SAGInoMIYA

ELECTRONIC EXPANSION VALVES
SERIES

SAGINOMIYA PRODUCT CATALOG

- Electronic Expansion Valves
- Motor Operated Valves
- Changeover Valves
- Controllers

Contents

ELECTRONIC EXPANSION VALVES / MOTOR OPERATED VALVES / CHANGEOVER VALVES

High Volume OEM Item ⇒ OEM

Type		Applications	Max.working pressure (MPa)	Connection	Port size ϕ (mm)	Cv value	＊1 Capacity (U.S.R.T.) {kW}	Rated voltage	Page
PKV	ELECTRONIC EXPANSION VALVES FOR LOW TEMPERATURES Can operate down to -50℃	・Freezers ・Cold storage ・Display cases, etc.	4.2	Flare	1.4 to 3.0	0.05 to 0.27	R448A : 1.5 to 8.1 {5.3 to 28.5} R407H : 1.7 to 9.3 {6.1 to 32.9}	12V.DC 24V.DC	7
GKV	ELECTRONIC EXPANSION VALVES FOR ULTRA LOW TEMPERATURES Can operate down to -70℃	・Freezers ・Cold storage ・Display cases, etc.	4.2	Flare	1.8 to 6.0	0.10 to 0.54	＊2 R23 : 3.5 to 19.0 {12.4 to 66.7} R448A : 3.0 to 16.2 {10.6 to 57.0}	12V.DC 24V.DC	9
VKV	MOTOR OPERATED VALVES Hot gas compatible	・Room air conditioners ・Packaged air conditioners ・VRF ・Chillers, etc.	4.3 (R32) 4.2 (Except R32)	Solder	1.4 to 4.0	0.05 to 0.45	R448A : 1.5 to 13.5 {5.3 to 47.5} R407H : 1.7 to 15.6 {6.1 to 54.8}	12V.DC 24V.DC	11
AKV OEM	MOTOR OPERATED VALVES Hot gas compatible	・Chillers ・Packaged air conditioners, etc.	4.2	Solder	5.5 to 6.5	0.81 to 0.96	R448 : 23.9 to 28.4 {84.2 to 99.8} R407H : 28.0 to 33.2 {98.6 to 116.9}	12V.DC	15
MKV	MOTOR OPERATED VALVES FOR LARGE CAPACITY Hot gas compatible	・Chillers ・Packaged air conditioners, etc.	3.3	Solder	16.0	2.82	R134a : 64.6 {227}	12V.DC	17
UKV OEM	ELECTRONIC EXPANSION VALVES Compact and lightweight Wide ranging lineup	・Room air conditioners ・Packaged air conditioners ・VRF, etc.	4.3	Solder	0.8 to 6.1	0.015 to 1.15	R32 : 0.8 to 58.3 {2.7 to 205.0} R410A : 0.5 to 39.6 {1.8 to 139.2}	12V.DC	19
LKV OEM	ELECTRONIC EXPANSION VALVES Quiet and low valve leakage	・Packaged air conditioners ・VRF, etc.	4.3	Solder	1.3 to 3.2	0.055 to 0.32	R32 : 2.8 to 16.2 {9.8 to 57.0} R410A : 1.9 to 11.0 {6.7 to 38.7}	12V.DC	23

＊1 CT 38℃ / ET 5℃ / SC 0K / SH 0K　＊2 CT -10℃ / ET -50℃ / SC 0K / SH 0K

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ELECTRONIC EXPANSION VALVES / MOTOR OPERATED VALVES / CHANGEOVER VALVES

High Volume OEM Item ⇒ OEM

Type	Applications	Max.working pressure (MPa)	Connection	Port size ϕ (mm)	Cv value	＊1 Capacity (U.S.R.T.) {kW}	Rated voltage	Page
UKV-J OEM  MOTOR OPERATED VALVES FOR CO_2 REFRIGERANT Compact and lightweight	・CO_2 Heat pump water heaters ・CO_2 Display cases, etc.	15.0	Solder	0.8 to 1.4	0.015 to 0.067	＊3 R744 : 0.8 to 3.5 {2.8 to 12.3} ＊4 R744 : 1.0 to 4.6 {3.7 to 16.3}	12V.DC 24V.DC	25
JKV OEM  MOTOR OPERATED VALVES FOR CO_2 REFRIGERANT Compact and lightweight	・CO_2 Heat pump water heaters ・CO_2 Display cases, etc.	15.0	Solder	2.0 to 4.0	0.12 to 0.49	＊3 R744 : 6.2 to 25.6 {21.9 to 90.1} ＊4 R744 : 8.3 to 34.0 {29.0 to 119.5}	12V.DC 24V.DC	25
UKV-F OEM  ELECTRONIC EXPANSION VALVES Internal check valve function	・Residential air conditioners, etc.	4.2	Solder	1.9 to 3.2	0.10 to 0.22	R32 : 5.1 to 11.1 {17.8 to 39.2} R410A : 3.4 to 7.6 {12.1 to 26.6}	12V.DC	29
RKV OEM  CHANGEOVER VALVES ELECTRONIC EXPANSION VALVES Can regulate multiple flows	・Household refrigerators ・Commercial refrigerators / freezers ・Vending machines, etc.	3.0	Solder	0.6 to 1.0	—	—	12V.DC	31

＊1 CT 38℃ / ET 5℃ / SC 0K / SH 0K　＊3 CT -5℃ / ET -25℃ / SC 0K / SH 0K
＊4 Gas cooler inlet temp. 70℃ / Gas cooler outlet temp. 22℃ / ET 6℃ / SH 0K

CONTROLLERS

Type	Applications	＊5 Compatible EEV types	Power supply voltage	Ambient temperature	Page
YNE  EEV CONTROLLERS EEV controllers for PKV/GKV type Can control multiple EEVs by connecting several YNEs	・Cold storage ・Food processing plants ・Environment test chambers, etc.	PKV GKV	85 to 264V.AC 50/60Hz	0 to 50℃	35
LNE  PULSE CONVERTERS Converts current input to driving pulse output	・Food processing plants ・Constant temperature / humidity chambers ・Environment test chambers ・Semiconductor chillers, etc.	PKV VKV AKV MKV etc.	24V.AC 50/60Hz or 24V.DC	-10 to 50℃	39

＊5 Please contact us for details.

REFERENCE INFORMATION

TERMINOLOGIES RELATED TO REFRIGERATION

- Pressure

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

- 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 kW = 102 kgf·m/sec = 860 kcal/h

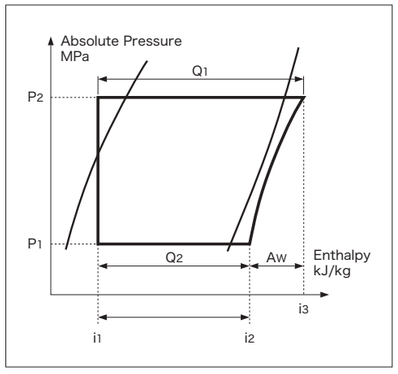
- Cooling Capacity

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

- Coefficient of Performance (COP)

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

ε : COP of a Refrigeration equipment
A_W : Heat Quantity Equivalent to Compression Work (kW)
Q_1 : Heat Quantity Discharged at the Condenser (kW)
Q_2 : Cooling Capacity (Load) (kW)
T_1 : Condensing Temperature (°C)
T_2 : Evaporating Temperature (°C)



- Cooling Effect (Cooling Power)

$q = i_2 - i_1$

q : Cooling Effect (kJ/kg)
i_1 : Enthalpy of liquid immediately before expansion valve (kJ/kg)
i_2 : 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)
t_1 : Inlet Water Temperature (°C)
t_2 : 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 :

°C	⬇	°F
-15.0	5	41.0

5°C ➡ 41.0°F
-15.0°C ⬅ 5°F

Temperature conversion formula :
°C = 5/9 (°F − 32)
°F = 9/5 × °C + 32

°C	⬇	°F
-101.1	-150	-238.0
-95.6	-140	-220.0
-90.0	-130	-202.0
-84.4	-120	-184.0
-78.9	-110	-166.0
-73.3	-100	-148.0
-67.8	-90	-130.0
-62.2	-80	-112.0
-56.7	-70	-94.0
-51.1	-60	-76.0
-45.6	-50	-58.0
-45.0	-49	-56.2
-44.4	-48	-54.4
-43.8	-47	-52.6
-43.3	-46	-50.8
-42.8	-45	-49.0
-42.2	-44	-47.2
-41.7	-43	-45.4
-41.1	-42	-43.6
-40.6	-41	-41.8
-40.0	-40	-40.0
-39.4	-39	-38.2
-38.9	-38	-36.4
-38.3	-37	-34.6
-37.8	-36	-32.8

°C	⬇	°F
-37.2	-35	-31.0
-36.7	-34	-29.2
-36.1	-33	-27.4
-35.6	-32	-25.6
-35.0	-31	-23.8
-34.4	-30	-22.0
-33.9	-29	-20.2
-33.3	-28	-18.4
-32.8	-27	-16.6
-32.2	-26	-14.8
-31.7	-25	-13.0
-31.1	-24	-11.2
-30.6	-23	-9.4
-30.0	-22	-7.6
-29.4	-21	-5.8
-28.9	-20	-4.0
-28.3	-19	-2.2
-27.8	-18	-0.4
-27.2	-17	1.4
-26.7	-16	3.2
-26.1	-15	5.0
-25.6	-14	6.8
-25.0	-13	8.6
-24.4	-12	10.4
-23.9	-11	12.2

°C	⬇	°F
-23.3	-10	14.0
-22.8	-9	15.8
-22.2	-8	17.6
-21.7	-7	19.4
-21.1	-6	21.2
-20.6	-5	23.0
-20.0	-4	24.8
-19.4	-3	26.6
-18.9	-2	28.4
-18.3	-1	30.2
-17.8	0	32.0
-17.2	1	33.8
-16.7	2	35.6
-16.1	3	37.4
-15.6	4	39.2
-15.0	5	41.0
-14.4	6	42.8
-13.9	7	44.6
-13.3	8	46.4
-12.8	9	48.2
-12.2	10	50.0
-11.7	11	51.8
-11.1	12	53.6
-10.6	13	55.4
-10.0	14	57.2

°C	⬇	°F
-9.4	15	59.0
-8.9	16	60.8
-8.3	17	62.6
-7.8	18	64.4
-7.2	19	66.2
-6.7	20	68.0
-6.1	21	69.8
-5.6	22	71.6
-5.0	23	73.4
-4.4	24	75.2
-3.9	25	77.0
-3.3	26	78.8
-2.8	27	80.6
-2.2	28	82.4
-1.7	29	84.2
-1.1	30	86.0
-0.6	31	87.8
0.0	32	89.6
0.6	33	91.4
1.1	34	93.2
1.7	35	95.0
2.2	36	96.8
2.8	37	98.6
3.3	38	100.4
3.9	39	102.2

°C	⬇	°F
4.4	40	104.0
5.0	41	105.8
5.6	42	107.6
6.1	43	109.4
6.7	44	111.2
7.2	45	113.0
7.8	46	114.8
8.3	47	116.6
8.9	48	118.4
9.4	49	120.2
10.0	50	122.0
15.6	60	140.0
21.1	70	158.0
26.7	80	176.0
32.2	90	194.0
37.8	100	212.0
43.3	110	230.0
48.9	120	248.0
54.4	130	266.0
60.0	140	284.0
65.6	150	302.0
71.1	160	320.0
76.7	170	338.0
82.2	180	356.0
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
0.0000000	0.0	0.00000
0.0098067	0.1	1.01972
0.0196113	0.2	2.03944
0.0294200	0.3	3.05916
0.0392266	0.4	4.07888
0.0490333	0.5	5.09860
0.0588399	0.6	6.11832
0.0686466	0.7	7.13804
0.0784532	0.8	8.15776
0.0882599	0.9	9.17748

MPa	⬇	kgf/cm²
0.0980665	1	10.1972
0.1961330	2	20.3944
0.2941995	3	30.5916
0.3922660	4	40.7888
0.4903325	5	50.9860
0.5883990	6	61.1832
0.6864655	7	71.3804
0.7845320	8	81.5776
0.8825985	9	91.7748
0.9806550	10	101.972

MPa	⬇	kgf/cm²
1.961330	20	203.944
2.941995	30	305.916
3.922660	40	407.888
4.903325	50	509.860
5.883990	60	611.832
6.864655	70	713.804
7.845320	80	815.776
8.825985	90	917.748
9.806650	100	1019.72

4) Pressure conversion table (MPa ⟷ psi)

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

MPa	⬇	psi
0.000000	0	0.00000
0.000690	0.1	14.5052
0.001379	0.2	29.0104
0.002069	0.3	43.5156
0.002758	0.4	58.0208
0.003448	0.5	72.5260
0.004137	0.6	87.0312
0.004827	0.7	101.536
0.005516	0.8	116.042
0.006206	0.9	130.547

MPa	⬇	psi
0.006895	1	145.052
0.013790	2	290.104
0.020685	3	435.156
0.027580	4	580.208
0.034475	5	725.260
0.041370	6	870.312
0.048265	7	1015.36
0.055160	8	1160.42
0.062055	9	1305.47
0.068950	10	1450.52

