

EXPANSION VALVES SERIES (THERMOSTATIC & CONSTANT PRESSURE EXPANSION VALVES)



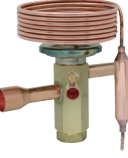

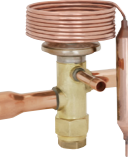



SAGINOMIYA PRODUCT CATALOG

- Thermostatic Expansion Valves
- Constant Pressure Expansion Valves
- Manually Operated Expansion Valves







EXPANSION VALVES

Type	Applications	Equalizer type	Connection	Max working Pressure (MPa)	Capacity (U.S.R.T.) (kW) * () : Charge type			
					R23	R134a	R404A	R407C
ARX 	<ul style="list-style-type: none"> • Bottle coolers • Display cases • Ice making machines • Industrial air conditioning systems, etc. 	Internal	Solder	2.8 (Except R407C) 3.3 (R407C)	—	0.24 to 1.80 {0.85 to 6.33} (S)	0.34 to 1.71 {1.20 to 6.01} (S)	0.50 to 2.47 {1.76 to 8.70} (S)
QCX 	<ul style="list-style-type: none"> • Display cases • Commercial refrigerators • Cold chain boxes • Air conditioning systems, Protected horticulture equipments, etc. 	Internal	Flare	3.0	—	0.24 to 3.64 {0.85 to 12.8} (C)	0.20 to 2.96 {0.70 to 10.4} (SA, C)	0.32 to 4.83 {1.13 to 17.0} (SA, C)
RCX 			Solder					
AEX 	<ul style="list-style-type: none"> • Refrigerators • Freezers • Refrigeration equipments for Ships • Chillers, etc. 	Internal	Flare	1.4	0.19 to 4.75 {0.68 to 16.7} (G)	0.36 to 9.58 {1.27 to 33.7} (G)	0.34 to 8.39 {1.20 to 29.5} (G)	—
SCX 	<ul style="list-style-type: none"> • Display cases • Commercial refrigerators • Cold chain boxes • Air conditioning systems, Protected horticulture equipments, etc. 	External	Flare	3.0	—	4.75 to 11.8 {16.7 to 41.5} (C)	3.64 to 9.07 {12.8 to 31.9} (SA, C)	5.94 to 14.8 {20.9 to 52.0} (SA, C)
	Solder							
ATX 	<ul style="list-style-type: none"> • Water chillers • Air conditioning systems • Freezers • Refrigerators • Brine coolers, etc. 	External	Flare	2.8 (Except R407C) R410A	—	0.70 to 60.0 {2.46 to 211} (S)	0.70 to 56.9 {2.46 to 200} (S)	1.00 to 83.3 {3.51 to 293} (S)
	Solder		3.3 (R407C) R410A					

Capacity (U.S.R.T.) (kW) * () : Charge type				Evaporating Temp. (°C) * () : Charge type						Page
R410A	R448A	R449A	Temperature condition	R23	R134a	R404A	R407C	R410A	R448A R449A	
—	—	—	CT 38°C ET 5°C	—	-40 to -10 (S)	-40 to -10 (S, CL)	-40 to -10 (S)	—	—	25
0.35 to 5.18 {1.22 to 18.2} (SA, C)	0.29 to 4.41 {1.03 to 15.5} (SA, C)	0.28 to 4.24 {0.99 to 14.9} (SA, C)	CT 38°C ET -5°C (SA, C)	—	-30 to 10 (C)	-40 to 10 (SA) -40 to 0 (C)	-40 to 10 (SA) -40 to 0 (C)	-45 to 10 (SA) -40 to -10 (C)	-40 to 10 (SA) -40 to 0 (C)	11
0.20 to 2.79 {0.71 to 9.81} (SL)	0.20 to 2.75 {0.70 to 9.68} (SL)	0.20 to 2.71 {0.69 to 9.53} (SL)	CT 38°C ET -30°C (SL)	—	-30 to 10 (C)	-40 to 0 (C) -60 to -25 (SL)	-40 to 0 (C)	-40 to -10 (C) -60 to -30 (SL)	-40 to 0 (C) -60 to -25 (SL)	
—	—	—	CT 38°C ET -5°C (R134a) (R404A) CT -40°C ET -80°C (R23)	-100 to -70 (G)	-30 to 10 (G)	-40 to 10 (G)	—	—	—	23
6.37 to 15.8 {22.4 to 55.6} (SA, C)	5.43 to 13.5 {19.1 to 47.4} (SA, C)	5.20 to 12.9 {18.3 to 45.5} (SA)	CT 38°C ET -5°C (SA, C)	—	-30 to 10 (C)	-40 to 10 (SA) -40 to 0 (C)	-40 to 10 (SA) -40 to 0 (C)	-45 to 10 (SA) -40 to -10 (C)	-40 to 10 (SA) -40 to 0 (C)	15
3.59 to 8.91 {12.6 to 31.3} (SL)	2.90 to 7.17 {10.2 to 25.2} (SL)	2.84 to 7.05 {10.0 to 24.8} (SL)	CT 38°C ET -30°C (SL)	—	-30 to 10 (C)	-40 to 0 (C) -60 to -25 (SL)	-40 to 0 (C)	-60 to -30 (SL)	-60 to -25 (SL)	
1.09 to 89.3 {3.85 to 314} (C, CL)	0.94 to 76.2 {3.30 to 268} (S, C)	0.91 to 73.7 {3.19 to 259} (S, C)	CT 38°C ET 5°C (S, C, CL)	—	-30 to 10 (S)	-40 to 10 (S) -60 to -25 (SL)	-40 to 10 (S)	-20 to 10 (C) -40 to -10 (CL)	-40 to 10 (S) -40 to 10 (C) -65 to -25 (SL)	19


Contents

■ CONSTANT PRESSURE EXPANSION VALVES

Type	Applications	Equalizer type	Connection	Max working Pressure (MPa)	Capacity (U.S.R.T.) (kW)	
					R23	R134a
 <p>CEX</p> <ul style="list-style-type: none"> • Bulk coolers • Water coolers • Refrigerators • Air dryers, etc. 		Internal	Flare	1.4	0.19 to 4.75 * {0.68 to 16.7}	0.36 to 9.58 {1.27 to 33.7}
 <p>CTX</p> <ul style="list-style-type: none"> • Air conditioning systems • Bulk coolers • Refrigerators / Freezers • Air dryers, etc. 		External	Flare Solder	2.8	—	0.70 to 60.0 {2.46 to 211}
 <p>CGX</p> <ul style="list-style-type: none"> • Air dryers • Spot coolers • Refrigerators / Freezers • Chillers, etc. 		Internal	Solder	2.5 (Except R410A) 3.3 (R410A)	—	1.80 {6.33} [0.22 {0.76}]
 <p>SPX</p> <ul style="list-style-type: none"> • Air dryers • Spot coolers • Refrigerators / Freezers • Chillers, etc. 		Internal	Solder	2.8 (Except R410A) 3.3 (R410A)	—	4.81 {16.9} [0.33 {1.17}]

Capacity (U.S.R.T.) (kW)						Page
R404A	R407C	R410A	R448A	R449A	Temperature condition	
0.34 to 8.39 {1.20 to 29.5}	0.51 to 13.2 {1.81 to 46.4}	—	0.47 to 12.0 {1.65 to 42.3}	0.45 to 11.5 {1.59 to 40.5}	CT 38°C / ET -5°C *CT -40°C / ET -80°C	27
0.70 to 56.9 {2.46 to 200}	1.00 to 83.3 {3.51 to 293}	—	0.94 to 76.2 {3.30 to 268}	0.91 to 73.7 {3.19 to 259}	CT 38°C / ET 5°C	29
1.71 {6.01} [0.28 {0.97}]	2.47 {8.69} [0.33 {1.16}]	2.64 {9.28} [1.24 {2.09}]	2.26 {7.93} [0.31 {1.09}]	—	CT 38°C / ET 5°C [CT 40°C / ET -10°C]	31
4.55 {16.0} [0.43 {1.50}]	6.60 {23.2} [0.51 {1.78}]	7.05 {24.8} [0.75 {2.64}]	6.29 {22.1} [0.48 {1.68}]	—	CT 38°C / ET 5°C [CT 40°C / ET -10°C]	31

■ MANUALLY OPERATED EXPANSION VALVES

Type	Applications	Equalizer type	Connection	Max working Pressure (MPa)	Capacity (U.S.R.T.) (kW)	
					R23	R134a
 <p>HEX</p> <ul style="list-style-type: none"> • Brine coolers • Refrigerations • Freezers, etc. 		Internal	Flare	1.4	— (Production possible)	0.36 to 9.58 {1.27 to 33.7}

Capacity (U.S.R.T.) (kW)						Page
R404A	R407C	R410A	R448A	R449A	Temperature condition	
0.34 to 8.39 {1.20 to 29.5}	0.51 to 13.2 {1.81 to 46.4}	—	—	—	CT 38°C / ET -5°C	33

REFERENCE INFORMATION

TERMINOLOGIES RELATED TO REFRIGERATION

● Pressure

$$\text{Absolute Pressure (MPa abs)} = \text{Gauge Pressure (MPa)} + \text{Standard Atmosphere (0.101325 MPa)}$$

● Degree of Vacuum

$$P = 0.1013 \cdot \frac{h}{76}$$

P : Absolute Pressure MPa (abs)

h : Degree of Vacuum (Column of Mercury) cmHg

● Power and Heat

$$1 \text{ kW} = 102 \text{ kgf} \cdot \text{m/sec} = 860 \text{ kcal/h}$$

● Cooling Capacity

This Catalog uses "U.S.R.T." and "kW" to indicate nominal capacity.

● Coefficient of Performance (COP)

$$\varepsilon = \frac{Q_2}{AW} = \frac{Q_2}{Q_1 - Q_2} = \frac{T_1 + 273.15}{T_1 - T_2}$$

ε : COP of a Refrigeration equipment

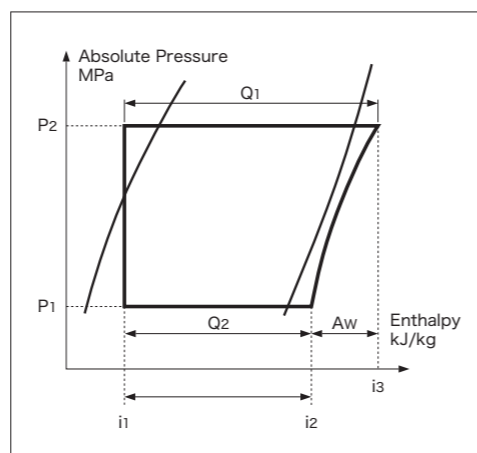
AW : Heat Quantity Equivalent to Compression Work (kW)

Q₁ : Heat Quantity Discharged at the Condenser (kW)

Q₂ : Cooling Capacity (Load) (kW)

T₁ : Condensing Temperature (°C)

T₂ : Evaporating Temperature (°C)



● Cooling Effect (Cooling Power)

$$q = i_2 - i_1$$

q : Cooling Effect (kJ/kg)

i₁ : Enthalpy of liquid immediately before expansion valve (kJ/kg)

i₂ : Enthalpy of vapor discharged from the evaporator (kJ/kg)

● Circulating Refrigerant Amount

$$G = 3,600 \times Q/q$$

G : Circulating Refrigerant Amount (kg/h)

Q : Cooling Capacity (kW)

q : Cooling Effect (kJ/kg)

● Water Amount and Water Temperature Difference

$$Q = 1/60 \cdot \rho \cdot \alpha \cdot G_w (t_1 - t_2)$$

Q : Cooling Capacity (kW)

ρ : Specific Gravity of Water (kg/m³)

α : Specific Heat Capacity of Water (J/K · kg)

G_w : Circulating Water Amount (m³/min)

t₁ : Inlet Water Temperature (°C)

t₂ : Outlet Water Temperature (°C)

CONVERSION TABLES

1) Temperature conversion table (°C ↔ °F)

The figures in the center column show the temperature to be converted. The figures on the left show conversion from Fahrenheit to Celsius and the figures on the right from Celsius to Fahrenheit.

Example :

	5°C → 41.0°F	
°C	↓	°F
-15.0	5	41.0
	-15.0°C ← 5°F	

Temperature conversion formula :

$$°C = 5/9 (°F - 32)$$

$$°F = 9/5 \times °C + 32$$

°C	↓	°F	°C	↓	°F	°C	↓	°F	°C	↓	°F	°C	↓	°F
-101.1	-150	-238.0	-37.2	-35	-31.0	-23.3	-10	14.0	-9.4	15	59.0	4.4	40	104.0
-95.6	-140	-220.0	-36.7	-34	-29.2	-22.8	-9	15.8	-8.9	16	60.8	5.0	41	105.8
-90.0	-130	-202.0	-36.1	-33	-27.4	-22.2	-8	17.6	-8.3	17	62.6	5.6	42	107.6
-84.4	-120	-184.0	-35.6	-32	-25.6	-21.7	-7	19.4	-7.8	18	64.4	6.1	43	109.4
-78.9	-110	-166.0	-35.0	-31	-23.8	-21.1	-6	21.2	-7.2	19	66.2	6.7	44	111.2
-73.3	-100	-148.0	-34.4	-30	-22.0	-20.6	-5	23.0	-6.7	20	68.0	7.2	45	113.0
-67.8	-90	-130.0	-33.9	-29	-20.2	-20.0	-4	24.8	-6.1	21	69.8	7.8	46	114.8
-62.2	-80	-112.0	-33.3	-28	-18.4	-19.4	-3	26.6	-5.6	22	71.6	8.3	47	116.6
-56.7	-70	-94.0	-32.8	-27	-16.6	-18.9	-2	28.4	-5.0	23	73.4	8.9	48	118.4
-51.1	-60	-76.0	-32.2	-26	-14.8	-18.3	-1	30.2	-4.4	24	75.2	9.4	49	120.2
-45.6	-50	-58.0	-31.7	-25	-13.0	-17.8	0	32.0	-3.9	25	77.0	10.0	50	122.0
-45.0	-49	-56.2	-31.1	-24	-11.2	-17.2	1	33.8	-3.3	26	78.8	15.6	60	140.0
-44.4	-48	-54.4	-30.6	-23	-9.4	-16.7	2	35.6	-2.8	27	80.6	21.1	70	158.0
-43.8	-47	-52.6	-30.0	-22	-7.6	-16.1	3	37.4	-2.2	28	82.4	26.7	80	176.0
-43.3	-46	-50.8	-29.4	-21	-5.8	-15.6	4	39.2	-1.7	29	84.2	32.2	90	194.0
-42.8	-45	-49.0	-28.9	-20	-4.0	-15.0	5	41.0	-1.1	30	86.0	37.8	100	212.0
-42.2	-44	-47.2	-28.3	-19	-2.2	-14.4	6	42.8	-0.6	31	87.8	43.3	110	230.0
-41.7	-43	-45.4	-27.8	-18	-0.4	-13.9	7	44.6	0.0	32	89.6	48.9	120	248.0
-41.1	-42	-43.6	-27.2	-17	1.4	-13.3	8	46.4	0.6	33	91.4	54.4	130	266.0
-40.6	-41	-41.8	-26.7	-16	3.2	-12.8	9	48.2	1.1	34	93.2	60.0	140	284.0
-40.0	-40	-40.0	-26.1	-15	5.0	-12.2	10	50.0	1.7	35	95.0	65.6	150	302.0
-39.4	-39	-38.2	-25.6	-14	6.8	-11.7	11	51.8	2.2	36	96.8	71.1	160	320.0
-38.9	-38	-36.4	-25.0	-13	8.6	-11.1	12	53.6	2.8	37	98.6	76.7	170	338.0
-38.3	-37	-34.6	-24.4	-12	10.4	-10.6	13	55.4	3.3	38	100.4	82.2	180	356.0
-37.8	-36	-32.8	-23.9	-11	12.2	-10.0	14	57.2	3.9	39	102.2	87.8	190	374.0

2) Temperature difference conversion table (°C ↔ °F)

This table is a comparison table of temperature difference. For example, a 9° F difference (77°F – 68°F) corresponds to a 5°C difference (25°C – 20°C).

