

# ***AUTOMATIC CONTROLS***

CATALOG-T



**SAGInoMIYA**



Headquarters



Sayama Plant



Tokorozawa Plant

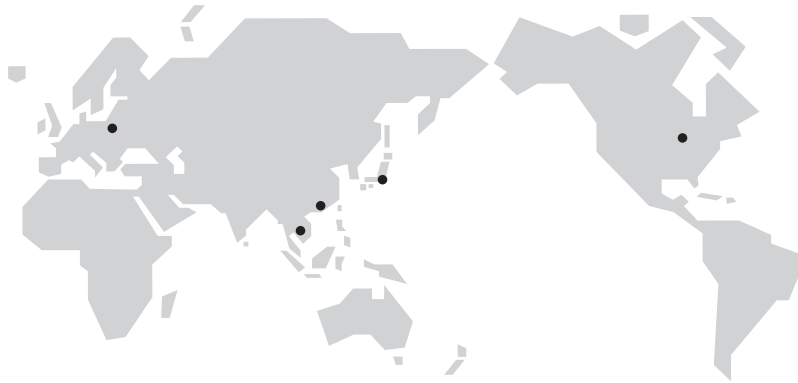
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Sales & Manufacturing

# ***AUTOMATIC CONTROLS***

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### 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 Centigrade and the figures on the right from Centigrade to Fahrenheit.

Example :

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

Temperature conversion formula :

$$^{\circ}\text{C} = 5/9 (^{\circ}\text{F} - 32)$$

$$^{\circ}\text{F} = 9/5 \times ^{\circ}\text{C} + 32$$

| °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)

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

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).

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

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

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

| kgf/cm² | ↓   | MPa      | kgf/cm² | ↓  | MPa     | kgf/cm² | ↓  | MPa     | kgf/cm² | ↓   | MPa      |
|---------|-----|----------|---------|----|---------|---------|----|---------|---------|-----|----------|
| 0       | 0   | 0        | 214.141 | 21 | 2.05940 | 520.057 | 51 | 5.00139 | 825.973 | 81  | 7.94339  |
| 1.01972 | 0.1 | 0.009806 | 224.338 | 22 | 2.15746 | 530.254 | 52 | 5.09946 | 836.170 | 82  | 8.04145  |
| 2.03944 | 0.2 | 0.019613 | 234.535 | 23 | 2.25553 | 540.451 | 53 | 5.19752 | 846.367 | 83  | 8.13952  |
| 3.05916 | 0.3 | 0.029420 | 244.732 | 24 | 2.35360 | 550.648 | 54 | 5.29559 | 856.564 | 84  | 8.23759  |
| 4.07888 | 0.4 | 0.039226 | 254.930 | 25 | 2.45166 | 560.846 | 55 | 5.39366 | 866.762 | 85  | 8.33565  |
| 5.09860 | 0.5 | 0.049033 | 265.127 | 26 | 2.54973 | 571.043 | 56 | 5.49172 | 876.959 | 86  | 8.43372  |
| 6.11832 | 0.6 | 0.058839 | 275.324 | 27 | 2.64780 | 581.240 | 57 | 5.58279 | 887.156 | 87  | 8.53179  |
| 7.13804 | 0.7 | 0.068646 | 285.521 | 28 | 2.74586 | 591.437 | 58 | 5.68786 | 897.353 | 88  | 8.62985  |
| 8.15776 | 0.8 | 0.078453 | 295.718 | 29 | 2.84393 | 601.634 | 59 | 5.78592 | 907.550 | 89  | 8.72792  |
| 9.17748 | 0.9 | 0.088259 | 305.916 | 30 | 2.94199 | 611.832 | 60 | 5.88399 | 917.748 | 90  | 8.82598  |
| 10.1972 | 1   | 0.09807  | 316.113 | 31 | 3.04006 | 622.029 | 61 | 5.98206 | 927.945 | 91  | 8.92405  |
| 20.3944 | 2   | 0.19613  | 326.310 | 32 | 3.18313 | 632.226 | 62 | 6.08012 | 938.142 | 92  | 9.02212  |
| 30.5916 | 3   | 0.29420  | 336.507 | 33 | 3.23619 | 642.423 | 63 | 6.17819 | 948.339 | 93  | 9.12018  |
| 40.7888 | 4   | 0.39227  | 346.704 | 34 | 3.33426 | 652.620 | 64 | 6.27626 | 958.536 | 94  | 9.21825  |
| 50.9860 | 5   | 0.49033  | 356.902 | 35 | 3.43233 | 662.818 | 65 | 6.37432 | 968.734 | 95  | 9.31632  |
| 61.1832 | 6   | 0.58840  | 367.099 | 36 | 3.53039 | 673.015 | 66 | 6.47239 | 978.931 | 96  | 9.41438  |
| 71.3804 | 7   | 0.68647  | 377.296 | 37 | 3.62846 | 683.212 | 67 | 6.57046 | 989.128 | 97  | 9.51245  |
| 81.5776 | 8   | 0.78453  | 387.493 | 38 | 3.72653 | 693.409 | 68 | 6.66852 | 999.325 | 98  | 9.61052  |
| 91.7748 | 9   | 0.88260  | 397.690 | 39 | 3.82459 | 703.606 | 69 | 6.76659 | 1000.52 | 99  | 9.70858  |
| 101.972 | 10  | 0.98066  | 407.888 | 40 | 3.92266 | 713.804 | 70 | 6.86465 | 1019.72 | 100 | 9.80665  |
| 112.169 | 11  | 1.07873  | 418.085 | 41 | 4.02073 | 724.001 | 71 | 6.96272 | 1529.58 | 150 | 14.70997 |
| 122.366 | 12  | 1.17680  | 428.282 | 42 | 4.11879 | 734.198 | 72 | 7.06079 | 2039.44 | 200 | 19.6133  |
| 132.563 | 13  | 1.27486  | 438.479 | 43 | 4.21686 | 744.395 | 73 | 7.15885 | 2549.30 | 250 | 24.51662 |
| 142.760 | 14  | 1.37293  | 448.676 | 44 | 4.31493 | 754.592 | 74 | 7.25692 | 3059.16 | 300 | 29.41995 |
| 152.958 | 15  | 1.47100  | 458.874 | 45 | 4.41299 | 764.790 | 75 | 7.35499 | 3569.02 | 350 | 34.32327 |
| 163.155 | 16  | 1.56906  | 469.071 | 46 | 4.51106 | 774.987 | 76 | 7.45305 | 4078.88 | 400 | 39.2266  |
| 173.352 | 17  | 1.66713  | 479.268 | 47 | 4.60913 | 785.184 | 77 | 7.55112 | 4588.74 | 450 | 44.12992 |
| 183.549 | 18  | 1.76520  | 489.465 | 48 | 4.70719 | 795.381 | 78 | 7.64919 | 5098.60 | 500 | 49.03325 |
| 193.746 | 19  | 1.96133  | 499.662 | 49 | 4.80526 | 805.578 | 79 | 7.74725 |         |     |          |
| 203.944 | 20  | 1.96133  | 509.860 | 50 | 4.90332 | 815.776 | 80 | 7.84532 |         |     |          |

4) Pressure conversion table (kgf/cm<sup>2</sup> ↔ psi)

| kgf/cm <sup>2</sup> | ↓   | psi    | kgf/cm <sup>2</sup> | ↓  | psi   | kgf/cm <sup>2</sup> | ↓  | psi   | kgf/cm <sup>2</sup> | ↓    | psi     |
|---------------------|-----|--------|---------------------|----|-------|---------------------|----|-------|---------------------|------|---------|
| 0                   | 0   | 0      | 0.773               | 11 | 156.5 | 2.180               | 31 | 440.9 | 4.218               | 60   | 853.4   |
| 0.0070              | 0.1 | 1.422  | 0.844               | 12 | 170.8 | 2.250               | 32 | 455.2 | 4.922               | 70   | 995.6   |
| 0.0141              | 0.2 | 2.845  | 0.914               | 13 | 184.9 | 2.320               | 33 | 469.4 | 5.625               | 80   | 1137.9  |
| 0.0211              | 0.3 | 4.267  | 0.984               | 14 | 199.1 | 2.390               | 34 | 483.6 | 6.328               | 90   | 1280.1  |
| 0.0281              | 0.4 | 5.689  | 1.055               | 15 | 213.4 | 2.461               | 35 | 497.8 | 7.031               | 100  | 1422.3  |
| 0.0352              | 0.5 | 7.112  | 1.125               | 16 | 227.6 | 2.531               | 36 | 512.0 | 7.734               | 110  | 1564.5  |
| 0.0422              | 0.6 | 8.534  | 1.195               | 17 | 241.8 | 2.601               | 37 | 526.3 | 8.437               | 120  | 1706.8  |
| 0.0492              | 0.7 | 9.956  | 1.266               | 18 | 256.0 | 2.672               | 38 | 540.5 | 9.140               | 130  | 1849.0  |
| 0.0562              | 0.8 | 11.379 | 1.336               | 19 | 270.2 | 2.742               | 39 | 554.7 | 9.843               | 140  | 1991.2  |
| 0.0633              | 0.9 | 12.801 | 1.406               | 20 | 284.5 | 2.812               | 40 | 568.9 | 10.55               | 150  | 2133.5  |
| 0.0703              | 1   | 14.22  | 1.477               | 21 | 298.7 | 2.883               | 41 | 583.2 | 14.06               | 200  | 2844.6  |
| 0.1406              | 2   | 28.45  | 1.547               | 22 | 312.9 | 2.953               | 42 | 597.4 | 21.09               | 300  | 4266.9  |
| 0.2109              | 3   | 42.67  | 1.617               | 23 | 327.1 | 3.023               | 43 | 611.6 | 28.12               | 400  | 5689.2  |
| 0.2812              | 4   | 56.89  | 1.687               | 24 | 341.4 | 3.094               | 44 | 625.8 | 35.15               | 500  | 7111.5  |
| 0.3515              | 5   | 71.12  | 1.758               | 25 | 355.6 | 3.164               | 45 | 640.1 | 42.18               | 600  | 8533.8  |
| 0.4218              | 6   | 85.34  | 1.828               | 26 | 369.8 | 3.234               | 46 | 654.3 | 49.22               | 700  | 9956.1  |
| 0.4922              | 7   | 99.56  | 1.898               | 27 | 384.0 | 3.304               | 47 | 668.5 | 56.25               | 800  | 11378.4 |
| 0.5625              | 8   | 113.79 | 1.969               | 28 | 398.3 | 3.375               | 48 | 682.7 | 63.30               | 900  | 12800.7 |
| 0.6328              | 9   | 128.01 | 2.039               | 29 | 412.5 | 3.445               | 49 | 696.9 | 70.31               | 1000 | 14223.0 |
| 0.7031              | 10  | 142.22 | 2.109               | 30 | 426.7 | 3.515               | 50 | 711.2 |                     |      |         |

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

1kW ↔ 860kcal/h

| kW    | ↓   | 1000 kcal/h | kW    | ↓ | 1000 kcal/h | kW    | ↓  | 1000 kcal/h | kW    | ↓   | 1000 kcal/h |
|-------|-----|-------------|-------|---|-------------|-------|----|-------------|-------|-----|-------------|
| 0.116 | 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        | 104.6 | 900 | 774         |

6) Length conversion table

(In ↔ mm)

| In    | mm    | In    | mm    |
|-------|-------|-------|-------|
| 1/8   | 3.18  | 1/64  | 0.40  |
| 1/4   | 6.35  | 3/64  | 1.19  |
| 3/8   | 9.53  | 5/64  | 1.98  |
| 1/2   | 12.70 | 7/64  | 2.78  |
| 5/8   | 15.88 | 9/64  | 3.57  |
| 3/4   | 19.05 | 11/64 | 4.39  |
| 7/8   | 22.23 | 13/64 | 5.16  |
| 1     | 25.40 | 15/64 | 5.95  |
| 1/16  | 1.59  | 17/64 | 6.75  |
| 3/16  | 4.76  | 19/64 | 7.54  |
| 5/16  | 7.94  | 21/64 | 8.33  |
| 7/16  | 11.11 | 23/64 | 9.13  |
| 9/16  | 14.29 | 25/64 | 9.92  |
| 11/16 | 17.46 | 27/64 | 10.72 |
| 13/16 | 20.64 | 29/64 | 11.51 |
| 15/16 | 23.81 | 31/64 | 12.30 |
| 1/32  | 0.79  | 33/64 | 13.10 |
| 3/32  | 2.38  | 35/64 | 13.89 |
| 5/32  | 3.97  | 37/64 | 14.68 |
| 7/32  | 5.56  | 39/64 | 15.48 |
| 9/32  | 7.14  | 41/64 | 16.27 |
| 11/32 | 8.73  | 43/64 | 17.07 |
| 13/32 | 10.32 | 45/64 | 17.86 |
| 15/32 | 11.91 | 47/64 | 18.65 |
| 17/32 | 13.49 | 49/64 | 19.45 |
| 19/32 | 15.08 | 51/64 | 20.24 |
| 21/32 | 16.67 | 53/64 | 21.04 |
| 23/32 | 18.26 | 55/64 | 21.83 |
| 25/32 | 19.84 | 57/64 | 22.62 |
| 27/32 | 21.43 | 59/64 | 23.42 |
| 29/32 | 23.02 | 61/64 | 24.21 |
| 31/32 | 24.61 | 63/64 | 25.00 |

7) Vacuum conversion table

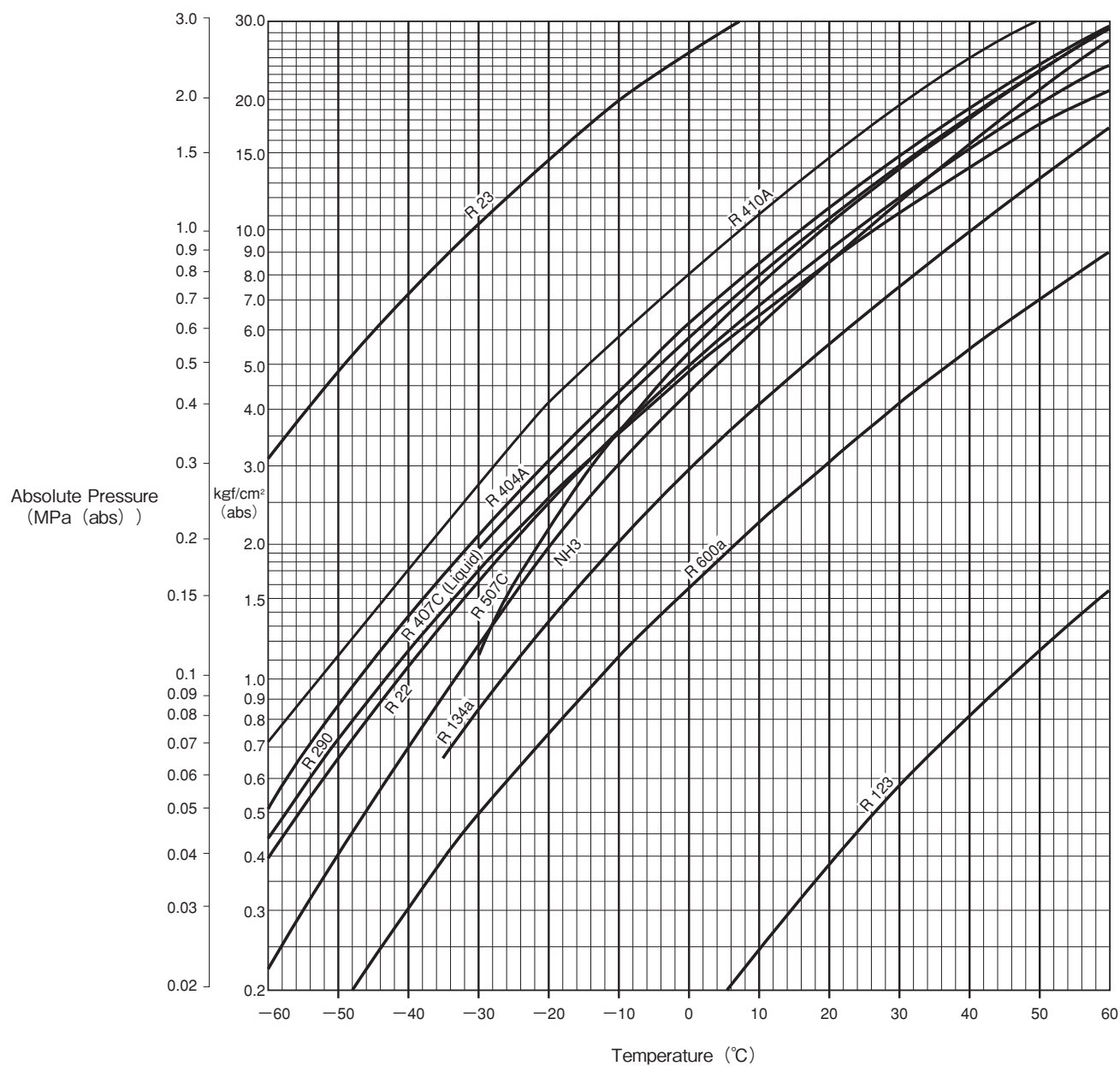
(MPa ↔ MPa (abs) ↔ cmHg v ↔ kgf/cm<sup>2</sup>(abs))

| MPa     | MPa (abs) | cmHg v | kgf/cm <sup>2</sup> (abs) | MPa     | MPa (abs) | cmHg v | kgf/cm <sup>2</sup> (abs) |
|---------|-----------|--------|---------------------------|---------|-----------|--------|---------------------------|
| -0.1013 | 0         | 76     | 0                         | -0.0480 | 0.0533    | 36     | 0.5438                    |
| -0.0987 | 0.0027    | 74     | 0.0274                    | -0.0453 | 0.0560    | 34     | 0.5710                    |
| -0.0960 | 0.0053    | 72     | 0.0544                    | -0.0427 | 0.0587    | 32     | 0.5981                    |
| -0.0933 | 0.0080    | 70     | 0.0816                    | -0.0400 | 0.0613    | 30     | 0.6254                    |
| -0.0907 | 0.0107    | 68     | 0.1088                    | -0.0373 | 0.0640    | 28     | 0.6526                    |
| -0.0880 | 0.0133    | 66     | 0.1360                    | -0.0347 | 0.0667    | 26     | 0.6798                    |
| -0.0853 | 0.0160    | 64     | 0.1631                    | -0.0320 | 0.0693    | 24     | 0.7069                    |
| -0.0827 | 0.0187    | 62     | 0.1903                    | -0.0293 | 0.0720    | 22     | 0.7341                    |
| -0.0800 | 0.0213    | 60     | 0.2175                    | -0.0267 | 0.0747    | 20     | 0.7613                    |
| -0.0773 | 0.0240    | 58     | 0.2447                    | -0.0240 | 0.0773    | 18     | 0.7885                    |
| -0.0747 | 0.0267    | 56     | 0.2719                    | -0.0213 | 0.0800    | 16     | 0.8157                    |
| -0.0720 | 0.0293    | 54     | 0.2991                    | -0.0187 | 0.0827    | 14     | 0.8429                    |
| -0.0693 | 0.0320    | 52     | 0.3263                    | -0.0160 | 0.0853    | 12     | 0.8700                    |
| -0.0667 | 0.0347    | 50     | 0.3535                    | -0.0133 | 0.0880    | 10     | 0.8972                    |
| -0.0640 | 0.0373    | 48     | 0.3806                    | -0.0107 | 0.0907    | 8      | 0.9245                    |
| -0.0613 | 0.0400    | 46     | 0.4078                    | -0.0080 | 0.0933    | 6      | 0.9517                    |
| -0.0587 | 0.0427    | 44     | 0.4350                    | -0.0053 | 0.0960    | 4      | 0.9788                    |
| -0.0560 | 0.0453    | 42     | 0.4622                    | -0.0027 | 0.0987    | 2      | 1.0060                    |
| -0.0533 | 0.0480    | 40     | 0.4894                    | 0       | 0.1013    | 0      | 1.0332                    |
| -0.0507 | 0.0507    | 38     | 0.5166                    |         |           |        |                           |

8) Other conversion values

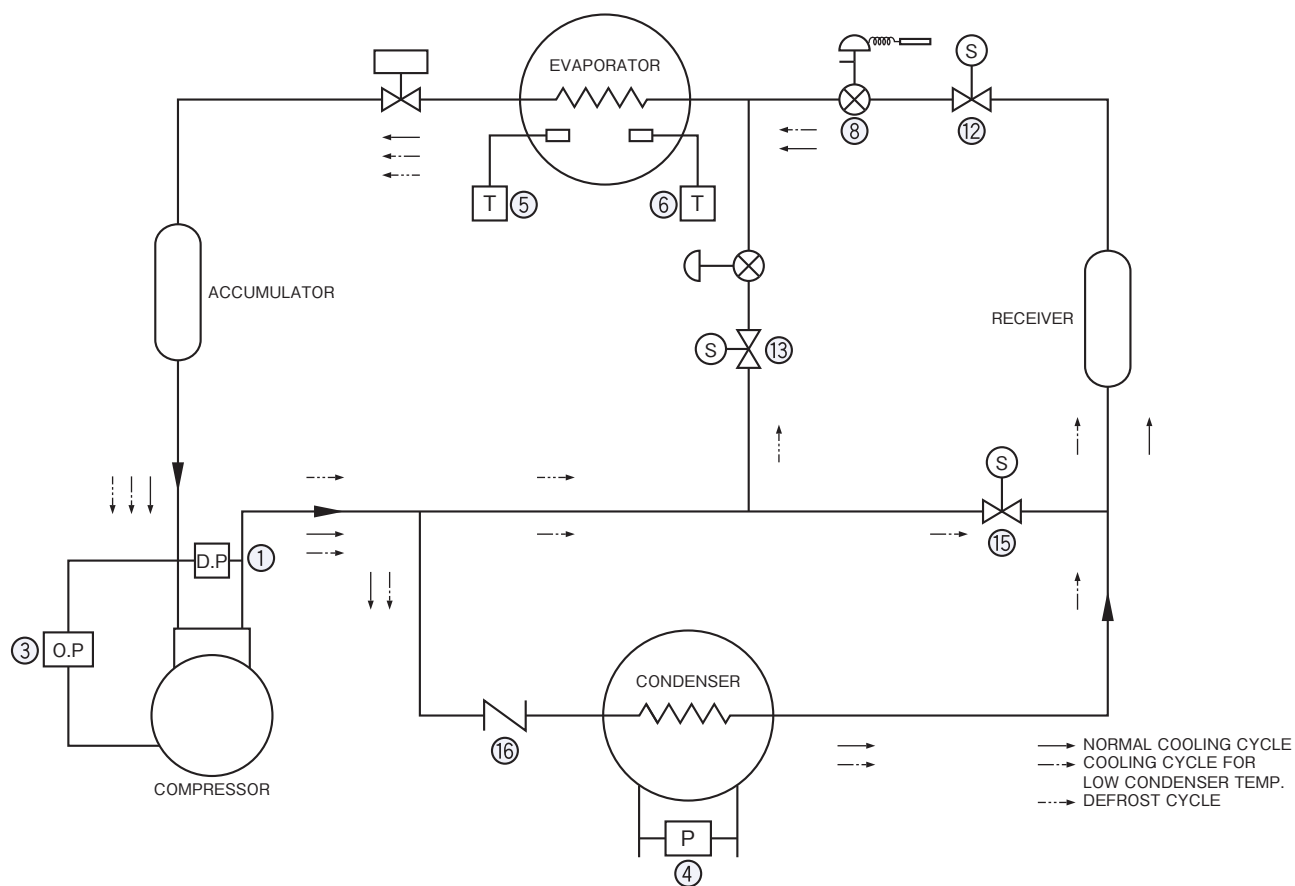
1 kg=2.20462 lb, 1mm=0.03937 inch  
 1 U.S. Refrigeration Ton=12,000 Btu/h=3,024 kcal/h  
 1 kgf/cm<sup>2</sup>=98.0667 kPa=0.980667 bar

2. SATURATED VAPOUR PRESSURE (°C ↔ MPa (abs), °C ↔ kgf/cm² (abs))



### 3. APPLICATION EXAMPLES

#### 1). Refrigeration System with Hot Gas Defrosting



① Dual Pressure Controls  
Type DYS



② Pressure Controls  
Type SYS



③ Oil Protection Controls  
Type ONS



④ Differential Pressure Controls  
Type WNS



⑤ Temperature Controls  
Type TNS



⑥ Temperature Controls  
Type ALS



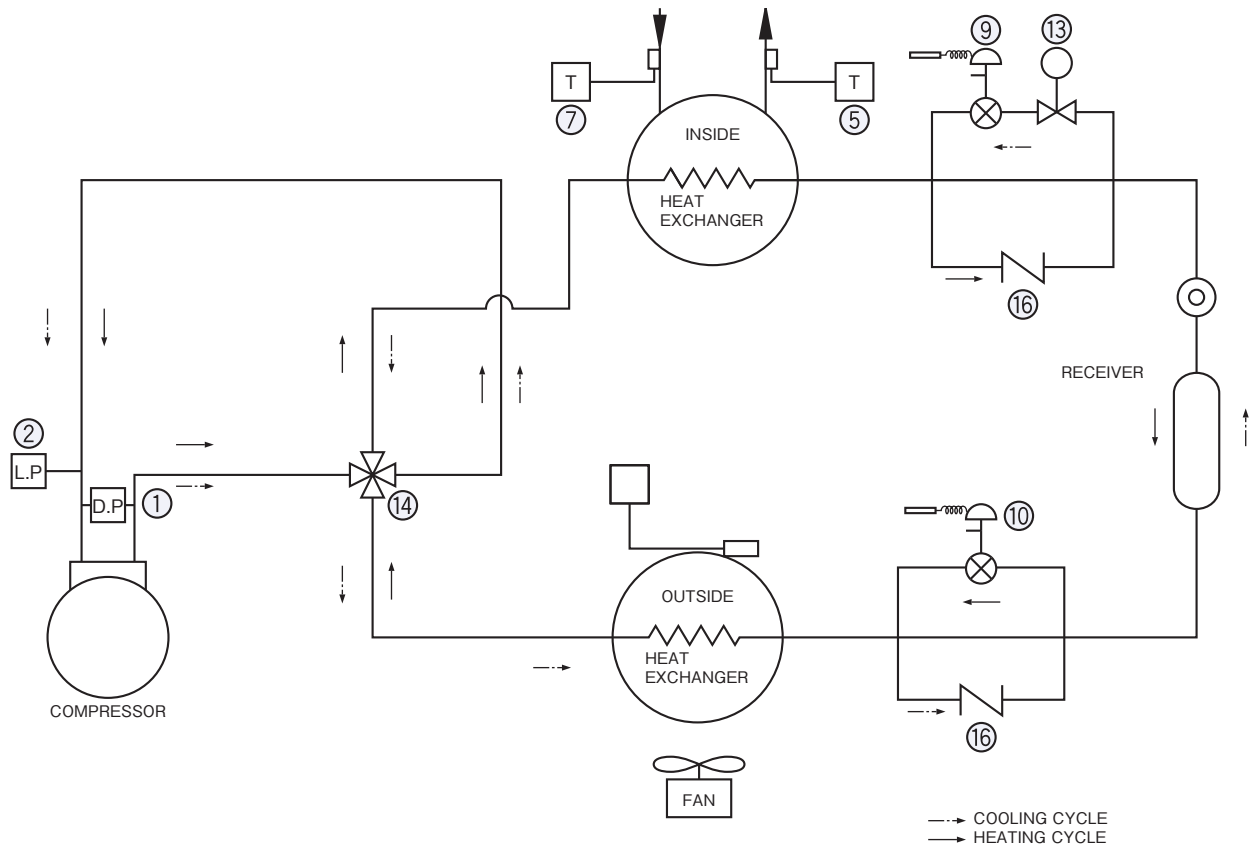
⑦ Electronic Step Thermostat  
Type DSE



⑧ Thermostatic Expansion Valve  
Type ATX



## 2). Heat Pump System...Chiller



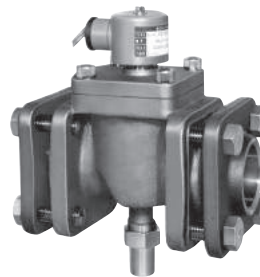
⑨ Thermostatic Expansion Valve  
Type RCX



⑩ Thermostatic Expansion Valve  
Type SCX



⑫ Solenoid Valve  
Type REV...E



⑬ Solenoid Valve  
Type REV...B



⑭ 4-Way Reversing Valve  
Type STF



⑮ Solenoid Valve  
Type VPV



⑯ Check Valve  
Type BCV



# APPROVAL STANDARD LIST

- Our products are listed by type number. In some types of products, not all models are listed.
- Some approved items have special catalog number for the listing.
- Some approved items require extra charges.
- Please contact the company for details.

## Standard for safety

|       | Type Number                                                                                                                                |                                |                                          |
|-------|--------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|------------------------------------------|
| CE    | Pressure Controls                                                                                                                          | Temperature Controls           | Solenoid Valves                          |
|       | ANS(W)(P), DNS(W)(P)<br>FNS(W)(P), HNS(W)<br>ONS(W), SNS(W)(P)<br>WNS(W), DYS, SYS<br>ETB, FTB, HTB LTB,<br>ACB, LCB, CCB XSK,<br>NSK, YNS | CNS(W)(P), INS(W)<br>TNS(W)(P) | REV, WEV, RPV, STF<br>BPV, VPV, SEV, HPV |
|       | Flow Switches                                                                                                                              | Fan Speed Controllers          |                                          |
|       | FQS                                                                                                                                        | RGE, XGE                       |                                          |
| UL    | Pressure Controls                                                                                                                          | Temperature Controls           | Solenoid Valves                          |
|       | DNS, HNS, SNS, WNS<br>ETB, FTB, HTB, LTB, SYS<br>ACB, XSK, NSK, DYS                                                                        | CNS, TNS, EWS<br>FWS, LWS, RWS | TEV, VPV, STF                            |
|       | Flow Switches                                                                                                                              | Electronic Expansion Valves    | Fan Speed Controllers                    |
|       | FQS                                                                                                                                        | AKV, UKV, VKV                  | RGE, XGE                                 |
|       |                                                                                                                                            |                                |                                          |
|       |                                                                                                                                            |                                |                                          |
| CQC   | Pressure Controls                                                                                                                          | Solenoid Valves                | Electronic Expansion Valves              |
|       | DYS, SYS, ACB, LCB, NSK<br>SNS, HNS, YNS, ONS, WNS                                                                                         | RPV, STF, TEV-S                | UKV                                      |
|       |                                                                                                                                            | Fan Speed Controllers          |                                          |
|       |                                                                                                                                            | RGE                            |                                          |
| CSA   | Pressure Controls                                                                                                                          |                                | Fan Speed Controllers                    |
|       | ETB, FTB, HTB, LTB, ACB, DNS, SNS                                                                                                          |                                | RGE, XGE                                 |
| IECEE | Pressure Controls                                                                                                                          |                                |                                          |
|       | ETB, FTB, HTB, LTB, ACB, LCB, SNS, HNS, WNS, YNS, ONS, DYS, SYS                                                                            |                                |                                          |
| DIN   | Pressure Controls                                                                                                                          |                                |                                          |
|       | ACB, DNS, SNS                                                                                                                              |                                |                                          |
| VDE   | Pressure Controls                                                                                                                          |                                |                                          |
|       | ETB, FTB, HTB, LTB, ACB                                                                                                                    |                                |                                          |
|       | Solenoid Valves                                                                                                                            |                                |                                          |
|       | STF(01~20, H01, H02)                                                                                                                       |                                |                                          |

## Standard for marine

|                 | Type Number                                |                      |
|-----------------|--------------------------------------------|----------------------|
|                 | Pressure Controls                          | Temperature Controls |
| <b>LR</b>       | ANS, DNS<br>FNS, HNS, ONS<br>SNS, WNS, YNS | CNS, INS, TNS        |
| <b>DNV · GL</b> | ANS, DNS<br>FNS, HNS, ONS<br>SNS, WNS, YNS | CNS, INS, TNS        |
| <b>BV</b>       | ANS, DNS<br>FNS, HNS, ONS<br>SNS, WNS, YNS | CNS, INS, TNS        |
| <b>ABS</b>      | ANS, DNS, FNS<br>HNS, ONS, SNS<br>WNS, YNS | CNS, INS, TNS        |
| <b>NK</b>       | ANS, DNS<br>FNS, HNS, ONS<br>SNS, WNS, YNS | CNS, INS, TNS        |

LR (Lloyd's Register of Shipping)...England  
 DNV·GL (Det Norske Veritas and Germanischer Lloyd)...  
 (Norway and Germany)  
 BV (Bureau Veritas)...France  
 ABS (American Bureau of Shipping)...America  
 NK (Nippon Kaiji Kyokai)...Japan

## International Protection Standard

| Type Number                                                         | International Protection                        |
|---------------------------------------------------------------------|-------------------------------------------------|
| Pressure Controls                                                   |                                                 |
| ONS, WNS, YNS, DYS<br>SYS, ETB, FTB, HTB, LTB                       | IP20                                            |
| ANS, FNS, HNS                                                       | IP20(Standard type)<br>IP44(When adding cover.) |
| ANS(W), DNS(W), FNS(W)<br>HNS(W), ONS(W), SNS(W)<br>WNS(W)          | IP62                                            |
| ANS(P), DNS(P), FNS(P)<br>SNS(P), NSK(BH)                           | IP66                                            |
| Temperature Controls · Humidity Controls                            |                                                 |
| EWS, FWS, LWS, RWS<br>CNS, INS, TNS, ALS, BLS<br>PWS, ARS, WRS, AHS | IP20                                            |
| *1 ALE, BLE                                                         | IP44                                            |
| CNS(W), INS(W), TNS(W)                                              | IP62                                            |
| CNS(P), TNS(P)                                                      | IP66                                            |

| Type Number                    | International Protection |
|--------------------------------|--------------------------|
| Pulse Converters               |                          |
| LNE                            | IP20                     |
| Solenoid Valves                |                          |
| REV(W), UEV(W), WEV(W)         | IP34                     |
| RPV(DIN plug)                  | IP65                     |
| RPV(Read wire)                 | IP67                     |
| Damper & Valve Motor Actuators |                          |
| EGK, WGK                       | IP62                     |
| Flow Switches                  |                          |
| FQS(standard Type)             | IP20                     |
| FQS(Drip proof models)         | IP62                     |
| Fan Speed Controllers          |                          |
| RGE                            | IP54                     |
| XGE                            | IP65                     |
| Temperature Recorders          |                          |
| AKM                            | IP20                     |

\* 1 When using the mounting bracket, the degree of protection between the front of the product and the bracket.

- Basically, the IP protection level of this catalog is based on the measured value of JIS C 0920.
- The above IP protection grade is a general benchmark for the selected product.
- If you need a certificate issued by an external agency, please contact us.

**PRESSURE CONTROLS**

|                                                      |       |
|------------------------------------------------------|-------|
| <b>SMALL PRESSURE CONTROLS</b> .....                 | 9–10  |
| Type <b>ACB &amp; LCB</b>                            |       |
| <b>SMALL PRESSURE CONTROLS</b> .....                 | 11–12 |
| Type <b>LTB, ETB, HTB &amp; FTB</b>                  |       |
| <b>SINGLE FUNCTION PRESSURE CONTROLS</b> .....       | 13–14 |
| Type <b>SNS &amp; HNS</b>                            |       |
| <b>DUAL PRESSURE CONTROLS</b> .....                  | 15–16 |
| Type <b>DNS</b>                                      |       |
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| Type <b>FNS &amp; ANS</b>                            |       |
| <b>OIL PROTECTION CONTROLS</b> .....                 | 21–22 |
| Type <b>ONS</b>                                      |       |
| <b>DIFFERENTIAL PRESSURE CONTROLS</b> .....          | 23    |
| Type <b>WNS &amp; YNS</b>                            |       |
| <b>PRESSURE SENSORS</b> .....                        | 25–27 |
| Type <b>NSK &amp; XSK</b>                            |       |

# SMALL PRESSURE CONTROLS (DISC TYPE)

High Volume OEM Item

Type ACB & LCB

SAGINO MIYA

## GENERAL DESCRIPTION

- Pressure Control CB series are disc type small pressure controls featuring compact structure and field proven high quality.
- It is designed to suit modern designed application with its compact and various type of connection styles, such application as air conditioning, automobile industries and others.

Type ACB...High & medium pressure range

Type LCB...Low pressure range

CE mark applicable (available upon request for Type ACB & Type LCB)

UL recognized (available upon request for Type ACB)



Type ACB, LCB



Type ACB, LCB

## SPECIFICATIONS

- Ambient temperature: -30 to 100°C

## STANDARD TYPE NUMBER SELECTION

Type ACB & LCB

Unit: MPa {kgf/cm<sup>2</sup>}

| Catalog No. | Contact Functions                       | Range      |            | Max. Pressure | Pressure Connections              | Terminal Construction (DIMENSION)               | Application              | Wt. (kg)                             |
|-------------|-----------------------------------------|------------|------------|---------------|-----------------------------------|-------------------------------------------------|--------------------------|--------------------------------------|
|             |                                         | Off        | On         |               |                                   |                                                 |                          |                                      |
| ACB         | SPST<br>(High Cut)<br>(A)               | 4.2 {42}   | 3.3 {33}   | 4.5 {45}      | 1/4" Solder<br>OR<br>Female Flare | Open( ① ・ ③ )<br>OR<br>Water Proof<br>( ② ・ ④ ) | High Pressure<br>Cut Out | Open (0.03)<br>Water Proof<br>(0.06) |
|             |                                         | 3.1 {31}   | 2.4 {24}   |               |                                   |                                                 |                          |                                      |
|             |                                         | 2.8 {28}   | 2.2 {22}   |               |                                   |                                                 |                          |                                      |
|             |                                         | 2.6 {26}   | 2.1 {21}   |               |                                   |                                                 |                          |                                      |
|             |                                         | 2.3 {23}   | 1.8 {18}   |               |                                   |                                                 |                          |                                      |
|             | SPST(High Cut)<br>+ Manual Reset<br>(B) | 2.8 {28}   | 2.1 {21}   |               |                                   | Water Proof( ⑤ )                                |                          | 0.06                                 |
|             |                                         | 2.6 {26}   | 2.0 {20}   |               |                                   |                                                 |                          |                                      |
|             |                                         | 2.3 {23}   | 1.8 {18}   |               |                                   |                                                 |                          |                                      |
|             | SPDT<br>(C)                             | 2.8 {28}   | 2.2 {22}   |               |                                   | Open( ⑥ )<br>OR<br>Water Proof( ⑦ )             |                          | Open (0.03)<br>Water Proof<br>(0.06) |
|             |                                         | 2.6 {26}   | 2.1 {21}   |               |                                   |                                                 |                          |                                      |
|             |                                         | 2.3 {23}   | 1.8 {18}   |               |                                   |                                                 |                          |                                      |
|             | SPDT<br>+ Manual Reset<br>(D)           | 2.8 {28}   | 2.1 {21}   |               |                                   | Water Proof( ⑧ )                                |                          | 0.08                                 |
|             |                                         | 2.6 {26}   | 2.0 {20}   |               |                                   |                                                 |                          |                                      |
|             |                                         | 2.3 {23}   | 1.8 {18}   |               |                                   |                                                 |                          |                                      |
| LCB         | SPST<br>(Low Cut)<br>(E)                | 0.22 {2.2} | 0.36 {3.6} | 1.5 {15}      |                                   | Open( ① ・ ③ )<br>OR<br>Water Proof<br>( ② ・ ④ ) | Low Pressure<br>Cut Out  | Open (0.03)<br>Water Proof<br>(0.06) |
|             |                                         | 0.17 {1.7} | 0.27 {2.7} |               |                                   |                                                 |                          |                                      |
|             |                                         | 0.07 {0.7} | 0.17 {1.7} |               |                                   |                                                 |                          |                                      |
|             |                                         | 0.05 {0.5} | 0.15 {1.5} |               |                                   |                                                 |                          |                                      |

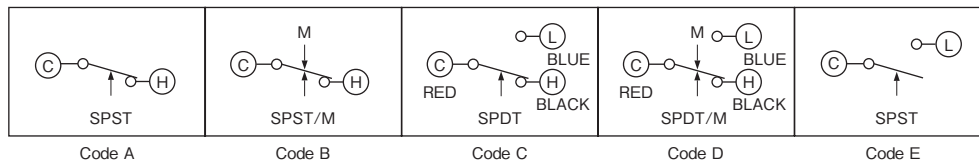
## ELECTRICAL RATINGS

Type ACB & LCB

| Category of Ratings |                       |                      | M Rating |         |        | L Rating  |           |           | T Rating    |              |
|---------------------|-----------------------|----------------------|----------|---------|--------|-----------|-----------|-----------|-------------|--------------|
| Rated Current (A)   | Rated Voltage (V)     | Power Factor (cos ϕ) | 125V.AC  | 250V.AC | 12V.DC | 125V.AC   | 250V.AC   | 12V.DC    | 12/24V.DC   |              |
|                     | Non-Inductive Current |                      | 1        | 1 to 6  | 1 to 4 | 1 to 4    | 0.02 to 2 | 0.02 to 1 | 0.05 to 0.1 | 0.01 to 0.05 |
|                     | Inductive Current     | Full Load            | 0.75     |         |        |           |           |           |             |              |
| Inrush Current      |                       | —                    | 1 to 24  | 1 to 16 | —      | 0.02 to 8 | 0.02 to 4 | —         | —           |              |

## CONTACT FUNCTIONS

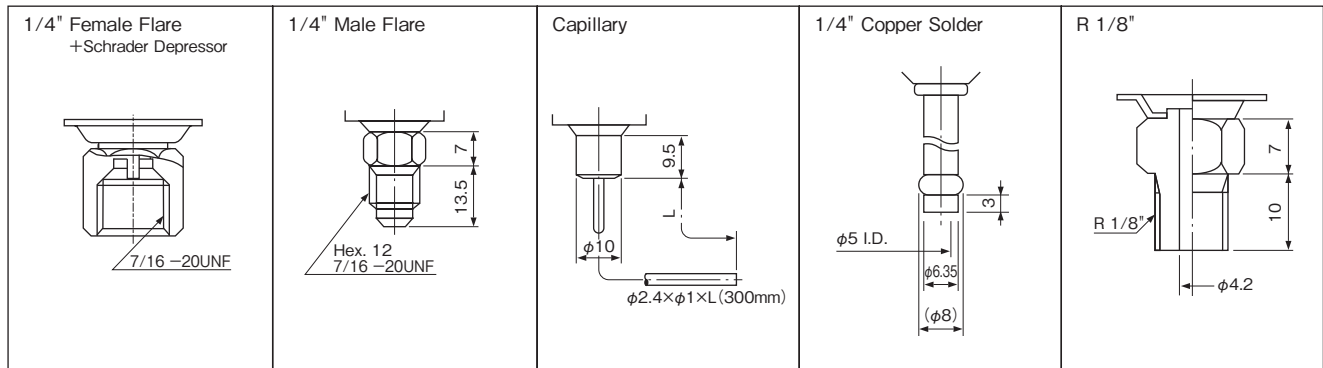
Type ACB & LCB



↑ : Operating direction on press. increase at High Press.Side  
M ↓ : Operating direction on manual reset

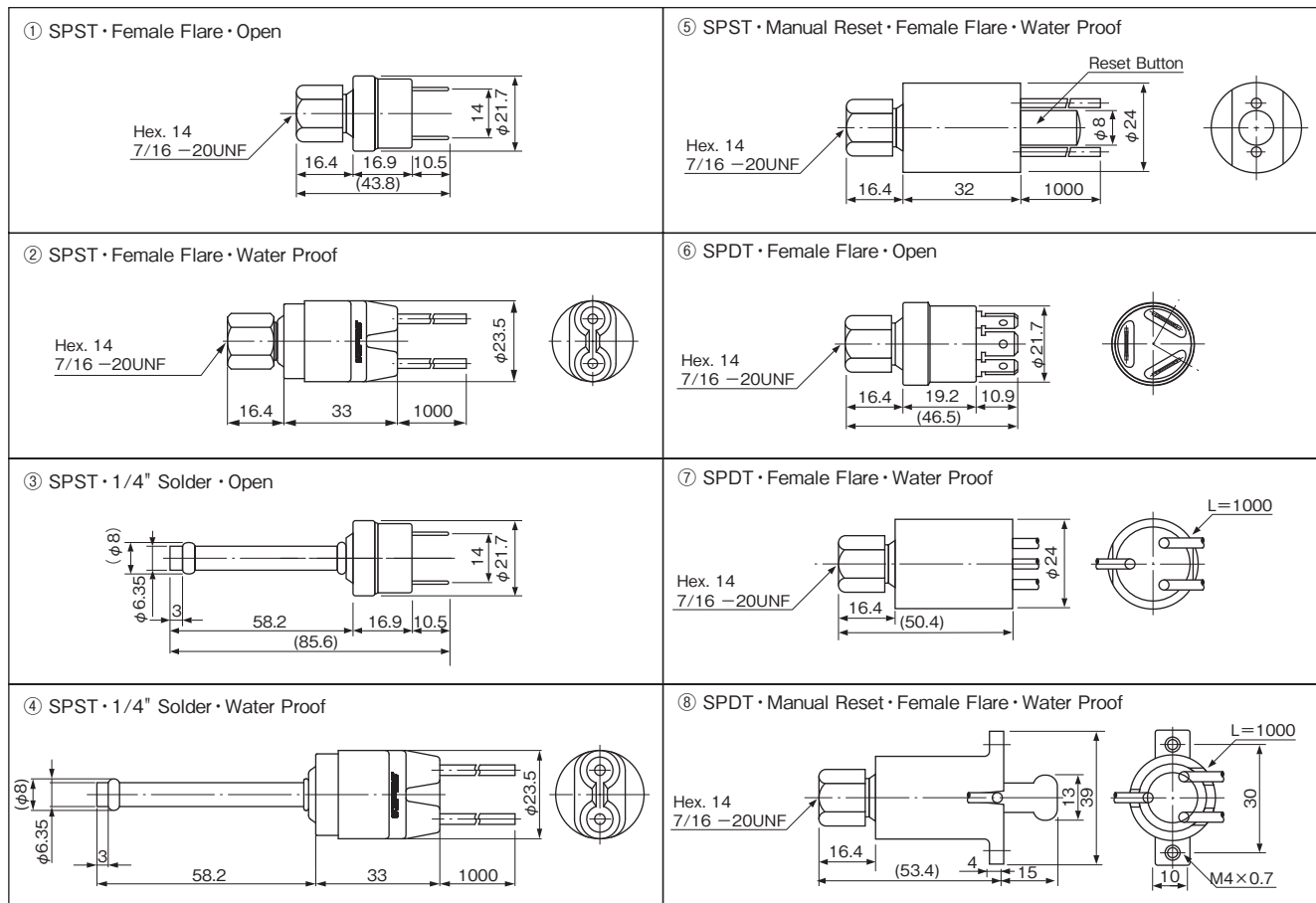
## PRESSURE CONNECTIONS

Unit: mm



## DIMENSIONS

Unit: mm



# SMALL PRESSURE CONTROLS

High Volume OEM Item

Type LTB, ETB, HTB & FTB

SAGINO MIYA

## GENERAL DESCRIPTION

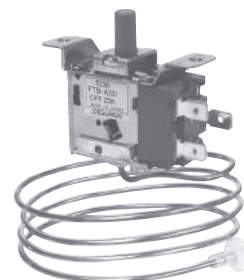
- Factory set pressure switch designed for use in refrigeration units of quantity production such as room air conditioner (heat pump), packaged air conditioner (heat pump), water chiller etc.
- With SPDT contact mechanism.
- Models identified with electrical rating code L can be used for minimum 0.02A/125V.AC rating.
- Models with 0.78 to 1.96 MPa {8 to 20 kgf/cm<sup>2</sup>} range are also available for HTB and FTB.
- Models with 0.098 MPa {1 kgf/cm<sup>2</sup>} differential are also available for HTB (max. range limit: 1.27 MPa {13 kgf/cm<sup>2</sup>}).

CE mark applicable (available upon request)

UL recognized (available upon request)



Type HTB



Type FTB

## SPECIFICATIONS

- Fluid temperature: -20 to 120°C
- Ambient temperature: -20 to 70°C

## TYPE NUMBER SELECTION

Unit: MPa {kgf/cm<sup>2</sup>}

| Catalog No. | Application   | Range     |             | Differential                                                                   | Factory Setting |           | Max. Working Pressure | Pressure Connections | * Electrical Ratings | Wt. (kg) |     |
|-------------|---------------|-----------|-------------|--------------------------------------------------------------------------------|-----------------|-----------|-----------------------|----------------------|----------------------|----------|-----|
|             |               | Min.      | Max.        |                                                                                | On              | Off       |                       |                      |                      |          |     |
| LTB-A301    | Low Pressure  | 0         | 0.392 {4}   | 0.059 to 0.147 {0.6 to 1.5}                                                    | 0.294 {3}       | 0.196 {2} | 1.5 {15}              | ①                    | H                    | 0.08     |     |
| LTB-A302    |               |           |             |                                                                                |                 |           |                       |                      | M                    |          |     |
| LTB-A303    |               |           |             |                                                                                |                 |           |                       |                      | L                    |          |     |
| LTB-A304    |               |           |             |                                                                                |                 |           |                       | ②                    | H                    |          |     |
| LTB-A305    |               |           |             |                                                                                |                 |           |                       |                      | M                    |          |     |
| LTB-A306    |               |           |             |                                                                                |                 |           |                       |                      | L                    |          |     |
| ETB-A301    |               | 0.098 {1} | 0.245 {2.5} | Automatic operation on pressure decrease and manual reset on pressure increase | Manual Reset    | 0.098 {1} |                       | ①                    | H                    | 0.1      |     |
| ETB-A302    |               |           |             |                                                                                |                 |           |                       |                      | M                    |          |     |
| ETB-A303    |               |           |             |                                                                                |                 |           |                       |                      | L                    |          |     |
| ETB-A304    |               |           |             |                                                                                |                 |           |                       | ②                    | H                    |          |     |
| ETB-A305    |               |           |             |                                                                                |                 |           |                       |                      | M                    |          |     |
| ETB-A306    |               |           |             |                                                                                |                 |           |                       |                      | L                    |          |     |
| HTB-A301    | High Pressure | 0.78 {8}  | 1.96 {20}   | 0.29 to 0.49 {3 to 5}                                                          | 1.96 {20}       | 2.45 {25} | 3.3 {33}              | ①                    | H                    | 0.09     |     |
| HTB-A302    |               |           |             |                                                                                |                 |           |                       |                      | M                    |          |     |
| HTB-A303    |               |           |             |                                                                                |                 |           |                       |                      | L                    |          |     |
| HTB-A304    |               | 1.96 {20} | 2.94 {30}   | 0.29 to 0.69 {3 to 7}                                                          |                 |           |                       | ②                    | H                    |          |     |
| HTB-A305    |               |           |             |                                                                                |                 |           |                       |                      | M                    |          |     |
| HTB-A306    |               |           |             |                                                                                |                 |           |                       |                      | L                    |          |     |
| FTB-A301    |               | 0.78 {8}  | 2.94 {30}   | Automatic operation on pressure increase and manual reset on pressure decrease | Manual Reset    |           |                       |                      | ①                    | H        | 0.1 |
| FTB-A302    |               |           |             |                                                                                |                 |           |                       |                      |                      | M        |     |
| FTB-A303    |               |           |             |                                                                                |                 |           |                       |                      |                      | L        |     |
| FTB-A304    |               |           |             |                                                                                |                 |           |                       |                      | ②                    | H        |     |
| FTB-A305    |               |           |             |                                                                                |                 |           |                       |                      |                      | M        |     |
| FTB-A306    |               |           |             |                                                                                |                 |           |                       |                      |                      | L        |     |

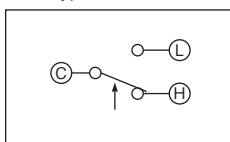
\* Refer to Electrical Ratings Table in the list below.

## ELECTRICAL RATINGS

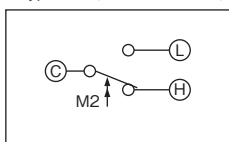
| Rated Voltage (V)     |                | Terminal | Power Factor (cos φ) | H Rating |         | M Rating |            | L Rating  |           |
|-----------------------|----------------|----------|----------------------|----------|---------|----------|------------|-----------|-----------|
|                       |                |          |                      | 125V.AC  | 250V.AC | 125V.AC  | 250V.AC    | 125V.AC   | 250V.AC   |
| Non-Inductive Current |                | C-L      | 1                    | 1 to 10  | 1 to 10 | 1 to 3   | 0.5 to 1.5 | 0.02 to 2 | 0.02 to 1 |
| Inductive Current     | Full Load      |          | 0.75                 | 1 to 6   | 1 to 6  | 1 to 2   | 0.5 to 1   |           |           |
|                       | Inrush Current |          | —                    | 1 to 24  | 1 to 24 | 1 to 8   | 0.5 to 4   |           |           |
| Non-Inductive Current |                | C-H      | 1                    | 1 to 16  | 1 to 16 | 1 to 6   | 0.5 to 5   | 0.02 to 2 | 0.02 to 1 |
| Inductive Current     | Full Load      |          | 0.75                 | 1 to 16  | 1 to 16 | 1 to 6   | 0.5 to 4   |           |           |
|                       | Inrush Current |          | —                    | 1 to 64  | 1 to 64 | 1 to 24  | 0.5 to 16  |           |           |

## CONTACT FUNCTIONS

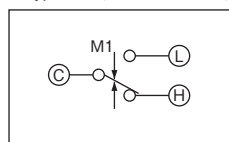
Type LTB & HTB



Type ETB (M2 : Manual Reset)



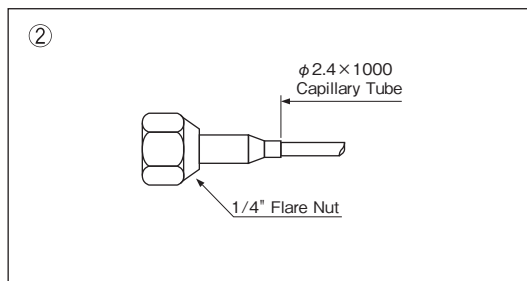
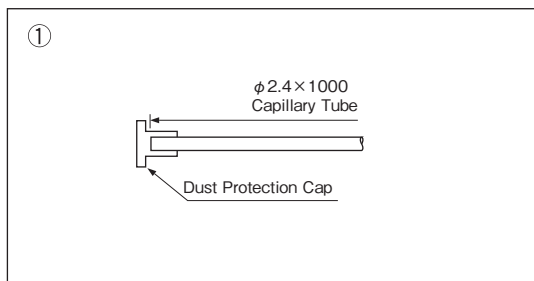
Type FTB (M1 : Manual Reset)



|   |                            |
|---|----------------------------|
| C | Common Terminal            |
| L | Close on Pressure Increase |
| H | Close on Pressure Decrease |

↑ : Operating direction on press. increase at High Press.Side  
M1 ↓, M2 ↑ : Operating direction on manual reset

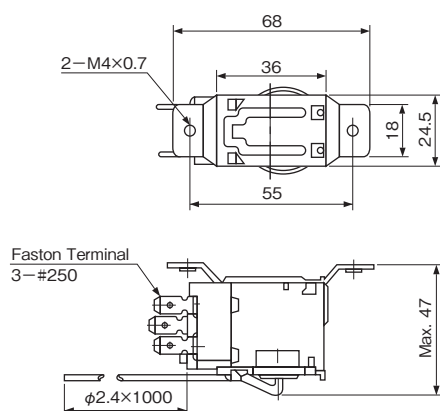
## PRESSURE CONNECTIONS



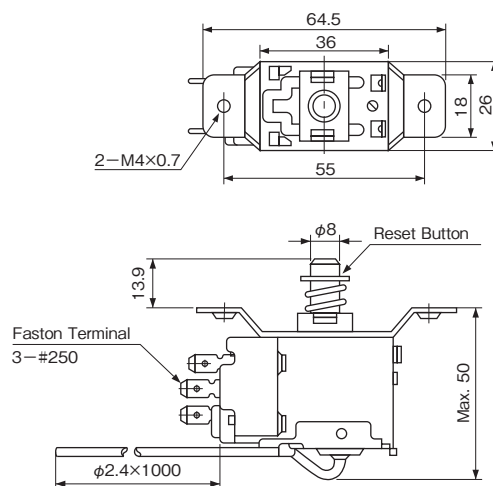
• 1/4" Solder Connection is also available upon request.

## DIMENSIONS

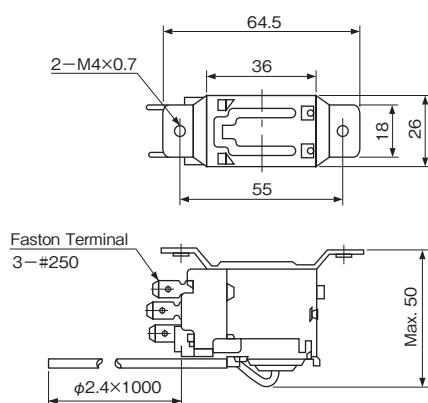
Type LTB



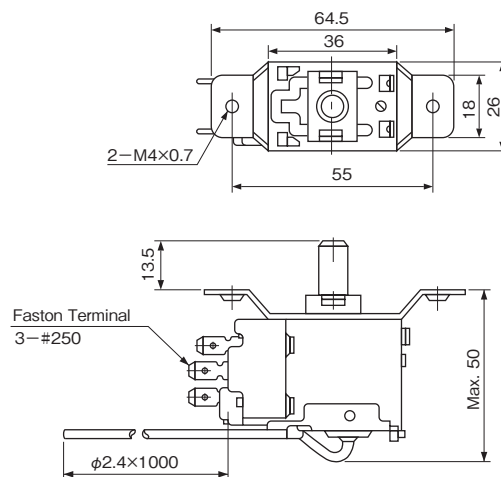
Type ETB



Type HTB



Type FTB



Unit: mm

# SINGLE FUNCTION PRESSURE CONTROLS

## Type SNS & HNS

**SAGInoMIYA**

### GENERAL DESCRIPTION

- For use with fluorinated refrigerants as well as with air and water. (Allowable fluid temp.: -20 to 120°C)
- Type SNS for universal application.
- Type HNS for high pressure safety cut out.
- Available drip proof enclosure for marine application or explosion proof enclosure for special application.
- Mounting bracket is supplied as standard.
- With SPDT contact mechanism.
- IP44 with upper lid (option).
- Stainless steel models are available upon request.



Type SNS



Type HNS

CE mark applicable (available upon request)

UL recognized (available upon request)

### SPECIFICATIONS

- Fluid temperature: -20 to 120°C
- Ambient temperature: -20 to 70°C

### TYPE NUMBER SELECTION

#### Type SNS—Automatic reset type

Unit: MPa {kgf/cm<sup>2</sup>}

| Catalog No. | Range           |          | Differential |            | Factory Setting |            | Max. Working Pressure | Contact Function | Wt. (kg) |
|-------------|-----------------|----------|--------------|------------|-----------------|------------|-----------------------|------------------|----------|
|             | Min.            | Max.     | Min.         | Max.       | Off (On)        | On (Off)   |                       |                  |          |
| SNS-C101X   | −0.06 {−50cmHg} | 0.1 {1}  | 0.015 {0.15} | 0.05 {0.5} | 0.025 {0.25}    | 0.05 {0.5} | 0.3 {3}               | Diagram 1        | 0.33     |
| SNS-C102X   | −0.02 {−20cmHg} | 0.2 {2}  | 0.025 {0.25} | 0.15 {1.5} |                 |            | 0.5 {5}               |                  |          |
| SNS-C103X   | −0.06 {−50cmHg} | 0.3 {3}  | 0.035 {0.35} | 0.2 {2}    | 0.05 {0.5}      | 0.15 {1.5} | 1 {10}                |                  |          |
| SNS-C104X   | −0.06 {−50cmHg} | 0.4 {4}  | 0.04 {0.4}   |            | 0.1 {1}         | 0.2 {2}    | 1.5 {15}              |                  |          |
| SNS-C106X   | −0.06 {−50cmHg} | 0.6 {6}  | 0.06 {0.6}   | 0.4 {4}    | 0.2 {2}         | 0.3 {3}    |                       |                  |          |
| SNS-C110X   | 0.1 {1}         | 1 {10}   | 0.1 {1}      | 0.3 {3}    | 0.4 {4}         | 0.6 {6}    |                       |                  |          |
| SNS-C120X   | 0.5 {5}         | 2 {20}   | 0.2 {2}      | 0.5 {5}    | 1.2 {12}        | 1.5 {15}   | 3 {30}                |                  |          |
| SNS-C130X   |                 | 3 {30}   | 0.3 {3}      | 1 {10}     | 2 {20}          | 2.5 {25}   | 3.3 {33}              |                  |          |
| SNS-C135X   | 1 {10}          | 3.5 {35} | 0.5 {5}      | 1.5 {15}   | 2.5 {25}        | 3 {30}     | 3.8 {38}              |                  |          |

#### Type SNS—Manual reset type

Unit: MPa {kgf/cm<sup>2</sup>}

| Catalog No.        | Range           |         | Manual Reset                                                                       | * Factory Setting |              | Max. Working Pressure | Contact Function | Wt. (kg) |
|--------------------|-----------------|---------|------------------------------------------------------------------------------------|-------------------|--------------|-----------------------|------------------|----------|
|                    | Min.            | Max.    |                                                                                    | Off               | On           |                       |                  |          |
| <b>SNS-C102XM2</b> | -0.02 {-20cmHg} | 0.2 {2} | Automatic operation on pressure decrease, and manual reset on pressure increase ※1 | 0.025 {0.25}      | Manual Reset | 0.5 {5}               | Diagram 2        | 0.33     |
| <b>SNS-C106XM2</b> | -0.06 {-50cmHg} | 0.6 {6} |                                                                                    | 0.2 {2}           |              | 1.5 {15}              |                  |          |
| <b>SNS-C130XM2</b> | 0.5 {5}         | 3 {30}  |                                                                                    | 2 {20}            |              | 3.3 {33}              |                  |          |

\* Based on the 1-3 terminal connection.

#### Type HNS—Automatic reset type

Unit: MPa {kgf/cm<sup>2</sup>}

| Catalog No.      | Range   |        | Differential        | * Factory Setting |          | Max. Working Pressure | Contact Function | Wt. (kg) |
|------------------|---------|--------|---------------------|-------------------|----------|-----------------------|------------------|----------|
|                  | Min.    | Max.   |                     | Off               | On       |                       |                  |          |
| <b>HNS-C130X</b> | 0.8 {8} | 3 {30} | 0.3 to 0.5 {3 to 5} | 2 {20}            | 1.6 {16} | 3.3 {33}              | Diagram 3        | 0.24     |

\* Based on the 1-3 terminal connection.

#### Type HNS—Manual reset type

Unit: MPa {kgf/cm<sup>2</sup>}

| Catalog No.        | Range   |        | Manual Reset                                                                       | * Factory Setting |              | Max. Working Pressure | Contact Function | Wt. (kg) |
|--------------------|---------|--------|------------------------------------------------------------------------------------|-------------------|--------------|-----------------------|------------------|----------|
|                    | Min.    | Max.   |                                                                                    | Off               | On           |                       |                  |          |
| <b>HNS-C130XM1</b> | 0.8 {8} | 3 {30} | Automatic operation on pressure increase, and manual reset on pressure decrease ※2 | 2 {20}            | Manual Reset | 3.3 {33}              | Diagram 4        | 0.24     |

\* Based on the 1-3 terminal connection.

- Enclosure: IP20
- Drip Proof Models: Available upon request. (Refer to page 48, 49, 50, 51.)

※1 Please press the reset button after the pressure increased at specified point.

Pressure Range : 02 ... about 0.04 MPa

06 ... about 0.1 MPa

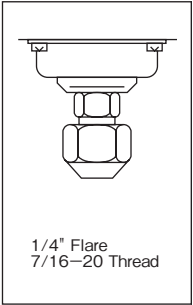
30 ... about 0.5 MPa

※2 Please press the reset button after the pressure decreased about 0.7 MPa or less.

ELECTRICAL RATINGS

| Rated Voltage (V)     |                | Power Factor (cos φ) | 125/250V. AC |
|-----------------------|----------------|----------------------|--------------|
| Rated Current (A)     |                |                      |              |
| Non-Inductive Current |                | 1                    | 12           |
| Inductive Current     | Full Load      | 0.75                 |              |
|                       | Inrush Current | —                    | 72           |

PRESSURE CONNECTIONS



Standard

Refer to page 45, 46.

CONTACT FUNCTIONS

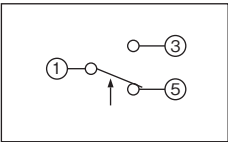


Diagram 1

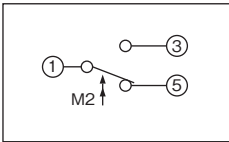


Diagram 2

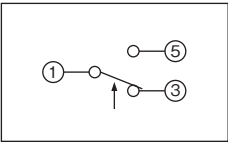


Diagram 3

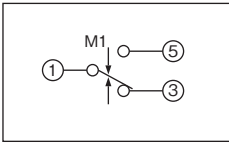


Diagram 4

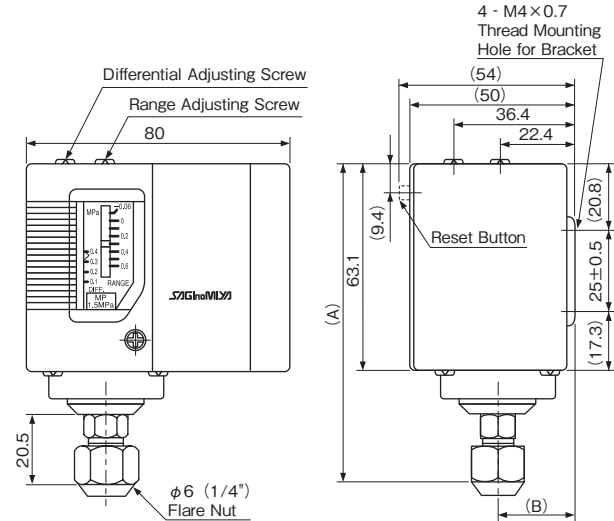
|   | Diagram 1 & 2             | Diagram 3 & 4             |
|---|---------------------------|---------------------------|
| 1 | Common Terminal           | Common Terminal           |
| 3 | Open on Pressure Increase | Open on Pressure Increase |
| 5 | Open on Pressure Decrease | Open on Pressure Decrease |

↑ : Operating direction on press. increase at High Press. Side  
M1 ↓ , M2 ↑ : Operating direction on manual reset

DIMENSIONS

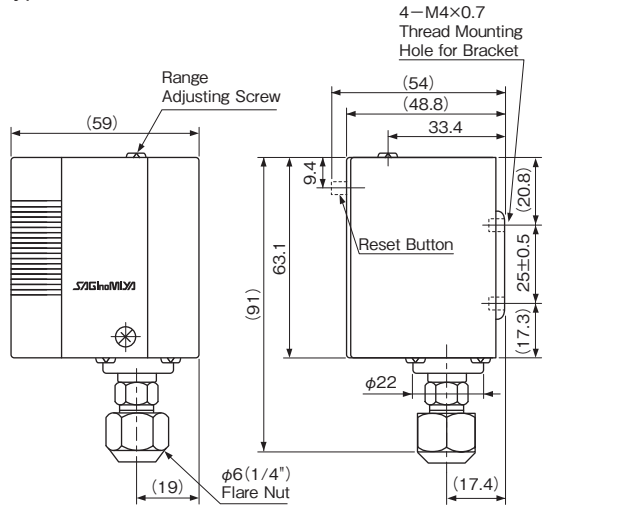
Standard

Type SNS



| Catalog No. | Unit: mm |      |
|-------------|----------|------|
|             | A        | B    |
| SNS-C101X   | 113.3    | 22.4 |
| SNS-C102X   | 99.7     |      |
| SNS-C103X   |          |      |
| SNS-C104X   | 96.8     |      |
| SNS-C106X   |          |      |
| SNS-C110X   |          |      |
| SNS-C120X   | 95.9     | 18.4 |
| SNS-C130X   | 93.5     |      |
| SNS-C135X   |          |      |
| SNS-C102XM2 | 99.7     | 22.4 |
| SNS-C106XM2 | 96.8     |      |
| SNS-C130XM2 | 93.5     | 18.4 |

Type HNS



Unit: mm

# DUAL PRESSURE CONTROLS

Type DNS

SAGHOMIYA

## GENERAL DESCRIPTION

- For use with fluorinated refrigerants as well as with air and water. (Allowable Fluid Temp.: -20 to 120°C)
- Various contact functions are available.
- Available drip proof enclosure for marine application or explosion proof enclosure for special application.
- Mounting bracket is supplied as standard.
- IP44 with upper lid (option).
- Stainless steel models are available upon request.



CE mark applicable (available upon request)

UL recognized (available upon request)

## SPECIFICATIONS

- Fluid temperature: -20 to 120°C
- Ambient temperature: -20 to 70°C

## TYPE NUMBER SELECTION

Automatic reset type

Unit: MPa {kgf/cm<sup>2</sup>}

| Catalog No. | Pressure Side | Range           |         | Differential                        |         | Factory Setting |          | Max. Working Pressure | Contact Function | Wt. (kg) |
|-------------|---------------|-----------------|---------|-------------------------------------|---------|-----------------|----------|-----------------------|------------------|----------|
|             |               | Min.            | Max.    | Min.                                | Max.    | Off             | On       |                       |                  |          |
| DNS-D304X   | Low Side      | -0.06 {-50cmHg} | 0.4 {4} | 0.04 {0.4}                          | 0.2 {2} | 0.1 {1}         | 0.2 {2}  | 1.5 {15}              | Diagram 1        | 0.49     |
|             | High Side     | 0.8 {8}         | 3 {30}  | Approx. 0.4 fixed {Approx. 4 fixed} |         | 2 {20}          | 1.6 {16} | 3.3 {33}              |                  |          |
| DNS-D306X   | Low Side      | -0.06 {-50cmHg} | 0.6 {6} | 0.06 {0.6}                          | 0.4 {4} | 0.2 {2}         | 0.3 {3}  | 1.5 {15}              |                  |          |
|             | High Side     | 0.8 {8}         | 3 {30}  | Approx. 0.4 fixed {Approx. 4 fixed} |         | 2 {20}          | 1.6 {16} | 3.3 {33}              |                  |          |
| DNS-D604X   | Low Side      | -0.06 {-50cmHg} | 0.4 {4} | 0.04 {0.4}                          | 0.2 {2} | 0.1 {1}         | 0.2 {2}  | 1.5 {15}              | Diagram 3        |          |
|             | High Side     | 0.8 {8}         | 3 {30}  | Approx. 0.4 fixed {Approx. 4 fixed} |         | 2 {20}          | 1.6 {16} | 3.3 {33}              |                  |          |
| DNS-D606X   | Low Side      | -0.06 {-50cmHg} | 0.6 {6} | 0.06 {0.6}                          | 0.4 {4} | 0.2 {2}         | 0.3 {3}  | 1.5 {15}              |                  |          |
|             | High Side     | 0.8 {8}         | 3 {30}  | Approx. 0.4 fixed {Approx. 4 fixed} |         | 2 {20}          | 1.6 {16} | 3.3 {33}              |                  |          |

Manual reset type

Unit: MPa {kgf/cm<sup>2</sup>}

| Catalog No. | Pressure Side | Range           |         | Differential                                                                       |         | Factory Setting |              | Max. Working Pressure | Contact Function | Wt. (kg) |
|-------------|---------------|-----------------|---------|------------------------------------------------------------------------------------|---------|-----------------|--------------|-----------------------|------------------|----------|
|             |               | Min.            | Max.    | Min.                                                                               | Max.    | Off             | On           |                       |                  |          |
| DNS-D304XM  | Low Side      | −0.06 {−50cmHg} | 0.4 {4} | 0.04 {0.4}                                                                         | 0.2 {2} | 0.1 {1}         | 0.2 {2}      | 1.5 {15}              | Diagram 2        | 0.49     |
|             | High Side     | 0.8 {8}         | 3 {30}  | Automatic operation on pressure increase, and manual reset on pressure decrease ※2 |         | 2 {20}          | manual reset | 3.3 {33}              |                  |          |
| DNS-D306XM  | Low Side      | −0.06 {−50cmHg} | 0.6 {6} | 0.06 {0.6}                                                                         | 0.4 {4} | 0.2 {2}         | 0.3 {3}      | 1.5 {15}              |                  |          |
|             | High Side     | 0.8 {8}         | 3 {30}  | Automatic operation on pressure increase, and manual reset on pressure decrease ※2 |         | 2 {20}          | manual reset | 3.3 {33}              |                  |          |
| DNS-D604XM  | Low Side      | −0.06 {−50cmHg} | 0.4 {4} | 0.04 {0.4}                                                                         | 0.2 {2} | 0.1 {1}         | 0.2 {2}      | 1.5 {15}              | Diagram 4        |          |
|             | High Side     | 0.8 {8}         | 3 {30}  | Automatic operation on pressure increase, and manual reset on pressure decrease ※2 |         | 2 {20}          | manual reset | 3.3 {33}              |                  |          |
| DNS-D606XM  | Low Side      | −0.06 {−50cmHg} | 0.6 {6} | 0.06 {0.6}                                                                         | 0.4 {4} | 0.2 {2}         | 0.3 {3}      | 1.5 {15}              |                  |          |
|             | High Side     | 0.8 {8}         | 3 {30}  | Automatic operation on pressure increase, and manual reset on pressure decrease ※2 |         | 2 {20}          |              | 3.3 {33}              |                  |          |
| DNS-D606XMM | Low Side      | −0.06{−50cmHg}  | 0.6 {6} | Automatic operation on pressure decrease, and manual reset on pressure increase ※1 |         | 0.2 {2}         | manual reset | 1.5 {15}              | Diagram 5        |          |
|             | High Side     | 0.8 {8}         | 3 {30}  | Automatic operation on pressure increase, and manual reset on pressure decrease ※2 |         | 2 {20}          |              | 3.3 {33}              |                  |          |

- Enclosure: IP20
- Drip Proof Models: Available upon request. (Refer to Pages 49, 50.)

