

Square body demonstrates powerful downsizing capacity.

JIG CYLINDERS C SERIES

Richly abundant series of 9 different types and 69 models

A rich series configuration spanning from $\phi 6$ [0.236in.] to $\phi 100$ [3.940in.] responds to diverse needs far better than previous thin type cylinders.

Moreover, Non-ion specification is also available as standard.

(Excludes $\phi 6$ [0.236in.], $\phi 8$ [0.315in.], and $\phi 10$ [0.394in.])

Provides powerful back-up for device miniaturization

Exhibits no protrusions in its external shape even after a sensor switch has been mounted, for easy mounting in tight spaces.

This cylinder is one step up on cylinders of the same class in terms of size, mass, and performance.



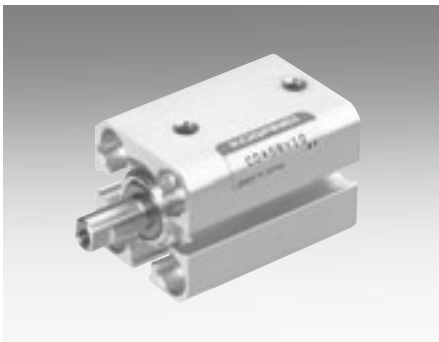
**$\phi 6$
[0.236in.]**

**$\phi 100$
[3.940in.]**



New Line-Up Includes $\phi 6$ [0.236in.], $\phi 8$ [0.315in.], and $\phi 10$ [0.394in.]

For a greater selection in response to needs for miniaturization, 3 new bore sizes at $\phi 6$, $\phi 8$, and $\phi 10$ have been added, increasing the range of sizes to choose from.



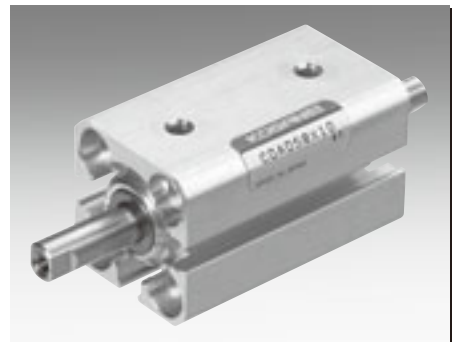
Standard Cylinders

$\phi 6$ [0.236in.]~ $\phi 100$ [3.940in.]



Non-rotating Cylinders

$\phi 6$ [0.236in.]~ $\phi 10$ [0.394in.]



Double Rod Cylinders

$\phi 6$ [0.236in.]~ $\phi 100$ [3.940in.]

The Jig Cylinders C Series Includes the 9 Types Shown Below.

■ Standard Cylinders

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■ Non-rotating Cylinders

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■ Square Rod Cylinders

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■ Double Rod Cylinders

p.154



■ Tandem Cylinders

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■ Dual Stroke Cylinders

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■ Lateral Load Resistant Cylinders

p.180



■ Long Stroke Cylinders

p.185



■ End Keep Cylinders

p.190



■ Mounting Brackets

p.197



■ Sensor Switches

p.199



| | Operation type | | | Cylinder specifications | | Rod end specifications | | Bumpers | Centering location | Non-ion specification | Mounting brackets | | |
|----------------------------------|--------------------|-------------------------|-------------------------|-------------------------|---------------------|------------------------|-------------|---------------------------------------|--------------------|---------------------------------------|-----------------------|-------------------------|-------------------------|
| | Double acting type | Single acting push type | Single acting pull type | Cylinder with magnet | Heat resistant type | Female thread | Male thread | Not available for heat resistant type | | Not available for heat resistant type | Foot mounting bracket | Flange mounting bracket | Clevis mounting bracket |
| Standard Cylinders | | | | | | | | | | | | | |
| Non-rotating Cylinders | Note | | | Note | | Note | Note | | | | | | |
| Square Rod Cylinders | | | | | | | | | | | | | |
| Double Rod Cylinders | | | | | | | | | | | | | |
| Tandem Cylinders | | | | | | | | | | | | | |
| Dual Stroke Cylinders | | | | | | | | | | | | | |
| Lateral Load Resistant Cylinders | | | | | | | | | | | | | |
| Long Stroke Cylinders | | | | | | | | | | | | | |
| End Keep Cylinders | | | | | | | | | | | | | |

■ The colored areas include bore sizes of $\phi 6$, $\phi 8$, and $\phi 10$.

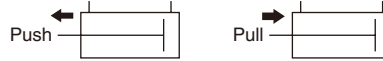
Note: Non-rotating cylinders are set at bore sizes $\phi 6$, $\phi 8$, and $\phi 10$ only.

Cylinder Thrust

Select a suitable bore size considering the load and air pressure to obtain the required thrust.

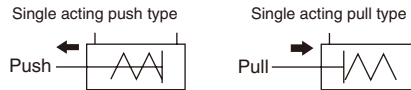
Since the figures in the table are calculated values, select a bore size that results in a load ratio (load ratio = $\frac{\text{Load}}{\text{Calculated value}}$) of 70% or less (50% or less for high speed).

● Double acting type



| Bore size mm [in.] | Piston rod diameter mm [in.] | Operation | Pressure area mm ² [in. ²] | Air pressure MPa [psi.] | | | | | | | | | | N [lbf.] |
|-----------------------|------------------------------------|-----------|--|-------------------------|----------------|----------------|----------------|----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| | | | | 0.1 [15] | 0.2 [29] | 0.3 [44] | 0.4 [58] | 0.5 [73] | 0.6 [87] | 0.7 [102] | 0.8 [116] | 0.9 [131] | 1.0 [145] | |
| 6 [0.236] | 4 [0.157] | Push side | 28.3 [0.0439] | 2.8 [0.63] | 5.7 [1.28] | 8.5 [1.91] | 11.3 [2.54] | 14.1 [3.17] | 17.0 [3.82] | 19.8 [4.45] | 22.6 [5.08] | 25.4 [5.71] | — | — |
| | | Pull side | 15.7 [0.0243] | 1.6 [0.36] | 3.1 [0.7] | 4.7 [1.06] | 6.3 [1.42] | 7.9 [1.78] | 9.4 [2.11] | 11.0 [2.47] | 12.6 [2.83] | 14.1 [3.17] | — | |
| 8 [0.315] | 5 [0.197] | Push side | 50.3 [0.0780] | 5.0 [1.12] | 10.1 [2.27] | 15.1 [3.39] | 20.1 [4.52] | 25.1 [5.64] | 30.2 [6.79] | 35.2 [7.91] | 40.2 [9.04] | 45.2 [10.2] | — | — |
| | | Pull side | 30.6 [0.0474] | 3.1 [0.70] | 6.1 [1.37] | 9.2 [2.07] | 12.3 [2.77] | 15.3 [3.44] | 18.4 [4.14] | 21.4 [4.81] | 24.5 [5.51] | 27.6 [6.20] | — | |
| 10 [0.394] | 5 [0.197] | Push side | 78.5 [0.1217] | 7.9 [1.78] | 15.7 [3.53] | 23.6 [5.31] | 31.4 [7.06] | 39.3 [8.83] | 47.1 [10.6] | 55.0 [12.4] | 62.8 [14.1] | 70.7 [15.9] | — | — |
| | | Pull side | 58.9 [0.0913] | 5.9 [1.33] | 11.8 [2.65] | 17.7 [3.98] | 23.6 [5.31] | 29.5 [6.63] | 35.3 [7.94] | 41.2 [9.26] | 47.1 [10.6] | 53.0 [11.9] | — | |
| 12 [0.472] | 6 [0.236] | Push side | 113.0 [0.175] | 11.3 [2.54] | 22.6 [5.08] | 33.9 [7.62] | 45.2 [10.2] | 56.5 [12.7] | 67.8 [15.2] | 79.1 [17.8] | 90.4 [20.3] | 101.7 [22.86] | 113.0 [25.40] | 113.0 [25.40] |
| | | Pull side | 84.8 [0.131] | 8.5 [1.91] | 17.0 [3.82] | 25.4 [5.71] | 33.9 [7.62] | 42.4 [9.53] | 50.9 [11.4] | 59.3 [13.3] | 67.8 [15.2] | 76.3 [17.2] | 84.8 [19.1] | |
| 16 [0.630] | 8 [0.315] | Push side | 201.0 [0.312] | 20.1 [4.52] | 40.2 [9.04] | 60.3 [13.6] | 80.4 [18.1] | 100.5 [22.59] | 120.6 [27.11] | 140.7 [31.63] | 160.8 [36.15] | 180.9 [40.67] | 201.0 [45.18] | 201.0 [45.18] |
| | | Pull side | 150.0 [0.233] | 15.1 [3.39] | 30.1 [6.77] | 45.2 [10.2] | 60.3 [13.6] | 75.4 [16.9] | 90.4 [20.3] | 105.5 [23.72] | 120.6 [27.11] | 135.6 [30.48] | 150.7 [33.88] | |
| 20 [0.787] | 10 [0.394] | Push side | 314.0 [0.487] | 31.4 [7.06] | 62.8 [14.1] | 94.2 [21.2] | 125.6 [28.23] | 157.0 [35.29] | 188.4 [42.35] | 219.8 [49.41] | 251.2 [56.47] | 282.6 [63.53] | 314.0 [70.59] | 314.0 [70.59] |
| | | Pull side | 235.5 [0.365] | 23.6 [5.31] | 47.1 [10.6] | 70.7 [15.9] | 94.2 [21.2] | 117.8 [26.48] | 141.3 [31.76] | 164.9 [37.07] | 188.4 [42.35] | 212.0 [47.66] | 235.5 [52.94] | |
| 25 [0.984] | 12 [0.472] | Push side | 490.6 [0.760] | 49.1 [11.0] | 98.1 [22.1] | 147.2 [33.09] | 196.3 [44.13] | 245.3 [55.14] | 294.4 [66.18] | 343.4 [77.20] | 392.5 [88.23] | 441.6 [99.27] | 490.6 [110.3] | 490.6 [110.3] |
| | | Pull side | 377.6 [0.585] | 37.8 [8.50] | 75.5 [17.0] | 113.3 [25.47] | 151.0 [33.94] | 188.8 [42.44] | 226.6 [50.94] | 264.3 [59.41] | 302.1 [67.91] | 339.8 [76.39] | 377.6 [84.88] | |
| 32 [1.260] | 16 [0.630] | Push side | 803.8 [1.246] | 80.4 [18.1] | 160.8 [36.15] | 241.2 [54.22] | 321.5 [72.27] | 401.9 [90.35] | 482.3 [108.4] | 562.7 [126.5] | 643.1 [144.6] | 723.5 [162.6] | 803.8 [180.7] | 803.8 [180.7] |
| | | Pull side | 602.9 [0.934] | 60.3 [13.6] | 120.6 [27.11] | 180.9 [40.67] | 241.2 [54.22] | 301.4 [67.75] | 361.7 [81.31] | 422.0 [94.87] | 482.3 [108.4] | 542.6 [122.0] | 602.9 [135.5] | |
| 40 [1.575] | 16 [0.630] | Push side | 1256.0 [1.947] | 125.6 [28.23] | 251.2 [56.47] | 376.8 [84.70] | 502.4 [112.9] | 628.0 [141.2] | 753.6 [169.4] | 879.2 [197.6] | 1004.8 [225.9] | 1130.4 [254.1] | 1256.0 [282.3] | 1256.0 [282.3] |
| | | Pull side | 1055.0 [1.635] | 105.5 [23.72] | 211.0 [47.43] | 316.5 [71.15] | 422.0 [94.87] | 527.5 [118.6] | 633.0 [142.3] | 738.5 [166.0] | 844.0 [189.7] | 949.5 [213.4] | 1055.0 [237.2] | |
| 50 [1.969] | 20 [0.787] | Push side | 1962.5 [3.042] | 196.3 [44.13] | 392.5 [88.23] | 588.8 [132.4] | 785.0 [176.5] | 981.3 [220.6] | 1177.5 [264.7] | 1373.8 [308.8] | 1570.0 [352.9] | 1766.3 [397.1] | 1962.5 [441.2] | 1962.5 [441.2] |
| | | Pull side | 1648.5 [2.555] | 164.9 [37.07] | 329.7 [74.12] | 494.6 [111.2] | 659.4 [148.2] | 824.3 [185.3] | 989.1 [222.3] | 1154.0 [259.4] | 1318.8 [296.5] | 1483.7 [333.5] | 1648.5 [370.6] | |
| 63 [2.480] | 20 [0.787] | Push side | 3115.7 [4.829] | 311.6 [70.05] | 623.1 [140.1] | 934.7 [210.1] | 1246.3 [280.2] | 1557.8 [350.2] | 1869.4 [420.2] | 2181.0 [490.3] | 2492.5 [560.3] | 2804.1 [630.4] | 3115.7 [700.4] | 3115.7 [700.4] |
| | | Pull side | 2801.7 [4.343] | 280.2 [62.99] | 560.3 [126.0] | 840.5 [188.9] | 1120.7 [251.9] | 1400.8 [314.9] | 1681.0 [377.9] | 1961.2 [440.9] | 2241.3 [503.8] | 2521.5 [566.8] | 2801.7 [629.8] | |
| 80 [3.150] | 25 [0.984] | Push side | 5024.0 [7.787] | 502.4 [112.9] | 1004.8 [225.9] | 1507.2 [338.8] | 2009.6 [451.8] | 2512.0 [564.7] | 3014.4 [677.6] | 3516.8 [790.6] | 4019.2 [903.5] | 4521.6 [1016.5] | 5024.0 [1129.4] | 5024.0 [1129.4] |
| | | Pull side | 4533.4 [7.027] | 453.3 [101.9] | 906.7 [203.8] | 1360.0 [305.7] | 1813.4 [407.7] | 2266.7 [509.6] | 2720.0 [611.5] | 3173.4 [713.4] | 3626.7 [815.3] | 4080.0 [917.2] | 4533.4 [1019.1] | |
| 100 [3.940] | 32 [1.181] | Push side | 7850.0 [12.168] | 785.0 [176.5] | 1570.0 [352.9] | 2355.0 [529.4] | 3140.0 [705.9] | 3925.0 [882.3] | 4710.0 [1058.8] | 5495.0 [1235.3] | 6280.0 [1411.7] | 7065.0 [1588.2] | 7850.0 [1764.7] | 7850.0 [1764.7] |
| | | Pull side | 7046.2 [10.922] | 704.6 [158.4] | 1409.2 [316.8] | 2113.8 [475.2] | 2818.5 [633.6] | 3523.1 [792.0] | 4227.7 [950.4] | 4932.3 [1108.8] | 5636.9 [1267.2] | 6341.5 [1425.6] | 7046.2 [1584.0] | |

