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- ㉑ Handling of temperature type automatic expansion valves
- ㉒ Type M2 constant pressure expansion valve

Pressure regulating valves

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- ㉕ Type SRJ, SR suction pressure regulating valve
- ㉗ Type DCC condensing pressure regulating valve
- ㉘ Type WV, WVF water regulating valve



Thermostat

- ㉙ Type EXT thermostat
- ㉚ Type U, U3 thermostat
- ㉛  (FCT-S Single function digital thermostat)
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- ㉝  (FCT-A Alarm type digital thermostat)
- ㉞ Type FCT digital thermostat common specifications
- ㉟ Type FET digital thermostat
- ㊱ Type FDT temperature controller

Gas leak detector

- ㊲ Type LAY refrigerant gas leak detector

driver (Electronic linear control valve control device)

- ㊳  driver (Type MGY)
- ㊴  driver (Type MFY)

Pressure switch

- ㊵ Type VFP, VFP-R high/low pressure switch
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- ㊷ Type VHP, VHP-R high pressure switch
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Solenoid valve

- ㊹ Type BAS, BMS solenoid valve
- ㊺ Type BAS-QYS solenoid valve
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- ㊽ Type S-4G water strainer
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Valve

- ① Type JAV packless valve
- ② Type JCV packless valve (vacuum use)
- ③ Type JLV packless valve
- ④ Type BP packless valve
- ⑤ Type BAV ball valve
- ⑥ Type FN, FNL packed valve
- ⑦ Type YN packed valve
- ⑧ Type YE manual expansion valve

Drier

- ⑨ Type DBF filter drier
- ⑩ Type DDF core type drier
- ⑪ Type DGF bi-flow drier
- ⑫ Type DM2, DF81, and DF8 filter drier

Pipe

- ⑬ Type SY, FS, and YS strainer
- ⑭ Type HSF suction strainer
- ⑮ Type HTF suction strainer
- ⑯ Type MSGP, SGP sight glass
- ⑰ Type MSGP-MF, SGF-Y sight glass
- ⑱ Type CV3, YCV5, and YCV8 check valve








Eco cooling mat (Energy-saving cooling equipment)

- ⑲ Type MAX eco cooling mat

Automatic devices for car air conditioner

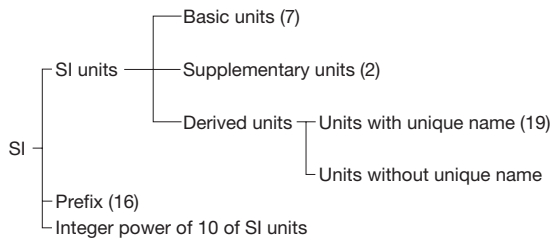
- ㉑ Type C, G, and R thermostatic expansion valve
- ㉒ Type VHE, VDE thermostatic expansion valve
- ㉓ Type RAS, RBS solenoid valve for refrigerant
- ㉔ Type NVS, NTS solenoid valve for refrigerant
- ㉕ Type QDC, CAS, and QBS regulating valve
- ㉖ Type A, D, and T pressure switch
- ㉗ Type ATF, AHF receiver drier

Automatic devices for room/package air conditioner

- ㉘ Type HFE thermostatic expansion valve
- ㉙ Type P drain pump series
- ㉚ Type AMS, ATS refrigerant solenoid valve
- ㉛  (Type EFM electronic linear control valve)
- ㉜  (Type CPM, HPM electronic linear control valve)
- ㉝  (Type XAM electronic linear control valve)
- ㉞ Type DCM motor switching valve
- ㉟  (Type KBM electronic linear control valve)
- ㊱  (Type HAM electronic linear control valve)
- ㊲  (Type CAM electronic linear control valve)
- ㊳  (Type KQM, RQM electronic linear control valve)
- ㊴ Type TCJ check joint
- ㊵ Type FSV, FCP, and FNT service valve
- ㊶ Type AC, RT, and OST Pipes

International System of Units (SI)

SI composition



SI base units

Quantity	Name	Symbol
Length	Meter	m
Mass	Kilogram	kg
Time	Second	s
Electric current	Ampere	A
Thermodynamic temperature	Kelvin	K
Amount of substance	Mole	mol
Luminous intensity	Candela	cd

SI supplementary units

Quantity	Name	Symbol
Solid angle	Radian	rad
Plane angle	Steradian	sr

SI derived units (units with unique name)

Quantity	Name	Symbol	Definition
Frequency	Hertz	Hz	s ⁻¹
Force	Newton	N	kg·m/s ²
Pressure · Stress	Pascal	Pa	N/m ²
Energy · Work	Joule	J	N·m
Power	Watt	W	J/s
Quantity of electricity	Coulomb	C	A·s
Electric potential difference · Electromotive force	Volt	V	W/A
Capacitance	Farad	F	C/V
Electric resistance	Ohm	Ω	V/A
Conductance	Siemens	S	A/V
Magnetic flux	Weber	Wb	V·s
Magnetic flux density	Tesla	T	Wb/m ²
Inductance	Henry	H	Wb/A
Celsius temperature	Celsius degree, degree	°C	t°C = (t+273.15) K
Light flux	Lumen	lm	cd·sr
Illuminance	Lux	lx	lm/m ²

SI prefixes

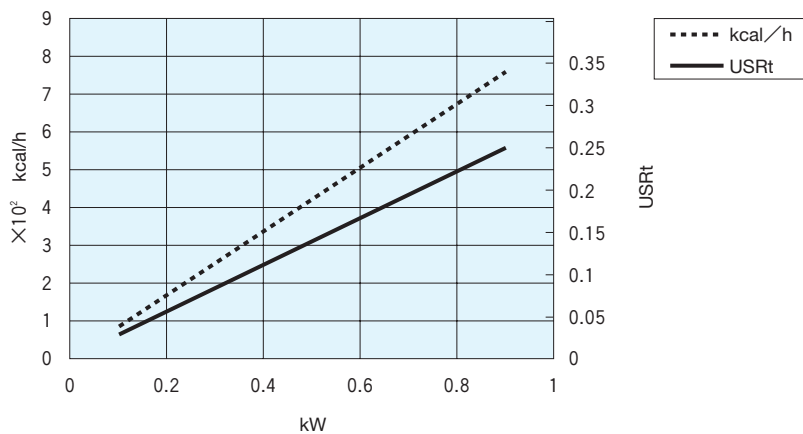
Factor	Name	Symbol	Factor	Name	Symbol
10 ¹⁸	Exa	E	10 ⁻¹	Deci	d
10 ¹⁵	Peta	P	10 ⁻²	Centi	c
10 ¹²	Tera	T	10 ⁻³	Milli	m
10 ⁹	Giga	G	10 ⁻⁶	Micro	μ
10 ⁶	Mega	M	10 ⁻⁹	Nano	n
10 ³	Kilo	k	10 ⁻¹²	Pico	p
10 ²	Hecto	h	10 ⁻¹⁵	Femto	f
10	Deca	da	10 ⁻¹⁸	Atto	a

SI conversion table

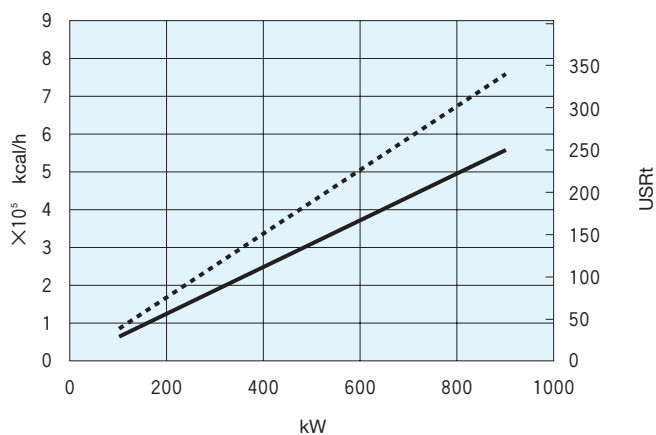
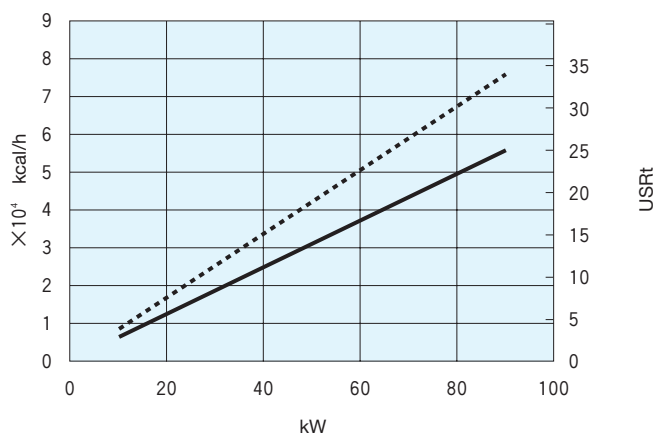
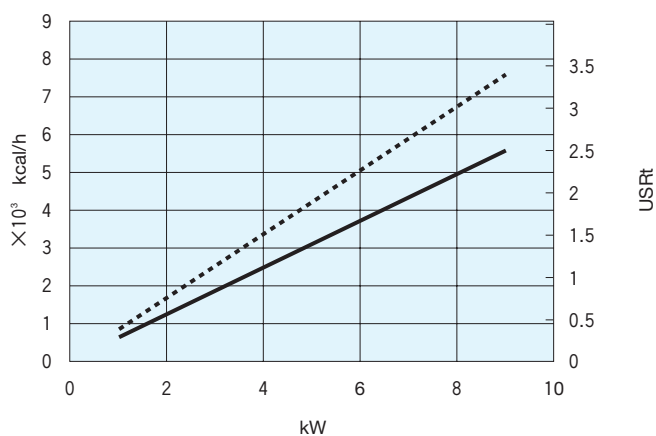
Unit symbol	Name	Conversion coefficient	Name	Unit symbol
		Conventional → SI		
		SI ← Conventional		
Length μ Å	Micron	1	Micrometer	μm
	Angstrom	0.1	Nanometer	nm
Volume cc	cc	1	Cubic centimeter	cm ³
Acceleration G Gal	G	9.80665	Meters per second per second	m/s ²
	Gal	0.01	Meters per second per second	m/s ²
Force kgf dyn	Kilogram force	9.80665	Newton	N
	Dyne	10 ⁻⁵	Newton	N
Torque kgf·m	Kilogram-force meter	9.80665	Newton meter	N·m
Pressure kgf/cm ² mmH ₂ O mmHg atm	Kilogram force Per square centimeter	98.0665	Kilopascal	kPa
	Millimeters of water column	9.80665	Pascal	Pa
	Millimeters of mercury Standard atmospheric pressure	133.322 101.325	Pascal Kilopascal	Pa kPa
Stress kgf/mm ²	Kilogram force Per square millimeter	9.80665 9.80665	Megapascal Newton Per square millimeter	MPa N/mm ²
	Viscosity P	Poise	0.1	Pascal second
Kinematic viscosity St	Stokes	10 ⁻⁴	Square meter per second	m ² /s
Energy kgf·m erg	Kilogram-force meter	9.80665	Joule	J
	Erg	10 ⁻⁷	Joule	J

Unit symbol	Name	Conversion coefficient	Name	Unit symbol
		Conventional → SI		
		SI ← Conventional		
Power kgf·m/s PS	Kilogram-force meter per second	9.80665	Watt	W
	Metric horsepower	735.5	Watt	W
Temperature difference deg	Degree	1	Kelvin	K
		1	Celsius degree or degree	°C
Heat cal	Calorie	4.18605 (measurement law)	Joule	J
Heat flow kcal/h	Kilocalorie per hour	1.16279	Watt	W
Thermal conductivity kcal/(h·m·°C)	Kilocalorie	1.16279	Kelvin per meter per watt	W/(m·K)
	Hours per meter per degree	1.16279	Degree per meter per watt	W/(m·°C)
Thermal capacity cal/°C	Calories per degree	4.18605 4.18605	Joules per kelvin	J/K
			Joules per degree	J/°C
Specific heat cal/(kg·°C)	Calories per kilogram per degree	4.18605 4.18605	Joules per kilogram per kelvin	J/(kg·K)
			Joules per kilogram per degree	J/(kg·°C)
Entropy kcal/K	Kilocalories per kelvin	4.18605	Kilojoules per kelvin	kJ/K
Magnetic field strength Oe	Oersted	79.5775	Amperes per meter	A/m
Magnetic flux density Gs	Gauss	10 ⁻⁴	Tesla	T
Magnetic flux Mx	Maxwell	10 ⁻⁸	Weber	Wb
Conductance Ω	Mho	1	Siemens	S

Refrigeration capacity conversion chart



Conversion coefficient
 $1 \text{ kcal/h} = 4.1868 \times 1000 / 3600 \text{ W} = 1.163 \text{ W}$
 $1 \text{ USRt} = 12000 \text{ Btu/h} = 3024 \text{ kcal/h}$



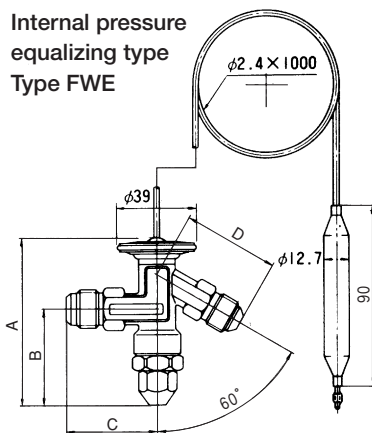
kW	kcal/h	US refrigeration ton USRt
0.1	86	0.03
0.2	172	0.06
0.3	258	0.09
0.4	344	0.11
0.5	430	0.14
0.6	516	0.17
0.7	602	0.20
0.8	688	0.23
0.9	774	0.26
1	860	0.28
2	1720	0.57
3	2580	0.85
4	3439	1.14
5	4299	1.42
6	5159	1.71
7	6019	1.99
8	6879	2.27
9	7739	2.56
10	8598	2.84
20	17197	5.69
30	25795	8.53
40	34394	11.37
50	42992	14.22
60	51591	17.06
70	60189	19.90
80	68788	22.75
90	77386	25.59
100	85985	28.43
200	171969	56.87
300	257954	85.30
400	343938	113.74
500	429923	142.17
600	515907	170.60
700	601892	199.04
800	687876	227.47
900	773861	255.91



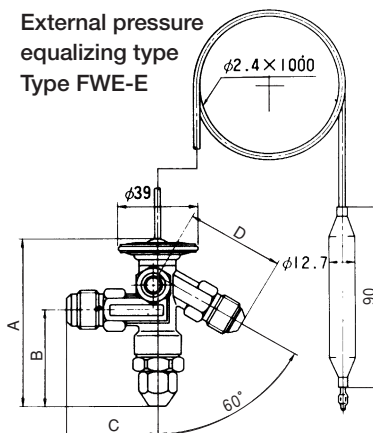
Type FWE thermostatic expansion valve

This thermostatic expansion valve has flare type connections and can also be used for hot gas defrost cycle. Evaporator temperature can be freely set depending on the purpose of use.

Internal pressure equalizing type
Type FWE



External pressure equalizing type
Type FWE-E



Applications	This expansion valve can be used over a wide range of applications including cooling, air conditioning, refrigeration, freezing, and ecological equipment. It is perfect for hot gas defrost cycle.			
Evaporator temperature range	Symbol	Wide W	Medium temperature M	Low temperature L
	R134a	+10°C to -30°C	-1°C to -30°C	-18°C to -30°C
	R22/R407C	+10°C to -40°C	-1°C to -40°C	-18°C to -40°C
	R404A	+10°C to -45°C	-1°C to -45°C	-18°C to -45°C
Static superheat degree adjustment range	0.5 to 7°C (Usually, adjustment is unnecessary. Do not spin the adjusting screw.)			
Factory setting	Static superheat degree 3.5°C			
Maximum use pressure	1.47MPa			
Air tightness pressure	1.67MPa			
Withstand pressure	4.41MPa			
Temperature sensing bulb sealing method	Gas cross charge			
Maximum use temperature	120°C			
Connection	Flare type			
Weight	330g (Internal pressure equalizing type) 340g (External pressure equalizing type)			

Capacitance change list

Nominal capacity kW	Evaporator temperature											
	10°C	5°C	0°C	-5°C	-10°C	-15°C	-20°C	-25°C	-30°C	-35°C	-40°C	-45°C
1.1	1.4	1.2	1.1	1.0	0.90	0.78	0.66	0.56	0.49	—	—	—
1.8	2.2	2.1	1.9	1.8	1.5	1.2	1.1	0.92	0.77	—	—	—
3.5	4.5	4.1	3.7	3.5	2.9	2.5	2.1	1.8	1.6	—	—	—
5.3	6.7	6.2	5.6	5.0	4.4	3.8	3.2	2.8	2.4	—	—	—
7.0	9.2	8.5	7.7	6.8	6.1	5.2	4.4	3.9	3.3	—	—	—
8.8	11.0	10.1	9.3	8.2	7.2	6.3	5.4	4.7	4.0	—	—	—
10.6	12.2	11.2	10.2	9.1	8.0	7.0	6.0	5.2	4.5	—	—	—
0.35	0.36	0.35	0.33	0.31	0.29	0.27	0.23	0.21	0.19	0.15	0.14	—
0.70	0.73	0.70	0.66	0.63	0.57	0.51	0.47	0.41	0.36	0.31	0.27	—
1.1	1.1	1.0	0.97	0.92	0.83	0.76	0.69	0.59	0.53	0.45	0.40	—
1.8	2.0	2.0	1.9	1.8	1.6	1.5	1.4	1.2	1.1	0.9	0.8	—
3.5	3.3	3.3	3.1	2.9	2.7	2.4	2.2	1.9	1.7	1.4	1.3	—
5.3	6.7	6.6	6.1	5.9	5.3	4.8	4.5	3.9	3.5	2.9	2.6	—
7.0	8.1	8.0	7.5	7.2	6.5	5.9	5.4	4.7	4.2	3.5	3.1	—
8.8	10.2	9.9	9.3	9.0	8.1	7.3	6.8	5.9	5.2	4.4	3.9	—
10.6	14.0	13.7	12.8	12.3	11.2	10.2	9.4	8.2	7.3	6.0	5.4	—
14.1	16.7	16.3	15.4	14.8	13.4	12.2	11.3	9.9	8.8	7.4	6.6	—
17.6	18.5	18.0	17.0	16.4	14.9	13.5	12.5	11.0	9.8	8.2	7.3	—
1.1	1.7	1.6	1.5	1.4	1.3	1.1	0.97	0.84	0.76	0.64	0.49	0.40
1.8	2.7	2.6	2.5	2.2	2.0	1.8	1.5	1.3	1.2	1.0	0.77	0.63
3.5	5.5	5.2	4.9	4.5	4.1	3.5	3.1	2.7	2.5	2.1	1.6	1.3
5.3	8.3	7.8	7.5	6.8	6.2	5.3	4.7	4.1	3.8	3.1	2.4	1.9
7.0	11.3	10.7	10.2	9.3	8.5	7.4	6.5	5.7	5.2	4.3	3.3	2.7
8.8	13.5	12.8	12.2	11.2	10.2	8.9	7.9	6.9	6.3	5.3	4.0	3.2
10.6	15.0	14.2	13.5	12.4	11.3	9.8	8.8	7.7	7.0	5.9	4.5	3.6

● Condenser temperature: 38°C, supercooling temperature: 0°C, superheating temperature change: 4°C/R134a, 3.5°C/R22, 3.5°C/R404A capacity. Unit: kW

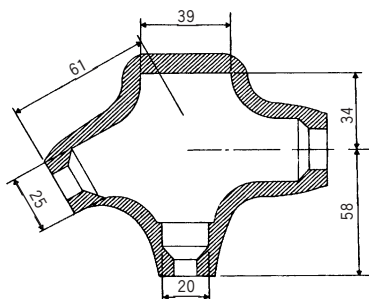
● When the pressure loss of the piping, evaporator, etc. was made 0.

Specifications

Type		Nominal capacity kW	Connection piping diameter Inlet x outlet mm (inches)	Refrigerant	Dimensions mm			
Internal pressure equalizing type	External pressure equalizing type				A	B	C	D
FWE- 324Q	FWE-E 324Q	1.1	6.35 (1/4) × 12.70 (1/2)	R134a	81	47.5	45	48
FWE- 524Q	FWE-E 524Q	1.8						
FWE-1024Q	FWE-E1024Q	3.5						
※FWE-1524Q	※FWE-E1524Q	5.3	9.52 (3/8) × 12.70 (1/2)					
※FWE- 334Q	※FWE-E 334Q	1.1						
※FWE- 534Q	※FWE-E 534Q	1.8						
※FWE-1034Q	※FWE-E1034Q	3.5						
FWE-1534Q	FWE-E1534Q	5.3						
FWE-2034Q	FWE-E2034Q	7.0						
FWE-2534Q	FWE-E2534Q	8.8	12.70 (1/2) × 15.88 (5/8)					
FWE-3034Q	FWE-E3034Q	10.6						
※FWE-2045Q	※FWE-E2045Q	7.0	6.35 (1/4) × 12.70 (1/2)				R22/ R407C	81
※FWE-2545Q	※FWE-E2545Q	8.8						
FWE-3045Q	FWE-E3045Q	10.6						
FWE- 124H	FWE-E 124H	0.35						
FWE- 224H	FWE-E 224H	0.7						
FWE- 324H	FWE-E 324H	1.1						
FWE- 524H	FWE-E 524H	1.8						
FWE-1024H	FWE-E1024H	3.5						
FWE-1524H	FWE-E1524H	5.3						
FWE-2024H	FWE-E2024H	7.0						
※FWE-2524H	※FWE-E2524H	8.8		9.52 (3/8) × 12.70 (1/2)				
※FWE- 134H	※FWE-E 134H	0.35						
※FWE- 234H	※FWE-E 234H	0.7						
※FWE- 334H	※FWE-E 334H	1.1						
※FWE- 534H	※FWE-E 534H	1.8						
※FWE-1034H	※FWE-E1034H	3.5						
※FWE-1534H	※FWE-E1534H	5.3	12.70 (1/2) × 15.88 (5/8)					
※FWE-2034H	※FWE-E2034H	7.0						
FWE-2534H	FWE-E2534H	8.8						
FWE-3034H	FWE-E3034H	10.6						
FWE-4034H	FWE-E4034H	14.1						
FWE-5034H	FWE-E5034H	17.6						
※FWE-3045H	※FWE-E3045H	10.6	15.88 (5/8) × 19.05 (3/4)					
FWE-4045H	FWE-E4045H	14.1						
FWE-5045H	FWE-E5045H	17.6	6.35 (1/4) × 12.70 (1/2)	R404A	81	47.5	45	48
FWE-5056H	FWE-E5056H	17.6						
FWE- 324N	FWE-E 324N	1.1						
FWE- 524N	FWE-E 524N	1.8						
FWE-1024N	FWE-E1024N	3.5						
※FWE-1524N	※FWE-E1524N	5.3					9.52 (3/8) × 12.70 (1/2)	
※FWE- 334N	※FWE-E 334N	1.1						
※FWE- 534N	※FWE-E 534N	1.8						
※FWE-1034N	※FWE-E1034N	3.5						
FWE-1534N	FWE-E1534N	5.3						
FWE-2034N	FWE-E2034N	7.0						
FWE-2534N	FWE-E2534N	8.8					12.70 (1/2) × 15.88 (5/8)	
FWE-3034N	FWE-E3034N	10.6						
※FWE-2045N	※FWE-E2045N	7.0	12.70 (1/2) × 15.88 (5/8)					
※FWE-2545N	※FWE-E2545N	8.8						
FWE-3045N	FWE-E3045N	10.6						

*: Only available by order

Drip-proof cover for valve

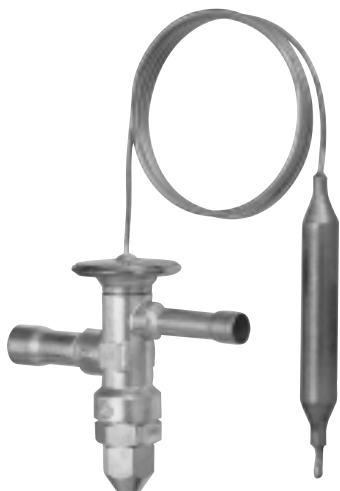


Drip-proof cover for

Types FWE and FSE

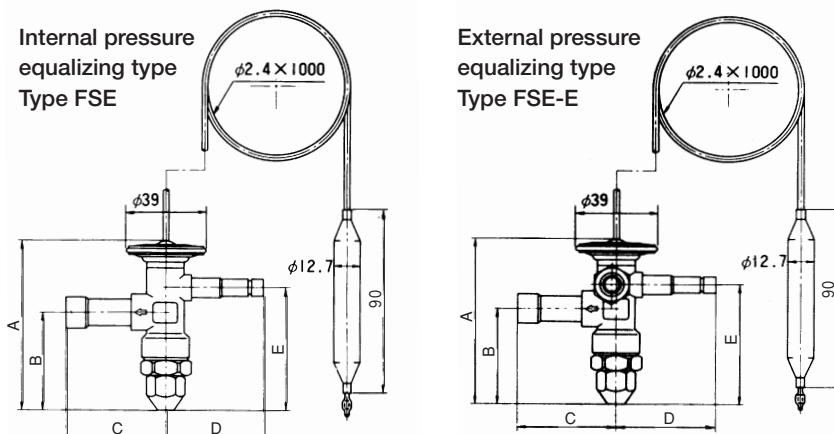
Fasten the body with tape from both sides. Perfect sealing is possible by covering with core tape.

Material: polyurethane foam



Type FSE thermostatic expansion valve (only available by order)

This thermostatic expansion valve has welded connections and can also be used in hot gas defrost cycle. Evaporator temperature can be freely set depending on the purpose of use.



Applications	This expansion valve can be used over a wide range of applications including cooling, air conditioning, refrigeration, and ecological equipment. It is perfect for hot gas defrost cycle.			
Evaporator temperature range	Symbol	Wide W	Medium temperature M	Low temperature L
	R134a	+10°C to -30°C	-1°C to -30°C	-18°C to -30°C
	R22/R407C	+10°C to -40°C	-1°C to -40°C	-18°C to -40°C
	R404A	+10°C to -45°C	-1°C to -45°C	-18°C to -45°C
Static superheat degree adjustment range	0.5 to 7°C (Usually, adjustment is unnecessary. Do not spin the adjusting screw.)			
Factory setting	Static superheat degree 3.5°C			
Maximum use pressure	1.47MPa			
Air tightness pressure	1.67MPa			
Withstand pressure	4.41MPa			
Temperature sensing bulb sealing method	Gas cross charge			
Maximum use temperature	120°C			
Connection	Brazed type			
Weight	300g (Internal pressure equalizing type) 310g (External pressure equalizing type)			

Capacitance change list

Nominal capacity kW	Evaporator temperature											
	10°C	5°C	0°C	-5°C	-10°C	-15°C	-20°C	-25°C	-30°C	-35°C	-40°C	-45°C
1.1	1.4	1.2	1.1	1.0	0.90	0.78	0.66	0.56	0.49	—	—	—
1.8	2.2	2.1	1.9	1.8	1.5	1.2	1.1	0.92	0.77	—	—	—
3.5	4.5	4.1	3.7	3.5	2.9	2.5	2.1	1.8	1.6	—	—	—
5.3	6.7	6.2	5.6	5.0	4.4	3.8	3.2	2.8	2.4	—	—	—
7.0	9.2	8.5	7.7	6.8	6.1	5.2	4.4	3.9	3.3	—	—	—
8.8	11.0	10.1	9.3	8.2	7.2	6.3	5.4	4.7	4.0	—	—	—
10.6	12.2	11.2	10.2	9.1	8.0	7.0	6.0	5.2	4.5	—	—	—
0.35	0.36	0.35	0.33	0.31	0.29	0.27	0.23	0.21	0.19	0.15	0.14	—
0.70	0.73	0.70	0.66	0.63	0.57	0.51	0.47	0.41	0.36	0.31	0.27	—
1.1	1.1	1.0	0.97	0.92	0.83	0.76	0.69	0.59	0.53	0.45	0.40	—
1.8	2.0	2.0	1.9	1.8	1.6	1.5	1.4	1.2	1.1	0.9	0.8	—
3.5	3.3	3.3	3.1	2.9	2.7	2.4	2.2	1.9	1.7	1.4	1.3	—
5.3	6.7	6.6	6.1	5.9	5.3	4.8	4.5	3.9	3.5	2.9	2.6	—
7.0	8.1	8.0	7.5	7.2	6.5	5.9	5.4	4.7	4.2	3.5	3.1	—
8.8	10.2	9.9	9.3	9.0	8.1	7.3	6.8	5.9	5.2	4.4	3.9	—
10.6	14.0	13.7	12.8	12.3	11.2	10.2	9.4	8.2	7.3	6.0	5.4	—
14.1	16.7	16.3	15.4	14.8	13.4	12.2	11.3	9.9	8.8	7.4	6.6	—
17.6	18.5	18.0	17.0	16.4	14.9	13.5	12.5	11.0	9.8	8.2	7.3	—
1.1	1.7	1.6	1.5	1.4	1.3	1.1	0.97	0.84	0.76	0.64	0.49	0.40
1.8	2.7	2.6	2.5	2.2	2.0	1.8	1.5	1.3	1.2	1.0	0.77	0.63
3.5	5.5	5.2	4.9	4.5	4.1	3.5	3.1	2.7	2.5	2.1	1.6	1.3
5.3	8.3	7.8	7.5	6.8	6.2	5.3	4.7	4.1	3.8	3.1	2.4	1.9
7.0	11.3	10.7	10.2	9.3	8.5	7.4	6.5	5.7	5.2	4.3	3.3	2.7
8.8	13.5	12.8	12.2	11.2	10.2	8.9	7.9	6.9	6.3	5.3	4.0	3.2
10.6	15.0	14.2	13.5	12.4	11.3	9.8	8.8	7.7	7.0	5.9	4.5	3.6

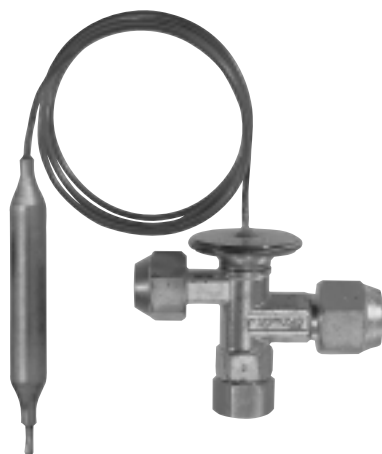
● Condenser temperature: 38°C, supercooling temperature: 0°C, superheating temperature change: 4°C/R134a, 3.5°C/R22, 3.5°C/R404A capacity.

Unit: kW

● When the pressure loss of the piping, evaporator, etc. was made 0.

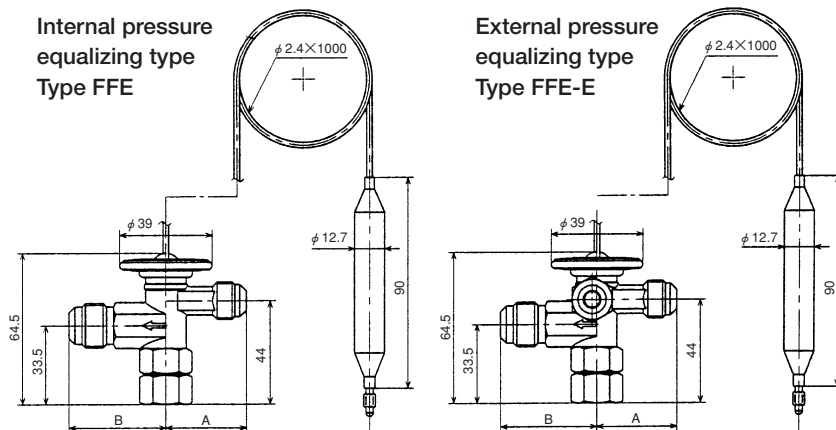
Specifications

Type		Nominal capacity kW	Connection piping diameter Inlet x outlet mm (inches)	Refrigerant	Dimensions mm			
Internal pressure equalizing type	External pressure equalizing type				A	B	C·D	E
FSE- 324Q	FSE-E 324Q	1.1	6.35 (1/4) × 12.70 (1/2)	R134a	81	47.5	49	59.5
FSE- 524Q	FSE-E 524Q	1.8						
FSE-1024Q	FSE-E1024Q	3.5						
FSE-1524Q	FSE-E1524Q	5.3						
FSE- 334Q	FSE-E 334Q	1.1	9.52 (3/8) × 12.70 (1/2)					
FSE- 534Q	FSE-E 534Q	1.8						
FSE-1034Q	FSE-E1034Q	3.5						
FSE-1534Q	FSE-E1534Q	5.3						
FSE-2034Q	FSE-E2034Q	7.0						
FSE-2534Q	FSE-E2534Q	8.8						
FSE-3034Q	FSE-E3034Q	10.6	12.70 (1/2) × 15.88 (5/8)					
FSE-2045Q	FSE-E2045Q	7.0						
FSE-2545Q	FSE-E2545Q	8.8						
FSE-3045Q	FSE-E3045Q	10.6						
FSE- 124H	FSE-E 124H	0.35	6.35 (1/4) × 12.70 (1/2)	R22/ R407C	81	47.5	49	59.5
FSE- 224H	FSE-E 224H	0.7						
FSE- 324H	FSE-E 324H	1.1						
FSE- 524H	FSE-E 524H	1.8						
FSE-1024H	FSE-E1024H	3.5						
FSE-1524H	FSE-E1524H	5.3						
FSE-2024H	FSE-E2024H	7.0						
FSE-2524H	FSE-E2524H	8.8						
FSE- 134H	FSE-E 134H	0.35	9.52 (3/8) × 12.70 (1/2)					
FSE- 234H	FSE-E 234H	0.7						
FSE- 334H	FSE-E 334H	1.1						
FSE- 534H	FSE-E 534H	1.8						
FSE-1034H	FSE-E1034H	3.5						
FSE-1534H	FSE-E1534H	5.3						
FSE-2034H	FSE-E2034H	7.0						
FSE-2534H	FSE-E2534H	8.8						
FSE-3034H	FSE-E3034H	10.6						
FSE-4034H	FSE-E4034H	14.1						
FSE-5034H	FSE-E5034H	17.6	12.70 (1/2) × 15.88 (5/8)					
FSE-3045H	FSE-E3045H	10.6						
FSE-4045H	FSE-E4045H	14.1						
FSE-5045H	FSE-E5045H	17.6						
FSE-5056H	FSE-E5056H	17.6	15.9 (5/8) × 19.1 (3/4)					
FSE- 324N	FSE-E 324N	1.1	6.35 (1/4) × 12.70 (1/2)					
FSE- 524N	FSE-E 524N	1.8						
FSE-1024N	FSE-E1024N	3.5						
FSE-1524N	FSE-E1524N	5.3						
FSE- 334N	FSE-E 334N	1.1	9.52 (3/8) × 12.70 (1/2)					
FSE- 534N	FSE-E 534N	1.8						
FSE-1034N	FSE-E1034N	3.5						
FSE-1534N	FSE-E1534N	5.3						
FSE-2034N	FSE-E2034N	7.0						
FSE-2534N	FSE-E2534N	8.8						
FSE-3034N	FSE-E3034N	10.6	12.70 (1/2) × 15.88 (5/8)					
FSE-2045N	FSE-E2045N	7.0						
FSE-2545N	FSE-E2545N	8.8						
FSE-3045N	FSE-E3045N	10.6						



Type FFE thermostatic expansion valve (only available by order)

This compact thermostatic expansion valve has flare connections and can also be used in hot gas defrost cycle. Evaporator temperature can be freely set depending on the purpose of use.



Applications	This expansion valve can be used over a wide range of applications including cooling, air conditioning, refrigeration, and ecological equipment. It is perfect for hot gas defrost cycle.			
Evaporator temperature range	Symbol	Wide W	Medium temperature M	Low temperature L
	R134a	+10°C to -30°C	-1°C to -30°C	-18°C to -30°C
	R22/R407C	+10°C to -40°C	-1°C to -40°C	-18°C to -40°C
	R404A	+10°C to -45°C	-1°C to -45°C	-18°C to -45°C
Static superheat degree adjustment range	0.5 to 7°C (Usually, adjustment is unnecessary. Do not spin the adjusting screw.)			
Factory setting	Static superheat degree 3.5°C			
Maximum use pressure	1.47MPa			
Air tightness pressure	1.67MPa			
Withstand pressure	4.41MPa			
Temperature sensing bulb sealing method	Gas cross charge			
Maximum use temperature	120°C			
Connection	Flare type			
Weight	290g (Internal pressure equalizing type) 300g (External pressure equalizing type)			

Capacitance change list

Nominal capacity kW	Evaporator temperature												
	10°C	5°C	0°C	-5°C	-10°C	-15°C	-20°C	-25°C	-30°C	-35°C	-40°C	-45°C	
1.1	1.4	1.2	1.1	1.0	0.90	0.78	0.66	0.56	0.49	—	—	—	
1.8	2.2	2.1	1.9	1.8	1.5	1.2	1.1	0.92	0.77	—	—	—	
3.5	4.5	4.1	3.7	3.5	2.9	2.5	2.1	1.8	1.6	—	—	—	
5.3	6.7	6.2	5.6	5.0	4.4	3.8	3.2	2.8	2.4	—	—	—	
7.0	9.2	8.5	7.7	6.8	6.1	5.2	4.4	3.9	3.3	—	—	—	
8.8	11.0	10.1	9.3	8.2	7.2	6.3	5.4	4.7	4.0	—	—	—	
10.6	12.2	11.2	10.2	9.1	8.0	7.0	6.0	5.2	4.5	—	—	—	
0.35	0.36	0.35	0.33	0.31	0.29	0.27	0.23	0.21	0.19	0.15	0.14	—	
0.70	0.73	0.70	0.66	0.63	0.57	0.51	0.47	0.41	0.36	0.31	0.27	—	
1.1	1.1	1.0	0.97	0.92	0.83	0.76	0.69	0.59	0.53	0.45	0.40	—	
1.8	2.0	2.0	1.9	1.8	1.6	1.5	1.4	1.2	1.1	0.9	0.8	—	
3.5	3.3	3.3	3.1	2.9	2.7	2.4	2.2	1.9	1.7	1.4	1.3	—	
5.3	6.7	6.6	6.1	5.9	5.3	4.8	4.5	3.9	3.5	2.9	2.6	—	
7.0	8.1	8.0	7.5	7.2	6.5	5.9	5.4	4.7	4.2	3.5	3.1	—	
8.8	10.2	9.9	9.3	9.0	8.1	7.3	6.8	5.9	5.2	4.4	3.9	—	
10.6	14.0	13.7	12.8	12.3	11.2	10.2	9.4	8.2	7.3	6.0	5.4	—	
14.1	16.7	16.3	15.4	14.8	13.4	12.2	11.3	9.9	8.8	7.4	6.6	—	
17.6	18.5	18.0	17.0	16.4	14.9	13.5	12.5	11.0	9.8	8.2	7.3	—	
1.1	1.7	1.6	1.5	1.4	1.3	1.1	0.97	0.84	0.76	0.64	0.49	0.40	
1.8	2.7	2.6	2.5	2.2	2.0	1.8	1.5	1.3	1.2	1.0	0.77	0.63	
3.5	5.5	5.2	4.9	4.5	4.1	3.5	3.1	2.7	2.5	2.1	1.6	1.3	
5.3	8.3	7.8	7.5	6.8	6.2	5.3	4.7	4.1	3.8	3.1	2.4	1.9	
7.0	11.3	10.7	10.2	9.3	8.5	7.4	6.5	5.7	5.2	4.3	3.3	2.7	
8.8	13.5	12.8	12.2	11.2	10.2	8.9	7.9	6.9	6.3	5.3	4.0	3.2	
10.6	15.0	14.2	13.5	12.4	11.3	9.8	8.8	7.7	7.0	5.9	4.5	3.6	

● Condenser temperature: 38°C, supercooling temperature: 0°C, superheating temperature change: 4°C/R134a, 3.5°C/R22, 3.5°C/R404A capacity.