※1 Please press the reset button after the pressure increased about 0.1 MPa or more.

※2 Please press the reset button after the pressure decreased about 0.7 MPa or less.

## ELECTRICAL RATINGS

| Rated Voltage (V)<br>Rated Current (A) |                | Power Factor<br>(cos ϕ) | 125/250V. AC |
|----------------------------------------|----------------|-------------------------|--------------|
| Non-Inductive Current                  |                | 1                       | 12           |
| Inductive Current                      | Full Load      | 0.75                    |              |
|                                        | Inrush Current | —                       |              |

Minimum contact capacity: 50mA

## CONTACT FUNCTIONS

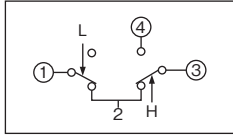


Diagram 1

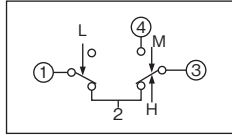


Diagram 2

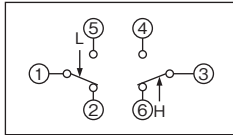


Diagram 3

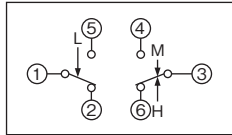


Diagram 4

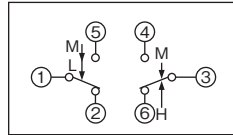
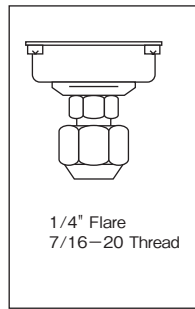


Diagram 5

↑ L: Operating direction on press. increase at Low Press. Side  
 ↑ H: Operating direction on press. increase at High Press. Side  
 ↓ M: Operating direction on manual reset

## PRESSURE CONNECTIONS

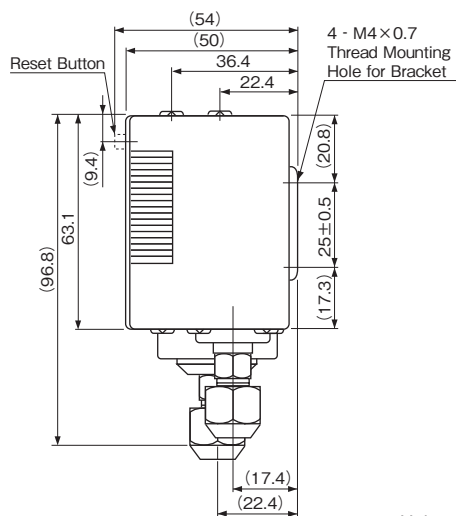
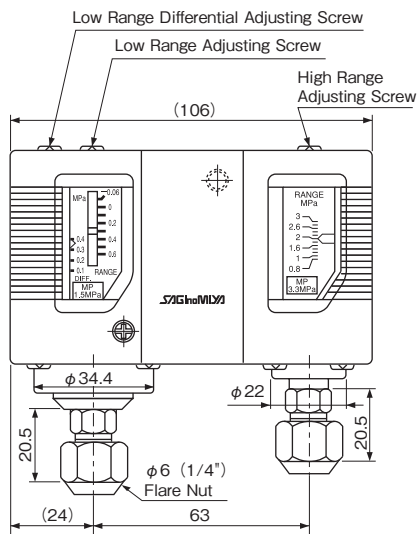


Standard

Refer to Pages 45, 46

## DIMENSIONS

## Standard Model



Unit: mm

# SINGLE FUNCTION PRESSURE CONTROLS

## Type SYS

**SAGInoMIA**

### GENERAL DESCRIPTION

- Type SYS is standard model. Reliable performance, and long life products.
- Applicable for R410A (SYS-C140X0)
- Scale plate with significantly clear visibility
- Compact and light weight

CE mark applicable (available upon request)

### SPECIFICATIONS

- Fluid temperature: -20 to 120°C
- Ambient temperature: -20 to 70°C

### TYPE NUMBER SELECTION

Automatic reset type

Unit: MPa {kgf/cm<sup>2</sup>}

| *1<br>Catalog No. | *2<br>Refrigerant          | Range           |          | Differential |          | Factory Setting |            | Max. Working Pressure | Contact Function | Wt. (kg) |
|-------------------|----------------------------|-----------------|----------|--------------|----------|-----------------|------------|-----------------------|------------------|----------|
|                   |                            | Min.            | Max.     | *3 Min.      | Max.     | Off (On)        | On (Off)   |                       |                  |          |
| <b>SYS-C103X0</b> | R404A, R407C<br>R134a, R22 | -0.06 {-50cmHg} | 0.3 {3}  | 0.035 {0.35} | 0.2 {2}  | 0.05 {0.5}      | 0.15 {1.5} | 1.65 {16.5}           | Diagram 1        | 0.25     |
| <b>SYS-C106X0</b> |                            |                 | 0.6 {6}  | 0.06 {0.6}   | 0.4 {4}  | 0.2 {2}         | 0.3 {3}    |                       |                  |          |
| <b>SYS-C110X0</b> |                            |                 | 1.1 {11} | 0.1 {1}      | 0.3 {3}  | 0.4 {4}         | 0.6 {6}    |                       |                  |          |
| <b>SYS-C130X0</b> |                            | 0.5 {5}         | 3 {30}   | 0.3 {3}      | 1 {10}   | 1.5 {15}        | 2 {20}     | 3.3 {33}              |                  |          |
| <b>SYS-C135X0</b> | R410A etc.                 | 1 {10}          | 3.5 {35} | 0.5 {5}      | 1.5 {15} | 2 {20}          | 2.5 {25}   | 3.8 {38}              |                  |          |
| <b>SYS-C140X0</b> |                            |                 | 4.3 {43} |              | 1 {10}   |                 |            | 4.7 {47}              |                  |          |

Manual reset type

Unit: MPa {kgf/cm<sup>2</sup>}

| *1<br>Catalog No.   | *2<br>Refrigerant | Range           |         | Manual Reset                                                                   | Factory Setting |              | Max. Working Pressure | Contact Function | Wt. (kg) |
|---------------------|-------------------|-----------------|---------|--------------------------------------------------------------------------------|-----------------|--------------|-----------------------|------------------|----------|
|                     |                   | Min.            | Max.    |                                                                                | Off (On)        | On (Off)     |                       |                  |          |
| <b>SYS-C106X0M2</b> | R404A, R407C      | -0.06 {-50cmHg} | 0.6 {6} | Automatic operation on pressure decrease and manual reset on pressure increase | 0.2 {2}         | Manual Reset | 1.65 {16.5}           | Diagram 2        | 0.25     |
| <b>SYS-C130X0M2</b> | R134a, R22        | 0.5 {5}         | 3 {30}  |                                                                                | 1.5 {15}        |              | 3.3 {33}              |                  |          |

• Enclosure: IP20

\*1 Standard unit display is MPa. Other unit displays are available upon request by changing "X0" portion of a catalog number.

[X0: MPa, X1: bar, X2: kgf/cm<sup>2</sup>, X3: kPa, X4: lb/in<sup>2</sup>, X5: psi]

\*2 The products other than SYS-C140X0 are not compatible with R410A refrigerant.

\*3 Indicates the average value also considering instrumental errors.

### ELECTRICAL RATINGS

| Rated Voltage (V)     |                | Power Factor<br>(cos ϕ) | 125/250V. AC |
|-----------------------|----------------|-------------------------|--------------|
| Rated Current (A)     |                |                         |              |
| Non-Inductive Current |                | 1                       | 12           |
| Inductive<br>Current  | Full Load      | 0.75                    |              |
|                       | Inrush Current | —                       | 72           |

Minimum contact capacity: 50mA

### CONTACT FUNCTIONS

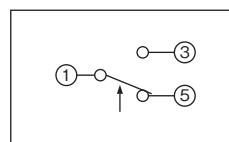


Diagram 1

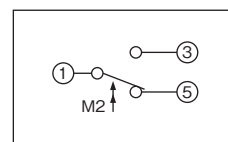


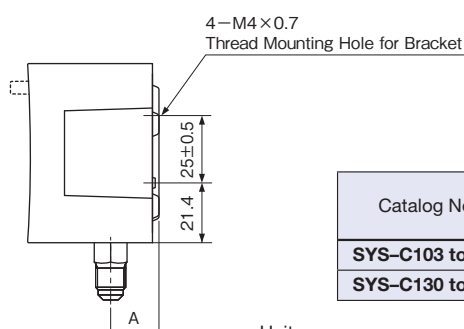
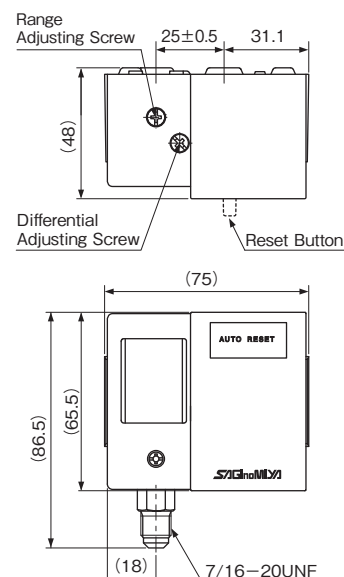
Diagram 2

| Diagram 1 & 2 |                            |
|---------------|----------------------------|
| 1             | Common Terminal            |
| 3             | Close on Pressure Increase |
| 5             | Close on Pressure Decrease |

↑: Operating direction on press. increase at High Press. Side

M2↑: Operating direction on manual reset

### DIMENSIONS



| Catalog No.            | Unit: mm |
|------------------------|----------|
|                        | A        |
| <b>SYS-C103 to 110</b> | 17.7     |
| <b>SYS-C130 to 140</b> | 16.7     |

Unit: mm

# DUAL PRESSURE CONTROLS

## Type DYS

**SAGINO MIYA**

### GENERAL DESCRIPTION

- Type DYS is dual pressure controls that is integrated with over pressure protection of the high pressure side and control of low pressure side of the refrigeration unit.
- Scale plate with significantly clear visibility
- Compact and light weight

CE mark applicable (available upon request)



### SPECIFICATIONS

- Fluid temperature:  $-20$  to  $120^{\circ}\text{C}$
- Ambient temperature:  $-20$  to  $70^{\circ}\text{C}$

### TYPE NUMBER SELECTION

Automatic reset type

Unit: MPa {kgf/cm<sup>2</sup>}

| *1          |               |                 |         |                                     |         |                 |          |                       |                  | Unit: mmHg (kg/cm <sup>2</sup> ) |  |
|-------------|---------------|-----------------|---------|-------------------------------------|---------|-----------------|----------|-----------------------|------------------|----------------------------------|--|
| Catalog No. | Pressure Side | Range           |         | Differential                        |         | Factory Setting |          | Max. Working Pressure | Contact Function | Wt. (kg)                         |  |
|             |               | Min.            | Max.    | *2 Min.                             | Max.    | Off             | On       |                       |                  |                                  |  |
| DYS-D306X0  | Low Side      | −0.06 {−50cmHg} | 0.6 {6} | 0.06 {0.6}                          | 0.4 {4} | 0.2 {2}         | 0.3 {3}  | 1.65 {16.5}           | Diagram 1        | 0.40                             |  |
|             | High Side     | 0.8 {8}         | 3 {30}  | Approx.0.5 fixed. {Approx.5 fixed.} |         | 2 {20}          | 1.5 {15} | 3.3 {33}              |                  |                                  |  |
| DYS-D606X0  | Low Side      | −0.06 {−50cmHg} | 0.6 {6} | 0.06 {0.6}                          | 0.4 {4} | 0.2 {2}         | 0.3 {3}  | 1.65 {16.5}           | Diagram 3        |                                  |  |
|             | High Side     | 0.8 {8}         | 3 {30}  | Approx.0.5 fixed. {Approx.5 fixed.} |         | 2 {20}          | 1.5 {15} | 3.3 {33}              |                  |                                  |  |

Manual reset type

Unit: MPa {kgf/cm<sup>2</sup>}

| *1<br>Catalog No. | Pressure Side | Range           |         | Differential                                                                   |      | Factory Setting |              | Max. Working Pressure | Contact Function | Wt. (kg) |
|-------------------|---------------|-----------------|---------|--------------------------------------------------------------------------------|------|-----------------|--------------|-----------------------|------------------|----------|
|                   |               | Min.            | Max.    | *2 Min.                                                                        | Max. | Off             | On           |                       |                  |          |
| DYS-D306X0M       | Low Side      | −0.06 {−50cmHg} | 0.6 {6} | 0.06 {0.6}      0.4 {4}                                                        |      | 0.2 {2}         | 0.3 {3}      | 1.65 {16.5}           | Diagram 2        | 0.40     |
|                   | High Side     | 0.8 {8}         | 3 {30}  | Automatic operation on pressure increase and manual reset on pressure decrease |      | 2 {20}          | manual reset | 3.3 {33}              |                  |          |
| DYS-D606X0M       | Low Side      | −0.06{−50cmHg}  | 0.6 {6} | 0.06 {0.6}      0.4 {4}                                                        |      | 0.2 {2}         | 0.3 {3}      | 1.65 {16.5}           | Diagram 4        |          |
|                   | High Side     | 0.8 {8}         | 3 {30}  | Automatic operation on pressure increase and manual reset on pressure decrease |      | 2 {20}          | manual reset | 3.3 {33}              |                  |          |
| DYS-D606X0MM      | Low Side      | −0.06{−50cmHg}  | 0.6 {6} | Automatic operation on pressure decrease and manual reset on pressure increase |      | 0.2 {2}         |              | 1.65 {16.5}           | Diagram 5        |          |
|                   | High Side     | 0.8 {8}         | 3 {30}  | Automatic operation on pressure increase and manual reset on pressure decrease |      | 2 {20}          |              | 3.3 {33}              |                  |          |

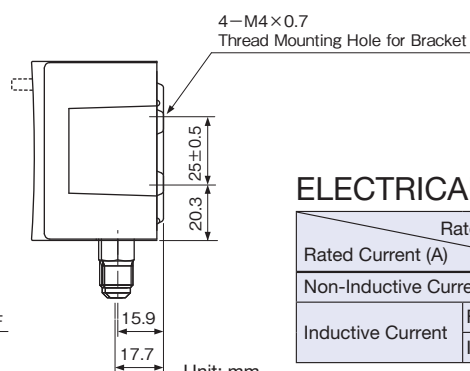
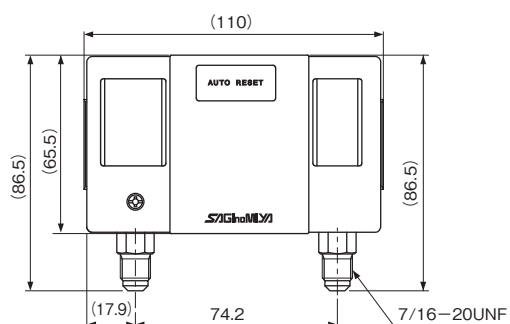
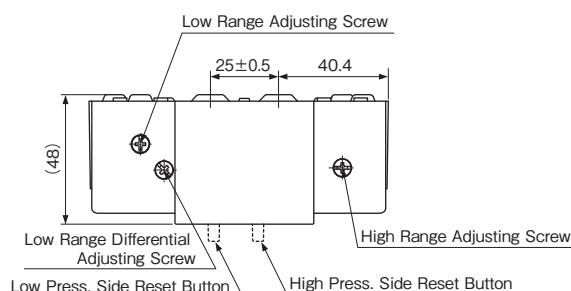
• Enclosure: IP20

\*1 Standard unit display is MPa. Other unit displays are available upon request by changing "X0" portion of a catalog number.

[X0: MPa, X1: bar, X2: kgf/cm<sup>2</sup>, X3: kPa, X4: lb/in<sup>2</sup>, X5: psi]

\*2 Indicates the average value also considering instrumental errors.

### DIMENSIONS



### CONTACT FUNCTIONS

Refer to Pages 16

### ELECTRICAL RATINGS

| Rated Voltage (V)     |                | Power Factor<br>(cos $\phi$ ) | 125/250V<br>AC |
|-----------------------|----------------|-------------------------------|----------------|
| Rated Current (A)     |                | 1                             | 12             |
| Non-Inductive Current |                |                               |                |
| Inductive Current     | Full Load      | 0.75                          | 72             |
|                       | Inrush Current | —                             |                |

Minimum contact capacity: 50mA

# PRESSURE CONTROLS WITH NARROW DIFFERENTIAL

## Type FNS & ANS

**SAGInoMIYA**

### GENERAL DESCRIPTION

- For use with fluorinated refrigerants as well as with air and water.
- Type FNS with fixed narrow differential
- Type ANS with adjustable narrow differential
- Available drip proof enclosure for marine application or explosion proof enclosure for special application.
- Mounting bracket is supplied as standard.
- With SPDT contact mechanism.
- IP44 with upper lid (option). ·····Type FNS
- Stainless steel models are available upon request.

CE mark applicable (available upon request)



Type FNS



Type ANS

### SPECIFICATIONS

- Fluid temperature: -20 to 120°C
- Ambient temperature: -20 to 70°C

### TYPE NUMBER SELECTION

Type FNS – Fixed narrow differential type

Unit: MPa {kgf/cm<sup>2</sup>}

| Type FNS - Fixed narrow differential type |                    |            |                                 |                     |                 |                       | Unit: MPa (kg/cm <sup>2</sup> ) |
|-------------------------------------------|--------------------|------------|---------------------------------|---------------------|-----------------|-----------------------|---------------------------------|
| Catalog No.                               | Range              |            | Differential                    | Factory Setting     |                 | Max. Working Pressure | Wt. (kg)                        |
|                                           | Min.               | Max.       | Fixed                           | Off                 | On              |                       |                                 |
| FNS-C101X                                 | -0.06<br>{-50cmHg} | 0.1<br>{1} | 0.006 Approx.<br>{0.06 Approx.} | (0.019)<br>{(0.19)} | 0.025<br>{0.25} | 0.3<br>{3}            | 0.32                            |
| FNS-C102X                                 | -0.02<br>{-20cmHg} | 0.2<br>{2} | 0.008 Approx.<br>{0.08 Approx.} | (0.042)<br>{(0.42)} | 0.05<br>{0.5}   | 0.5<br>{5}            |                                 |
| FNS-C106X                                 | -0.06<br>{-50cmHg} | 0.6<br>{6} | 0.02 Approx.<br>{0.2 Approx.}   | (0.28)<br>{(2.8)}   | 0.3<br>{3.0}    | 1.5<br>{15}           |                                 |
| FNS-C110X                                 | 0.1<br>{1}         | 1<br>{10}  | 0.025 Approx.<br>{0.25 Approx.} | (0.575)<br>{(5.75)} | 0.6<br>{6.0}    |                       |                                 |
| FNS-C130X                                 | 0.5<br>{5}         | 3<br>{30}  | 0.12 Approx.<br>{1.2 Approx.}   | (2.38)<br>{(23.8)}  | 2.5<br>{25}     | 3.3<br>{33}           |                                 |

Type ANS – Adjustable narrow differential type

Unit: MPa {kgf/cm<sup>2</sup>}

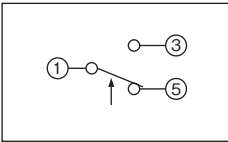
| Catalog No. | Range              |             | Differential    |                 |                 |                 | Factory Setting |                 | Max. Working Pressure | Wt. (kg) |
|-------------|--------------------|-------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------------|----------|
|             |                    |             | Min.            |                 | Max.            |                 |                 |                 |                       |          |
|             | Min.               | Max.        | Bottom          | Top             | Bottom          | Top             | Off             | On              |                       |          |
| ANS-C101XB  | −0.06<br>{−50cmHg} | 0.1<br>{1}  | 0.007<br>{0.07} | 0.007<br>{0.07} | 0.014<br>{0.14} | 0.015<br>{0.15} | 0.018<br>{0.18} | 0.025<br>{0.25} | 0.3<br>{3}            | 0.32     |
| ANS-C103XB  | −0.02<br>{−20cmHg} | 0.3<br>{3}  | 0.008<br>{0.08} | 0.01<br>{0.1}   | 0.018<br>{0.18} | 0.027<br>{0.27} | 0.141<br>{1.41} | 0.15<br>{1.5}   | 1<br>{10}             |          |
| ANS-C106XB  | −0.06<br>{−50cmHg} | 0.6<br>{6}  | 0.015<br>{0.15} | 0.018<br>{0.18} | 0.03<br>{0.3}   | 0.045<br>{0.45} | 0.28<br>{2.84}  | 0.3<br>{3.0}    | 1.5<br>{15}           |          |
| ANS-C110XB  | 0.1<br>{1}         | 1<br>{10}   | 0.02<br>{0.2}   | 0.03<br>{0.3}   | 0.045<br>{0.45} | 0.07<br>{0.7}   | 0.575<br>{5.75} | 0.6<br>{6.0}    |                       |          |
| ANS-C130XB  | 0.5<br>{5}         | 3<br>{30}   | 0.12<br>{1.2}   | 0.2<br>{2.0}    | 0.23<br>{2.3}   | 0.37<br>{3.7}   | 2.32<br>{23.2}  | 2.5<br>{25}     | 3.3<br>{33}           |          |
| ANS-C135XB  | 1<br>{10}          | 3.5<br>{35} |                 |                 | 0.24<br>{2.4}   | 0.39<br>{3.9}   | 2.82<br>{28.2}  | 3<br>{30}       | 3.8<br>{38}           |          |

- Enclosure: IP20
- Drip Proof Models: Available upon request. (Refer to page 51.)

ELECTRICAL RATINGS

| Rated Voltage (V)     |                | Power Factor (cos φ) | 125/250V. AC |
|-----------------------|----------------|----------------------|--------------|
| Rated Current (A)     |                |                      |              |
| Non-Inductive Current |                | 1                    | 12           |
| Inductive Current     | Full Load      | 0.75                 |              |
|                       | Inrush Current | —                    | 72           |

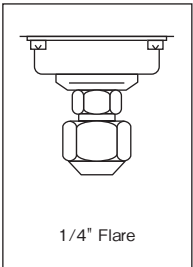
CONTACT FUNCTIONS



|   |                            |
|---|----------------------------|
| 1 | Common Terminal            |
| 3 | Close on Pressure Increase |
| 5 | Close on Pressure Decrease |

↑ : Operating direction on press. increase at High Press. Side

PRESSURE CONNECTIONS

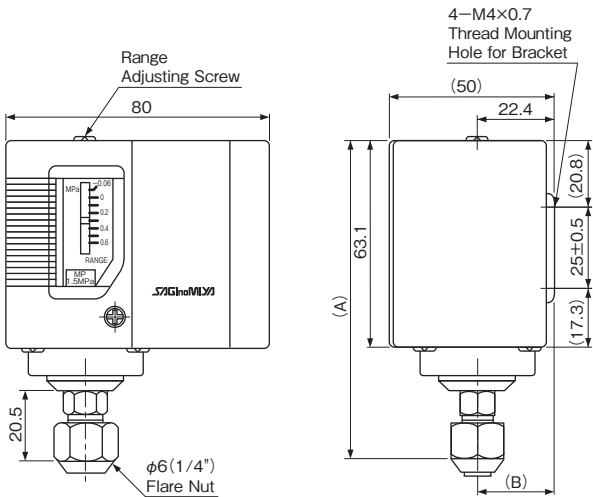


Standard

Refer to page 45, 46.

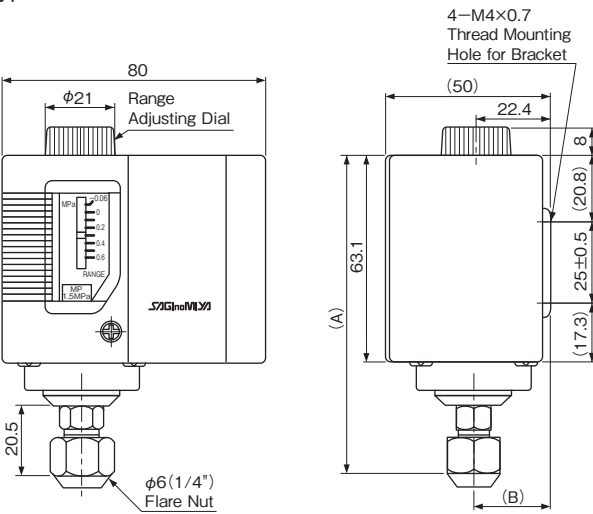
DIMENSIONS

Standard Model  
Type FNS



| Catalog No. | Unit: mm |      |
|-------------|----------|------|
|             | A        | B    |
| FNS-C101X   | 113.3    | 22.4 |
| FNS-C102X   | 99.7     |      |
| FNS-C106X   | 96.8     |      |
| FNS-C110X   | 96.8     |      |
| FNS-C130X   | 93.5     | 18.4 |

Type ANS



Unit: mm

| Catalog No. | Unit: mm |      |
|-------------|----------|------|
|             | A        | B    |
| ANS-C101XB  | 113.3    | 22.4 |
| ANS-C103XB  | 99.7     |      |
| ANS-C106XB  | 96.8     |      |
| ANS-C110XB  | 96.8     |      |
| ANS-C130XB  | 93.5     | 18.4 |
| ANS-C135XB  | 93.5     |      |

# OIL PROTECTION CONTROLS

**Type ONS**

**SAGINOMIYA**

## GENERAL DESCRIPTION

- Provides dependable protection against major break-down on pressure lubricated refrigeration compressors by guarding against low lubrication oil pressure.
- With manual reset.
- Built in time delay switch.
- Mounting bracket is supplied as standard.
- Stainless steel models are available upon request.

CE mark applicable (available upon request)

## SPECIFICATIONS

- Fluid temperature: -20 to 120°C
- Ambient temperature: -20 to 70°C



## TYPE NUMBER SELECTION

Unit: MPa {kgf/cm<sup>2</sup>}

| Catalog No.    | Range         |               | Differential                              | Timer Specification                          |               |                                                   | Connection                                   | Wt. (kg) |
|----------------|---------------|---------------|-------------------------------------------|----------------------------------------------|---------------|---------------------------------------------------|----------------------------------------------|----------|
|                | Min.          | Max.          | Fixed                                     | Delay Time(sec.)                             | Timer Voltage | Timer Circuit                                     |                                              |          |
| ONS-C106XQ1    | 0.05<br>{0.5} | 0.35<br>{3.5} | Approx.<br>0.05<br><br>{ Approx.<br>0.5 } | 45                                           | 100/200V. AC  | Standard<br>(SPST)<br>without<br>Alarm<br>Contact | 1/4" Flare Nut                               | 0.55     |
| ONS-C106XQ2    |               |               |                                           | 90                                           |               |                                                   |                                              |          |
| ONS-C106XQ3    |               |               |                                           | 110                                          |               |                                                   |                                              |          |
| ONS-C106XQ4    |               |               |                                           | 45                                           | 110/220V. AC  |                                                   |                                              |          |
| ONS-C106XQ5    |               |               |                                           | 90                                           |               |                                                   |                                              |          |
| ONS-C106XQ6    |               |               |                                           | 110                                          |               |                                                   |                                              |          |
| ONS-C106XQ7    |               |               |                                           | 45                                           | 115/230V. AC  |                                                   |                                              |          |
| ONS-C106XQ8    |               |               |                                           | 90                                           |               |                                                   |                                              |          |
| ONS-C106XQ9    |               |               |                                           | 110                                          |               |                                                   |                                              |          |
| ONS-C106XQ10   |               |               |                                           | 45                                           | 120/240V. AC  |                                                   |                                              |          |
| ONS-C106XQ11   |               |               |                                           | 90                                           |               |                                                   |                                              |          |
| ONS-C106XQ12   |               |               |                                           | 110                                          |               |                                                   |                                              |          |
| ONS-C106XL1Q1  |               |               |                                           | 45                                           | 100/200V. AC  | Standard<br>(SPST)<br>without<br>Alarm<br>Contact | 1000mm Capil.<br>Tube with 1/4"<br>Flare Nut | 0.62     |
| ONS-C106XL1Q2  |               |               |                                           | 90                                           |               |                                                   |                                              |          |
| ONS-C106XL1Q3  |               |               |                                           | 110                                          |               |                                                   |                                              |          |
| ONS-C106XL1Q4  |               |               |                                           | 45                                           | 110/220V. AC  |                                                   |                                              |          |
| ONS-C106XL1Q5  |               |               |                                           | 90                                           |               |                                                   |                                              |          |
| ONS-C106XL1Q6  |               |               |                                           | 110                                          |               |                                                   |                                              |          |
| ONS-C106XL1Q7  |               |               |                                           | 45                                           | 115/230V. AC  |                                                   |                                              |          |
| ONS-C106XL1Q8  |               |               |                                           | 90                                           |               |                                                   |                                              |          |
| ONS-C106XL1Q9  |               |               |                                           | 110                                          |               |                                                   |                                              |          |
| ONS-C106XL1Q10 |               |               |                                           | 45                                           | 120/240V. AC  |                                                   |                                              |          |
| ONS-C106XL1Q11 |               |               |                                           | 90                                           |               |                                                   |                                              |          |
| ONS-C106XL1Q12 |               |               |                                           | 110                                          |               |                                                   |                                              |          |
| ONS-C106XQ25   |               |               |                                           | 45                                           | 100/200V. AC  | With Alarm<br>Contact<br>(SPDT)                   | 1/4" Flare Nut                               | 0.55     |
| ONS-C106XQ26   |               |               |                                           | 90                                           |               |                                                   |                                              |          |
| ONS-C106XQ27   |               |               |                                           | 110                                          |               |                                                   |                                              |          |
| ONS-C106XQ28   |               |               |                                           | 45                                           | 110/220V. AC  |                                                   |                                              |          |
| ONS-C106XQ29   |               |               |                                           | 90                                           |               |                                                   |                                              |          |
| ONS-C106XQ30   |               |               |                                           | 110                                          |               |                                                   |                                              |          |
| ONS-C106XQ31   |               |               |                                           | 45                                           | 115/230V. AC  |                                                   |                                              |          |
| ONS-C106XQ32   |               |               |                                           | 90                                           |               |                                                   |                                              |          |
| ONS-C106XQ33   |               |               |                                           | 110                                          |               |                                                   |                                              |          |
| ONS-C106XQ34   |               |               |                                           | 45                                           | 120/240V. AC  |                                                   |                                              |          |
| ONS-C106XQ35   |               |               |                                           | 90                                           |               |                                                   |                                              |          |
| ONS-C106XQ36   |               |               |                                           | 110                                          |               |                                                   |                                              |          |
| ONS-C106XL1Q25 | 45            | 100/200V. AC  | With Alarm<br>Contact<br>(SPDT)           | 1000mm Capil.<br>Tube with 1/4"<br>Flare Nut | 0.62          |                                                   |                                              |          |
| ONS-C106XL1Q26 | 90            |               |                                           |                                              |               |                                                   |                                              |          |
| ONS-C106XL1Q27 | 110           |               |                                           |                                              |               |                                                   |                                              |          |
| ONS-C106XL1Q28 | 45            | 110/220V. AC  |                                           |                                              |               |                                                   |                                              |          |
| ONS-C106XL1Q29 | 90            |               |                                           |                                              |               |                                                   |                                              |          |
| ONS-C106XL1Q30 | 110           |               |                                           |                                              |               |                                                   |                                              |          |
| ONS-C106XL1Q31 | 45            | 115/230V. AC  |                                           |                                              |               |                                                   |                                              |          |
| ONS-C106XL1Q32 | 90            |               |                                           |                                              |               |                                                   |                                              |          |
| ONS-C106XL1Q33 | 110           |               |                                           |                                              |               |                                                   |                                              |          |
| ONS-C106XL1Q34 | 45            | 120/240V. AC  |                                           |                                              |               |                                                   |                                              |          |
| ONS-C106XL1Q35 | 90            |               |                                           |                                              |               |                                                   |                                              |          |
| ONS-C106XL1Q36 | 110           |               |                                           |                                              |               |                                                   |                                              |          |

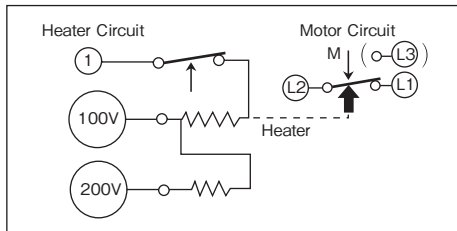
- Max. Working Pressure: 1.5 MPa {15 kgf/cm<sup>2</sup>}
- Limit of Pressure Diff.  $H_p \geq L_p$ : 1.5 MPa {15 kgf/cm<sup>2</sup>},  $H_p$  represents oil pump discharge pressure and  $L_p$  crank case pressure.
- Enclosure: IP20
- Drip Proof Models: Available upon request. (Refer to page 52.)

※After the timer operation, please press the reset button later 30 minutes.

## ELECTRICAL RATINGS

| Rated Current (A)     | Rated Voltage (V) | Power Factor (cos $\phi$ ) | 125/250V. AC |
|-----------------------|-------------------|----------------------------|--------------|
| Non-Inductive Current |                   | 1                          | 3.5          |
| Inductive Current     | Full Load         | 0.75                       | 3            |
|                       | Inrush Current    | —                          | 10           |

## CONTACT FUNCTIONS



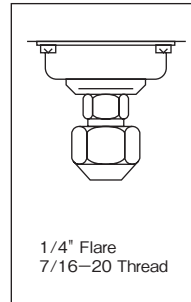
↑ : Operating direction of pressure increase

↑ : Operating direction of timer when energized

M ↓ : Operating direction of manual reset

(L3: Alarm Contact provided with a lead wire approx.)  
 $\phi 3.5 \times 100\text{mm}$  with a soldered terminal.

## PRESSURE CONNECTIONS



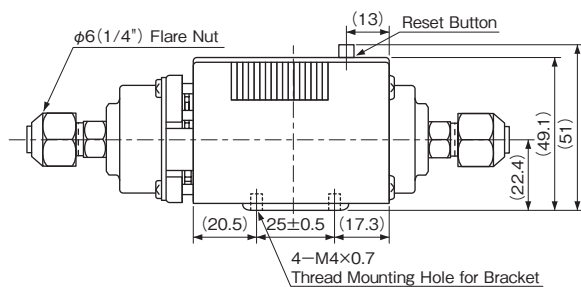
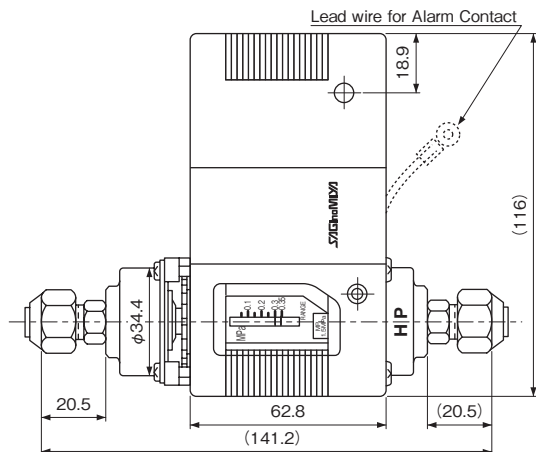
Standard

Refer to page 45, 46.

|     |                |                                         |
|-----|----------------|-----------------------------------------|
| 1   | Heater Circuit | Common Terminal                         |
| 100 |                | 100V Power Supply Terminal              |
| 200 |                | 200V Power Supply Terminal              |
| L1  | Motor Circuit  | Open on Decrease of Pressure Difference |
| L2  |                | Main Contact                            |
| L3  |                | Alarm Contact                           |

110/220V. AC, 120/240V. AC etc. available

## DIMENSIONS



Unit: mm

# DIFFERENTIAL PRESSURE CONTROLS

## Type WNS & YNS

**SAGInoMIYA**

## GENERAL DESCRIPTION

### Type WNS

- Differential pressure is adjustable controller.
- It is suitable for water cutoff detection of cooling water circuit.
- Standard Type : IP20

### Type YNS

- Narrow differential pressure (fixed) controller.
- Standard Type : IP20

CE mark applicable (available upon request)  
UL recognized (available upon request)

## SPECIFICATIONS

- Fluid temperature: -20 to 120°C
- Ambient temperature: -20 to 70°C
- For water, air and fluorinated refrigerant

## TYPE NUMBER SELECTION

Type WNS – Adjustable differential type for water, air and fluorinated refrigerant

Unit: MPa {kgf/cm<sup>2</sup>}

| Catalog No.      | Range      |            | Differential |            | Factory Setting |            | Max. Working Pressure | Limit of Press. Differential (HP > LP) | Wt. (kg) |
|------------------|------------|------------|--------------|------------|-----------------|------------|-----------------------|----------------------------------------|----------|
|                  | Min.       | Max.       | Min.         | Max.       | Off             | On         |                       |                                        |          |
| <b>WNS-C102X</b> | 0.03 {0.3} | 0.2 {2}    | 0.03 {0.3}   | 0.15 {1.5} | 0.05 {0.5}      | 0.02 {0.2} | 0.5 {5}               | 0.5 {5}                                | 0.43     |
| <b>WNS-C106X</b> | 0.05 {0.5} | 0.35 {3.5} | 0.05 {0.5}   | 0.25 {2.5} | 0.1 {1.0}       | 0.05 {0.5} | 1.5 {15}              | 1.5 {15}                               |          |

Type YNS – Fixed narrow differential

Unit: MPa {kgf/cm<sup>2</sup>}

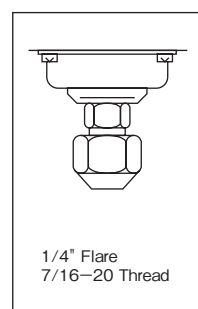
| Catalog No.      | Range        |            | Differential         |  | Factory Setting |              | Max. Working Pressure | Limit of Press. Differential (HP > LP) | Wt. (kg) |
|------------------|--------------|------------|----------------------|--|-----------------|--------------|-----------------------|----------------------------------------|----------|
|                  | Min.         | Max.       | Fixed                |  | Off             | On           |                       |                                        |          |
| <b>YNS-C102X</b> | 0.02 {0.2}   | 0.2 {2}    | 0.015 {0.15} approx. |  | 0.05 {0.5}      | 0.035 {0.35} | 0.5 {5}               | 0.5 {5}                                | 0.43     |
| <b>YNS-C106X</b> | 0.025 {0.25} | 0.35 {3.5} | 0.025 {0.25} approx. |  | 0.15 {1.5}      | 0.125 {1.25} | 1.5 {15}              | 1.5 {15}                               |          |

- HP.....High Side Press. LP.....Low Side Press.
- Enclosure: IP20
- Drip proof models: Available upon request. (Refer to page 52.)
- Please contact us if other range models are required.

## ELECTRICAL RATINGS

| Rated Voltage (V)     |                | Power Factor (cos ϕ) | 125/250V. AC |
|-----------------------|----------------|----------------------|--------------|
| Rated Current (A)     |                |                      |              |
| Non-Inductive Current |                | 1                    | 12           |
| Inductive Current     | Full Load      | 0.75                 |              |
|                       | Inrush Current | —                    |              |

## PRESSURE CONNECTIONS



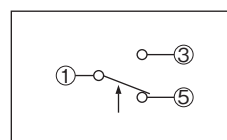
Standard

Refer to page 45, 46.

| Catalog No.      | Unit: mm |      |      |       |
|------------------|----------|------|------|-------|
|                  | φ A      | B    | C    | D     |
| <b>WNS-C102X</b> | 38.5     | 50.0 | 39.0 | 147.2 |
| <b>WNS-C106X</b> | 34.4     | 47.0 | 36.0 | 141.2 |



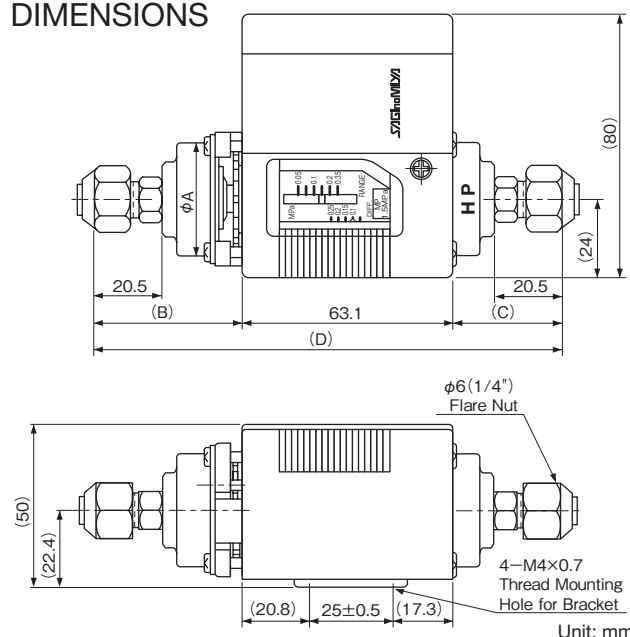
## CONTACT FUNCTIONS



|   |                            |
|---|----------------------------|
| 1 | Common Terminal            |
| 3 | Close on Pressure Increase |
| 5 | Close on Pressure Decrease |

↑ : Operating direction on press. increase at High Press. Side

## DIMENSIONS



## PRESSURE SENSORS

High Volume OEM Item (Type NSK)

Type NSK & XSK

SAGINO MIYA

### GENERAL DESCRIPTION

- High reliability and accuracy
- Double diaphragm structure
- Diffusion silicone chip pressure sensor

### SPECIFICATIONS

- Fluid temperature range:  $-30$  to  $120^{\circ}\text{C}$  (Type NSK)  
 $-20$  to  $70^{\circ}\text{C}$  (Type XSK)
- Ambient temperature range:  $-30$  to  $100^{\circ}\text{C}$  (Type NSK-BC, BE)  
 $-30$  to  $80^{\circ}\text{C}$  (Type NSK-BH)  
 $-20$  to  $70^{\circ}\text{C}$  (Type XSK)

CE mark applicable (available upon request)

UL recognized (available upon request)



Type NSK-BC

Type NSK-BE

Type NSK-BH

Type XSK

### TYPE NUMBER SELECTION

Unit: MPa {bar}

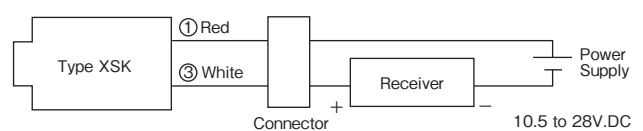
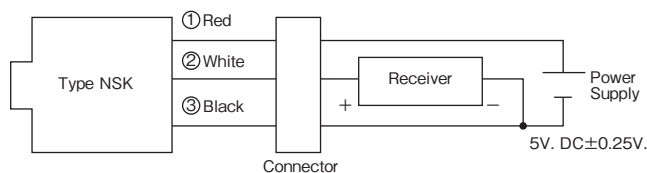
| Catalog No. |         |                         | Pressure Range        | Supply Voltage     | Output                                   | * Accuracy      | Current Consumption             | Load Resistance    | Airtight Pressure | Wt. (kg) |
|-------------|---------|-------------------------|-----------------------|--------------------|------------------------------------------|-----------------|---------------------------------|--------------------|-------------------|----------|
| NSK-        | BC      | 010I-***                | 0 to 1 {0 to 10}      | 5V. DC $\pm$ 0.25V | 0.5 to 3.5V. DC<br>or<br>0.5 to 4.5V. DC | $\pm$ 2.5% F.S. | Max. 10mA                       | Min. 10 k $\Omega$ | 3.85 {38.5}       | 0.07     |
|             |         | 017I-***                | 0 to 1.7 {0 to 17}    |                    |                                          |                 |                                 |                    |                   |          |
|             |         | 020I-***                | 0 to 2 {0 to 20}      |                    |                                          |                 |                                 |                    |                   |          |
|             |         | 030I-***                | 0 to 3 {0 to 30}      |                    |                                          |                 |                                 |                    | 4.56 {45.6}       |          |
|             |         | 035I-***                | 0 to 3.5 {0 to 35}    |                    |                                          |                 |                                 |                    |                   |          |
|             |         | 042I-***                | 0 to 4.15 {0 to 41.5} |                    |                                          |                 |                                 |                    |                   |          |
|             |         | 050I-***                | 0 to 5 {0 to 50}      |                    |                                          |                 |                                 |                    | 5.5 {55}          |          |
|             | BE      | 010I-***                | 0 to 1 {0 to 10}      | 5V. DC $\pm$ 0.25V | 0.5 to 3.5V. DC<br>or<br>0.5 to 4.5V. DC | $\pm$ 2.5% F.S. | Max. 10mA                       | Min. 10 k $\Omega$ | 3.85 {38.5}       | 0.04     |
|             |         | 017I-***                | 0 to 1.7 {0 to 17}    |                    |                                          |                 |                                 |                    |                   |          |
|             |         | 020I-***                | 0 to 2 {0 to 20}      |                    |                                          |                 |                                 |                    |                   |          |
|             |         | 030I-***                | 0 to 3 {0 to 30}      |                    |                                          |                 |                                 |                    | 4.56 {45.6}       |          |
|             |         | 035I-***                | 0 to 3.5 {0 to 35}    |                    |                                          |                 |                                 |                    |                   |          |
|             |         | 042I-***                | 0 to 4.15 {0 to 41.5} |                    |                                          |                 |                                 |                    |                   |          |
|             |         | 050I-***                | 0 to 5 {0 to 50}      |                    |                                          |                 |                                 |                    | 5.5 {55}          |          |
|             | BH      | 010D-***                | 0 to 1 {0 to 10}      | 5V. DC $\pm$ 0.25V | 0.5 to 3.5V. DC<br>or<br>0.5 to 4.5V. DC | $\pm$ 2.5% F.S. | Max. 10mA                       | Min. 10 k $\Omega$ | 3.85 {38.5}       | 0.06     |
|             |         | 017D-***                | 0 to 1.7 {0 to 17}    |                    |                                          |                 |                                 |                    |                   |          |
|             |         | 020D-***                | 0 to 2 {0 to 20}      |                    |                                          |                 |                                 |                    |                   |          |
|             |         | 030D-***                | 0 to 3 {0 to 30}      |                    |                                          |                 |                                 |                    | 4.56 {45.6}       |          |
|             |         | 035D-***                | 0 to 3.5 {0 to 35}    |                    |                                          |                 |                                 |                    |                   |          |
|             |         | 042D-***                | 0 to 4.15 {0 to 41.5} |                    |                                          |                 |                                 |                    |                   |          |
|             |         | 050D-***                | 0 to 5 {0 to 50}      |                    |                                          |                 |                                 |                    | 5.5 {55}          |          |
| XSK- AC     | 10I-194 | -0.05 to 1 {-0.5 to 10} | 10.5 to 28V. DC       | 4 to 20mA. DC      | $\pm$ 3% F.S.                            | —               | Max. 100 $\Omega$<br>at 12V. DC | 3.85 {38.5}        | 0.09              |          |
|             | 20I-194 | 0 to 2 {0 to 20}        |                       |                    |                                          |                 |                                 |                    |                   |          |
|             | 30I-194 | 0 to 3 {0 to 30}        |                       |                    |                                          |                 | Max. 500 $\Omega$<br>at 24V. DC | 5.5 {55}           |                   |          |
|             | 35I-194 | 0 to 3.5 {0 to 35}      |                       |                    |                                          |                 |                                 |                    |                   |          |
|             | 50I-194 | 0 to 5 {0 to 50}        |                       |                    |                                          |                 |                                 |                    |                   |          |

\* Included non lineality hysteresis, and temperature drift

\* Accuracy of 2.5% or less is available upon request.

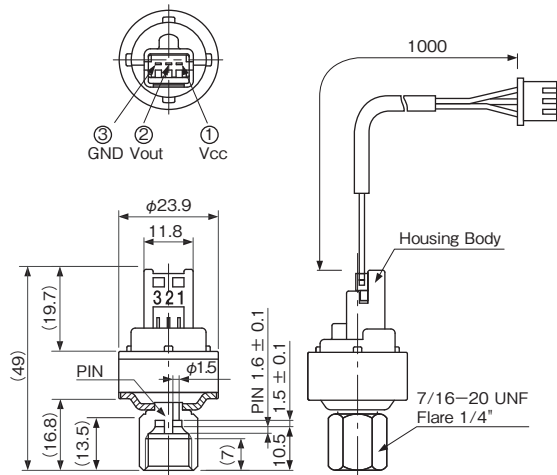
• Enclosure: IP66 (Type NSK-BH)

### WIRING

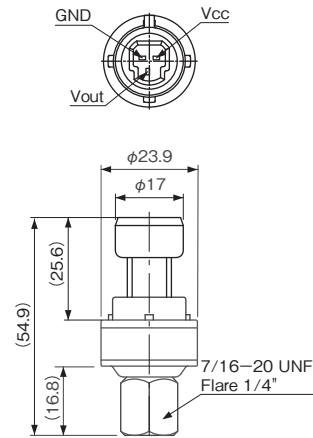


## DIMENSIONS

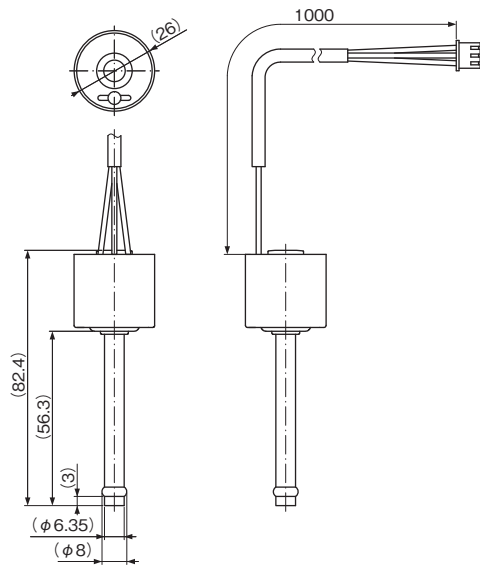
Type NSK-BC (Molex connector)



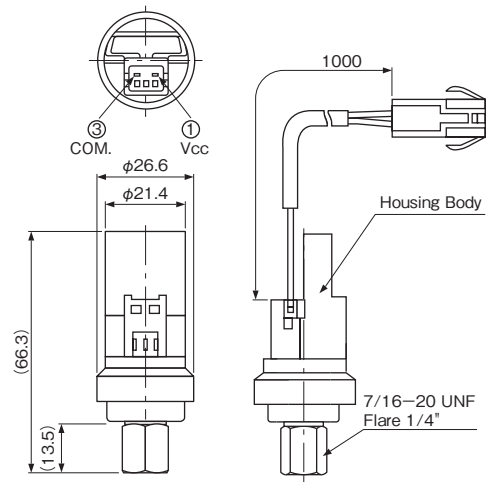
Type NSK-BE (Packard connector)



Type NSK-BH (Lead wire direct Connector)



Type XSK (Molex connector)



Unit: mm

## ACCESSORY

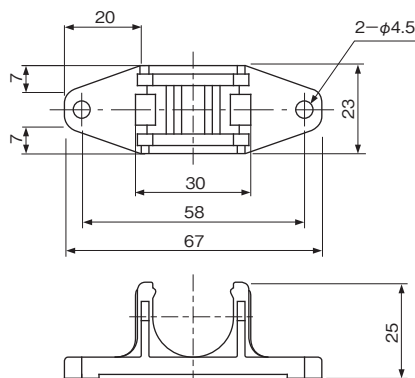
- Lead wire with connector is supplied as standard accessory except for NSK-BE type.

## OPTIONAL PARTS

### Bracket

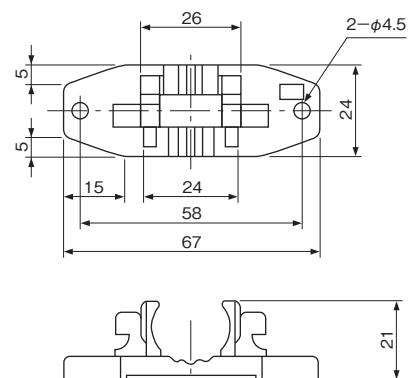
- NSK

Type No. NSK-PP02 (for NSK-BC, BE)



- XSK

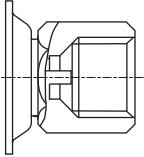
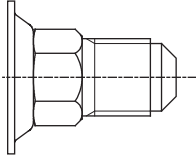
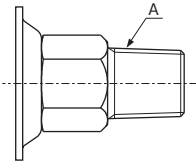
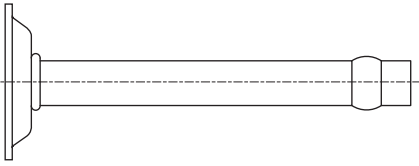
Type No. YSK-PP02



Unit: mm

PRESSURE CONNECTIONS

- Connection Material  
Stainless steel pressure connection is available upon request. (R only)
- Connection Style  
Standard connection style is 7/16–20UNF Female Flare with schrader depressor.  
The following connection styles are available upon request.

| 7/16–20UNF Female Flare 1/4" with schrader depressor                                                                                                                                                                                                                                                                                   | 7/16–20UNF Male Flare 1/4"                                                                          |      |      |     |  |     |      |     |      |     |                                                                                                                                            |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|------|------|-----|--|-----|------|-----|------|-----|--------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                                                                                                                                      |  |      |      |     |  |     |      |     |      |     |                                                                                                                                            |
| R                                                                                                                                                                                                                                                                                                                                      | 1/4" Copper Solder (Type NSK–BH)                                                                    |      |      |     |  |     |      |     |      |     |                                                                                                                                            |
| <div><table><tr><th>A</th><th>Type</th></tr><tr><td>1/8"</td><td>NSK</td></tr><tr><td></td><td>XSK</td></tr><tr><td>1/4"</td><td>XSK</td></tr><tr><td>3/8"</td><td>XSK</td></tr></table></div> | A                                                                                                   | Type | 1/8" | NSK |  | XSK | 1/4" | XSK | 3/8" | XSK |  |
| A                                                                                                                                                                                                                                                                                                                                      | Type                                                                                                |      |      |     |  |     |      |     |      |     |                                                                                                                                            |
| 1/8"                                                                                                                                                                                                                                                                                                                                   | NSK                                                                                                 |      |      |     |  |     |      |     |      |     |                                                                                                                                            |
|                                                                                                                                                                                                                                                                                                                                        | XSK                                                                                                 |      |      |     |  |     |      |     |      |     |                                                                                                                                            |
| 1/4"                                                                                                                                                                                                                                                                                                                                   | XSK                                                                                                 |      |      |     |  |     |      |     |      |     |                                                                                                                                            |
| 3/8"                                                                                                                                                                                                                                                                                                                                   | XSK                                                                                                 |      |      |     |  |     |      |     |      |     |                                                                                                                                            |

**TEMPERATURE & HUMIDITY CONTROLS**

|                                                         |       |
|---------------------------------------------------------|-------|
| <b>TEMPERATURE CONTROLS</b> .....                       | 29–30 |
| Type <b>LWS, FWS, RWS &amp; EWS</b>                     |       |
| <b>TEMPERATURE CONTROLS</b> .....                       | 31–32 |
| Type <b>TNS, CNS &amp; INS</b>                          |       |
| <b>TEMPERATURE CONTROLS</b> .....                       | 33    |
| Type <b>ALS &amp; BLS</b>                               |       |
| <b>PROPORTIONAL TEMPERATURE CONTROLS</b> .....          | 34    |
| Type <b>PWS</b>                                         |       |
| <b>ROOM THERMOSTATS</b> .....                           | 35–36 |
| Type <b>ARS</b>                                         |       |
| <b>ROOM THERMOSTATS</b> .....                           | 37    |
| Type <b>WRS</b>                                         |       |
| <b>ROOM HUMIDISTATS</b> .....                           | 38    |
| Type <b>AHS</b>                                         |       |
| <b>DIGITAL THERMOSTATS &amp; DIGITAL HUMIDISTATS</b> .. | 39–42 |
| Type <b>ALE &amp; BLE</b>                               |       |

# TEMPERATURE CONTROLS

REMOTE / DIRECT SENSING

Type LWS, FWS, RWS & EWS

SAGINOMIYA

## GENERAL DESCRIPTION

- Most suitable model can be selected from the variations of wide temperature range with either adjustable or fixed differential. Narrow differential is further advantageous.
- Sensing elements are air sensed and liquid sensed type depending on control media. Also, sensing element can be selected from remote or direct type depending on application.
- Single pole double throw contacts allows use for either heating or cooling application, with large contact rating as well.
- Adjusting mechanism is driver adjusting type as standard on delivery, but a knob assembly and a concealed plate are also supplied as standard accessories.

**UL** listed (available upon request)



Type LWS



Type EWS

## TYPE NUMBER SELECTION (SPECIFICATIONS)

Type LWS – Set high type with standard remote sensing element

Unit: °C

| Catalog No. |             |       |                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  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Adjusting Range |      | Differential |      | Bulb Size (mm) | Ambient Temp. | Limit of Bulb Temp. | Wt. (kg) |
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| Type        | Designation |       |                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  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|             | Contact     | Model | Differential    | Rating                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Capillary Length | Min.                  | Max. | Min.         | Max. |                |               |                     |          |
| LWS-        | C1          | 030   | A<br>(Variable) | G<br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br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|                  |                       |      |              |      |                |               |                     |          |

Type FWS – Air Sensed type with standard remote sensing element

Unit: °C

| Catalog No. |             |       |                 |        |                                                  | Temp. Adjusting Range |      | Differential |      | Bulb Size (mm)    | Ambient Temp. | Limit of Bulb Temp. | Wt. (kg) |
|-------------|-------------|-------|-----------------|--------|--------------------------------------------------|-----------------------|------|--------------|------|-------------------|---------------|---------------------|----------|
| Type        | Designation |       |                 |        |                                                  |                       |      |              |      |                   |               |                     |          |
|             | Contact     | Model | Differential    | Rating | Capillary Length                                 | Min.                  | Max. | Min.         | Max. |                   |               |                     |          |
| FWS-        | C1          | 030   | A<br>(Variable) | G<br>R | Standard L1 (L = 1m)                             | -35                   | 30   | 2            | 7    | Max.<br>ϕ 37 × 58 | -20 to 70     | 60                  | 0.52     |
|             |             | 060   |                 |        |                                                  | -5                    | 60   |              |      |                   |               | 90                  |          |
|             |             | 090   |                 |        |                                                  | 25                    | 90   |              |      |                   |               | 120                 |          |
|             |             | 120   |                 |        |                                                  | 40                    | 120  |              |      |                   |               | 150                 |          |
|             |             | 030   | F<br>(Fixed)    |        | Option L2 (L = 2m)<br>L3 (L = 3m)<br>L5 (L = 5m) | -35                   | 30   | 2 (Fixed)    | 60   |                   |               |                     |          |
|             |             | 060   |                 |        |                                                  | -5                    | 60   |              | 90   |                   |               |                     |          |
|             |             | 090   |                 |        |                                                  | 25                    | 90   |              | 120  |                   |               |                     |          |
|             |             | 120   |                 |        |                                                  | 40                    | 120  |              | 150  |                   |               |                     |          |
|             |             | 030   |                 |        |                                                  | -35                   | 30   | 2.5 (Fixed)  | 60   |                   |               |                     |          |
|             |             | 060   |                 |        |                                                  | -5                    | 60   |              | 90   |                   |               |                     |          |
|             |             | 090   |                 |        |                                                  | 25                    | 90   |              | 120  |                   |               |                     |          |
|             |             | 120   |                 |        |                                                  | 40                    | 120  |              | 150  |                   |               |                     |          |

# Type RWS – with coiled capillary sensing element

Unit: °C

| Catalog No. |             |       |                 |            | Temp. Adjusting Range |      | Differential |      | Sensing Element (mm)                | Ambient Temp. | Limit of Tube Temp. | Wt. (kg) |
|-------------|-------------|-------|-----------------|------------|-----------------------|------|--------------|------|-------------------------------------|---------------|---------------------|----------|
| Type        | Designation |       |                 |            |                       |      |              |      |                                     |               |                     |          |
|             | Contact     | Model | Differential    | Rating     | Min.                  | Max. | Min.         | Max. |                                     |               |                     |          |
| RWS-        | C1          | 060   | A<br>(Variable) | G<br><br>R | —5                    | 60   | 2            | 7    | Coiled<br>Tube<br>Max.<br>ϕ 42 × 40 | — 20 to 60    | 60                  | 0.43     |
|             |             | 034   |                 |            | —10                   | 35   | 1.4          | 5    |                                     | — 20 to 70    | 70                  |          |
|             |             | 054   |                 |            | 10                    | 55   |              |      |                                     | — 20 to 70    | 70                  |          |
|             |             | 060   | F<br>(Fixed)    |            | —5                    | 60   | 2 (Fixed)    |      |                                     | — 20 to 70    | 70                  |          |
|             |             | 034   |                 |            | —10                   | 35   | 1.4(Fixed)   |      |                                     | — 20 to 70    | 70                  |          |
|             |             | 054   |                 |            | 10                    | 55   |              |      |                                     | — 20 to 60    | 60                  |          |

# Type EWS – with direct immersion sensing element

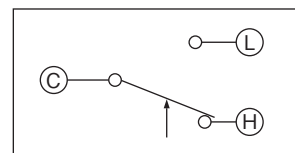
Unit: °C

| Catalog No. |             |       |                 |            | Temp. Adjusting Range |      | Differential |      | Sensing Element (mm) | Ambient Temp. | Limit of Tube Temp. | Wt. (kg) |
|-------------|-------------|-------|-----------------|------------|-----------------------|------|--------------|------|----------------------|---------------|---------------------|----------|
| Type        | Designation |       |                 |            |                       |      |              |      |                      |               |                     |          |
|             | Contact     | Model | Differential    | Rating     | Min.                  | Max. | Min.         | Max. |                      |               |                     |          |
| EWS-        | C1          | 080   | A<br>(Variable) | G<br><br>R | 0                     | 80   | 2.5          | 8    | ϕ 10.8×70            | -20 to 70     | 110                 | 0.51     |
|             |             | 120   |                 |            | 40                    | 120  |              |      |                      |               | 150                 |          |
|             |             | 160   |                 |            | 95                    | 160  |              |      |                      |               | 185                 |          |
|             |             | 080   | F<br>(Fixed)    |            | 0                     | 80   | 2.5 (Fixed)  | 110  |                      |               |                     |          |
|             |             | 120   |                 |            | 40                    | 120  |              | 150  |                      |               |                     |          |
|             |             | 160   |                 |            | 95                    | 160  |              | 185  |                      |               |                     |          |

## ELECTRICAL RATINGS

| Electrical Rating Code | Rated Voltage (V)<br>Rated Current (A) |           | Power Factor (cos ϕ) | 125V. AC    | 250V. AC    |
|------------------------|----------------------------------------|-----------|----------------------|-------------|-------------|
|                        |                                        |           |                      |             |             |
| G                      | Non-Inductive Current                  |           | 1.0                  | 0.5 to 16   | 0.5 to 8    |
|                        | Inductive Current                      | Full Load | 0.75                 |             |             |
|                        |                                        |           | Inrush Current       | —           | 96          |
| R                      | Non-Inductive Current                  |           | 1.0                  | 0.05 to 8.5 | 0.05 to 4.5 |
|                        | Inductive Current                      | Full Load | 0.75                 |             |             |
|                        |                                        |           | Inrush Current       | —           | 51          |

## CONTACT STYLE



Models "set high"

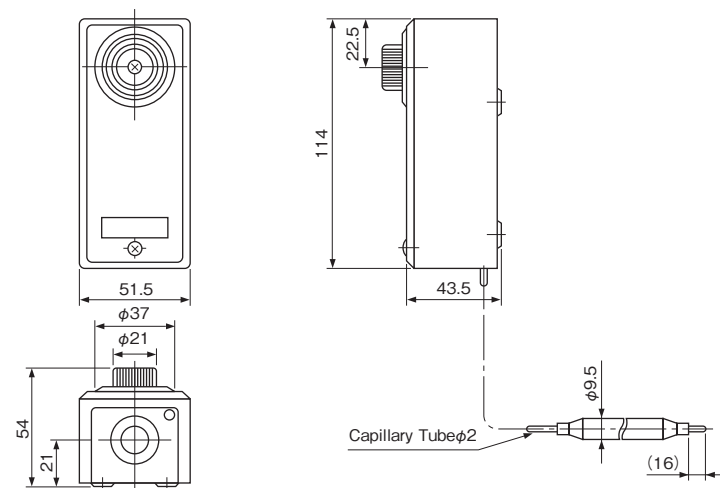
The dial indicates the high switch point (C – L close, C – H open).

The low switch point (C – L open, C – H close) is obtained by deducting the differential from the high switch point.

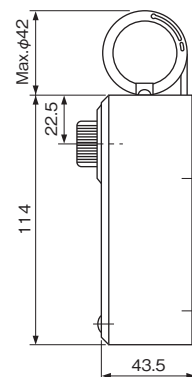
Arrow mark indicates a direction of switch action on temperature increase.

## DIMENSIONS

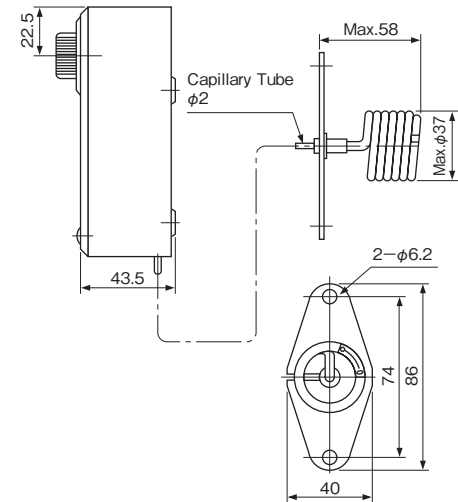
### Type LWS



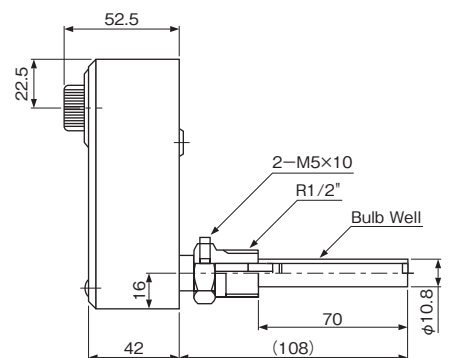
### Type RWS



### Type FWS



### Type EWS



Unit: mm

ACCESSORY : Available upon request. (Refer to page 47.)

# TEMPERATURE CONTROLS

## GENERAL PURPOSE

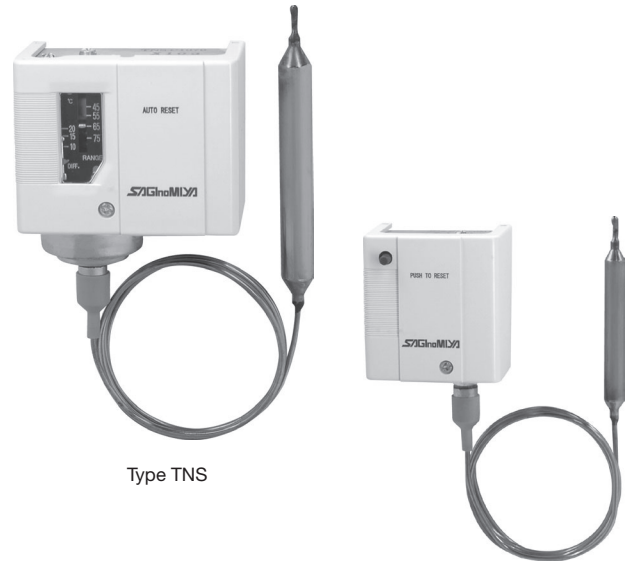
### Type TNS, CNS & INS

**SAGInoMIYA**

### GENERAL DESCRIPTION

- Type TNS is provided with a differential adjustable mechanism.
- Type CNS is provided with a fixed differential. Also manual reset models are available.
- Type INS provides automatic High-cut temperature control with manual reset.
- Narrow and adjustable temperature differential for more accurate control model Type BNS is available.
- Available drip proof enclosure for marine application or explosion proof enclosure for special application.
- A mounting bracket is supplied as standard.
- With SPDT contact mechanism.
- IP44 with upper lid (option).

CE mark applicable (available upon request)  
UL recognized (available upon request)



Type TNS

Type INS

### TYPE NUMBER SELECTION (SPECIFICATIONS)

#### Type TNS – Automatic Reset Type

Unit: °C

| Catalog No.   | Range |      | Differential        |      | Factory Setting     |          | Limit Temp. | Bulb Size (mm)      |     | Usage Condition | Wt. (kg) |
|---------------|-------|------|---------------------|------|---------------------|----------|-------------|---------------------|-----|-----------------|----------|
|               | Min.  | Max. | Min.                | Max. | Off (On)            | On (Off) |             | φ A                 | B   |                 |          |
| TNS-C100X     | −25   | 0    | Bottom 4.5<br>Top 3 | 15   | −18                 | −15      | 70          | 6                   | 80  | Ts > TB         | 0.34     |
| TNS-C114X     | −15   | 15   |                     |      | −3                  | 0        |             |                     |     |                 |          |
| TNS-C134X     | 0     | 35   |                     |      | 17                  | 20       |             |                     |     |                 |          |
| TNS-C1070X    | 45    | 75   | 4                   | 20   | 61                  | 65       | 115         | 12.7                | 100 | Ts < TB         | 0.37     |
| TNS-C1100X    | 65    | 105  | 5                   |      | 70                  | 75       | 140         |                     |     |                 |          |
| TNS-C1120X    | 95    | 125  |                     |      | 110                 | 115      | 160         |                     |     |                 |          |
| TNS-C1150X    | 115   | 150  |                     |      | 140                 | 145      | 180         |                     |     |                 |          |
| TNS-C1010XC   | −45   | 10   | 4                   |      | −4                  | 0        | 45          |                     |     | Ts ≡ TB         |          |
| TNS-C1034XC   | −20   | 35   |                     |      | 16                  | 20       | 70          |                     |     |                 |          |
| TNS-C1070XC   | 15    | 70   |                     |      | 36                  | 40       | 115         |                     |     |                 |          |
| TNS-C114XQ009 | −30   | 15   | Bottom 5<br>Top 2   | 15   | −8                  | −5       | 120         | Capillary Tube Type |     | Ts > TB         |          |
| TNS-C114XQ010 |       |      |                     |      | Capillary Coil Type |          |             |                     |     |                 |          |
| TNS-C134XQ009 | −5    | 35   |                     |      | 12                  | 15       |             | Capillary Tube Type |     |                 |          |
| TNS-C134XQ010 |       |      |                     |      | Capillary Coil Type |          |             |                     |     |                 |          |

- Bottom...Differential when the switch is set at minimum of range.
- Top...Differential when the switch is set at maximum of range.
- Ts...Ambient temp. of switch body. • Tb...Sensing bulb temp.
- Drip proof models: Available upon request. (Refer to page 53.)
- Enclosure: IP20

#### Type CNS – Automatic Reset Type

Unit: °C

| Catalog No.      | Range |      | Differential             | Factory Setting |     | Limit Temp. | Bulb Size (mm) |    | Usage Condition | Wt. (kg) |
|------------------|-------|------|--------------------------|-----------------|-----|-------------|----------------|----|-----------------|----------|
|                  | Min.  | Max. |                          | Off             | On  |             | φ A            | B  |                 |          |
| <b>CNS-C115X</b> | -35   | -15  | Bottom 4<br>Top 3(fixed) | -28             | -25 | 70          | 6              | 80 | Ts > Tb         | 0.34     |
| <b>CNS-C100X</b> | -25   | 0    | approx. 3<br>(fixed)     | -18             | -15 |             |                |    |                 |          |
| <b>CNS-C114X</b> | -15   | 15   | Bottom 4<br>Top 3(fixed) | -3              | 0   |             |                |    |                 |          |
| <b>CNS-C134X</b> | 0     | 35   |                          | 17              | 20  |             |                |    |                 |          |

- Bottom...Differential when the switch is set at minimum of range.
- Top...Differential when the switch is set at maximum of range.
- Ts...Ambient temp. of switch body. • Tb...Sensing bulb temp.
- Enclosure: IP20

## TYPE CNS – Manual Reset Type

Unit: °C

| Catalog No.        | Range |      | Manual Reset                                                                         | * Factory Setting |              | Limit Temp. | Bulb Size (mm) |    | Usage Condition | Wt. (kg) |
|--------------------|-------|------|--------------------------------------------------------------------------------------|-------------------|--------------|-------------|----------------|----|-----------------|----------|
|                    | Min.  | Max. |                                                                                      | Off               | On           |             | φ A            | B  |                 |          |
| <b>CNS-C115XM2</b> | -35   | -15  | Automatic operation on temperature decrease and manual reset on temperature decrease | -28               | Manual Reset | 70          | 6              | 80 | Ts > TB         | 0.34     |
| <b>CNS-C100XM2</b> | -25   | 0    |                                                                                      | -18               |              |             |                |    |                 |          |
| <b>CNS-C114XM2</b> | -15   | 15   |                                                                                      | -3                |              |             |                |    |                 |          |
| <b>CNS-C134XM2</b> | 0     | 35   |                                                                                      | 17                |              |             |                |    |                 |          |

\* Based on the 1-3 terminal connection.