● Single acting type



| Operation type | Bore size mm [in.] | Piston rod diameter mm [in.] | Pressure area mm ² [in. ²] | Air pressure MPa [psi.] | | | | | | | | | | N [lbf.] |
|-------------------------------|-----------------------|------------------------------------|--|-------------------------|---------------|---------------|---------------|---------------|----------------|----------------|----------------|----------------|----------------|----------|
| | | | | 0.1 [15] | 0.2 [29] | 0.3 [44] | 0.4 [58] | 0.5 [73] | 0.6 [87] | 0.7 [102] | 0.8 [116] | 0.9 [131] | 1.0 [145] | |
| Single acting push type | 6 [0.236] | 4 [0.157] | 28.3 [0.0439] | — | — | 5.6 [1.26] | 8.4 [1.89] | 11.2 [2.52] | 14.1 [3.17] | 16.9 [3.80] | 19.7 [4.43] | 22.5 [5.06] | — | — |
| | 8 [0.315] | 5 [0.197] | 50.3 [0.0780] | — | — | 10.4 [2.34] | 15.4 [3.46] | 20.4 [4.59] | 25.5 [5.73] | 30.5 [6.86] | 35.5 [7.98] | 40.5 [9.10] | — | |
| | 10 [0.394] | 5 [0.197] | 78.5 [0.1217] | — | — | 18.9 [4.25] | 26.7 [6.00] | 34.6 [7.78] | 42.4 [9.53] | 50.3 [11.3] | 58.1 [13.1] | 66.0 [14.8] | — | |
| | 12 [0.472] | 6 [0.236] | 113.0 [0.175] | — | 12.8 [2.88] | 24.1 [5.42] | 35.4 [7.96] | 46.7 [10.5] | 58.0 [13.0] | 69.3 [15.6] | 80.6 [18.1] | 91.9 [20.7] | 103.2 [23.20] | |
| | 16 [0.630] | 6 [0.236] | 201.0 [0.312] | — | 26.1 [5.87] | 46.2 [10.4] | 66.3 [14.9] | 86.4 [19.4] | 106.5 [23.94] | 126.6 [28.46] | 146.7 [32.98] | 166.8 [37.50] | 186.9 [42.02] | |
| | 20 [0.787] | 8 [0.315] | 314.0 [0.487] | — | 49.0 [11.0] | 80.4 [18.1] | 111.8 [25.13] | 143.2 [32.19] | 174.6 [39.25] | 206.0 [46.31] | 237.4 [53.37] | 268.8 [60.43] | 300.2 [67.48] | |
| | 25 [0.984] | 10 [0.394] | 490.6 [0.760] | — | 76.3 [17.2] | 125.4 [28.19] | 174.5 [39.23] | 223.5 [50.24] | 272.6 [61.28] | 321.6 [72.30] | 370.7 [83.33] | 419.8 [94.37] | 468.8 [105.4] | |
| | 32 [1.260] | 12 [0.472] | 803.8 [1.246] | — | 123.4 [27.74] | 203.8 [45.81] | 284.1 [63.87] | 364.5 [81.94] | 444.9 [100.0] | 525.3 [118.1] | 605.7 [136.2] | 686.1 [154.2] | 766.4 [172.3] | |
| | 40 [1.575] | 16 [0.630] | 1256.0 [1.947] | — | 205.9 [46.29] | 331.5 [74.52] | 457.1 [102.8] | 582.7 [131.0] | 708.3 [159.2] | 833.9 [187.5] | 959.5 [215.7] | 1085.1 [243.9] | 1210.5 [272.1] | |
| | 50 [1.969] | 20 [0.787] | 1962.5 [3.042] | 141.0 [31.70] | 337.2 [75.80] | 533.5 [119.9] | 729.7 [164.0] | 926.0 [208.2] | 1122.2 [252.3] | 1318.5 [296.4] | 1514.7 [340.5] | 1711.0 [384.6] | 1907.2 [428.7] | |
| Single acting pull type | 6 [0.236] | 4 [0.157] | 15.7 [0.0243] | — | — | 1.8 [0.40] | 3.4 [0.76] | 5.0 [1.12] | 6.5 [1.46] | 8.1 [1.82] | 9.7 [2.18] | 11.2 [2.52] | — | — |
| | 8 [0.315] | 5 [0.197] | 30.6 [0.0474] | — | — | 4.5 [1.01] | 7.6 [1.71] | 10.6 [2.38] | 13.7 [3.08] | 16.7 [3.75] | 19.8 [4.45] | 22.9 [5.15] | — | |
| | 10 [0.394] | 5 [0.197] | 58.9 [0.0913] | — | — | 13.0 [2.92] | 18.9 [4.25] | 24.8 [5.58] | 30.6 [6.88] | 36.5 [8.21] | 42.4 [9.53] | 48.3 [10.9] | — | |
| | 12 [0.472] | 6 [0.236] | 84.8 [0.131] | — | 7.2 [1.62] | 15.6 [3.51] | 24.1 [5.42] | 32.6 [7.33] | 41.1 [9.24] | 49.5 [11.1] | 58.0 [13.0] | 66.5 [14.9] | 75.0 [16.9] | |
| | 16 [0.630] | 6 [0.236] | 150.7 [0.234] | — | 16.0 [3.60] | 31.1 [6.99] | 46.2 [10.4] | 61.3 [13.8] | 76.3 [17.2] | 91.4 [20.5] | 106.5 [23.94] | 121.5 [27.31] | 136.6 [30.71] | |
| | 20 [0.787] | 8 [0.315] | 235.5 [0.365] | — | 33.3 [7.49] | 56.9 [12.8] | 80.4 [18.1] | 104.0 [23.38] | 127.5 [28.66] | 151.1 [33.97] | 174.6 [39.25] | 198.2 [44.56] | 221.7 [49.84] | |
| | 25 [0.984] | 10 [0.394] | 377.6 [0.585] | — | 75.5 [17.0] | 113.3 [25.47] | 151.0 [33.94] | 188.8 [42.44] | 226.6 [50.94] | 264.3 [59.41] | 302.1 [67.91] | 339.8 [76.39] | 377.6 [84.88] | |
| | 32 [1.260] | 12 [0.472] | 602.9 [0.934] | — | 61.4 [13.8] | 121.7 [27.36] | 182.0 [40.91] | 242.2 [54.45] | 302.5 [68.00] | 362.8 [81.56] | 423.1 [95.11] | 483.4 [108.7] | 543.7 [122.2] | |
| | 40 [1.575] | 16 [0.630] | 1055.0 [1.635] | — | 165.7 [37.25] | 271.2 [60.97] | 376.7 [84.68] | 482.2 [108.4] | 587.7 [132.1] | 693.2 [155.8] | 798.7 [179.5] | 904.2 [203.3] | 1009.7 [227.0] | |
| | 50 [1.969] | 20 [0.787] | 1648.5 [2.555] | 109.6 [24.64] | 274.4 [61.69] | 439.3 [98.75] | 604.1 [135.8] | 769.0 [172.9] | 933.8 [209.9] | 1098.7 [247.0] | 1263.5 [284.0] | 1428.4 [321.1] | 1593.2 [358.2] | |

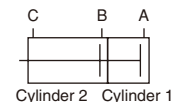
● Spring return force

| N [lbf.] | | | |
|-----------------|---|---|------------------|
| Bore size mm | Stroke mm | Zero stroke | End of stroke |
| 6 | × 5 × 10 | 2.1 [0.47] 1.2 [0.27] | 2.9 [0.65] |
| 8 | × 5 × 10 | 3.3 [0.74] 1.9 [0.43] | 4.7 [1.06] |
| 10 | × 5 × 10 | 3.3 [0.74] 1.9 [0.43] | 4.7 [1.06] |
| 12 | × 5 × 10 × 15 × 20 × 25 × 30 | 7.7 [1.73] 5.7 [1.28] 3.7 [0.83] 5.7 [1.28] 4.7 [1.06] 3.7 [0.83] | 9.8 [2.20] |
| 16 | × 5 × 10 × 15 × 20 × 25 × 30 | 11.1 [2.50] 8.2 [1.84] 5.3 [1.19] 8.2 [1.84] 6.7 [1.51] 5.3 [1.19] | 14.1 [3.17] |
| 20 | × 5 × 10 × 15 × 20 × 25 × 30 | 11.6 [2.61] 9.5 [2.14] 7.3 [1.64] 9.5 [2.14] 8.4 [1.89] 7.3 [1.64] | 13.8 [3.10] |

| N [lbf.] | | | |
|-----------------|--|--|------------------|
| Bore size mm | Stroke mm | Zero stroke | End of stroke |
| 25 | × 5 × 10 × 15 × 20 × 25 × 30 | 18.1 [4.07] 14.5 [3.26] 10.7 [2.41] 14.5 [3.26] 12.7 [2.85] 10.9 [2.45] | 21.8 [4.90] |
| 32 | × 5 × 10 × 15 × 20 × 25 × 30 | 32.0 [7.19] 26.7 [6.00] 21.3 [4.79] 26.7 [6.00] 24.0 [5.40] 21.3 [4.79] | 37.4 [8.41] |
| 40 | × 5 × 10 × 15 × 20 × 25 × 30 | 37.7 [8.47] 30.2 [6.79] 22.6 [5.08] 30.2 [6.79] 26.4 [5.93] 22.6 [5.08] | 45.3 [10.18] |
| 50 | × 10 × 15 × 20 × 25 × 30 × 35 × 40 | 45.4 [10.21] 40.5 [9.10] 35.5 [7.98] 43.0 [9.67] 40.5 [9.10] 38.0 [8.54] 35.5 [7.98] | 55.3 [12.43] |

● How to read the thrust table

- For the thrust of the double rod cylinder double acting type, see the pull side of the double acting type thrust table. For the thrust of the single acting type, see the single acting pull type thrust table.
- The thrust of the tandem cylinder is double that of the standard type when air is supplied simultaneously to Port A and Port B, for any operation type before the stroke in Cylinder 1 is complete. When air is supplied to any of Ports A, B, or C alone, then the thrust is the same as for the standard type.



- The thrust for dual stroke cylinders is the same as for the standard type, for any operation type.
- When directly carrying a load, care must be exercised of a lateral load.

For details, see p.206 "Lateral Load."

● Square rod cylinders



| | | N [lbf.] | | | | | | | | | | | |
|-----------------------|-----------------------------|-----------|--|------------------|---------------|---------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| Bore size mm [in.] | Piston rod size mm [in.] | Operation | Pressure area mm ² [in. ²] | Air pressure MPa | | | | | | | | | |
| | | | | 0.1 [15] | 0.2 [29] | 0.3 [44] | 0.4 [58] | 0.5 [73] | 0.6 [87] | 0.7 [102] | 0.8 [116] | 0.9 [131] | 1.0 [145] |
| 20 [0.787] | □ 7.4 [□ 0.291] | Push side | 314.0 [0.487] | 31.4 [7.06] | 62.8 [14.1] | 94.2 [21.2] | 125.6 [28.23] | 157.0 [35.29] | 188.4 [42.35] | 219.8 [49.41] | 251.2 [56.47] | 282.6 [63.53] | 314.0 [70.59] |
| | | Pull side | 259.2 [0.402] | 25.9 [5.82] | 51.8 [11.6] | 77.8 [17.5] | 103.7 [23.3] | 129.6 [29.13] | 155.5 [34.96] | 181.5 [40.80] | 207.4 [46.62] | 233.3 [52.45] | 259.2 [58.27] |
| 25 [0.984] | □ 13 [□ 0.512] | Push side | 490.6 [0.760] | 49.1 [11.0] | 98.1 [22.1] | 147.2 [33.09] | 196.3 [44.13] | 245.3 [55.14] | 294.4 [66.18] | 343.4 [77.20] | 392.5 [88.23] | 441.6 [99.27] | 490.6 [110.3] |
| | | Pull side | 435.9 [0.676] | 43.6 [9.80] | 87.2 [19.6] | 130.8 [29.40] | 174.3 [39.18] | 217.9 [48.98] | 261.5 [58.79] | 305.1 [68.59] | 348.7 [78.39] | 392.3 [88.19] | 435.9 [97.99] |
| 32 [1.260] | □ 18 [□ 0.709] | Push side | 803.8 [1.246] | 80.4 [18.1] | 160.8 [36.15] | 241.2 [54.22] | 321.5 [72.27] | 401.9 [90.35] | 482.3 [108.4] | 562.7 [126.5] | 643.1 [144.6] | 723.5 [162.6] | 803.8 [180.7] |
| | | Pull side | 634.8 [0.984] | 63.5 [14.3] | 127.0 [28.55] | 190.5 [42.82] | 253.9 [57.08] | 317.4 [71.35] | 380.9 [85.63] | 444.4 [99.90] | 507.9 [114.2] | 571.4 [128.5] | 634.8 [142.7] |
| 40 [1.575] | □ 18 [□ 0.709] | Push side | 1256.0 [1.947] | 125.6 [28.23] | 251.2 [56.47] | 376.8 [84.70] | 502.4 [112.9] | 628.0 [141.2] | 753.6 [169.4] | 879.2 [197.6] | 1004.8 [225.9] | 1130.4 [254.1] | 1256.0 [282.3] |
| | | Pull side | 1087.0 [1.685] | 108.7 [24.44] | 217.4 [48.87] | 326.1 [73.31] | 434.8 [97.74] | 543.5 [122.2] | 652.2 [146.6] | 760.9 [171.1] | 869.6 [195.5] | 978.3 [219.9] | 1087.0 [244.4] |
| 50 [1.969] | □ 18 [□ 0.709] | Push side | 1962.5 [3.042] | 196.3 [44.13] | 392.5 [88.23] | 588.8 [132.4] | 785.0 [176.5] | 981.3 [220.6] | 1177.5 [264.7] | 1373.8 [308.8] | 1570.0 [352.9] | 1766.3 [397.1] | 1962.5 [441.2] |
| | | Pull side | 1638.5 [2.540] | 163.9 [36.84] | 327.7 [73.67] | 491.6 [110.5] | 655.4 [147.3] | 819.3 [184.2] | 983.1 [221.0] | 1147.0 [257.8] | 1310.8 [294.7] | 1474.7 [331.5] | 1638.5 [368.3] |
| 63 [2.480] | □ 18 [□ 0.709] | Push side | 3115.7 [4.829] | 311.6 [70.05] | 623.1 [140.1] | 934.7 [210.1] | 1246.3 [280.2] | 1557.8 [350.2] | 1869.4 [420.2] | 2181.0 [490.3] | 2492.5 [560.3] | 2804.1 [630.4] | 3115.7 [700.4] |
| | | Pull side | 2791.7 [4.327] | 279.2 [62.76] | 558.3 [125.5] | 837.5 [188.3] | 1116.7 [251.0] | 1395.8 [313.8] | 1675.0 [376.5] | 1954.2 [439.3] | 2233.3 [502.0] | 2512.5 [564.8] | 2791.7 [627.6] |

JIG CYLINDERS C SERIES DUAL STROKE CYLINDERS

Double Acting Type,
Single Acting Push Type, Single Acting Pull Type



JIG CYLINDERS C SERIES

Symbols

● Double acting type ● Single acting push type ● Single acting pull type



Specifications

| Bore size mm [in.] | | 12 | 16 | 20 | 25 | 32 | 40 | 50 | 63 | 80 | 100 |
|--|--------------------|--|---------|---------|---------|---------|---------|-----------------------|---------|--------------------|---------|
| Item | | [0.472] | [0.630] | [0.787] | [0.984] | [1.260] | [1.575] | [1.969] | [2.480] | [3.150] | [3.940] |
| Operation type | | Double acting type, Single acting push type, Single acting pull type | | | | | | | | Double acting type | |
| Media | | Air | | | | | | | | | |
| Operating pressure range MPa [psi.] | Double acting type | 0.1~1.0 [15~145] | | | | | | 0.05~1.0 [7~145] | | | |
| | Single acting type | 0.15~1.0 Note1 [22~145] | | | | | | 0.1~1.0 [15~145] | — | | |
| Proof pressure MPa [psi.] | | 1.5 [218] | | | | | | | | | |
| Operating temperature range °C [°F] | | 0~60 [32~140] (The heat resistant specification is 120 [248]. Note2) | | | | | | | | | |
| Operating speed range mm/s [in./sec.] | Double acting type | 30~500 [1.2~19.7] | | | | | | 30~300 [1.2~11.8] | | | |
| | Single acting type | 100~500 [3.9~19.7] | | | | | | 100~300 [3.9~11.8] | — | | |
| Cushion | Double acting type | Rubber bumper (Option Note2) | | | | | | | | | |
| | Single acting type | None | | | | | | | | — | |
| Lubrication | | Not required (If lubrication is required, use Turbine Oil Class 1 [ISO VG32] or equivalent.) | | | | | | | | | |
| Port size | | M5×0.8 | | | | Rc1/8 | | Rc1/4 | | Rc3/8 | |

Remark: For Handling Instructions and Precautions, see p.205.