°C	↓	°F
0.056	0.1	0.18
0.111	0.2	0.36
0.278	0.5	0.90
0.56	1	1.8
1.11	2	3.6
1.67	3	5.4
2.22	4	7.2
2.78	5	9.0
3.33	6	10.8
3.89	7	12.6
4.44	8	14.4
5.00	9	16.2
5.56	10	18.0
6.11	11	19.8
6.67	12	21.6
8.33	15	27.0

3) Pressure conversion table (kgf/cm² ↔ MPa)

The figures in the center column show the pressure to be converted. The figures on the right show conversion from MPa to kgf/cm² and the figures on the left from kgf/cm² to MPa.

Example : 1 MPa = 10.1972 kgf/cm², 1 kgf/cm² = 0.09807 MPa

MPa	↓	kgf/cm²	MPa	↓	kgf/cm²	MPa	↓	kgf/cm²
0.000000	0.0	0.00000	0.0980665	1	10.1972	1.961330	20	203.944
0.0098067	0.1	1.01972	0.1961330	2	20.3944	2.941995	30	305.916
0.0196113	0.2	2.03944	0.2941995	3	30.5916	3.922660	40	407.888
0.0294200	0.3	3.05916	0.3922660	4	40.7888	4.903325	50	509.860
0.0392266	0.4	4.07888	0.4903325	5	50.9860	5.883990	60	611.832
0.0490333	0.5	5.09860	0.5883990	6	61.1832	6.864655	70	713.804
0.0588399	0.6	6.11832	0.6864655	7	71.3804	7.845320	80	815.776
0.0686466	0.7	7.13804	0.7845320	8	81.5776	8.825985	90	917.748
0.0784532	0.8	8.15776	0.8825985	9	91.7748	9.806650	100	1019.72
0.0882599	0.9	9.17748	0.9806550	10	101.972			

4) Pressure conversion table (MPa ↔ psi)

Example : 1 MPa = 145.052 psi, 1 psi = 0.006895 MPa

MPa	↓	psi	MPa	↓	psi	MPa	↓	psi
0.000000	0	0.00000	0.006895	1	145.052	0.137900	20	2901.04
0.000690	0.1	14.5052	0.013790	2	290.104	0.206850	30	4351.56
0.001379	0.2	29.0104	0.020685	3	435.156	0.275800	40	5802.08
0.002069	0.3	43.5156	0.027580	4	580.208	0.344750	50	7252.60
0.002758	0.4	58.0208	0.034475	5	725.260	0.413700	60	8703.12
0.003448	0.5	72.5260	0.041370	6	870.312	0.482650	70	10153.6
0.004137	0.6	87.0312	0.048265	7	1015.36	0.551600	80	11604.2
0.004827	0.7	101.536	0.055160	8	1160.42	0.620550	90	13054.7
0.005516	0.8	116.042	0.062055	9	1305.47	0.689500	100	14505.2
0.006206	0.9	130.547	0.068950	10	1450.52			

5) Capacity conversion table (kW ↔ kcal/h)

Example : 1 kW ↔ 860 kcal/h

kW	↓	1000 kcal/h	kW	↓	1000 kcal/h	kW	↓	1000 kcal/h	kW	↓	1000 kcal/h
0.166	0.1	0.086	1.162	1	0.86	11.62	10	8.6	116.2	100	86
0.232	0.2	0.172	2.325	2	1.72	23.25	20	17.2	232.5	200	172
0.348	0.3	0.258	3.488	3	2.58	34.88	30	25.8	348.8	300	258
0.465	0.4	0.344	4.651	4	3.44	46.51	40	34.4	465.1	400	344
0.581	0.5	0.430	5.813	5	4.33	58.13	50	43.3	581.3	500	433
0.697	0.6	0.516	6.976	6	5.16	69.76	60	51.6	697.6	600	516
0.813	0.7	0.602	8.139	7	6.02	81.39	70	60.2	813.9	700	602
0.930	0.8	0.688	9.302	8	6.88	93.02	80	68.8	930.2	800	688
1.046	0.9	0.774	10.46	9	7.74	104.6	90	77.4	1046	900	774

6) Length conversion table (in ↔ mm)

in	mm	in	mm	in	mm	in	mm
1/8	3.18	1/32	0.79	1/64	0.40	33/64	13.10
1/4	6.35	3/32	2.38	3/64	1.19	35/64	13.89
3/8	9.53	5/32	3.97	5/64	1.98	37/64	14.68
1/2	12.70	7/32	5.56	7/64	2.78	39/64	15.48
5/8	15.88	9/32	7.14	9/64	3.57	41/64	16.72
3/4	19.05	11/32	8.73	11/64	4.39	43/64	17.07
7/8	22.23	13/32	10.32	13/64	5.16	45/64	17.86
1	25.40	15/32	11.91	15/64	5.95	47/64	18.65
1/16	1.59	17/32	13.49	17/64	6.75	49/64	19.45
3/16	4.76	19/32	15.08	19/64	7.54	51/64	20.24
5/16	7.94	21/32	16.67	21/64	8.33	53/64	21.04
7/16	11.11	23/32	18.26	23/64	9.13	55/64	21.83
9/16	14.29	25/32	19.84	25/64	9.92	57/64	22.62
11/16	17.46	27/32	21.43	27/64	10.72	59/64	23.42
13/16	20.64	29/32	23.02	29/64	11.51	61/64	24.21
15/16	23.81	31/32	24.61	31/64	12.30	63/64	25.00

7) Vacuum conversion table (MPa ↔ MPa (abs) ↔ cmHgV ↔ kgf/cm² (abs))

Example : -0.0667 MPa ↔ 0.0347 MPa(abs) ↔ 50 cmHgV ↔ 0.3535 kgf/cm² (abs)

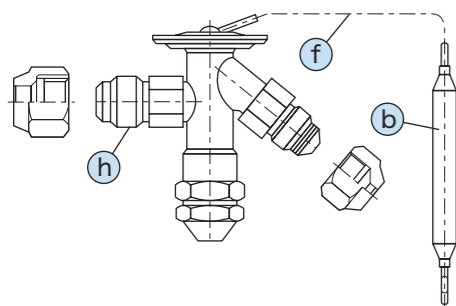
MPa	MPa (abs)	cmHg V	kgf/cm² (abs)	MPa	MPa (abs)	cmHg V	kgf/cm² (abs)	MPa	MPa (abs)	cmHg V	kgf/cm² (abs)
-0.1013	0.0000	76	0.0000	-0.0613	0.0400	46	0.4078	-0.0213	0.0800	16	0.8157
-0.0987	0.0027	74	0.0272	-0.0587	0.0427	44	0.4350	-0.0187	0.0827	14	0.8429
-0.0960	0.0053	72	0.0544	-0.0560	0.0453	42	0.4622	-0.0160	0.0853	12	0.8700
-0.0933	0.0080	70	0.0816	-0.0533	0.0480	40	0.4894	-0.0133	0.0880	10	0.8972
-0.0907	0.0107	68	0.1088	-0.0507	0.0507	38	0.5166	-0.0107	0.0907	8	0.9245
-0.0880	0.0133	66	0.1360	-0.0480	0.0533	36	0.5438	-0.0080	0.0933	6	0.9517
-0.0853	0.0160	64	0.1631	-0.0453	0.0560	34	0.5710	-0.0053	0.0960	4	0.9788
-0.0827	0.0187	62	0.1903	-0.0427	0.0587	32	0.5981	-0.0027	0.0987	2	1.0060
-0.0800	0.0213	60	0.2175	-0.0400	0.0613	30	0.6254	0	0.1013	0	1.0332
-0.0773	0.0240	58	0.2447	-0.0373	0.0640	28	0.6526				
-0.0747	0.0267	56	0.2719	-0.0347	0.0667	26	0.6798				
-0.0720	0.0293	54	0.2991	-0.0320	0.0693	24	0.7069				
-0.0693	0.0320	52	0.3263	-0.0293	0.0720	22	0.7341				
-0.0667	0.0347	50	0.3535	-0.0267	0.0747	20	0.7613				
-0.0640	0.0373	48	0.3806	-0.0240	0.0773	18	0.7885				

OVERVIEW OF EXPANSION VALVE

Thermostatic expansion valves reduce the pressure of liquid refrigerant at high-temperature and high-pressure discharged from the condenser to a state where it can easily evaporate, ensuring the optimum flow rate in the evaporator.

Thermostatic expansion valves keep the superheat of refrigerant gas within a certain range in accordance with the capacity of compressor which changes as the cooling load increases or decreases and prevent abnormal heating and liquid return.

ITEMS TO BE DESIGNATED WHEN PLACING ORDERS

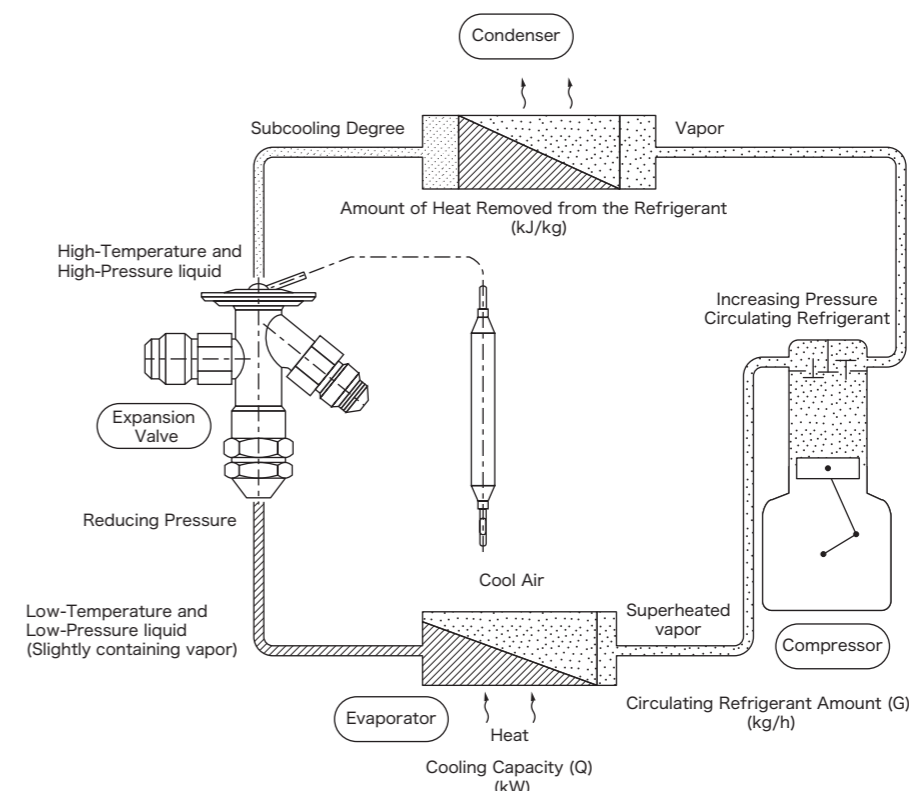


1. For standard models, please specify the catalog number.
2. For special specifications except standard models, please specify the following points.

- Normal Pressure, Minimum and Maximum Operating Pressure (Condensing Pressure, Evaporating Pressure)
- Application, Charge Types (b)
- Normal Temperature, Minimum and Maximum Operating Temperature (Condensing Temperature, Evaporating Temperature)
- Mounting location (Temperature of the mounting location at the body, sensing bulb, etc.)
- Cooling Capacity (With condensing temperature and evaporating temperature)
- Length of the Capillary Tube (f)
- Refrigerant
- Connection type (Flare, Solder) (h)

TERMS AND DEFINITIONS

- Catalog No. On standard products, specify the Catalog No. only.
- Adjustable Range It is possible to set at any position within Adjustable Range. (Mainly based on a valve opening start position.)
- Capacity Nominal capacity under standard operating conditions
- Connection Type Flare connections mainly adopt flare pipe connections for refrigeration. All dimensions are shown based on the piping side to be connected.
- Max. Working Pressure The maximum usable pressure at which the valve will function without any problems under normal operating conditions.