MPa	⬇	psi
0.137900	20	2901.04
0.206850	30	4351.56
0.275800	40	5802.08
0.344750	50	7252.60
0.413700	60	8703.12
0.482650	70	10153.6
0.551600	80	11604.2
0.620550	90	13054.7
0.689500	100	14505.2

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

Example : 1 kW ⟷ 860 kcal/h

kW	⬇	1000 kcal/h
0.166	0.1	0.086
0.232	0.2	0.172
0.348	0.3	0.258
0.465	0.4	0.344
0.581	0.5	0.430
0.697	0.6	0.516
0.813	0.7	0.602
0.930	0.8	0.688
1.046	0.9	0.774

kW	⬇	1000 kcal/h
1.162	1	0.86
2.325	2	1.72
3.488	3	2.58
4.651	4	3.44
5.813	5	4.33
6.976	6	5.16
8.139	7	6.02
9.302	8	6.88
10.46	9	7.74

kW	⬇	1000 kcal/h
11.62	10	8.6
23.25	20	17.2
34.88	30	25.8
46.51	40	34.4
58.13	50	43.3
69.76	60	51.6
81.39	70	60.2
93.02	80	68.8
104.6	90	77.4

kW	⬇	1000 kcal/h
116.2	100	86
232.5	200	172
348.8	300	258
465.1	400	344
581.3	500	433
697.6	600	516
813.9	700	602
930.2	800	688
1046	900	774

6) Length conversion table (in ⟷ mm)

in	mm
1/8	3.18
1/4	6.35
3/8	9.53
1/2	12.70
5/8	15.88
3/4	19.05
7/8	22.23
1	25.40
1/16	1.59
3/16	4.76
5/16	7.94
7/16	11.11
9/16	14.29
11/16	17.46
13/16	20.64
15/16	23.81

in	mm
1/32	0.79
3/32	2.38
5/32	3.97
7/32	5.56
9/32	7.14
11/32	8.73
13/32	10.32
15/32	11.91
17/32	13.49
19/32	15.08
21/32	16.67
23/32	18.26
25/32	19.84
27/32	21.43
29/32	23.02
31/32	24.61

in	mm
1/64	0.40
3/64	1.19
5/64	1.98
7/64	2.78
9/64	3.57
11/64	4.39
13/64	5.16
15/64	5.95
17/64	6.75
19/64	7.54
21/64	8.33
23/64	9.13
25/64	9.92
27/64	10.72
29/64	11.51
31/64	12.30

in	mm
33/64	13.10
35/64	13.89
37/64	14.68
39/64	15.48
41/64	16.72
43/64	17.07
45/64	17.86
47/64	18.65
49/64	19.45
51/64	20.24
53/64	21.04
55/64	21.83
57/64	22.62
59/64	23.42
61/64	24.21
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)
-0.1013	0.0000	76	0.0000
-0.0987	0.0027	74	0.0272
-0.0960	0.0053	72	0.0544
-0.0933	0.0080	70	0.0816
-0.0907	0.0107	68	0.1088
-0.0880	0.0133	66	0.1360
-0.0853	0.0160	64	0.1631
-0.0827	0.0187	62	0.1903
-0.0800	0.0213	60	0.2175
-0.0773	0.0240	58	0.2447
-0.0747	0.0267	56	0.2719
-0.0720	0.0293	54	0.2991
-0.0693	0.0320	52	0.3263
-0.0667	0.0347	50	0.3535
-0.0640	0.0373	48	0.3806

MPa	MPa (abs)	cmHg V	kgf/cm² (abs)
-0.0613	0.0400	46	0.4078
-0.0587	0.0427	44	0.4350
-0.0560	0.0453	42	0.4622
-0.0533	0.0480	40	0.4894
-0.0507	0.0507	38	0.5166
-0.0480	0.0533	36	0.5438
-0.0453	0.0560	34	0.5710
-0.0427	0.0587	32	0.5981
-0.0400	0.0613	30	0.6254
-0.0373	0.0640	28	0.6526
-0.0347	0.0667	26	0.6798
-0.0320	0.0693	24	0.7069
-0.0293	0.0720	22	0.7341
-0.0267	0.0747	20	0.7613
-0.0240	0.0773	18	0.7885

MPa	MPa (abs)	cmHg V	kgf/cm² (abs)
-0.0213	0.0800	16	0.8157
-0.0187	0.0827	14	0.8429
-0.0160	0.0853	12	0.8700
-0.0133	0.0880	10	0.8972
-0.0107	0.0907	8	0.9245
-0.0080	0.0933	6	0.9517
-0.0053	0.0960	4	0.9788
-0.0027	0.0987	2	1.0060
0	0.1013	0	1.0332

OVERVIEW OF ELECTRONIC EXPANSION VALVES

TERMS AND DEFINITIONS

- **Catalog No.** — On standard products, specify the Catalog No. only.
- **Port Size** — The inner diameter of the valve.
- **Capacity** — Nominal capacity under standard operating conditions.
- **Connection (Copper Tube Solder)** — ODF (Outside Diameter Female) :
"Connection size" is the outside diameter of the piping to be connected.
Insert the piping into the connection tube of the valve and braze connection.

  ODM (Outside Diameter Male) :
"Connection size" is the outside diameter of the valve connection tube.
Cover the pipe, such as an expanded pipe, with the connection tube of the valve and braze connection.

  OD (Outer Diameter) : Outer diameter of the connection.

  ID (Inner Diameter) : Inner diameter of the connection.
- **Operating Pressure Differential (O.P.D)** — The pressure difference between the inlet and outlet sides of the valve is within this range, the valve will open and close reliably.
- **Max. Working Pressure** — The maximum usable pressure at which the valve will function without any problems under normal operating conditions.
- **Fluid Temperature** — The temperature range of fluid that can flow inside the valve.
- **Energizing Ratio (Duty Cycle)** — The proportion of energized time in a cycle, where one cycle is the sum of the energized and the unenergized time.
- **Pressure Indication** — Gauge pressure
- **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.)
- **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.)
- **Subcooling (SC)** — The degree of temperature reduction, without changes of pressure, against the pressure equivalent to the refrigerant liquid temperature.
It is usually necessary to consider subcooling of approx. 1 to 3℃.
(Difference between the temperature at the expansion valve inlet and the temperature equivalent to the refrigerant pressure.)
- **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 evaporator outlet and temperature equivalent to the evaporating pressure.)

ELECTRONIC EXPANSION VALVES FOR LOW TEMPERATURES / Type PKV

Type PKV

Scan here
for the capacity chart. ⇒

URL : https://saginomiya.co.jp/en/auto/pdf/pkv_capacity.pdf

FEATURES

- Can operate down to -50℃.
- Compatible with type YNE EEV controllers (Pages 35 to 38).
- Can be used together with liquid feed solenoid valves.

APPLICATIONS

- Freezers
- Cold storage
- Display cases, etc.

COMMON SPECIFICATIONS

- Max. working pressure : 4.2 MPa
- Fluid temperature : -50 to 60℃
  (It should be 50% or less on energizing ratio.)
- Ambient temperature : -50 to 60℃
  (It should be 50% or less on energizing ratio.)
- Ambient humidity : 95%RH or less
- Flow direction : B → A (Single direction)
- Excitation method : 1-2 phase, Uni-polar

DESCRIPTION OF CATALOG NO.

$$\frac{\text{PKV}}{\text{Ⅰ}} - \frac{14}{\text{Ⅱ}}\ \frac{\text{B}}{\text{Ⅲ}}\ \frac{\text{S}}{\text{Ⅳ}}$$

Ⅰ	Type
Ⅱ	Port size
Ⅲ	Connection type
Ⅳ	Coil style

TYPE NUMBER SELECTION

Catalog No.	＊1 Refrigerant	Port size ϕ (mm)	Cv value	Connection (Flare) Side B	Connection (Flare) Side A	Operation range pulse	Airtight test pressure (MPa)	＊2 M.O.P.D. (MPa)	Strainer	＊3 Wt. (kg)
PKV-14BS	R134a R404A R410A R448A R449A R407H R463A-J	1.4	0.05	3/8"	3/8"	0 to 480	4.2	3.5	Inlet-side 100 mesh	0.5
PKV-18BS		1.8	0.10							
PKV-24BS		2.4	0.17							
PKV-30BS		3.0	0.27		1/2"			2.5		0.7

＊1 For other refrigerants, please contact us.
＊2 Please be aware of O.P.D when using with high-pressure refrigerant such as R410A.
＊3 Includes coil.

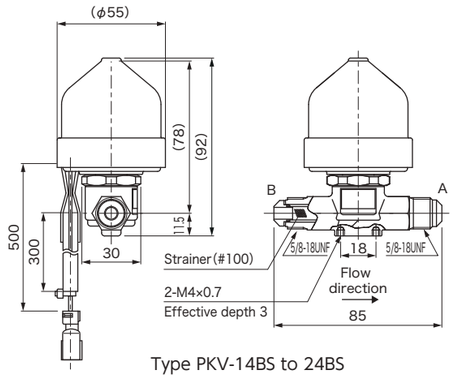
Catalog No.	Capacity (U.S.R.T.) {kW} CT 38℃ / ET 5℃ / SC 0K / SH 0K						
	R134a	R404A	R410A	R448A	R449A	R407H	R463A-J
PKV-14BS	1.1 {4.0}	1.0 {3.6}	1.7 {6.1}	1.5 {5.3}	1.4 {5.1}	1.7 {6.1}	1.8 {6.5}
PKV-18BS	2.3 {8.1}	2.1 {7.3}	3.4 {12.1}	3.0 {10.6}	2.9 {10.2}	3.5 {12.2}	3.7 {13.0}
PKV-24BS	3.9 {13.7}	3.5 {12.3}	5.9 {20.6}	5.1 {17.9}	4.9 {17.3}	5.9 {20.7}	6.3 {22.1}
PKV-30BS	6.2 {21.7}	5.6 {19.6}	9.3 {32.7}	8.1 {28.5}	7.8 {27.5}	9.3 {32.9}	10.0 {35.1}

COIL SPECIFICATIONS

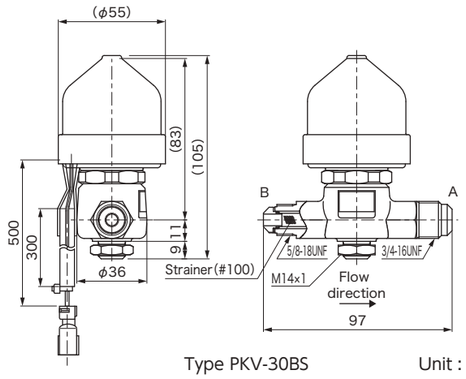
Catalog No. (Valve body)	＊1 Rated voltage	Current	Power consumption	＊2 Insulation class
PKV-14BS to 30BS	12V.DC ± 10%	0.26A / Phase (20℃)	Approx. 6.5W	Class E molded

＊1 24V.DC coil is also available. Please contact us for details.
＊2 Compliant with IEC60085, 60335-2-40.

DIMENSIONS



Type PKV-14BS to 24BS

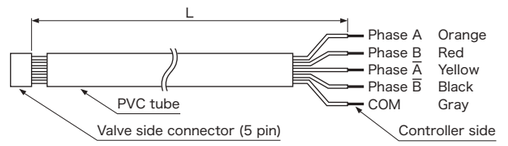


Type PKV-30BS

Unit : mm

OPTIONAL PARTS

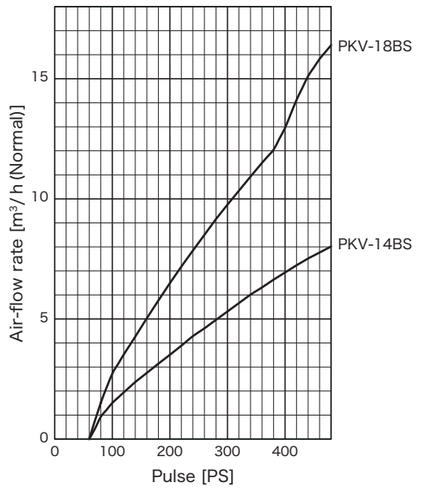
- Relay cable



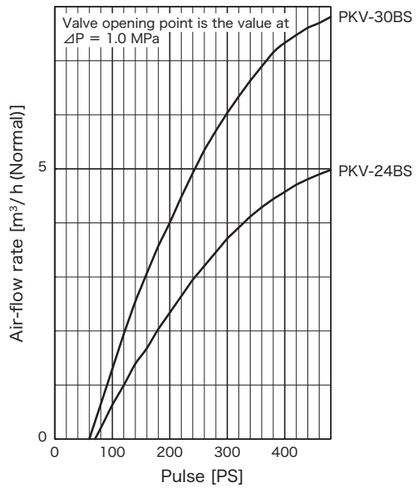
Catalog No.	L (m)
PKV-LK02N	2
PKV-LK05N	5
PKV-LK10N	10

FLOW CHARACTERISTICS

Flow direction : B→A ⊿P = 1.0 MPa



Flow direction : B→A ⊿P = 0.1 MPa



RELATED PRODUCT

- EEV controllers Type YNE (Pages 35 to 38)
- Pulse converters Type LNE (Pages 39 to 40)

ELECTRONIC EXPANSION VALVES FOR ULTRA LOW TEMPERATURES / Type GKV

Type GKV

Scan here
for the capacity chart. ⇒

URL : https://saginomiya.co.jp/en/auto/pdf/gkv_capacity.pdf

FEATURES

- Can operate down to -70℃.
- Compatible with type YNE EEV controllers (Pages 35 to 38).
- Can be used together with liquid feed solenoid valves.

