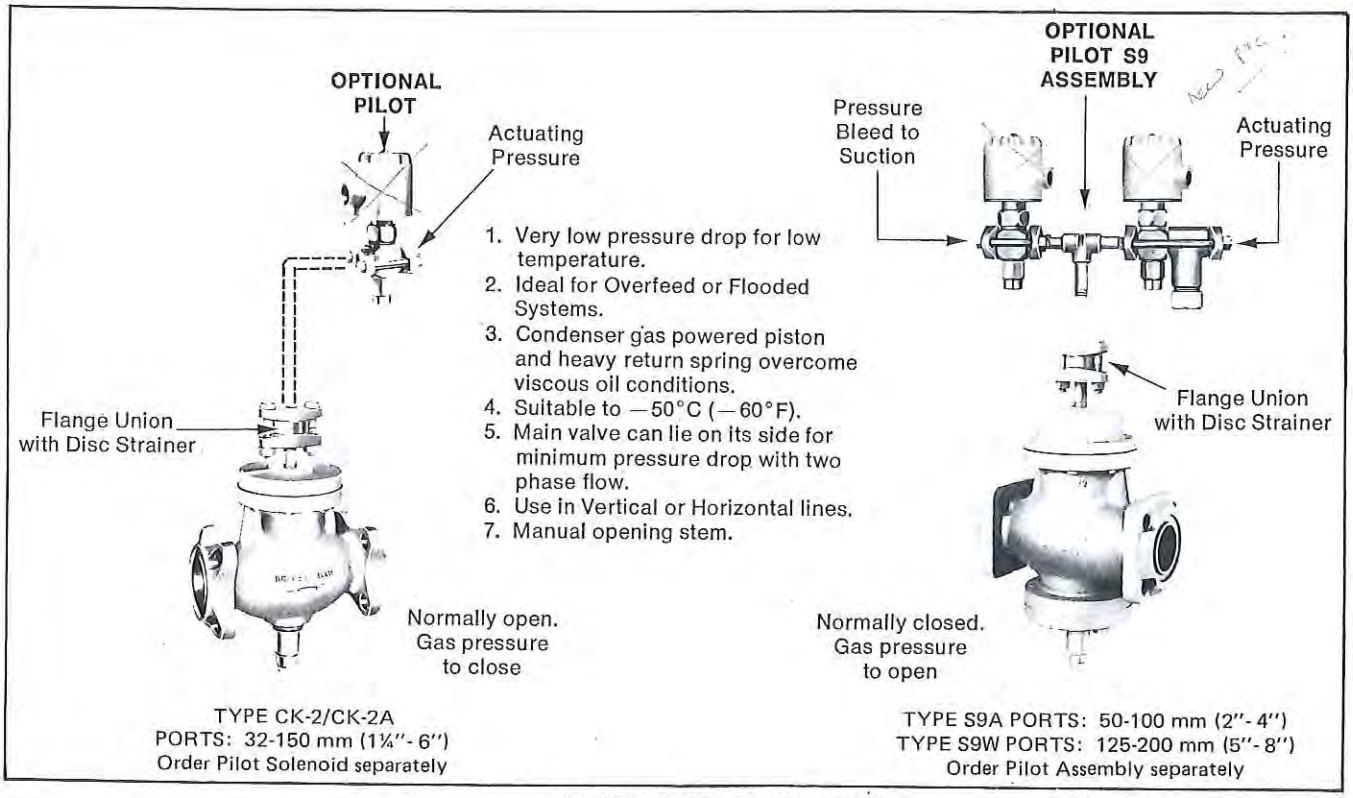
Parker Refrigerating Specialties Company

CONDENSER GAS POWERED SOLENOID VALVES FOR LOW TEMPERATURES

AMMONIA



1. Very low pressure drop for low temperature.
2. Ideal for Overfeed or Flooded Systems.
3. Condenser gas powered piston and heavy return spring overcome viscous oil conditions.
4. Suitable to −50°C (−60°F).
5. Main valve can lie on its side for minimum pressure drop with two phase flow.
6. Use in Vertical or Horizontal lines.
7. Manual opening stem.

TYPE CK-2/CK-2A
PORTS: 32-150 mm (1¼"- 6")
Order Pilot Solenoid separately

TYPE S9A PORTS: 50-100 mm (2"- 4")
TYPE S9W PORTS: 125-200 mm (5"- 8")
Order Pilot Assembly separately

GENERAL SPECIFICATIONS

Maximum Opening Pressure Difference - 1896 kPa (275 PSIG)
Design Pressure - 2069 kPa (300 PSIG)
Maximum Fluid Temperature - 105°C (220°F)
Minimum Fluid Temperature - −50°C (−60°F)
Seat Material - CK-2 32mm (1¼") Port Size - Teflon; All others - Metal
Body Material - Semi-steel

VALVE (Without Solenoid(s))		PORT SIZE		CONNECTIONS SW FLANGE		Description	PILOT SOLENOID(S)				FLOW COEFFICIENTS	
									FLANGE CONNS.			
Cat. No.	Type	mm	ins.	Std.	Also Avail.		Cat. No.	Type	Std.	Also Avail.	Kv	Cv
121840	CK-2	32	1¼	1¼	1½	Normally Open	121810	S6N	1/2"SW	To Suit all Solenoids 1/4", 3/8", 1/2" & 3/4" FPT or SW	16.3	19.0
121841	CK-2A	40	1-5/8	1½	2	Normally Open					31.7	37.0
121842	CK-2	50	2	2	1½	Normally Open					43.7	51.0
121843	S9A	50	2	2	1½	Normally Closed	121836	S9(PA)	3/8"FPT		38.5	45.0
121844	CK-2	65	2½	2½	—	Normally Open	121810	S6N	1/2"SW		70.2	82.0
121845	S9A	65	2½	2½	—	Normally Closed	121836	S9(PA)	3/8"FPT		55.6	65.0
121846	CK-2	75	3	3	—	Normally Open	121810	S6N	1/2"SW		103	120
121847	S9A	75	3	3	—	Normally Closed	121836	S9(PA)	3/8"FPT		85.6	100
121848	CK-2	100	4	4	—	Normally Open	121810	S6N	1/2"SW		171	200
121849	S9A	100	4	4	—	Normally Closed	121836	S9(PA)	3/8"FPT		154	180
121850	CK-2	125	5	5	—	Normally Open	121812	S8F	1/2"SW		244	285
121851	CK-2	150	6	6	—	Normally Open					342	400
				Welds Directly in the Line								
121854	S9W	125	5	5	—	Normally Closed	121836	S9(PA)	3/8"FPT		193	225
121855	S9W	150	6	6	—	Normally Closed	121837	S9(PA)	1/2"FPT		304	355
121856	S9W	200	8	8	—	Normally Closed	121838	S9(PA)	3/4"FPT		621	725

NOTES: (1) S9 (PA) = S9 Pilot Assembly — refer illustration above. Under 100mm (4") Port Size one pilot or S9 Pilot Assembly can operate two CK-2(A) or two S9 valves. Actuating pressure must be at least 70 kPa (10psi) above valve inlet pressure.
(2) CK-2/CK-2A and S9 Valves are supplied standard **without** Pilot Solenoid(s).
(3) If separate Strainer required, select from Page 121-C.
(4) **SOLENOID COILS FOR ABOVE VALVES — As per Page 121.**

ORDERING GUIDE: Specify Port Size, Type, Connection size and type with pilot actuating connection size and type, with or without pilot solenoid, Pilot solenoid Volts and Frequency and Pilot connection size and type. CK-2 and S9 Valves are supplied standard **without** pilot solenoid.

CAPACITIES — Refer Tech. Page 121-b

Parker

Refrigerating Specialties Company

AMMONIA SOLENOID VALVE CAPACITIES

Port Size mm	Port Size inch	Type	Liquid① Tons psi Pr. Drop 2	5	Tons SUCTION for Evap. Temps Listed② At 1 psi Pres. Drop 40°F	20°F	0°F	−20°F	At 2 psi Pres. Drop 40°F	20°F	0°F	−20°F	Tons HOT GAS Defrost③ Supply for Evap. Temp. Listed 20°F	0°F	−20°F	−40°F
5 mm	3/16"	S6N	15	24	—	—	—	—	—	—	—	—	1.9	1.6	1.3	1.0
13 mm	1/2"	S8F	67	110	3.5	2.8	2.2	1.7	5.0	4.0	3.1	2.3	8.4	7.0	5.6	4.2
20 mm	3/4"	S4A	180	280	—	—	—	—	13	11	8.3	6.3	23	19	15	11
		S7A	200	320	10	8.4	6.6	5.0	15	12	9.2	7.0	25	21	17	13
25 mm	1"	S4A	250	390	—	—	—	—	18	15	12	8.7	31	26	21	16
		S7A	250	390	13	10	8.2	6.3	18	15	12	8.7	31	26	21	16
32 mm	1 1/4"	S4A	440	690	—	—	—	—	32	26	20	15	55	46	37	28
		S5A	470	750	25	20	16	12	35	28	22	17	—	—	—	—
40 mm	1 5/8"	S4A	830	1300	—	—	—	—	62	49	38	29	100	87	70	52
		S5A	920	1500	48	39	30	23	68	55	43	32	—	—	—	—
50 mm	2"	S4A	1200	2000	—	—	—	—	92	73	57	43	160	130	100	78
		S5A	1200	2000	67	54	42	32	94	76	59	44	—	—	—	—
65 mm	2 1/2"	S4A	1700	2800	—	—	—	—	130	100	80	61	220	180	140	110
		S5A	2000	3200	110	86	67	52	150	120	94	71	—	—	—	—
75 mm	3"	S4A	2500	3900	—	—	—	—	180	150	120	87	310	260	210	160
		S5A	2900	4500	150	120	94	72	210	170	130	100	—	—	—	—
100 mm	4"	S4A	4000	6400	Use CK-2 or S9A				300	240	190	140	—	—	—	—
125 mm	5"	S4W	—	—	Use CK-2 or S9W				420	330	260	200	—	—	—	—
150 mm	6"	S4W	—	—	Use CK-2 or S9W				660	525	410	310	—	—	—	—
200 mm	8"	S4W	—	—	Use CK-2 or S9W				1300	1100	830	630	—	—	—	—

① Based on −7 °C (20°F) liquid with no flashing through valve, −15°C (5°F) evaporator temperature and no liquid overfeed. For liquid overfeed multiply evaporator tons by recirculating rate and size valve to resultant tons. Use of −7°C (20°F) liquid for capacities in this table is sufficiently accurate for most liquid overfeed systems. To correct table values for 30°C (86°F) condensing and liquid multiply by 0.9.

② Based on 30°C (86°F) condensing temperature, and the evaporator temperatures listed. Shown for dry suction gas flow only. Capacities are maximum. No reserve is included for such excess load as pull-down, large oil volume, or liquid overfeed (recirculation).

③ Nominal evaporator capacities listed are based on normal defrost times, saturated hot gas inlet to valve of 7 kg/cm² (100 psig) or higher; and defrost pressure of 4.9 kg/cm² (70 psig). Defrost time will depend on amounts of liquid, frost and mass of evaporator as well as piping arrangement and connection locations. Next size larger valve will shorten defrost time; next size smaller will lengthen time.

FOR SUCTION LINES

Evap. Temp. °F Ev. Pres. psig	Pres. Drop Thru Valve psi	Tons CK-2 Normally Open Close For Defrosting 32 mm 1¼"	40 mm 1⅝"	50 mm 2"	65 mm 2½"	75 mm 3"	100 mm 4"	125 mm 5"	150 mm 6"	200 mm 8"
20°F	1.0	23	45	62	100	140	240	350	490	Not
33.5	0.5	16	32	43	71	100	170	250	340	Avail.
0°F	1.0	19	37	51	80	110	200	280	400	Not
15.7	0.5	13	26	36	56	78	140	200	280	Avail.
−20°F	0.50	11	21	28	45	63	110	160	220	Not
3.6	0.25	7.6	15	21	32	45	80	110	160	Avail.
−40°F	0.50	8.2	16	22	35	48	86	120	170	Not
8.7 in hg	0.25	5.8	11	15	25	34	61	90	120	Avail.
Evap. Temp. °F Ev. Pres. psig	Pres. Drop Thru Valve psi	Tons S9A Normally Closed 32 mm 1¼"	40 mm 1⅝"	50 mm 2"	65 mm 2½"	75 mm 3"	100 mm 4"	S9W Welds direct into line 125 mm 5"	150 mm 6"	200 mm 8"
0°F	1.0	Not	Not	45	64	89	180	220	350	720
15.7	0.50	Avail.	Avail.	32	46	63	130	160	250	510
−40°F	0.50	Not	Not	19	28	39	77	97	150	310
8.7 in hg	0.25	Avail.	Avail.	14	20	27	55	69	110	220

Capacities are based on liquid temperatures equal to evaporator temperatures. For Liquid over feed systems, nominal 2:1 to 5:1 ratio, use next size larger valve. See Page 121-b for flow coefficients Kv/Cv.

GRAVITY FLOODED

Capacities are nominal and are based on accepted industry practice concerning surge drum height and evaporator geometry.

Tons Gravity Flooded U. S. Capacities							
Port Size mm	Port Size inch	Type	Liquid Leg	Gas Return for Evap. Temp. 20°F	0°F	−20°F	−40°F
32 mm	1¼"	CK-2	4	2.6	2.1	1.6	1.2
40 mm	1⅝"	CK-2	6	4.0	3.2	2.4	1.8
50 mm	2"	CK-2	11	9.7	7.7	5.9	4.5
		S9A	11	9.7	7.7	5.9	4.5
65 mm	2½"	CK-2	18	16	12	9.6	7.3
		S9A	18	16	12	9.6	7.3
75 mm	3"	CK-2	30	27	21	16	12
		S9A	30	27	21	16	12
100 mm	4"	CK-2	60	57	45	35	27
		S9A	60	57	45	35	27
125 mm	5"	CK-2	105	100	82	63	48
		S9W	105	100	82	63	48
150 mm	6"	CK-2	160	170	130	100	78
		S9W	160	170	130	100	78
200 mm	8"	S9W	330	350	280	210	160

ORDERING : REFER TO PAGES 121, 121-a and 121-c

REFRIGERANT STRAINER

FOR AMMONIA, R-12, R-22, R-502, AND OTHER REFRIGERANTS

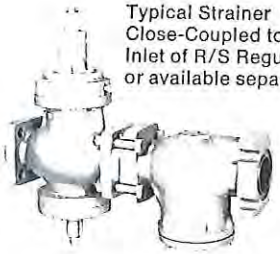
R/S CONTROLS

Parker Refrigerating Specialties Company

1

TYPE

RSF
NTFF
RSW



Typical Strainer Close-Coupled to Inlet of R/S Regulator, or available separate.

FEATURES —

- Filters Dirt
- Stainless Steel Screen
- 60 Mesh Screen
- Can Be Close Coupled
- Heavy Duty
- Generous Screen Area
- Cleanable in Line
- Flanged

DESCRIPTION

These heavy duty, semi-steel bodied Refrigerant Strainers with stainless steel screens are designed especially for the protection of R/S Refrigerant Control Valves from dirt and other foreign material in refrigerant lines. The fine stainless screen mesh will collect particles above several thousandths of an inch in diameter. Generous screen areas provide maximum dirt capacity at minimum pressure drop. The strainers may be close coupled to R/S valves having same gasket size or used separately with appropriate companion flanges and adapter ring.

GENERAL SPECIFICATIONS

Design Pressure (SWP)	:	2069 kPa (300PSIG)
Maximum Refrigerant Temperature	:	105°C (220°F)
Minimum Refrigerant Temperature	:	–50°C (–60°F)
Body Material	:	Cast semi-steel
Screen Material	:	Stainless Steel with openings 0.23 x 0.23 mm (0.009" x 0.009"); 0.2 mm (0.0075") wire

Periodic inspection and cleaning is necessary for reliable valve operation

STRAINER		USED ON PORT SIZES		CONNECTION SIZE (ins.)		SCREEN AREA	
CAT. NO.	TYPE & SIZE	mm	ins.	Std.	Also Avail.	sq. cm	sq. ins.
121800	NTFF 13mm (½")	5 & 13	3/16 & 1/2	½	¾	39	6
121801	RSF 25mm (1")	20 & 25	3/4 & 1	1	¾, 1¼	116	18
121802	RSF 32mm (1¼")	32	1-1/4	1¼	1½	230	36
121803	RSF 50mm (2")	40 & 50	1-5/8 & 2	2	1½	500	78
121804	RSF 65mm (2½")	65	2-1/2	2½	—	570	88
121805	RSF 75mm (3")	75	3	3	—	570	88
121806	RSF 100mm (4")	100	4	4	—	650	101
Welds directly in the line — No flanges required.							
121807	RSW 125mm (5")	125	5	5	—	790	123
121808	RSW 150mm (6")	150	6	6	—	1410	219
121809	RSW 200mm (8")	200	8	8	—	1750	272

SAFE OPERATION

People doing any work on a refrigeration system must be qualified and completely familiar with the system and the R/S Co. valves involved, or all other precautions will be meaningless. This includes reading and understanding pertinent R/S product bulletins and Bulletin RSB prior to installation or servicing work.