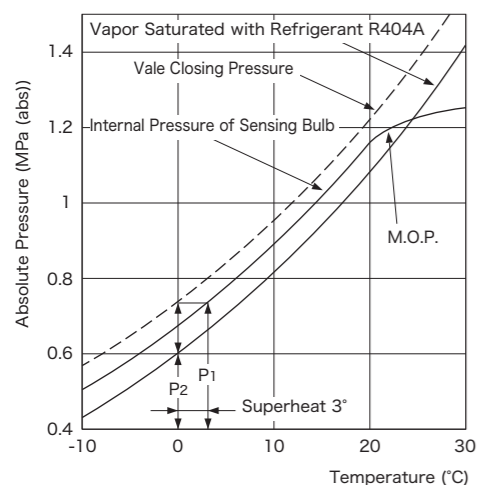


Relation between Expansion Valve and Refrigeration Cycle

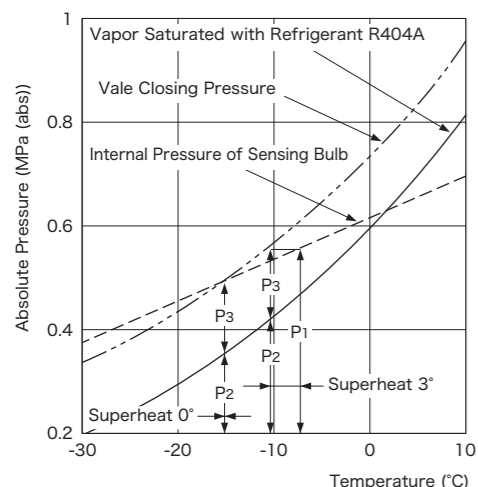
1. Condensing Temperature (CT)
The highest temperature of the liquid condition of refrigerant in the refrigerant cycle. (Temperature of saturated refrigerant liquid at the expansion valve inlet)
2. Evaporating Temperature (ET)
The temperature at mixture condition of refrigerant gas and liquid to cool water or air load etc. (Temperature of saturated refrigerant vapor at the expansion valve outlet)
3. Subcooling (SC)
The degree of temperature reduction, without changes of pressure, against the pressure equivalent to the refrigerant liquid temperature. (Difference between the temperature at the expansion valve inlet and temperature equivalent to the refrigerant pressure)
4. Superheat (SH)
The degree of temperature increase, without changes of pressure, against the pressure equivalent to the refrigerant gas temperature. (Difference between the temperature at the sensing element of the expansion valve and the temperature equivalent to the pressure at the equalizing section)
5. Condensing Pressure
The pressure equivalent to CT.
6. Evaporating Pressure
The pressure equivalent to ET.
7. Cooling Capacity
The amount of cooling heat in kW.
1 U.S. Refrigeration ton (U.S.R.T.) = 3.52 kW
8. Pressure Drop
The major cause of pressure drop is frictional resistance in piping. Pressure drop in the high-pressure side causes a reduction in the degree of subcooling or the generation of flush gas, while pressure drop in the low-pressure side causes temperature variance in the evaporator and a reduction in capacity. Pressure drop in the internal pressure equalized expansion valve leads to an increase of operating superheat.
9. Maximum Operating Pressure
The maximum pressure (designed pressure) at which the expansion valve functions without problems under normal conditions of use.

SENSING BULB CHARGING TYPE

It is necessary to select the most appropriate charging type in accordance with the type of refrigerant, evaporating temperature, thermal effect by defrost, ambient temperature of the mounting part, etc.



Charging Characteristics of S and G



Characteristics of C charge

Special Charging Types (S) (SA) (SL)

Composed a mixture of different gases, minimize the operating superheat compared with charging type (G) and control the maximum operating pressure (M.O.P.).

- Symbols are changed in accordance with the difference in the applied range of evaporating temperature and M.O.P.
- Mainly for cooling units (protected horticulture), heat pump equipment, and low temperature equipment

Gas Charging Type (G)

The same refrigerant used for the equipment is charged, and there is a point at which charged liquid becomes superheated gas at the certain temperature rise. This point is called the maximum operating pressure (M.O.P.).

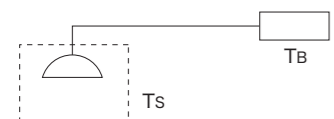
- Mainly for cooling units
- Controlling M.O.P. enables to prevent liquid return at start-up and to prevent overload of the compressor motor.

Special Charging Types (C) and (CL)

Adsorbent and special gas are charged. Using changes in pressure by high-temperature desorption and low-temperature adsorption, these types can minimize the operating superheat at low temperature condition. These types can be controlled correctly regardless of temperature difference between sensing bulb temperature and ambient temperature around the body. There is no control of M.O.P.; however, overload prevention effect can be expected.

- Symbols are changed in accordance with the difference in the applied range of evaporating temperature.
- Mainly for low and extremely low temperature equipment

Charging types shown in () are special charging types.



Ts : temperature at element.
Tb : temperature at sensing bulb (controlled temperature)

Application/Equipment	Charging Type					
	G	S	(SA)	(SL)	C	(CL)
Relation between Ts and Tb	Ts > Tb	Ts ≥ Tb	Ts ≥ Tb	Ts ≥ Tb	—	—
MOP Control (Overloading Prevention)	○	○	○	○	△	△
Cooling Equipment	○	* 2	○			
Low-Temperature Equipment	* 1	* 2		○	○	○
Application to Extremely-Low-Temperature Equipment	* 1	* 2		○		○
Application to Heat Pump Equipment		* 2	○		△	

○ means "applicable," and △ means "may not be applicable."

* 1 : Applicable AEX only.

* 2 : Depending on the M.O.P. setup.

PRESSURE EQUALIZATION TYPES

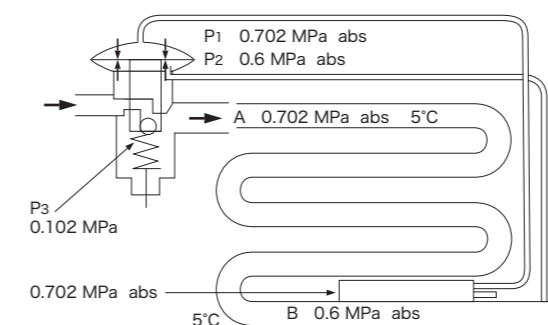
Please select external pressure equalization types for equipment with large pressure drop and fluctuation of evaporator, and internal pressure equalization types for equipment with smaller pressure drop in the evaporator.

For example, when there is pressure drop of 0.102 MPa on the low-pressure side, the internal pressure equalization type will increase operating superheat approximately 5°C.

Setting :

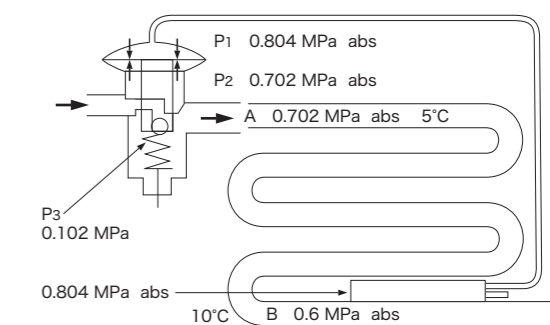
- Refrigerant R404A
- Point A 0.702 MPa abs (5°C)
- Point B 0.6 MPa abs (0°C)
- Spring Pressure P3 0.102 MPa

External Pressure Equalization Type



Pressure in Sensing Bulb (P1)
= 0.6 + 0.102
= 0.702 MPa Saturation Temperature
Operating superheat is 5°C – 0°C = 5°C.

Internal Pressure Equalization Type



Pressure in Sensing Bulb (P1)
= 0.702 + 0.102
= 0.804 MPa Saturation Temperature
Operating superheat is 10°C – 0°C = 10°C.

PRESSURE DROP IN LOW-PRESSURE PIPING

Equivalent to pressure drop appears as an increase in operating superheat, which leads to pressure drop in suction piping and reduction of cooling capacity. Therefore, it is necessary to pay attention to excessive increases in operating superheat.

A pressure difference equivalent to 1°C temperature difference is a guideline for the selecting pressure equalization type.

When there is a pressure difference higher than the values shown in the table below, is the external pressure equalization types are effective.

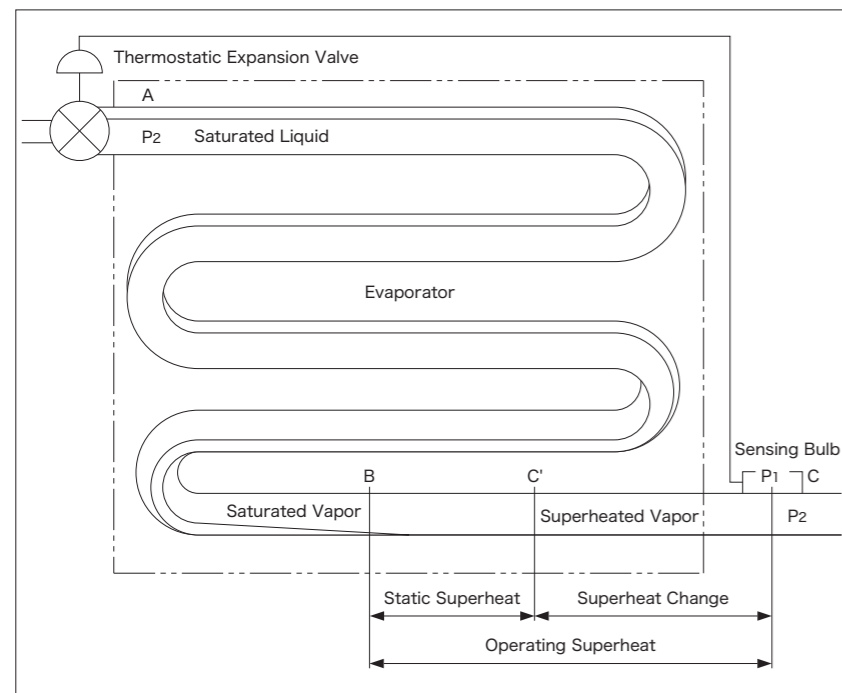
Pressure Difference Equivalent to 1°C Temperature (MPa)

Refrigerant	Evaporating Temperature (°C)									
	10	5	0	-5	-10	-20	-30	-40	-50	-60
R134a	0.014	0.012	0.011	0.009	0.008	0.006	0.004	0.003	—	—
R404A	0.025	0.022	0.019	0.017	0.015	0.012	0.008	0.006	0.004	0.003
R407C	0.021	0.018	0.016	0.014	0.012	0.009	0.006	0.004	0.003	0.002
R410A	0.033	0.029	0.026	0.023	0.020	0.015	0.011	0.008	0.006	0.004
R448A	0.022	0.020	0.017	0.015	0.013	0.010	0.007	0.005	0.003	0.002
R449A	0.022	0.019	0.017	0.015	0.013	0.010	0.007	0.005	0.003	0.002

SUPERHEAT

The degree of temperature increase, without a change of pressure, against the saturated vapor temperature of the refrigerant. Expansion valve superheat has static superheat (SSH) and superheat change (SHC), and the sum of SSH and SHC is the operating superheat (OSH), which is equivalent to the degree of superheat generated at the evaporator outlet.

Operating Principle of Superheat



Static Superheat (SSH) : Superheat from valve closing position to valve opening
 Superheat Change (SHC) : Superheat from valve opening to required flow rate
 Operating Superheat (OSH) : Static Superheat + Superheat Change

Static Superheat Adjustment

Adjustment of superheat means the adjustment of static superheat. Please set the static superheat for the safety of equipment unless there is a specific reason.

	Adjustable Range of Static Superheat (°C)	Amount of Change per Spindle Rotation (MPa)
QCX RCX	1 ~ 5 (R410A)	Approx. 0.045
	1 ~ 7 (R448A, R449A)	
SCX	1 ~ 5 (R134a, R404A, R448A, R449A)	Approx. 0.05
	1 ~ 7 (R407C, R410A)	
AEX	0 ~ 20	Approx. 0.05
ATX	1 ~ 7 (R410A, S, SL charge for R404A)	Approx. 0.007
	0 ~ 8 (S, SL charge)	
	0 ~ 10 (C charge for R448A, R449A)	

INFORMATION ON THERMOSTATIC EXPANSION VALVE SELECTION SOFTWARE

Thermostatic Expansion Valve Selection Software on Saginomiya website can easily and automatically select a suitable model for the usage conditions such as refrigerant type, cooling capacity, and condensing temperature. Please use it when selecting expansion valve.

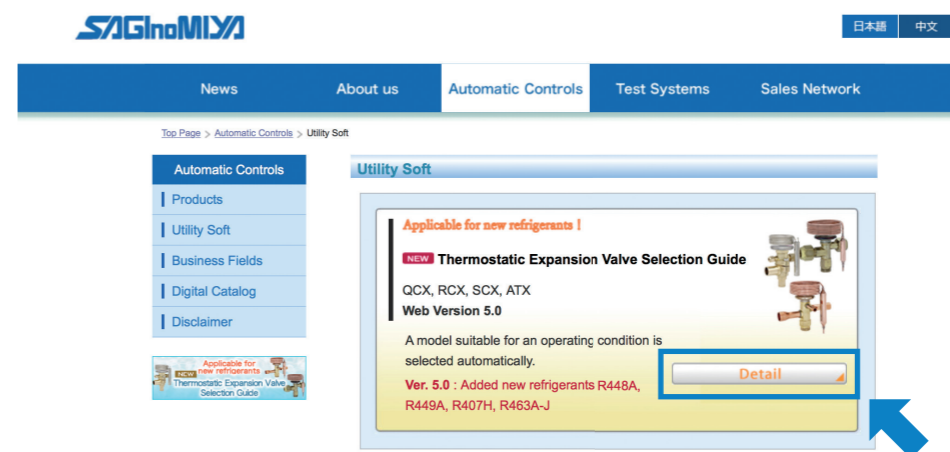
* Available products : QCX, RCX, SCX, ATX

[How to use]

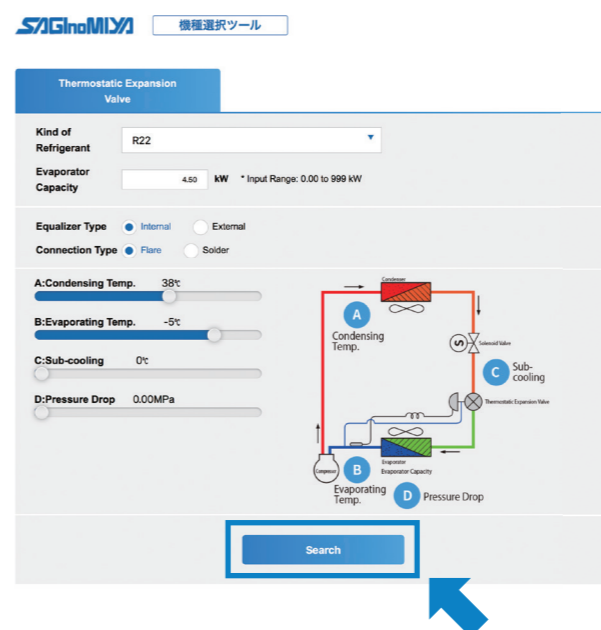
1. Access Saginomiya website from the following URL or QR code.
 URL : <https://www.saginomiya.co.jp/en/auto/utilitysoft.html>



2. The following screen is displayed, and click "Detail".



3. The following screen is displayed. Select each condition and click "Search".



4. Search results are displayed at the bottom of the screen.

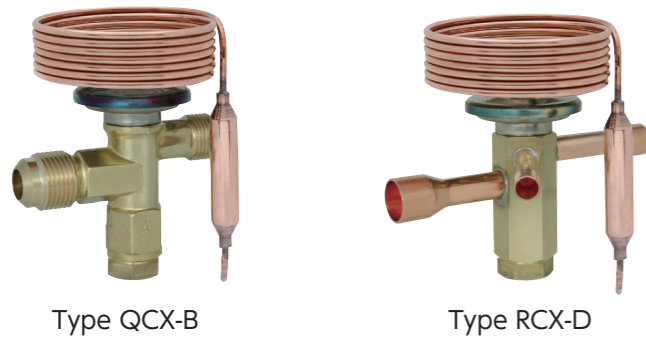
Catalog Number	Choice1	Choice2
	QCX-1234BHC	QCX-1234BHSA
Valve Capacity (kW)	4.41	4.41
Valve Capacity Ratio (%)	102.0	102.0
Equalizer Type	Internal	Internal
MOP (°C)	Non	Valid(18°)
Connection Type	Flare	Flare
Inlet Connection Size (")	3/8	3/8
Outlet Connection Size (")	1/2	1/2
Equalizer Connection Size (")	-	-
Temp. Condition	$T_e \geq T_s$	$T_e \geq T_s$

Note
 This selection result is applicable under the general operating conditions. Please confirm total system will be operated properly by trial running before actual use.