APPLICATIONS

- Freezers
- Cold storage
- Display cases, etc.

COMMON SPECIFICATIONS

- Max. working pressure : 4.2 MPa
- Fluid temperature : -70 to 60℃
  (It should be 50% or less on energizing ratio.)
- Ambient temperature : -70 to 60℃
  (It should be 50% or less on energizing ratio.)
- Ambient humidity : 95%RH or less
- Flow direction : B → A (Single direction)
- Excitation method : 1-2 phase, Uni-polar

DESCRIPTION OF CATALOG NO.

GKV – 18 B S

Ⅰ	Type
Ⅱ	Port size
Ⅲ	Connection type
Ⅳ	Coil style

TYPE NUMBER SELECTION

Catalog No.	＊1 Refrigerant	Port size ϕ (mm)	Cv value	Connection (Flare)		Operation range pulse	Airtight test pressure (MPa)	＊2 M.O.P.D. (MPa)	Strainer	＊3 Wt. (kg)
				Side B	Side A					
GKV-18BS	R23 R134a R404A R410A R448A R449A R407H R463A-J	1.8	0.10	3/8"	1/2"	0 to 480	4.2	3.5	Inlet-side 120 mesh	1.6
GKV-34BS		3.4	0.31					1.77		
GKV-60BS		6.0	0.54							

＊1 For other refrigerants, please contact us.
＊2 Please be aware of O.P.D when using with high-pressure refrigerant such as R410A.
＊3 Includes coil.

TYPE NUMBER SELECTION

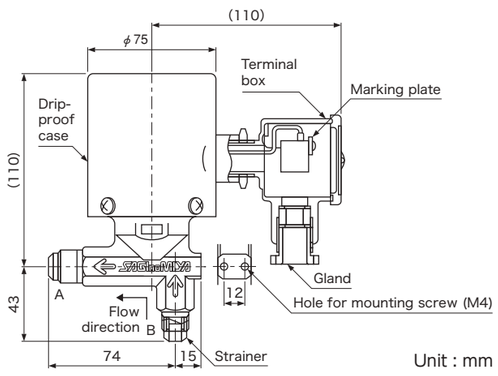
Catalog No.	Capacity (U.S.R.T.) {kW} CT 38℃ / ET 5℃ / SC 0K / SH 0K (＊ R23 : CT -10℃ / ET -50℃ / SC 0K / SH 0K)							
	R23＊	R134a	R404A	R410A	R448A	R449A	R407H	R463A-J
GKV-18BS	3.5 {12.4}	2.3 {8.1}	2.1 {7.3}	3.4 {12.1}	3.0 {10.6}	2.9 {10.2}	3.5 {12.2}	3.7 {13.0}
GKV-34BS	10.9 {38.3}	7.1 {25.0}	6.4 {22.5}	10.7 {37.5}	9.3 {32.7}	9.0 {31.5}	10.7 {37.7}	11.5 {40.3}
GKV-60BS	19.0 {66.7}	12.4 {43.5}	11.2 {39.2}	18.6 {65.4}	16.2 {57.0}	15.6 {54.9}	18.7 {65.7}	20.0 {70.2}

COIL SPECIFICATIONS

Catalog No. (Valve body)	＊1 Rated voltage	Current	Power consumption	＊2 Insulation class
GKV-18BS to 60BS	12V.DC ± 10%	0.26A / Phase (20℃)	Approx. 6.5W	Class E molded

＊1 24V.DC coil is also available. Please contact us for details.
＊2 Compliant with IEC60085, 60335-2-40.

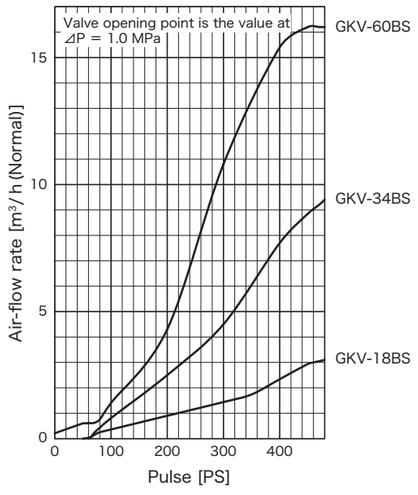
DIMENSIONS



Unit : mm

FLOW CHARACTERISTICS

Flow direction : B→A ⊿P = 0.1 MPa



RELATED PRODUCT

- EEV controllers Type YNE (Pages 35 to 38)

MOTOR OPERATED VALVES / Type VKV

Type VKV
(Drip-proof model)

Type VKV
(Hot gas compatible model)

Scan here
for the capacity table. ⇒

URL : https://saginomiya.co.jp/en/auto/pdf/vkv_capacity.pdf

FEATURES

- Suitable for a wide range of air conditioning and refrigeration systems.
- Hot gas compatible models are also available (Excluding VKV-40D).
- Standards : UL, cUL (Please contact us for details.)

APPLICATIONS

- Room air conditioners
- Packaged air conditioners
- VRF
- Chillers etc.

COMMON SPECIFICATIONS

- Max. working pressure : 4.3 MPa (R32)
  4.2 MPa (Except R32)
- Fluid temperature : -50 to 60℃
  (It should be 50% or less on energizing ratio.)
  -50 to 120℃
  (Hot gas compatible model. It should be 50% or less on energizing ratio.)
- Ambient temperature : -50 to 60℃
  (It should be 50% or less on energizing ratio.)
- Flow direction : Bi-flow
- Excitation method : 1-2 phase, Uni-polar

DESCRIPTION OF CATALOG NO.

$$\frac{VKV}{I} - \frac{18}{II}\,\frac{D}{III}\,\frac{S}{IV}\,\frac{\square\square}{V}$$

I	Type
II	Port size
III	Connection type
IV	Coil style
V	Serial number

TYPE NUMBER SELECTION

Catalog No.	＊1 Refrigerant	Port size ϕ (mm)	Cv value	Connection (Solder) (mm)		Operation range pulse	B → A M.O.P.D. (MPa)	A → B Valve closing pressure (MPa)	＊2 Wt. (kg)
				Side B	Side A				
VKV-14DS	R32 R134a R404A R407C R410A R448A R449A R407H	1.4	0.05	ϕ7.94 ODM	ϕ7.94 ODM	0 to 480	3.5	2.8 or less	0.27
VKV-18DS		1.8	0.10					2.4 or less	
VKV-25DS		2.5	0.18					2.2 or less	0.29
VKV-30DS		3.0	0.24				2.5	1.5 or less	
VKV-32DS		3.2	0.28	ϕ9.52 ODM	ϕ12.7 ODM			1.0 or less	0.31
VKV-40DS		4.0	0.45	ϕ12.7 ODM				0.3 or less	0.33

＊1 For other refrigerants, please contact us.
＊2 Includes a drip-proof type coil. (Lead wire length 500mm)

TYPE NUMBER SELECTION

＜Hot gas compatible model＞

Catalog No.	＊1 Refrigerant	Port size ϕ (mm)	Cv value	Connection (Solder) (mm)		Operation range pulse	B → A M.O.P.D. (MPa)	A → B Valve closing pressure (MPa)	＊2 Wt. (kg)
				Side B	Side A				
VKV-14DS167	R32 R134a R404A R407C R410A R448A R449A R407H	1.4	0.05	ϕ7.94 ODM	ϕ7.94 ODM	0 to 480	3.5	2.8 or less	0.27
VKV-18DS168		1.8	0.10					2.4 or less	
VKV-25DS169		2.5	0.18					2.2 or less	0.29
VKV-30DS170		3.0	0.24				2.5	1.5 or less	
VKV-32DS171		3.2	0.28	ϕ9.52 ODM	ϕ12.7 ODM			1.0 or less	0.31

＊1 For other refrigerants, please contact us.
＊2 Includes a coil. (Lead wire length 500mm)

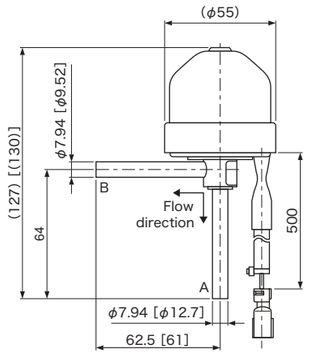
Catalog No.	Capacity (U.S.R.T.) {kW} CT 38℃ / ET 5℃ / SC 0K / SH 0K							
	R32	R134a	R404A	R407C	R410A	R448A	R449A	R407H
VKV-14DS VKV-14DS167	2.5 {8.9}	1.1 {4.0}	1.0 {3.6}	1.5 {5.3}	1.7 {6.1}	1.5 {5.3}	1.4 {5.1}	1.7 {6.1}
VKV-18DS VKV-18DS168	5.1 {17.8}	2.3 {8.1}	2.1 {7.3}	3.0 {10.6}	3.4 {12.1}	3.0 {10.6}	2.9 {10.2}	3.5 {12.2}
VKV-25DS VKV-25DS169	9.1 {32.1}	4.1 {14.5}	3.7 {13.1}	5.4 {19.0}	6.2 {21.8}	5.4 {19.0}	5.2 {18.3}	6.2 {21.9}
VKV-30DS VKV-30DS170	12.2 {42.8}	5.5 {19.3}	5.0 {17.4}	7.2 {25.4}	8.3 {29.1}	7.2 {25.3}	6.9 {24.4}	8.3 {29.2}
VKV-32DS VKV-32DS171	14.2 {49.9}	6.4 {22.5}	5.8 {20.3}	8.4 {29.6}	9.6 {33.9}	8.4 {29.6}	8.1 {28.5}	9.7 {34.1}
VKV-40DS	22.8 {80.2}	10.3 {36.2}	9.3 {32.7}	13.5 {47.6}	15.5 {54.5}	13.5 {47.5}	13.0 {45.8}	15.6 {54.8}

COIL SPECIFICATIONS

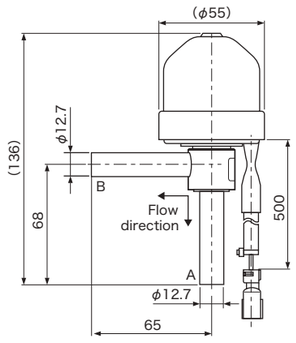
Catalog No. (Valve body)	＊1 Rated voltage	Current	Power consumption	＊2 Insulation class
VKV-14DS to 32DS VKV-14DS167 to 32DS171	12V.DC ± 10%	0.26A / Phase (20℃)	Approx. 3.1W	Class E molded
VKV-40DS		0.38A / Phase (20℃)	Approx. 4.6W	

＊1 24V.DC coil is also available. Please contact us for details.
＊2 Compliant with IEC60085, 60335-2-40.

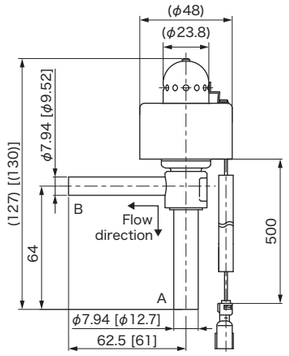
DIMENSIONS



Type VKV-14DS to 30DS [32DS]



Type VKV-40DS

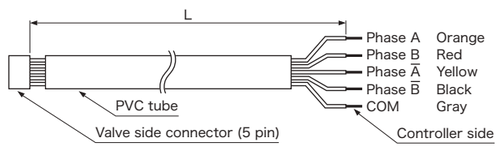


Type VKV-14DS167 to 30DS170 [32DS171]
(Hot gas compatible model)

Unit : mm

OPTIONAL PARTS

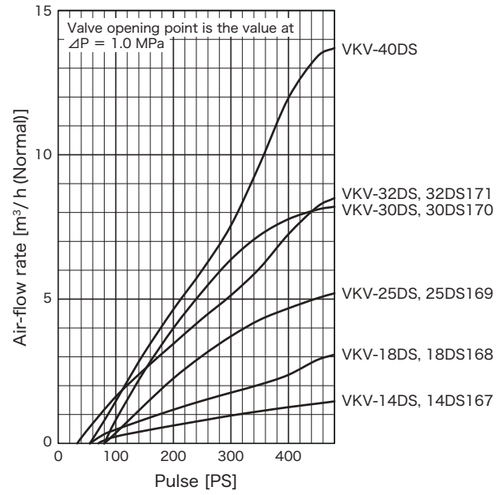
- Relay cable



Catalog No.	L (m)
PKV-LK02N	2
PKV-LK05N	5
PKV-LK10N	10

FLOW CHARACTERISTICS

Flow direction : B→A　　⊿P = 0.1 MPa



RELATED PRODUCT

- Pulse converters Type LNE (Pages 39 to 40)

MOTOR OPERATED VALVES / Type AKV

Type AKV

High Volume OEM Item

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

Coil sold separately

FEATURES

- Hot gas compatible.
- No hysteresis when opening or closing the valve.
- Energy-saving design (No holding power required).
- Bi-flow operation.
- Standards : UL, cUL (Please contact us for details.)