- Ts...Ambient temp. of switch body. • TB...Sensing bulb temp.
- Enclosure: IP20

## TYPE INS – Manual Reset Type

Unit: °C

| Catalog No.         | Range |      | Manual Reset                                                                         | * Factory Setting |     | Limit Temp. | Bulb Size (mm) |    | Usage Condition | Wt. (kg) |
|---------------------|-------|------|--------------------------------------------------------------------------------------|-------------------|-----|-------------|----------------|----|-----------------|----------|
|                     | Min.  | Max. |                                                                                      | Off               | On  |             | φ A            | B  |                 |          |
| <b>INS-C1070XM1</b> | 25    | 75   | Automatic operation on temperature increase and manual reset on temperature decrease | Manual Reset      | 65  | 115         | 9.5            | 80 | Ts < TB         | 0.26     |
| <b>INS-C1120XM1</b> | 70    | 120  |                                                                                      |                   | 115 | 160         |                |    |                 |          |
| <b>INS-C1150XM1</b> | 115   | 150  |                                                                                      |                   | 140 | 180         |                |    |                 |          |

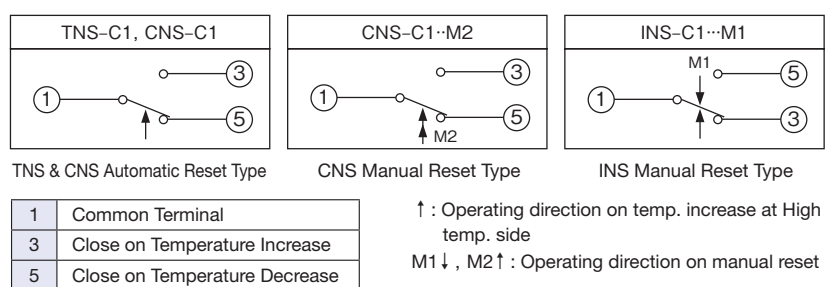
\* Based on the 1-3 terminal connection.

- Ts...Ambient temp. of switch body. • TB...Sensing bulb temp.
- Enclosure: IP20

## ELECTRICAL RATINGS

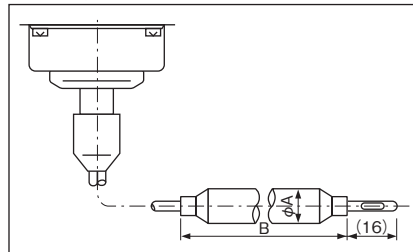
| Rated Voltage (V)     |                | Power Factor (cos ϕ) | 125/250 V. AC |
|-----------------------|----------------|----------------------|---------------|
| Rated Current (A)     |                |                      |               |
| Non-Inductive Current |                | 1                    | 12            |
| Inductive Current     | Full Load      | 0.75                 |               |
|                       | Inrush Current | —                    |               |

## CONTACT FUNCTIONS

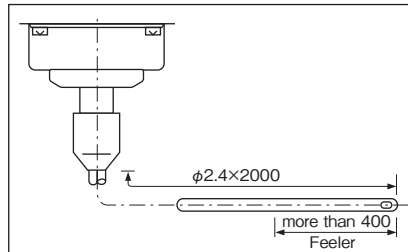


## SENSING ELEMENT STYLE

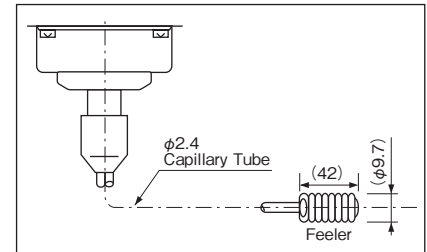
### Sensing Bulb Type



### Capillary Tube Type



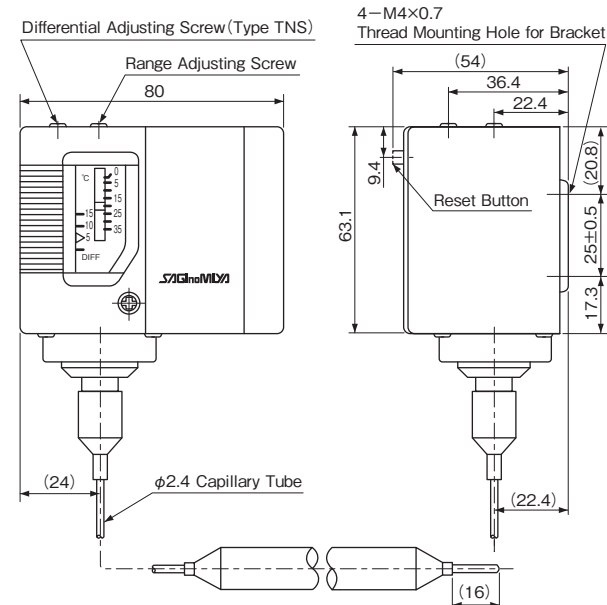
### Capillary Coil Type



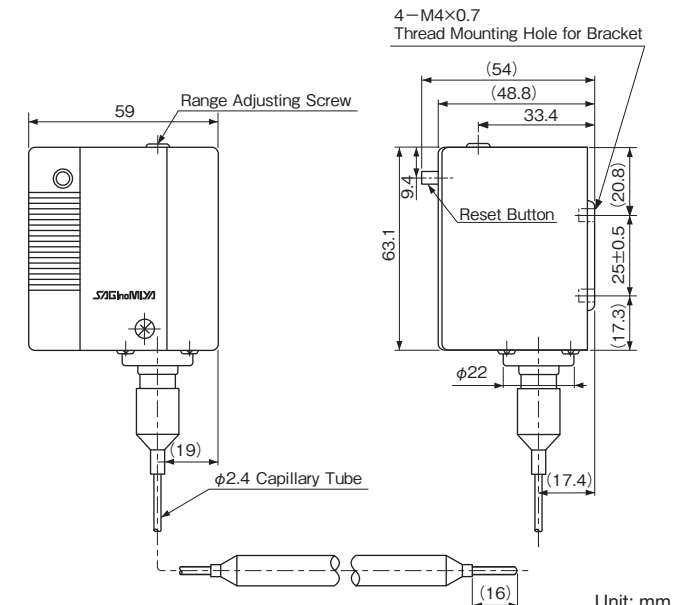
Standard: 1000mm Capillary tube. Other capillary length are available upon request.

## DIMENSIONS

### Type TNS, CNS



### Type INS



Unit: mm

# TEMPERATURE CONTROLS

## Type ALS & BLS

**SAGInoMIYA**

### GENERAL DESCRIPTION

- Wide temp. range and narrow fixed differential. One control can meet most of your refrigeration or heating applications.
- Easy and accurate setting with large external knob.
- Tin Plating of bulb and capillary for food.
- SUS of main body for anti-corrosion and high durability, ABS resin of cover for anti-static.
- With SPDT contact mechanism.
- Insert holder is available upon request.
- Can mount horizontal and vertical position.



Type ALS



Type BLS

### TYPE NUMBER SELECTION (SPECIFICATIONS)

Unit: °C

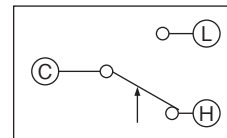
| Catalog No. | Range |      | Differential        | Limit of Bulb Temp. | Bulb Size (mm) | Capillary Tube Length (mm) | Wt. (kg) |
|-------------|-------|------|---------------------|---------------------|----------------|----------------------------|----------|
|             | Min.  | Max. |                     |                     |                |                            |          |
| BLS-C1020L1 | −20   | 20   | Approx. 2.0 (Fixed) | 60                  | ϕ 10×100       | ϕ 2.4×1000                 | 0.3      |
| ALS-C1011L1 | −60   | −10  | Approx. 2.5 (Fixed) |                     |                |                            |          |
| ALS-C1020L1 | −40   | 20   |                     |                     |                |                            |          |
| ALS-C1050L1 | −10   | 50   |                     |                     |                |                            |          |
| ALS-C1090L1 | 40    | 90   |                     |                     |                |                            |          |

• When order model with earth terminal, add a suffix "x" to Catalog No.

### ELECTRICAL RATINGS

| Rated Voltage (V)     |                | Power Factor (cos φ) | 125V.AC | 250V.AC | 450V.AC | 24V.DC | 125V.DC |
|-----------------------|----------------|----------------------|---------|---------|---------|--------|---------|
| Rated Current (A)     |                |                      |         |         |         |        |         |
| Non-Inductive Current |                | 1                    | 10      | 5       | 2       | 5      | 0.5     |
| Inductive Current     | Full Load      | 0.75                 | 8.5     | 4.5     | 1       | 3      | 0.2     |
|                       | Inrush Current | —                    | 50      | 37      | 10      | 10     | 5       |

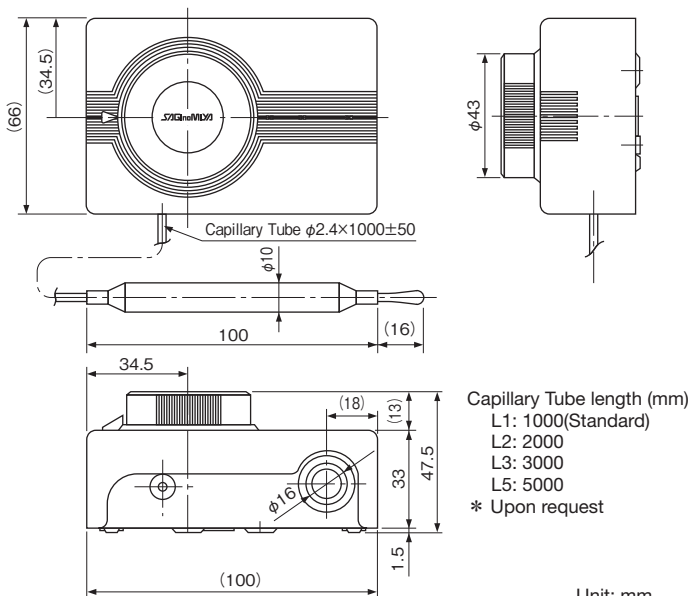
### CONTACT FUNCTIONS



Arrow Mark indicates direction of operation on temperature increase.

|   |                               |
|---|-------------------------------|
| C | Common Terminal               |
| L | Close on Temperature Increase |
| H | Close on Temperature Decrease |

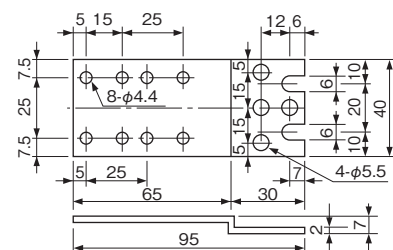
### DIMENSIONS



Unit: mm

### ACCESSORY

#### Mounting Bracket



|          |          |
|----------|----------|
| Part No. | ALS-AE02 |
|----------|----------|

# PROPORTIONAL TEMPERATURE CONTROLS

## Type PWS

**SAGINO MIYA**

### GENERAL DESCRIPTION

- Designed for accurate control for air and liquid temperature in duct and boiler.
- Incorporates a potentiometer which produces a variable voltage signal to actuate AWK/EGK type damper motor or MJV/WGK type motor valve.
- Proportional band (throttling range) is adjustable.
- Electrical rating: 24V. AC, 50mA.  
Potentiometer resistance 0 to 135Ω.

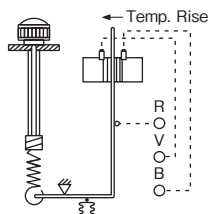


### TYPE NUMBER SELECTION (SPECIFICATIONS)

Unit: °C

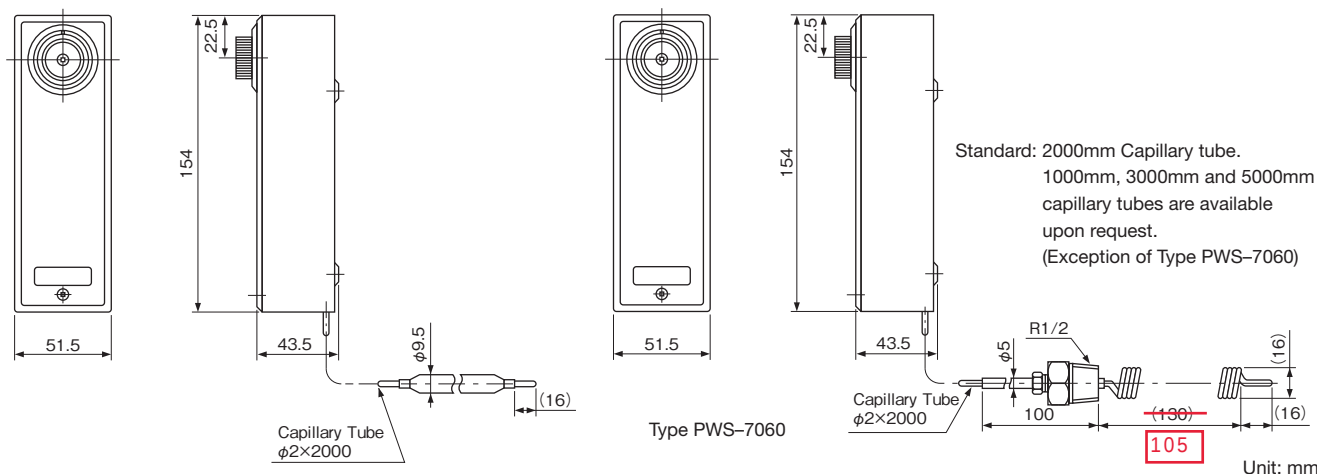
| Catalog No.     | Construction           | Adjustable Temp. Range | Proportional Band |      | Usage Condition | Max. Ambient Temp. |                 | Wt. (kg) |
|-----------------|------------------------|------------------------|-------------------|------|-----------------|--------------------|-----------------|----------|
|                 |                        |                        | Min.              | Max. |                 | At Switch Body     | At Sensing Bulb |          |
| <b>PWS-7034</b> | With One Potentiometer | −10 to 35              | 2.5               | 14   | $T_s \cong T_b$ | −20 to 70          | 60              | 0.52     |
| <b>PWS-7054</b> |                        | 10 to 55               |                   |      |                 |                    | 80              |          |
| <b>PWS-7074</b> |                        | 30 to 75               |                   |      |                 |                    | 100             |          |
| <b>PWS-7094</b> |                        | 50 to 95               |                   |      |                 |                    | 120             |          |
| <b>PWS-7120</b> |                        | 40 to 120              | 4                 | 20   |                 |                    | 150             |          |
| <b>PWS-7060</b> |                        | −5 to 60               | 35                | 15   |                 |                    | 90              | 0.68     |

### INTERNAL WIRINGS (POTENTIOMETER ARRANGEMENT)



Resistance variation at potentiometer with increase of temperature:  
Increase between R and B  
Decrease between R and V  
R...Common terminal

### DIMENSIONS



# ROOM THERMOSTATS

## Type ARS

SAGInoMIYA

### GENERAL DESCRIPTION

- High quality room thermostat for heating or cooling.
- Used for low or line voltage.
- Easy to adjust with dial knob.
- Dial stopper screw prevents unauthorized change of setting.



### SPECIFICATIONS

- Ambient temperature:  $-20$  to  $50^{\circ}\text{C}$  (Double-digit type)  
 $-10$  to  $50^{\circ}\text{C}$  (Propotional type)

### TYPE NUMBER SELECTION

#### Double-digit type

| Catalog No. |              |       |                      | Range |      | Differential | Step Differential | Factory Setting                     |          | Wt. (kg) |
|-------------|--------------|-------|----------------------|-------|------|--------------|-------------------|-------------------------------------|----------|----------|
| Type        | Contact Type | Temp. | Special Application  | Min.  | Max. |              |                   | Off (On)                            | On (Off) |          |
| ARS-        | C1           | 20    | —<br>(Standard Type) | 0     | 20   | Approx. 1.5  | —                 | (8.5)                               | 10       | 0.17     |
|             |              | 30    |                      | 10    | 30   |              |                   | (18.5)                              | 20       |          |
|             |              | 40    |                      | 20    | 40   |              |                   | (23.5)                              | 25       |          |
|             |              | 20    | S                    | 0     | 20   |              |                   | (8.5)                               | 10       |          |
|             |              | 30    |                      | 10    | 30   |              |                   | (18.5)                              | 20       |          |
|             |              | 40    |                      | 20    | 40   |              |                   | (23.5)                              | 25       |          |
|             | S6           | 30    | —<br>(Standard Type) | 10    | 30   |              | Approx. 2         | Heat Side (18.5)<br>Low Side (16.5) | 20<br>18 | 0.22     |

Unit:  $^{\circ}\text{C}$

#### Propotional type

| Catalog No. |              |       |                           | Range |      | Differential | Factory Setting                         | Wt. (kg) |
|-------------|--------------|-------|---------------------------|-------|------|--------------|-----------------------------------------|----------|
| Type        | Contact Type | Temp. | Special Application       | Min.  | Max. |              |                                         |          |
| ARS-        | P1           | 30    | —<br>(Standard Type)<br>S | 10    | 30   | Approx. 2    | 25<br>Center value of Proportional band | 0.17     |

Unit:  $^{\circ}\text{C}$

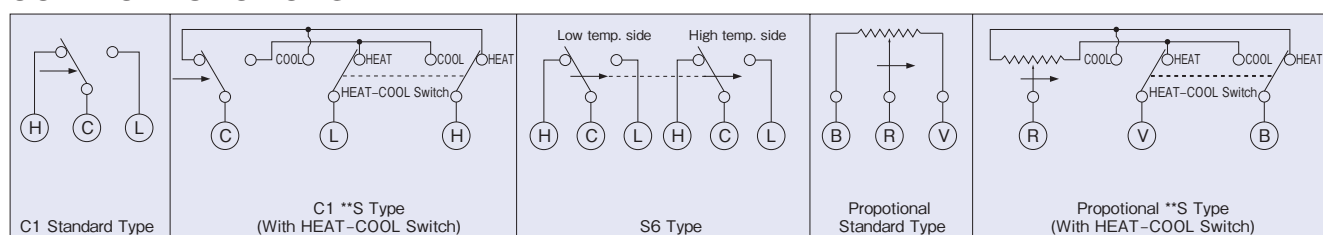
### ELECTRICAL RATINGS

| Catalog No.                            |                |                         | ARS-C1 |     |    | ARS-S6 |     |
|----------------------------------------|----------------|-------------------------|--------|-----|----|--------|-----|
| Rated Voltage (V)<br>Rated Current (A) |                | Power Factor<br>(cos ϕ) | AC     |     | DC | AC     |     |
|                                        |                |                         | 125    | 250 | 24 | 125    | 250 |
| Non-Inductive Current                  |                | 1.0                     | 6      | 3   | 2  | 4      | 2   |
| Inductive Current                      | Full Load      | 0.75                    | 6      | 3   | 1  | 4      | 2   |
|                                        | Inrush Current | —                       | 24     | 12  | 10 | 16     | 8   |

Minimum contact capacity: 50mA

|                                        |        |
|----------------------------------------|--------|
| Catalog No.                            | ARS-P1 |
| Rated Voltage (V)<br>Rated Current (A) | AC     |
|                                        | 24     |
| Allowable current value                | 50mA   |
| Resistance of the potentiometer        | 135 Ω  |

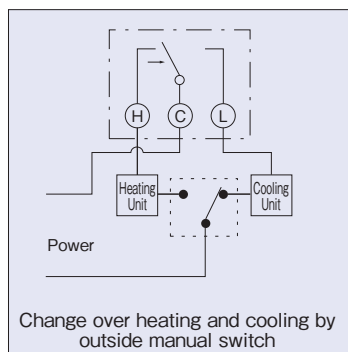
### CONTACT FUNCTIONS



Arrow indicates temp. rise.

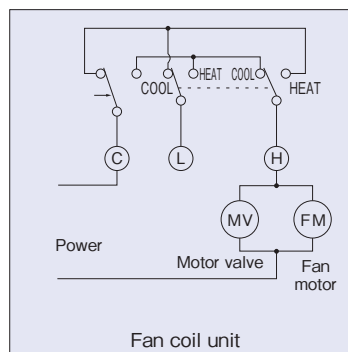
## APPLICATION SAMPLES

-C1

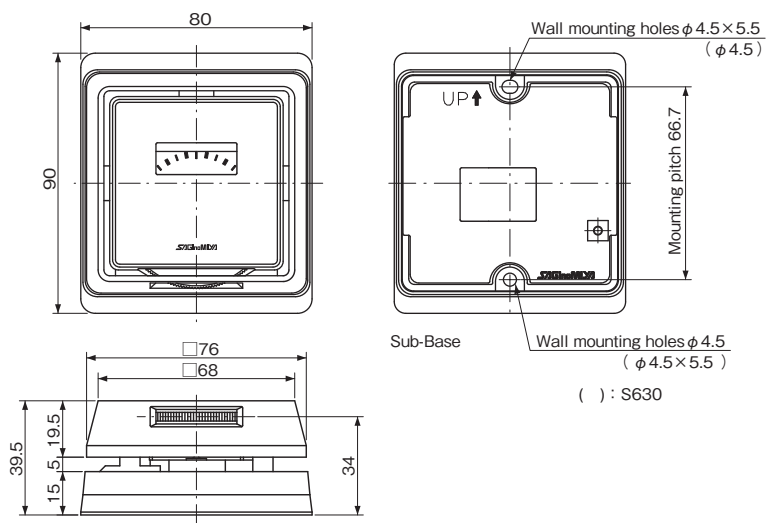


Arrow indicates temp. rise.

-C1\*\*S



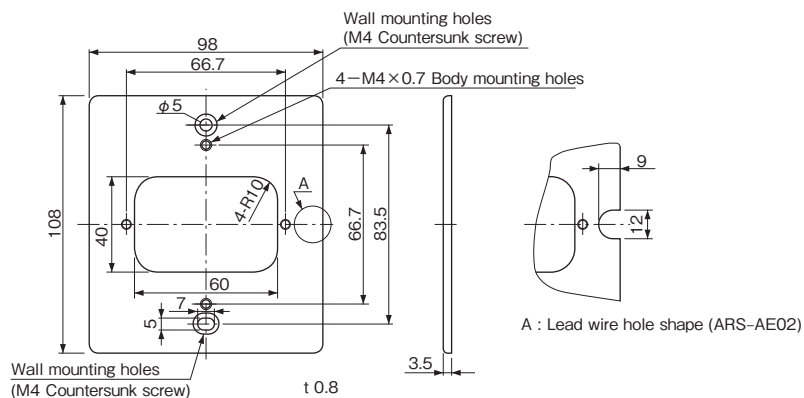
## DIMENSIONS



Unit: mm

## OPTIONAL PARTS

Mounting pitch 83.5mm plate (ARS-AE01, ARS-AE02)



Unit: mm

| Parts No.       | Lead wire hole |
|-----------------|----------------|
| <b>ARS-AE01</b> | Not Exist      |
| <b>ARS-AE02</b> | Exist          |

# ROOM THERMOSTATS

**Type WRS**

**SAGInoMIYA**

## GENERAL DESCRIPTION

- For fan coil units and air conditioners.
- Used for low or line voltage.
- Various models available with Fan Selector switch and/or Heat-Off-Cool change over switching.
- Using a diaphragm element, it assures high reliability and accurate control.
- Ambient temperature:  $-20$  to  $50^{\circ}\text{C}$



## TYPE NUMBER SELECTION (SPECIFICATIONS)

Unit:  $^{\circ}\text{C}$

| Catalog No. |                       |                     | Sub-Base Function  |              | Range |      | Differential        | Wt. (kg) |
|-------------|-----------------------|---------------------|--------------------|--------------|-------|------|---------------------|----------|
| Type        | Contact & Temp. Range | Special Application | Change over Switch | Fan Switch   | Min.  | Max. |                     |          |
| <b>WRS-</b> | <b>C130</b>           | X1                  | ON-OFF, HEAT-COOL  | HIGH-MED-LOW | 10    | 30   | Approx. 1.5 (Fixed) | 0.25     |
|             |                       | X2                  | ON-OFF             |              |       |      |                     |          |
|             |                       | X7                  | ON-OFF, HEAT-COOL  |              |       |      |                     |          |

- Change over switch of HEAT-COOL on WRS-C130X1 is only for changing switch mechanism of room thermostat itself between HIGHCUT (HEATING) and LOWCUT (COOLING) according to system requirement.
- Please refer to the application sample and wiring diagram.

## ELECTRICAL RATINGS

| Rated Voltage (V)     |                | Power Factor (cos ϕ) | 125V. AC | 250V. AC |
|-----------------------|----------------|----------------------|----------|----------|
| Rated Current (A)     |                |                      |          |          |
| Non-Inductive Current |                | 1                    | 6        | 3        |
| Inductive Current     | Full Load      | 0.75                 |          |          |
|                       | Inrush Current | —                    | 24       | 12       |

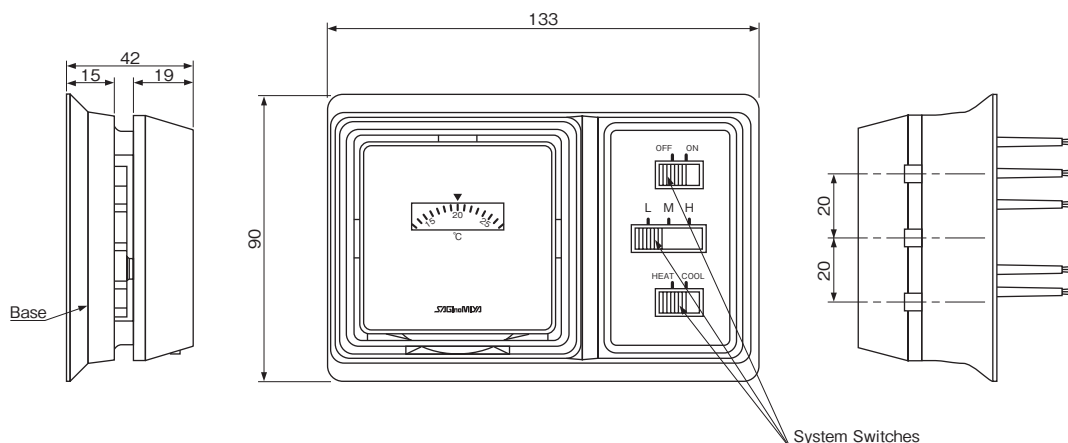
Minimum contact capacity: 50mA

## CONTACT FUNCTIONS

| Type            | WRS-C130X1 | WRS-C130X2 | WRS-C130X7 |
|-----------------|------------|------------|------------|
| Internal Wiring |            |            |            |

Arrow indicates temp. rise.

## DIMENSIONS



Unit: mm

# ROOM HUMIDISTATS

**Type AHS**

**SAGINOMIYA**

## GENERAL DESCRIPTION

- Accurate humidity control assured by nylon ribbon.
- Used for low or line voltage.
- Easy adjustment by dial knob.
- Dial stopper screw prevents unauthorized change of setting.



## SPECIFICATIONS

Unit: % RH

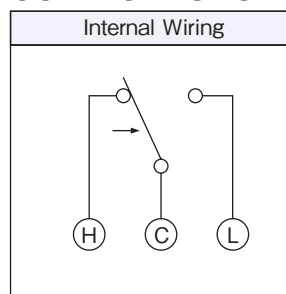
| Catalog No.      | Contact | Range |      | Differential | Ambient Temp. on Use (°C) | Wt. (kg) |
|------------------|---------|-------|------|--------------|---------------------------|----------|
|                  |         | Min   | Max. |              |                           |          |
| <b>AHS-C1090</b> | SPDT    | 30    | 90   | Approx. 5    | 10 to 40                  | 0.17     |

## ELECTRICAL RATINGS

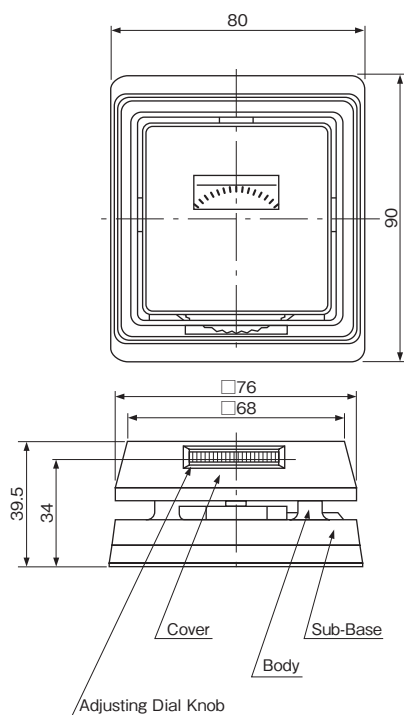
| Rated Voltage (V)     |                | Power Factor (cos $\phi$ ) | 125V. AC | 250V. AC | 24V. DC |
|-----------------------|----------------|----------------------------|----------|----------|---------|
| Rated Current (A)     |                |                            |          |          |         |
| Non-Inductive Current |                | 1.0                        | 4.5      | 2        | 1       |
| Inductive Current     | Full Load      | 0.75                       | 3        | 1.5      | 0.4     |
|                       | Inrush Current | —                          | 12       | 6        | 2       |

Minimum Contact Capacity: 50mA

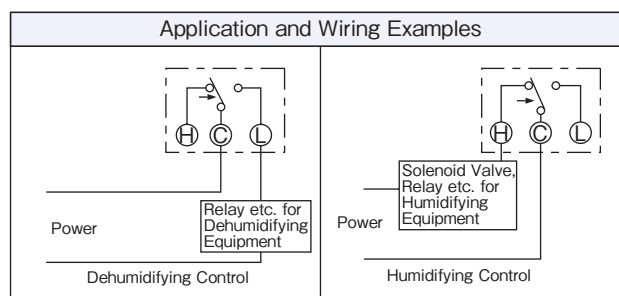
## CONTACT FUNCTIONS



## DIMENSIONS



Unit: mm



Arrow mark indicates humidity increase.

# DIGITAL THERMOSTATS & DIGITAL HUMIDISTATS

## Type ALE & BLE

**SAGInoMIYA**

### GENERAL DESCRIPTION

- LCD with high brightness backlight
- Power supply voltage: 85 to 264V.AC 50/60Hz
- Forced ON/OFF
- Relay output: 250V. AC , 10A ( $\cos \phi = 1$ )  
6A ( $\cos \phi = 0.7$ )  
3A ( $\cos \phi = 0.4$ )
- Ambient temperature: Controller ... - 10 to 50°C
- Type ALE:
  - Available 0.1°C pitch display (select 0.1°C / 0.5°C / 1°C)
  - Max.4 ON/OFF points during 24 hours model available.
  - MODBUS communication
- Type BLE:
  - Setting in each 1%RH is possible.
  - Ambient temperature: Humidity sensor 0 to 50°C



Type ALE



Type BLE

### TYPE NUMBER SELECTION (SPECIFICATIONS)

#### Type ALE – Digital Thermostats

Unit: °C

| Catalog No.  | Temp. Set Range | Differential | Temp. Indication | Function                             | Sensor Part No.<br>(Standard) | Wt.<br>(kg) |
|--------------|-----------------|--------------|------------------|--------------------------------------|-------------------------------|-------------|
| ALE-SD11-011 | -50 to 30       | Min. 0.5     | -55 to 40        | Standard(1 Step)                     | TEK-83H609 (with 2m lead)     | 0.2         |
| ALE-SD12-011 |                 |              |                  | 2 Step                               |                               |             |
| ALE-SD13-011 |                 |              |                  | 1 Step + Hi/Lo limit with time delay |                               |             |
| ALE-SD14-011 |                 |              |                  | 1 Step + Programmable                |                               |             |
| ALE-SD15-011 |                 |              |                  | 2 Step + Programmable                |                               |             |
| ALE-SD21-011 | 0 to 100        |              | 0 to 110         | Standard(1 Step)                     | TEK-83H601 (with 2m lead)     |             |
| ALE-SD22-011 |                 |              |                  | 2 Step                               |                               |             |
| ALE-SD23-011 |                 |              |                  | 1 Step + Hi/Lo limit with time delay |                               |             |
| ALE-SD24-011 |                 |              |                  | 1 Step + Programmable                |                               |             |
| ALE-SD25-011 |                 |              |                  | 2 Step + Programmable                |                               |             |

- Temperature sensor type TEK-83H609 or TEK-83H601 and sensor holder are supplied as standard accessories.
- Enclosure IP44(Front of products)

#### Type BLE – Digital humidistats

Unit: %RH

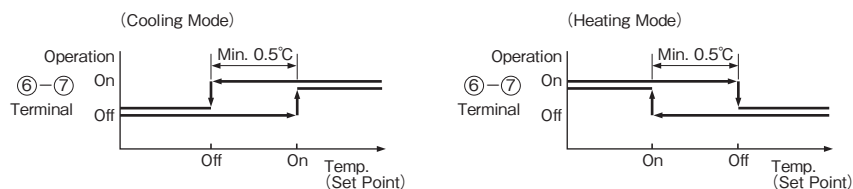
| Catalog No.         | Humidity Set Range | Differential | Humidity Indication | Calibration | Function | Sensor Part No. (Standard) | Wt. (kg) |
|---------------------|--------------------|--------------|---------------------|-------------|----------|----------------------------|----------|
| <b>BLE-SD11-011</b> | 30 to 90           | Min. 3       | 20 to 99            | ±10         | 1 Step   | HEK-11R001                 | 0.3      |
| <b>BLE-SD12-011</b> |                    |              |                     |             | 2 Step   |                            |          |

- Humidity sensor type HEK-11R001 is supplied as standard accessory.
- Enclosure IP44(Front of products)

### OPERATION

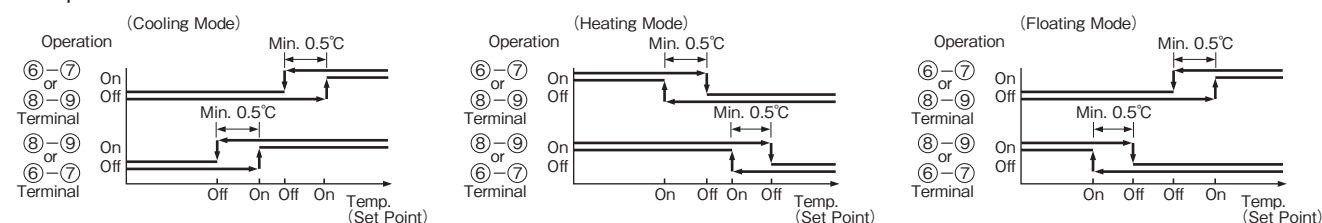
#### Type ALE – Digital thermostats

##### Standard (1 Step) model

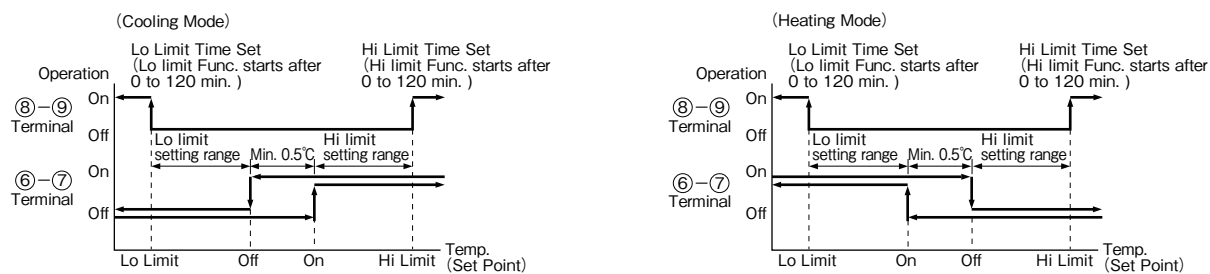


- Free to set On/Off set point independently within the range.
- When Off set point is changed, On set point automatically shifts. (Diff. remains same)
- When On set point is changed, Off set point remains unchanged. (Diff. changes)

##### 2 Step model

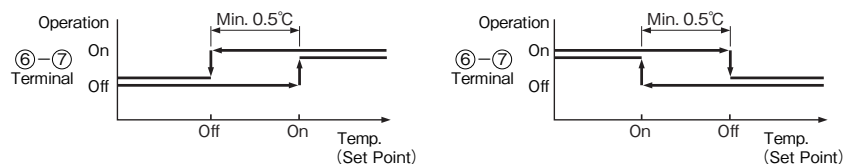


## 1 Step + Hi/Lo limit with time delay model



- Hi/Lo limit output is reset manually (Push reset: Push **ENT** Key in 2 sec or power off)
- Delay Timer can be set in the time range from 0 to 120 min respectively.

## 1 Step + Programmable model



- Free to set On/Off set point independently within the range.
- When Off set point is changed, On set point automatically shifts. (Diff. remains same)
- When On set point is changed, Off set point remains unchanged. (Diff. changes)

### Programmable function

Max. 4 ON/OFF points during 24 hours model available.

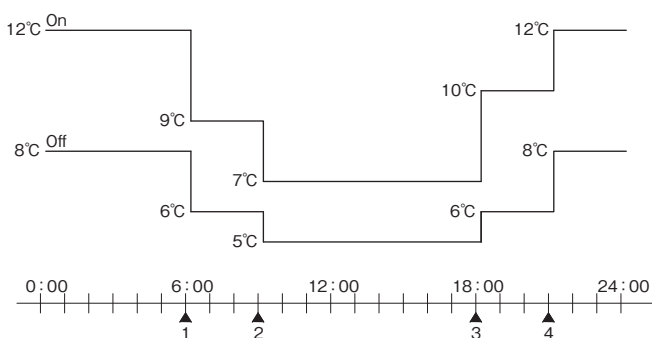
- Change the set temperature (ON / OFF) at the specified time.
- Stop the control at the specified time.

### [Program example 1]

Change the set temperature four times a day at the specified time.

Item1:6:00 OFF 6°C / ON 9°C  
 Item2:9:00 OFF 5°C / ON 7°C  
 Item3:18:00 OFF 6°C / ON 10°C  
 Item4:21:00 OFF 8°C / ON 12°C

This program performs the following operations.

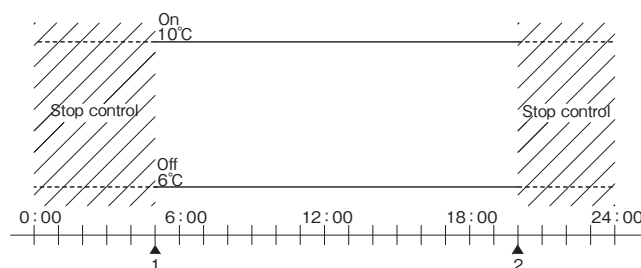


### [Program example 2]

Stop control in the night (20:00 to 5:00)

Item1:5:00 OFF 6°C / ON 9°C  
 Item2:20:00 OFF 5°C / ON 7°C

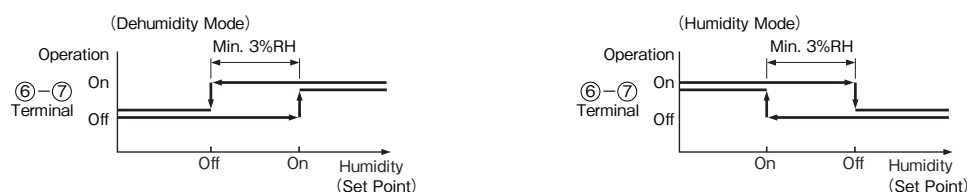
This program performs the following operations.



※This model can combine the settings of program example 1 and 2. In this case also a combination of up to 4 points within 24 hours.

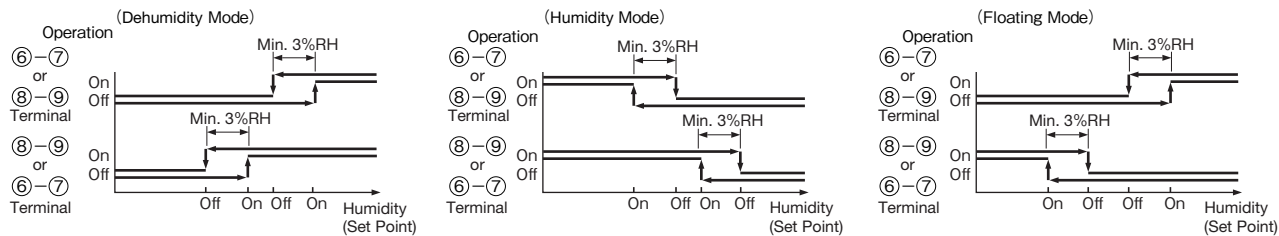
## Type BLE – Digital humidistats

### Standard (1 Step) model



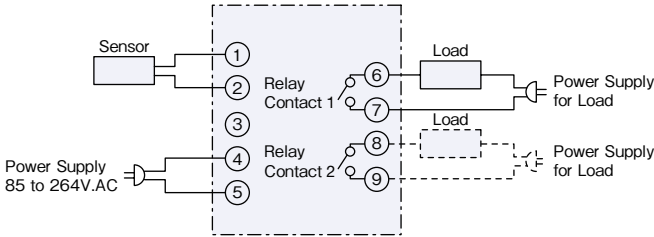
- Free to set On/Off set point independently within the range.
- When Off set point is changed, On set point automatically shifts. (Diff. remains same)
- When On set point is changed, Off set point remains unchanged. (Diff. changes)

2 Step model

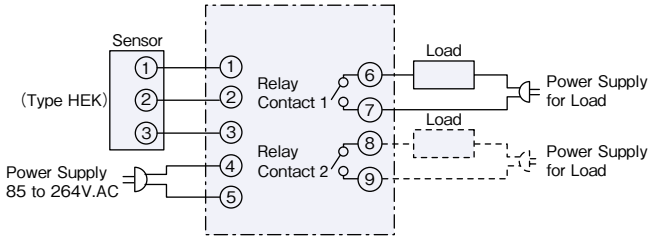


WIRING DIAGRAM

Type ALE



Type BLE



⑥-⑦:(Control output) :Standard (1 Step) model, 2 Step model,  
1 Step model + Hi/Lo limit with time delay model,  
and 1 Step model + Programmable model

⑧-⑨:(Control output) :2 Step model  
(Alarm output) :1 Step model + Hi/Lo limit with time delay model

⑥-⑦:(Control output):Standard (1 Step) model and 2 Step model

⑧-⑨:(Control output):2 Step model

ACCESSORIES

| Sensor Part No.             | Applicable Model                                                             | Dimension | Remarks                                                                                                                                                                                                                                                                                                 |
|-----------------------------|------------------------------------------------------------------------------|-----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| TEK-83H609<br>(Temperature) | ALE-SD11-011<br>ALE-SD12-011<br>ALE-SD13-011<br>ALE-SD14-011<br>ALE-SD15-011 |           | <ul style="list-style-type: none"><li>Ambient temp. on usage: - 55 to 80°C</li><li>When the sensor is in use under the condition of dew, water dripping or outdoor, the sensor should be vertically installed with lead wire outlet downward.</li><li>Sensor holder is supplied as standard.</li></ul>  |
| TEK-83H601<br>(Temperature) | ALE-SD21-011<br>ALE-SD22-011<br>ALE-SD23-011<br>ALE-SD24-011<br>ALE-SD25-011 |           | <ul style="list-style-type: none"><li>Ambient temp. on usage: - 40 to 110°C</li><li>When the sensor is in use under the condition of dew, water dripping or outdoor, the sensor should be vertically installed with lead wire outlet downward.</li><li>Sensor holder is supplied as standard.</li></ul> |
| HEK-11R001<br>(Humidity)    | BLE-SD11-011<br>BLE-SD12-011                                                 |           | <ul style="list-style-type: none"><li>Designed to accord room interior.</li><li>Designed to be installed where certain air flow runs and the room humidity is represented.</li><li>Depending on load or other conditions, humidity control may become difficult.</li></ul>                              |

Following sensors are available as option. (Ambient temperature sensors are available upon request.)

Direct immersion sensor with nipple ..... TEK-83N

Wall mounting sensor ..... TEK-83R

Surface temp. sensor ..... TEK-83E

Direct immersion sensor with terminal cover ..... TEK-83B

Bulb well ..... TEK-00N

## Communication function

### Type ALE

This product allows the following operations using the communication function.

Saginomiya Seisakusho's monitoring software allows the following checks and operations on the PC.

- Monitoring current temperature
- Checking current settings
- Switching operation mode (COOL/HEAT)
- Registering program
- Setting time
- Saving measurement data
- Monitoring output ON/OFF
- Setting OFF/ON setting values
- Setting calibration
- Enabling/disabling program function
- Locking/unlocking key

\* You need to provide an RS-485 communication converter and a communication cable required for communication.

\* Please download the monitoring software from the saginomiya website. (Free of charge)

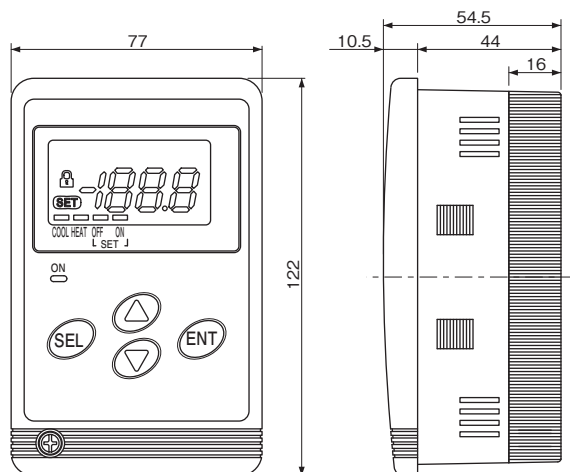
The following shows a summary of communication specifications.

- Interface : IRS-485
- Connection method : Two-wire half-duplex multi-drop connection
- Number of connected units : 16 or less
- Protocol : Modbus
- Transmission mode : Remote Terminal Unit (RTU)

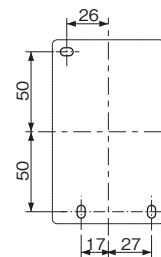
\* For details on communication specifications, contact your dealer or Saginomiya Seisakusho.

## DIMENSIONS

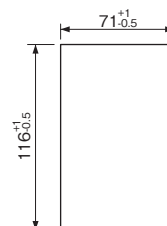
### Type ALE, BLE



Wall Mount Installation Dimension



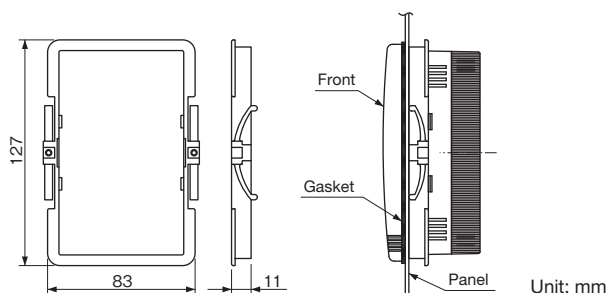
Panel Cut Dimension



Unit: mm

## OPERATION

### Type ALE-AA02 Panel Mount Bracket including Gasket



**PRESSURE & TEMPERATURE CONTROLS INFORMATION**

**CONNECTION & ACCESSORIES** . . . . . 45–47  
**DRIP PROOF & WATER PROOF CONTROLS** . . . . . 48–53  
Series **NS-W & NS-P**

# CONNECTION & ACCESSORIES

## NS PRESSURE CONTROLS NOMENCLATURE

Catalog No. is decided according to the specifications.

Example: HNS – C1 30 X 

|    |
|----|
| M1 |
|----|

|   |
|---|
| N |
|---|

|   |
|---|
| W |
|---|

|   |
|---|
| G |
|---|

|   |
|---|
| Q |
|---|

I      II      III      IV

I N=SUS Bellows

II W=Drip Proof, P=Water Proof (Except for Type HNS, WNS, YNS)

III Connection Style.... Refer to Connection Table Below

IV Option....Special No.

## ONS PROTECTION CONTROLS NOMENCLATURE

Catalog No. is decided according to the specifications.

Example: ONS – C1 06 X 

|   |
|---|
| N |
|---|

|   |
|---|
| W |
|---|

|   |
|---|
| G |
|---|

|   |
|---|
| Q |
|---|

I      II      III      IV

I N=SUS Bellows

II W=Drip Proof

III Connection Style.... Refer to Connection Table Below

IV Timer Specification.... Q1~Q12, Q25~Q36

## Connection Table (for NS Series Pressure Controls )

| Connection Style |               |              | Size | Copper     |     |              |            |      | Steel  |
|------------------|---------------|--------------|------|------------|-----|--------------|------------|------|--------|
|                  |               |              |      | 1/4"       | φ 8 | 3/8"         | φ 10       | 1/2" | φ 10.5 |
| B                | Flare         | Except Below |      | (Stand.)   | B1  | B2           | B3         | B4   | —      |
|                  |               | ANS          |      | B          | B1  | B2           | B3         | B4   | —      |
| U                | Union         |              |      | U1         | U2  | —            | U (Stand.) | —    | U3     |
| G                | Female Thread |              | Rc   | G (Stand.) | —   | G3           | —          | G6   | —      |
|                  |               |              | G    | G1         | —   | G4           | —          | G7   | —      |
|                  |               |              | NPT  | G2         | —   | G5           | —          | G8   | —      |
| M                | Male Thread   | Except Below | R    | M02        | —   | M01 (Stand.) | —          | M07  | —      |
|                  |               |              | G    | M03        | —   | M05          | —          | M08  | —      |
|                  |               |              | NPT  | M04        | —   | M06          | —          | M09  | —      |
|                  |               | ANS          | R    | M1         | —   | M (Stand.)   | —          | M6   | —      |
|                  |               |              | G    | M2         | —   | M4           | —          | M7   | —      |
|                  |               |              | NPT  | M3         | —   | M5           | —          | M8   | —      |
| K                | Flareless     | Direct       |      | K1         | K2  | —            | K (Stand.) | —    | —      |
|                  |               | Connector    |      | —          | —   | —            | —          | —    | K3     |

| Connection Style |           | Size | 1000 mm     | 2000 mm |
|------------------|-----------|------|-------------|---------|
|                  |           |      |             |         |
| L                | Capillary |      | L1 (Stand.) | L2      |

# NS TEMPERATURE CONTROLS NOMENCLATURE

Catalog No. is decided according to the specifications.

Example: TNS – C1 100 X M2 W L1 Q1  
I II III

I W=Drip Proof, P=Water Proof

II Connection Style.... Refer to Connection Table Below

III Option....Special No.

## Capillary Length Table

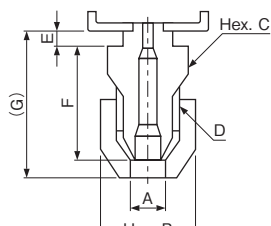
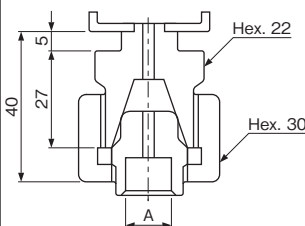
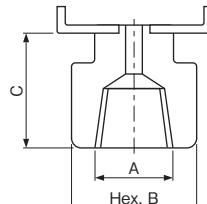
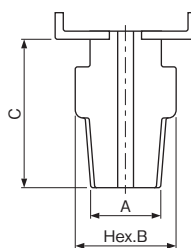
| Connection Style | Size | Normal     |     | Nickel Plated |        |
|------------------|------|------------|-----|---------------|--------|
|                  |      | Except BNS | BNS | Except BNS    | BNS    |
| 1m               |      | Standard   | L1  | Q012          | L1Q012 |
| 2m               |      |            | L2  |               | L2Q012 |
| 3m               |      |            | L3  |               | L3Q012 |
| 5m               |      |            | L5  |               | L5Q012 |
| 7m               |      |            | L7  |               | L7Q012 |
| 10m              |      |            | L0  |               | L0Q012 |
| Except Above     |      | LQ         | LZ  | LQ012         | LZQ012 |

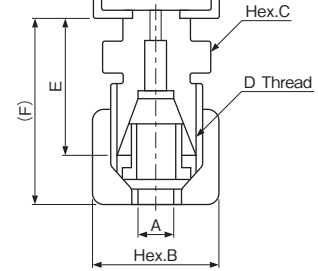
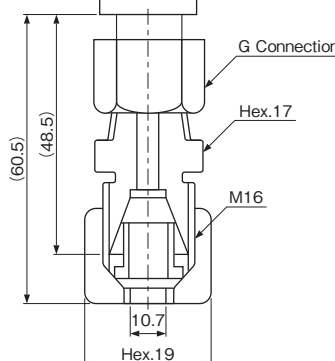
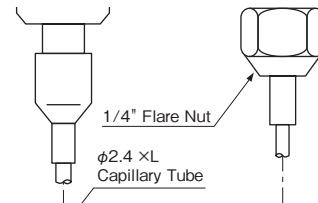
\* TNS-C1010XC to TNS-C1070XC: Capillary length are 1m to 5m

## Connection Dimension Table

Unit: mm

Unit: mm

| (B) Flare                                                                           |         | (U) Union                                                                           |    | Pipe Thread                                                                          |   |                                                                                      |    |  |  |  |  |  |
|-------------------------------------------------------------------------------------|---------|-------------------------------------------------------------------------------------|----|--------------------------------------------------------------------------------------|---|--------------------------------------------------------------------------------------|----|--|--|--|--|--|
|                                                                                     |         |                                                                                     |    | (G) Female                                                                           |   | (M) Male                                                                             |    |  |  |  |  |  |
|  |         |  |    |  |   |  |    |  |  |  |  |  |
| Size                                                                                | A       | B                                                                                   | C  | D                                                                                    | E | F                                                                                    | G  |  |  |  |  |  |
| φ 1/4                                                                               | φ 6.5   | 17                                                                                  | 12 | 7/16-20 UNF                                                                          | 0 | 20.5                                                                                 | 26 |  |  |  |  |  |
| φ 8                                                                                 | φ 8.2   | 22                                                                                  | 17 | 5/8-18 UNF                                                                           | 5 | 24.5                                                                                 | 36 |  |  |  |  |  |
| φ 3/8                                                                               | φ 9.7   |                                                                                     |    |                                                                                      |   |                                                                                      |    |  |  |  |  |  |
| φ 10                                                                                | φ 10.2  | 24                                                                                  | 22 | 3/4-16 UNF                                                                           | 5 | 27.5                                                                                 | 40 |  |  |  |  |  |
| φ 1/2                                                                               | φ 12.9  |                                                                                     |    |                                                                                      |   |                                                                                      |    |  |  |  |  |  |
| Size                                                                                | A       |                                                                                     |    |                                                                                      |   |                                                                                      |    |  |  |  |  |  |
| φ 6 Copper                                                                          | φ 6.5   |                                                                                     |    |                                                                                      |   |                                                                                      |    |  |  |  |  |  |
| φ 8 Copper                                                                          | φ 8.5   |                                                                                     |    |                                                                                      |   |                                                                                      |    |  |  |  |  |  |
| φ 10 Copper                                                                         | φ 10.5  |                                                                                     |    |                                                                                      |   |                                                                                      |    |  |  |  |  |  |
| φ 10.5 Steel                                                                        | φ 11.0  |                                                                                     |    |                                                                                      |   |                                                                                      |    |  |  |  |  |  |
| Size                                                                                | A       | B                                                                                   | C  |                                                                                      |   |                                                                                      |    |  |  |  |  |  |
| 1/4"                                                                                | Rc1/4   | 19                                                                                  | 23 |                                                                                      |   |                                                                                      |    |  |  |  |  |  |
|                                                                                     | G1/4    |                                                                                     |    |                                                                                      |   |                                                                                      |    |  |  |  |  |  |
|                                                                                     | 1/4 NPT |                                                                                     |    |                                                                                      |   |                                                                                      |    |  |  |  |  |  |
| 3/8"                                                                                | Rc3/8   | 22                                                                                  | 23 |                                                                                      |   |                                                                                      |    |  |  |  |  |  |
|                                                                                     | G3/8    |                                                                                     |    |                                                                                      |   |                                                                                      |    |  |  |  |  |  |
|                                                                                     | 3/8 NPT |                                                                                     |    |                                                                                      |   |                                                                                      |    |  |  |  |  |  |
| 1/2"                                                                                | Rc1/2   | 27                                                                                  | 27 |                                                                                      |   |                                                                                      |    |  |  |  |  |  |
|                                                                                     | G1/2    |                                                                                     |    |                                                                                      |   |                                                                                      |    |  |  |  |  |  |
|                                                                                     | 1/2 NPT |                                                                                     |    |                                                                                      |   |                                                                                      |    |  |  |  |  |  |
| Size                                                                                | A       | B                                                                                   | C  |                                                                                      |   |                                                                                      |    |  |  |  |  |  |
| 1/4"                                                                                | R1/4    | 17                                                                                  | 29 |                                                                                      |   |                                                                                      |    |  |  |  |  |  |
|                                                                                     | G1/4    |                                                                                     |    |                                                                                      |   |                                                                                      |    |  |  |  |  |  |
|                                                                                     | 1/4 NPT |                                                                                     |    |                                                                                      |   |                                                                                      |    |  |  |  |  |  |
| 3/8"                                                                                | R3/8    | 19                                                                                  | 29 |                                                                                      |   |                                                                                      |    |  |  |  |  |  |
|                                                                                     | G3/8    |                                                                                     |    |                                                                                      |   |                                                                                      |    |  |  |  |  |  |
|                                                                                     | 3/8 NPT |                                                                                     |    |                                                                                      |   |                                                                                      |    |  |  |  |  |  |
| 1/2"                                                                                | R1/2    | 22                                                                                  | 33 |                                                                                      |   |                                                                                      |    |  |  |  |  |  |
|                                                                                     | G1/2    |                                                                                     |    |                                                                                      |   |                                                                                      |    |  |  |  |  |  |
|                                                                                     | 1/2 NPT |                                                                                     |    |                                                                                      |   |                                                                                      |    |  |  |  |  |  |

| (K) Flareless Type Connection                                                       |      |    |                                                                                      |     |    | (L) Capillary                                                                         |      |
|-------------------------------------------------------------------------------------|------|----|--------------------------------------------------------------------------------------|-----|----|---------------------------------------------------------------------------------------|------|
| Copper Pipe (Direct)                                                                |      |    | Steel Pipe (Connector Option)                                                        |     |    |                                                                                       |      |
|  |      |    |  |     |    |  |      |
| Size                                                                                | A    | B  | C                                                                                    | D   | E  | F                                                                                     |      |
| φ 6                                                                                 | 6.2  | 14 | 14                                                                                   | M12 | 23 | 33                                                                                    |      |
| φ 8                                                                                 | 8.2  | 17 | 14                                                                                   | M14 | 23 | 33                                                                                    |      |
| φ 10                                                                                | 10.2 | 19 | 17                                                                                   | M16 | 23 | 34                                                                                    |      |
| K3                                                                                  |      |    |                                                                                      |     |    | Type                                                                                  | L    |
|                                                                                     |      |    |                                                                                      |     |    | L1                                                                                    | 1000 |
|                                                                                     |      |    |                                                                                      |     |    | L2                                                                                    | 2000 |

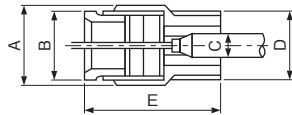
# ACCESSORIES

## Mounting Brackets

| Name | Body Bracket      |                              |           |           |                   |           | Bulb Bracket                    |           |
|------|-------------------|------------------------------|-----------|-----------|-------------------|-----------|---------------------------------|-----------|
|      | Type              | Parts No.                    | Type      | Parts No. | Type              | Parts No. | Type                            | Parts No. |
|      | YS, NS, FE Series | SNS-AE01<br>(Standard Acce.) | NS Series | SNS-AE02  | LWS<br>FWS<br>RWS | LWS-AE08  | ALS, BLS                        | ALS-AE09  |
|      |                   | SNS-AE11                     | ALS, BLS  | ALS-AE02  |                   |           | LWS<br>PWS<br>(Except PWS-7060) | LWS-AE12  |
|      | ALS, BLS          | ALS-AE01                     |           |           |                   |           |                                 |           |
| Form |                   |                              |           |           |                   |           |                                 |           |
|      | ( ) SNS-AE11      |                              |           |           |                   |           | Ambient temp.: -40 to 90°C      |           |

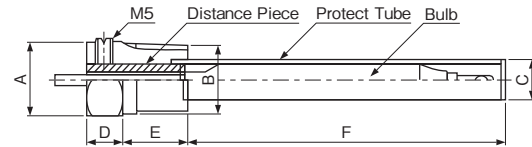
## Insert Holder, Protect Tube (For Temperature Controls)

Insert Holder



| Size | Max Press.  | Torque  | A       | B       | D    | E    |
|------|-------------|---------|---------|---------|------|------|
| 1/2" | Static      | 12N · m | Hex. 24 | Hex. 22 | R1/2 | (43) |
| 3/4" | Press. 1MPa | or less | Hex. 32 | Hex. 30 | R3/4 | (54) |

Protect Tube



| Size | Max Press.  | Torque  | A       | B    | D  | E  |
|------|-------------|---------|---------|------|----|----|
| 1/2" | Static      | 12N · m | Hex. 24 | R1/2 | 10 | 20 |
| 3/4" | Press. 3MPa | or less | Hex. 24 | R3/4 | 10 | 22 |

## Insert Holder

| Controls Catalog No. |                            | Size | Parts No. | Size C               |
|----------------------|----------------------------|------|-----------|----------------------|
| NS                   | TNS-C100 to C134           | 1/2" | TNS-AB01  | φ 6                  |
|                      | CNS-C115 (M2) to C134 (M2) | 3/4" | TNS-AB09  |                      |
|                      | TNS-C1070                  | 1/2" | TNS-AB04  | φ 12.7               |
|                      | TNS-C1010C to C1070C       | 3/4" | TNS-AB07  |                      |
|                      | TNS-C1100 to C1150         | 1/2" | TNS-AB17  | φ 12.7<br>Heat Proof |
|                      |                            | 3/4" | TNS-AB18  |                      |
| WS                   | INS-C1070M1                | 1/2" | TNS-AB02  | φ 9.5                |
|                      |                            | 3/4" | TNS-AB05  |                      |
|                      | INS-C1120M1, C1150M1       | 1/2" | TNS-AB15  | φ 9.5<br>Heat Proof  |
|                      |                            | 3/4" | TNS-AB16  |                      |
| WS                   | LWS-C1030 to C1094         | 1/2" | LWS-AB02  | φ 9.5                |
|                      | PWS-7034 to 7094           | 3/4" | LWS-AB05  |                      |
| LS                   | LWS-C1120 to C1240         | 1/2" | LWS-AB15  | φ 9.5<br>Heat Proof  |
|                      | PWS-7120                   | 3/4" | LWS-AB16  |                      |
|                      | ALS-C1011 to C1050         | 1/2" | ALS-AB03  | φ 10                 |
|                      | BLS-C1020                  | 3/4" | ALS-AB06  |                      |
|                      | ALS-C1090                  | 1/2" | ALS-AB10  | φ 10<br>Heat Proof   |

## Protect Tube

| Controls Catalog No. |                            | Size | Parts No. |          | Size C × F              |
|----------------------|----------------------------|------|-----------|----------|-------------------------|
|                      |                            |      | Copper    | SUS      |                         |
| NS                   | TNS-C100 to C134           | 1/2" | TNS-AC01  | TNS-AC46 | φ 8 × 95                |
|                      | CNS-C115 (M2) to C134 (M2) | 3/4" | TNS-AC35  | TNS-AC56 |                         |
|                      | TNS-C1070 to C1150         | 1/2" | TNS-AC05  | TNS-AC12 | φ 15 × 115              |
|                      |                            | 3/4" | TNS-AC09  | TNS-AC14 |                         |
|                      | INS-C1070M1 to C1150M1     | 1/2" | TNS-AC02  | TNS-AC11 | φ 12 × 95               |
|                      |                            | 3/4" | TNS-AC06  | TNS-AC13 |                         |
| WS                   | LWS-C1030 to C1090         | 1/2" | LWS-AC15  | LWS-AC21 | φ 12 × 110              |
|                      |                            | 3/4" | LWS-AC17  | LWS-AC23 |                         |
|                      | LWS-C1120 to C1160         | 1/2" | LWS-AC19  | LWS-AC25 | φ 12 × 80               |
|                      | PWS-7120                   | 3/4" | LWS-AC20  | LWS-AC26 |                         |
|                      | LWS-C1200 to C1240         | 1/2" | LWS-AC48  | LWS-AC50 | φ 12 × 80<br>Heat Proof |
|                      |                            | 3/4" | LWS-AC49  | LWS-AC51 |                         |
| LS                   | LWS-C1034 to C1094         | 1/2" | LWS-AC16  | LWS-AC22 | φ 12 × 140              |
|                      | PWS-7034 to 7094           | 3/4" | LWS-AC18  | LWS-AC24 |                         |
|                      | EWS-C1080 to C1160         | 1/2" | EWS-AC27  | —        | φ 10.8 × 70             |
|                      |                            | 3/4" | —         | EWS-AC28 | φ 12 × 75               |
| LS                   | ALS-C1011 to C1090         | 1/2" | ALS-AC03  | ALS-AC36 | φ 12 × 105              |
|                      |                            | 3/4" | ALS-AC07  | —        |                         |

# DRIP PROOF & WATER PROOF CONTROLS

## SERIES NS-W & NS-P

SAGInoMIYA

### GENERAL DESCRIPTION

- Approved by various marine standards such as Bureau Veritas, Lloyd's Register, Det Norske Veritas · Germanischer Lloyd's, Nippon Kaiji Kyokai, ABS etc.
- Suitable for indoor or outdoor applications where water drips and dusts are apt to enter, such as marine refrigeration units or industrial plants.
- External wiring is made by cabtyre cable connection with cable glands.  
Standard gland size:  $\phi 20\text{mm}$   
Semi standard gland size:  $\phi 15\text{mm}$
- To order, specify catalog No. with "W" or "P".  
Example: Type SNS-C106XW Drip proof model  
Type SNS-C106XP Water proof model



Type SNS-P, FNS-P, ANS-P



Type SNS-W, FNS-W, ANS-W

- Type SNS-W/P — Drip proof and Water proof model of single function pressure controls.

### TYPE NUMBER SELECTION (SPECIFICATIONS)

Automatic reset type

| Automatic reset type |      |                 |          |              |            |                 |            |                       | Unit: MPa (kgf/cm <sup>2</sup> ) |                                          |
|----------------------|------|-----------------|----------|--------------|------------|-----------------|------------|-----------------------|----------------------------------|------------------------------------------|
| Catalog No.          |      | Range           |          | Differential |            | Factory Setting |            | Max. Working Pressure | Contact Function                 | Wt. (kg)                                 |
|                      |      | Min.            | Max.     | Min.         | Max.       | Off (On)        | On (Off)   |                       |                                  |                                          |
| SNS-C101X            | W    | −0.06 {−50cmHg} | 0.1 {1}  | 0.015 {0.15} | 0.05 {0.5} | 0.025 {0.25}    | 0.05 {0.5} | 0.3 {3}               | Diagram 1                        | SNS-W: Approx. 1.1<br>SNS-P: Approx. 0.6 |
| SNS-C102X            | W, P | −0.02 {−20cmHg} | 0.2 {2}  | 0.025 {0.25} | 0.15 {1.5} |                 |            | 0.5 {5}               |                                  |                                          |
| SNS-C103X            | W, P | −0.06 {−50cmHg} | 0.3 {3}  | 0.035 {0.35} | 0.2 {2}    | 0.05 {0.5}      | 0.15 {1.5} | 1 {10}                |                                  |                                          |
| SNS-C104X            | W, P | −0.06 {−50cmHg} | 0.4 {4}  | 0.04 {0.4}   |            | 0.1 {1}         | 0.2 {2}    | 1.5 {15}              |                                  |                                          |
| SNS-C106X            | W, P | −0.06 {−50cmHg} | 0.6 {6}  | 0.06 {0.6}   | 0.4 {4}    | 0.2 {2}         | 0.3 {3}    |                       |                                  |                                          |
| SNS-C110X            | W, P | 0.1 {1}         | 1 {10}   | 0.1 {1}      | 0.3 {3}    | 0.4 {4}         | 0.6 {6}    | 3.3 {33}              |                                  |                                          |
| SNS-C130X            | W, P | 0.5 {5}         | 3 {30}   | 0.3 {3}      | 1 {10}     | 2 {20}          | 2.5 {25}   |                       |                                  |                                          |
| SNS-C135X            | W, P | 1 {10}          | 3.5 {35} | 0.5 {5}      | 1.5 {15}   | 2.5 {25}        | 3 {30}     | 3.8 {38}              |                                  |                                          |

Manual reset type

| Catalog No. |      | Range           |         | Manual Reset                                                                   | * Factory Setting |              | Max. Working Pressure | Contact Function | Wt. (kg)                                 |
|-------------|------|-----------------|---------|--------------------------------------------------------------------------------|-------------------|--------------|-----------------------|------------------|------------------------------------------|
|             |      | Min.            | Max.    |                                                                                | Off (On)          | On (Off)     |                       |                  |                                          |
| SNS-C102XM2 | W, P | -0.02 {-20cmHg} | 0.2 {2} | Automatic operation on pressure decrease and manual reset on pressure increase | 0.025 {0.25}      | Manual Reset | 0.5 {5}               | Diagram 2        | SNS-W: Approx. 1.1<br>SNS-P: Approx. 0.6 |
| SNS-C106XM2 | W, P | -0.06 {-50cmHg} | 0.6 {6} |                                                                                | 0.2 {2}           |              | 1.5 {15}              |                  |                                          |
| SNS-C130XM2 | W, P | 0.5 {5}         | 3 {30}  |                                                                                | 2 {20}            |              | 3.3 {33}              |                  |                                          |

\* Based on the 1-3 terminal connection.

