8	68B5232		68B4201		[9] 16 × 22	68B6136		68B4249	No. 2: 68B2006
TEY 12-8	24000			[10] 7/8 × 1 1/8	68B5233		68B4202		[10] 22 × 28	68B6137		68B4250	No. 3: 68B2007
TEY 12-12	36000			[10] 7/8 × 1 1/8	68B5234		68B4203		[10] 22 × 28	68B6138		68B4251	No. 4: 68B2008
TE 20													
TEY 20-20	60000	ext.		[10] 7/8 × 1 1/8	68B8140				[10] 22 × 28	68B8142			68B2175

Footnotes, see page 10

Approvals:
DSRK, DDR-Schiffs-Revision und -Klassifikation.
PRS, Polski Rejestr Statków.

Thermostatic Expansion Valves
Types T/TE

Technical data and code Nos. *Range:* B *Refrigerant:* R 22

[1] [2] Type and rated capacity tons (TR)	[2] Rated capacity kcal/h	[3] pressure equalization	Connection in inches (inlet × outlet)		[4] [5] [6] [7] Code No. of assembled valve		Connection in mm (inlet × outlet)		[4] [5] [6] [7] [12] Code No. of assembled valve		[1] Code No. of separate orifice assembly
			flare	[9] solder connections	[13] range B −60°C to −25°C		[12] flare	[9] solder connections	[13] range B −60°C to −25°C		
			[8] angle-way	straight-way	with MOP	without MOP	[8] angle-way	straight-way	with MOP	without MOP	
T 2/TE 2											
TX 2-0.3	900	int.	1/4 × 1/2		68-6053	68-6208	6 × 12		68-6053	68-6208	No. 1: 68-2004
TEX 2-0.3	900	ext.	1/4 × 1/2		68-6059	68-6215	6 × 12		68-6059	68-6215	
TX 2-0.5	1500	int.	1/4 × 1/2		68-6054	68-6209	6 × 12		68-6054	68-6209	No. 2: 68-2005
TEX 2-0.5	1500	ext.	1/4 × 1/2		68-6060	68-6216	6 × 12		68-6060	68-6216	
TX 2-0.8	2400	int.	1/4 × 1/2		68-6055	68-6211	6 × 12		68-6055	68-6211	No. 3: 68-2006
TEX 2-0.8	2400	ext.	1/4 × 1/2		68-6061	68-6218	6 × 12		68-6061	68-6218	
TX 2-1.2	3600	int.	3/8 × 1/2		68-6056	68-6212	10 × 12		68-6056	68-6212	No. 4: 68-2007
TEX 2-1.2	3600	ext.	3/8 × 1/2		68-6062	68-6219	10 × 12		68-6062	68-6219	
TX 2-1.5	4500	int.	3/8 × 1/2		68-6057	68-6213	10 × 12		68-6057	68-6213	No. 5: 68-2008
TEX 2-1.5	4500	ext.	3/8 × 1/2		68-6063	68-6220	10 × 12		68-6063	68-6220	
TX 2-2	6000	int.	3/8 × 1/2		68-6134	68-6214	10 × 12		68-6134	68-6214	No. 6: 68-2009
TEX 2-2	6000	ext.	3/8 × 1/2		68-6136	68-6221	10 × 12		68-6136	68-6221	
TE 5											
TEX 5-3	9000	ext.		1/2 × 5/8	68B7002	68B8017		12 × 16	68B7201	68B8053	No. 1: 68B2089
TEX 4-4.5	13500			1/2 × 5/8	68B7003	68B8018		12 × 16	68B7202	68B8054	No. 2: 68B2090
TEX 5-7.5	22500			1/2 × 7/8	68B7004	68B8019		12 × 22	68B7203	68B8055	No. 3: 68B2091
TE 12											
TEX 12-4.5	13500	ext.		[9] 5/8 × 7/8	68B5175			[9] 16 × 22	68B6005		No. 1: 68B2005
TEX 12-7.5	22500			[9] 5/8 × 7/8	68B5176			[9] 16 × 22	68B6006		No. 2: 68B2006
TEX 12-12	36000			[10] 7/8 × 1 1/8	68B5177			[10] 22 × 28	68B6007		No. 3: 68B2007
TEX 12-18	54000			[10] 7/8 × 1 1/8	68B5178			[10] 22 × 28	68B6008		No. 4: 68B2008
TE 20											
TEX 20-20	60000	ext.		[10] 7/8 × 1 1/8	68B8132			[10] 22 × 28	68B8134		68B2172
TE 55											
TEX 55-35	105000	ext.		[11] 7/8 × 1 1/8	68G5065			[11] 22 × 28	68G5069		68G2005
TEX 55-60	180000			[11] 7/8 × 1 1/8	68G5066			[11] 22 × 28	68G5070		68G2006

Footnotes, see page 10

Approvals:
DSRK, DDR-Schiffs-Revision und -Klassifikation.
PRS, Polski Rejestr Statków.

Thermostatic Expansion Valves Types T/TE

Technical data and code Nos.

Range: B

Refrigerant: R 502

[1] [2] Type and rated capacity tons (TR)	[2] Rated capacity kcal/h	[3] Pressure equalization	Connection in inches (inlet × outlet)		[4] [5] [6] [7] Code No. of assembled valve		Connection in mm (inlet × outlet)		[4] [5] [6] [7] [12] Code No. of assembled valve		[1] Code No. of separate orifice assembly
			flare	[9] solder connections	[13] range B −60°C to −25°C		[12] flare	[8] solder connections	[13] range B −60°C to −25°C		
			angle-way	straight-way	with MOP	without MOP	[8] angle-way	straight-way	with MOP	without MOP	
T 2/TE 2											
TY 2-0.3	900	int.	1/4 × 1/2		68-6079	68-6236	6 × 12		68-6079	68-6236	No. 1: 68-2004
TEY 2-0.3	900	ext.	1/4 × 1/2		68-6086	68-6243	6 × 12		68-6086	68-6243	
TY 2-0.5	1500	int.	1/4 × 1/2		68-6080	68-6237	6 × 12		68-6080	68-6237	No. 2: 68-2005
TEY 2-0.5	1500	ext.	1/4 × 1/2		68-6087	68-6244	6 × 12		68-6087	68-6244	
TY 2-0.8	2400	int.	1/4 × 1/2		68-6081	68-6239	6 × 12		68-6081	68-6239	No. 3: 68-2006
TEY 2-0.8	2400	ext.	1/4 × 1/2		68-6088	68-6246	6 × 12		68-6088	68-6246	
TY 2-1.2	3600	int.	3/8 × 1/2		68-6082	68-6240	10 × 12		68-6082	68-6240	No. 4: 68-2007
TEY 2-1.2	3600	ext.	3/8 × 1/2		68-6089	68-6247	10 × 12		68-6089	68-6247	
TY 2-1.5	4500	int.	3/8 × 1/2		68-6083	68-6241	10 × 12		68-6083	68-6241	No. 5: 68-2008
TEY 2-1.5	4500	ext.	3/8 × 1/2		68-6090	68-6248	10 × 12		68-6090	68-6248	
TY 2-2	6000	int.	3/8 × 1/2		68-6138	68-6242	10 × 12		68-6138	68-6242	No. 6: 68-2009
TEY 2-2	6000	ext.	3/8 × 1/2		68-6145	68-6249	10 × 12		68-6145	68-6249	
TEY 5-2	6000	ext.		1/2 × 5/8	68B7110	68B8035		12 × 16	68B7237	68B8071	No. 1: 68B2089
TEY 5-3	9000			1/2 × 5/8	68B7111	68B8036		12 × 16	68B7238	68B8072	No. 2: 68B2090
TEY 5-5	15000			1/2 × 7/8	68B7112	68B8037		12 × 22	68B7239	68B8073	No. 3: 68B2091
TE 12											
TEY 12-3	9000	ext.		[9] 5/8 × 7/8	68B5054			[9] 16 × 22	68B6038		No. 1: 68B2005
TEY 12-5	15000			[9] 5/8 × 7/8	68B5055			[9] 16 × 22	68B6039		No. 2: 68B2006
TEY 12-8	24000			[10] 7/8 × 1 1/8	68B5056			[10] 22 × 28	68B6040		No. 3: 68B2007
TEY 12-12	36000			[10] 7/8 × 1 1/8	68B5057			[10] 22 × 28	68B6041		No. 4: 68B2008
TE 20											
TEY 20-14	42000	ext.		[10] 7/8 × 1 1/8	68B8156			[10] 22 × 28	68B8158		68B2175
TE 55											
TEY 55-24	72000	ext.		[11] 7/8 × 1 1/8	68B5113			[11] 22 × 28	68B5117		68G2011
TEY 55-40	120			[11] 7/8 × 1 1/8	68G5114			[11] 22 × 28	68G5118		68G2012

Footnotes, see page 10

Approvals:
DSRK, DDR-Schiffs-Revision und -Klassifikation.
PRS, Polski Rejestr Statków.

Thermostatic Expansion Valves Type TEA

Technical data and code Nos.

Range: D (−50°C to 0°C) *Refrigerant:* R 717 (NH_3)

Type and size in tons (TR)	[1]) Rated capacity	Connection weld flanges		[2]) Code No.		
	kcal/h	inlet in	outlet in	assembled valve	3) separate orifice assembly	separate power element
TEA 20						
TEA 20-1	3 000	1/2	1/2	68G6000	68G2050	68G3250
TEA 20-2	6 000	1/2	1/2	68G6001	68G2051	68G3250
TEA 20-3	9 000	1/2	1/2	68G6002	68G2052	68G3250
TEA 20-5	15 000	1/2	1/2	68G6003	68G2053	68G3250
TEA 20-8	24 000	1/2	1/2	68G6004	68G2054	68G3250
TEA 20-12	36 000	1/2	1/2	68G6005	68G2055	68G3250
TEA 20-20	60 000	1/2	1/2	68G6006	68G2056	68G3250
TEA 85						
TEA 85-33	99 000	3/4	3/4	68G6007	68G2057	68G3251
TEA 85-55	165 000	3/4	3/4	68G6008	68G2058	68G3251
TEA 85-85	255 000	3/4	3/4	68G6009	68G2059	68G3251

[1]) Rated capacity is the valve capacity at −15°C evaporating temperature and +32°C condensing temperature. The capacities are based on approx. 4°C subcooling ahead of valve.

[2]) Separate strainer for TEA 20, code No. 6-0042; for TEA 85, code No. 6-0048. The strainer is supplied with bolts, nuts, and gaskets.

[3]) Separate discharge orifice (code No. 6-0466) is only available for TEA 20 with a rated capacity af 3000 kcal/h (1 TR).

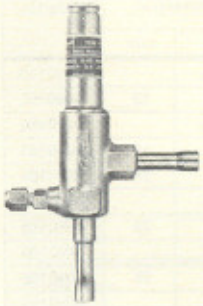
Approvals:
DSRK, DDR-Schiffs-Revision und -Klassifikation.
PRS, Polski Rejestr Statków.