APPLICATIONS

- Chillers
- Packaged air conditioners, etc.

COMMON SPECIFICATIONS

- Max. working pressure : 4.2 MPa
- Fluid temperature : -30 to 120℃
  (It should be 50% or less on energizing ratio.)
- Ambient temperature : -30 to 60℃
  (It should be 50% or less on energizing ratio.)
- Flow direction : Bi-flow
- Excitation method : 1-2 phase, Uni-polar

DESCRIPTION OF CATALOG NO.

AKV – 55 D □□

(Ⅰ) (Ⅱ Ⅲ Ⅳ)

Ⅰ	Type
Ⅱ	Port size
Ⅲ	Connection type
Ⅳ	Serial number

＊ Coil is not included with the valve body.
Please purchase it separately.

TYPE NUMBER SELECTION

Catalog No.	＊1 Refrigerant	Port size ϕ (mm)	Cv value	＊2 Connection (Solder) (mm)	Operation range pulse	B → A M.O.P.D. (MPa)	A → B Valve closing pressure (MPa)	＊3 Wt. (kg)
AKV-55D	R134a R404A R407C R410A R448A R449A R407H R463A-J	5.5	0.81	ϕ 15.88 ODM	0 to 480	2.3	0.5 or less	0.42
AKV-65D		6.5	0.96					

＊1 For other refrigerants, please contact us.
＊2 Connection A and B are the same size.
＊3 Valve only. (without coil)

TYPE NUMBER SELECTION

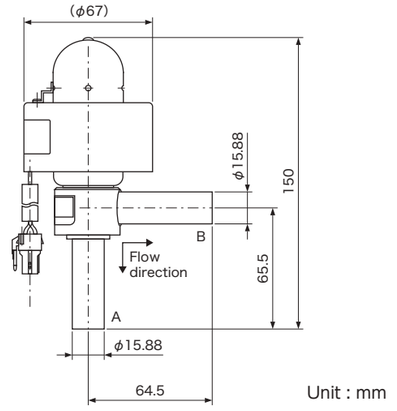
Catalog No.	Capacity (U.S.R.T.) {kW} CT 38℃ / ET 5℃ / SC 0K / SH 0K							
	R134a	R404A	R407C	R410A	R448A	R449A	R407H	R463A-J
AKV-55D	18.5 {65.2}	16.7 {58.8}	25.3 {88.8}	27.9 {98.1}	23.9 {84.2}	23.4 {82.4}	28.0 {98.6}	29.7 {104.5}
AKV-65D	22.0 {77.3}	19.8 {69.7}	29.9 {105.2}	33.1 {116.2}	28.4 {99.8}	27.8 {97.6}	33.2 {116.9}	35.2 {123.9}

COIL SPECIFICATIONS

Catalog No. (Coil)	Rated voltage	Current	Power consumption	＊1 Insulation class	＊2 Wt. (kg)
AKV-MOZS□□□	12V.DC ± 10%	0.38A / Phase (20℃)	Approx. 9.5W	Class E molded	0.4

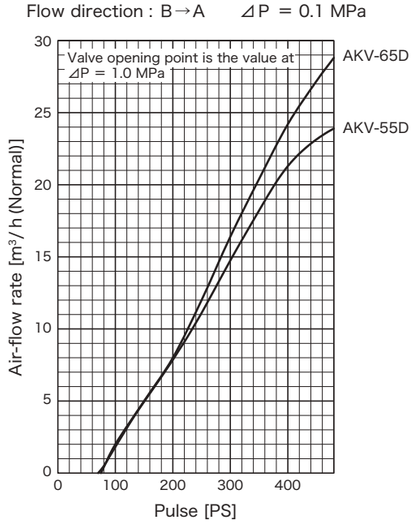
＊1 Compliant with IEC60085, 60335-2-40.
＊2 For lead wire length of 700mm.

DIMENSIONS



Unit : mm

FLOW CHARACTERISTICS



RELATED PRODUCT

- Pulse converters Type LNE (Pages 39 to 40)

MOTOR OPERATED VALVES FOR LARGE CAPACITY / Type MKV

Type MKV

FEATURES

- Optimal for regulating high flow.
- Hot gas compatible.
- Energy-saving design (No holding power required).

APPLICATIONS

- Chillers
- Packaged air conditioners, etc.

COMMON SPECIFICATIONS

- Max. working pressure : 3.3 MPa
- Fluid temperature : -30 to 120℃
  (It should be 50% or less on energizing ratio.)
- Ambient temperature : -30 to 60℃
  (It should be 50% or less on energizing ratio.)
- Flow direction : B → A (Single flow)
- Excitation method : 1-2 phase, Uni-polar

DESCRIPTION OF CATALOG NO.

MKV – 16 06 D S □□
I II III IV V VI

I	Type
II	Port size
III	Connection tube I.D.
IV	Connection type
V	Coil style
VI	Serial number

TYPE NUMBER SELECTION

Catalog No.	＊1 Refrigerant	Port size φ (mm)	Cv value	＊2 Capacity (U.S.R.T.) {kW}			Connection (Solder) (mm)		Operation range pulse	M.O.P.D. (MPa)	＊3 Wt. (kg)
				R134a	R404A	R407C	Side B	Side A			
MKV-1606DS	R134a R404A R407C	16.0	2.82	64.6 {227}	58.2 {205}	87.9 {309}	φ 19.05 ID	φ 12.7 ID	0 to 656	2.5	1.2

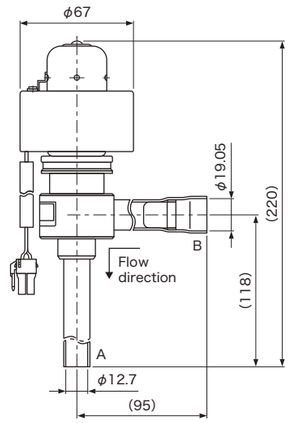
＊1 For other refrigerants, please contact us.
＊2 CT 38℃ / ET 5℃ / SC 0K / SH 0K
＊3 Includes a drip-proof type coil. (Lead wire length 700mm)

COIL SPECIFICATIONS

Catalog No. (Valve body)	Rated voltage	Current	Power consumption	＊1 Insulation class
MKV-1606DS	12V.DC ± 10%	0.38A / Phase (20℃)	Approx. 9.5W	Class E molded

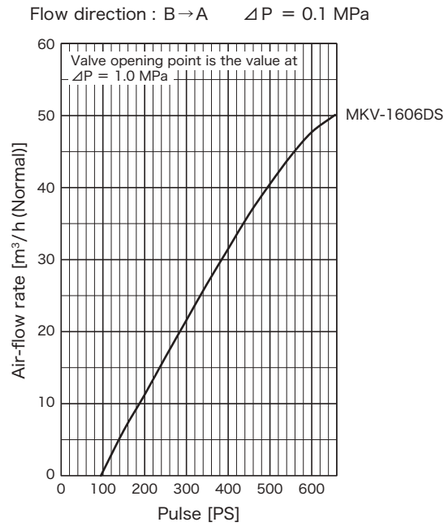
＊1 Compliant with IEC60085, 60335-2-40.

DIMENSIONS



Unit : mm

FLOW CHARACTERISTICS



RELATED PRODUCT

- Pulse converters Type LNE (Pages 39 to 40)

ELECTRONIC EXPANSION VALVES / Type UKV

Type UKV-S

Type UKV-S
(Bent fittings)

Type UKV-SH

High Volume OEM Item

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

Coil sold separately

FEATURES

- Compact and lightweight.
- Energy-saving design (No holding power required).
- Bi-flow operation for heat pump systems.
- Customized flow characteristics.
- Standards : UL, cUL, CQC (UKV-SH only), CE (ATEX)
  (Please contact us for details.)

APPLICATIONS

- Room air conditioners
- Packaged air conditioners
- VRF, etc.

COMMON SPECIFICATIONS

- Max. working pressure : 4.3 MPa
- Fluid temperature : -30 to 70℃
  (It should be 50% or less on energizing ratio.)
- Ambient temperature : -30 to 70℃
  (It should be 50% or less on energizing ratio.)
- Flow direction : Bi-flow
- Excitation method : 1-2 phase, Uni-polar

DESCRIPTION OF CATALOG NO.

UKV – S 18 D □□
I Ⅱ Ⅲ Ⅳ

Ⅰ	Type
Ⅱ	Port size
Ⅲ	Connection type
Ⅳ	Serial number

＊ Coil is not included with the valve body.
Please purchase it separately.

TYPE NUMBER SELECTION

Catalog No.	＊1 Refrigerant	Port size ϕ (mm)	Cv value	＊2 Connection (Solder) (mm)	＊3 Operation range pulse	B → A M.O.P.D. (MPa)	A → B Valve closing pressure (MPa)	＊4 Wt. (kg)
UKV-S08D	R32 R134a R404A R407C R410A R448A (UKV-S only) R449A (UKV-S only) R407H	0.8	0.015	ϕ 6.35 OD or ϕ 7.94 OD	0 to 480	3.5	3.5 or less	0.05
UKV-S10D		1.0	0.025					
UKV-S14D		1.4	0.056					
UKV-S18D		1.8	0.10					
UKV-S25D		2.5	0.19				3.0 or less	
UKV-S30D		3.0	0.26					
UKV-S32D		3.2	0.28					
UKV-S40D		4.0	0.38			2.6	0.7 or less	
UKV-SH40D		4.0	0.60	ϕ 9.52 OD or ϕ 12.7 OD or ϕ 12.8 ID		3.5	3.5 or less	0.07 (ϕ 9.52 OD)
UKV-SH45D		4.5	0.70					
UKV-SH50D		5.0	0.90				3.0 or less	0.08 (ϕ 12.7 OD ϕ 12.8 ID)
UKV-SH53D		5.3	1.00			3.0		
UKV-SH61D		6.1	1.15			2.3	2.0 or less	

＊1 For other refrigerants, please contact us.
＊2 Connection A and B are the same size.
＊3 Also operational with 0 to 500 pulse. Please contact us for details.
＊4 Valve only. (without coil)

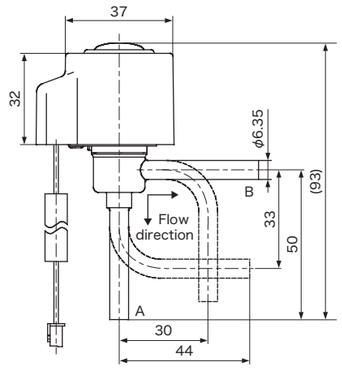
Catalog No.	Capacity (U.S.R.T.) {kW} CT 38℃ / ET 5℃ / SC 0K / SH 0K							
	R32	R134a	R404A	R407C	R410A	R448A	R449A	R407H
UKV-S08D	0.8 {2.7}	0.3 {1.2}	0.3 {1.1}	0.5 {1.6}	0.5 {1.8}	0.5 {1.6}	0.4 {1.5}	0.5 {1.8}
UKV-S10D	1.3 {4.5}	0.6 {2.0}	0.5 {1.8}	0.8 {2.6}	0.9 {3.0}	0.8 {2.6}	0.7 {2.5}	0.9 {3.0}
UKV-S14D	2.8 {10.0}	1.3 {4.5}	1.2 {4.1}	1.7 {5.9}	1.9 {6.8}	1.7 {5.9}	1.6 {5.7}	1.9 {6.8}
UKV-S18D	5.1 {17.8}	2.3 {8.1}	2.1 {7.3}	3.0 {10.6}	3.4 {12.1}	3.0 {10.6}	2.9 {10.2}	3.5 {12.2}
UKV-S25D	9.6 {33.9}	4.4 {15.3}	3.9 {13.8}	5.7 {20.1}	6.5 {23.0}	5.7 {20.1}	5.5 {19.3}	6.6 {23.1}
UKV-S30D	13.2 {46.3}	6.0 {20.9}	5.4 {18.9}	7.8 {27.5}	9.0 {31.5}	7.8 {27.5}	7.5 {26.4}	9.0 {31.7}
UKV-S32D	14.2 {49.9}	6.4 {22.5}	5.8 {20.3}	8.4 {29.6}	9.6 {33.9}	8.4 {29.6}	8.1 {28.5}	9.7 {34.1}
UKV-S40D	19.3 {67.7}	8.7 {30.6}	7.8 {27.6}	11.4 {40.2}	13.1 {46.0}	11.4 {40.1}	11.0 {38.6}	13.2 {46.3}
UKV-SH40D	30.4 {106.9}	13.7 {48.3}	12.4 {43.6}	18.0 {63.4}	20.7 {72.6}	—	—	20.8 {73.1}
UKV-SH45D	35.5 {124.8}	16.0 {56.4}	14.5 {50.8}	21.0 {74.0}	24.1 {84.8}	—	—	24.2 {85.2}
UKV-SH50D	45.6 {160.4}	20.6 {72.5}	18.6 {65.4}	27.1 {95.2}	31.0 {109.0}	—	—	31.2 {109.6}
UKV-SH53D	50.7 {178.2}	22.9 {80.5}	20.7 {72.6}	30.1 {105.7}	34.4 {121.1}	—	—	34.6 {121.8}
UKV-SH61D	58.3 {205.0}	26.3 {92.6}	23.7 {83.5}	34.6 {121.6}	39.6 {139.2}	—	—	39.8 {140.0}

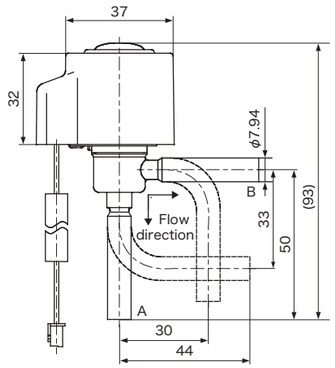
COIL SPECIFICATIONS

Catalog No. (Coil)	Rated voltage	Current	＊1 Insulation class	Enclosure	＊2 Wt. (kg)	Compatible catalog No. (Valve body)
KVC-1A□□□	12V.DC ± 10%	0.26A / Phase (20℃)	Class E molded	IP66	0.12	UKV-S08D to S40D
KVC-1H□□□		0.375A / Phase (20℃)			0.18	UKV-SH40D to SH61D

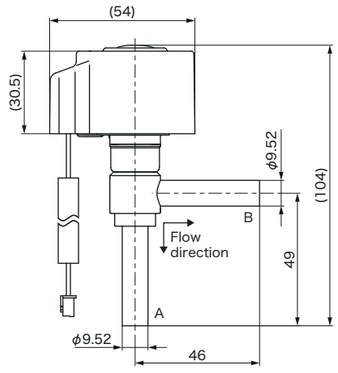
＊1 Compliant with IEC60085, 60335-2-40.
＊2 For lead wire length of 1000mm.