Unit: kW

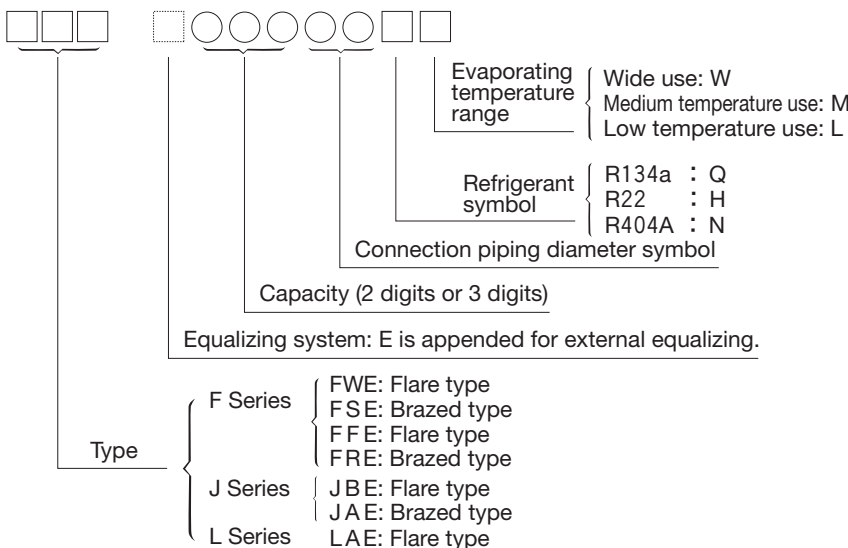
● When the pressure loss of the piping, evaporator, etc. was made 0.

Specifications

Type		Nominal capacity kW	Connection piping diameter Inlet x outlet mm (inches)	Refrigerant	Dimensions mm		
Internal pressure equalizing type	External pressure equalizing type				A	B	
FFE- 324Q	FFE-E 324Q	1.1	6.35 (1/4) × 12.70 (1/2)	R134a	35	41	
FFE- 524Q	FFE-E 524Q	1.8					
FFE-1024Q	FFE-E1024Q	3.5					
FFE-1524Q	FFE-E1524Q	5.3					
FFE- 334Q	FFE-E 334Q	1.1	9.52 (3/8) × 12.70 (1/2)		34	41	
FFE- 534Q	FFE-E 534Q	1.8					
FFE-1034Q	FFE-E1034Q	3.5					
FFE-1534Q	FFE-E1534Q	5.3					
FFE-2034Q	FFE-E2034Q	7.0					
FFE-2534Q	FFE-E2534Q	8.8					
FFE-3034Q	FFE-E3034Q	10.6					
FFE- 324H	FFE-E 324H	1.1	6.35 (1/4) × 12.70 (1/2)		R22/ R407C	35	41
FFE- 524H	FFE-E 524H	1.8					
FFE-1024H	FFE-E1024H	3.5					
FFE-1524H	FFE-E1524H	5.3					
FFE-2024H	FFE-E2024H	7.0					
FFE-2524H	FFE-E2524H	8.8					
FFE- 334H	FFE-E 334H	1.1	9.52 (3/8) × 12.70 (1/2)	34		41	
FFE- 534H	FFE-E 534H	1.8					
FFE-1034H	FFE-E1034H	3.5					
FFE-1534H	FFE-E1534H	5.3					
FFE-2034H	FFE-E2034H	7.0					
FFE-2534H	FFE-E2534H	8.8					
FFE-3034H	FFE-E3034H	10.6					
FFE-4034H	FFE-E4034H	14.1					
FFE-5034H	FFE-E5034H	17.6					
FFE- 324N	FFE-E 324N	1.1	6.35 (1/4) × 12.70 (1/2)	R404A		35	41
FFE- 524N	FFE-E 524N	1.8					
FFE-1024N	FFE-E1024N	3.5					
FFE-1524N	FFE-E1524N	5.3					
FFE- 334N	FFE-E 334N	1.1	9.52 (3/8) × 12.70 (1/2)		34	41	
FFE- 534N	FFE-E 534N	1.8					
FFE-1034N	FFE-E1034N	3.5					
FFE-1534N	FFE-E1534N	5.3					
FFE-2034N	FFE-E2034N	7.0					
FFE-2534N	FFE-E2534N	8.8					
FFE-3034N	FFE-E3034N	10.6					

Type designation and symbols

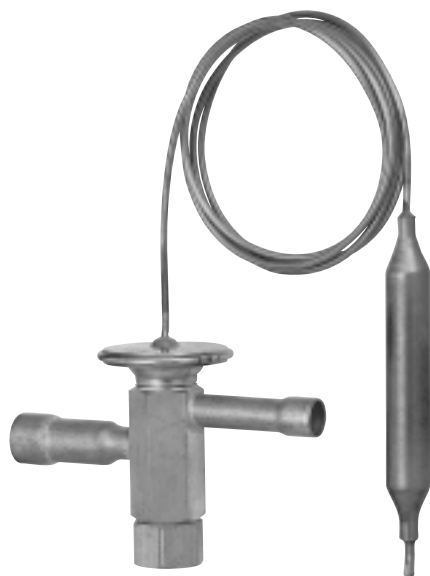
The format of each F, J and L Series expansion valve is displayed as shown below.



Connection piping diameter symbol

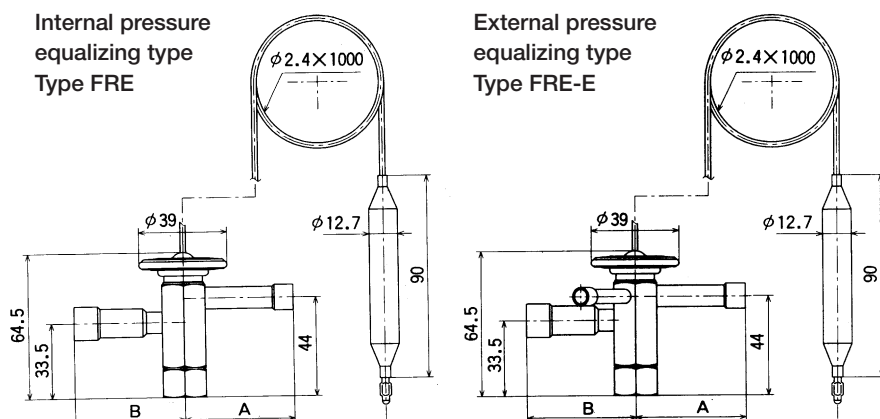
Applicable to connection piping diameters of 34.92mm or more.

Symbol	Inlet x outlet mm (inches)
A1	22.2 × 34.92 (7/8 × 1 3/8)
A2	22.2 × 41.28 (7/8 × 1 5/8)
A3	28.58 × 34.92 (1 1/8 × 1 3/8)
A4	28.58 × 41.28 (1 1/8 × 1 5/8)



■ Type FRE thermostatic expansion valve (only available by order)

This is a compact thermostatic expansion valve with welded connections and can also be used in hot gas defrost cycle. Evaporator temperature can be freely set depending on the purpose of use.



Applications	This expansion valve can be used over a wide range of applications including cooling, air conditioning, refrigeration, freezing and ecological equipment. It is perfect for hot gas defrost cycle.			
Evaporator temperature range	Symbol	Wide W	Medium temperature M	Low temperature L
	R134a	+10°C to -30°C	-1°C to -30°C	-18°C to -30°C
	R22/R407C	+10°C to -40°C	-1°C to -40°C	-18°C to -40°C
	R404A	+10°C to -45°C	-1°C to -45°C	-18°C to -45°C
Static superheat degree adjustment range	0.5 to 7°C (Usually, adjustment is unnecessary. Do not spin the adjusting screw.)			
Factory setting	Static superheat degree 3.5°C			
Maximum use pressure	1.47MPa			
Air tightness pressure	1.67MPa			
Withstand pressure	4.41MPa			
Temperature sensing bulb sealing method	Gas cross charge			
Maximum use temperature	120°C			
Connection	Brazed type			
Weight	230g (Internal pressure equalizing type) 235g (External pressure equalizing type)			

Capacitance change list

Nominal capacity kW	Evaporator temperature											
	10°C	5°C	0°C	-5°C	-10°C	-15°C	-20°C	-25°C	-30°C	-35°C	-40°C	-45°C
1.1	1.4	1.2	1.1	1.0	0.90	0.78	0.66	0.56	0.49	—	—	—
1.8	2.2	2.1	1.9	1.8	1.5	1.2	1.1	0.92	0.77	—	—	—
3.5	4.5	4.1	3.7	3.5	2.9	2.5	2.1	1.8	1.6	—	—	—
5.3	6.7	6.2	5.6	5.0	4.4	3.8	3.2	2.8	2.4	—	—	—
7.0	9.2	8.5	7.7	6.8	6.1	5.2	4.4	3.9	3.3	—	—	—
8.8	11.0	10.1	9.3	8.2	7.2	6.3	5.4	4.7	4.0	—	—	—
10.6	12.2	11.2	10.2	9.1	8.0	7.0	6.0	5.2	4.5	—	—	—
0.35	0.36	0.35	0.33	0.31	0.29	0.27	0.23	0.21	0.19	0.15	0.14	—
0.70	0.73	0.70	0.66	0.63	0.57	0.51	0.47	0.41	0.36	0.31	0.27	—
1.1	1.1	1.0	0.97	0.92	0.83	0.76	0.69	0.59	0.53	0.45	0.40	—
1.8	2.0	2.0	1.9	1.8	1.6	1.5	1.4	1.2	1.1	0.9	0.8	—
3.5	3.3	3.3	3.1	2.9	2.7	2.4	2.2	1.9	1.7	1.4	1.3	—
5.3	6.7	6.6	6.1	5.9	5.3	4.8	4.5	3.9	3.5	2.9	2.6	—
7.0	8.1	8.0	7.5	7.2	6.5	5.9	5.4	4.7	4.2	3.5	3.1	—
8.8	10.2	9.9	9.3	9.0	8.1	7.3	6.8	5.9	5.2	4.4	3.9	—
10.6	14.0	13.7	12.8	12.3	11.2	10.2	9.4	8.2	7.3	6.0	5.4	—
14.1	16.7	16.3	15.4	14.8	13.4	12.2	11.3	9.9	8.8	7.4	6.6	—
17.6	18.5	18.0	17.0	16.4	14.9	13.5	12.5	11.0	9.8	8.2	7.3	—
1.1	1.7	1.6	1.5	1.4	1.3	1.1	0.97	0.84	0.76	0.64	0.49	0.40
1.8	2.7	2.6	2.5	2.2	2.0	1.8	1.5	1.3	1.2	1.0	0.77	0.63
3.5	5.5	5.2	4.9	4.5	4.1	3.5	3.1	2.7	2.5	2.1	1.6	1.3
5.3	8.3	7.8	7.5	6.8	6.2	5.3	4.7	4.1	3.8	3.1	2.4	1.9
7.0	11.3	10.7	10.2	9.3	8.5	7.4	6.5	5.7	5.2	4.3	3.3	2.7
8.8	13.5	12.8	12.2	11.2	10.2	8.9	7.9	6.9	6.3	5.3	4.0	3.2
10.6	15.0	14.2	13.5	12.4	11.3	9.8	8.8	7.7	7.0	5.9	4.5	3.6

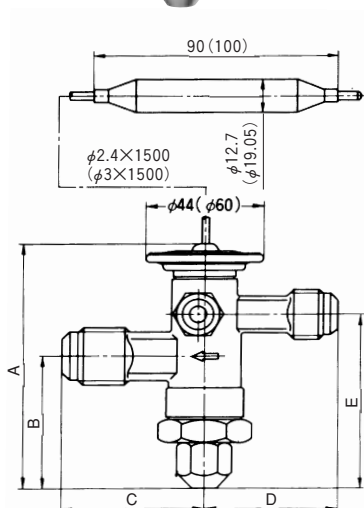
● Condenser temperature: 38°C, supercooling temperature: 0°C, superheating temperature change: 4°C/R134a, 3.5°C/R22, 3.5°C/R404A capacity.

Unit: kW

● When the pressure loss of the piping, evaporator, etc. was made 0.

Specifications

Type		Nominal capacity kW	Connecting piping diameter Inlet x outlet mm (inches)	Refrigerant	Dimensions mm		
Internal pressure equalizing type	External pressure equalizing type				A	B	
FRE- 324Q	FRE-E 324Q	1.1	6.35 (1/4) × 12.70 (1/2)	R134a	48.5	48.5	
FRE- 524Q	FRE-E 524Q	1.8					
FRE-1024Q	FRE-E1024Q	3.5					
FRE-1524Q	FRE-E1524Q	5.3					
FRE- 334Q	FRE-E 334Q	1.1	9.52 (3/8) × 12.70 (1/2)		R134a	48.5	48.5
FRE- 534Q	FRE-E 534Q	1.8					
FRE-1034Q	FRE-E1034Q	3.5					
FRE-1534Q	FRE-E1534Q	5.3					
FRE-2034Q	FRE-E2034Q	7.0					
FRE-2534Q	FRE-E2534Q	8.8					
FRE-3034Q	FRE-E3034Q	10.6					
FRE- 324H	FRE-E 324H	1.1	6.35 (1/4) × 12.70 (1/2)	R22/ R407C		48.5	48.5
FRE- 524H	FRE-E 524H	1.8					
FRE-1024H	FRE-E1024H	3.5					
FRE-1524H	FRE-E1524H	5.3					
FRE-2024H	FRE-E2024H	7.0					
FRE-2524H	FRE-E2524H	8.8					
FRE- 334H	FRE-E 334H	1.1	9.52 (3/8) × 12.70 (1/2)		R22/ R407C	48.5	48.5
FRE- 534H	FRE-E 534H	1.8					
FRE-1034H	FRE-E1034H	3.5					
FRE-1534H	FRE-E1534H	5.3					
FRE-2034H	FRE-E2034H	7.0					
FRE-2534H	FRE-E2534H	8.8					
FRE-3034H	FRE-E3034H	10.6					
FRE-4034H	FRE-E4034H	14.1					
FRE-5034H	FRE-E5034H	17.6					
FRE- 324N	FRE-E 324N	1.1	6.35 (1/4) × 12.70 (1/2)	R404A		48.5	48.5
FRE- 524N	FRE-E 524N	1.8					
FRE-1024N	FRE-E1024N	3.5					
FRE-1524N	FRE-E1524N	5.3					
FRE- 334N	FRE-E 334N	1.1	9.52 (3/8) × 12.70 (1/2)			R404A	48.5
FRE- 534N	FRE-E 534N	1.8					
FRE-1034N	FRE-E1034N	3.5					
FRE-1534N	FRE-E1534N	5.3					
FRE-2034N	FRE-E2034N	7.0					
FRE-2534N	FRE-E2534N	8.8					
FRE-3034N	FRE-E3034N	10.6					



Type JBE thermostatic expansion valve

This is a medium capacity thermostatic expansion valve with flare connections and can also be used in hot gas defrost cycle. Evaporator temperature can be freely set depending on the purpose of use.

Applications	This expansion valve can be used over a wide range of applications including heat pump, cooling, air conditioning, refrigeration, freezing, and ecological equipment. It is also perfect for hot gas defrost cycle.			
Evaporator temperature range	Symbol	Wide	Medium temperature	Low temperature
		W	M	L
	R134a	+10°C to -30°C	-1°C to -30°C	-18°C to -30°C
	R22/R407C	+10°C to -40°C	-1°C to -40°C	-18°C to -40°C
	R404A	+10°C to -45°C	-1°C to -45°C	-18°C to -45°C
Static superheat degree adjustment range	0.5 to 7°C (Usually, adjustment is unnecessary. Do not spin the adjusting screw.)			
Factory setting	Static superheat degree 3.5°C			
Maximum use pressure	2.75MPa			
Air tightness pressure	2.94MPa			
Withstand pressure	4.41MPa			
Temperature sensing bulb sealing method	Gas cross charge			
Maximum use temperature	120°C			
Connection	Flare type			
Diaphragm diameter	R134a-R404A: 10.6 to 26.4kW R22/R407C : 17.6 to 44.0kW	φ44mm		
	R134a-R404A: 35.2kW or more R22/R407C : 52.7kW or more	φ60mm		
Weight	R134a-R404A: 10.6 to 26.4kW R22/R407C : 17.6 to 44.0kW	500g (Internal pressure equalizing type) 540g (External pressure equalizing type)		
	R134a-R404A: 35.2kW or more R22/R407C : 52.7kW or more	850g (External pressure equalizing type)		

Capacitance change list

Nominal capacity kW	Evaporator temperature												
	10°C	5°C	0°C	-5°C	-10°C	-15°C	-20°C	-25°C	-30°C	-35°C	-40°C	-45°C	
10.6	13.5	12.4	11.6	10.5	9.1	7.9	6.8	6.0	5.8	—	—	—	
14.1	17.5	16.1	15.0	13.6	11.8	10.3	8.9	7.8	7.6	—	—	—	
17.6	21.3	19.6	18.2	16.5	14.4	12.5	10.8	9.5	9.2	—	—	—	
21.1	24.1	22.3	20.7	18.8	16.4	14.2	12.3	10.9	10.6	—	—	—	
26.4	29.2	26.7	25.0	22.7	19.8	17.2	14.9	13.2	12.8	—	—	—	
35.2	36.5	34.3	30.5	26.9	23.4	21.0	18.2	16.3	14.6	—	—	—	
44.0	47.0	44.2	39.4	34.8	30.3	27.4	23.6	21.2	19.0	—	—	—	
70.3	68.0	64.0	57.5	51.0	44.6	40.5	35.1	31.6	28.6	—	—	—	
17.6	20.3	19.8	19.0	18.0	16.9	15.3	14.0	12.5	11.1	10.1	9.1	—	
22.9	26.3	25.7	24.7	23.3	22.1	19.9	18.3	16.2	14.5	13.2	11.8	—	
28.1	32.0	31.3	30.1	28.3	26.9	24.1	22.3	19.8	17.7	16.1	14.4	—	
35.2	36.5	35.6	34.3	32.3	30.7	27.6	25.4	22.6	20.2	18.3	16.5	—	
44.0	44.2	43.1	41.4	39.1	37.1	33.4	30.8	27.5	24.6	22.3	20.1	—	
52.7	55.2	54.9	51.1	48.6	44.5	40.6	37.7	33.3	30.7	26.7	23.3	—	
70.3	71.5	71.1	66.1	63.0	57.8	52.8	49.0	43.4	40.0	34.9	30.4	—	
105.5	104.7	103.9	97.0	92.8	85.4	78.4	73.0	65.0	60.0	52.4	46.0	—	
10.6	16.3	15.7	14.0	13.6	12.4	11.1	9.7	8.7	7.3	6.3	5.5	4.4	
14.1	21.2	20.4	18.7	17.7	16.2	14.4	12.6	11.3	9.5	8.2	7.2	5.7	
17.6	25.7	24.7	22.7	21.4	19.7	17.6	15.4	13.8	11.6	10.0	8.8	7.0	
21.1	29.3	28.2	25.8	24.5	22.4	20.1	17.6	15.8	13.3	11.5	10.1	8.0	
26.4	35.4	33.9	31.2	29.6	27.1	24.2	21.3	19.2	16.2	13.9	12.3	9.8	
35.2	43.9	41.8	39.0	36.5	33.3	29.8	26.1	22.8	19.9	17.1	14.3	11.9	
44.0	56.6	54.0	50.5	47.3	43.1	38.7	34.0	29.8	26.1	22.3	18.7	15.6	
70.3	82.3	78.7	73.7	69.3	63.4	57.2	50.6	44.5	39.1	33.6	28.3	23.7	

● Condenser temperature: 38°C, supercooling temperature: 0°C, superheating temperature change: 4°C/R134a, 3.5°C/R22, 3.5°C/R404A capacity.

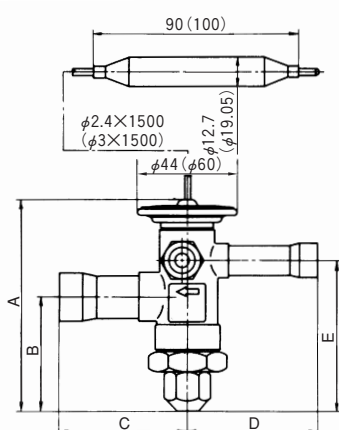
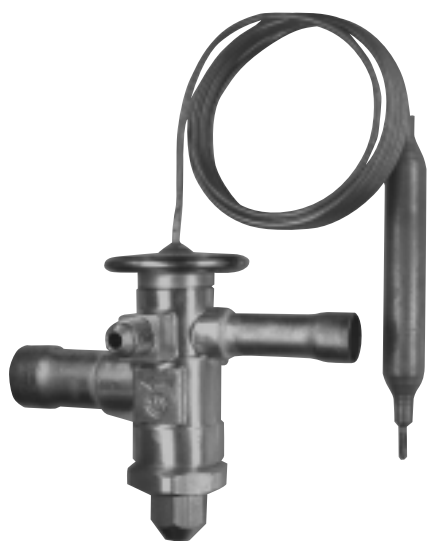
Unit: kW

● When the pressure loss of the piping, evaporator, etc. was made 0.

Specifications

Type		Nominal capacity kW	Connecting piping diameter Inlet x outlet mm (inches)	Refrigerant	Dimensions mm																									
Internal pressure equalizing type	External pressure equalizing type				A	B	C	D	E																					
JBE- 3034Q	JBE-E 3034Q	10.6	9.52 (3/8) × 12.70 (1/2)	R134a	92	49.5	49	46.5	65.5																					
JBE- 4034Q	JBE-E 4034Q	14.1					12.70 (1/2) × 15.88 (5/8)	53		49.5	57	52	73.5																	
JBE- 3045Q	JBE-E 3045Q	10.6	15.88 (5/8) × 19.05 (3/4)											92	49.5	56.5	53	65.5												
JBE- 4045Q	JBE-E 4045Q	14.1																	107	55	60.5	56	73.5							
JBE- 5045Q	JBE-E 5045Q	17.6																						—	—	—	—	—		
JBE- 6045Q	JBE-E 6045Q	21.1																											—	—
※JBE- 7545Q	※JBE-E 7545Q	26.4			—	—			—																					
—	※JBE-E10045Q	35.2					—	—		—	—	—																		
※JBE- 3056Q	※JBE-E 3056Q	10.6	15.88 (5/8) × 19.05 (3/4)										92	49.5	56.5	53	65.5													
※JBE- 4056Q	※JBE-E 4056Q	14.1																107	55	60.5	56	73.5								
JBE- 5056Q	JBE-E 5056Q	17.6																					—	—	—	—	—			
JBE- 6056Q	JBE-E 6056Q	21.1																										—	—	—
JBE- 7556Q	JBE-E 7556Q	26.4		—	—	—			—																					
—	※JBE-E10056Q	35.2					—	—		—	—	—																		
—	※JBE-E12556Q	44.0	—										—	—	—	—														
—	※JBE-E20056Q	70.3															—	—	—	—	—									
JBE- 5034H	JBE-E 5034H	17.6																				9.52 (3/8) × 12.70 (1/2)	R22/R407C	92	49.5	49	46.5			
JBE- 6534H	JBE-E 6534H	22.9																								12.70 (1/2) × 15.88 (5/8)	53	49.5	57	52
JBE- 5045H	JBE-E 5045H	17.6		15.88 (5/8) × 19.05 (3/4)	92	49.5			56.5													53								
JBE- 6545H	JBE-E 6545H	22.9					107	55		60.5	56	73.5																		
JBE- 8045H	JBE-E 8045H	28.1	—										—	—	—	—														
JBE-10045H	JBE-E10045H	35.1															—	—	—	—	—									
※JBE-12545H	※JBE-E12545H	44.0																						—	—					
—	JBE-E15045H	52.7																								—	—	—	—	—
JBE- 5056H	JBE-E 5056H	17.6		15.88 (5/8) × 19.05 (3/4)	92	49.5			56.5													53								
JBE- 6556H	JBE-E 6556H	22.9					107	55		60.5	56	73.5																		
JBE- 8056H	JBE-E 8056H	28.1	—										—	—	—	—														
JBE-10056H	JBE-E10056H	35.1															—	—	—	—	—									
JBE-12556H	JBE-E12556H	44.0																					—	—	—					
—	※JBE-E15056H	52.7																								—	—	—	—	—
—	※JBE-E20056H	70.3		—	—	—			—													—								
—	※JBE-E30056H	105.5					—	—		—	—	—																		
JBE- 3034N	JBE-E 3034N	10.6	9.52 (3/8) × 12.70 (1/2)										R404A	92	49.5	49														
JBE- 4034N	JBE-E 4034N	14.1														12.70 (1/2) × 15.88 (5/8)	53	49.5	57	52	73.5									
JBE- 3045N	JBE-E 3045N	10.6	15.88 (5/8) × 19.05 (3/4)																				92	49.5	56.5					
JBE- 4045N	JBE-E 4045N	14.1																								107	55	60.5	56	73.5
JBE- 5045N	JBE-E 5045N	17.6		—	—	—			—													—								
JBE- 6045N	JBE-E 6045N	21.1					—	—		—	—	—																		
※JBE- 7545N	※JBE-E 7545N	26.4												—	—															
—	※JBE-E10045N	35.2														—	—	—	—	—										
※JBE- 3056N	※JBE-E 3056N	10.6	15.88 (5/8) × 19.05 (3/4)																		92		49.5	56.5	53					
※JBE- 4056N	※JBE-E 4056N	14.1																								107	55	60.5	56	73.5
JBE- 5056N	JBE-E 5056N	17.6		—	—	—			—													—								
JBE- 6056N	JBE-E 6056N	21.1					—	—		—	—	—																		
JBE- 7556N	JBE-E 7556N	26.4											—	—	—															
—	※JBE-E10056N	35.2														—	—	—	—	—										
—	※JBE-E12556N	44.0	—																		—		—	—	—					
—	※JBE-E20056N	70.3																								—	—	—	—	—

*: Only available by order



■ Type JAE thermostatic expansion valve (only available by order)

This is a medium capacity thermostatic expansion valve with welded connections and can also be used in hot gas defrost cycle. Evaporator temperature can be freely set depending on the purpose of use.

Applications	This expansion valve can be used over a wide range of applications including heat pump, cooling, air conditioning, refrigeration, freezing, and ecological equipment. It is also perfect for hot gas defrost cycle.			
Evaporator temperature range	Symbol	Wide	Medium temperature	Low temperature
		W	M	L
	R134a	+10°C to -30°C	-1°C to -30°C	-18°C to -30°C
R22/R407C	+10°C to -40°C	-1°C to -40°C	-18°C to -40°C	
R404A	+10°C to -45°C	-1°C to -45°C	-18°C to -45°C	
Static superheat degree adjustment range	0.5 to 7°C (Usually, adjustment is unnecessary. Do not spin the adjusting screw.)			
Factory setting	Static superheat degree 3.5°C			
Maximum use pressure	2.75MPa			
Air tightness pressure	2.94MPa			
Withstand pressure	4.41MPa			
Temperature sensing bulb sealing method	Gas cross charge			
Maximum use temperature	120°C			
Connection	Brazed type			
Diaphragm diameter	R134a-R404A: 10.6 to 26.4kW R22/R407C : 17.6 to 44.0kW	φ44mm		
	R134a-R404A: 35.2kW or more R22/R407C : 52.7kW or more	φ60mm		
Weight	R134a-R404A: 10.6 to 26.4kW R22/R407C : 17.6 to 44.0kW	450g (Internal pressure equalizing type) 490g (External pressure equalizing type)		
	R134a-R404A: 35.2kW or more R22/R407C : 52.7kW or more	790g (External pressure equalizing type)		

Capacitance change list

Nominal capacity kW	Evaporator temperature												
	10°C	5°C	0°C	-5°C	-10°C	-15°C	-20°C	-25°C	-30°C	-35°C	-40°C	-45°C	
10.6	13.5	12.4	11.6	10.5	9.1	7.9	6.8	6.0	5.8	—	—	—	
14.1	17.5	16.1	15.0	13.6	11.8	10.3	8.9	7.8	7.6	—	—	—	
17.6	21.3	19.6	18.2	16.5	14.4	12.5	10.8	9.5	9.2	—	—	—	
21.1	24.1	22.3	20.7	18.8	16.4	14.2	12.3	10.9	10.6	—	—	—	
26.4	29.2	26.7	25.0	22.7	19.8	17.2	14.9	13.2	12.8	—	—	—	
35.2	36.5	34.3	30.5	26.9	23.4	21.0	18.2	16.3	14.6	—	—	—	
44.0	47.0	44.2	39.4	34.8	30.3	27.4	23.6	21.2	19.0	—	—	—	
70.3	68.0	64.0	57.5	51.0	44.6	40.5	35.1	31.6	28.6	—	—	—	
17.6	20.3	19.8	19.0	18.0	16.9	15.3	14.0	12.5	11.1	10.1	9.1	—	
22.9	26.3	25.7	24.7	23.3	22.1	19.9	18.3	16.2	14.5	13.2	11.8	—	
28.1	32.0	31.3	30.1	28.3	26.9	24.1	22.3	19.8	17.7	16.1	14.4	—	
35.2	36.5	35.6	34.3	32.3	30.7	27.6	25.4	22.6	20.2	18.3	16.5	—	
44.0	44.2	43.1	41.4	39.1	37.1	33.4	30.8	27.5	24.6	22.3	20.1	—	
52.7	55.2	54.9	51.1	48.6	44.5	40.6	37.7	33.3	30.7	26.7	23.3	—	
70.3	71.5	71.1	66.1	63.0	57.8	52.8	49.0	43.4	40.0	34.9	30.4	—	
105.5	104.7	103.9	97.0	92.8	85.4	78.4	73.0	65.0	60.0	52.4	46.0	—	
10.6	16.3	15.7	14.0	13.6	12.4	11.1	9.7	8.7	7.3	6.3	5.5	4.4	
14.1	21.2	20.4	18.7	17.7	16.2	14.4	12.6	11.3	9.5	8.2	7.2	5.7	
17.6	25.7	24.7	22.7	21.4	19.7	17.6	15.4	13.8	11.6	10.0	8.8	7.0	
21.1	29.3	28.2	25.8	24.5	22.4	20.1	17.6	15.8	13.3	11.5	10.1	8.0	
26.4	35.4	33.9	31.2	29.6	27.1	24.2	21.3	19.2	16.2	13.9	12.3	9.8	
35.2	43.9	41.8	39.0	36.5	33.3	29.8	26.1	22.8	19.9	17.1	14.3	11.9	
44.0	56.6	54.0	50.5	47.3	43.1	38.7	34.0	29.8	26.1	22.3	18.7	15.6	
70.3	82.3	78.7	73.7	69.3	63.4	57.2	50.6	44.5	39.1	33.6	28.3	23.7	

● Condenser temperature: 38°C, supercooling temperature: 0°C, superheating temperature change: 4°C/R134a, 3.5°C/R22, 3.5°C/R404A capacity.

Unit: kW

● When the pressure loss of the piping, evaporator, etc. was made 0.

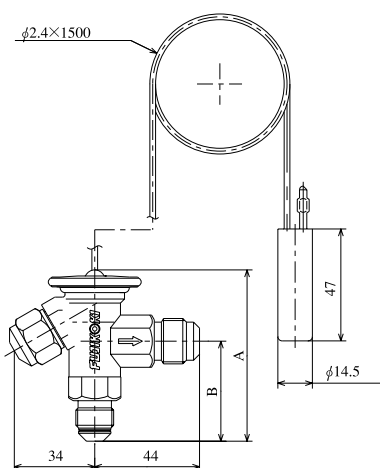
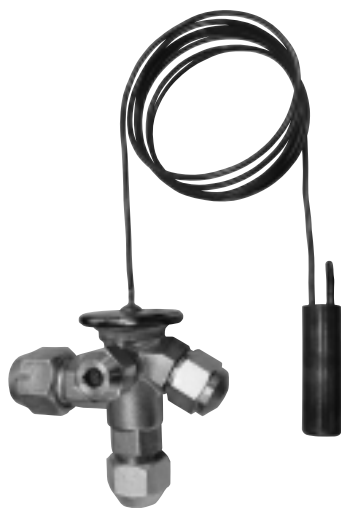
Specifications

Type		Nominal capacity kW	Connecting piping diameter Inlet x outlet mm (inches)	Refrigerant	Dimensions mm				
Internal pressure equalizing type	External pressure equalizing type				A	B	C	D	E
JAE- 3034Q	JAE-E 3034Q	10.6	9.52 (3/8) × 12.70 (1/2)	R134a	92	49.5	56.5	56.5	65.5
JAE- 4034Q	JAE-E 4034Q	14.1							
JAE- 3046Q	JAE-E 3046Q	10.6							
JAE- 4046Q	JAE-E 4046Q	14.1							
JAE- 5046Q	JAE-E 5046Q	17.6							
JAE- 6046Q	JAE-E 6046Q	21.1							
JAE- 7546Q	JAE-E 7546Q	26.4							
JAE- 3047Q	JAE-E 3047Q	10.6							
JAE- 4047Q	JAE-E 4047Q	14.1							
JAE- 5047Q	JAE-E 5047Q	17.6							
JAE- 6047Q	JAE-E 6047Q	21.1							
JAE- 7547Q	JAE-E 7547Q	26.4							
JAE- 3056Q	JAE-E 3056Q	10.6							
JAE- 4056Q	JAE-E 4056Q	14.1							
JAE- 5056Q	JAE-E 5056Q	17.6							
JAE- 6056Q	JAE-E 6056Q	21.1							
JAE- 7556Q	JAE-E 7556Q	26.4							
JAE- 3057Q	JAE-E 3057Q	10.6							
JAE- 4057Q	JAE-E 4057Q	14.1							
JAE- 5057Q	JAE-E 5057Q	17.6							
JAE- 6057Q	JAE-E 6057Q	21.1							
JAE- 7557Q	JAE-E 7557Q	26.4							
—	JAE-E10079Q	35.2	22.22 (7/8) × 28.58 (1 1/8)	107	54	66.5	65.5	73.5	
—	JAE-E12579Q	44.0							
—	JAE-E20079Q	70.3							
—	JAE-E100A1Q	35.2							
—	JAE-E125A1Q	44.0							
—	JAE-E200A1Q	70.3							
—	JAE-E100A2Q	35.2							
—	JAE-E125A2Q	44.0							
—	JAE-E200A2Q	70.3							
—	JAE-E100A3Q	35.2							
—	JAE-E125A3Q	44.0							
—	JAE-E200A3Q	70.3							
—	JAE-E100A4Q	35.2							
—	JAE-E125A4Q	44.0							
—	JAE-E200A4Q	70.3							
JAE- 5034H	JAE-E 5034H	17.6	9.52 (3/8) × 12.70 (1/2)	R22/R407C	92	49.5	56.5	56.5	65.5
JAE- 6534H	JAE-E 6534H	22.9							
JAE- 5046H	JAE-E 5046H	17.6							
JAE- 6546H	JAE-E 6546H	22.9							
JAE- 8046H	JAE-E 8046H	28.1							
JAE-10046H	JAE-E10046H	35.2							
JAE-12546H	JAE-E12546H	44.0							
JAE- 5047H	JAE-E 5047H	17.6							
JAE- 6547H	JAE-E 6547H	22.9							
JAE- 8047H	JAE-E 8047H	28.1							
JAE-10047H	JAE-E10047H	35.2							
JAE-12547H	JAE-E12547H	44.0							
JAE- 5056H	JAE-E 5056H	17.6							
JAE- 6556H	JAE-E 6556H	22.9							
JAE- 8056H	JAE-E 8056H	28.1							
JAE-10056H	JAE-E10056H	35.2							
JAE-12556H	JAE-E12556H	44.0							
JAE- 5057H	JAE-E 5057H	17.6							
JAE- 6557H	JAE-E 6557H	22.9							
JAE- 8057H	JAE-E 8057H	28.1							
JAE-10057H	JAE-E10057H	35.2							
JAE-12557H	JAE-E12557H	44.0							

Specifications

Type		Nominal capacity kW	Connecting piping diameter Inlet x outlet mm (inches)	Refrigerant	Dimensions mm									
Internal pressure equalizing type	External pressure equalizing type				A	B	C	D	E					
—	JAE-E15079H	52.7	22.22 (7/8) × 28.58 (1 1/8)	R22/R407C	107	54	66.5	65.5	73.5					
—	JAE-E20079H	70.3												
—	JAE-E30079H	105.5												
—	JAE-E150A1H	52.7	22.22 (7/8) × 34.92 (1 3/8)											
—	JAE-E200A1H	70.3												
—	JAE-E300A1H	105.5												
—	JAE-E150A2H	52.7	22.22 (7/8) × 41.28 (1 5/8)											
—	JAE-E200A2H	70.3												
—	JAE-E300A2H	105.5												
—	JAE-E150A3H	52.7	28.58 (1 1/8) × 34.92 (1 3/8)											
—	JAE-E200A3H	70.3												
—	JAE-E300A3H	105.5												
—	JAE-E150A4H	52.7	28.58 (1 1/8) × 41.28 (1 5/8)											
—	JAE-E200A4H	70.3												
—	JAE-E300A4H	105.5												
JAE- 3034N	JAE-E 3034N	10.6	9.52 (3/8) × 12.70 (1/2)	R404A	92	49.5	56.5	56.5	65.5					
JAE- 4034N	JAE-E 4034N	14.1												
JAE- 3046N	JAE-E 3046N	10.6	12.70 (1/2) × 19.05 (3/4)											
JAE- 4046N	JAE-E 4046N	14.1												
JAE- 5046N	JAE-E 5046N	17.6												
JAE- 6046N	JAE-E 6046N	21.1												
JAE- 7546N	JAE-E 7546N	26.4												
JAE- 3047N	JAE-E 3047N	10.6								12.70 (1/2) × 22.22 (7/8)				
JAE- 4047N	JAE-E 4047N	14.1												
JAE- 5047N	JAE-E 5047N	17.6												
JAE- 6047N	JAE-E 6047N	21.1												
JAE- 7547N	JAE-E 7547N	26.4												
JAE- 3056N	JAE-E 3056N	10.6	15.88 (5/8) × 19.05 (3/4)											
JAE- 4056N	JAE-E 4056N	14.1												
JAE- 5056N	JAE-E 5056N	17.6												
JAE- 6056N	JAE-E 6056N	21.1												
JAE- 7556N	JAE-E 7556N	26.4												
JAE- 3057N	JAE-E 3057N	10.6								15.88 (5/8) × 22.22 (7/8)				
JAE- 4057N	JAE-E 4057N	14.1												
JAE- 5057N	JAE-E 5057N	17.6												
JAE- 6057N	JAE-E 6057N	21.1												
JAE- 7557N	JAE-E 7557N	26.4												
—	JAE-E10079N	35.2	22.22 (7/8) × 28.58 (1 1/8)								107	54	66.5	65.5
—	JAE-E12579N	44.0												
—	JAE-E20079N	70.3												
—	JAE-E100A1N	35.2	22.22 (7/8) × 34.92 (1 3/8)											
—	JAE-E125A1N	44.0												
—	JAE-E200A1N	70.3												
—	JAE-E100A2N	35.2	22.22 (7/8) × 41.28 (1 5/8)											
—	JAE-E125A2N	44.0												
—	JAE-E200A2N	70.3												
—	JAE-E100A3N	35.2	28.58 (1 1/8) × 34.92 (1 3/8)											
—	JAE-E125A3N	44.0												
—	JAE-E200A3N	70.3												
—	JAE-E100A4N	35.2	28.58 (1 1/8) × 41.28 (1 5/8)											
—	JAE-E125A4N	44.0												
—	JAE-E200A4N	70.3												

■ Type LBE thermostatic expansion valve for extremely low temperatures (R404A specifications)



- Completely stable control is possible at extremely low temperatures.
- Orifice is replaceable type, and capacity can be changed without changing the expansion valve body.
- The thermal sensing bulb uses a gas cross charge with thermal ballast material featuring excellent ambient temperature affect and hunting characteristics.
- Also perfect for hot gas defrost cycle.