### ELECTRICAL RATINGS

| Rated Voltage (V)     |                | Power Factor<br>(cos ϕ) | 125/250V. AC |
|-----------------------|----------------|-------------------------|--------------|
| Rated Current (A)     |                |                         |              |
| Non-Inductive Current |                | 1                       | 12           |
| Inductive<br>Current  | Full Load      | 0.75                    |              |
|                       | Inrush Current | —                       | 72           |

Minimum contact capacity: 50mA

### CONTACT FUNCTIONS

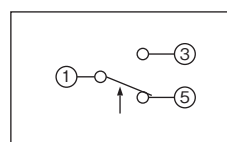


Diagram 1

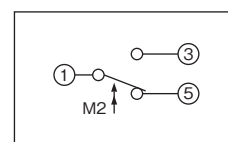


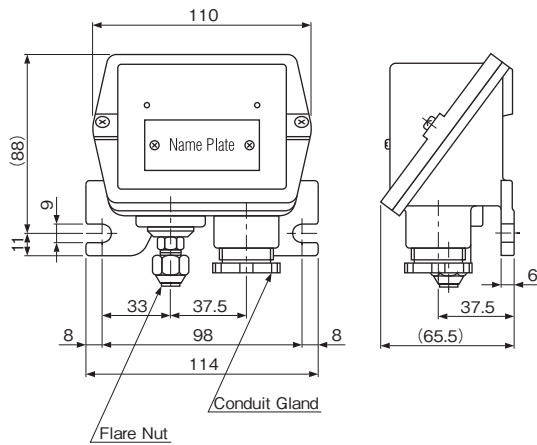
Diagram 2

| Diagram 1 & 2 |                            |
|---------------|----------------------------|
| 1             | Common Terminal            |
| 3             | Close on Pressure Increase |
| 5             | Close on Pressure Decrease |

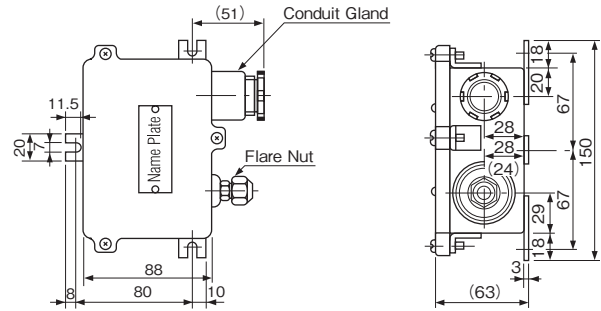
↑ : Operating direction on press. increase at High Press. Side  
M2 ↑ : Operating direction on manual reset

## DIMENSIONS

Type SNS-P, FNS-P, ANS-P



Type SNS-W, FNS-W, ANS-W



Unit: mm

## ● Type DNS-W/P — Drip proof and Water proof model of dual function pressure controls



Type DNS-P



Type DNS-W

## TYPE NUMBER SELECTION (SPECIFICATIONS)

Automatic reset type

Unit: MPa {kgf/cm<sup>2</sup>}

| Catalog No. |      | Pressure Side | Range           |         | Differential                          |         | Factory Setting |          | Max. Working Pressure | Contact Function | Wt. (kg)                                 |
|-------------|------|---------------|-----------------|---------|---------------------------------------|---------|-----------------|----------|-----------------------|------------------|------------------------------------------|
|             |      |               | Min.            | Max.    | Min.                                  | Max.    | Off             | On       |                       |                  |                                          |
| DNS-D304X   | W, P | Low Side      | -0.06 {-50cmHg} | 0.4 {6} | 0.04 {0.4}                            | 0.2 {2} | 0.1 {1}         | 0.2 {2}  | 1.5 {15}              | Diagram 3        | DNS-W: Approx. 1.4<br>DNS-P: Approx. 0.9 |
|             |      | High Side     | 0.8 {8}         | 3 {30}  | Approx. 0.4 fixed. {Approx. 4 fixed.} |         | 2 {20}          | 1.6 {16} | 3.3 {33}              |                  |                                          |
| DNS-D306X   | W, P | Low Side      | -0.06 {-50cmHg} | 0.6 {6} | 0.06 {0.6}                            | 0.4 {4} | 0.2 {2}         | 0.3 {3}  | 1.5 {15}              |                  |                                          |
|             |      | High Side     | 0.8 {8}         | 3 {30}  | Approx. 0.4 fixed. {Approx. 4 fixed.} |         | 2 {20}          | 1.6 {16} | 3.3 {33}              |                  |                                          |
| DNS-D604X   | W, P | Low Side      | -0.06 {-50cmHg} | 0.4 {6} | 0.04 {0.4}                            | 0.2 {2} | 0.1 {1}         | 0.2 {2}  | 1.5 {15}              | Diagram 5        |                                          |
|             |      | High Side     | 0.8 {8}         | 3 {30}  | Approx. 0.4 fixed. {Approx. 4 fixed.} |         | 2 {20}          | 1.6 {16} | 3.3 {33}              |                  |                                          |
| DNS-D606X   | W, P | Low Side      | -0.06 {-50cmHg} | 0.6 {6} | 0.06 {0.6}                            | 0.4 {4} | 0.2 {2}         | 0.3 {3}  | 1.5 {15}              |                  |                                          |
|             |      | High Side     | 0.8 {8}         | 3 {30}  | Approx. 0.4 fixed. {Approx. 4 fixed.} |         | 2 {20}          | 1.6 {16} | 3.3 {33}              |                  |                                          |

Manual reset type

Unit: MPa {kgf/cm<sup>2</sup>}

| Catalog No. |      | Pressure Side | Range           |         | Differential                                                                   |      | Factory Setting |              | Max. Working Pressure | Contact Function | Wt. (kg)                                 |           |
|-------------|------|---------------|-----------------|---------|--------------------------------------------------------------------------------|------|-----------------|--------------|-----------------------|------------------|------------------------------------------|-----------|
|             |      |               | Min.            | Max.    | Min.                                                                           | Max. | Off             | On           |                       |                  |                                          |           |
| DNS-D304XM  | W, P | Low Side      | −0.06 {−50cmHg} | 0.4 {4} | 0.04 {0.4}      0.2 {2}                                                        |      | 0.1 {1}         | 0.2 {2}      | 1.5 {15}              | Diagram 4        | DNS-W: Approx. 1.4<br>DNS-P: Approx. 0.9 |           |
|             |      | High Side     | 0.8 {8}         | 3 {30}  | Automatic operation on pressure increase and manual reset on pressure decrease |      | 2 {20}          | manual reset | 3.3 {33}              |                  |                                          |           |
| DNS-D306XM  | W, P | Low Side      | −0.06{−50cmHg}  | 0.4 {4} | 0.06 {0.6}      0.4 {4}                                                        |      | 0.2 {2}         | 0.3 {3}      | 1.5 {15}              |                  |                                          |           |
|             |      | High Side     | 0.8 {8}         | 3 {30}  | Automatic operation on pressure increase and manual reset on pressure decrease |      | 2 {20}          | manual reset | 3.3 {33}              |                  |                                          |           |
| DNS-D604XM  | W, P | Low Side      | −0.06{−50cmHg}  | 0.4 {4} | 0.04 {0.4}      0.2 {2}                                                        |      | 0.1 {1}         | 0.2 {2}      | 1.5 {15}              | Diagram 6        |                                          |           |
|             |      | High Side     | 0.8 {8}         | 3 {30}  | Automatic operation on pressure increase and manual reset on pressure decrease |      | 2 {20}          | manual reset | 3.3 {33}              |                  |                                          |           |
| DNS-D606XM  | W, P | Low Side      | −0.06{−50cmHg}  | 0.6 {6} | 0.06 {0.6}      0.4 {4}                                                        |      | 0.2 {2}         | 0.3 {3}      | 1.5 {15}              |                  |                                          | Diagram 7 |
|             |      | High Side     | 0.8 {8}         | 3 {30}  | Automatic operation on pressure increase and manual reset on pressure decrease |      | 2 {20}          | manual reset | 3.3 {33}              |                  |                                          |           |
| DNS-D606XMM | W    | Low Side      | −0.06{−50cmHg}  | 0.6 {6} | Automatic operation on pressure decrease and manual reset on pressure increase |      | 0.2 {2}         | manual reset | 1.5 {15}              |                  |                                          |           |
|             |      | High Side     | 0.8 {8}         | 3 {30}  | Automatic operation on pressure increase and manual reset on pressure decrease |      | 2 {20}          |              | 3.3 {33}              |                  |                                          |           |

## ELECTRICAL RATINGS

| Rated Voltage (V)     |                | Power Factor (cos $\phi$ ) | 125/250V. AC |
|-----------------------|----------------|----------------------------|--------------|
| Rated Current (A)     |                |                            |              |
| Non-Inductive Current |                | 1                          | 12           |
| Inductive Current     | Full Load      | 0.75                       |              |
|                       | Inrush Current | —                          | 72           |

## CONTACT FUNCTIONS

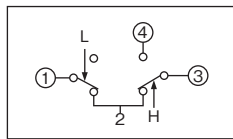


Diagram 3

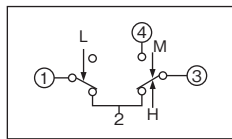


Diagram 4

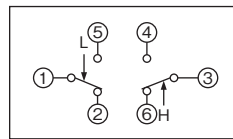


Diagram 5

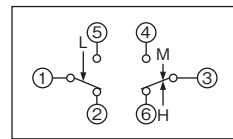


Diagram 6

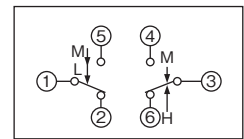
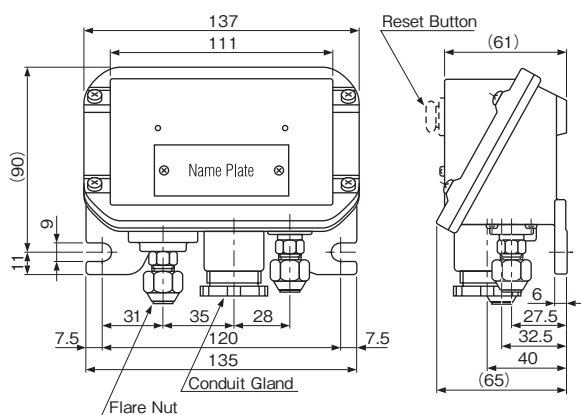


Diagram 7

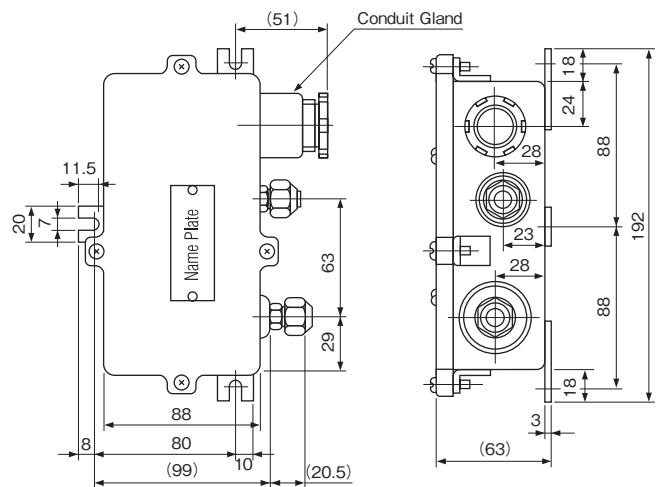
L ↓ : Operating direction on press. increase at Low Press. Side  
H ↑ : Operating direction on press. increase at High Press. Side  
M ↓ : Operating direction on manual reset

## DIMENSIONS

Type DNS-P



Type DNS-W



Unit: mm

## ● Type HNS-W — Drip proof model of single function high pressure controls



HNS-W

## TYPE NUMBER SELECTION (SPECIFICATIONS)

Automatic reset type

Unit: MPa {kgf/cm<sup>2</sup>}

| Catalog No.      |          | Range      |           | Differential                       | * Factory Setting |             | Max. Working Pressure | Wt. (kg)    |
|------------------|----------|------------|-----------|------------------------------------|-------------------|-------------|-----------------------|-------------|
|                  |          | Min.       | Max.      |                                    | Off               | On          |                       |             |
| <b>HNS-C130X</b> | <b>W</b> | 0.8<br>{8} | 3<br>{30} | 0.3 to 0.5 Fixed<br>{3 to 5 fixed} | 2<br>{20}         | 1.6<br>{16} | 3.3<br>{33}           | Approx. 1.1 |

For specifications, electrical ratings, and contact functions, refer to page 13, 14.

Manual reset type

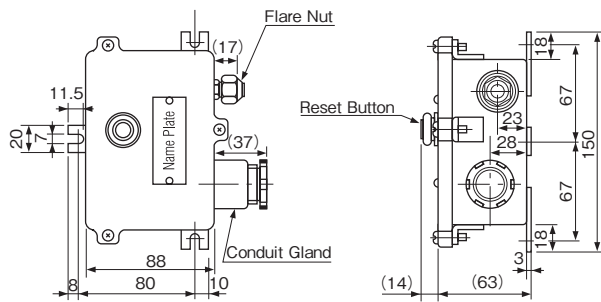
Unit: MPa {kgf/cm<sup>2</sup>}

| Catalog No.        |          | Range      |           | Manual Reset                                                                   | * Factory Setting |              | Max. Working Pressure | Wt. (kg)    |
|--------------------|----------|------------|-----------|--------------------------------------------------------------------------------|-------------------|--------------|-----------------------|-------------|
|                    |          | Min.       | Max.      |                                                                                | Off               | On           |                       |             |
| <b>HNS-C130XM1</b> | <b>W</b> | 0.8<br>{8} | 3<br>{30} | Automatic operation on pressure increase and manual reset on pressure decrease | 2<br>{20}         | manual reset | 3.3<br>{33}           | Approx. 1.1 |

For specifications, electrical ratings, and contact functions, refer to page 13, 14.

## DIMENSIONS

### Type HNS-W



Unit: mm

- Type FNS-W/P & ANS-W/P — Drip proof and Water proof model of single function pressure controls



FNS-W, ANS-W

## TYPE NUMBER SELECTION (SPECIFICATIONS)

### Type FNS – Fixed narrow differential

Unit: MPa {kgf/cm<sup>2</sup>}

| Catalog No.      |             | Range                            |                         | Differential                                                     | Factory Setting                           |                                | Max. Working Pressure     | Wt. (kg)                                             |
|------------------|-------------|----------------------------------|-------------------------|------------------------------------------------------------------|-------------------------------------------|--------------------------------|---------------------------|------------------------------------------------------|
|                  |             | Min.                             | Max.                    | Fixed                                                            | Off                                       | On                             |                           |                                                      |
| <b>FNS-C1**X</b> | <b>W, P</b> | -0.06 {-50cmHg}<br>to<br>0.5 {5} | 0.1 {1}<br>to<br>3 {30} | 0.006 Approx. {0.06 Approx.}<br>to<br>0.12 Approx. {1.2 Approx.} | (0.019) {(0.19)}<br>to<br>(2.38) {(23.8)} | 0.025 {0.25}<br>to<br>2.5 {25} | 0.3 {3}<br>to<br>3.3 {33} | FNS-W:<br>Approx.<br>1.3<br>FNS-P:<br>Approx.<br>0.6 |

\* FNS-C101X, type W is the only available.

For specifications, electrical ratings, and contact functions, refer to page 19, 20.  
For dimensions, refer to page 49.

### Type ANS – Adjustable narrow differential

Unit: MPa {kgf/cm<sup>2</sup>}

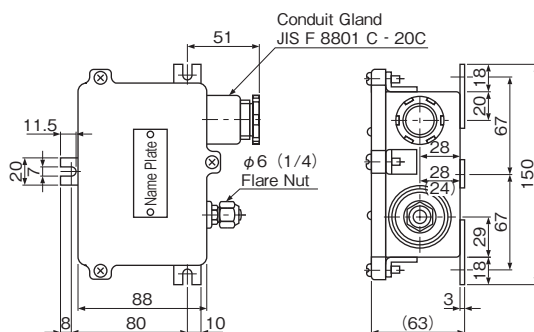
| Catalog No. |      | Range                     |                     | Differential               |                           |                            |                            | Factory Setting             |                        | Max. Working Pressure | Wt. (kg)                                 |
|-------------|------|---------------------------|---------------------|----------------------------|---------------------------|----------------------------|----------------------------|-----------------------------|------------------------|-----------------------|------------------------------------------|
|             |      |                           |                     | Min.                       |                           | Max.                       |                            |                             |                        |                       |                                          |
|             |      | Min.                      | Max.                | Bottom                     | Top                       | Bottom                     | Top                        | Off                         | On                     |                       |                                          |
| ANS-C1**XB  | W, P | −0.06 {−50cmHg to 1 {10}} | 0.1 {1} to 3.5 {35} | 0.007 {0.07} to 0.12 {1.2} | 0.007 {0.07} to 0.2 {2.0} | 0.014 {0.14} to 0.24 {2.4} | 0.015 {0.15} to 0.39 {3.9} | 0.018 {0.18} to 2.82 {28.2} | 0.025 {0.25} to 3 {30} | 0.3 {3} to 3.8 {38}   | ANS-W: Approx. 1.3<br>ANS-P: Approx. 0.6 |
|             |      |                           |                     |                            |                           |                            |                            |                             |                        |                       |                                          |

\* ANS-C101XB, type W is the only available.

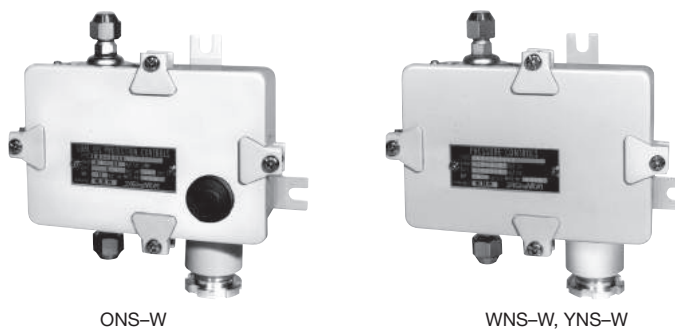
For specifications, electrical ratings, and contact functions, refer to page 19, 20.  
For dimensions, refer to page 49.

## DIMENSIONS

### Type FNS-W, Type ANS-W



● Type ONS-W , WNS-W & YNS-W — Drip proof model of differential pressure controls



## TYPE NUMBER SELECTION (SPECIFICATIONS)

Type ONS – for oil protection

Unit: MPa {kgf/cm<sup>2</sup>}

| Catalog No.      |          | Range      |            | Differential               | Timer Specification |                                                     |                                              | Wt. (kg)    |
|------------------|----------|------------|------------|----------------------------|---------------------|-----------------------------------------------------|----------------------------------------------|-------------|
|                  |          | Min.       | Max.       | Fixed                      | Delay Time (sec.)   | Timer Voltage                                       | Timer Circuit                                |             |
| <b>ONS-C106X</b> | <b>W</b> | 0.05 {0.5} | 0.35 {3.5} | Approx. 0.05 {Approx. 0.5} | 45, 90, 110         | 100/200V. AC 110/220V. AC 115/230V. AC 120/240V. AC | Standard (SPST) without Alarm Contact (SPDT) | Approx. 1.3 |

For specifications, electrical ratings, and contact functions, refer to page 21, 22.

Type WNS – for water, air and fluorinated refrigerant

Unit: MPa {kgf/cm<sup>2</sup>}

| Catalog No.      |          | Range      |            | Differential |            | Factory Setting |            | Max. Working Pressure | Limit of Press. Differential (HP > LP) | Wt. (kg)    |
|------------------|----------|------------|------------|--------------|------------|-----------------|------------|-----------------------|----------------------------------------|-------------|
|                  |          | Min.       | Max.       | Min.         | Max.       | Off             | On         |                       |                                        |             |
| <b>WNS-C102X</b> | <b>W</b> | 0.03 {0.3} | 0.2 {2}    | 0.03 {0.3}   | 0.15 {1.5} | 0.05 {0.5}      | 0.02 {0.2} | 0.5 {5}               | 0.5 {5}                                | Approx. 1.3 |
| <b>WNS-C106X</b> |          | 0.05 {0.5} | 0.35 {3.5} | 0.05 {0.5}   | 0.25 {2.5} | 0.1 {1.0}       | 0.05 {0.5} | 1.5 {15}              | 1.5 {15}                               |             |

For specifications, electrical ratings, and contact functions, refer to page 23.

Type YNS – for water, air and fluorinated refrigerant

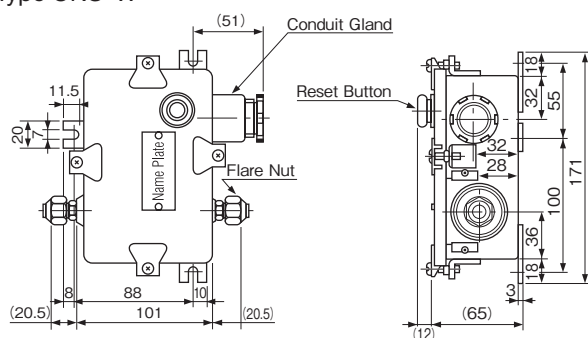
Unit: MPa {kgf/cm<sup>2</sup>}

| Catalog No.      |          | Range        |            | Differential                 | Factory Setting |                  | Max. Working Pressure | Limit of Press. Differential (HP > LP) | Wt. (kg)    |
|------------------|----------|--------------|------------|------------------------------|-----------------|------------------|-----------------------|----------------------------------------|-------------|
|                  |          | Min.         | Max.       | Fixed                        | Off             | On               |                       |                                        |             |
| <b>YNS-C102X</b> | <b>W</b> | 0.02 {0.2}   | 0.2 {2}    | Approx. 0.015 {Approx. 0.15} | 0.05 {0.5}      | {0.035} {(0.35)} | 0.5 {5}               | 0.5 {5}                                | Approx. 1.3 |
| <b>YNS-C106X</b> |          | 0.025 {0.25} | 0.35 {3.5} | Approx. 0.025 {Approx. 0.25} | 0.15 {1.5}      | {0.125} {(1.25)} | 1.5 {15}              | 1.5 {15}                               |             |

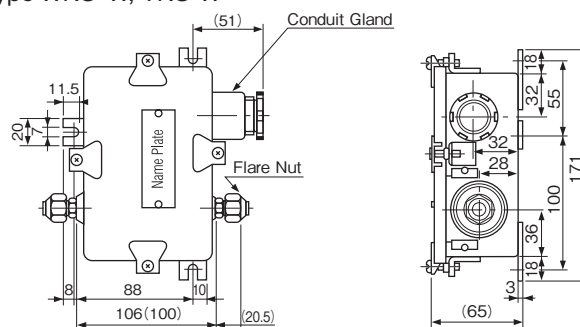
For specifications, electrical ratings, and contact functions, refer to page 23.

## DIMENSIONS

Type ONS-W

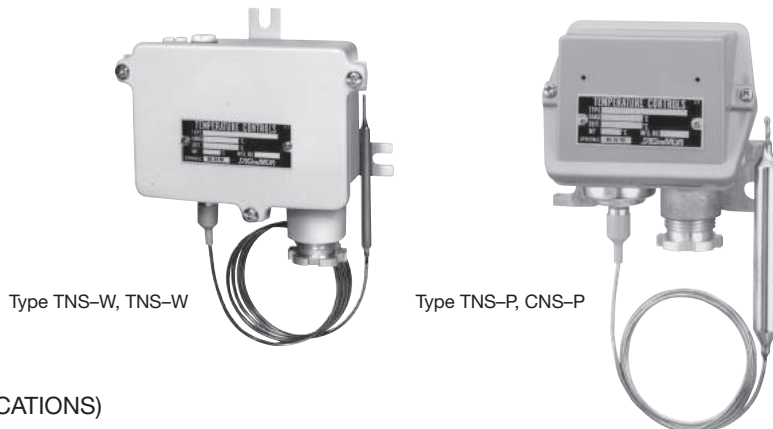


Type WNS-W, YNS-W



Unit: mm

- Type TNS-W/P, CNS-W/P & INS-W — Drip proof and Water proof model of temperature controls



## TYPE NUMBER SELECTION (SPECIFICATIONS)

### Type TNS – Automatic reset type

Unit: °C

| Catalog No.       |             | Range      |          | Differential |        | Factory Setting |            | Limit Temp. | Usage Condition                            | Wt. (kg)                                       |
|-------------------|-------------|------------|----------|--------------|--------|-----------------|------------|-------------|--------------------------------------------|------------------------------------------------|
|                   |             | Min.       | Max.     | Min.         | Max.   | Off (On)        | On (Off)   |             |                                            |                                                |
| <b>TNS-C1* *X</b> | <b>W, P</b> | -45 to 115 | 0 to 150 | 2 to 5       | 15, 20 | -18 to 140      | -15 to 145 | 40 to 180   | $T_s > T_b$ , $T_s < T_b$ , $T_s \leq T_b$ | TNS-W:<br>Approx. 1.3<br>TNS-P:<br>Approx. 0.7 |

For specifications, electrical ratings, and contact functions, refer to page 31, 32.

### Type CNS – Automatic reset type

Unit: °C

| Catalog No.       |             | Range    |           | Differential   | Factory Setting |           | Limit Temp. | Usage Condition | Wt. (kg)                                       |
|-------------------|-------------|----------|-----------|----------------|-----------------|-----------|-------------|-----------------|------------------------------------------------|
|                   |             | Min.     | Max.      |                | Off             | On        |             |                 |                                                |
| <b>CNS-C1* *X</b> | <b>W, P</b> | -35 to 0 | -15 to 35 | Bottom 4 Top 3 | -28 to 17       | -25 to 20 | 70          | $T_s > T_b$     | CNS-W:<br>Approx. 1.3<br>CNS-P:<br>Approx. 0.7 |

For specifications, electrical ratings, and contact functions, refer to page 31, 32.

### Type CNS – Manual reset type

Unit: °C

| Catalog No.         |             | Range    |           | Manual Reset                                                                          | Factory Setting |              | Limit Temp. | Usage Condition | Wt. (kg)                                       |
|---------------------|-------------|----------|-----------|---------------------------------------------------------------------------------------|-----------------|--------------|-------------|-----------------|------------------------------------------------|
|                     |             | Min.     | Max.      |                                                                                       | Off             | On           |             |                 |                                                |
| <b>CNS-C1* *XM2</b> | <b>W, P</b> | -35 to 0 | -15 to 35 | Automatic operation on temperature decrease and manual reset on temperature increase. | -28 to 17       | Manual Reset | 70          | $T_s > T_b$     | CNS-W:<br>Approx. 1.3<br>CNS-P:<br>Approx. 0.7 |

For specifications, electrical ratings, and contact functions, refer to page 31, 32.

### Type INS – Manual reset type

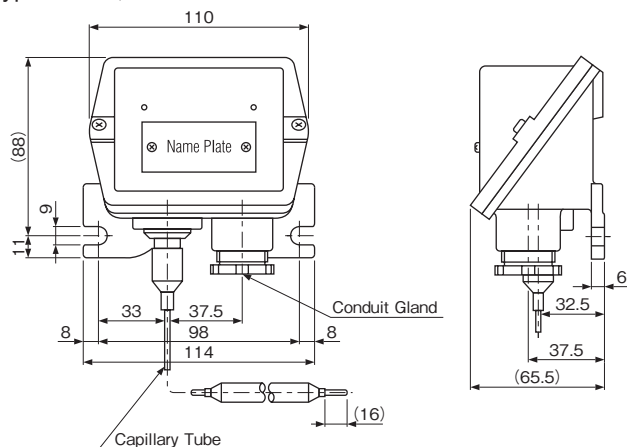
Unit: °C

| Catalog No.         |          | Range     |           | Manual Reset                                                                          | Factory Setting |           | Limit Temp. | Usage Condition | Wt. (kg)    |
|---------------------|----------|-----------|-----------|---------------------------------------------------------------------------------------|-----------------|-----------|-------------|-----------------|-------------|
|                     |          | Min.      | Max.      |                                                                                       | Off             | On        |             |                 |             |
| <b>INS-C1070XM1</b> | <b>W</b> | 25 to 115 | 75 to 150 | Automatic operation on temperature increase and manual reset on temperature decrease. | Manual Reset    | 65 to 140 | 115 to 180  | $T_s < T_b$     | Approx. 1.3 |

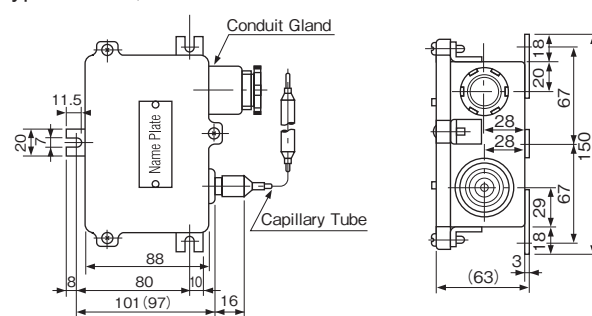
For specifications, electrical ratings, and contact functions, refer to page 31, 32.

## DIMENSIONS

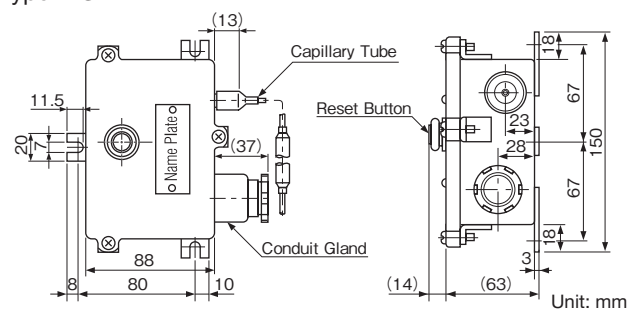
### Type TNS-P, CNS-P



### Type TNS-W, CNS-W



### Type INS-W



Unit: mm

**EXPANSION VALVES**

|                                          |       |
|------------------------------------------|-------|
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# EXPANSION VALVES

## GENERAL INFORMATION

**SAGINOMIYA**

## VALVE SELECTION

In order to properly select Expansion Valves, the following items should be considered.

- 1) Required valve capacity should be based on the actual system operating conditions rather than the normal valve capacity rating.
- 2) When there exists an appreciable pressure drop between the valve outlet and the evaporator outlet, i.e., above 0.02 MPa {0.2 kgf/cm<sup>2</sup>}, or when a pressure drop type of refrigerant distributor is used at the evaporator inlet, the valve should have the external equalizer feature for best performance. Otherwise, it will increase a static superheat (valve opening temp.), restricting the refrigerant flow and causing the reduction of system capacity. As for R134a, 0.01 MPa {0.1kgf/cm<sup>2</sup>} pressure drop will increase the static superheat approximately 1°C.
- 3) Internally equalized valve may be used with the evaporator which has a negligible pressure drop, i.e., below 0.02 MPa {0.2 kgf/cm<sup>2</sup>}

## GUIDE FOR EQUALIZER (Internal or External)

An internal or external equalizer should be selected depending on pressure drop between valve outlet and evaporator outlet. Internal equalizer increases superheat in the refrigeration system of which evaporator has some pressure drop, and the increase of superheat decreases the effective area of evaporator.

Select internal or external equalizer depending on refrigerant, pressure drop and evaporating temperature. The Guide Table for Equalizer indicates the pressure difference of refrigerant corresponding to 1°C temperature. The external equalizer valves should be used when the pressure drop exceeds the value of pressure difference indicated in the Table.

## GUIDE TABLE FOR EQUALIZER

Unit: MPa {kgf/cm<sup>2</sup>}

| Refrigerant | Evaporating Temperature (°C) |                 |                 |                 |                 |                 |                 |                 |                 |                 |
|-------------|------------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
|             | 10                           | 5               | 0               | −5              | −10             | −20             | −30             | −40             | −50             | −60             |
| R134a       | 0.014<br>{0.14}              | 0.012<br>{0.12} | 0.011<br>{0.11} | 0.009<br>{0.09} | 0.008<br>{0.08} | 0.006<br>{0.06} | 0.004<br>{0.04} | 0.003<br>{0.03} | —               | —               |
| R22         | 0.024<br>{0.24}              | 0.02<br>{0.20}  | 0.018<br>{0.18} | 0.016<br>{0.16} | 0.014<br>{0.14} | 0.011<br>{0.11} | 0.008<br>{0.08} | 0.006<br>{0.06} | 0.004<br>{0.04} | 0.003<br>{0.03} |
| R404A       | 0.025<br>{0.25}              | 0.022<br>{0.22} | 0.019<br>{0.19} | 0.017<br>{0.17} | 0.015<br>{0.15} | 0.012<br>{0.12} | 0.008<br>{0.08} | 0.006<br>{0.06} | 0.004<br>{0.04} | 0.003<br>{0.03} |
| R407C       | 0.021<br>{0.21}              | 0.018<br>{0.18} | 0.016<br>{0.16} | 0.014<br>{0.14} | 0.012<br>{0.12} | 0.009<br>{0.09} | 0.006<br>{0.06} | 0.004<br>{0.04} | 0.003<br>{0.03} | 0.002<br>{0.02} |
| R410A       | 0.033<br>{0.33}              | 0.029<br>{0.29} | 0.026<br>{0.26} | 0.023<br>{0.23} | 0.020<br>{0.20} | 0.015<br>{0.15} | 0.011<br>{0.11} | 0.008<br>{0.08} | 0.006<br>{0.06} | 0.004<br>{0.04} |

Pressure Diff. corresponding to 1°C temperature.

## GUIDE FOR SETTING OF SUPERHEAT

Superheat Adjuster of Expansion Valve adjusts the superheat by which the valve begins to open from the fully closed condition, and this superheat is called Static Superheat.

S.S.H.: Static Superheat

O.S.H.: Operating Superheat (Superheat necessary for valve and refrigeration system operation)

S.H.C.: Superheat Change (Superheat which keeps the valve opening at the optimum balance point for refrigeration systems)

$S.S.H. = O.S.H. - S.H.C.$

To change the adjustment, remove the seal cap and turn the adjusting spindle. Turning the spindle clockwise to compress the spring decreases flow and raises superheat and turning the spindle counter clockwise to loosen the spring increases flow and lowers superheat.

## CHARGE & MOP (MAXIMUM OPERATING PRESSURE)

**G-Charge:** Gas charge used generally on air conditioning gives pressure limiting, but loses control if valve body becomes colder than sensing bulb. A gas charged valve should be installed in a location where the valve body can be warmer than the bulb to prevent condensation of the charge in the powerhead.

**L-Charge:** Liquid charge provides accurate control when valve body becomes colder than sensing bulb; hence a liquid charged valve may be installed in any location regardless of temperature. The charge, however, does not provide maximum operating pressure (pressure limiting) for motor overload protection.

**C-Charge:** Cross charge and Cross Low Temp. charge used generally on low temperature range application will not lose control even if valve body becomes colder than sensing bulb. A cross charged valve may be installed in any location regardless of temperature. Cross charge (C) for normal refrigeration (higher than  $-40^{\circ}\text{C}$  temp. range) and Cross Low Temp. charge (CL and CY) for low temp. refrigeration (CY...  $-70$  to  $-40^{\circ}\text{C}$  with R22 for Type ATX valves).

**S-Charge:** Saginomiya's all purpose special charge combines the best properties of gas and liquid charges. The charge provides accurate control even if valve body becomes colder than sensing bulb and further it provides MOP (pressure limiting) for motor overload protection. S-charged valve may be installed in any location regardless of temperature.

## ORDERING INFORMATION

1) Catalog Number ... On standard products, specify the Catalog No. only.

2) Special Specifications ... On special applications, specify the followings:

- |                                                    |                                       |
|----------------------------------------------------|---------------------------------------|
| a) Normal Pressure and Maximum Pressure            | g) Length of Capillary Tube           |
| b) Normal Temperature and Minimum Temperature      | h) External or Internal Evaporator    |
| c) Detailed Application                            | i) Pressure Drop at Evaporator        |
| d) Refrigerant                                     | j) MOP (Maximum Operating Pressure)   |
| e) Valve Location                                  | k) Two Stage Compressor System or not |
| f) Capacity (Condensing & Evaporating Temperature) |                                       |

## EXPANSION VALVES (SMALL CAPACITY TYPE)

High Volume OEM Item

Type ARX

SAGINO MIYA

### GENERAL DESCRIPTION

- This product is expansion valve for small capacity.
- Application: Bottle cooler, display case, ice making machine, industrial air conditioner.

### SPECIFICATIONS

- Charge: S-charge (MOP20°C), C-charge, CL-charge
- Max. working pressure: 3.0MPa {30kgf/cm<sup>2</sup>}
- Adjustable range of static superheat: 0 to 5°C

### VALVE NOMENCLATURE

Catalog No. is decided according to the specifications.

Example: ARX - 2303 D H S  
I II III IV V

I : Type..... ARX-Small capacity thermostatic expansion valve

II: Model..... The first and the second digits indicate inlet and outlet pipe size respectively.  
The last two digits indicate nominal capacity.

III: Connection..... D-Solder Connection

IV: Refrigerant..... H = R22, M = R134a, P = R407C, U = R404A

V: Charge type..... S = S-charge, C = C-charge, CL = CL-charge

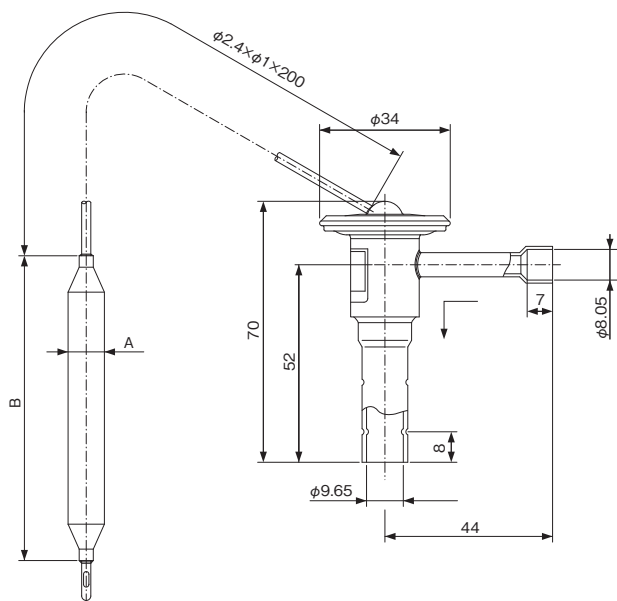


### TYPE NUMBER SELECTION

| Catalog No. |       |               |                                            |                            | Capacity (U.S.R.T.) {kW} |             |             |             | Connection |        | Capil. Tube Length (mm) | Wt. (kg) |
|-------------|-------|---------------|--------------------------------------------|----------------------------|--------------------------|-------------|-------------|-------------|------------|--------|-------------------------|----------|
| Type        | Model | Connection    | Refrigerant                                | Charge                     | R134a                    | R22         | R407C       | R404A       | Inlet      | Outlet |                         |          |
| ARX-        | 2303  | D<br>(Solder) | H(R22)<br>M(R134a)<br>P(R407C)<br>U(R404A) | S                          | 0.48 {1.69}              | 0.36 {1.27} | 0.50 {1.76} | 0.34 {1.20} | 5/16"      | 3/8"   | 200                     | 0.12     |
|             | 2305  |               |                                            | (R22, R134a, R404A, R407C) | 0.80 {2.81}              | 0.60 {2.11} | 0.82 {2.88} | 0.57 {2.00} |            |        |                         |          |
|             | 2308  |               |                                            | C                          | 1.28 {4.57}              | 0.96 {3.37} | 1.34 {4.71} | 0.93 {3.27} |            |        |                         |          |
|             | 2310  |               |                                            | (R22) CL                   | 1.60 {5.63}              | 1.20 {4.22} | 1.65 {5.80} | 1.14 {4.01} |            |        |                         |          |
|             | 2315  |               |                                            | (R22, R404A)               | 2.40 {8.44}              | 1.80 {6.33} | 2.47 {8.70} | 1.71 {6.01} |            |        |                         |          |

Capacity: Based on condensing temp. 38°C and evaporating temp. 5°C.

### DIMENSIONS



Unit: mm

| Refrigerant                    | Charge | A    | B  |
|--------------------------------|--------|------|----|
| H(R22)<br>M(R134a)<br>U(R404A) | S      | 3/8" | 80 |
| P(R407C)                       | S      | 1/2" | 80 |
| H(R22)                         | C      | 1/2" | 80 |
| H(R22)<br>U(R404A)             | CL     | 3/8" | 50 |

# EXPANSION VALVES

## Type QCX & RCX

**SAGInoMIYA**

### GENERAL DESCRIPTION

- Application: Commercial refrigerator, freezer, air conditioner, cold chain box, etc.
- Suitable for refrigeration systems with hot gas defrosting.
- Type QCX ... Internal equalizer type  
Type RCX ... External equalizer type
- The same products can be used for R22 and R407C.
- With superheat external adjust device.

### SPECIFICATIONS

- Max. working pressure: 3.0 MPa {30kgf/cm<sup>2</sup>}
- Adjustable range of static superheat:  
1 to 7°C at R22, R134a, R404A  
1 to 5°C at R407C, R410A
- $\bigcirc$  Increase about 0.045MPa / rotation
- Superheat change: 4 to 5°C (C, SL-charge)  
3 to 4°C (SA-charge)



Type QCX-B



Type QCX-D



Type RCX-B



Type RCX-D

| Charge |       | A Zone                 | R Zone     | F Zone     | MOP<br>(°C) | Temp. Condition                                 |
|--------|-------|------------------------|------------|------------|-------------|-------------------------------------------------|
|        |       | Evaporating Temp. (°C) |            |            |             | Power Element Temp.: Ts, Sensing Bulb Temp.: TB |
| SA     | R22   | −40 to 10              | —          | —          | 18          | Ts ≧ TB                                         |
| C      |       | —                      | −40 to 0   |            | —           | Ts ≧ TB                                         |
| SL     |       |                        | —          | −60 to −25 | −20         | Ts ≧ TB                                         |
| C      | R134a | −30 to 10              |            | —          | —           | Ts ≧ TB                                         |
| SA     | R404A | −40 to 10              | —          | —          | 18          | Ts ≧ TB                                         |
| C      |       | —                      | −40 to 0   |            | —           | Ts ≧ TB                                         |
| SL     |       |                        | —          | −60 to −25 | −20         | Ts ≧ TB                                         |
| SA     | R407C | −40 to 10              | —          | —          | 18          | Ts ≧ TB                                         |
| C      |       | —                      | −40 to 0   |            | —           | Ts ≧ TB                                         |
| SA     | R410A | −45 to 10              | —          | —          | 18          | Ts ≧ TB                                         |
| C      |       | —                      | −40 to −10 |            | —           | Ts ≧ TB                                         |

### VALVE NOMENCLATURE

Catalog No. is decided according to the specifications.

Example:  $\frac{\text{QCX}}{\text{I}} - \frac{0234}{\text{II}} \frac{\text{B}}{\text{III}} \frac{\text{U}}{\text{IV}} \frac{\text{SA}}{\text{V}}$

I : Type..... QCX-Internal equalizer type, RCX-External equalizer type

II : Model..... The first and the second digits indicate nominal capacity.

The last two digits indicate inlet and outlet pipe size respectively.

III : Connection..... B-Flare Connection, D-Solder Connection

IV : Refrigerant..... M = R134a, H = R22, R407C, U = R404A, V = R410A

V : Charge type..... SL = SL-charge, C = C-charge, SA = SA-charge

# TYPE NUMBER SELECTION (1)

| Application |                                                       | Catalog No.  |             | Refrigerant | Capacity (U.S.R.T.) {kW} |             | Connection |        | Capil. Tube Length (mm) | Wt. (kg) |                                           |                                           |              |                                                                                  |
|-------------|-------------------------------------------------------|--------------|-------------|-------------|--------------------------|-------------|------------|--------|-------------------------|----------|-------------------------------------------|-------------------------------------------|--------------|----------------------------------------------------------------------------------|
|             |                                                       |              |             |             | A,R Zone                 | F Zone      |            |        |                         |          |                                           |                                           |              |                                                                                  |
|             |                                                       |              |             |             | C.T. 38°C                | C.T. 38°C   | Inlet      | Outlet |                         |          |                                           |                                           |              |                                                                                  |
|             |                                                       |              |             |             | E.T. -5°C                | E.T. -30°C  |            |        |                         |          |                                           |                                           |              |                                                                                  |
| F Zone      | Freezing<br>-60 to -25°C<br>(SL: R22, R404A)          | QCX-<br>RCX- | 0334B[D]HSL | R22         | —                        | 0.22 {0.79} |            |        |                         |          |                                           |                                           |              |                                                                                  |
|             |                                                       |              | 0534B[D]HSL |             |                          | 0.33 {1.16} |            |        |                         |          |                                           |                                           |              |                                                                                  |
|             |                                                       |              | 0834B[D]HSL |             |                          | 0.54 {1.91} |            |        |                         |          |                                           |                                           |              |                                                                                  |
|             |                                                       |              | 1234B[D]HSL |             |                          | 0.87 {3.07} |            |        |                         |          |                                           |                                           |              |                                                                                  |
|             |                                                       |              | 1634B[D]HSL |             |                          | 1.10 {3.87} |            |        |                         |          |                                           |                                           |              |                                                                                  |
|             |                                                       |              | 2434B[D]HSL |             |                          | 1.68 {5.91} |            |        |                         |          |                                           |                                           |              |                                                                                  |
|             |                                                       |              | 3134B[D]HSL |             |                          | 2.27 {7.97} |            |        |                         |          |                                           |                                           |              |                                                                                  |
|             |                                                       |              | 4734B[D]HSL |             |                          | 3.10 {10.9} |            |        |                         |          |                                           |                                           |              |                                                                                  |
|             |                                                       |              | 0234B[D]USL | R404A       | —                        | 0.13 {0.46} |            |        |                         |          |                                           |                                           |              |                                                                                  |
|             |                                                       |              | 0334B[D]USL |             |                          | 0.19 {0.68} |            |        |                         |          |                                           |                                           |              |                                                                                  |
|             |                                                       |              | 0534B[D]USL |             |                          | 0.32 {1.11} |            |        |                         |          |                                           |                                           |              |                                                                                  |
|             |                                                       |              | 0834B[D]USL |             |                          | 0.51 {1.79} |            |        |                         |          |                                           |                                           |              |                                                                                  |
|             |                                                       |              | 1034B[D]USL |             |                          | 0.64 {2.25} |            |        |                         |          |                                           |                                           |              |                                                                                  |
|             |                                                       |              | 1534B[D]USL |             |                          | 0.98 {3.44} |            |        |                         |          |                                           |                                           |              |                                                                                  |
|             |                                                       |              | 2034B[D]USL |             |                          | 1.32 {4.63} |            |        |                         |          |                                           |                                           |              |                                                                                  |
|             |                                                       |              | 3034B[D]USL |             |                          | 1.80 {6.34} |            |        |                         |          |                                           |                                           |              |                                                                                  |
| R Zone      | Refrigeration<br>-40 to 0°C<br>(C: R22, R404A, R407C) | QCX-<br>RCX- | 0334B[D]HC  | R22         | —                        | 0.31 {1.10} |            |        |                         |          | 3/8" Flare [B]<br><br>[ 3/8" Solder [D] ] | 1/2" Flare [B]<br><br>[ 1/2" Solder [D] ] | ø 2.4 × 1500 | 0.28 (QCX-***34B)<br>0.24 (QCX-***34D)<br>0.29 (RCX-***34B)<br>0.24 (RCX-***34D) |
|             |                                                       |              | 0534B[D]HC  |             |                          | 0.47 {1.65} |            |        |                         |          |                                           |                                           |              |                                                                                  |
|             |                                                       |              | 0834B[D]HC  |             |                          | 0.78 {2.75} |            |        |                         |          |                                           |                                           |              |                                                                                  |
|             |                                                       |              | 1234B[D]HC  |             |                          | 1.25 {4.41} |            |        |                         |          |                                           |                                           |              |                                                                                  |
|             |                                                       |              | 1634B[D]HC  |             |                          | 1.57 {5.51} |            |        |                         |          |                                           |                                           |              |                                                                                  |
|             |                                                       |              | 2434B[D]HC  |             |                          | 2.35 {8.26} |            |        |                         |          |                                           |                                           |              |                                                                                  |
|             |                                                       |              | 3134B[D]HC  |             |                          | 3.13 {11.0} |            |        |                         |          |                                           |                                           |              |                                                                                  |
|             |                                                       |              | 4734B[D]HC  |             |                          | 4.69 {16.5} |            |        |                         |          |                                           |                                           |              |                                                                                  |
|             |                                                       |              | 0234B[D]UC  | R404A       | —                        | 0.20 {0.70} |            |        |                         |          |                                           |                                           |              |                                                                                  |
|             |                                                       |              | 0334B[D]UC  |             |                          | 0.30 {1.05} |            |        |                         |          |                                           |                                           |              |                                                                                  |
|             |                                                       |              | 0534B[D]UC  |             |                          | 0.49 {1.74} |            |        |                         |          |                                           |                                           |              |                                                                                  |
|             |                                                       |              | 0834B[D]UC  |             |                          | 0.78 {2.76} |            |        |                         |          |                                           |                                           |              |                                                                                  |
|             |                                                       |              | 1034B[D]UC  |             |                          | 0.99 {3.48} |            |        |                         |          |                                           |                                           |              |                                                                                  |
|             |                                                       |              | 1534B[D]UC  |             |                          | 1.48 {5.22} |            |        |                         |          |                                           |                                           |              |                                                                                  |
|             |                                                       |              | 2034B[D]UC  |             |                          | 1.98 {6.95} |            |        |                         |          |                                           |                                           |              |                                                                                  |
|             |                                                       |              | 3034B[D]UC  |             |                          | 2.96 {10.4} |            |        |                         |          |                                           |                                           |              |                                                                                  |
|             |                                                       |              | 0334B[D]HC  | R407C       | —                        | 0.32 {1.13} |            |        |                         |          |                                           |                                           |              |                                                                                  |
|             |                                                       |              | 0534B[D]HC  |             |                          | 0.48 {1.70} |            |        |                         |          |                                           |                                           |              |                                                                                  |
|             |                                                       |              | 0834B[D]HC  |             |                          | 0.81 {2.84} |            |        |                         |          |                                           |                                           |              |                                                                                  |
|             |                                                       |              | 1234B[D]HC  |             |                          | 1.29 {4.54} |            |        |                         |          |                                           |                                           |              |                                                                                  |
|             |                                                       |              | 1634B[D]HC  |             |                          | 1.61 {5.67} |            |        |                         |          |                                           |                                           |              |                                                                                  |
|             |                                                       |              | 2434B[D]HC  |             |                          | 2.42 {8.51} |            |        |                         |          |                                           |                                           |              |                                                                                  |
|             |                                                       |              | 3134B[D]HC  |             |                          | 3.21 {11.3} |            |        |                         |          |                                           |                                           |              |                                                                                  |
|             |                                                       |              | 4734B[D]HC  |             |                          | 4.83 {17.0} |            |        |                         |          |                                           |                                           |              |                                                                                  |
|             | Refrigeration<br>-30 to 10°C<br>(C: R134a)            | QCX-<br>RCX- | R134a       | —           | 0.24 {0.85}              |             |            |        |                         |          |                                           |                                           |              |                                                                                  |
|             |                                                       |              |             |             | 0434B[D]MC               | 0.36 {1.28} |            |        |                         |          |                                           |                                           |              |                                                                                  |
|             |                                                       |              |             |             | 0634B[D]MC               | 0.61 {2.13} |            |        |                         |          |                                           |                                           |              |                                                                                  |
|             |                                                       |              |             |             | 1034B[D]MC               | 0.96 {3.38} |            |        |                         |          |                                           |                                           |              |                                                                                  |
|             |                                                       |              |             |             | 1234B[D]MC               | 1.21 {4.27} |            |        |                         |          |                                           |                                           |              |                                                                                  |
|             |                                                       |              |             |             | 1834B[D]MC               | 1.82 {6.40} |            |        |                         |          |                                           |                                           |              |                                                                                  |
|             |                                                       |              |             |             | 2434B[D]MC               | 2.43 {8.54} |            |        |                         |          |                                           |                                           |              |                                                                                  |
|             |                                                       |              |             |             | 3634B[D]MC               | 3.64 {12.8} |            |        |                         |          |                                           |                                           |              |                                                                                  |
|             | Refrigeration<br>-40 to -10°C<br>(C: R410A)           | QCX-<br>RCX- | R410A       | —           | 0.35 {1.22}              |             |            |        |                         |          |                                           |                                           |              |                                                                                  |
|             |                                                       |              |             |             | 0534B[D]VC               | 0.52 {1.83} |            |        |                         |          |                                           |                                           |              |                                                                                  |
|             |                                                       |              |             |             | 0934B[D]VC               | 0.86 {3.04} |            |        |                         |          |                                           |                                           |              |                                                                                  |
|             |                                                       |              |             |             | 1434B[D]VC               | 1.37 {4.82} |            |        |                         |          |                                           |                                           |              |                                                                                  |
|             |                                                       |              |             |             | 1734B[D]VC               | 1.73 {6.08} |            |        |                         |          |                                           |                                           |              |                                                                                  |
|             |                                                       |              |             |             | 2634B[D]VC               | 2.59 {9.12} |            |        |                         |          |                                           |                                           |              |                                                                                  |
|             |                                                       |              |             |             | 3534B[D]VC               | 3.44 {12.1} |            |        |                         |          |                                           |                                           |              |                                                                                  |
|             |                                                       |              |             |             | 5234B[D]VC               | 5.18 {18.2} |            |        |                         |          |                                           |                                           |              |                                                                                  |

• External equalizer for RCX: 1/4" flare (for all flare outlet bodies) , 1/4" solder[D] (for all solder outlet bodies)

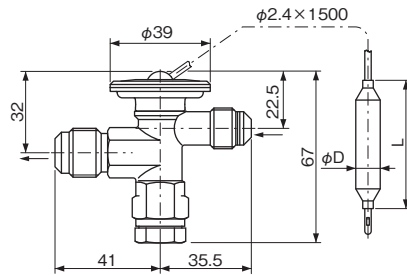
## TYPE NUMBER SELECTION (2)

| Application |                                                            | Catalog No. |             | Refrigerant | Capacity (U.S.R.T.) {kW} |            | Connection     |                | Capil. Tube Length (mm) | Wt. (kg)                                                                         |             |
|-------------|------------------------------------------------------------|-------------|-------------|-------------|--------------------------|------------|----------------|----------------|-------------------------|----------------------------------------------------------------------------------|-------------|
|             |                                                            |             |             |             | A,R Zone                 | F Zone     |                |                |                         |                                                                                  |             |
|             |                                                            |             |             |             | C.T. 38°C                | C.T. 38°C  | Inlet          | Outlet         |                         |                                                                                  |             |
|             |                                                            |             |             |             | E.T. −5°C                | E.T. −30°C |                |                |                         |                                                                                  |             |
| A Zone      | Air Conditioning<br>−40 to 10°C<br>(SA: R22, R404A, R407C) | QCX-RCX-    | 0334B[D]HSA | R22         | 0.31 {1.10}              | —          | 3/8" Flare [B] | 1/2" Flare [B] | ϕ 2.4 × 1500            | 0.28 (QCX-***34B)<br>0.24 (QCX-***34D)<br>0.29 (RCX-***34B)<br>0.24 (RCX-***34D) |             |
|             |                                                            |             | 0534B[D]HSA |             | 0.47 {1.65}              |            |                |                |                         |                                                                                  |             |
|             |                                                            |             | 0834B[D]HSA |             | 0.78 {2.75}              |            |                |                |                         |                                                                                  |             |
|             |                                                            |             | 1234B[D]HSA |             | 1.25 {4.41}              |            |                |                |                         |                                                                                  |             |
|             |                                                            |             | 1634B[D]HSA |             | 1.57 {5.51}              |            |                |                |                         |                                                                                  |             |
|             |                                                            |             | 2434B[D]HSA |             | 2.35 {8.26}              |            |                |                |                         |                                                                                  |             |
|             |                                                            |             | 3134B[D]HSA |             | 3.13 {11.0}              |            |                |                |                         |                                                                                  |             |
|             |                                                            |             | 4734B[D]HSA |             | 4.69 {16.5}              |            |                |                |                         |                                                                                  |             |
|             |                                                            |             | 0234B[D]USA | R404A       | 0.20 {0.70}              | —          |                |                |                         |                                                                                  |             |
|             |                                                            |             | 0334B[D]USA |             | 0.30 {1.05}              |            |                |                |                         |                                                                                  |             |
|             |                                                            |             | 0534B[D]USA |             | 0.49 {1.74}              |            |                |                |                         |                                                                                  |             |
|             |                                                            |             | 0834B[D]USA |             | 0.78 {2.76}              |            |                |                |                         |                                                                                  |             |
|             |                                                            |             | 1034B[D]USA |             | 0.99 {3.48}              |            |                |                |                         |                                                                                  |             |
|             |                                                            |             | 1534B[D]USA |             | 1.48 {5.22}              |            |                |                |                         |                                                                                  |             |
|             |                                                            |             | 2034B[D]USA |             | 1.98 {6.95}              |            |                |                |                         |                                                                                  |             |
|             |                                                            |             | 3034B[D]USA |             | 2.96 {10.4}              |            |                |                |                         |                                                                                  |             |
|             |                                                            |             | 0334B[D]HSA | R407C       | 0.32 {1.13}              | —          |                |                |                         |                                                                                  |             |
|             |                                                            |             | 0534B[D]HSA |             | 0.48 {1.70}              |            |                |                |                         |                                                                                  |             |
|             |                                                            |             | 0834B[D]HSA |             | 0.81 {2.84}              |            |                |                |                         |                                                                                  |             |
|             |                                                            |             | 1234B[D]HSA |             | 1.29 {4.54}              |            |                |                |                         |                                                                                  |             |
|             |                                                            |             | 1634B[D]HSA |             | 1.61 {5.67}              |            |                |                |                         |                                                                                  |             |
|             |                                                            |             | 2434B[D]HSA |             | 2.42 {8.51}              |            |                |                |                         |                                                                                  |             |
|             |                                                            |             | 3134B[D]HSA |             | 3.21 {11.3}              |            |                |                |                         |                                                                                  |             |
|             |                                                            |             | 4734B[D]HSA |             | 4.83 {17.0}              |            |                |                |                         |                                                                                  |             |
|             | Air Conditioning<br>−45 to 10°C<br>(SA:R410A)              |             | 0334B[D]VSA | R410A       | 0.35 {1.22}              | —          |                |                |                         |                                                                                  |             |
|             |                                                            |             |             |             | 0534B[D]VSA              |            |                |                |                         |                                                                                  | 0.52 {1.83} |
|             |                                                            |             |             |             | 0934B[D]VSA              |            |                |                |                         |                                                                                  | 0.86 {3.04} |
|             |                                                            |             |             |             | 1434B[D]VSA              |            |                |                |                         |                                                                                  | 1.37 {4.82} |
|             |                                                            |             |             |             | 1734B[D]VSA              |            |                |                |                         |                                                                                  | 1.73 {6.08} |
|             |                                                            |             |             |             | 2634B[D]VSA              |            |                |                |                         |                                                                                  | 2.59 {9.12} |
|             |                                                            |             |             |             | 3534B[D]VSA              |            |                |                |                         |                                                                                  | 3.44 {12.1} |
|             |                                                            |             |             |             | 5234B[D]VSA              |            |                |                |                         |                                                                                  | 5.18 {18.2} |

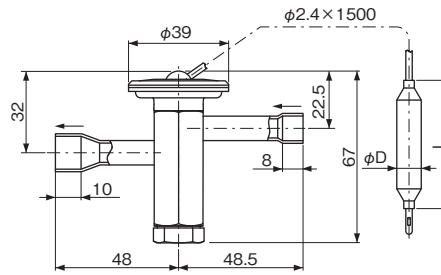
• External equalizer for RCX: 1/4" flare (for all flare outlet bodies) , 1/4" solder (for all solder outlet bodies)

## DIMENSIONS

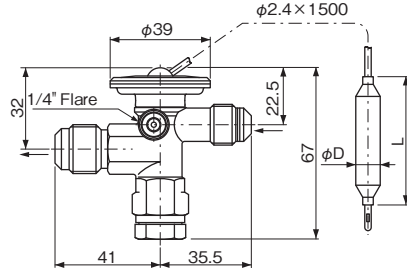
Type QCX-B



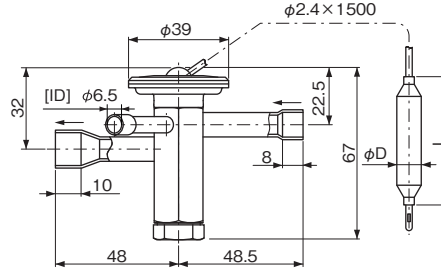
Type QCX-D



Type RCX-B

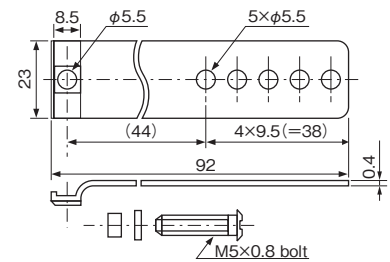


Type RCX-D



## ACCESSORY

### • Sensing Bulb Mounting Band



|    | D    | L  |
|----|------|----|
| SA | 12.7 | 80 |
| C  | 9.5  | 50 |
| SL | 12.7 | 80 |

Unit: mm

# EXPANSION VALVES

## Type SCX

**SAGINOMIYA**

### GENERAL DESCRIPTION

- Application: Chillers, cold chain boxes, heat pump air conditioner, air conditioning, etc.
- Suitable for refrigeration systems with hot gas defrosting.
- The same products can be used for R22 and R407C.
- With superheat external adjust device.

### SPECIFICATIONS

- Max. working pressure: 3.0 MPa {30kgf/cm<sup>2</sup>}
- Adjustable range of static superheat:  
1 to 7°C at R22, R134a, R404A  
1 to 5°C at R407C, R410A
- $\bigcirc$  Increase about 0.045MPa / rotation
- Superheat change: 4 to 5°C (C, SL-charge)  
3 to 4°C (SA-charge)



Type SCX-D



Type SCX-B

| Charge |       | A Zone                 | R Zone     | F Zone | MOP (°C)   | Temp. Condition                                 |
|--------|-------|------------------------|------------|--------|------------|-------------------------------------------------|
|        |       | Evaporating Temp. (°C) |            |        |            | Power Element Temp.: Ts, Sensing Bulb Temp.: Tb |
| SA     | R22   | −40 to 10              | —          | —      | 18         | Ts ≥ Tb                                         |
| C      |       | —                      | −40 to 0   |        | —          | Ts ≡ Tb                                         |
| SL     |       |                        | —          |        | −60 to −25 | −20                                             |
| C      | R134a | −30 to 10              |            | —      | —          | Ts ≡ Tb                                         |
| SA     | R404A | −40 to 10              | —          | —      | 18         | Ts ≥ Tb                                         |
| C      |       | —                      | −40 to 0   |        | —          | Ts ≡ Tb                                         |
| SL     |       |                        | —          |        | −60 to −25 | −20                                             |
| SA     | R407C | −40 to 10              | —          | —      | 18         | Ts ≥ Tb                                         |
| C      |       | —                      | −40 to 0   |        | —          | Ts ≡ Tb                                         |
| SA     | R410A | −45 to 10              | —          | —      | 18         | Ts ≥ Tb                                         |
| C      |       | —                      | −40 to −10 |        | —          | Ts ≡ Tb                                         |

### VALVE NOMENCLATURE

Catalog No. is decided according to the specifications.

Example:  $\frac{\text{SCX}}{\text{I}}$  -  $\frac{0445}{\text{II}}$   $\frac{\text{D}}{\text{III}}$   $\frac{\text{U}}{\text{IV}}$   $\frac{\text{SA}}{\text{V}}$

I : Type..... SCX-External equalizer type

II: Model..... The first and the second digits indicate nominal capacity.

The last two digits indicate inlet and outlet pipe size respectively.

III: Connection..... B-Flare Connection, D-Solder Connection

IV: Refrigerant..... H = R22, M = R134a, P = R407C, U = R404A, V = R410A

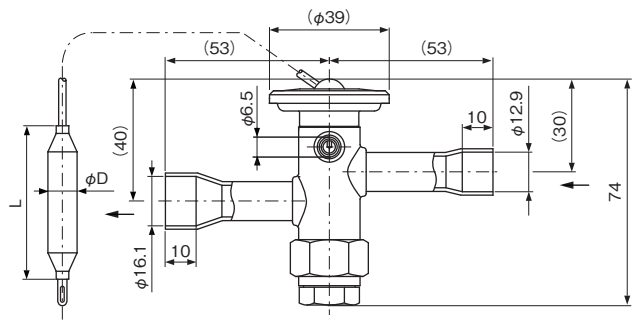
V: Charge type..... SL = SL-charge, C = C-charge, SA = SA-charge

# TYPE NUMBER SELECTION

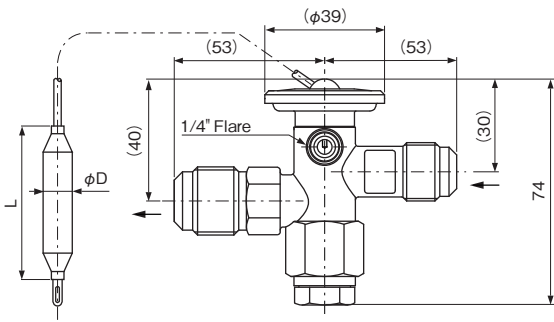
| Application               |                |                                   | Catalog No.      | Refrigerant                                                                                                                                                                         | Capacity (U.S.R.T.){kW}                               |                                                                                                                                                                                                    | Connection                                                              |                                             |                                   | Capil. Tube Length (mm)           | Wt. (kg)                                                                  |
|---------------------------|----------------|-----------------------------------|------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------|---------------------------------------------|-----------------------------------|-----------------------------------|---------------------------------------------------------------------------|
|                           |                |                                   |                  |                                                                                                                                                                                     | A,R Zone                                              | F Zone                                                                                                                                                                                             |                                                                         |                                             |                                   |                                   |                                                                           |
|                           |                |                                   |                  |                                                                                                                                                                                     | C.T. 38°C                                             | C.T. 38°C                                                                                                                                                                                          | Inlet                                                                   | Outlet                                      | Equalizer                         |                                   |                                                                           |
|                           |                |                                   |                  |                                                                                                                                                                                     | E.T. —5°C                                             | E.T. —30°C                                                                                                                                                                                         |                                                                         |                                             |                                   |                                   |                                                                           |
| F Zone                    | Freezing       | —60 to —25°C<br>(SL:R22,R404A)    | SCX—             | 0645D[B]HSL<br>0845D[B]HSL<br>1057DHSL<br>1257DHSL<br>1457DHSL                                                                                                                      | R22                                                   | —                                                                                                                                                                                                  | 3.25 {11.4}                                                             | 1/2" Solder(D)<br>[1/2" Flare(B)]           | 5/8" Solder(D)<br>[5/8" Flare(B)] | 1/4" Solder(D)<br>[1/4" Flare(B)] | 0.31<br>(SCX—**45D)<br><br>0.39<br>[SCX—**45B]<br><br>0.32<br>(SCX—**57D) |
|                           |                |                                   |                  |                                                                                                                                                                                     |                                                       |                                                                                                                                                                                                    | 4.53 {15.9}                                                             | 5/8" Solder(D)                              | 7/8" Solder(D)                    |                                   |                                                                           |
|                           |                |                                   |                  |                                                                                                                                                                                     |                                                       |                                                                                                                                                                                                    | 5.70 {20.0}                                                             |                                             |                                   |                                   |                                                                           |
|                           |                |                                   |                  |                                                                                                                                                                                     |                                                       |                                                                                                                                                                                                    | 6.83 {24.0}                                                             |                                             |                                   |                                   |                                                                           |
|                           |                |                                   |                  |                                                                                                                                                                                     |                                                       |                                                                                                                                                                                                    | 8.08 {28.4}                                                             |                                             |                                   |                                   |                                                                           |
|                           |                |                                   | R404A            | —                                                                                                                                                                                   | 1.92 {6.74}                                           | 1/2" Solder(D)<br>[1/2" Flare(B)]                                                                                                                                                                  | 5/8" Solder(D)<br>[5/8" Flare(B)]                                       |                                             |                                   |                                   |                                                                           |
|                           |                |                                   |                  |                                                                                                                                                                                     | 2.67 {9.39}                                           | 5/8" Solder(D)                                                                                                                                                                                     | 7/8" Solder(D)                                                          |                                             |                                   |                                   |                                                                           |
|                           |                |                                   |                  |                                                                                                                                                                                     | 3.36 {11.8}                                           |                                                                                                                                                                                                    |                                                                         |                                             |                                   |                                   |                                                                           |
|                           |                |                                   |                  |                                                                                                                                                                                     | 4.03 {14.2}                                           |                                                                                                                                                                                                    |                                                                         |                                             |                                   |                                   |                                                                           |
|                           |                |                                   |                  |                                                                                                                                                                                     | 4.76 {16.7}                                           |                                                                                                                                                                                                    |                                                                         |                                             |                                   |                                   |                                                                           |
| R Zone                    | Refrigeration  | —30 to 10°C<br>(C:R134a)          | SCX—             | 0545D[B]MC<br>0745D[B]MC<br>0857DMC<br>1057DMC<br>1257DMC                                                                                                                           | R134a                                                 | —                                                                                                                                                                                                  | 4.76 {16.7}<br>6.62 {23.3}<br>8.32 {29.3}<br>9.98 {35.1}<br>11.8 {41.5} | 1/2" Solder(D)<br>[1/2" Flare(B)]           | 5/8" Solder(D)<br>[5/8" Flare(B)] |                                   |                                                                           |
|                           |                |                                   |                  |                                                                                                                                                                                     |                                                       |                                                                                                                                                                                                    |                                                                         | 5/8" Solder(D)                              | 7/8" Solder(D)                    |                                   |                                                                           |
|                           |                |                                   |                  |                                                                                                                                                                                     |                                                       |                                                                                                                                                                                                    |                                                                         | R22                                         | —                                 | 5/8" Solder(D)                    | 7/8" Solder(D)                                                            |
|                           |                |                                   |                  |                                                                                                                                                                                     |                                                       |                                                                                                                                                                                                    |                                                                         |                                             |                                   | 5/8" Solder(D)                    | 7/8" Solder(D)                                                            |
|                           |                |                                   |                  |                                                                                                                                                                                     |                                                       |                                                                                                                                                                                                    |                                                                         |                                             |                                   | 5/8" Solder(D)                    | 7/8" Solder(D)                                                            |
|                           |                | R404A                             | —                | 1/2" Solder(D)<br>[1/2" Flare(B)]                                                                                                                                                   | 5/8" Solder(D)<br>[5/8" Flare(B)]                     |                                                                                                                                                                                                    |                                                                         |                                             |                                   |                                   |                                                                           |
|                           |                |                                   |                  | 5/8" Solder(D)                                                                                                                                                                      | 7/8" Solder(D)                                        |                                                                                                                                                                                                    |                                                                         |                                             |                                   |                                   |                                                                           |
|                           |                |                                   |                  | 5/8" Solder(D)                                                                                                                                                                      | 7/8" Solder(D)                                        |                                                                                                                                                                                                    |                                                                         |                                             |                                   |                                   |                                                                           |
|                           |                |                                   |                  | 5/8" Solder(D)                                                                                                                                                                      | 7/8" Solder(D)                                        |                                                                                                                                                                                                    |                                                                         |                                             |                                   |                                   |                                                                           |
|                           |                |                                   |                  | 5/8" Solder(D)                                                                                                                                                                      | 7/8" Solder(D)                                        |                                                                                                                                                                                                    |                                                                         |                                             |                                   |                                   |                                                                           |
|                           |                | —40 to 0°C<br>(C:R22,R404A,R407C) | SCX—             | 0645D[B]HC<br>0845D[B]HC<br>1057DHC<br>1257DHC<br>1457DHC<br>0445D[B]UC<br>0545D[B]UC<br>0657DUC<br>0857DUC<br>0957DUC<br>0645D[B]HC<br>0845D[B]HC<br>1057DHC<br>1257DHC<br>1457DHC | R22<br><br><br><br><br>R404A<br><br><br><br><br>R407C | —<br><br><br><br><br>—<br><br><br><br><br>—                                                                                                                                                        | 1/2" Solder(D)<br>[1/2" Flare(B)]                                       | 5/8" Solder(D)<br>[5/8" Flare(B)]           |                                   |                                   |                                                                           |
|                           |                |                                   |                  |                                                                                                                                                                                     |                                                       |                                                                                                                                                                                                    | 5/8" Solder(D)                                                          | 7/8" Solder(D)                              |                                   |                                   |                                                                           |
|                           |                |                                   |                  |                                                                                                                                                                                     |                                                       |                                                                                                                                                                                                    | 5/8" Solder(D)                                                          | 7/8" Solder(D)                              |                                   |                                   |                                                                           |
|                           |                |                                   |                  |                                                                                                                                                                                     |                                                       |                                                                                                                                                                                                    | 5/8" Solder(D)                                                          | 7/8" Solder(D)                              |                                   |                                   |                                                                           |
|                           |                |                                   |                  |                                                                                                                                                                                     |                                                       |                                                                                                                                                                                                    | 5/8" Solder(D)                                                          | 7/8" Solder(D)                              |                                   |                                   |                                                                           |
|                           |                |                                   |                  |                                                                                                                                                                                     |                                                       |                                                                                                                                                                                                    | 5/8" Solder(D)                                                          | 7/8" Solder(D)                              |                                   |                                   |                                                                           |
|                           |                |                                   |                  |                                                                                                                                                                                     |                                                       |                                                                                                                                                                                                    | 5/8" Solder(D)                                                          | 7/8" Solder(D)                              |                                   |                                   |                                                                           |
|                           |                |                                   |                  |                                                                                                                                                                                     |                                                       |                                                                                                                                                                                                    | 5/8" Solder(D)                                                          | 7/8" Solder(D)                              |                                   |                                   |                                                                           |
|                           |                |                                   |                  |                                                                                                                                                                                     |                                                       |                                                                                                                                                                                                    | 5/8" Solder(D)                                                          | 7/8" Solder(D)                              |                                   |                                   |                                                                           |
|                           |                |                                   |                  |                                                                                                                                                                                     |                                                       |                                                                                                                                                                                                    | 5/8" Solder(D)                                                          | 7/8" Solder(D)                              |                                   |                                   |                                                                           |
|                           |                | —40 to —10°C<br>(C:R410A)         | SCX—             | 0645D[B]VC<br>0945D[B]VC<br>1157DVC<br>1357DVC<br>1657DVC                                                                                                                           | R410A                                                 | —                                                                                                                                                                                                  | 1/2" Solder(D)<br>[1/2" Flare(B)]                                       | 5/8" Solder(D)<br>[5/8" Flare(B)]           |                                   |                                   |                                                                           |
|                           |                |                                   |                  |                                                                                                                                                                                     |                                                       |                                                                                                                                                                                                    | 5/8" Solder(D)                                                          | 7/8" Solder(D)                              |                                   |                                   |                                                                           |
|                           |                |                                   |                  |                                                                                                                                                                                     |                                                       |                                                                                                                                                                                                    | 5/8" Solder(D)                                                          | 7/8" Solder(D)                              |                                   |                                   |                                                                           |
|                           |                |                                   |                  |                                                                                                                                                                                     |                                                       |                                                                                                                                                                                                    | 5/8" Solder(D)                                                          | 7/8" Solder(D)                              |                                   |                                   |                                                                           |
|                           |                |                                   |                  |                                                                                                                                                                                     |                                                       |                                                                                                                                                                                                    | 5/8" Solder(D)                                                          | 7/8" Solder(D)                              |                                   |                                   |                                                                           |
|                           |                | A Zone                            | Air Conditioning | —40 to 10°C<br>(SA:R22,R404A,R407C)                                                                                                                                                 | SCX—                                                  | 0645D[B]HSA<br>0845D[B]HSA<br>1057DHSA<br>1257DHSA<br>1457DHSA<br>0445D[B]USA<br>0545D[B]USA<br>0657DUSA<br>0857DUSA<br>0957DUSA<br>0645D[B]HSA<br>0845D[B]HSA<br>1057DHSA<br>1257DHSA<br>1457DHSA | R22<br><br><br><br><br>R404A<br><br><br><br><br>R407C                   | —<br><br><br><br><br>—<br><br><br><br><br>— | 1/2" Solder(D)<br>[1/2" Flare(B)] | 5/8" Solder(D)<br>[5/8" Flare(B)] |                                                                           |
|                           |                |                                   |                  |                                                                                                                                                                                     |                                                       |                                                                                                                                                                                                    |                                                                         |                                             | 5/8" Solder(D)                    | 7/8" Solder(D)                    |                                                                           |
|                           |                |                                   |                  |                                                                                                                                                                                     |                                                       |                                                                                                                                                                                                    |                                                                         |                                             | 5/8" Solder(D)                    | 7/8" Solder(D)                    |                                                                           |
|                           |                |                                   |                  |                                                                                                                                                                                     |                                                       |                                                                                                                                                                                                    |                                                                         |                                             | 5/8" Solder(D)                    | 7/8" Solder(D)                    |                                                                           |
|                           |                |                                   |                  |                                                                                                                                                                                     |                                                       |                                                                                                                                                                                                    |                                                                         |                                             | 5/8" Solder(D)                    | 7/8" Solder(D)                    |                                                                           |
| 5/8" Solder(D)            | 7/8" Solder(D) |                                   |                  |                                                                                                                                                                                     |                                                       |                                                                                                                                                                                                    |                                                                         |                                             |                                   |                                   |                                                                           |
| 5/8" Solder(D)            | 7/8" Solder(D) |                                   |                  |                                                                                                                                                                                     |                                                       |                                                                                                                                                                                                    |                                                                         |                                             |                                   |                                   |                                                                           |
| 5/8" Solder(D)            | 7/8" Solder(D) |                                   |                  |                                                                                                                                                                                     |                                                       |                                                                                                                                                                                                    |                                                                         |                                             |                                   |                                   |                                                                           |
| 5/8" Solder(D)            | 7/8" Solder(D) |                                   |                  |                                                                                                                                                                                     |                                                       |                                                                                                                                                                                                    |                                                                         |                                             |                                   |                                   |                                                                           |
| 5/8" Solder(D)            | 7/8" Solder(D) |                                   |                  |                                                                                                                                                                                     |                                                       |                                                                                                                                                                                                    |                                                                         |                                             |                                   |                                   |                                                                           |
| 5/8" Solder(D)            | 7/8" Solder(D) |                                   |                  |                                                                                                                                                                                     |                                                       |                                                                                                                                                                                                    |                                                                         |                                             |                                   |                                   |                                                                           |
| 5/8" Solder(D)            | 7/8" Solder(D) |                                   |                  |                                                                                                                                                                                     |                                                       |                                                                                                                                                                                                    |                                                                         |                                             |                                   |                                   |                                                                           |
| 5/8" Solder(D)            | 7/8" Solder(D) |                                   |                  |                                                                                                                                                                                     |                                                       |                                                                                                                                                                                                    |                                                                         |                                             |                                   |                                   |                                                                           |
| 5/8" Solder(D)            | 7/8" Solder(D) |                                   |                  |                                                                                                                                                                                     |                                                       |                                                                                                                                                                                                    |                                                                         |                                             |                                   |                                   |                                                                           |
| 5/8" Solder(D)            | 7/8" Solder(D) |                                   |                  |                                                                                                                                                                                     |                                                       |                                                                                                                                                                                                    |                                                                         |                                             |                                   |                                   |                                                                           |
| —45 to 10°C<br>(SA:R410A) | SCX—           |                                   |                  | 0645D[B]VSA<br>0945D[B]VSA<br>1157DVSA<br>1357DVSA<br>1657DVSA                                                                                                                      | R410A                                                 | —                                                                                                                                                                                                  | 1/2" Solder(D)<br>[1/2" Flare(B)]                                       | 5/8" Solder(D)<br>[5/8" Flare(B)]           |                                   |                                   |                                                                           |
|                           |                |                                   |                  |                                                                                                                                                                                     |                                                       |                                                                                                                                                                                                    | 5/8" Solder(D)                                                          | 7/8" Solder(D)                              |                                   |                                   |                                                                           |
|                           |                |                                   |                  |                                                                                                                                                                                     |                                                       |                                                                                                                                                                                                    | 5/8" Solder(D)                                                          | 7/8" Solder(D)                              |                                   |                                   |                                                                           |
|                           |                |                                   |                  |                                                                                                                                                                                     |                                                       |                                                                                                                                                                                                    | 5/8" Solder(D)                                                          | 7/8" Solder(D)                              |                                   |                                   |                                                                           |
|                           |                |                                   |                  |                                                                                                                                                                                     |                                                       |                                                                                                                                                                                                    | 5/8" Solder(D)                                                          | 7/8" Solder(D)                              |                                   |                                   |                                                                           |

DIMENSIONS

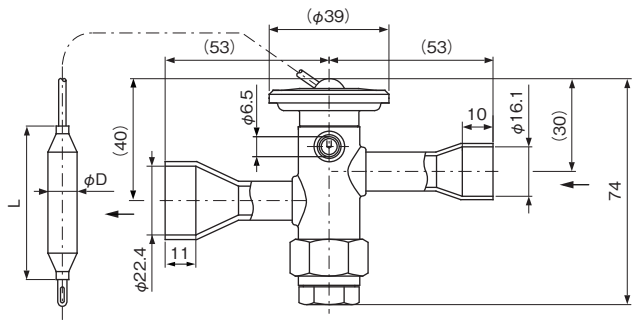
Type SCX-\*\*45D



Type SCX-\*\*45B



Type SCX-\*\*57D

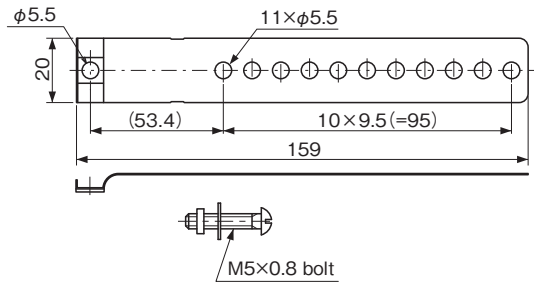


|    | D    | L  |
|----|------|----|
| SA | 12.7 | 80 |
| C  | 9.5  | 50 |
| SL | 12.7 | 80 |

Unit: mm

ACCESSORY

- Sensing Bulb Mounting Band



# EXPANSION VALVES

## Type ATX (R410A)

**SAGINO MIYA**

### GENERAL DESCRIPTION

- Applicable for R410A
- Application: General refrigeration and air conditioning system.
- Suitable for refrigeration systems with hot gas defrosting.