Evaporating Pressure Regulators Type CPP
Thermostatic Regulators Type CPT
Crankcase Pressure Regulators Type CPL

Technical data and code Nos.

Refrigerants:
R 12, R 22, R 502, etc.

Approvals: DSRK, DDR-Schiffs-Revision und -Klassifikation. PRS, Polski Rejestr Statków.



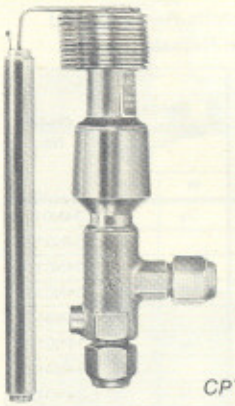
CPP

Type	Regulating range p_e bar	Rated capacity in 1000 kcal/h at $t_o = -10°C$ and $t_k = 25°C$			Flare connection		Code No.	Solder connection		Code No.
		R 12	R 22	R 502	in	mm		in	mm	
CPP 12	0 to 6	1.2	2.1	2.1	1/2		34N0051	1/2		34N0055
		1.2	2.1	2.1		12	34N0053		12	34N0062
CPP 15		1.9	3.4	3.4	5/8		34N0052	5/8		34N0056
		1.9	3.4	3.4		16	34N0054		16	34N0063
CPP 18		3.0	5.0	5.1					18	34N0064
CPP 22		4.3	7.0	7.1				7/8		34N0058
		4.3	7.0	7.1					22	34N0065
CPP 28		7.3	12	12				1 1/8		34N0060
		7.3	12	12					28	34N0066
CPP 35		11	18	18				1 3/8		34N0061
		11	18	18					35	34N0067

Technical data and code Nos.

Refrigerants:
R 12, R 22, R 502, etc.

Approvals: DSRK, DDR-Schiffs-Revision und -Klassifikation. PRS, Polski Rejestr Statków.



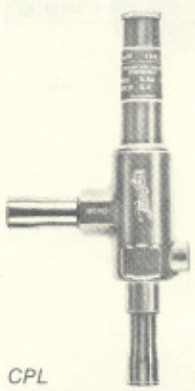
CPT

Type	Regulation range °C	Rated capacity in 1000 kcal/h at $t_o = -10°C$ and $t_k = 25°C$			Flare connection		Code No.	Solder connection		Code No.
		R 12	R 22	R 502	in	mm		in	mm	
CPT 12	−40 to +25	1.2	2.1	2.1	1/2		34N1001	1/2		34N1005
CPT 12		1.2	2.1	2.1		12	34N1003		12	34N1012
CPT 15		1.9	3.4	3.4	5/8		34N1002	5/8		34N1006
CPT 15		1.9	3.4	3.4		16	34N1004		16	34N1013
CPT 18		3.0	5.0	5.1					18	34N1014
CPT 22		4.3	7.0	7.1				7/8		34N1008
CPT 22		4.3	7.0	7.1					22	34N1015
CPT 28		7.3	12	12				1 1/8		34N1010
CPT 28		7.3	12	12					28	34N1016
CPT 35		11	18	18				1 3/8		34N1011
CPT 35		11	18	18					35	34N1017

Technical data and code Nos.

Refrigerants:
R 12, R 22, R 502, etc.

Approvals: DSRK, DDR-Schiffs-Revision und -Klassifikation. PRS, Polski Rejestr Statków.



CPL

Type	Regulation range p_e bar	Rated capacity in 1000 kcal/h at $t_o = -10°C$ and $t_k = 25°C$			Flare connection		Code No.	Solder connection		Code No.
		R 12	R 22	R 502	in	mm		in	mm	
CPL 12	0 to 4	1.2	2.1	2.1	1/2		34N0131	1/2		34N0135
CPL 12		1.2	2.1	2.1		12	34N0133		12	34N0142
CPL 15		1.9	3.4	3.4	5/8		34N0132	5/8		34N0136
CPL 15		1.9	3.4	3.4		16	34N0134		16	34N0143
CPL 18		3.0	5.0	5.1					18	34N0144
CPL 22		4.3	7.0	7.1				7/8		34N0138
CPL 22		4.3	7.0	7.1					22	34N0145
CPL 28		7.3	12	12				1 1/8		34N0140
CPL 28		7.3	12	12					28	34N0146
CPL 35		11	18	18				1 3/8		34N0141
CPL 35		11	18	18					35	34N0147

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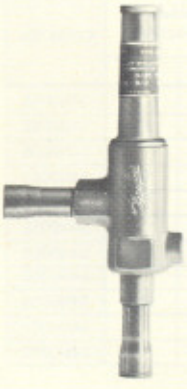
Capacity Regulators Type CPC
Condensing Pressure Regulators Type CPR + CPC
Pressure-relief Valves Type CPR

Technical data and code Nos.

Refrigerants:
R 12, R 22, R 502, etc.

Approvals: DSRK, DDR-Schiffs-Revision und -Klassifikation. PRS, Polski Rejestr Statków.



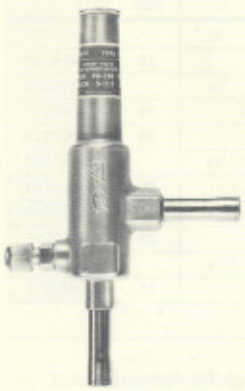
CPC

Type	Regulation range p_e bar	Rated capacity in 1000 kcal/h at $t_o = -10°C$, $t_k = 25°C$ and $\Delta p_o = 0.7$ bar			Flare connection		Code No.	Solder connection		Code No.
		R 12	R 22	R 502	in	mm		in	mm	
CPC 12	0 to 13	9.9	19	16	1/2		34N0151	1/2		34N0155
CPC 12		9.9	19	16		12	34N0153		12	34N0162
CPC 15		9.9	19	16	5/8		34N0152	5/8		34N0156
CPC 15		9.9	19	16		16	34N0154		16	34N0163
CPC 18		9.9	19	16					18	34N0164
CPC 22		9.9	19	16				7/8		34N0158
CPC 22		9.9	19	16					22	34N0165
CPC 28		17	33	27				1 1/8		34N0160
CPC 28		17	33	27					28	34N0166
CPC 35		17	33	27				1 3/8		34N0161
CPC 35		17	33	27					35	34N0167

Technical data and code Nos.

Refrigerants:
R 12, R 22, R 502, etc.

Approvals: DSRK, DDR-Schiffs-Revision und -Klassifikation. PRS, Polski Rejestr Statków.



CPR

Type	Regulation range p_e bar	Max. liquid capacity V_l 1000 kcal/h at $t_o = -10°C$ and $t_k = 30°C$			Max. hot-gas capacity V_h m^3/h at $t_o = -10°C$ and $t_k = 30°C$			Flare connection		Code No.	Solder connection		Code No.
		R 12	R 22	R 502	R 12	R 22	R 502	in	mm		in	mm	
CPR 12	5 to 17,5	7.3	9.2	6.4	9.1	10.5	9.1	1/2		34N0111	1/2		34N0115
									12	34N0113		12	34N0122
CPR 15		12	15	11	15.2	17.5	15.2	5/8		34N0112	5/8		34N0116
									16	34N0114		16	34N0123
CPR 18		18	23	16	21	24.5	21					18	34N0124
CPR 22		24	31	22	25	29	25				7/8		34N0118
												22	34N0125
CPR 28		40	51	35	40	46	40				1 1/8		34N0120
												28	34N0126
CPR 35		63	79	55	60	69	60				1 3/8		34N0121
												35	34N0127
CPC 12	0 to 13	with pressure gauge connection						1/2		34N0180	1/2		34N0181
									12	34N0182		12	34N0183

Modulating Regulators Type PHS/HSA + Pilot Valves

General

The modulating regulators type PHS/HSA + pilot valves cover the following application ranges

Evaporating pressure regulators

Thermostatic regulators

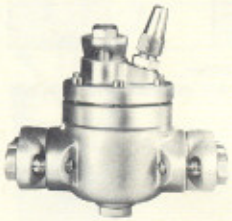
Crankcase pressure regulators

Capacity regulators

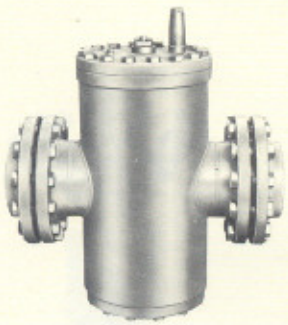
Technical data and code Nos.

Refrigerants: R 717 (NH_3), R 12, R 22, R 502, etc.

Approvals: DSRK, DDR-Schiffs-Revision und -Klassifikation. PRS, Polski Rejestr Statków.



PHS



HSA

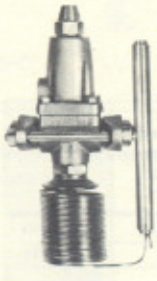
I. Main valves (Regulation range dependent on the pilot valve)

Type	Rated suction vapour capacity in 1000 kcal/h at $t_o = -10°C$, and $t_k = 25°C$ and $\Delta p = 0.14$ bar				k_v value m^3/h	Solder connection		Code No.	Weld connection in	Code No.
	R 12	R 22	R 502	R 717 (NH_3)		in	mm			
PHS 20	7,1	10	8,5	27	6,6	7/8		26H1206	3/4	26H1210
						1 1/8		26H1208	1	26H1211
							22	26H1202		
							28	26H1203		
PHS 25	10	15	12	40	9,6	7/8		26H1219	3/4	26H1222
						1 1/8		26H1221	1	26H1223
							22	26H1216		
							28	26H1217		
PHS 32	18	27	22	71	16.8	1 3/8		26H1230	1 1/4	26H1232
						1 5/8		26H1231	1 1/2	26H1233
							35	26H1227		
							42	26H1228		
PHS 40	28	41	34	110	26.4	1 5/8		26H1236	1 1/2	26H1238
						2 1/8		26H1237	2	26H1239
							42	26H1234		
							54	26H1235		
PHS 50	36	52	42	137	33	1 5/8		26H1242	1 1/2	26H1244
						2 1/8		26H1243	2	26H1245
							42	26H1240		
							54	26H1241		
PHS 65	83	120	97	316	76.2	2 5/8		26H1246	2 1/2	26H1247
HSA 70	95	138	111	363	87.5				2 1/2	26G0007
									3	26G0008
HSA 100	167	241	195	635	153				4	26G0010
HSA 125	222	332	272	882	184				6	26G0023
HSA 140	311	466	380	1235	255				6	26G0022
HSA 150	400	598	489	1588	330				6	26G0021
HSA 160	555	831	679	2204	455				8	26G0020
HSA 200	776	1160	947	3076	635				8	26G0019

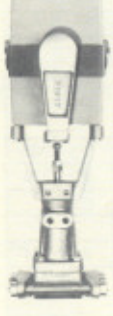
Modulating Regulators Type PHS/HSA + Pilot Valves

Technical data and code Nos.