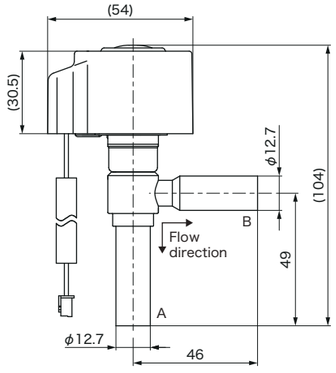
DIMENSIONS

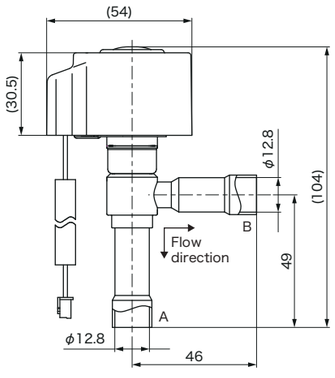




Type UKV-S



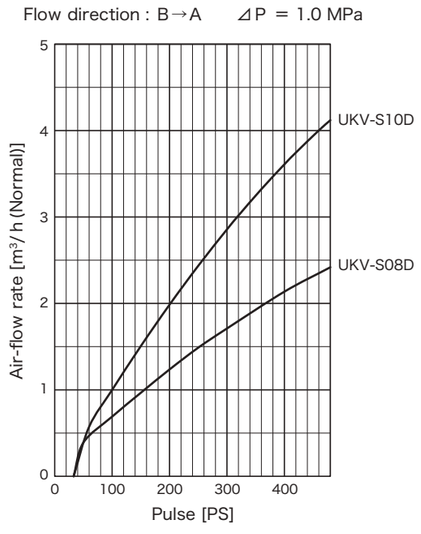


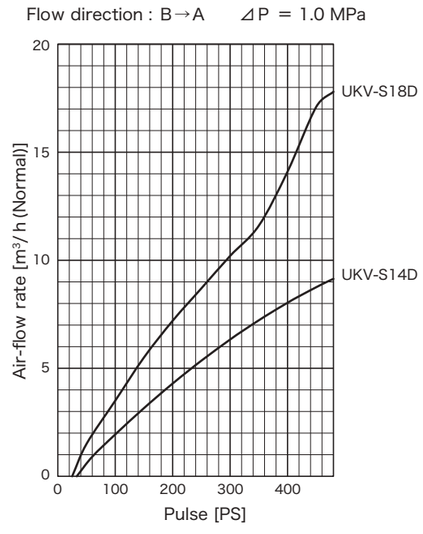


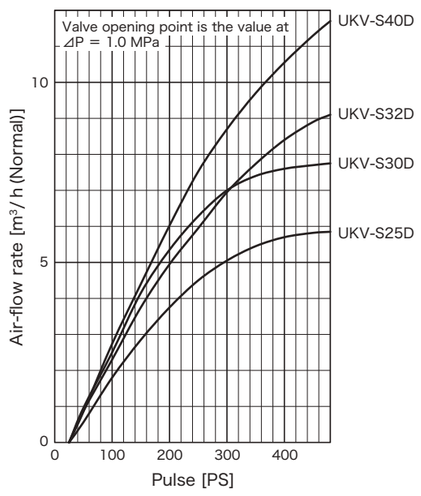
Unit : mm

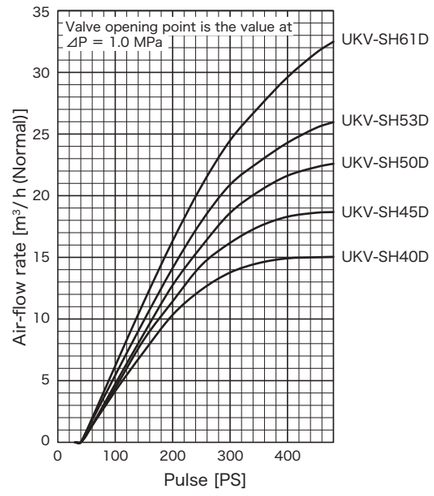
Type UKV-SH

FLOW CHARACTERISTICS









ELECTRONIC EXPANSION VALVES / Type LKV

Type LKV-S

Type LKV-S
(Bent fittings)

High Volume OEM Item

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

Coil sold separately

FEATURES

- Minimizes refrigerant-flow-induced noise, making for a more pleasant indoor experience.
- Low valve leakage performance helps reduce water leakage or other problems.
- Stable flow characteristics enable it to quickly reach the target valve opening rate.
- Bi-flow operation.
- Standards : CE (ATEX) (Please contact us for details.)

APPLICATIONS

- Packaged air conditioners
- VRF (Indoor unit), etc.

COMMON SPECIFICATIONS

- Max. working pressure : 4.3 MPa
- Fluid temperature : -30 to 68℃
  (It should be 50% or less on energizing ratio.)
- Ambient temperature : -30 to 70℃
  (It should be 50% or less on energizing ratio.)
- Flow direction : Bi-flow
- Excitation method : 1-2 phase, Uni-polar

DESCRIPTION OF CATALOG NO.

LKV − S 13 D □□
Ⅰ Ⅱ Ⅲ Ⅳ

Ⅰ	Type
Ⅱ	Port size
Ⅲ	Connection type
Ⅳ	Serial number

＊ Coil is not included with the valve body.
Please purchase it separately.

TYPE NUMBER SELECTION

Catalog No.	＊1 Refrigerant	Port size ϕ (mm)	Cv value	＊2 Connection (Solder) (mm)	＊3 Operation range pulse	B → A M.O.P.D. (MPa)	A → B Valve closing pressure (MPa)	A → B Valve leakage (ΔP = 1.0 MPa, Air) (cm³/min)	＊4 Wt. (kg)
LKV-S13D	R32 R134a R404A R407C R410A R448A R449A R407H	1.3	0.055	ϕ 7.94 OD	0 to 480	3.0	3.0 or less	150	0.06
LKV-S16D		1.6	0.085						
LKV-S19D		1.9	0.12						
LKV-S23D		2.3	0.18						
LKV-S26D		2.6	0.22						
LKV-S29D		2.9	0.26						
LKV-S32D		3.2	0.32						

＊1 For other refrigerants, please contact us.
＊2 Connection A and B are the same size.
＊3 Also operational with 0 to 500 pulse. Please contact us for details.
＊4 Valve only. (without coil)

TYPE NUMBER SELECTION

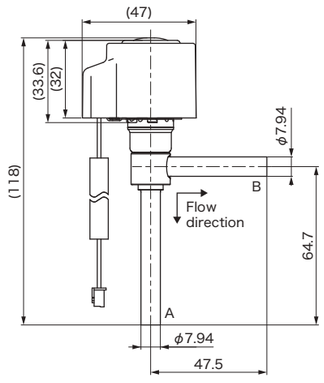
Catalog No.	Capacity (U.S.R.T.) {kW} CT 38℃ / ET 5℃ / SC 0K / SH 0K							
	R32	R134a	R404A	R407C	R410A	R448A	R449A	R407H
LKV-S13D	2.8 {9.8}	1.3 {4.4}	1.1 {4.0}	1.7 {5.8}	1.9 {6.7}	1.7 {5.8}	1.6 {5.6}	1.9 {6.7}
LKV-S16D	4.3 {15.2}	1.9 {6.8}	1.8 {6.2}	2.6 {9.0}	2.9 {10.3}	2.6 {9.0}	2.5 {8.6}	2.9 {10.3}
LKV-S19D	6.1 {21.4}	2.7 {9.7}	2.5 {8.7}	3.6 {12.7}	4.1 {14.5}	3.6 {12.7}	3.5 {12.2}	4.2 {14.6}
LKV-S23D	9.1 {32.1}	4.1 {14.5}	3.7 {13.1}	5.4 {19.0}	6.2 {21.8}	5.4 {19.0}	5.2 {18.3}	6.2 {21.9}
LKV-S26D	11.2 {39.2}	5.0 {17.7}	4.5 {16.0}	6.6 {23.3}	7.6 {26.6}	6.6 {23.2}	6.4 {22.4}	7.6 {26.8}
LKV-S29D	13.2 {46.3}	6.0 {20.9}	5.4 {18.9}	7.8 {27.5}	9.0 {31.5}	7.8 {27.5}	7.5 {26.4}	9.0 {31.7}
LKV-S32D	16.2 {57.0}	7.3 {25.8}	6.6 {23.2}	9.6 {33.8}	11.0 {38.7}	9.6 {33.8}	9.3 {32.5}	11.1 {39.0}

COIL SPECIFICATIONS

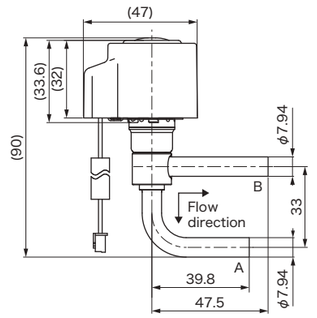
Catalog No. (Coil)	Rated voltage	Current	＊1 Insulation class	Enclosure	＊2 Wt. (kg)
KVC-1A□□□	12V.DC ± 10%	0.26A / Phase (20℃)	Class E molded	IP66	0.12

＊1 Compliant with IEC60085, 60335-2-40.
＊2 For lead wire length of 1000mm.

DIMENSIONS



Type LKV-S

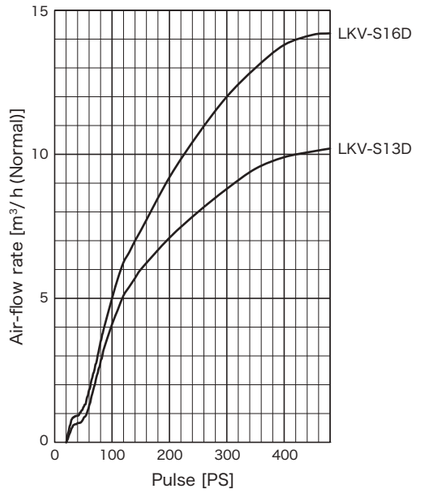


Type LKV-S
(Bent fittings)

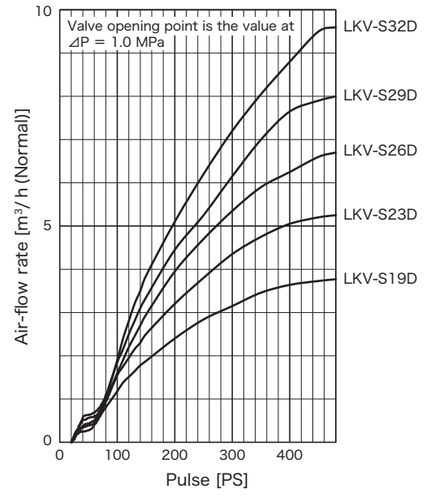
Unit : mm

FLOW CHARACTERISTICS

Flow direction : A→B ⊿P = 1.0 MPa



Flow direction : A→B ⊿P = 0.1 MPa



MOTOR OPERATED VALVES FOR CO_2 REFRIGERANT / Type UKV-J, JKV

Type UKV-J

Type JKV-20, 24D

Type JKV-40D

High Volume OEM Item

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

Coil sold separately

FEATURES

- M.O.P.D. 10.0 MPa.
- Compact and lightweight.
- Energy-saving design.
- Standards : UL (UKV-J only) (Please contact us for details.)