Where cold refrigerant liquid lines are used, it is necessary that certain precautions be taken to avoid damage which could result from liquid expansion. Temperature increase in a piping section full of solid liquid will cause high pressure due to the expanding liquid which can possibly rupture a gasket, pipe or valve. All hand valves isolating such sections should be marked, warning against accidental closing, and must not be closed until the liquid is removed. Check valves must never be installed upstream of solenoid valves or regulators with electric shut-off, nor should hand valves upstream of solenoid valves or downstream of check valves be closed until the liquid has been removed. It is advisable to properly install relief devices in any section where liquid expansion could take place.

Avoid all piping of control arrangements which might produce thermal or pressure shock. For the protection of people and products, all refrigerant must be removed from the section to be worked on, before a valve, strainer, or other device is opened or removed.

REFER PAGES 121, 121-a and 121-b FOR R/S SOLENOID VALVES

NOTES

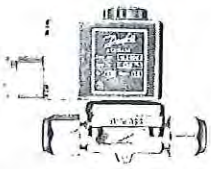
QUICK AS A FLASH

AND VERY CAREFUL. THAT'S OUR ORDER DEPARTMENT. WHETHER YOUR ORDER IS LARGE OR SMALL, IT WILL RECEIVE PROMPT AND EXACTING ATTENTION. WE DESPATCH OVER 90% OF ALL ORDERS ON THE SAME DAY THEY ARE RECEIVED.

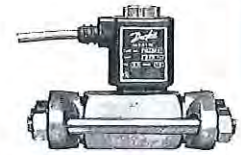
Danfoss SOLENOID VALVES

Type EVR For fluorinated refrigerants

Used in refrigeration plants for — refrigerator and freezer display counters, cold stores and deep freeze stores, milk coolers, drinking water coolers and air conditioning plants.
Designed for use in Liquid, Suction and Hot Gas Lines.



EVR 6, flare



EVRA 3

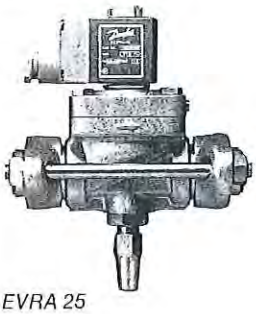
Types EVRA, EVSA, HSA and PM
For fluorinated refrigerants and ammonia

EVRA — Can be used in Liquid, Suction and Hot Gas Lines. Often used as a pilot valve for the pilot-controlled Main Valves HSA and PM.

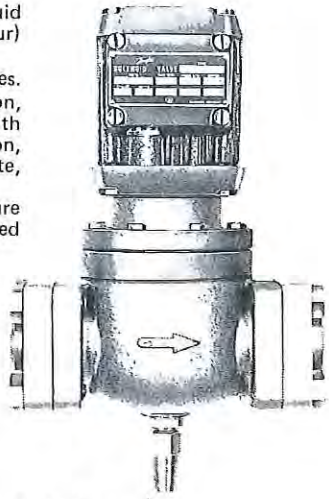
EVSA — Designed for use in Suction Lines — EVSA25 also for Liquid Lines. Can also be used in return lines (liquid/vapour) in refrigeration systems with pump recirculation.

HSA — Pilot controlled Main Valves used in Liquid & Suction Lines.

PM — Electrically controlled shut-off valves for refrigeration, freezing and air conditioning plants. Servo operated with screwed on pilot valves. Designed for use in Liquid, Suction, Hot Gas, Pressure, Return (liquid/vapour), Condensate, Pressure equalizing and by-pass Lines.
They also have a variety of uses for regulation of pressure and temperature, the Main Valve function being determined exclusively by the selected pilot valve.



EVRA 25



EVSA 35

HSA/HSAH 70–100

Cat. No.	Type	Code No.	Conn. (ins.)	Type Seat	Opening Diff. Pressure kPa Min.	Maximum Liq.	Maximum Gas	Kv Factor	Max. Test Press. kPa	Temp. of Medium °C
TYPE EVR — R12, R22, R502 FOR LIQUID, SUCTION, HOT GAS										
DIRECT CONTROL										
	EVR 2	32F2002	1/4" Flare	Teflon	0	1750	1850	0.16	4600	−40 to 100
12251	EVR 3	32F2033	1/4" Flare	Teflon	0	2100	2200	0.27	4600	−40 to 105
SERVO CONTROL										
12253	EVR 6	32F2063	3/8" Flare	Teflon	5	2100	2200	0.8	4600	−40 to 105
12254	EVR 6	32F2083	3/8" Sold.					0.8		
12255	EVR 10	32F2103	1/2" Flare					1.9		
12256	EVR 10	32F2123	1/2" Sold.					1.9		
12257	EVR 15	32F2143	5/8" Flare					2.6		
12258	EVR 15	32F2163	5/8" Sold.					2.6		
12259	EVR 20	32F2213	7/8" Sold.					5.0		
12260	EVR 25	32F2263	1-1/8"Sold					10.0		
EVR Complete with Manual Lift Stem Less Coil										
	EVR 15	32F1232	5/8" Sold.	Teflon	5	2100	2200	2.6	4600	−40 to 105
	EVR 20	32F1251	7/8" Sold.					5.0		
TYPE EVRA — AMMONIA (R717), R12, R22, R502 (Without Flanges)										
(Direct Control for Liquid & Hot Gas — Servo Control for Liquid, Suction, & Hot Gas)										
DIRECT CONTROL										
12276	EVRA 3	32F3103	1/2, 3/4	Teflon	0	2100	2200	0.23	5000	−40 to 105
SERVO CONTROL										
12277	EVRA 10	32F3113	1/2, 3/4	Teflon	5	2100	2200	1.5	5000	−40 to 105
12278	EVRA 15	32F3123	1/2, 3/4					2.7		
12279	EVRA 20	32F3133	3/4, 1					4.5		
12280	EVRA 25	32F3143	3/4, 1		10	2100	2200	9.8		
WELD FLANGE SETS TO SUIT EVRA										
12281		27N1115	1/2		Suits Sizes EVRA 3, 10 & 15					
12282		27N1120	3/4							
12283		27N1220	3/4		Suits Sizes EVRA 20 & 25					
12284		27N1225	1							
TYPE EVSA — AMMONIA (R717), R12, R22, R502										
(EVSA 25 for Liquid & Suction — EVSA 35 & 50 for Suction)										
FORCED SERVO CONTROL (With Inbuilt Strainer and Spindle for Manual Opening)										
12218	EVSA 25	32Z0201	1" W.F.	Rubber	0	1750	1750	7.5	3500	−60 to 50
12219	EVSA 35	32Z0204	1½" W.F.					18.5		
12220	EVSA 50	32Z0207	2" W.F.					29.0		
MAIN VALVES — PILOT CONTROLLED										
TYPE HSA — AMMONIA (R717), R12, R22 & R502 (Liquid & Suction)										
11922	HSA 70	26G0008	3" W.F.		14	1750	1750	87.5	2800	−60 to 60
11923	HSA 100	26G0010	4" W.F.					153.0		
TYPE PM1 & PM3 — AMMONIA (R717), R12, R22 & R502 (Liquid, Suction & Hot Gas)										

Sizes : PM1 — 20, 25, 32, 40
PM3 — 20, 25, 32, 40, 50, 65
Refer next page for Capacities and Page 119-b for full details.

KK.41.A2.02 & KC.30.A1.02

ELECTRICAL COIL DATA		
Cat. No.	**Code No.**	**Description (Encapsulated Coils)**
TO SUIT EVR (With Junction Box)		
12267	18Z6702	240V. 50Hz. 10W.
12268	18Z6704	415V. 50Hz. 10W.
12265	18Z6707	24V. 50Hz. 10W.
12266	18Z6711	110/120V. 50Hz. 10W.
TO SUIT EVR 3 & 25 (With Junction Box)		
12269	18Z6856	12V. DC. 20W.
TO SUIT EVR 6 to 20 (With Junction Box)		
12270	18Z6886	12V. DC. 20W.
TO SUIT EVSA (With Junction Box)		
122315	32Z8005	240V. 50Hz.22W.

CAPACITIES

Refer next Page

DANFOSS SOLENOID VALVE CAPACITIES

(FOR SOLENOID VALVES DETAILED ON PAGE 122)

VALVE TYPE	LIQUID LINE kW (Tons)				SUCTION LINE kW (Tons)				HOT GAS LINE m^3/h (cu. ft/hr)			
	R12	R22	R502	R717	R12	R22	R502	R717	R12	R22	R502	R717
EVR 2	2.6 (0.7)	3.3 (0.9)	2.2 (0.6)	— —	— —	— —	— —	— —	0.9 (31.8)	0.8 (28.2)	0.7 (24.7)	— —
EVR 3	4.2 (1.2)	5.5 (1.6)	3.7 (1.1)	— —	— —	— —	— —	— —	1.5 (53.0)	1.4 (49.4)	1.2 (42.4)	— —
EVR 6	12.6 (3.6)	16.2 (4.6)	11.2 (3.2)	— —	1.2 (0.3)	1.9 (0.5)	1.5 (0.4)	— —	4.3 (151.8)	4.2 (148.3)	3.4 (120.0)	— —
EVR 10	29.8 (8.5)	38.5 (10.9)	26.5 (7.5)	— —	2.8 (0.8)	4.3 (1.2)	3.6 (1.0)	— —	10.3 (364)	9.9 (350)	8.0 (282)	— —
EVR 15	39.2 (11.1)	50.6 (14.4)	34.8 (9.9)	— —	3.7 (1.1)	5.7 (1.6)	4.8 (1.4)	— —	13.6 (480)	13.0 (459)	10.5 (371)	— —
EVR 20	78.4 (22.3)	101.3 (28.8)	69.7 (19.8)	— —	7.4 (2.1)	11.4 (3.2)	9.4 (2.7)	— —	27.1 (957)	26.0 (918)	21.0 (742)	— —
EVR 25	156.9 (44.6)	202.5 (57.6)	139.3 (39.6)	— —	15.0 (4.3)	22.8 (6.5)	19.0 (5.4)	— —	54.3 (1917)	52.0 (1836)	42.0 (1483)	— —

Rated Capacities : Liquid & Suction based on 25°C evap. temp. and 15 kPa Press. Drop.
Hot Gas based on 35°C cond. temp., 100 kPa Press. Drop and hot gas temp. 60°C for R12/R502 & 90°C for R22.

VALVE TYPE	LIQUID LINE kW (Tons)				SUCTION LINE kW (Tons)				HOT GAS LINE m^3/h (cu. ft/hr)			
	R12	R22	R502	R717	R12	R22	R502	R717	R12	R22	R502	R717
EVRA 3	3.4 (1.0)	4.4 (1.3)	3.0 (0.9)	21 (6.0)	— —	— —	— —	— —	1.2 (44)	1.2 (42)	1.0 (34)	2.7 (96)
EVRA 10	22 (6.3)	29 (8.3)	20 (5.7)	137 (39)	2.1 (0.6)	3.3 (0.9)	2.7 (0.8)	8.5 (2.4)	8.2 (288)	7.8 (275)	6.3 (222)	17.8 (627)
EVRA 15	41 (12)	52 (15)	36 (10)	249 (71)	3.8 (1.1)	5.9 (1.7)	4.9 (1.4)	15.4 (4.4)	14.7 (518)	14.0 (495)	11.3 (400)	32.0 (1128)
EVRA 20	67 (19)	87 (25)	60 (17)	414 (118)	6.5 (1.9)	9.9 (2.8)	8.1 (2.3)	26 (7.3)	24.5 (863)	23.4 (825)	18.9 (666)	53.3 (1881)
EVRA 25	148 (42)	191 (55)	131 (38)	904 (260)	14.2 (4.1)	22 (6.2)	17.9 (5.1)	56 (16)	53.2 (1879)	50.9 (1797)	41.1 (1451)	116.0 (4095)

Rated Capacities : Liquid & Suction based on −10°C evap. temp., 25°C liquid temp. ahead of valve and 15 kPa Press. Drop.
Hot Gas based on 35°C cond. temp., 100 kPa Press. Drop and hot gas temp. 60°C for R12/R502 & 105°C for R22/R717

EVSA 25	113 (32)	147 (42)	100 (29)	691 (197)	10.8 (3.1)	16.5 (12)	13.7 (9.7)	43 (30)	— —	— —	— —	— —
EVSA 35	— —	— —	— —	— —	27 (7.7)	41 (18)	34 (15)	105 (47)	— —	— —	— —	— —
EVSA 50	— —	— —	— —	— —	42 (12)	64 (18)	53 (15)	165 (47)	— —	— —	— —	— —

Rated Capacities : Liquid & Suction based on −10°C evap. temp., 25°C liquid temp. ahead of valve and 14 kPa Press. Drop.

HSA 70	1356 (386)	1755 (499)	1205 (343)	8269 (2353)	110 (31)	160 (46)	129 (37)	421 (120)	— —	— —	— —	— —
HSA 100	2373 (675)	3070 (874)	2117 (602)	14470 (4117)	194 (56)	280 (80)	226 (65)	737 (210)	— —	— —	— —	— —

Rated Capacities : Liquid & Suction based on −10°C evap. temp., 25°C liquid temp. ahead of valve and 14 kPa Press. Drop.

VALVE TYPE	LIQUID LINE kW (Tons)				SUCTION LINE kW (Tons)				HOT GAS LINE m^3/h (cu. ft/hr)			
	R12	R22	R502	R717	R12	R22	R502	R717	R12	R22	R502	R717
PM1-20 PM3-20	70 (19.9)	90 (25.6)	62 (17.6)	430 (122)	7.7 (2.2)	12 (3.4)	9.5 (2.7)	31 (8.8)	29 (1024)	25 (883)	22 (777)	64 (2260)
PM1-25 PM3-25	120 (34.1)	155 (44.1)	110 (31.3)	740 (210)	14 (4.0)	20 (5.7)	17 (4.8)	54 (15.4)	51 (1801)	44 (1554)	38 (1342)	110 (3884)
PM1-32 PM3-32	190 (54)	250 (71.1)	170 (48.3)	1170 (333)	21 (6.0)	32 (9.1)	26 (7.4)	84 (23.9)	80 (2825)	69 (2436)	59 (2083)	170 (6003)
PM1-40 PM3-40	335 (95.3)	430 (122)	295 (83.9)	2030 (577)	37 (10.5)	55 (15.6)	45 (12.8)	150 (42.6)	140 (4943)	120 (4237)	100 (3531)	300 (10593)
PM3-50	510 (145)	660 (188)	455 (129)	3120 (887)	57 (16.2)	85 (24.2)	70 (19.9)	230 (65.4)	210 (7415)	190 (6709)	160 (5650)	470 (16596)
PM3-65	750 (213)	1090 (310)	845 (240)	5140 (1461)	94 (26.7)	140 (39.8)	110 (31.3)	370 (105)	360 (12712)	310 (10946)	260 (9181)	770 (27189)

Rated Capacities : Liquid based on −10°C evap. temp., 25°C liquid temp. ahead of valve and 10 kPa Press. Drop.
Suction based on −10°C evap. temp., 32°C cond. temp. and 14 kPa Press. Drop.
Hot Gas based on 35°C cond. temp., 100 kPa Press. Drop and hot gas temp. 60°C for R12/R22/R502 & 90°C for R717.

KK.41.A2.02 & KC.30.A1.02

Danfoss SOLENOID VALVES

TYPE EVSI FOR BRINE AND WATER

Type EVSI are servo-controlled solenoid valves which are normally closed when the coil is de-energised

ADVANTAGES

- LARGE CAPACITY • SMALL DIMENSIONS • EASY TO SERVICE
- LITTLE AFFECTED BY DIRT • LITTLE LIQUID HAMMER
- LONG WORKING LIFE • QUIET IN OPERATION

APPLICATIONS : Brine Refrigeration Plants, Air Conditioning and Heating Plants.