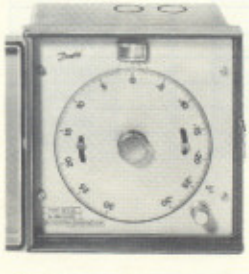
CVM



CVMT



CVMM



EPT 60

II. Pilot valves

Type	Regulation range	Solder connection in	Solder connection mm	Code No.	Weld connection in	Code No.
CVM	0 to 7 bar	1/2		27B1002	1/2	27B1001
CVM	0 to 7 bar		12	27B1003		
CVML	−0.7 bar to +1 bar	*	*		1/2	27B1043
CVMH	5 bar to 16 bar	*	*		1/2	27B1042
CVMP	0 bar to 7 bar	1/2		27B1008	1/2	27B1007
CVMP	0 bar to 7 bar		12	27B1009		
CVMO	0 bar to 7 bar	*	*		1/2	27B1041
CVMT	−50°C to −10°C	1/2		27B1032	1/2	27B1031
CVMT	−50°C to −10°C		12	27B1033		
CVMT	−25°C to +20°C	1/2		27B1035	1/2	27B1034
CVMT	−25°C to +20°C		12	27B1036		
**) CVMM (110V, 50-60 Hz) + EPT60	0 to 7 bar	1/2		27B1020 + 84U1002	1/2	27B1019
**) CVMM (110V, 50-60 Hz) + EPT60	0 to 7 bar		12	27B1021 + 84U1002		
**) CVMM (220V, 50-60 Hz) + EPT60	0 to 7 bar	1/2		27B1026 + 84U1002	1/2	27B1025
**) CVMM (220V, 50-60 Hz) + EPT60	0 to 7 bar		12	27B1027 + 84U1002		

*) CVML, CVMH and CVMO with 1/2 in or 12 mm solder connection can be supplied to special order.
**) PHS or HSA with pilot valve CVMM controlled by EPT 60 constitute a PI regulator which will maintain the required temperature to an accuracy of ±0.1°C.

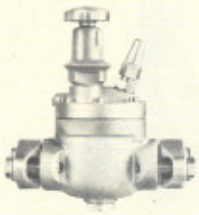
Sensors and pockets for EPT 60, see page 9.

Evaporating Pressure Regulators with Built-on Pilot Valves Type PHSC

Technical data and code Nos.

Refrigerants: R 717 (NH_3), R 12, R 22, R 502, etc.

Approvals: DSRK, DDR-Schiffs-Revision und -Klassifikation. PRS, Polski Rejestr Statków.



PHSC, Comb. O

Type	Rated suction vapour capacity in 1000 kcal/h at $t_o = -10°C$, $t_k = 25°C$ and $\Delta p = 0.14$ bar				k_v-value m^3/h	Solder connection		Code No.	Weld nonnection in	Code No.
	R 12	R 22	R502	R 717 (NH_3)		in	mm			
PHSC 20-0	7,1	10	8,5	27	6.6	7/8		26H1312	3/4	26H1320
						1 1/8		26H1316	1	26H1322
							22	26H1304		
							28	26H1306		
PHSC 25-0	10	15	12	40	8.8	7/8		26H1338	3/4	26H1344
						1 1/8		26H1342	1	26H1346
							22	26H1332		
							28	26H1344		
PHSC 32-0	18	27	22	71	12.5	1 3/8		26H1360	1 1/4	26H1364
						1 5/8		26H1362	1 1/2	26H1366
							35	26H1354		
							42	26H1356		

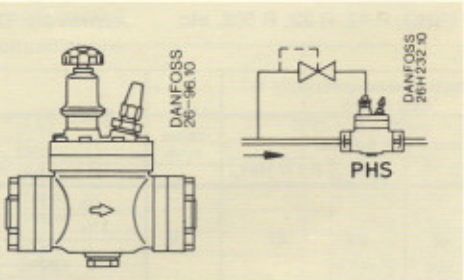
PHSC, Comb. 1

Type	Rated suction vapour capacity in 1000 kcal/h at $t_o = -10°C$, $t_k = 25°C$ and $\Delta p = 0.21$ bar				k_v-value m^3/h	Solder flange in	Code No.	Weld flange in	Code No.
	R 12	R 22	R 502	R 717 (NH_3)					
PHSC 20-1 PHSC 20-2 PHSC 20-3 PHSC 20-4	7,5	11	9,1	30	6.6	1 1/8	26H2003 26H2009 26H2015 26H2021	1	26H2005 26H2011 26H2017 26H2023
PHSC 25-1 PHSC 25-2 PHSC 25-3 PHSC 25-4	11.7	17.6	14.2	47	8	1 1/8	26H2027 26H2033 26H2039 26H2045	1	26H2029 26H2035 26H2041 26H2047
PHSC 32-1 PHSC 32-2 PHSC 32-3 PHSC 32-4	19,8	30	24	78	12.5	1 3/8	26H2051 26H2057 26H2063 26H2069	1 1/2	26H2053 26H2059 26H2065 26H2071
PHSC 40-1 PHSC 40-2 PHSC 40-3 PHSC 40-4	30	45	37	121	21.5	2 1/8	26H2075 26H2081 26H2087 26H2093	2	26H2077 26H2083 26H2089 26H2095
PHSC 50-1 PHSC 50-2 PHSC 50-3 PHSC 50-4	41	63	51	168	27.6	2 1/8	26H2099 26H2105 26H2111 26H2117	2	26H2101 26H2107 26H2113 26H2119

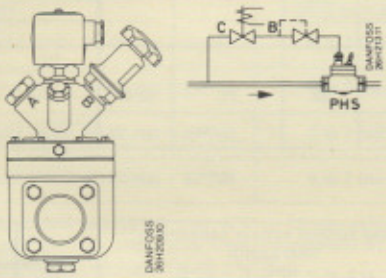
PHSC, Comb. 4

Evaporating Pressure Regulators with Built-on Pilot Valves Type PHSC

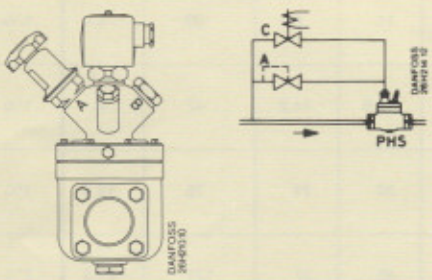
Combinations



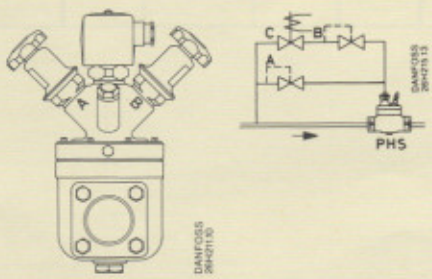
Combination 0
Constant pressure regulation



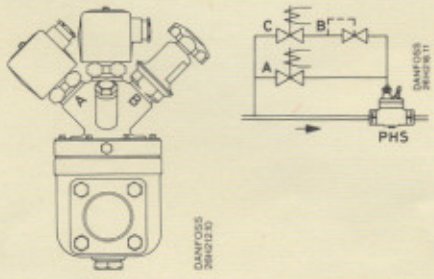
Combination 1
Constant pressure regulation with electric close override



Combination 2
Constant pressure regulation with electric open override or on/off regulation



Combination 3
Constant pressure regulation with changeover between two different preset evaporating pressures



Combination 4
Constant pressure regulation with electric close override or on/off regulation

Capacity Regulators Type PHC

Technical data and code Nos.

PHC

Refrigerants:
R 717 (NH_3), R 12, R 22, R 502, etc.

Approvals: DSRK, DDR-Schiffs-Revision und -Klassifikation. PRS, Polski Rejestr Statków.

Type	Rated capacity in 1000 kcal/h*) at t_o = −10°C, t_k = 25°C				k_v-value m^3/h	Weld connection in	Code No.
	R 12	R 22	R 502	R 717 (NH_3)			
PHC 3	8.3	16	13.4	45	1.14	3/4	26H2130
PHC 8	28	55	46	153	2.35	3/4	26H2133
PHC 12	39	76	63	210	8.7	1	26H2136

*) Capacity = compressor capacity minus the actual evaporator load.

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Solenoid Valves
Types EVJ, EVJD, EVJA, EVJDA, EVSA
Types PHV + EVJA, PHL + EVJA, HSA + EVJA

Technical data and code Nos.

When ordering, please state type, code No., coil type, coil voltage and frequency.