### SPECIFICATIONS

- Max. working pressure: 3.3 MPa {33kgf/cm<sup>2</sup>}
- Adjustable range of static superheat: 1 to 7°C
- $\bigcirc$  Increase about 0.007MPa / rotation



TYPE ATX-D

| Charge    | Evaporating Temp.(°C) | MOP (°C) | Temp. Condition                                 |
|-----------|-----------------------|----------|-------------------------------------------------|
|           |                       |          | Power Element Temp.: Ts, Sensing Bulb Temp.: Tb |
| <b>C</b>  | 10 to -20             | —        | $T_s \approx T_b$                               |
| <b>CL</b> | -10 to -40            |          |                                                 |

### VALVE NOMENCLATURE

Catalog No. is decided according to the specifications.

Example:  $\frac{\text{ATX}}{\text{I}} - \frac{34006}{\text{II}} \frac{\text{B}}{\text{III}} \frac{\text{V}}{\text{IV}} \frac{\text{C}}{\text{V}}$

I : Type ... ATX—Thermostatic expansion valve for general use.

II : Model ... The first and the second digits indicate inlet and outlet pipe size respectively.  
The last three digits indicate nominal capacity.

III : Connection ... B—Flare Nut Connection D—Solder Connection

IV : Refrigerant ... V = R410A

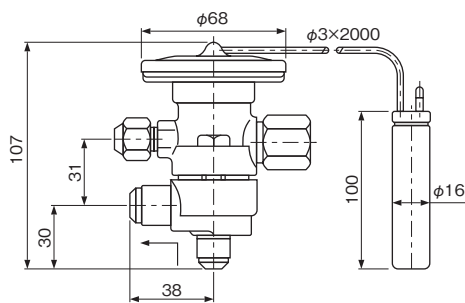
V : Charge type ... C = C-charge, CL = CL-charge

### TYPE NUMBER SELECTION

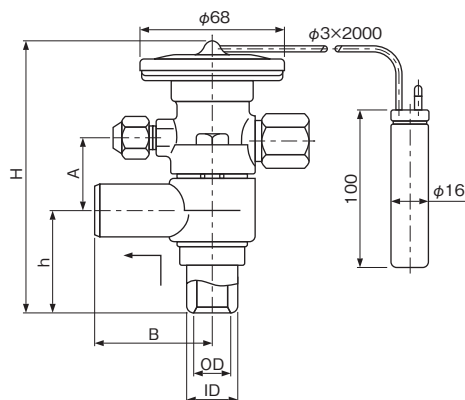
| Catalog No. |       |                               |              |         | Capacity (U.S.R.T.){kW} |       | Connection             |                          |               | Wt. (kg)                 |     |
|-------------|-------|-------------------------------|--------------|---------|-------------------------|-------|------------------------|--------------------------|---------------|--------------------------|-----|
| Type        | Model | Connection                    | Refrigerant  | Charge  | CT38°C                  | ET5°C | Inlet                  | Outlet                   | Equalizer     |                          |     |
| ATX-        | 34006 | B (Flare)<br>or<br>D (Solder) | V<br>(R410A) | C<br>CL | 1.10 {3.85}             |       | 3/8"<br>{3/8"OD}       | 1/2"<br>{1/2"OD}         | 1/4"<br>Flare | 1.2<br>(B)<br>1.1<br>[D] |     |
|             | 34013 |                               |              |         | 2.32 {8.14}             |       |                        |                          |               |                          |     |
|             | 34023 |                               |              |         | 3.98 {14.0}             |       |                        |                          |               |                          |     |
|             | 34035 |                               |              |         | 6.05 {21.3}             |       |                        |                          |               |                          |     |
|             | 34045 |                               |              |         | 7.77 {27.3}             |       |                        |                          |               |                          |     |
|             | 57060 | D (Solder)                    |              |         | 10.7 {37.6}             |       | 5/8"OD<br>or<br>7/8"ID | 7/8"OD<br>or<br>1-1/8"ID |               | 1.3                      |     |
|             | 57080 |                               |              |         | 14.3 {50.3}             |       |                        |                          |               |                          |     |
|             | 71110 |                               |              |         | 19.6 {69.0}             |       |                        |                          |               |                          |     |
|             | 71140 |                               |              |         | 24.9 {87.4}             |       |                        |                          |               |                          |     |
|             | 71160 |                               |              |         | 28.6 {101}              |       |                        |                          |               |                          |     |
|             | 12220 |                               |              |         | 39.4 {139}              |       | 1"OD<br>or<br>1-1/4"ID | 1"OD<br>or<br>1-1/4"ID   |               |                          | 1.5 |
|             | 12270 |                               |              |         | 48.2 {170}              |       |                        |                          |               |                          |     |
|             | 12330 |                               |              |         | 58.6 {206}              |       |                        |                          |               |                          |     |
|             | 12420 |                               |              |         | 74.2 {261}              |       |                        |                          |               |                          |     |
|             | 12500 |                               |              |         | 89.2 {314}              |       |                        |                          |               |                          |     |

## DIMENSIONS

Type ATX-B



Type ATX-D

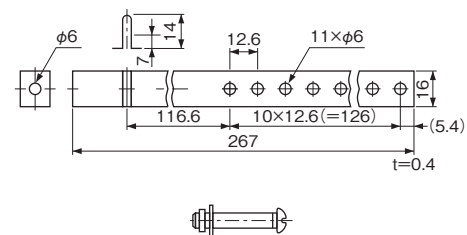


| Type                    | H   | h  | A  | B  |
|-------------------------|-----|----|----|----|
| ATX-34006D<br>to 34045D | 107 | 30 | 31 | 38 |
| ATX-57060D<br>to 71160D | 132 | 52 | 34 | 51 |
| ATX-12220D<br>to 12500D | 138 | 56 | 36 |    |

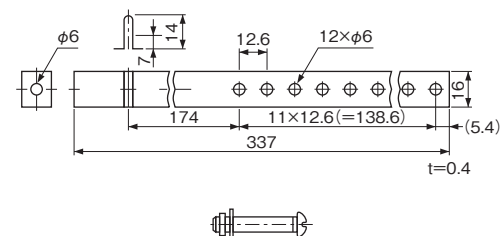
## ACCESSORY

### • Sensing Bulb Mounting Band

For Type ATX-34006 to 71160



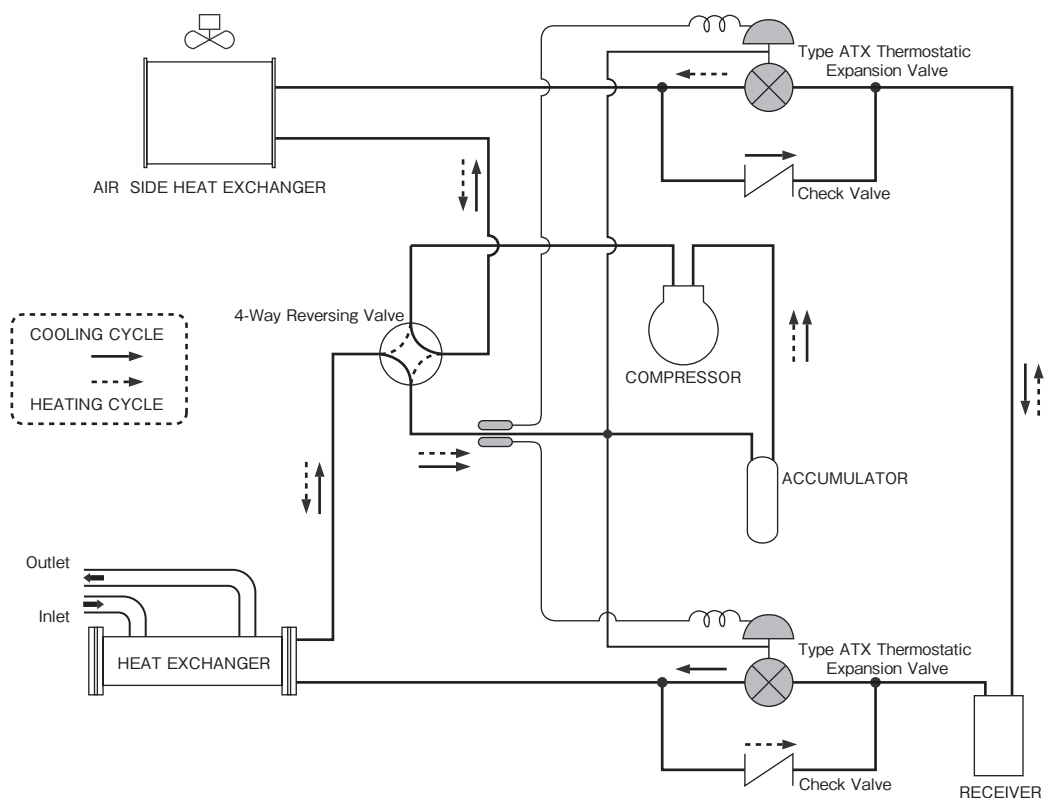
For Type ATX-12220 to 12500



## SYSTEM EXAMPLE

### Heat Pump Chiller System

- In case of using ATX in heat pump circuits, sensing bulb and external equalizer shall be mounted at a position between 4way reversing valve and accumulator.



# EXPANSION VALVES

## Type ATX

SAGINOMIYA

### GENERAL DESCRIPTION

- Application: General refrigeration and air conditioning system.
- In cases where the evaporation temperature is  $-20^{\circ}\text{C}$  or lower, S-charge type is best suited for heat-pump air conditioners and unloading system attached devices.

### SPECIFICATIONS

- Max. working pressure:  
 2.8 MPa {28kgf/cm<sup>2</sup>} ..... (S, SL, CY-charge)  
 3.3 MPa {33kgf/cm<sup>2</sup>} ..... (S-charge for R407C)  
 1.4 MPa {14kgf/cm<sup>2</sup>} ..... (G, L, C, CL-charge)
- Adjustable range of static superheat:  
 3 to  $13^{\circ}\text{C}$  ..... (G, L, CL-charge)  
 0 to  $13^{\circ}\text{C}$  ..... (CY-charge)  
 0 to  $8^{\circ}\text{C}$  ..... (S-charge)  
 1 to  $7^{\circ}\text{C}$  ..... (S, SL-charge for R404A)
- $\bigcirc$  Increase about 0.007MPa / rotation



Type ATX-B



Type ATX-D

### VALVE NOMENCLATURE

Catalog No. is decided according to the specifications.

Example:  $\frac{\text{ATX}}{\text{I}} - \frac{34006}{\text{II}} \frac{\text{B}}{\text{III}} \frac{\text{H}}{\text{IV}} \frac{\text{L}}{\text{V}}$

I : Type..... ATX-Thermostatic expansion valve for general use.

II : Model..... The first and second digits indicate inlet and outlet pipe size respectively.  
 The last three digits indicate nominal capacity.

III : Connection..... B-Flare Nut Connection, D-Solder Connection

IV : Refrigerant..... M = R134a, H = R22, U = R404A, P = R407C

V : Charge type..... G = G-charge, L = L-charge, C = C-charge, CL = CL-charge, CY = CY-charge,  
 S = S-charge, SL = SL-charge

### TYPE NUMBER SELECTION

| Catalog No. |       |            |             |                | Capacity (U.S.R.T.) {kW} |            |            |            |            | Connection |        |            | Capil. Tube Length (mm) | Wt. (kg) |
|-------------|-------|------------|-------------|----------------|--------------------------|------------|------------|------------|------------|------------|--------|------------|-------------------------|----------|
| Type        | Model | Connection | Refrigerant | Charge         | R22                      | R134a      | R404A      | R407C      | R404A(SL)  | Inlet      | Outlet | Equalizer  |                         |          |
| ATX-        | 34006 | B (Flare)  | M (R134a)   | S (R134a)      | 1.0 {3.51}               | 0.7 {2.46} | 0.7 {2.46} | 1.0 {3.51} | 0.3 {1.16} | 3/8"       | 1/2"   | 1/4" Flare | $\phi 3 \times 1500$    | 1.2      |
|             | 34013 |            |             |                | 2.1 {7.39}               | 1.6 {5.63} | 1.5 {5.27} | 2.2 {7.74} | 0.8 {2.90} |            |        |            |                         |          |
|             | 34023 |            | H (R22)     | SL (R404A)     | 3.6 {12.7}               | 2.8 {9.85} | 2.7 {9.49} | 3.7 {13.0} | 1.4 {4.78} |            |        |            |                         |          |
|             | 34035 |            |             |                | 5.5 {19.3}               | 4.2 {14.8} | 4.0 {14.1} | 5.7 {20.0} | 2.0 {7.19} |            |        |            |                         |          |
|             | 34045 |            | P (R407C)   | G L C CL (R22) | 7.0 {24.8}               | 5.4 {19.0} | 5.1 {17.9} | 7.2 {25.3} | 2.6 {9.23} |            |        |            |                         |          |

• Capacity: Based on condensing temp.  $38^{\circ}\text{C}$  and evaporating temp.  $5^{\circ}\text{C}$ . ( $-30^{\circ}\text{C}$  for SL-charge).

## TYPE NUMBER SELECTION

| Catalog No. |       |            |                                                |                                                                    | Capacity (U.S.R.T.) {kW} |             |             |             |             | Connection         |                      |            | Capil. Tube Length (mm) | Wt. (kg) |
|-------------|-------|------------|------------------------------------------------|--------------------------------------------------------------------|--------------------------|-------------|-------------|-------------|-------------|--------------------|----------------------|------------|-------------------------|----------|
| Type        | Model | Connection | Refrigerant                                    | Charge                                                             | R22                      | R134a       | R404A       | R407C       | R404A(SL)   | Inlet              | Outlet               | Equalizer  |                         |          |
| ATX-        | 34006 | D (Solder) | M (R134a)<br>H (R22)<br>U (R404A)<br>P (R407C) | S (R134a)<br>R22<br>R404A<br>R407C<br>SL (R404A)<br>G L C CL (R22) | 1.0 {3.51}               | 0.7 {2.46}  | 0.7 {2.46}  | 1.0 {3.51}  | 0.3 {1.16}  | 3/8" OD            | 1/2" OD              | 1/4" Flare | $\phi 3 \times 1500$    | 1.1      |
|             | 34013 |            |                                                |                                                                    | 2.1 {7.39}               | 1.6 {5.63}  | 1.5 {5.27}  | 2.2 {7.74}  | 0.8 {2.90}  |                    |                      |            |                         |          |
|             | 34023 |            |                                                |                                                                    | 3.6 {12.7}               | 2.8 {9.85}  | 2.7 {9.49}  | 3.7 {13.0}  | 1.4 {4.78}  |                    |                      |            |                         |          |
|             | 34035 |            |                                                |                                                                    | 5.5 {19.3}               | 4.2 {14.8}  | 4.0 {14.1}  | 5.7 {20.0}  | 2.0 {7.19}  |                    |                      |            |                         |          |
|             | 34045 |            |                                                |                                                                    | 7.0 {24.8}               | 5.4 {19.0}  | 5.1 {17.9}  | 7.2 {25.3}  | 2.6 {9.23}  |                    |                      |            |                         |          |
|             | 57060 |            |                                                |                                                                    | 9.7 {34.1}               | 7.2 {25.4}  | 6.8 {23.9}  | 10.0 {35.1} | 3.7 {12.9}  | 5/8" OD or 7/8" ID | 7/8" OD or 1-1/8" ID | 1/4" Flare | $\phi 3 \times 2000$    | 1.3      |
|             | 57080 |            |                                                |                                                                    | 13.0 {45.7}              | 9.6 {33.7}  | 9.1 {32.0}  | 13.4 {47.1} | 4.9 {17.3}  |                    |                      |            |                         |          |
|             | 71110 |            |                                                |                                                                    | 17.8 {62.6}              | 13.2 {46.4} | 12.5 {44.0} | 18.3 {64.3} | 6.9 {24.4}  |                    |                      |            |                         |          |
|             | 71140 |            |                                                |                                                                    | 22.6 {79.4}              | 16.8 {59.1} | 16.0 {56.3} | 23.3 {81.9} | 8.7 {30.7}  |                    |                      |            |                         |          |
|             | 71160 |            |                                                |                                                                    | 26.0 {91.6}              | 19.2 {67.5} | 18.2 {64.0} | 26.8 {94.2} | 10.0 {35.0} |                    |                      |            |                         |          |
|             | 12220 |            |                                                |                                                                    | 35.8 {126}               | 26.4 {92.8} | 25.1 {88.3} | 36.9 {130}  | 13.7 {48.2} | 1" OD or 1-1/4" ID | 1" OD or 1-1/4" ID   | 1/4" Flare | $\phi 3 \times 3000$    | 1.5      |
|             | 12270 |            |                                                |                                                                    | 43.5 {154}               | 32.4 {114}  | 30.8 {108}  | 44.8 {158}  | 16.9 {59.3} |                    |                      |            |                         |          |
|             | 12330 |            |                                                |                                                                    | 53.4 {187}               | 39.6 {140}  | 37.6 {132}  | 55.0 {193}  | 20.6 {72.4} |                    |                      |            |                         |          |
|             | 12420 |            |                                                |                                                                    | 67.6 {237}               | 50.4 {177}  | 47.9 {168}  | 69.6 {245}  | 27.6 {97.1} |                    |                      |            |                         |          |
|             | 12500 |            |                                                |                                                                    | 81.0 {285}               | 60.0 {211}  | 57.0 {200}  | 83.4 {293}  | 33.0 {116}  |                    |                      |            |                         |          |

• Capacity: Based on condensing temp. 38°C and evaporating temp. 5°C. (−30°C for SL-charge).

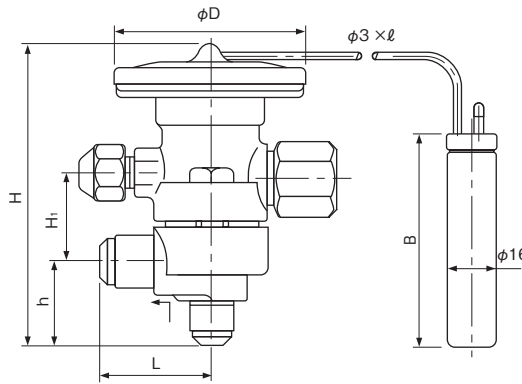
### Extreme Low Temperature Model ( − 70°C to − 40°C)

| Catalog No. |       |                               |             |                          | Capacity (U.S.R.T.) {kW} | Connection               |        |            | Capil. Tube Length (mm) | Wt. (kg)    |
|-------------|-------|-------------------------------|-------------|--------------------------|--------------------------|--------------------------|--------|------------|-------------------------|-------------|
| Type        | Model | Connection                    | Refrigerant | Charge                   | R22                      | Inlet                    | Outlet | Equalizer  |                         |             |
| ATX-        | 34006 | B (Flare)<br>or<br>D (Solder) | H (R22)     | CY<br>( Extreme<br>Low ) | 1.39 {4.88}              | 3/8"OD                   | 1/2"OD | 1/4" Flare | ϕ 3<br>×<br>2000        | 1.2 (Flare) |
|             | 34013 |                               |             |                          | 3.21 {11.3}              |                          |        |            |                         |             |
|             | 34023 |                               |             |                          | 5.40 {19.0}              |                          |        |            |                         |             |
|             | 34035 |                               |             |                          | 7.56 {26.6}              |                          |        |            |                         |             |
|             | 34045 |                               |             |                          | 9.74 {34.3}              |                          |        |            |                         |             |
|             | 57060 | 11.3 {39.8}                   |             |                          | 5/8"OD<br>or<br>7/8"ID   | 7/8"OD<br>or<br>1-1/8"ID | 1.3    |            |                         |             |
|             | 57080 | 15.3 {53.7}                   |             |                          |                          |                          |        |            |                         |             |

• Capacity: Based on condensing temp. 40°C and evaporating temp. −60°C, sub-cooling 50°C.

## DIMENSIONS

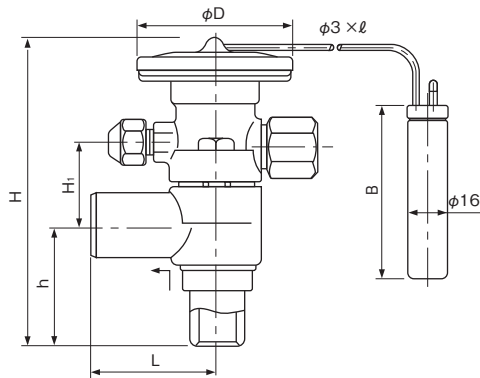
### Type ATX-B



| Catalog No. |       |                         | Unit: mm |     |                |    |          |        |     |  |
|-------------|-------|-------------------------|----------|-----|----------------|----|----------|--------|-----|--|
| Type        | Model | Connection              | L        | H   | H <sub>1</sub> | h  | $\phi D$ | $\ell$ | B   |  |
| ATX-        | 34006 | B (Flare) or D (Solder) | 38       | 107 | 31             | 30 | 64       | 1500   | 76  |  |
|             | 34013 |                         |          |     |                |    |          |        |     |  |
|             | 34023 |                         |          |     |                |    |          |        |     |  |
|             | 34035 |                         |          |     |                |    |          |        |     |  |
|             | 34045 |                         |          |     |                |    |          |        |     |  |
|             | 57060 | D (Solder)              | 51       | 132 | 34             | 52 | 68       | 2000   | 100 |  |
|             | 57080 |                         |          |     |                |    |          |        |     |  |
|             | 71110 |                         |          |     |                |    |          |        |     |  |
|             | 71140 |                         |          |     |                |    |          |        |     |  |
|             | 71160 |                         |          |     |                |    |          |        |     |  |
|             | 12220 |                         |          |     |                |    |          |        |     |  |
|             | 12270 |                         |          |     |                |    |          |        |     |  |
|             | 12330 |                         |          |     |                |    |          |        |     |  |
|             | 12420 |                         |          |     |                |    |          |        |     |  |
|             | 12500 |                         |          |     |                |    |          |        |     |  |

• S,CY,SL-Charge :  $\phi D=68, \ell=2000, B=100$

### Type ATX-D

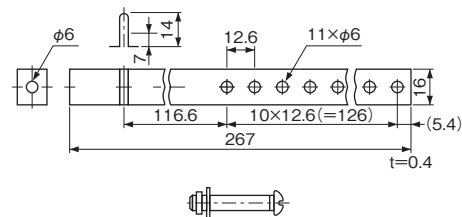


Unit: mm

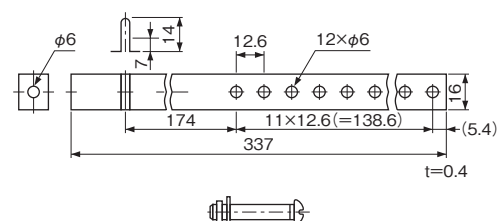
## ACCESSORY

### • Sensing Bulb Mounting Band

For Type ATX-34006 to 71160



For Type ATX-12220 to 12500



# EXPANSION VALVES

High Volume OEM Item

## Type AEX

SAGINOMIYA

### GENERAL DESCRIPTION

- This product demonstrates excellent performance over a wide range of evaporation temperature.
- The AEX-Z type adopts a bellows seal mechanism and performs stable control even at extremely low temperatures.
- Application: Refrigerator, Freezer, Extreme low temperature warehouse and Refrigeration equipment for Ships.

### SPECIFICATIONS

- Max. working pressure: 1.4MPa {14 kgf/cm<sup>2</sup>}
- Airtight test pressure: 1.6MPa{16 kgf/cm<sup>2</sup>}
- Body and sensing bulb Max. temperature: 80°C
- Adjustable range of static superheat: 0 ~ 20°C
- Increase about 0.05 MPa / rotation



Type AEX



Type AEX-Z

### VALVE NOMENCLATURE

Catalog No. is decided according to the specifications.

Example:  $\frac{\text{AEX}}{\text{I}} - \frac{2333}{\text{II}} \frac{\text{B}}{\text{III}} \frac{\text{H}}{\text{IV}} \frac{\text{Z}}{\text{V}}$

I : Type..... AEX—Thermostatic expansion valve for general use. (Internal equalizer type.)

II: Model..... The first and the second digits indicate inlet and outlet pipe size respectively.  
The last two digits indicate nominal capacity.

III: Connection..... B—Flare Nut Connection

IV: Refrigerant..... H = R22, M=R134a, C=R23, U=R404A

V: Temperature class..... no representation = standard type, Z = Extreme Low Temperature type

| Charge |       | Temperature class       | Refrigerant | Evaporating Temp. (°C) | MOP (°C) | Temp. Condition                                   |
|--------|-------|-------------------------|-------------|------------------------|----------|---------------------------------------------------|
|        |       |                         |             |                        |          | Power Element Temp.: Ts<br>Sensing Bulb Temp.: Tb |
| G      | R22   | standard                | H           | 10~-40                 | 13       | Ts>Tb                                             |
|        | R134a |                         | M           | 10~-30                 |          |                                                   |
|        | R404A |                         | U           | 10~-40                 |          |                                                   |
|        | R22   | Extreme Low Temperature | H           | 10~-70                 | -60      |                                                   |
|        | R23   |                         | C(R23)      | -70~-100               |          |                                                   |
|        | R404A |                         | U           | 10~-70                 | 13       |                                                   |

G: Gas charge Type

### TYPE NUMBER SELECTION (SPECIFICATIONS)

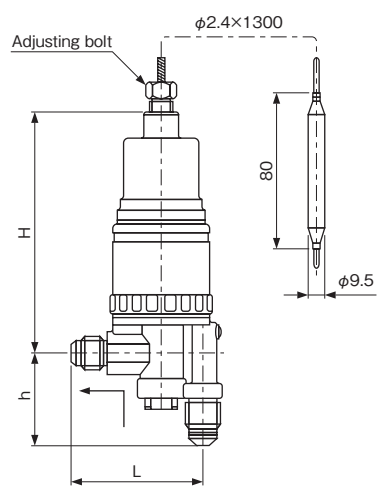
| Catalog No. |       |                                                          |                                                                       | Capacity (U.S.R.T.) {kW} |                     |             |             | Connection          |            | Wt. (kg)   |      |
|-------------|-------|----------------------------------------------------------|-----------------------------------------------------------------------|--------------------------|---------------------|-------------|-------------|---------------------|------------|------------|------|
| Type        | Model | Connection                                               | Refrigerant                                                           | R22                      | R23                 | R134a       | R404A       | Inlet               | Outlet     |            |      |
| AEX-        | 2333B | H<br>(R22)<br>M<br>(R134a)<br>C<br>(R23)<br>U<br>(R404A) | No representation<br>(standard)<br><br>Z<br>(Extreme Low Temperature) | 0.50 {1.76}              | Production possible | 0.36 {1.27} | 0.34 {1.20} | 1/4"(3/8")<br>Flare | 3/8" Flare | 0.95       |      |
|             | 2335B |                                                          |                                                                       | 0.95 {3.34}              |                     | 0.72 {2.53} | 0.68 {2.39} |                     |            | 1/2" Flare | 1.15 |
|             | 2345B |                                                          |                                                                       | 1.40 {4.92}              |                     | 1.10 {3.87} | 1.05 {3.69} |                     |            |            |      |
|             | 2348B |                                                          |                                                                       | 1.90 {6.68}              |                     | 1.50 {5.28} | 1.40 {4.92} |                     |            |            |      |
|             | 2341B |                                                          |                                                                       | 3.70 {13.0}              |                     | 2.60 {9.14} | 2.50 {8.79} | 3/8"(1/4")<br>Flare | 1.30       |            |      |
|             | 2344B |                                                          |                                                                       | 6.0 {21.1}               |                     | 4.41 {15.5} | 4.21 {14.8} | 1/2" Flare          | 5/8" Flare |            |      |
|             | 3454B |                                                          |                                                                       | 5/8"(1/2")<br>Flare      |                     | 3/4" Flare  |             |                     |            |            |      |
|             | 4564B |                                                          |                                                                       |                          |                     |             |             |                     |            |            |      |
|             | 4566B |                                                          |                                                                       |                          |                     |             |             |                     |            |            |      |
|             | 4568B |                                                          |                                                                       |                          |                     |             |             |                     |            |            |      |

• Capacity: Based on condensing temp. 38°C and evaporating temp. -5°C.

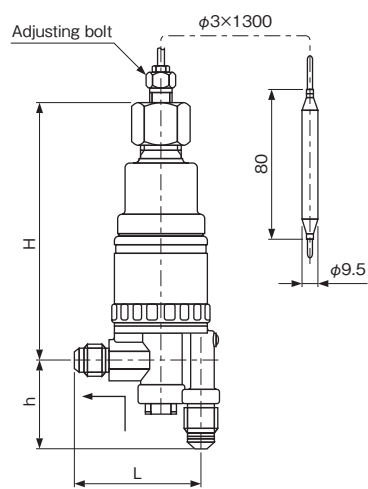
• If you need connection sizes in ( ), please specify first.

• H dimension of Z type is about 24 mm larger.

DIMENSIONS



Type AEX



Type AEX-Z

Unit: mm

| Catalog No. |       |              |                                 | L    | H      | h          |
|-------------|-------|--------------|---------------------------------|------|--------|------------|
| Type        | Model | Refrigerant  | Evaporating Temp.               |      |        |            |
| AEX-        | 2333B | H<br>(R22)   | No representation<br>(standard) | 70.5 | 132    | 47<br>(46) |
|             | 2335B |              |                                 |      |        |            |
|             | 2345B |              |                                 |      |        |            |
|             | 2348B | M<br>(R134a) | Z<br>(Extreme Low Temperature)  | 73.5 | 133    | 46(47)     |
|             | 2341B |              |                                 |      |        |            |
|             | 2342B | C<br>(R23)   | 81                              | 135  | 48(49) |            |
|             | 2344B |              |                                 |      |        |            |
|             | 3454B | U<br>(R404A) | 84.5                            | 136  | 52     |            |
|             | 4564B |              |                                 |      |        |            |
|             | 4566B |              |                                 |      |        |            |
| 4568B       |       |              |                                 |      |        |            |

## ELECTRONIC EXPANSION VALVES

High Volume OEM Item

Type UKV, VKV & AKV

**SAGINOMIYA**

### GENERAL DESCRIPTION

- Application: Wide range of air conditioning and refrigeration equipment
- Refrigerant: R22, R134a, R404A, R407C, R410A
- High cool down capability.
- Quick response.
- Less energy consumption.
- Bi-Flow capability.



Type UKV



Type AKV

### SPECIFICATIONS

Max. working pressure: 4.2 MPa {42kgf/cm<sup>2</sup>}

Valve operating pulse range: 0 to 480 pulse, 1–2 phase excitation.

### TYPE NUMBER SELECTION

Type UKV – High volume OEM item

| Catalog No.    | Port Size<br>(φ mm) | Capacity<br>(U.S.R.T.) {kW} |            |            |             |             | Connection (Solder)<br>(mm) |           | Operating Pressure<br>Differential<br>B to A flow direction<br>(MPa) {kgf/cm <sup>2</sup> } | Valve shut press<br>on, A to B<br>flow direction<br>(MPa) {kgf/cm <sup>2</sup> } | Wt.<br>(kg) |
|----------------|---------------------|-----------------------------|------------|------------|-------------|-------------|-----------------------------|-----------|---------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------|-------------|
|                |                     | R22                         | R134a      | R404A      | R407C       | R410A       | B side                      | A side    |                                                                                             |                                                                                  |             |
| <b>UKV-08D</b> | 0.8                 | 0.4 {1.5}                   | 0.34 {1.2} | 0.3 {1.1}  | 0.4 {1.6}   | 0.5 {1.8}   | φ 6.35 OD                   | φ 6.35 OD | 0 to 3.5 {0 to 35}                                                                          | 2.0 {20} or less                                                                 | 0.05        |
| <b>UKV-10D</b> | 1.0                 | 0.7 {2.6}                   | 0.58 {2.0} | 0.5 {1.8}  | 0.8 {2.7}   | 0.9 {3.1}   | φ 7.94 OD                   | φ 7.94 OD |                                                                                             | 3.5 {35} or less                                                                 |             |
| <b>UKV-14D</b> | 1.4                 | 1.6 {5.8}                   | 1.28 {4.5} | 1.2 {4.1}  | 1.7 {5.9}   | 1.9 {6.8}   | φ 7.94 OD                   | φ 7.94 OD |                                                                                             | 2.0 {20} or less                                                                 |             |
| <b>UKV-18D</b> | 1.8                 | 2.9 {10.3}                  | 2.3 {8.1}  | 2.1 {7.3}  | 3.0 {10.6}  | 3.4 {12.1}  | φ 6.35 OD                   | φ 6.35 OD |                                                                                             | 2.8 {28} or less                                                                 |             |
| <b>UKV-25D</b> | 2.5                 | 5.6 {19.6}                  | 4.4 {15.3} | 3.9 {13.8} | 5.7 {20.1}  | 6.5 {23.0}  | φ 7.94 OD                   | φ 7.94 OD | 0 to 2.8 {0 to 28}                                                                          | 2.2 {22} or less                                                                 |             |
| <b>UKV-30D</b> | 3.0                 | 7.6 {26.8}                  | 6.0 {20.9} | 5.4 {18.9} | 7.8 {27.5}  | 9.0 {31.5}  |                             |           |                                                                                             | 1.5 {15} or less                                                                 |             |
| <b>UKV-32D</b> | 3.2                 | 8.2 {28.8}                  | 6.4 {22.5} | 5.8 {20.3} | 8.4 {29.6}  | 9.6 {33.9}  |                             |           |                                                                                             | 1.2 {12} or less                                                                 |             |
| <b>UKV-40D</b> | 4.0                 | 11.1 {39.1}                 | 8.7 {30.6} | 7.9 {27.6} | 11.4 {40.2} | 13.1 {46.0} |                             |           |                                                                                             | 0.7 {7} or less                                                                  |             |

• Capacity: Based on CT = 38°C, ET = 5°C, SC = 0°C and SH = 0°C

• Please contact us if other capacity or connection are required.

Type VKV – Middle volume OEM item

| Catalog No.    | Port Size<br>(φ mm) | Capacity<br>(U.S.R.T.) {kW} |             |            |             |             | Connection (Solder)<br>(mm) |           | Operating Pressure<br>Differential<br>B to A flow direction<br>(MPa) {kgf/cm <sup>2</sup> } | Valve shut press<br>on, A to B<br>flow direction<br>(MPa) {kgf/cm <sup>2</sup> } | Wt.<br>(kg) |
|----------------|---------------------|-----------------------------|-------------|------------|-------------|-------------|-----------------------------|-----------|---------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------|-------------|
|                |                     | R22                         | R134a       | R404A      | R407C       | R410A       | B side                      | A side    |                                                                                             |                                                                                  |             |
| <b>VKV-14D</b> | 1.4                 | 1.5 {5.2}                   | 1.1 {4.0}   | 1.0 {3.6}  | 1.5 {5.3}   | 1.7 {6.1}   | φ 7.94 OD                   | φ 7.94 OD | 0 to 3.5 {0 to 35}                                                                          | 2.8 {28} or less                                                                 | 0.11        |
| <b>VKV-18D</b> | 1.8                 | 2.9 {10.3}                  | 2.3 {8.1}   | 2.1 {7.3}  | 3.0 {10.6}  | 3.4 {12.1}  |                             |           |                                                                                             | 2.4 {24} or less                                                                 |             |
| <b>VKV-20D</b> | 2.0                 | 3.5 {12.4}                  | 2.7 {9.7}   | 2.5 {8.7}  | 3.6 {12.7}  | 4.1 {14.5}  |                             |           |                                                                                             | 2.4 {24} or less                                                                 | 0.13        |
| <b>VKV-25D</b> | 2.5                 | 5.3 {18.5}                  | 4.1 {14.5}  | 3.7 {13.1} | 5.4 {19.0}  | 6.2 {21.8}  |                             |           |                                                                                             | 2.2 {22} or less                                                                 |             |
| <b>VKV-30D</b> | 3.0                 | 7.0 {24.7}                  | 5.5 {19.3}  | 4.9 {17.4} | 7.2 {25.4}  | 8.3 {29.1}  | φ 9.52 OD                   | φ 12.7 OD | 0 to 2.5 {0 to 25}                                                                          | 1.5 {15} or less                                                                 | 0.15        |
| <b>VKV-32D</b> | 3.2                 | 8.2 {28.8}                  | 6.4 {22.5}  | 5.8 {20.3} | 8.4 {29.6}  | 9.6 {33.9}  |                             |           |                                                                                             | 1.0 {10} or less                                                                 |             |
| <b>VKV-40D</b> | 4.0                 | 13.2 {46.4}                 | 10.3 {36.2} | 9.3 {32.7} | 13.5 {47.6} | 15.5 {54.5} |                             |           |                                                                                             | 0.3 {3} or less                                                                  | 0.16        |

• Capacity: Based on CT = 38°C, ET = 5°C, SC = 0°C and SH = 0°C

• Please contact us if valves for application of hot gas bypass are required.

## Type AKV – Large capacity type

| Catalog No.    | Port Size<br>( $\phi$ mm) | Capacity<br>(U.S.R.T.) {kW} |             |             |              |              | Connection (Solder)<br>(mm) |                 | Operating Pressure<br>Differential<br>B to A flow direction<br>(MPa) {kgf/cm <sup>2</sup> } | Valve shut press<br>on, A to B<br>flow direction<br>(MPa) {kgf/cm <sup>2</sup> } | Wt.<br>(kg) |
|----------------|---------------------------|-----------------------------|-------------|-------------|--------------|--------------|-----------------------------|-----------------|---------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------|-------------|
|                |                           | R22                         | R134a       | R404A       | R407C        | R410A        | B side                      | A side          |                                                                                             |                                                                                  |             |
| <b>AKV-55D</b> | 5.5                       | 23.7 {83.4}                 | 18.5 {65.2} | 16.7 {58.8} | 24.4 {85.6}  | 27.9 {98.1}  | $\phi$ 15.88 OD             | $\phi$ 15.88 OD | 0 to 2.3 {0 to 23}                                                                          | 0.5 {5} or less                                                                  | 0.4         |
| <b>AKV-65D</b> | 6.5                       | 28.1 {98.9}                 | 22.0 {77.3} | 19.8 {69.8} | 29.9 {105.2} | 33.0 {116.2} |                             |                 |                                                                                             |                                                                                  | 0.42        |

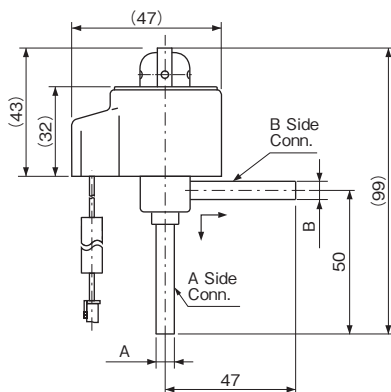
• Capacity: Based on CT = 38°C, ET = 5°C, SC = 0°C and SH = 0°C

## Coil

| Valve Type | Rated Voltage & Current | Wt.(kg) |
|------------|-------------------------|---------|
| Type UKV   | 12V DC...260mA/Phase    | 0.13    |
| Type VKV   | 12V DC...380mA/Phase    | 0.15    |
| Type AKV   | 12V DC...375mA/Phase    | 0.4     |

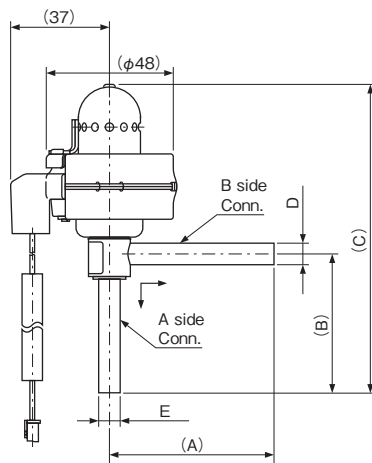
## DIMENSIONS

### Type UKV



| Catalog No.    | A           | B |
|----------------|-------------|---|
| <b>UKV-08D</b> | $\phi$ 6.35 |   |
| <b>UKV-10D</b> | $\phi$ 7.94 |   |
| <b>UKV-14D</b> | $\phi$ 7.94 |   |
| <b>UKV-18D</b> | $\phi$ 6.35 |   |
| <b>UKV-25D</b> | $\phi$ 7.94 |   |
| <b>UKV-30D</b> | $\phi$ 7.94 |   |
| <b>UKV-32D</b> | $\phi$ 7.94 |   |
| <b>UKV-40D</b> | $\phi$ 7.94 |   |

### Type VKV-14D to -32D

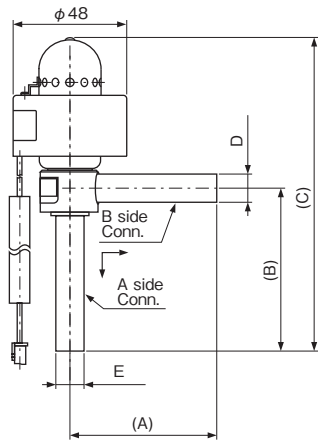


| Catalog No.    | A  | B  | C   | D           | E           |
|----------------|----|----|-----|-------------|-------------|
| <b>VKV-14D</b> |    |    |     |             |             |
| <b>VKV-18D</b> |    |    |     |             |             |
| <b>VKV-20D</b> | 64 | 49 | 112 | $\phi$ 7.94 |             |
| <b>VKV-25D</b> |    |    |     |             |             |
| <b>VKV-30D</b> |    |    |     |             |             |
| <b>VKV-32D</b> | 66 | 64 | 130 | $\phi$ 9.52 | $\phi$ 12.7 |

Unit: mm

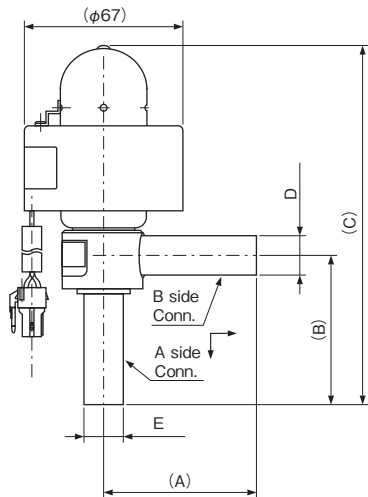
DIMENSIONS

Type VKV-40D



| Catalog No.    | A  | B  | C   | D           | E           |
|----------------|----|----|-----|-------------|-------------|
| <b>VKV-40D</b> | 66 | 68 | 136 | $\phi 12.7$ | $\phi 12.7$ |

Type AKV



| Catalog No.    | A    | B    | C   | D            | E |
|----------------|------|------|-----|--------------|---|
| <b>AKV-55D</b> | 64.5 | 65.5 | 150 | $\phi 15.88$ |   |
| <b>AKV-65D</b> |      |      |     |              |   |

Unit: mm

# ELECTRONIC EXPANSION VALVES

High Volume OEM Item

## Type UKV-F

SAGInoMIYA

### GENERAL DESCRIPTION

- Application: Residential air conditioner, etc.
- Refrigerant: R22, R134a, R404A, R407C, R410A
- With internal check valve function.
- High cool down capability.
- Quick response.
- Less energy consumption.



Type UKV-F

### SPECIFICATIONS

Max. working pressure: 4.2 MPa {42kgf/cm<sup>2</sup>}

Valve operating pulse range: 0 to 500 pulse, 1-2 phase excitation.

### TYPE NUMBER SELECTION

Type UKV-F – With internal check valve function

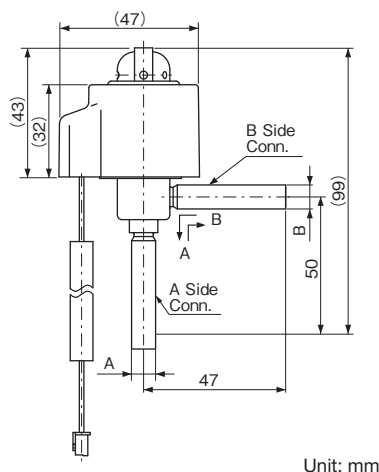
| Catalog No. | Port Size<br>( $\phi$ mm) | Capacity<br>(U.S.R.T.) {kW} |            |            |            |            | Connection (Solder)<br>(mm) |                   | Operating Pressure<br>Differential (MPa) {kgf/cm <sup>2</sup> } |        | Cv Value<br>Flow Direction<br>A to B<br>Full opening<br>position | Wt.<br>(kg) |
|-------------|---------------------------|-----------------------------|------------|------------|------------|------------|-----------------------------|-------------------|-----------------------------------------------------------------|--------|------------------------------------------------------------------|-------------|
|             |                           | R22                         | R134a      | R404A      | R407C      | R410A      | B side                      | A side            | B to A                                                          | A to B |                                                                  |             |
| UKV-F19D    | 1.9                       | 2.9 {10.3}                  | 2.3 {8.1}  | 2.1 {7.3}  | 3.0 {10.6} | 3.4 {12.1} | $\phi$ 7.94<br>OD           | $\phi$ 7.94<br>OD | 0 to 3.3<br>{0 to 33}                                           | N/A    | 0.47                                                             | 0.05        |
| UKV-F25D    | 2.5                       | 4.7 {16.5}                  | 3.7 {12.9} | 3.3 {11.6} | 4.8 {16.9} | 5.5 {19.4} |                             |                   |                                                                 |        |                                                                  |             |

• Capacity: Based on CT = 38°C, ET = 5°C, SC = 0°C and SH = 0°C

### Coil

| Rated Voltage & Current | Wt.(kg) |
|-------------------------|---------|
| 12V DC...260mA/Phase    | 0.13    |

### DIMENSIONS

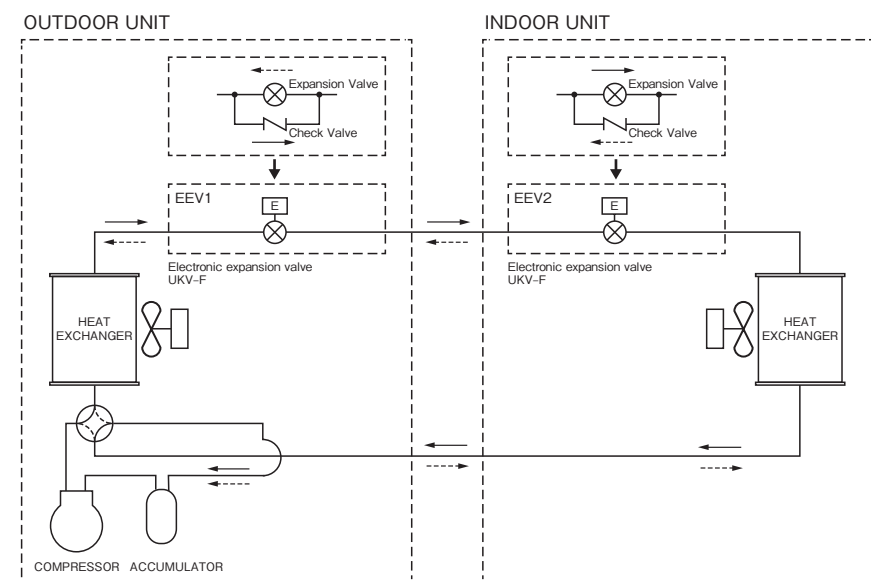


Unit: mm

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

| Catalog No. | A           | B |
|-------------|-------------|---|
| UKV-F19D    | $\phi$ 7.94 |   |
| UKV-F25D    |             |   |

### 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.

# PULSE CONVERTERS

## Type LNE

**SAGInoMIYA**

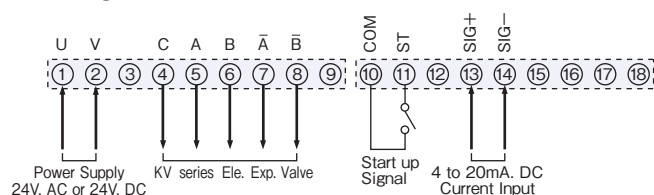
### GENERAL DESCRIPTION

- Can be used for all types of VKV, PKV, and AKV electronic expansion valves.
- Current input is converted to driving pulse output to electronic expansion valve with the pulse converter.
- Convert 4 to 20mA. DC input to 0 to 480 pulse output.

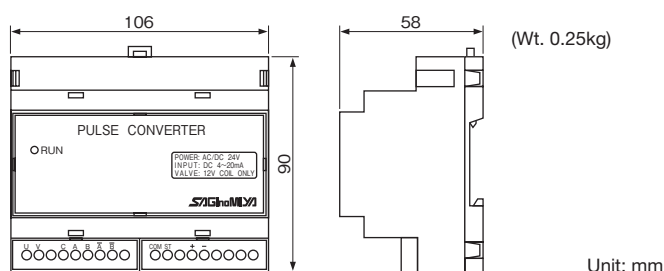
|               |                |                           |
|---------------|----------------|---------------------------|
| Input         | Start up input | No voltage contact signal |
|               | Current input  | 4 to 20mA. DC             |
| Output        | 0 to 480 pulse | For VKV, PKV & AKV        |
| Sampling time |                | 0.1, 1, 5, and 10 sec.    |



### WIRING



### DIMENSIONS (Type: LNE-ZN20-020)



**SOLENOID VALVES & CONTROL VALVES**

|                                                     |       |
|-----------------------------------------------------|-------|
| <b>SOLENOID VALVES FOR REFRIGERANT</b> . . . . .    | 77    |
| Type <b>TEV &amp; VPV</b>                           |       |
| <b>SOLENOID VALVES FOR REFRIGERANT</b> . . . . .    | 78–79 |
| Type <b>SEV</b>                                     |       |
| <b>SOLENOID VALVES FOR REFRIGERANT</b> . . . . .    | 80–81 |
| Type <b>RPV</b>                                     |       |
| <b>SOLENOID VALVES FOR REFRIGERANT</b> . . . . .    | 82–84 |
| Type <b>REV &amp; UEV</b>                           |       |
| <b>SOLENOID VALVES FOR WATER</b> . . . . .          | 85    |
| Type <b>WEV</b>                                     |       |
| <b>BI-FLOW SOLENOID VALVES</b> . . . . .            | 86    |
| Type <b>BPV</b>                                     |       |
| <b>3-WAY SOLENOID VALVES</b> . . . . .              | 87    |
| Type <b>IEV</b>                                     |       |
| <b>4-WAY REVERSING VALVES</b> . . . . .             | 88–90 |
| Type <b>STF</b>                                     |       |
| <b>MOTORIZED BALL VALVES</b> . . . . .              | 91–92 |
| Type <b>MJV</b>                                     |       |
| <b>DAMPER &amp; VALVE MOTOR ACTUATORS</b> . . . . . | 93–94 |
| Type <b>EGK &amp; WGK</b>                           |       |
| <b>2-WAY &amp; 3-WAY CONTROL VALVES</b> . . . . .   | 95–97 |
| Type <b>NVK</b>                                     |       |

# SOLENOID VALVES FOR REFRIGERANT

High Volume OEM Item

Type TEV & VPV

SAGINOMIYA

## GENERAL DESCRIPTION

- Direct-operated, pilot operated, 2-way, normally closed valve. Normally open type is available.
- For use with non-corrosive refrigerant.
- Compactly designed for use in small appliances produced in quantity such as room air conditioners, dehumidifiers and ice making machines.
- Various piping configuration available.



Type VPV



Type TEV

## SPECIFICATIONS

- Fluid temperature: -30 to 120°C
- Ambient temperature: -30 to 50°C

## TYPE NUMBER SELECTION

Unit: MPa {kgf/cm<sup>2</sup>}

| Catalog No.  | Port Size (mm) | Cv Value | * Nominal Capacity (U.S.R.T.) {kW} |             |            |             | Connection       |        | O.P.D.       |            | Max. Working Pressure | Operation    | Wt. (kg) |           |              |
|--------------|----------------|----------|------------------------------------|-------------|------------|-------------|------------------|--------|--------------|------------|-----------------------|--------------|----------|-----------|--------------|
|              |                |          | R410A                              | R134a       | R404A      | R22         | Copper Tube O.D. | Style  | Min.         | Max.       |                       |              |          |           |              |
| TEV-S1220D   | 1.2            | 0.037    | 0.2 {0.6}                          | 0.1 {0.5}   | 0.1 {0.4}  | 0.2 {0.6}   | 1/4"             | Solder | 0            | 3.6 {36.7} | 4.3 {43.8}            | Normal Close | 0.025    |           |              |
| TEV-S1620D   | 1.6            | 0.07     | 0.3 {1.0}                          | 0.3 {1.0}   | 0.2 {0.7}  | 0.3 {1.1}   |                  |        |              | 2.75 {28}  |                       |              |          |           |              |
| TEV-S1920D   | 1.9            | 0.1      | 0.4 {1.5}                          | 0.4 {1.5}   | 0.3 {1.0}  | 0.5 {1.6}   |                  |        | 0            | 2.06 {21}  |                       | Normal Open  | 0.06     |           |              |
| VPV-L202D    | 1.8            | 0.06     | 0.3 {1.0}                          | 0.3 {1.0}   | 0.2 {0.7}  | 0.3 {1.1}   | 1/4"             |        |              | 3.6 {36.7} |                       |              |          | 2.75 {28} | Normal Close |
| VPV-603D     | 5.8            | 0.65     | 2.8 {9.7}                          | 2.7 {9.6}   | 1.9 {6.7}  | 2.9 {10.3}  | 5/16"            |        | 0.005 {0.05} | 0.01 {0.1} |                       | 0.14         |          |           |              |
| VPV-803DQ50  | 7.8            | 1.5      | 6.4 {22.4}                         | 6.3 {22.2}  | 4.4 {15.4} | 6.8 {23.8}  | 3/8"             |        | 0.015 {0.15} |            |                       |              | 0.26     |           |              |
| VPV-1204DQ50 | 11.0           | 3.0      | 12.7 {44.8}                        | 12.6 {44.4} | 8.8 {30.9} | 13.5 {47.6} | 1/2"             |        |              |            |                       |              |          |           |              |

• O.P.D.: Operating Pressure Differential (by air pressure)

\* Nominal capacities are based on ΔP = 0.015MPa, condensing temp. = 38°C and evaporating temp. = 5°C

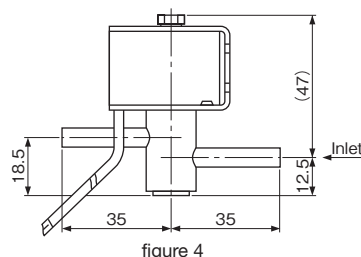
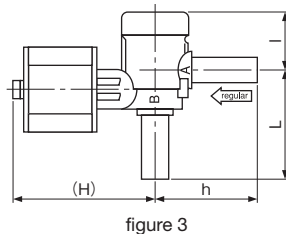
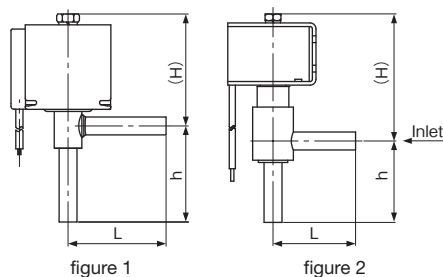
## ELECTRICAL RATING OF SOLENOID COILS

| Type | Rated Voltage                                           |         | Tolerance (%) | Voltampere |        | Power Consumption (W) | Insulation Class | Wt. (kg) |
|------|---------------------------------------------------------|---------|---------------|------------|--------|-----------------------|------------------|----------|
|      |                                                         |         |               | Running    | Inrush |                       |                  |          |
| TEV  | 24V. AC<br>100V. AC<br>110V. AC<br>120V. AC<br>208V. AC | 50/60Hz | ±10           | 9/7        | 22/16  | 4.5/3.5               | Class B Molded   | 0.1      |
| VPV  | 220V. AC<br>230V. AC<br>240V. AC                        |         |               | 13/10      | 36/30  | 8/7                   |                  | 0.14     |

Current (A) = Voltampere / Rated Voltage

\* IEC compliance

## DIMENSIONS



| Catalog No. |          | Unit: mm |      |      |      | Form     |
|-------------|----------|----------|------|------|------|----------|
|             |          | L        | H    | h    | l    |          |
| TEV-        | S1220D   | 35       | 40   | 33   | —    | figure 1 |
|             | S1620D   |          |      |      |      |          |
|             | S1920D   |          |      |      |      |          |
| VPV-        | 603D     | 36.5     | 55   | 36   | —    | figure 2 |
|             | 803DQ50  | 41.5     | 53.5 | 38.5 | 22.5 | figure 3 |
|             | 1204DQ50 | 61.5     | 57.5 | 61.5 | 28.5 | figure 4 |
|             | L202D    | —        | —    | —    | —    |          |

Unit: mm

# SOLENOID VALVES FOR REFRIGERANT

## Type SEV

**SAGINOMIYA**

### GENERAL DESCRIPTION

- Pilot operated, 2-way, normally closed valve.
- For non-corrosive refrigerant (liquid or gas) in refrigeration units. Also available for air application.
- Can operate under no pressure difference. (SEV-303, 502 and 603)
- Can install horizontally and vertically. (Coil should be located above the axis of pipe line.)



Type SEV-B



Type SEV-D

### TYPE NUMBER SELECTION

Unit: MPa {kgf/cm<sup>2</sup>}

| Catalog No. | Port Size (mm) | Cv Value | * Nominal Capacity (U.S.R.T.) {kw} |             |             |             | Connection       |        | O.P.D.       |                  | Max. Working Pressure | Body Test Press. | Fluid Temp. (°C) | Ambient Temp. (°C) | Wt. (kg) |
|-------------|----------------|----------|------------------------------------|-------------|-------------|-------------|------------------|--------|--------------|------------------|-----------------------|------------------|------------------|--------------------|----------|
|             |                |          | R410A                              | R134a       | R404A       | R22         | Copper Tube O.D. | Style  | Min.         | Max.             |                       |                  |                  |                    |          |
| SEV-303BXF  | 3              | 0.25     | 2.25 {7.91}                        | 1.05 {3.7}  | 0.73 {2.57} | 1.13 {3.97} | 3/8"             | Flare  | 0            | 2.45 {25} for AC | X: 2.94 {30}          | X: 4.41 {45}     | -40 to 125       | -30 to 50          | 0.4      |
| SEV-502BXF  | 5              | 0.51     | 3.5 {12.4}                         | 2.2 {7.6}   | 1.5 {5.2}   | 2.3 {8.1}   | 1/4"             |        |              |                  |                       |                  |                  |                    |          |
| SEV-502BYF  | 5              | 0.51     | 3.5 {12.4}                         | 2.2 {7.6}   | 1.5 {5.2}   | 2.3 {8.1}   | 1/4"             |        |              |                  |                       |                  |                  |                    |          |
| SEV-603BXF  | 6              | 0.80     | 8.5 {29.8}                         | 3.4 {11.8}  | 2.3 {8.2}   | 3.6 {12.7}  | 3/8"             |        |              |                  |                       |                  |                  |                    |          |
| SEV-603BYF  | 6              | 0.80     | 8.5 {29.8}                         | 3.4 {11.8}  | 2.3 {8.2}   | 3.6 {12.7}  | 3/8"             |        |              |                  |                       |                  |                  |                    |          |
| SEV-1004BXF | 10             | 1.75     | 14.8 {52.2}                        | 7.4 {25.9}  | 5.1 {18.0}  | 7.9 {27.8}  | 1/2"             | Solder | 0            | 1.96 {20} for DC | Y: 4.2 {42}           | Y: 6.3 {63}      | -40 to 125       | -30 to 50          | 0.7      |
| SEV-1004BYF | 10             | 1.75     | 14.8 {52.2}                        | 7.4 {25.9}  | 5.1 {18.0}  | 7.9 {27.8}  | 1/2"             |        |              |                  |                       |                  |                  |                    |          |
| SEV-1205BXF | 12             | 2.9      | 22.5 {79.1}                        | 12.2 {42.9} | 8.5 {29.8}  | 13.1 {46.0} | 5/8"             |        |              |                  |                       |                  |                  |                    |          |
| SEV-1205BYF | 12             | 2.9      | 22.5 {79.1}                        | 12.2 {42.9} | 8.5 {29.8}  | 13.1 {46.0} | 5/8"             |        |              |                  |                       |                  |                  |                    |          |
| SEV-1506BXF | 15             | 4.5      | 19.1 {67.2}                        | 18.9 {66.6} | 13.2 {46.3} | 20.3 {71.4} | 3/4"             |        |              |                  |                       |                  |                  |                    |          |
| SEV-502DXF  | 5              | 0.53     | 2.2 {7.9}                          | 2.2 {7.9}   | 1.5 {5.5}   | 2.4 {8.4}   | 1/4"             | Solder | 0            | 1.96 {20} for DC | Y: 4.2 {42}           | Y: 6.3 {63}      | -40 to 125       | -30 to 50          | 0.3      |
| SEV-502DYF  | 5              | 0.53     | 2.2 {7.9}                          | 2.2 {7.9}   | 1.5 {5.5}   | 2.4 {8.4}   | 1/4"             |        |              |                  |                       |                  |                  |                    |          |
| SEV-603DXF  | 6              | 0.83     | 3.5 {12.4}                         | 3.5 {12.3}  | 2.4 {8.5}   | 3.8 {13.2}  | 3/8"             |        |              |                  |                       |                  |                  |                    |          |
| SEV-603DYF  | 6              | 0.83     | 3.5 {12.4}                         | 3.5 {12.3}  | 2.4 {8.5}   | 3.8 {13.2}  | 3/8"             |        |              |                  |                       |                  |                  |                    |          |
| SEV-1004DXF | 10             | 2.0      | 8.5 {29.8}                         | 8.4 {29.6}  | 5.9 {20.6}  | 9.0 {31.7}  | 1/2"             |        |              |                  |                       |                  |                  |                    |          |
| SEV-1004DYF | 10             | 2.0      | 8.5 {29.8}                         | 8.4 {29.6}  | 5.9 {20.6}  | 9.0 {31.7}  | 1/2"             | Solder | 0.007 {0.07} | 1.96 {20} for DC | Y: 4.2 {42}           | Y: 6.3 {63}      | -40 to 125       | -30 to 50          | 0.8      |
| SEV-1205DXF | 12             | 3.5      | 14.8 {52.2}                        | 14.7 {51.8} | 10.2 {36.0} | 15.8 {55.5} | 5/8"             |        |              |                  |                       |                  |                  |                    |          |
| SEV-1205DYF | 12             | 3.5      | 14.8 {52.2}                        | 14.7 {51.8} | 10.2 {36.0} | 15.8 {55.5} | 5/8"             |        |              |                  |                       |                  |                  |                    |          |
| SEV-1506DXF | 15             | 5.3      | 22.5 {79.1}                        | 22.3 {78.5} | 15.5 {54.5} | 23.9 {84.1} | 3/4"             |        |              |                  |                       |                  |                  |                    |          |
| SEV-1506DYF | 15             | 5.3      | 22.5 {79.1}                        | 22.3 {78.5} | 15.5 {54.5} | 23.9 {84.1} | 3/4"             |        |              |                  |                       |                  |                  |                    |          |

\* Nominal capacities are based on ΔP = 0.015 MPa, condensing temp. = 38°C and evaporating temp. = 5°C, Supercool temp. = 0°C

• Weight includes a coil

• Enclosure IP34 (SEV-W:Drip proof model)

### ELECTRICAL RATING OF SOLENOID COILS

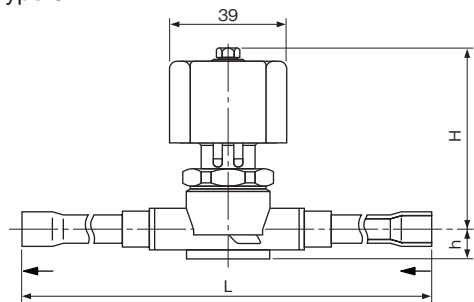
| Rated Voltage                                         |         | Tolerance (%) | Voltampere (VA) |        | Power Consumption (W) | * Insulation Class |
|-------------------------------------------------------|---------|---------------|-----------------|--------|-----------------------|--------------------|
|                                                       |         |               | Running         | Inrush |                       |                    |
| 24V.AC, 100V.AC, 110V.AC<br>200V.AC, 220V.AC, 240V.AC | 50/60Hz | ±10           | 15/11           | 45/33  | 7/6                   | Class B Molded     |
| 12V. DC, 24V. DC, 100V. DC                            | —       |               | —               | —      | 10                    |                    |

Current (A) = Voltampere / Rated Voltage

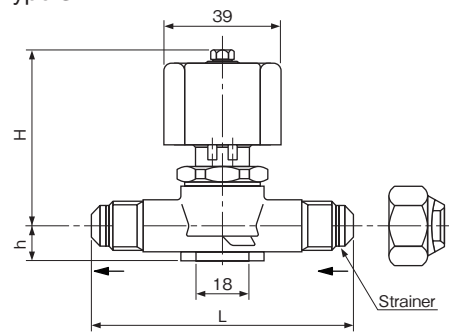
\* IEC compliance

DIMENSIONS

Type SEV-D



Type SEV-B



Unit: mm

| Catalog No. |       | Unit: mm |    |      |
|-------------|-------|----------|----|------|
|             |       | L        | H  | h    |
| SEV-        | 303B  | 85       | 58 | 11.5 |
|             | 502B  |          |    |      |
|             | 603B  |          |    |      |
|             | 1004B | 105      | 85 | 20.5 |
|             | 1205B | 115      | 88 | 22   |
|             | 1506B | 135      | 95 | 25   |
|             | 502D  | 270      | 58 | 10.5 |
|             | 603D  |          |    |      |
|             | 1004D |          |    |      |
|             | 1205D | 180      | 88 | 22   |
|             | 1506D | 190      | 95 | 25   |

# SOLENOID VALVES FOR REFRIGERANT

## Type RPV

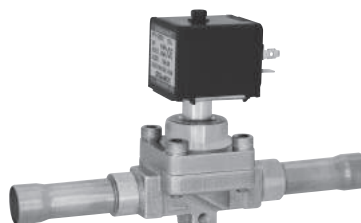
**SAGINOMIYA**

### GENERAL DESCRIPTION

- New solenoid valves for refrigerant "High-pressure R410A standard"
- Various product line up (Body: 21 types, Coil: DIN plug type, Lead wire type)
- Low power consumption (6W at 50Hz / 4.5W at 60Hz)

### SPECIFICATIONS

- Body test pressure: 6.5MPa (66.2kgf/cm<sup>2</sup>)
- Fluid temperature: -40 to 125°C
- Ambient temperature: -30 to 50°C



Type RPV-D



Type RPV-B

### TYPE NUMBER SELECTION

Unit: MPa {kgf/cm<sup>2</sup>}

| Catalog No. | Port Size (mm) | Cv Value | Nominal Capacity (U.S.R.T.) {kW} |             |             |             | Connection       |        | O.P.D.       |            | Max. Working Pressure | Wt. (kg)   |            |     |
|-------------|----------------|----------|----------------------------------|-------------|-------------|-------------|------------------|--------|--------------|------------|-----------------------|------------|------------|-----|
|             |                |          | R410A                            | R134a       | R404A       | R22         | Copper Tube O.D. | Style  | Min.         | Max.       |                       |            |            |     |
| RPV-302BYF  | 3              | 0.27     | 1.1 {4.0}                        | 1.1 {4.0}   | 0.8 {2.8}   | 1.2 {4.3}   | 1/4"             | Flare  | 0            | 3.6 {36.7} | 4.3 {43.8}            | 0.3        |            |     |
| RPV-303BYF  |                | 0.30     | 1.3 {4.5}                        | 1.3 {4.4}   | 0.9 {3.1}   | 1.4 {4.8}   | 3/8"             |        |              |            |                       | 0.3        |            |     |
| RPV-602BYF  | 6              | 0.60     | 2.5 {9.0}                        | 2.5 {8.9}   | 1.8 {6.2}   | 2.7 {9.5}   | 1/4"             |        | 0.005 {0.05} |            |                       | 0.4        |            |     |
| RPV-603BYF  |                | 0.90     | 3.8 {13.4}                       | 3.8 {13.3}  | 2.6 {9.3}   | 4.0 {14.0}  | 3/8"             |        |              |            |                       | 0.4        |            |     |
| RPV-803BYF  | 8              | 1.2      | 5.1 {17.9}                       | 5.1 {17.8}  | 3.5 {12.3}  | 5.4 {19.0}  | 3/8"             |        | 0.005 {0.05} |            |                       | 0.45       |            |     |
| RPV-804BYF  |                | 1.4      | 5.9 {20.9}                       | 5.9 {20.7}  | 4.1 {14.4}  | 6.3 {22.0}  | 1/2"             |        |              |            |                       | 0.45       |            |     |
| RPV-1004BYF | 10             | 2.4      | 10.2 {35.8}                      | 10.1 {35.5} | 7.0 {24.7}  | 10.8 {38.0} | 1/2"             |        | 0.005 {0.05} |            |                       | 0.6        |            |     |
| RPV-1005BYF |                | 2.4      | 10.2 {35.8}                      | 10.1 {35.5} | 7.0 {24.7}  | 10.8 {38.0} | 5/8"             |        |              |            |                       | 0.6        |            |     |
| RPV-1205BYF | 12             | 3.6      | 15.3 {53.7}                      | 15.2 {53.3} | 10.5 {37.0} | 16.2 {57.0} | 5/8"             |        | 0            |            |                       | 3.6 {36.7} | 4.3 {43.8} | 0.7 |
| RPV-1606BYF | 16             | 5.6      | 23.8 {83.6}                      | 23.6 {82.9} | 16.4 {57.6} | 25.3 {89.0} | 3/4"             |        |              |            |                       |            |            | 1.1 |
| RPV-302DYF  | 3              | 0.27     | 1.1 {4.0}                        | 1.1 {4.0}   | 0.8 {2.8}   | 1.2 {4.3}   | 1/4"             | Solder | 0            | 3.6 {36.7} | 4.3 {43.8}            | 0.3        |            |     |
| RPV-303DYF  |                | 0.30     | 1.3 {4.5}                        | 1.3 {4.4}   | 0.9 {3.1}   | 1.4 {4.8}   | 3/8"             |        |              |            |                       | 0.3        |            |     |
| RPV-602DYF  | 6              | 0.60     | 2.5 {9.0}                        | 2.5 {8.9}   | 1.8 {6.2}   | 2.7 {9.5}   | 1/4"             |        | 0.005 {0.05} |            |                       | 0.4        |            |     |
| RPV-603DYF  |                | 0.90     | 3.8 {13.4}                       | 3.8 {13.3}  | 2.6 {9.3}   | 4.0 {14.0}  | 3/8"             |        |              |            |                       | 0.4        |            |     |
| RPV-803DYF  | 8              | 1.2      | 5.1 {17.9}                       | 5.1 {17.8}  | 3.5 {12.3}  | 5.4 {19.0}  | 3/8"             |        | 0.005 {0.05} |            |                       | 0.4        |            |     |
| RPV-804DYF  |                | 1.4      | 5.9 {20.9}                       | 5.9 {20.7}  | 4.1 {14.4}  | 6.3 {22.0}  | 1/2"             |        |              |            |                       | 0.4        |            |     |
| RPV-1004DYF | 10             | 2.4      | 10.2 {35.8}                      | 10.1 {35.5} | 7.0 {24.7}  | 10.8 {38.0} | 1/2"             |        | 0.005 {0.05} |            |                       | 0.6        |            |     |
| RPV-1005DYF |                | 2.4      | 10.2 {35.8}                      | 10.1 {35.5} | 7.0 {24.7}  | 10.8 {38.0} | 5/8"             |        |              |            |                       | 0.6        |            |     |
| RPV-1205DYF | 12             | 3.6      | 15.3 {53.7}                      | 15.2 {53.3} | 10.5 {37.0} | 16.2 {57.0} | 5/8"             |        | 0            |            |                       | 3.6 {36.7} | 4.3 {43.8} | 0.7 |
| RPV-1606DYF | 16             | 5.6      | 23.8 {83.6}                      | 23.6 {82.9} | 16.4 {57.6} | 25.3 {89.0} | 3/4"             |        |              |            |                       |            |            | 1.1 |
| RPV-1607DYF |                | 5.6      | 23.8 {83.6}                      | 23.6 {82.9} | 16.4 {57.6} | 25.3 {89.0} | 7/8"             | 1.1    |              |            |                       |            |            |     |

- Enclosure Lead wire direct: IP67 / DIN: IP65 (When DIN socket is used)
- Nominal capacities (R410A) are based on ΔP = 0.015 MPa, condensing temp. = 38°C and evaporating temp. = 5°C
- Weight includes a coil (Without Strainer, Flare nuts, Bracket).