Applications	Freezing & refrigerating equipment
Evaporator temperature range	-25°C to -60°C
Static superheat degree adjustment range	0.5 to 7°C
Factory setting	4°C
Maximum use pressure	3.4MPa
Air tightness pressure	3.4MPa
Withstand pressure	4.41MPa
Temperature sensing bulb sealing method	Gas cross charge
Connection	Flare type
Weight	350g (Internal pressure equalizing type) 360g (External pressure equalizing type)

Specifications

Type		Nominal capacity kW	Connection piping diameter Inlet x outlet mm (inches)
R404A			
Internal pressure equalizing type	External pressure equalizing type		
LBE- 224NL	LBE-E 224NL	0.7	6.35 (1/4) × 12.7 (1/2)
LBE- 524NL	LBE-E 324NL	1.8	
LBE- 634NL	LBE-E 634NL	2.1	9.52 (3/8) × 12.7 (1/2)
LBE-1034NL	LBE-E1034NL	3.5	
LBE-1434NL	LBE-E1434NL	4.9	
LBE-1734NL	LBE-E1734NL	6.0	
LBE-1934NL	LBE-E1934NL	6.7	

Capacitance change list

Nominal capacity kW	Orifice No.	Evaporator temperature					Refrigerant used
		-25°C	-30°C	-40°C	-50°C	-60°C	
0.7	0	0.75	0.70	0.60	0.52	0.45	R404A
1.8	1	1.3	1.2	0.7	0.6	0.5	
2.1	2	1.6	1.5	1.0	0.7	0.6	
3.5	3	3.0	2.8	2.2	1.8	1.2	
4.9	4	5.0	4.2	3.3	2.6	1.8	
6.0	5	5.5	5.1	4.0	3.3	2.2	
6.7	6	7.0	6.5	5.0	3.8	3.0	

- Condenser temperature: 32°C, supercooling temperature: 0°C, superheating temperature change: 4°C/R22 capacity
- When the pressure loss of the piping, evaporator, etc. was made 0.

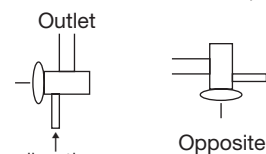
Unit: kW

■ Handling of temperature type automatic expansion valves

Since this device prevents erroneous operation and destruction of the expansion valve, pay careful attention to the following points.

Body installation

- 1) Do not install the body with the expansion valve outlet side facing up.
- 2) Do not install the expansion valve in the opposite direction.
("Opposite direction" is the direction in which the diaphragm is at the bottom.)
It is the direction in which refrigerating oil and foreign matter inside the equipment will easily collect inside the expansion valve and cause trouble.



Thermal sensing bulb installation

Pay careful attention to the following points and correctly install the thermal sensing bulb between the evaporator outlet and the compressor.

- 1) Make the surface of the suction line to which the thermal sensing bulb is to be installed smooth and clean.
- 2) Securely connect the thermal sensing bulb in parallel with the suction line at a horizontal section of the suction line.
- 3) When the outside diameter of the suction line is 3/4 inch or more, install the thermal sensing bulb within a range of 45° downward from the horizontal position as shown in Fig. (1).

Moreover, when diameter of the suction line is less than 3/4 inch, the perimeter temperature error of the bulb can be ignored and the bulb can be installed at any position on the circumference of the line.

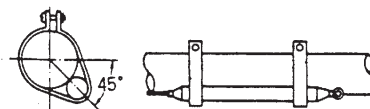
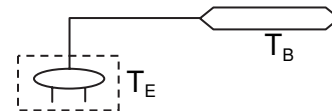


Fig. (1)

- 4) Use the accessory bands to securely fix the thermal sensing bulb. (Fig. (1))
- 5) Block the thermal sensing bulb against the outside air so that it will not be affected by temperatures (especially the affect of ventilation) other than that of the suction line. Always use non-absorbing material to block the thermal sensing bulb.
Moreover, the (thermal sensing bulb temperature) $T_B \leq T_E$ (element temperature) relationship is an appropriate condition.



- 6) Do not install the temperature sensing bulb when the suction line forms a U (Fig. 2) at the evaporator outlet.

This is because liquid and oil will easily collect at the U section and the temperature sensing bulb will be affected by the liquid collected at the U section without regard to load changes. When there is a U section, be sure it is one step lower than the temperature sensing bulb installation position as shown in Fig. (3).

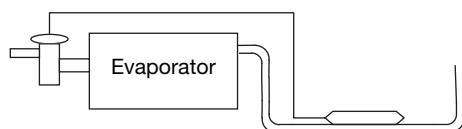


Fig. (2)

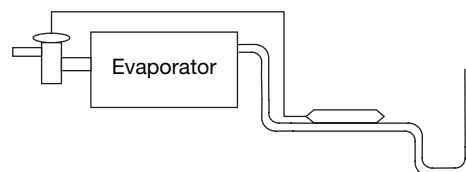


Fig. (3)

- 7) When using an external equalizing type expansion valve, install the temperature sensing bulb at the evaporator side away from the connection position of the equalizing line as shown in Fig. (4).

- 8) When using a header at the evaporator, install the temperature sensing bulb at the compressor side away from the header outlet as shown in Fig. (5).

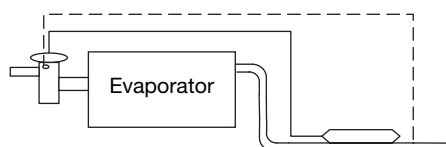


Fig. (4)

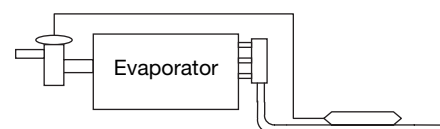
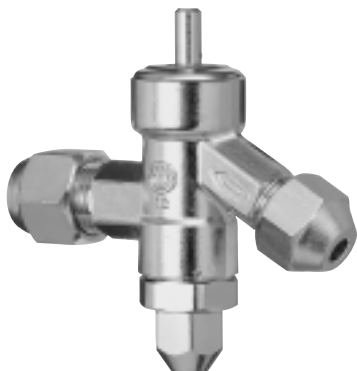


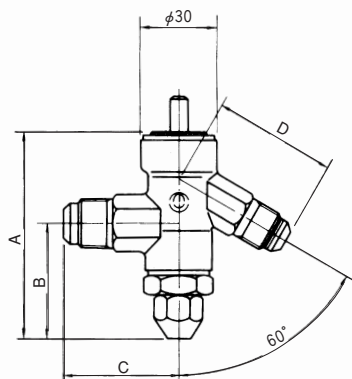
Fig. (5)

■ Type M2 constant pressure expansion valve



The Type M2 constant pressure expansion valve is used with cooling equipment, etc. to prevent the evaporator pressure from dropping below the set value when the refrigerator load is fixed. It can also be used as a bypass circuit for capacity control. When the refrigerator is operating, this expansion valve keeps the evaporation pressure inside the evaporator constant and prevents the liquid refrigerant from flowing into the evaporator by closing when the refrigerator was stopped.

When the refrigerant of the cooling equipment is R134a, R22, or R404A, specify the operating pressure adjustment range symbol (H, M, L) according to the evaporator pressure.



Type	Connection piping diameter Inlet x outlet mm (inches)	Dimensions mm			
		A	B	C	D
M2- 824	6.35 (1/4) × 12.70 (1/2)	79	43	45	48
M2-1224					
M2-1924					
M2-2534	9.52 (3/8) × 12.70 (1/2)	95	55	46	55
M2-2734					
M2-3734					

Operating pressure adjustment (high temperature use: H
range and symbols low temperature use: L) made to order

Symbol	Operating pressure adjustment range	Factory setting	Amount of change per 1 turn of adjusting screw	Air tightness pressure	Maximum use pressure	Withstand pressure
High temperature use	H 0.441 to 0.226MPa	0.324MPa	Approx. 0.02MPa	1.67MPa	1.37MPa	4.41MPa
Medium temperature use	M 0.275 to 0.095MPa	0.157MPa				
Low temperature use	L 0.118 to -0.093MPa	0.098MPa				

- Since general purpose products are medium temperature use M symbol products, when ordering H or L symbol products, please specify the symbols above.
- M is not appended to the end of the type designation for M symbol products, but a symbol is displayed at the end of the type designation of H and L products.
- Special operating pressure adjustment range (0.706 to 0.490MPa) specifications for high temperature use and above are also available. Please inquire separately.

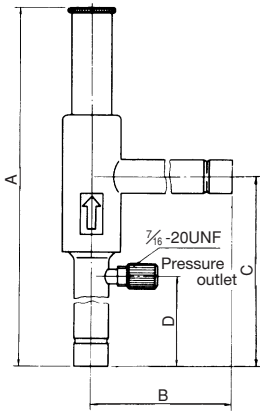
Capacitance change list

Type	Nominal capacity kW	Evaporator temperature											
		10°C	5°C	0°C	-5°C	-10°C	-15°C	-20°C	-25°C	-30°C	-35°C	-40°C	-45°C
M2- 524	0.7	0.80	0.77	0.73	0.67	0.59	0.55	0.49	0.43	0.41	—	—	—
M2- 824	1.1	1.5	1.4	1.3	1.2	1.1	0.99	0.87	0.78	0.72	—	—	—
M2-1224	1.8	2.7	2.5	2.3	2.0	1.8	1.6	1.4	1.2	1.1	—	—	—
M2-1924	3.5	4.7	4.3	4.0	3.5	3.0	2.7	2.3	2.0	1.8	—	—	—
M2-2534	5.3	6.5	5.9	5.4	4.7	4.0	3.6	3.1	2.7	2.4	—	—	—
M2-3034	7.0	7.9	7.2	6.6	5.7	4.9	4.4	3.8	3.3	3.0	—	—	—
M2-2734	10.6	12.2	11.1	10.2	8.8	7.6	6.9	5.9	5.1	4.6	—	—	—
M2-3734	14.1	18.5	15.6	14.3	12.4	10.7	9.6	8.2	7.1	6.4	—	—	—
M2- 524	1.1	—	—	1.2	1.2	1.1	1.0	0.95	0.84	0.73	0.66	0.55	—
M2- 824	1.8	—	—	2.3	2.2	2.0	1.9	1.7	1.5	1.3	1.2	0.97	—
M2-1224	2.8	—	—	3.9	3.7	3.4	3.1	2.7	2.4	2.1	1.9	1.5	—
M2-1924	5.6	—	—	6.8	6.3	5.8	5.2	4.6	4.0	3.4	3.0	2.4	—
M2-2534	8.4	—	—	9.4	8.6	7.8	6.9	6.2	5.3	4.5	4.0	3.2	—
M2-3034	11.3	—	—	11.4	10.5	9.5	8.4	7.5	6.4	5.5	4.8	3.9	—
M2-2734	16.9	—	—	17.7	16.2	14.7	13.1	11.6	10.0	8.5	7.4	6.0	—
M2-3734	22.5	—	—	24.9	22.8	20.6	18.2	16.1	13.8	11.7	10.3	8.3	—
M2- 524	0.7	—	—	—	0.91	0.84	0.77	0.70	0.62	0.56	0.48	0.40	0.33
M2- 824	1.1	—	—	—	1.7	1.5	1.4	1.3	1.1	0.99	0.85	0.71	0.58
M2-1224	1.8	—	—	—	2.8	3.7	2.3	2.1	1.8	1.6	1.3	1.1	0.81
M2-1924	3.5	—	—	—	5.1	4.4	4.7	3.5	3.0	2.6	2.2	1.8	1.4
M2-2534	5.3	—	—	—	6.8	6.0	5.3	4.7	4.0	3.5	2.9	2.4	1.9
M2-3034	7.0	—	—	—	8.3	7.3	6.5	5.7	4.8	4.2	3.5	2.9	2.3
M2-2734	10.6	—	—	—	12.8	11.3	10.1	8.8	7.5	6.5	5.5	4.6	3.6
M2-3734	14.1	—	—	—	18.0	15.9	14.1	12.3	10.4	9.0	7.7	6.3	4.9

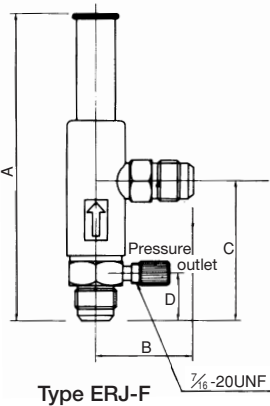
- Condenser temperature: 38°C, supercooling temperature: 0°C, superheating temperature change: 4°C/R134a, 3.5°C/R22, 3.5°C/R404A capacity at each corresponding pressure.

Unit: kW

- When the pressure loss of the piping, evaporator, etc. was made 0.



Type ERJ-Y



Type ERJ-F

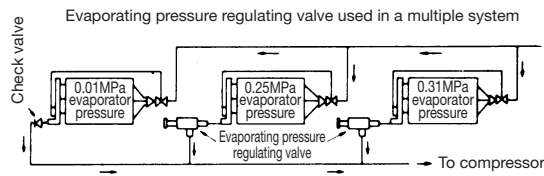
■ Type ERJ evaporating pressure regulating valve

■ Type ER evaporating pressure regulating valve (only available by order)

These valves can be used with equipment that adjusts the flow of an evaporator by means of a thermostatic expansion valve, etc. The thermostatic expansion valve controls the refrigerant flow in response to the load. However, since the evaporator temperature and pressure are not control objectives, an evaporating pressure regulating valve is installed because the evaporating pressure must be maintained. Compatible refrigerants are R134a, R22, and R404A.

[Example of use]

The figure is an example of installation to prevent excessive drying by maintaining and adjusting the temperature at each of the medium and high temperature evaporators of a multi-evaporator refrigerator at which 2 or more evaporators are kept at a different temperature.



Evaporator pressure change and capacity conversion factor

Evaporator pressure change MPa	0.014	0.027	0.04	0.06	0.07	0.085	0.1
Capacity conversion factor	0.3	0.6	0.76	1.0	1.18	1.3	1.4

● The table above is used to calculate the capacity when the evaporator pressure change is other than 0.06MPa.

Specifications

Type	Maximum use pressure	Air tightness pressure	Adjustment range	Maximum use liquid temperature	Factory setting	Dimensions mm				Connection		Weight g
						A	B	C	D	Piping diameter mm (inches)	Shape	
ERJ-4F	2.5MPa	3.0MPa	0.05 to 0.69MPa	100°C	0.2MPa	171	51	77	25	12.7 (1/2)	Flare	500
ERJ-5F						173	54	79	27	15.9 (5/8)		550
ERJ-6F						177	89	83	31	19.1 (3/4)		600
ERJ-4Y						245	133	151	83	12.7 (1/2)	Brazed	500
ERJ-5Y						245	133	151	83	15.9 (5/8)		550
ERJ-6Y						245	133	151	83	19.1 (3/4)		550
ERJ-7Y						245	133	151	83	22.2 (7/8)		600
ERJ-8Y						310	145	196	85	25.4 (1)		1200
ERJ-9Y						310	145	196	85	28.6 (1 1/4)		1200

● The no pressure outlet type designation takes the "J" symbol after "ER". (Example) ER-4F

● Pressure adjustment: ERJ-4 to 7---Approx. 0.06MPa/turn

ERJ-8 to 9---Approx. 0.04MPa/turn

When the adjusting screw is turned clockwise, the pressure rises.

Capacitance change list (kW)

Type	Evaporating pressure temperature °C	Refrigerant used R134a						Refrigerant used R22						Refrigerant used R404A					
		Saturation pressure MPa	Pressure difference before and after valve MPa					Saturation pressure MPa	Pressure difference before and after valve MPa					Saturation pressure MPa	Pressure difference before and after valve MPa				
			0.014	0.034	0.069	0.137	0.014		0.034	0.069	0.137	0.014	0.034		0.069	0.137			
ERJ 4F to 6F 4Y to 7Y	5	0.25	3.3	5.7	8.1	11.0	0.48	4.3	7.1	10.7	15.7	0.61	3.7	6.2	8.8	11.9			
	0	0.20	3.0	4.9	6.9	9.1	0.39	3.9	6.4	9.7	13.7	0.51	3.3	5.3	7.5	9.8			
	-5	0.15	2.7	4.6	6.4	7.5	0.32	3.6	5.8	8.7	12.2	0.42	3.0	4.9	6.8	8.0			
	-10	0.10	2.4	3.9	5.1	6.4	0.25	3.1	5.2	7.8	10.2	0.34	2.6	4.2	5.4	6.8			
	-15	0.06	2.1	3.6	4.4	5.3	0.20	3.0	4.4	6.8	8.4	0.26	2.3	3.8	4.6	5.6			
	-20	0.03	1.9	2.8	3.7	—	0.15	2.5	4.0	5.9	7.1	0.21	2.0	3.0	3.9	4.7			
ERJ 8Y to 9Y	5	0.25	8.1	12.9	18.3	23.6	0.48	10.7	17.1	24.5	33.9	0.61	8.8	14.0	19.8	25.6			
	0	0.20	7.3	11.9	16.1	19.9	0.39	9.7	15.4	21.9	29.9	0.51	7.9	12.8	17.3	21.4			
	-5	0.15	6.6	10.4	13.8	16.5	0.32	8.8	13.9	19.7	26.7	0.42	7.1	11.1	14.7	17.5			
	-10	0.10	5.9	9.2	12.0	13.9	0.25	7.6	12.1	17.5	22.3	0.34	6.2	9.8	12.7	14.7			
	-15	0.06	5.0	8.4	10.2	11.4	0.20	6.9	10.9	15.3	18.5	0.26	5.3	8.8	10.7	12.0			
	-20	0.03	4.8	6.7	8.4	—	0.15	6.0	9.6	12.8	15.5	0.21	5.0	7.0	8.7	10.3			
-25	0.01	—	—	—	—	0.10	5.4	8.4	11.0	12.7	0.16	4.6	6.2	7.6	8.3				

● Shows the capacity at condensing temperature 40°C, superheating 5.5°C.

● The capacity change table outlines the capacity vs. pressure difference before and after the valve.

(Since the pressure difference before and after the valve depends on the refrigerator load and the state of the refrigerant, use the capacity as a guideline.)

■ Type SRJ suction pressure regulating valve

■ Type SR suction pressure regulating valve (only available by order)



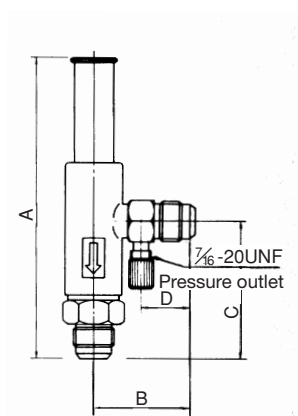
These pressure regulating valves lighten the load on the refrigerator by preventing a large amount of refrigerant from flowing inside the compressor when the refrigerating equipment is off and quickly lowering the suction pressure to the set pressure when the compressor starts.

Compatible refrigerants are R134a, R22, and R404A.

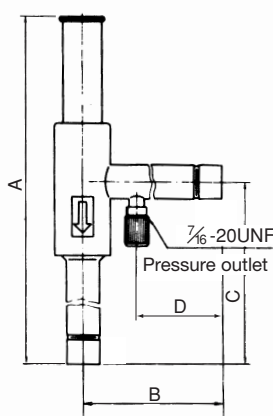
[Suction pressure regulating valve capacity selection]

1. Use a type of the same size as the refrigerator piping.
2. The capacity table outlines the capacity vs. pressure difference before and after the valve.

(Since the pressure difference before and after the valve depends on the refrigerator load and refrigerant state, use the capacity as a guideline.)



Type SRJ-F



Type SRJ-Y

Specifications

Type	Maximum use pressure	Air tightness pressure	Adjustment range	Maximum use liquid temperature	Factory setting	Dimensions mm				Connection		Weight g
						A	B	C	D	Piping diameter mm (inches)	Shape	
SRJ-4F	2.5MPa	3.0MPa	0.05 to 0.69MPa	100°C	0.2MPa	171	51	77	25	12.7 (1/2)	Flare	500
SRJ-5F						173	54	79	27	15.9 (5/8)		550
SRJ-6F						177	89	83	31	19.1 (3/4)		600
SRJ-4Y						Brazed	245	133	151	83	12.7 (1/2)	500
SRJ-5Y							245	133	151	83	15.9 (5/8)	550
SRJ-6Y							245	133	151	83	19.1 (3/4)	550
SRJ-7Y							245	133	151	83	22.2 (7/8)	600
SRJ-8Y							310	145	196	85	25.4 (1)	1200
SRJ-9Y							310	145	196	85	28.6 (1 1/8)	1200
SRJ-11Y							310	145	196	85	34.9 (1 3/8)	1250

● The no pressure outlet type designation takes the "J" symbol after "SR". (Example) SR-4F

● Pressure adjustment: {SRJ4 to 7---Approx. 0.06MPa/turn

{SRJ8 to 11---Approx. 0.04MPa/turn

When the adjusting screw is turned clockwise, the pressure rises.

Capacitance change list (kW)

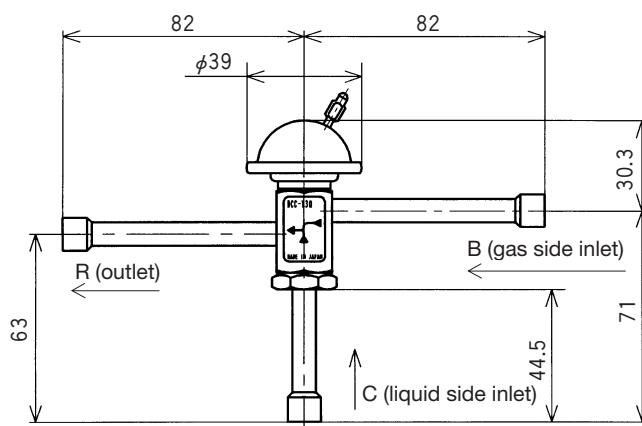
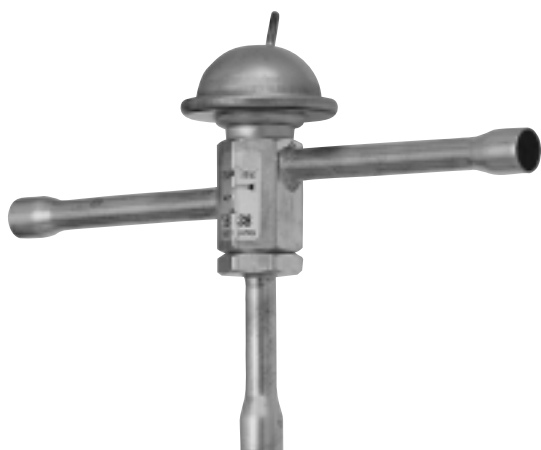
Type	Suction pressure MPa	Saturation temperature °C	Pressure difference before and after valve MPa (hPa)																		Refrigerant
			0.003 (30)						0.007 (70)						0.013 (130)						
			Set pressure MPa																		
			0.07	0.14	0.21	0.27	0.34	0.41	0.07	0.14	0.21	0.27	0.34	0.41	0.07	0.14	0.21	0.27	0.34	0.41	
SRJ-4F	0	-26	1.2	2.1	2.5	2.6	2.6	2.6	1.7	2.9	3.5	3.7	3.7	3.7	2.4	4.1	4.9	5.2	5.2	5.2	R134a
SRJ-5F	0.07	-14	—	1.7	2.8	3.4	3.6	3.6	—	2.4	3.9	4.8	5.0	5.0	—	3.3	5.6	6.7	7.0	7.0	
SRJ-6F	0.14	-6	—	—	2.0	3.4	4.0	4.2	—	—	2.8	4.7	5.7	5.9	—	—	4.0	6.8	8.0	8.5	
SRJ-4Y	0.21	1	—	—	—	2.4	3.9	4.4	—	—	—	3.3	5.6	6.7	—	—	—	4.7	7.9	9.4	
SRJ-5Y	0.27	7	—	—	—	—	2.7	4.6	—	—	—	—	3.9	6.6	—	—	—	—	5.5	9.4	
SRJ-6Y	0.34	12	—	—	—	—	—	3.2	—	—	—	—	—	4.6	—	—	—	—	—	6.5	
SRJ-7Y	0.34	12	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	6.5	
SRJ-8Y	0	-26	3.2	5.4	5.4	5.4	5.4	5.4	4.5	7.6	7.6	7.6	7.6	7.6	6.1	10.6	10.6	10.6	10.6	10.6	R134a
SRJ-9Y	0.07	-14	—	4.3	7.3	7.3	7.3	7.3	—	6.0	10.3	10.3	10.3	10.3	—	8.4	14.4	14.4	14.4	14.4	
SRJ-11Y	0.14	-6	—	—	5.1	8.8	8.8	8.8	—	—	7.2	12.4	12.4	12.4	—	—	10.0	17.3	17.3	17.3	
SRJ-9Y	0.21	1	—	—	—	6.0	10.3	10.3	—	—	—	8.5	14.6	14.6	—	—	—	11.7	20.3	20.3	
SRJ-11Y	0.27	7	—	—	—	7.1	12.1	12.1	—	—	—	10.1	17.1	17.1	—	—	—	—	13.9	24.0	
SRJ-8Y	0.34	12	—	—	—	—	—	8.4	—	—	—	—	—	11.9	—	—	—	—	—	16.4	
SRJ-4F	0	-40	1.2	2.1	2.5	2.6	2.6	2.6	1.7	2.9	3.5	3.7	3.7	3.7	2.5	4.2	4.9	5.2	5.2	5.2	R22
SRJ-5F	0.07	-29	—	1.6	2.7	3.3	3.5	3.5	—	2.3	3.8	4.6	4.9	4.9	—	3.2	5.4	6.4	6.8	6.8	
SRJ-6F	0.14	-21	—	—	1.9	3.3	4.0	4.2	—	—	2.7	4.6	5.6	5.9	—	—	3.9	6.6	7.8	8.3	
SRJ-4Y	0.21	-14	—	—	—	2.2	3.8	4.5	—	—	—	3.1	5.3	6.4	—	—	—	4.5	7.5	8.9	
SRJ-5Y	0.27	-8	—	—	—	—	2.5	4.2	—	—	—	—	3.5	5.9	—	—	—	—	5.0	8.1	
SRJ-6Y	0.34	-3	—	—	—	—	—	2.4	—	—	—	—	—	3.4	—	—	—	—	—	5.5	
SRJ-7Y	0.34	-3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	5.5	
SRJ-8Y	0	-40	3.1	5.4	5.4	5.4	5.4	5.4	4.4	7.6	7.6	7.6	7.6	7.6	6.1	10.6	10.6	10.6	10.6	10.6	R22
SRJ-9Y	0.07	-29	—	4.1	7.0	7.0	7.0	7.0	—	5.8	10.0	10.0	10.0	10.0	—	8.0	13.9	13.9	13.9	13.9	
SRJ-11Y	0.14	-21	—	—	5.0	8.6	8.6	8.6	—	—	7.1	12.1	12.1	12.1	—	—	9.8	16.9	16.9	16.9	
SRJ-9Y	0.21	-14	—	—	—	5.7	9.8	9.8	—	—	—	8.1	13.8	13.8	—	—	—	11.2	17.4	17.4	
SRJ-11Y	0.27	-8	—	—	—	—	6.4	10.9	—	—	—	—	9.0	15.4	—	—	—	—	12.4	21.5	
SRJ-8Y	0.34	-3	—	—	—	—	—	7.0	—	—	—	—	—	9.9	—	—	—	—	—	13.6	
SRJ-4F	0	-47	0.8	1.3	1.6	1.7	1.7	1.7	1.1	1.8	2.2	2.3	2.3	2.3	1.5	2.6	3.1	3.3	3.3	3.3	R404A
SRJ-5F	0.07	-33	—	1.1	1.8	2.2	2.3	2.3	—	1.5	2.6	3.1	3.3	3.3	—	2.2	3.7	4.4	4.6	4.6	
SRJ-6F	0.14	-27	—	—	1.3	2.3	2.7	2.8	—	—	1.9	3.2	3.8	3.9	—	—	2.6	4.5	5.3	5.7	
SRJ-4Y	0.21	-20	—	—	—	1.6	2.7	2.9	—	—	—	2.2	3.7	4.5	—	—	—	3.2	5.3	6.3	
SRJ-5Y	0.27	-14	—	—	—	—	1.9	3.2	—	—	—	—	2.6	4.5	—	—	—	—	3.8	6.4	
SRJ-6Y	0.34	-10	—	—	—	—	—	2.2	—	—	—	—	—	3.1	—	—	—	—	—	4.5	
SRJ-7Y	0.34	-10	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4.5	
SRJ-8Y	0	-47	2.0	3.4	3.4	3.4	3.4	3.4	2.8	4.8	4.8	4.8	4.8	4.8	3.9	6.7	6.7	6.7	6.7	6.7	R404A
SRJ-9Y	0.07	-33	—	2.8	4.7	4.7	4.7	4.7	—	3.9	6.7	6.7	6.7	6.7	—	5.5	9.4	9.4	9.4	9.4	
SRJ-11Y	0.14	-27	—	—	3.4	5.8	5.8	5.8	—	—	4.8	8.2	8.2	8.2	—	—	6.6	11.5	11.5	11.5	
SRJ-9Y	0.21	-20	—	—	—	4.0	6.9	6.9	—	—	—	5.7	9.8	9.8	—	—	—	7.9	13.6	13.6	
SRJ-11Y	0.27	-14	—	—	—	—	4.9	8.2	—	—	—	—	6.8	11.6	—	—	—	—	9.4	16.3	
SRJ-8Y	0.34	-10	—	—	—	—	—	5.8	—	—	—	—	—	8.1	—	—	—	—	—	11.2	

■ Type DCC condensing pressure regulating valve (only available by order)

Since this valve maintains an appropriate condenser pressure in response to the outside air temperature changes of an air-cooled condenser, the refrigerating capacity is stable throughout the year.

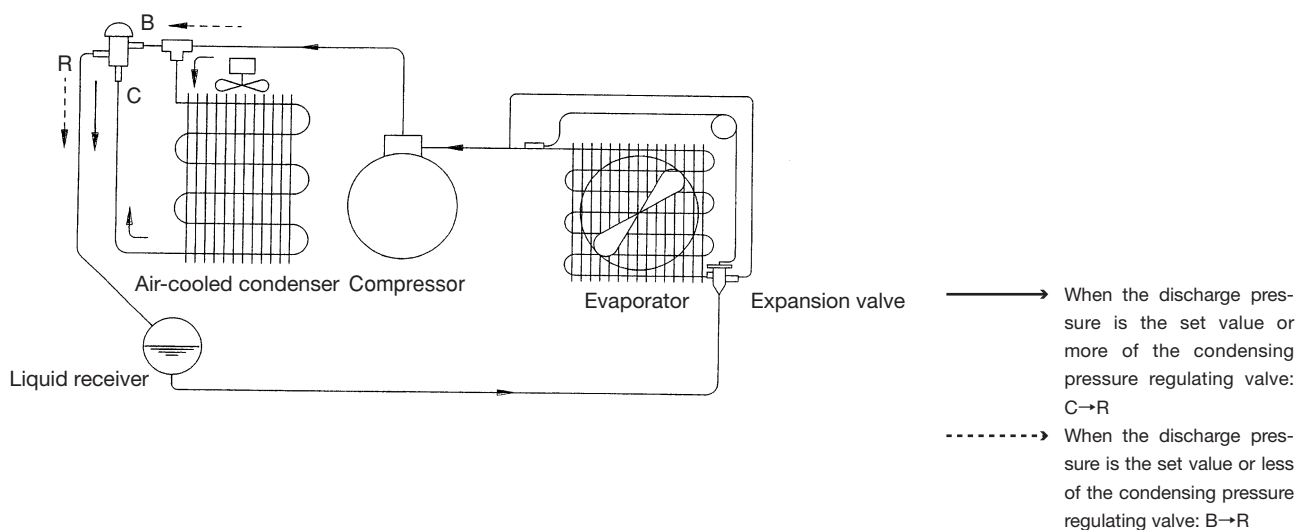
This regulating valve is perfect for use in hot gas defrost cycle and in regions where the outside temperature is low.

Compatible refrigerants are R134a, R22, and R404A.



[Usage example]

Condenser pressure regulating valve

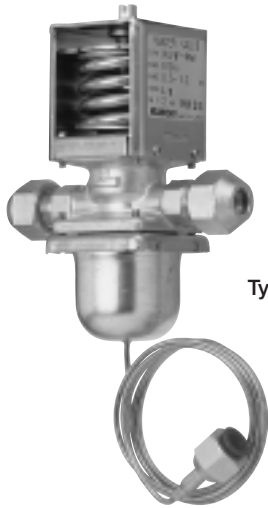


Specifications

Type	Connection		Valve diameter mm	Refrigerant	Factory setting MPa	Maximum use liquid temperature °C	Maximum use pressure MPa	Air tightness pressure MPa	Withstand pressure MPa	Weight g
	Piping diameter mm (inch)	Shape								
DCC-Y3Q	9.5 (3/8)	Blazed	5.5	R134a	0.83	120	2.9	2.9	4.4	155
DCC-Y3H				R22	1.32					
DCC-Y3N				R404A	1.52					

■ Type WV water regulating valve (pressure type)

■ Type WVF water regulating valve (only available by order)



Type WVF

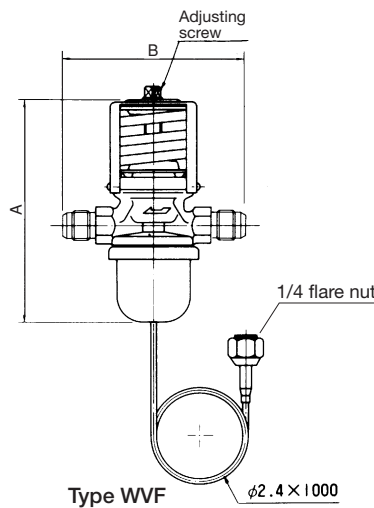


Type WV

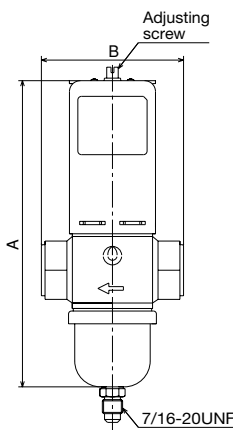
The Type WV and WVF water regulating valves control water flow in proportion to the pressure in a condenser. These valves automatically regulate the flow of cooling water required to stabilize the refrigerant pressure in the condenser in response to pressure changes in the valves. When the refrigerator is stopped, these valves automatically stop the flow of cooling water. When the adjusting screw is turned clockwise, the cooling water flow rate decreases.

When there is the danger of freezing when the refrigerator is not used in the winter, etc., always drain the water from the cooling system. Otherwise, the condenser, piping, water regulating valve and other devices may be damaged.

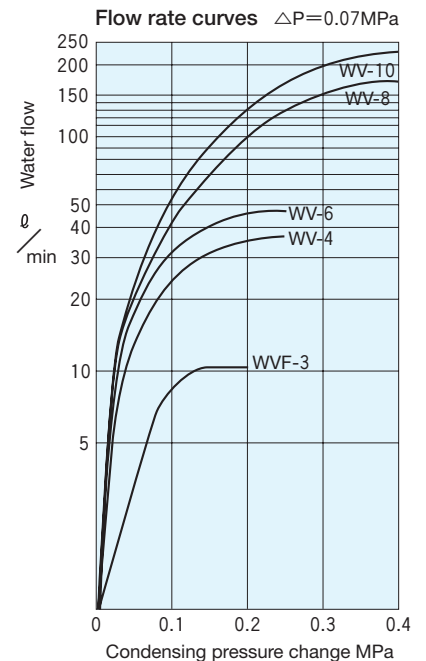
A Type S-4G water strainer (page 47) is available for use with the Type WV-4.



Type WVF φ2.4 × 1000



Type WV



The flow rate curves are for water regulating valve outlet/inlet pressure difference $\Delta P=0.07\text{MPa}$. When the water regulating valve outlet/inlet pressure difference is other than $\Delta P=0.07\text{MPa}$, multiply by the correction coefficient given in the table below.