[Note for use]

The Search results of selection software can be applied in case of general operating conditions. When using our products, please be sure to conduct trial ran to confirm that total system is fully functional.

THERMOSTATIC EXPANSION VALVES / Type QCX & RCX



Thermostatic Expansion Valve Selection Software⇒

URL : <https://www.saginomiya.co.jp/en/auto/utilitysoft.html>

Capacity Table⇒

URL : http://saginomiya.co.jp/en/auto/pdf/qcx_capacity.pdf

FEATURES

- Wide temperature range. Applicable for deep freezing, refrigeration and air conditioning systems (single flow).
- Equipped with a strainer for flare type
- Suitable for refrigeration systems with hot gas defrosting
- Compatible with low GWP refrigerants (R448A, R449A)
- Standards : UL/cUL (Please contact us for details such as approved specifications.)

COMMON SPECIFICATIONS

- Type QCX : Internal equalizer type
- Type RCX : External equalizer type
- Max. working pressure : 3.0 MPa
- Max. body and sensing bulb temperature : 80°C
- Adjustable range of static superheat :
 - 1 to 7°C (R134a, R404A, R448A, R449A)
 - 1 to 5°C (R407C, R410A)
- Increase about 0.045 MPa / rotation
- Flare connection / Solder connection

Charge	Evaporating Temp. (°C)	MOP (°C)	Temp. Condition
C	R134a	-30 to 10	—
SA	R404A	-40 to 10	Ts ≥ Tb
C		-40 to 0	—
SL	R407C	-60 to -25	Ts ≥ Tb
SA		-40 to 10	Ts ≥ Tb
C	R410A	-40 to 0	—
SA		-45 to 10	Ts ≥ Tb
C	R448A	-40 to -10	—
SL		-60 to -30	Ts ≥ Tb
SA	R449A	-40 to 10	Ts ≥ Tb
C		-40 to 0	—
SL	-60 to -25	-20	Ts ≥ Tb

Ts : Power Element Temp. , Tb : Sensing Bulb Temp.

APPLICATIONS

- Display cases
- Commercial refrigerators
- Cold chain boxes
- Air conditioning systems, Protected horticulture equipments, etc.

DESCRIPTION OF CATALOG NUMBER

QCX - 03 3 4 B V SA
I II III IV V VI VII

I	Type
II	Capacity
III	Inlet pipe size
IV	Outlet pipe size
V	Connection
VI	Refrigerant
VII	Charge type

TYPE NUMBER SELECTION

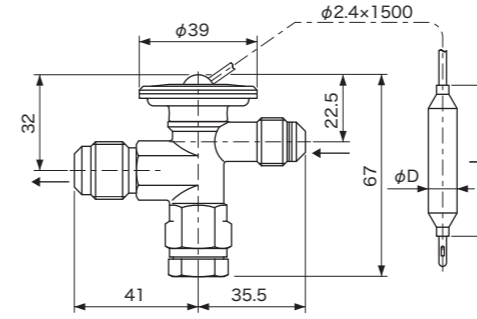
Catalog No.				Equalizer Type	Capacity (U.S.R.T.) {kW}		Connection			Factory superheat setting (°C)	Wt. (kg)
Type	Model	Refrigerant	Charge Type		Charge : SA, C	Charge : SL	Inlet	Outlet	Equalizer		
					CT 38°C	CT 38°C					
					ET -5°C	ET -30°C					
QCX RCX	0234B [D]	M (R134a)	C	Internal (QCX) External (RCX)	3/8" Flare [3/8" (OD)] Solder	1/2" Flare [1/2" (OD)] Solder	1/4" Flare [1/4" (OD)] Solder	5	0.28 (QCX-B) 0.24 (QCX-D) 0.29 (RCX-B) 0.24 (RCX-D)	0.24 {0.85}	—
	0434B [D]									0.36 {1.28}	—
	0634B [D]									0.61 {2.13}	—
	1034B [D]									0.96 {3.38}	—
	1234B [D]									1.21 {4.27}	—
	1834B [D]									1.82 {6.40}	—
	2434B [D]									2.43 {8.54}	—
	3634B [D]									3.64 {12.8}	—
	0234B [D]	U (R404A)	SA C SL							0.20 {0.70}	0.13 {0.46}
	0334B [D]									0.30 {1.05}	0.19 {0.68}
	0534B [D]									0.49 {1.74}	0.32 {1.11}
	0834B [D]									0.78 {2.76}	0.51 {1.79}
	1034B [D]									0.99 {3.48}	0.64 {2.25}
	1534B [D]									1.48 {5.22}	0.98 {3.44}
	2034B [D]									1.98 {6.95}	1.32 {4.63}
	3034B [D]									2.96 {10.4}	1.80 {6.34}
	0334B [D]	H (R407C)	SA C							0.32 {1.13}	—
	0534B [D]									0.48 {1.70}	—
	0834B [D]									0.81 {2.84}	—
	1234B [D]									1.29 {4.54}	—
	1634B [D]									1.61 {5.67}	—
	2434B [D]									2.42 {8.51}	—
	3134B [D]									3.21 {11.3}	—
	4734B [D]									4.83 {17.0}	—

TYPE NUMBER SELECTION

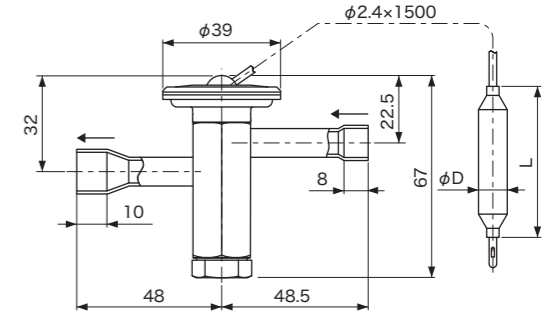
Catalog No.				Equalizer Type	Capacity (U.S.R.T.) {kW}		Connection			Factory superheat setting (°C)	Wt. (kg)
Type	Model	Refrigerant	Charge Type		Charge : SA, C	Charge : SL	Inlet	Outlet	Equalizer		
					CT 38°C ET -5°C	CT 38°C ET -30°C					
QCX RCX	0334B [D]	V (R410A)	SA C SL	Internal (QCX) External (RCX)	0.35 {1.22}	0.20 {0.71}	3/8" Flare [3/8" (OD)] Solder	1/2" Flare [1/2" (OD)] Solder	1/4" Flare [1/4" (OD)] Solder	5	0.28 (QCX-B) 0.24 (QCX-D) 0.29 (RCX-B) 0.24 (RCX-D)
	0534B [D]				0.52 {1.83}	0.30 {1.05}					
	0934B [D]				0.86 {3.04}	0.49 {1.71}					
	1434B [D]				1.37 {4.82}	0.79 {2.77}					
	1734B [D]				1.73 {6.08}	0.99 {3.50}					
	2634B [D]				2.59 {9.12}	1.51 {5.33}					
	3534B [D]				3.44 {12.1}	2.04 {7.17}					
	5234B [D]				5.18 {18.2}	2.79 {9.81}					
	0334B [D]	C1 (R448A)	SA C SL		0.29 {1.03}	0.20 {0.70}					
	0434B [D]				0.44 {1.55}	0.29 {1.03}					
	0734B [D]				0.74 {2.59}	0.48 {1.70}					
	1234B [D]				1.18 {4.14}	0.78 {2.73}					
	1534B [D]				1.47 {5.17}	0.98 {3.44}					
	2234B [D]				2.21 {7.76}	1.49 {5.25}					
	2934B [D]				2.93 {10.3}	2.01 {7.08}					
	4334B [D]				4.41 {15.5}	2.75 {9.68}					
	0334B [D]	C1 (R449A)	SA C SL		0.28 {0.99}	0.20 {0.69}					
	0434B [D]				0.42 {1.49}	0.29 {1.01}					
	0734B [D]				0.71 {2.48}	0.47 {1.67}					
	1234B [D]				1.13 {3.97}	0.76 {2.68}					
	1534B [D]				1.41 {4.96}	0.96 {3.38}					
	2234B [D]				2.12 {7.44}	1.47 {5.17}					
	2934B [D]				2.82 {9.93}	1.98 {6.97}					
	4334B [D]				4.24 {14.9}	2.71 {9.53}					

• For other refrigerant, please contact SAGINOMIYA.

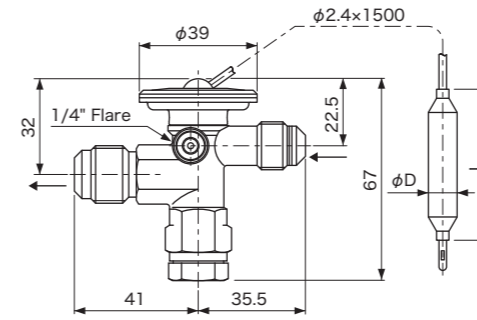
DIMENSIONS



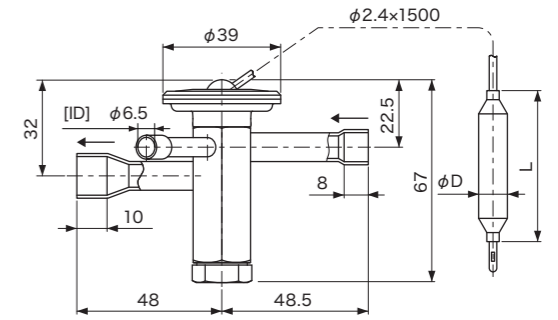
Type QCX-B



Type QCX-D



Type RCX-B



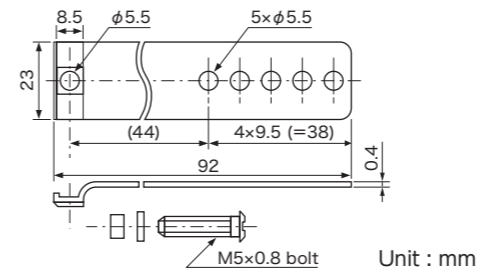
Type RCX-D

Unit : mm

Charge	Unit : mm	
	D	L
SA	12.7	80
C	9.5	50
SL	12.7	80

ACCESSORY

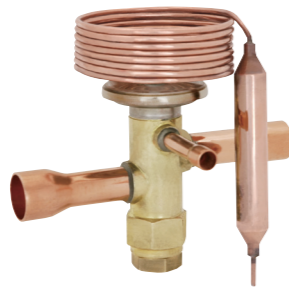
- Sensing Bulb Mounting Band



THERMOSTATIC EXPANSION VALVES / Type SCX



Type SCX-B



Type SCX- ** 45D

Thermostatic Expansion Valve Selection Software⇒



URL : <https://www.saginomiya.co.jp/en/auto/utilitysoft.html>

Capacity Table⇒



URL : http://saginomiya.co.jp/en/auto/pdf/scx_capacity.pdf

FEATURES

- Wide temperature range. Applicable for deep freezing, refrigeration and air conditioning systems (single flow).
- Small and lightweight design
- Suitable for refrigeration systems with hot gas defrosting
- Capable of controlling degree of superheat regardless of fluctuations in condensation pressure.
- Compatible with low GWP refrigerants (R448A, R449A)
- Standards : UL/cUL (Please contact us for details such as approved specifications.)

COMMON SPECIFICATIONS

- External equalizer type
- Max. working pressure : 3.0 MPa
- Max. body and sensing bulb temperature : 80°C
- Adjustable range of static superheat :
 - 1 to 7°C (R134a, R404A, R448A, R449A)
 - 1 to 5°C (R407C, R410A)
 ○ Increase about 0.045 MPa / rotation
- Flare connection / Solder connection

Charge	Evaporating Temp. (°C)	MOP (°C)	Temp. Condition
C R134a	-30 to 10	—	—
SA R404A	-40 to 10	18	Ts ≥ Tb
C R404A	-40 to 0	—	—
SL R404A	-60 to -25	-20	Ts ≥ Tb
SA R407C	-40 to 10	18	Ts ≥ Tb
C R407C	-40 to 0	—	—
SA R410A	-45 to 10	18	Ts ≥ Tb
C R410A	-40 to -10	—	—
SL R410A	-60 to -30	-20	Ts ≥ Tb
SA R448A	-40 to 10	18	Ts ≥ Tb
C R448A	-40 to 0	—	—
SL R448A	-60 to -25	-20	Ts ≥ Tb
SA R449A	-40 to 10	18	Ts ≥ Tb
C R449A	-40 to 0	—	—
SL R449A	-60 to -25	-20	Ts ≥ Tb

Ts : Power Element Temp. , Tb : Sensing Bulb Temp.

APPLICATIONS

- Display cases
- Commercial refrigerators
- Cold chain boxes
- Air conditioning systems, Protected horticulture equipments, etc.