Notes: 1. The single acting pull type of ϕ 12 is 0.18~1.0MPa [26~145psi].

2. For heat resistant specification, consult us.

3. Not available for heat resistant specification.

Bore Size and Stroke

For non-standard strokes, see p.206.

| For non standard strokes, see page 2 | | | | mm |
|--------------------------------------|-----------|--|--|----|
| Operation type | Bore size | Standard strokes | | |
| | | Standard cylinder | Cylinder with magnet | |
| Double acting type | 12 | 5, 10, 15, 20, 25, 30 | 5, 10, 15, 20, 25, 30 | |
| | 16 | | | |
| | 20 | 5, 10, 15, 20, 25, 30, 35, 40, 45, 50 | 5, 10, 15, 20, 25, 30, 35, 40, 45, 50 | |
| | 25 | | | |
| | 32 | 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 75, 100 | 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 75, 100 | |
| | 40 | | | |
| | 50 | 10, 15, 20, 25, 30, 35, 40, 45, 50, 75, 100 | 10, 15, 20, 25, 30, 35, 40, 45, 50, 75, 100 | |
| | 63 | | | |
| | 80 | | | |
| 100 | | | | |
| Single acting type | 12 | 5, 10, 15, 20, 25, 30 | 5, 10, 15, 20, 25, 30 | |
| | 16 | | | |
| | 20 | | | |
| | 25 | | | |
| | 32 | | | |
| | 40 | | | |
| | 50 | 10, 15, 20, 25, 30, 35, 40 | 10, 15, 20, 25, 30, 35, 40 | |

Remarks: 1. Stroke tolerance $^{+1}_0$ [+0.039in.]

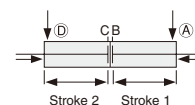
2. In most cases, body cutting is used for the non-standard strokes.

However, body cutting is not used for strokes of less than 5mm for ϕ 12~ ϕ 40, and strokes of less than 10mm for ϕ 50~ ϕ 100. The collar packed is used for these cases.

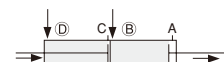
Operation of Dual Stroke Cylinders

Dual Stroke Cylinders are a set of 2 cylinders connected back to back.

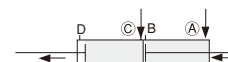
The cylinder body can be secured in place and each stroke can be controlled separately. It can also be used to obtain 2-stage or 3-stage strokes by securing the piston rod on one side in place.



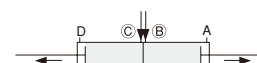
The rods retract stroke 1 and stroke 2 when air is supplied from Ports A and D.



The rod moves stroke 1 when air is supplied from Ports B and D.



The rod moves stroke 2 when air is supplied from Ports A and C.



The rod moves stroke 1 and stroke 2 when air is supplied from Ports B and C.

Order Codes for Dual Stroke Cylinders

| Operation type | | Rod end specification | | Mounting type | | Sensor switch type ^{Note5} (For cylinder with magnet) | | Lead wire length | | Number of sensor switches (For cylinder with magnet) Blank: No sensor switch | | |
|--|------------------------------|---|---------------|---------------------------------------|---|---|----------------------------|---|---|---|--|------------------|
| DA : Double acting type | SA : Single acting push type | TA : Single acting pull type | Female thread | Male thread | Basic type | Flange mounting type ^{Note6} | Blank: No sensor switch | -ZE135 : With ZE135 ● 2-lead wire Solid state type ● With indicator lamp ● DC10~28V ● Horizontal lead wire | -ZE155 : With ZE155 ● 3-lead wire Solid state type ● With indicator lamp ● DC4.5~28V ● Horizontal lead wire | A : 1000mm [39in.] B : 3000mm [118in.] | Blank: No sensor switch | |
| | | | Blank | -B | Blank | -3 | | -ZE235 : With ZE235 ● 2-lead wire Solid state type ● With indicator lamp ● DC10~28V ● Vertical lead wire | -ZE255 : With ZE255 ● 3-lead wire Solid state type ● With indicator lamp ● DC4.5~28V ● Vertical lead wire | | 1 : With 1 sensor switch 2 : With 2 sensor switches | |
| | | | | | | | | -ZE101 : With ZE101 ● 2-lead wire Reed switch type ● Without indicator lamp ● DC5~28V AC85~115V ● Horizontal lead wire | -ZE102 : With ZE102 ● 2-lead wire Reed switch type ● With indicator lamp ● DC10~28V AC85~115V ● Horizontal lead wire | | | |
| | | | | | | | | -ZE201 : With ZE201 ● 2-lead wire Reed switch type ● Without indicator lamp ● DC5~28V AC85~115V ● Vertical lead wire | -ZE202 : With ZE202 ● 2-lead wire Reed switch type ● With indicator lamp ● DC10~28V AC85~115V ● Vertical lead wire | | | |
| Heat resistant specification | | Cylinder specification | | Bumper ^{Note4} | | Centering location ^{Note7} | | | | | | |
| Blank : Standard cylinder ^{Note1} F : Heat resistant cylinder ^{Note2} | | Blank : Standard cylinder ^{Note1} (Non-ion specification) S : Cylinder with magnet ^{Note3} (Non-ion specification) | | Blank : No bumper -R : With bumper | | Blank : No centering location -G : With centering location | | | | | | |
| Dual stroke cylinder | | | | | | | | | | | | |
| Basic type | | | | Bore size × Stroke | | | | | | | | |
| C | DA SA TA | F | W | S | Bore size × Stroke1 × Stroke2 | -B ^{Note8} | -R | -G | -3 | -ZE135 -ZE155 -ZE235 -ZE255 -ZE101 -ZE102 -ZE201 -ZE202 | A B | 1 2 : n |

● See table for bore size and stroke.

● Mounting brackets are included at shipping.

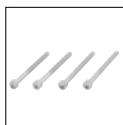
● For the order codes of sensor switches only, see p.199.

- Notes: 1. In the standard cylinder, a magnet for the sensor switch is not built-in.
 2. Not available for the cylinder with magnet or the cylinder with bumper.
 3. Not available in heat resistant specification.
 4. For the double acting type only. Not available for heat resistant specification.
 5. For details of sensor switches, see p.1544.
 6. The flange mounting bracket can be mounted on the end of cylinder 2 only. Moreover, it cannot be mounted on the bore size ϕ 40 with centering location (-G).
 7. Not available for the bore size ϕ 12.
 8. For information regarding the cylinder joint and cylinder rod end for male thread, see p.1568.

Additional Parts (To be ordered separately)



Flange mounting bracket
(p.198)

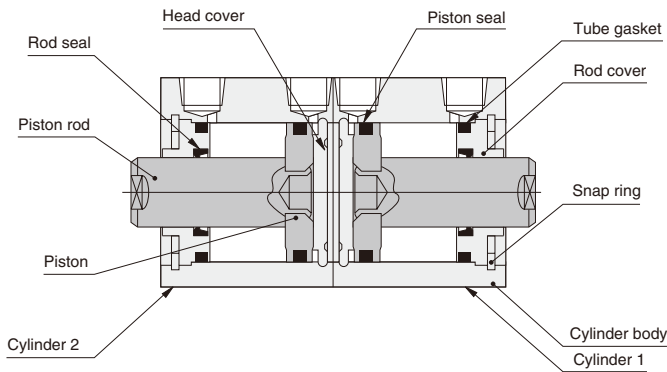


Mounting screws
(p.209)

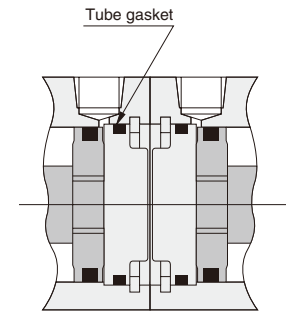
Inner Construction and Major Parts

● Double acting type (CDAW)

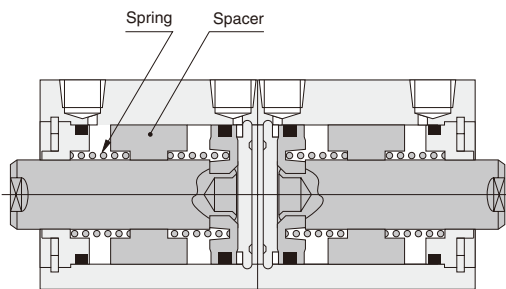
● $\phi 12 \sim \phi 40$



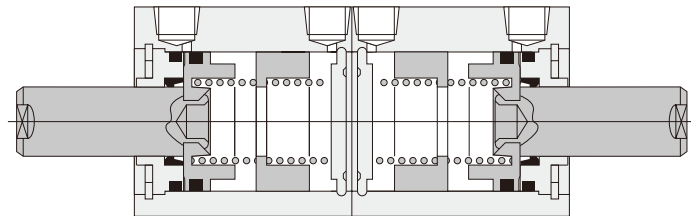
● $\phi 50 \sim \phi 100$



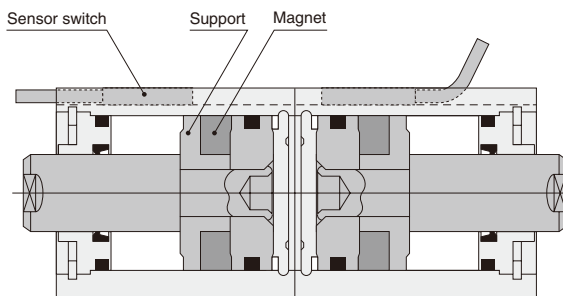
● Single acting push type (CSAW)



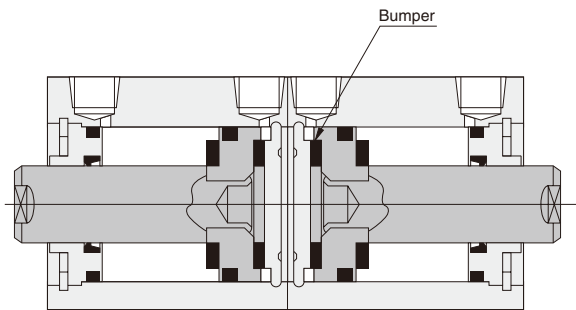
● Single acting pull type (CTAW)



● Cylinder with magnet



● With bumper



Major Parts and Materials

| Parts | Bore mm | φ 12 | φ 16 | φ 20 | φ 25 | φ 32 | φ 40 | φ 50 | φ 63 | φ 80 | φ 100 |
|---------------|---------|--|------|------|------|------|-----------------------|------|------|------|-------|
| Cylinder body | | Aluminum alloy (anodized) | | | | | | | | | |
| Piston | | Aluminum alloy (special rust prevention treatment) | | | | | | | | | |
| Piston rod | | Stainless steel (chrome plated) | | | | | Steel (chrome plated) | | | | |
| Seal | | Synthetic rubber (NBR) | | | | | | | | | |
| Rod cover | | Aluminum alloy (special wear-resistant treatment) | | | | | | | | | |
| Head cover | | Aluminum alloy (anodized) | | | | | | | | | |
| Snap ring | | Steel (phosphate coating) | | | | | | | | | |
| Spring | | Piano wire | | | | | | | | — | |
| Spacer | | Aluminum alloy (special rust prevention treatment) | | | | | | | | — | |
| Bumper | | Synthetic rubber (NBR; urethane for φ 12 only) | | | | | | | | | |
| Magnet | | Plastic magnet | | | | | | | | | |
| Support | | Aluminum alloy (special rust prevention treatment) | | | | | | | | | |

Seals

| Parts Bore mm | Rod seal | Piston seal | Tube gasket | |
|------------------|----------|----------------|-------------|-----------|
| | | | Rod side | Head side |
| $\phi 12$ | MYR-6 | COP-12 | Y090260 | None |
| $\phi 16$ | MYR-8 | COP-16 | Y090207 | None |
| $\phi 20$ | MYR-10 | COP-20(MYA-16) | Y090216 | None |
| $\phi 25$ | MYR-12 | COP-25(MYA-21) | Y090210 | None |
| $\phi 32$ | MYR-16 | COP-32 | L090084 | None |
| $\phi 40$ | MYR-16 | COP-40 | L090151 | None |
| $\phi 50$ | MYR-20 | COP-50 | L090174 | L090106 |
| $\phi 63$ | MYR-20 | COP-63 | L090180 | L090107 |
| $\phi 80$ | PNY-25 | COP-80 | L090171 | L090108 |
| $\phi 100$ | PNY-32 | COP-100 | L090172 | L090109 |

Note: Items in parentheses () are for the single acting type.