Pressure difference correction coefficient

ΔP MPa	Correction coefficient
0.04	0.75
0.07	1
0.1	1.2
0.2	1.7
0.3	2
0.4	2.4

Installation posture

Install the water regulating valve piping with the adjusting screw at the top.

(When unavoidable, the water regulating valve can be used between the perpendicular and horizontal.)

Condensing pressure change per 1 turn of the adjusting screw

When the adjusting screw is turned clockwise, the pressure per 1 turn shown below rises. Use this as a guideline during pressure adjustment.

Type	Amount of change (MPa/turn)
WVF-3M	Approx. 0.08
WVF-3H	Approx. 0.10
WV-4	Approx. 0.12
WV-6	
WV-8M WV-8H	Approx. 0.09
WV-10M WV-10H	

Specifications

Type	Condensing pressure regulation range MPa	Maximum use pressure MPa	Body connection		Dimensions mm		Connection pipe type	Refrigerant	Water pressure resistance MPa	Weight g
			Piping diameter mm	Shape	A	B				
※WVF-3M	0.5~1.2	2.0	9.5	Flare	127	100	1/4 flare nut type	R134a	1.0	900
※WVF-3H	0.7~1.5				R22•R404A	900				
WV-4	0.5~1.8	2.0	21.7	Rc $\frac{1}{2}$	168	78	R134a	1250		
WV-6				Rc $\frac{3}{4}$	168	80	R22•R404A	1300		
WV-8M	0.5~1.2	2.0	34.0	Rc1	210	116	R134a	4000		
WV-8H	0.7~1.4						R22•R404A	4000		
WV-10M	0.5~1.2						R134a	4500		
WV-10H	0.7~1.4						R22•R404A	4500		

● * : Only available by order

Type EXT thermostat

Large-capacity power elements have been integrated to improve the temperature control accuracy. This thermostat uses a switch that quickly opens and closes with large contact/opening forces, preventing contact welding and radio wave hindrance. Safety factors have been fully taken into account: a grounding terminal installed and terminal arrangement improved for easier wiring. The main part of the body uses stainless steel to provide improved corrosion resistance. An additional port for capillary installation is provided in the top left of the backside of the body for easier assembly and installation without spoiling the elegant appearance. You will be able to enjoy simpler piping and body installation than ever.

Specifications

Type	Adjustment range °C	On/Off temperature difference (DIFF)	Connection terminal	Thermal sensing bulb limit temperature °C	Thermal sensing bulb length mm	Thermostatic charge	Weight g
EXT-60	30 to 90	2 to 4	Common cooling	100	55	A	285
EXT-C15	-10 to 40	Approx. 2.5	Common cooling	60	55	A	
EXT-1	-20 to 20		Common cooling	60	55	A	
EXT-M15	-30 to 0		Common cooling	60	55	A	
EXT-M35	-50 to -20		Common cooling	60	86	G	
EMT3-1	-20 to 20		1.3	Common cooling	60	84	

The standard capillary tube is 1 m long (2 m for EXT-M35). 2m and 3m tubes are also available.

The on/off temperature difference (DIFF) indicates the value for the center of the adjustable range.

Electrical ratings

(Unit: A)

Rated current	Rated voltage			
	AC125V	AC250V	DC12V	DC24V
Power factor (close/trip)	0.7 to 0.8/ 0.4 to 0.5	0.7 to 0.8/ 0.4 to 0.5	Inductive load	Inductive load
Instantaneous current value	50	50	5 (3)	3 (3)
Non-inductive load current value	15 (3) ※	15 (3)	5 (3)	3 (3)
Contact configuration	Single pole/double throw (SP/DT)			

* Data inside parenthesis indicates the electric capacity when the common and heating contacts are connected.

Important : Type EMT3-1 has lower electric rating than that shown in the table above.

(The instantaneous current of EMT3-1 is 15 A for 125VAC or 10 A for 250VAC).

To open and close a circuit with higher current than those shown in the table above such as motor load, use an electromagnetic switch.

About switches of EXT thermostats

A thermostat can turn on and off two types of loads: resistance load such as lamps and heaters and inductive load such as relays, solenoid valves and motors. The amount of current then would range from a few milli-amperes to even ten amperes. Particularly in a circuit with an inductive load, a large arc current will flow when the switch is turned on or off. This may cause contact welding or radio wave hindrance. The EXT thermostat uses a switch that has been developed to eliminate these problems. The switch provides four major features: 1) higher pressure applied to contacts closed, 2) higher opening force of contacts, 3) less chattering, and 4) contact material with a high melting point.

Precaution for installation

To install, use the supplied screws or alternate appropriate screws the same size as the thickness of the bracket plus 6 mm or less.

EDP-1 drip-proof case

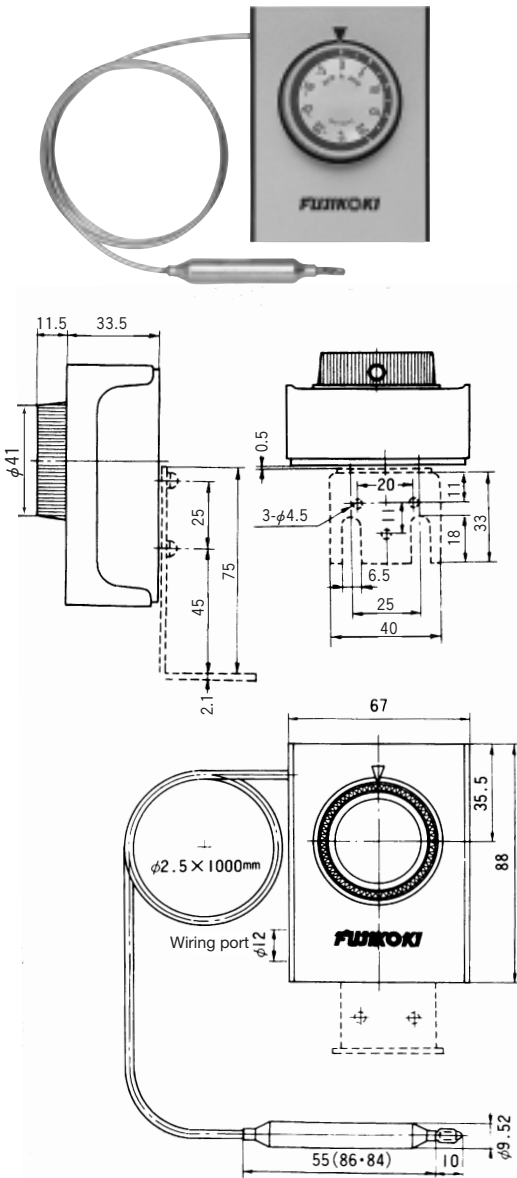
This is a special drip-proof case for the EXT thermostat. Recommended to use this case when you install an EXT thermostat on a defrost circuit or any other location where the thermostat may be exposed to water. [Use the EDP-1 special bracket (supplied in a same package).]

P compression fitting for bulb mounting

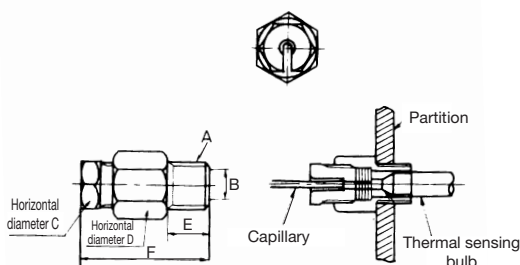
When the thermostat is used with its bulb inserted into a duct or refrigerator, the compression fitting can be used to secure the bulb on the wall. The threaded fitting ensures perfect stop.

Unit: mm

Type	A (inches)	B	C	D	E	F
P30	R 3/8	φ9.7	21	21	15	(47.5)
P40	R 1/2	φ13.0	22	26	19	(56.5)
P60	R 3/4	φ19.5	29	35	20	(60.5)
P80	R1	φ25.8	38	40	23	(68.5)



Type EDP-1 drip-proof case

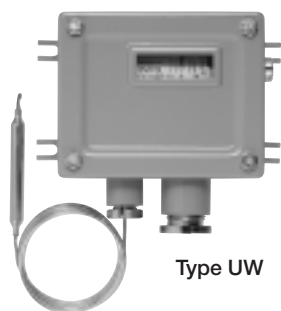


Type P thermal sensing bulb mounting screw

■ Type U, Type U3 thermostat

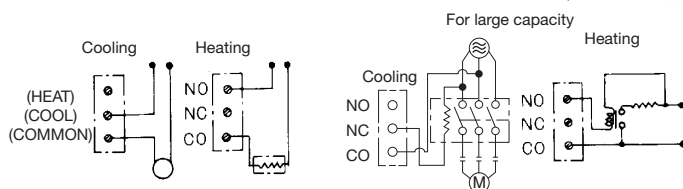
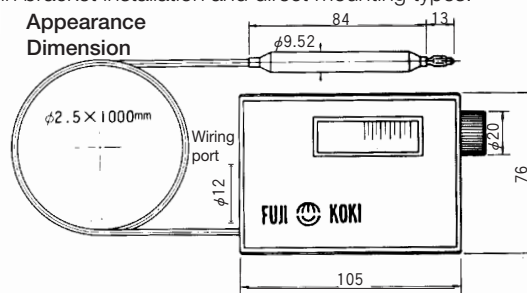


Type U, Type U3



Type UW

These thermostats can control temperature over a wide enough range to make it possible to use them for a variety of applications including refrigeration and air-conditioning. The on/off temperature difference (DIFF) can be adjusted. A water-proof model (Type UW) is also available for use in a place where it may be exposed to water. The main part of the thermostat body uses stainless steel to provide improved corrosion resistance. The capillary port is so designed to allow easy connection and removal without spoiling the elegant appearance. The product is available in bracket installation and direct mounting types.



Terminals wiring method

When used in cooling	CO-NC	Pointer indicates the OFF point
When used in heating	CO-NO	Pointer indicates the ON point

The switch is a single pole/double throw type. Therefore, it can be used for cooling or heating. The basic connections conform to the diagram at the left.

Specifications

Type	Adjustment range °C	On/Off temperature difference °C				Thermostatic charge	Thermal sensing bulb limit temperature °C	Weight g
		Min.		Max.				
		Low temperature part	High temperature part	Low temperature part	High temperature part			
U-M30	-50 to -10	2	1	5	3	G	50	350
U-5	-20 to 30		3		6.5	A	60	
U-60	20 to 100		3		7		120	
U-110	90 to 150	4	2	10	5	L	160	
U-160	140 to 190	5	3	10	6		210	

- Data on the table above was collected through operating temperature tests using a brine temperature tank.
- The on/off temperature differences shown on the table above are based on the center value of the adjustable range. High indicates the upper controlled temperature and Low indicates the lower controlled temperature.
- The standard capillary tube is 1 m long. 2m and 3m tubes are also available.

Electrical ratings (Type U, Type UW)

(Unit: A)

Voltage rating	AC125V	AC250V	DC12V	DC24V
Motor load current value	(CO-NC) 5.8	2.9	2	1
	(CO-NO) 3.5	2	1.2	0.6
Instantaneous current value	35	18	10	10
Non-inductive load current value	10	5	4	2
Contact configuration	Single pole/double throw (SP/DT)			

To turn on and off a load with higher currents than those shown in the table above, always use an electromagnetic switch.

U3 thermostats(only available by order)

The U3 thermostat is a sensitive regulator suitable for applications where smaller temperature differences are required than for Type U.

The temperature difference of Type U3 is 1.3°C (average).

The U3's specifications, temperature adjustable range (except the temperature differences), thermostatic charge, appearance, and dimensions are all the same as those for Type U.

Note that the U3 thermostats have no adjusting screw for changing the temperature difference because they have a fixed on/off temperature difference.

Electrical ratings (Type U3)

(Unit: A)

Voltage rating	AC125V	AC250V	DC12V	DC24V
Non-inductive load current value	15	10	5	1
Contact configuration	3	2	2	0.6
Motor load current value	Single pole/double throw (SP/DT)			

Important: Never use screws longer than the supplied screws (M4×0.7×6 mm) to install a bracket.



Type FCT digital thermostat



- The Type FCT digital thermostat is suitable for temperature control in cooling, heating, and a diversity of other applications.
- Simple function type, 2 outputs type, and high/low temperature alarm type that cover a wide range of applications, temperature ranges, and installation methods and meet the needs of users are available.
- Simple setting by large LED display and button operation
- Dimensions and installation are interchangeable with the existing Type FCT digital thermostat
- Easy-to-use free power supply (AC85V to 264V)
- Thermostats for low temperature use (-50°C to 50°C) and high temperature use (0°C to 100°C) are available
- 0.5°C minimum on-off temperature differential (DIFF)
- Box type and panel mounted type are available to match the installation method
- A salt water sensor (sold separately) is available

Application

Prefabricated freezer and refrigerator, industrial freezer and refrigerator, show cases, kitchen, flower case, pond, etc.

Fujikoki is the generic name of Fujikoki digital thermostats.

FCT-S: Single function type

- Temperature output only single function type
- Setting is simple on/off temperature setting only

Type

Type	Temperature range
FCT-L50S (P)	Low temperature use (-50°C to 50°C)
FCT-H00S (P)	High temperature use (0°C to 100°C)

* P at the end of the type designation indicates panel mounted type.

Panel mounted type (embedded type) can be secured from the front or back of the panel.

Appearance



(Box type)



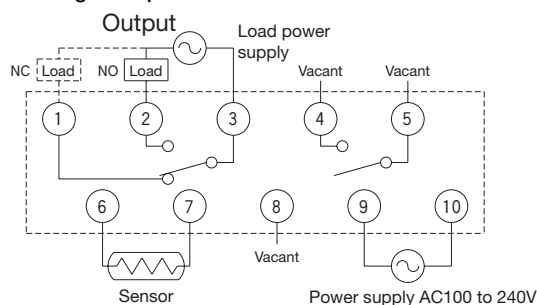
(Panel mounted type)

Specifications

Items	Type	FCT-L50S (P)	FCT-H00S (P)
Temperature setting range		-50°C to 50°C (0.5°C step)	0°C to 100°C (0.5°C step)
Temperature regulation operation characteristics (Selectable by setting item)		(When cooling operation) 	(When heating operation)
Output display LED		Lighted by output relay ON	
Temperature display range		-55°C to 60°C (0.5°C step)	-5°C to 110°C (0.5°C step, 100°C and higher: 1°C step)
On-off temperature differential setting range		0.5°C or more (Arbitrary within adjustable range)	
Set temperature monitor		Call by selector SW	
Set temperature setting method		Selector SW and setting SW and up, down SW	
Display off function		When the display off function is enabled, the temperature display and LED displays other than output LED and dot are not displayed.	
Temperature correction function		Display and control are performed by the sum of the actual temperature and the temperature correction value.	
Key lock function		When the key lock function is enabled, key operation is disabled.	
Set value memory function		The set values are also memorized in semiconductor memory when the power is interrupted.	
Contact capacity (resistive load)		AC250V/DC30V 10A 1c (minimum load DC5V 10mA *)	
Power supply voltage		AC100V to AC240V +10%, -15% (50/60Hz)	
Power consumption		10W or less (body only)	
Operating temperature range (body)		-10 to 50°C (no freezing)	
Operating humidity range (body)		85%RH (no condensation)	
Terminal shape		Screw terminal M3.5 w/square washer (5 poles double throw: 10 poles)	
Temperature sensor		FCT-L50 (P) use temperature sensor	FCT-H00 (P) use temperature sensor
Accessories		Temperature sensor, mounting bracket, mounting screws, instruction manual	

* Minimum load level guideline value. Since this value depends on the switching frequency, environmental conditions, and anticipated reliability standard, we recommend that it be checked using the actual load at actual use.

Wiring example



Type FCT digital thermostat

FCT-D: 2 outputs type

- Temperature is controlled by 2 temperature regulation outputs.
- Off temperature and on temperature can be set separately (output 1, output 2)

Type

Type	Temperature range
FCT-L50D (P)	Low temperature use (-50°C to 50°C)
FCT-H00D (P)	High temperature use (0°C to 100°C)

* P at the end of the type designation indicates panel mounted type.

Panel mounted type (embedded type) can be secured from the front or back of the panel.

Appearance

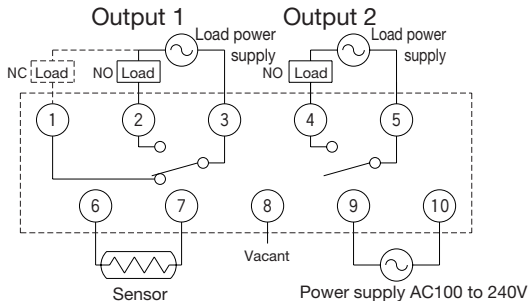


(Box type)



(Panel mounted type)

Wiring example



Specifications

Items	Type	FCT-L50D (P)	FCT-H00D (P)
Temperature setting range		-50°C to 50°C (0.5°C step)	0°C to 100°C (0.5°C step)
		(However, the OFF temperature and ON temperature cannot be set to the same temperature.)	
Temperature regulation operation characteristics		(When output OFF < output ON) (When output 1) Between terminal 2 and 3 close Between terminal 1 and 3 open (When output 2) Between terminal 4 and 5 close	(When output OFF > output ON) (When output 1) Between terminal 2 and 3 close Between terminal 1 and 3 open (When output 2) Between terminal 4 and 5 close
		<ul style="list-style-type: none"> · Output 1 relay is operated by output 2 on/off set temperature (terminals 2-3, 1-3) · Output 2 relay is operated by output 1 on/off set temperature (terminals 4-5) · The output 1 and output 2 on/off temperatures can be set separately and operated independently. 	
Output 1 display LED		The output 1 display LED is lit by output 1 relay ON	
Output 2 display LED		The output 2 display LED is lit by output 2 relay ON	
Temperature display range		-55°C to 60°C	-5°C to 110°C (0.5°C step, 100°C and higher: 1°C step)
		"Lo" blinks when the sensor input temperature drops below than the temperature display range and "Hi" blinks when the sensor input temperature rises above the temperature display range.	
On-off temperature differential setting range		0.5°C or more (Arbitrary within adjustable range)	
Set temperature monitor		Call by selector SW	
Set temperature setting method		Selector SW and setting SW and up, down SW	
Display off function		When the display off function is enabled, the temperature display and LED displays other than output 1 and 2 LED and dot are not displayed.	
Temperature correction function		Display and control are performed by the sum of the actual temperature and the temperature correction value.	
Key lock function		When the key lock function is enabled, key operation is disabled.	
Set value memory function		The set values are also memorized in semiconductor memory when the power is interrupted.	
Contact capacity (resistive load)		AC250V/DC30V 10A 1c (minimum load DC5V 10mA *) 1c for output 1, 1a for output 2	
Power supply voltage		AC100V to AC240V +10%, -15% (50/60Hz)	
Power consumption		10W or less (body only)	
Operating temperature range (body)		-10 to 50°C (no freezing)	
Operating humidity range (body)		85%RH (no condensation)	
Terminal shape		Screw terminal M3.5 w/square washer (5 poles double throw: 10 poles)	
Temperature sensor		FCT-L50 (P) use temperature sensor	FCT-H00 (P) use temperature sensor
Accessories		Temperature sensor, mounting bracket, mounting screws, instruction manual	

* Minimum load level guideline value. Since this value depends on the switching frequency, environmental conditions, and anticipated reliability standard, we recommend that it be checked using the actual load at actual use.

Type FCT digital thermostat

FCT-A: Type with alarm

- Single function (S) + alarm output
- High temperature alarm and low temperature alarm can be set
- Alarm output with delay timer
- Delay time 0 to 120 mins

Type

Type	Temperature range
FCT-L50A (P)	Low temperature use (-50°C to 50°C)
FCT-H00A (P)	High temperature use (0°C to 100°C)

* P at the end of the type designation indicates panel mounted type.

Panel mounted type (embedded type) can be secured from the front or back of the panel.

Appearance

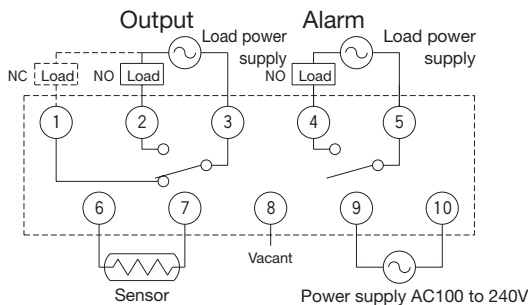


(Box type)



(Panel mounted type)

Wiring example



Specifications

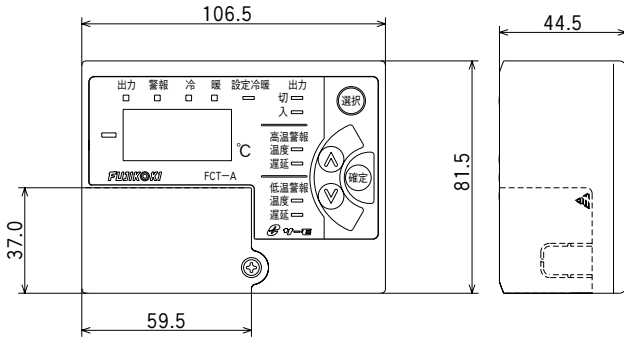
Items	FCT-L50A (P)	FCT-H00A (P)
Temperature setting range	-50°C to 50°C (0.5°C step)	0°C to 100°C (0.5°C step)
Temperature regulation operation characteristics (Selectable by setting item)	(When cooling operation) 	(When heating operation)
Output display LED	Lighted by output relay ON	
Alarm setting range	High temperature	no/ to -60°C (0.5°C step)
	Low temperature	no/-55°C to (0.5°C step)
Alarm setting range	no: Alarm function is disabled. Cannot be set within the current temperature regulation range (between OFF temperature and ON temperature).	
	Delay time	0 min to 120 mins (0 min to 10 mins: 1 min step, 10 mins to 120 mins: 5 mins step)
Alarm operating characteristics (Selectable by setting item)	(When high temperature alarm) 	(When low temperature alarm)
Alarm display LED	The alarm display LED is lit by alarm relay ON	
Temperature display range	-55°C to 60°C (0.5°C step)	-5°C to 110°C (0.5°C step, 100°C and higher: 1°C step)
On-off temperature differential setting range	0.5°C or more (Arbitrary within adjustable range)	
Set temperature monitor	Call by selector SW	
Set temperature setting method	Selector SW and setting SW and up, down SW	
Display off function	When the display off function is enabled, the temperature display and LED displays other than output and alarm LED and dot are not displayed.	
Temperature correction function	Display and control are performed by the sum of the actual temperature and the temperature correction value.	
Key lock function	When the key lock function is enabled, key operation is disabled.	
Set value memory function	The set values are also memorized in semiconductor memory when the power is interrupted.	
Contact capacity (resistive load)	AC250V/DC30V 10A 1c (minimum load DC5V 10mA *) 1c for output 1, 1a for alarm	
Power supply voltage	AC100V to AC240V +10%, -15% (50/60Hz)	
Power consumption	10W or less (body only)	
Operating temperature range (body)	-10 to 50°C (no freezing)	
Operating humidity range (body)	85%RH (no condensation)	
Terminal shape	Screw terminal M3.5 w/square washer (5 poles double throw: 10 poles)	
Temperature sensor	FCT-L50 (P) use temperature sensor	FCT-H00 (P) use temperature sensor
Accessories	Temperature sensor, mounting bracket, mounting screws, instruction manual	

* Minimum load level guideline value. Since this value depends on the switching frequency, environmental conditions, and anticipated reliability standard, we recommend that it be checked using the actual load at actual use.

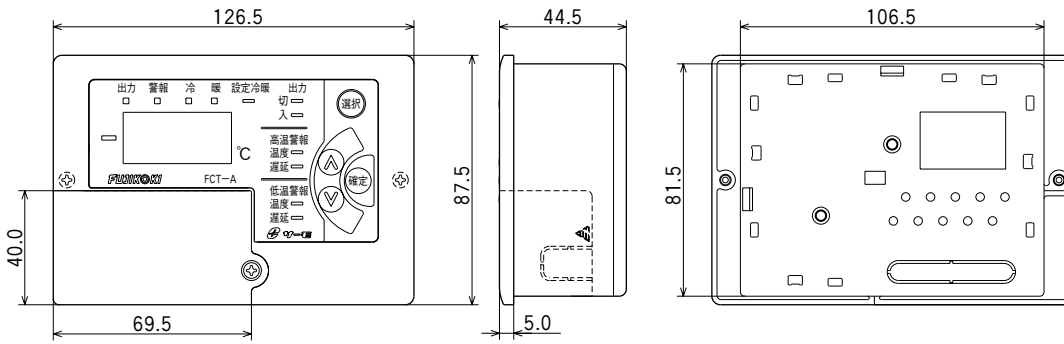
Type FCT digital thermostat common specifications

Outline dimensions

(1) Box type

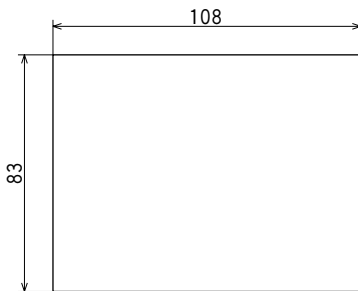


(2) Panel mounted type



(Reference: Panel cutout dimensions)

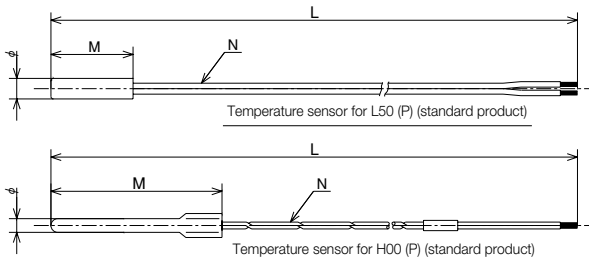
* Common for both box type and panel mounted type



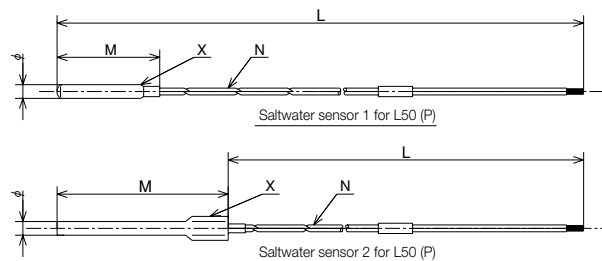
(Unit: mm)

Temperature sensor shape

(1) Standard product (Supplied with body)



(2) Saltwater sensor (sold separately)



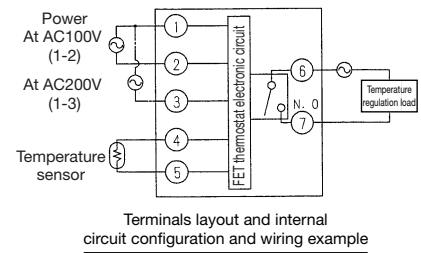
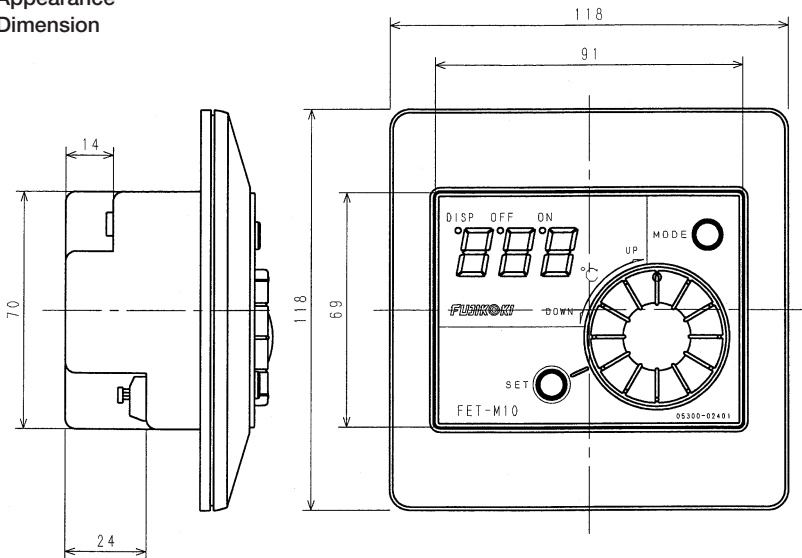
	φ	L	M	X	N	Operating temperature range	(Unit: mm)
Temperature sensor for L50 (P) (standard product)	6	2000	24	—	Parallel 2-conductor wire	-50°C to 150°C	
Temperature sensor for H00 (P) (standard product)	4	2000	50	—	Twisted wire	-10°C to 180°C	
Saltwater sensor 1 for L50 (P) (sold separately)	4	2000	30	Heat shrink tube	Twisted wire	-40°C to 60°C	
		4000				-40°C to 60°C	
Saltwater sensor 2 for L50 (P) (sold separately)	4	2000	100	SUS304	Twisted wire	-40°C to 60°C	
			300			-40°C to 60°C	



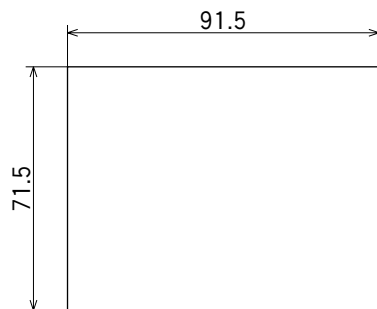
Type FET digital thermostat

- High capacity control of heater and similar devices up to 20A.
- Embedded type perfect for floor heating.

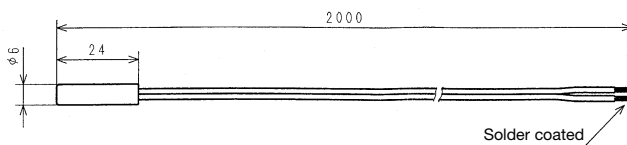
Appearance Dimension



(Reference: Panel cutout dimensions)



Sensor shape



(Unit: mm)

Specifications

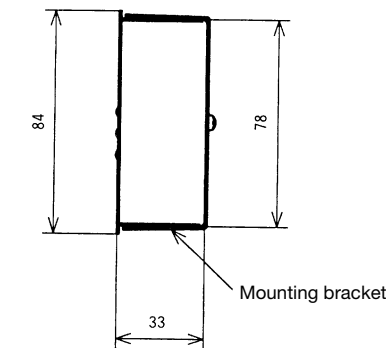
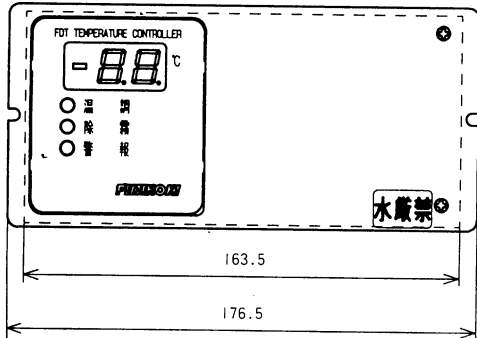
Items	Type	Type FET-M10 digital thermostat
Temperature setting range		-10 to 50°C
Operation characteristics (Selection by switch on PC board, factory setting: HEAT side)		<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>(When cooling operation)</p> </div> <div style="text-align: center;"> <p>(When heating operation)</p> </div> </div>
Temperature display range		-45°C to 55°C <small>"Lo" blinks when the sensor input temperature drops below than the temperature display range and "Hi" blinks when the sensor input temperature rises above the temperature display range.</small>
On-off temperature differential setting range		1°C or more (Selected operating characteristic is held and arbitrary within regulation range)
Display monitor SET (ON/STANDBY)		On: SET pressed---LED display and temperature regulation operation begin from the standby state Standby: SET pressed---LED display and temperature regulation load return from the on state to the standby state
Set temperature monitor		Call by MODE button
Set temperature setting method		After the MODE button is pressed, SET button/setting volume combined use type
DISP display function		When the DISP display function is enabled, digitally displayed only when the thermostat is ON.
Set value memory function		ON, OFF, and DISP display set values are saved to a semiconductor memory even after a power interruption.
ON monitor LED		Comes on when "Closed" between output terminals No. 6 and No. 7 and goes off when "Open" between output terminals No. 6 and No. 7.
Contact capacity (resistive load)		AC125V 20A/AC250V 20A (COSφ= 1: resistive load)
Power supply voltage		AC100V/AC200V, ±10% (50/60Hz) common use
Operating temperature range (body)		-10 to 50°C (no freezing)
Operating humidity range (body)		35 to 80%RH (at 40°C) (no condensation)
Terminal shape		Screw-less terminal board
Temperature sensor		Dedicated sensor
Input sensor		"Lo" blink display: At input sensor breaking or other abnormality, control output OFF
Alarm operation		"Hi" blink display: At input sensor short or other abnormality, control output OFF
Accessories		Temperature sensor, instruction manual



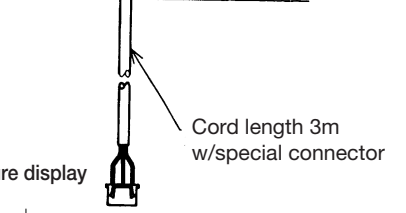
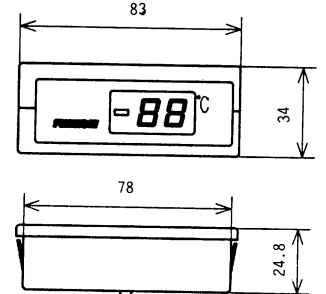
Type FDT temperature controller

- Temperature display appears in two locations: a display in the controller body and a separate digital temperature indicator. Most suitable for commercial freezers and refrigerators with a customer show-case requiring remote temperature monitoring.
- Main features include refrigerator temperature control by switching on/off, defrosting with a combined use of defrost timer and a defrost end detecting thermostat, and high/low temperature alarm with output delay timer.
- The 85VAC to 240VAC free power voltage allows easy wiring.

Body

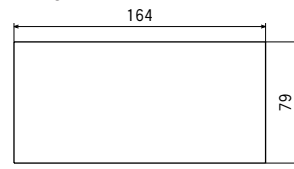


Digital temperature display

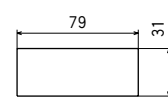


(Reference: Panel cutout dimensions)

Body

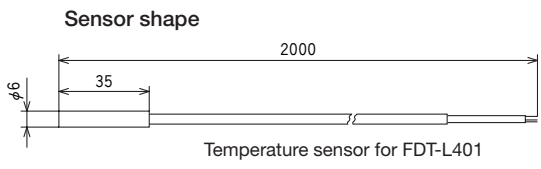


Digital temperature display



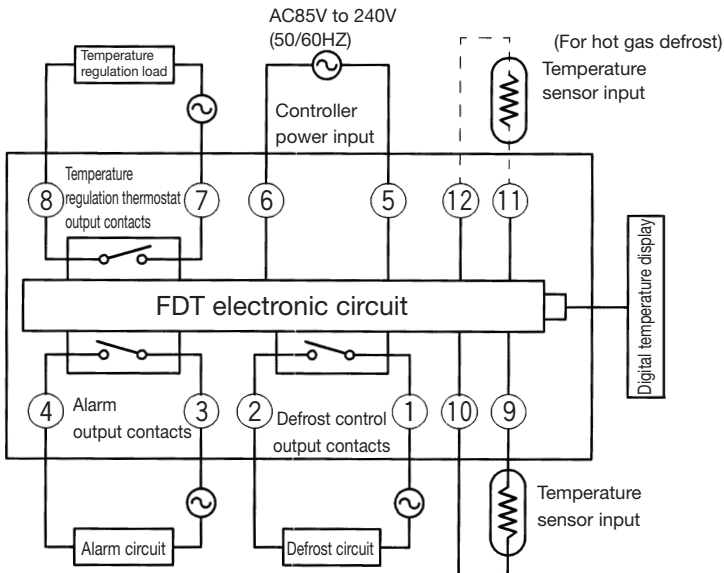
Cord length 3m w/special connector

(Unit: mm)



Temperature sensor for FDT-L401

Terminals layout and internal circuit configuration and wiring example



Specifications

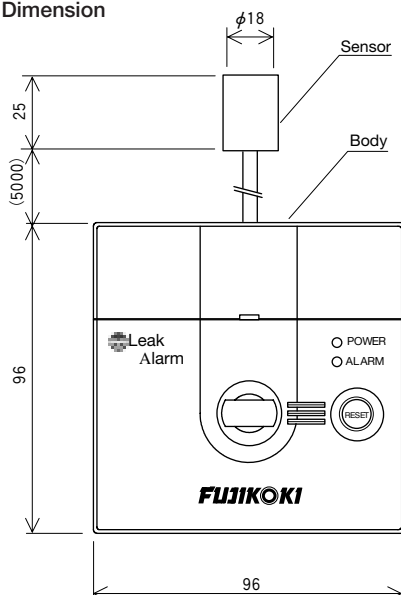
		Type	FDT-L401
Temperature regulation function	Cooling	O F F	-40 to 30°C
		D I F F	0.5 to 6°C
	Heating	O F F	-10 to 55°C
		D I F F	1 to 20°C
Compartment interior temperature correction		Temperature sensor input corrected ±5°C	
Output contact capacity (resistive load)		AC250V 3A	
Defrost functions	Defrost system		Heater system, off cycle system
	Defrost cycle time		None/2 to 24 hrs
	Defrost time		15 mins to 60 mins
	Defrost complete sensing thermostat		None/0 to 15°C
	Defrost operation		Power interruption reset integration system
	Forced defrost		Interrupt by forced defrost switch
Output contact capacity (resistive load)		AC250V 1A	
Alarm functions	High temperature alarm temperature differential		None/temperature regulation ON+1 to 10°C
	High temperature alarm delay time		None/30 mins to 60 mins
	Low temperature alarm temperature differential		None/temperature regulation OFF-1 to -10°C
	Low temperature alarm delay time		20 mins (fixed)
	Output contact capacity (resistive load)		AC250V 1A
Set value change/protect switching		Selected by SET switch	
Defrost & alarm function protect		Selected by PDA switch	
Power supply voltage		AC85V to 240V (50/60Hz)	
Operating temperature range (body)		-10 to 50°C (no freezing)	
Operating humidity range (body)		80%RH (no condensation)	
Terminal shape		Screw terminals M3/M3.5 staggered double throw 8 poles Sensor input M3 2 poles, Dedicated digital temperature display connector	
Temperature sensor		Dedicated sensor for FDT-L401	
Accessories		Digital temperature display, temperature sensor, mounting bracket, mounting screws, instruction manual	

Type LAY refrigerant gas leak detector

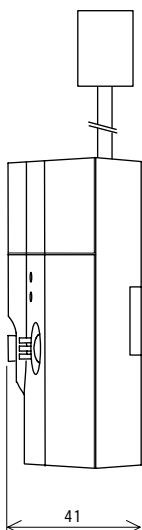


- Detects freezer refrigerator/air conditioning refrigerant leaks and generates an alarm.
- Can be used to prevent human injury accidents/refrigerant efficiency drop/refrigerant loss/environment destruction.
- Compatible refrigerants are R22, R404A, R407C, and R410A.
- With its sensor separated, it can be used with -40°C freezers.
- Can be immediately installed and used without troublesome adjustment.
- Flexibly accept the power supply between 100 and 240AC, so wiring is easy.
- Alarm buzzer/ lamp and alarm relay are built-in.