VALVE TYPE			CONN. BSP. INT.	kv** m^3/h @ P.D. 100 kPa	OPENING DIFFERENTIAL PRESSURE kPa (PSI)		TEMP. OF MEDIUM °C (°F)	MAX. TEST PRESS. kPa (psig)
CAT. NO.	MODEL*	CODE NO.			MIN.	MAX.		
12241	EVSI 15	32U4507	½"	4				
12242	EVSI 20	32U4527	¾"	8			−30°C to	
12243	EVSI 25	32U4547	1"	11	30	1000	+100°C	2000
12244	EVSI 32	32U4567	1¼"	16	(4.3)	(145)	(−22°F to	(290)
12245	EVSI 40	32U4587	1½"	22			+212°F)	
12246	EVSI 50	32U4607	2"	40				
	EVSI 65	16D4105	2½"	50				
	EVSI 80	16D4106	3"	75	25	1000	−25°C to	2000
	EVSI100	16D4107	4"	130	(3.6)	(145)	90°C	(290)

ELECTRICAL COIL DATA (Coils without Junction Box)		
CAT. NO.	CODE NO.	Volts/Freq.
122288	42N6526	220V.50Hz.
122289	42N7502	240V.50Hz.
122290	42N7505	415V.50Hz.
122291	42N7550	12V. DC.
122292	42N7551	24V. DC.
122296	42N0156	Junction Box
POWER CONSUMPTION		
AC/DC		
9 Watts		

KN.41.D3.02 & KN.41.H3.02

* Solenoid valves for water and brine fitted with terminal box and encapsulated coil for use on 240V. 50Hz.

** kv value is the water flow volume in m^3/h at a pressure drop across the valve of 100 kPa

FOR WATER										
VALVE TYPE	PRESSURE DROP ACROSS VALVE kPa & PSIG									
	kPa	PSIG	kPa	PSIG	kPa	PSIG	kPa	PSIG	kPa	PSIG
	35	5	69	10	172	25	345	50	690	100
	FLOW LITRES PER SEC. & IMPERIAL GALLS. PER MIN.									
	L/s	GPM	L/s	GPM	L/s	GPM	L/s	GPM	L/s	GPM
EVSI 15	0.48	6.3	0.91	12	1.51	20	2.27	30	3.33	44
EVSI 20	0.91	12.0	1.82	24	2.95	39	4.16	55	6.44	85
EVSI 25	1.44	19.0	2.50	33	4.01	53	5.60	74	7.80	103
EVSI 32	2.35	31.0	3.79	50	5.60	74	8.33	110	11.66	154
EVSI 40	3.33	44.0	5.00	66	7.80	103	11.13	147	16.13	213
EVSI 50	6.13	81.0	9.46	125	14.46	191	21.12	279	30.59	404
FOR BRINE										
EVSI 15	0.43	5.7	0.82	10.8	1.36	18.0	2.04	27.0	3.00	39.6
EVSI 20	0.82	10.8	1.64	21.6	2.66	35.1	3.74	49.5	5.80	76.5
EVSI 25	1.30	17.1	2.25	29.7	3.61	47.7	5.04	66.6	7.02	92.7
EVSI 32	2.12	27.9	3.41	45.0	5.04	66.6	7.50	99.0	10.49	138.6
EVSI 40	3.00	39.6	4.50	59.4	7.02	92.7	10.02	132.3	14.52	191.7
EVSI 50	5.52	72.9	8.51	112.5	13.01	171.9	19.01	251.1	27.53	363.6

CAPACITIES FOR SIZES 65, 80 AND 100 AVAILABLE ON APPLICATION

SAGINOMIYA SOLENOID VALVES

FOR R12, R22, R502.

Type MEV

Type REV

MEV SERIES – Direct Operated or Pilot Operated, 2 Way Normally Closed

REV SERIES – Pilot Operated, Normally Closed

VALVE TYPE		PORT SIZE	CONNECTIONS	RATED CAPACITY AT 14kPa (2psi) PD						MAX. WORK. PRESS.
				R12		R22		R502		
CAT. NO.	MODEL*	mm		kW	Tons	kW	Tons	kW	Tons	
MODEL MEV										
122426	MEV 502 BXF	5.0	1/4" M.Flare	6.0	1.7	7.4	2.1	4.9	1.4	2844 kPa (412psig)
122427	MEV 503 BXF		3/8" M.Flare							
MODEL REV – without Manual Lift Stem										
122433	REV 703 BXF	7.0	3/8" M.Flare	12.3	3.5	15.5	4.4	10.2	2.9	2844 kPa (412psig)
	REV 703 DXF		3/8" Sol./Tails							
122435	REV 1004 BXF	10.0	1/2" M.Flare	24.6	7.0	30.9	8.8	20.7	5.9	
	REV 1004 DXF		1/2" Sol./Tails							
122437	REV 1205 BXF	12.0	5/8" M.Flare	43.3	12.3	54.5	15.5	36.6	10.4	
	REV 1205 DXF		5/8" Sol./Tails							
122439	REV 1506 BXF	15.0	3/4" M.Flare	65.4	18.6	82.3	23.4	55.6	15.8	
	REV 1506 DXF		3/4" Sol./Tails							
	REV 2007 DXF	20.0	7/8" Sol./Tails	111.1	31.6	140.0	39.8	94.6	26.9	
	REV 2010 DXF		1" Sol./Tails							
	REV 2511 DXF	25.0	1-1/8" Sol./Tails	171.0	48.5	215.0	61.1	145.0	41.2	
	REV 2513 DXF		1-3/8" Sol./Tails							
	REV 3213 DXF	32.0	1-3/8" Sol./Tails	240.0	68.2	302.0	85.9	204.0	58.0	
	REV 3215 DXF		1-5/8" Sol./Tails							
SOLENOID COILS										
122447	MEV 322 BRSC	To suit MEV Models - 240V. 50Hz AC.								
122448	REV – 2	To suit REV Models - 240V. 50HZ AC.								

* REV Valves with Manual Lift Stem available on application.

SPEEDY SERVICE

WE ARE ORGANIZED TO MAKE PROMPT DELIVERY FROM OUR VAST STOCKS. WHETHER YOUR ORDER IS LARGE OR SMALL WE WILL EXCERCISE GREAT CARE IN SELECTING AND PACKING YOUR ORDER. MORE THAN 90% OF ALL ORDERS RECEIVED ARE DESPATCHED THE SAME DAY WE AIM TO KEEP YOU AND YOUR JOB MOVING SATISFACTORILY

ALCO SOLENOID VALVES
QUICK SELECTION CAPACITY TABLES — R12, R22, R502
FOR ALCO SOLENOID VALVES —
100RA — 228RB — 200RA — 240RA — 540RA

LIQUID REFRIGERANT CAPACITIES — TONS

Valve Type	Port Size (ins.)	R12					R22					R502				
		PRESSURE DROP ACROSS VALVE — PSI														
		2	3	4	5	10	2	3	4	5	10	2	3	4	5	10
100RA	7/64	0.8	0.98	1.13	1.26		1.04	1.27	1.47	1.64		0.69	0.85	0.98	1.10	
228RB	5/32	1.5	1.8	2.1	2.4	3.4	1.8	2.2	2.5	2.8	4.0	1.3	1.5	1.8	2.0	2.8
200RA	1/4	3.6	4.4	5.1	5.7	8.1	4.6	5.6	6.5	7.2	10.2	3.0	3.7	4.3	4.8	6.7
200RA	5/16	5.3	6.5	7.5	8.4	11.9	6.7	8.2	9.5	10.6	15.0	4.4	5.4	6.2	7.0	9.9
200RA	3/8	6.4	7.8	9.0	10.1	14.3	8.1	10.0	11.4	12.8	18.0	5.3	6.5	7.5	8.4	11.9
240RA 540RA	1/2	10.1	12.4	14.3	16.0	22.6	12.7	15.6	18.0	20.1	28.5	8.4	10.3	11.9	13.3	18.8
240RA 540RA	9/16*	15.0	18.4	21.2	23.7	33.5	19.0	23.3	26.9	30.1	42.5	12.5	15.3	17.7	19.8	27.9
240RA 540RA	9/16**	19.7	24.1	27.9	31.2	44.1	24.9	30.5	35.2	39.4	55.7	16.4	20.1	23.2	25.9	36.7
240RA 540RA	3/4	22.6	27.7	32.0	35.7	50.5	28.5	34.9	40.3	45.1	63.7	18.8	23.0	26.6	29.7	42.0
240RA 540RA	1	37.5	45.9	53.0	59.3	83.9	47.4	58.0	67.0	74.9	105.9	31.3	38.3	44.2	49.4	69.9
240RA	1¼	59.1	74.4	86.7	95.6	132.2	75.8	95.4	111.0	122.5	169.5	52.2	65.7	76.5	84.3	116.7

DISCHARGE CAPACITIES — TONS

Valve Type	Port Size (ins.)	R12					R22					R502				
		PRESSURE DROP ACROSS VALVE — PSI														
		2	10	25	50	100	2	10	25	50	100	2	10	25	50	100
100RA	7/64	0.09	0.19	0.28	0.33	0.33	0.13	0.30	0.45	0.56	0.62	0.11	0.24	0.37	0.46	0.52
228RB	5/32	0.21	0.48	0.68	0.79	0.80	0.31	0.71	1.05	1.35	1.49	0.22	0.59	0.91	1.17	1.33
200RA	1/4	0.53	1.19	1.73	2.02	2.05	0.82	1.84	2.77	3.44	3.82	0.66	1.47	2.27	2.82	3.19
200RA	5/16	0.83	1.87	2.71	3.16	3.21	1.28	2.87	4.33	5.37	5.97	1.02	2.30	3.55	4.41	4.98
200RA	3/8	1.20	2.69	3.90	4.55	4.62	1.84	4.13	6.24	7.73	8.59	1.47	3.31	5.11	6.35	7.18
240RA 540RA	1/2	2.0	4.4	6.4	7.5	7.6	2.9	6.6	10.0	12.4	13.7	2.3	5.1	8.0	9.9	11.2
240RA 540RA	9/16*	2.7	6.0	8.8	10.2	10.4	4.0	8.9	13.4	16.7	18.5	3.1	6.9	10.8	13.4	15.1
240RA 540RA	9/16**	3.4	7.5	10.9	12.8	13.0	5.0	11.1	16.8	20.8	23.2	3.9	8.7	13.5	16.7	18.9
240RA 540RA	3/4	4.0	8.9	13.0	15.2	15.4	5.9	13.1	19.9	24.7	27.5	4.6	10.3	16.0	19.9	22.5
240RA 540RA	1	7.9	17.6	25.7	30.0	30.4	11.8	26.3	39.9	49.4	54.9	9.2	20.5	31.9	39.6	44.7
240RA	1¼	11.4	24.3	34.9	41.2		16.5	36.0	53.8	69.0	77.4	13.6	29.7	44.6	57.4	65.3

SUCTION GAS CAPACITIES — TONS

Valve Type	Port Size (ins.)	R12					R22					R502				
		PRESSURE DROP ACROSS VALVE — PSI														
		2	5	10	15	20	2	5	10	15	20	2	5	10	15	20
240RA	1/2	1.4	2.2	3.0	3.7	4.2	2.1	3.3	4.6	5.6	6.4	1.6	2.6	3.7	4.5	5.2
240RA	9/16*	1.8	2.9	4.1	5.0	5.6	2.8	4.4	6.2	7.6	8.6	2.2	3.5	4.9	6.0	7.0
240RA	9/16**	2.3	3.6	5.1	6.2	7.0	3.5	5.5	7.7	9.4	10.7	2.7	4.3	6.1	7.5	8.7
240RA	3/4	2.7	4.3	6.0	7.4	8.3	4.1	6.5	9.1	11.2	12.7	3.3	5.2	7.3	8.9	10.3
240RA	1	5.4	8.6	12.1	14.9	16.6	8.2	13.0	18.4	22.5	25.5	6.6	10.4	14.7	18.0	20.8
240RA	1¼	7.7	11.7	15.3	17.1	17.9	11.5	17.6	23.8	27.8	30.5	9.4	14.6	19.8	23.2	25.5

* 5/8" ODF Connection ** 7/8" & 1-1/8" ODF Connection

EVAPORATOR TEMPERATURE CORRECTION FACTORS

Evaporator Temp. °C (°F)	4.4 (40)	−1.1 (30)	−6.7 (20)	−12.2(10)	−17.8(0)	−23.3(−10)	−28.9(−20)	−34.4(−30)	−40(−40)
MULTIPLIER	1.00	.96	.92	.88	.84	.80	.77	.74	.71

All capacities and factors shown are based on normal condensing temperatures 38°C (100°F), isentropic compression plus 28°C (50°F), 4.4°C (40°F) evaporator, 18°C (65°F) suction gas and saturated liquid entering an expansion device per ARI Standard 760-80. For capacities at other operating conditions, use the appropriate correction factor given in above table. Factors apply to all three refrigerants given.

NOTE : 540 RA Valves are 2-Way NORMALLY OPEN — All other Valves are 2-Way NORMALLY CLOSED
Refer to following pages for Specifications, Ordering Catalogue Nos., Electrical Coil Data and Old v New Cross Reference

ALCO SOLENOID VALVES

THIS SERIES OF ALCO 2-WAY, NORMALLY CLOSED VALVES ESPECIALLY SUITED FOR LIQUID OR DISCHARGE GAS REFRIGERANT SERVICE. THEIR BASIC FUNCTION IS THE SAME AS MANUALLY OPERATED SHUT-OFF VALVES, BUT BEING SOLENOID ACTUATED, THEY CAN BE POSITIONED IN REMOTE LOCATIONS AND CONVENIENTLY CONTROLLED BY SUITABLE ELECTRICAL DEVICES.

FEATURES

- Operates in any position . . . Can be conveniently located in horizontal or vertical lines.
- Space-saving Integral Junction Box and Coil Housing . . . . Saves cost of handy-box connections.
- Long life Moulded Coils provide water, shock and vibration protection to Coil Winding.
- Coil Assembly removable without shut-down of line pressure.
- Snap-on Coil Retainer . . . Easy to remove and Install.

100RA

APPLICATION:
Small capacity systems where compact, direct acting hermetic valves are desirable. For 2069 kPa (300 psi) maximum operating pressure differential on AC and DC voltages and for standard refrigerants except Ammonia.

TYPE 100RA — DIRECT ACTING

VALVE		PORT SIZE	MOPD kPa (PSI)	CONNECTION SIZE	MAX. FLUID TEMP. °C (°F)	SAFE WORK. PRESS. kPa (psig)	BURST PRESS. kPa (psig)
CAT. NO.	TYPE						
123101	100RA 2S2	7/64"	2069 (300)	1/4" ODF	141 (285)	3448 (500)	17240 (2500)
123102	100RA 2S3			3/8" ODF			
123103	100RA 2S4			1/2" ODF			
123104	100RA 2F2			1/4" SAE			
123105	100RA 2F3			3/8" SAE			
123106	100RA 2P2			1/4" NPTF			

13.30T - 9/75

TYPE 228RB — PILOT OPERATED

123107	228RB 3S3	5/32"	2069	3/8" ODF	107	3100	15510

13.34T - 8/72

200RA
228RB

APPLICATION:
Larger systems requiring pilot operated serviceable valves. For 2069 kPa (300 psi) maximum operating pressure differential on AC and DC voltages and for standard refrigerants except Ammonia.