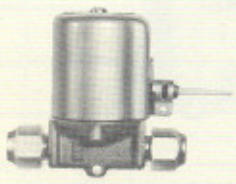
Type	Code No. Terminal box a. c. Coil type I = IP 43 II = IP 67 III = IP 43, heat resistant[3]	Code No. Terminal box d. c. Coil type I = IP 43	Media[1] A = R 717 F = R 12 X = R 22 Y = R 502 O = oil L = air W = water	[2] Connection in	k_v-value m^3/h	Differential pressure Δp Min. bar	Max. liquid (at max. 2°E) bar	Max. atmospheric air and media gas bar	Media temp. [3] °C
EVJ 2	32K4703 32K4713	32K4705	OLW	1/8 BSP int. 1/4 BSP int.	0.11	0	25	25	−10 to +90
EVJ 3	32K4003 32K4033 32K4733	32K4005 32K4035 32K4735	OLW/FXY FXY OLW	1/4 flare 1/4 flare 1/4 BSP Tr. ext.	0.18	0	17	17	−25 to +90 −40 to +105 −10 to +90
EVJ 4	32K4753 32K4763	32K4755 32K4765	OLW	1/4 flare 1/4 BSP Tr. ext.	0.3	0	6	9	−10 to +90
EVJ 6	32K4803 32K4813	32K4805 32K4815	OLW	3/8 flare 3/8 BSP Tr. ext.	0.78	0	1.2	1.2	−10 to +90
EVJ 10	32K4833 32K4843	32K4835 32K4845	OLW	1/2 flare 1/2 BSP Tr. ext.	1.6	0	0.4	0.4	−10 to +90
EVJ 15	32K4863	32K4865	OLW	1/2 BSP int.	2.85	0	0.09	0.09	−10 to +90
EVJ 20	32K4883	32K4885	OLW	3/4 BSP int.	4.5	0	0.055	0.055	−10 to +90
EVJ 25	32K4903	32K4905	OLW	1 BSP int.	8	0	0.035	0.035	−10 to +90
EVJD 6	32K4103 32K4133 32K4923 32K4933	32K4105 32K4135 32K4925 32K4935	F FXY OLW OLW	3/8 flare 3/8 flare 3/8 flare 3/8 BSP Tr. ext.	1	0.05	17 14	17 17	−10 to +50 −40 to +105 −10 to +100 −10 to +100
EVJD 10	32K4203 32K4233 32K4963 32K4973 32K4983	32K4205 32K4235 32K4965 32K4975 32K4985	F FXY OLW OLW W	1/2 flare 1/2 flare 1/2 flare 1/2 BSP Tr. ext. 1/2 BSP Tr. ext.	1.5 1.26	0.05	17 14	17 17	−10 to +50 −40 to +105 −10 to +100 −10 to +100 −10 to +100
EVJD 15	32K4303	32K4305	FXY	5/8 flare	2.6	0.05	17.5	17.5	−40 to +105
EVJD 20	32K4403	32K4405	FXY	3/4 flare	5	0.05	17.5	17.5	−40 to +105
EVJD 25	32K4463	32K4465	FXY	1 1/2 × 1 3/8 solder	9.8	0.05	17.5	17.5	−40 to +105
EVJA 3	32K4543	32K4545	AFXY	1/2 weld	0.23	0	21	21	−40 to +105
EVJDA 10	32K4503	32K4505	AFXY	1/2 weld	1.5	0.05	17.5	17.5	−40 to +105
EVJDA 15	32K4643	32K4645	AFXY	3/4 weld	2.7				
EVJDA 20	32K4673	32K4675	AFXY	1 weld	4.5				
EVJDA 25	32K4683	32K4685	AFXY	1 weld	9.8	0.05	21	21	−40 to +105
EVSA 25	32Z0201		AFXY	1 weld	7.5	0	17.5	17.5	−60 to +50
EVSA 35	32Z0204		AFXY	1 1/2 weld	18.5				
EVSA 50	32Z0207		AFXY	2 weld	29				
PHV 25	26H1001	Pilot valve EVJA 3	AFXY	1 weld	8.7	0.2	17.5		−60 to +140
PHV 32	26H1004			1 1/4 weld	17.4				
PHV 40	26H1007			1 1/2 weld	29	0.3	17.5		
PHV 50	26H1010			2 weld	34.2				
PHL 25	26H1013	Pilot valve EVJA 3	AFXY	1 weld	11.1	0	1 (close)		−60 to +140
PHL 32	26H1016			1 1/2 weld	24				
PHL 50	26H1019			2 weld	38.7				
PHL 65	26H1022			2 1/2 weld	110				
HSA 70	26G0007 26G0006	Pilot valve EVJA 3	AFXY	2 1/2 weld 3 weld	87.5	0.14	17.5	17.5	−60 to +60 (HSAH: −60 to +140)
HSA 100	26G0010			4 weld	153				
HSA 125	26G0023			6 weld	184				−60 to +120
HSA 140	26G0022			6 weld	255				
HSA 150	26G0021			6 weld	330				
HSA 160	26G0020			8 weld	455				
HSA 200	26G0019			8 weld	635				

[1] In refrigeration plants the valves can be used in the following places:
In liquid lines: EVJ 3, EVJD 6-25, EVJA 3, EVJDA 10-25, EVSA 25, PHV 25-50, HSA 70-200.
In suction lines: EVJD 6-25, EVJDA 10-25, EVSA 25-50, PHV 25-65, HSA 70-200.
In hot-gas lines: EVJ 3, EVJD 6-25, EVJA 3, EVJDA 10-25, HSAH 70-100, HSA 125-200.
[2] The following types are available with solder connections: EVJ, EVJD, EVJA, EVSA.
[3] Max. ambient temperature: Normal 40°C. For valves with heat-resistant coil, 80°C.

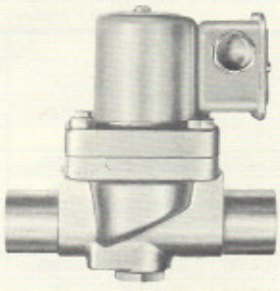
Solenoid Valves
Types EVJ, EVJD, EVJA, EVJDA, EVSA
Types PHV + EVJA, PHL + EVJA, HSA + EVJA

EVJ 2

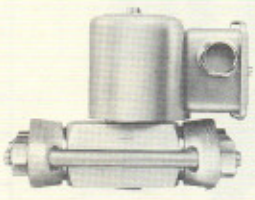
EVJD 6 – 10



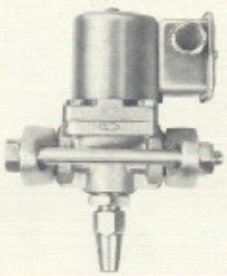
EVJD 25



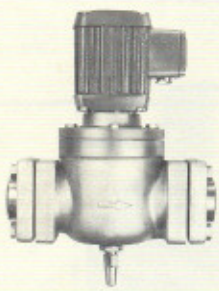
EVJA 3



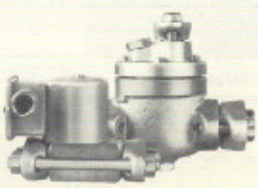
EVJDA 15



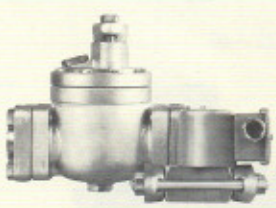
EVSA 50



PHV + EVJA



PHL + EVJA



HSA + EVJA

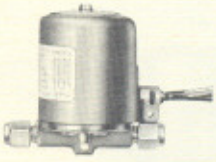
Approvals

See page 27

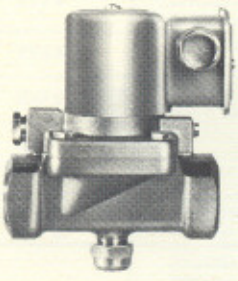
Solenoid Valves
Types EVJN, EVD, EVJHS

Technical data and code Nos.

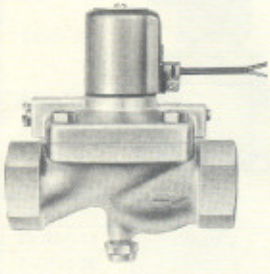
When ordering, please state type, code No., coil type, coil voltage and frequency.



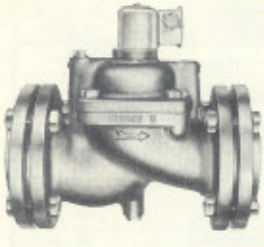
EVJN 5



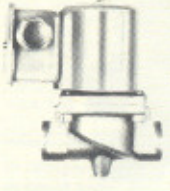
EVD 25



EVD 32 – 40



EVD 65 – 100



EVJHS 15

Type	Code No. 1 m cable a. c. Three wire Coil type II = IP 67	Code No. Terminal box a. c. Coil type I = IP 43. II = IP 67. III = IP 43, heat resistant	Code No. Terminal box d. c. Coil type I = IP 43 [1]	Media A = R 717, F = R 12, X = R 22, Y = R 502, Z = R 13, Q = R 13B1, K = N_2, O = oil, L = air, W = water, B = brine, D = steam	Connection in	k_v-value m^3/h	Differential pressure Δp Min. bar	Differential pressure Δp Max. liquid (at max. 2°E) bar	Differential pressure Δp Max. atmospheric air and media gas bar	Media temp. 3) 4) °C
EVJN 3	42H3005		[1] 42G3006	XY ZQK	1/4 flare	0.18	0	17.5	17.5	−200 to +50
EVJN 5	42G3007		[1] 42G3008		3/8 flare	0.54	0	5	5	
EVJN 10	42G3009 42G3011 42G3013		[1] 42G3010 [1] 42G3012 [1] 42G3014		3/8 flare 1/2 flare 1/2 BSP	1.68	0	17.5	17.5	
EVD 15		32U4003	32U4005	WBD	1/2 BSP int.	2.6	0.15	10	10	−10 to +100
		32U4013	32U4015	OL						0 to +100
EVD 20		32U4053	32U4055	WBD	3/4 BSP int.	5.3	0.15	10	10	−10 to +100
		32U4063	32U4065	OL						0 to +100
EVD 25		32U4103	32U4105	WBD	1 BSP int.	9	0.15	10	10	−10 to +100
		32U4113	32U4115	OL						0 to +100
EVD 32		32U4153	32U4155	WBD	1 1/4 BSP int.	21	0.15	10	10	−10 to +100
		32U4163	32U4165	OL						0 to +100
EVD 40		32U4203	32U4205	WBD	1 1/2 BSP int.	21	0.15	10	10	−10 to +100
		32U4213	32U4215	OL						0 to +100
EVD 50		32U4253	32U4255	WBD	2 BSP int.	37.5	0.3	10	10	−10 to +100
		32U4263	32U4265	OL						0 to +100
EVD 65		16D4011	16D4061	WB	2 1/2 weld fl.	50	0.25	10		−25 to +90
		16D4031	16D4081	WB	2 1/2 BSP fl.					
EVD 80		16D4012	16D4062	WB	3 weld fl.	75	0.25	10		−25 to +90
		16D4032	16D4082	WB	3 BSP fl.					
EVD 100		16D4013	16D4063	WB	4 weld fl.	130	0.25	10		−25 to +90
		16D4033	16D4083	WB	4 BSP fl.					
EVJHS 15		[2] 32U3023		D	1/2 BSP int.	4.8	0.1		10	max. 160
		[2] 32U3033								max. 185
EVJHS 20		[2] 32U3043		D	3/4 BSP int.	6	0.1		10	max. 160
		[2] 32U3053								max. 185

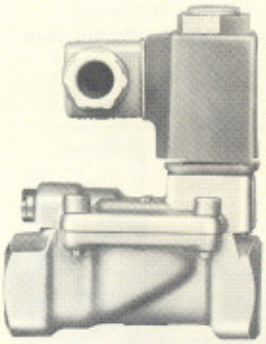
[1] EVJN is supplied with 1 m three-wire cable and encapsulated coil, IP 67.
[2] EVJSH is supplied with a normally enclosed coil, IP 43.
[3] Max. media temperature for EVD in WBD and WB versions and with heat-resistant coil: +120°C at 40°C ambient temperature.
[4] Max. ambient temperature: For EVJN +60°C, for EVD +40°C (+80°C if the valve has a heat-resistant coil), for EVJHS +40°C.

Approvals

See page 27

Solenoid Valves
Types EVSI and EVP

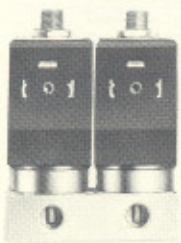
Technical data and code Nos.



EVSI

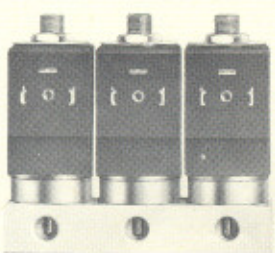
Type	Code No.	Media O = oil L = air W = water B = brine D = steam	Connection in	k_v-value m³/h	Opening differential pressure Δ p bar
EVSI 15	32U4507	WBD	1/2 BSP int.	4	0.3 to 10
	32U4517	OL			
EVSI 20	32U4527	WBD	3/4 BSP int.	8	0.3 to 10
	32U4537	OL			
EVSI 25	32U4547	WBD	1 BSP int.	11	0.2 to 10
	32U4557	OL			
EVSI 32	32U4567	WBD	1 1/4 BSP int.	16	0.3 to 10
	32U4577	OL			
EVSI 40	32U4587	WBD	1 1/2 BSP int.	22	0.3 to 10
	32U4597	OL			
EVSI 50	32U4607	WBD	2 BSP int.	40	0.3 to 10
	32U4617	OL			

When ordering, please state type, code No., coil voltage and frequency.