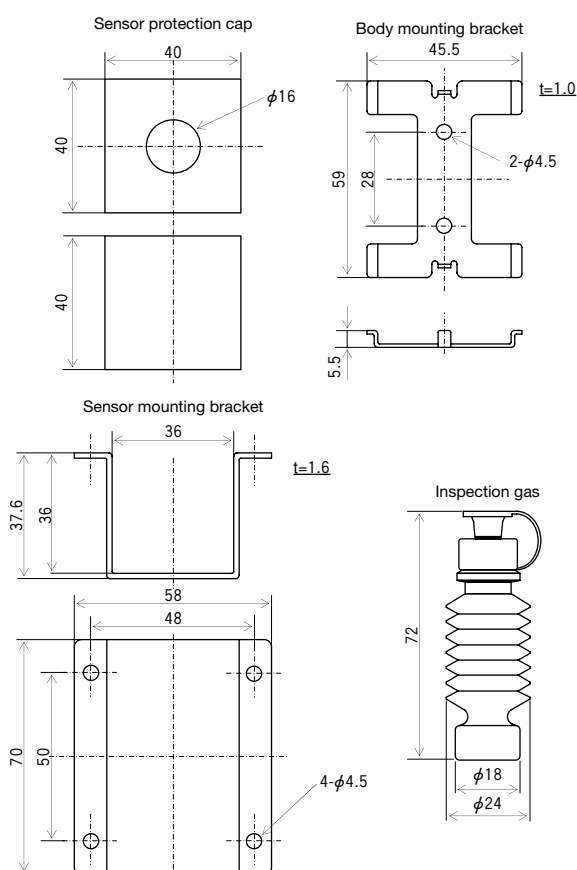
Appearance Dimension



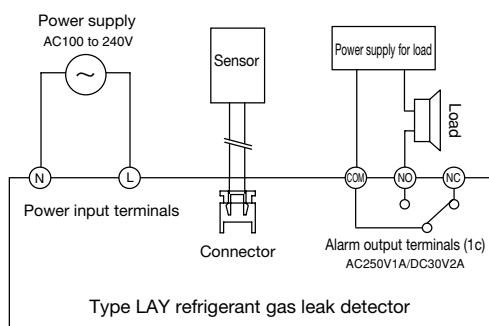
Unit: mm



Accessories



Connection example



Specifications

Type	LAY-HR33L
Detection objective	R22, R404A, R407C, R410 (common use)
Detection system	Hot wire semiconductor
Alarm density	500 to 3000ppm(*1)
Alarm	Lamp: Red LED Buzzer: Intermittent buzzer Output: Relay (1c)
Power supply voltage	AC100 to 240V
Power consumption	5W or less
Temperature range	Body: -10 to 40°C Sensor: -40 to 35°C
Humidity range	85%RH or less
Accessories	Sensor mounting bracket Sensor protection cap Body mounting bracket Inspection gas Instruction manual

*1: For R404A. Please inquire for other gases.

Type MGY electronic linear control valve driver

- The eVALVE driver is a device which controls a Fujikoki electronic linear control valve.
- A Type MGY which controls the eVALVE by remote signal and a Type MFY which can operate the eVALVE by button operation are available.



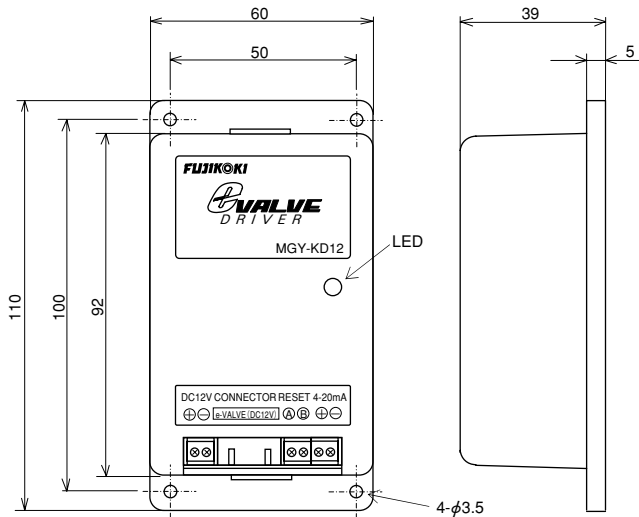
Type MGY:

- This device proportionally controls the eVALVE by means of a DC4 to 20mA remote signal.
- The direct driven Type CAM and Types HAM, KBM, and LFM eVALVE can be controlled.

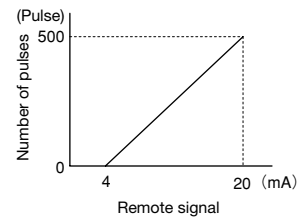
	eVALVE type	Excitation system	Excitation speed	Number of pulses	Type of coil	Control operation	Sampling time
Selected by internal DIP switch	Type CAM, HAM, KBM, etc.	1-2 phase excitation	80pps	0 to 500 pulses	CW product,	CW operation,	0.1 sec., 1 sec.
	Type LFM, (KBM), etc.	2-2 phase excitation	20pps	0 to 250 pulses	CCW product	CCW operation	5 sec., 10 sec.

- Two types are available depending on the eVALVE drive voltage.
 MGY-KD12-1: DC12V eVALVE only
 MGY-KD24-1: DC24V eVALVE only

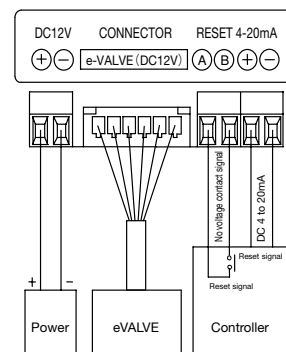
Appearance Dimension



Operation example (When CW operation)



Wiring example



Specifications

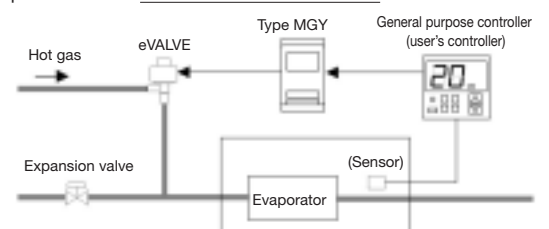
General specifications

Type	MGY-KD12-1	MGY-KD24-1
Power supply voltage	DC12V	DC24V
Power consumption	2W or less (Type MGY body only)	
Operating temperature range	-10 to 50°C (no freezing)	
Operating humidity range	85%RH or less (no condensation)	
Remote signal	DC4 to 20mA (Maximum rating DC0 to 22mA)	
Reset signal	No voltage contact input	
Accessories	Screw (M3x12mm) x 4, instruction manual	

Application:

- Hot gas control
- Reheater flow rate control
- Evaporator superheat control

Hot gas control configuration example



Type MFY electronic linear control valve driver

- The e VALVE driver is a device which controls a Fujikoki electronic linear control valve.
- A Type MGY which controls the e VALVE by remote signal and a Type MFY which can operate the e VALVE by button operation are available.



Type MFY:

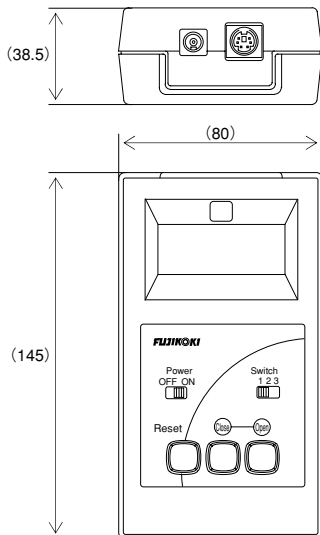
- This device switches the e VALVE manually by button operation.
- Direct driven Type CAM and Types HAM and KBM e VALVE and gear Type EFM e VALVE can be operated.

Controlled object

	eVALVE type	Excitation system	Excitation speed	Number of pulses	Type of coil
Selected by changeover SW	Type CAM, HAM, KBM, etc.	1-2 phase excitation	60pps	0 to 500 pulses	CW product CCW product
	Type EFM etc.	2-2 phase excitation	200pps (open) 100pps (close)	0 to 2000 pulses	CW product

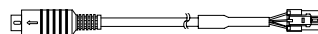
- Compatible with DC12V eVALVE.
MFY-MD12: DC12V eVALVE only

Appearance Dimension Unit: mm



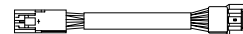
Accessories

Connection cable (3000mm)

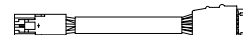


* e VALVE connector: 176285(AMP)

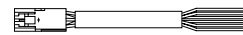
Conversion cable (1300mm) x 3



* e VALVE connector: XAP-06V-1 (JST)

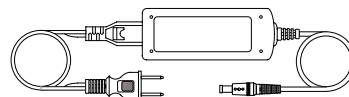


* e VALVE connector: XHP-6 (JST)



* No e VALVE side connector (for connection use other than XAP and XHP).

AC adapter (AC100V)



* Battery drive is also possible.
If interested, please inquire.

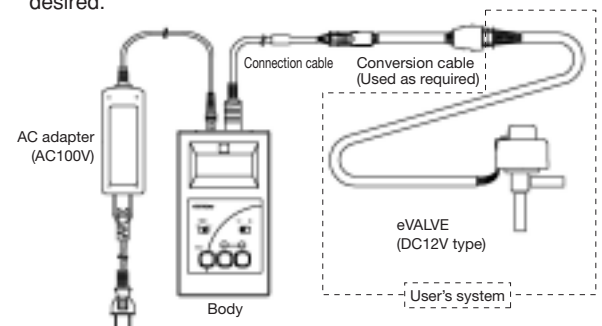
Specifications

General specifications (body)

Type	MFY-MD12
Power supply voltage	AC100V (accessory AC adapter used)
Power consumption	10W or less
Operating temperature range	0°C to 40°C (no freezing)
Operating humidity range	85%RH or less (no condensation)
Accessories	AC adapter, connection cable, conversion cable x 3, instruction manual

Application:

- Maintenance of building air conditioner and other systems that use an e VALVE.
- Other applications where operating an e VALVE easily is desired.

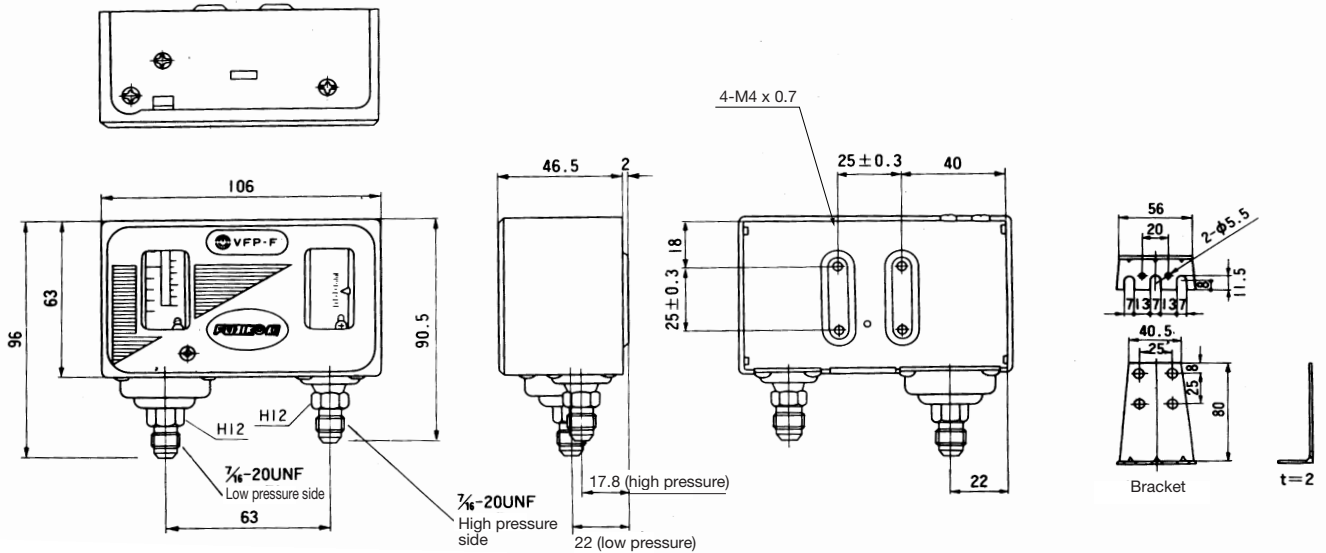




■ Type VFP high/low pressure switches

■ Type VFP-R high/low pressure switches (only available by order)

- These pressure switches are used to control low pressure and to prevent abnormally high pressure in refrigeration systems.
- Two types of high pressure side switches are available: automatic reset type (Type VFP) and manual reset type (Type VRF-R).
- Two contact configurations are available: 4 terminals specification and 6 terminals specification
- Compatible refrigerants are R22, R134a, R404A, and R407C.



Specifications

Pressure: MPa

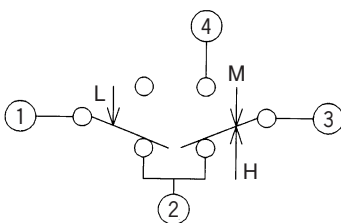
Type	Terminal	Operating pressure adjustment range		On-off pressure differential adjustment range		Maximum operating pressure		Sealing pressure		Withstand pressure		Weight g
		Low pressure side	High pressure side	Low pressure side	High pressure side (fixed)	Low pressure side	High pressure side	Low pressure side	High pressure side	Low pressure side	High pressure side	
VFP-F	4 terminals	-65 kPa to 0.6	0.8 to 3.0	0.06 to 0.4	0.29 to 0.49	1.77	3.24	1.77	3.24	2.65	4.86	470
VFP-RF					Manual reset							475
VFP-F606	6 terminals	-65 kPa to 0.6	0.8 to 3.0	0.06 to 0.4	0.29 to 0.49	1.77	3.24	1.77	3.24	2.65	4.86	470
VFP-RF606					Manual reset							475

* The operating pressure adjustment range shows the operating point when the pressure rises.

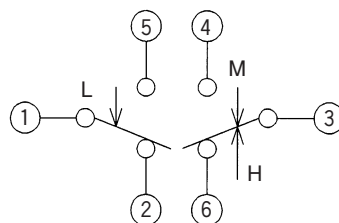
Contact configuration

Classification	Low pressure side	High pressure side
4 terminals	Single pole single throw (SP/ST)	Single pole double throw (SP/DT)
6 terminals	Single pole double throw (SP/DT)	Single pole double throw (SP/DT)

4 terminals circuit diagram



6 terminals circuit diagram



Electrical ratings

(Unit: A)

Rated voltage	AC125V	AC250V
Inductive load current	8.5	4.5
Instantaneous current	40	20
Non-inductive load current	10	5

When a load with a current value greater than that shown above must be turned ON-OFF, use the pressure switch together with an electromagnetic switch.

* The symbols represent the following:

(1), (2), (3), (4), (5), (6): Terminal No.

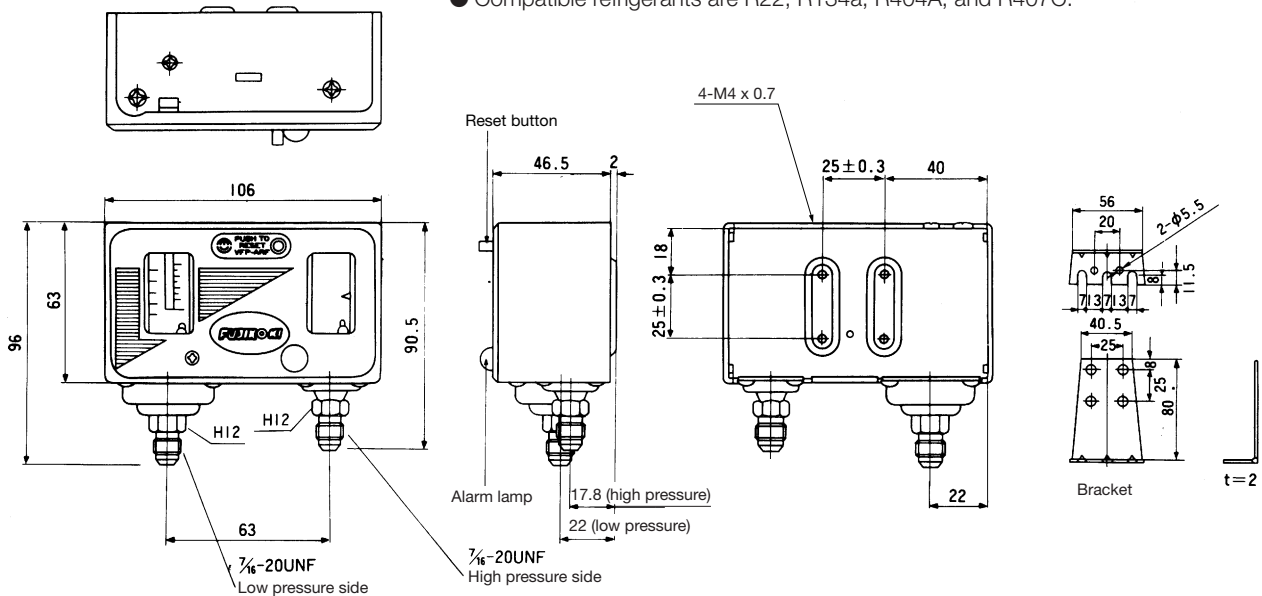
L: Low pressure side pressure, H: High pressure side pressure, M: Manual reset

Arrows [↓ ↑]: Operating direction when pressure rises or at manual reset



Type VFP-AR high/low pressure switch (only available by order)

- High/low pressure switch with an alarm lamp at the high pressure side as standard. (AC200V use lamp is standard.)
- Since the switch at both the high pressure side and low pressure side is single pole double throw type; it can also be used in low pressure side alarm and operation display circuits.
- Independent contact output can be obtained at both the high pressure and low pressure sides. (However in this case, the connections between terminals (1) to (6) are disconnected.)
- Compatible refrigerants are R22, R134a, R404A, and R407C.

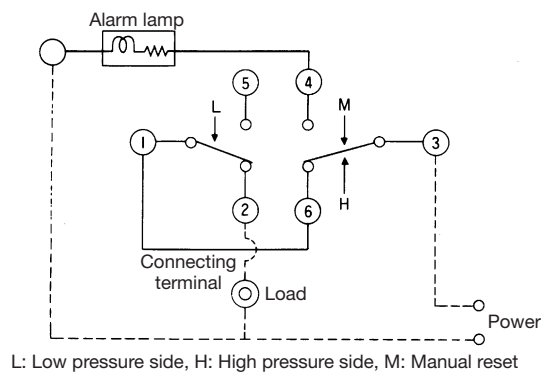


Specifications

Pressure: MPa

Type	Operating pressure adjustment range		On-off pressure differential adjustment range		Maximum operating pressure		Sealing pressure		Withstand pressure		Weight g
	Low pressure side	High pressure side	Low pressure side	High pressure side	Low pressure side	High pressure side	Low pressure side	High pressure side	Low pressure side	High pressure side	
VFP-ARF	-65 kPa to 0.6	0.8 to 3.0	0.06 to 0.4	Manual reset	1.77	3.24	1.77	3.24	2.65	4.86	480

* The operating pressure adjustment range shows the operating point when the pressure rises.



Electrical ratings

(Unit: A)

Rated voltage	AC125V	AC250V
Inductive load current	8.5	4.5
Instantaneous current	40	20
Non-inductive load current	10	5
Contact configurations	Low pressure side (SP/DT) High pressure side (SP/DT)	

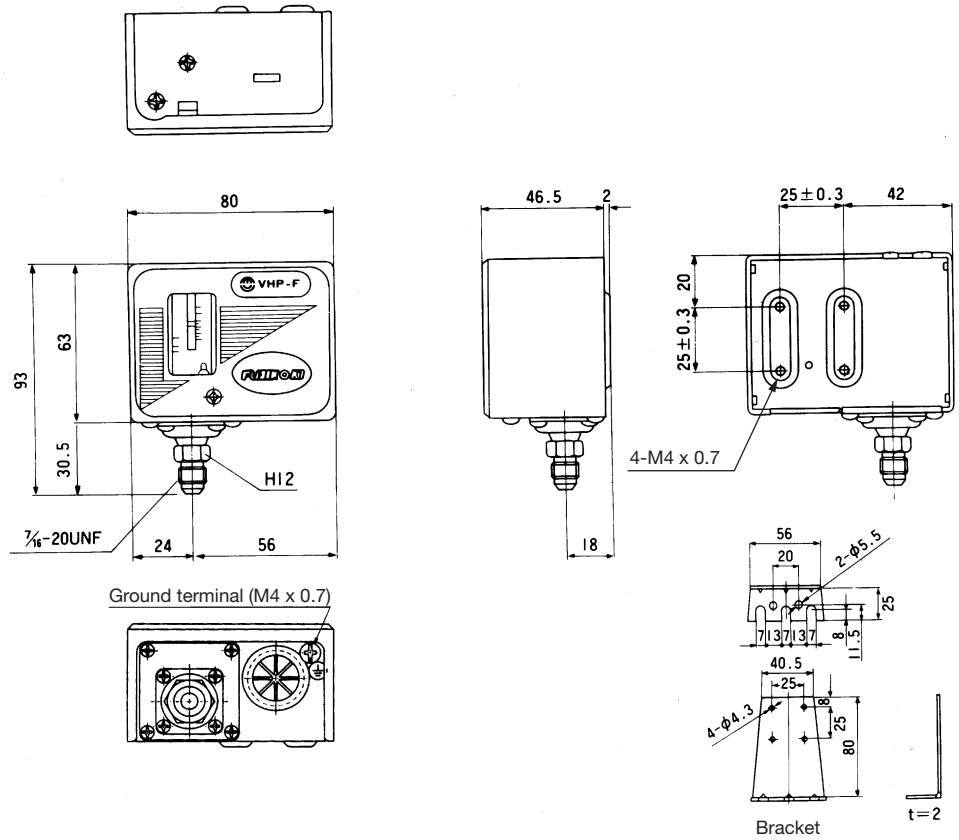
When a load with a current value greater than that shown above must be turned ON-OFF, use the pressure switch together with an electromagnetic switch.

■ Type VHP high pressure switch

■ Type VHP-R high pressure switch (only available by order)



- The Type VHP is a high pressure switch used to prevent abnormally high pressure operation and in the alarm circuit, etc. of a freezer.
- Since a wide operating pressure adjustment range and on-off pressure differential adjustment are possible; also use it in applications besides the above.
- Compatible refrigerants are R22, R134a, R404A, and R407C.
- Two types are available: automatic reset type and manual reset type



Specifications

Pressure: MPa

Type	Operating pressure adjustment range	On-off pressure differential adjustment range	Maximum operating pressure	Sealing pressure	Withstand pressure	Weight g
VHP-F	0.5 to 3.0	0.3 to 1.0	3.24	3.24	4.85	350
VHP-RF		Manual reset				

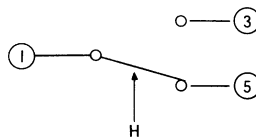
* The operating pressure adjustment range shows the operating point when the pressure rises.

Electrical ratings

(Unit: A)

Rated voltage	AC125V	AC250V
Inductive load current	8.5	4.5
Instantaneous current	40	20
Non-inductive load current	10	5
Contact configurations	SP/DT	

When a load with a current value greater than that shown above must be turned ON-OFF, use the pressure switch together with an electromagnetic switch.

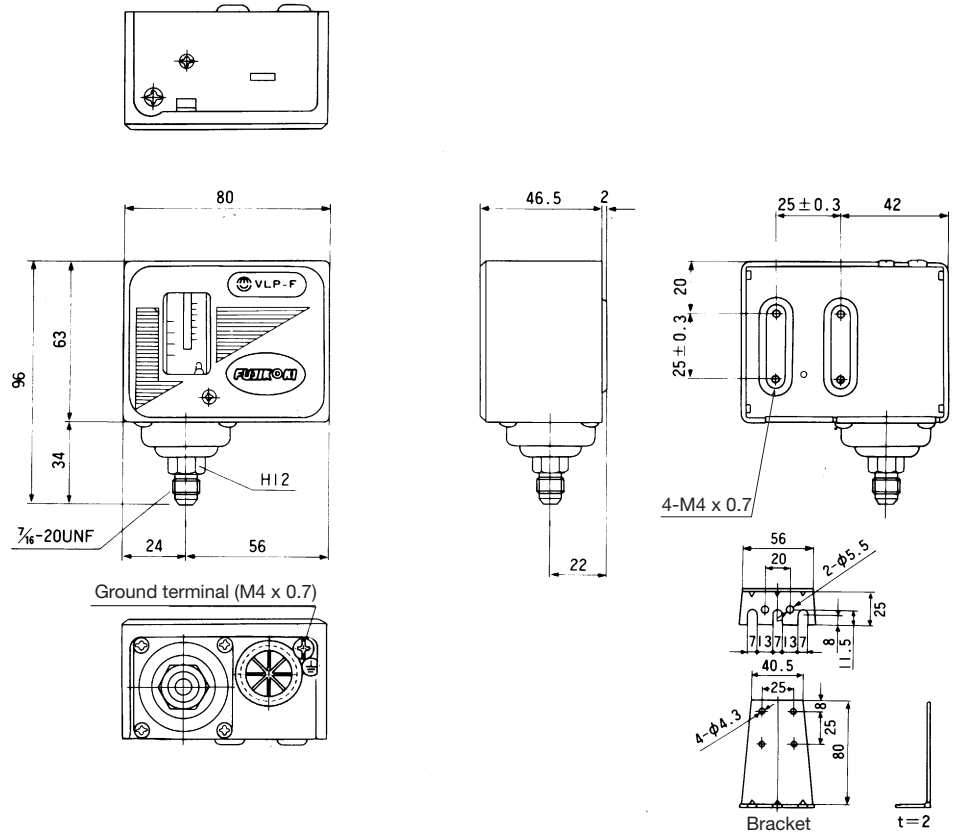




■ Type VLP low pressure switch

■ Type VLP-R low pressure switch (only available by order)

- The Type VLP is a low pressure switch used to control the operation and prevent vacuum operation of a freezer.
- Compatible refrigerants are R22, R134a, R404A, and R407C.
- Two types are available: automatic reset type and manual reset type.



Specifications

Pressure: MPa

Type	Operating pressure adjustment range	On-off pressure differential adjustment range	Maximum operating pressure	Sealing pressure	Withstand pressure	Weight g
VLP-F	-65kPa to 0.6	0.06 to 0.4	1.77	1.77	2.65	350
VLP-RF		Manual reset				

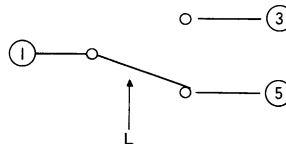
* The operating pressure adjustment range shows the operating point when the pressure rises.

Electrical ratings

(Unit: A)

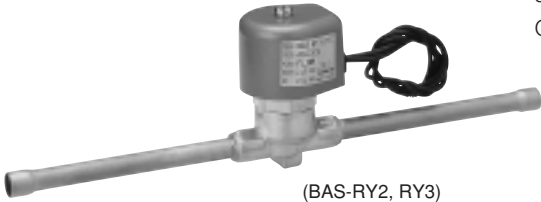
Rated voltage	AC125V	AC250V
Inductive load current	8.5	4.5
Instantaneous current	40	20
Non-inductive load current	10	5
Contact configurations	SP/DT	

When a load with a current value greater than that shown above must be turned ON-OFF, use the pressure switch together with an electromagnetic switch.





(BAS-RF2, RF3)



(BAS-RY2, RY3)



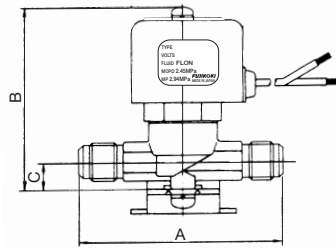
(BMS-RF4 to RF6)



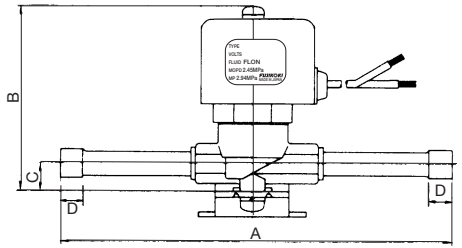
(BMS-RY4 to RY12)

■ Type BAS, BMS solenoid valve

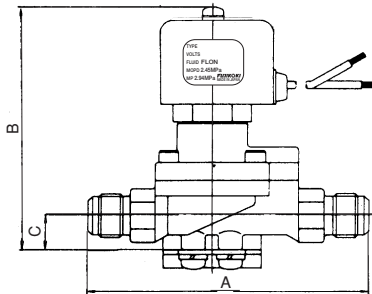
These solenoid valves can be used in freezing and air conditioning system liquid; discharge, suction, and hot gas bypass lines. The Type BAS is the piston type and the Type BMS is the diaphragm type. Both types are pilot-operated and are operated sensitively by even small pressure differences. The Type BAS has a built-in strainer, but a type with an external strainer connected by a pipe is also available. Compatible refrigerants are R134a, R22, and R404A.



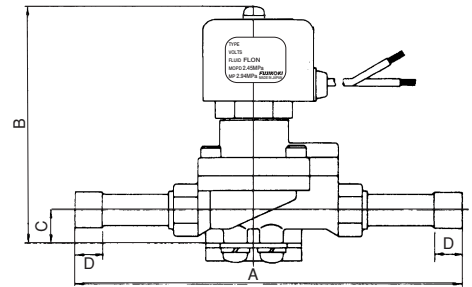
(BAS-RF2, RF3)



(BAS-RY2, RY3)



(BMS-RF4 to RF6)



(BMS-RY4 - RY12)

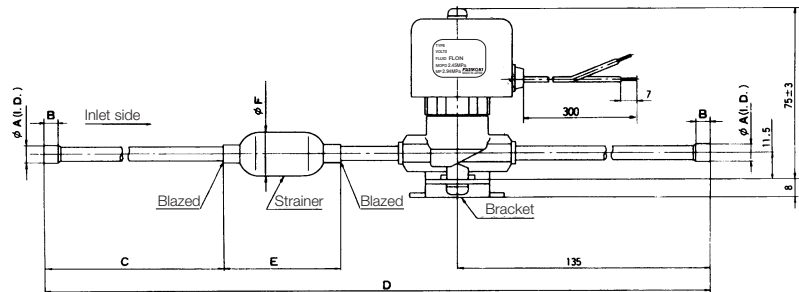
Specifications

Type	Connection pipe diameter mm (inches)	Valve diameter mm	Operating pressure differential MPa	Liquid line capacity kW			Standard coil capacity		Dimensions mm				Weight g
				R22	R134a	R404A	Voltage rating	Power consumption	A	B	C	D	
BAS-RF2	6.35 (1/4) flare	6	0 to 2.45	10.3	9.7	6.8	AC 100V 200V 50/60Hz Common use	7/6W (50/60Hz)	86	75	11.5	—	480
BAS-RY2	6.35 (1/4) blazed								270			7	410
BAS-RF3	9.52 (3/8) flare								84	—	480		
BAS-RY3	9.52 (3/8) blazed								270	9	420		
BMS-RF4	12.7 (1/2) flare	10	0.007 to 2.45	34.5	32.2	22.7			114	99	14	—	840
BMS-RY4	12.7 (1/2) blazed								160			11	750
BMS-RF5	15.88 (5/8) flare	12.5		51.7	48.3	34.1			129	103	15.5	—	1050
BMS-RY5	15.88 (5/8) blazed								180			14	850
BMS-RF6	19.05 (3/4) flare	16		83.1	77.6	54.8			145	108	17	—	1500
BMS-RY6	19.05 (3/4) blazed								190			18	1100
BMS-RY7	22.22 (7/8) blazed	20		142.7	133.2	94.1			230	129	29	20	2000
BMS-RY8	25.40 (1) blazed												
BMS-RY9	28.58 (1 1/8) blazed	25		227.3	212.2	149.9	240	137	32.5	25	2500		
BMS-RY10	31.75 (1 1/4) blazed												
BMS-RY11	34.95 (1 3/8) blazed	32		316.7	295.6	208.8	260	145.5	35.5	27	4000		
BMS-RY12	38.10 (1 1/2) blazed												

- Sealing pressure and maximum operating pressure 2.94MPa, withstand pressure 4.41MPa.
- Liquid line capacity: Condensing pressure 38°C, evaporator pressure 5°C, pressure drop 0.015MPa value.
- Operating temperature range: Ambient temperature -30°C to +50°C, fluid temperature -40°C to +130°C.

■ Type BAS-QYS solenoid valve

This solenoid valve with welded strainer blocks dirt and spatter, both of which are typical enemies of refrigeration cycles. A 100 mesh strainer system eliminates very fine foreign matter to clean the inside of the cycle and protect the functional components including refrigerators from possible failures due to foreign matter. Compatible refrigerants are R134a, R22, and R404A.

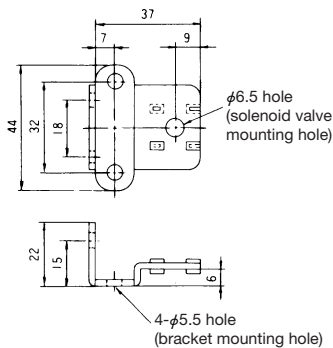


Specifications

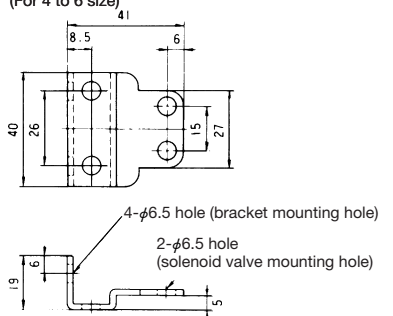
Type	Voltage	Frequency	Connection pipe diameter mm (inches)	Dimensions mm						Weight g
				A	B	C	D	E	F	
BAS-QY2S100-1	AC100V	50/60 Hz Common use	6.35 (1/4)	6.50	7	106	349	55 (small)	19.4	450
BAS-QY2S200-1	AC200V									
BAS-QY3S100-1	AC100V		9.52 (3/8)	9.65	9	107	351	140 (large)	30.0	460
BAS-QY3S200-1	AC200V									
BAS-QY2S100	AC100V		6.35 (1/4)	6.50	7	106	434	140 (large)	30.0	535
BAS-QY2S200	AC200V									
BAS-QY3S100	AC100V		9.52 (3/8)	9.65	9	107	436	140 (large)	30.0	550
BAS-QY3S200	AC200V									

- Sealing pressure and maximum operating pressure 2.94MPa, withstand pressure 4.41MPa.
- Operating temperature range: Ambient temperature -30°C to $+50^{\circ}\text{C}$, fluid temperature -40°C to $+130^{\circ}\text{C}$
- Liquid line capacity is the same as that of the Types BAS-RY2 and BAS-RY3.
- (small)(large) in Dimensions E indicate the volume of each strainer.

Bracket for Type BAS 1 = 2



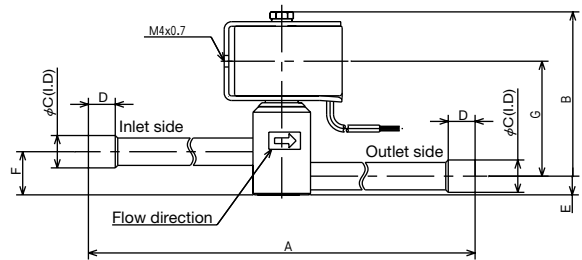
Bracket for Type BMS 1 = 2
(For 4 to 6 size)



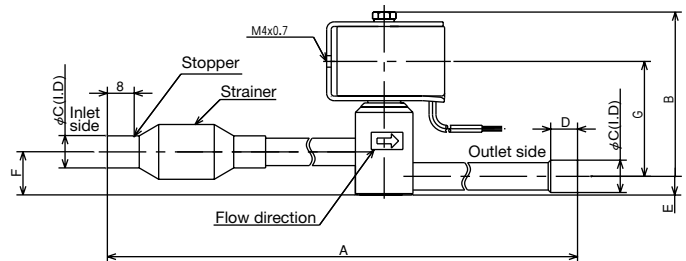
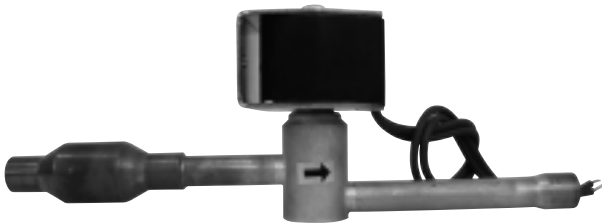
■ **Type AUS solenoid valve** (only available by order)
 ■ **Type AUS-QYS solenoid valve** (only available by order)

These energy-saving solenoid valves are used in the refrigerant circuit of freezers. They are used for multiple purposes, including hot gas lines. Compatible refrigerants are R134a, R22, R404A, R407C, and R410A.

Type AUS



Type AUS-QYS



Specifications

Type	Connection pipe diameter mm (inches)	Valve diameter mm	Operating pressure differential MPa	Standard coil capacity		Dimensions mm							Weight g
				Voltage rating	Power consumption	A	B	C	D	E	F	G	
AUS-QY2	6.35 (1/4)	7	0 to 2.8	AC 100V AC 200V 50/60Hz Common use	6/5W (50/60Hz)	247	55	6.45	7	5	11	38	230
AUS-QYS2						175							230
AUS-QY3	9.52 (3/8)					247	57	9.65	9	6.5	15	40	240
AUS-QYS3						175							240

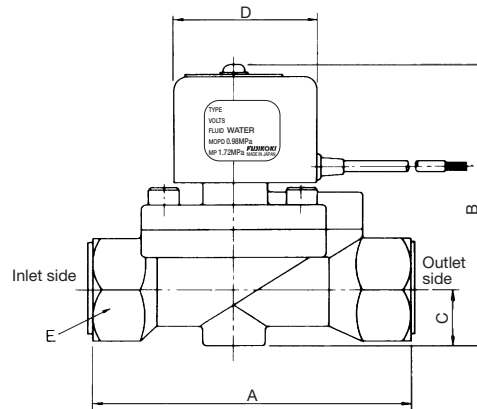
- Sealing pressure and maximum operating pressure 4.15MPa, withstand pressure 6.23MPa.
- Operating temperature range: Ambient temperature -30°C to +50°C, fluid temperature -30°C to +120°C



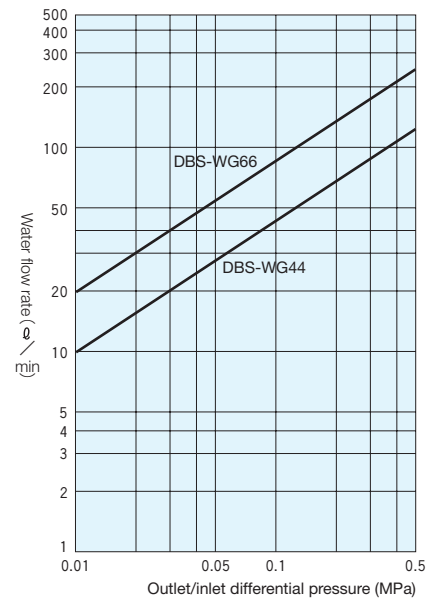
■ Type DBS solenoid valve (for water)

This is an improved operating stability pilot-operated normally open solenoid valve for water. It is small and light weight and is also used in vertical piping. It is a low power consumption energy-saving type with water-resistance molded coil. This solenoid valve is perfect for controlling the cooling water of air conditioning systems and brine.