DESCRIPTION OF CATALOG NUMBER

SCX - 05 4 5 B M C
I II III IV V VI VII

I	Type
II	Capacity
III	Inlet pipe size
IV	Outlet pipe size
V	Connection
VI	Refrigerant
VII	Charge type

TYPE NUMBER SELECTION

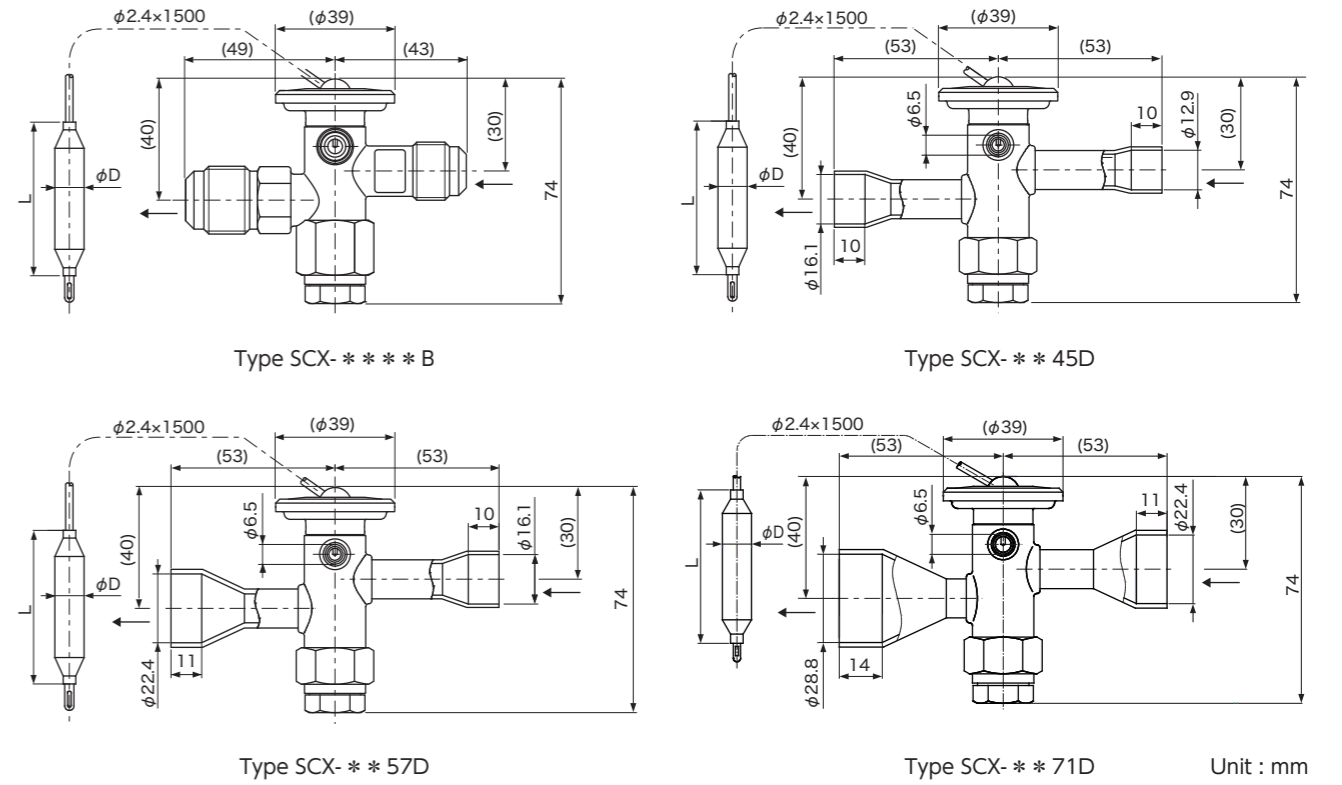
Catalog No.				Equalizer Type	Capacity (U.S.R.T.) (kW)		Connection			Factory superheat setting (°C)	Wt. (kg)		
Type	Model	Refrigerant	Charge Type		Charge : SA, C	Charge : SL	Inlet	Outlet	Equalizer				
					CT 38°C ET -5°C	CT 38°C ET -30°C							
SCX	0545B [D]	M (R134a)	C	External	SA C SL	5 (Except R407C) 2 (R407C)	1/4" Flare [1/4" Solder]	4.75 (16.7)	—	1/2" Flare	5/8" Flare	0.39 [0.31]	
	0745B [D]							[1/2" Solder]	[5/8" Solder]				
	0857D							8.33 (29.3)	—	5/8" Solder	7/8" Solder		
	1057D							9.98 (35.1)	—				
	1257D							11.8 (41.5)	—				
	0871D							8.33 (29.3)	—	7/8" Solder	1-1/8" Solder		0.35
	1071D							9.98 (35.1)	—				
	1271D							11.8 (41.5)	—				
	0445B [D]	3.64 (12.8)	1.92 (6.74)					1/2" Flare	5/8" Flare				
	0545B [D]	5.09 (17.9)	2.67 (9.39)					[1/2" Solder]	[5/8" Solder]				
	0657D	6.40 (22.5)	3.36 (11.8)					5/8" Solder	7/8" Solder				
	0857D	7.65 (26.9)	4.04 (14.2)										
	0957D	9.07 (31.9)	4.75 (16.7)					7/8" Solder	1-1/8" Solder	0.35			
	0671D	6.40 (22.5)	3.36 (11.8)										
0871D	7.65 (26.9)	4.04 (14.2)											
0971D	9.07 (31.9)	4.75 (16.7)											
0645B [D]	5.94 (20.9)	—	H (R407C)	SA C	0.39 [0.31]	1/2" Flare	5/8" Flare						
0845B [D]	8.28 (29.1)	—				[1/2" Solder]	[5/8" Solder]						
1057D	10.4 (36.6)	—				5/8" Solder	7/8" Solder						
1257D	12.5 (43.9)	—											
1457D	14.8 (52.0)	—											
1071D	10.4 (36.6)	—				7/8" Solder	1-1/8" Solder	0.35					
1271D	12.5 (43.9)	—											
1471D	14.8 (52.0)	—											

TYPE NUMBER SELECTION

Catalog No.				Equalizer Type	Capacity (U.S.R.T.) (kW)		Connection			Factory superheat setting (°C)	Wt. (kg)
Type	Model	Refrigerant	Charge Type		Charge : SA, C	Charge : SL	Inlet	Outlet	Equalizer		
					CT 38°C ET -5°C	CT 38°C ET -30°C					
SCX	0645B [D]	V (R410A)	SA C SL	External	6.37 {22.4}	3.59 {12.6}	1/2" Flare [1/2"]	5/8" Flare [5/8"]	1/4" Flare [1/4"] Solder	5	0.39 [0.31]
	0945B [D]				8.87 {31.2}	5.00 {17.6}					
	1157D				11.2 {39.2}	6.28 {22.1}	5/8" Solder	7/8" Solder			0.32
	1357D				13.4 {47.0}	7.54 {26.5}					
	1657D				15.8 {55.6}	8.91 {31.3}					
	1171D				11.2 {39.2}	6.28 {22.1}	7/8" Solder	1-1/8" Solder			0.35
	1371D				13.4 {47.0}	7.54 {26.5}					
	1671D				15.8 {55.6}	8.91 {31.3}					
	0545B [D]	C1 (R448A)	SA C SL		5.43 {19.1}	2.90 {10.2}					
	0745B [D]				7.56 {26.6}	4.01 {14.1}					
	0957D				9.50 {33.4}	5.06 {17.8}	5/8" Solder	7/8" Solder			0.32
	1157D				11.4 {40.0}	6.06 {21.3}					
	1357D				13.5 {47.4}	7.17 {25.2}					
	0971D				9.50 {33.4}	5.06 {17.8}	7/8" Solder	1-1/8" Solder			0.35
1171D	11.4 {40.0}			6.06 {21.3}							
1371D	13.5 {47.4}			7.17 {25.2}							
0545B [D]	C1 (R449A)	SA C SL	5.20 {18.3}	2.84 {10.0}	1/2" Flare [1/2"]	5/8" Flare [5/8"]			0.39 [0.31]		
0745B [D]			7.25 {25.5}	3.95 {13.9}							
0957D			9.13 {32.1}	4.98 {17.5}	5/8" Solder	7/8" Solder	0.32				
1157D			10.9 {38.4}	5.97 {21.0}							
1357D			12.9 {45.5}	7.05 {24.8}							
0971D			9.13 {32.1}	4.98 {17.5}	7/8" Solder	1-1/8" Solder	0.35				
1171D			10.9 {38.4}	5.97 {21.0}							
1371D			12.9 {45.5}	7.05 {24.8}							

• For other refrigerant, please contact SAGINOMIYA.

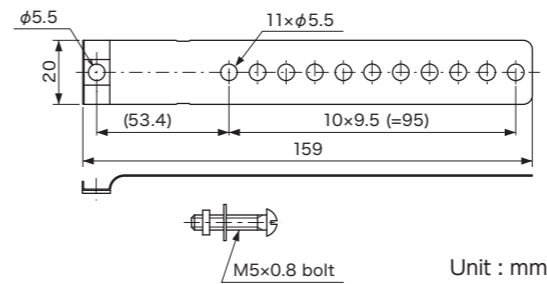
DIMENSIONS



Charge	Unit : mm	
	D	L
SA	12.7	80
C	9.5	50
SL	12.7	80

ACCESSORY

- Sensing Bulb Mounting Band



THERMOSTATIC EXPANSION VALVES / Type ATX



Type ATX-B



Type ATX-D

Thermostatic Expansion Valve Selection Software ⇒



URL : <https://www.saginomiya.co.jp/en/auto/utilitysoft.html>

Capacity Table ⇒



URL : http://saginomiya.co.jp/en/auto/pdf/atx_capacity.pdf

FEATURES

- Suitable for refrigeration systems with hot gas defrosting
- Compatible with low GWP refrigerants (R448A, R449A)

APPLICATIONS

- Water chillers
- Air conditioning systems
- Freezers
- Refrigerators
- Brine coolers, etc.

COMMON SPECIFICATIONS

- External equalizer type
- Max. working pressure : 2.8 MPa (R134a, R404A, R448A, R449A), 3.3 MPa (R407C, R410A)
- Max. body temperature : 80°C
- Max. sensing bulb temperature : 40°C (C, CL Charge), 120°C (S, SL Charge)
- Adjustable range of static superheat : 0 to 10°C (C Charge for R448A and R449A), 0 to 8°C (S, SL Charge), 1 to 7°C (R410A, S, SL Charge for R404A)
 - Increase about 0.007 MPa / rotation
- Flare connection / Solder connection

DESCRIPTION OF CATALOG NUMBER

ATX - $\frac{3}{I}$ $\frac{4}{II}$ $\frac{006}{III}$ $\frac{B}{IV}$ $\frac{U}{V}$ $\frac{S}{VI}$ $\frac{S}{VII}$

I	Type
II	Inlet pipe size
III	Outlet pipe size
IV	Capacity
V	Connection
VI	Refrigerant
VII	Charge type

Charge	Evaporating Temp. (°C)	MOP (°C)	Temp. Condition	
S	R134a	-30 to 10	20	Ts ≥ Tb
S	R404A	-40 to 10	20	Ts ≥ Tb
SL		-60 to -25	-20	Ts ≥ Tb
S	R407C	-40 to 10	20	Ts ≥ Tb
C	R410A	-20 to 10	—	—
CL		-40 to -10	—	—
S	R448A	-40 to 10	20	Ts ≥ Tb
C		-40 to 10	—	—
SL		-60 to -25	-20	Ts ≥ Tb
S	R449A	-40 to 10	20	Ts ≥ Tb
C		-40 to 10	—	—
SL		-60 to -25	-20	Ts ≥ Tb

Ts : Power Element Temp. , Tb : Sensing Bulb Temp.

TYPE NUMBER SELECTION

< S, C, CL Charge >

Catalog No.				Equalizer Type	Connection			Factory superheat setting (°C)	Wt. (kg)
Type	Model	Refrigerant	Charge Type		Inlet	Outlet	Equalizer		
ATX	34006B [D]	M (R134a) U (R404A) P (R407C) V (R410A) C (Others) C1 (R448A) C1 (R449A)	S (R134a, R404A, R407C, R448A, R449A) C (R410A, R448A, R449A) CL (R410A)	External	3/8" Flare [3/8" (OD)] Solder	1/2" Flare [1/2" (OD)] Solder	1/4" Flare	5	1.2 [1.1]
	34013B [D]								
	34023B [D]								
	34035B [D]								
	34045B [D]								
	57060D								
	57080D								
	71110D								
	71140D								
	71160D								
	12220D								
	12270D								
	12330D								
	12420D								
	12500D								

• For other refrigerant, please contact SAGINOMIYA.

Catalog No.				Capacity (U.S.R.T.) (kW)					
Type	Model	Refrigerant	Charge Type	CT 38°C / ET 5°C					
				R134a	R404A	R407C	R410A	R448A	R449A
ATX	34006B [D]	M (R134a) U (R404A) P (R407C) V (R410A) C (Others) C1 (R448A) C1 (R449A)	S (R134a, R404A, R407C, R448A, R449A) C (R410A, R448A, R449A) CL (R410A)	0.70	0.70	1.00	1.09	0.94	0.91
	34013B [D]			{2.46}	{2.46}	{3.51}	{3.85}	{3.30}	{3.19}
	34023B [D]			1.60	1.50	2.20	2.31	1.97	1.91
	34035B [D]			{5.63}	{5.27}	{7.74}	{8.14}	{6.94}	{6.72}
	34045B [D]			2.80	2.70	3.70	3.98	3.38	3.27
	57060D			{9.85}	{9.49}	{13.0}	{14.0}	{11.9}	{11.5}
	57080D			4.21	4.01	5.69	6.06	5.15	4.98
	71110D			{14.8}	{14.1}	{20.0}	{21.3}	{18.1}	{17.5}
	71140D			5.40	5.09	7.20	7.76	6.63	6.40
	71160D			{19.0}	{17.9}	{25.3}	{27.3}	{23.3}	{22.5}
	12220D			7.22	6.80	9.98	10.7	9.10	8.82
	12270D			{25.4}	{23.9}	{35.1}	{37.6}	{32.0}	{31.0}
	12330D			9.58	9.10	13.4	14.3	12.2	11.8
	12420D			{33.7}	{32.0}	{47.1}	{50.3}	{42.9}	{41.5}
	12500D			13.2	12.5	18.3	19.6	16.7	16.2
	{46.4}	{44.0}	{64.3}	{69.0}	{58.8}	{56.9}			

• For other refrigerant, please contact SAGINOMIYA.