APPLICATIONS

- CO_2 Heat pump water heaters
- CO_2 Display cases, etc.

COMMON SPECIFICATIONS

- Max. working pressure : 15.0 MPa
- Fluid temperature : -30 to 70℃ *
  (It should be 50% or less on energizing ratio.)
- Ambient temperature : -30 to 70℃ *
  (It should be 50% or less on energizing ratio.)
- Flow direction : B → A (Single direction)
- Excitation method : 1-2 phase, Uni-polar

* Coils for low temperatures are also available. Please contact us for details.
(Fluid temperature: -40 to 60℃ Ambient temperature: -50 to 60℃)

DESCRIPTION OF CATALOG NO.

UKV – J 08 D □□
I Ⅱ Ⅲ Ⅳ

JKV – 20 D □□
I Ⅱ Ⅲ Ⅳ

I	Type
Ⅱ	Port size
Ⅲ	Connection type
Ⅳ	Serial number

* Coil is not included with the valve body.
Please purchase it separately.

TYPE NUMBER SELECTION

Catalog No.	Port size φ (mm)	0 pulse flow	Cv value	Capacity (U.S.R.T.) {kW} ＊1 R744	Capacity (U.S.R.T.) {kW} ＊2 R744	＊3 Connection (Solder) (mm)	Operation range pulse	B → A M.O.P.D. (MPa)	＊4 Wt. (kg)
UKV-J08D	0.8	Close	0.015	0.8 {2.8}	1.0 {3.7}	φ6.35 OD	0 to 480	10.0	0.05
UKV-J10D	1.0	Close	0.025	1.3 {4.6}	1.7 {6.1}	φ6.35 OD	0 to 480	10.0	0.05
UKV-J14D	1.4	Close	0.056	2.9 {10.3}	3.9 {13.7}	φ6.35 OD	0 to 480	10.0	0.05
UKV-J14D	1.4	Open	0.067	3.5 {12.3}	4.6 {16.3}	φ6.35 OD	0 to 480	10.0	0.05
JKV-20D	2.0	Close / Open	0.12	6.2 {21.9}	8.3 {29.0}	φ7.94 OD	0 to 480	10.0	0.13
JKV-24D	2.4	Close / Open	0.17	8.7 {30.7}	11.6 {40.7}	φ7.94 OD	0 to 480	10.0	0.13
JKV-40D	4.0	Close	0.49	25.6 {90.1}	34.0 {119.5}	φ12.7 OD	0 to 480	10.0	0.3

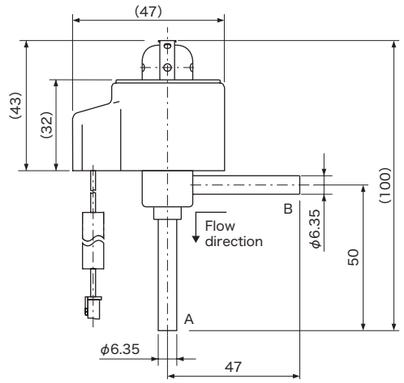
＊1 CT -5℃ / ET -25℃ / SC 0K / SH 0K
＊2 Gas cooler inlet temp. 70℃ / Gas cooler outlet temp. 22℃ / ET 6℃ / SH 0K
＊3 Connection A and B are the same size.
＊4 Valve only. (without coil)

COIL SPECIFICATIONS

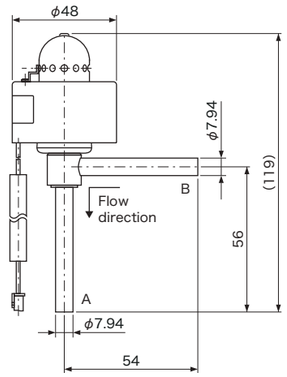
Catalog No. (Valve body)	Rated voltage	Current	＊1 Insulation class	Enclosure	＊2 Wt. (kg)
UKV-J08D to J14D	12V.DC ± 10% 24V.DC ± 10%	0.26A / Phase (20℃) 0.13A / Phase (20℃)	Class E molded	IP66	0.13
JKV-20D	12V.DC ± 10% 24V.DC ± 10%	0.26A / Phase (20℃) 0.13A / Phase (20℃)	Class E molded	IP56	0.16
JKV-24D, 40D	12V.DC ± 10%	0.38A / Phase (20℃)	Class E molded	IP56	0.18
JKV-24D, 40D	24V.DC ± 10%	0.21A / Phase (20℃)	Class E molded	IP56	0.17

＊1 Compliant with IEC60085, 60335-2-40.
＊2 For lead wire length of 1000mm (UKV-J) / 500mm (JKV).

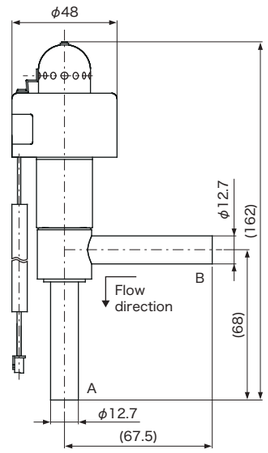
DIMENSIONS



Type UKV-J



Type JKV-20, 24D

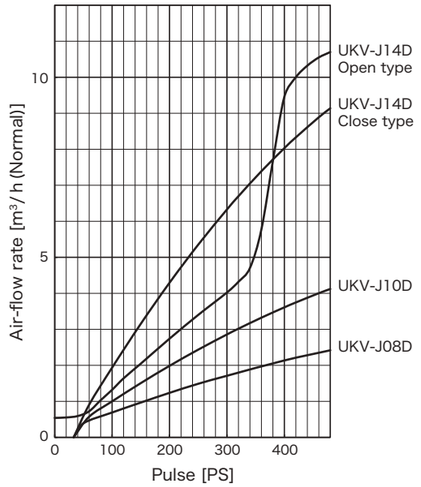


Type JKV-40D

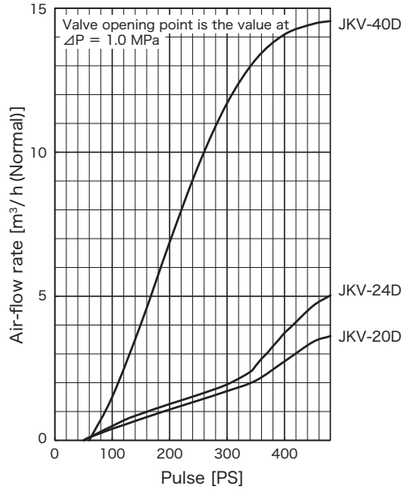
Unit : mm

FLOW CHARACTERISTICS

Flow direction : B→A　⊿P = 1.0 MPa



Flow direction : B→A　⊿P = 0.1 MPa



ELECTRONIC EXPANSION VALVES / Type UKV-F

Type UKV-F

High Volume OEM Item

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

Coil sold separately

FEATURES

- Internal check valve function.
- Energy-saving design.
- High cool down capability.
- Quick response.
- Standards : UL, cUL (Please contact us for details.)

APPLICATIONS

- Residential air conditioners, etc.

COMMON SPECIFICATIONS

- Max. working pressure : 4.2 MPa
- Fluid temperature : -30 to 68℃
  (It should be 50% or less on energizing ratio.)
- Ambient temperature : -26 to 60℃
  (It should be 50% or less on energizing ratio.)
- Flow direction : Bi-flow (A→B is usable only at 500 pulse.)
- Excitation method : 1-2 phase, Uni-polar

DESCRIPTION OF CATALOG NO.

UKV－F 19 D □□

Ⅰ Ⅱ Ⅲ Ⅳ

Ⅰ	Type
Ⅱ	Port size
Ⅲ	Connection type
Ⅳ	Serial number

＊ Coil is not included with the valve body.
Please purchase it separately.

TYPE NUMBER SELECTION

Catalog No.	＊1 Refrigerant	Port size φ B → A (mm)	Cv value B → A	Cv value A → B	＊2 Connection (Solder) (mm)	Operation range pulse	B → A M.O.P.D. (MPa)	＊3 Wt. (kg)
UKV-F19D	R32 R134a R404A R410A R407C	1.9	0.10	0.47	φ 7.94 OD	0 to 500	3.3	0.05
UKV-F25D		2.5	0.16					
UKV-F32D		3.2	0.22				2.8	

＊1 For other refrigerants, please contact us.
＊2 Connection A and B are the same size.
＊3 Valve only. (without coil)

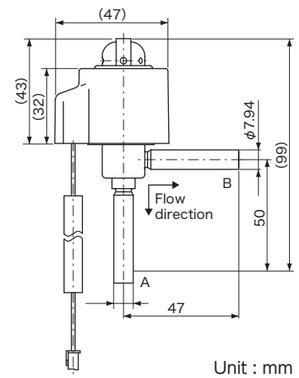
Catalog No.	Capacity (U.S.R.T.) {kW} CT 38℃ / ET 5℃ / SC 0K / SH 0K				
	R32	R134a	R404A	R410A	R407C
UKV-F19D	5.1 {17.8}	2.3 {8.1}	2.1 {7.3}	3.4 {12.1}	3.0 {10.6}
UKV-F25D	8.1 {28.5}	3.7 {12.9}	3.3 {11.6}	5.5 {19.4}	4.8 {16.9}
UKV-F32D	11.1 {39.2}	5.0 {17.7}	4.6 {16.0}	7.6 {26.6}	6.6 {23.3}

COIL SPECIFICATIONS

Catalog No. (Valve body)	Rated voltage	Current	＊1 Insulation class	Enclosure	Wt. (kg)
UKV-F19D to F32D	12V.DC ± 10%	0.26A / Phase (20℃)	Class E molded	IP66	0.13

＊1 Compliant with IEC60085, 60335-2-40.

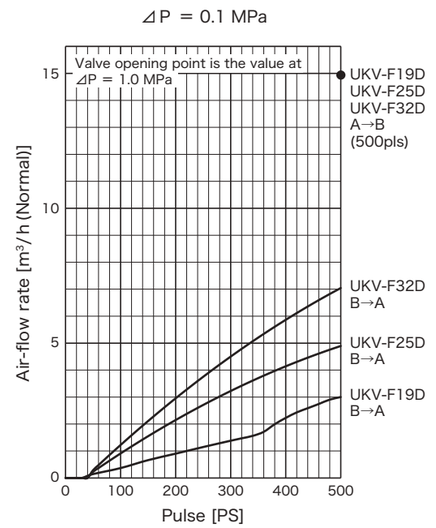
DIMENSIONS



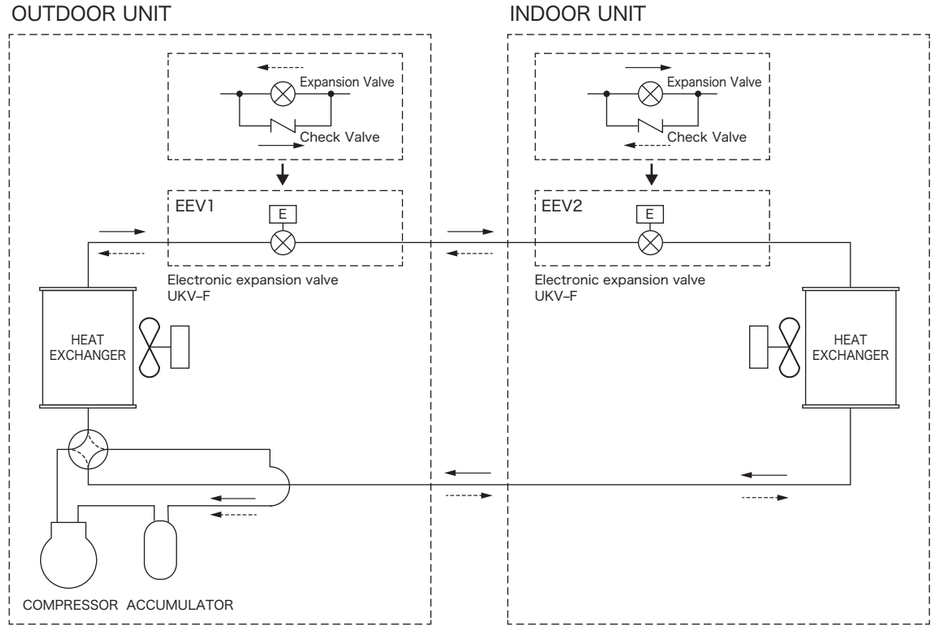
Unit : mm

B→A : Flow when the valve works as an expansion valve.
A→B : Flow when the valve works as a tube.

FLOW CHARACTERISTICS



APPLICATION EXAMPLE



COOLING CYCLE
HEATING CYCLE

COOLING CYCLE
EEV1 : Flow when the valve works as a tube.
EEV2 : Flow when the valve works as an expansion valve.

HEATING CYCLE
EEV1 : Flow when the valve works as an expansion valve
EEV2 : Flow when the valve works as a tube.

CHANGEOVER VALVES, ELECTRONIC EXPANSION VALVES / Type RKV

Type RKV-H, RKV-B

Type RKV-C

Type RKV-K

High Volume OEM Item

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

Coil sold separately

FEATURES

- Highly durable (Operating life of 300,000 cycles at full stroke).
- Energy-saving design (No holding power required).
- Capable of regulating multiple flow settings (Open, closed, low-flow).
- Standards : UL, cUL (Please contact us for details.)