Compatible fluids are water, hot water, antifreeze, and brine.



Water flow rate characteristics curves



Specifications

Type	Connection		Valve diameter mm	Cv value	Operating pressure differential MPa	Standard coil capacity		Dimensions mm					Weight g
	Size	Shape				Voltage rating	Power consumption	A	B	C	D	E	
DBS-WG44	1/2	Rc1/2	10	2.7	0.007 to 0.98	AC 100V AC 200V 50/60Hz Common use	6/5W	84	83	15	46	H27	600
DBS-WG66	3/4	Rc3/4	16	5.1			50/60Hz	104	93	18		H34	1000

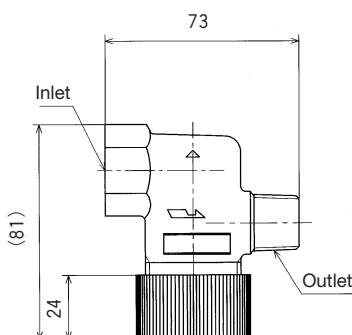
- Sealing pressure and maximum operating pressure 1.72MPa, withstand pressure 3.43MPa.
- Operating temperature range: Ambient temperature -10°C to $+50^{\circ}\text{C}$, fluid temperature -10°C to $+100^{\circ}\text{C}$.
- Absolutely avoid freezing of the fluid used.
- Always install a #60 to #100 mesh strainer at the inlet side. The Type S-4G water strainer (below) is available for the Type DBS-WG4.



■ Type S-4G water strainer

Specifications

Type	S-4G
Material	Body ABS resin Metal net Stainless steel 60 mesh Spring Stainless steel
Connection	Inlet 1/2 female Outlet 1/2 male
Installation method	(1) Screw the 1/2 male screw of the S-4G outlet onto a water supply valve and water solenoid valve of 1/2 the piping size. (2) Install the S-4G vertically with the opening of the metallic mesh replacement strainer at the bottom.
Installation torque	7N/m or less



- When connecting the S-4G to piping, pay attention to the following to avoid cracking of the joint material and water leakage.
- * There is no problem with vinyl piping, but if screwed on with too much force when connecting iron pipe to the S-4G, the body of the S-4G may crack. Screw on by hand; do not use a wrench. Do not tighten to a torque of 7N/m or more.
- * Connect the joint section with sealing tape or sealant.

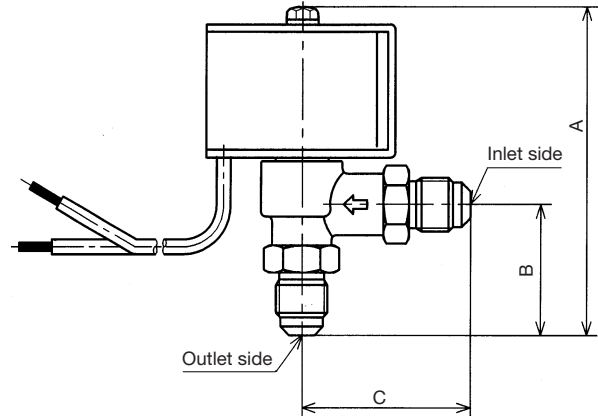
■ Type AFS solenoid valve (only available by order)

Direct driven solenoid valve used in the refrigerant recovery circuit and auto gas charger of freezers and car air conditioners. Use it over a wide range of applications from vacuum to sealing pressure.

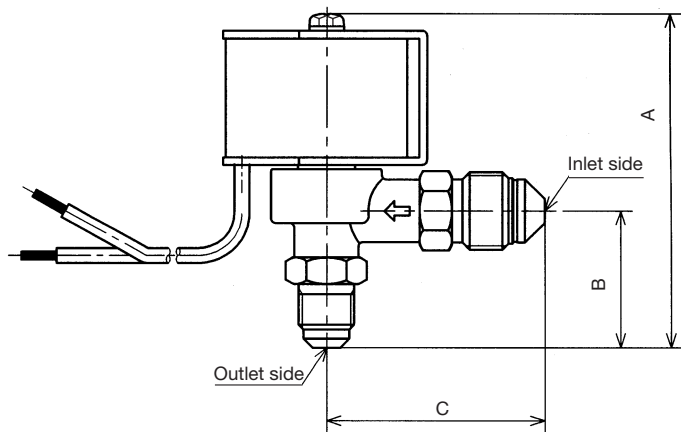
Compatible refrigerants are R12, R134a, R22, R404A, R407C, R500, and R502 etc.



Type AFS-QF2



Type AFS-QF32



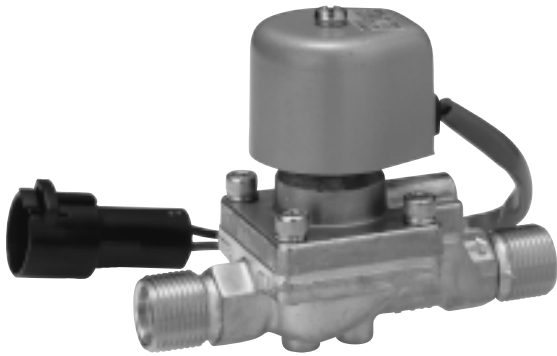
Specifications

Type	Connection pipe diameter mm (inches)	Valve diameter mm	Liquid used	Operating pressure differential MPa	Standard coil capacity		Dimensions mm			Weight g
					Voltage rating	Power consumption	A	B	C	
AFS-QF2-1	6.35 (1/4) flare	2	R12/R134a	-0.1 to 2	AC 100V AC 200V 50/60Hz Common use	6/5W (50/60Hz)	67.5	27	36	200
AFS-QF2-2			R134a/R404A R407C/R500							
AFS-QF32-1	9.52 (3/8) flare/inlet		R12/R134a				68.5	28	42.5	
AFS-QF32-2	6.35 (1/4) flare/outlet		R134a/R404A R407C/R500							

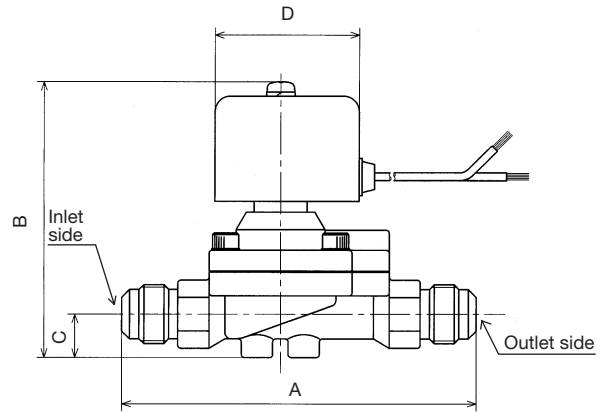
- Sealing pressure and maximum operating differential pressure 2.84MPa, withstand pressure 4.27MPa
- Operating temperature range: Ambient temperature -20°C to $+45^{\circ}\text{C}$, fluid temperature -30°C to $+80^{\circ}\text{C}$
- AFS-QF32 has a strainer (100mesh) at the inlet side.

■ Type BPS solenoid valve (only available by order)

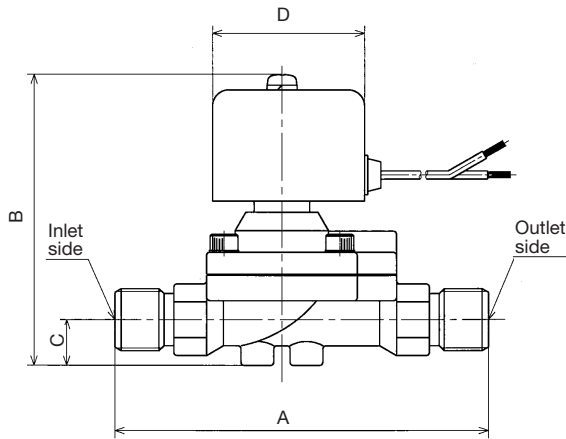
Pilot-operated normally closed solenoid valve which can also be used in the liquid, discharge, suction, or hot bypass line of freezer and air conditioning systems. Compatible refrigerants are R22, R134a, and R404.



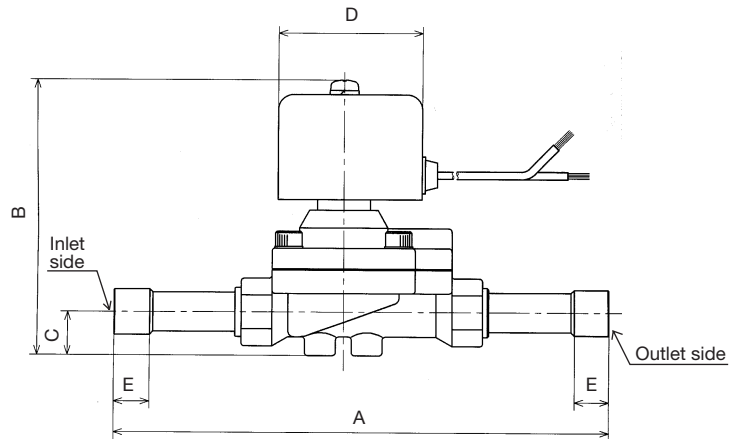
Type BPS-QF



Type BPS-QP



Type BPS-QY



Specifications

Type	Connection pipe diameter mm (inches)	Valve diameter mm	Operating pressure differential MPa	Liquid line capacity kW			Standard coil capacity		Dimensions mm					Weight g		
				R22	R134a	R404A	Voltage rating	Power consumption	A	B	C	D	E			
BPS-QF	12.7 (1/2) flare	10	-0.007 to 2.06	34.5	32.2	22.7	AC 100V AC 200V 50/60Hz Common use	7/6W (50/60Hz)	114	89	14	46.5	-	700		
BPS-QP	12.7 (1/2) O-ring seal								114						11	620
BPS-QY	12.7 (1/2) blazed								160							

- Sealing pressure and maximum operating pressure 2.94MPa, withstand pressure 4.41MPa.
- Liquid line capacity is the condensing temperature 38°C, evaporator temperature 5°C, pressure drop 0.015MPa value.
- Operating temperature range: Ambient temperature -30°C to +50°C, fluid temperature -40°C to +130°C



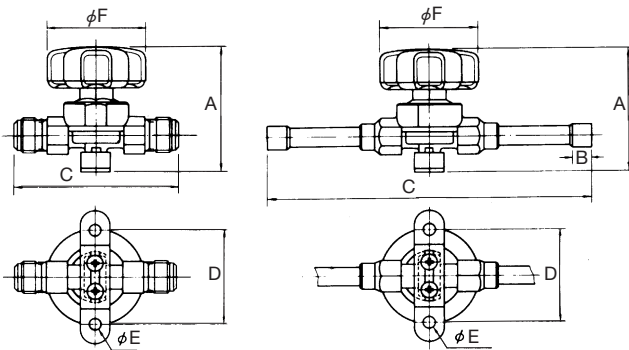
Type JAV

■ Type JAV packless valve

- This valve maintains air tightness by using a stainless steel diaphragm to block the inside and outside.
- A reset spring is used at the valve and valve switching is smooth even in the 0.13Pa vacuum region. A back seat system is used to provide a double seal construction against leakage.
- Type JAV-7 and larger types are equipped with an O-ring for waterproofing to prevent freezing of the valve by the invasion of water.



Type JAV-Y



Type JAV

Type JAV-Y

Performance

Type	JAV-2 to JAV-6 JAV-Y2 to JAV-Y6	JAV-Y7 to JAV-Y10
Maximum operating pressure	3.5MPa	3.0MPa
Sealing pressure	3.5MPa	3.0MPa
Withstand pressure	5.5MPa	4.5MPa
Compatible refrigerants	R22, R134a, R404A, R407C	
Fluid temperature	-40 to 120°C	
Ambient temperature	-30 to 40°C	

Specifications

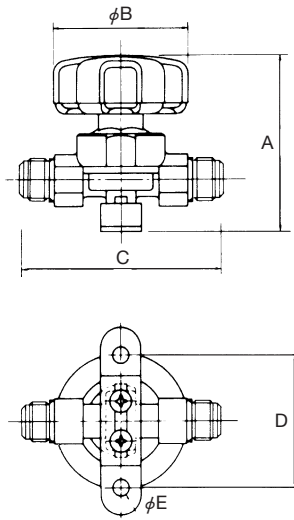
Type	Connection	Connection pipe diameter mm (inches)	Valve diameter mm	Kv value	Thread size	Dimensions mm						Weight g	
						A	B	C	D	E	F		
JAV-2	Flare	6.35 (1/4)	9	0.43	7/16-20UNF	62.5	—	77	49	6	50	230	
JAV-3		9.52 (3/8)		0.91		64.5		83				305	
JAV-4		12.70 (1/2)		1.86		76		101	55	60	490		
JAV-5		15.88 (5/8)	16	2.80		89		128	68	7	70	885	
JAV-6		19.05 (3/4)		3.10		93		135				1110	
JAV-Y2		Blazed	6.35 (1/4)	9		0.43		—	62.5	10	165	49	6
JAV-Y3	9.52 (3/8)		0.91		64.5	83	260						
JAV-Y4	12.70 (1/2)		1.86		76	190	55		60		440		
JAV-Y5	15.88 (5/8)		16	2.80	89	14	7		70		830		
JAV-Y6	19.05 (3/4)			3.10	93	200					68	880	
JAV-Y7-1	22.22 (7/8)		20	4.40	—	15	188		68		7	70	1650
JAV-Y7	4.40									188			1650
JAV-Y8	25.40 (1)						4.45		127	18	192	88	10
JAV-Y9	28.58 (1 1/8)			(4.50)		—	20		196	88	10	98	1650
JAV-Y10	31.75 (1 1/4)												1650

● Dimension A represents the dimension when open fully.



■ Type JCV packless valve (only available by order)

- This is a packless valve with a rubber seat at the valve and is vacuum use.
- A reset spring is used at the valve and valve switching is smooth even when used down to a vacuum region of about 0.13Pa.



Performance

Maximum operating pressure	3.5MPa
Sealing pressure	3.5MPa
Withstand pressure	5.5MPa
Compatible refrigerants	R22
Fluid temperature	-30 to 80°C
Ambient temperature	-30 to 40°C

Specifications

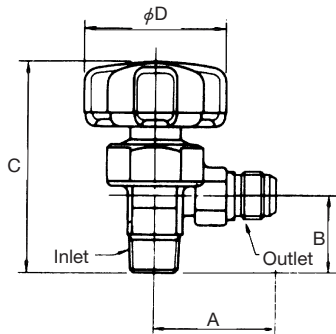
Type	Connection	Connection pipe diameter mm (inches)	Valve diameter mm	Kv value	Thread size	Dimensions mm					Weight g
						A	B	C	D	E	
JCV-2	Flare	6.35 (1/4)	9	0.43	7/16-20UNF	62.5	50	70	49	6	230
JCV-3		9.52 (3/8)		0.91	5/8-18UNF	64.5		74			305
JCV-4		12.70 (1/2)	14	1.86	3/4-16UNF	76	60	92	55	7	490
JCV-5		15.88 (5/8)		2.80	1 1/16-14UNS	93	70	118	68		885

- Dimension A represents the dimension when open fully.



■ Type JLV packless valve

- This is a packless valve with an angular direction of flow.
- The outlet has a flare bolt connection and the inlet has a gas bolt connection.
- Valve performance and internal construction are the same as those of the Type JAV.



Performance

Maximum operating pressure	3.5MPa
Sealing pressure	3.5MPa
Withstand pressure	5.5MPa
Compatible refrigerants	R22, R134a, R404A, R407C
Fluid temperature	-30 to 80°C
Ambient temperature	-30 to 40°C

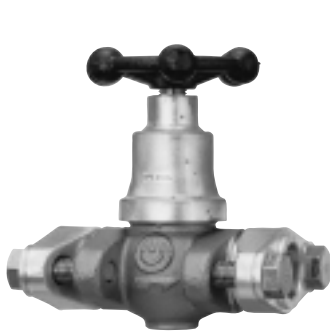
Specifications

Type	Connection	Inlet side thread size	Outlet side		Valve diameter mm	Dimensions mm				Weight g
			Connecting pipe diameter mm (inches)	Thread size		A	B	C	D	
JLV-2	Inlet side gas bolt	R1/4	6.35 (1/4)	7/16-20UNF	9	38.5	24	71	50	210
JLV-3		R3/8	9.52 (3/8)	5/8-18UNF		41.5	27	75		250
JLV-4		R1/2	12.70 (1/2)	3/4-16UNF		14	50.5	40		95.5
JLV-5	Outlet side flare	R5/8	15.88 (5/8)	7/8-14UNF	16	64		104.5	70	720
JLV-6		R3/4	19.05 (3/4)	1 1/16-14UNS		67.5	43	109.5		1000

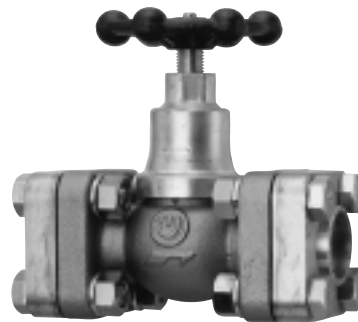
- Dimension C represents the dimension when open fully.

■ Type BP packless valve (only available by order)

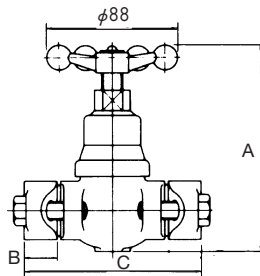
- The Type BP packless valve uses an internal phosphor bronze bellows to maintain air tightness.
- The connecting pipe uses a flange connection.



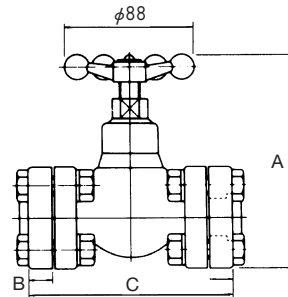
Type BP8



Type BP10



Type BP8



Type BP10

Performance

Maximum operating pressure	3.0MPa
Sealing pressure	3.0MPa
Withstand pressure	4.5MPa
Compatible refrigerants	R22
Operating temperature	80°C or less

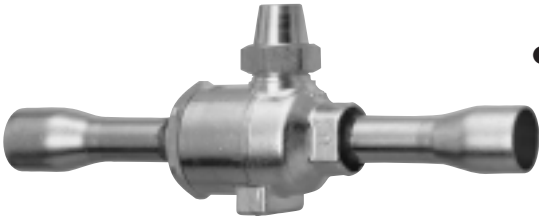
- When using a refrigerant other than R22, please consult us separately.

Specifications

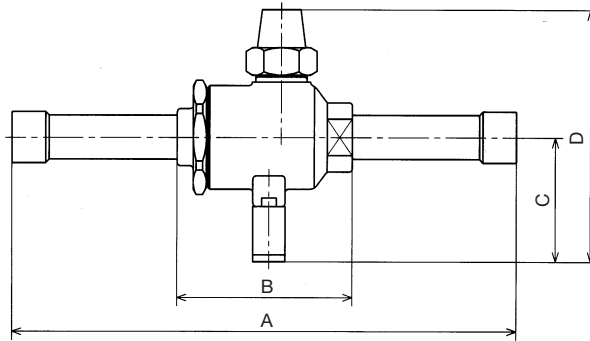
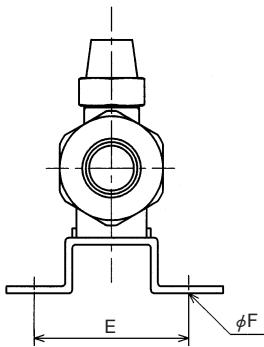
Type	Connection	Connecting pipe diameter mm (inches)	Valve diameter mm	Dimensions mm			Weight g
				A	B	C	
BP-8	Flange	25.40 (1)	23	140	22	119	2500
BP-10		31.75 (1 1/4)	23	148	16	139	3900

- Dimension A represents the dimension when open fully.

■ Type BAV ball valve



- The Type BAV ball valve is a compact, lightweight valve featuring superior operability.
(The ball valve can be fully opened and fully closed by merely turning the valve stem 90°.)
- The internal uses a valving element having a liquid expansion prevention construction.



The shape of the pipe flare section of the BAV-Y2 and BAV-Y3 is shown below.



Performance

Maximum operating pressure	3.43MPa
Sealing pressure	3.43MPa
Withstand pressure	4.5MPa
Compatible refrigerants	R22
Fluid temperature	-40 to 120°C
Ambient temperature	-30 to 40°C

- When using a refrigerant other than R22, please consult us separately.

Specifications

Type	Connection	Connecting pipe diameter mm (inches)	Valve diameter mm	Dimensions mm						Weight g	
				A	B	C	D	E	F		
BAV-Y2	Brazed	6.35 (1/4)	10	150	54	36	73	45	6	285	
BAV-Y3		9.52 (3/8)								290	
BAV-Y4		12.70 (1/2)	10	156	54	36	73	45	6	300	
BAV-Y5		15.88 (5/8)								310	
BAV-Y6		19.05 (3/4)	15	174.5	66	33	72.5	49	55	7	410
BAV-Y7		22.22 (7/8)	700								
BAV-Y8		25.40 (1)	20	178.5	74.5	34	81	88	10	710	
BAV-Y9		28.58 (1 1/8)								720	
BAV-Y10		31.75 (1 1/4)	32	244	104	47	109	88	10	730	
BAV-Y11		34.92 (1 3/8)								1800	
BAV-Y12		38.10 (1 1/2)	40	282	132	55	127.5	88	10	1900	
BAV-Y13		41.28 (1 5/8)								2000	
※BAV-Y16		50.80 (2)	40	302	132	55	127.5	88	10	3200	
※BAV-Y17		53.98 (2 1/8)								3300	

※: Only available by order

- Products with a service port are also available. Please inquire separately.

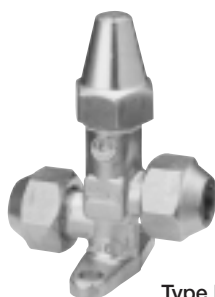
- Note: Since this valve cannot be used for valve closing in the reverse flow direction, check the arrow mark (direction of flow) on the body before use

■ Type FN packed valve

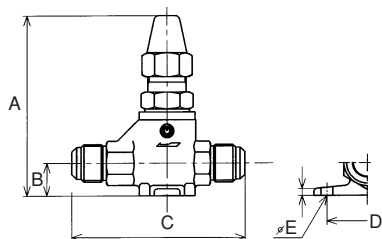
- The packed valve has the shaft of the valve stem sealed by packing.
- The connecting pipe of the Type FN is straight.



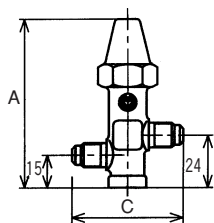
Type FN



Type FN 2



Type FN



Type FN 2

Performance

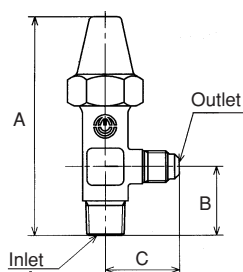
Maximum operating pressure	3.0MPa
Sealing pressure	3.0MPa
Withstand pressure	4.5MPa
Compatible refrigerants	R22, R134a, R404A, R407C
Fluid temperature	-20 to 100°C
Ambient temperature	-30 to 40°C
Cap tightening torque	20N·m
Clamp tightening torque	9N·m

Specifications

Type	Connection	Connecting pipe diameter mm (inches)	Thread size	Valve diameter mm	Dimensions mm					Valve stem tightening torque N/m	Weight g
					A	B	C	D	E		
FN2-22	Flare	6.35 (1/4)	7/16-20UNF	5	76	—	50	38	7	13	350
FN2-33		9.52 (3/8)	5/8-18UNF	7			52				400
FN-44		12.70 (1/2)	3/4-16UNF	11	102	19	90	700			
FN-55		15.88 (5/8)	7/8-14UNF	13	106	100	47	750			
FN-66		19.05 (3/4)	1 1/16-14UNS	16	113	23	110	20		1030	

■ Type FNL packed valve

- The Type FNL is a packed valve with angular direction of flow.
- The inlet uses a gas bolt and the outlet uses a flare bolt.

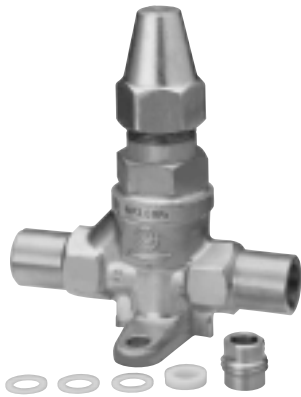


Performance

Maximum operating pressure	3.0MPa
Sealing pressure	3.0MPa
Withstand pressure	4.5MPa
Compatible refrigerants	R22, R134a, R404A, R407C
Fluid temperature	-20 to 100°C
Ambient temperature	-30 to 40°C
Cap tightening torque	20N·m
Clamp tightening torque	9N·m

Specifications

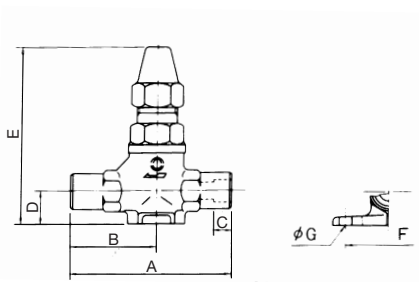
Type	Connection	Inlet side thread size	Outlet side		Valve diameter mm	Dimensions mm			Valve stem tightening torque N/m	Weight g		
			Connecting pipe diameter mm (inches)	Thread size		A	B	C				
FNL-22	Inlet side	R1/4	6.35 (1/4)	7/16-20UNF	5	75	24	26	13	225		
FNL-33		R3/8	9.52 (3/8)	5/8-18UNF	7					240		
FNL-44	Gas thread	R1/2	12.70 (1/2)	3/4-16UNF	11	120	40	45	16	535		
FNL-55	Outlet side	R1/2	15.88 (5/8)	7/8-14UNF	13					122	50	605
FNL-66		Flare	R3/4	19.05 (3/4)	1 1/16-14UNS					16	135	50



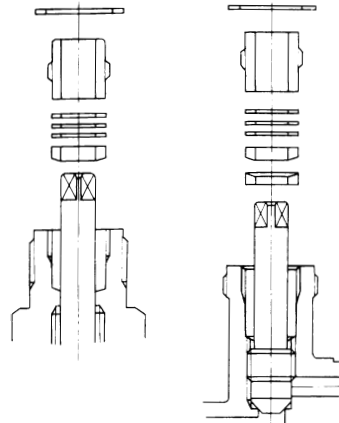
Type YN

Type YN packed valve (only available by order)

- The Type YN packed valve is a brazing type valve.
- To avoid the effect of brazing heat, the packing is not installed. After brazing work, use the valve by install the accessory packing.

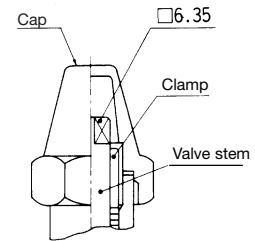


Packing installation procedure



YN-44
YN-55
YN-66

YN2-22
YN2-33



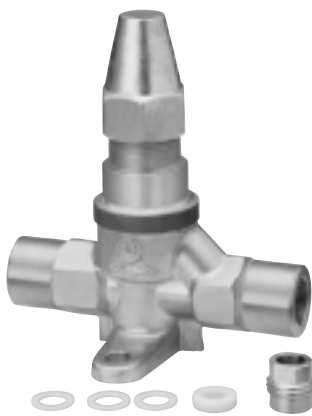
Performance

Maximum operating pressure	3.0MPa
Sealing pressure	3.0MPa
Withstand pressure	4.5MPa
Compatible refrigerants	R22, R134a, R404A, R407C
Fluid temperature	-20 to 100°C
Ambient temperature	-30 to 40°C
Cap tightening torque	20N·m
Clamp tightening torque	9N·m

Specifications

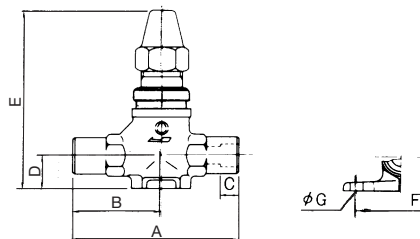
Type	Connection	Connecting pipe diameter mm (inches)	Valve diameter mm	Dimensions mm							Valve stem tightening torque N/m	Weight g
				A	B	C	D	E	F	G		
YN2-22	Blazed	6.35 (1/4)	5	60	30	8	16	83	38	7	13	345
YN2-33		9.52 (3/8)	7									380
YN-44		12.70 (1/2)	11	90	48	10	19	103	47		16	710
YN-55		15.88 (5/8)	13									100
YN-66		19.05 (3/4)	16	96	51	12	23	114	20		1040	

Type YE manual expansion valve



Type YE 3

- The Type YE is an auxiliary valve for bypassing the refrigerant cycle if control is lost due to failure of an automatic expansion valve.
- The flow rate can be adjusted by turning the valve stem, but the flow rate cannot be controlled by this valve alone.
- Use this valve by installing the accessory packing after brazing, the same as the Type YN.



Performance

Maximum operating pressure	3.0MPa
Sealing pressure	3.0MPa
Withstand pressure	4.5MPa
Compatible refrigerants	R22, R134a, R404A, R407C
Fluid temperature	-40 to 120°C
Ambient temperature	-30 to 40°C
Cap tightening torque	20N·m
Clamp tightening torque	9N·m

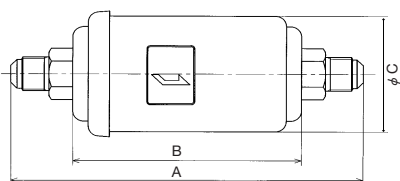
Specifications

Type	Connection	Connecting pipe diameter mm (inches)		Valve diameter mm	Dimensions mm							Valve stem tightening torque N/m	Weight g
		Inlet	Outlet		A	B	C	D	E	F	G		
YE3-434	Blazed	9.52 (3/8)	12.70 (1/2)	4	90	48	10	19	102.5	47	7	16	700
YE3-834				8									700
YE3-444		12.70 (1/2)		4									710
YE3-844				8									710

■ Type DBF filter drier



- The Type DBF drier is a completely sealed filter drier that uses synthetic zeolite as the desiccant.
- Impurities, oxides, undissolved impurities which degrade moisture removal and cleanliness inside the refrigeration system are effectively trapped and the refrigeration circuit is kept clean.
- Bright blue appearance. Corrosion resistant paint actually proven by JIS salt-water spray test is used.



Performance

Maximum operating temperature	3.3MPa
Sealing pressure	3.3MPa
Withstand pressure	4.95MPa
Compatible refrigerants	R22, R134a, R404A
Operating temperature range	-30 to 120°C
Vibration resistance	43.1m/s ²
Corrosion resistance	JIS saltwater spray test 72 hours
Filtering capacity	35µm min. or more

Specifications

Type	Connection	Connecting pipe diameter mm (inches)	Thread size	Dimensions mm			Weight g
				A	B	C	
DBF-F 270Q	Flare	6.35 (1/4)	7/16-20UNF	125	77	55	520
DBF-F 370Q				131			535
DBF-F3100Q		9.52 (3/8)	5/8-18UNF	154	100	77	640
DBF-F3200Q				174	120	77	1270
DBF-F4100Q		12.70 (1/2)	3/4-16UNF	168	100	55	670
DBF-F4200Q				188	120	77	1300
DBF-F5100Q		15.88 (5/8)	7/8-14UNF	174	100	55	700
DBF-F5200Q				194	120	77	1350
DBF-F5280Q		19.05 (3/4)	1 1/16-14UNS	219	145	77	1650
DBF-F6200Q				204	120		1400
DBF-F6280Q				229	145		1760

Drier capacity

Type	Desiccant charge g	Moisture absorption capacity g	Refrigerant processing capacity kg (refrigerant temperature 52°C)		
			R22	R134a	R404A
DBF-F 270Q	70	12.3	12.37	7.21	9.42
DBF-F 370Q					
DBF-F3100Q	100	17.5	17.68	10.29	13.46
DBF-F3200Q	200	35.0	35.35	20.59	26.92
DBF-F4100Q	100	17.5	17.68	10.29	13.46
DBF-F4200Q	200	35.0	35.35	20.59	26.92
DBF-F5100Q	100	17.5	17.68	10.29	13.46
DBF-F5200Q	200	35.0	35.35	20.59	26.92
DBF-F5280Q	280	49.0	49.49	28.82	37.69
DBF-F6200Q	200	35.0	35.35	20.59	26.92
DBF-F6280Q	280	49.0	49.49	28.82	37.69

* Refrigerant processing capacity is the calculated value based on the following conditions when the water in refrigerant saturated with water is absorbed up to 0ppm.

Refrigerant processing capacity = Absorption capacity ÷ humidity

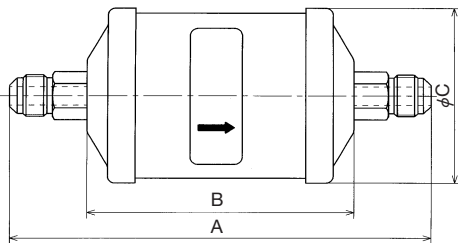
Absorption capacity = Desiccant charge X desiccant moisture absorption rate

Humidity wetness: R22=990ppm, R134a=1700ppm, R404A=1300ppm

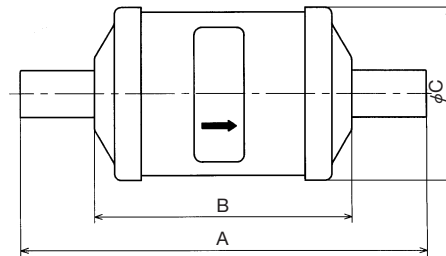


Type DDF core type drier

- The Type DDF is a core-type drier that uses a 100% molecular sieve.
- This serialized product is available in 49 models by combination of connection type (flare, brazed) and core size and other attributes to meet various applications.



Flare type



Brazed type

Performance

Maximum operating pressure	3.3MPa
Sealing pressure	3.3MPa
Withstand pressure	4.95MPa
Compatible refrigerants	R22, R134a, R404A, R407C
Operating temperature	-45 to -65°C
Vibration resistance	43.1m/s ²
Filtering capacity	40µm min. or more

Specifications

Type	Make to order *1	Connection	Connecting pipe diameter mm (inches)	Thread size	Dimensions mm			Weight g
					A	B	C	
DDF-032-1		Flare	6.35 (1/4)	7/16-20UNF	111	65	41	250
DDF-052-1	ADK-052				122			
DDF-053-1	ADK-053		9.52 (3/8)	5/8-18UNF	130	76	67	600
DDF-083-1	ADK-083				150			
DDF-084-1	ADK-084		12.7 (1/2)	3/4-16UNF	156	97	67	600
DDF-085-1	ADK-085		15.88 (5/8)	7/8-14UNF	168			
DDF-163-1	ADK-163		9.52 (3/8)	5/8-18UNF	175	121	80	1700
DDF-164-1	ADK-164		12.7 (1/2)	3/4-16UNF	181			
DDF-165-1	ADK-165		15.88 (5/8)	7/8-14UNF	193	189	80	1700
DDF-303-1	ADK-303		9.52 (3/8)	5/8-18UNF	243			
DDF-304-1	ADK-304		12.7 (1/2)	3/4-16UNF	249	196	92	2200
DDF-305-1	ADK-305		15.88 (5/8)	7/8-14UNF	260			
DDF-306-1			19.05 (3/4)	1 1/16-14UNS	268	196	92	2200
DDF-415-1	ADK-415		15.88 (5/8)	7/8-14UNF	264			
DDF-032S-1	ADK-032S	Brazed	6.35 (1/4)	7/16-20UNF	97	65	44	250
DDF-033S-1	ADK-033S				102			
DDF-052S-1					115	76	67	350
DDF-053S-1					113			

*1 The products listed above set as conventional standard products may become make to order products and their type designation may also change in the future.

Water absorption capacity

Unit: g

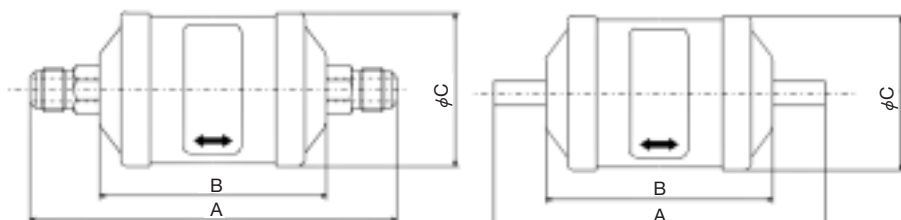
Type	R22		R134a		R404A		R407C	
	24°C	52°C	24°C	52°C	24°C	52°C	24°C	52°C
DDF-03**	4.5	4.2	4.8	4.5	5.0	4.8	1.2	1.2
DDF-05**	12.4	11.6	13.1	12.4	13.5	13.1	8.8	8.3
DDF-08**	16.7	15.7	17.8	16.7	18.3	17.8	10.6	10.0
DDF-16**	28.0	26.3	29.8	28.0	30.7	29.8	18.2	17.4
DDF-30**	55.2	50.7	57.5	55.2	59.1	57.5	34.4	32.7
DDF-41**	70.4	66.0	74.8	70.4	77.0	74.8	46.3	44.1

* Water absorption capacity is the amount of water absorbed by the desiccant in the refrigerant according to ARI standards (American Air-conditioning and Refrigeration Institute).

■ Type DGF bi-flow drier



- The Type DGF is a bi-flow type drier.
- This drier uses activated aluminum oxide + synthetic zeolite as the main component of the desiccant, and can remove not only water, but also acids and oxides in refrigerant.