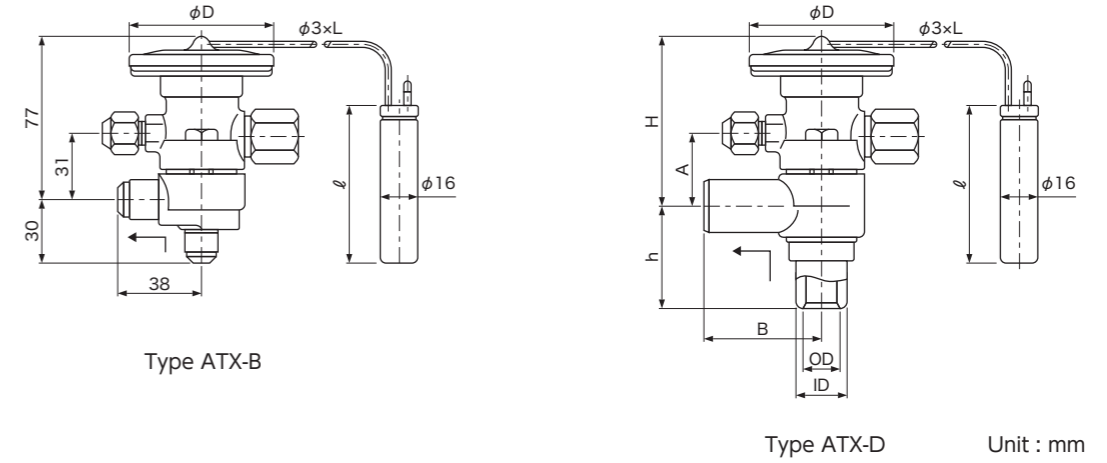
TYPE NUMBER SELECTION

< SL Charge >

Catalog No.		Refrigerant	Charge Type	Equalizer Type	Connection			Factory superheat setting (°C)	Wt. (kg)
Type	Model				Inlet	Outlet	Equalizer		
ATX	34006B [D]	U (R404A)	SL (R404A, R448A, R449A)	External	3/8" Flare [3/8" (OD) Solder]	1/2" Flare [1/2" (OD) Solder]	1/4" Flare	5	1.2 [1.1]
	34013B [D]								
	34023B [D]								
	34035B [D]								
	34045B [D]								
	57060D				C1 (R448A)	5/8" (OD) or 7/8" (ID) Solder		7/8" (OD) or 1-1/8" (ID) Solder	1.3
	57080D								
	71110D								
	71140D				C1 (R449A)	1" (OD) or 1-1/4" (ID) Solder		1" (OD) or 1-1/4" (ID) Solder	1.5
	71160D								
	12220D								
	12270D								
12330D									
12420D									
12500D									

Catalog No.		Refrigerant	Charge Type	Capacity (U.S.R.T.) {kW}		
Type	Model			CT 38°C / ET -30°C		
				R404A	R448A	R449A
ATX	34006B [D]	U (R404A)	SL (R404A, R448A, R449A)	0.33 {1.16}	0.50 {1.76}	0.49 {1.73}
	34013B [D]			0.82 {2.90}	1.26 {4.42}	1.24 {4.35}
	34023B [D]			1.36 {4.78}	2.07 {7.29}	2.04 {7.17}
	34035B [D]			2.04 {7.19}	3.10 {10.9}	3.04 {10.7}
	34045B [D]			2.62 {9.23}	3.98 {14.0}	3.92 {13.8}
	57060D			3.67 {12.9}	5.57 {19.6}	5.49 {19.3}
	57080D			4.92 {17.3}	7.48 {26.3}	7.37 {25.9}
	71110D			6.94 {24.4}	9.47 {33.3}	9.33 {32.8}
	71140D			8.73 {30.7}	13.3 {46.7}	13.1 {46.0}
	71160D			9.95 {35.0}	18.6 {65.3}	18.3 {64.3}
	12220D			13.7 {48.2}	24.5 {86.2}	24.1 {84.9}
	12270D			16.9 {59.3}	29.6 {104}	29.3 {103}
	12330D			20.6 {72.4}	35.8 {126}	35.3 {124}
	12420D			27.6 {97.1}	46.9 {165}	46.4 {163}
	12500D			33.0 {116}	59.2 {208}	58.3 {205}

DIMENSIONS

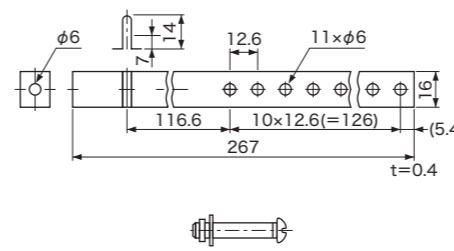


Catalog No.		Unit : mm						
Type	Model	H	h	A	B	φD	L	ℓ
ATX	34006B [D]	77	30	31	38	68	2000	100
	34013B [D]							
	34023B [D]							
	34035B [D]							
	34045B [D]							
	57060D	80	52	34	51			
	57080D							
	71110D							
	71140D	82	56	36	51			
	71160D							
	12220D							
	12270D							
12330D								
12420D								
12500D								

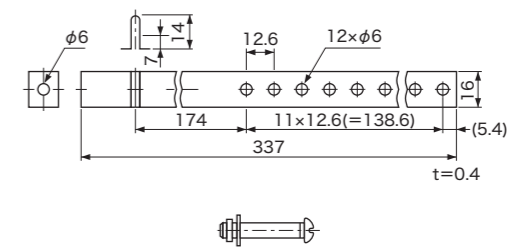
ACCESSORY

● Sensing Bulb Mounting Band

For Type ATX-34006 to 71160



For Type ATX-12220 to 12500



Unit : mm

THERMOSTATIC EXPANSION VALVES / Type AEX



AEX-2333BU



AEX-2333BUZ

Capacity Table⇒



URL : http://saginomiya.co.jp/en/auto/pdf/aex_capacity.pdf

FEATURES

- High performance over a wide range of evaporation temperature.
- The AEX-Z type adopts a bellow seal mechanism and performs stable control even at extremely low temperature.
- Equipped with a strainer in inlet.

COMMON SPECIFICATIONS

- Internal equalizer type
- Max. working pressure : 1.4 MPa
- Max. body and sensing bulb temperature : 80°C
- Adjustable range of static superheat : 0 to 20°C
 - Increase about 0.05 MPa / rotation
- Flare connection

Charge	Temperature class	Evaporating Temp. (°C)	MOP (°C)	Temp. Condition
G	R134a	Standard	-30 to 10	Ts > Tb
	R404A			
	R23	Extreme Low Temperature	-100 to -70	
	R404A		-70 to 10	

Ts : Power Element Temp. , Tb : Sensing Bulb Temp.

APPLICATIONS

- Refrigerators
- Freezers
- Refrigeration equipments for Ships
- Chillers, etc.

DESCRIPTION OF CATALOG NUMBER

AEX - 23 3 3 B U Z
I II III IV V VI VII

I	Type
II	Inlet pipe size
III	Outlet pipe size
IV	Capacity
V	Connection
VI	Refrigerant
VII	Temperature class

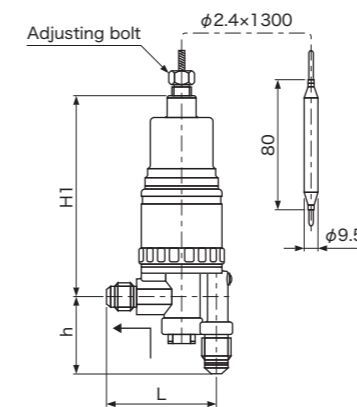
TYPE NUMBER SELECTION

Catalog No.				Equalizer Type	Capacity (U.S.R.T.) [kW]			* 2 Connection		Factory superheat setting (°C)	Wt. (kg)
Type	Model	* 1 Refrigerant	Temperature class		CT 38°C ET -5°C		CT -40°C ET -80°C	Inlet	Outlet		
AEX	2333B	M (R134a) C (R23, others) U (R404A)	— (Standard) Z (Extreme Low Temperature)		Internal	R134a	R404A				
	2335B			0.36 {1.27}		0.34 {1.20}	0.19 {0.68}				
	2345B			0.72 {2.53}		0.68 {2.39}	0.39 {1.36}				
	2348B			1.10 {3.87}		1.05 {3.69}	0.60 {2.10}				
	2341B			1.50 {5.28}		1.40 {4.92}	0.89 {3.13}				
	2342B			2.60 {9.14}		2.50 {8.79}	1.53 {5.37}				
	2344B			4.41 {15.5}		4.21 {14.8}	2.61 {9.16}				
	3454B			7.20 {25.3}		6.00 {21.1}	3.58 {12.6}				
	4564B			9.58 {33.7}		8.39 {29.5}	4.75 {16.7}				
	4566B							3/8" (1/4") Flare	1/2" Flare	5/8" (1/2") Flare	3/4" Flare
4568B											

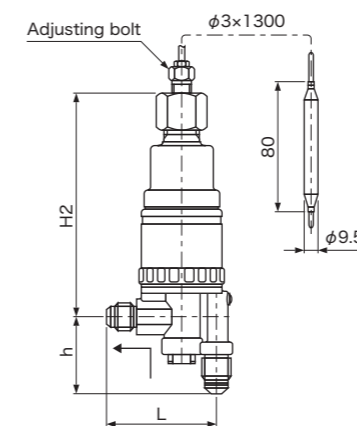
* 1 For other refrigerant, please contact SAGINOMIYA.

* 2 If you need connection sizes in (), please specify first.

DIMENSIONS



Type AEX



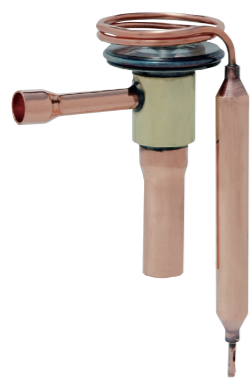
Type AEX-Z

Unit : mm

Catalog No.		Unit : mm			
Type	Model	L	H1	H2	h
AEX	2333B	70.5	132	156	47 (46)
	2335B				
	2345B	73.5			46 (47)
	2348B				
	2341B	81			48 (49)
	2342B				
	2344B	84.5			52
	3454B				
	4564B	90.5			56.5 (55.5)
	4566B				
4568B					

• Values in () are the dimensions in the case of connection size () in TYPE NUMBER SELECTION.

THERMOSTATIC EXPANSION VALVES (SMALL CAPACITY TYPE) / Type ARX



Type ARX-2303D

High Volume OEM Item

Drawings must be exchanged for purchase. Please contact SAGINOMIYA for more details.

FEATURES

- Compact and lightweight design
- Static superheat fixed type
- Suitable for refrigeration systems with hot gas defrosting
- Standards : UL/cUL (Please contact us for details such as approved specifications.)

APPLICATIONS

- Bottle coolers
- Display cases
- Ice making machines
- Industrial air conditioning systems, etc.

COMMON SPECIFICATIONS

- Internal equalizer type
- Max. working pressure : 2.8 MPa (Except R407C), 3.3 MPa (R407C)
- Max. body and sensing bulb temperature : 80°C
- Adjustable range of static superheat : 0 to 5°C
- Solder connection

Charge	Evaporating Temp. (°C)	MOP (°C)	Temp. Condition
S	R134a	-	-
	R404A		
	R407C		
CL	R404A		

Ts : Power Element Temp. , Tb : Sensing Bulb Temp.

DESCRIPTION OF CATALOG NUMBER

ARX - $\frac{2}{I}$ $\frac{3}{II}$ $\frac{03}{III}$ $\frac{D}{IV}$ $\frac{M}{V}$ $\frac{S}{VI}$ $\frac{S}{VII}$

I	Type
II	Inlet pipe size
III	Outlet pipe size
IV	Capacity
V	Connection
VI	Refrigerant
VII	Charge type

TYPE NUMBER SELECTION

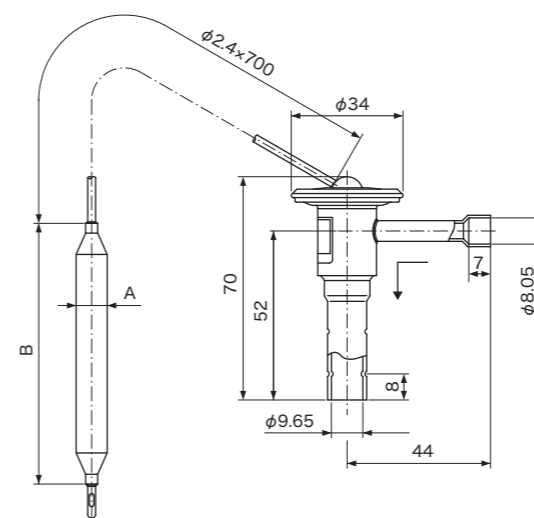
Type	Model	Catalog No.		Equalizer Type	Capacity (U.S.R.T.) (kW)			Connection		Factory superheat setting (°C)	Wt. (kg)
		* 1 Refrigerant	Charge Type		CT 38°C / ET 5°C			Inlet	Outlet		
					R134a	R404A	R407C				
ARX	2302D	M (R134a) U (R404A) P (R407C)	S (R134a, R404A, R407C) CL (R404A)	Internal	0.24 {0.85}	-	-	5/16" Solder	3/8" Solder	* 2 3 (fixed)	0.12
	2303D				0.36 {1.27}	0.34 {1.20}	0.50 {1.76}				
	2305D				0.60 {2.11}	0.57 {2.00}	0.82 {2.88}				
	2308D				0.96 {3.37}	0.93 {3.27}	1.34 {4.71}				
	2310D				1.20 {4.22}	1.14 {4.01}	1.65 {5.80}				
	2315D				1.80 {6.33}	1.71 {6.01}	2.47 {8.70}				

* 1 For other refrigerant, please contact SAGINOMIYA.

* 1 Models for flammable refrigerants are also available. Please contact SAGINOMIYA for details.

* 2 If you need to change superheat setting value, please specify first.

DIMENSIONS



Unit : mm

Charge	Unit : mm	
	A	B
S	R134a	80
	R404A	
	R407C	
CL	R404A	50

CONSTANT PRESSURE EXPANSION VALVES / Type CEX



CEX-2333B

Capacity Table⇒



URL : http://saginomiya.co.jp/en/auto/pdf/cex_capacity.pdf

FEATURES

- Available for bypass circuit configuration and constant load operation. (excluding hot gas circuit)
- Applicable in the vacuum area.
- Equipped with a strainer in inlet.

APPLICATIONS

- Bulk coolers
- Water coolers
- Refrigerators
- Air dryers, etc.

COMMON SPECIFICATIONS

- Internal equalizer type
- Max. working pressure : 1.4 MPa
- Max. body temperature : 80°C
- Pressure adjustment : ◯ increase about 0.03 MPa / rotation
- Flare connection

DESCRIPTION OF CATALOG NUMBER

CEX - 23 3 3 B U Z
I II III IV V VI VII

I	Type
II	Inlet pipe size
III	Outlet pipe size
IV	Capacity
V	Connection
VI	Refrigerant
VII	Temperature class

Temperature class	Refrigerant	Evaporating Temp. (°C)
Standard	R134a	-30 to 10
	R404A	-40 to -5
	R407C	-40 to 0
	R448A	-40 to 0
	R449A	-40 to 0
Extreme Low Temperature	R23	-100 to -70
	R404A	-70 to -5

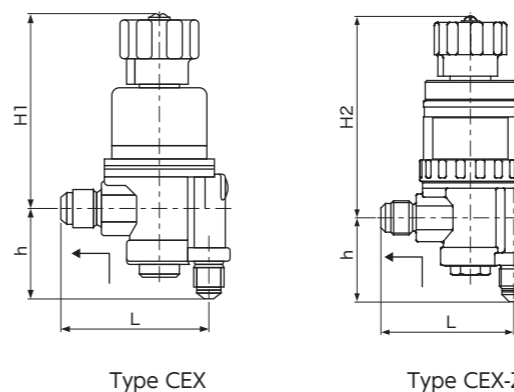
TYPE NUMBER SELECTION

Catalog No.				Equalizer Type	Adjustable range of set pressure (MPa)	Connection		Factory pressure setting (MPa)	Wt. (kg)	
Type	Model	Refrigerant	Temperature class			Inlet	Outlet			
CEX	2333B	M (R134a) C (R23, others) U (R404A) P (R407C) C1 (R448A) C1 (R449A)	— (Standard) Z (Extreme Low Temperature)	Internal	-0.047 to 0.45 (C, U, P, C1) -0.047 to 0.35 (M)	1/4" (3/8") Flare	3/8" Flare	M : 0.142 C : 0.206 U : 0.412 P : 0.279 C1 : 0.325	0.70	
	2335B						1/2" Flare			0.85
	2345B									
	2348B					3/8" (1/4") Flare	1.00			
	2341B									
	2342B					1/2" Flare	1.25			
	2344B									
	3454B					5/8" (1/2") Flare	3/4" Flare		1.40	
	4564B									
4566B										
4568B										

- If the pressure and temperature meet the specified conditions, each fluorocarbon-based refrigerants can be used with each other.
- If you need connection sizes in (), please specify first.
- The set pressure is the pressure at the beginning of valve opening.
- For other refrigerant, please contact SAGINOMIYA.