TYPE 200RA — PILOT OPERATED

VALVE TYPE				PORT SIZE	CONNECTION SIZE	MOPD 2069 kPa 300 psi
WITH MANUAL STEM		LESS MANUAL STEM with Mtg. Brack. Prov.				
CAT. NO.	TYPE	CAT. NO.	TYPE			
123123	200RA 4P2—M	123138	200RA 4P2—T	1/4	1/4" NPTF	MAX. FLUID TEMP. 141°C 285°F
123124	200RA 4P3—M	123139	200RA 4P3—T		3/8" "	
123125	200RA 4S3—M	123140	200RA 4S3—T		3/8"ODF-1/2"ODM	
123126	200RA 4S4—M	123141	200RA 4S4—T		1/2 " - 5/8 "	
123127	200RA 4F3—M	123142	200RA 4F3—T		3/8"SAE(MALE)	
123128	200RA 5P3—M	123143	200RA 5P3—T	5/16	3/8" NPTF	SAFE WORK PRESS. 3448 kPa (500psig)
123129	200RA 5S4—M	123144	200RA 5S4—T		1/2"ODF-5/8"ODM	
123130	200RA 5S5—M	123145	200RA 5S5—T		5/8" ODF	
123131	200RA 5F4—M	123146	200RA 5F4—T		1/2"SAE(MALE)	
123132	200RA 5F5—M	123147	200RA 5F5—T		5/8" " "	
123133	200RA 6P3—M	123148	200RA 6P3—T	3/8	3/8" NPTF	BURST PRESS. 17240kPa (2500psig)
123134	200RA 6S4—M	123149	200RA 6S4—T		1/2"ODF-5/8"PDM	
123135	200RA 6S5—M	123150	200RA 6S5—T		5/8"ODF	
123136	200RA 6F4—M	123151	200RA 6F4—T		1/2"SAE(MALE)	
123137	200RA 6F5—M	123152	200RA 6F5—T		5/8" " "	

13.31T - 9/75

ELECTRICAL SOLENOID COIL DATA — COIL TYPE AMG

CAT. NO.	Nominal Voltage & Frequency	Applied Voltage & Frequency	VALVE TYPE — 100RA AMPERES Inrush	VALVE TYPE — 100RA AMPERES Holding	VALVE TYPE — 100RA VA Holding	VALVE TYPE 228RB AMPERES Inrush	VALVE TYPE 228RB AMPERES Holding	VALVE TYPE 228RB VA Holding	VALVE TYPE 200RA AMPERES Inrush	VALVE TYPE 200RA AMPERES Holding	VALVE TYPE 200RA VA Holding	WATTS (MAX)
123251	24AC — 50/60	24/50	1.20	0.96	23	1.70	1.00	24	2.00	1.00	24.0	12
123252	120AC — 50/60	120/50	0.25	0.21	25	0.38	0.24	29	0.45	0.24	28.8	
123253	240AC — 50/60	240/50	0.16	0.10	24	0.20	0.14	33	0.24	0.14	33.6	
123254	480AC — 50/60	480/50	0.06	0.05	24	0.10	0.07	33	0.11	0.07	33.6	
123255	6DC	6DC	—	1.88	—	—	2.24	—	—	2.24	13.4	15
123256	12DC	12DC	—	0.93	—	—	1.11	—	—	1.11	13.3	
123257	24DC	24DC	—	0.46	—	—	0.55	—	—	0.55	13.2	

COIL INSULATION : 100RA & 200RA Class F Moulded. 228RB — "AC" Class B Moulded "DC" Class F Moulded.

NOTE: Coils are supplied with a Junction Box (coil type AMG). If desired, coils can be supplied with a Conduit Boss on special order (coil type AMC). Standard wire lead length of coils with Junction Box is 152 mm (6"). Wire lead length of coils with Conduit Boss is 457 mm (18").

CAPACITIES : Refer Tech. Page 123

ALCO SOLENOID VALVES

240RA

APPLICATION:
Large capacity systems requiring pilot operated serviceable valves. For 2069 kPa (300 psi) maximum operating pressure differential on AC and DC voltages and for standard refrigerants except R717.

240RA SERIES
2–WAY, NORMALLY CLOSED DIAPHRAGM VALVES
FOR LIQUID, SUCTION OR HOT GAS REFRIGERANT SERVICE

VALVE TYPE				PORT SIZE	CONNECTION SIZE	MOPD
WITH MANUAL STEM		LESS MANUAL STEM with Mtg. Bracket Provided				
CAT. NO.	MODEL	CAT. NO.	MODEL			
123182	240RA8T5-M	123187	240RA8T5-T	1/2"	5/8" ODF	2069 kPa (300 psi)
123183	240RA8T7-M	123188	240RA8T7-T		7/8" ODF	
123184	240RA9T7-M	123189	240RA9T7-T	9/16"	7/8" ODF	
	240RA9T9-M		240RA9T9-T		1-1/8" ODF	
123185	240RA12T7-M	123190	240RA12T7-T	3/4"	7/8" ODF	
	240RA12T9-M		240RA12T9-T		1-1/8" ODF	
123186	240RA16T9-M	123191	240RA16T9-T	1"	1-1/8" ODF	
	240RA16T11-M	123172	240RA16T11-T		1-3/8" ODF	
123168	240RA20S11-M		240RA20S11-T	1-1/4"	1-3/8" ODF	
123169	240RA20S13-M		240RA20S13-T		1-5/8" ODF	
123170	240RA20S17-M		240RA20S17-T		2-1/8" ODF	

540RA

APPLICATION:
For liquid or discharge gas refrigerant service where a normally open valve is desirable.

540RA SERIES
PILOT OPERATED, 2 – WAY, NORMALLY OPEN VALVES
FOR LIQUID OR DISCHARGE GAS REFRIGERANT SERVICE
(NO MANUAL STEM)

VALVE TYPE		PORT SIZE	CONNECTION SIZE	MOPD	MAX. FLUID TEMP.	SAFE WORK PRESS.	BURST PRESS.
CAT. NO.	MODEL						
123192	540RA 8T5—T	1/2"	5/8" ODF	1724 kPa (250 psi)	141°C (285°F)	3103 kPa (450 psig)	15514 kPa (2250 psig)
123193	540RA 9T5—T	9/16"	5/8" ODF				
123194	540RA 9T7—T		7/8" ODF				
123195	540RA 9T9—T		1-1/8" ODF				
123196	540RA 12T7—T	3/4"	7/8" ODF				
123197	540RA 12T9—T		1-1/8" ODF				
123198	540RA 16T9—T	1"	1-1/8" ODF				
123199	540RA 16T11—T		1-3/8" ODF				

SERIES 702RA
3 – WAY DIRECT – ACTING
PILOT SERVICE ON LIQUID OR GAS REFRIGERANT SERVICE

123200	702RA 01	1/16"	1/4" SAE MF	2069kPa (300 psi)	107°C (225°F)	2758kPa (400psig)	

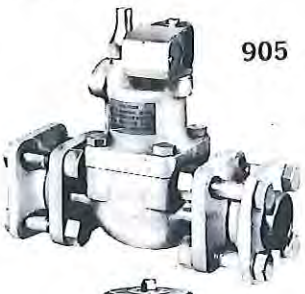
ELECTRICAL SOLENOID COIL DATA – COIL TYPE AMG

CAT. NO.	NOMINAL VOLTAGE & FREQUENCY	APPLIED VOLTAGE & FREQUENCY	SERIES 240RA & 540RA				SERIES 702RA			
			AMPS		VA	WATTS	AMPS		VA	WATTS
			Inrush	Holding	Holding	(Max)	Inrush	Holding	Holding	(Max)
123251	24 – 50/60	24/50	1.20	0.96	23	12	1.70	1.00	24	12
123252	120 – 50/60	120/50	0.25	0.21	25	12	0.38	0.24	29	12
123253	240 – 50/60	240/50	0.16	0.10	24	12	0.20	0.14	33	12
123254	480 – 50/60	480/50	0.06	0.05	24	12	0.10	0.07	33	12
123255	6 DC	6 DC	2.60	1.88	–	15	–	2.24	–	15
123256	12 DC	12 DC	1.31	0.93	–	15	–	1.11	–	15
123257	24 DC	24 DC	0.67	0.46	–	15	–	0.55	–	15

COIL INSULATION : CLASS F MOULDED EXCEPT 702RA IN AC – CLASS B MOULDED

NOTE : Coils are supplied with a Junction Box (coil type AMG). If desired, coils can be supplied with a Conduit Boss on special order (coil type AMC). Standard wire lead length of coils with Junction Box is 152 mm (6 inches). Wire lead length of coils with Conduit Boss is 457 mm (18 inches).

CAPACITIES : Refer Tech. Page 123



ALCO CONTROLS SOLENOID VALVES for AMMONIA

M & DS SERIES — 2 WAY NORMALLY CLOSED

These valves, except for the direct acting M91 and DS, are all pilot operated, piston type for Ammonia liquid, suction or hot gas refrigeration service.
Max. Safe Work. Press. 2069 kPa (300 psig). Max. Fluid Temp. 107°C (225°F).

905/905H SERIES — 2 WAY NORMALLY CLOSED

For R12, R22, R502 & R717 suitable for liquid, suction or hot gas refrigerant service.

FEATURES :

- Available for AC or DC service — standard voltages.
- Coil housing provides a junction box as standard and can be rotated to any desired position.
- Come apart construction for easy cleaning and service.
- Packless construction.
- Synthetic seat disc for tight seating.
- Manual opening stem.
- Quiet operation.

Max. Safe Work. Press. 2758 kPa (400 psig). Max. Fluid Temp. 107°C (225°F).

FA4 SERIES — CONDENSER GAS POWERED

Dual solenoid version — spring loaded piston operated soft seat design using condenser gas to hold valve in open position, permitting the valve to be sized for full line size and operate at no pressure drop.
Max. Safe Work. Press. 2069 kPa (300 psig). Max. Fluid Temp. 107°C (225°F).

AMMONIA SYSTEM APPLICATION CHART

TYPE AND APPLICATION	PORT DIAMETER (INS).							
	1/8	3/8	1/2	3/4	1	1-1/4	1-1/2	2
Direct Acting Liquid or Hot Gas for all applications including pilot duty.	M91F	—	—	—	—	—	—	—
Pilot Operated—Normal & subcooled liquid line service.	—	DS2184	M811	M511	—	—	—	—
Pilot Operated—with mechanical interlink for low pressure drop suction gas & liquid recirculating system.	—	—	M811	M511	—	—	—	—
Spring Closing—Piston operated, soft seat, suction service and low pressure liquid. Min. 2 psi P.D.	—	905-11	905-12	905-13	905-14	905-15	905-16	905-18
Condenser Gas Powered—Piston operated, soft seat design for liquid or gas legs on gravity or recirculating flooded systems where NO pressure drop permitted.	—	FA4-11	FA4-12	FA4-13	FA4-14	FA4-15	FA4-16	FA4-18
Hot Gas Defrost or Bypass Lines. (Min. 2 psi P.D.).	M91F	DS2184	M811	M511	905H-14	905H-15	905H-16	905H-18
Spring Closing—Piston operated design for hot gas bypass, hot gas defrost feed, or liquid service.	—	905H-11	905H-12	905H-13	905H-14	905H-15	905H-16	905H-18

VALVE TYPE		Port Size	Connection Size	MOPD (psi)		Manual Opening	Recommended Strainer	
Cat. No.	Model	(ins)	(ins)	AC	DC	Stem	Cat. No.	Model
123201	M91F	1/8	1/2FPT Flg	250	212	YES		JR32
123202	DS2184	3/8	3/8NPT Fem	250	212	NO		
123203	M811	1/2	1/2FPT Flg	250	212	YES		JR32
123204	M511	3/4	3/4 " "	250	212	YES		SR13
123205	905-11	3/8	1/2 " "	200	170	YES		
123206	905-12	1/2	3/4 " "	200	170	YES		
123207	905-13	3/4	3/4 " "	200	170	YES		
123208	905-14	1	1 " "	200	170	YES		
123209	905-15	1¼	1¼ " "	200	170	YES		
123210	905-16	1½	1½ " "	200	170	YES		
123211	905-18	2	2 " "	200	170	YES		
123212	905H-11	3/8	1/2 " "	200	170	YES		
123213	905H-12	1/2	3/4 " "	200	170	YES		
123214	905H-13	3/4	3/4 " "	200	170	YES		
123215	905H-14	1	1 " "	200	170	YES		
123216	905H-15	1¼	1¼ " "	200	170	YES		
123217	905H-16	1½	1½ " "	200	170	YES		
123218	905H-18	2	2 " "	200	170	YES		
123219	FA4-11	3/8	3/4 " "			YES		
123220	FA4-12	1/2	3/4 " "			YES		
123221	FA4-13	3/4	3/4 " "			YES		
123222	FA4-14	1	1 " "			YES		
123223	FA4-15	1¼	1¼ " "			YES		
123224	FA4-16	1½	1½ " "			YES		
123225	FA4-18	2	2 " "			YES		

ON APPLICATION

ELECTRICAL COIL DATA		
CAT. NO.	COIL TYPE	Volts/Freq.
M SERIES — Type X22606*		
123265	X22606-7118	24V — 50/60
123266	X22606-7218	120V — 50/60
123267	X22606-6918	240V — 50/60
123268	X22606-8818	480V — 50/60
123269	X22606-2118	6V — DC
123270	X22606-2218	12V — DC
123271	X22606-0418	24V — DC
123272	X22606-1018	115V — DC
DS SERIES — Type X22164*		
123273	X22164-7118	24V — 50/60
123274	X22164-7218	120V — 50/60
123275	X22164-6918	240V — 50/60
123276	X22164-8818	480V — 50/60
123277	X22164-2218	12V — DC
123287	X22164-1018	115V — DC
905/905H/FA4 SERIES* — Type AMG		
123251	AMG	24V — 50/60
123252	AMG	120V — 50/60
123253	AMG	240V — 50/60
123254	AMG	480V — 50/60
123255	AMG	6V — DC
123256	AMG	12V — DC
123257	AMG	24V — DC

* Specify Voltage and Frequency when ordering.

CAPACITIES — REFER TECH. PAGE 123-d

SOLENOID VALVES
AMMONIA CAPACITY TABLES

(FOR SOLENOID VALVES DETAILED ON PAGE 123-c)

LIQUID SERVICE CAPACITY

PORT SIZE	VALVE TYPE	LIQUID CAPACITY kW & TONS – R717 PRESSURE DROP ACROSS VALVE									
		14kPa (2psi)		28kPa (4psi)		41kPa (6psi)		55kPa (8psi)		69kPa (10psi)	
		kW	Tons	kW	Tons	kW	Tons	kW	Tons	kW	Tons
1/8"	M91F	32	9	45	12.7	55	15.6	63	18	70	20
3/8"	DS2184	74	21	106	30	130	37	148	42	169	48
1/2"	M811	137	39	193	55	236	67	274	78	306	87
3/4"	M511	352	100	506	144	619	176	717	204	893	254
1"	905H-14	717	204	1016	289	1242	353	1435	408	1604	456
1¼"	905H-15	1080	307	1526	434	1871	532	2163	615	2416	687
1½"	905H-16	1618	460	2286	650	2800	796	3236	920	3615	1028
2"	905H-18	2866	815	4052	1152	4959	1410	5736	1631	6404	1821

SUCTION GAS CAPACITY

PORT SIZE	VALVE TYPE	SUCTION GAS CAPACITY kW & TONS – R717* EVAPORATOR TEMPERATURE °C & °F													
		4.4°C(40°F)		–7°C(20°F)		–18°C(0°F)		–23°C(–10°F)		–29°C(–20°F)		–34°C(–30°F)		–40°C(–40°F)	
		kW	Tons	kW	Tons	kW	Tons	kW	Tons	kW	Tons	kW	Tons	kW	Tons
1/2"	M811	15.8	4.5	12.7	3.6	9.8	2.8	9.1	2.6	7.7	2.2	6.3	1.8	5.6	1.6
3/4"	M511	35.5	10.1	28.8	8.2	22.5	6.4	20.4	5.8	17.6	5.0	14.8	4.2	12.3	3.5
3/8"	905-11	7.7	2.2	6.3	1.8	5.3	1.5	4.6	1.3	4.2	1.2	3.2	0.9	2.5	0.7
1/2"	905-12	18.6	5.3	15.5	4.4	12.3	3.5	10.6	3.0	9.8	2.8	7.7	2.2	6.3	1.8
3/4"	905-13	52.1	14.8	41.9	11.9	32.7	9.3	27.8	7.9	25.7	7.3	20.4	5.8	16.5	4.7
1"	905-14	97.4	27.7	78.8	22.4	61.2	17.4	52.1	14.8	48.2	13.7	38.0	10.8	31.3	8.9
1¼"	905-15	147	41.8	119	33.8	92.8	26.4	78.4	22.3	72.5	20.6	57.3	16.3	46.8	13.3
1½"	905-16	219	62.3	177	50.2	138	39.2	117	33.3	108	30.7	85.5	24.3	70.0	19.9
2"	905-18	390	110.8	314	89.4	245	69.8	208	59.2	192	54.6	152	43.2	124	35.3

* Capacity based on 30°C(86°F) cond. temp., evap. temps shown, 5.6°C(10°F) superheat and 7 kPa (1psi) pressure drop across valve except 14 kPa (2psi) on 905 Series.