Type	Code No.	Medium	Connection in	k_v-value m³/h	Differential pressure m³/h		Max. media temp. °C	Max. ambient temp. °C
NC = closed with de-energized coil NO = open with de-energized coil	Without terminal box Separate terminal box code No. 42N0151	L = air			min. bar	max. bar		
EVP 302 NC	42N1140	L	1/8 BSP int.	0.12	0	10	−10 to +60	40
EVP 302 NO	42N1120	L	1/8 BSP int.	0.12				
EVP 302 NC	42N1160	L	Flanges	0.12				
EVP 302 NO	42N1161	L	Flanges	0.12				
EVP 302 NC	42N1162	L	Manifold for two units 1/8 BSP int.	0.12 per unit				
EVP 302 NC	42N1163	L	Manifold for three units 1/8 BSP int.					

When ordering, please state type, code No., coil voltage and frequency.



EVP

Approvals

EVJ	EVJD	EVJA	EVJDA	EVSA	PHV + EVJA	PHL + EVJA	HSA + EVJA	EVJN	EVD	EVD spec.	EVJHS	EVSI	EVP
×	×	×	×	×	×	×	×	×	×	×	×	×	×
×	×	×	×		×	×	×	×	×	×	×	×	×
				×							×	×	
×	×	×	×		×	×	×		×	×	×	×	
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×	×	×	×	×	×	×	×	×	×	×	×		
×	×	×	×	×	×	×	×		×	×			
×	×	×	×						×	[1]	[2]		
×	×	×	×	×					×				

[1]) Available on request.
[2]) With special coil.

Ⓓ Demko, Denmark
Nemko, Norway
VDE, W. Germany (Prüfkl. II)
SEV, Switzerland
ÖVE, Austria
Sähkötorkastuslaitos, Finland
Det norske Veritas
Lloyds Register of Shipping
Germanischer Lloyd
Germanischer Lloyd
DSRK DDR-Schiffs-Revision und -Klassifikation
Bureau Veritas
Registro Italiano Navale
PRS Polski Rejestr Statków
USSR Register of Shipping
American Bureau of Shipping
UL, U.S.A.
CSA, Canada (with spec. design)

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Self-contained Thermostatic Valves Types AVTA, WVTS, IVT, IVF, IVR, for Water and Brine

General

AVTA and WVTS valves *open on a rise in temperature* and are designed *for cooling purposes.*

AVTB valves *close on a rise in temperature* and are designed *for heating purposes.*

The standard length of capillary tube is 2 m.

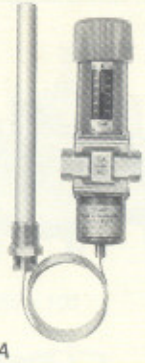
Bulb pockets must be ordered under code No. 3N0050.
Certain valves are available on request with a different length of capillary tube, armoured capillary tube (brass flex) and/or a smaller bulb.

Technical data and code Nos.
For water and brine

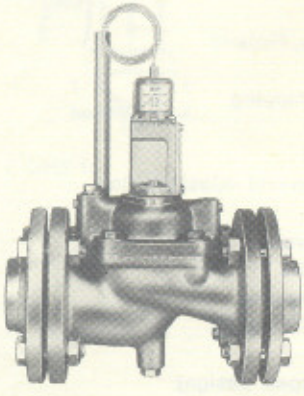
Application	k_{vs} value m^3/h	Type	Connection	Operating pressure max. p_e bar	Opening and operating differential pressures min. bar	Opening and operating differential pressures max. bar	Test pressure p_e bar	Pressure on bulb max. p_e bar	Flow temperature °C	Max. bulb temperature °C: 55	55	80	85	110
										Temperature ranges °C: −15 to +10	0-30	20-60	25-65	50-90
For the control of cooling water on oil coolers, dry cleaning machines, condensers, distilling apparatus, plastic moulding machines etc.	1.8	AVTA 15	½ in BSP int.	10	0	7	16	25	−25 to +110		3N2132		3N2162	3N2182
	2.9	AVTA 20	¾ in BSP int.								3N3132		3N3162	3N3182
	5.0	AVTA 25	1 in BSP int.								3N4132		3N4162	3N4182
For the control of hot water on oil preheaters, hot water tanks, heat exchangers, etc.	1.8	AVTB 15	½ in BSP int.	10	0	7	16	25	−25 to +110		3N2232	3N2252		3N2272
	2.9	AVTB 20	¾ in BSP int.								3N3232	3N3252		3N3272
	5.0	AVTB 25	1 in BSP int.								3N4232	3N4252		3N4272
For the control of cooling water for air compressors, internal combustion engines, pumps, high-frequency ovens, etc.	11.5	WVTS 32	1¼ in BSP int.	10	1) 0.5	1) 4	16	25	−25 to +90	16D3143	16D3243		16D3343	
	22	WVTS 40	1½ in BSP int.							16D3124	16D3204		16D3304	
	33	WVTS 50	2 in flange		1) 0.3					16D3135	16D3215		16D3315	
	45	WVTS 65	2½ in flange							16D3136	16D3216		16D3316	
	78	WVTS 80	3 in flange							16D3138	16D3218		16D3318	
	130	WVTS 100	4 in flange							16D3139	16D3219		16D3319	

1) WVTS valves can be fitted with a different servo spring which will increase min. and max. opening differential pressure to 1 and 10 bar respectively.

p_e = effective pressure



AVTA



WVTS 50 - 100

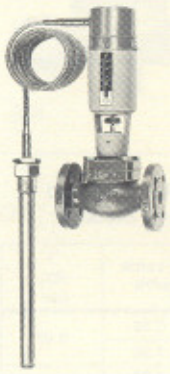
Self-contained Thermostatic Valves Types AVTA, WVTS, IVT, IVF, IVR, for Water and Brine

For water, oil and steam

A complete regulator consists of a control unit *type IVT* and a valve body *type IVF* or *type IVR*. When ordering, please state the two code Nos. The parts will be supplied separately.

IVT units *close* the valve on rising temperature and are designed for *heating purposes*.

The IVF is a single-seated pressure-relieved valve with flange connections.
The IVR is a single-seated valve without pressure-relief and has thread connections.



Control unit type IVT

Application	Temperature regulating range °C	Max. bulb temperature °C	Capillary tube length m	Code No.
For use with valve body Type IVF or IVR for regulation of: oil preheaters, autoclaves, heat exchangers industrial baths, calorifiers, distilling apparatus, drying ovens, etc.	10-45	65	2	065-7260
	35-70	90	2	065-7264
	35-70	90	4	065-7265
	60-100	125	2	065-7266
	60-100	125	4	065-7267
	85-125	155	2	065-7268
	100-140	165	2	065-7270

Valve body type IVF

Size mm	Connection	k_{vs} value m³/h	Max. operating temperature °C	Max. operating pressure p_e bar	Max. differential pressure Δp bar	Max. test pressure p_e bar	Code No.
15	Flange DIN 2533	4.0	180	Water: 16 bar at 120°C 13 bar at 180°C Steam: 10 bar	8	32	065-7215
20		6.3					065-7220
25		10					065-7225
32		16					065-7232
40		20					065-7240
50		25					065-7250

p_e = effective pressure

Valve body type IVR

Size mm	Connection	k_{vs} value m³/h	Max. operating temperature °C	Max. operating pressure p_e bar	Max. differential pressure Δp bar	Max. test pressure p_e bar	Code No.
15	½ in BSP int.	0.63	180	10	10	16	065-7006
15	½ in BSP int.	1.00			10		065-7008
15	½ in BSP int.	2.50			6.3		065-7012
15	½ in BSP int.	4.00			4.0		065-7015
20	¾ in BSP int.	6.30			2.5		065-7020
25	1 in BSP int.	10.00			1.6		065-7025

p_e = effective pressure

Pneumatically-controlled Valves Type PIH
Check Valves Types NRV and NRVA

Technical data and code Nos.

PIH

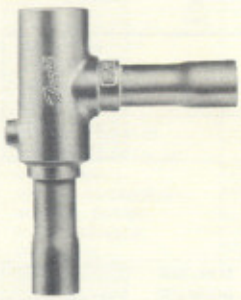
Type	Code No.	Medium	Connection for medium in	Compressed air connection in	k_v-value m^3/h	Differential pressure Δp		Max. temp. of medium °C	Max. ambient temp. °C
						min. bar	max. bar		
PIH 15	32U3160	Steam	1/2 BSP int.	1/8 BSP int.	4.8	0	10	185	80
PIH 20	32U3165		3/4 BSP int.	1/8 BSP int.	6				

Technical data and code Nos.

Refrigerants: R 12, R 22, R 502, etc.

Approvals: DSRK, DDR-Schiffs-Revision und -Klassifikation. PRS, Polski Rejestr Statków.

NRV 6 – 15



NRV 22s – 35s

Type	Version		Connection in	Code No.	Connection mm	Code No.	k_v-value m^3/h	[1] Δp_o bar
NRV 6	straight-way	flare	1/4	20-1001	6	20-1005	0.56	0.07
NRV 10			3/8	20-1002	10	20-1006	1.38	
NRV 12			1/2	20-1003	12	20-1007	1.97	0.05
NRV 15			5/8	20-1004	16	20-1009	3.60	
NRV 6s		solder	1/4	20-1010	6	20-1014	0.56	0.07
NRV 10s			3/8	20-1011	10	20-1015	1.38	
NRV 12s			1/2	20-1012	12	20-1016	1.97	0.05
NRV 15s			5/8	20-1013	16	20-1018	3.60	
NRV 22s	angle-way		7/8	20-1020	22	20-1024	8.50	0.04
NRV 28s			1 1/8	20-1021	28	20-1025	19.0	
NRV 35s			1 3/8	20-1022	35	20-1026	29.0	

[1]) Δp_o = the minimum pressure differential at which the valve is completely open.

Refrigerants: R 717 (NH_3), R 12, R 22, R 502, etc.

Approvals: DSRK, DDR-Schiffs-Revision und -Klassifikation. PRS, Polski Rejestr Statków.