Mass

Dual stroke

● Double acting type

| Bore size mm [in.] | Zero stroke mass ^{Note1} | Additional mass for each 1mm [0.0394in.] of stroke1 | Additional mass for each 1mm [0.0394in.] of stroke2 | Additional mass of cylinder with bumper | Additional mass of cylinder with magnet | Mass of mounting bracket Flange bracket | Additional mass of sensor switch ^{Note2} | |
|-----------------------|--------------------------------------|---|---|--|--|--|---|-----------|
| | | | | | | | ZE□□□A | ZE□□□B |
| 12 [0.472] | 44.26 [1.561] | 1.4 [0.0494] | 1.28 [0.0451] | 13.39 [0.472] | 13.73 [0.484] | 55 [1.94] | 15 [0.53] | 35 [1.23] |
| 16 [0.630] | 61.11 [2.156] | 1.73 [0.0610] | 1.62 [0.0571] | 16.71 [0.589] | 20.41 [0.720] | 71 [2.50] | | |
| 20 [0.787] | 96.79 [3.414] | 2.37 [0.0836] | 2.26 [0.0797] | 23.14 [0.816] | 52.54 [1.853] | 101 [3.56] | | |
| 25 [0.984] | 147.69 [5.210] | 3.3 [0.116] | 3.11 [0.110] | 32.05 [1.131] | 76.92 [2.713] | 160 [5.64] | | |
| 32 [1.260] | 220.3 [7.771] | 4.31 [0.152] | 4.11 [0.145] | 42.13 [1.486] | 106.84 [3.769] | 186 [6.56] | | |
| 40 [1.575] | 345.12 [12.174] | 5.08 [0.179] | 4.77 [0.168] | 0 | 141.38 [4.987] | 335 [11.82] | | |
| 50 [1.969] | 562.47 [19.840] | 7.48 [0.264] | 7.03 [0.248] | 0 | 220.44 [7.776] | 447 [15.77] | | |
| 63 [2.480] | 896.12 [31.609] | 9.14 [0.322] | 8.69 [0.307] | 0 | 322.4 [11.37] | 591 [20.85] | | |
| 80 [3.150] | 1755.88 [61.936] | 13.51 [0.477] | 13.06 [0.461] | 0 | 494.4 [17.44] | 1414 [49.88] | | |
| 100 [3.940] | 3207.76 [113.15] | 19.06 [0.672] | 18.61 [0.656] | 0 | 724.4 [25.55] | 2606 [91.92] | | |

Notes 1: The above table is for the standard strokes.

2: Sensor switch codes A and B show the lead wire lengths.

A: 1000mm [39in.] B: 3000mm [118in.]

Calculation example: For the mass of a double acting type cylinder with magnet, bore size of 25mm, 30mm for stroke 1, 10mm for stroke 2, and with 2 sensor switches (ZE135A)

$$147.69 + (3.3 \times 30) + (3.11 \times 10) + 76.92 + (15 \times 2) = 384.71 \text{ g [13.570oz.]}$$

Dual stroke

● Single acting push type

| Single acting push type | | | | | | | | | | g [oz.] | |
|-------------------------|-----------------------------------|---------------------|---------------------|---------------------|---|---|--|-----------------------------|--|-----------|--|
| Bore size mm [in.] | Zero stroke mass ^{Note1} | | | | Additional mass for each 1mm [0.0394in.] of stroke1 | Additional mass for each 1mm [0.0394in.] of stroke2 | Additional mass of cylinder with magnet | Mass of mounting bracket | Additional mass of sensor switch ^{Note2} | | |
| | Stroke1 | | | | | | | Flange bracket | ZE□□□A | ZE□□□B | |
| | 5~15 (φ 50: 10~20) | | 16~30 (φ 50: 21~40) | | | | | | | | |
| | Stroke2 | | | | | | | | | | |
| | 5~15 (φ 50: 10~20) | 16~30 (φ 50: 21~40) | 5~15 (φ 50: 10~20) | 16~30 (φ 50: 21~40) | | | | | | | |
| 12 [0.472] | 55.88 [1.971] | 69.98 [2.468] | 71.1 [2.508] | 85.21 [3.006] | 1.4 [0.0494] | 1.28 [0.0451] | 16.11 [0.568] | 55 [1.94] | 15 [0.53] | 35 [1.23] | |
| 16 [0.630] | 80.31 [2.833] | 99.64 [3.515] | 100.76 [3.554] | 120.1 [4.236] | 1.73 [0.0610] | 1.62 [0.0571] | 21.21 [0.748] | 71 [2.50] | | | |
| 20 [0.787] | 96.88 [3.417] | 124.84 [4.404] | 125.96 [4.443] | 153.93 [5.430] | 2.37 [0.0836] | 2.26 [0.0797] | 51.89 [1.830] | 101 [3.56] | | | |
| 25 [0.984] | 147.45 [5.201] | 186 [6.561] | 187.98 [6.631] | 226.53 [7.990] | 3.3 [0.116] | 3.11 [0.110] | 80.18 [2.828] | 160 [5.64] | | | |
| 32 [1.260] | 223.01 [7.866] | 306.96 [10.828] | 309.93 [10.932] | 393.89 [13.894] | 4.31 [0.152] | 4.11 [0.145] | 103.14 [3.638] | 186 [6.56] | | | |
| 40 [1.575] | 345.03 [12.170] | 453.44 [15.994] | 458.06 [16.157] | 566.48 [19.982] | 5.08 [0.179] | 4.77 [0.168] | 141.93 [5.006] | 335 [11.82] | | | |
| 50 [1.969] | 561.93 [19.821] | 691.19 [24.381] | 697.85 [24.616] | 827.1 [29.175] | 7.48 [0.264] | 7.03 [0.248] | 216.54 [7.638] | 447 [15.77] | | | |

Notes 1: The above table is for the standard strokes.

2: Sensor switch codes A and B show the lead wire lengths.

A: 1000mm [39in.] B: 3000mm [118in.]

Calculation example: For the mass of a single acting push type cylinder with magnet, bore size of 25mm, 20mm for stroke 1, 20mm for stroke 2, and with 2 sensor switches (ZE135A)

$$226.53 + (3.3 \times 20) + (3.11 \times 20) + 80.18 + (15 \times 2) = 464.91 \text{ g [16.399oz.]}$$

Dual stroke

● Single acting pull type

| Single acting pull type | | | | | | | | | | g [oz.] | |
|-------------------------|-----------------------------------|---------------------|---------------------|---------------------|---------------|---|---|--|-----------------------------|--|--------|
| Bore size mm [in.] | Zero stroke mass ^{Note1} | | | | | Additional mass for each 1mm [0.0394in.] of stroke1 | Additional mass for each 1mm [0.0394in.] of stroke2 | Additional mass of cylinder with magnet | Mass of mounting bracket | Additional mass of sensor switch ^{Note2} | |
| | Stroke1 | | | | | | | | | Flange bracket | ZE□□□A |
| | 5~15 (φ 50: 10~20) | | 16~30 (φ 50: 21~40) | | | | | | | | |
| | Stroke2 | | | | | | | | | | |
| | 5~15 (φ 50: 10~20) | 16~30 (φ 50: 21~40) | 5~15 (φ 50: 10~20) | 16~30 (φ 50: 21~40) | | | | | | | |
| 12 [0.472] | 54.88 [1.936] | 66.76 [2.355] | 67.88 [2.394] | 79.77 [2.814] | 1.4 [0.0494] | 1.28 [0.0451] | 17.67 [0.623] | 55 [1.94] | 15 [0.53] | 35 [1.23] | |
| 16 [0.630] | 78.77 [2.778] | 94.15 [3.321] | 95.27 [3.360] | 110.66 [3.903] | 1.73 [0.0610] | 1.62 [0.0571] | 23.31 [0.822] | 71 [2.50] | | | |
| 20 [0.787] | 117.58 [4.147] | 139.48 [4.920] | 140.6 [4.959] | 162.49 [5.732] | 2.37 [0.0836] | 2.26 [0.0797] | 53.74 [1.896] | 101 [3.56] | | | |
| 25 [0.984] | 175.72 [6.198] | 205.63 [7.253] | 207.61 [7.323] | 237.52 [8.378] | 3.3 [0.116] | 3.11 [0.110] | 78.89 [2.783] | 160 [5.64] | | | |
| 32 [1.260] | 255.75 [9.021] | 316.83 [11.176] | 319.8 [11.280] | 380.88 [13.435] | 4.31 [0.152] | 4.11 [0.145] | 105.39 [3.717] | 186 [6.56] | | | |
| 40 [1.575] | 395.6 [13.954] | 480.5 [16.949] | 485.12 [17.112] | 570.02 [20.107] | 5.08 [0.179] | 4.77 [0.168] | 138.9 [4.899] | 335 [11.82] | | | |
| 50 [1.969] | 634.13 [22.368] | 726.4 [25.623] | 733.06 [25.857] | 825.32 [29.112] | 7.48 [0.264] | 7.03 [0.248] | 144.56 [5.099] | 447 [15.77] | | | |

Notes 1: The above table is for the standard strokes.

2: Sensor switch codes A and B show the lead wire lengths.

A: 1000mm [39in.] B: 3000mm [118in.]

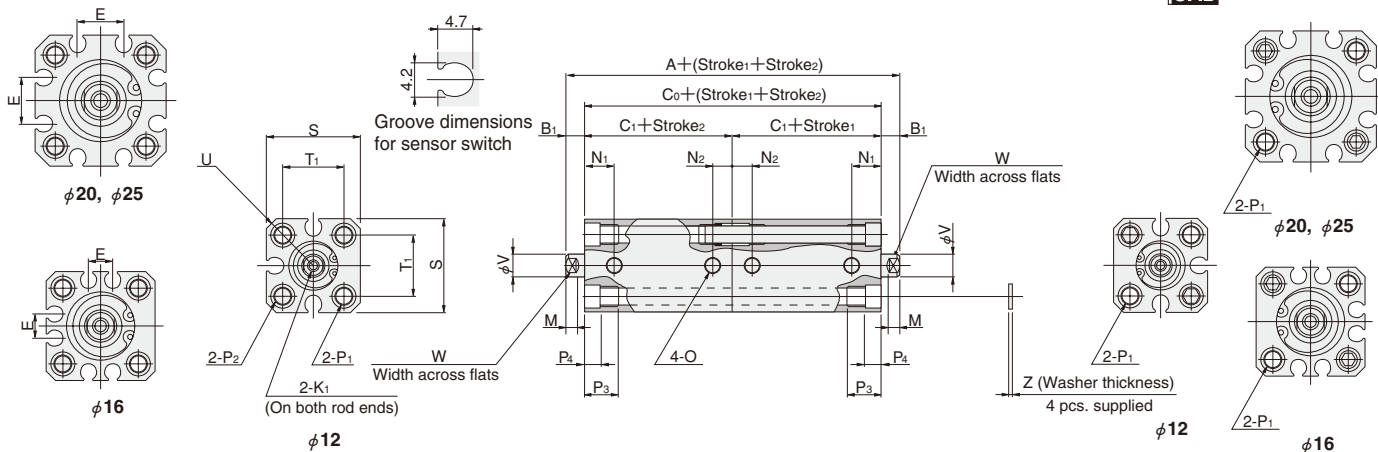
Calculation example: For the mass of a single acting pull type cylinder with magnet, bore size of 25mm, 20mm for stroke 1, 20mm for stroke 2, and with 2 sensor switches (ZE135A)

$$237.52 + (3.3 \times 20) + (3.11 \times 20) + 78.89 + (15 \times 2) = 474.61 \text{ g [16.741oz.]}$$

Dimensions of Dual Stroke Double Acting Type (mm)

● $\phi 12 \sim \phi 25$

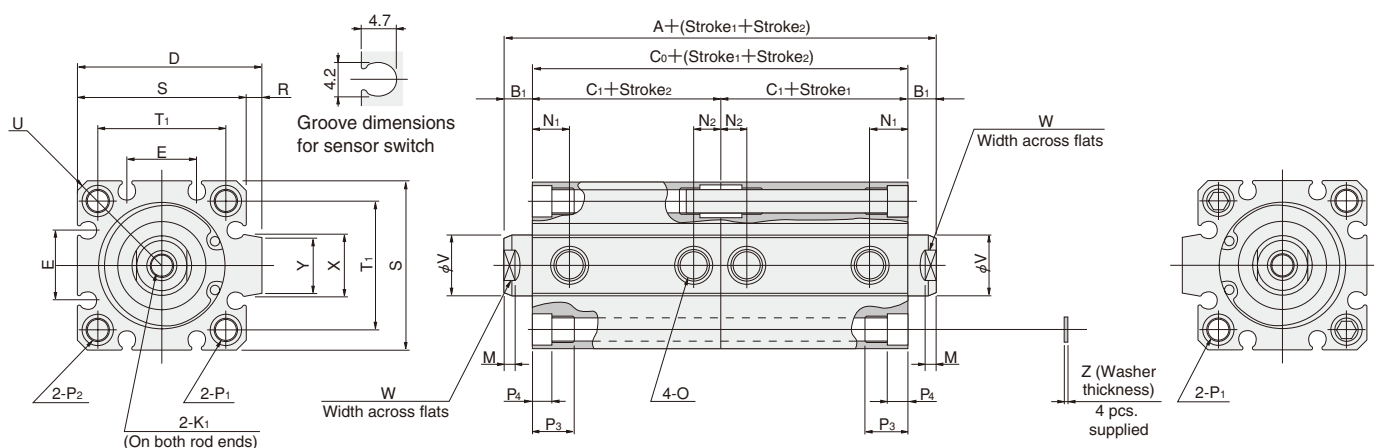
CAD Bore size



● The drawing is for $\phi 12$.