Performance

Maximum operating pressure	3.3MPa
Sealing pressure	3.3MPa
Withstand pressure	4.95MPa
Compatible refrigerants	R22, R134a, R404A, R407C
Operating temperature	-45 to -65°C
Vibration resistance	43.1m/s ²
Filtering capacity	40µm min. or more

Specifications

Type	Make to order *1	Connection	Connecting pipe diameter mm (inches)	Thread size	Dimensions mm			Weight g	
					A	B	C		
DGF-052	BFK-052	Flare	6.35 (1/4)	7/16-20UNF	123	77	69	450	
DGF-053	BFK-053		9.52 (3/8)	5/8-18UNF	131				
DGF-083	BFK-083		9.52 (3/8)	5/8-18UNF	152	98	69	650	
DGF-084	BFK-084		12.70 (1/2)	3/4-16UNF	157				
DGF-085	BFK-085		15.88 (5/8)	7/8-14UNF	169	119	81	900	
DGF-163	BFK-163		9.52 (3/8)	5/8-18UNF	173				
DGF-164	BFK-164		12.70 (1/2)	3/4-16UNF	179	191	81	1700	
DGF-165	BFK-165		15.88 (5/8)	7/8-14UNF	190				
DGF-304	BFK-304		12.70 (1/2)	3/4-16UNF	251	271	81	1700	
DGF-305	BFK-305		15.88 (5/8)	7/8-14UNF	263				
DGF-306	BFK-306		19.05 (3/4)	1•1/16-14UNS	271	Blazed	77	69	450
DGF-052S	BFK-052S		6.35 (1/4)		106				
DGF-053S	BFK-053S		9.52 (3/8)		114				
DGF-082S	BFK-082S		6.35 (1/4)		133				
DGF-083S		9.52 (3/8)		135					
DGF-084S	BFK-084S	12.70 (1/2)		137					
DGF-085S	BFK-085S	15.88 (5/8)		143					
DGF-162S		6.35 (1/4)		147					
DGF-163S	BFK-163S	9.52 (3/8)		157					
DGF-164S	BFK-164S	12.70 (1/2)		159					
DGF-165S		15.88 (5/8)		166					
DGF-167S	BFK-167S	22.22 (7/8)		179					
DGF-303S	BFK-303S	9.52 (3/8)		229					
DGF-304S	BFK-304S	12.70 (1/2)		230					
DGF-305S	BFK-305S	15.88 (5/8)		237					
DGF-306S	BFK-306S	19.05 (3/4)		247					
DGF-307S	BFK-307S	22.22 (7/8)		252					
DGF-309S	BFK-309S	28.55 (1 1/8)		261					

*1 The products listed above set as conventional standard products may become make to order products and their type designation may also change in the future.

Water absorption capacity

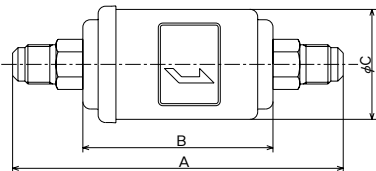
Unit: g

Type	R22		R134a		R404A		R407C	
	24°C	52°C	24°C	52°C	24°C	52°C	24°C	52°C
DGF-05 ..	4.8	4.5	5.2	4.8	5.3	5.2	4.0	3.2
DGF-08 ..	10.3	9.6	11.0	10.3	11.4	11.0	8.5	6.7
DGF-16 ..	14.9	13.0	15.9	14.9	16.5	15.9	12.3	9.8
DGF-30 ..	39.9	37.3	43.1	39.9	44.0	42.6	33.2	26.5



Type DM2 filter drier

- The Type DM2 drier is a completely sealed drier using zeolite and activated aluminum oxide as the desiccant.
- This drier efficiently collects impurities, oxide, and undissolved impurities which impede moisture removal and cleanliness inside refrigeration systems and displays an excellent effect in keeping the refrigeration circuit clean.
- Bright blue appearance. Corrosion resistant paint actually proven by JIS salt-water spray test is used.



Performance

Maximum operating pressure	2.0MPa
Sealing pressure	3.2MPa
Withstand pressure	4.8MPa
Compatible refrigerants	R22
Operating temperature	-30 to 120°C
Vibration resistance	43.1m/s ²
Corrosion resistance	JIS saltwater spray test 72 hours
Filtering capacity	35µm min. or more

Specifications

Type	Connection	Connecting pipe diameter mm (inches)	Thread size	Dimensions mm			Desiccant charge g		Weight g
				A	B	C	Zeolite	Aluminum oxide	
DM2- 352	Flare	6.35 (1/4)	7/16-20UNF	113	70	53	24	6	270
DM2- 602				118					355
DM2- 603				124					415
DM2- 903		9.52 (3/8)	5/8-18UNF	146	92	65	65	20	480
DM2- 904				160					545
DM2-1854				173					920
DM2- 905		12.70 (1/2)	3/4-16UNF	166	105	73	130	55	920
DM2-1854				173					920
DM2- 905				166					92
DM2-1855	15.88 (5/8)	7/8-14UNF	179	105	73	130	55	985	
DM2-1855			179					985	
DM2-1856			189					1180	



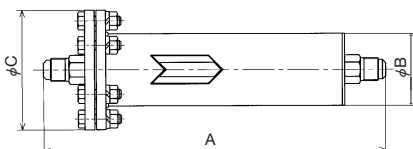
Type DF81



Type DF8

Type DF81, DF8 filter drier

- The Types DF81 and DF8 are filter driers with replaceable desiccant. The desiccant is charged and replaced by removing the flange section.
- The desiccant is bead type silica gel.



Performance

Type	Type DF81	Type DF8
Maximum operating pressure	2.5MPa	2.0MPa
Sealing pressure	3.2MPa	3.2MPa
Withstand pressure	4.8MPa	4.8MPa
Compatible refrigerants	R22	

Specifications

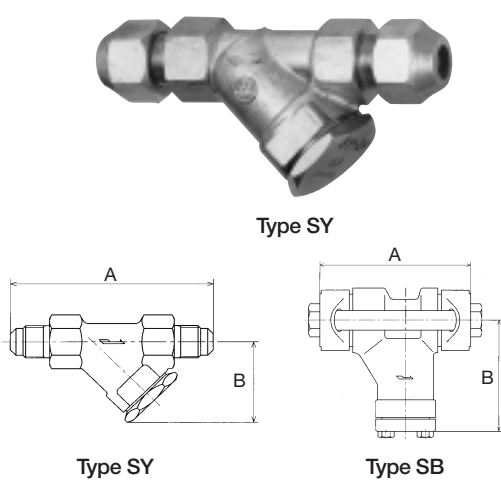
Type	Connection	Connecting pipe diameter mm (inches)	Thread size	Dimensions mm			Desiccant charge g	Weight g
				A	B	C		
DF81-2G	Flare	6.35 (1/4)	7/16-20UNF	208	44.5	77	90	1160
DF81-3G		9.52 (3/8)	5/8-18UNF	242			130	1220
DF8-4G		12.70 (1/2)	3/4-16UNF	279	60.5	100	300	2250
DF8-5G		15.88 (5/8)	7/8-14UNF	285				2930
DF8-6G		19.05 (3/4)	1 1/16-14UNS	379				450

■ Type SY, FS, and YS strainer

- These strainers are used to remove metal powder and other foreign matter in refrigerant cycles.
- The Type SY is a flare type strainer with a replaceable metallic mesh filter.
- The Type SB is a flange type strainer with a replaceable metallic mesh filter.
- The Type FS is a flare type strainer with a completely sealed construction.
- The Type YS is a brazed type strainer with a completely sealed construction.

Performance

Type	Type SY, SB	Type FS, YS
Maximum operating pressure	3.0MPa	2.0MPa
Sealing pressure	3.0MPa	2.0MPa
Withstand pressure	4.5MPa	3.0MPa
Compatible refrigerants	R22, R134a, R404A	
Metallic mesh size	100	



Specifications (Type SY, SB)

Type	Connection	Connecting pipe diameter mm (inches)	Thread size	Dimensions mm		Metallic mesh area cm ²	Weight g
				A	B		
SY-2F	Flare	6.35 (1/4)	7/16-20UNF	90	42	10	330
SY-3F		9.52 (3/8)	5/8-18UNF	96			
SY-4F		12.70 (1/2)	3/4-16UNF	109	50	20	530
SY-5F		15.88 (5/8)	7/8-14UNF	113			
SY-6F		19.05 (3/4)	1 1/16-14UNS	150			
SB-60	Flange	19.05 (3/4)	—	108	74	36	1400
SB-80		25.40 (1)					1500
SB-100		31.75 (1 1/4)					1600

Specifications (Type FS, YS)

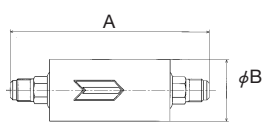
Type	Connection	Connecting pipe diameter mm (inches)	Thread size	Dimensions mm		Metallic mesh area cm ²	Weight g
				A	B		
FS-30	Flare	9.52 (3/8)	5/8-18UNF	148	60.5	32	520
FS-40		12.70 (1/2)	3/4-16UNF	162			590
FS-50		15.88 (5/8)	7/8-14UNF	198		50	1000
FS-60		19.05 (3/4)	1 1/16-14UNS	208			1000
YS-09	Blazed	28.58 (1 1/8)	—	230	75	670	
YS-10		31.75 (1 1/4)				680	
YS-12		38.10 (1 1/2)				710	



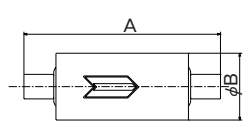
Type FS



Type YS



Type FS

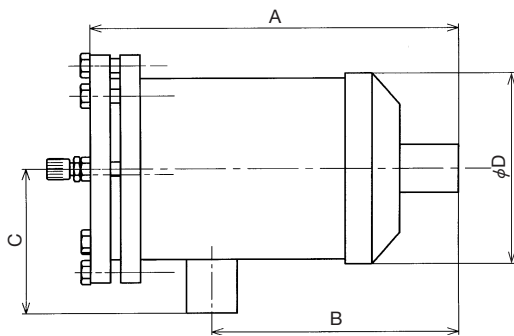


Type YS

■ Type HSF suction strainer



- This strainer is installed to the low pressure side (gas line) to protect a compressor. It is ideal for scroll compressor units which abhor foreign matter.
 - Cassette type filter core is standard as a standard.
 - Can also be used as a drier by replacing the filter core with a drier core.
 - A service port is provided at the inlet side, and the foreign matter collected at the strainer can be checked by connecting a pressure gauge to this port and comparing its reading to the compressor suction pressure.
- * The filter core and drier core are sold separately.



Performance

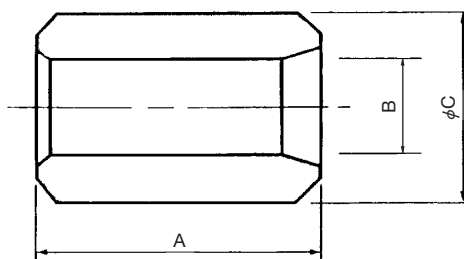
Maximum operating pressure	2.7MPa
Sealing pressure	2.7MPa
Withstand pressure	4.0MPa
Compatible refrigerants	R22, R134a, R404A, R407C
Operating temperature	-45 to -65°C
Vibration resistance	43.1m/s ²
Filtering capacity	40μm min. or more

Specifications

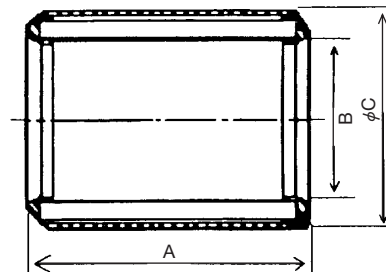
Type	Connecting pipe diameter mm (inches)	Dimensions (mm)				Weight g
		A	B	C	φD	
HSF-485	15.88 (5/8)	241	152	96	126	3730
HSF-487	22.23 (7/8)	246	159	95	126	3750
HSF-489	28.58 (1 1/8)	248	160	98	126	3750
HSF-4811	34.93 (1 3/8)	250	164	101	126	3800
HSF-4813	41.28 (1 5/8)	251	165	102	126	3800
HSF-4817	53.98 (2 1/8)	256	167	113	126	3900
HSF-4821	66.68 (2 5/8)	265	179	121	126	3950
HSF-967	22.23 (7/8)	386	298	95	126	5100
HSF-969	28.58 (1 1/8)	387	299	98	126	5130
HSF-9611	34.92 (1 3/8)	389	303	101	126	5180
HSF-9613	41.28 (1 5/8)	390	304	102	126	5230
HSF-9617	53.98 (2 1/8)	395	306	113	126	5250
HSF-9621	66.68 (2 5/8)	405	318	121	126	6650
HSF-9625	79.38 (3 1/8)	420	321	139	126	6650

Core dimensions and specifications

Drier core (for liquid pipe)



Filter core (suction pipe = suction use)



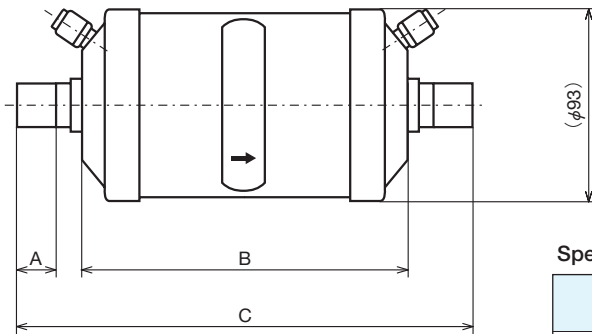
Type	Dimensions mm			Filtering area cm ²	Weight g
	A	B	C		
CD-48	140	45	94	445	700

Type	Dimensions mm			Filtering area cm ²	Weight g
	A	B	C		
C-48	140	70	95	710	300



■ Type HTF suction strainer

- The Type HTF suction strainer is installed to the low pressure side (gas line) to protect a compressor. It is ideal for scroll compressor units which abhor foreign matter.
- A service port is provided at both the inlet and outlet.
- Sealed construction.



Performance

Maximum operating pressure	3.3MPa
Sealing pressure	3.3MPa
Withstand pressure	4.95MPa
Compatible refrigerants	R22, R134a, R404A, R407C
Operating temperature	-45 to -65°C
Vibration resistance	43.1m/s ²
Filtering capacity	40μm min. or more

Specifications

Type	Make to order type designation*1	Connection piping diameter Both outlet and inlet mm (inches)	Dimensions mm			Weight g
			A	B	C	
HTF-28S3	ASF-28S3-VV	9.53 (3/8)	11	105	142	900
HTF-28S4	ASF-28S4-VV	12.7 (1/2)	13		144	
HTF-35S5	ASF-35S5-VV	15.88 (5/8)	16	121	166	1100
HTF-45S6		19.05 (3/4)	16	141	197	1400
HTF-45S7	ASF-45S7-VV	22.22 (7/8)	19		202	
HTF-50S9		28.58 (1-1/8)	23	156	225	1600
HTF-64S17		53.98 (2-1/8)	34	230	297	
HTF-75S11		34.92 (1-1/4)	25	210	311	2300
HTF-75S13		41.28 (1-5/8)	27		309	

*1 The products above set as conventional standard products may become only available by order products and their type designation may also change in the future.



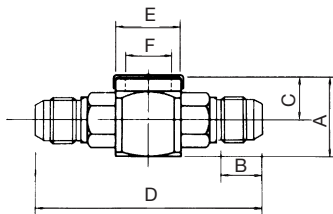
Type MSGP-F
Type MSP-F

■ Type MSGP sight glass

- The Type MSGP is a sight glass with moisture indicator.
- Besides the state of the refrigerant or oil flow, the moisture indicator also shows the moisture content in the refrigerant by moisture-color indication.
- This sight glass is available in two connection types: flare type and brazed type. (The brazed type has steel pipe (copper plated) connections.)

Performance

Maximum operating pressure	3.2MPa
Sealing pressure	3.2MPa
Withstand pressure	4.8MPa
Compatible refrigerants	R22, R134a, R404A



Type MSGP-F
Type SGP-F

Moisture indicator characteristics (color and moisture concentration relationship) Moisture concentration: ppm

Color (state)	R134a	R22	R404A
	40°C		
Green (DRY)	70 or less	90 or less	48 or less
Light green (Caution)	70 to 150	90 to 190	48 to 95
Yellow (WET)	150 or more	190 or more	95 or more

* Pay careful attention to the following points regarding the moisture indicator:

- When brazing the piping, take cooling and other measures so that the temperature does not exceed 100°C.
- The moisture indicator may lose its color if it comes into direct contact with water or is exposed to high humidity.
- If a large amount of oil gets on the moisture indicator; it will become difficult for the color to change.
- Use the color change characteristics as a guideline only.

Specifications

Type	Connection	Connecting pipe diameter mm (inches)	Thread size	Dimensions mm						Finish	Weight g
				A	B	C	D	E	F		
MSGP-2F	Flare	6.35(1/4)	7/16-20UNF	34	13	17	80	32	22	Blue lacquer paint	260
MSGP-3F		9.52(3/8)	5/8-18UNF		15.5		86				315
MSGP-4F		12.70(1/2)	3/4-16UNF	39	18	100	405				
MSGP-5F		15.88(5/8)	7/8-14UNF		20	106	465				
MSGP-6F		19.05(3/4)	1 1/16-14UNS	47	24	25	116				770

■ Type SGP sight glass (only available by order)

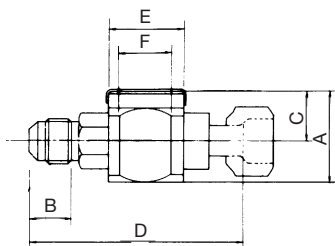
Performance

Maximum operating pressure	3.2MPa
Sealing pressure	3.2MPa
Withstand pressure	4.8MPa
Compatible refrigerants	R22, R134a, R404A

- The Type SGP is a sight glass without moisture indicator. Use it when moisture detection is unnecessary.
- Its dimensions, material, and other specifications are the same as those of the Type MSGP.

Specifications

Type	Connection	Connecting pipe diameter mm (inches)	Thread size	Dimensions mm						Finish	Weight g
				A	B	C	D	E	F		
SGP-2F	Flare	6.35(1/4)	7/16-20UNF	34	13	17	80	32	22	Blue lacquer paint	260
SGP-3F		9.52(3/8)	5/8-18UNF		15.5		86				315
SGP-4F		12.70(1/2)	3/4-16UNF	39	18	100	405				
SGP-5F		15.88(5/8)	7/8-14UNF		20	106	465				
SGP-6F		19.05(3/4)	1 1/16-14UNS	47	24	25	116				770



Type MSGP-MF

■ Type MSGP-MF sight glass

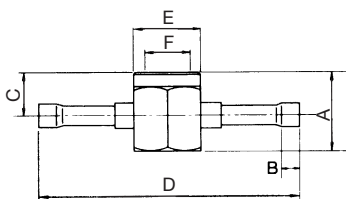
- The Type MSGP-MF is the same as the Type MSGP except for the connection type.
- One side is a flare nut so that it can be directly connected to a drier, etc. (The pipe can be made of copper.)
- A moisture indicator is provided.

Performance

Maximum operating pressure	3.2MPa
Sealing pressure	3.2MPa
Withstand pressure	4.8MPa
Compatible refrigerants	R22, R134a, R404A

Specifications

Type	Connection	Connecting pipe diameter mm (inches)	Thread size	Dimensions mm						Finish	Weight g
				A	B	C	D	E	F		
MSGP-MF2	Flare	6.35 (1/4)	7/16-20UNF	34	13	17	80	32	22	Blue lacquer paint	250
MSGP-MF3		9.52 (3/8)	5/8-18UNF		15.5		86				290
MSGP-MF4		12.70 (1/2)	3/4-16UNF	39	18	100	360				
MSGP-MF5		15.88 (5/8)	7/8-14UNF		20	106	395				

Type SGF-Y
(Pipe is copper.)

■ Type SGF-Y sight glass

- The Type SGF-Y is the Type MSGP-Y with copper pipe.
- A moisture indicator is provided.

Performance

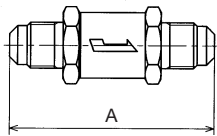
Maximum operating pressure	3.2MPa
Sealing pressure	3.2MPa
Withstand pressure	4.8MPa
Compatible refrigerants	R22, R134a, R404A

Specifications

Type	Connection	Connecting pipe diameter mm (inches)	Dimensions mm						Finish	Weight g
			A	B	C	D	E	F		
SGF-Y2	Blazed	6.35 (1/4)	34	8	17	124	32	22	Copper mesh	185
SGF-Y3		9.52 (3/8)		190						
SGF-Y4		12.70 (1/2)		195						
SGF-Y5		15.88 (5/8)	10	19	144	195				
SGF-Y6		19.05 (3/4)				265				
SGF-Y7		22.22 (7/8)	39	12	200	265				
SGF-Y9		28.58 (1 1/8)				15				275



Type CV3



Type CV3 check valve

- The Type CV3 is a flare type check valve.
- A Teflon valve is incorporated into the brass body. This valve is operated by a small differential pressure.
- The check valve can be used in the following applications:
 - Installed to the evaporator outlet of a low temperature refrigerating system to prevent the refrigerant and refrigerating oil from flowing back into the evaporator when the refrigerating system is stopped.
 - Installed to the evaporator outlet of a refrigerating system that uses 2 or more evaporators to prevent the refrigerant from flowing to the evaporators while the refrigerating system is stopped.
 - Used in the cooling/heating switching piping of a heat pump cycle.
 - Used in piping which requires prevention of reverse flow of the refrigerant.

Performance

Maximum operating pressure	4.2MPa
Sealing pressure	4.2MPa
Withstand pressure	6.3MPa
Compatible refrigerants	R22, R134a, R404A, R407C, R410A
Minimum valve open/close pressure differential	0.03MPa or less

Specifications

Type	Connection	Connecting pipe diameter mm (inches)	Thread size	Valve diameter mm	Dimensions A mm	Weight g
CV3-2	Flare	6.35 (1/4)	7/16-20UNF	7	66	300
CV3-3		9.52 (3/8)	5/8-18UNF	7	71	330
CV3-4		12.70 (1/2)	3/4-16UNF	10	83	400
CV3-5		15.88 (5/8)	7/8-14UNF	12.5	94	440
CV3-6		19.05 (3/4)	1 1/16-14UNS	16	115	600

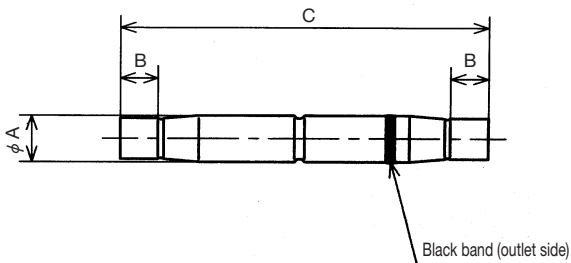
Type YCV5, YCV8 check valve



Type YCV5



Type YCV8



- The Type YCV is a brazed type check valve.
- It has a slim body and incorporates a nylon valve.
- The direction of flow is indicated by an arrow and a black band (seal impression) which indicates the outlet side.
- When brazing, wrap a wet cloth around the pipe so that the seat temperature remains below 120°C.

Performance

Maximum operating pressure	4.2MPa
Sealing pressure	4.2MPa
Withstand pressure	6.3MPa
Compatible refrigerants	R22, R134a, R404A, R407C, R410A
Minimum valve open/close pressure differential	0.03MPa or less

Specifications

Type	Connection	Connecting pipe diameter mm (inches)	Valve diameter mm	Dimensions mm			Weight g
				A	B	C	
YCV5-2	Blazed	6.35 (1/4)	5	12.7	8	110	40
YCV5-3		9.52 (3/8)			10		40
YCV8-3		9.52 (3/8)	8	19.05	11	150	120
YCV8-4		12.70 (1/2)					120
YCV8-5		15.88 (5/8)					14



Mat unit



Belt ass'y

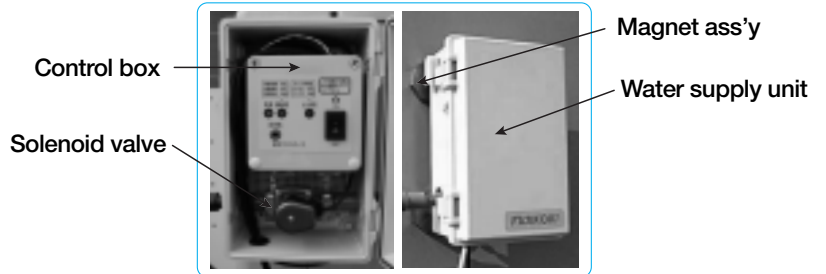
Mat unit

Angle ass'y

Type MAX eco cooling mat

- This mat prevents high pressure cutoff of refrigerators and air conditioners in the summer.
It also senses the outside air temperature and high pressure piping temperature and copes with pressure rises due to sudden load changes.
- Increased refrigerating capacity (extends the life of old devices)
- Cooling effect saves energy (Reduction of electric charges and peak power consumption), reduction of CO₂
- Indirect cooling system does not corrode aluminum fins
- Filter effect shuts out dirt which is sucked into and clogs the condenser
Can also shut out seeds, lint, and other foreign matter which is difficult to remove by fin cleaning.
- City heat island countermeasures effect
- Also has a shading effect and water sprinkling effect.

Water supply unit



Control box

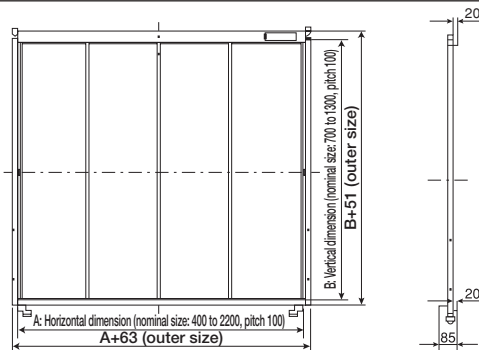
Solenoid valve

Magnet ass'y

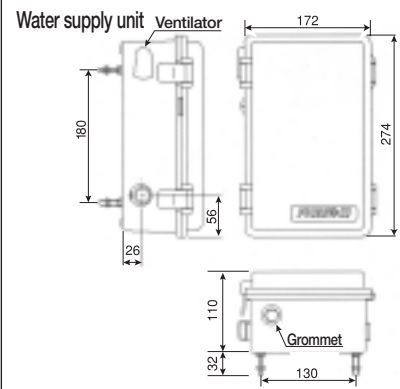
Water supply unit

Outline dimensions

Mat unit



There are 133 kinds of mat units by horizontal dimension and vertical dimension combination.



General specifications

Item	Mat unit	Water supply unit
Operating system	Vaporization humidification	Intermittent operation of solenoid valve by sensor input Intermittent operation of solenoid valve by power ON/OFF remote operation ON-OFF operation of solenoid valve by test run switch
Connection	Water supply piping: PVC pipe for city water (size 13) Drain piping: PVC pipe for city water (size 13)	Temperature sensor: Outside air temperature use / clip + band High pressure piping temperature use / heat resistant tape + band
Fluid	City water and industrial water	
Electrical rating		AC200V/100V (50/60Hz)
Wiring system		Sleeve crimping connection to AWG20 electric wire
Usage location	Outdoor or indoor	
Operating temperature range	10 to 60°C	
Operating water pressure range	0.1 to 0.3 MPa	
Operating water temperature range	10 to 40°C	
Water flow	Water flow automatic control by outside air temperature (Per mat when 1000 horizontal size mat used)	-40°C or more: 22.5L/h or more -35°C or more to less than 40°C: 18.0L/h or more -30°C or more to less than 35°C: 12.9L/h or more -less than 30°C: 10.0L/h or more
Control system		• Outside air temperature control • Piping temperature control (combined with outside air temperature control) • Remote operation control
Storage temperature range	-20 to -60°C	
Operating humidity range	10%RH to 85%RH (at 40°C) (no condensation)	
Water flow setting system	Manual needle valve	
Control channel	1st path, 2nd path, 3rd path (water supply flow 420L/h or less)	
Water flow adjustment range	0 to 420 L/h (at water pressure 0.1MPa)	
Installation system	Self-standing angle + belt Suspension wire + belt (1, 2, 3 chamfer compatible)	Magnet type Bracket type

Water supply unit performance specifications

Item	Contents				
Operating characteristics	<ul style="list-style-type: none"> * A PC executes automatic variable intermittent control of the solenoid valve in response to the outside air temperature at the sensor (selectively) set value or more at the rated voltage. * Intermittent control automatically varies the water flow below in response to the outside air temperature. * When one of the sensor abnormalities below is detected, the water supply unit is stopped and an LED is displayed. The water supply unit is automatically reset after the abnormality is removed. <p>Sensor abnormality content</p> <table border="1"> <tr> <td>Abnormally high temperature</td> <td>Outside air inlet temperature sensor: 105°C or more High pressure piping temperature sensor: 150°C or more</td> </tr> <tr> <td>Abnormally low temperature</td> <td>Outside air inlet temperature sensor: -5°C or less High pressure piping temperature sensor: -5°C or less</td> </tr> </table>	Abnormally high temperature	Outside air inlet temperature sensor: 105°C or more High pressure piping temperature sensor: 150°C or more	Abnormally low temperature	Outside air inlet temperature sensor: -5°C or less High pressure piping temperature sensor: -5°C or less
Abnormally high temperature	Outside air inlet temperature sensor: 105°C or more High pressure piping temperature sensor: 150°C or more				
Abnormally low temperature	Outside air inlet temperature sensor: -5°C or less High pressure piping temperature sensor: -5°C or less				
Sealing	No leakage at solenoid valve piping at 0.6MPa.				
Withstand pressure	No leakage or damage at solenoid piping at 1.75MPa.				
Insulation resistance	100MΩ or more at DC500V (normal temperature, normal humidity)				
Dielectric strength	No insulation breakdown at AC1800Vx1 sec.				
Power supply voltage fluctuation	No abnormalities in operating characteristics at rated power supply voltage ±10%				
Power consumption	10W or less at rated power supply voltage (AC200V/100V)				

* Always install a strainer (60 mesh or more) to the primary side piping of the water supply unit.

* For high wind velocity outdoor units (3m/sec or more), please consult us in advance because it will cause mat and holder deformation and the entry of water spray into the fins.

* Use where the water quality is poor will cause the growth of algae.

Kinds of water supply units

Control method	Voltage specification	Product name
Outside air temperature control	AC200V	MAX-WCT20AT
	AC100V	MAX-WCT10AT
Piping temperature control combined use	AC200V	MAX-WCT20PT
	AC100V	MAX-WCT10PT

Selective options selection method

Item	Name	Selection method	Number required
Mat unit installation method	Angle ass'y	Used at self-standing fixing (L=0.65m/1.6m selection)	1 per mat
	Suspension set	Used at suspension fixing	1 per mat
	Belt ass'y	Always necessary for auxiliary fixing	2 per outdoor unit
	Hook	Used only for both sides installation	2 per belt
Water supply unit primary side piping	Joint	Used only when primary side disconnection is necessary	1 per water supply unit
	Valve ass'y	Always necessary at water flow adjustment use	1 per mat
Water supply unit secondary side piping	Telescopic joint	Always necessary at secondary side disconnection use	1 per mat
	Magnet ass'y	Used to fix to outdoor unit iron plate	4 per water supply unit
Water supply unit installation method	Bracket set	Used to fix to mat unit (Select when mat unit is self-standing type or suspended type)	1 per water supply unit
	Outside air temperature sensor set	Used at outside temperature control and piping temperature control combined use and in remote operation control (L=2m/4m selection)	1 per water supply unit
Control system	Piping sensor set	Used at piping temperature control combined use (L=2m/4m selection)	1 per water supply unit

Car Air-Con.



Car Air Conditioner

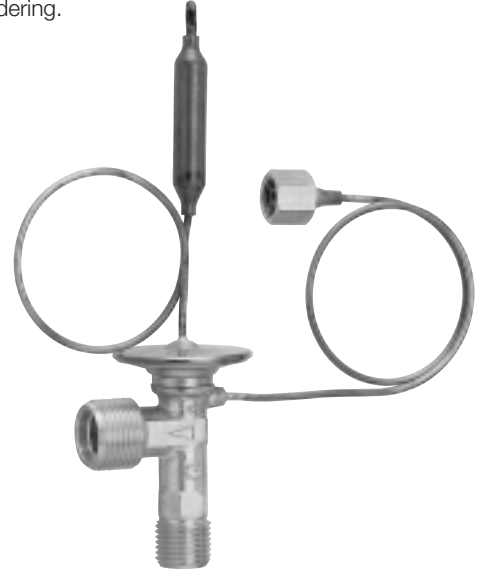
(Only available by order)

- Type C thermostatic expansion valve (only available by order)
- Type G thermostatic expansion valve (only available by order)
- Type R thermostatic expansion valve (only available by order)

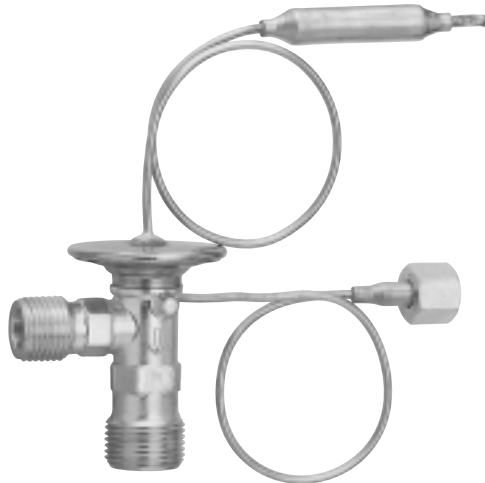
- These are compact, light weight, high performance thermostatic expansion valves for car air conditioners.
- Since it is an internal regulation type and the superheat setting is adjusted at the factory, please specify when ordering.



Type C



Type G



Type R

Specifications

Type	Type C	Type G	Type R
Application	Car air conditioner		
Nominal capacity	R134a: 1.7, 3.5, 5.3kW (capacity at condensing temperature 38°C, evaporating temperature 5°C, overcooling temperature 0°C, superheating temperature 4°C, piping, evaporator, etc. pressure loss 0)		
Evaporating temperature range	-5 to 10°C		
Sealing pressure	1.67MPa		
Withstand pressure	4MPa	4.5MPa	
Maximum operating pressure	1.47MPa		
Thermal sensing tube sealing system	G charge	A charge	G/A charge
Heat resistance	120°C	80°C	120°C:G charge, 80°C:A charge
Pressure equalizing system	Internal equalizing	Internal/External pressure equalizing type	
Connecting pipe diameter mm (inches)	Inlet: 9.52(3/8), outlet: 12.70 (1/2) Flare: CAE, O-ring connection: CBE	Inlet: 9.52 (3/8), outlet: 12.70 (1/2) Flare: GAE, O-ring connection: GBE	Inlet: 9.52 (3/8), outlet: 12.70 (1/2) Flare: RAE, O-ring connection: RBE
Weight	155g	175g (internal equalizing), 185g (external equalizing)	180g (internal equalizing), 190g (external equalizing)

- **Type VHE thermostatic expansion valve** (only available by order)
- **Type VDE thermostatic expansion valve** (only available by order)

- Thermal sensing tube-less and external equalizing capillary simplify installation work.
- Since it is an internal regulating type and the superheat setting is adjusted at the factory, please specify when ordering.



Type VHE



Type VDE

Specifications

Application	Car air conditioner
Evaporating temperature range	R134a, 10 to -5°C
Capacity	R134a, 3.5kW, 5.3kW
Withstand pressure	4.5MPa
Heat resistance	120°C
Maximum operating pressure	1.47MPa
Equalizing system	External equalizing
Sealing system	Gas charge Gas cross charge
Connection	Flange
Weight	VHE125g/VDE145g

■ **Type RAS solenoid valve for refrigerant** (only available by order)

■ **Type RBS solenoid valve for refrigerant** (only available by order)

- Automatic normally opened 2-way valve for DC power supply used in the refrigerant circuit (high pressure side) of car air conditioners and refrigeration cars.
- Aluminum body makes it light weight and corrosion resistant.
A straight flow type and a perpendicular flow type are available to match the application of piping space.



Type RAS



Type RBS

Specifications

Type	Connecting pipe diameter mm	Valve diameter mm	Compatible refrigerants	Operating pressure differential	Standard coil capacity		Sealing pressure Withstand pressure	Weight g
					V	W		
RAS-QPK	8	2	R134a R404A	0 to 1.47MPa	DC12	7.5	Sealing 3.53MPa Withstand 5.3MPa	170
RBS-QPK	O-ring seal				DC24			

■ **Type NVS refrigerant solenoid valves** (only available by order)
 ■ **Type NTS refrigerant solenoid valves** (only available by order)

- Type NVS refrigerant solenoid valves are pilot-operated normally opened 2-way valves for DC power supplies used in the refrigerant circuit (low pressure side) of car air conditioners and refrigerated vehicles.
- Aluminum body makes it light weight and corrosion resistant.
- Two types are available: Type NTS with built-in relief valve to vent the internal pressure built up at the evaporator side when the solenoid valve was turned off and the Type NVS with no relief valve.



Type NVS



Type NTS

Specifications

Type	Connecting pipe diameter mm (inches)	Valve diameter mm	Compatible refrigerants	Operating pressure differential	Standard coil capacity		Sealing pressure Withstand pressure	Weight g
					V	W		
NVS-QPN	15.88 (5/8)	11	R134a R404A	6.86KPa to 0.69MPa	DC12	9	Sealing 1.47MPa Withstand 2.7MPa	350
NTS-QPN	O-ring seal				DC24			

- **Type QDC regulating valve** (only available by order)
- **Type CAS regulating valve** (only available by order)
- **Type QBS regulating valve** (only available by order)

- These valves are regulating valves which optimally control the discharge capacity of a variable capacity compressor.
- The Type QDC senses the internal pressure to control.
- The Types CAS and QBS control in response to signals input from the outside.
- The Type QBS is compatible with clutchless compressors.

Internal control type



Type QDC

External control type



Type CAS



Type QBS

- **Type A pressure switch** (only available by order)
- **Type D pressure switch** (only available by order)
- **Type T pressure switch** (only available by order)

- These pressure switches control on/off of electric condenser fans in response to the pressure in refrigeration cycles. They are also protection switches which stop the compressor when the pressure exceeds a predetermined level.
- They are compact, lightweight, and extremely durable.
- The perfect pressure switch for various applications are serialized. Please contact us for specifications.

● **Type A single switch**

<p>Type ACP</p> <p style="text-align: center;">Contact operation</p> <p style="text-align: center;">Waterproof connector direct connection type</p>	<p>Type ADP</p> <p style="text-align: center;">Contact operation</p> <p style="text-align: center;">Waterproof connector direct connection type</p>
--	--

Application: High/low pressure protection switch which stops the compressor when the pressure in the refrigeration cycle drops below or rises above a predetermined value.