APPLICATIONS

- Household refrigerators
- Commercial refrigerators / freezers
- Vending machines, etc.

COMMON SPECIFICATIONS

- Max. working pressure : 3.0 MPa
- Fluid temperature : -30 to 65℃
  (It should be 50% or less on energizing ratio)
- Ambient temperature : -30 to 65℃
  (It should be 50% or less on energizing ratio)
- Ambient humidity : 95%RH or less
- Excitation method : 1-2 phase, Uni-polar

DESCRIPTION OF CATALOG NO.

RKV – C 08 D □□
I II III IV V

I	Type
II	Function
III	Port size
IV	Connection type
V	Serial number

＊ Coil is not included with the valve body.
Please purchase it separately.

TYPE NUMBER SELECTION

Catalog No.	Function	＊1 Refrigerant	Port size ϕ (mm)	Connection (Solder) (mm)		M.O.P.D. (MPa)	＊2 Wt. (kg)
				Inlet (A)	Outlet (B, C, D)		
RKV-H06D	Expansion valve	R134a R600a	0.6	ϕ 2.1 ID	ϕ 2.2 ID	1.0	0.03
RKV-B10D	2-way changeover valve		1.0		ϕ 1.9 ID	1.8	
RKV-C08D	3-way changeover valve		0.8			2.8	0.04
RKV-C10D			1.0			1.8	
RKV-C08DWL	3-way changeover valve with expansion function		0.8			1.0	
RKV-K10D	4-way changeover valve		1.0		ϕ 2.2 ID	1.8	

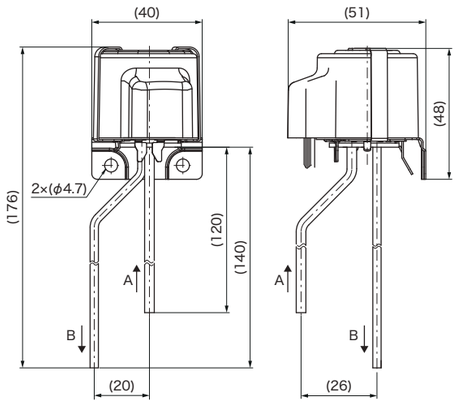
＊1 For other refrigerants, please contact us.
＊2 Valve only. (without coil)

COIL SPECIFICATIONS

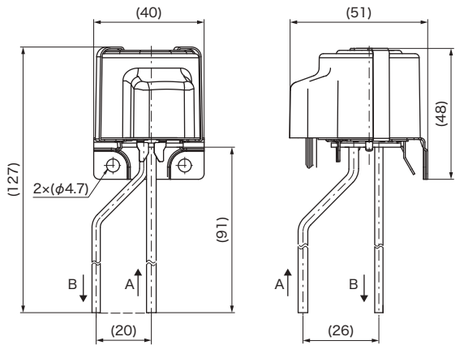
Catalog No. (Coil)	Rated voltage	Current	＊1 Insulation class	Enclosure	＊2 Wt. (kg)
RKV- R□□□	12V.DC ± 10%	0.26A / Phase (20℃)	Class E molded	IP66	0.1

＊1 Compliant with IEC60085, 60335-2-40.
＊2 For lead wire length of 300mm.

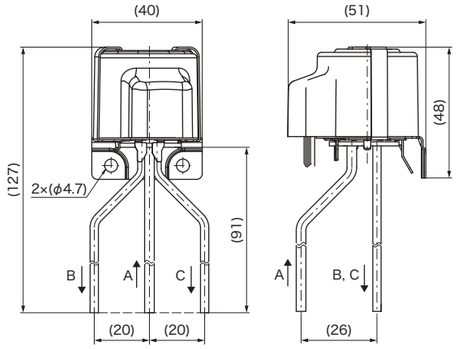
DIMENSIONS



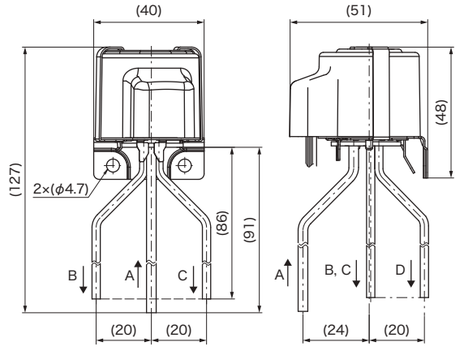
Type RKV-H06D



Type RKV-B10D



Type RKV-C

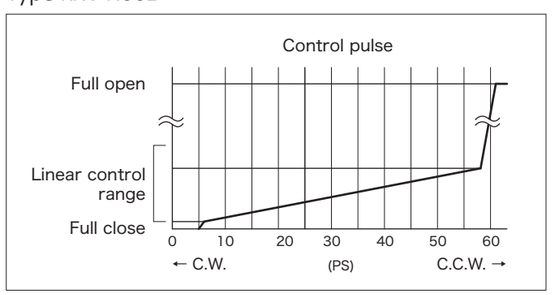


Type RKV-K10D

Unit : mm

VALVE OPERATION CHARACTERISTICS

Type RKV-H06D

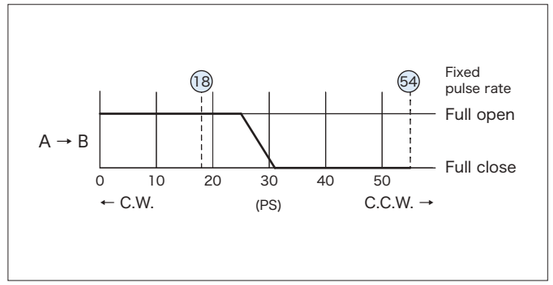


Control pulse

Pulse	Flow direction
	A → B
0	Full close
5 to 55	Linear control
64	Full open

VALVE OPERATION CHARACTERISTICS

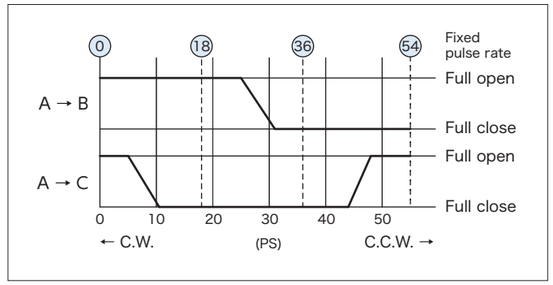
Type RKV-B10D *



Flow direction (Fixed pulse rate)

Mode	Pulse	Flow direction
		A → B
1	18	Full open
2	54	Full close

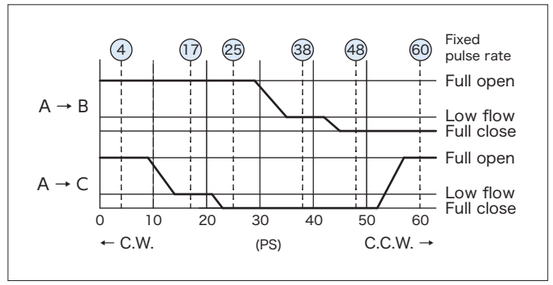
Type RKV-C08D, C10D *



Flow direction (Fixed pulse rate)

Mode	Pulse	Flow direction	
		A → B	A → C
1	0	Full open	Full open
2	18	Full open	Full close
3	36	Full close	Full close
4	54	Full close	Full open

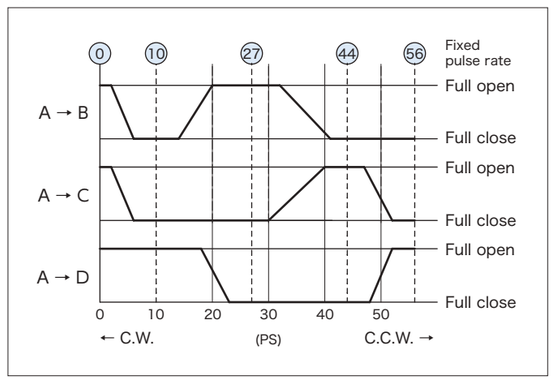
Type RKV-C08DWL *



Flow direction (Fixed pulse rate)

Mode	Pulse	Flow direction	
		A → B	A → C
1	4	Full open	Full open
2	17	Full open	Minimal open
3	25	Full open	Full close
4	38	Minimal open	Full close
5	48	Full close	Full close
6	60	Full close	Full open

Type RKV-K10D *



Flow direction (Fixed pulse rate)

Mode	Pulse	Flow direction		
		A → B	A → C	A → D
1	0	Full open	Full open	Full open
2	10	Full close	Full close	Full open
3	27	Full open	Full close	Full close
4	44	Full close	Full open	Full close
5	56	Full close	Full close	Full open

* Type RKV-B, C and K can be used only at fixed pulse rate.

EEV CONTROLLERS / Type YNE

Type YNE

FEATURES

- Dedicated controller for PKV/GKV type electronic expansion valves.
- Together with an EEV, a solenoid valve, and a temperature sensor, it constitutes a superheat control system.
- Connect up to 4 controllers to manage multiple electronic expansion valves.
- Impressive load-following capabilities allow for stable control even with large variations in cooling load.

APPLICATIONS

- Cold storage
- Food processing plants
- Environment test chambers, etc.

COMMON SPECIFICATIONS

- Power supply voltage : 85 to 264V.AC 50/60Hz
- Power consumption : 15VA or less
- Ambient temperature : 0 to 50℃
- Weight : 0.3kg

DESCRIPTION OF CATALOG NO.

YNE – SN 20 Q
Ⅰ Ⅱ Ⅲ Ⅳ

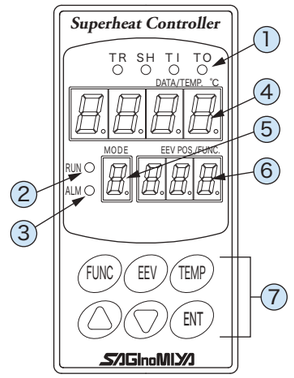
Ⅰ	Type
Ⅱ	Power supply voltage
Ⅲ	Temperature
Ⅳ	Special specification (Language : EN)

TYPE NUMBER SELECTION

Catalog No.	Function	Display	＊3 Settings	Alarm	Master-Slave communication system
YNE-SN20Q	・Room temp. control ＊1 ・Superheat control	・Room temp. ＊2 ・Operating superheat ・EEV position ・Detected error ・Address of each unit etc.	・Room temp. ・Superheat ・Upper / lower-limit alarm temp. ・Slaver units settings etc.	・Upper / lower-limit temperature ・Sensor error ・EEV error ・Liquid floodback	Up to three slave units can be connected to one master unit.

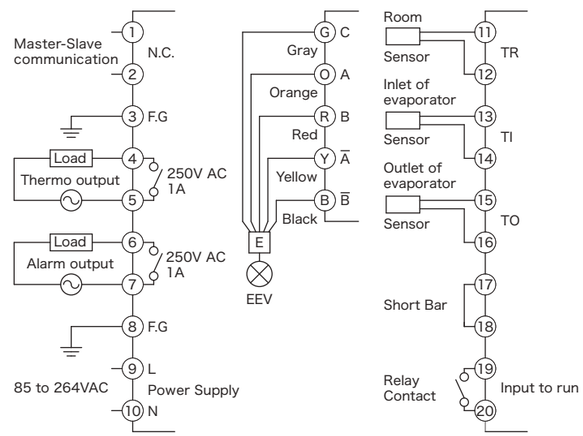
＊1 When using the built-in thermostat or an external thermostat (contact input).
＊2 When using a room temperature sensor.
＊3 Parameter data backup : EEPROM

DISPLAY PANEL

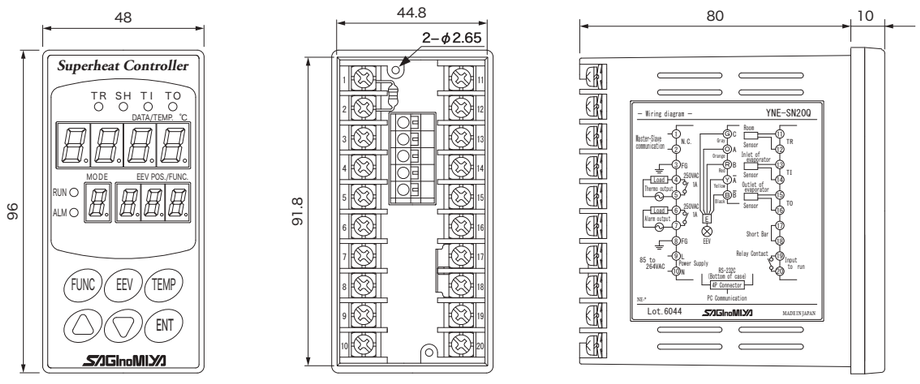


No.		Name	Note	
①	TR	Room temperature indicator light (Red)	Range : -70.0 to 20.0℃ (Blinks “20.0” at 20.0℃ or more)	The indicator light corresponding to the displayed temperature ④ is lit. It blinks when detecting an error on each sensor.
	SH	Superheat indicator light (Red)	Range : -99.9 to 99.9	
	TI	Evaporator inlet temp. indicator light (Red)	Range : -70.0 to 20.0℃ (Blinks “20.0” at 20.0℃ or more)	
	TO	Evaporator outlet temp. indicator light (Red)		
②	RUN	RUN LED (Green)	Lit when the controller is operating.	
③	ALM	ALM LED (Red)	Blinks when a warning is active.	
④	DATA / TEMP Display		(Operation mode) Displays the temperature corresponding to ①.	
			(Setup mode) Displays the setting value of each control parameter.	
⑤	MODE Display		Displays the control status. Normal operation 0, Address of master-slave communication 1 to 4, communication error d, Inlet temp. > Outlet temp. b etc.	
⑥	EEV POS. / FUNC. Display		(Operation mode) Displays the EEV position.	
			(Setup mode) Displays the setting numbers of each control parameter.	
⑦	FUNC Key		To select the control parameters	
	EEV Key		To switch to manual operation or set address of the controller	
	TEMP Key		To select the temperature to be displayed on ④TEMP display	
	▲ Key		To increase value / To open the EEV during manual operation	
	▼ Key		To decrease value / To close the EEV during manual operation	
	ENT Key		To set the entered control parameter	