### ELECTRICAL RATING OF SOLENOID COILS

| Rated Voltage |         | Tolerance (%) | Voltampere (VA) |        | Power Consumption (W) | *1 Insulation Class | Coil Style |             |
|---------------|---------|---------------|-----------------|--------|-----------------------|---------------------|------------|-------------|
|               |         |               | Running         | Inrush |                       |                     | Lead wire  | DIN plug *2 |
| 24V.AC        | 50/60Hz | ±10           | 12.5/9.5        | 45/44  | 6/4.5                 | Class B Molded      | ○          | ○           |
| 100V.AC       |         |               |                 |        |                       |                     |            |             |
| 200V.AC *3    |         |               |                 |        |                       |                     |            |             |
| 220V.AC *4    |         |               |                 |        |                       |                     |            |             |
| 230V.AC *5    |         |               |                 |        |                       |                     |            |             |
| 240V.AC *6    |         |               |                 |        |                       |                     |            |             |

\*1 IEC compliance.

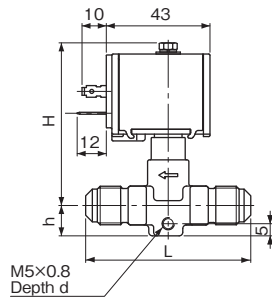
\*2 EN 175301-803 (DIN 43650) / ISO 4400

For \*3 to \*6, please refer to the following

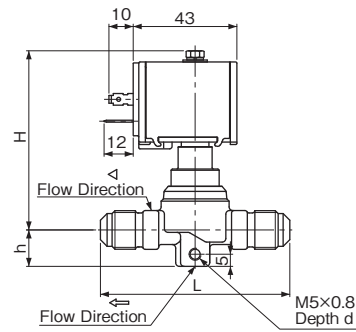
| In case of the following voltage and frequency | Voltampere (VA) | Power Consumption (W) |
|------------------------------------------------|-----------------|-----------------------|
|                                                | Running         |                       |
| *3 200 to 208V. AC (60Hz)                      | 9.5 to 11       | 4.5 to 5              |
| *4 220 to 230V. AC (60Hz)                      |                 |                       |
| *5 220 to 230V. AC (50Hz)                      | 10.5 to 12.5    | 5.2 to 6              |
| *5 230 to 240V. AC (60Hz)                      | 9.5 to 11       | 4.5 to 5              |
| *6 230 to 240V. AC (50Hz)                      | 10.5 to 12.5    | 5.2 to 6              |

## DIMENSIONS

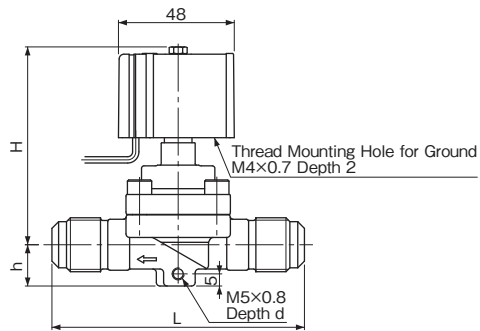
Type RPV-302BYF, 303BYF



Type RPV-602BYF to 804BYF

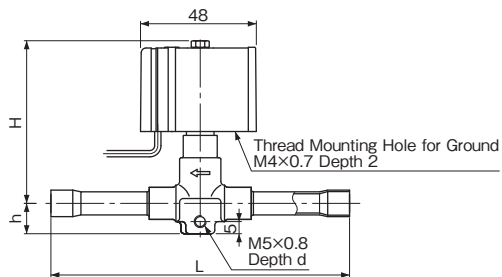


Type RPV-1004BYF to 1606BYF

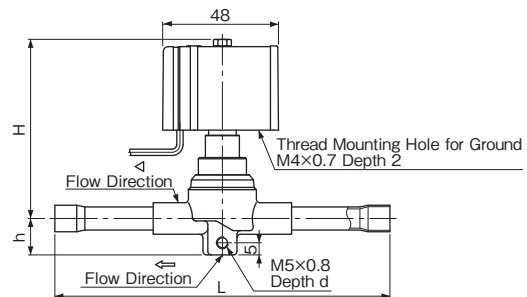


| Catalog No. | Unit: mm |      |      |    |
|-------------|----------|------|------|----|
|             | L        | H    | h    | d  |
| RPV-302BYF  | 64       | 67   | 12.5 | 12 |
| RPV-303BYF  | 68       | 67   | 12.5 | 12 |
| RPV-602BYF  | 71       | 74   | 15   | 12 |
| RPV-603BYF  | 78       | 74   | 15   | 12 |
| RPV-803BYF  | 84       | 75.5 | 15   | 14 |
| RPV-804BYF  | 90       | 75.5 | 15   | 14 |
| RPV-1004BYF | 96       | 77   | 15.5 | 17 |
| RPV-1005BYF | 101      | 77   | 15.5 | 17 |
| RPV-1205BYF | 104      | 82   | 17   | 20 |
| RPV-1606BYF | 124      | 89   | 19   | 24 |

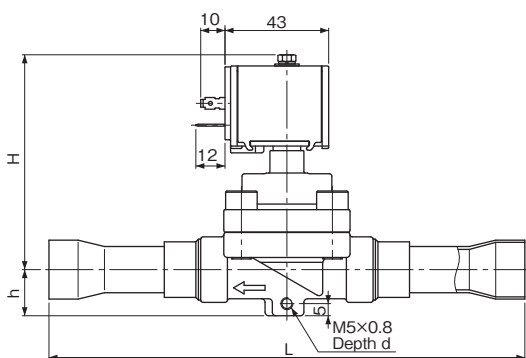
Type RPV-302DYF, 303DYF



Type RPV-602DYF to 804DYF



Type RPV-1004DYF to 1607DYF

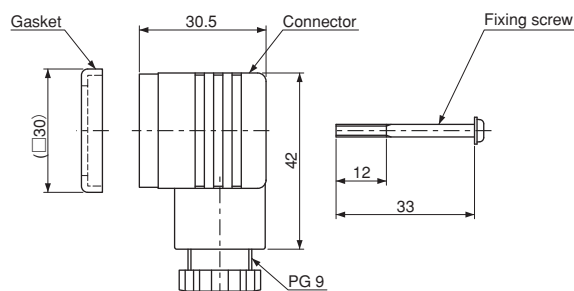


| Catalog No. | Unit: mm |      |      |    |
|-------------|----------|------|------|----|
|             | L        | H    | h    | d  |
| RPV-302DYF  | 123      | 67   | 12.5 | 12 |
| RPV-303DYF  | 123      | 67   | 12.5 | 12 |
| RPV-602DYF  | 140      | 74   | 15   | 12 |
| RPV-603DYF  | 138      | 74   | 15   | 12 |
| RPV-803DYF  | 141      | 75.5 | 15   | 14 |
| RPV-804DYF  | 139      | 75.5 | 15   | 14 |
| RPV-1004DYF | 158      | 77   | 15.5 | 17 |
| RPV-1005DYF | 168      | 77   | 15.5 | 17 |
| RPV-1205DYF | 171      | 82   | 17   | 20 |
| RPV-1606DYF | 196      | 89   | 19   | 24 |
| RPV-1607DYF | 196      | 89   | 19   | 24 |

Unit: mm

## OPTIONAL PARTS

DIN socket for DIN plug coil  
Flare Nut



# SOLENOID VALVES FOR REFRIGERANT

## Type REV & UEV

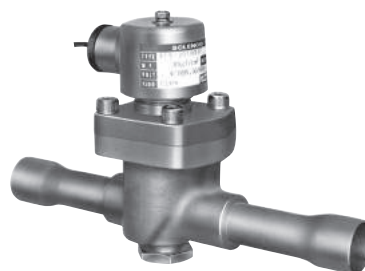
**SAGInoMIYA**

### GENERAL DESCRIPTION

- Type REV: Pilot operated, 2-way, Normally closed valve.  
Type UEV: Pilot operated, 2-way, Normally opened valve.
- For non-corrosive refrigerant (liquid or gas) in refrigeration, cooling, air conditioning systems.
- "Double plunger" construction provides reliable On/Off action.
- Compact molded coil commonly fits all valve sizes.
- Operates in any position ... can be conveniently located in horizontal or vertical line with coil on top.
- Manual Opening Stem ... On Flange connection models, supplied as standard. On Flare or Solder connection models, supplied upon request.



Type UEV-D



Type REV-D

### SPECIFICATIONS

- Fluid temperature: -40 to 125°C (Type REV)  
-40 to 120°C (Type UEV)
- Ambient temperature: -30 to 40°C

### TYPE NUMBER SELECTION

Type REV – Normally closed valve (1)

Unit: MPa {kgf/cm<sup>2</sup>}

| Catalog No. | Port Size (mm) | Cv Value | Nominal Capacity (U.S.R.T.) {kw} |                |               |             | Connection       |                 |        | O.P.D.       |           | Max. Working Pressure | Wt. (kg) |
|-------------|----------------|----------|----------------------------------|----------------|---------------|-------------|------------------|-----------------|--------|--------------|-----------|-----------------------|----------|
|             |                |          | R410A                            | R134a          | R404A         | R22         | Copper Tube O.D. | Steel Tube O.D. | Style  | Min.         | Max.      |                       |          |
| REV-703BXF  | 7              | 1.0      | 4.2 {14.9}                       | 4.2 {14.8}     | 2.9 {10.3}    | 4.6 {16}    | 3/8"             |                 | Flare  |              |           |                       | 0.6      |
| REV-1004BXF | 10             | 2.0      | 8.5 {29.8}                       | 8.4 {29.6}     | 5.9 {20.6}    | 9.1 {32}    | 1/2"             |                 |        |              |           |                       | 0.9      |
| REV-1205BXF | 12             | 3.5      | 14.9 {52.2}                      | 14.7 {51.8}    | 10.2 {36}     | 15.9 {56}   | 5/8"             |                 |        |              |           |                       | 1.1      |
| REV-1506BXF | 15             | 5.3      | 22.5 {79.1}                      | 22.3 {78.5}    | 15.5 {54.5}   | 23.9 {84}   | 3/4"             |                 |        |              |           |                       | 1.5      |
| REV-1003GXF | 10             | 2.0      | 8.5 {29.8}                       | 8.4 {29.6}     | 5.9 {20.6}    | 9.1 {32}    | 3/8"             |                 | Rc     |              |           |                       | 1.0      |
| REV-1204GXF | 12             | 3.5      | 14.9 {52.2}                      | 14.7 {51.8}    | 10.2 {36}     | 15.9 {56}   | 1/2"             |                 |        |              |           |                       | 1.3      |
| REV-1506GXF | 15             | 5.3      | 22.5 {79.1}                      | 22.3 {78.5}    | 15.5 {54.5}   | 23.9 {84}   | 3/4"             |                 |        |              |           |                       | 1.7      |
| REV-703DXF  | 7              | 1.0      | 4.2 {14.9}                       | 4.2 {14.8}     | 2.9 {10.3}    | 4.6 {16}    | 3/8"             |                 | Solder |              |           |                       | 0.5      |
| REV-1004DXF | 10             | 2.0      | 8.5 {29.8}                       | 8.4 {29.6}     | 5.9 {20.6}    | 9.1 {32}    | 1/2"             |                 |        |              |           |                       | 0.8      |
| REV-1205DXF | 12             | 3.5      | 14.9 {52.2}                      | 14.7 {51.8}    | 10.2 {36}     | 15.9 {56}   | 5/8"             |                 |        |              |           |                       | 0.9      |
| REV-1506DXF | 15             | 5.3      | 22.5 {79.1}                      | 22.3 {78.5}    | 15.5 {54.5}   | 23.9 {84}   | 3/4"             |                 |        |              |           |                       | 1.1      |
| REV-2007DXF |                |          |                                  |                |               |             | 7/8"             |                 |        |              |           |                       |          |
| REV-2010DXF | 20             | 9.0      | 38.2 {134.3}                     | 37.9 {133.2}   | 26.3 {92.6}   | 40.7 {143}  | 1"               |                 |        | 0.007 {0.07} | 2.45 {25} | 2.94 {30}             | 1.6      |
| REV-2011DXF |                |          |                                  |                |               |             | 1-1/8"           |                 |        |              |           |                       |          |
| REV-2511DXF |                |          |                                  |                |               |             | 1-1/8"           |                 |        |              |           |                       |          |
| REV-2512DXF | 25             | 13.8     | —                                | 58.1 {204.3}   | 40.4 {141.9}  | 62.3 {219}  | 1-1/4"           |                 |        |              |           |                       | 2.2      |
| REV-2513DXF |                |          |                                  |                |               |             | 1-3/8"           |                 |        |              |           |                       |          |
| REV-3213DXF |                |          |                                  |                |               |             | 1-3/8"           |                 |        |              |           |                       |          |
| REV-3214DXF | 32             | 19.4     | —                                | 81.7 {287.2}   | 56.7 {199.5}  | 87.6 {308}  | 1-1/2"           |                 |        |              |           |                       | 3.2      |
| REV-3215DXF |                |          |                                  |                |               |             | 1-5/8"           |                 |        |              |           |                       |          |
| REV-2006EXF | 20             | 9.0      | 38.2 {134.3}                     | 37.9 {133.2}   | 26.3 {92.6}   | 40.7 {143}  | 7/8"             | 1-1/8"          | 3/4"   |              |           |                       | 5.1      |
| REV-2510EXF | 25             | 13.8     |                                  | 58.1 {204.3}   | 40.4 {141.9}  | 62.3 {219}  | 1"               | 1-1/2"          | 1"     |              |           |                       | 7.7      |
| REV-3212EXF | 32             | 19.4     |                                  | 81.7 {287.2}   | 56.7 {199.5}  | 87.6 {308}  | 1-1/4"           | 1-5/8"          | 1-1/4" |              |           |                       | 8.9      |
| REV-4014EXF | 40             | 32.0     |                                  | 134.7 {473.7}  | 93.6 {329.1}  | 144.5 {508} | 1-1/2"           | 2"              | 1-1/2" |              |           |                       | 10.8     |
| REV-5020EXF | 50             | 45.0     |                                  | 189.5 {666.2}  | 131.6 {462.9} | 165.8 {583} | 2"               | 2-1/2"          | 2"     |              |           |                       | 16.3     |
| REV-6524EXF |                |          |                                  |                |               |             | 2-1/2"           | 3"              | 2-1/2" |              |           |                       | 23.2     |
| REV-6530EXF | 65             | 74.0     |                                  | 311.6 {1095.5} | 216.5 {761.1} | 272.7 {959} | 3"               | 3-1/2"          | 3"     |              |           |                       | 26.6     |

- Weight includes a coil.
- Enclosure IP34 (REV-W: Drip proof model)
- Nominal capacities (R410A) are based on  $\Delta P = 0.015$  MPa, condensing temp. = 38°C and evaporating temp. = 5°C

## TYPE NUMBER SELECTION

### Type REV – Normally closed valve (2)

Unit: MPa {kgf/cm<sup>2</sup>}

| Catalog No. | Port Size (mm) | Cv Value | Nominal Capacity (U.S.R.T.) (kw) |              |             |            | Connection       |        | O.P.D.       |           | Max. Working Pressure | Wt. (kg)     |           |          |              |           |          |     |
|-------------|----------------|----------|----------------------------------|--------------|-------------|------------|------------------|--------|--------------|-----------|-----------------------|--------------|-----------|----------|--------------|-----------|----------|-----|
|             |                |          | R410A                            | R134a        | R404A       | R22        | Copper Tube O.D. | Style  | Min.         | Max.      |                       |              |           |          |              |           |          |     |
| REV-703BYF  | 7              | 1.0      | 4.2 {14.9}                       | 4.2 {14.8}   | 2.9 {10.3}  | 4.6 {16}   | 3/8"             | Flare  | 0.007 {0.07} | 2.45 {25} | 4.2 {42}              | 0.6          |           |          |              |           |          |     |
| REV-1004BYF | 10             | 2.0      | 8.5 {29.8}                       | 8.4 {29.6}   | 5.9 {20.6}  | 9.1 {32}   | 1/2"             |        |              |           |                       | 0.9          |           |          |              |           |          |     |
| REV-1205BYF | 12             | 3.5      | 14.9 {52.2}                      | 14.7 {51.8}  | 10.2 {36}   | 15.9 {56}  | 5/8"             |        |              |           |                       | 1.1          |           |          |              |           |          |     |
| REV-1506BYF | 15             | 5.3      | 22.5 {79.1}                      | 22.3 {78.5}  | 15.5 {54.5} | 23.9 {84}  | 3/4"             |        |              |           |                       | 1.5          |           |          |              |           |          |     |
| REV-1003GYF | 10             | 2.0      | 8.5 {29.8}                       | 8.4 {29.6}   | 5.9 {20.6}  | 9.1 {32}   | 3/8"             | Rc     |              |           |                       | 0.007 {0.07} | 2.45 {25} | 4.2 {42} | 1.0          |           |          |     |
| REV-1204GYF | 12             | 3.5      | 14.9 {52.2}                      | 14.7 {51.8}  | 10.2 {36}   | 15.9 {56}  | 1/2"             |        |              |           |                       |              |           |          | 1.3          |           |          |     |
| REV-1506GYF | 15             | 5.3      | 22.5 {79.1}                      | 22.3 {78.5}  | 15.5 {54.5} | 23.9 {84}  | 3/4"             |        |              |           |                       |              |           |          | 1.7          |           |          |     |
| REV-703DYF  | 7              | 1.0      | 4.2 {14.9}                       | 4.2 {14.8}   | 2.9 {10.3}  | 4.6 {16}   | 3/8"             | Solder |              |           |                       |              |           |          | 0.007 {0.07} | 2.45 {25} | 4.2 {42} | 0.5 |
| REV-1004DYF | 10             | 2.0      | 8.5 {29.8}                       | 8.4 {29.6}   | 5.9 {20.6}  | 9.1 {32}   | 1/2"             |        |              |           |                       |              |           |          |              |           |          | 0.8 |
| REV-1205DYF | 12             | 3.5      | 14.9 {52.2}                      | 14.7 {51.8}  | 10.2 {36}   | 15.9 {56}  | 5/8"             |        |              |           |                       |              |           |          |              |           |          | 0.9 |
| REV-1506DYF | 15             | 5.3      | 22.5 {79.1}                      | 22.3 {78.5}  | 15.5 {54.5} | 23.9 {84}  | 3/4"             |        |              |           |                       |              |           |          |              |           |          | 1.1 |
| REV-2007DYF | 20             | 9.0      | 38.2 {134.3}                     | 37.9 {133.2} | 26.3 {92.6} | 40.7 {143} | 7/8"             |        |              |           |                       |              |           |          |              |           |          | 1.6 |
| REV-2010DYF |                |          |                                  |              |             |            | 1"               |        |              |           |                       |              |           |          |              |           |          |     |
| REV-2011DYF |                |          |                                  |              |             |            | 1-1/8"           |        |              |           |                       |              |           |          |              |           |          |     |

- Weight includes a coil.
- Enclosure IP34 (REV-W: Drip proof model)
- Nominal capacities (R410A) are based on  $\Delta P = 0.015$  MPa, condensing temp. = 38°C and evaporating temp. = 5°C

## TYPE NUMBER SELECTION

### Type UEV – Normally opened valve

Unit: MPa {kgf/cm<sup>2</sup>}

| Catalog No. | Port Size (mm) | Cv Value | Nominal Capacity (U.S.R.T.) (kw) |              |             |            | Connection       |        | O.P.D.       |           | Max. Working Pressure | Wt. (kg) |  |  |     |
|-------------|----------------|----------|----------------------------------|--------------|-------------|------------|------------------|--------|--------------|-----------|-----------------------|----------|--|--|-----|
|             |                |          | R410A                            | R134a        | R404A       | R22        | Copper Tube O.D. | Style  | Min.         | Max.      |                       |          |  |  |     |
| UEV-1004BXF | 10             | 2.0      | 8.5 {29.8}                       | 8.4 {29.6}   | 5.9 {20.6}  | 9.1 {32}   | 1/2"             | Flare  | 0.007 {0.07} | 1.96 {20} | 2.94 {30}             | 0.9      |  |  |     |
| UEV-1205BXF | 12             | 3.5      | 14.9 {52.2}                      | 14.7 {51.8}  | 10.2 {36}   | 15.9 {56}  | 5/8"             |        |              |           |                       | 1.1      |  |  |     |
| UEV-1506BXF | 15             | 5.3      | 22.5 {79.1}                      | 22.3 {78.5}  | 15.5 {54.5} | 23.9 {84}  | 3/4"             |        |              |           |                       | 1.5      |  |  |     |
| UEV-1003GXF | 10             | 2.0      | 8.5 {29.8}                       | 8.4 {29.6}   | 5.9 {20.6}  | 9.1 {32}   | 3/8"             | Rc     |              |           |                       |          |  |  | 1.0 |
| UEV-1204GXF | 12             | 3.5      | 14.9 {52.2}                      | 14.7 {51.8}  | 10.2 {36}   | 15.9 {56}  | 1/2"             |        |              |           |                       | 1.3      |  |  |     |
| UEV-1506GXF | 15             | 5.3      | 22.5 {79.1}                      | 22.3 {78.5}  | 15.5 {54.5} | 23.9 {84}  | 3/4"             |        |              |           |                       | 1.7      |  |  |     |
| UEV-2010GXF | 20             | 9.0      | 38.2 {134.3}                     | 37.9 {133.2} | 26.3 {92.6} | 40.7 {143} | 1"               |        |              |           |                       | 1.9      |  |  |     |
| UEV-1004DXF | 10             | 2.0      | 8.5 {29.8}                       | 8.4 {29.6}   | 5.9 {20.6}  | 9.1 {32}   | 1/2"             | Solder |              |           |                       |          |  |  | 0.8 |
| UEV-1205DXF | 12             | 3.5      | 14.9 {52.2}                      | 14.7 {51.8}  | 10.2 {36}   | 15.9 {56}  | 5/8"             |        |              |           |                       | 0.9      |  |  |     |
| UEV-1506DXF | 15             | 5.3      | 22.5 {79.1}                      | 22.3 {78.5}  | 15.5 {54.5} | 23.9 {84}  | 3/4"             |        |              |           |                       | 1.1      |  |  |     |
| UEV-2007DXF | 20             | 9.0      | 38.2 {134.3}                     | 37.9 {133.2} | 26.3 {92.6} | 40.7 {143} | 7/8"             |        |              |           |                       | 1.6      |  |  |     |
| UEV-2010DXF |                |          |                                  |              |             |            | 1"               |        |              |           |                       |          |  |  |     |
| UEV-2011DXF |                |          |                                  |              |             |            | 1-1/8"           |        |              |           |                       |          |  |  |     |

- Weight includes a coil.
- Enclosure IP34 (UEV-W: Drip proof model)
- Nominal capacities (R410A) are based on  $\Delta P = 0.015$  MPa, condensing temp. = 38°C and evaporating temp. = 5°C

## ELECTRICAL RATING OF SOLENOID COILS

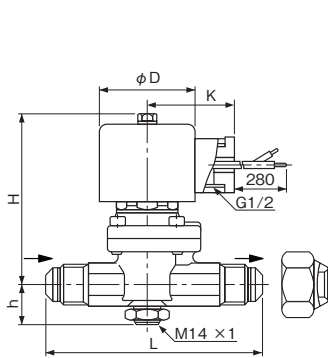
| Type | Rated Voltage                                         | Tolerance (%) | Voltampere (VA) |        | Power Consumption (W) | Insulation Class |
|------|-------------------------------------------------------|---------------|-----------------|--------|-----------------------|------------------|
|      |                                                       |               | Running         | Inrush |                       |                  |
| REV  | 24V.AC, 100V.AC, 110V.AC<br>200V.AC, 220V.AC, 240V.AC | 50/60Hz       | +10<br>-15      | 17/14  | 43/35                 | 8/7              |
|      | 12V.DC, 24V.DC<br>48V.DC, 100V.DC                     | —             | ±10             | —      | —                     | 10               |
| UEV  | 24V.AC, 100V.AC, 110V.AC<br>200V.AC, 220V.AC, 240V.AC | 50/60Hz       | +10<br>-15      | 17/14  | 43/35                 | 8/7              |

Current (A) = Voltampere / Rated Voltage

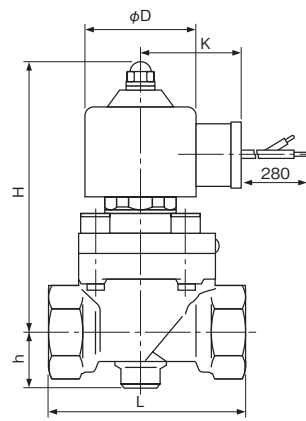
\* IEC compliance

## DIMENSIONS

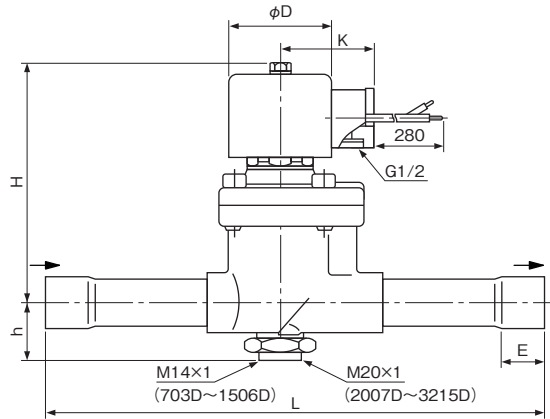
Type REV-B, UEV-BX



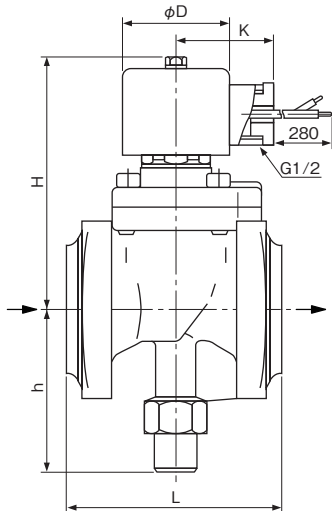
Type REV-G, UEV-GX



Type REV-D, UEV-DX



Type REV-EX



Unit: mm

| Catalog No. |            | Unit: mm |              |    |    |    |    |
|-------------|------------|----------|--------------|----|----|----|----|
|             |            | L        | H            | h  | E  | φD | K  |
| REV-        | 703BX [Y]  | 90       | 70 [73]      | 19 | —  | 48 | 44 |
|             | 1004BX [Y] | 105      | 88 [90]      | 21 |    |    |    |
|             | 1205BX [Y] | 115      | 90 [92]      | 22 |    |    |    |
|             | 1506BX [Y] | 135      | 96 [99]      | 25 |    |    |    |
|             | 1003GX [Y] | 65       | 89 [91]      | 20 |    |    |    |
|             | 1204GX [Y] | 75       | 94 [96]      | 21 |    |    |    |
|             | 1506GX [Y] | 85       | 99 [102]     | 24 |    |    |    |
|             | 703DX [Y]  | 150      | 70 [73]      | 19 | 10 |    |    |
|             | 1004DX [Y] | 160      | 88 [90]      | 21 | 13 |    |    |
|             | 1205DX [Y] | 180      | 90 [92]      | 22 | 16 |    |    |
|             | 1506DX [Y] | 190      | 96 [99]      | 25 | 19 |    |    |
|             | 2007DX [Y] | 230      | 112<br>[116] | 29 | 20 |    |    |
|             | 2010DX [Y] |          |              |    |    |    |    |
|             | 2011DX [Y] |          |              |    |    |    |    |
|             | 2511DX     | 240      | 123          | 31 | 23 |    |    |
|             | 2512DX     |          |              |    |    |    |    |
|             | 2513DX     |          |              |    |    |    |    |
|             | 3213DX     | 260      | 126          | 35 | 26 |    |    |
|             | 3214DX     |          |              |    |    |    |    |
|             | 3215DX     |          |              |    |    |    |    |
|             | 2006EX     | 95       | 112          | 73 | —  |    |    |
| 2510EX      | 110        | 123      | 78           |    |    |    |    |
| 3212EX      | 120        | 126      | 87           |    |    |    |    |
| 4014EX      | 130        | 133      | 92           |    |    |    |    |
| 5020EX      | 170        | 149      | 115          |    |    |    |    |
| 6524EX      | 200        | 169      | 129          |    |    |    |    |
| 6530EX      | 210        |          |              |    |    |    |    |
| UEV-        | 1004BX     | 105      | 108          | 21 |    | —  | 48 |
|             | 1205BX     | 115      | 110          | 22 |    |    |    |
|             | 1506BX     | 135      | 116          | 25 |    |    |    |
|             | 1003GX     | 65       | 109          | 20 |    |    |    |
|             | 1204GX     | 75       | 112          | 21 |    |    |    |
|             | 1506GX     | 85       | 119          | 24 |    |    |    |
|             | 2010GX     | 100      | 133          | 33 |    |    |    |
|             | 1004DX     | 160      | 108          | 21 | 13 |    |    |
|             | 1205DX     | 180      | 110          | 22 | 16 |    |    |
|             | 1506DX     | 190      | 116          | 25 | 19 |    |    |
|             | 2007DX     | 230      | 132          | 29 | 20 |    |    |
|             | 2010DX     |          |              |    |    |    |    |
|             | 2011DX     |          |              |    |    |    |    |

# SOLENOID VALVES FOR WATER

## Type WEV

**SAGINOMIYA**

### GENERAL DESCRIPTION

- Pilot operated, 2-way, normally closed valve.
- For water in refrigeration, cooling, air conditioning systems, and general industrial plant.
- Valves for non-corrosive brine are available. To order, specify catalog No. with "B"  
Example: WEV-1504GLW for water  
WEV-1504GLB for non-corrosive brine, warm water
- Compact molded coil commonly fits all valve sizes.
- Operates in any position ... can be conveniently located in horizontal or vertical line with coil on top.



Type WEV-G



Type WEV-F

### TYPE NUMBER SELECTION (SPECIFICATIONS)

| Catalog No. |        |                              | Port Size<br>(mm) | Cv<br>Value | Connection      |                                 | O.P.D.          |            | Max.<br>Working<br>Pressure | Wt.<br>(kg)  |     |
|-------------|--------|------------------------------|-------------------|-------------|-----------------|---------------------------------|-----------------|------------|-----------------------------|--------------|-----|
| Type        | Model  | Fluid                        |                   |             | Steel Tube O.D. | Style                           | Min.            | Max.       |                             |              |     |
| WEV-        | 1504GL | W<br>(Water)                 | 15                | 4.3         | 1/2"            | Rc                              | 0.015<br>{0.15} | 0.03 {0.3} | 0.98<br>{10}                | 0.98<br>{10} | 0.6 |
|             | 2006GL |                              | 20                | 7.8         | 3/4"            |                                 |                 |            |                             |              | 0.8 |
|             | 2510GL |                              | 25                | 10.4        | 1"              |                                 |                 |            |                             |              | 1.1 |
|             | 3212GL |                              | 32                | 17.6        | 1-1/4"          |                                 |                 |            |                             |              | 1.6 |
|             | 4014GL |                              | 40                | 26          | 1-1/2"          |                                 |                 |            |                             |              | 2.4 |
|             | 5020GL |                              | 50                | 42          | 2"              |                                 |                 |            |                             |              | 3.6 |
|             | 1504FL | B<br>(glycol,<br>Warm Water) | 15                | 4.3         | 1/2"            | *<br><br>Flange<br>(Round Type) | 0.015<br>{0.15} | 0.03 {0.3} |                             |              | 2.0 |
|             | 2006FL |                              | 20                | 7.8         | 3/4"            |                                 |                 |            |                             |              | 2.6 |
|             | 2510FL |                              | 25                | 10.4        | 1"              |                                 |                 |            |                             |              | 3.7 |
|             | 3212FL |                              | 32                | 17.6        | 1-1/4"          |                                 |                 |            |                             |              | 5.0 |
|             | 4014FL |                              | 40                | 26          | 1-1/2"          |                                 |                 |            |                             |              | 5.7 |
|             | 5020FL |                              | 50                | 42          | 2"              |                                 |                 |            |                             |              | 7.7 |
|             | 6524FL |                              | 65                | 65          | 2-1/2"          |                                 | 12.8            |            |                             |              |     |
|             | 8030FL |                              | 80                | 100         | 3"              |                                 | 16.5            |            |                             |              |     |

\* Without companion flange (Weight without companion flange and bolts)

- O.P.D.: Operating Pressure Differential (by water pressure)
- Ambient temperature: -30 to 50°C, allowable fluid temperature: 0 to 60°C (Type W), -35 to 90°C (Type B)
- Apparent power: 16VA
- Use of a strainer 80 to 100 mesh at the valve inlet is recommended.
- Weight includes a coil
- Enclosure IP34 (WEV-W: Drip proof model)

### ELECTRICAL RATING OF SOLENOID COILS

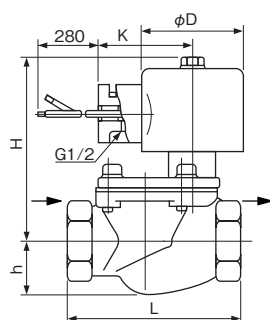
| Rated Voltage                                         | Tolerance<br>(%) | Voltampere (VA) |        | Power Consumption<br>(W) | Insulation Class        |
|-------------------------------------------------------|------------------|-----------------|--------|--------------------------|-------------------------|
|                                                       |                  | Running         | Inrush |                          |                         |
| 24V.AC, 100V.AC, 110V.AC<br>200V.AC, 220V.AC, 240V.AC | ±10              | 18/14           | 57/47  | 9/8                      | *<br><br>Class B Molded |
| 12V.DC, 24V.DC<br>48V.DC, 100V.DC                     |                  | —               | —      | 11                       |                         |

Specify voltage & frequency when order.

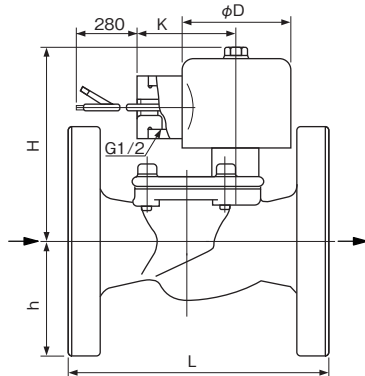
\* IEC compliance

### DIMENSIONS

Type WEV-G



Type WEV-F



Unit: mm

| Catalog No. |        | Unit: mm |     |    |    |    |
|-------------|--------|----------|-----|----|----|----|
|             |        | L        | H   | h  | φD | K  |
| WEV-        | 1504GL | 65       | 82  | 19 | 48 | 44 |
|             | 2006GL | 80       | 86  | 25 |    |    |
|             | 2510GL | 90       | 91  | 29 |    |    |
|             | 3212GL | 105      | 97  | 36 |    |    |
|             | 4014GL | 120      | 103 | 47 |    |    |
|             | 5020GL | 140      | 126 | 55 |    |    |
|             | 1504FL | 105      | 82  | 48 |    |    |
|             | 2006FL | 115      | 86  | 50 |    |    |
|             | 2510FL | 125      | 91  | 63 |    |    |
|             | 3212FL | 140      | 97  | 68 |    |    |
|             | 4014FL | 150      | 103 | 70 |    |    |
|             | 5020FL | 160      | 126 | 78 |    |    |
|             | 6524FL | 200      | 138 | 88 |    |    |
|             | 8030FL | 240      | 152 | 93 |    |    |

# BI-FLOW SOLENOID VALVES

High Volume OEM Item

Type BPV

SAGINO MIYA

## GENERAL DESCRIPTION

- Bi-flow controlling applicable. Developed for the purpose of simplification of complicated refrigeration circuit.
- Not only for ordinary refrigeration circuit, suitable for flow change of heat exchanger on multi type heat pump air conditioner.



Type BPV-A

## SPECIFICATIONS

- Fluid temperature: — 30 to 120°C
- Ambient temperature: — 20 to 60°C

## TYPE NUMBER SELECTION

| Catalog No. |         | * Fluid     | Port Size (mm) | Cv Value | Bleed Cv Value<br>B → A | * Nominal Capacity (U.S.R.T.) {kw} |             |              |              | Connection |                  | Operation Pressure Differential (MPa) |      | Max. Working Pressure (MPa) | Wt. (kg) |
|-------------|---------|-------------|----------------|----------|-------------------------|------------------------------------|-------------|--------------|--------------|------------|------------------|---------------------------------------|------|-----------------------------|----------|
|             |         |             |                |          |                         | R410A                              | R134a       | R404A        | R22          | Style      | Copper Tube O.D. | Min.                                  | Max. |                             |          |
| BPV-        | 803ADY  | Refrigerant | 7.8            | 1.5      | Less Than 0.01          | 6.4 {22.4}                         | 6.3 {22.2}  | 4.4 {15.4}   | 6.8 {23.8}   | Solder     | 3/8"             | 0.01                                  | 2    | 4.2                         | 0.33     |
|             | 1204ADY |             | 11             | 2.9      | Less Than 0.013         | 12.3 {43.3}                        | 12.2 {42.9} | 8.5 {29.8}   | 13.1 {46.0}  |            | 1/2"             |                                       |      |                             | 0.46     |
|             | 1706ADY |             | 17             | 6.6      |                         | 28 {98.5}                          | 27.8 {97.7} | 19.3 {67.98} | 29.8 {104.7} |            | 3/4"             | 0.015                                 |      |                             | 0.86     |

\* Gas line only

- Bleeding will be happen when pressure of B side is higher than A side.
- Weight includes a coil

## ELECTRICAL RATING OF SOLENOID COILS

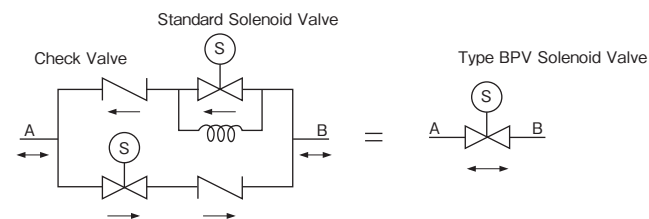
| Port Size<br>(mm) | Rated Voltage                        |         | Tolerance<br>(%) | Voltampere (VA) |        | Power Consumption<br>(W) | Insulation Class    |
|-------------------|--------------------------------------|---------|------------------|-----------------|--------|--------------------------|---------------------|
|                   |                                      |         |                  | Running         | Inrush |                          |                     |
| 7.8, 11           | 100V.AC, 200V.AC<br>220V.AC, 240V.AC | 50/60Hz | ±10              | 12/10           | 36/30  | 6/5                      | * Class B<br>Molded |
| 17                |                                      |         |                  | 17/14           | 51/42  | 7.5/6                    |                     |

\* Current (A)=Voltampere / Rated Voltage

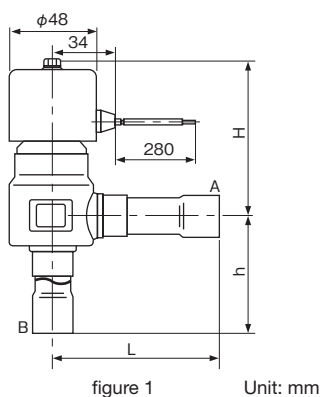
\* IEC compliance

## Function of Bi-flow Solenoid Valve

Equivalent circuit of type BPV Bi-flow Solenoid Valve is as follow.



## DIMENSIONS



| Catalog No. |         | Unit: mm |    |    | Form     |
|-------------|---------|----------|----|----|----------|
|             |         | L        | H  | h  |          |
| BPV-        | 803ADY  | 48       | 76 | 48 | figure 1 |
|             | 1204ADY | 61       | 69 | 60 |          |
|             | 1706ADY | 91       | 85 | 82 |          |

# 3-WAY SOLENOID VALVES

## Type IEV

**SAGINO MIYA**

### GENERAL DESCRIPTION

- For non-corrosive refrigerant (gas) in refrigeration units or air.
- Pilot operated, 3-way Distributing valve and Selector valve.



Type IEV-B



Type IEV-C

### TYPE NUMBER SELECTION (SPECIFICATIONS)

| Catalog No.  | Port Size (mm) | Cv Value | * Nominal Capacity (Refrigerants in Liquid) (U.S.R.T.) |     | Connection         |        | O.P.D.     |             | Max. Working Press. | Body Test Press. | Fluid Temp. (°C) | Ambient Temp. (°C) | Operation | Wt. (kg) |     |
|--------------|----------------|----------|--------------------------------------------------------|-----|--------------------|--------|------------|-------------|---------------------|------------------|------------------|--------------------|-----------|----------|-----|
|              |                |          | R134a                                                  | R22 | Copper pipe (O.D.) | Style  | Min.       | Max.        |                     |                  |                  |                    |           |          |     |
| IEV-B1505DXF | 18             | 6.3      | 16                                                     | 20  | 5/8"               | Solder | 0.49 {5.0} | 2.25 {22.9} | 2.94 {30}           | 4.41 {45}        | —20 to 120       | —20 to 50          | branched  | 0.95     |     |
| IEV-B2007DXF | 20             | 9.0      | 23                                                     | 29  | 7/8"               |        | 0.29 {3.0} | 2.06 {21}   |                     |                  | —20 to 125       |                    |           | switched | 1.0 |
| IEV-B3211DXF | 30             | 25       | 65                                                     | 79  | 1-1/8"             |        |            |             |                     |                  |                  |                    |           |          | 2.6 |
| IEV-B3212DXF |                |          |                                                        |     | 1-1/4"             |        |            |             |                     |                  |                  |                    |           |          |     |
| IEV-B3213DXF |                |          |                                                        |     | 1-3/8"             |        |            |             |                     |                  |                  |                    |           |          |     |
| IEV-C3211DXF |                |          | 42                                                     | 36  | 1-1/8"             |        |            |             |                     |                  |                  |                    |           |          |     |
| IEV-C3212DXF |                |          |                                                        |     | 1-1/4"             |        |            |             |                     |                  |                  |                    |           |          |     |
| IEV-C3213DXF |                |          |                                                        |     | 1-3/8"             |        |            |             |                     |                  |                  |                    |           |          |     |

\* Nominal capacities are based on  $\Delta P = 0.015$  MPa, condensing temp. = 38°C and evaporating temp. = 5°C.

• O.P.D.: Operating Pressure Differential (by air pressure)

• Weight includes a coil

### ELECTRICAL RATING OF SOLENOID COILS

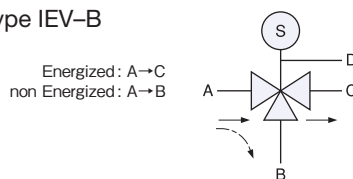
| Port Size (mm) | Rated Voltage                        |         | Tolerance (%) | Voltampere (VA) |        | Power Consumption (W) | Insulation Class |
|----------------|--------------------------------------|---------|---------------|-----------------|--------|-----------------------|------------------|
|                |                                      |         |               | Running         | Inrush |                       |                  |
| 18, 20         | 100V.AC, 110V.AC<br>200V.AC, 220V.AC | 50/60Hz | ±10           | 11/9            | 33/27  | 6/5                   | * Class B Molded |
| 30             |                                      |         |               | 16/13           | 40/33  | 8/7                   |                  |

Current (A) = Voltampere / Rated Voltage

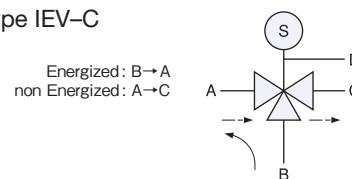
\* IEC compliance

### OPERATION

Type IEV-B

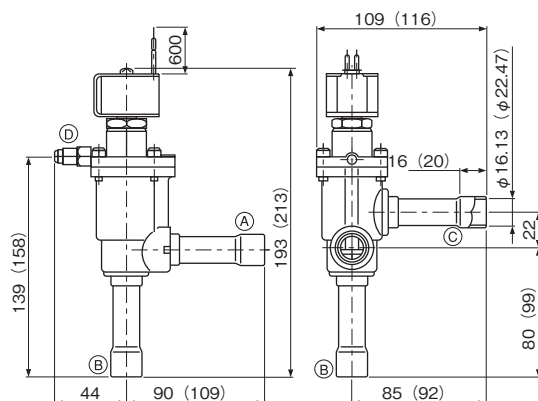


Type IEV-C

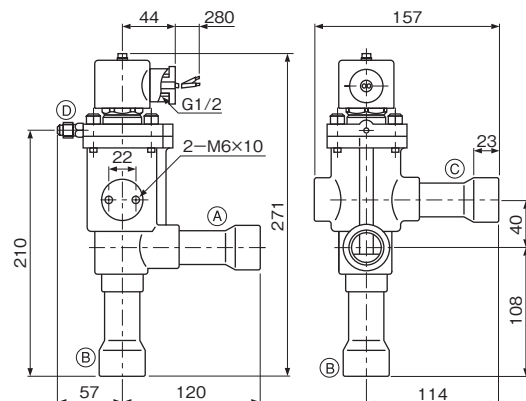


### DIMENSIONS

Type IEV-B1505DXF (B2007DXF)



Type IEV-B3211DXF to B3213DXF, C3211DXF to C3213DXF



Unit: mm

# 4-WAY REVERSING VALVES

High Volume OEM Item (Type STF)

**Type STF**

**SAGINOMIYA**

## GENERAL DESCRIPTION

- Pilot operated 4-way reversing valves are suitable for heat pump applications on unitary, split system and window type air conditioners, etc.
- 4-way pilot valve adoption has an advantage on reliable changeover operations.
- Designed to lower the minimum operating pressure difference between high and low side. Pressure drop and valve leakage are minimized.

CE mark applicable (available upon request)

UL listed (available upon request)

## SPECIFICATIONS

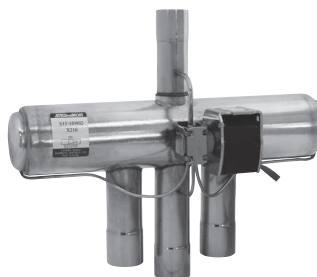
- Max. working pressure: 4.2MPa {42.8kgf/cm<sup>2</sup>}  
(Type STF-H\*\*\*\*)  
4.15MPa {42.3kgf/cm<sup>2</sup>}  
(Type STF-\*\*\*\*G)
- Ambient temperature: - 20 to 55°C
- Allowable fluid temperature: - 20 to 120°C  
(STF-H0104 to STF-1511G)  
- 20 to 130°C  
(STF-2023G to 6001G)
- Ambient humidity: Less than 95% R.H.



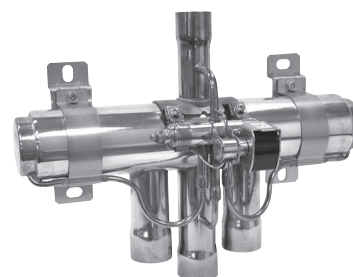
Type STF-H01, H02



Type STF-H04, H07



Type STF-H06, H09



Type STF-25, 30, 40, 50, 60

## TYPE NUMBER SELECTION

| Catalog No. | Port Size (mm) | Capacity (R410A) |              | O.P.D. (MPa) {kgf/cm <sup>2</sup> } |           | Connection (O.D.) |                 | Wt. (kg) |
|-------------|----------------|------------------|--------------|-------------------------------------|-----------|-------------------|-----------------|----------|
|             |                | (kW)             | (U.S.R.T.)   | Max.                                | Min.      | Discharge         | Suction & Coils |          |
| STF-H0104   | 8              | 1.8 to 6.4       | 0.51 to 1.82 | 3.1 {31.6}                          | 0.3 {3.1} | 5/16"             | 3/8"            | 0.2      |
| STF-H0202   | 11.1           | 2.0 to 11.4      | 0.57 to 3.24 |                                     |           | 3/8"              | 1/2"            | 0.32     |
| STF-H0301   | 11.5           | 5.3 to 14.6      | 1.50 to 4.15 |                                     |           | 1/2"              | 5/8"            | 0.37     |
| STF-H0404   | 16             | 8.3 to 33        | 2.36 to 9.39 |                                     |           |                   | 3/4"            | 0.77     |
| STF-H0601   | 18.1           | 8.4 to 45        | 2.39 to 12.8 |                                     |           |                   |                 | 0.87     |
| STF-H0712   | 20             | 21 to 53         | 5.97 to 15.0 |                                     |           | 3/4"              | 7/8"            | 1.2      |
| STF-H0901   | 21.3           | 21 to 68.5       | 5.97 to 19.5 |                                     |           |                   |                 | 1.23     |
| STF-1511G   | 23             | 39 to 59         | 11.1 to 16.7 |                                     |           | 7/8"              | 1-1/8"          | 1.55     |
| STF-2023G   | 24             | 39 to 74         | 11.1 to 21.0 |                                     |           | 1"                | 1-1/4"          | 3.4      |
| STF-2501G   | 28             | 52 to 94         | 14.8 to 26.7 |                                     |           | 1-1/4"            | 1-1/2"          | 4.7      |
| STF-3001G   | 34             | 65 to 124        | 18.5 to 35.2 |                                     |           | 1-1/2"            | 1-3/4"          | 9.1      |
| STF-4001G   | 40             | 115 to 188       | 32.7 to 53.4 |                                     |           |                   | 2-1/8"          | 9.4      |
| STF-5001G   | 50             | 145 to 235       | 41.2 to 66.8 |                                     |           |                   | 2-5/8"          | 20.0     |
| STF-6001G   | 60             | 230 to 360       | 65.4 to 102  |                                     |           | I.D. 1-5/8"       |                 |          |

• O.P.D.: Operating Pressure Differential (with air)

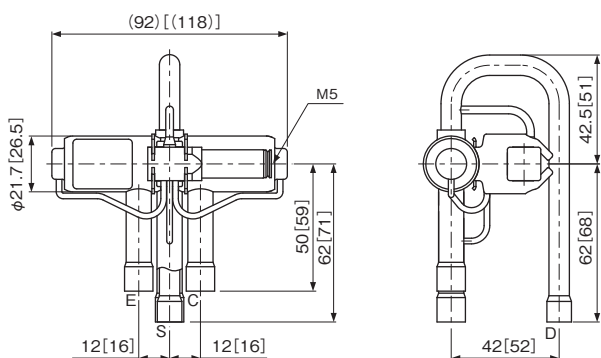
## ELECTRICAL RATING OF SOLENOID COILS

| Catalog No.    | Rated Voltage |         | Tolerance (%) | Voltampere(VA) |        | Power Consumption (W) | Insulation Class        |
|----------------|---------------|---------|---------------|----------------|--------|-----------------------|-------------------------|
|                |               |         |               | Running        | Inrush |                       |                         |
| STF-H * * * *  | 100V. AC      | 50/60Hz | +10           | 10/8           | 30/24  | 6/5                   | *<br><br>Class B Molded |
|                | 200V. AC      |         | -15           |                |        |                       |                         |
|                | 110V. AC      |         | +10           | 11/9           | 33/27  |                       |                         |
|                | 220V. AC      |         | -10           |                |        |                       |                         |
| STF- * * * * G | 230V. AC      | 50/60Hz | +10           | 13/10          | 39/30  | 7/6                   |                         |
|                | 240V. AC      |         | -15           | 11/9           | 33/27  | 6/6                   |                         |
|                | 100V. AC      |         | +10           |                |        |                       |                         |
|                | 200V. AC      |         | -10           |                |        |                       |                         |

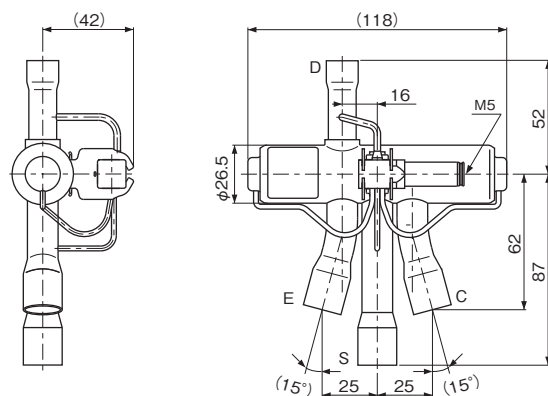
\* IEC compliance

## DIMENSIONS

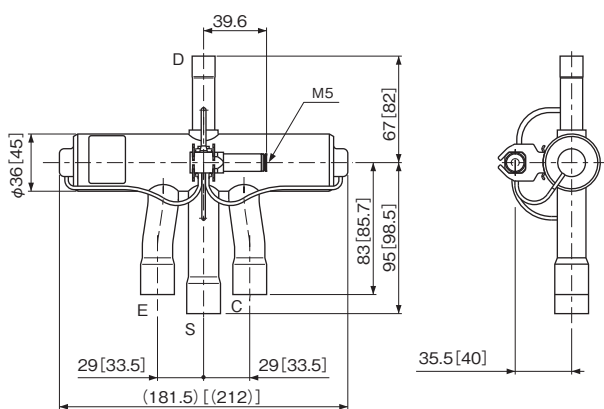
Type STF-H0104 [H0202]



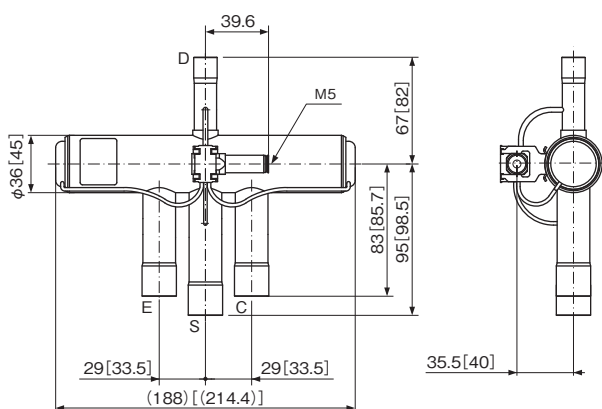
Type STF-H0301



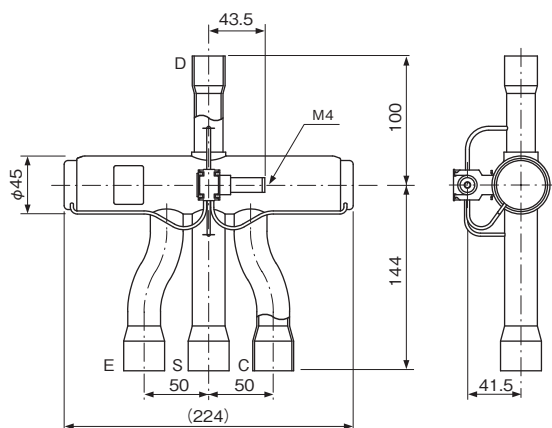
Type STF-H0404 [H0712]



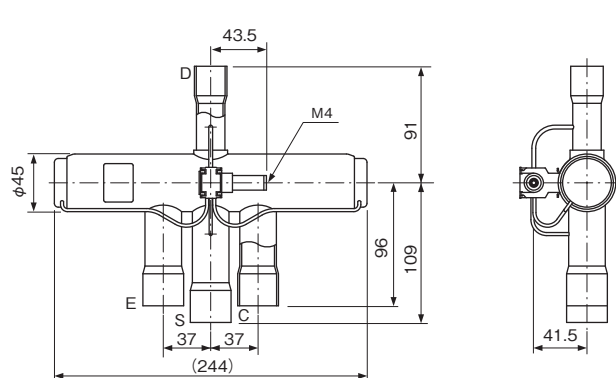
Type STF-H0601 [H0901]



Type STF-1511G

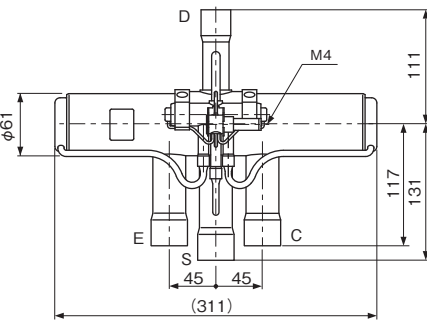
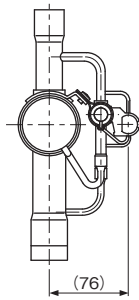


Type STF-2023G

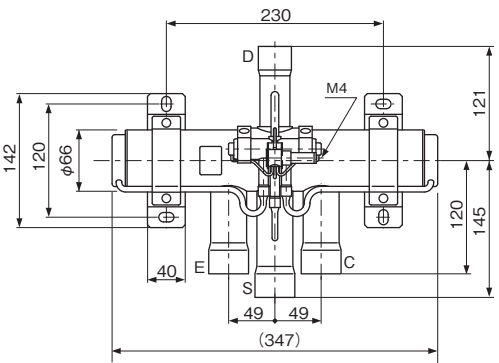
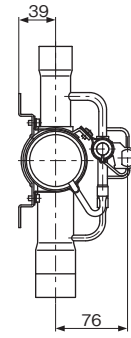


Unit: mm

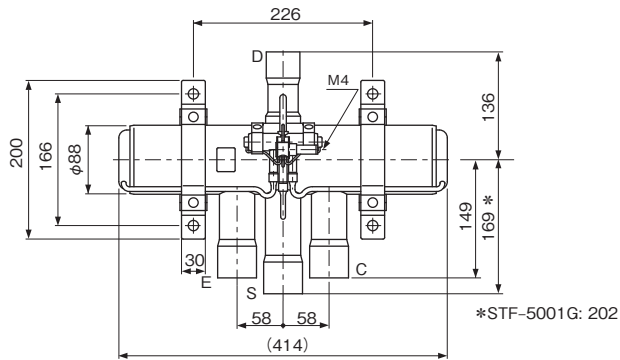
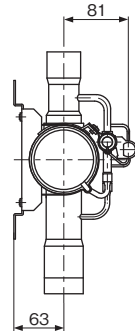
Type STF-2501G



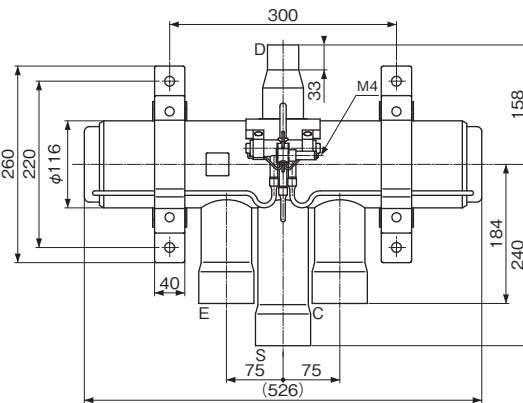
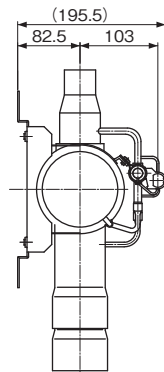
Type STF-3001G



Type STF-4001G, -5001G

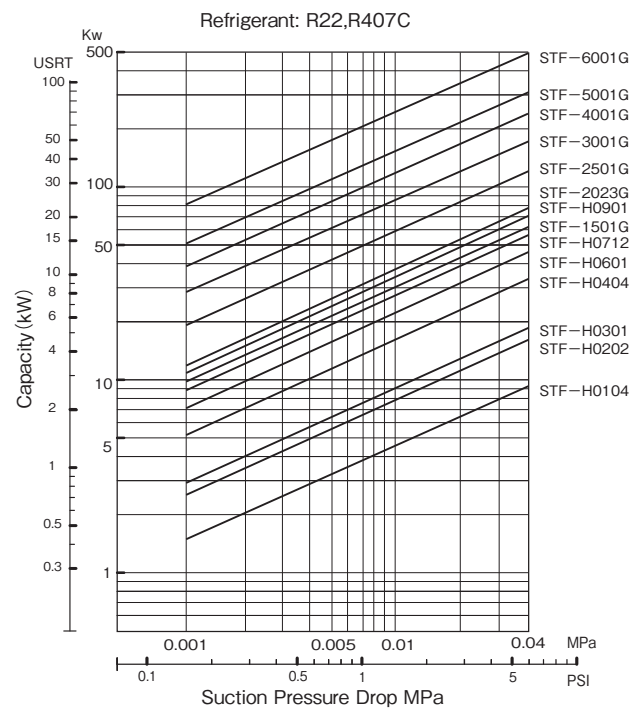
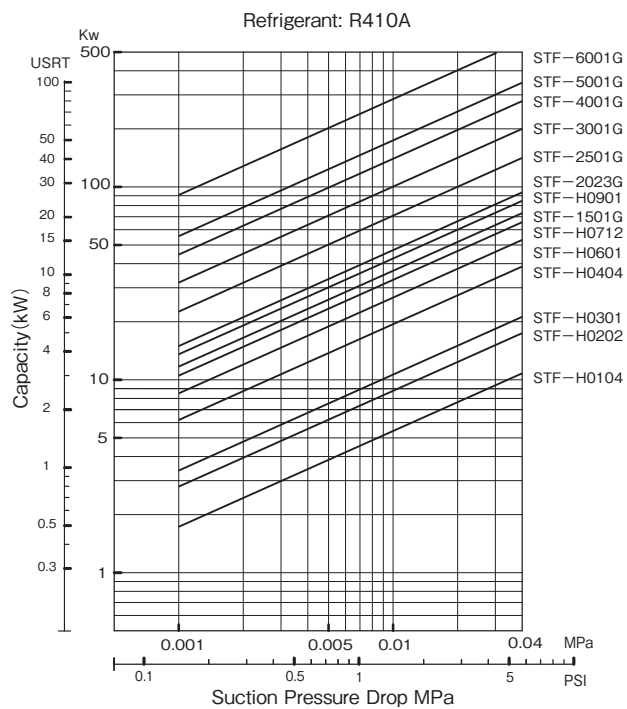


Type STF-6001G



Unit: mm

## FLOW RATE (Capacity)



\* Flow Rate Conditions Condensing temp.: 38°C  
Evaporator temp.: 5°C  
Superheat temp.: 5°C

# MOTORIZED BALL VALVES

## Type MJV

**SAGINO MIYA**

## GENERAL DESCRIPTION

- Proportional Control valve for hot or chilled water, industrial water and steam circuit.
- Compact & Light weight design, manual operation is also available.
- Various types of water supply Equipments
- Air Handling Units
- Ice Storage Units



Type MJV

## SPECIFICATIONS

| Valve Type        |                        | Two-way Valve                                                                                                         | Two-way Valve for Steam                                                 | Three-way Valve                         |
|-------------------|------------------------|-----------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------|-----------------------------------------|
| Item              |                        |                                                                                                                       |                                                                         |                                         |
| VALVE PART        | Water Test Pressure    | 1.6MPa                                                                                                                |                                                                         |                                         |
|                   | Air Tight Pressure     | 1.6MPa                                                                                                                |                                                                         |                                         |
|                   | Max. Working Pressure  | 1.6MPa (0.2MPa for Steam)                                                                                             | 1.6MPa (0.5MPa for Steam)                                               | 1.6MPa                                  |
|                   | Fluid                  | Non-corrosive water and Steam                                                                                         |                                                                         | Non-corrosive water                     |
|                   | Fluid Temperature      | 0 to 120°C                                                                                                            | 0 to 160°C                                                              | 0 to 90°C                               |
|                   | Flow Characteristics   | Equal Percentage                                                                                                      |                                                                         | Corrected Linear                        |
|                   | Valve Leakage          | Cv: 0.1% or less                                                                                                      |                                                                         | —                                       |
|                   | Material               | Body: Bronze Casting, Seat Ring: Fluoro-resin, O-ring: Fluoro rubber, Spindle: Stainless Steel, Plug: Stainless Steel |                                                                         |                                         |
| MOTOR PART        | Power Supply Voltage   | 24V.AC±10%, 50/60Hz                                                                                                   |                                                                         |                                         |
|                   | Max. power Consumption | 12VA                                                                                                                  |                                                                         |                                         |
|                   | Housing Construction   | Rain-Proof (JIS C 0920 IP53)                                                                                          |                                                                         |                                         |
|                   | Ambient Temperature    | Operating Temp.: -10 to 50°C, Storage Temp.: -20 to 70°C                                                              |                                                                         |                                         |
|                   | Timing                 | Approx. 52 sec.                                                                                                       |                                                                         |                                         |
|                   | INPUT SIGNAL           | Resistance Input                                                                                                      | 0 to 135Ω                                                               |                                         |
|                   |                        | Current Input                                                                                                         | DC 4 to 20mA (Input Impedance 250Ω)                                     |                                         |
|                   |                        | Voltage Input                                                                                                         | DC 1 to 5V (Input Impedance 100kΩ), DC 0 to 10V (Input Impedance 250kΩ) |                                         |
|                   | Material               | Case: PPS Resin, Cover: ABS Resin                                                                                     |                                                                         |                                         |
|                   | Manual Operation       | Yes                                                                                                                   |                                                                         |                                         |
|                   | Flow Display           | O: Open, S: Close                                                                                                     |                                                                         | O: Open(C→A), S: Close(C→A)             |
| Movement of Valve |                        | Input Signal 135Ω・4mA・1V・0V:Close                                                                                     |                                                                         | Input Signal 135Ω・4mA・1V・0V: Close(C→A) |

## TYPE NUMBER SELECTION

### Two-way Valve

| Catalog No. |         |                              | Connection Rc (O.D.) | Cv Value | Max. Operation Press. Differential (MPa) | Connection Fastening Torque (N·m) | Dimension |     |    | Wt. (kg) |
|-------------|---------|------------------------------|----------------------|----------|------------------------------------------|-----------------------------------|-----------|-----|----|----------|
| Type        | Model   | Input Signal                 |                      |          |                                          |                                   | H         | L   | D  |          |
| MJV-        | 1504GQ1 | 70<br>(Resistance 0 to 135Ω) | 1/2"                 | 1        | 1                                        | 34.3                              | 152       | 56  | 34 | 1.5      |
|             | 1504GQ2 |                              |                      | 2        |                                          |                                   |           |     |    |          |
|             | 1504G   |                              |                      | 3.5      |                                          |                                   |           |     |    |          |
|             | 2006G   | 71<br>(4 to 20 mA)           | 3/4"                 | 6.5      | 0.8                                      | 49                                | 155       | 69  | 43 | 1.7      |
|             | 2510G   | 72<br>(1 to 5 VDC)           | 1"                   | 12       |                                          | 58.8                              | 159       | 82  | 51 | 1.9      |
|             | 3212G   | 73<br>(0 to 10 VDC)          | 1-1/4"               | 20       |                                          | 78.5                              | 165       | 97  | 65 | 2.6      |
|             | 4014G   |                              | 1-1/2"               | 30       | 0.6                                      | 83.4                              | 178       | 106 | 72 | 3.2      |
|             | 5020G   |                              | 2"                   | 45       | 0.4                                      | 98.1                              | 185       | 128 | 90 | 4.6      |

### Two-way Valve for Steam

| Catalog No. |          |                                     | Connection Rc (O.D.) | Cv Value | Max. Operation Press. Differential (MPa) | Connection Fastening Torque (N·m) | Dimension |    |    | Wt. (kg) |
|-------------|----------|-------------------------------------|----------------------|----------|------------------------------------------|-----------------------------------|-----------|----|----|----------|
| Type        | Model    | Input Signal                        |                      |          |                                          |                                   | H         | L  | D  |          |
| MJV-        | H1504GQ1 | 70 (Resistance 0 to 135Ω)           | 1/2"                 | 1        | 1                                        | 34.3                              | 202       | 56 | 34 | 1.8      |
|             | H1504GQ2 |                                     |                      | 2        |                                          |                                   |           |    |    |          |
|             | H1504G   |                                     |                      | 3.5      |                                          |                                   |           |    |    |          |
|             | H2006G   | 71 (4 to 20 mA)                     | 3/4"                 | 6.5      | 0.8                                      | 49                                | 205       | 69 | 43 | 2.0      |
|             | H2510G   | 72 (1 to 5 VDC)<br>73 (0 to 10 VDC) | 1"                   | 12       |                                          | 58.8                              | 209       | 82 | 51 | 2.2      |

## Three-way Valve

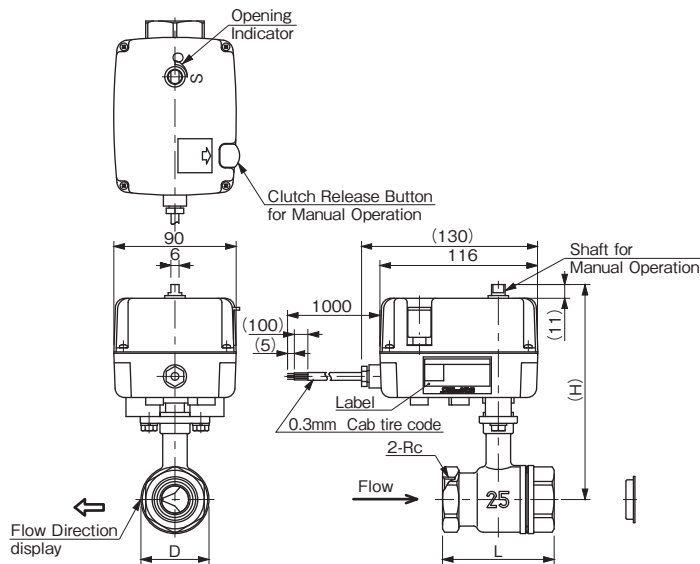
| Catalog No. |        |                        | Connection Rc (O.D.) | Cv Value | Max. Operation Press. Differential (MPa) | Connection Fastening Torque (N·m) | Dimension |    |     |    | Wt. (kg) |
|-------------|--------|------------------------|----------------------|----------|------------------------------------------|-----------------------------------|-----------|----|-----|----|----------|
| Type        | Model  | Input Signal           |                      |          |                                          |                                   | H1        | H2 | H2  | L  |          |
| MJV-        | M1504G | 70                     | 1/2"                 | 3.5      | 0.1                                      | 34.3                              | 152       | 30 | 56  | 34 | 1.6      |
|             | M2006G | (Resistance 0 to 135Ω) | 3/4"                 | 6.5      |                                          | 49                                | 155       | 37 | 69  | 43 | 1.8      |
|             | M2510G | 71                     | 1"                   | 12       |                                          | 58.8                              | 159       | 44 | 82  | 51 | 2.1      |
|             | M3212G | (4 to 20 mA)           | 1-1/4"               | 20       |                                          | 78.5                              | 165       | 51 | 97  | 65 | 2.8      |
|             | M4014G | 72                     | 1-1/2"               | 30       |                                          | 83.4                              | 178       | 57 | 106 | 72 | 3.5      |
|             | M5020G | (1 to 5 VDC)           | 2"                   | 45       |                                          | 98.1                              | 185       | 67 | 128 | 90 | 5.0      |
|             |        | 73                     |                      |          |                                          |                                   |           |    |     |    |          |
|             |        | (0 to 10 VDC)          |                      |          |                                          |                                   |           |    |     |    |          |

## WIRING

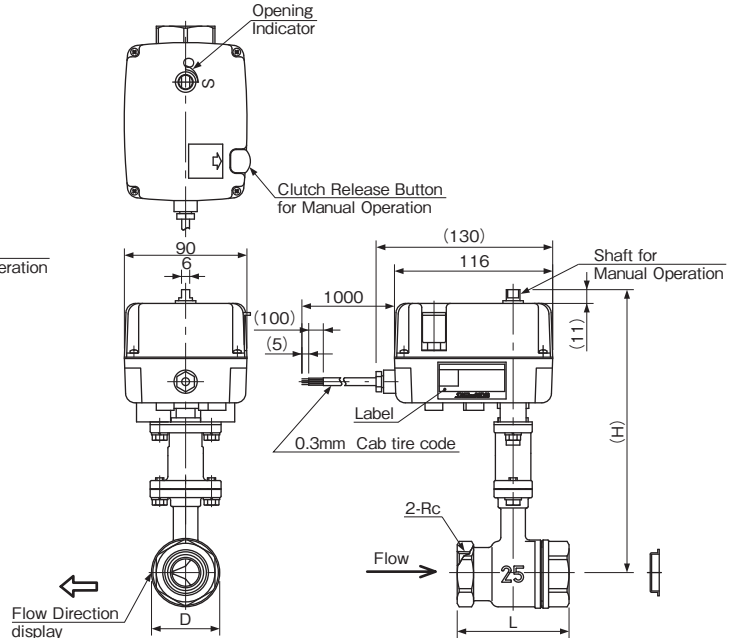
| Resistance Input                                                                       | Current Input                                                                          | Voltage Input                                                                                  |
|----------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|
| ① (Blue)COM. Input<br>② (Brown)0 to 135Ω<br>③ (Black)<br>④ (Red) Supply Voltage 24V.AC | ① (Blue)COM. Input<br>② (Brown)4 to 20mA<br>③ (Black)<br>④ (Red) Supply Voltage 24V.AC | ① (Blue)COM. Input<br>② (Brown)1 to 5V, 0 to 10V<br>③ (Black)<br>④ (Red) Supply Voltage 24V.AC |

## DIMENSIONS

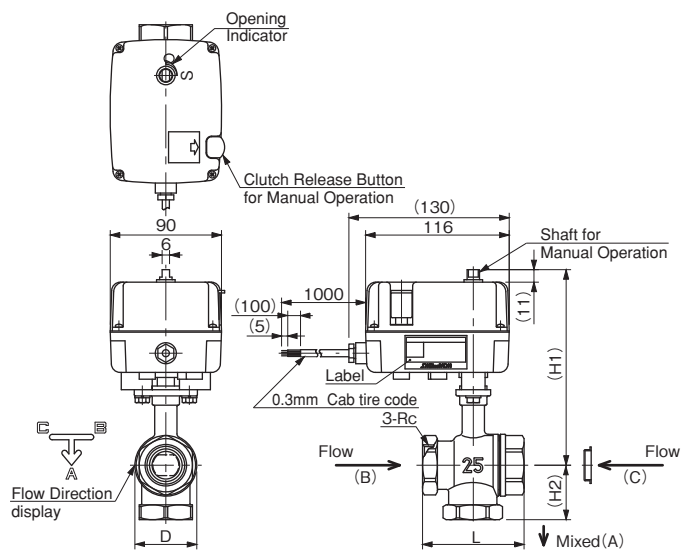
Two-way Valve



Two-way Valve for Steam



Three-way Valve

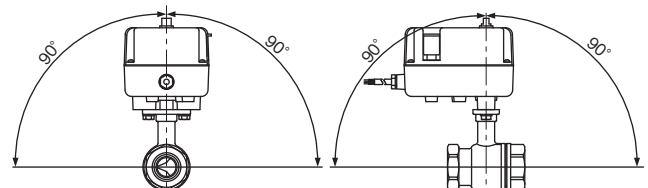


## Manual Operation

- Use a spanner at Manual Operation shaft (Torque:3N·m), with pushing a Clutch Release Button. Manual operation can be carried out by rotating the shaft. Don't operate in energized position for the safety. -- please do not operate it by any means.