● $\phi 32 \sim \phi 100$

CAD Bore size



| Type | Standard cylinder (CDAW) | | | | Cylinder with magnet (CDAWS) | | | | Standard cylinder with bumper (CDAW-R) | | | | Cylinder with magnet and bumper (CDAWS-R) | | | | D | E | K ₁ | M | N ₁ | N ₂ | O |
|-------------|--------------------------|----------------|----------------|----------------|------------------------------|----------------|----------------|----------------|--|----------------|----------------|----------------|---|----------------|----------------|----------------|------|------|-------------------|-----|----------------|----------------|----------|
| Code | A | B ₁ | C ₀ | C ₁ | A | B ₁ | C ₀ | C ₁ | A | B ₁ | C ₀ | C ₁ | A | B ₁ | C ₀ | C ₁ | | | | | | | |
| 12 [0.472] | 44 | 5 | 34 | 17 | 54 | 5 | 44 | 22 | 54 | 5 | 44 | 22 | 64 | 5 | 54 | 27 | — | — | M3 X 0.5 Depth8 | 3.5 | 8 | 5 | M5 X 0.8 |
| 16 [0.630] | 45 | 5.5 | 34 | 17 | 55 | 5.5 | 44 | 22 | 55 | 5.5 | 44 | 22 | 65 | 5.5 | 54 | 27 | — | 6.2 | M4 X 0.7 Depth8 | 3.5 | 8 | 5 | M5 X 0.8 |
| 20 [0.787] | 50 | 5.5 | 39 | 19.5 | 70 | 5.5 | 59 | 29.5 | 60 | 5.5 | 49 | 24.5 | 80 | 5.5 | 69 | 34.5 | — | 12.2 | M5 X 0.8 Depth10 | 4.5 | 9.5 | 5 | M5 X 0.8 |
| 25 [0.984] | 54 | 6 | 42 | 21 | 74 | 6 | 62 | 31 | 64 | 6 | 52 | 26 | 84 | 6 | 72 | 36 | — | 12.2 | M6 X 1 Depth10 | 5 | 10.5 | 5 | M5 X 0.8 |
| 32 [1.260] | 60 | 7 | 46 | 23 | 80 | 7 | 66 | 33 | 70 | 7 | 56 | 28 | 80 | 7 | 66 | 33 | 48.5 | 18.2 | M8 X 1.25 Depth12 | 6 | 9.5 | 7.5(6) | Rc1/8 |
| 40 [1.575] | 66 | 7 | 52 | 26 | 86 | 7 | 72 | 36 | 66 | 7 | 52 | 26 | 86 | 7 | 72 | 36 | 56.5 | 18.2 | M8 X 1.25 Depth12 | 6 | 10.5 | 7.5 | Rc1/8 |
| 50 [1.969] | 74 | 9 | 56 | 28 | 94 | 9 | 76 | 38 | 74 | 9 | 56 | 28 | 94 | 9 | 76 | 38 | 70 | 24.8 | M10 X 1.5 Depth15 | 7 | 11 | 9.5 | Rc1/4 |
| 63 [2.480] | 82 | 9 | 64 | 32 | 102 | 9 | 84 | 42 | 82 | 9 | 64 | 32 | 102 | 9 | 84 | 42 | 83 | 26.8 | M10 X 1.5 Depth15 | 7 | 12.5 | 11 | Rc1/4 |
| 80 [3.150] | 104 | 11 | 82 | 41 | 124 | 11 | 102 | 51 | 104 | 11 | 82 | 41 | 124 | 11 | 102 | 51 | 102 | 32.8 | M14 X 2 Depth20 | 9 | 18 | 12 | Rc3/8 |
| 100 [3.940] | 126 | 12 | 102 | 51 | 146 | 12 | 122 | 61 | 126 | 12 | 102 | 51 | 146 | 12 | 122 | 61 | 122 | 32.8 | M18 X 2.5 Depth20 | 9 | 22.5 | 16.5 | Rc3/8 |

| Code | P ₁ | | | | P ₂ | | P ₃ | P ₄ | R | S | T ₁ | U | V | W | X | Y | Z | Appropriate through bolt※ | |
|-------------|--------------------|--|---------------------------------|------|----------------|-----|----------------|----------------|-------|----|----------------|------|------|-----|-----|---|---|---------------------------|--|
| 12 [0.472] | φ 4.3 (Thru hole) | C bore φ 6.5 (Both sides) and M5 X 0.8 (Both sides) | Counterbore φ 6.5 and M5 X 0.8 | 9.5 | 4.5 | — | 25 | 16.3 | R16 | 6 | 5 | — | — | 1 | M3 | | | | |
| 16 [0.630] | φ 4.3 (Thru hole) | C bore φ 6.5 (Both sides) and M5 X 0.8 (Both sides) | Counterbore φ 6.5 and M5 X 0.8 | 9.5 | 4.5 | — | 29 | 19.8 | R19 | 8 | 6 | — | — | 1 | M3 | | | | |
| 20 [0.787] | φ 4.3 (Thru hole) | C bore φ 6.5 (Both sides) and M5 X 0.8 (Both sides) | Counterbore φ 6.5 and M5 X 0.8 | 9.5 | 4.5 | — | 34 | 24 | R22 | 10 | 8 | — | — | 1 | M3 | | | | |
| 25 [0.984] | φ 5.1 (Thru hole) | C bore φ 8 (Both sides) and M6 X 1 (Both sides) | Counterbore φ 8 and M6 X 1 | 11.5 | 5.5 | — | 40 | 28 | R25 | 12 | 10 | — | — | 1 | M4 | | | | |
| 32 [1.260] | φ 5.1 (Thru hole) | C bore φ 8 (Both sides) and M6 X 1 (Both sides) | Counterbore φ 8 and M6 X 1 | 11.5 | 5.5 | 4.5 | 44 | 34 | R29.5 | 16 | 14 | 15 | 13.6 | 1 | M4 | | | | |
| 40 [1.575] | φ 6.9 (Thru hole) | C bore φ 9.5 (Both sides) and M8 X 1.25 (Both sides) | Counterbore φ 9.5 and M8 X 1.25 | 15.5 | 7.5 | 4.5 | 52 | 40 | R35 | 16 | 14 | 15 | 13.6 | 1.6 | M5 | | | | |
| 50 [1.969] | φ 6.9 (Thru hole) | C bore φ 11 (Both sides) and M8 X 1.25 (Both sides) | Counterbore φ 11 and M8 X 1.25 | 16.5 | 8.5 | 8 | 62 | 48 | R41 | 20 | 17 | 21.6 | 19 | 1.6 | M6 | | | | |
| 63 [2.480] | φ 6.9 (Thru hole) | C bore φ 11 (Both sides) and M8 X 1.25 (Both sides) | Counterbore φ 11 and M8 X 1.25 | 16.5 | 8.5 | 8 | 75 | 60 | R50 | 20 | 17 | 21.6 | 19 | 1.6 | M6 | | | | |
| 80 [3.150] | φ 10.5 (Thru hole) | C bore φ 14 (Both sides) and M12 X 1.75 (Both sides) | Counterbore φ 14 and M12 X 1.75 | 22.5 | 10.5 | 8 | 94 | 74 | R62 | 25 | 22 | 27.6 | 25 | 1.6 | M8 | | | | |
| 100 [3.940] | φ 12.3 (Thru hole) | C bore φ 17.5 (Both sides) and M14 X 2 (Both sides) | Counterbore φ 17.5 and M14 X 2 | 27 | 13 | 8 | 114 | 90 | R75 | 32 | 27 | 27.6 | 25 | 2 | M10 | | | | |

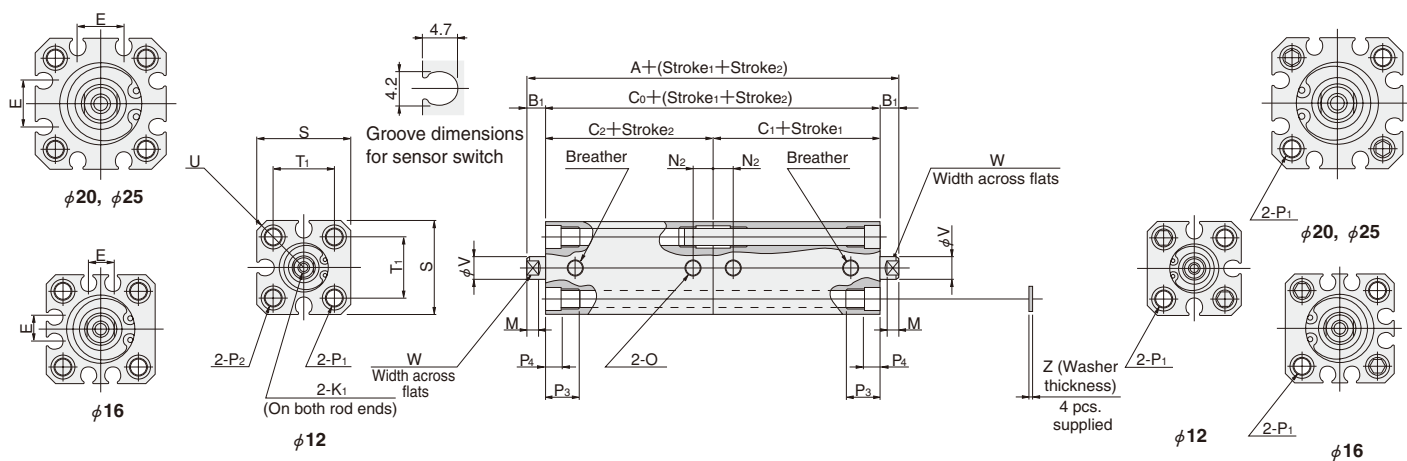
Note: Figure in parentheses [] is for the standard cylinder (CDAW) with 5mm stroke.

※ Some types of mounting screws are available (to be ordered separately). See p.209.

Dimensions of Dual Stroke Single Acting Push Type (mm)

● $\phi 12 \sim \phi 25$

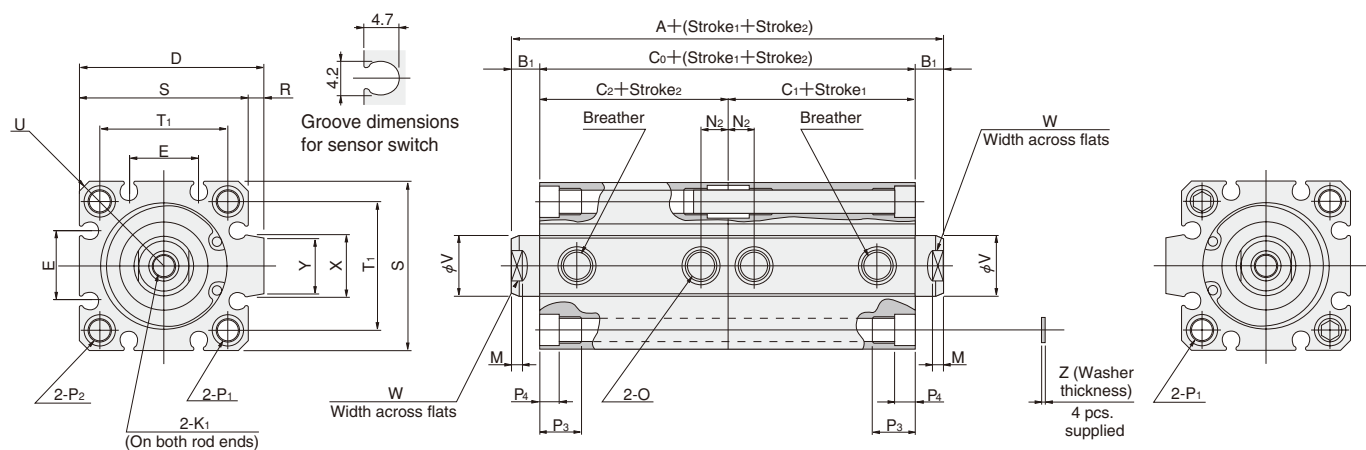
CAD Bore size



● The drawing is for $\phi 12$.

● $\phi 32 \sim \phi 50$

CAD Bore size



| Type Stroke1 | Standard cylinder (CSAW) | | | | | | | | | | Cylinder with magnet (CSAWS) | | | | | | | | | | |
|-----------------|--------------------------|----------------|----------------|----------------|----------------|---------------------|----------------|----------------|----------------|----------------|------------------------------|----------------|----------------|----------------|----------------|---------------------|----------------|----------------|----------------|----------------|------|
| | 5~15 (φ 50: 10~20) | | | | | 16~30 (φ 50: 21~40) | | | | | 5~15 (φ 50: 10~20) | | | | | 16~30 (φ 50: 21~40) | | | | | |
| Code | A | B ₁ | C ₀ | C ₁ | C ₂ | A | B ₁ | C ₀ | C ₁ | C ₂ | A | B ₁ | C ₀ | C ₁ | C ₂ | A | B ₁ | C ₀ | C ₁ | C ₂ | |
| 12 [0.472] | D1 | 54 | 5 | 44 | 22 | 22 | 64 | 5 | 54 | 32 | 22 | 64 | 5 | 54 | 27 | 27 | 74 | 5 | 64 | 37 | 27 |
| | D2 | 64 | | 54 | | 32 | 74 | | 64 | | 32 | 74 | | 64 | | 37 | 84 | | 74 | | 37 |
| 16 [0.630] | D1 | 55 | 5.5 | 44 | 22 | 22 | 65 | 5.5 | 54 | 32 | 22 | 65 | 5.5 | 54 | 27 | 27 | 75 | 5.5 | 64 | 37 | 27 |
| | D2 | 65 | | 54 | | 32 | 75 | | 64 | | 32 | 75 | | 64 | | 37 | 85 | | 74 | | 37 |
| 20 [0.787] | D1 | 50 | 5.5 | 39 | 19.5 | 19.5 | 60 | 5.5 | 49 | 29.5 | 19.5 | 70 | 5.5 | 59 | 29.5 | 29.5 | 80 | 5.5 | 69 | 39.5 | 29.5 |
| | D2 | 60 | | 49 | | 29.5 | 70 | | 59 | | 29.5 | 80 | | 69 | | 29.5 | 39.5 | | 90 | | 79 |
| 25 [0.984] | D1 | 54 | 6 | 42 | 21 | 21 | 64 | 6 | 52 | 31 | 21 | 74 | 6 | 62 | 31 | 31 | 84 | 6 | 72 | 41 | 31 |
| | D2 | 64 | | 52 | | 31 | 74 | | 62 | | 31 | 31 | | 84 | | 72 | 31 | | 41 | | 94 |
| 32 [1.260] | D1 | 60 | 7 | 46 | 23 | 23 | 75 | 7 | 61 | 38 | 23 | 80 | 7 | 66 | 33 | 33 | 95 | 7 | 81 | 48 | 33 |
| | D2 | 75 | | 61 | | 38 | 90 | | 76 | | 38 | 95 | | 81 | | 33 | 48 | | 110 | | 96 |
| 40 [1.575] | D1 | 66 | 7 | 52 | 26 | 26 | 81 | 7 | 67 | 41 | 26 | 86 | 7 | 72 | 36 | 36 | 101 | 7 | 87 | 51 | 36 |
| | D2 | 81 | | 67 | | 41 | 96 | | 82 | | 41 | 101 | | 87 | | 36 | 51 | | 116 | | 102 |
| 50 [1.969] | D1 | 74 | 9 | 56 | 28 | 28 | 89 | 9 | 71 | 43 | 28 | 94 | 9 | 76 | 38 | 38 | 109 | 9 | 91 | 53 | 38 |
| | D2 | 89 | | 71 | | 43 | 104 | | 86 | | 43 | 43 | | 109 | | 91 | 38 | | 53 | | 124 |

| Bore mm [in.] | Code | D | E | K ₁ | M | N ₂ | O | P ₁ |
|------------------|------|------|------|-----------------|-----|----------------|--------|--|
| 12 [0.472] | D1 | — | — | M3×0.5 Depth6 | 3.5 | 5 | M5×0.8 | φ 4.3 (Thru hole) Counterbore φ 6.5 (Both sides) and M5×0.8 (Both sides) |
| | D2 | — | — | | | | | |
| 16 [0.630] | D1 | — | 6.2 | M4×0.7 Depth8 | 3.5 | 5 | M5×0.8 | φ 4.3 (Thru hole) Counterbore φ 6.5 (Both sides) and M5×0.8 (Both sides) |
| | D2 | — | — | | | | | |
| 20 [0.787] | D1 | — | 12.2 | M5×0.8 Depth10 | 4.5 | 5 | M5×0.8 | φ 4.3 (Thru hole) Counterbore φ 6.5 (Both sides) and M5×0.8 (Both sides) |
| | D2 | — | — | | | | | |
| 25 [0.984] | D1 | — | 12.2 | M6×1 Depth10 | 5 | 5 | M5×0.8 | φ 5.1 (Thru hole) Counterbore φ 8 (Both sides) and M6×1 (Both sides) |
| | D2 | — | — | | | | | |
| 32 [1.260] | D1 | 48.5 | 18.2 | M8×1.25 Depth12 | 6 | 7.5 | Rc1/8 | φ 5.1 (Thru hole) Counterbore φ 8 (Both sides) and M6×1 (Both sides) |
| | D2 | — | — | | | | | |
| 40 [1.575] | D1 | 56.5 | 18.2 | M8×1.25 Depth12 | 6 | 7.5 | Rc1/8 | φ 6.9 (Thru hole) Counterbore φ 9.5 (Both sides) and M8×1.25 (Both sides) |
| | D2 | — | — | | | | | |
| 50 [1.969] | D1 | 70 | 24.8 | M10×1.5 Depth15 | 7 | 9.5 | Rc1/4 | φ 6.9 (Thru hole) Counterbore φ 11 (Both sides) and M8×1.25 (Both sides) |
| | D2 | — | — | | | | | |