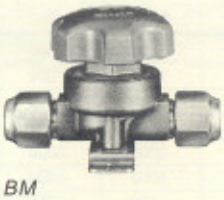
NRVA

Type	Weld flange connection in	Code No.		k_v-value m^3/h	Δp_o bar[1])	
		valve	[2]) special spring		with standard spring	with special spring
NRVA 15	1/2	20-2000	20-2307	5.0	0.075	0.3
NRVA 20	3/4	20-2001		5.8		
NRVA 25	1	20-2002	20-2317	18.4		
NRVA 32	1 1/4	20-2003		24.2		
NRVA 40	1 1/2	20-2004	20-2327	50		
NRVA 50	2	20-2005				
NRVA 65	2 1/2	20-2006	20-2337	60		

[1]) Δp_o = the minimum pressure differential at which the valve is completely open.
[2]) A special-type spring can be obtained to replace the standard spring.

Shut-off Valves Type BM

Technical data and code Nos.



BM

Refrigerants: R 12, R 22, R 502, etc.

Approvals: DSRK, DDR-Schiffs-Revision und -Klassifikation. PRS, Polski Rejestr Statków.

Version	Type	Flare connection for inch tubes in	Code No.	Flare connection for mm tubes mm	Code No.	Solder connection for mm tubes in	Code No.	Solder connection for mm tubes mm	Code No.	k_v-value m³/h
Straight-way	BML 6	1/4	9G0101	6	9G0107	1/4	9G0102	6	9G0108	0.30
	BML 10	3/8	9G0121	10	9G0127	3/8	9G0122	10	9G0128	0.84
	BML 12	1/2	9G0141	12	9G0147	1/2	9G0142	12	9G0148	1.50
	BML 15	5/8	9G0161	15	9G0167	5/8	9G0162	15	9G0169	2.20
	BML 15			16	9G0168			16	9G0170	2.20
	BML 18					3/4	9G0181	18	9G0184	2.90
	BML 22					7/8	9G0191	22	9G0194	2.90
T-way	BMT 6	1/4	9G0105	6	9G0111	1/4	9G0106	6	9G0112	0.30
	BMT 10	3/8	9G0125	10	9G0131	3/8	9G0126	10	9G0132	0.84
	BMT 12	1/2	9G0145	12	9G0151	1/2	9G0146	12	9G0152	1.50
	BMT 15	5/8	9G0165	15	9G0175	5/8	9G0166	15	9G0177	2.20
	BMT 15			16	9G0176			16	9G0178	2.20
	BMT 18					3/4	9G0183	18	9G0186	2.90
	BMT 22					7/8	9G0193	22	9G0196	2.90
Angle-way	BMV 6	1/4 × 1/4 *)	9G0103	1/4 × 6 *)	9G0109	1/4	9G0104	6	9G0110	0.50
	BMV 10	3/8 × 3/8 *)	9G0123	3/8 × 10 *)	9G0129	3/8	9G0124	10	9G0130	1.10
	BMV 12	3/8 × 1/2 *)	9G0143	3/8 × 12 *)	9G0149	1/2	9G0144	12	9G0150	1.70
	BMV 15	1/2 × 5/8 *)	9G0163	1/2 × 15 *)	9G0171	5/8	9G0164	15	9G0173	2.50
	BMV 15			1/2 × 16 *)	9G0172			16	9G0174	2.50
	BMV 18					3/4	9G0182	18	9G0185	3.20
	BMV 22					7/8	9G0192	22	9G0195	3.20

*) Connections for angleway versions, inlet × outlet = NPT × flare.

Filter Driers
Types DC, DS and DCR

Technical data and code Nos.

Refrigerants: R 12, R 22, R 502, etc.

Approvals: DSRK, DDR-Schiffs-Revision und -Klassifikation. PRS, Polski Rejestr Statków.

Type	Connection in inches flare *)	Code No.	Connection in mm flare *)	Code No.	Plant capacity in kcal/h for refrigeration and deep-freeze plants		
					R 12	R 22	R 502
DC 032	1/4	23U0110	6	23U0128	800	800	800
DC 052	1/4	23U0111	6	23U0129	1000	1000	1000
DC 053	3/8	23U0112	10	23U0130	1000	1000	1000
DC 082	1/4	23U0113	6	23U0131	1500	1500	1500
DC 083	3/8	23U0114	10	23U0132	3000	3000	3000
DC 084	1/2	23U0115	12	23U0133	3000	3000	3000
DC 162	1/4	23U0116	6	23U0134	3000	4500	2250
DC 163	3/8	23U0117	10	23U0135	6000	6000	6000
DC 164	1/2	23U0118	12	23U0136	6000	9000	6000
DC 165	5/8	23U0119	16	23U0137	6000	9000	6000
DC 303	3/8	23U0120	10	23U0138	9000	12000	6000
DC 304	1/2	23U0121	12	23U0139	12000	15000	9000
DC 305	5/8	23U0122	16	23U0140	15000	22500	15000
DC 415	5/8	23U0124	16	23U0142	22500	22500	22500

*) DC can also be supplied with solder connections.

DC

Type DC filter driers have a solid core.

Refrigerants: R 12, R 22, R 502, etc.

Approvals: DSRK, DDR-Schiffs-Revision und -Klassifikation. PRS, Polski Rejestr Statków.

Type	Connection in inches flare	Code No.	Connection in mm flare	Code No.	Plant capacity in kcal/h for refrigeration and deep-freeze plants		
					R 12	R 22	R 502
DS 032	1/4	23U0012	6	23U0080	800	800	800
DS 052	1/4	23U0013	6	23U0081	1000	1000	1000
DS 053	3/8	23U0014	10	23U0082	1000	1000	1000
DS 082	1/4	23U0015	6	23U0083	1500	1500	1500
DS 083	3/8	23U0016	10	23U0084	3000	3000	3000
DS 084	1/2	23U0017	12	23U0085	3000	3000	3000
DS 162	1/4	23U0018	6	23U0086	2500	3500	1800
DS 163	3/8	23U0019	10	23U0087	5000	4500	5000
DS 164	1/2	23U0020			5000	7000	5000
DS 165	5/8	23U0021			5000	7000	5000
DS 303	3/8	23U0022			9000	12000	6000
DS 304	1/2	23U0023			12000	15000	9000
DS 305	5/8	23U0024			15000	22500	15000

DS

Type DS filter driers have a silicagel charge.

Refrigerants: R 12, R 22, R 502, etc.

Approvals: DSRK, DDR-Schiffs-Revision und -Klassifikation. PRS, Polski Rejestr Statków.

Type	Connection in inches		Code No. Filter drier housing without solid core	Connection in mm	Code No. Filter drier housing without solid core	Code No. Solid core	Number reqd.	Plant capacity in kcal/h for deep-freeze, refrigeration, and air-conditioning plants with a separate compressor		
	solder ODF	weld		solder ODF				R 12	R 22	R 502
DCR 0485	5/8	1/2	23U1000			23U1020	1	24 000	36 000	22 000
DCR 0487	7/8	3/4	23U1001	22	23U1011	23U1020	1	36 000	45 000	30 000
DCR 0967	7/8	3/4	23U1002			23U1020	2	50 000	75 000	45 000
DCR 0969	1 1/8	1	23U1003	28	23U1013	23U1020	2	75 000	105 000	65 000
DCR 14411	1 3/8	1 1/4	23U1005	35	23U1005	23U1020	3	120 000	150 000	105 000
DCR 19213	1 5/8	1 1/2	23U1007	42	23U1017	23U1020	4	180 000	225 000	150 000

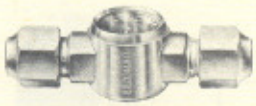
DCR

Type DCR filter driers have an interchangeable solid core which must be ordered for separate supply in an airtight container.

Solid cores

Sight Glasses Types SGI and SGR
Oil Separators Type OUB

Technical data and code Nos.



SGI

SGR

Version	Type	*) Connection	Code No.
ext. × ext. flare	SGI 6	1/4 in × 1/4 in (6 mm × 6 mm)*)	14-0012
	SGI 10	3/8 in × 3/8 in (10 mm × 10 mm)*)	14-0016
	SGI 12	1/2 in × 1/2 in (12 mm × 12 mm)*)	14-0020
solder version	SGI 6s	1/4 in × 1/4 in	14-0034
	SGI 10s	3/8 in × 3/8 in	14-0035
	SGI 12s	1/2 in × 1/2 in	14-0036
	SGI 15s	5/8 in × 5/8 in	14-0037
	SGI 22s	7/8 in × 7/8 in	14-0039
	SGI 6s	6 mm × 6 mm	14-0040
	SGI 10s	10 mm × 10 mm	14-0041
	SGI 12s	12 mm × 12 mm	14-0042
	SGI 16s	16 mm × 16 mm	14-0044
	SGI 18s	18 mm × 18 mm	14-0045
	SGI 22s	22 mm × 22 mm	14-0046
BSP or NPT	SGR 3/4	3/4 BSP	14-0004
	SGR 3/4	3/4 NPT	14-0005

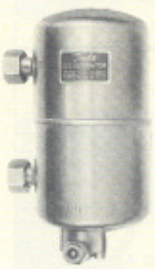
*) When ordering the flare version with mm connection, please state mm size together with code No.

Type SGI sight glasses are equipped with a moisture indicator.

Refrigerants: R 12, R 22, R 502, etc.

Approvals: DSRK, DDR-Schiffs-Revision und -Klassifikation. PRS, Polski Rejestr Statków.

Technical data and code Nos.



OUB

Refrigerants: R 12, R 22, R 502, etc.

Approvals: DSRK, DDR-Schiffs-Revision und -Klassifikation. PRS, Polski Rejestr Statków.

Type	Connection *)	Rated plant capacity in 1000 kcal/h at $t_o = -15°C$, and $t_k = 30°C$			Code No.	
		R 12	R 22	R 502	Straightway	Angleway
OUB 1	3/8 in (10 mm) flare	2.0	2.7	3.0	40B0010 + 2 × 40B0132	40B0010 + 2 × 40B0133
	3/8 in (10 mm) solder	2.0	2.7	3.0	40B0010 + 2 × 40B0140	40B0010 + 2 × 40B0141
	1/2 in (12 mm) flare	2.0	2.7	3.0	40B0010 + 2 × 40B0134	40B0010 + 2 × 40B0135
	1/2 in (12 mm) solder	2.0	2.7	3.0	40B0010 + 2 × 40B0142	40B0010 + 2 × 40B0143
	5/8 in (16 mm) flare	2.0	2.7	3.0	10B0010 + 2 × 40B0136	40B0010 + 2 × 40B0137
	5/8 in (16 mm) solder	2.0	2.7	3.0	40B0010 + 2 × 40B0144	40B0010 + 2 × 40B0145
	without connection nipples				40B0010	
OUB 4	5/8 in (16 mm) flare	7.6	10.0	11.0	40B0040 + 2 × 40B0256	40B0040 + 2 × 40B0257
	5/8 in (16 mm) solder	7.6	10.0	11.0	40B0040 + 2 × 40B0266	40B0040 + 2 × 40B0267
	3/4 in (18 mm) flare	7.6	10.0	11.0	40B0040 + 2 × 40B0258	40B0040 + 2 × 40B0259
	3/4 in (18 mm) solder	7.6	10.0	11.0	40B0040 + 2 × 40B0268	40B0040 + 2 × 40B0269
	7/8 in (22 mm) solder	7.6	10.0	11.0	40B0040 + 2 × 40B0270	40B0040 + 2 × 40B0271
	1 in (25 mm) flare	7.6	10.0	11.0	40B0040 + 2 × 40B0260	40B0040 + 2 × 40B0261
	1 in (25 mm) solder	7.6	10.0	11.0	40B0040 + 2 × 40B0272	40B0040 + 2 × 40B0273
	1 1/8 in (28 mm) solder	7.6	10.0	11.0	40B0040 + 2 × 40B0274	40B0040 + 2 × 40B0275
	without connection nipples				40B0040	

*) When ordering the flare version with mm connection, please state mm size together with code No.