Catalog No.				Capacity (U.S.R.T.) {kW}					
Type	Model	Refrigerant	Temperature class	CT 38°C ET -5°C					CT -40°C ET -80°C
				R134a	R404A	R407C	R448A	R449A	R23
CEX	2333B	M (R134a) C (R23, others) U (R404A) P (R407C) C1 (R448A) C1 (R449A)	— (Standard) Z (Extreme Low Temperature)	0.36 {1.27}	0.34 {1.20}	0.51 {1.81}	0.47 {1.65}	0.45 {1.59}	0.19 {0.68}
	2335B			0.72 {2.53}	0.68 {2.39}	0.98 {3.44}	0.89 {3.14}	0.86 {3.01}	0.39 {1.36}
	2345B			1.10 {3.87}	1.05 {3.69}	1.44 {5.07}	1.31 {4.62}	1.26 {4.43}	0.60 {2.10}
	2348B			1.50 {5.28}	1.40 {4.92}	1.96 {6.88}	1.78 {6.27}	1.71 {6.02}	0.89 {3.13}
	2341B			2.60 {9.14}	2.50 {8.79}	3.81 {13.4}	3.47 {12.2}	3.33 {11.7}	1.53 {5.37}
	2342B			4.41 {15.5}	4.21 {14.8}	6.17 {21.7}	5.63 {19.8}	5.40 {19.0}	2.61 {9.16}
	2344B			7.20 {25.3}	6.00 {21.1}	9.90 {34.8}	9.02 {31.7}	8.67 {30.5}	3.58 {12.6}
	3454B			9.58 {33.7}	8.39 {29.5}	13.2 {46.4}	12.0 {42.3}	11.5 {40.5}	4.75 {16.7}
	4564B								
	4566B								
	4568B								

DIMENSIONS



Catalog No.		Unit : mm					
Type	Model	L	H1	H2	h		
CEX	2333B	70.5	92	112	47 (46)		
	2335B						
	2345B						
	2348B	73.5			46 (47)		
	2341B						
	2342B	81			48 (49)		
	2344B						
	3454B	84.5			93	113	52
	4564B	90.5			95	115	56.5 (55.5)
	4566B						
4568B							

• Values in () are the dimensions in the case of connection size () in TYPE NUMBER SELECTION.

CONSTANT PRESSURE EXPANSION VALVES / Type CTX



Type CTX-B



Type CTX-D

Capacity Table⇒



URL : http://saginomiya.co.jp/en/auto/pdf/ctx_capacity.pdf

FEATURES

- Available for bypass circuit configuration and constant load operation

APPLICATIONS

- Air conditioning systems
- Bulk coolers
- Refrigerators / Freezers
- Air dryers, etc.

COMMON SPECIFICATIONS

- External equalizer type
- Max. working pressure : 2.8 MPa
- Max. body temperature : 80°C
- Adjustable of pressure : ○increase about 0.065 MPa / rotation
- Adjustable range of pressure setting : -0.01 to 0.45 MPa
- Flare connection / Solder connection

DESCRIPTION OF CATALOG NUMBER

CTX - $\frac{3}{I}$ $\frac{4}{II}$ $\frac{006}{III}$ $\frac{B}{IV}$ $\frac{U}{V}$ $\frac{U}{VI}$

I	Type
II	Inlet pipe size
III	Outlet pipe size
IV	Capacity
V	Connection
VI	Refrigerant

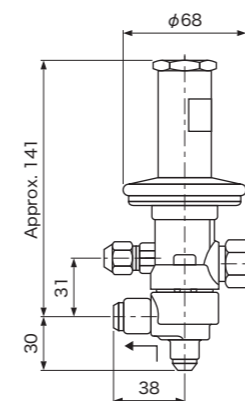
TYPE NUMBER SELECTION

Type	Catalog No.		Connection			Factory pressure setting (MPa)	Wt. (kg)
	Model	Refrigerant	Inlet	Outlet	Equalizer		
CTX	34006B [D]	M (R134a) U (R404A) P (R407C) C1 (R448A) C1 (R449A)	3/8" Flare or [(OD) Solder]	1/2" Flare or [(OD) Solder]	1/4" Flare	M : 0.142 U : 0.412 P : 0.279 C1 : 0.324	1.2 [1.1]
	34013B [D]						
	34023B [D]						
	34035B [D]						
	34045B [D]						
	57060D		5/8" (OD) or 7/8" (ID) Solder	7/8" (OD) or 1-1/8" (ID) Solder			1.3
	57080D						
	71110D						
	71140D						
	71160D						
	12220D		1" (OD) or 1-1/4" (ID) Solder	1" (OD) or 1-1/4" (ID) Solder			1.5
	12270D						
	12330D						
	12420D						
	12500D						

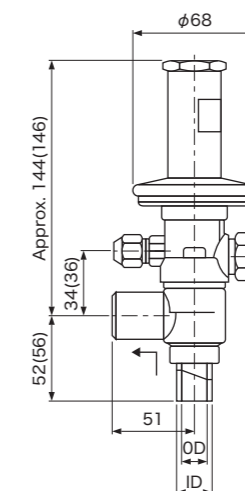
- If pressure and temperature match the specified conditions, each fluorocarbon-based refrigerants can be used.
- Factory pressure setting is the pressure when a valve starts to open.
- For other refrigerant, please contact SAGINOMIYA.

Type	Catalog No.		Capacity (U.S.R.T.) [kW]				
	Model	Refrigerant	CT 38°C / ET 5°C				
			R134a	R404A	R407C	R448A	R449A
CTX	34006B [D]	M (R134a) U (R404A) P (R407C) C1 (R448A) C1 (R449A)	0.70 {2.46}	0.70 {2.46}	1.00 {3.51}	0.94 {3.30}	0.91 {3.19}
	34013B [D]		1.60 {5.63}	1.50 {5.27}	2.20 {7.74}	1.97 {6.94}	1.91 {6.72}
	34023B [D]		2.80 {9.85}	2.70 {9.49}	3.70 {13.0}	3.39 {11.9}	3.27 {11.5}
	34035B [D]		4.21 {14.8}	4.01 {14.1}	5.69 {20.0}	5.15 {18.1}	4.98 {17.5}
	34045B [D]		5.40 {19.0}	5.09 {17.9}	7.20 {25.3}	6.63 {23.3}	6.40 {22.5}
	57060D		7.22 {25.4}	6.80 {23.9}	9.98 {35.1}	9.10 {32.0}	8.82 {31.0}
	57080D		9.58 {33.7}	9.10 {32.0}	13.4 {47.1}	12.2 {42.9}	11.8 {41.5}
	71110D		13.2 {46.4}	12.5 {44.0}	18.3 {64.3}	16.7 {58.8}	16.2 {56.9}
	71140D		16.8 {59.1}	16.0 {56.3}	23.3 {81.9}	21.2 {74.6}	20.5 {72.1}
	71160D		19.2 {67.5}	18.2 {64.0}	26.8 {94.2}	24.5 {86.0}	23.7 {83.2}
	12220D		26.4 {92.8}	25.1 {88.3}	37.0 {130}	33.6 {118}	32.4 {114}
	12270D		32.4 {114}	30.7 {108}	44.9 {158}	41.2 {145}	39.8 {140}
	12330D		39.8 {140}	37.5 {132}	54.9 {193}	50.1 {176}	48.3 {170}
	12420D		50.3 {177}	47.8 {168}	69.7 {245}	63.4 {223}	61.1 {215}
	12500D		60.0 {211}	56.9 {200}	83.3 {293}	76.2 {268}	73.7 {259}

DIMENSIONS

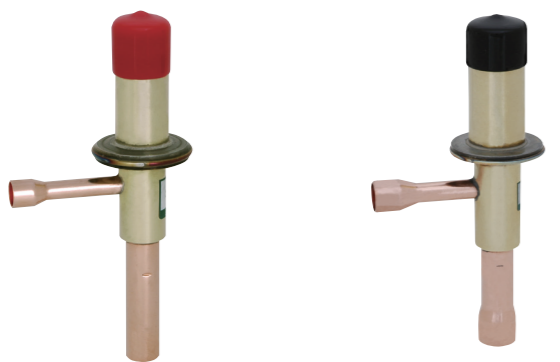


Type CTX-B



Type CTX-57060D to 71160D
(Type CTX-12220D to 12500D) Unit : mm

CONSTANT PRESSURE EXPANSION VALVES, CAPACITY REGULATING VALVES / Type CGX & SPX



Type CGX

Type SPX

High Volume OEM Item

Drawings must be exchanged for purchase. Please contact SAGINOMIYA for more details.

FEATURES

- Suitable for capacity control of equipment operating at low load.

APPLICATIONS

- Air dryers
- Spot coolers
- Refrigerators / Freezers
- Chillers, etc.

COMMON SPECIFICATIONS

	CGX	SPX
Equalizer Type	Internal	
Max. working pressure	2.5 MPa (Except R410A) 3.3 MPa (R410A)	2.8 MPa (Except R410A) 3.3 MPa (R410A)
Body Max. temperature	80°C	
Adjustable range of pressure	0.35 to 0.5 MPa ○ increase about 0.075 MPa / rotation (Except R410A) 0.5 to 0.9 MPa ○ increase about 0.08 MPa / rotation (R410A)	0.2 to 0.6 MPa ○ increase about 0.075 MPa / rotation (Except R410A) 0.5 to 0.9 MPa ○ increase about 0.075 MPa / rotation (R410A)
Connection	Solder	

DESCRIPTION OF CATALOG NUMBER

- CGX, SPX (Except CGX-2623D)

- CGX-2623D

CGX - 2 3 15 D U
I II III IV V VI

CGX - 26 2 3 D U
I II III IV V VI

I	Type
II	Inlet pipe size
III	Outlet pipe size
IV	Capacity
V	Connection
VI	Refrigeration

I	Type
II	Capacity
III	Inlet pipe size
IV	Outlet pipe size
V	Connection
VI	Refrigeration

TYPE NUMBER SELECTION

Type	Catalog No.		Equalizer Type	Adjustable range of set pressure (MPa)	Connection		Factory pressure setting (MPa)	Wt. (kg)
	Model	Refrigerant			Inlet	Outlet		
CGX	2315D	M (R134a) U (R404A) P (R407C) C1 (R448A) C1 (R449A)	Internal	0.35 to 0.5	5/16" Solder	3/8" Solder	M : 0.206 ± 0.02 U : 0.51 ± 0.02 P : 0.373 ± 0.02 C1 : 0.412 ± 0.02	0.15
	2623D	V (R410A)		0.5 to 0.9			V : 0.72 ± 0.02	0.22
SPX	4540D	M (R134a) U (R404A) P (R407C) V (R410A) C1 (R448A) C1 (R449A)		0.5 to 0.9 (R410A) 0.2 to 0.6 (Others)	1/2" Solder	5/8" Solder	M : 0.206 ± 0.02 U : 0.51 ± 0.02 P : 0.373 ± 0.02 V : 0.72 ± 0.02 C1 : 0.412 ± 0.02	0.26 (0.33) *

* SPX-4540DV

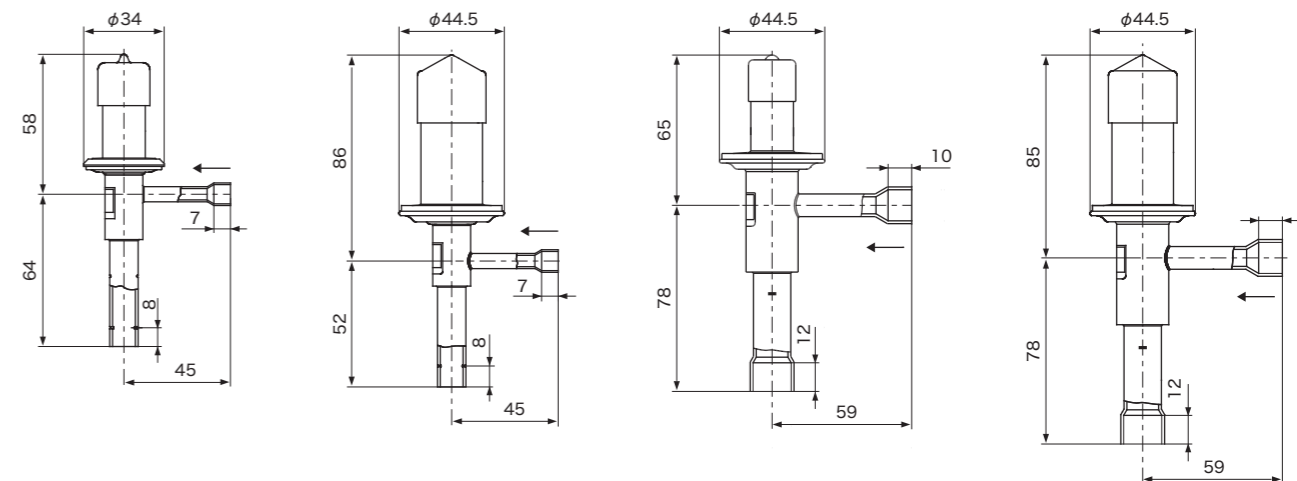
• For other refrigerant, please contact SAGINOMIYA.