| Bore mm [in.] | Code | P ₂ | P ₃ | P ₄ | R | S | T ₁ | U | V | W | X | Y | Z | Appropriate through bolt※ |
|------------------|------|----------------------------------|----------------|----------------|-----|----|----------------|-------|----|----|------|------|-----|------------------------------|
| 12 [0.472] | D1 | Counterbore φ 6.5 and M5×0.8 | 9.5 | 4.5 | — | 25 | 16.3 | R16 | 6 | 5 | — | — | 1 | M3 |
| | D2 | | | | | | | | | | | | | |
| 16 [0.630] | D1 | Counterbore φ 6.5 and M5×0.8 | 9.5 | 4.5 | — | 29 | 19.8 | R19 | 8 | 6 | — | — | 1 | M3 |
| | D2 | | | | | | | | | | | | | |
| 20 [0.787] | D1 | Counterbore φ 6.5 and M5×0.8 | 9.5 | 4.5 | — | 34 | 24 | R22 | 10 | 8 | — | — | 1 | M3 |
| | D2 | | | | | | | | | | | | | |
| 25 [0.984] | D1 | Counterbore φ 8 and M6×1 | 11.5 | 5.5 | — | 40 | 28 | R25 | 12 | 10 | — | — | 1 | M4 |
| | D2 | | | | | | | | | | | | | |
| 32 [1.260] | D1 | Counterbore φ 8 and M6×1 | 11.5 | 5.5 | 4.5 | 44 | 34 | R29.5 | 16 | 14 | 15 | 13.6 | 1 | M4 |
| | D2 | | | | | | | | | | | | | |
| 40 [1.575] | D1 | Counterbore φ 9.5 and M8×1.25 | 15.5 | 7.5 | 4.5 | 52 | 40 | R35 | 16 | 14 | 15 | 13.6 | 1.6 | M5 |
| | D2 | | | | | | | | | | | | | |
| 50 [1.969] | D1 | Counterbore φ 11 and M8×1.25 | 16.5 | 8.5 | 8 | 62 | 48 | R41 | 20 | 17 | 21.6 | 19 | 1.6 | M6 |
| | D2 | | | | | | | | | | | | | |

Note: D1 is when stroke 2 is 5~15 (φ 50: 10~20)mm.

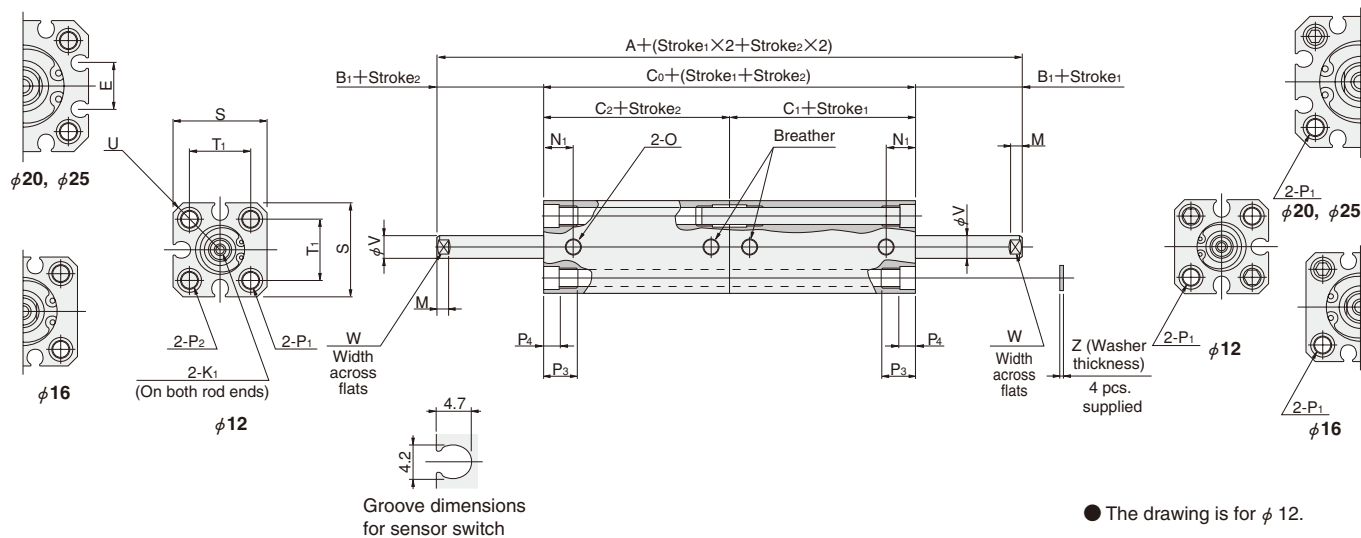
D2 is when stroke 2 is 16~30 (φ 50: 21~40)mm.

※ Some types of mounting screws are available (to be ordered separately). See p.209.

Dimensions of Dual Stroke Single Acting Pull Type (mm)

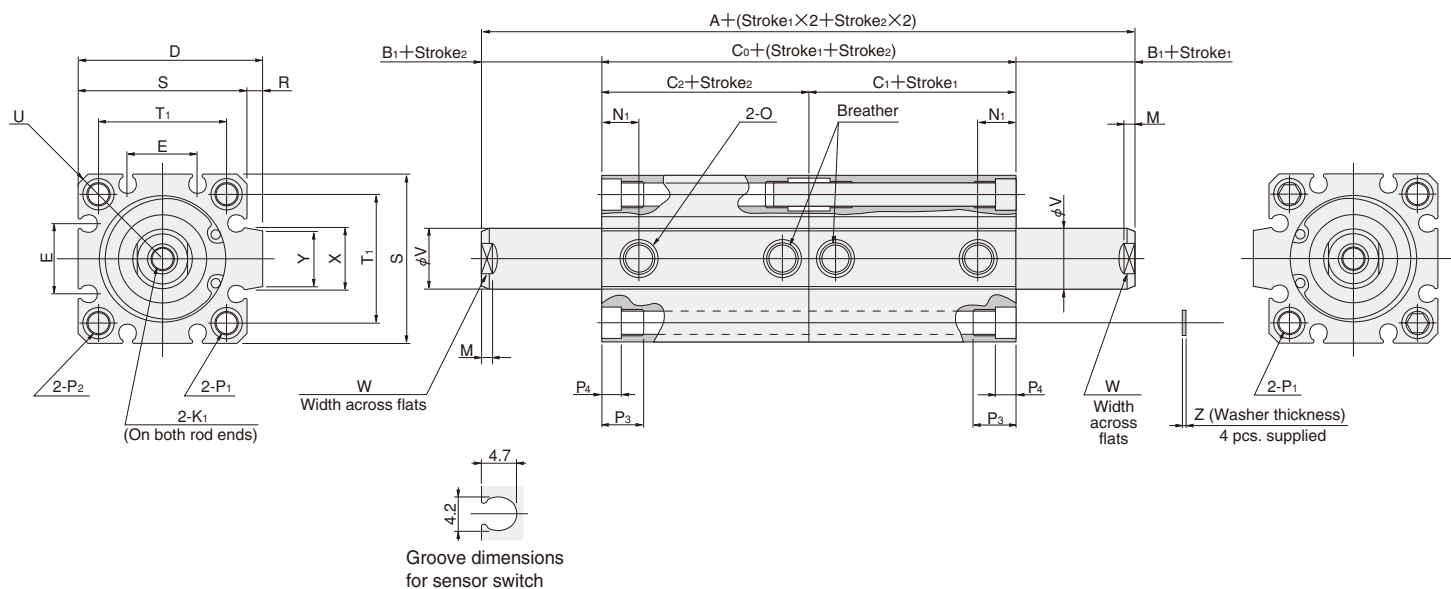
● $\phi 12 \sim \phi 25$

CAD Bore size



● $\phi 32 \sim \phi 50$

CAD Bore size



| Type Stroke1 | Standard cylinder (CTAW) | | | | | | | | | | Cylinder with magnet (CTAWS) | | | | | | | | | | |
|-----------------|--------------------------|----------------|----------------|----------------|----------------|---------------------|----------------|----------------|----------------|----------------|------------------------------|----------------|----------------|----------------|----------------|---------------------|----------------|----------------|----------------|----------------|------|
| | 5~15 (φ 50: 10~20) | | | | | 16~30 (φ 50: 21~40) | | | | | 5~15 (φ 50: 10~20) | | | | | 16~30 (φ 50: 21~40) | | | | | |
| Code | A | B ₁ | C ₀ | C ₁ | C ₂ | A | B ₁ | C ₀ | C ₁ | C ₂ | A | B ₁ | C ₀ | C ₁ | C ₂ | A | B ₁ | C ₀ | C ₁ | C ₂ | |
| 12 [0.472] | D1 | 54 | 5 | 44 | 22 | 22 | 64 | 5 | 54 | 32 | 22 | 64 | 5 | 54 | 27 | 27 | 74 | 5 | 64 | 37 | 27 |
| | D2 | 64 | | 54 | | 32 | 74 | | 64 | | 32 | 74 | | 64 | | 37 | 84 | | 74 | | 37 |
| 16 [0.630] | D1 | 55 | 5.5 | 44 | 22 | 22 | 65 | 5.5 | 54 | 32 | 22 | 65 | 5.5 | 54 | 27 | 27 | 75 | 5.5 | 64 | 37 | 27 |
| | D2 | 65 | | 54 | | 32 | 75 | | 64 | | 32 | 75 | | 64 | | 37 | 85 | | 74 | | 37 |
| 20 [0.787] | D1 | 60 | 5.5 | 49 | 24.5 | 24.5 | 70 | 5.5 | 59 | 34.5 | 24.5 | 80 | 5.5 | 69 | 34.5 | 34.5 | 90 | 5.5 | 79 | 44.5 | 34.5 |
| | D2 | 70 | | 59 | | 34.5 | 80 | | 69 | | 34.5 | 90 | | 79 | | 44.5 | 100 | | 89 | | 44.5 |
| 25 [0.984] | D1 | 64 | 6 | 52 | 26 | 26 | 74 | 6 | 62 | 36 | 26 | 84 | 6 | 72 | 36 | 36 | 94 | 6 | 82 | 46 | 36 |
| | D2 | 74 | | 62 | | 36 | 84 | | 72 | | 36 | 94 | | 82 | | 46 | 104 | | 92 | | 46 |
| 32 [1.260] | D1 | 70 | 7 | 56 | 28 | 28 | 85 | 7 | 71 | 43 | 28 | 90 | 7 | 76 | 38 | 38 | 105 | 7 | 91 | 53 | 38 |
| | D2 | 85 | | 71 | | 43 | 100 | | 86 | | 43 | 105 | | 91 | | 53 | 120 | | 106 | | 53 |
| 40 [1.575] | D1 | 76 | 7 | 62 | 31 | 31 | 91 | 7 | 77 | 46 | 31 | 96 | 7 | 82 | 41 | 41 | 111 | 7 | 97 | 56 | 41 |
| | D2 | 91 | | 77 | | 46 | 106 | | 92 | | 46 | 111 | | 97 | | 56 | 126 | | 112 | | 56 |
| 50 [1.969] | D1 | 74 | 9 | 56 | 28 | 28 | 89 | 9 | 71 | 43 | 28 | 94 | 9 | 76 | 38 | 38 | 109 | 9 | 91 | 53 | 38 |
| | D2 | 89 | | 71 | | 43 | 104 | | 86 | | 43 | 109 | | 91 | | 53 | 124 | | 106 | | 53 |

| Bore mm [in.] | Code | D | E | K ₁ | M | N ₁ | O | P ₁ |
|------------------|------|------|------|-----------------|-----|----------------|--------|--|
| 12 [0.472] | D1 | — | — | M3×0.5 Depth6 | 3.5 | 8 | M5×0.8 | φ 4.3 (Thru hole) Counterbore φ 6.5 (Both sides) and M5×0.8 (Both sides) |
| | D2 | — | — | M3×0.5 Depth6 | 3.5 | 8 | M5×0.8 | φ 4.3 (Thru hole) Counterbore φ 6.5 (Both sides) and M5×0.8 (Both sides) |
| 16 [0.630] | D1 | — | 6.2 | M4×0.7 Depth8 | 3.5 | 8 | M5×0.8 | φ 4.3 (Thru hole) Counterbore φ 6.5 (Both sides) and M5×0.8 (Both sides) |
| | D2 | — | 6.2 | M4×0.7 Depth8 | 3.5 | 8 | M5×0.8 | φ 4.3 (Thru hole) Counterbore φ 6.5 (Both sides) and M5×0.8 (Both sides) |
| 20 [0.787] | D1 | — | 12.2 | M5×0.8 Depth10 | 4.5 | 9.5 | M5×0.8 | φ 4.3 (Thru hole) Counterbore φ 6.5 (Both sides) and M5×0.8 (Both sides) |
| | D2 | — | 12.2 | M5×0.8 Depth10 | 4.5 | 9.5 | M5×0.8 | φ 4.3 (Thru hole) Counterbore φ 6.5 (Both sides) and M5×0.8 (Both sides) |
| 25 [0.984] | D1 | — | 12.2 | M6×1 Depth10 | 5 | 10.5 | M5×0.8 | φ 5.1 (Thru hole) Counterbore φ 8 (Both sides) and M6×1 (Both sides) |
| | D2 | — | 12.2 | M6×1 Depth10 | 5 | 10.5 | M5×0.8 | φ 5.1 (Thru hole) Counterbore φ 8 (Both sides) and M6×1 (Both sides) |
| 32 [1.260] | D1 | 48.5 | 18.2 | M8×1.25 Depth12 | 6 | 9.5 | Rc1/8 | φ 5.1 (Thru hole) Counterbore φ 8 (Both sides) and M6×1 (Both sides) |
| | D2 | 48.5 | 18.2 | M8×1.25 Depth12 | 6 | 9.5 | Rc1/8 | φ 5.1 (Thru hole) Counterbore φ 8 (Both sides) and M6×1 (Both sides) |
| 40 [1.575] | D1 | 56.5 | 18.2 | M8×1.25 Depth12 | 6 | 10.5 | Rc1/8 | φ 6.9 (Thru hole) Counterbore φ 9.5 (Both sides) and M8×1.25 (Both sides) |
| | D2 | 56.5 | 18.2 | M8×1.25 Depth12 | 6 | 10.5 | Rc1/8 | φ 6.9 (Thru hole) Counterbore φ 9.5 (Both sides) and M8×1.25 (Both sides) |
| 50 [1.969] | D1 | 70 | 24.8 | M10×1.5 Depth15 | 7 | 11 | Rc1/4 | φ 6.9 (Thru hole) Counterbore φ 11 (Both sides) and M8×1.25 (Both sides) |
| | D2 | 70 | 24.8 | M10×1.5 Depth15 | 7 | 11 | Rc1/4 | φ 6.9 (Thru hole) Counterbore φ 11 (Both sides) and M8×1.25 (Both sides) |