Danfoss Contactors and Motor Starters

General

Design

All control relays, contactors and motor starters are designed in accordance with the specifications in IEC 158-1, 292-1, VDE 0660, BS 775 and 587.

Approvals

	Control relays	Contactors	Thermal relays	Electronic timers	Motor starters	Star-delta starters	Bakelite cases	Mild steel cases 22B	Mild steel cases CT10F, CHT10F
Demko, Denmark						1)		1)	
Nemko, Norway									
Semko, Sweden						1)		1)	
Sähkötarkastuslaitos, Finland		2)							
ÖVE, Austria									
SEV, Switzerland									
CEBEC, Belgium									
CSA, Canada		3)	4)						
Lloyds Register of Shipping			5)						

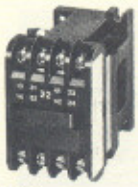
1) approval not obligatory
2) not CH25. C32 and C45 in special versions
3) not CH25
4) T16C and T80
5) not T16C

Control relays Types C6 and CH6

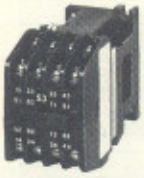
Application

Control relays types C6 and CH6 are for all forms of electrical control and interlocks.

C6 and CH6 relays can be obtained with a.c. coils. CH6 is also available with a coil for d.c. actuation.

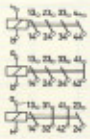
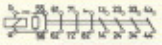


C6



CH6

CH6 d.c.

Type	Contact combination	Code No.*)	Rating
C6		37B0150 37B0151 37B0152	I_{make} = 20 A I_{break} = 6 A cos φ = 0.35 24–500 V
CH6		37B0160 37B0161 37B0162 37B0163 37B0164	
CH6**		37B1164	

*) Please state code No., coil voltage, and frequency.
**) For d.c. actuation.

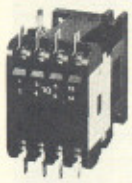
Ordering

for a.c. actuation
4-pole: Type C6
8-pole: Type CH6

for d.c. actuation
7-pole: Type CH6

Contactors and Motor Starters

Contactors 10-45A, types C10, CH10, CH16, CH25, C32 and C45

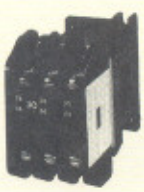


C10 with AMP connectors

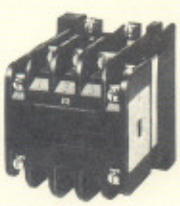
CH10

CH16

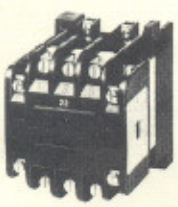
CH16 for d.c. actuation



CH25



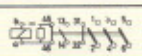
C32



C45

The contactors are designed for switching ohmic, capacitive, and inductive loads.

All the controls are available with coils for a.c. operation. CH16 can also be obtained with a coil for d.c. actuation.

Type	Contact combination	Code No.[1] Screw terminal	6.3 mm AMP connector	Rating at 3×380/440 V
C 10		37B1270 37B0170 37B0171	37B1370 37B1140 37B1141	10 A (AC_3) 16 A (AC_1)
CH 10		37B0175 37B0177		
CH 16		37L0020 37L0021 37L0022 37L0023		16 A (AC_3) 25 A (AC_1)
CH 16[2]		37L1022		
CH 25		37L0120 37L0121 37L0122 37L0123		25 A (AC_3) 25 A (AC_1)
C 32		37L0050 37L0051 37L0052		32 A (AC_3) 45 A (AC_1)
C 45		37L0070 37L0071 37L0072		45 A (AC_3) 63 A (AC_1)

[1]) Please state code No., coil voltage, and frequency.
[2]) For d.c. actuation.

Ordering

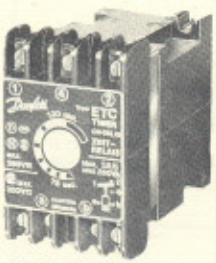
For a.c. actuation:
10A: Types C10 and CH10
16A: Type CH16
25A: Type CH25
32A: Type C32
45A: Type C45

For d.c. actuation:
16A: Type CH16

Electronic Timers Types ETI, ETC

Electronic timers

ETI with break contact



ETC

Application

Electronic timers types ETI and ETC produce a time delay between electrical control functions.

For a.c. actuation:
2–50s: Type ETI
2–120s: Type ETC

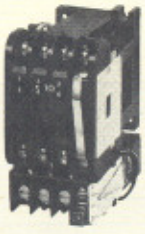
Ordering

Type	Contact	Time (s)	Voltage*) (V)	Code No.
ETI	○—○	2–50	110	47L0213
			220/240	47L0215
			380/415	47L0217
ETI	○ ○ ○	2–50	110	47L0223
			220/240	47L0225
			380/415	47L0227
ETC	○ ○ ○	2–50	24	47L0240
			42	47L0241
			110	47L0242
			220/240	47L0243
			380/415	47L0244
		40–90	24	47L0250
			42	47L0251
			110	47L0252
			220/240	47L0253
			380/415	47L0254
		75–120	24	47L0260
			42	47L0261
			110	47L0262
			220/240	47L0263
			380/415	47L0264

*) The voltages stated apply to both 50 and 60 Hz.

Motor Starters Types CT10 and CHT16

Motor starters types CT10 and CHT16



CT10
(C10 + T16 with manual reset) with start and stop/reset

Application

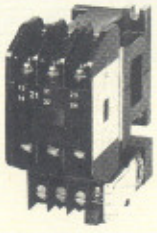
Motor starters Types CT10 and CHT16 are designed for the switching and thermal protection of single and three-phase a.c. motors.

10A: type CT10
16A: type CH16

Ordering

Range A	Max. mains fuse		CT10		CHT16	
	normal	slow	I-O/reset	O/reset	I-O/reset	O/reset
0.13– 0.20	1	–	47B1200	47B1220	47L1200	47L1220
0.19– 0.29	2	–	47B1201	47B1221	47L1201	47L1221
0.27– 0.42	2	2	47B1202	47B1222	47L1202	47L1222
0.4 – 0.62	4	4	47B1203	47B1223	47L1203	47L1223
0.6 – 0.92	6	4	47B1204	47B1224	47L1204	47L1224
0.85– 1.3	6	4	47B1205	47B1225	47L1205	47L1225
1.2 – 1.9	10	6	47B1206	47B1226	47L1206	47L1226
1.8 – 2.8	16	10	47B1207	47B1227	47L1207	47L1227
2.7 – 4.2	25	20	47B1208	47B1228	47L1208	47L1228
4 – 6.2	35	20	47B1209	47B1229	47L1209	47L1229
6 – 9.2	35	25	47B1210	47B1230	47L1210	47L1230
8 –12	35	25	–	–	47L1211	47L1231
11 –16	35	25	–	–	47L1212	47L1232
Number of free auxiliary contacts			0	1	2	3
Empty case*			47B0017	47B0018	47L0017	47L0018
Empty case**			47B0019	47B0020	47L0019	47L0020

* with Pg 16 screwed cable entries
** with M20 screwed cable entries and mushroom stop button



CHT16
(CH16 + T16 with manual reset) with stop/reset

Coil data

Voltages at 50 Hz: 24 - 42 - 48 / 110 - 200 - 220 / 240 - 250 - 380 / 415 - 440 - 500 V

Voltages at 60 Hz: 24 - 110 - 200 / 220 - 240 - 380 / 440 - 500 - 550 / 600 V

Tolerances: + 10% to − 15%

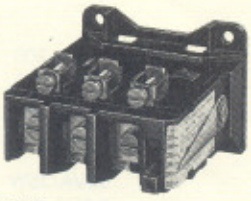
Consumption, inrush: 55VA/35W
holding: 8.5VA/3.2W

Thermal Relays 16-80A
Types T16, T16C, T25 and T80

T16

T16C

T25



T80

Application

Relays T16, T16C, T25 and T80 are for the thermal protection of single and three phase a.c. motors against overload and phase failure.

Ordering

Range A	Max. mains fuses		Type T16		Type T16C		Type T25		Type T80	
	normal	slow	Man. reset	Auto. reset	Man. reset	Auto. reset	Man. reset	Auto. reset	Man. reset	Auto. reset
0.13– 0.20	1	–	47L0060	47L0100	47L2060	47L2100				
0.19– 0.29	2	–	47L0061	47L0101	47L2061	47L2101				
0.27– 0.42	2	2	47L0062	47L0102	47L2062	47L2102				
0.4 – 0.62	4	4	47L0063	47L0103	47L2063	47L2103				
0.6 – 0.92	6	4	47L0064	47L0104	47L2064	47L2104				
0.85– 1.3	6	4	47L0065	47L0105	47L2065	47L2105				
1.2 – 1.9	10	6	47L0066	47L0106	47L2066	47L2106				
1.8 – 2.8	16	10	47L0067	47L0107	47L2067	47L2107				
2.7 – 4.2	25	20	47L0068	47L0108	47L2068	47L2108				
4 – 6.2	35	20	47L0069	47L0109	47L2069	47L2109				
6 – 9.2	35	25	47L0070	47L0110	47L2070	47L2110				
8 –12	35	25	47L0071	47L0111	47L2071	47L2111				
11 –16	35	25	47L0072	47L0112	47L2072	47L2112				
15 –20	50	35					47L0073	47L0113		
19 –25	50	35					47L0074	47L0114		
16 –23	80	63							47L1013	47L1113
22 –32	80	63							47L1014	47L1114
30 –45	125	100							47L1015	47L1115
42 –63	125	100							47L1016	47L1116
60 –80	160	125							47L1017	47L1117

Max. operating voltage

T16 and T25 : 500V~
T16C : 600V~
T80 (Europe) : 500V~
T80 (Canada): 600V~

Switch

Max. load:

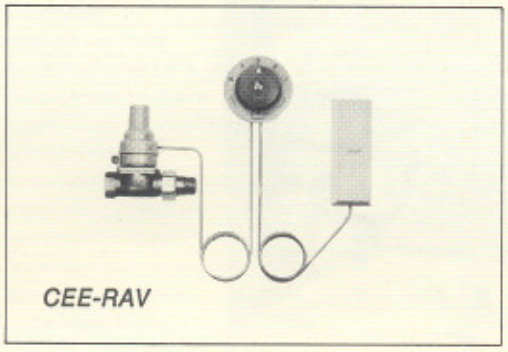
T16, T16C, T25: 2A 500V~
2A 250V⎓
20W⎓

T80 : 4A 500V~
2A 250V⎓
20W⎓

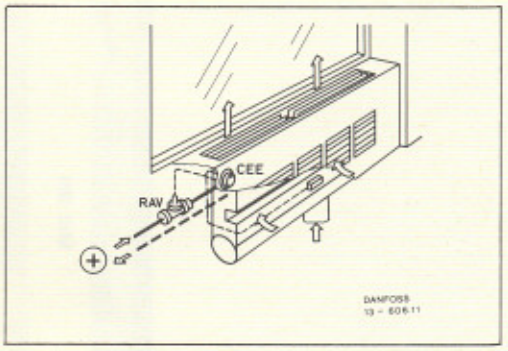
Thermostatic Water Valves for Ventilating and Air Conditioning Installations

Application

For induction units and air conditioning terminals.
These self-contained valves are mounted on heat exchangers in the heating/cooling terminals in the cabins and saloons.