SOLENOID COMPRESSOR DISCHARGE GAS CAPACITY

PORT SIZE	VALVE TYPE	NOMINAL DISCHARGE GAS CAPACITY m^3/h & CFM – R717* PRESSURE DROP ACROSS VALVE – kPa (psi)												MAX. OPERATING PRESS. DIFF. **
		14 (2)		69 (10)		138 (20)		276 (40)		414 (60)		483 (70)		
		m^3/h	CFM	m^3/h	CFM	m^3/h	CFM	m^3/h	CFM	m^3/h	CFM	m^3/h	CFM	
1/8"	M91F	6.5	3.8	15.6	9.2	20.9	12.3	26.0	15.3	27.4	16.1	27.5	16.2	1724kPa
1/2"	M811	10.2	6.0	25.0	14.7	33.3	19.6	41.3	24.3	43.8	25.8	44.0	25.9	
3/4"	M511	22.9	13.5	55.7	32.8	75.1	44.2	92.8	54.6	98.6	58.0	99.1	58.3	(250psi)
3/8"	905H-11	3.2	1.9	7.8	4.6	10.5	6.2	13.1	7.7	13.8	8.1	13.9	8.2	
1/2"	905H-12	7.6	4.5	18.7	11.0	25.0	14.7	30.9	18.2	32.8	19.3	33.0	19.4	
3/4"	905H-13	20.4	12.0	50.0	29.4	66.9	39.4	82.8	48.7	87.7	51.6	88.2	51.9	2069kPa
1"	905H-14	38.2	22.5	93.6	55.1	125.1	73.6	155.1	91.3	164.1	96.6	165.2	97.2	
1¼"	905H-15	57.8	34.0	141.0	83.0	188.6	111.0	233.8	137.6	247.4	145.6	248.9	146.5	(300psi)
1½"	905H-16	86.3	50.8	211.0	124.2	282.1	166.0	349.7	205.8	370.0	217.8	372.3	219.1	
2"	905H-18	152.9	90.0	373.7	219.9	500.0	294.0	620.0	364.6	655.4	385.7	659.5	388.1	

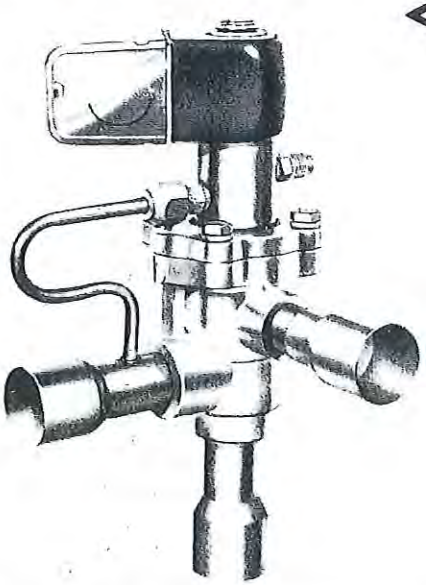
* Based on the solenoid valve inlet pressure corresponding to 24°C(75°F) saturation temp. and an inlet gas temp. of 35°C(95°F) (or 11°C[20°F] superheat).

** 15% less on DC (905 Series – 2069 kPa[300psi] for DC).

FA4 CAPACITIES kW & TONS – R717

PORT SIZE	VALVE TYPE	SUCTION LINE* 3-5 kPa(0.5 psi) Press. Drop				GRAVITY FLOODED SYSTEMS							
						LIQUID LEG		GAS RETURN LEG					
		–18°C(0°F)		–40°C(–40°F)				–7°C(20°F)		–18°C(0°F)		–7°C(–20°F)	
		kW	Tons	kW	Tons	kW	Tons	kW	Tons	kW	Tons	kW	Tons
3/8"	FA4 - 11	2.6	0.75	1.5	0.43	–	–	–	–	–	–	–	–
1/2"	FA4 - 12	6.3	1.8	3.5	1.0	–	–	–	–	–	–	–	–
3/4"	FA4 - 13	16.9	4.8	9.5	2.7	–	–	–	–	–	–	–	–
1"	FA4 - 14	31.3	8.9	17.9	5.1	–	–	–	–	–	–	–	–
1¼"	FA4 - 15	47.1	13.4	27.4	7.8	17.6	5.0	8.8	2.5	7.0	2.0	5.3	1.5
1½"	FA4 - 16	70.7	20.1	40.8	11.6	26.4	7.5	14.1	4.0	10.6	3.0	8.8	2.5
2"	FA4 - 18	125.2	35.6	72.5	20.6	35.2	10.0	35.2	10.0	28.1	8.0	21.1	6.0

* Suction line capacities based on saturated evap. temps., 5.6°C(10°F) superheat and press. drops shown.



ALCO CONTROLS SOLENOID VALVES

SERIES 3031RB SOLENOID VALVES FOR HEAT RECLAIM APPLICATIONS

SOLENOID OPERATED 3-WAY VALVES, DESIGNED ESPECIALLY TO MEET THE REQUIREMENTS OF THE HIGH TEMPERATURES AND PRESSURES EXISTING IN COMPRESSOR DISCHARGE GAS APPLICATIONS. IT IS SPECIFICIALLY DESIGNED TO DIVERT GAS TO AN AUXILIARY CONDENSER FOR HEAT RECLAIM APPLICATIONS.

FEATURES

- Tight seating, Rulon seat disc
- Quick, positive shifting
- Operates in any position
- Rugged internal construction with heavy duty forged brass bodies

ADVANTAGES

- 3-Way pilot eliminates high to low side bleed — higher system efficiency
- 3-Way pilot is field serviceable
- High capacity — less pressure drop — higher system efficiency
- All copper fittings — easy brazing

VALVE TYPE		PORT SIZE (ins)	CONNECTIONS (ins)	MOPD	SAFE WORK PRESS.	MAX. FLUID TEMP.	PILOT CONNECTION
CAT. NO.	MODEL						
123226	3031RB–12S7	3/4	7/8 ODF	2069 kPa (300 psi)	3103 kPa (450 psig)	149°C (300°F)	1/4" SAE Male Flare
123227	3031RB–12S9		1-1/8 ODF				
123228	3031RB–20S9	1-1/4	1-1/8 ODF				
123229	3031RB–20S11		1-3/8 ODF				

NOTE: 3031 SERIES VALVES AVAILABLE WITH BLEED PORT ON APPLICATION

13.50T. 6/78

ELECTRICAL SOLENOID COIL DATA — COIL TYPE AMG

CAT. NO.	NOMINAL VOLTAGE & FREQUENCY	APPLIED VOLTAGE & FREQUENCY	AMPS		VA (Holding)	WATTS (Max.)	Coil Insulation	NOTE
			Inrush	Holding				
123251	24 – 50/60	24/50	1.20	0.96	23	12	CLASS "F" Moulded	Coils are supplied with a Junction Box (coil type AMG). If desired, coils can be supplied with a Conduit Boss on special order (coil type AMC). Standard wire lead length of coils with Junction Box is 152 mm (6 inches). Wire lead length of coils with Conduit Boss is 457 mm (18 inches).
123252	120 – 50/60	120/50	0.25	0.21	25			
123253	240 – 50/60	240/50	0.16	0.10	24			
123254	480 – 50/60	480/50	0.06	0.05	24			
123255	6 DC	6 DC	–	2.38	–	15		
123256	12 DC	12 DC	–	1.19	–			
123257	24 DC	24 DC	–	0.59	–			

DISCHARGE GAS CAPACITIES* — kW (Tons)

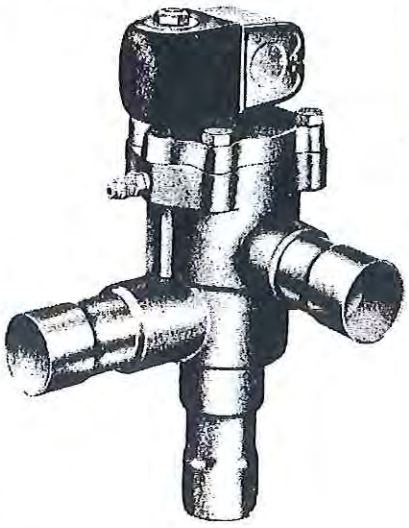
SAT'D. EVAP. TEMP.		3031RB — 12 SERIES PRESSURE DROP ACROSS VALVE						3031RB — 20 SERIES PRESSURE DROP ACROSS VALVE					
		kPa	psi	kPa	psi	kPa	psi	kPa	psi	kPa	psi	kPa	psi
°C	°F	14	2	28	4	41	6	14	2	28	4	41	6
		kW	Tons	kW	Tons	kW	Tons	kW	Tons	kW	Tons	kW	Tons
R12													
4.4	40	24.3	6.9	34.5	9.8	42.2	12.0	63.0	17.9	89.3	25.4	109.4	31.1
7	20	23.2	6.6	33.1	9.4	40.4	11.5	60.5	17.2	85.5	24.3	104.8	29.8
18	0	22.2	6.3	31.3	8.9	38.7	11.0	58.0	16.5	81.9	23.3	100.2	28.5
–29	–20	21.1	6.0	29.9	8.5	36.6	10.4	55.2	15.7	78.1	22.2	95.7	27.2
–40	–40	20.0	5.7	28.5	8.1	34.8	9.9	52.4	14.9	74.2	21.1	90.7	25.8
R22													
4.4	40	35.2	10.0	49.6	14.1	60.8	17.3	91.4	26.0	129.4	36.8	158.3	45.0
7	20	34.1	9.7	48.5	13.8	59.4	16.9	89.0	25.3	125.9	35.8	154.4	43.9
18	0	33.4	9.5	47.1	13.4	57.7	16.4	86.5	24.6	122.4	34.8	149.8	42.6
–29	–20	32.4	9.2	45.7	13.0	55.9	15.9	83.7	23.8	118.5	33.7	145.3	41.3
–40	–40	31.3	8.9	44.0	12.5	53.8	15.3	80.9	23.0	114.6	32.6	140.3	39.9
R502													
4.4	40	29.2	8.3	41.1	11.7	50.6	14.4	76.0	21.6	107.3	30.5	131.5	37.4
7	20	27.8	7.9	39.4	11.2	48.2	13.7	72.1	20.5	102.3	29.1	125.2	35.6
18	0	26.4	7.5	37.3	10.6	45.4	12.9	68.2	19.4	96.7	27.5	118.5	33.7
–29	–20	24.6	7.0	34.8	9.9	42.9	12.2	64.4	18.3	90.7	25.8	111.1	31.6
–40	–40	23.2	6.6	32.7	9.3	40.1	11.4	60.1	17.1	84.8	24.1	103.8	29.5

* Capacities are based on a normal condensing temperature, isentropic compression +10°C(+50°F), evaporator temperature as shown, suction gas superheated to 18°C(65°F), and 38°C(100°F) saturated liquid entering the TX valve.

FOR OPERATION & APPLICATION DETAILS REFER TECH. PAGE 123-g

ALCO CONTROLS SOLENOID VALVES

SERIES 3041R PILOT-OPERATED SOLENOID VALVES FOR HOT GAS DEFROST APPLICATIONS



SOLENOID OPERATED 3-WAY VALVES, DESIGNED ESPECIALLY FOR SUCTION LINE USE ON COUNTERFLOW HOT GAS DEFROST APPLICATIONS. THE NORMALLY CLOSED PORT PROVIDES TIGHT CLOSURE OF THE HOT GAS DEFROST LINE DURING THE COOLING CYCLE. THE LOW PRESSURE DROP, NORMALLY OPEN PORT, PROVIDES TIGHT CLOSURE DURING THE DEFROST CYCLE.

FEATURES

• Tight-seating, Rulon seat disc • Quick, positive shifting • Operates in any position • Rugged internal construction with heavy duty forged brass bodies

VALVE TYPE		PORT SIZE (ins)	CONNECTIONS (ins)	MOPD	SAFE WORK PRESS.	MAX. FLUID TEMP.	PILOT CONNECTION
CAT. NO.	MODEL						
123230	3041R–12S7	3/4	7/8 ODF	2069 kPa (300 psi)	3103 kPa (450 psig)	149°C (300°F)	1/4" SAE Male Flare or 1/4" ODF
123231	3041R–12S9		1-1/8 ODF				
123232	3041R–20S9	1-1/4	1-1/8 ODF				
123234	3041R–20S11		1-3/8 ODF				

13.51T. 3/70

ELECTRICAL SOLENOID COIL DATA — COIL TYPE BMG								
CAT. NO.	NOMINAL VOLTAGE & FREQUENCY	APPLIED VOLTAGE & FREQUENCY	AMPS		VA (Holding)	WATTS (Max.)	Coil Insulation	
			Inrush	Holding				
123278	24 — 50/60	24/50	3.00	1.30	31	15	Class 'B' Potted	Wire lead length with standard Junction Box 152mm (6") Wire lead length with special Conduit Boss 457mm (18")
123279	120 — 50/60	120/50	0.60	0.26				
123280	Dual 120—50/60 Voltage 240—50/60	120/50	0.60	0.26				
		240/50	0.30	0.13				
123281	240 — 50/60	240/50	0.30	0.13				
123282	480 — 50/60	480/50	0.16	0.07				
123283	6DC	6DC	—	3.30	—	19		
123284	12DC	12DC	—	1.60				
123285	24DC	24DC	—	0.80				

SUCTION GAS CAPACITIES * — kW (Tons)																	
SATURATED EVAPORATOR TEMPERATURE		PRESSURE DROP ACROSS VALVE — kPa (psi)															
		3.4kPa (½psi)				14kPa (2psi)				21kPa (3psi)				35kPa (5psi)			
		PORT SIZE — INS.															
		3/4"		1-1/4"		3/4"		1-1/4"		3/4"		1-1/4"		3/4"		1-1/4"	
°C	°F	kW	Tons	kW	Tons	kW	Tons	kW	Tons	kW	Tons	kW	Tons	kW	Tons	kW	Tons
R12																	
4.4	40	5.3	1.5	14.1	4.0	11.3	3.2	30.9	8.8	13.4	3.8	35.5	10.1	16.5	4.7	45.7	13.0
– 7	20	4.6	1.3	13.4	3.8	8.8	2.5	23.9	6.8	10.6	3.0	29.2	8.3	12.7	3.6	35.5	10.1
– 18	0	3.5	1.0	9.1	2.6	6.7	1.9	18.6	5.3	7.7	2.2	21.8	6.2	9.5	2.7	26.4	7.5
–29	–20	2.8	0.8	7.4	2.1	4.9	1.4	13.7	3.9	5.6	1.6	16.2	4.6	6.3	1.8	17.9	5.1
–40	–40	1.8	0.5	4.6	1.3	2.8	0.8	7.4	2.1	2.8	0.8	8.1	2.3	2.8	0.8	8.1	2.3
R22																	
4.4	40	8.4	2.4	23.6	6.7	17.6	5.0	48.9	13.9	20.0	5.7	55.9	15.9	25.7	7.3	71.0	20.2
– 7	20	7.0	2.0	17.9	5.1	13.4	3.8	34.8	9.9	15.8	4.5	41.8	11.9	20.0	5.7	52.8	15.0
– 18	0	5.3	1.5	14.8	4.2	10.2	2.9	28.1	8.0	12.3	3.5	34.5	9.8	15.5	4.4	42.6	12.1
–29	–20	4.2	1.2	12.7	3.6	7.7	2.2	22.9	6.5	9.1	2.6	27.4	7.8	11.3	3.2	33.1	9.4
–40	–40	2.8	0.8	7.4	2.1	4.6	1.3	15.8	4.5	5.3	1.5	17.9	5.1	5.6	1.6	19.3	5.5
R502																	
4.4	40	4.2	1.2	12.3	3.5	13.4	3.8	36.9	10.5	16.5	4.7	45.7	13.0	21.4	6.1	58.7	16.7
– 7	20	3.9	1.1	10.9	3.1	10.6	3.0	29.5	8.4	13.0	3.7	36.2	10.3	17.2	4.9	47.8	13.6
– 18	0	3.5	1.0	9.5	2.7	8.1	2.3	22.5	6.4	9.8	2.8	27.1	7.7	12.3	3.5	34.5	9.8
–29	–20	2.8	0.8	7.7	2.2	6.3	1.8	17.2	4.9	7.4	2.1	20.4	5.8	9.1	2.6	25.3	7.2
–40	–40	1.4	0.4	4.9	1.4	3.9	1.1	10.6	3.0	4.2	1.2	12.0	3.4	4.9	1.4	13.4	3.8

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*Capacities are based on normal condensing temperature 38°C(100°F) isentropic compression 10°C(50°F), evaporator temperature as shown, 18°C(65°F) suction gas and 38°C(100°F) saturated liquid entering the TX valve.

FOR OPERATION & APPLICATION DETAILS REFER TECH. PAGE 123-g

SOLENOID VALVES
SERIES 3000
OPERATION AND APPLICATION DATA

SERIES 3031RB FOR HEAT RECLAIM APPLICATIONS

OPERATION

Operation of the 3031RB valve is governed by the position of the plunger in the 3-way pilot. It should also be remembered that the valve is pilot operated and therefore depends on the refrigerant gas to shift the piston assembly.