## Mounting Position

Mounting position should be in the below range.



Unit: mm

Opening Indicator: O...Open, S...Close

# DAMPER & VALVE MOTOR ACTUATORS

## Type EGK & WGK

**SAGInoMIYA**

### GENERAL DESCRIPTION

- Series GK motor actuator can provide On-Off, proportional or floating control of damper, valve or other controlling devices.
- Balancing relay without contact causes no burn-out.
- Type EGK is for damper.
- Type WGK is for valve.

### TYPE NUMBER SELECTION (SPECIFICATIONS)

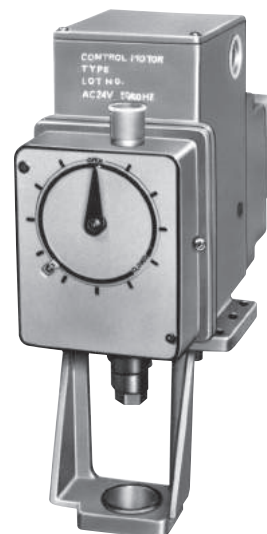
Power requirement: 24V.AC  $\pm 10\%$ , 50/60Hz

Max. power consumption: 21VA (without spring return action)  
24VA (with spring return action)

Input signal: resistance 0 to 135 $\Omega$   
Current 4 to 20mA. DC  
(Input Impedance 250 $\Omega$ )  
Voltage 1 to 5V. DC  
(Input Impedance 100k $\Omega$ )



Type EGK



Type WGK

#### Type: EGK

Torque: 12.2N·m {1.25 kg·m}  
(without spring return action)  
3.9N·m {0.4 kg·m}  
(with spring return action)  
Rotation angle: 90 to 270°  
(without spring return action)  
90 to 160°  
(with spring return action)  
Delivery Setting 90°  
Timing: 80 sec/160°  
Ambient temp.: - 20 to 55°C  
(without spring return action)  
- 10 to 55°C  
(with spring return action)  
Weight: 4.3kg  
(without spring return action)  
6.1kg  
(with spring return action)

#### Type: WGK

Thrust: 1220N {125 kgf}  
(without spring return action)  
390N {40 kgf}  
(with spring return action)  
Stroke: 14 to 50mm  
(without spring return action)  
14 to 30mm  
(with spring return action)  
Delivery Setting 20mm  
Timing: 80 sec/stroke 25mm  
Ambient temp.: - 20 to 55°C  
(without spring return action)  
- 10 to 55°C  
(with spring return action)  
Weight: 5kg  
(without spring return action)  
6.7kg  
(with spring return action)

### DAMPER MOTOR SELECTION

| Function                     | On-Off / Floating Control | Without Positioning Balance Relay | With Positioning Balance Relay | With Positioning Balance Relay |               |
|------------------------------|---------------------------|-----------------------------------|--------------------------------|--------------------------------|---------------|
|                              | *1 On-Off / Floating      | *2 On-Off Servo                   | *3 Resistance Input            | *4 Current Input               | Voltage Input |
| Standard                     | EGK-N500A                 | EGK-N600 A/S                      | EGK-N700 A/S                   | EGK-N701 A/S                   | EGK-N702 A/S  |
| With Auxiliary Potentiometer | —                         | EGK-N610 A/S                      | EGK-N710 A/S                   | EGK-N711 A/S                   | EGK-N712 A/S  |
| With Auxiliary Switch        | EGK-N520A                 | EGK-N620 A/S                      | EGK-N720 A/S                   | EGK-N721 A/S                   | EGK-N722 A/S  |

### VALVE MOTOR SELECTION

| Function                     | On-Off / Floating Control | Without Positioning Balance Relay | With Positioning Balance Relay | With Positioning Balance Relay |               |
|------------------------------|---------------------------|-----------------------------------|--------------------------------|--------------------------------|---------------|
|                              | *1 On-Off / Floating      | *2 On-Off Servo                   | *3 Resistance Input            | *4 Current Input               | Voltage Input |
| Standard                     | WGK-N500A                 | WGK-N600 A/S                      | WGK-N700 A/S                   | WGK-N701 A/S                   | WGK-N702 A/S  |
| With Auxiliary Potentiometer | —                         | WGK-N610 A/S                      | WGK-N710 A/S                   | WGK-N711 A/S                   | WGK-N712 A/S  |
| With Auxiliary Switch        | WGK-N520A                 | WGK-N620 A/S                      | WGK-N720 A/S                   | WGK-N721 A/S                   | WGK-N722 A/S  |

\* 1. The motor actuates with On-Off or floating signal from sensor.

\* 2. The motor actuates with proportional signal from electronic sensor (Example: Type RBE Control Unit).

\* 3. The motor actuates with the signal between 0 and 135 $\Omega$  from electric sensor (Example: Type PWS Thermostat).

\* 4. Spring Return Type is so designed that actuator shaft returns to safe side on current failure.

• Auxiliary potentiometer is to provide the signal between 0 and 135 $\Omega$  in accordance with motor angular rotation for output.

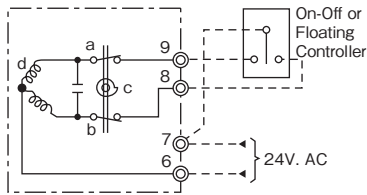
• Auxiliary switch provides the contact signal of S.P.D.T. for output.

• Enclosure: IP62

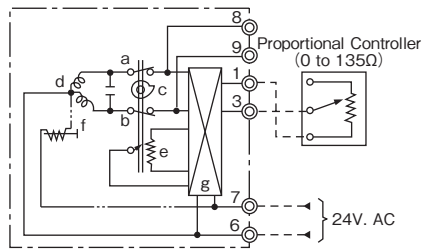
## INTERNAL WIRINGS

- Check power supply to be 24V. AC  $\pm 10\%$ .
- Wiring is to be based on the technical standard of electrical installation. Be assured to use covered copper wire larger than 1.2 mm dia.
- Terminal wiring should be conducted with flexible wire of adequate length to prevent wire disconnection from slight move of the motor.

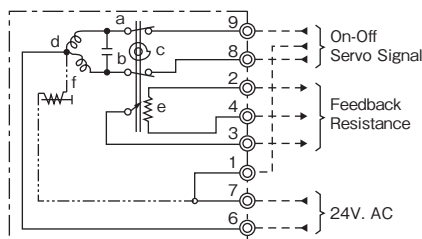
EGK-N500A, WGK-N500A



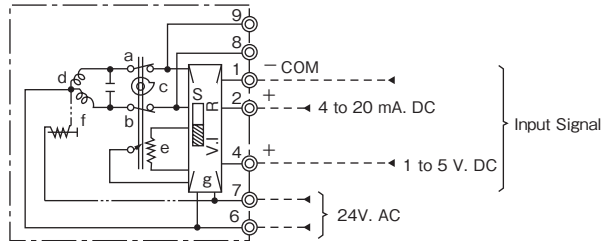
EGK-N700A/S, WGK-N700A/S



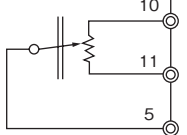
EGK-N600A/S, WGK-N600A/S



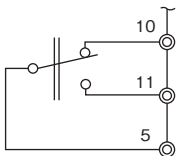
EGK-N701A/S, N702A/S, WGK-N701A/S, N702A/S



Auxiliary Potentiometer



Auxiliary Switch



EGK-N □ 1 □ A/S  
WGK-N □ 1 □ A/S

EGK-N □ 2 □ A/S  
WGK-N □ 2 □ A/S

⊙ Terminals

— Motor Internal Wiring

--- Motor External Wiring

— Spring Return Type Only

a: Upper Limit Switch

b: Lower Limit Switch

c: Cam

d: Condenser Motor

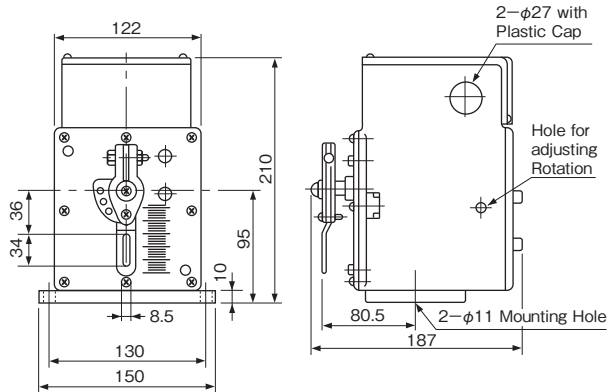
e: Feedback Potentiometer

f: Spring Return Releasing Magnet

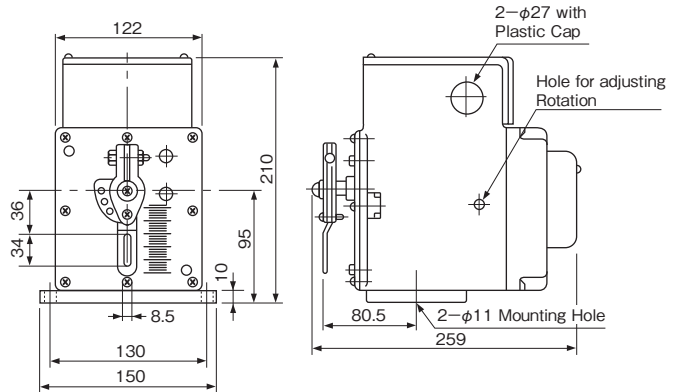
g: Balance Relay

## DIMENSIONS

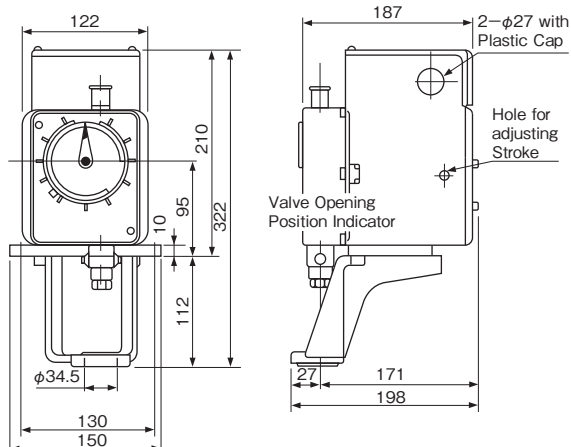
Type EGK-N...A



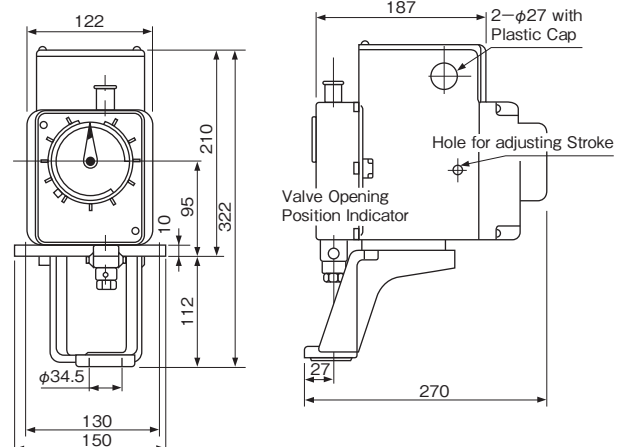
Type EGK-N...S



Type WGK-N...A



Type WGK-N...S



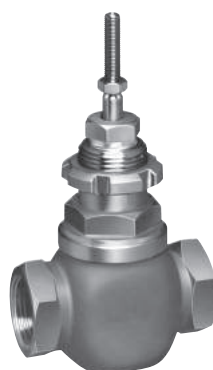
# 2-WAY & 3-WAY CONTROL VALVES

## Type NVK

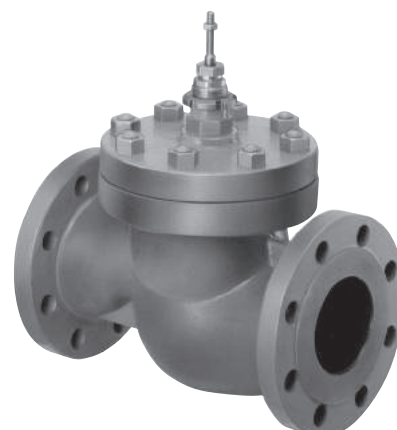
**SAGINOMIYA**

### GENERAL DESCRIPTION

- Type NVK control valves are accompanied by Saginomiya type WGK motor for two position (On-Off), floating or proportional control.
- For use with low or high pressure hot and chilled water or non-corrosive fluid.
- NVK ... 2-way valve (single seated type)  
NVK-W ... 2-way valve (double seated type)  
NVK-M ... 3-way valve (mixing valve)
- Wide model selection available for various applications.
- V-port plug provides almost linear flow characteristic.



Type NVK-G



Type NVK-F

### TYPE NUMBER SELECTION (SPECIFICATIONS)

#### Type NVK – 2-way valve

| Model                 | NVK— * * * * GL                   | NVK— * * * * FL  | NVK—W * * * * FL                  |
|-----------------------|-----------------------------------|------------------|-----------------------------------|
| Item                  |                                   |                  |                                   |
| Connection            | Rc                                | Flange (JIS 10K) | Flange (JIS 10K)                  |
| Fluid                 | Non-corrosive Water and Steam     |                  |                                   |
| Max. Working Press.   | 0.98MPa {10 kgf/cm <sup>2</sup> } |                  | 0.98MPa {10 kgf/cm <sup>2</sup> } |
| Fluid Temp. (°C)      | 0 to 200                          |                  | 0 to 200                          |
| Flow Characteristic   | Equal Percentage                  |                  |                                   |
| Material of Body      | CAC406                            | FC200            | FC200                             |
| Material of Plug      | SCS14                             |                  |                                   |
| Material of Seat Ring | SUS316                            |                  |                                   |
| Material of Stem      | SUS304                            |                  |                                   |

#### Type NVK-M – 3-way valve

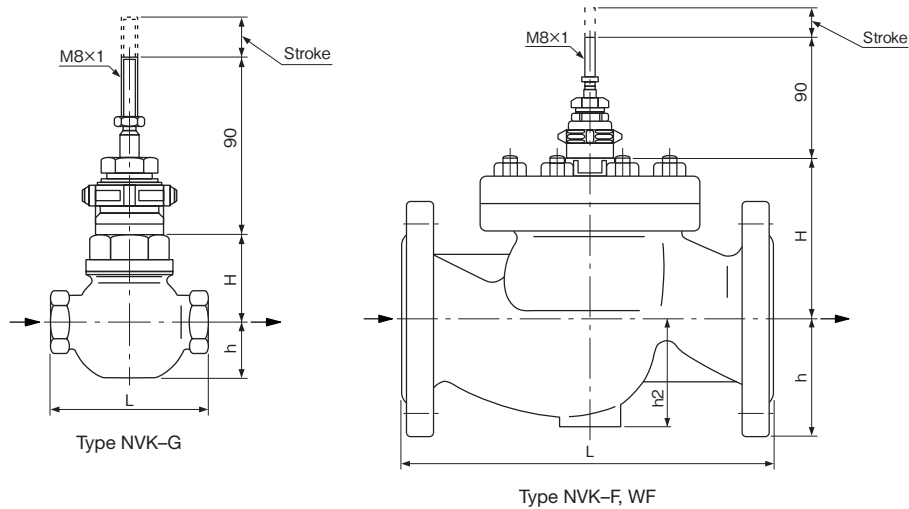
| Model                 | NVK—M * * * * GL                         | NVK—M * * * * FL |
|-----------------------|------------------------------------------|------------------|
| Item                  |                                          |                  |
| Connection            | Rc                                       | Flange (JIS 10K) |
| Fluid                 | Non-corrosive Water for Air conditioning |                  |
| Max. Working Press.   | 0.98MPa {10 kgf/cm <sup>2</sup> }        |                  |
| Fluid Temp. (°C)      | 0 to 200                                 |                  |
| Flow Characteristic   | Equal Percentage                         |                  |
| Material of Body      | CAC406                                   | FC200            |
| Material of Plug      | SCS14                                    |                  |
| Material of Seat Ring | SUS316                                   |                  |
| Material of Stem      | SUS304                                   |                  |

## Type NVK – 2-way valve

| Catalog No. |          | Port Size (mm) | Connection |                  | Cv Value | Stroke (mm) | Close off Rating MPa {kgf/cm <sup>2</sup> } |              |            | Dimensions (mm) |     |        | Wt. (kg) |
|-------------|----------|----------------|------------|------------------|----------|-------------|---------------------------------------------|--------------|------------|-----------------|-----|--------|----------|
|             |          |                | Tube O.D.  | Style            |          |             | WGK-N * A                                   | WGK-N * S    | WGK-N * L  | L               | H   | h (h2) |          |
| NVK-        | 1504GL@1 | 15             | 1/2"       | Rc               | 1        | 20          | 0.98 {10}                                   | 0.98 {10}    | 0.98 {10}  | 80              | 43  | 28     | 0.9      |
|             | 1504GL@2 |                |            |                  | 2.5      |             |                                             |              |            |                 |     |        |          |
|             | 1504GL   |                |            |                  | 5        |             |                                             | 0.66 {6.7}   |            |                 |     |        |          |
|             | 2006GL   | 20             | 3/4"       |                  | 8        |             |                                             | 0.38 {3.9}   |            |                 |     |        | 0.95     |
|             | 2510GL   | 25             | 1"         |                  | 12       |             |                                             | 0.24 {2.4}   |            | 90              | 48  | 29     | 1.2      |
|             | 3212GL   | 32             | 1-1/4"     |                  | 20       |             | 0.95 {9.7}                                  | 0.14 {1.4}   |            | 105             | 50  | 30     | 1.6      |
|             | 4014GL   | 40             | 1-1/2"     |                  | 30       |             | 0.61 {6.2}                                  | 0.09 {0.9}   |            | 120             | 60  | 35     | 2.4      |
|             | 5020GL   | 50             | 2"         |                  | 45       |             | 0.40 {4.1}                                  | 0.05 {0.5}   |            | 140             | 68  | 46     | 3.6      |
|             | 6524FL   | 65             | 2-1/2"     | Flange (JIS 10K) | 70       | 30          | 0.28 {2.9}                                  | 0.044 {0.45} | 0.48 {4.9} | 276             | 125 | 87.5   | 19.9     |
|             | 8030FL   | 80             | 3"         |                  | 110      |             | 0.19 {1.9}                                  | 0.028 {0.29} | 0.31 {3.2} | 298             | 149 | 92.5   | 25       |
|             | 10040FL  | 100            | 4"         |                  | 180      |             | 0.12 {1.2}                                  | —            | 0.2 {2}    | 352             | 169 | 105    | 36       |
| NVK-W       | 4014FL@1 | 40             | 1-1/2"     | Flange (JIS 10K) | 20       | 20          | 0.98 {10}                                   |              | —          | 222             | 110 | 70     | 10.5     |
|             | 4014FL   |                |            |                  | 30       |             |                                             |              |            | 254             | 114 | (80)   | 13.5     |
|             | 5020FL   | 50             | 2"         |                  | 45       |             |                                             |              |            | 276             | 129 | (96)   | 18       |
|             | 6524FL   | 65             | 2-1/2"     |                  | 70       |             |                                             | 0.81 {8.3}   |            | 298             | 156 | (115)  | 28.5     |
|             | 8030FL   | 80             | 3"         |                  | 110      |             |                                             | 0.66 {6.7}   |            | 352             | 187 | (150)  | 46.5     |
|             | 10040FL  | 100            | 4"         |                  | 180      | 40          | —                                           |              |            | 403             | 208 | (153)  | 63.3     |
|             | 12550FL  | 125            | 5"         |                  | 260      |             |                                             |              |            | 451             | 225 | (170)  | 90.6     |
|             | 15060FL  | 150            | 6"         |                  | 380      |             |                                             |              |            | 543             | 278 | (212)  | 167      |
|             | 20080FL  | 200            | 8"         |                  | 630      | 45          | 0.69 {7}                                    |              |            | 673             | 319 | (232)  | 251      |
|             | 250100FL | 250            | 10"        |                  | 960      |             | 0.49 {5}                                    |              |            |                 |     |        |          |

- Cv ... Flow (L/min) passing through the valve at full opening when water temperature is 15°C and pressure difference across the valve is 0.00048 MPa {0.0049 kgf/cm<sup>2</sup>}
- The dimension value bracketed off by ( ) shows "h2" value due to "h2" value being bigger than the one of "h".

## DIMENSIONS



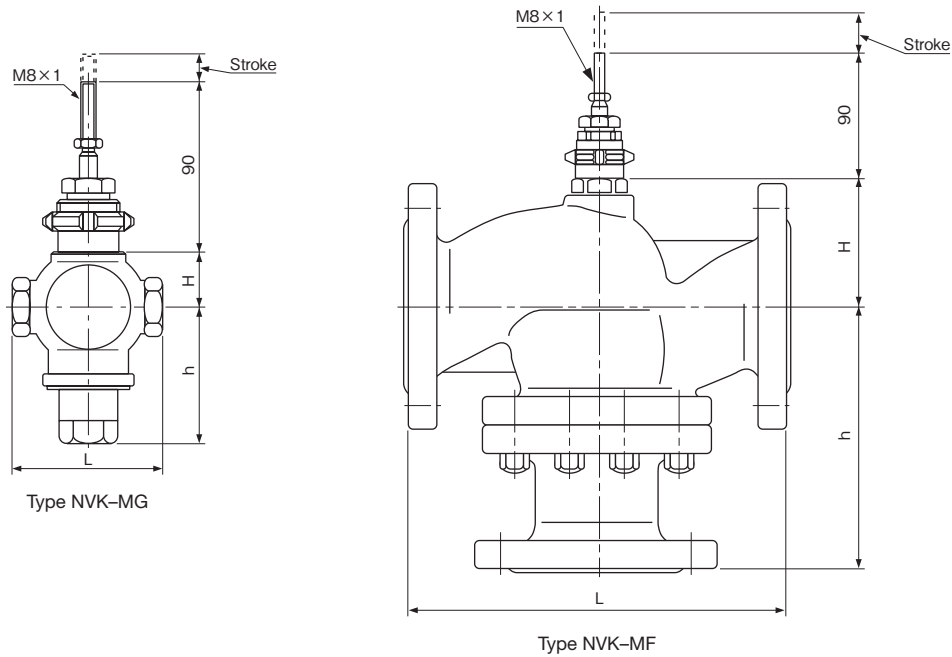
Unit: mm

Type NVK 3-way valve (used as a mixing valve)

| Catalog No. |         | Port Size (mm) | Connection |                  | Cv Value | Stroke (mm) | Close off Rating MPa {kgf/cm <sup>2</sup> } |              |            | Dimension (mm) |     |     | Wt. (kg) |
|-------------|---------|----------------|------------|------------------|----------|-------------|---------------------------------------------|--------------|------------|----------------|-----|-----|----------|
|             |         |                | Tube O.D.  | Style            |          |             | WGK-N * A                                   | WGK-N * S    | WGK-N * L  | L              | H   | h   |          |
| NVK-M       | 1504GL  | 15             | 1/2"       | Rc               | 5        | 20          | 0.98 {10}                                   | 0.38 {3.9}   | 0.98 {10}  | 80             | 29  | 72  | 1.1      |
|             | 2006GL  | 20             | 3/4"       |                  | 8        |             |                                             | 0.23 {2.3}   |            | 80             | 29  | 73  | 1.12     |
|             | 2510GL  | 25             | 1"         |                  | 12       |             | 0.95 {9.7}                                  | 0.14 {1.4}   |            | 90             | 32  | 77  | 1.45     |
|             | 3212GL  | 32             | 1-1/4"     |                  | 20       |             |                                             | 0.09 {0.9}   |            | 105            | 38  | 80  | 1.95     |
|             | 4014GL  | 40             | 1-1/2"     |                  | 30       |             | 0.61 {6.2}                                  | 0.09 {0.9}   |            | 120            | 43  | 84  | 2.7      |
|             | 5020GL  | 50             | 2"         |                  | 45       |             | 0.40 {4.1}                                  | 0.061 {0.62} |            | 140            | 51  | 97  | 4.17     |
|             | 6524FL  | 65             | 2-1/2"     | Flange (JIS 10K) | 70       | 30          | 0.28 {2.9}                                  | 0.044 {0.45} | 0.48 {4.9} | 276            | 92  | 185 | 24.5     |
|             | 8030FL  | 80             | 3"         |                  | 110      |             | 0.19 {1.9}                                  | 0.028 {0.29} | 0.31 {3.2} | 298            | 106 | 215 | 31       |
|             | 10040FL | 100            | 4"         |                  | 180      | 40          | 0.12 {1.2}                                  | —            | 0.2 {2}    | 352            | 131 | 238 | 42       |
|             | 12550FL | 125            | 5"         |                  | 260      |             | 0.08 {0.8}                                  |              | 0.13 {1.3} | 403            | 149 | 263 | 64.5     |
|             | 15060FL | 150            | 6"         |                  | 380      |             | 0.05 {0.5}                                  |              | 0.09 {0.9} | 451            | 173 | 288 | 92       |

• Cv ... Flow (L/min) passing through the valve at full opening when water temperature is 15°C and pressure difference across the valve is 0.00048 MPa {0.0049 kgf/cm<sup>2</sup>}

## DIMENSIONS



Unit: mm

## OTHER VALVES

|                                                            |         |
|------------------------------------------------------------|---------|
| <b>CHECK VALVES</b> . . . . .                              | 99      |
| Type <b>ACV &amp; BCV</b>                                  |         |
| <b>PRESSURE ACTUATED WATER REGULATING VALVES</b> . . . . . | 100     |
| Type <b>VWR</b>                                            |         |
| <b>PRESSURE ACTUATED WATER REGULATING VALVES</b> . .       | 101–102 |
| Type <b>CWR, AWR, GWR, MWR &amp; SWR</b>                   |         |
| <b>TEMPERATURE ACTUATED WATER REGULATING VALVES</b> . . .  | 103–104 |
| Type <b>OWR, HWR &amp; XWR</b>                             |         |
| <b>PRESSURE REGULATING VALVES</b> . . . . .                | 105–106 |
| Type <b>EPR</b>                                            |         |
| <b>PRESSURE REGULATING VALVES</b> . . . . .                | 107–108 |
| Type <b>SPR &amp; DPR</b>                                  |         |
| <b>PRESSURE REGULATING VALVES</b> . . . . .                | 109–110 |
| Type <b>HPR</b>                                            |         |
| <b>DIAPHRAGM TYPE STOP VALVES</b> . . . . .                | 111     |
| Type <b>ADV</b>                                            |         |
| <b>BELLOWS TYPE STOP VALVES</b> . . . . .                  | 112–113 |
| Type <b>NBV</b>                                            |         |

# CHECK VALVES

## Type ACV & BCV

**SAGINOMIYA**

### GENERAL DESCRIPTION

- Install in the liquid line of heat pump air conditioner to prevent the counter flow at change over of cycles from heating to cooling and vice versa.
- Also for prevention of reverse flow of high pressure gas when compressor stops.
- For use with Fluorinated Refrigerants, and Inert Gas.
- Can be mounted in horizontal or vertical line.
- Valve material : Fluorocarbon resin



Type ACV-B



Type BCV

### TYPE NUMBER SELECTION (SPECIFICATIONS)

#### Type ACV

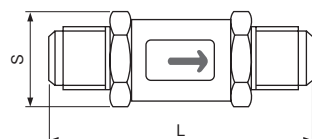
| Catalog No.       | Fluid                    | Port Size (mm) | Cv Value | Connection         |                       | Max. Working Pressure (MPa) {kgf/cm <sup>2</sup> } | Allowable Liquid Temp. (°C) | Wt. (kg) |      |
|-------------------|--------------------------|----------------|----------|--------------------|-----------------------|----------------------------------------------------|-----------------------------|----------|------|
|                   |                          |                |          | Copper Tube (O.D.) | Style                 |                                                    |                             | B        | D    |
| <b>ACV-2B (D)</b> | Fluorinated Refrigerants | 4.8            | 0.55     | 1/4"               | B: Flare<br>D: Solder | 3<br>{30.6}                                        | -40 to 125                  | 0.1      | 0.05 |
| <b>ACV-3B (D)</b> |                          | 7.5            | 1        | 3/8"               |                       |                                                    |                             | 0.2      | 0.1  |
| <b>ACV-4B (D)</b> | Air                      | 10             | 2.4      | 1/2"               |                       |                                                    |                             | 0.4      | 0.2  |
| <b>ACV-5B (D)</b> |                          | 12.5           | 4.2      | 5/8"               |                       |                                                    |                             | 0.5      | 0.3  |
| <b>ACV-6B (D)</b> | Inert Gas                | 16             | 6        | 3/4"               |                       |                                                    |                             | 0.7      | 0.5  |

#### Type BCV

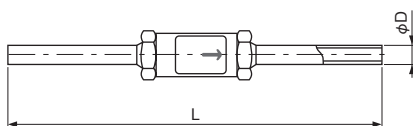
| Catalog No.       | Fluid                    | Port Size (mm) | Cv Value | Connection         |        | Max. Working Pressure (MPa) {kgf/cm <sup>2</sup> } | Allowable Liquid Temp. (°C) | Wt. (kg) |   |
|-------------------|--------------------------|----------------|----------|--------------------|--------|----------------------------------------------------|-----------------------------|----------|---|
|                   |                          |                |          | Copper Tube (I.D.) | Style  |                                                    |                             | B        | D |
| <b>BCV-302DY</b>  | Fluorinated Refrigerants | 3              | 0.33     | 1/4"               | Solder | 4.15<br>{42.3}                                     | -30 to 120                  | 0.02     |   |
| <b>BCV-603DY</b>  |                          | 5.5            | 0.97     | 3/8"               |        |                                                    |                             | 0.04     |   |
| <b>BCV-804DY</b>  |                          | 8              | 2        | 1/2"               |        |                                                    |                             | 0.07     |   |
| <b>BCV-1005DY</b> |                          | 10             | 3.5      | 5/8"               |        |                                                    |                             | 0.14     |   |
| <b>BCV-1306DY</b> |                          | 12.5           | 4.7      | 3/4"               |        |                                                    |                             | 0.18     |   |
| <b>BCV-1810DY</b> |                          | 18             | 8        | 1"                 |        |                                                    |                             | 0.34     |   |

• Standard valve material of BCV-1005DY is Polyamide resin.

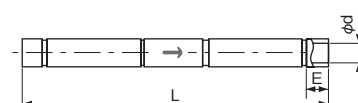
### DIMENSIONS



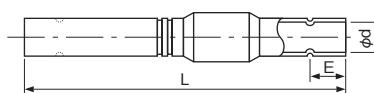
Type ACV-B



Type ACV-D



Type BCV-302DY to 804DY



Type BCV-1005DY to 1810DY

Unit: mm

#### Type ACV

| Catalog No.   | Unit: mm |       |    |
|---------------|----------|-------|----|
|               | L        | φD    | S  |
| <b>ACV-2B</b> | 58       | —     | 14 |
| <b>ACV-3B</b> | 76       |       | 19 |
| <b>ACV-4B</b> | 87       |       | 24 |
| <b>ACV-5B</b> | 103      |       | 30 |
| <b>ACV-6B</b> | 115      |       | 36 |
| <b>ACV-2D</b> | 120      | 6.35  | —  |
| <b>ACV-3D</b> | 160      | 9.53  |    |
| <b>ACV-4D</b> | 187      | 12.70 |    |
| <b>ACV-5D</b> | 235      | 15.88 |    |
| <b>ACV-6D</b> | 300      | 19.05 |    |

#### Type BCV

| Catalog No.       | Unit: mm |       |    |
|-------------------|----------|-------|----|
|                   | L        | φD    | E  |
| <b>BCV-302DY</b>  | 112      | 6.55  | —  |
| <b>BCV-603DY</b>  | 120      | 9.71  | 8  |
| <b>BCV-804DY</b>  | 140      | 12.93 | 13 |
| <b>BCV-1005DY</b> | 160      | 16.12 | 16 |
| <b>BCV-1306DY</b> | 180      | 19.30 | 19 |
| <b>BCV-1810DY</b> | 200      | 25.7  | 20 |

# PRESSURE ACTUATED WATER REGULATING VALVES

## Type VWR

**SAGINOMIYA**

### GENERAL DESCRIPTION

- Type VWR: 2-way press. actuated water regulating valves, open on pressure increase.
- Refrigerant: R410A, R407C, R404A
- Type VWR is applicable to the adjustment range which exceeds the applicable adjustment range of type AWR (Refer to next page).
- Pressure connection: 1/4" flare nut (Standard)
- Body material: Bronze for water and glycol.



### TYPE NUMBER SELECTION (SPECIFICATIONS)

#### PRESSURE ACTUATED VALVES 2-WAY

Unit: MPa {kgf/cm<sup>2</sup>}

| Catalog No. | Kind of Refrigerant | Valve Body Material      | Connection |       | Press. Range              | Max. Working Press. | Max. Water Temp.(°C) | Max. Water Press. | * Factory Setting | Wt. (kg) |
|-------------|---------------------|--------------------------|------------|-------|---------------------------|---------------------|----------------------|-------------------|-------------------|----------|
|             |                     |                          | Size       | Style |                           |                     |                      |                   |                   |          |
| VWR-        | 1203G               | Fluorinated Refrigerants | 3/8"       | Rc    | 1.5 to 2.9 {15.3 to 29.6} | 4.2 {42.8}          | 60                   | 1 {10.2}          | 2.4 {24.5}        | 0.68     |
|             | 1504G               |                          | 1/2"       |       |                           |                     |                      |                   |                   | 0.9      |
|             | 2006G               |                          | 3/4"       |       |                           |                     |                      |                   |                   | 1.0      |

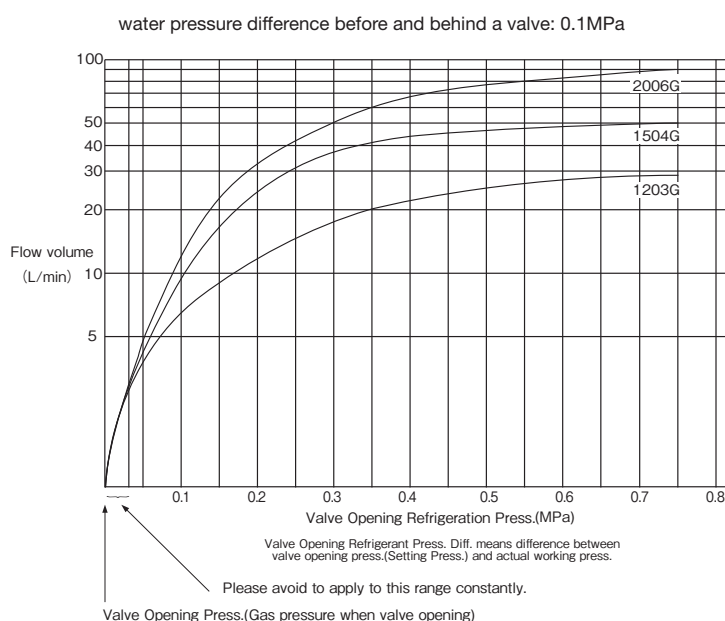
\* Pressure at which valve starts opening.

• Adjust type VWR to a set value which is suitable for the refrigerant employed.

### FLOW CAPACITY

Flow Capacity shows respectively refrigeration press. diff. at horizontal axis and flow rate of cooling water at vertical axis considering water press. diff. before and behind a valve with 0.1 MPa. (press. diff. between inlet and outlet of valve)

In case of water press. diff. before and behind a valve is excepting for 0.1MPa, value is calculated multiplying by coefficient in compensation table.



### ADJUSTMENT

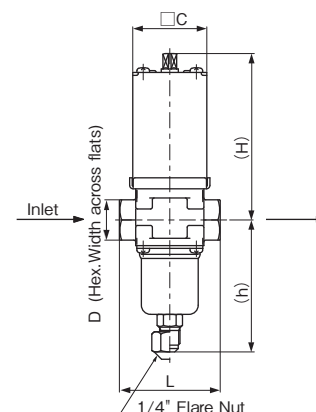
One full turn of adjusting screw changes pressure setting as shown below.

| Catalog No. | Change in Press. Setting |
|-------------|--------------------------|
| VWR- 1203G  | Approx. 0.2MPa           |
| 1504G       |                          |
| 2006G       |                          |

### COMPENSATION COEFFICIENTS

| Press. Drop Across Valve: MPa {kgf/cm <sup>2</sup> } | Coefficient |
|------------------------------------------------------|-------------|
| 0.2 {2}                                              | 1.4         |
| 0.1 {1}                                              | 1           |
| 0.03 {0.3}                                           | 0.55        |
| 0.05 {0.5}                                           | 0.7         |
| 0.07 {0.7}                                           | 0.8         |

### DIMENSIONS



| Catalog No. |       | Unit: mm |    |     |    |                            |
|-------------|-------|----------|----|-----|----|----------------------------|
|             |       | D        | L  | H   | h  | <input type="checkbox"/> C |
| VWR-        | 1203G | 22       | 55 | 91  | 72 | 40                         |
|             | 1504G | 27       | 70 | 100 | 83 | 42                         |
|             | 2006G | 32       | 80 | 104 | 87 |                            |

# PRESSURE ACTUATED WATER REGULATING VALVES

Type CWR, AWR, GWR, MWR & SWR

SAGINOMIYA

## GENERAL DESCRIPTION

- Type CWR, AWR & MWR: 2-way press. actuated water regulating valves, open on pressure increase.
- Type GWR: 2-way press. actuated water regulating valves, open on pressure decrease.
- Type SWR: 3-way press. actuated water regulating valves.
- Pressure connection: 1/4" flare nut (Standard)
- Body material: Bronze for water and glycol, cast iron for water only



Type AWR



Type SWR

## TYPE NUMBER SELECTION (SPECIFICATIONS)

### PRESSURE ACTUATED VALVES 2-WAY

Unit: MPa {kgf/cm<sup>2</sup>}

| Catalog No.    |          | Kind of Refrigerant      | Valve Body Material | Connection |                                | Press. Range               | Max. Working Press. | Max. Water Temp. (°C) | Max. Water Press. | * Factory Setting              | Wt. (kg)       |                               |
|----------------|----------|--------------------------|---------------------|------------|--------------------------------|----------------------------|---------------------|-----------------------|-------------------|--------------------------------|----------------|-------------------------------|
|                |          |                          |                     | Size       | Style                          |                            |                     |                       |                   |                                |                |                               |
| CWR--          | 803GLWQ1 | Fluorinated Refrigerants | Bronze              | 3/8"       | Rc                             | 0.6 to 1.8 {6.0 to 18.0}   | 2 {20}              | 60                    | 0.98 {10}         | 0.75 {7.5}                     | 0.45           |                               |
| AWR--          | 1204BLW  |                          |                     | 1/2"       | Flare                          | 0.78 to 1.77 {8.0 to 18.0} | 1.96 {20}           |                       |                   | 0.98 {10}                      | 0.88 {9}       | 0.8                           |
|                | 1203GLW  |                          |                     | 3/8"       | Rc                             | 0.59 to 1.77 {6.0 to 18.0} |                     |                       |                   |                                | 0.74 {7.5}     | 0.66                          |
| AWR--<br>GWR-- | 1504GLW  |                          |                     | 1/2"       |                                |                            |                     |                       |                   |                                |                | 0.8                           |
|                | 2006GLW  |                          |                     | 3/4"       |                                |                            |                     |                       |                   |                                |                | 1.0                           |
|                | 2510GLW  |                          |                     | 1"         |                                |                            |                     |                       |                   |                                |                | 1.8                           |
|                | 3212GLW  |                          |                     | 1-1/4"     |                                |                            |                     |                       |                   |                                |                | 2.1                           |
|                | 4014FLW  |                          |                     | 1-1/2"     |                                |                            |                     |                       |                   |                                |                | 11.2                          |
|                | 5020FLWR |                          | Cast Iron           | 2"         | R: 0.59 to 1.18 {6.0 to 12.0}  | R: 0.74 {7.5}              |                     |                       |                   |                                | 17.8           |                               |
|                | 5020FLWH |                          |                     | 2-1/2"     | H: 1.08 to 1.77 {11.0 to 18.0} | H: 1.23 {12.5}             |                     |                       |                   |                                | 21.6           |                               |
|                | 6524FLWR |                          |                     | Flange     | 0.59 to 1.77 {6.0 to 18.0}     | 0.74 {7.5}                 |                     |                       |                   |                                | 11.2           |                               |
|                | 6524FLWH |                          | Bronze              |            |                                |                            |                     |                       |                   |                                | 2"             | R: 0.59 to 1.18 {6.0 to 12.0} |
| MWR--          | 4014FLW  |                          |                     |            |                                |                            | 1-1/2"              |                       |                   | H: 1.08 to 1.77 {11.0 to 18.0} | H: 1.23 {12.5} | 21.6                          |

\* Pressure at which valve starts opening.

• AWR, GWR & MWR with flange connection are supplied with JIS 10K (0.98 MPa) round companion flanges (JIS B2220 2239) and bolts/nuts.

### PRESSURE ACTUATED VALVES 3-WAY

Unit: MPa {kgf/cm<sup>2</sup>}

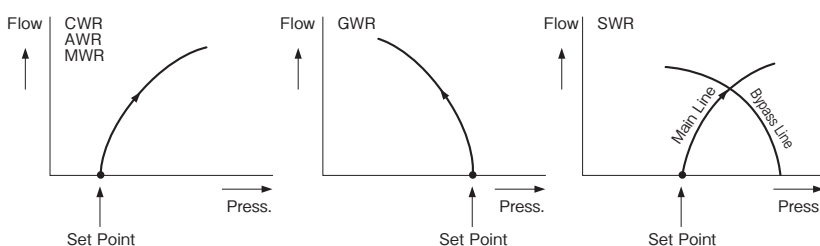
| Catalog No. |         | Kind of Refrigerant      | Valve Body Material | Connection |       | Press. Range           | Max. Working Press. | Max. Water Temp. (°C) | Max. Water Press. | * Factory Setting | Wt. (kg) |
|-------------|---------|--------------------------|---------------------|------------|-------|------------------------|---------------------|-----------------------|-------------------|-------------------|----------|
|             |         |                          |                     | Size       | Style |                        |                     |                       |                   |                   |          |
| SWR-        | 1504GLW | Fluorinated Refrigerants | Bronze              | 1/2"       | Rc    | 0.59 to 1.77 {6 to 18} | 1.96 {20}           | 60                    | 0.98 {10}         | 0.74 {7.5}        | 1.1      |
|             | 2006GLW |                          |                     | 3/4"       |       |                        |                     |                       |                   |                   | 1.5      |
|             | 2510GLW |                          |                     | 1"         |       |                        |                     |                       |                   |                   | 2.5      |
|             | 3212GLW |                          |                     | 1-1/4"     |       |                        |                     |                       |                   |                   | 3.0      |

\* Pressure at which main valve starts opening.

• Pressure range: Main line opening point

## VALVE ACTION

Set Point is pressure for valve opening. Each characteristic of valves is different as follows.



## ADJUSTMENT

One full turn of adjusting screw changes pressure setting as shown below.

| Catalog No.  |         | Change in Press. Setting |
|--------------|---------|--------------------------|
| AWR-         | 1204BLW | Approx. 0.1MPa           |
|              | 1203GLW |                          |
| AWR-GWR-SWR- | 1504GLW | Approx. 0.075MPa         |
|              | 2006GLW |                          |
|              | 2510GLW |                          |
| AWR-MWR-GWR- | 3212GLW | Approx. 0.09MPa          |
|              | 4014FLW |                          |
|              | 5020FLW |                          |
|              | 6524FLW |                          |

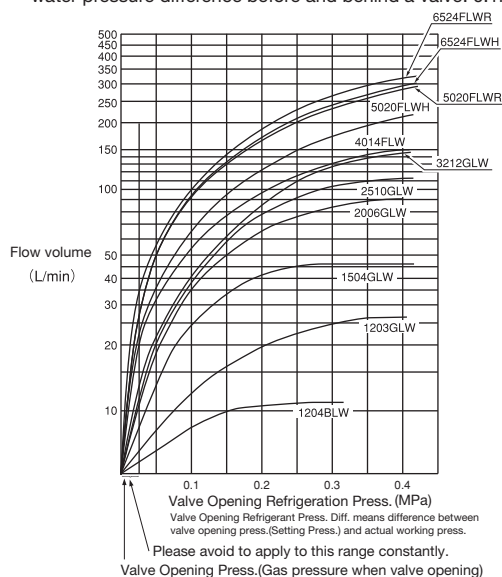
## FLOW CAPACITY

Flow Capacity shows respectively refrigeration press. diff. at horizontal axis and flow rate of cooling water at vertical axis considering water press. diff. before and behind a valve with 0.1 MPa. (press. diff. between inlet and outlet of valve)

In case of water press. diff. before and behind a valve is excepting for 0.1MPa, value is calculated multiplying by coefficient in compensation table.

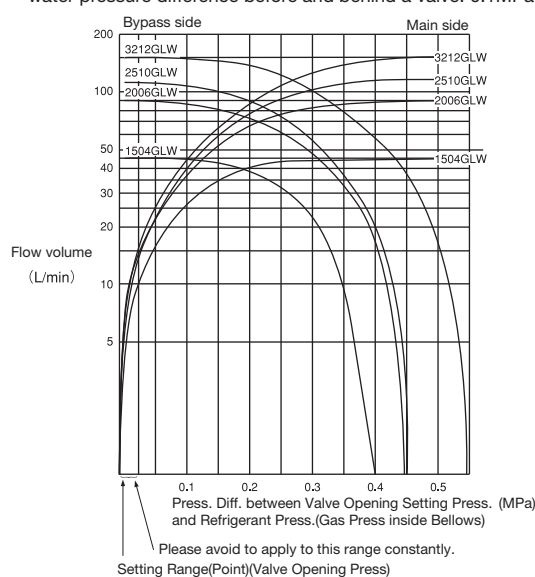
Type AWR, MWR, GWR

water pressure difference before and behind a valve: 0.1MPa



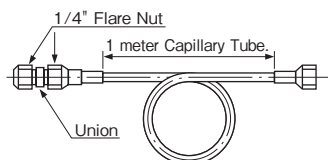
Type SWR

water pressure difference before and behind a valve: 0.1MPa



## ACCESSORY

- Pressure dampening capillary tube assembly only attached for AWR-50, -65, MWR-50 and -65. Please use these for safety.

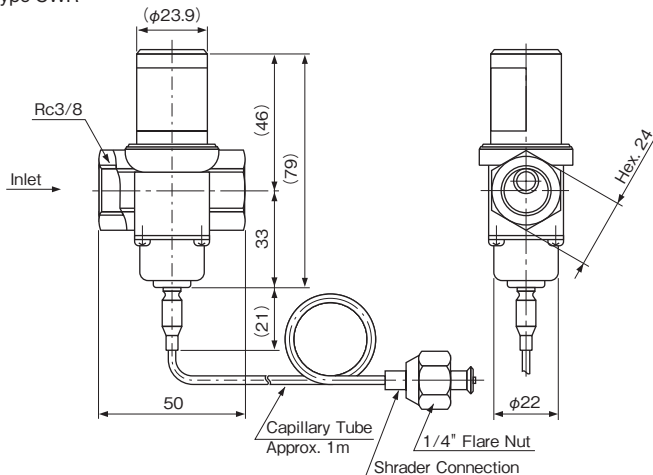


## COMPENSATION COEFFICIENTS

| Press. Drop Across Valve: MPa {kgf/cm <sup>2</sup> } | Coefficient |
|------------------------------------------------------|-------------|
| 0.2 {2}                                              | 1.4         |
| 0.1 {1}                                              | 1           |
| 0.03 {0.3}                                           | 0.55        |
| 0.05 {0.5}                                           | 0.7         |
| 0.07 {0.7}                                           | 0.8         |

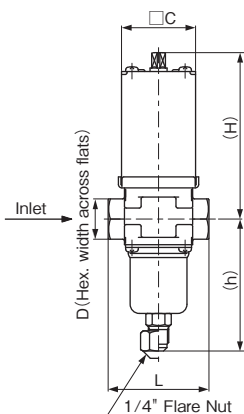
## DIMENSIONS

Type CWR

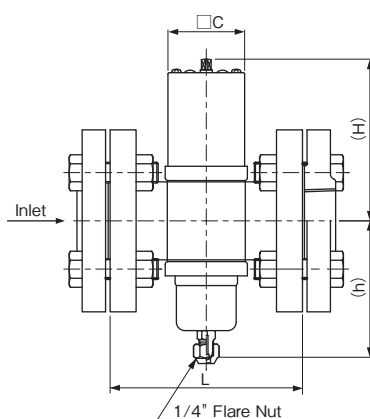


| Catalog No.  |         | Unit: mm |     |     |     |                |    |
|--------------|---------|----------|-----|-----|-----|----------------|----|
|              |         | D        | L   | H   | h   | h <sub>1</sub> | □C |
| AWR-         | 1204BLW | —        | 100 | 90  | 70  | —              | 40 |
|              | 1203GLW | 22       | 55  | 91  | 72  |                |    |
| AWR-GWR-     | 1504GLW | 27       | 70  | 100 | 83  |                | 42 |
|              | 2006GLW | 32       | 80  | 104 | 87  |                |    |
|              | 2510GLW | 40       | 90  | 116 | 97  |                | 59 |
|              | 3212GLW | 50       | 100 | 121 | 102 |                |    |
| AWR-MWR-GWR- | 4014FLW | —        | 148 | 125 | 105 | —              | 89 |
|              | 5020FLW | —        | 173 | 180 | 155 |                |    |
|              | 6524FLW | —        | 179 | 180 | 155 |                |    |
| SWR-         | 1504GLW | 27       | 70  | 100 | 31  | 114            | 42 |
|              | 2006GLW | 32       | 80  | 104 | 39  | 126            |    |
|              | 2510GLW | 40       | 90  | 116 | 44  | 141            | 59 |
|              | 3212GLW | 50       | 100 | 121 | 54  | 156            |    |

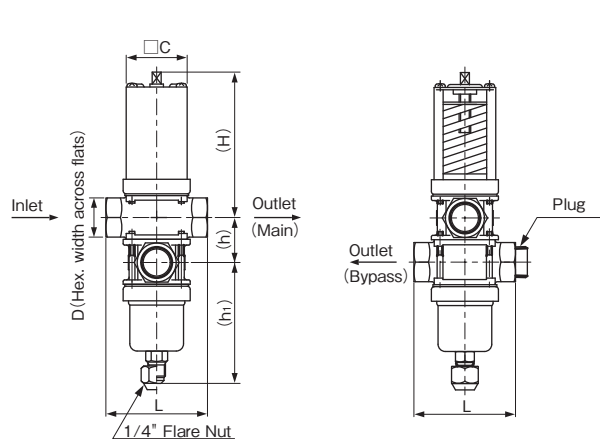
Type AWR-G, GWR-G



Type AWR-F, MWR-F, GWR-F



Type SWR



Unit: mm

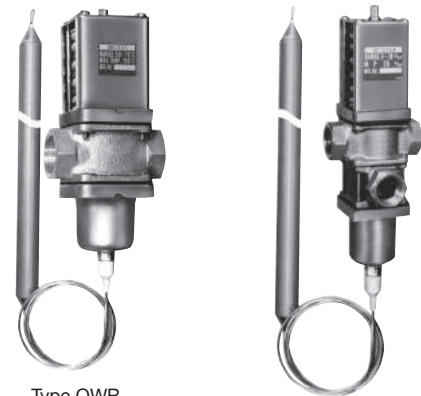
# TEMPERATURE ACTUATED WATER REGULATING VALVES

## Type OWR, HWR & XWR

**SAGInoMIYA**

### GENERAL DESCRIPTION

- Type OWR: 2-way temp. actuated water regulating valves, open on temperature increase.
- Type HWR: 2-way temp. actuated water regulating valves, open on temperature decrease.
- Type XWR: 3-way temp. actuated water regulating valves.
- Temperature sensing element (Bulb)
- Body material: Bronze for water and glycol, cast iron for water only



Type OWR

Type XWR

### TYPE NUMBER SELECTION (SPECIFICATIONS)

#### TEMPERATURE ACTUATED VALVES 2-WAY

Unit: °C

| Catalog No. |        | Valve Body Material | Connection |        | Temp. Range | Max. Water Temp. | Max. Water Press. MPa {kgf/cm <sup>2</sup> } | Max. Bulb Temp. | Bulb Size (mm) | * Factory Setting | Wt. (kg) |
|-------------|--------|---------------------|------------|--------|-------------|------------------|----------------------------------------------|-----------------|----------------|-------------------|----------|
|             |        |                     | Size       | Style  |             |                  |                                              |                 |                |                   |          |
| OWR-HWR-    | 5004G  | Bronze              | 1/2"       | Rc     | 30 to 50    | 60               | 0.98 {10}                                    | 80              | φ 19×150       | 40                | 1.0      |
|             | 5006G  |                     | 3/4"       |        |             |                  |                                              |                 | 1.2            |                   |          |
|             | 5010G  |                     | 1"         |        |             |                  |                                              |                 | 2.0            |                   |          |
|             | 5012G  |                     | 1-1/4"     |        |             |                  |                                              |                 | 2.2            |                   |          |
|             | 5014F  | Cast Iron           | 1-1/2"     | Flange | 11.5        |                  |                                              |                 |                |                   |          |
|             | 5020F  |                     | 2"         |        | 18.3        |                  |                                              |                 |                |                   |          |
|             | 5024F  |                     | 2-1/2"     |        | 22.2        |                  |                                              |                 |                |                   |          |
|             | P7504G | Bronze              | 1/2"       | Rc     | 50 to 75    |                  |                                              | 100             | φ 19×150       | 60                | 1.0      |
|             | P7506G |                     | 3/4"       |        |             |                  |                                              |                 | 1.2            |                   |          |
|             | P7510G |                     | 1"         |        |             |                  |                                              |                 | 2.0            |                   |          |
|             | P7512G |                     | 1-1/4"     |        |             |                  |                                              |                 | 2.2            |                   |          |
|             | P7514F | Cast Iron           | 1-1/2"     | Flange |             |                  |                                              |                 | 11.5           |                   |          |
|             | P7520F |                     | 2"         |        |             |                  |                                              |                 | 18.3           |                   |          |
|             | P7524F |                     | 2-1/2"     |        |             |                  |                                              |                 | 22.2           |                   |          |

\* Pressure at which valve starts opening.

• OWR & HWR with flange connection are supplied with JIS 10K (0.98 MPa) round companion flanges (JIS B2220 2239) and bolt/nuts.

• Capillary tube ... Standard φ 24mm × 1 meter, optional 1.5, 2 and 3 meters

#### TEMPERATURE ACTUATED VALVES 3-WAY

Unit: °C

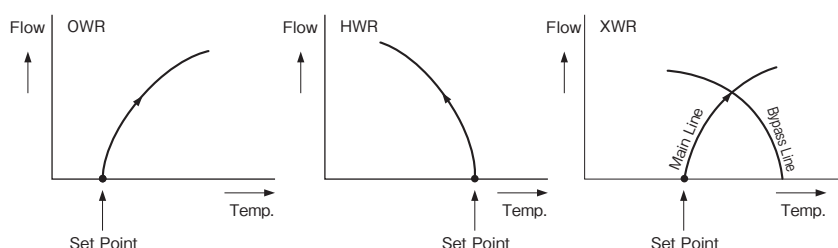
| Catalog No. |        | Valve Body Material | Connection |       | Temp. Range | Max. Water Temp. | Max. Water Press. MPa {kgf/cm <sup>2</sup> } | Max. Bulb Temp. | Bulb Size (mm) | * Factory Setting | Wt. (kg) |
|-------------|--------|---------------------|------------|-------|-------------|------------------|----------------------------------------------|-----------------|----------------|-------------------|----------|
|             |        |                     | Size       | Style |             |                  |                                              |                 |                |                   |          |
| XWR-        | 5004G  | Bronze              | 1/2"       | Rc    | 30 to 50    | 60               | 0.98 {10}                                    | 80              | φ 19×150       | 40                | 1.0      |
|             | 5006G  |                     | 3/4"       |       |             |                  |                                              |                 | 1.5            |                   |          |
|             | 5010G  |                     | 1"         |       |             |                  |                                              |                 | 2.5            |                   |          |
|             | 5012G  |                     | 1-1/4"     |       |             |                  |                                              |                 | 3.0            |                   |          |
|             | P7504G |                     | 1/2"       |       | 50 to 75    |                  |                                              | 100             | φ 19×150       | 60                | 1.1      |
|             | P7506G |                     | 3/4"       |       |             |                  |                                              |                 | 1.5            |                   |          |
|             | P7510G |                     | 1"         |       |             |                  |                                              |                 | 2.5            |                   |          |
|             | P7512G |                     | 1-1/4"     |       |             |                  |                                              |                 | 3.0            |                   |          |

\* Pressure at which valve starts opening.

• Capillary tube ... Standard φ 24mm × 1 meter, optional 1.5, 2 and 3 meters

### VALVE ACTION

Set Point is pressure for valve opening. Each characteristic of valves is different as follows.



### ADJUSTMENT

One full turn of adjusting screw changes temperature setting as shown below.

| Catalog No.             | Change in Temp. Setting |
|-------------------------|-------------------------|
| OWR-HWR-XWR-<br>* * 04G | Approx. 4.0°C           |
| * * 06G                 |                         |
| * * 10G                 |                         |
| * * 12G                 | Approx. 3.0°C           |
| * * 14F                 |                         |
| OWR-HWR-<br>* * 20F     | Approx. 4.0°C           |
| * * 24F                 |                         |

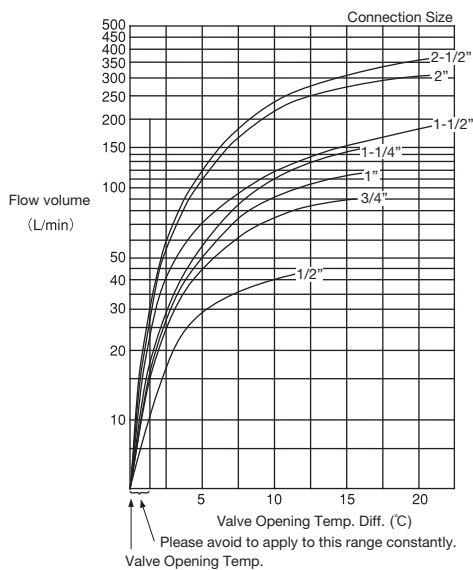
## FLOW CAPACITY

Flow Capacity shows respectively opening temp. diff. at horizontal axis and flow rate of cooling water at vertical axis considering water press. diff. before and behind a valve with 0.1 MPa. (press. diff. between inlet and outlet of valve)

In case of water press. diff. before and behind a valve is excepting for 0.1MPa, value is calculated multiplying by coefficient in compensation table.

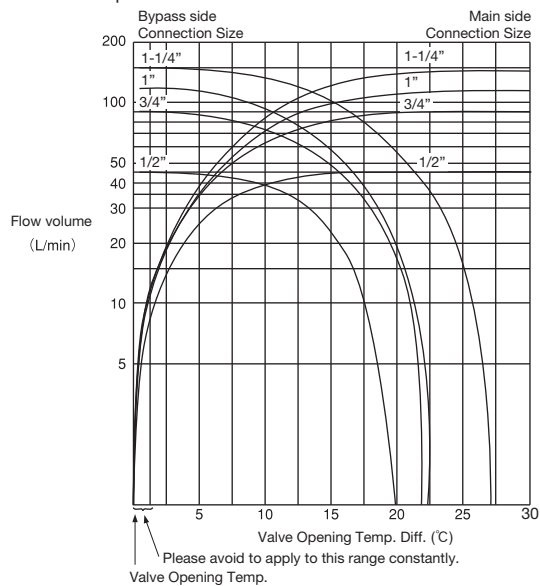
Type OWR, HWR

water pressure difference before and behind a valve: 0.1MPa



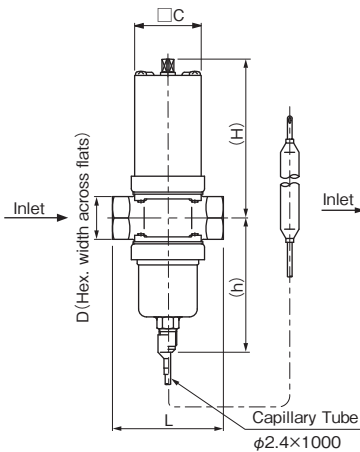
Type XWR

water pressure difference before and behind a valve: 0.1MPa

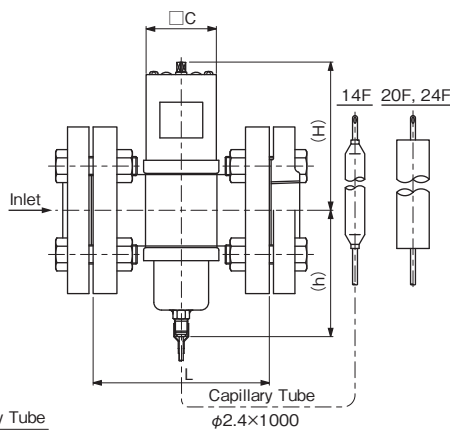


## DIMENSIONS

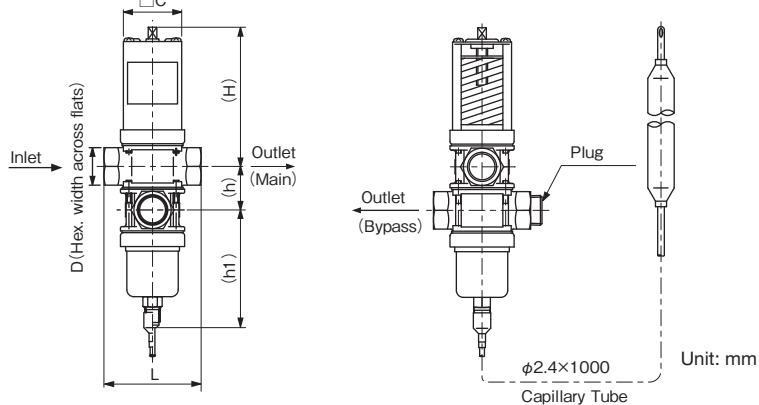
Type OWR-G, HWR-G



Type OWR-F, HWR-F



Type XWR



## COMPENSATION COEFFICIENTS

| Press. Drop Across Valve: MPa {kgf/cm <sup>2</sup> } | Coefficient |
|------------------------------------------------------|-------------|
| 0.2 {2}                                              | 1.4         |
| 0.1 {1}                                              | 1           |
| 0.03 {0.3}                                           | 0.55        |
| 0.05 {0.5}                                           | 0.7         |
| 0.07 {0.7}                                           | 0.8         |

| Catalog No. |        | Unit: mm |     |     |     |    |
|-------------|--------|----------|-----|-----|-----|----|
|             |        | D        | L   | H   | h   | □C |
| OWR-HWR-    | 5004G  | 27       | 70  | 100 | 83  | 42 |
|             | 5006G  | 32       | 80  | 104 | 87  |    |
|             | 5010G  | 40       | 90  | 116 | 97  |    |
|             | 5012G  | 50       | 100 | 121 | 102 |    |
|             | 5014F  | —        | 148 | 125 | 105 | 59 |
|             | 5020F  | —        | 173 | 180 | 155 |    |
|             | 5024F  | —        | 179 | 180 | 155 |    |
|             | P7504G | 27       | 70  | 100 | 83  | 42 |
|             | P7506G | 32       | 80  | 104 | 87  |    |
|             | P7510G | 40       | 90  | 116 | 97  |    |
|             | P7512G | 50       | 100 | 121 | 102 |    |
|             | P7514F | —        | 148 | 125 | 106 | 59 |
|             | P7520F | —        | 173 | 180 | 155 |    |
|             | P7524F | —        | 179 | 180 | 155 |    |

| Catalog No. |        | Unit: mm |     |     |    |                |    |
|-------------|--------|----------|-----|-----|----|----------------|----|
|             |        | D        | L   | H   | h  | h <sub>1</sub> | □C |
| XWR-        | 5004G  | 27       | 70  | 100 | 31 | 114            | 42 |
|             | 5006G  | 32       | 80  | 104 | 39 | 126            |    |
|             | 5010G  | 40       | 90  | 116 | 44 | 141            | 59 |
|             | 5012G  | 50       | 100 | 121 | 54 | 156            |    |
|             | P7504G | 27       | 70  | 100 | 31 | 114            | 42 |
|             | P7506G | 32       | 80  | 104 | 39 | 126            |    |
|             | P7510G | 40       | 90  | 116 | 44 | 141            | 59 |
|             | P7512G | 50       | 100 | 121 | 54 | 156            |    |

# PRESSURE REGULATING VALVES

## Type EPR

**SAGINOMIYA**

### GENERAL DESCRIPTION

- Direct operated, 2-way valves designed for maintaining suitable evaporating pressure in refrigeration. Fitted at the evaporator outlet to keep suitable set evaporating pressure.



Type EPR-B



Type EPR-D

### SPECIFICATIONS

| Operation              | Direct Operation type                                                                                                                         |
|------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| Specifications         |                                                                                                                                               |
| Max. Working Pressure  | 2.5MPa {25kgf/cm <sup>2</sup> }                                                                                                               |
| Airtight Test Pressure | 3MPa {30kgf/cm <sup>2</sup> }                                                                                                                 |
| Fulid Temp.            | to 100°C                                                                                                                                      |
| Pressure Adjustment    | ◎ Increase 1604 to 05: 0.08MPa {Approx.0.82kgf/cm <sup>2</sup> } /rotation<br>1905 to 07: 0.05MPa {Approx.0.51kgf/cm <sup>2</sup> } /rotation |

### TYPE NUMBER SELECTION

| Catalog No. |       | Equalization | Port size (mm) | Nominal Capacity (U.S.R.T.) {kW}                     |           |           |           | Adjusting Range (MPa) {kgf/cm <sup>2</sup> } | Connection |                    | Factory Setting (MPa) {kgf/cm <sup>2</sup> } | Wt. (kg) |
|-------------|-------|--------------|----------------|------------------------------------------------------|-----------|-----------|-----------|----------------------------------------------|------------|--------------------|----------------------------------------------|----------|
|             |       |              |                | CT 38°C ΔP0.074MPa {0.75kgf/cm <sup>2</sup> } ET 5°C |           |           |           |                                              |            |                    |                                              |          |
| Type        | Model |              |                | R22                                                  | R134a     | R404A     | R407C     |                                              | Style      | Copper Tube (O.D.) |                                              |          |
| EPR-        | 1604B | Internal     | 15             | 2.6 {9.1}                                            | 1.5 {5.3} | 1.9 {6.7} | 2.0 {6.9} | 0 to 0.6 {0 to 6}                            | Flare      | 1/2"               | 0.3 {3}                                      | 0.3      |
|             | 1605B |              |                |                                                      |           |           |           |                                              |            | 5/8"               |                                              |          |
|             | 1905B |              | 20             | 5.5 {19}                                             | 3.5 {12}  | 4.1 {14}  | 5.4 {19}  |                                              |            | 3/4"               |                                              |          |
|             | 1906B |              |                |                                                      |           |           |           |                                              | 12.7       | 0.2                |                                              |          |
|             | 1604D |              | 15             | 2.6 {9.1}                                            | 1.5 {5.3} | 1.9 {6.7} | 2.0 {6.9} |                                              | 15.88      | 0.4                |                                              |          |
|             | 1605D |              |                |                                                      |           |           |           |                                              | 19.05      |                    |                                              |          |
|             | 1905D |              | 20             | 5.5 {19}                                             | 3.5 {12}  | 4.1 {14}  | 5.4 {19}  |                                              | 22.23      |                    |                                              |          |
|             | 1906D |              |                |                                                      |           |           |           |                                              |            |                    |                                              |          |
|             | 1907D |              |                |                                                      |           |           |           |                                              |            |                    |                                              |          |

- Nominal capacity is based on condensing temp. 38°C, evaporating temp. 5°C, pressure drop across the valve 0.074 MPa {0.75kgf/cm<sup>2</sup>}, and Set Pressure R134a...0.1MPa {1kgf/cm<sup>2</sup>}, R22, R407C...0.2MPa {2kgf/cm<sup>2</sup>}, R404A...0.3MPa {3kgf/cm<sup>2</sup>}

APPLICATION EXAMPLE

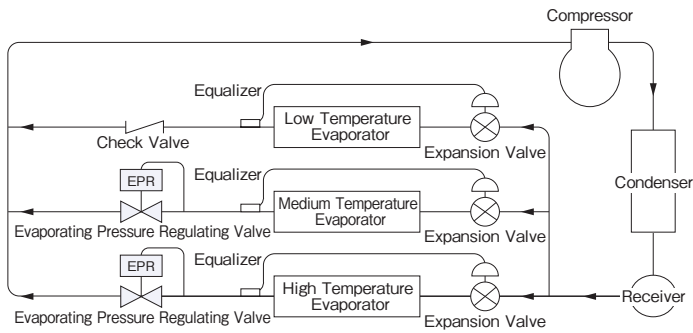
•Evaporating pressure regulating valve type EPR

At multi evaporator system, evaporating pressure regulating valves are used to control each different pressure (temperature) of evaporators.

Compressor operates based on the lowest pressure (temperature) of evaporators, pressure regulating valves keep pressure (temperature) of each evaporator at their setting pressure.

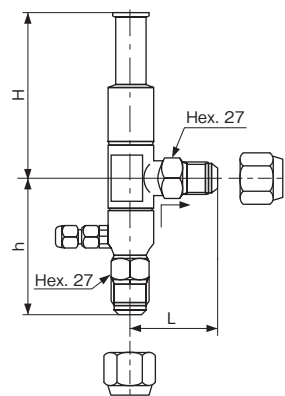
In this case, a check valve is required at the outlet of lowest pressure evaporator.

Also, evaporating pressure regulating valve is used at water chiller for prevent form congelation of cool water and vegetable warehouse for prevents form over dehumidification.

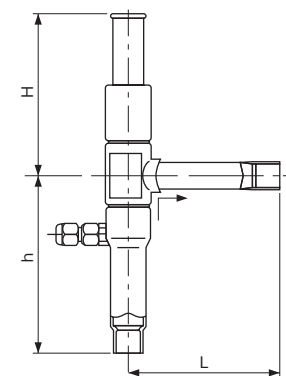


DIMENSIONS

Type EPR-B



Type EPR-D



Unit: mm

| Catalog No. |       | Unit: mm |     |     |
|-------------|-------|----------|-----|-----|
| Type        | Model | L        | H   | h   |
| EPR-        | 1604B | 45       | 82  | 91  |
|             | 1605B | 53       |     | 94  |
|             | 1905B | 56       |     | 100 |
|             | 1906B | 60       | 109 | 105 |
|             | 1604D | 71       | 82  | 78  |
|             | 1605D |          |     |     |
|             | 1905D | 100      | 109 | 120 |
|             | 1907D |          |     |     |

## PRESSURE REGULATING VALVES

High Volume OEM Item (Type DPR)

### Type SPR & DPR

**SAGINOMIYA**

### GENERAL DESCRIPTION

- Type SPR ... Direct operated, 2-way valves, designed for maintaining suitable compressor suction pressure in refrigeration or air conditioning units.

Fitted in suction line after the evaporator to prevent compressor overload.