CEE-RAV



Advantages

Individual and constant room temperature between 8 and 30°C according to the setting selected.

Setting unit and sensor are located separately.

Valves for two and four-pipe systems.

Valves for hot water. Valves for cold water. Valves for hot and cold water. Sequence valves and diverter valves.

Order the special brochure dealing with thermostatic water valves for ventilating and air conditioning installations.

Easy to install.

No electrics, no pneumatics.

Very little servicing.

Thermostatic Mixing Valve Type BLT

Application

Type BLT mixing valves are for use in ships cabins and wherever else there is a need to mix hot and cold water to obtain a constant water temperature of between 10 and 60°C.

Advantages

Bathing comfort; the water temperature selected is held constant – no cold shivers and no hot shocks.

No danger of scalding in the event of cold water failure.

Easy to install.

Easy to service.

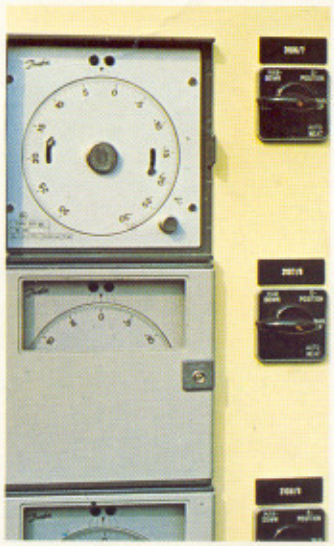
Easy to clean.

Approval
Approved by the Department of Trade, Marine Division (UK).

Order the special BLT brochure.

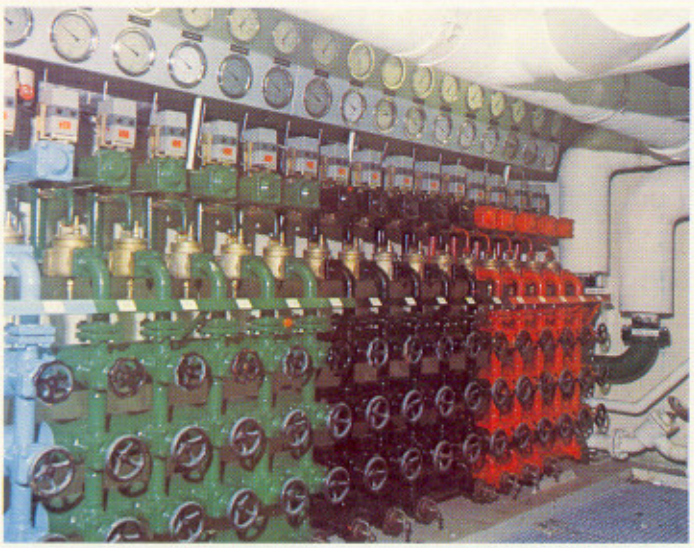
Printed in Denmark by Danfoss Litho 10.77. 20.000

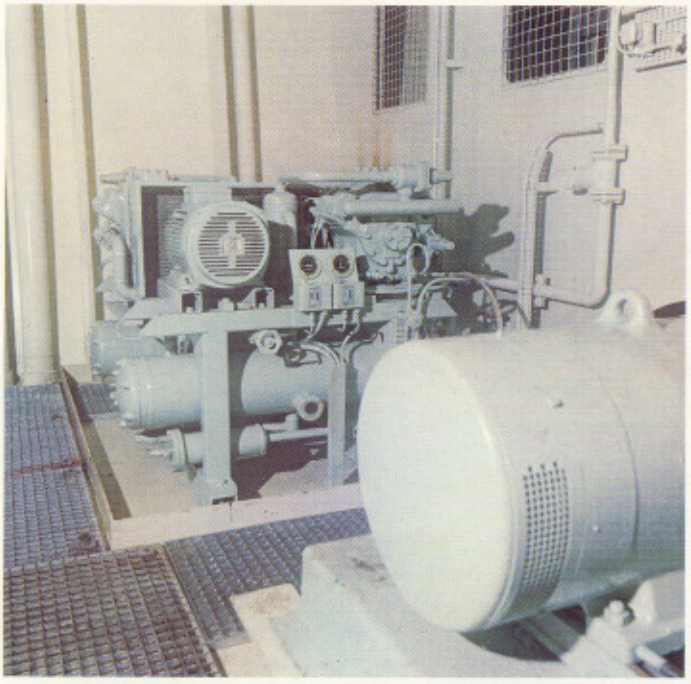
Application examples of automatic refrigeration controls on board ship



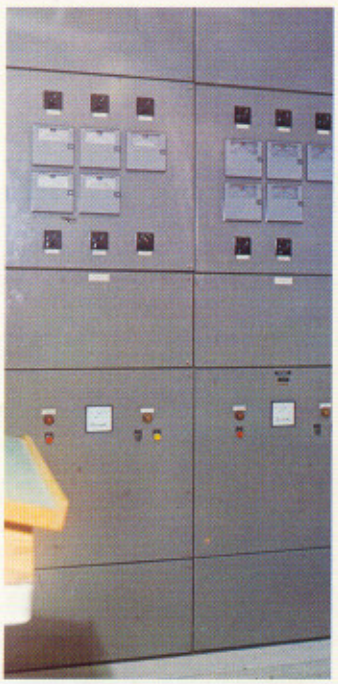
Valve arrangement for the refrigerated cargo hold. ▶
For both low temperatures (freezing) and for high temperatures (refrigerated compartment for fruit), hold temperatures are maintained by temperature-controlled evaporating pressure regulators type EPT 60, main valves type PHS and motor-controlled pilot valves type CVMM.

◀ Electronic thermostat.
Electronic thermostat type EPT 60 is well-suited to applications where there are strict requirements for the accurate regulation of the temperature in the holds. The thermostat covers a temperature range −30°C to +30°C and is able to operate with a dead zone of ±0.1°C.

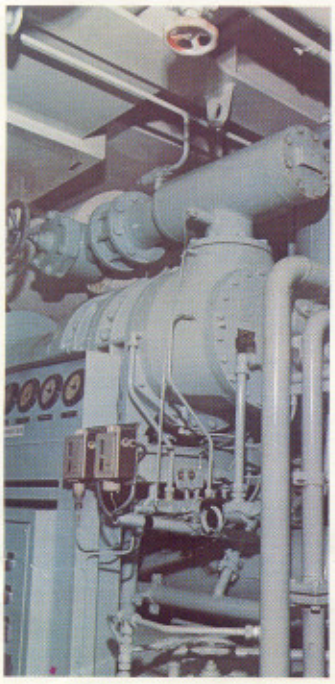




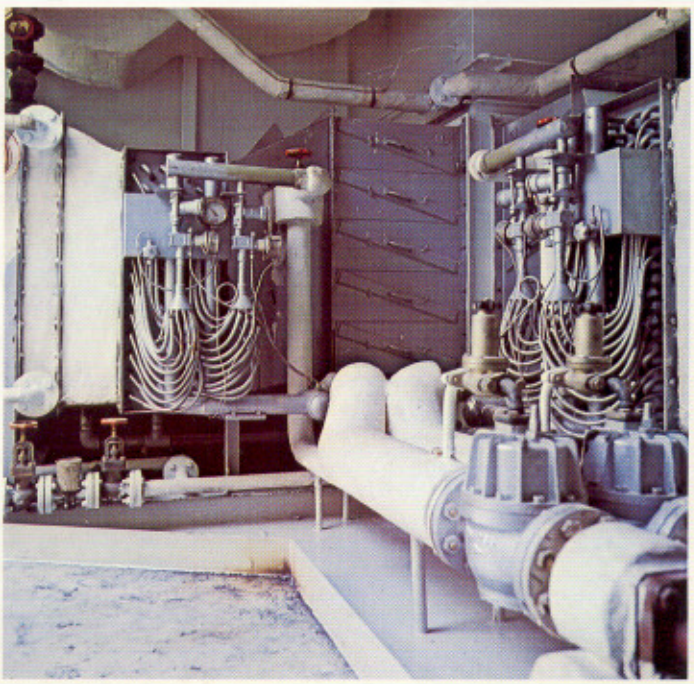
Control panel for the refrigeration room. ▶
From the panel, temperatures in the refrigerated cargo holds can be controlled by the electronic thermostats type EPT 60. These are electrically connected to the motor-controlled pilot valves type CVMM which form part of the valve arrangement.



◀ Refrigeration plant.
The refrigeration compressors are equipped with low pressure controls type KP 1 and high pressure controls type KP 5.
The oil differential pressure controls type MP 55 ensure that oil pressure in the compressors is sufficiently high.



◀ Refrigeration plant for the cargo.
The screw compressors are equipped with low pressure controls type RT 1A, high pressure controls type RT 5A and oil differential pressure controls type RT 260A.
Oil temperature is maintained by the type RT 101 thermostat, compressed gas temperature by the type RT 107 thermostat.



Evaporators for the air conditioning plant in a large liner. ▶
The injection of refrigerant in the evaporators is controlled by thermostatic expansion valves type TE. Evaporating temperature is held constant by main valves type PHS equipped with pressure-controlled pilot valves type CVM.

You can find Danfoss everywhere - always within reach

Danfoss is an international concern with factories in 6 countries and subsidiaries in 14 countries.
Danfoss products are backed by a world-wide distribution and service network covering more than 100 countries on 5 continents.

Danfoss' product programme covers automatic controls for refrigeration, air conditioning, heating and ventilating plant, industrial automatics, components for burners and boilers, hydraulic components, and components for refrigerators and freezers.

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