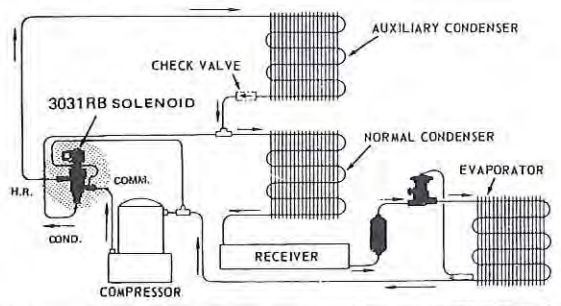
NORMAL OPERATION

With the solenoid coil de-energised the valve is in the normal operating mode and the refrigerant gas is diverted to the normal condenser. The volume directly above the piston assembly is open to suction pressure through the external pilot connection and the volume underneath the piston assembly is open to discharge pressure through the compressor discharge connection. This difference in pressure across the piston assembly results in the piston assembly being shifted upward, shutting the heat reclaim coil port and opening the normal condenser port.

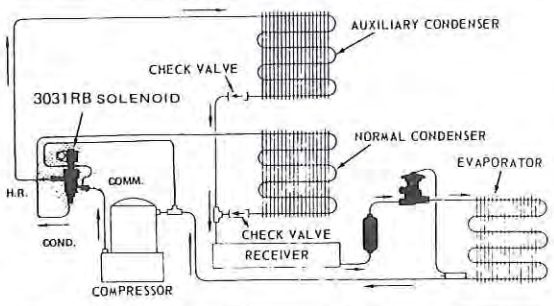
HEAT RECLAIM OPERATION

Discharge gas flow to the heat reclaim condenser is accomplished by energising the solenoid coil. In this manner, discharge gas is allowed to fill the volume above the piston assembly through the 1/4" cap tube and the open bottom port in the 3-way pilot. Discharge gas is also allowed to fill the volume below the piston assembly through the compressor discharge connection. The pressure on both sides of the piston assembly is now equal and it is the piston spring which exerts force on top of the piston assembly and shifts it downward. The normal condenser port is now closed and the heat reclaim coil port is open. In both the energised and de-energised positions, constant bypass of discharge gas to suction is eliminated.

HEAT RECLAIMING SYSTEM
SERIES CONDENSERS



HEAT RECLAIMING SYSTEM
PARALLEL CONDENSERS



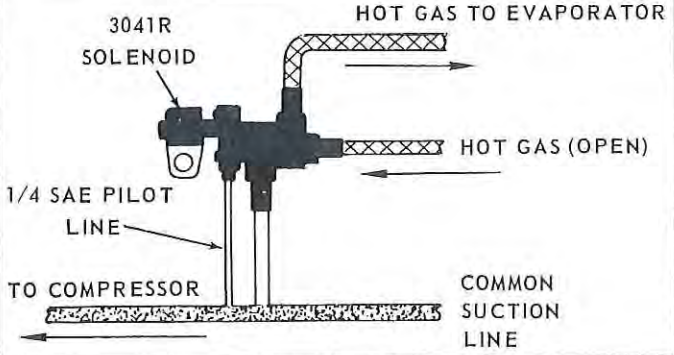
FLOW THRU AUXILIARY CONDENSER IS ACCOMPLISHED WHEN 3031RB IS ENERGISED

SERIES 3041R FOR HOT GAS DEFROST APPLICATIONS

OPERATION

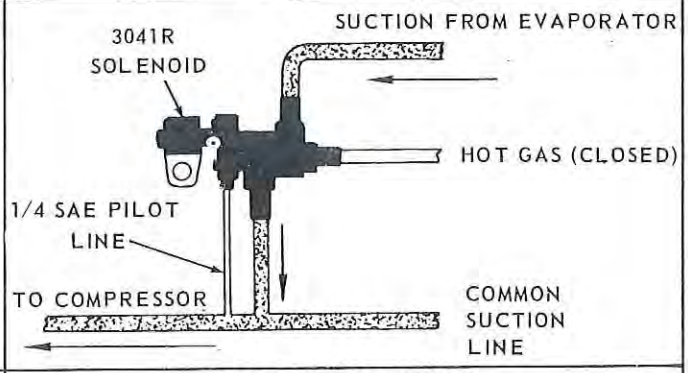
When the 3041R solenoid is de-energised, the pilot line to the suction side of the compressor is closed. Discharge gas pressure escapes through the bleed port onto the top of the piston and drives it downward, closing the bottom seat. This allows the suction gas to flow in the normal direction to the compressor. When the solenoid is energised, the pressure on top of the piston is reduced by the gas bleeding off to the suction line, enabling the piston to be driven upward against the top seat, closing off the suction line connection, which permits a reverse flow of the hot gas through the suction line to the evaporator for hot gas defrost.

HOT GAS DEFROST CYCLE



3041R ENERGISED

COOLING CYCLE



3041R DE-ENERGISED

FOR SELECTION, CAPACITY & ORDERING – REFER : 3031RB PAGE 123-e 3041R PAGE 123-f

ALCO CONTROLS SOLENOID VALVES

FOR WATER

121

SERIES 121 DIRECT ACTING

2 - Way Normally closed valves especially suited for water (or steam) service.

SERIES 201 & 231 PILOT OPERATED

2 - Way Normally closed valves especially suited for water (or steam) service.

SERIES 241 PILOT OPERATED DIAPHRAGM TYPE

2 - Way Normally closed diaphragm valves especially suited for water (or air) service.

241

FEATURES

* One coil fits all valve sizes
* Operates in any position - horizontal or vertical lines
* Coil assembly removeable without shut-down of line pressure
* Long life moulded coils - Class F Insulation - Stand. on Water Service
* Unique captive diaphragm for longer life (Series 241)
* Deep drawn Stainless Steel enclosing tube (no weld points) — (Series 241).

201

231

SERIES 121 DIRECT ACTING

VALVE		Replaces old Valve No.	Port Size	Conn. Size NPTF	MOPD kPa (psi)		Max. AC Fluid Temp.	Safe Work. Press.	Burst Press. kPa(psig)	Coil Type
CAT. NO.	MODEL				AC	DC				
123234	121WB5CP02	1021FBI–D	5/32"	1/4"	690 (100)	276 (40)	82°C (180°F)	6895 kPa (1000 psig)	34475 (5000)	AMG Refer next page
123235	121WB03P02	1021FBI–E	3/16"	1/4"	414 (60)	207 (30)				
123236	121WB04P02	1021FBI–F	1/4"	1/4"	138 (20)	35 (5)				

13.41T — 12/74

SERIES 201 & 231 PILOT OPERATED

123237	201WB04P02	5011FBI–F	1/4"	1/4"	1379 (200)	690 (100)	93°C (200°F)	3448 kPa (500psig)	17238 (2500)	AMG Refer next page
123238	201WB05P03	5011HBI–G	5/16"	3/8"						
123239	201WB06P03	5011HBI–H	3/8"	3/8"						
123240	231WB08P04	5021JBI–J	1/2"	1/2"	1724 (250)	1034 (150)	93°C (200°F)	2413 kPa (350 psig)	12066 (1750)	
123241	231WB12P06	5021KBI–K	3/4"	3/4"						
123242	231WB16P08	5021LBI–L	1"	1"						
123243	231WB20P10	5021MBI–M	1¼"	1¼"						
123244	231WB24P12	5021NBI–N	1½"	1½"						

13.42T — 11/73

SERIES 241 PILOT OPERATED DIAPHRAGM TYPE

VALVE		Port Size (ins.)	Conn. Size NPTF (ins.)	Maximum Operating Pressure Differential AC		Minimum Operating Pressure Differential AC		Max. AC Fluid Temp.	Safe Work. Press. kPa (psig)	Burst Press. kPa (psig)	Coil Type
CAT. NO.	MODEL			kPa	psi	kPa	psi				
123245	241WA10P03	5/8"	3/8"	1034	150	35	5	82°C (180°F)	2069 (300)	10343 (1500)	AMG Refer next page
123246	241WA10P04	5/8"	1/2"	1034	150	35	5				
123247	241WA12P06	3/4"	3/4"	1034	150	35	5				
123248	241WA16P08	1"	1"	862	125	35	5		1724 (250)	8619 (1250)	

13.40T — 12/74

REFER NEXT PAGE FOR CAPACITY TABLES & ELECTRICAL DATA

SOLENOID VALVES
WATER SERVICE
CAPACITY TABLES

(FOR SOLENOID VALVES DETAILED ON PAGE 123-h)

121 SERIES	PRESSURE DROP ACROSS VALVE PORT kPa & PSIG											
	kPa	PSIG	kPa	PSIG	kPa	PSIG	kPa	PSIG	kPa	PSIG	kPa	PSIG
	14	2	35	5	69	10	138	20	207	30	345	50
PORT SIZE	FLOW – LITRES PER SEC.& IMPERIAL GALLS. PER MIN.											
	l/s	GPM	l/s	GPM	l/s	GPM	l/s	GPM	l/s	GPM	l/s	GPM
5/32	.041	.54	.067	.88	.091	1.20	.127	1.68	.157	2.08	.206	2.72
3/16	.048	.63	.073	.96	.109	1.44	.151	2.00	.188	2.48	.242	3.20
1/4	.059	.78	.097	1.28	.133	1.76	.188	2.48	.230	3.04	–	–

201 231 SERIES	PRESSURE DROP ACROSS VALVE PORT kPa & PSIG											
	kPa	PSIG	kPa	PSIG	kPa	PSIG	kPa	PSIG	kPa	PSIG	kPa	PSIG
	35	5	69	10	172	25	345	50	690	100	1379	200
PORT SIZE	FLOW – LITRES PER SEC. & IMPERIAL GALLS. PER MIN.											
	L6s	GPM	L6s	GPM	l/s	GPM	l/s	GPM	l/s	GPM	l/s	GPM
1/4	0.17	2.2	0.23	3.0	0.36	4.8	0.51	6.8	0.73	9.6	1.03	13.6
5/16	0.22	2.9	0.30	4.0	0.48	6.4	0.68	9.0	0.97	12.8	1.37	18.1
3/8	0.30	4.0	0.42	5.5	0.71	9.4	0.94	12.4	1.33	17.6	1.89	24.9
1/2	0.48	6.4	0.67	8.8	1.06	14.0	1.50	19.8	2.12	28.0	3.00	39.6
3/4	0.97	12.8	1.34	17.7	2.12	28.0	3.00	39.6	4.24	56.0	6.00	79.2
1	1.82	24.0	2.48	32.8	3.94	52.0	5.57	73.6	7.87	104.0	11.1	147.2
1 1/4	2.18	28.8	3.03	40.0	4.85	64.0	6.84	90.4	9.69	128.0	13.7	180.8
1 1/2	3.39	44.8	4.78	63.2	7.57	100.0	10.7	141.6	15.1	200.0	21.4	283.2

241 SERIES VALVE No.	CV FACTOR	PD ACROSS VALVE kPa & PSIG			
		kPa	PSIG	kPa	PSIG
		35	5	69	10
		FLOW LITRE/S & IMP. GPM			
		l/s	GPM	l/s	GPM
241WA 10 PO3	2.8	0.39	5.1	0.54	7.1
241WA 10 PO4	3.6	0.48	6.4	0.69	9.1
241WA 12 PO6	5.5	0.74	9.8	1.05	13.9
241WA 16 PO8	13.0	1.76	23.3	2.49	32.9

ELECTRICAL SOLENOID COIL DATA – COIL TYPE AMG														
CAT. NO.	Nominal Voltage & Frequency	Applied Voltage & Frequency	TYPE 121				TYPE 201 & 231				TYPE 241			
			AMPS		VA	Watts	AMPS		VA	Watts	AMPS		VA	Watts
			Inrush	Hold.	Hold.	Max.	Inrush	Hold.	Hold.	Max.	Inrush	Hold.	Hold.	Hold.
123251	24AC – 50/60	24/50	1.43	0.96	23	12	1.20	0.96	23	12	2.25	0.86	20.7	9.7
123252	120AC – 50/60	120/50	0.32	0.21	25		0.25	0.21	25		0.52	0.20	24.0	11.1
123253	240AC – 50/60	240/50	0.16	0.10	24		0.16	0.10	24		0.27	0.12	29.3	14.6
123254	480AC – 50/60	480/50	0.07	0.05	24		0.06	0.05	24		0.14	0.06	28.8	12.5
123255	6DC	6DC	–	1.88	–	15	2.60	1.88	–	15	–	–	–	–
123256	12DC	12DC	–	0.93	–		1.31	0.93	–		–	–	–	–
123257	24DC	24DC	–	0.46	–		0.67	0.46	–		–	–	–	–
COIL INSULATION : CLASS F MOULDED														

NOTE: Coils are supplied with a Junction Box (coil type AMG). If desired, coils can be supplied with a Conduit Boss on special order (coil type AMC). Standard wire lead length of coils with Junction Box is 152mm (6"). Wire lead length of coils with Conduit Boss is 457mm (18").

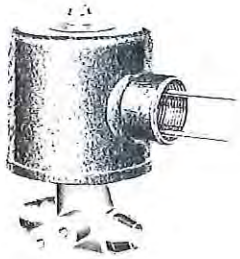
CROSS REFERENCE SOLENOID

ALCO OLD VALVES —vs— ALCO NEW VALVES

REFRIGERATION SOLENOID VALVES NUMERICAL CROSS REFERENCE

FOR REFRIGERANTS OTHER THAN AMMONIA

S1 SERIES



REPLACED BY

100R SERIES

REPLACED BY

100RA SERIES

OLD VALVE NUMBER	BASIC ① COIL NUMBER	REPLACED BY	VALVE NUMBER	BASIC ① COIL NUMBER	REPLACED BY	CURRENT VALVE NUMBER	BASIC ① COIL NUMBER
S101-5	XA1550		100R2S2	BGG		100RA2S2	AMG
S101-9			100R2S2			100RA2S2	
S101-7			100R2S2			100RA2S2	
S101-4			100R2S3			100RA2S3	
S120-1			100R2S4			100RA2S4	
S101			100R2F2			100RA2F2	
S101-2			100R2F2			100RA2F2	
S101-8			100R2F3			100RA2F3	
S101-3			100R2P2			100RA2P2	
S101-6			100R2P3			NONE	
S155			200R4S3			200RA4S3	
S155M			200R4S3M			200RA4S3M	
S120			200R4S4			200RA4S4	
S120C			200R4S4			200RA4S4	
S120M			200R4S4M			200RA4S4M	
S120-T			200R4S4M			200RA4S4M	
S115F			200R4F3			200RA4F3	
NONE			200R4P2			200RA4P2	
S115			200R4P3			200RA4P3	
S115-1			200R4P3			200RA4P3	
S115C			200R4P3			200RA4P3	
S115M			200R4P3M			200RA4P3M	
S115M-1			200R4P3M	BGG		200RA4P3M	
S155-1	XA1550		228R3S3	ABG		228RB3S3	AMG
S34-1 3/8" ODF	XA1550		200R4S3	BGG		200RA4S3	AMG
S34 3/8" ODF			200R4S3M			200RA4S3M	
S34-1 1/2" ODF			200R4S4			200RA4S4	
S34 1/2" ODF			200R4S4M			200RA4S4M	
S34-1 3/8" FPT			200R4P3			200RA4P3	
S34 3/8" FPT	XA1550		200R4P3M			200RA4P3M	
NONE	NONE		200R5S4			200RA5S4	
S34-1 5/8" ODF	XA1550		200R5S5			200RA5S5	
S34 5/8" ODF			200R5S5M			200RA5S5M	
S34-1 1/2" SAE			200R5F4			200RA5F4	
S34 1/2" SAE			200R5F4M			200RA5F4M	
NONE			200R5F5			200RA5F5	
NONE			200R5P3			200RA5P3	
S36-1 1/2" ODF			200R6S4			200RA6S4	
S37-1 5/8" ODF			200R6S5			200RA6S5	
S36-1 5/8" ODF			200R6S5			200RA6S5	
S37 5/8" ODF			200R6S5M			200RA6S5M	
S37F-1 1/2" SAE			200R6F4			200RA6F4	
S37F 1/2" SAE			200R6F4M			200RA6F4M	
S37F-1 5/8"SAE			200R6F5			200RA6F5	
S37F 5/8" SAE			200R6F5M			200RA6F4M	
S36-1 3/8" FPT	XA1550		200R6P3	BGG		200RA6P3	AMG
S221	XA1550		200R6S5M	BGG		200RA6S5M	AMG
S225			200R6S5M			200RA6S5M	
S225H			200R6S5M			200RA6S5M	
S225-1			200R6S5			200RA6S5	
S804-4			200R6S5			200RA6S5	
S804-3			200R6S4			200RA6S4	
S804-5			200R6P3			200RA6P3	
S896			④ 230R9S7			④ 230RA9S7 *	
S310-1	XA1550		230R9S7	BGG		230RA9S7 *	AMG

* See bottom chart on Tech. Page 123-k for Replacement 230RA Series.