● **Type D dual switch**

<p>Type DNP</p> <p style="text-align: center;">Contact operation</p> <p style="text-align: center;">Faston terminal connection type A type with a rubber cover is also available.</p>	<p>Type DTP</p> <p style="text-align: center;">Contact operation</p> <p style="text-align: center;">Waterproof connector direct connection type</p>
--	--

Application: Electric fan control and compressor protection switch that integrates a Type A single switch and a Type D dual switch.

● **Type T triple switch**

<p>Type TBP</p> <p style="text-align: center;">Contact operation</p> <p style="text-align: center;">Compressor protector</p> <p style="text-align: center;">Electric fan</p> <p style="text-align: center;">Waterproof connector direct connection type</p>	<p>Type TDP</p> <p style="text-align: center;">Contact operation</p> <p style="text-align: center;">Compressor protector</p> <p style="text-align: center;">Electric fan</p> <p style="text-align: center;">Waterproof connector direct connection type</p>
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■ **Type ATF receiver drier** (only available by order)
 ■ **Type AHF receiver drier** (only available by order)

- Lightweight aluminum body
- Excellent corrosion and vibration resistances
- High moisture absorption capacity
- Various pressure switches can be mounted

● **Type ATF receiver drier**



Flange connection type

Specifications

Type	Capacity
Type ATF-25	230cc
Type ATF-28	260cc
Type ATF-33	310cc
Type ATF-35	290cc
Type ATF-44	370cc

* Please contact us for specifications.

● **Type AHF receiver drier**



O-ring seal joint connection type

Specifications

Type	Capacity
Type AHF-30	300cc
Type AHF-39	390cc

* Please contact us for specifications.

Room/Package Air-Con.



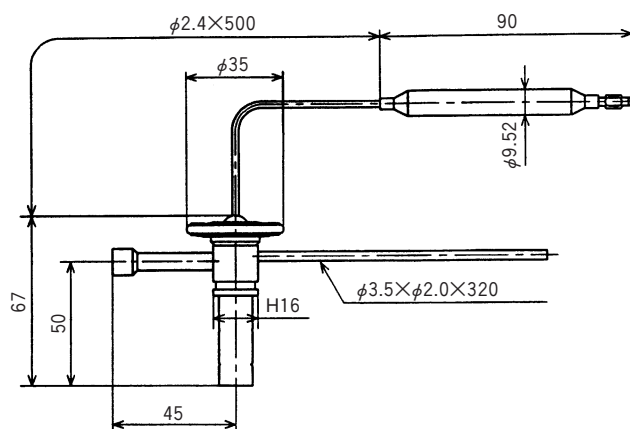
Room/Package Air Conditioner

(Only available by order)

■ Type HFE thermostatic expansion valve (only available by order)



- The Type HFE are compact, lightweight, high performance diaphragm type thermostatic expansion valves perfect for superheat control of compact room air conditioners, freezers, and refrigeration equipment etc.
- Can be used with heat pump air conditioners.
- These are internally adjustable valves so superheat is set at the factory. Please specify your desired superheat when ordering.

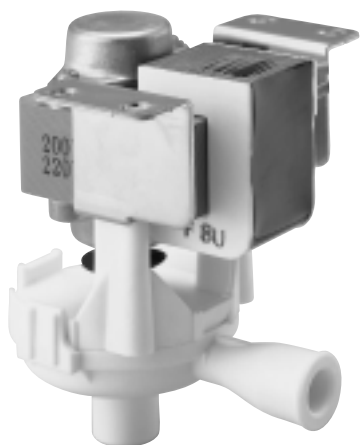


Specifications

Application	Room air conditioner, freezing and refrigeration equipment
Nominal capacity	R22, R407C: 1.7, 3.5, 5.3kW R404A : 1.1, 1.7, 3.5kW Condensing temperature 38°C, evaporating temperature 5°C, supercooling temperature 0°C, superheating temperature 3.5°C, piping and evaporator pressure loss 0 capacity
Evaporator temperature range	R22, R407C: -40 to 10°C R404A : -45 to 10°C
Sealing pressure	3MPa
Withstand pressure	4.5MPa
Maximum operating pressure	2.75MPa
Thermal sensing bulb sealing system	G, N, gas cross, A charge
Heat resistance	G, N, gas cross charge: 120°C A charge: 80°C
Equalizing system	Internal equalizing type: Type HFE External equalizing type: Type HFE-E
Connecting pipe diameter mm (inches)	Inlet: $\phi 6.35$ (1/4) or $\phi 8$ (5/16) brazed Outlet: $\phi 9.52$ (3/8) or $\phi 12.70$ (1/2) brazed
Weight	80g

■ Type P drain pump series (only available by order)

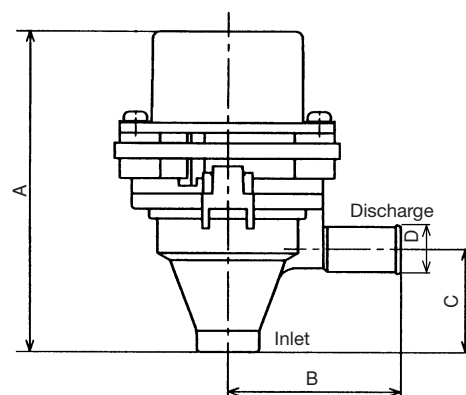
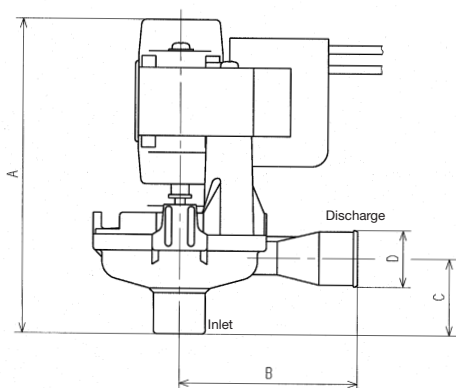
- These pumps are integrated in the indoor unit of package air conditioners and housing air conditioners to expel the drain water generated in the evaporator during cooling or defrosting.
- These pumps are serialized according to head and are high performance, high efficiency, low noise, low vibration, compact, lightweight, energy-saving type.
- Available in two power supply types: AC and DC.
- Two types of motor coil are available: taping and mold.



Type PJD, PKD and PLD

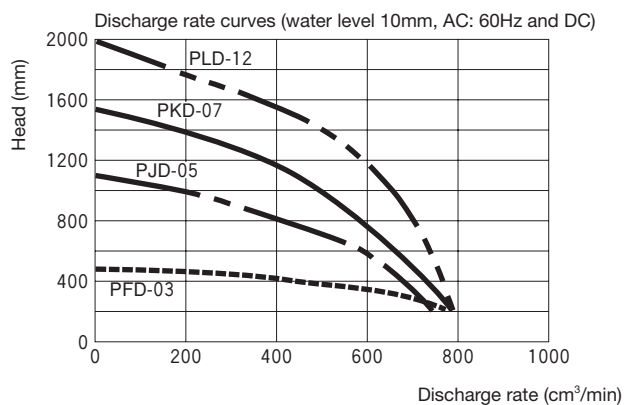
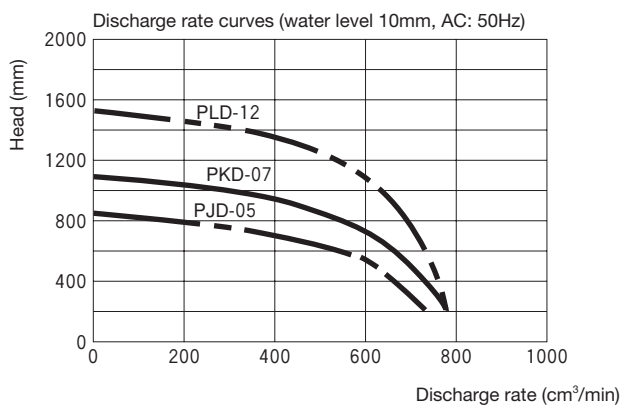


Type PFD



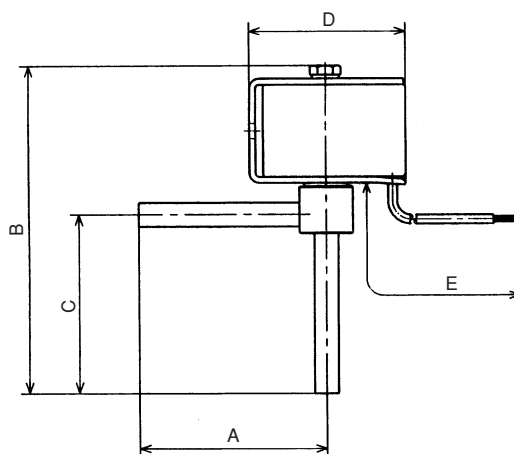
Specifications

Type	Practical head (shutoff head) mm	Discharge rate cm ³ /min	Starting voltage	Apparent power VA 50/60 Hz	Dimensions mm				Weight g
					A	B	C	D	
PJD-03	300 (500)	400 or more	AC100V	20.8/16.2 or less	87	44.5	23	14	300
PJD-05	500 (850)		AC200V	21.6/16.8 or less		47.5			310
PKD-07	700 (1100)		AC230V	24.0/19.2 or less	92	49			410
PLD-12	1200 (1500)	200 or more	50/60Hz Common use	25.2/20.4 or less	96	55	17	500	
PFD-03	300 (500)		DC21V	3.15W or less	85	44.5	27	13	110



■ **Type AMS refrigerant solenoid valve** (only available by order)
 ■ **Type ATS refrigerant solenoid valve** (only available by order)

- These solenoid valves are used in the refrigeration circuit of room air conditioners, package air conditioners, show cases, ice makers, and other air conditioners and freezing and refrigeration equipment.
- The Type AMS is a direct acting 2-way valve (normally opened valve) and is perfect for use with small capacity machines. Also, since it is compact and light-weight, the piping space can also be made compact.
- The Type ATS is a pilot-operated 2-way valve (normally opened type) and is perfect for use with large capacity machines.



Specifications

Voltage	AC100/200V 50/60Hz common use
Power consumption	50Hz:6W 60Hz:5W
Compatible refrigerants	R22, R134a R404A, R407C, and R410A
Maximum operating pressure	3MPa
Operating ambient temperature	-30 to 50°C
Operating fluid temperature	-30 to 120°C
Weight	AMS 160g ATS 185g

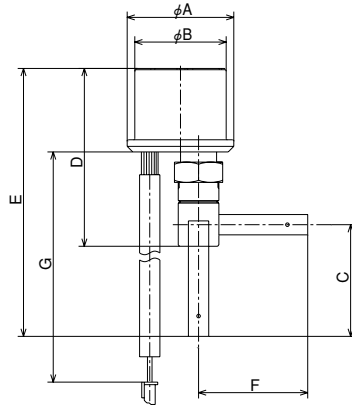
Specifications

Type	Connecting pipe diameter mm (inches)	Valve diameter mm	Dimensions mm					Operating pressure differential	Sealing pressure	Withstand pressure
			A	B	C	D	E			
AMS-16S	4.76 (3/16) Blazed	1.6	49	87	47	40.5	400	0 to 2.45MPa	3.5MPa	5.2MPa
AMS-20S	6.35 (1/4) Blazed	2.0								
AMS-24S		2.4								
ATS-7S	7.94 (5/16) Blazed	7.0	61.5	104	55.5			0 to 2.45MPa		

■ Type EFM electronic linear control valve (only available by order)



EFM-04YN to 40YP



- The Type EFM is a refrigerant flow control valve driven by a 4-phase pulse motor. (The drive circuit must be developed separately.)
- 2000-stage valve element positioning from valve close to valve open ensures more precise control.
- This valve is perfect for mounting to extremely quiet operation indoor units.
- This valve can also be used with heat pump air conditioners.

Specifications

Drive voltage	DC12V
Power consumption	1.5W
Compatible refrigerants	R22, R407C, R404A and R410A
Design pressure	0 to 4.15MPa
Maximum operating pressure	3.8MPa
Operating temperature	-30 to 70°C
Valve open/close time	20 sec. (standard)
Weight	140 to 170g

Specifications

Type	* Nominal capacity kW				Connecting pipe diameter mm (inches)	Dimensions mm						
	R404A	R22	R407C	R410A		A	B	C	D	E	F	G
EFM-05	1.26	1.75	1.91	1.90	6.35 (1/4) Blazed	41	35	43	71	105	43	330 500 650 865
EFM-10	2.51	3.52	3.82	4.30								
EFM-15	3.77	5.27	5.72	6.80								
EFM-20	5.03	7.03	7.63	9.20								
EFM-25	6.29	8.79	9.54	7.70								
EFM-30	7.54	10.6	11.5	9.50								
EFM-40	10.1	14.1	15.3	12.9	12.70 (1/2) Blazed	41	35	49	78	114	46	330 500 650 865
EFM-50	12.6	17.6	19.1	16.0								
EFM-60	15.1	21.1	22.9	20.3								
EFM-80	20.1	28.1	30.5	26.7								
EFM-A0	25.1	35.2	38.2	33.1								

* Nominal capacity is the condensing temperature 38°C, evaporating temperature 5°C, supercooling temperature 0°C, superheating temperature 0°C, piping, etc. pressure loss 0 capacity

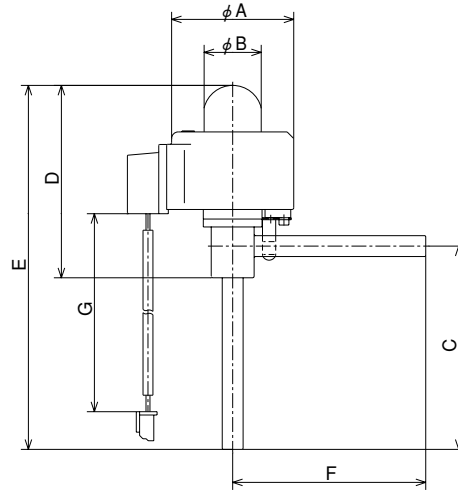
* R410A refrigerant shows the maximum capacity. (1400-stage valve element positioning from valve close to valve open)

- Type CPM electronic linear control valve (only available by order)
- Type HPM electronic linear control valve (only available by order)

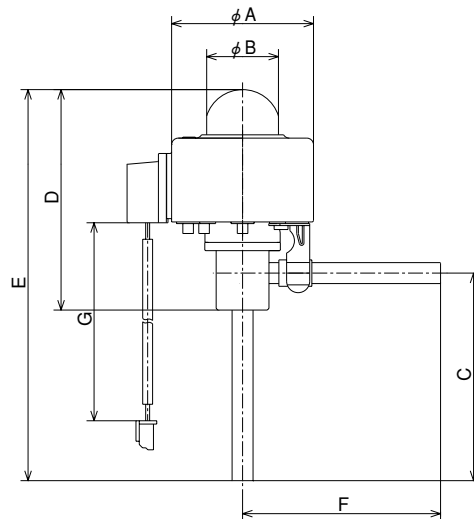
- These valves are CO₂ refrigerant control valves driven by a 4-phase pulse motor. (The drive circuit must be developed separately.)
- 500-stage valve element positioning from valve close to valve open ensure more precise control.
- These valves can also be used with CO₂ water heaters.



CPM-03 to 12YC



HPM-D20 to 24



Specifications

Type	Nominal capacity kW	Connecting pipe diameter mm (inches)	Dimensions mm						
			A	B	C	D	E	F	G
CPM-03YC	1.1	6.35 (1/4)	37	17	62	58	110	59	330
CPM-04YC	1.4								
CPM-12YC	4.5								
HPM-D20	9.4	6.35 (1/4)	43	22	63	67	118	60	800
HPM-D24	13.5	7.94 (5/16)							

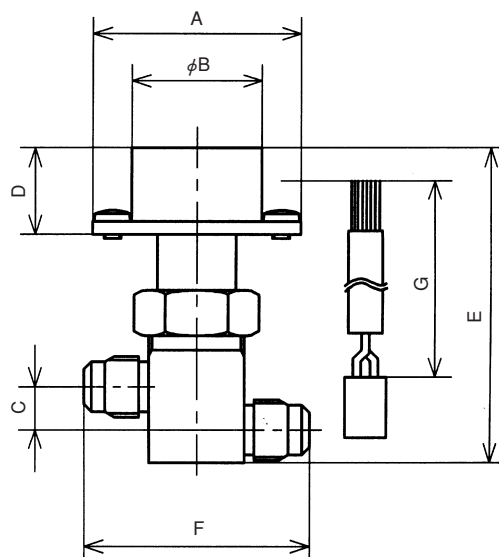
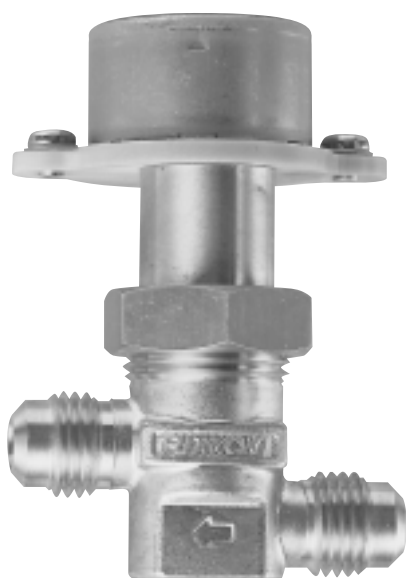
* Nominal capacity depends on the unit usage state.

Specifications

	CPM	HPM
Drive voltage	DC12V	
Power consumption	6.2W	8.4W
Compatible refrigerants	R744	
Operating pressure	0 to 14MPa	
Maximum operating pressure differential	10MPa	
Operating temperature	-30 to 70°C	
Valve open/close timing	12 sec.	
Weight	130g	230g

■ Type XAM electronic linear control valve (only available by order)

- The Type XAM are hot and cold water flow control valves driven by a 4-phase pulse motor. (The drive circuit must be developed separately.)
- 4000-stage valve element positioning from valve close to valve open ensures more precise control.
- These valves are perfect for installation to extremely quiet operation indoor units
- The flow direction is 1 direction.
- Cold water control required a separate sealed mechanism motor section.



XAM-06FW to 12FW

Specifications

Type	Cv value	Connecting pipe diameter mm	Dimensions mm						
			A	B	C	D	E	F	G
XAM-06FW	0.6	M14×1.5 Flare	48	30	10	20	74	52	300
XAM-12FW	1.2								

Specifications

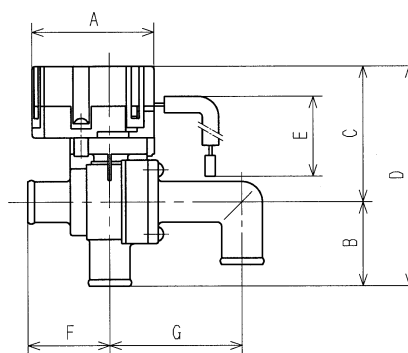
Drive voltage	DC5V
Power consumption	0.8W
Controlled fluid	Hot/cold water
Operating pressure	0 to 1MPa
Maximum operating pressure differential	0.3MPa
Operating temperature	0 to 80°C
Valve open/close timing	32 secs.
Weight	175g

■ Type DCM motor switching valve (only available by order)

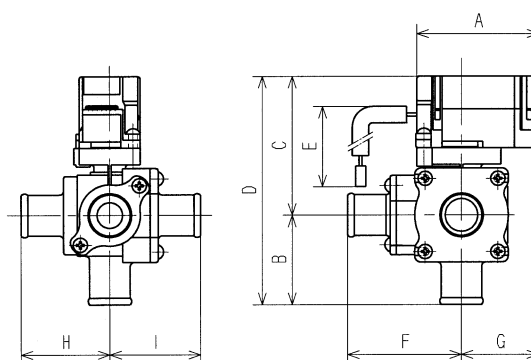
- The Type DCM is a hot and cold water circuit flow path switching valve driven by a DC motor. (The drive circuit must be developed separately.)
- Flow path is sequentially switched up to 3 directions within a short time.
- This valve is ideal for installation to extremely quiet operation indoor units.
- The direction of flow is 1 direction.
- The valve has a ball valve construction so there is almost no pressure loss.



DCM-10HW3



DCM-10HW3



DCM-10HW4

Specifications

Type	Cv value	Connecting pipe diameter mm	Dimensions mm								
			A	B	C	D	E	F	G	H	I
DCM-10HW3	10	20	60	40	65	105	500	40	65	—	—
DCM-10HW4	10	Hose joint	60	45	70	115	500	55	40	45	45

Specifications

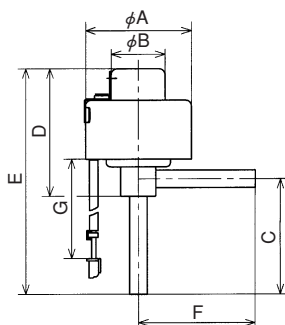
	DCM-10HW3	DCM-10HW4
Drive voltage	DC12V	DC12V
Power consumption	3W	3W
Controlled fluid	Hot/cold water	Hot/cold water
Operating pressure	0 to 0.3MPa	0 to 0.3MPa
Maximum operating pressure differential	0.1MPa	0.1MPa
Operating temperature	0 to 65°C	0 to 65°C
Switching time	8 secs.	4 secs.
Weight	250g	300g

■ Type KBM electronic linear control valve (only available by order)



KBM-04YN to 40YP

- The Type KBM is a refrigerant flow control valve driven by a 4-phase pulse motor. (The drive circuit must be developed separately.)
 - 500-stage valve element positioning from valve close to valve open ensures more precise control.
 - This valve can also be used in dry control and defrost control, as well as in flow control.
 - This valve can be used with heat pump air conditioners.
- * See pages 38 to 39 for a detailed description of the electronic linear control valve control driver (Type MGY, Type MFY).



Specifications

Drive voltage	DC12V, DC24V
Power consumption	6W
Compatible refrigerants	R22, R404A, R407C
Operating pressure	0 to 2.95MPa
Maximum operating pressure differential	2.26MPa
Operating temperature	-30 to 70°C
Valve open/close timing	12 sec. (standard)
Weight	260 to 280g

Specifications

Type	* Nominal capacity kW			Connecting pipe diameter mm (inches)	Dimensions mm						
	R404A	R22	R407C		A	B	C	D	E	F	G
KBM-05	1.26	1.75	1.91	6.35 (1/4) Blazed	48	24.5	54	59	105	53	330 500 700 900 1100
KBM-10	2.51	3.52	3.82								
KBM-15	3.77	5.27	5.72								
KBM-20	5.03	7.03	7.63								
KBM-25	6.29	8.79	9.54								
KBM-30	7.54	10.6	11.5								
KBM-40	10.1	14.1	15.3								
KBM-50	12.6	17.6	19.1	12.70 (1/2) Blazed	48	24.5	56	66	111	53	330 500 700 900 1100
KBM-60	15.1	21.1	22.9								
KBM-80	20.1	28.1	30.5								
KBM-A0	25.1	35.2	38.2								

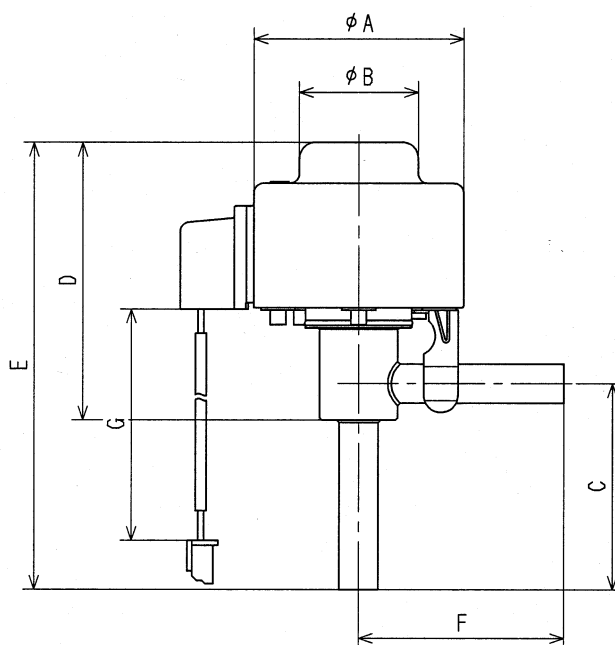
* Nominal capacity is the capacity when the valve is fully open at condensing temperature 38°C, evaporating temperature 5°C, supercooling temperature 0°C, superheating temperature 0°C, evaporator and piping pressure loss 0 capacity.

■ Type HAM electronic linear control valve (only available by order)

- The Type KBM is a refrigerant flow control valve driven by a 4-phase pulse motor. (The drive circuit must be developed separately.)
 - 500-stage valve element positioning from valve close to valve open ensures more precise control.
 - This valve can also be used in dry control and defrost control, as well as in flow control.
 - This valve can be used with heat pump air conditioners.
- * See pages 38 to 39 for a detailed description of the electronic linear control valve control driver (Type MGY, Type MFY).



HAM-D24 to 32



Specifications

Drive voltage	DC12V
Power consumption	6.2W
Compatible refrigerants	R22, R407C, R410A, R404A, R134a
Operating pressure	0 to 4.15MPa
Maximum operating pressure differential	3.5MPa (HAM-D24 to D28) 2.26MPa (HAM-D30 to D32)
Operating temperature	-30 to 60°C
Valve open/close timing	12 sec. (standard)
Weight	200g

Specifications

Type	* Nominal capacity kW					Connecting pipe diameter mm (inches)	Dimensions mm						
	R22	R407C	R410A	R404A	R134a		A	B	C	D	E	F	G
HAM-D24	14.6	14.9	17.5	10.4	11.5	8 (5/16) Blazed	43	25	42	57	92	42	330
HAM-D26	17.6	18.0	21.2	12.5	500								
HAM-D28	21.2	21.5	25.4	15.0	650								
HAM-D30	24.7	25.2	—	17.5	800								
HAM-D32	28.2	28.7	—	20.0	1100								

* Nominal capacity is the capacity when the valve is fully open at condensing temperature 38°C, evaporating temperature 5°C, supercooling temperature 0°C, superheating temperature 0°C, evaporator and piping pressure loss 0 capacity.

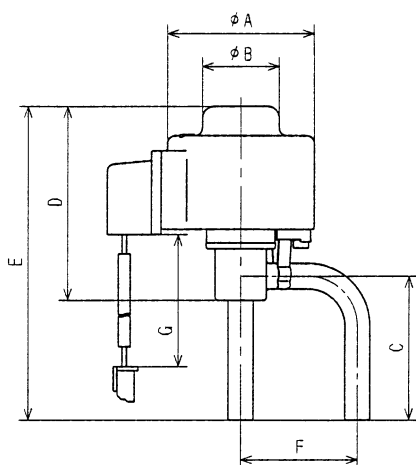
■ Type CAM electronic linear control valve (only available by order)



CAM-D13 to 24

- The Type CAM is a refrigerant flow control valve driven by a 4-phase pulse motor. (The drive circuit must be developed separately.)
- The existing product (Type LAM) has been downsized and lightened 50% to be able to fit in recent compact air conditioning units.
- Like the existing product (Type LAM), the Type CAM also has 500-stage valve element positioning, ensuring more precise control.
- New software does not have to be developed because the Type CAM is compatible with the existing product (Type LAM).
- The Type CAM can also be used in dry control and defrost control, as well as flow control.
- This valve can be used with heat pump air conditioners.

* See pages 38 to 39 for a detailed description of the electronic linear control valve control driver (Type MGY, Type MFY)



Specifications

Drive voltage	DC12V, DC24V
Power consumption	6.2W
Compatible refrigerants	R22, R407C, R410A, R404A, R134a
Operating pressure	0 to 4.15MPa
Maximum operating pressure differential	3.5MPa (CAM-D13 to D22) 2.7MPa (CAM-D24)
Operating temperature	-30 to 60°C
Valve open/close timing	12 sec. (standard)
Weight	150 to 160g

Specifications

Type	* Nominal capacity kW					Connecting pipe diameter mm (inches)	Dimensions mm							
	R22	R407C	R410A	R404A	R134a		A	B	C	D	E	F	G	
CAM-D13A	1.8	1.8	2.2	1.3	1.5	6.35 (1/4) Blazed	37	19.5	36	49	79	30	330	
CAM-D13B	3.5	3.6	4.2	2.5	2.8									500
CAM-D16	5.6	5.8	6.8	4.0	4.4									700
CAM-D18	7.3	7.5	8.8	5.2	5.7									900
CAM-D20	8.8	8.9	10.5	6.2	6.8									1100
CAM-D22	10.8	11.1	13.0	7.7	8.5									
CAM-D24	14.6	14.9	17.5	10.4	11.5									

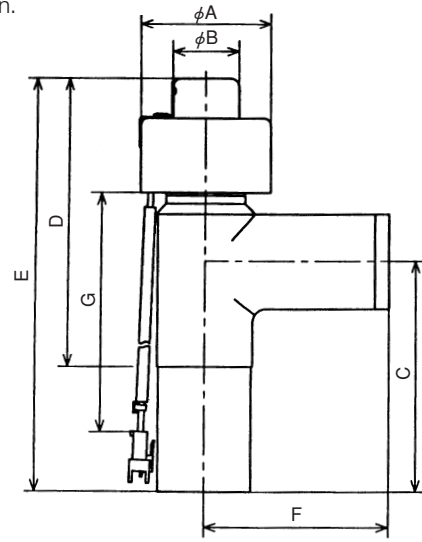
* Nominal capacity is the capacity when the valve is fully open at condensing temperature 38°C, evaporating temperature 5°C, supercooling temperature 0°C, superheating temperature 0°C, evaporator and piping pressure loss 0 capacity.

■ Type KQM electronic linear control valve (only available by order)
 ■ Type RQM electronic linear control valve (only available by order)

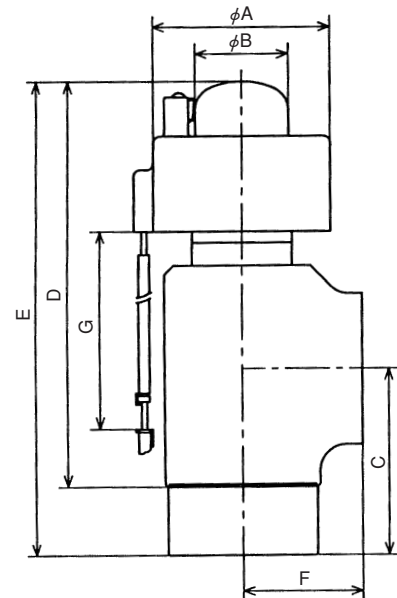
- These valves are flow control valves for absorption type refrigerators and are driven by a 4-phase pulse motor. (The drive circuit must be developed separately.)
- The Type KQM has 250-stage valve element positioning from valve close to valve open and the Type RQM has 300-stage valve elements positioning from valve close to valve open, ensuring more precise control.
- High corrosion resistance has been achieved by using all stainless steel material.
- The flow direction is 1 direction.



KQM-40 to 70



RQM-80 to A3



Specifications

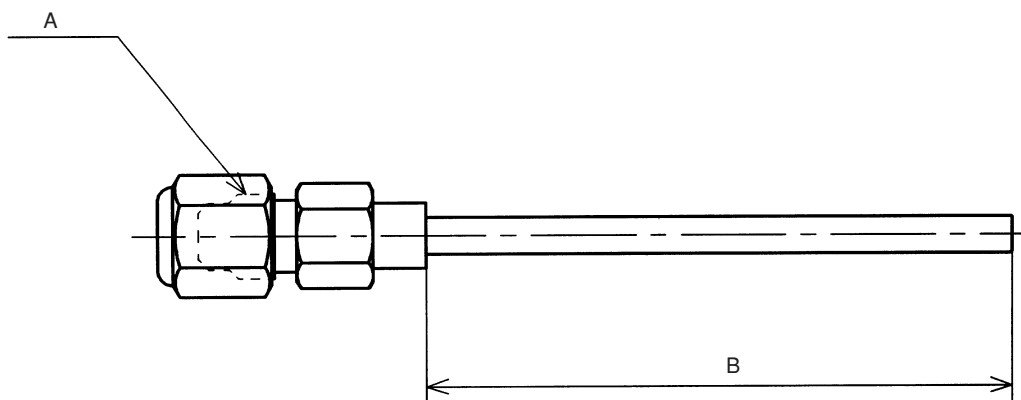
Type	Cv value	Connecting pipe diameter	Dimensions mm						
			A	B	C	D	E	F	G
KQM-40	4	25A welding	48	24.5	83	104	149	68	330 500
KQM-50	5								
KQM-60	6								
KQM-70	7								
RQM-80 to A3	8 to 13	40A welding	66.5	35	68	147	170	45	

Specifications

Drive voltage	DC18V
Power consumption	KQM 19W
	RQM 8W
Controlled fluid	LiBr aqueous solution/water
Operating pressure	-0.1 to 0MPa
Maximum operating pressure differential	0.05 to 0.10MPa
Operating temperature	-20 to 70°C
Switching time	25 sec.
Weight	KQM 620g
	RQM 1,700g

■ Type TCJ check joint (only available by order)

- The Type TCJ check joint is used for refrigerant charging and service connection to the outside.
- A valve core is built into the body so the valve is opened merely by joining.
- Compatible refrigerants are R22, R134a, R404A, R407C, and R410A.
- Please contact us for the piping length.
- Please contact us according to the refrigerant.



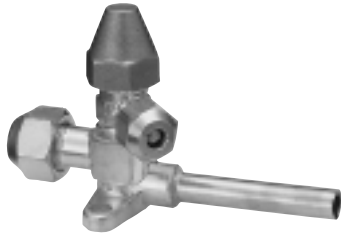
Specifications

Type	Connecting pipe diameter mm (inches)	Dimensions mm		Sealing pressure	Withstand pressure	Operating temperature	Weight
		A	B				
TCJ-2F15	4.76 (3/16) Blazed	7/16-20UNF	100	3.0MPa	4.5MPa	-30 to 120°C	43g
TCJ-2F20	6.35 (1/4) Blazed						

- When the refrigerant used is R410A, dimension A becomes 1/2-20UNF.
- Depending on the refrigerant used, the sealing pressure, withstand pressure, and ball core specifications will be different.



Type FSV



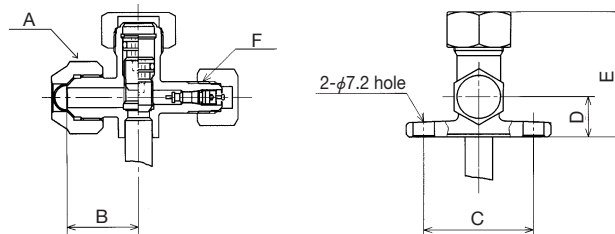
Type FCP



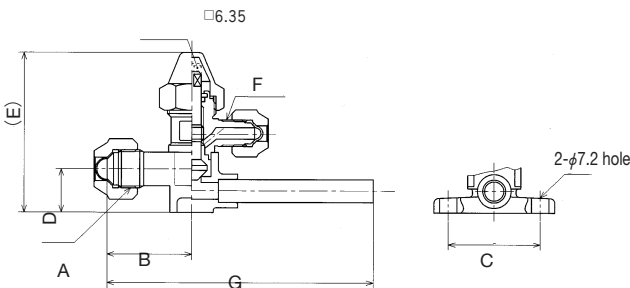
Type FNT

- Type FSV service valve (only available by order)
- Type FCP service valve (only available by order)
- Type FNT service valve (only available by order)

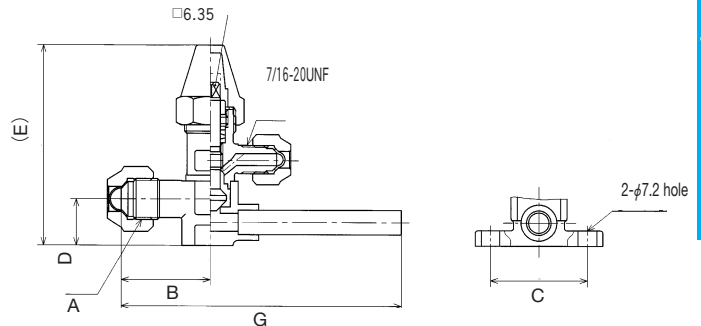
- The purpose of these valves is connection piping with indoor unit and outdoor unit.
- Since the valve stem section is covered with a cap to prevent leakage more securely from the valve stem, always leave the cap installed.
- The Type FSV has a valve core at the backseat side service port and can be connected as is by removing the flare nut.
- Connect the Types FCP and FNT by removing the flare nut after backseating by turning the valve stem fully counterclockwise.
- The Types FCP and FNT are set for straight piping.
- The Type FNT uses a Teflon seal at the valve stem and is applicable when the temperature is low and when the valve stem is operated repeatedly.
- Compatible refrigerants are R22, R404A, and R407C. Only the Type FNT is compatible with R410A.
- Please contact us according to the refrigerant.



Type FSV



Type FCP



Type FNT

Specifications

Type	Connecting pipe diameter mm (inches)	Dimensions mm							
		A	B	C	D	E	F	G	
FSV-A2	6.35 (1/4)	7/16-20UNF	26	38	15	40	7/16-20UNF	—	
FSV-JA3	9.52 (3/8)	5/8-18UNF	27			43			
FSV-JA4	12.70 (1/2)	3/4-16UNF	33			55			
FSV-JA5	15.88 (5/8)	7/8-14UNF	36.5		60				
FSV-JA6	19.05 (3/4)	11/16-14UNS	43		77				
FCP-22	6.35 (1/4)	7/16-20UNF	35		38	18			66.5
FCP-33	9.52 (3/8)	5/8-18UNF	35						
FCP-44	12.70 (1/2)	3/4-16UNF	33	40				22	
FCP-55	15.88 (5/8)	7/8-14UNF	35		79	136			
FCP-66	19.05 (3/4)	11/16-14UNS	43		44	34			87
FNT-22	6.35 (1/4)	7/16-20UNF	35	38	18	78		110	
FNT-33	9.52 (3/8)	5/8-18UNF	35						
FNT-44	12.70 (1/2)	3/4-16UNF	33				40	22	83
FNT-55	15.88 (5/8)	7/8-14UNF	35	29	99.5	136			
FNT-66	19.05 (3/4)	11/16-14UNS	43	44	34	107.5			

- **Type AC accumulator** (only available by order)
- **Type RT receiver tank** (only available by order)
- **Type OST oil separator** (only available by order)

● Type AC accumulator

The Type AC accumulator is installed to the low pressure side of a compressor and prevents liquid from flowing back to the compressor.

* Please contact us for specifications and size.



● Type RT receiver tank

The Type RT is installed between the high pressure side and thermal expansion valve of a condenser and sends only the liquid refrigerant to the evaporator.

* Please contact us for specifications.



● Type OST oil separator

The Type OST is installed between the high pressure side and condenser of a compressor and separates the oil mixed in the refrigerant and returns it to the compressor.

* Please contact us for specifications.