Type	Catalog No.		Capacity (U.S.R.T.) {kW}				
	Model	Refrigerant	CT 38°C / ET 5°C [CT 40°C / ET -10°C]				
			R134a	R404A	R407C	R410A	R448A
CGX	2315D	M (R134a) U (R404A) P (R407C) C1 (R448A) C1 (R449A)	1.80 {6.33} [0.22 {0.76}]	1.71 {6.01} [0.28 {0.97}]	2.47 {8.69} [0.33 {1.16}]	—	2.26 {7.93} [0.31 {1.09}]
	2623D	V (R410A)	—	—	—	2.64 {9.28} [1.24 {2.09}]	—
SPX	4540D	M (R134a) U (R404A) P (R407C) V (R410A) C1 (R448A) C1 (R449A)	4.81 {16.9} [0.33 {1.17}]	4.55 {16.0} [0.43 {1.50}]	6.60 {23.2} [0.51 {1.78}]	7.05 {24.8} [0.75 {2.64}]	6.29 {22.1} [0.48 {1.68}]

• Capacity : CT 38°C / ET 5°C : Application for constant pressure expansion valves
CT 40°C / ET -10°C : Application for capacity regulating valves (Hot gas 80°C)

• For other refrigerant, please contact SAGINOMIYA.

DIMENSIONS



Type CGX-2315D

Type CGX-2623D

Type SPX-4540D

Type SPX-4540D (for R410A)

Unit : mm

MANUALLY OPERATED EXPANSION VALVES / Type HEX



Type HEX-B

Capacity Table⇒



URL : http://saginomiya.co.jp/en/auto/pdf/hex_capacity.pdf

FEATURES

- Widely available for bypass circuit configuration.
- Opening and closing the valve with a manual handle.
- Equipped with a strainer in inlet.

APPLICATIONS

- Brine coolers
- Refrigerations
- Freezers, etc.

COMMON SPECIFICATIONS

- Internal equalizer type
- Max. working pressure : 1.4 MPa
- Ambient temperature : 80°C
- Flare connection

Temperature class	Refrigerant	Evaporating Temp. (°C)
Standard	R134a	-30 to 10
	R404A	-40 to 10
	R407C	-40 to 10
Extreme Low Temperature	R23	-100 to -70
	R404A	-70 to 10

DESCRIPTION OF CATALOG NUMBER

HEX - 23 3 3 B U Z
I II III IV V VI VII

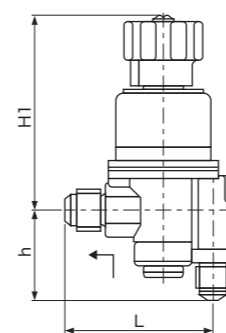
I	Type
II	Inlet pipe size
III	Outlet pipe size
IV	Capacity
V	Connection
VI	Refrigerant
VII	Temperature class

TYPE NUMBER SELECTION

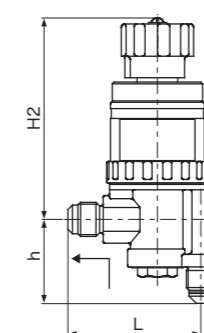
Type	Catalog No.			Equalizer Type	Capacity (U.S.R.T.) {kW}				Connection		Wt. (kg)	
	Model	Refrigerant	Temperature class		CT 38°C / ET -5°C				Inlet	Outlet		
					R23	R134a	R404A	R407C				
HEX	2333B	M (R134a) C (R23, others) U (R404A) P (R407C)	— (Standard) Z (Extreme Low Temperature)	Internal	Production possible		0.36 {1.27}	0.34 {1.20}	0.51 {1.81}	1/4" (3/8") Flare	3/8" Flare	0.7
	2335B						0.72 {2.53}	0.68 {2.39}	0.98 {3.44}			
	2345B						1.10 {3.87}	1.05 {3.69}	1.44 {5.07}			
	2348B						1.50 {5.28}	1.40 {4.92}	1.96 {6.88}			
	2341B						2.60 {9.14}	2.50 {8.79}	3.81 {13.4}	3/8" (1/4") Flare	1/2" Flare	0.85
	2342B						4.41 {15.5}	4.21 {14.8}	6.17 {21.7}			
	2344B						7.20 {25.3}	6.00 {21.1}	9.90 {34.8}	5/8" (1/2") Flare	5/8" Flare	1.0
	3454B						9.58 {33.7}	8.39 {29.5}	13.2 {46.4}			
	4564B						1/2" Flare	5/8" Flare	3/4" Flare	1.4		
	4566B											
4568B												

- If the pressure and temperature meet the specified conditions, each fluorocarbon-based refrigerant can be used with each other.
- If you need connection sizes in (), please specify first.

DIMENSIONS



Type HEX



Type HEX-Z

Catalog No.		Unit : mm					
Type	Model	L	H1	H2	h		
HEX	2333B	70.5	92	112	47 (46)		
	2335B						
	2345B						
	2348B	73.5			46 (47)		
	2341B						
	2342B	81			48 (49)		
	2344B						
	3454B	84.5			93	113	52
	4564B	90.5			95	115	56.5 (55.5)
	4566B						
4568B							

- Values in () are the dimensions in the case of connection size () in TYPE NUMBER SELECTION.

CONSENT RELATED TO DISCLAIMERS

We, SAGINOMIYA SEISAKUSHO, INC., (hereinafter referred to as "Saginomiya"), truly appreciate your choosing Saginomiya's products (hereinafter referred to as "Products").
When the Products are used, this document as provided below shall be applicable except to the extent that there is anything to the contrary in any applicable estimate, agreement, catalogue, specification, etc.

● CONFIRMATION OF OPERATION

All customers using the Products (hereinafter referred to as "Customers") are requested to, after properly installing the Products, test the operation of the Products to confirm that all the systems in connection with the Products fully function.
In order to prevent the occurrence of bodily injury, fire accidents, serious damage, etc., in connection with the Customers' machinery or equipment due to improper installation of the Products, Saginomiya kindly requests the Customers to take the necessary safety measures by preparing safe designs such as a fail-safe design (*1) and a fire spread prevention design, as well as to make the proper adjustments for product reliability necessary for fault-tolerance (*2).

- (*1) Fail-safe design: Design to ensure safety in the event of any mechanical failure
- (*2) Fault-tolerance: Utilization of redundancy technology

Periodic Inspection of the Products
Be sure to confirm the proper operation of the Products and keep records of such operation at least once a year.

Saginomiya shall be held harmless and be indemnified by the Customers from any damages incurred due to the Customers failing to conduct the above operational procedures, provided, however, that, this shall not apply if the damages which the Customers incurred due to the defect of the Products caused by Saginomiya.

● RESTRICTIONS OF USE

The Products are designed and manufactured for the purpose of using them for cooling and heating and refrigerating appliances and air conditioning equipment or various industrial equipment, but are not designed and manufactured for the purpose of using the Products for any instrument or system related to human life or health purposes.
Therefore, the use of the Products in fields related to items (1) through (3) below is not intended whatsoever. Saginomiya shall be held harmless and be indemnified from any and all damages incurred by use of the Products under item (3).

- (1) In any field related to nuclear power and radiation;
- (2) In any field related to space or seafloor equipment;
- (3) In any equipment or device requiring a high degree of reliance on such equipment or device with respect to which it is reasonably foreseeable that failure or malfunction of the equipment or device would either directly or indirectly cause serious damage to human life, health or property;

Also, when using the Products under the fields related to items (1) through (9) below (except for item (3), in relation to which the Products must never be used), please be sure to notify our Saginomiya's contact desk in charge of sales and obtain Saginomiya's prior written approval for such use. Saginomiya shall be held harmless and be indemnified from any and all damages incurred by use of the Products in relation to these fields if the Customers do not notify Saginomiya's contact desk and obtain Saginomiya's prior written approval.

- (4) Transportation device (railroad, aviation, ship or vessel, vehicle equipment, etc.);
- (5) Disaster-prevention or crime-prevention device;
- (6) Facility or application directly related to medical equipment, burning appliances, electro thermal equipment, amusement rides and devices, facilities/applications associated directly with billing, or device using flammable fluid;
- (7) Equipment requiring high reliance on supply systems such as electricity, gas, water, etc., in large-scale communication system, or in transportation or air traffic control system;
- (8) Facilities that are to comply with regulations of governmental / public agencies or specific industries or
- (9) Other machineries or equipment equivalent to those set forth in the above items (4) to (8) which require for high reliability and safety.

It is recommended to replace the Products within 5 to 10 years of delivery if no other duration of use is provided in the applicable specifications or instruction manual because the conditions and environment of use also have an impact on the Products.

● SCOPE OF WARRANTY

SAGINOMIYA WILL PROVIDE THE CUSTOMERS WITH REPLACEMENT OR REPAIRED THE PRODUCTS DELIVERED, FREE OF COST, ONLY WITHIN ONE YEAR OF DELIVERY TO THE CUSTOMER, IF FAILURE OCCURS IN THE CUSTOMERS' EQUIPMENT USING THE PRODUCTS DUE TO A DEFECT OF THE PRODUCTS; PROVIDED, HOWEVER, THAT IN ANY EVENT THE RATIO OF THE AMOUNT THAT SAGINOMIYA BEARS FOR THE DAMAGES INCURRED BY THE FAILURE OF THE PRODUCTS OR CUSTOMERS' EQUIPMENT SHALL NOT EXCEED THE PRICE OF THE PRODUCTS WE DELIVERED. IN ADDITION, SAGINOMIYA SHALL BE HELD HARMLESS AND BE INDEMNIFIED FROM ANY AND ALL DAMAGES INCURRED WHEN THE FAILURE OF THE CUSTOMERS' EQUIPMENT OCCURRED DUE TO ANY CAUSE SET FORTH BELOW.

- (1) WHEN CAUSED BY INAPPROPRIATE HANDLING OR USE OF THE PRODUCTS BY THE CUSTOMERS (SUCH AS NOT COMPLYING WITH THE CONDITIONS, ENVIRONMENTAL SPECIFICATIONS OR CAUTIONS INDICATED IN ANY APPLICABLE CATALOGUE, SPECIFICATIONS, INSTRUCTION MANUAL, ETC.);
- (2) WHEN FAILURE OCCURRED DUE TO ANY REASON OTHER THAN THE PRODUCTS;
- (3) WHEN CAUSED BY MODIFICATION OR REPAIR OF THE PRODUCTS MADE BY ANYONE OTHER THAN SAGINOMIYA OR DESIGNEE OF SAGINOMIYA;
- (4) WHEN CAUSED BY THE USE OF THE PRODUCTS IN VIOLATION OF THE ABOVE "RESTRICTIONS OF USE" OR "CONFIRMATION OF OPERATION";
- (5) WHEN SUCH FAILURE WAS NOT REASONABLY FORESEEABLE AT THE TIME OF SAGINOMIYA'S SHIPMENT; OR
- (6) BY ANY OTHER CAUSE NOT ATTRIBUTABLE TO SAGINOMIYA, SUCH AS AN ACT OF GOD, DISASTER, OR ACT OF ANY THIRD PARTY.

PLEASE NOTE THAT THE CUSTOMERS WILL NOT BE ENTITLED TO ANY OF THE ABOVE WARRANTY IF THE CUSTOMERS PURCHASED THE PRODUCTS FROM INTERNET AUCTION, ETC.

SAGINOMIYA
SEISAKUSHO, INC.
Revision1 (2014.12) 2014.10

⚠ WARNING

Failure to read and follow all instruction carefully before installing or operation the product could cause personal injury and/or property damage.

Specifications are subject to change without notice.



Headquarters



Sayama Plant



Tokorozawa Plant

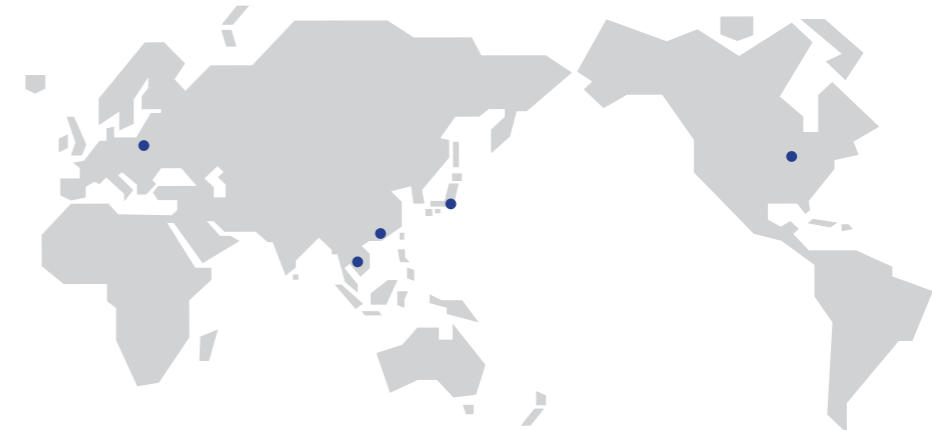


Shinjyuku Garden Tower 22F
8-2, Okubo 3-chome, Shinjyuku-ku
Tokyo, 169-0072 Japan



Yonezawa Plant

OVERSEAS NETWORK



SAGINOMIYA EUROPE Sp. z o.o. (Poland)
Aleje Jerozolimskie 212 02-486
Warsaw, Poland
Sales



FOSHAN HUALU AUTOMATIC CONTROLS LIMITED (China)
No.59&61, Wenhua Nan Road, Chancheng District
Foshan, Guangdong, China
Sales & Manufacturing



SAGINOMIYA AMERICA, INC. (USA)
655 Metro Place South suite 220, Dublin
Ohio 43017, U.S.A.
Sales



Danfoss Saginomiya Sp. z o.o. (Poland)
ul. Chrzanowska 5, 05-825 Grodzisk
Mazowiecki, Poland
Manufacturing



Saginomiya (Thailand) Co., Ltd. (Thailand)
159/38 Serm-mit Tower, Room No.2401, 24th floor
Sukhumvit 21 Road, Klongtoey Nua Sub-district
Wattana District, Bangkok 10110, Thailand
Sales & Manufacturing

**NOTES FOR SAFETY**

Failure to read and follow all instruction carefully before installing or operating the product could cause personal injury and/or property damage.

Specifications are subject to change without notice.

SAGINOMIYA
SEISAKUSHO,INC.

<Japan, Korea, Oceania>

E-mail : inter@saginomiya.co.jp

Tel : +81-3-6205-9120 Fax : +81-3-6205-9122

URL : <http://www.saginomiya-global.com/en/>

<Asia>

Saginomiya (Thailand) Co., Ltd. E-mail : info@saginomiya.co.th
Tel : +66-2260-8364 Fax : +66-2260-8366

<Europe, Middle East, Africa>

SAGINOMIYA EUROPE Sp. z o.o. E-mail : info@saginomiya.eu
Tel : +48-22-101-30-00 Fax : +48-22-101-30-01

<North America, Latin America>

SAGINOMIYA AMERICA, INC. E-mail : Sales@saginomiya-am.com
Tel : +1-614-766-7390 Fax : +1-614-766-7391

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