ALCO SOLENOID VALVE CROSS REFERENCES — REFER ALSO TECH. PAGES 123-k & 123-l

REFRIGERATION SOLENOID VALVES NUMERICAL CROSS REFERENCE

FOR REFRIGERANTS OTHER THAN AMMONIA

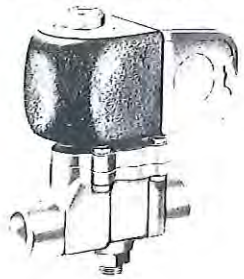
ALCO CONTROLS

M3 SERIES

R3 SERIES

REPLACED BY

230R SERIES



REPLACED BY

230RA SERIES

REPLACED BY

* 240RA SERIES *

OLD VALVE NUMBER	BASIC ① COIL NUMBER	VALVE NUMBER	BASIC ① COIL NUMBER	CURRENT VALVE NUMBER	BASIC ① COIL NUMBER
NONE	NONE	230R8S5	BGG	230RA8S5 *	AMG
NONE	NONE	230R9S5		230RA9S5 *	
M635-1	XA1702	230R9S7		230RA9S7 *	
M635H-1		230R9S7		230RA9S7 *	
M635		230R9S7M		230RA9S7M *	
M635H		230R9S7M		230RA9S7M *	
M344-1		230R12S7		230RA12S7 *	
M344H-1		230R12S7		230RA12S7 *	
M355-1		230R12S7		230RA12S7 *	
M355H-1		230R12S7		230RA12S7 *	
M355H		230R12S7M		230RA12S7M *	
M355		230R12S7M		230RA12S7M *	
— M344		230R12S7M		230RA12S7M *	
M344H	XA1702	230R12S7M	BGG	230RA12S7M *	AMG
R345-1	XA1704	230R16S9	BGG	230RA16S9 *	AMG
R345H-1		230R16S9		230RA16S9 *	
R355-1		230R16S9		230RA16S9 *	
R355H-1		230R16S9		230RA16S9 *	
R345		230R16S9M		230RA16S9M *	
R345H		230R16S9M		230RA16S9M *	
R355		230R16S9M		230RA16S9M *	
R355H		230R16S9M		230RA16S9M *	
R11 1-1/8"ODF ②		230R16S9M		230RA16S9M *	
R1H 1-1/8"ODF ②		230R16S9M	BGG	230RA16S9M *	
R12		905-14	XA1550/BGG	905-14	
R61 ②		230R20S11M	BGG	230RA20S11M *	
R6H ②		230R20S11M	BGG	230RA20S11M *	
R61-1 ②	XA1704	④ 230R20S11T	BGG	④230RA20S11T *AMG	
R6H-1	XA1704	④ 230R20S11T	BGG	④230RA20S11T *AMG	
R62		905-15	XA1550/BGG	905-15	
R62-1		905-15		905-15	
R21		905H-16 ③		905H-16 ③	
R21-1		905H-16 ③		905H-16 ③	
R22		905-16		905-16	
R22-1		905-16		905-16	
R2H		905H-16		905H-16	
R2H-1	XA1704	905H-16	XA1550/BGG	905H-16	
		230R20S13T	BGG	230RA20S13T * AMG	
		230R20S17M	BGG	230RA20S17M * AMG	
DS2360-1	XA1550	100R2P3	BGG	200RA4P3	
DS2228	XA1714	228R3S3	ABG	228RB3S3	
S608-1	XA1550	702RA01	AMG	702RA001	
9010-1R	AAG	100R2S2	BGG	100RA2S2	
9010-2R	AAG	④ 100R2S3	BGG	④100RA2S3	AMG

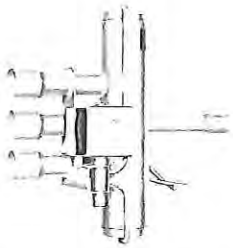
1. Specify the voltage/frequency rating.
2. Replacement valves do not have flange connections. For flanged connections see the 905 series valves.
3. For low pressure recirculated liquid use the 905-16.
4. 230R and 230RA valves cannot be used for ammonia use.

OLD 230 RA * TYPE NO.	REPLACEMENT 240 RA * TYPE NO.
230RA9S7	240RA9T7
230RA8S5	240RA8T5
230RA9S5	240RA9T5
230RA9S7M	240RA9T7M
230RA12S7	240RA12T7
230RA12S7M	240RA12T7M
230RA16S9	240RA16T9
230RA16S9M	240RA16T9M
230RA20S11M	240RA20T11M
230RA20S11T	240RA20T11T
230RA20S13T	240RA20T13T
230RA20S17M	240RA20T17M
AMG COIL	AMG COIL

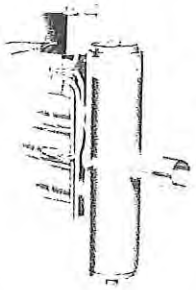
ALCO SOLENOID VALVE CROSS REFERENCE – REFER ALSO TECH. PAGES 123-j & 123-l

4 WAY REVERSING VALVE CROSS REFERENCE

ACTIVE 4—WAY VALVES (old vs. new)



4WE4 & 4WE6



4WER8

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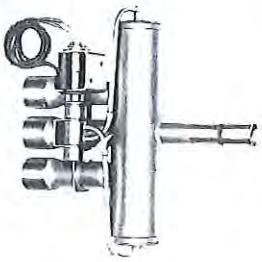


401RB

REPLACED BY

401RD SERIES

OLD TYPE NO.	REPLACED BY ③	REPLACED BY	REPLACED BY	CURRENT TYPE NO.
	4WER Series	401RB4 Series	401RB335	401RD435
	"	"	401RB3F46	401RD4F46
	"	"	401RB357	401RD457
		401RB5 Series	401RB5F36	401RD6F36
4WB4-45	4WE4-45 or 4WER4-45	401RB445	401RB5F45	401RD6F45
		401RB4F46	401RB5F46	401RD6F46
4WB4-47	4WE4-47 or 4WER4-47	—	—	—
		401RB4F47	401RB5F47	401RD6F47
4WB4-57	4WE4-57 or 4WER4-57	401RB457	401RB5F57	401RD6F57
			401RB5F67	401RD6F67
	4WE6 Series	401RB6 Series	401RB10F46	401RD10F46
	"	401RB6F47	401RB10F47	401RD10F47
	"	401RB6F57	401RB10F57	401RD10F57
4WB6-67	4WE6-67 or 4WER6-67	401RB667	401RB10F67	401RD10F67
4WB6-69	4WE6-69 or 4WER6-69	401RB669	401RB10F69	401RD10F69
4WB6-79	4WE6-79 or 4WER6-79	401RB679	401RB10F79	401RD10F79
	4WER8-F911	401RB-8F911	401RB-15F911	Still Current
BASIC COIL NO.				
X8400 ①	X8400 or X9268 (Epoxy) ① ④	AMF - Open Frame ① ②	AMF - Open Frame ① ②	AMF - Open Frame ① ②

① Specify the voltage/frequency rating.
② For field replacement on 401RB valves, order AMG①
③ 4WER Series had removable pilot, 401RB Series does not have the removable Pilot Feature.
④ For field replacement on 4WE and 4WER valves, order X8321 Coil Kit to replace the X8400 Coil and X9594 Coil Kit to replace the X9268 Coil.

M91F SERIES

No Change

M511 SERIES

Replaces M5
No Exterior Physical Change

M811 SERIES

Replaces M8
No Exterior Physical Change

AMMONIA SOLENOID VALVE NUMERICAL CROSS REFERENCE

OLD VALVE NUMBER	BASIC ① COIL NUMBER	REPLACED BY	VALVE NUMBER	BASIC ① COIL NUMBER	REPLACED BY	CURRENT VALVE NUMBER	BASIC ① COIL NUMBER
M91F	XA1702		NONE	NONE		M91F	X22606
M5	↕		M511-1	XA1702		M511	↕
M5-H	↕		M511	↕		M511	↕
M8	↕		M811-1	↕		M811	↕
M8-H	XA1702		M811	XA1702		M811	X22606
R11	XA1704		905-14	XA1550/BGG		905-14②	AMG
R12	↕		905-14	↕		905-14②	↕
R1H	↕		905-14	↕		905-14②	↕
R61	↕		905-15	↕		905-15②	↕
R62	↕		905-15	↕		905-15②	↕
R6H	↕		905-15	↕		905-15②	↕
R21	↕		905-16	↕		905-16②	↕
R22	↕		905-16	↕		905-16②	↕
R2H	XA1704		905-16	XA1550/BGG		905-16②	AMG

① Specify the voltage/frequency rating
② Use the 905H series on high differential pressure whether liquid or discharge gas.

ALCO SOLENOID VALVE CROSS REFERENCE — REFER ALSO TECH. PAGES 123-j & 123-k

COILS FOR ALCO SOLENOID VALVES

SUMMARY OF ALCO ELECTRICAL SOLENOID COILS

SOLENOID SERIES	CAT. NO.	COIL TYPE	VOLTS	FREQ.
100RA 228RB 200RA 240RA 540RA 702RA 905/905H FA4 3031RB 121 201 231	123251	AMG	24	50/60
	123252	AMG	120	50/60
	123253	AMG	240	50/60
	123254	AMG	480	50/60
	123255	AMG	6	DC
	123256	AMG	12	DC
	123257	AMG	24	DC
241	123251	AMG	24	50/60
	123252	AMG	120	50/60
	123253	AMG	240	50/60
	123254	AMG	480	50/60
FA5	123253	AMG	240	50/60
FA8	123253	AMG	240	50/60
	123254	AMG	480	50/60
M SERIES	123265	X22606 – 7118	24	50/60
	123266	X22606 – 7218	120	50/60
	123267	X22606 – 6918	240	50/60
	123268	X22606 – 8818	480	50/60
	123269	X22606 – 2118	6	DC
	123270	X22606 – 2218	12	DC
	123271	X22606 – 0418	24	DC
	123272	X22606 – 1018	115	DC
DS SERIES	123273	X22164 – 7118	24	50/60
	123274	X22164 – 7218	120	50/60
	123275	X22164 – 6918	240	50/60
	123276	X22164 – 8818	480	50/60
	123277	X22164 – 2218	12	DC
	123287	X22164 – 1018	115	DC
3041 R	123278	BMG	24	50/60
	123279	BMG	120	50/60
	123280	BMG	Dual 120/240	50/60
	123281	BMG	240	50/60
	123282	BMG	480	50/60
	123283	BMG	6	DC
	123284	BMG	12	DC
	123285	BMG	24	DC

Above Electrical Solenoid Coils are also detailed against their respective Solenoid Valve Types on Pages:

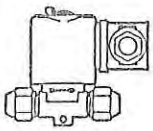
SOLENOID VALVE SERIES	PAGE No.
FA8	117-b
FA5	118
100RA, 228RB, 200RA	123-a
240RA, 540RA, 702RA	123-b
M, DS, 905/905H, FA4	123-c
3031RB	123-e
3041R	123-f
121, 201, 231, 241	123-h/i

Castel

SOLENOID VALVES

26/5/88

Rev.1 17/6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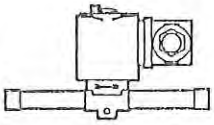
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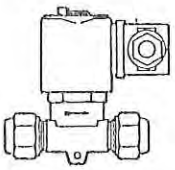
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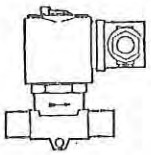
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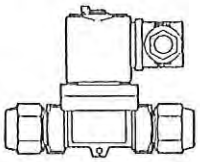
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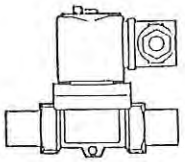
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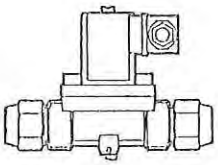
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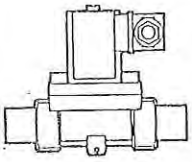
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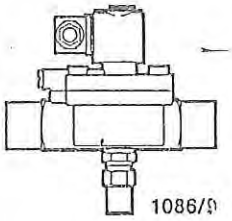
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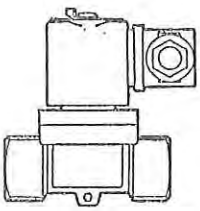
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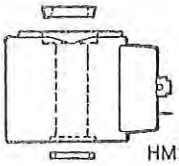
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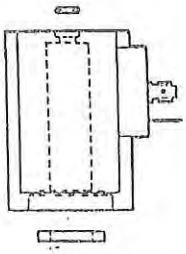

HS2

FOR REFRIGERATION & AIR CONDITIONING

R12 - R22 - R502 For Liquid, Suction, Hot Gas

CAT. NO.	MODEL	Conns.	Port Diam. mm	Opening Differential Pressure kPa (psi) Min	Opening Differential Pressure kPa (psi) Max (MOPD)	Fluid Temp. °C	Safe Work Press kPa (psig)	Kv** Factor m³/hr
NORMALLY CLOSED – DIRECT OPERATED								
12332	1020/2	1/4" Fl.	2.5	0 (0)	2100 (305)	-35 to +110	4000 (580)	0.175
12334	1026/2	1/4" ODF	2.2					0.150
12366	1020/3	3/8" Fl.	3.0	0 (0)	1800 (261)			0.280
NORMALLY CLOSED – PILOT OPERATED								
12336	1064/3	3/8" Fl.	6.5	5 (0.7)	2100 (305)	-35 to +110	4000 (580)	0.80
12340	1066/3	3/8" ODF	6.5					
12337	1070/4	1/2" Fl.	12.5					2.20
	1076/4	1/2" ODF	12.5					
12338	1070/5	5/8" Fl.	12.5					2.61
	1076/5	5/8" ODF	12.5					
12343	1080/6	3/4" Fl.	17.0	3 (0.4)			3200 (464)	4.30
	1086/6	3/4" ODF	17.0					
12344	1086/7	7/8" ODF 1 1/8" ODM	17.0					5.11
	1086/9 *	1 1/8" ODF 1 3/8" ODM	25.5	5 (0.7)				10
SUPPLIED COMPLETE WITH COIL, JUNCTION BOX & BRACKET								

* With Manual lift Stem.

FOR WATER, BRINE & AIR

CAT. NO.	MODEL	Conns.	Port Diam mm	Opening Differential Pressure kPa (psi) Min	Opening Differential Pressure kPa (psi) Max (MOPD)	Fluid Temp. °C	Safe Work. Press kPa (psi)	Kv ** Factor m³/hr
NORMALLY CLOSED – PILOT OPERATED								
12322	1132/03	3/8" FPT	12.5	10 (1.5)	1700 (247)	-25/+110	4000 (580)	2.1
12323	1132/04	1/2" FPT						2.2
12324	1132/06	3/4" FPT	20.5	15 (2.2)	1200 (174)	-15/+110	2000 (270)	6.0
12325	1132/08	1" FPT						6.0
SUPPLIED COMPLETE WITH COIL & JUNCTION BOX								

** Kv = Water Flow at 100 kPa (14.5 psi) Pressure Drop across valve

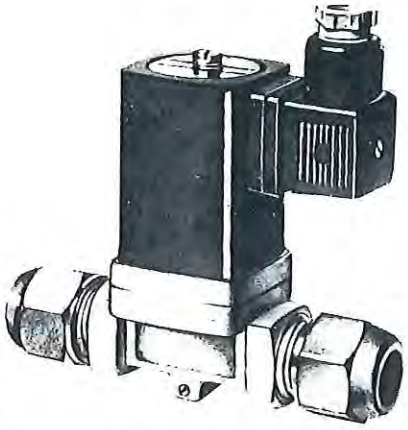
SOLENOID COILS

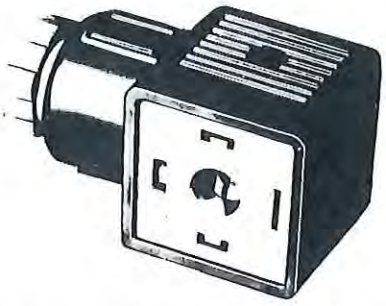
CAT NO.	P/N	Power	Suits Models
12346	HM2/404240	240V. 50/60 Hz	1020/2, 1026/2, 1020/3, 1064/3, 1066/3, 1070/4, 1076/4, 1070/5, 1076/5, 1086/9, 1132/03, 1132/04, 1132/06, 1132/08
12347	HS2/474240		1080/6, 1086/6, 1086/7 1066/2, 1066/3

REFER NEXT PAGE FOR CAPACITIES

CASTEL SOLENOID VALVES

RI2 - R22 - R502





New Series of Solenoid Valves for use with Fluorinated Refrigerants
Featuring :
Compact design and encapsulated coil complete with junction box

Redesigned Junction Box Connector
Can be used in any of 3 or 4 positions by turning through 90° increments.