| Bore mm [in.] | Code | P ₂ | P ₃ | P ₄ | R | S | T ₁ | U | V | W | X | Y | Z | Appropriate through bolt※ |
|------------------|------|-------------------|----------------|----------------|-----|----|----------------|-------|----|----|------|------|-----|------------------------------|
| 12 [0.472] | D1 | Counterbore φ 6.5 | 9.5 | 4.5 | — | 25 | 16.3 | R16 | 6 | 5 | — | — | 1 | M3 |
| | D2 | and M5×0.8 | | | | | | | | | | | | |
| 16 [0.630] | D1 | Counterbore φ 6.5 | 9.5 | 4.5 | — | 29 | 19.8 | R19 | 8 | 6 | — | — | 1 | M3 |
| | D2 | and M5×0.8 | | | | | | | | | | | | |
| 20 [0.787] | D1 | Counterbore φ 6.5 | 9.5 | 4.5 | — | 34 | 24 | R22 | 10 | 8 | — | — | 1 | M3 |
| | D2 | and M5×0.8 | | | | | | | | | | | | |
| 25 [0.984] | D1 | Counterbore φ 8 | 11.5 | 5.5 | — | 40 | 28 | R25 | 12 | 10 | — | — | 1 | M4 |
| | D2 | and M6×1 | | | | | | | | | | | | |
| 32 [1.260] | D1 | Counterbore φ 8 | 11.5 | 5.5 | 4.5 | 44 | 34 | R29.5 | 16 | 14 | 15 | 13.6 | 1 | M4 |
| | D2 | and M6×1 | | | | | | | | | | | | |
| 40 [1.575] | D1 | Counterbore φ 9.5 | 15.5 | 7.5 | 4.5 | 52 | 40 | R35 | 16 | 14 | 15 | 13.6 | 1.6 | M5 |
| | D2 | and M8×1.25 | | | | | | | | | | | | |
| 50 [1.969] | D1 | Counterbore φ 11 | 16.5 | 8.5 | 8 | 62 | 48 | R41 | 20 | 17 | 21.6 | 19 | 1.6 | M6 |
| | D2 | and M8×1.25 | | | | | | | | | | | | |

Note: D1 is when stroke 2 is 5~15 (φ 50: 10~20)mm.

D2 is when stroke 2 is 16~30 (φ 50: 21~40)mm.

※ Some types of mounting screws are available (to be ordered separately). See p.209.

Dimensions of Male Rod End Thread Specification (mm)



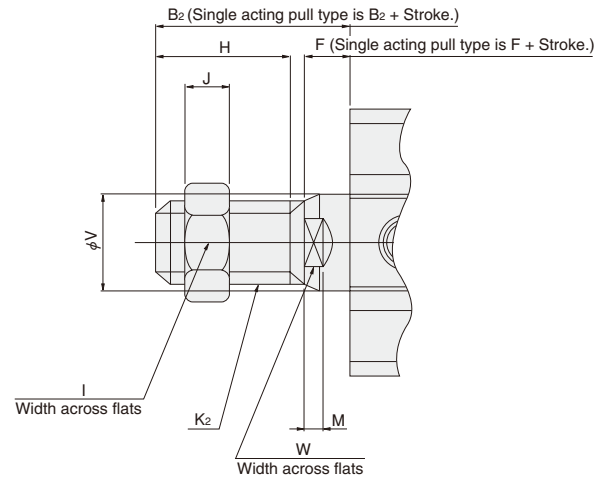
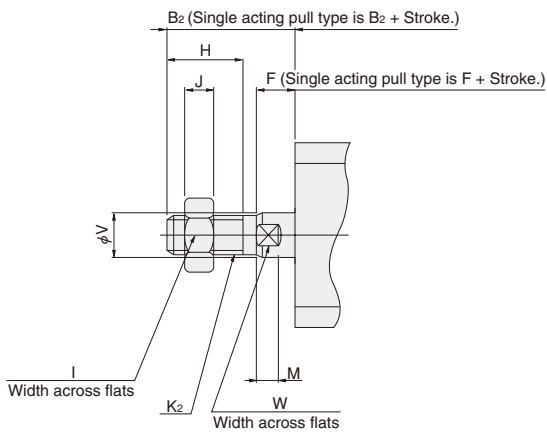
Available in the file of each cylinder body.

● Double acting type, Single acting push type, Single acting pull type

● $\phi 12 \sim \phi 25$

● $\phi 32 \sim \phi 100$

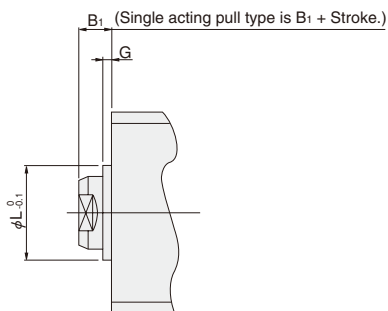
(Single acting type available up to $\phi 50$)



| Bore mm [in.] | Code | B ₂ | F | H | I | J | K ₂ | M | V | W |
|------------------|------|----------------|-----|----|----|----|----------------|-----|----|----|
| 12 [0.472] | | 17 | 5 | 10 | 8 | 4 | M5×0.8 | 3.5 | 6 | 5 |
| 16 [0.630] | | 20.5 | 5.5 | 13 | 10 | 5 | M6×1 | 3.5 | 8 | 6 |
| 20 [0.787] | | 22.5 | 5.5 | 15 | 12 | 5 | M8×1 | 4.5 | 10 | 8 |
| 25 [0.984] | | 24 | 6 | 15 | 14 | 6 | M10×1.25 | 5 | 12 | 10 |
| 32 [1.260] | | 35 | 7 | 25 | 19 | 8 | M14×1.5 | 6 | 16 | 14 |
| 40 [1.575] | | 35 | 7 | 25 | 19 | 8 | M14×1.5 | 6 | 16 | 14 |
| 50 [1.969] | | 37 | 9 | 25 | 27 | 11 | M18×1.5 | 7 | 20 | 17 |
| 63 [2.480] | | 37 | 9 | 25 | 27 | 11 | M18×1.5 | 7 | 20 | 17 |
| 80 [3.150] | | 44 | 11 | 30 | 32 | 13 | M22×1.5 | 9 | 25 | 22 |
| 100 [3.940] | | 50 | 12 | 35 | 36 | 14 | M26×1.5 | 9 | 32 | 27 |

Remark: Cylinder joints and cylinder rod ends are available for mounting with the rod end male thread specification. For details, see p.1568.

Dimensions of Centering Location (mm)

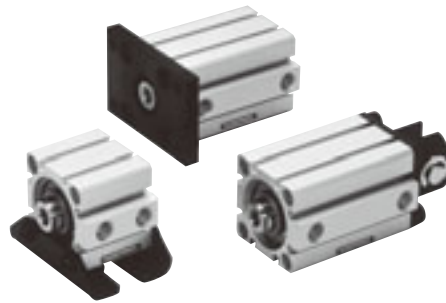


● Not available for bore size $\phi 12$.

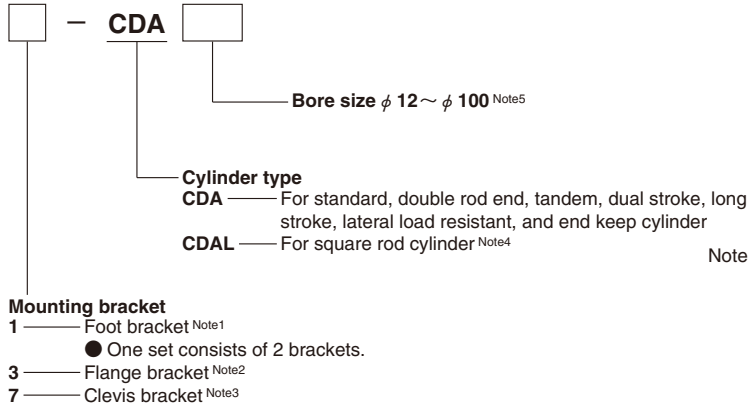
| Bore mm [in.] | Code | B ₁ | G | L |
|------------------|------|----------------|-----|-----|
| 16 [0.630] | | 5.5 | 1.5 | 9.4 |
| 20 [0.787] | | 5.5 | 1.5 | 12 |
| 25 [0.984] | | 6 | 2 | 15 |
| 32 [1.260] | | 7 | 2 | 21 |
| 40 [1.575] | | 7 | 2 | 29 |
| 50 [1.969] | | 9 | 2 | 38 |
| 63 [2.480] | | 9 | 2 | 40 |
| 80 [3.150] | | 11 | 2 | 45 |
| 100 [3.940] | | 12 | 2 | 55 |

JIG CYLINDERS C SERIES MOUNTING BRACKETS

Foot Mounting Bracket, Flange Mounting Bracket, Clevis Mounting Bracket



Order Codes of Mounting Bracket Only



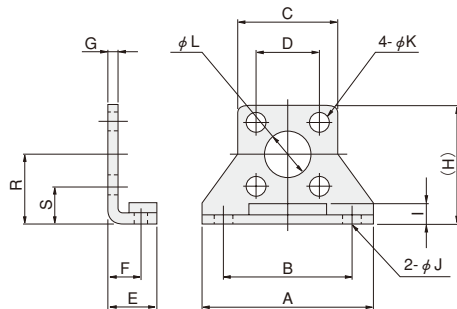
- Notes: 1. Cannot be mounted on tandem or dual stroke cylinders.
 And cannot be mounted on the 5mm strokes of $\phi 16$ and $\phi 25$, and 10mm strokes of $\phi 50$, $\phi 63$, and $\phi 80$ of the standard cylinders.
2. Cannot be mounted on the head side of the tandem cylinder, cylinder 1 side of the dual stroke cylinder, the rod side of the square rod cylinder with centering location, or the bore size $\phi 40$ with centering location (-G).
3. Cannot be used with anything other than the long stroke cylinder, the lateral load resistant cylinder, or the end keep cylinder.
4. Applicable to the foot mounting bracket only.
5. Not available for $\phi 6$ [0.236in.], $\phi 8$ [0.315in.], and $\phi 10$ [0.394in.].

Dimensions of Foot Mounting Bracket (mm)

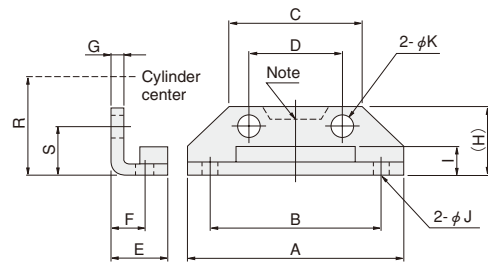


$\phi 12 \sim \phi 40$: CDA-OP1, $\phi 50 \sim \phi 100$: CDA-OP2

● $\phi 12 \sim \phi 16$

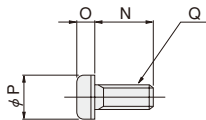


● $\phi 20 \sim \phi 100$

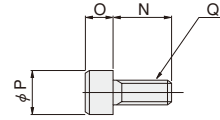


Note: Only for $\phi 50$

● Mounting screw For $\phi 12 \sim \phi 80$



For $\phi 100$



| | | | | | | | | | | | | | | | | | | | Material: Steel | |
|------------------|------|-----|-----|-----|------|------|------|-----|------|-----|-----|-----|----|-------------|-----|------|-----|----|-----------------|---------------------------|
| Bore mm [in.] | Code | A | B | C | D | E | F | G | H | I | J | K | L | N | O | P | Q | R | S | Mass g [oz.] |
| 12 [0.472] | | 44 | 34 | 25 | 16.3 | 12.5 | 8 | 2 | 29.5 | 4.5 | 4.5 | 5.5 | 11 | 12 | 2.7 | 9.5 | M5 | 17 | 8.9 | 50 [1.76] |
| 16 [0.630] | | 48 | 38 | 29 | 19.8 | 13 | 8 | 2 | 33.5 | 4.5 | 4.5 | 5.5 | 11 | 12 | 2.7 | 9.5 | M5 | 19 | 9.1 | 62 [2.19] |
| 20 [0.787] | | 54 | 44 | 34 | 24 | 15 | 9.2 | 3.2 | 16.5 | 7 | 4.5 | 5.5 | — | 12 (12, 20) | 2.7 | 9.5 | M5 | 24 | 12 | 84 [2.96] (87 [3.07]) |
| 25 [0.984] | | 64 | 52 | 40 | 28 | 16.5 | 10.7 | 3.2 | 17.5 | 6 | 5.5 | 6.6 | — | 14 (14, 22) | 3.3 | 10.5 | M6 | 26 | 12 | 104 [3.67] (108 [3.81]) |
| 32 [1.260] | | 68 | 56 | 44 | 34 | 17 | 11.2 | 3.2 | 19 | 8 | 5.5 | 6.6 | — | 14 (14, 25) | 3.3 | 10.5 | M6 | 30 | 13 | 126 [4.44] (131 [4.62]) |
| 40 [1.575] | | 78 | 64 | 52 | 40 | 18.2 | 11.2 | 3.2 | 19 | 7 | 6.6 | 9 | — | 20 (20, 30) | 4.4 | 14 | M8 | 33 | 13 | 160 [5.64] (168 [5.93]) |
| 50 [1.969] | | 96 | 78 | 62 | 48 | 22.7 | 14.7 | 3.2 | 22 | 8 | 9 | 9 | — | 20 (20, 35) | 4.4 | 14 | M8 | 39 | 15 | 220 [7.76] (232 [8.18]) |
| 63 [2.480] | | 108 | 90 | 75 | 60 | 25.2 | 16.2 | 3.2 | 24 | 8.5 | 9 | 9 | — | 20 (20, 35) | 4.4 | 14 | M8 | 46 | 16 | 300 [10.58] (312 [11.01]) |
| 80 [3.150] | | 134 | 112 | 94 | 74 | 30.5 | 19.5 | 4.5 | 33 | 12 | 11 | 14 | — | 25 | 6.6 | 21 | M12 | 59 | 22 | 644 [22.72] |
| 100 [3.940] | | 160 | 134 | 114 | 90 | 35.5 | 23 | 6 | 40 | 14 | 14 | 16 | — | 30 | 14 | 21 | M14 | 71 | 26 | 1172 [41.34] |

Remark: Figures in parentheses () are for square rod cylinders.
 Two figures in parentheses (), Left side: for head side; Right side: for rod side

Dimensions of Flange Mounting Bracket (mm)