- Type DPR ... Fitted in by-pass line between compressor discharge and suction line in refrigeration or air conditioning units. (Quantity order only.)

Senses excessive compressor discharge pressure and releases it through the bypass line to the low pressure side to protect the compressor from overloading.

Reduces frequency of cut-in and cut-out of high pressure switch to keep the compressor operating.

A typical advantage is in the heating cycle of heat pump systems during spring or autumn, or at the time when filter is clogged with foreign materials.



Type SPR-B



Type SPR-D



Type DPR

### SPECIFICATIONS (Type SPR)

| Operation Specifications | Standard model                                                                                                                                                                                                      | Set pressure range wide model                                                                                                                                                                                       |
|--------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Max. Working Pressure    | 2.5MPa {25kgf/cm <sup>2</sup> }                                                                                                                                                                                     |                                                                                                                                                                                                                     |
| Airtight Test Pressure   | 3MPa {30kgf/cm <sup>2</sup> }                                                                                                                                                                                       |                                                                                                                                                                                                                     |
| Fulid Temp.              | to 100°C                                                                                                                                                                                                            |                                                                                                                                                                                                                     |
| Pressure Adjustment      | ○ Increase 1604 to 05: Approx. 0.08MPa {0.82kgf/cm <sup>2</sup> } /rotation<br>1905 to 07: Approx. 0.05MPa {0.51kgf/cm <sup>2</sup> } /rotation<br>3011 to 13: Approx. 0.03MPa {0.31kgf/cm <sup>2</sup> } /rotation | ○ Increase 1604 to 05: Approx. 0.13MPa {1.33kgf/cm <sup>2</sup> } /rotation<br>1905 to 07: Approx. 0.07MPa {0.71kgf/cm <sup>2</sup> } /rotation<br>3011 to 13: Approx. 0.04MPa {0.41kgf/cm <sup>2</sup> } /rotation |

### TYPE NUMBER SELECTION

#### Type SPR – Standard model

| Catalog No. |       | Fluid | Port Size (mm) | Nominal Capacity (U.S.R.T.) {kW}       |            |            |        | Connection         |       | Wt. (kg) |
|-------------|-------|-------|----------------|----------------------------------------|------------|------------|--------|--------------------|-------|----------|
|             |       |       |                | CT38°C ΔP0.049MPa {0.5kgf/cm²} ET—10°C |            |            |        |                    |       |          |
| Type        | Model |       |                | R22                                    | R134a      | R404A      | R407C  | Copper Tube (O.D.) | Style |          |
| SPR-        | 1604B | 15    | 1.4 {4.9}      | 0.9 {3.2}                              | 1.1 {3.9}  | 1.3 {4.7}  | 1/2"   | Flare              | 0.3   |          |
|             | 1605B |       |                |                                        |            |            | 5/8"   |                    |       |          |
|             | 1905B |       |                |                                        |            |            | 3/4"   |                    |       |          |
|             | 1906B | 20    | 3.0 {10.5}     | 1.8 {6.3}                              | 2.5 {8.8}  | 3.1 {10.9} | 1/2"   | Solder             | 0.5   |          |
|             | 1604D |       |                |                                        |            |            | 5/8"   |                    |       |          |
|             | 1605D |       |                |                                        |            |            | 3/4"   |                    |       |          |
|             | 1905D | 20    | 3.0 {10.5}     | 1.8 {6.3}                              | 2.5 {8.8}  | 3.1 {10.9} | 7/8"   | 0.4                |       |          |
|             | 1906D |       |                |                                        |            |            | 1-1/8" |                    |       |          |
|             | 1907D |       |                |                                        |            |            | 1-3/8" |                    |       |          |
|             | 3011D | 29    | 5.0 {17.6}     | 2.7 {9.5}                              | 4.5 {15.8} | 5.4 {19.1} |        | 1.3                |       |          |
| 3013D       |       |       |                |                                        |            |            |        |                    |       |          |

• Nominal capacity is based on condensing temp. 38°C, evaporating temp. – 10°C, pressure drop across the valve 0.049 MPa {0.5kgf/cm<sup>2</sup>}, and Set Pressure R134a...0.2MPa {2kgf/cm<sup>2</sup>}, R22,R407C...0.4MPa {4kgf/cm<sup>2</sup>}, R404A...0.5MPa {5kgf/cm<sup>2</sup>}.

#### Type SPR – Set pressure range wide model

| Catalog No. |        | Fluid | Port Size (mm) | Nominal Capacity (U.S.R.T.) {kW}       | Connection         |       | Wt. (kg) |
|-------------|--------|-------|----------------|----------------------------------------|--------------------|-------|----------|
|             |        |       |                | CT38°C ΔP0.049MPa {0.5kgf/cm²} ET—10°C |                    |       |          |
| Type        | Model  |       |                | R404A                                  | Copper Tube (O.D.) | Style |          |
| SPR-        | 1604BW | 15    | 1.08 {3.8}     | 1/2"                                   | Flare              | 0.3   |          |
|             | 1605BW |       |                | 5/8"                                   |                    |       |          |
|             | 1905BW |       |                | 3/4"                                   |                    |       |          |
|             | 1906BW | 20    | 2.1 {7.4}      | 1/2"                                   | Solder             | 0.2   |          |
|             | 1604DW |       |                | 5/8"                                   |                    |       |          |
|             | 1605DW |       |                | 3/4"                                   |                    |       |          |
|             | 1905DW | 20    | 2.1 {7.4}      | 7/8"                                   |                    | 0.4   |          |
|             | 1906DW |       |                |                                        |                    |       |          |
|             | 1907DW |       |                |                                        |                    |       |          |
|             | 3011DW | 29    | 4.04 {14.2}    | 1-1/8"                                 |                    | 1.3   |          |
| 3013DW      | 1-3/8" |       |                |                                        |                    |       |          |

• Nominal capacity is based on condensing temp. 38°C, evaporating temp. – 10°C, pressure drop across the valve 0.049 MPa {0.5kgf/cm<sup>2</sup>}, and Set Pressure 0.5MPa {5kgf/cm<sup>2</sup>}.

## Type DPR

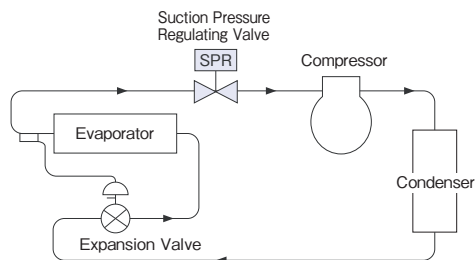
| Catalog No. |       | Fluid                    | Port Size (mm) | * Factory Adjustable Range (MPa) | Connection (mm) |        | Max. Working Press. (MPa) {kgf/cm <sup>2</sup> } | Wt. (kg) |
|-------------|-------|--------------------------|----------------|----------------------------------|-----------------|--------|--------------------------------------------------|----------|
| Type        | Model |                          |                |                                  | Tube (I.D.)     | Style  |                                                  |          |
| <b>DPR-</b> | 343D  | Fluorinated Refrigerants | 3.4            | 0.98 to 2.45                     | 7.94            | Solder | 2.9 {29}                                         | 0.11     |

The drawing exchange is necessary for the instruction of working pressure setting. Please contact us before order.

## APPLICATION EXAMPLE

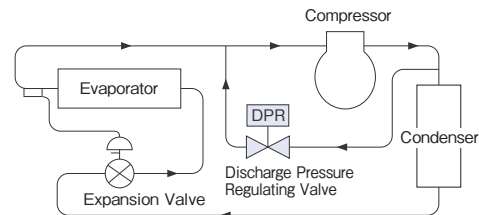
### • Suction pressure regulating valve type SPR

Suction pressure regulating valve is installed between compressor and evaporator in order to keep outlet pressure (suction pressure) under it's setting. In case of rapid increase of load, suction pressure regulating valve could be used to prevent from overload of electric motor for compressor.



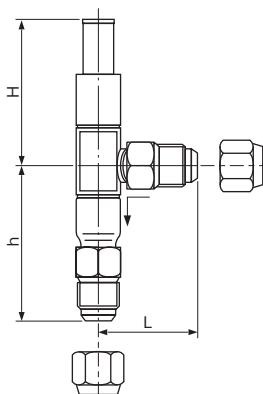
### • Discharge pressure regulating valve type DPR

Discharge pressure regulating valve is mounted in the low-pressure side bypass piping from the discharge piping of a compressor as a control valve to control the discharge pressure to be lower than the specified pressure for the purpose of preventing the compressor from being an abnormal high pressure.

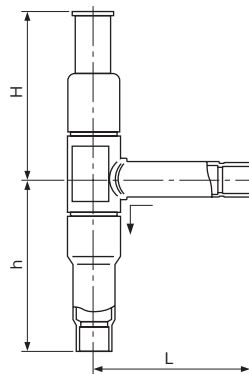


## DIMENSIONS

Type SPR-B

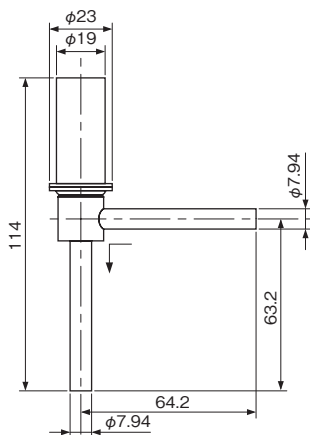


Type SPR-D



| Catalog No. |       | Unit: mm |     |     |
|-------------|-------|----------|-----|-----|
| Type        | Model | L        | H   | h   |
| <b>SPR-</b> | 1604B | 45       | 82  | 91  |
|             | 1605B | 53       |     | 94  |
|             | 1905B | 56       | 109 | 100 |
|             | 1906B | 60       |     | 105 |
|             | 1604D | 71       | 82  | 78  |
|             | 1605D |          |     |     |
|             | 1905D | 100      | 109 | 120 |
|             | 1906D |          |     |     |
|             | 1907D |          |     |     |
|             | 3011D | 140      | 147 | 170 |
|             | 3013D |          |     |     |

Type DPR



Unit: mm

# PRESSURE REGULATING VALVES

## Type HPR

**SAGINOMIYA**

## GENERAL DESCRIPTION

- Type HPR can control the condensing pressure corresponding to the change in the outside temperature, and prevents the condensation pressure decrease in the control in winter, also steady throughout the year control is possible.
- This product properly maintains the inlet pressure of the expansion valve and prevents the decrease in the refrigeration capacity.
- Suitable for refrigeration systems with hot gas defrosting.



## SPECIFICATIONS

Max. Working Pressure: 2.9MPa {29kgf/cm<sup>2</sup>} (R22, R134a, R404A, R407C)

4.17MPa {41.7kgf/cm<sup>2</sup>} (R410A)

Airtight Test Pressure: 3.5MPa {35kgf/cm<sup>2</sup>} (R22, R134a, R404A, R407C)

4.17MPa {41.7kgf/cm<sup>2</sup>} (R410A)

Fluid Temperature: to 125°C

## TYPE NUMBER SELECTION

| Catalog No. |           |                                                             | Port size (mm) | Connection         |                             | Factory Setting (MPa)                 | Wt. (kg) |
|-------------|-----------|-------------------------------------------------------------|----------------|--------------------|-----------------------------|---------------------------------------|----------|
| Type        | Model     | Refrigerant                                                 |                | Copper Tube (O.D.) | Style                       |                                       |          |
| HPR-        | 1304D [B] | H (R22)<br>M (R134a)<br>U (R404A)<br>P (R407C)<br>V (R410A) | 13             | 1/2"               | Copper Tube O.D.<br>[Flare] | 1.32 (H,U,P)<br>0.686 (M)<br>2.15 (V) | 0.76     |
|             | 1305D [B] |                                                             |                | 5/8"               |                             |                                       |          |
|             | 2207D     |                                                             | 22             | 7/8"               |                             |                                       | 1.65     |

• Flare type is produced only 5/8 and 1/2.

• R410A type is produced only 5/8 and 1/2.

## CAPACITY TABLE

Nominal capacity is based on condensing temp. 38°C, evaporating temp. 5°C, and Supercooling temp. 0°C.

### R22

| Catalog No. |             | Port size (mm) | Capacity (U.S.R.T.) {kW}                       |             |              |             |              |             |              |             |
|-------------|-------------|----------------|------------------------------------------------|-------------|--------------|-------------|--------------|-------------|--------------|-------------|
|             |             |                | R22                                            |             |              |             |              |             |              |             |
| Type        | Model       |                | Pressure drop across the valve (MPa) {kgf/cm²} |             |              |             |              |             |              |             |
|             |             |                | 0.005 {0.05}                                   | 0.01 {0.1}  | 0.015 {0.15} | 0.02 {0.2}  | 0.025 {0.25} | 0.03 {0.3}  | 0.035 {0.35} | 0.04 {0.4}  |
| HPR-        | 1304D [B] H | 13             | 5.97 {21.0}                                    | 8.50 {29.9} | 10.4 {36.5}  | 12.0 {42.2} | 13.4 {47.1}  | 15.2 {53.5} | 16.1 {56.6}  | 17.0 {59.8} |
|             | 1305D [B] H |                |                                                |             |              |             |              |             |              |             |
|             |             | 2207DH         | 22                                             | 14.7 {51.7} | 20.8 {73.1}  | 25.6 {90.0} | 29.6 {104}   | 33.0 {116}  | 36.1 {127}   | 39.0 {137}  |

### R134a

| Catalog No. |             | Port size (mm) | Capacity (U.S.R.T.) {kW}                       |              |             |              |             |              |             |             |
|-------------|-------------|----------------|------------------------------------------------|--------------|-------------|--------------|-------------|--------------|-------------|-------------|
|             |             |                | R134a                                          |              |             |              |             |              |             |             |
| Type        | Model       |                | Pressure drop across the valve (MPa) {kgf/cm²} |              |             |              |             |              |             |             |
|             |             | 0.005 {0.05}   | 0.01 {0.1}                                     | 0.015 {0.15} | 0.02 {0.2}  | 0.025 {0.25} | 0.03 {0.3}  | 0.035 {0.35} | 0.04 {0.4}  |             |
| HPR-        | 1304D [B] M | 13             | 5.94 {20.9}                                    | 8.47 {29.8}  | 10.4 {36.4} | 12.0 {42.2}  | 13.3 {46.9} | 15.1 {53.1}  | 16.0 {56.1} | 16.9 {59.4} |
|             | 1305D [B] M |                |                                                |              |             |              |             |              |             |             |
|             | 2207DM      | 22             | 14.6 {51.5}                                    | 20.7 {72.8}  | 25.5 {89.5} | 29.3 {103}   | 33.0 {116}  | 35.8 {126}   | 39.0 {137}  | 41.8 {147}  |

### R404A

| Catalog No. |             | Port size (mm) | Capacity (U.S.R.T.) {kW}                       |              |             |              |             |              |             |             |
|-------------|-------------|----------------|------------------------------------------------|--------------|-------------|--------------|-------------|--------------|-------------|-------------|
|             |             |                | R404A                                          |              |             |              |             |              |             |             |
| Type        | Model       |                | Pressure drop across the valve (MPa) {kgf/cm²} |              |             |              |             |              |             |             |
|             |             | 0.005 {0.05}   | 0.01 {0.1}                                     | 0.015 {0.15} | 0.02 {0.2}  | 0.025 {0.25} | 0.03 {0.3}  | 0.035 {0.35} | 0.04 {0.4}  |             |
| HPR-        | 1304D [B] U | 13             | 3.90 {13.7}                                    | 5.23 {18.4}  | 6.74 {23.7} | 7.88 {27.7}  | 8.73 {30.7} | 9.87 {34.7}  | 10.5 {36.8} | 11.0 {38.7} |
|             | 1305D [B] U |                |                                                |              |             |              |             |              |             |             |
|             | 2207DU      | 22             | 9.58 {33.7}                                    | 13.6 {47.7}  | 16.7 {58.7} | 19.3 {67.8}  | 21.6 {75.8} | 23.6 {82.9}  | 25.5 {89.6} | 27.3 {95.9} |

## R407C

| Catalog No. |             | Port size (mm) | Capacity (U.S.R.T.) {kW}                       |             |              |             |              |             |              |             |
|-------------|-------------|----------------|------------------------------------------------|-------------|--------------|-------------|--------------|-------------|--------------|-------------|
|             |             |                | R407C                                          |             |              |             |              |             |              |             |
| Type        | Model       |                | Pressure drop across the valve (MPa) {kgf/cm²} |             |              |             |              |             |              |             |
|             |             |                | 0.005 {0.05}                                   | 0.01 {0.1}  | 0.015 {0.15} | 0.02 {0.2}  | 0.025 {0.25} | 0.03 {0.3}  | 0.035 {0.35} | 0.04 {0.4}  |
| HPR-        | 1304D [B] P | 13             | 6.14 {21.6}                                    | 8.76 {30.8} | 10.7 {37.6}  | 12.4 {43.5} | 13.8 {48.5}  | 15.7 {55.1} | 16.6 {58.3}  | 17.5 {61.6} |
|             | 1305D [B] P |                |                                                |             |              |             |              |             |              |             |
|             | 2207DP      | 22             | 15.1 {53.1}                                    | 21.4 {75.1} | 26.3 {92.4}  | 30.4 {107}  | 33.8 {119}   | 37.0 {130}  | 40.1 {141}   | 42.9 {151}  |

## R410A

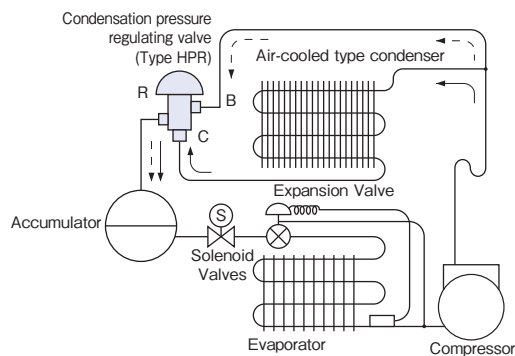
| Catalog No. |             | Port size (mm) | Capacity (U.S.R.T.) {kW}                       |             |              |             |              |             |              |             |
|-------------|-------------|----------------|------------------------------------------------|-------------|--------------|-------------|--------------|-------------|--------------|-------------|
|             |             |                | R410A                                          |             |              |             |              |             |              |             |
| Type        | Model       |                | Pressure drop across the valve (MPa) {kgf/cm²} |             |              |             |              |             |              |             |
|             |             |                | 0.005 {0.05}                                   | 0.01 {0.1}  | 0.015 {0.15} | 0.02 {0.2}  | 0.025 {0.25} | 0.03 {0.3}  | 0.035 {0.35} | 0.04 {0.4}  |
| HPR-        | 1304D [B] V | 13             | 6.57 {23.1}                                    | 9.36 {32.9} | 11.4 {40.2}  | 13.2 {46.4} | 14.7 {51.8}  | 16.8 {58.9} | 17.7 {62.3}  | 18.7 {65.8} |
|             | 1305D [B] V |                |                                                |             |              |             |              |             |              |             |

## APPLICATION EXAMPLE

This product can control the condensing pressure corresponding to the change in the outside temperature, and prevents the condensing pressure decrease in the control in the winter, also steady throughout the year control is possible.

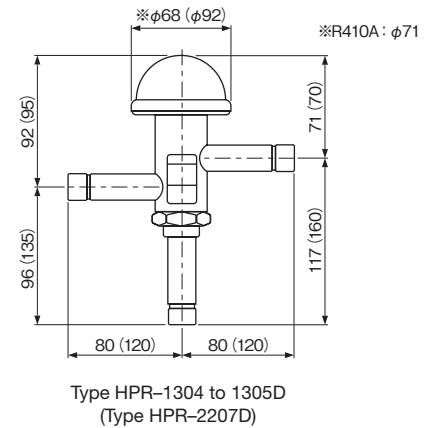
This product properly maintains the inlet pressure of the expansion valve and prevents the decrease in the refrigeration capacity.

Suitable for use in refrigeration systems with hot gas defrosting and in extremely cold region.



- Condensing Pressure higher than the set value (summer) C→R
- Condensing Pressure lower than the set value (winter) B→R

## DIMENSIONS



Unit: mm

# DIAPHRAGM TYPE STOP VALVES

## Type ADV

**SAGINOMIYA**

### GENERAL DESCRIPTION

- The valve can be used on the lines of delivery gas, liquid, suction gas and hot gas, etc.
- The valve is applicable to not only Fluorinated refrigerants, but also air.
- In spite of its compactness and light weight, the port diameter is comparatively large to enable to flow a large amount.
- The large diameter handle makes easy and smooth rotation even in vacuum condition.
- Carefully processed valve with selected material provides long trouble free service and dependable operation.
- Type ADV cannot be used in a reverse flow.



Type ADV-B



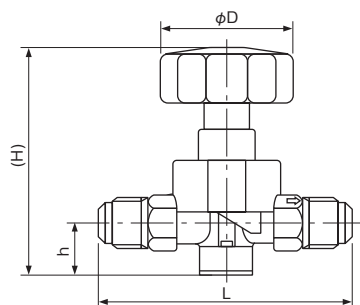
Type ADV-D

### TYPE NUMBER SELECTION (SPECIFICATIONS)

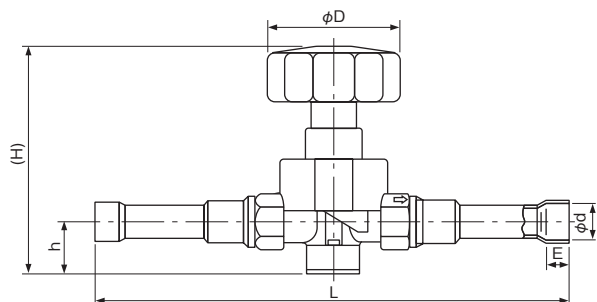
Unit: MPa {kgf/cm<sup>2</sup>}

| Catalog No. |        | Port Size (mm) | Cv Value | Connection         |        | Max. Working Pressure | Fluid Temp. (°C) | Wt. (kg) |
|-------------|--------|----------------|----------|--------------------|--------|-----------------------|------------------|----------|
|             |        |                |          | Copper Tube (O.D.) | Style  |                       |                  |          |
| ADV-        | 902BY  | 9              | 0.35     | 1/4"               | Flare  | 3.6 {36}              | -40 to 120       | 0.26     |
|             | 903BY  |                | 0.79     | 3/8"               |        |                       |                  | 0.32     |
|             | 1404BY | 14             | 1.61     | 1/2"               |        |                       |                  | 0.51     |
|             | 1605BY | 16             | 2.82     | 5/8"               |        |                       |                  | 0.85     |
|             | 1606BY |                | 3.46     | 3/4"               |        |                       |                  | 1.13     |
|             | 902DY  | 9              | 0.35     | 1/4" (6.35)        | Solder |                       |                  | 0.24     |
|             | 903DY  |                | 0.79     | 3/8" (9.53)        |        |                       |                  | 0.28     |
|             | 1404DY | 14             | 1.61     | 1/2" (12.7)        |        |                       |                  | 0.46     |
|             | 1605DY | 16             | 2.82     | 5/8" (15.88)       |        |                       |                  | 0.76     |
|             | 1606DY |                | 3.46     | 3/4" (19.05)       |        |                       |                  | 0.91     |
|             | 1607DY |                |          | 7/8" (22.23)       |        |                       |                  |          |

### DIMENSIONS



Type ADV-BY



Type ADV-DY

Unit: mm

| Catalog No. |        | Unit: mm |      |      |    |       |    |
|-------------|--------|----------|------|------|----|-------|----|
|             |        | L        | H    | h    | φD | φd    | E  |
| ADV-        | 902BY  | 80       | 75   | 20   | 52 | —     | —  |
|             | 903BY  | 85       | 75.5 | 19.5 |    |       |    |
|             | 1404BY | 101      | 87.5 |      |    |       |    |
|             | 1605BY | 128      | 98   | 23   | 70 |       |    |
|             | 1606BY | 135      | 102  | 25   |    |       |    |
|             | 902DY  | 165      | 75   | 20   | 52 | 6.5   | 8  |
|             | 903DY  |          | 75.5 | 19.5 |    | 9.65  |    |
|             | 1404DY |          | 87.5 |      |    | 12.95 |    |
|             | 1605DY | 200      | 98   | 23   | 70 | 16.15 | 12 |
|             | 1606DY |          | 102  | 25   |    | 19.3  | 14 |
| 1607DY      | 22.45  |          |      |      |    |       |    |

# BELLOWS TYPE STOP VALVES

## Type NBV

**SAGINO MIYA**

### GENERAL DESCRIPTION

- The valve is a bellows seal type stop valve.
- There is no external leakage from the ground part.
- It can be used for fluorocarbon refrigerant circuits such as R22, R134a, R404A, compressed air etc.
- Fluid Temperature: — 30 to 120°C



### TYPE NUMBER SELECTION

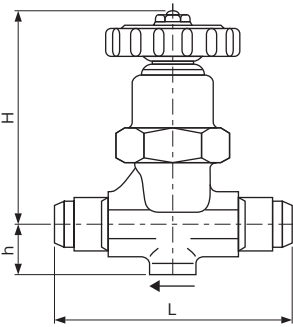
#### Flare Type

| Catalog No. |        |                                             | Port Size (mm) | Cv Value | Connection |                                  | Wt. (kg) |
|-------------|--------|---------------------------------------------|----------------|----------|------------|----------------------------------|----------|
| Type        | Model  | Pressure class (Max.Working Pressure) (Mpa) |                |          | Size       | Style                            |          |
| NBV-        | 502B   | X (2.94)                                    | 5              | 0.36     | 1/4"       | Flare (JIS B8607)                | 0.3      |
|             | 803B   |                                             | 7.5            | 0.82     | 3/8"       |                                  | 0.4      |
|             | 1004B  |                                             | 10             | 1.4      | 1/2"       |                                  | 0.6      |
|             | 1305B  |                                             | 13             | 2.4      | 5/8"       |                                  | 0.8      |
|             | 1606B  |                                             | 16             | 4.2      | 3/4"       |                                  | 1.2      |
|             | 502AMB |                                             | 5              | 0.39     | 1/4"       | Inlet R Outlet Flare (JIS B8067) | 0.3      |
|             | 803AMB |                                             | 7.5            | 0.89     | 3/8"       |                                  | 0.4      |
|             |        |                                             |                |          |            |                                  |          |
| NBV-        | 502B   | Y (3.53)                                    | 5              | 0.36     | 1/4"       | Flare (JIS B8607)                | 0.3      |
|             | 803B   |                                             | 7.5            | 0.82     | 3/8"       |                                  | 0.4      |
|             | 1004B  |                                             | 10             | 1.4      | 1/2"       |                                  | 0.6      |
|             | 1305B  |                                             | 13             | 2.4      | 5/8"       |                                  | 0.8      |
|             | 1606B  |                                             | 16             | 4.2      | 3/4"       |                                  | 1.2      |
|             | 502AMB |                                             | 5              | 0.39     | 1/4"       | Inlet R Outlet Flare (JIS B8067) | 0.3      |
|             | 803AMB |                                             | 7.5            | 0.89     | 3/8"       |                                  | 0.4      |
|             |        |                                             |                |          |            |                                  |          |

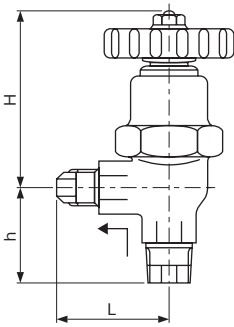
#### Pipe Thread Type

| Catalog No. |        |                                             | Port Size (mm) | Cv Value | Connection |       | Wt. (kg) |
|-------------|--------|---------------------------------------------|----------------|----------|------------|-------|----------|
| Type        | Model  | Pressure class (Max.Working Pressure) (Mpa) |                |          | Size       | Style |          |
| NBV-        | 802G   | X (2.94)                                    | 7.5            | 0.8      | 1/4"       | Rc    | 0.3      |
|             | 1003G  |                                             | 10             | 1.4      | 3/8"       |       | 0.4      |
|             | 1304G  |                                             | 13             | 2.9      | 1/2"       |       | 0.6      |
|             | 2006G  |                                             | 20             | 6.7      | 3/4"       |       | 1.1      |
|             | 802AG  |                                             | 7.5            | 0.8      | 1/4"       |       | 0.3      |
|             | 1003AG |                                             | 10             | 1.5      | 3/8"       |       | 0.4      |
|             | 1304AG |                                             | 13             | 3.1      | 1/2"       |       | 0.6      |
|             | 2006AG |                                             | 20             | 7.3      | 3/4"       |       | 1.1      |
| NBV-        | 802G   | Y (3.53)                                    | 7.5            | 0.8      | 1/4"       | Rc    | 0.3      |
|             | 1003G  |                                             | 10             | 1.4      | 3/8"       |       | 0.4      |
|             | 1304G  |                                             | 13             | 2.9      | 1/2"       |       | 0.6      |
|             | 2006G  |                                             | 20             | 6.7      | 3/4"       |       | 1.1      |
|             | 802AG  |                                             | 7.5            | 0.8      | 1/4"       |       | 0.3      |
|             | 1003AG |                                             | 10             | 1.5      | 3/8"       |       | 0.4      |
|             | 1304AG |                                             | 13             | 3.1      | 1/2"       |       | 0.6      |
|             | 2006AG |                                             | 20             | 7.3      | 3/4"       |       | 1.1      |

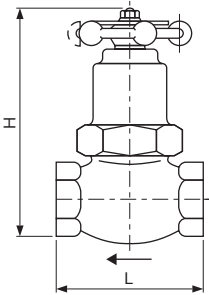
DIMENSIONS



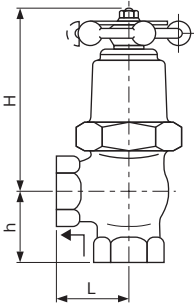
Type NBV-B



Type NBV-AMB



Type NBV-G



Type NBV-AG

| Catalog No. |        | L   | H    | h  |
|-------------|--------|-----|------|----|
| NBV-        | 502B   | 60  | 61   | 12 |
|             | 803B   | 70  | 65   | 15 |
|             | 1004B  | 90  | 78   | 17 |
|             | 1305B  | 100 | 85   | 18 |
|             | 1606B  | 110 | 88.5 | 26 |
|             | 502AMB | 35  | 55   | 30 |
|             | 803AMB | 40  | 65   | 40 |
|             | 802G   | 54  | 65   | -  |
|             | 1003G  | 60  | 78   |    |
|             | 1304G  | 65  | 79   |    |
|             | 2006G  | 80  | 105  |    |
|             | 802AG  | 24  | 58   | 24 |
|             | 1003AG | 28  | 71   | 28 |
|             | 1304AG | 33  | 73   | 33 |
|             | 2006AG | 40  | 105  | 40 |

Unit: mm



**OTHER CONTROL EQUIPMENT**

**FLOW SWITCHES** ..... 116  
Type **FQS**  
**CONDENSER FAN SPEED CONTROLLERS** .... 119–120  
Type **RGE**  
**CONDENSER FAN SPEED CONTROLLERS** ..... 121  
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**TEMPERATURE RECORDERS** ..... 122  
Type **AKM & BKM**  
**CO<sub>2</sub> REFRIGERANT APPLICATIONS** ..... 125–127  
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**BELLOWS** ..... 128  
Type **HBL & WSL**  
**OTHER CONTROLS & VALVES** ..... 129  
Type **RKV & BI-METAL (No. 03, 05 & 24)**

# FLOW SWITCHES

## Type FQS

SAGINO MIYA

## GENERAL DESCRIPTION

- For use on liquid lines such as water, ethylene glycol, or any non-corrosive fluid in chillers, pumps, condensers, boilers, etc.
- With S.P.D.T. contact mechanism.
- Paddle consists of three segments that can be removed or trimmed for use in 1 to 6" pipe.
- Drip proof models: Available upon request.

CE mark applicable (available upon request)

UL listed (available upon request)



## SPECIFICATIONS

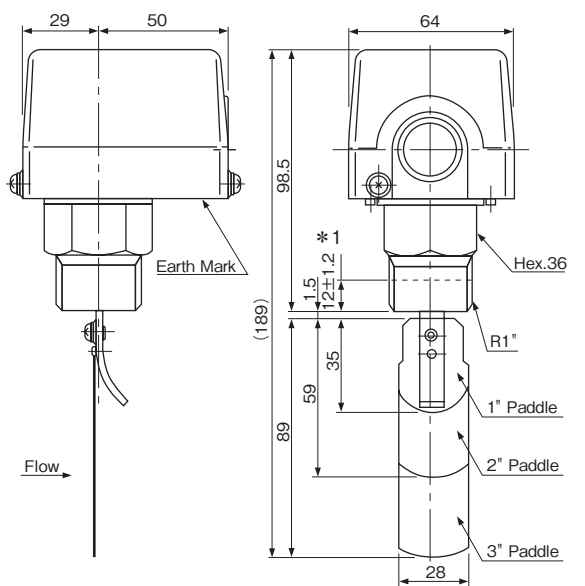
| Catalog No.     | Paddle Size | Connection |       | Max. Working Pressure<br>MPa{kgf/cm <sup>2</sup> } | Fluid Temp.<br>(°C) | Max. Flow Velocity<br>(m/s) | Wt.<br>(kg) |
|-----------------|-------------|------------|-------|----------------------------------------------------|---------------------|-----------------------------|-------------|
|                 |             | Size       | Style |                                                    |                     |                             |             |
| <b>FQS-U30G</b> | 1"+2"+3"    | 1"         | R     | 0.98<br>{10}                                       | 5 to 80             | 2                           | 0.6         |

• Enclosure: IP20 (IP62 model: available upon request.)

## ELECTRICAL RATINGS

| Rated Voltage (V)     |              | Power Factor<br>(cos $\phi$ ) | 125V.<br>AC | 250V.<br>AC |
|-----------------------|--------------|-------------------------------|-------------|-------------|
| Rated Current (A)     |              |                               |             |             |
| Non-Inductive Current |              | 1                             | 15          | 15          |
| Inductive<br>Current  | Full Load    | 0.75                          | 3.5         | 2.5         |
|                       | Locked Rotor | 0.45                          | 21          | 15          |

## DIMENSIONS



\* 1 Connection screwed length to a Tee joint is 12 ± 1.2mm. Unit: mm

## OPERATION ADJUSTMENT RANGE TABLE

- When the operating value is not specified, the flow switch is shipped with the operating value set around the minimum flow rate.
- When you turn the flow adjusting screw clockwise, the operating point goes up. When you turn it counterclockwise, the operating point goes down.
- When more than two paddles is attached, you can change the flow rate adjustment range by removing the paddles one by one in order of the longer paddle first.

| Pipe Size | Paddle Size | * 2 Adjustment range (L/min) |               |               |               |
|-----------|-------------|------------------------------|---------------|---------------|---------------|
|           |             | Min.                         |               | Max.          |               |
|           |             | Flow Decrease                | Flow Increase | Flow Decrease | Flow Increase |
| 1"        | 1"          | 18                           | 28            | 45            | 55            |
| 1-1/4"    |             | 43                           | 53            | 100           | 120           |
| 1-1/2"    |             | 63                           | 78            | 135           | 162           |
| 2"        | 1"+2"       | 50                           | 65            | 150           | 180           |
|           | 1"          | 151                          | 181           | 220           | 264           |
| 2-1/2"    | 1"+2"       | 105                          | 126           | 355           | 426           |
|           | 1"          | 356                          | 427           | 360           | 432           |
| 3"        | 1"+2"+3"    | 100                          | 120           | 225           | 270           |
|           | 1"+2"       | 226                          | 271           | 480           | 576           |
|           | 1"          | 481                          | 577           | 510           | 612           |
| 4"        | 1"+2"+3"    | 200                          | 240           | 385           | 462           |
|           | 1"+2"       | 386                          | 463           | 820           | 984           |
|           | 1"          | 821                          | 985           | 870           | 1044          |
| 5"        | 1"+2"+3"    | 350                          | 420           | 594           | 713           |
|           | 1"+2"       | 595                          | 714           | 1265          | 1518          |
|           | 1"          | 1266                         | 1519          | 1342          | 1610          |
| 6"        | 1"+2"+3"    | 530                          | 636           | 836           | 1003          |
|           | 1"+2"       | 837                          | 1004          | 1780          | 2136          |
|           | 1"          | 1781                         | 2137          | 1890          | 2268          |

\* 2 Flow decrease ... Flow amount at which the switch operates on flow decrease.  
Flow increase ... Flow amount at which the switch operates on flow increase.

# CONDENSER FAN SPEED CONTROLLERS

Type RGE

SAGInoMIYA

## GENERAL DESCRIPTION

- The most suitable for controlling the condenser fan speed of freezing or refrigeration condensing units, package air conditioners, or other units which are operated throughout the year.
- Keep condensing pressure constant in winter and intermediate seasons for stable operation.
- Following modes are selectable during low-speed operation.
  - Minimum Speed Operation
  - Cut off Operation
- Excellent electrical noise-resistant design.
- Applicable to the external forced operation switch.

CE mark applicable

SP<sub>US</sub> listed (available upon request)



Single-phase type



Three-phase type

## SPECIFICATIONS

- Max. working pressure: 4.7MPa
- Control method: Phase control
- Enclosure: IP54

## TYPE NUMBER SELECTION

| Catalog No. | *1 F.V.S. Setting (MPa) |                 |     | *2 E.P.B. (MPa) | Refrigerants      | Electrical Ratings                         |                             | Function                                                                                                                                    | Ambient Temp. (°C) | Operation | Wt. (kg) |
|-------------|-------------------------|-----------------|-----|-----------------|-------------------|--------------------------------------------|-----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|--------------------|-----------|----------|
|             | Factory Set             | Adjusting Range |     |                 |                   |                                            | Ampere                      |                                                                                                                                             |                    |           |          |
|             | Min.                    | Max.            |     |                 |                   |                                            |                             |                                                                                                                                             |                    |           |          |
| RGE-Z1L4-7  | 1.9                     | 0.8             | 2.8 | Fixed 0.6       | R22, R404A, R407C | Single phase<br>200 to 240V. AC<br>50/60Hz | 0.2 to 3A                   | At approx. 45% (50Hz)<br>at approx. 35% (60Hz)<br>Cut Off or Minimum<br>Speed function is<br>selectable with<br>changeover switch.          | -20 to 55          | ①         | 0.36     |
| RGE-Z1L6-7  | 3.2                     | 1.6             | 3.9 | Fixed 0.9       | R410A             |                                            | 0.2 to 4A                   |                                                                                                                                             |                    |           | 0.5      |
| RGE-Z1N4-7  | 1.9                     | 0.8             | 2.8 | Fixed 0.4       | R22, R404A, R407C |                                            | 0.2 to 6A                   |                                                                                                                                             |                    |           | 0.54     |
| RGE-Z1N6-7  | 3.2                     | 1.6             | 3.9 | Fixed 0.8       | R410A             |                                            | Default setting:<br>Cut Off | 0.58                                                                                                                                        |                    |           |          |
| RGE-Z1P4-7  | 1.9                     | 0.8             | 2.8 | Fixed 0.4       | R22, R404A, R407C |                                            |                             |                                                                                                                                             |                    |           |          |
| RGE-Z1P6-7  | 3.2                     | 1.6             | 3.9 | Fixed 0.8       | R410A             |                                            |                             |                                                                                                                                             |                    |           |          |
| RGE-Z1Q4-7  | 1.9                     | 0.8             | 2.8 | Fixed 0.4       | R22, R404A, R407C |                                            |                             |                                                                                                                                             |                    |           |          |
| RGE-Z1Q6-7  | 3.2                     | 1.6             | 3.9 | Fixed 0.8       | R410A             |                                            |                             |                                                                                                                                             |                    |           |          |
| RGE-Z3R4-7  | 1.6                     | 0.8             | 2.8 | Fixed 0.4       | R22, R404A, R407C | Three phase<br>200 to 240V. AC<br>50/60Hz  | 0.2 to 5A                   | At approximately 35%,<br>Cut Off or Minimum<br>Speed function is<br>selectable with<br>changeover switch.<br>Default setting:<br>Min. Speed | -20 to 50          | ②         | 1.4      |
| RGE-Z3R6-7  | 3.2                     | 1.6             | 3.9 | Fixed 0.8       | R410A             |                                            | 0.2 to 7A                   |                                                                                                                                             |                    |           | 1.53     |
| RGE-Z3T4-7  | 1.6                     | 0.8             | 2.8 | Fixed 0.6       | R22, R404A, R407C |                                            |                             |                                                                                                                                             |                    |           |          |
| RGE-Z3T6-7  | 3.2                     | 1.6             | 3.9 | Fixed 0.8       | R410A             | Three phase<br>380 to 415V. AC<br>50/60Hz  | 0.2 to 5A                   |                                                                                                                                             | -15 to 50          |           | 1.4      |
| RGE-X3R4-7  | 1.6                     | 0.8             | 2.8 | Fixed 0.4       | R22, R404A, R407C |                                            |                             |                                                                                                                                             |                    |           |          |
| RGE-X3R6-7  | 3.2                     | 1.6             | 3.9 | Fixed 0.8       | R410A             |                                            |                             |                                                                                                                                             |                    |           |          |

\* 1: The pressure at which the control delivers 95% output effective voltage (VRMS).

\* 2: Pressure width where effective voltage corresponds to the minimum speed or causes cut off operation

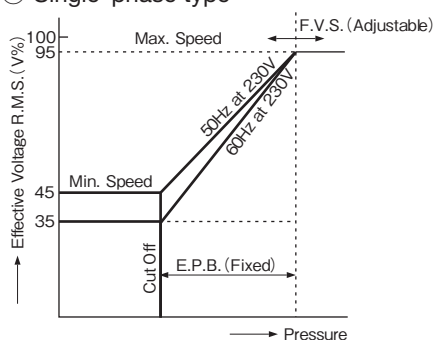
• Min. speed: Fan motor will be kept running at the specific value (V%) when pressure band increase more than E.P.B.

• Cut off: Fan motor will be stopped when pressure decrease to the specific value (V%) for R.M.S.

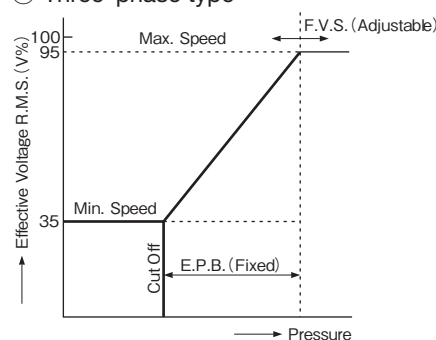
• For other pressure set values or min. speed/cut off set values, please contact us.

## OPERATION

① Single-phase type



② Three-phase type

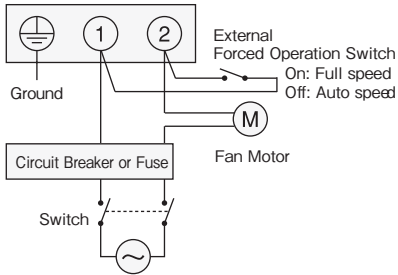


The operating characteristics may vary according to the voltage, frequency, and fan motor characteristics.

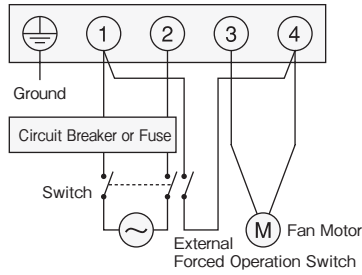
## WIRING

### Single-phase type

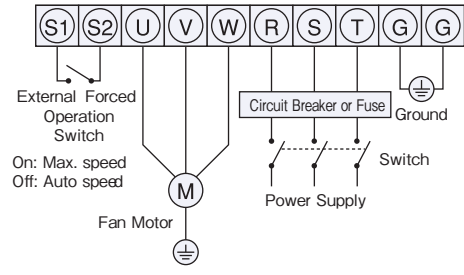
for 2A (RGE-Z1)



for 4A, 6A, 8A (RGE-Z1)



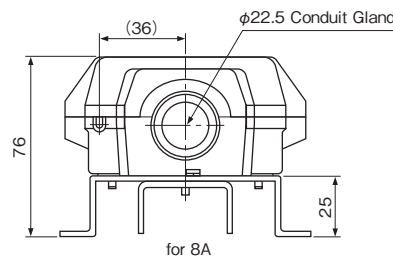
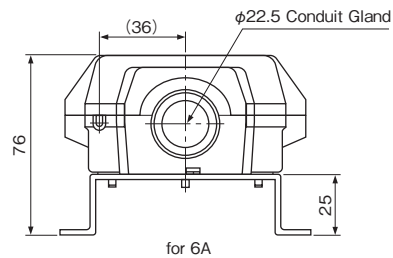
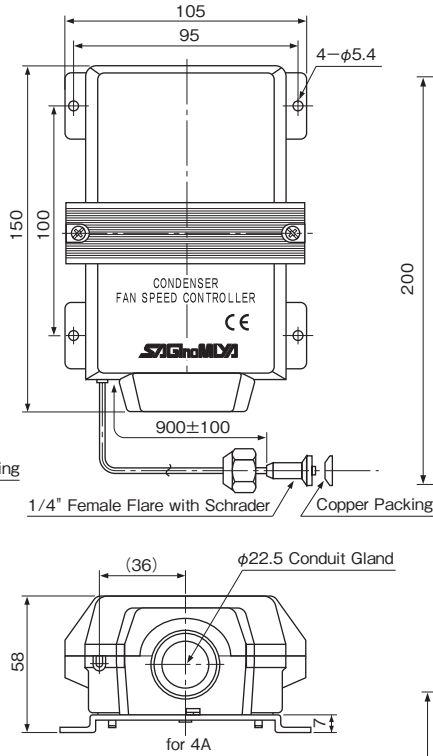
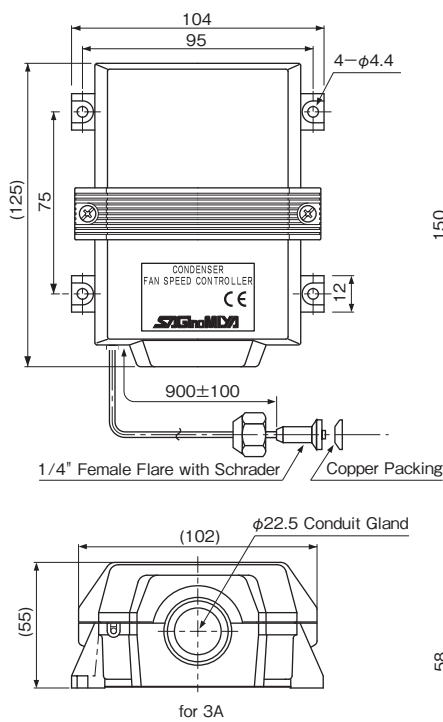
### Three-phase type



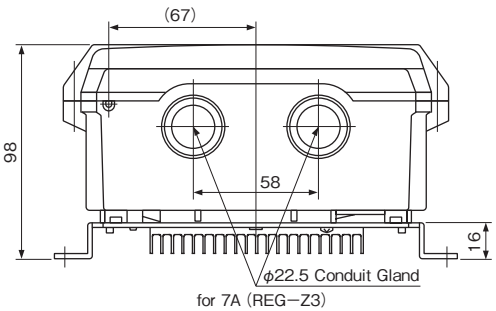
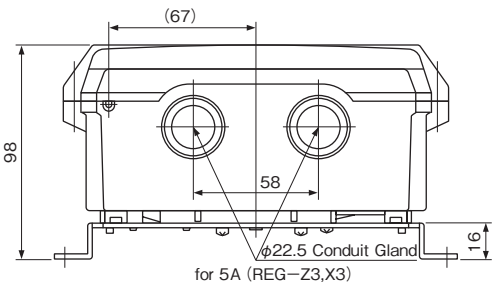
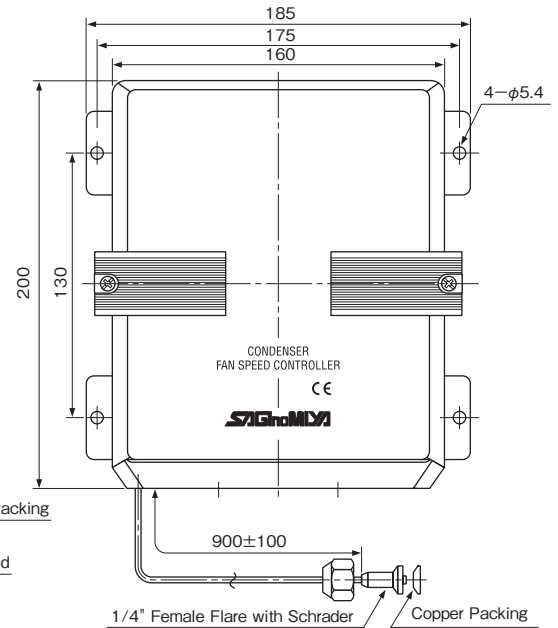
Use external forced operation switch that is able to reduce current consumption of fan motors. Use a forced operation switch with non-voltage contact signal.

## DIMENSIONS

### Single-phase type



### Three-phase type



Unit: mm

# CONDENSER FAN SPEED CONTROLLERS

Type **XGE**

**SAGInoMIYA**

## GENERAL DESCRIPTION

- The most suitable for controlling the speed of a condenser fan of freezing and refrigeration condensing unit, package air conditioner and other units which are operated throughout a year.
- Keep condensing pressure constant in winter and intermediate seasons for stable operation.

CE mark applicable

SP<sub>US</sub> listed (available upon request)



## SPECIFICATIONS

- Control method: Phase control
- Max. working pressure: 4.7MPa
- Power supply: [Rated Voltage] 200 to 240V. AC ~ single phase [Frequency] 50/60Hz [Rated Amp.] 0.2 to 3A
- Pressure connection: 1/4" Female flare with Schrader (7/16-20 UNF)
- Enclosure: IP65

## TYPE NUMBER SELECTION

| Catalog No. | *1 F.V.S. Setting (MPa) |                 |      | *2 E.P.B (MPa) | Refrigerants      | Function        | Ambient temp. (°C) | Fluid temp. (°C) | Wt. (kg) |
|-------------|-------------------------|-----------------|------|----------------|-------------------|-----------------|--------------------|------------------|----------|
|             | Factory Set             | Adjusting Range |      |                |                   |                 |                    |                  |          |
|             |                         | Min.            | Max. |                |                   |                 |                    |                  |          |
| XGE-4CC-7   | 1.9                     | 1.0             | 2.5  | 0.6            | R22, R407C, R404A | Cut off type    | -20 to 55          | -20 to 70        | 0.19     |
| XGE-4MC-7   |                         |                 |      |                |                   | Min. speed type |                    |                  |          |
| XGE-6CC-7   | 2.8                     | 2.2             | 3.9  | 0.7            | R410A             | Cut off type    |                    |                  |          |
| XGE-6MC-7   |                         |                 |      |                |                   | Min. speed type |                    |                  |          |

Cut off : Fan motor will be stopped when pressure decrease to the specific value(V%) for R.M.S.

Min. speed: Fan motor will be kept running at the specific value(V%) when pressure band increase more than E.P.B.

\*1 F.V.S.: FULL VOLTAGE SET POINT

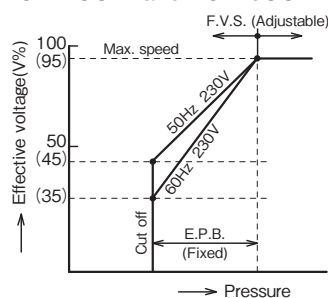
The pressure at which the control delivers 95% output effective voltage.

\*2 E.P.B.: EFFECTIVE PROPORTIONAL BAND

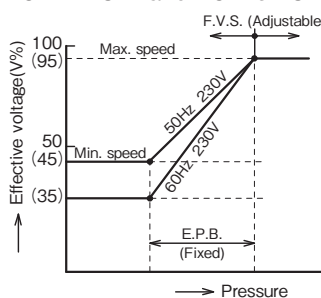
Pressure width where effective voltage corresponds to the min. speed or causes cut off operation.

## OPERATION

XGE-4CC-7 and XGE-6CC-7 (Cut off type)

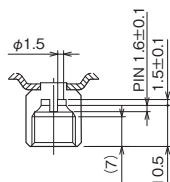
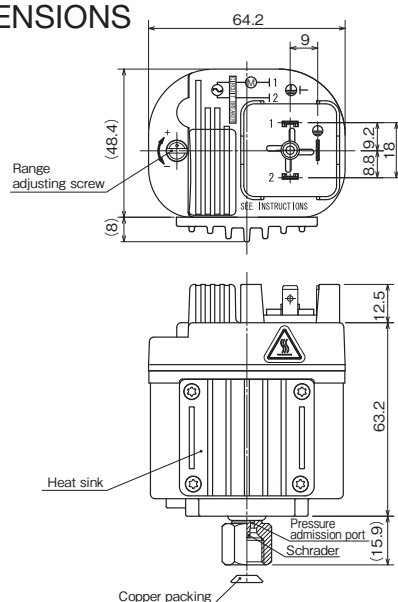


XGE-4MC-7 and XGE-6MC-7 (Min. speed type)



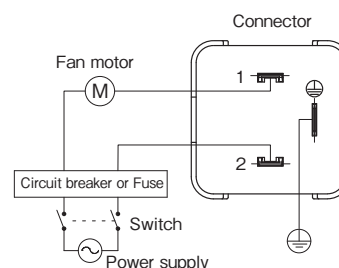
\*The operating characteristic may vary according to the voltage, frequency, and fan motor characteristics.

## DIMENSIONS



Unit: mm

## WIRINGS



Supplied with a gasket. Cable exit in 4 directions possible.

## ACCESSORIES (XGE-1 Plug parts set)

- Plug
- Gasket
- Plug fixing screw
- Plastic bag

# TEMPERATURE RECORDERS

## Type AKM & BKM

**SAGINO MIYA**

### GENERAL DESCRIPTION

- Portable temperature recorder widely applicable for use in refrigeration, air conditioning and medical fields.
- High recording accuracy with quartz driving motor.  
Recording paper feeding speed: 3.3mm per hour
- Motor driven by dry cell battery: 1.5V. DC, C-type  
Life 1 year
- Type BKM is a temperature sensitive recording paper which is supplied as standard for use 12 month period.  
Specify catalog No. when order additional papers.
- Higher and lower alarm pointers can be set within the range.



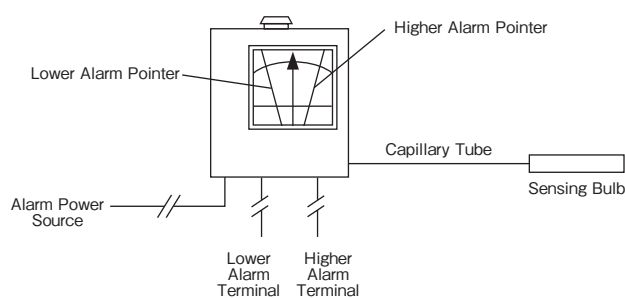
### TYPE NUMBER SELECTION (SPECIFICATIONS)

Unit: °C

| Catalog No.  | Application Examples         | Temp. Range |      | Indicating Accuracy | Recording Accuracy            | Alarm Accuracy | Alarm Power Source | Catalog No. of Recording Paper | Wt. (kg) |  |  |  |
|--------------|------------------------------|-------------|------|---------------------|-------------------------------|----------------|--------------------|--------------------------------|----------|--|--|--|
|              |                              | Min.        | Max. |                     |                               |                |                    |                                |          |  |  |  |
| AKM-4014LH1X | For Refrigeration & Freezing | -40         | 14   | ±2                  | ±0.5 plus Indicating Accuracy | Temp. Scale ±2 | 100 to 120V. AC    | BKM-4044X                      | 1.6      |  |  |  |
| AKM-4014LH2X |                              |             |      |                     |                               |                | 200 to 240V. AC    |                                |          |  |  |  |
| AKM-0054LH1X | For Air-conditioning         | 0           | 54   |                     |                               |                | 100 to 120V. AC    | BKM-0054X                      |          |  |  |  |
| AKM-0054LH2X |                              |             |      |                     |                               |                | 200 to 240V. AC    |                                |          |  |  |  |
| AKM-1044LH1X |                              | -10         | 44   |                     |                               |                | 100 to 120V. AC    | BKM-4044X                      |          |  |  |  |
| AKM-1044LH2X |                              |             |      |                     |                               |                | 200 to 240V. AC    |                                |          |  |  |  |
| AKM-0620LH1X | For Medical Use              | -6          | 20   | -6 to 2             | ±2                            |                | 100 to 120V. AC    | BKM-0620X                      |          |  |  |  |
| AKM-0620LH2X |                              |             |      | 2 to 8              | ±0.8                          |                | 200 to 240V. AC    |                                |          |  |  |  |
|              |                              |             |      | 8 to 20             | ±2                            |                |                    |                                |          |  |  |  |

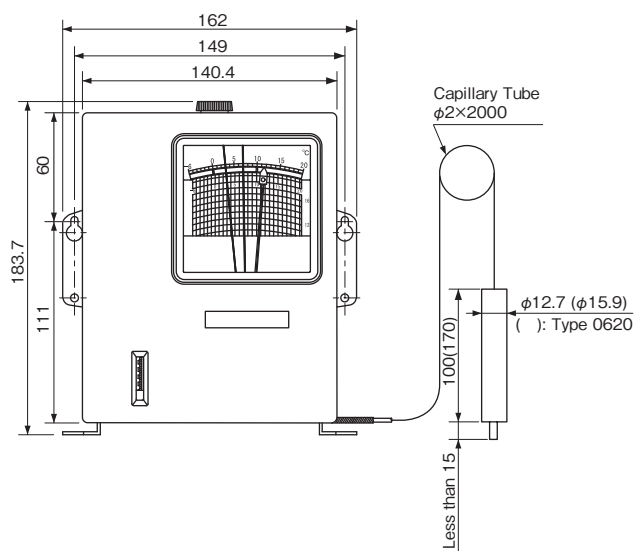
• Alarm Contact: Each one on upper and lower limit pointer, 100V. AC1A, 200V. AC 0.5A.

### WIRINGS



- Standard capillary tube length:  $\phi 2.0 \times 2000$ mm  
(Plastic covering on capillary tube available.)
- Alarm lamp or buzzer can be connected to the contacts on higher and lower alarm terminals.

### DIMENSIONS



Unit: mm

## CO<sub>2</sub> REFRIGERANT APPLICATIONS

High Volume OEM Item

Type CCB, HSK, HPV, UKV-J & JKV

SAGINO MIYA

### GENERAL DESCRIPTION

- Used for CO<sub>2</sub> refrigerant applications.
- Available for extreme high pressure.
- Application: Bottle cooler, display case, heat pump water heaters, vending machine



Type CCB



Type HSK



Type HPV



Type UKV-J

### ● PRESSURE CONTROL for High Pressure [Type CCB]

### SPECIFICATIONS

Unit: MPa {kgf/cm<sup>2</sup>}

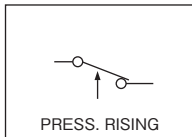
| Catalog No.  | Setting  |          | Max. Pressure | Contact Function | Pressure Connection | Terminal Construction | Application           | Wt. (kg) |
|--------------|----------|----------|---------------|------------------|---------------------|-----------------------|-----------------------|----------|
|              | on       | off      |               |                  |                     |                       |                       |          |
| CCB- * * * * | 10 {100} | 15 {150} | 15 {150}      | SPST (High Cut)  | 1/4" Solder         | Open                  | High Pressure Cut Out | 0.07     |

• Allowable fluid temperature: -30 to 100 °C

### ELECTRICAL RATINGS

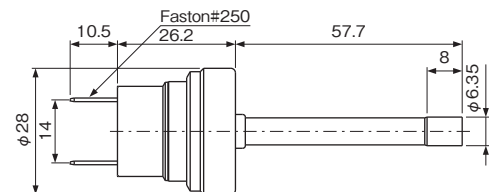
| Category of Ratings   |                |                         | T Rating |         | M Rating     |          |
|-----------------------|----------------|-------------------------|----------|---------|--------------|----------|
| Rated Voltage (V)     |                | Power Factor<br>(cos ϕ) | 24V. DC  | 12V. DC | 120V. AC     | 240V. AC |
| Rated Current (A)     |                |                         |          |         |              |          |
| Non-Inductive Current |                |                         | 1        |         | 0.01 to 0.05 |          |
| Inductive Current     | Full Load      | 0.75                    | —        | —       | —            | —        |
|                       | Inrush Current | —                       |          |         |              |          |

### CONTACT FUNCTION



### DIMENSIONS

Type CCB



Unit: mm

### ● PRESSURE SENSOR for High Pressure [Type HSK]

### SPECIFICATIONS

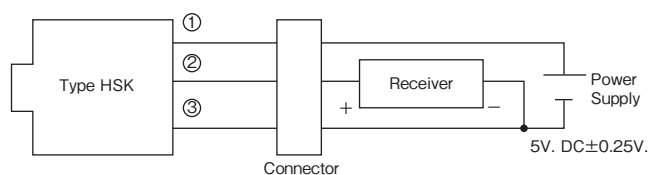
Unit: MPa {kgf/cm<sup>2</sup>}

| Catalog No.       | Pressure Range        | Supply Voltage | Output          | Accuracy   | Current Consumption | Load Resistance | Airtight Pressure | Pressure Connection | Wt. (kg) |
|-------------------|-----------------------|----------------|-----------------|------------|---------------------|-----------------|-------------------|---------------------|----------|
| HSK-BC150D- * * * | {0 to 150}<br>0 to 15 | 5V. DC±0.25V   | 0.5 to 4.5V. DC | ±2.5% F.S. | Max. 10mA           | Min. 10kΩ       | 15 {150}          | φ 6 Solder          | 0.07     |

• Allowable fluid temperature: -30 to 120 °C

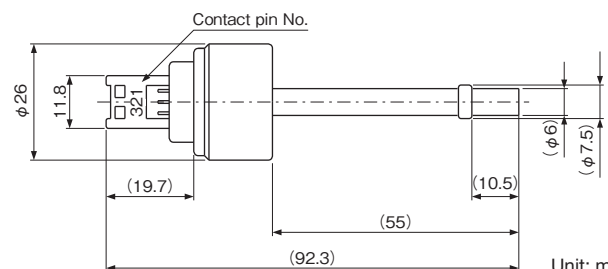
• Ambient temperature: -30 to 100 °C

### WIRING



### DIMENSIONS

Type HSK



Unit: mm

## ● SOLENOID VALVE for High Pressure [Type HPV]

### TYPE NUMBER SELECTION (SPECIFICATIONS)

Unit: MPa {kgf/cm<sup>2</sup>}

| Catalog No. | Port Size (mm) | Cv Value | Connection       |        | O.P.D. |            | Max. Working Pressure | Operation    | Wt. (kg) |
|-------------|----------------|----------|------------------|--------|--------|------------|-----------------------|--------------|----------|
|             |                |          | Copper Tube O.D. | Style  | Min.   | Max.       |                       |              |          |
| HPV-102DQ1  | 1.0            | 0.028    | 1/4"             | Solder | 0      | 10.0 {100} | 13.0 {130}            | Normal close | 0.05     |
| HPV-122D    | 1.2            | 0.038    |                  |        | 0      |            | 13.8 {138}            |              | 0.09     |
| HPV-402DQ3  | 4.0            | 0.32     | 1/4"             |        | 0      |            | 14.0 {140}            |              | 0.09     |
| HPV-825DS   | 7.8            | 0.54     | 5/16"            |        | 0.1{1} |            | 15.0 {150}            |              | 0.13     |

- O.P.D.: Operating Pressure Differential (by air pressure)
- Ambient temperature: -20 to 50 °C
- Allowable fluid temperature: -30 to 120 °C

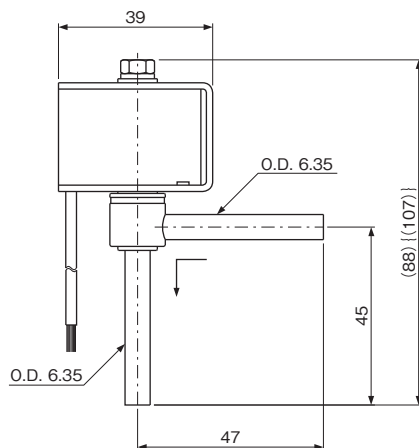
### ELECTRICAL RATING OF SOLENOID COILS

| Valve Type | Rated Voltage |         | Tolerance (%) | Voltampere |        | Power Consumption (W) | Insulation Class           | Wt. (kg) |
|------------|---------------|---------|---------------|------------|--------|-----------------------|----------------------------|----------|
|            |               |         |               | Running    | Inrush |                       |                            |          |
| HPV-102DQ1 | 100V. AC      | 50/60Hz | ±10           | 11/8       | 32/27  | 6/4.5                 | *<br><br>Class B<br>Molded | 0.13     |
| HPV-122D   | 200V. AC      |         |               | 16/13      | 52/38  | 9/8                   |                            | 0.16     |
| HPV-402DQ3 | 200V. AC      |         |               | 10/8       | 32/26  | 5.5/4.5               |                            | 0.16     |
| HPV-825DS  |               |         |               | 14/11      | 42/33  | 7/6                   |                            | 0.20     |

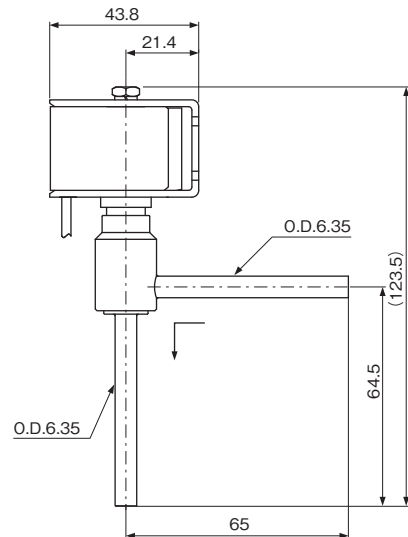
\* IEC compliance

### DIMENSIONS

Type HPV-102DQ1 {HPV-122D}

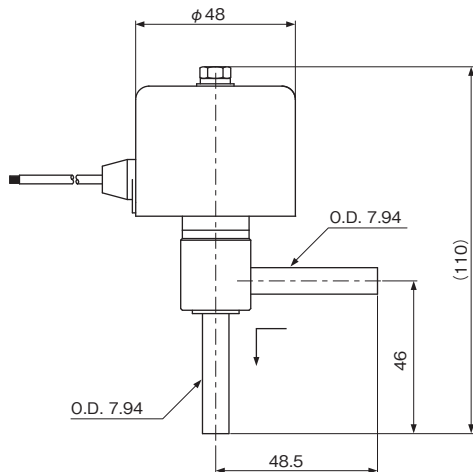


Type HPV-402DQ3



Please contact us if other connection are required.

Type HPV-825DS



Unit: mm

## ● ELECTRONIC EXPANSION VALVE for High Pressure [Type UKV-J, JKV]

### TYPE NUMBER SELECTION (SPECIFICATIONS)

Unit: MPa {kgf/cm<sup>2</sup>}

| Catalog No. | O PULSE FLOW | Port Size<br>(ϕ mm) | Cv Value | Capacity (U.S.R.T) {kW}    |                            | Max. Working Pressure | Operating Pressure Differential | Connection (Solder) (mm) |           | Wt. (kg) |      |
|-------------|--------------|---------------------|----------|----------------------------|----------------------------|-----------------------|---------------------------------|--------------------------|-----------|----------|------|
|             |              |                     |          | *1 R744 (CO <sub>2</sub> ) | *2 R744 (CO <sub>2</sub> ) |                       |                                 | B side                   | A side    |          |      |
|             |              |                     |          |                            |                            |                       |                                 |                          |           |          |      |
| UKV-J14D    | OPEN TYPE    | 1.4                 | 0.056    | 2.9 {10.3}                 | 3.9 {13.6}                 | 15 {150}              | 0 to 10<br>{0 to 100}           | ϕ 6.35 OD                | ϕ 6.35 OD | 0.05     |      |
|             | CLOSE TYPE   |                     |          |                            |                            |                       |                                 |                          |           |          |      |
| JKV-20D     | OPEN TYPE    | 2.0                 | 0.12     | 6.2 {21.9}                 | 8.2 {29.0}                 |                       |                                 | ϕ 7.94 OD                | ϕ 7.94 OD |          | 0.13 |
|             | CLOSE TYPE   |                     |          |                            |                            |                       |                                 |                          |           |          |      |
| JKV-24D     | OPEN TYPE    | 2.4                 | 0.17     | 8.7 {30.7}                 | 11.6 {40.7}                |                       | 0 to 8 {0 to 80}                |                          |           |          |      |
|             | CLOSE TYPE   |                     |          |                            |                            |                       |                                 |                          |           |          |      |

\* 1: CT = -5 °C, ET = -25 °C, SH = 0 °C, SC = 0 °C

\* 2: Gas cooler inlet temp. = 70 °C, Gas cooler outlet temp. = 22 °C, ET = 6 °C, SH = 0 °C

• Allowable fluid temperature: -30 to 70 °C

• Ambient temperature: -30 to 70 °C

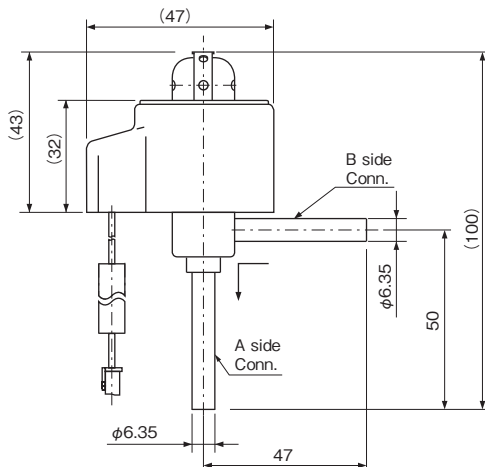
### SPECIFICATIONS OF COIL

| Valve Type | Excitation method    | Rated Voltage & Current    | Insulation Class | Wt. (kg) |
|------------|----------------------|----------------------------|------------------|----------|
| UKV-J14D   | 1-2 Phase excitation | 12V. DC. . . . 260mA/Phase | * Class E Molded | 0.12     |
| JKV-20D    |                      |                            |                  | 0.17     |
| JKV-24D    |                      | 12V. DC. . . . 380mA/Phase |                  | 0.18     |

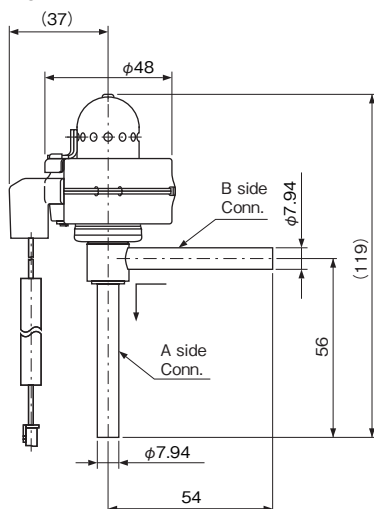
\* IEC compliance

### DIMENSIONS

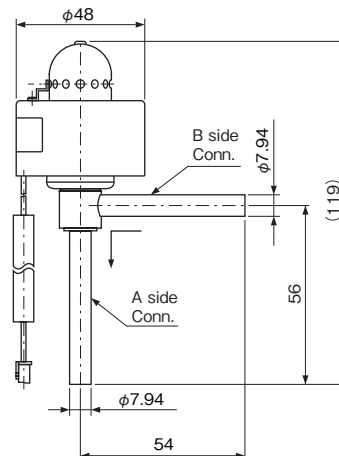
Type UKV-J



Type JKV-20D



Type JKV-24D



Unit: mm

# BELLOWS

High Volume OEM Item

Type HBL &amp; WSL

SAGINO MIYA



## Hydraulically-Formed Bellows

Type HBL etc...

Hydraulically corrugated bellows made from a tin wall metal pipe.  
Material and specifications are selectable for applications.  
Match for mass production and quality are very stable.

Material example: Phosphor bronze, beryllium copper, stainless steel, inconel, etc .



## Welding Bellows

Type WSL etc ...

Bellows made from precision-made tin wall metal rings.  
Suitable for extremely precision use.  
Material is selectable for applications.

Material example: Stainless steel, inconel, etc .



## Welding Bellows for vacuum use 〈S bellows〉

Welding bellows for low pressure and long stroke use  
Main Characteristics: Using anticorrosion material SUS316L  
Long stroke structure  
With End Fittings for easy to install  
Low price and fast delivery



## • Applications

Aerospace, marine, chemical, refrigeration, air conditioning, electric, construction, medical, and other various kinds of industrys.  
Bellows assembled with fittings are also available.

# OTHER CONTROLS & VALVES

**Type RKV & BI-METAL(No.03, 05 & 24)**

**SAGInoMIYA**

## GENERAL DESCRIPTION

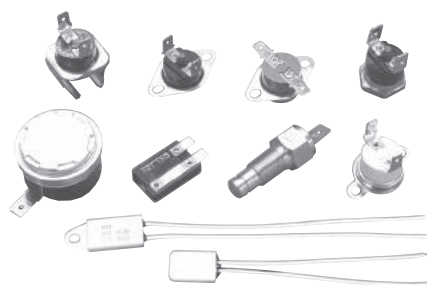
Various controls and valves are available by Saginomiya.  
The following are some examples.

- 3-WAY CHANGE-OVER VALVE  
Type RKV
  - Control appliance for changing over flow direction in two evaporator type household refrigerator.



Type RKV

- BI-METAL DISC THERMOSTATS  
Type 03, 05, 24
  - For various applications, wide available temperature range: — 20 to 260°C
  - Auto reset or manual reset



Please contact the company for detail information on the above controls.

# 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.

# ***Automatic Controls***

REFERENCE INFORMATION  
APPROVAL STANDARD LIST  
PRESSURE CONTROLS  
TEMPERATURE & HUMIDITY CONTROLS  
PRESSURE & TEMPERATURE CONTROLS INFORMATION  
EXPANSION VALVES  
SOLENOID VALVES & CONTROL VALVES  
OTHER VALVES  
OTHER CONTROL EQUIPMENT