VALVE CAT. NO.	VALVE MODEL	Conn.	Nominal Orifice mm	Opening Differential Pressure kPa (psi) min	Opening Differential Pressure kPa (psi) max(MOPD)	Fluid Temperature °C (°F) min	Fluid Temperature °C (°F) max	Safe Working Pressure kPa(psig)
NORMALLY CLOSED — DIRECT OPERATED								
12358	1020/2	1/4" Fl.	2	0 (0)	1800 (261)	−15 (+5)	+60 (+140)	4000 (580)
NORMALLY CLOSED — SERVO OPERATED								
12359	1080/3	3/8" Fl.	10	5 (0.7)	2100 (305)	−35 (−31)	+110 (+230)	4000 (580)
12360	1080/4	1/2" Fl.	10	5 (0.7)	2100 (305)	−35 (−31)	+110 (+230)	4000 (580)
12361	1080/5	5/8" Fl.	12.5	5 (0.7)	2100 (305)	−35 (−31)	+110 (+230)	4000 (580)
12362	1080/6	3/4" Fl.	17	3 (0.4)	2100 (305)	−35 (−31)	+110 (+230)	3200 (464)
SOLENOID COILS								
12370	1900/412	Type HM —	240V. 50Hz. AC — to suit Model 1020/2					
12371	1900/442	Type HS —	240V. 50Hz. AC — to suit Models 1080/					

LIQUID CAPACITIES*

MODEL	R12				R22				R502			
	PRESSURE DROP ACROSS VALVE											
	15kPa(2.2psi)		35kPa(5psi)		15kPa(2.2psi)		35kPa(5psi)		15kPa(2.2psi)		35kPa(5psi)	
	kW	Tons	kW	Tons	kW	Tons	kW	Tons	kW	Tons	kW	Tons
1020/2	2.38	0.68	3.61	1.03	3.14	0.89	4.77	1.36	2.21	0.63	3.37	0.96
1080/3	20.6	5.8	31.3	8.9	26.7	7.6	40.7	11.6	18.6	5.3	28.8	8.2
1080/4	35.0	10.0	52.9	15.1	45.5	12.9	68.6	19.5	31.1	8.8	48.6	13.8
1080/5	41.5	11.8	62.8	17.9	54.0	15.4	81.6	23.2	38.3	10.9	57.8	16.5
1080/6	68.1	19.4	103.3	29.4	88.4	25.2	134.3	38.2	62.8	17.9	95.0	27.0

* LIQUID CAPACITY — based on a liquid temperature ahead of the valve of +25°C (+77°F) and evap. temp. −10°C (+14°F).

SUCTION GAS CAPACITIES*

MODEL	R12				R22				R502			
	EVAPORATOR TEMPERATURE AT 15 kPa (2.2psi) P.D.											
	−30°C(−22°F)		+10°C(+50°F)		−30°C(−22°F)		+10°C(+50°F)		−30°C(−22°F)		+10°C(+50°F)	
	kW	Tons	kW	Tons	kW	Tons	kW	Tons	kW	Tons	kW	Tons
1080/3	1.33	0.38	2.85	0.81	1.98	0.56	4.19	1.19	1.57	0.45	3.61	1.03
1080/4	2.15	0.61	4.77	1.36	3.37	0.96	7.09	2.02	2.67	0.76	6.05	1.72
1080/5	2.56	0.73	5.70	1.62	4.01	1.14	8.49	2.41	3.14	0.89	7.21	2.05
1080/6	4.19	1.19	9.42	2.68	6.63	1.89	13.96	3.97	5.23	1.49	11.86	3.37

* SUCTION GAS CAPACITY — based on −30°C and +10°C evap. temp. at a pressure drop of 15 kPA (2.2psi) across the valve

HOT GAS CAPACITIES — m^3/h*

MODEL	R12				R22				R502			
	PRESSURE DROP — kPa at Condensing Temperature 35°C(95°F)											
	50	100	200	300	50	100	200	300	50	100	200	300
1020/2	0.58	0.82	1.2	1.6	0.52	0.73	1.1	1.35	0.4	0.6	0.9	1.15
1080/3	5.0	7.0	10.5	13.4	4.50	6.3	8.9	11.5	3.7	5.2	7.4	9.8
1080/4	8.5	12.0	17.7	22.8	7.65	10.8	15.3	20.0	6.3	8.9	12.6	17.0
1080/5	10.0	14.0	20.7	26.6	9.0	12.7	18.0	23.5	7.5	10.6	15.0	20.0
1080/6	16.6	23.4	34.6	45.0	15.0	21.1	29.9	39.0	12.5	17.6	24.9	33.2

* HOT GAS CAPACITY — Expressed in m^3/h at 35°C (95°F) cond. temp. and various pressure drops across the valve and on a temperature of +60°C (140°F) superheated vapour ahead of the valve in the hot gas line.

WATER REGULATING VALVES

Condensing-Pressure Regulators for Water-Cooled Condensers Pressure-Contr. Water Valves, WVFX, WVS

WVFX 10 - 25

WVS 32 - 40

Application. The water valves are used for regulating the quantity of water in refrigeration systems with water-cooled condensers. Using the water valves results in modulating regulation of the condensing pressure so that it is kept almost constant during operation. When the refrigeration system is stopped, the cooling water flow is shut off automatically.

Design Function. The pressure impulses from the condensing pressure are transmitted via the bellows element to the valve cone so that the valve - even at very small pressure variations - can adapt the quantity of water required by the condenser.

General. If in the case of fluorinated refrigerants it is desired to have a capillary tube for pipe connection, a 1 m (3.3 ft) capillary tube with ¼" flared coupling nuts at either end can be obtained under code No. 60-0071. The valves are pressure-relieved in such a way that a variation in the water pressure will not affect their setting. To protect the refrigeration system against overload in case of failure of the cooling water supply to the water valve, a safety cut-out should be fitted on the pressure side of the refrigeration system.

DESCRIPTION		TYPE	CAT. NO.	CODE NO.	REFRIGERANT SIDE Medium	Conn.	PRESSURE RANGE To Begin Opening kPa(psig)	PRESSURE RANGE Completely Open kPa(psig)	Max. Test Press.	WATER SIDE Medium	Conn. (Ins.)	Max. Operat. Press.	Max. Test Press.	FLOW COEFF. Cv** Valve Imp.GPM
Press. Controlled	Directly Controlled	WVFX10	1241	3N1100	R12	1/4" Flare	345-1572 (50-228)	634-1862 (92-270)	2600 kPa 377 psig	Fresh Water, Brine	3/8 BSP	979 kPa 142 psig	979 kPa 142 psig	1.2
		WVFX15	1242	3N2100							1/2 "			1.8
		WVFX20	1243	3N3100	R22						3/4 "			3.0
		WVFX25	1244	3N4100							1 "			4.8
		WVFX32	1245	3F1232	R502		393-1669 (57-242)	690-1958 (100-284)			1¼ "			10.6
		WVFX40	1246	3F1240							1½ "			10.6
	Servo Controlled	WVS32	12411	16D3043	R12 R22 R502 R717	1/4" Flare or Weld Nipple	214-1862 (31-270)	296-1958 (43-284)	2600 kPa 377 psig	Fresh Water, Brine	1¼ "	979 kPa 142 psig	1572 kPa 228 psig	12.0
		WVS40	12412	16D3034							1½ "			20.0
		WVS50	12413	16D3075							2W.Flg.			31.0
		WVS65	12414	16D3076							2½ "			44.0
		WVS80	12415	16D3078							3 "			77.0
		WVS100	12416	16D3089							4 "			121.0
CAPILLARY 1m (3.3ft) with two 1/4" Flare coupling Nuts. Code No. 60-0071									CAT. NO. 13923					

Opening differential pressure : WVFX max. 979kPa (142 PSI), WVS32-40 min. 49kPa (7.1 PSI) max. 979kPa (142 PSI)
WVS50-100 min. 30kPa (4.3 PSI) max. 979kPa (142 PSI)

Differential Pressure range for WVS of 98-979kPa (14.2 — 142 PSI) with replacement servo spring available on request.

** The maximum Cv factor indicates the water capacity in Imp. gal/min when the valve is completely open at a pressure drop across it of 7 kPa (1 PSI).

RISE IN CONDENSING PRESS. ABOVE VALVE OPENING PRESS.		PRESSURE DROP ACROSS VALVE		FLOW — Imperial Galls. per Min. & litre/s VALVE SIZE											
				WVFX 10		WVFX 15		WVFX 20		WVFX 25		WVFX 32		WVFX 40	
kPa	PSI	kPa	PSI	Imp. GPM	l/s	Imp. GPM	l/s	Imp. GPM	l/s	Imp. GPM	l/s	Imp. GPM	l/s	Imp. GPM	l/s
138	20	48	7	1.9	0.14	3.0	0.23	3.5	0.26	5.0	0.38	8.0	0.61	8.0	0.61
		193	28	4.1	0.31	5.7	0.43	7.3	0.55	10.0	0.76	18.0	1.36	18.0	1.36
		393	57	6.0	0.45	8.0	0.61	10.4	0.79	14.0	1.06	27.0	2.04	27.0	2.04
207	30	48	7	2.7	0.20	4.0	0.30	5.0	0.38	7.5	0.57	14.0	1.06	14.0	1.06
		193	28	5.5	0.42	7.8	0.59	10.4	0.79	15.5	1.17	28.0	2.12	28.0	2.12
		393	57	7.8	0.59	11.0	0.83	14.5	1.10	22.0	1.67	41.0	3.10	41.0	3.10
276	40	48	7	3.1	0.23	4.7	0.36	6.3	0.48	10.0	0.76	19.0	1.44	19.0	1.44
		193	28	6.2	0.47	9.0	0.68	13.2	1.00	20.0	1.51	38.0	2.88	38.0	2.88
		393	57	8.6	0.65	13.0	0.98	18.5	1.40	28.8	2.18	55.0	4.16	55.0	4.16
				WVS 32		WVS 40		WVS 50		WVS 65		WVS 80		WVS 100	
35	5	48	7	14	1.06	18	1.4	30	2.3	53	4.0	75	5.7	110	8.3
		193	28	34	2.57	36	2.7	54	4.1	78	5.9	130	9.8	190	14.4
		393	57	58	4.39	51	3.9	72	5.5	95	7.2	185	14.0	280	21.2
69	10	48	7	24	1.82	42	3.2	70	5.3	110	8.3	150	11.4	240	18.2
		193	28	55	4.16	78	5.9	115	8.7	162	12.3	270	20.4	435	32.9
		393	57	86	6.51	108	8.2	166	12.6	242	18.3	400	30.3	630	47.7
104	15	48	7	25	1.89	56	4.2	82	6.2	124	9.4	210	15.9	335	25.4
		193	28	58	4.39	108	8.2	166	12.6	231	17.5	390	29.5	635	48.1
		393	57	88	6.66	153	11.6	233	17.6	333	25.2	580	43.9	910	68.9

For detailed selections, capacities and applications refer Danfoss Bulletin KK.30.A2.02.

WATER REGULATING VALVES

Condensing-Pressure Regulators for Water-Cooled Condensers Temperature-Controlled Water Valves, AVTA, WVTS

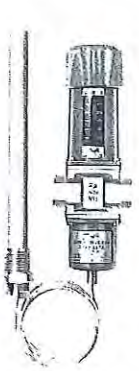
Application. The thermostatic valve is suitable for regulating jobs where temperature control is required by means of a water or brine flow. This may apply, for example, to:
— temperature regulation in fresh water or brine cooling systems.
— cooling water regulation for condensers in cooling systems where it is not desired to use pressure-controlled water valves.
Thermostatic regulation gives an economical water consumption since the valves react even to small temperature variations.

The thermostatic water valves open on a rise in the bulb temperature.

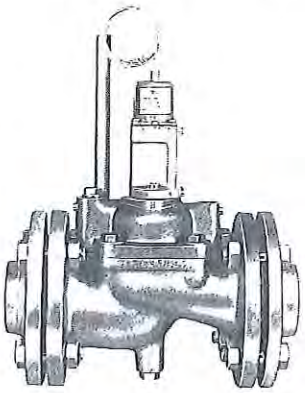
Type AVTB **closing** on a rise in the bulb temperature, available on application

Design Function.
General. When the temperature at the valve bulb increases, the pressure inside the bulb is increased, and this pressure increase is transmitted to the valve cone which opens to flow.
The valves are pressure-relieved in such a way that a change in the water pressure does not affect the valve setting. Besides, the valves work independently of the ambient temperature.
The universal charge gives correct function, no matter whether the valve body and bellows housing are warmer or colder than the bulb.

The valves are supplied with 2 m (6.7 ft) capillary tube and a capillary tube gland.



AVTA



WVTS 50 - 100

DESCRIPTION		VALVE TYPE Model	Cat. No.	Code No.	BULB SIDE Temp. Range	Max. Bulb Temp.	WATER SIDE Medium	Conn.	Temp. Limits Water	Temp. Limits Brine	Max. Operat. Press.	Max. Test Press.	Cv* Value Imp. GPM
Temp. Controlled	Directly Controlled	AVTA 15	12485	3N2132	0 - 30°C (32-86°F)	55°C (131°F)	Fresh Water Brine	½"BSP int.	Max. 110°C (230°F)	Max. 110°C (230°F)	1000 kPa 145 psig	1600 kPa 232 psig	1.7
		AVTA 20	12486	3N3132				¾" " "					2.9
		AVTA 25	12487	3N4132				1" " "					4.7
		AVTA 15	12476	3N2162	25-65°C (77-149°F)	85°C (185°F)		½" " "					1.7
		AVTA 20	12483	3N3162				¾" " "					2.9
		AVTA 25	12484	3N4162				1" " "					4.7
		AVTA 15	12488	3N2182	50 - 90°C (122-194°F)	110°C (230°F)		½" " "					1.7
		AVTA 20	12489	3N3182				¾" " "					2.9
		AVTA 25	12490	3N4182				1" " "					4.7
	Servo Controlled	WVTS 32	12496	16D3343	25 - 65°C (77-149°F)	85°C (185°F)	Fresh Water Brine	1¼" " "	Max. 90°C (194°F)	Min. −25°C (−13°F)	1000 kPa 145 psig	1600 kPa 232 psig	11
		WVTS 40	12497	16D3304				1½" " "					21
		WVTS 50		16D3315				2" Weld Flg.					32
		WVTS 65		16D3316				2½" " "					44
		WVTS 80		16D3318				3" " "					74
		WVTS100		16D3319				4" " "					121

Opening differential pressure : AVTA max.690kPa(100PSI), WVTS 32– 40 min.49kPa(7.1PSI) max.393kPa(57PSI)
50–100 min.30kPa(4.3PSI) max.393kPa(57PSI)
Differential pressure range for WVTS of 98 – 979kPa(14.2 - 142PSI) with replacement servo-spring available on request.
*The max. Cv-factor indicates the water capacity in Imp.gal/min when the valve is completely open at a press. drop across it of 7kPa(1PSI)

REFER MANUFACTURERS BULLETIN KK.30.A2.02 FOR DETAILED CAPACITY AND APPLICATION DATA

Pressure Operated Water Valves FOR R12

This type of valve controls the flow of water to the condenser on water-cooled machines. It is a water-economizing valve which allows only the necessary quantity of water to pass in order that the correct condenser cooling may be achieved. It also cuts off the water flow when the unit is stopped.

The pressure line is tapped in between the compressor and its condenser, and a simple adjustment enables the flow of water to be modulated in relation to the pressure in the system.

VALVE CAT. NO.	VALVE Model	CONN.	CAPACITY litre/s	CAPACITY Imp. GPM	PRESS. RANGE kPa(PSIG)	MAX. PERMIT PRESS. Refrig.	MAX. PERMIT PRESS. Water	CAPILLARY Length	CAPILLARY Conn.
12417	WR½	½F. BSP	0.64	8.4	414-1551	2448kPa	1000kPa	1m	¼"Flare
12418	WR¾	¾F. BSP	1.06	14.0	(60-225)	(355 PSIG)	(145 PSIG)	(3ft.4")	