WIRING DIAGRAM



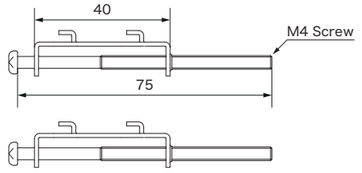
DIMENSIONS



Unit : mm

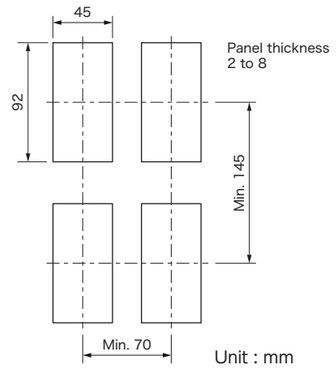
STANDARD ACCESSORY

- Mounting adapters (2 pcs)



Unit : mm

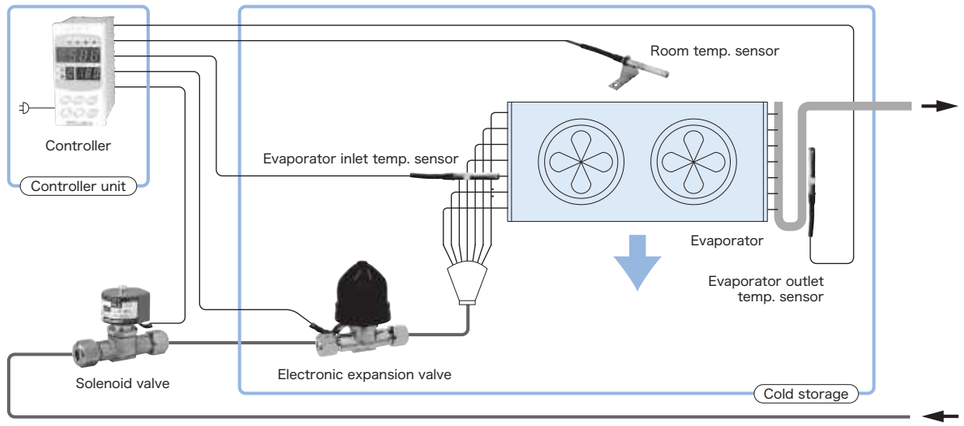
PANEL CUTOUT DIMENSIONS



Unit : mm

SYSTEM CONFIGURATION

Superheat control system



OVERVIEW OF THE SYSTEM COMPONENTS

- Electronic expansion valve

Please refer to each product page.

Type PKV	Pages 7 to 8
Type GKV	Pages 9 to 10

- Solenoid valve

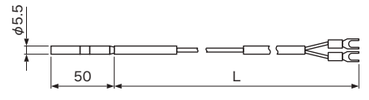
For type SEV solenoid valves, please refer to pages 7 to 12 of our product catalog "SOLENOID VALVES Series".

Compatibility table for EEVs and solenoid valves

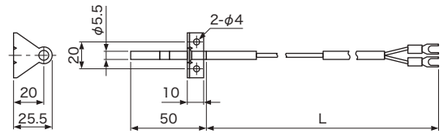
EEV Catalog No.	Solenoid valve Catalog No.
PKV-14BS	SEV-303BYF SEV-303DYF
PKV-18BS	SEV-603BYF SEV-603DYF
PKV-24BS	
GKV-18BS	
PKV-30BS	SEV-1004BYF SEV-1004DYF
GKV-34BS	
GKV-60BS	

- Temperature sensor

Catalog No.	Usage	Lead wire length (L) (mm)	Temperature sensing element	Accuracy (℃)	Working temp. (℃)	Wt. (kg)
AEK-23H538	For evaporator inlet / outlet temperature	5100	Copper RTD Ro = 2000 Ω	± 0.5	-75 to 100	0.07
AEK-23H539		10100				0.12
AEK-23K510	For room temperature	5100				0.07
AEK-23K511		10100				0.12



Type AEK-23H



Type AEK-23K Unit : mm

PULSE CONVERTERS / Type LNE

Type LNE

FEATURES

- Current input is converted to driving pulse output for an electronic expansion valve.
- Converts 4 to 20 mA. DC input into 0 to 480 pulses or 0 to 656 pulses output.

APPLICATIONS

- Food processing plants
- Constant temperature / humidity chambers
- Environment test chambers
- Semiconductor chillers, etc.

COMMON SPECIFICATIONS

- Power supply voltage : 24V.AC 50/60Hz or 24V.DC
- Power consumption : 15VA or less
- Ambient temperature : -10 to 50℃

DESCRIPTION OF CATALOG NO.

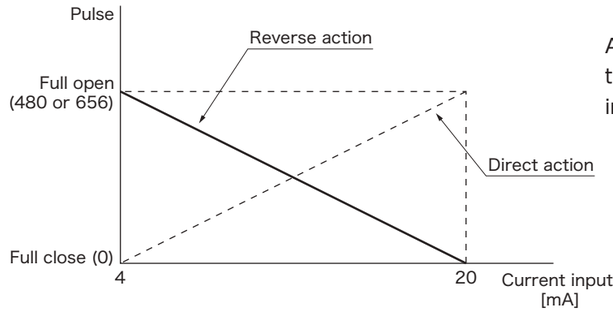
$$\frac{\text{LNE}}{\text{Ⅰ}} - \frac{\text{ZN}}{\text{Ⅱ}}\,\frac{20}{\text{Ⅲ}} - \frac{020}{\text{Ⅳ}}$$

Ⅰ	Type
Ⅱ	Power supply voltage
Ⅲ	Function
Ⅳ	Serial number

TYPE NUMBER SELECTION

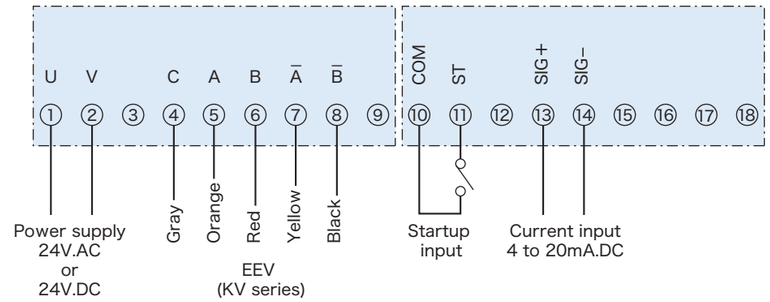
Catalog No.	Power supply voltage	Input		Output (12V.DC)	Sampling time (sec)	Ambient temp. (℃)	Wt. (kg)
		Current input	Startup input				
LNE-ZN20-020	24V.AC 50/60Hz or 24V.DC ± 10% 15VA or less	4 to 20mA.DC	Dry contact input	0 to 480 pulses or 0 to 656 pulses	0.1, 1, 5 and 10	-10 to 50	0.25

OPERATION

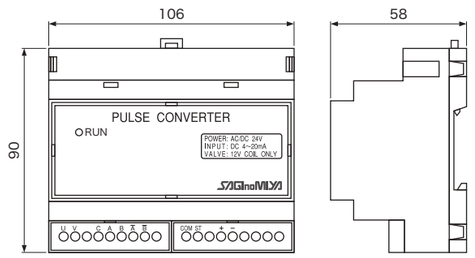


As the current input value increases, the number of pulses decreases or increases accordingly.

WIRING



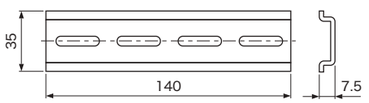
DIMENSIONS



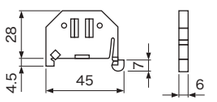
Unit : mm

STANDARD ACCESSORY

- Mounting plate



- End stop (2pcs)



Unit : mm

CONSENT RELATED TO DISCLAIMERS

We, SAGINOMIYA SEISAKUSHO, INC., (hereinafter referred to as "Saginomiya"), truly appreciate your choosing Saginomiya's product (hereinafter referred to as this "Product").
When this Product is 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 this Product (hereinafter referred to as "Customers") are requested to, after properly installing this Product, test the operation of this Product to confirm that all the systems in connection with this Product 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 this Product, 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 this Product
Be sure to confirm the proper operation of this Product 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 this Product caused by Saginomiya.

●RESTRICTIONS OF USE

This Product is 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 is not designed and manufactured for the purpose of using this Product for any instrument or system related to human life or health purposes.
Therefore, the use of this Product 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 this Product 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 this Product under the fields related to items (1) through (10), (except for item (3), in relation to which this Product must never be used), please be sure to notify 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 this Product in relation to these fields if the Customers do not notify Saginomiya's contact desk and obtain Saginomiya's prior written approval.

(4) Heating, cooling and air conditioning equipment that uses flammable and/or toxic refrigerants, or various industrial equipment that uses flammable and/or toxic fluids;
(5) Transportation device (railroad, aviation, ship or vessel, vehicle equipment, etc.);
(6) Disaster-prevention or crime-prevention device;
(7) Facility or application directly related to medical equipment, burning appliances, electro thermal equipment, amusement rides and devices, facilities/applications associated directly with billing;
(8) 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;
(9) Facilities that are to comply with regulations of governmental / public agencies or specific industries or
(10) Other machineries or equipment equivalent to those set forth in the above items (4) to (9) which require for high reliability and safety.

It is recommended to replace this Product 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 this Product.

●SCOPE OF WARRANTY

SAGINOMIYA WILL PROVIDE THE CUSTOMERS WITH REPLACEMENT OR REPAIRED THIS PRODUCT DELIVERED, FREE OF COST, ONLY WITHIN ONE YEAR OF DELIVERY TO THE CUSTOMER, IF FAILURE OCCURS IN THE CUSTOMERS' EQUIPMENT USING THIS PRODUCT DUE TO A DEFECT OF THIS PRODUCT; PROVIDED, HOWEVER, THAT IN ANY EVENT THE RATIO OF THE AMOUNT THAT SAGINOMIYA BEARS FOR THE DAMAGES INCURRED BY THE FAILURE OF THIS PRODUCT OR CUSTOMERS' EQUIPMENT SHALL NOT EXCEED THE PRICE OF THIS PRODUCT 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 THIS PRODUCT 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 THIS PRODUCT;
(3) WHEN CAUSED BY MODIFICATION OR REPAIR OF THIS PRODUCT MADE BY ANYONE OTHER THAN SAGINOMIYA OR DESIGNEE OF SAGINOMIYA;
(4) WHEN CAUSED BY THE USE OF THIS PRODUCT 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 THIS PRODUCT FROM INTERNET AUCTION, ETC.

SAGINOMIYA
SEISAKUSHO,INC.
2024.5

⚠ 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

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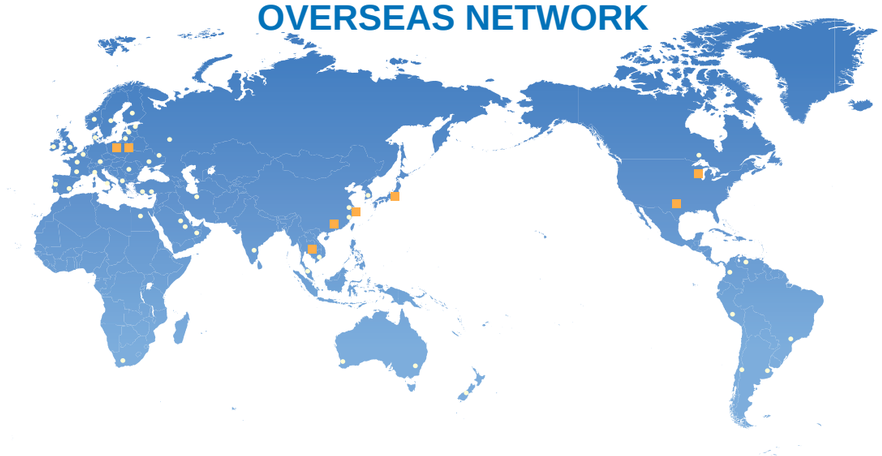
OVERSEAS NETWORK



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⚠ 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.

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2024.10