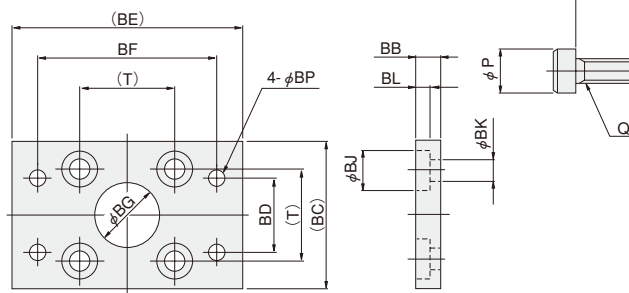
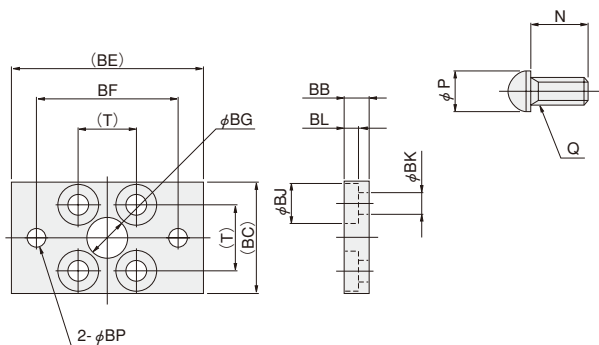
φ 12~φ 40 : CDA-OP3, φ 50~φ 100 : CDA-OP4

● φ 12~φ 16

● Mounting screw For φ 12~φ 80

● φ 20~φ 100

● Mounting screw For φ 100



Material: Steel

| Bore mm [in.] | Code | N | P | Q | T | BB | BC | BD | BE | BF | BG | BJ | BK | BL | BP | Mass g [oz.] |
|------------------|--------|--------|------|-----|------|----|-----|----|-----|-----|----|----|-----|------|-----|---------------------------|
| 12 [0.472] | 12 | 12 | 9.5 | M5 | 16.3 | 6 | 28 | — | 50 | 38 | 11 | 10 | 5.5 | 3.6 | 4.5 | 55 [1.94] |
| 16 [0.630] | 12 | 12 | 9.5 | M5 | 19.8 | 6 | 32 | — | 54 | 42 | 11 | 10 | 5.5 | 3.6 | 4.5 | 71 [2.50] |
| 20 [0.787] | 12(18) | 12(18) | 9.5 | M5 | 24 | 6 | 36 | 24 | 58 | 46 | 15 | 10 | 5.5 | 3.6 | 4.5 | 101 [3.56] (105 [3.70]) |
| 25 [0.984] | 14(22) | 14(22) | 10.5 | M6 | 28 | 8 | 42 | 28 | 68 | 54 | 17 | 11 | 6.6 | 4.3 | 5.5 | 160 [5.64] (165 [5.82]) |
| 32 [1.260] | 14(25) | 14(25) | 10.5 | M6 | 34 | 8 | 48 | 34 | 72 | 58 | 22 | 11 | 6.6 | 4.3 | 5.5 | 186 [6.56] (196 [6.91]) |
| 40 [1.575] | 20(30) | 20(30) | 14 | M8 | 40 | 8 | 58 | 40 | 84 | 68 | 28 | 15 | 9 | 5.3 | 6.6 | 335 [11.82] (351 [12.38]) |
| 50 [1.969] | 20(35) | 20(35) | 14 | M8 | 48 | 8 | 66 | 40 | 102 | 82 | 38 | 15 | 9 | 5.3 | 9 | 447 [15.77] (471 [16.61]) |
| 63 [2.480] | 20(35) | 20(35) | 14 | M8 | 60 | 8 | 78 | 50 | 116 | 96 | 40 | 15 | 9 | 5.3 | 9 | 591 [20.85] (615 [21.69]) |
| 80 [3.150] | 25 | 25 | 21 | M12 | 74 | 12 | 100 | 70 | 142 | 118 | 45 | 22 | 14 | 7.3 | 11 | 1414 [49.88] |
| 100 [3.940] | 30 | 30 | 21 | M14 | 90 | 20 | 116 | 80 | 170 | 142 | 55 | 23 | 16 | 15.2 | 14 | 2606 [91.92] |

Remark: Figures in parentheses () are for square rod cylinders.

Dimensions of Clevis Mounting Bracket (mm)

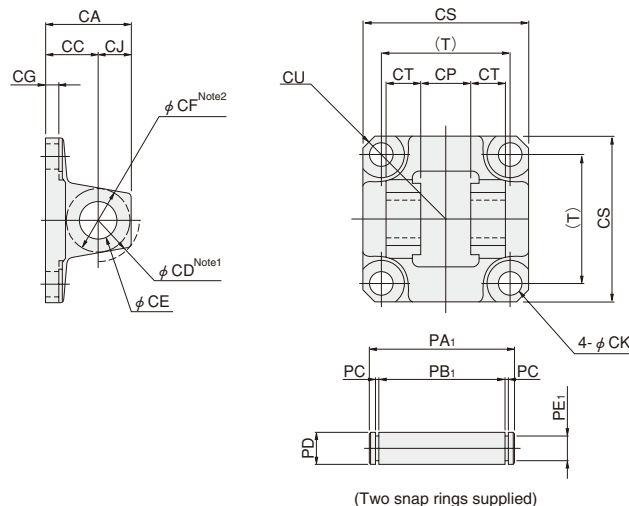
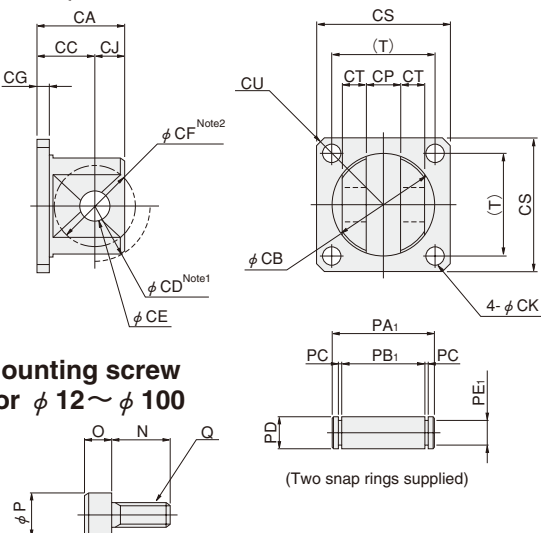


φ 12~φ 40 : CDA-OP5, φ 50~φ 100 : CDA-OP6

● φ 12~φ 40

● φ 50~φ 100

● Mounting screw For φ 12~φ 100



Material: Steel

| Bore mm [in.] | | Code | N | O | P | Q | T | CA | CB | CC | CD | CE | CF | CG | CJ | CK | CP | CS | CT | CU | PA ₁ | PB ₁ | PC | PD | PE ₁ | Mass g [oz.] |
|---------------|--|------|----|----|-----|-----|------|----|----|----|-------|----------------------------------|-------|----|----|------------------------|------------------------------------|-----|------|-------|-----------------|-----------------|------|--|-----------------|--------------|
| 12 [0.472] | | | 12 | 5 | 8.5 | M5 | 16.3 | 15 | 12 | 11 | R 7.5 | 4 ^{+0.03} ₀ | R5 | 4 | 4 | 5.5 | 4 ^{+0.2} _{+0.1} | 25 | 3 | R16 | 15 | 10.6 | 0.7 | 4 ₁₈ | 2.5 | 30 [1.06] |
| 16 [0.630] | | | 12 | 5 | 8.5 | M5 | 19.8 | 17 | 16 | 12 | R10 | 5 ^{+0.03} ₀ | R6 | 4 | 5 | 5.5 | 5 ^{+0.2} _{+0.1} | 29 | 3.5 | R19 | 17 | 12.6 | 0.7 | 5 ₁₈ | 3 | 40 [1.41] |
| 20 [0.787] | | | 12 | 5 | 8.5 | M5 | 24 | 25 | 22 | 17 | R14 | 8 ^{+0.04} ₀ | R11 | 4 | 8 | 5.5 | 8 ^{+0.4} _{+0.2} | 34 | 5.2 | R22 | 24.4 | 19.6 | 0.9 | 8 ₁₈ | 6 | 75 [2.65] |
| 25 [0.984] | | | 16 | 6 | 10 | M6 | 28 | 25 | 26 | 17 | R16 | 8 ^{+0.04} ₀ | R11 | 4 | 8 | 6.6 | 8 ^{+0.4} _{+0.2} | 40 | 5.2 | R25 | 24.4 | 19.6 | 0.9 | 8 ₁₈ | 6 | 100 [3.53] |
| 32 [1.260] | | | 16 | 6 | 10 | M6 | 34 | 29 | 34 | 19 | R20 | 10 ^{+0.04} ₀ | R12.5 | 4 | 10 | 6.6 | 12 ^{+0.4} _{+0.2} | 44 | 8 | R29.5 | 34 | 29.2 | 0.9 | 10 ₁₈ | 8 | 165 [5.82] |
| 40 [1.575] | | | 20 | 8 | 13 | M8 | 40 | 29 | 34 | 19 | R20 | 10 ^{+0.04} ₀ | R12.5 | 4 | 10 | 9 | 12 ^{+0.4} _{+0.2} | 52 | 8 | R35 | 34 | 29.2 | 0.9 | 10 ₁₈ | 8 | 200 [7.05] |
| 50 [1.969] | | | 22 | 8 | 13 | M8 | 48 | 32 | — | 19 | R17 | 14 ^{+0.08} ₀ | R14 | 5 | 13 | 9 Counterbore φ 17 | 20 ^{+0.6} _{+0.3} | 63 | 12.5 | R41.5 | 55 | 47 | 1.15 | 14 ^{-0.030} _{-0.070} | 13.4 | 315 [11.11] |
| 63 [2.480] | | | 20 | 8 | 13 | M8 | 60 | 32 | — | 19 | R17 | 14 ^{+0.08} ₀ | R14 | 6 | 13 | 9 Counterbore φ 20 | 20 ^{+0.6} _{+0.3} | 76 | 15 | R50.5 | 60 | 52 | 1.15 | 14 ^{-0.030} _{-0.070} | 13.4 | 495 [17.46] |
| 80 [3.150] | | | 30 | 12 | 18 | M12 | 74 | 52 | — | 32 | R24 | 20 ^{+0.1} ₀ | R20 | 7 | 20 | 14 Counterbore φ 22 | 32 ^{+0.6} _{+0.3} | 95 | 16 | R62.5 | 74 | 66 | 1.35 | 20 ^{-0.040} _{-0.084} | 19 | 1110 [39.15] |
| 100 [3.940] | | | 30 | 14 | 21 | M14 | 90 | 52 | — | 32 | R24 | 20 ^{+0.1} ₀ | R21 | 7 | 20 | 16 Counterbore φ 26 | 32 ^{+0.6} _{+0.3} | 115 | 16 | R75.5 | 74 | 66 | 1.35 | 20 ^{-0.040} _{-0.084} | 19 | 1490 [52.56] |

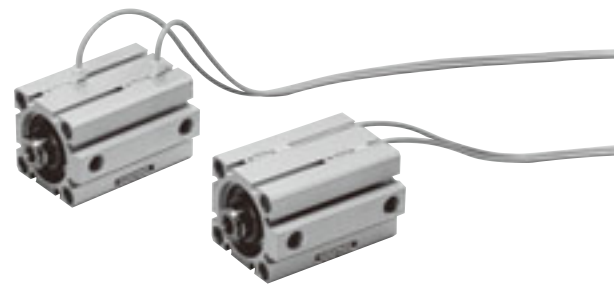
Notes: 1. CD = Swing range of clevis mounting bracket itself.

2. CF = Maximum radius of swing for mating bracket.

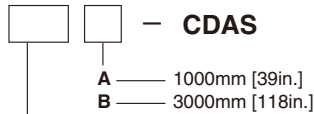
Remark: φ 12~φ 50 are mounted with 2 bolts.

JIG CYLINDERS C SERIES SENSOR SWITCHES

Solid State Type, Reed Switch Type



Order Codes

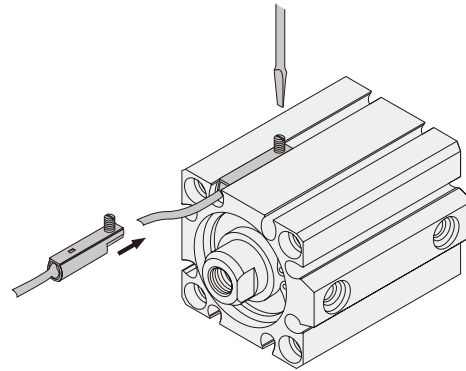


| | | | | |
|--------------|------------------|------------------------|------------|----------------------|
| ZE135 | Solid state type | with indicator lamp | DC10V~28V | Horizontal lead wire |
| ZE235 | Solid state type | with indicator lamp | DC10V~28V | Vertical lead wire |
| ZE101 | Reed switch type | without indicator lamp | DC5V~28V | Horizontal lead wire |
| | | | AC85~115V | |
| ZE201 | Reed switch type | without indicator lamp | DC5V~28V | Vertical lead wire |
| | | | AC85~115V | |
| ZE155 | Solid state type | with indicator lamp | DC4.5V~28V | Horizontal lead wire |
| ZE255 | Solid state type | with indicator lamp | DC4.5V~28V | Vertical lead wire |
| ZE102 | Reed switch type | with indicator lamp | DC10V~28V | Horizontal lead wire |
| | | | AC85~115V | |
| ZE202 | Reed switch type | with indicator lamp | DC10V~28V | Vertical lead wire |
| | | | AC85~115V | |

● For details of sensor switches, see p.1544.

Moving Sensor Switch

- Loosening mounting screw allows the sensor switch to be moved along the switch mounting groove on the cylinder body.
- Tighten the mounting screw with a tightening torque of 0.1~0.2N·m [0.9~1.8in·lbf].



Minimum Cylinder Strokes When Using Sensor Switches

● Solid state type

| Bore size | 2 pcs. mounting <small>Note</small> | | 1 pc. mounting |
|-------------------------|-------------------------------------|--------------------|----------------|
| | 1-surface mounting | 2-surface mounting | |
| 6~12 [0.236~0.472in.] | 30 | 10 | 5 |
| 16~100 [0.630~3.940in.] | 10 | | |

Note: Two pieces can be mounted with 5mm stroke.
Take note that overlapping may occur, however.

● Reed switch type

| Bore size | 2 pcs. mounting | | 1 pc. mounting |
|-------------------------|--------------------|--------------------|----------------|
| | 1-surface mounting | 2-surface mounting | |
| 12 [0.472in.] | 30 | 10 | 10 |
| 16~100 [0.630~3.940in.] | 10 | | |

Sensor Switch Operating Range, Response Differential, and Maximum Sensing Location

● Operating range : ℓ

The distance the piston travels in one direction, while the switch is in the ON position.

● Response differential : C

The distance between the point where the piston turns the switch ON and the point where the switch is turned OFF as the piston travels in the opposite direction.

● Solid state type

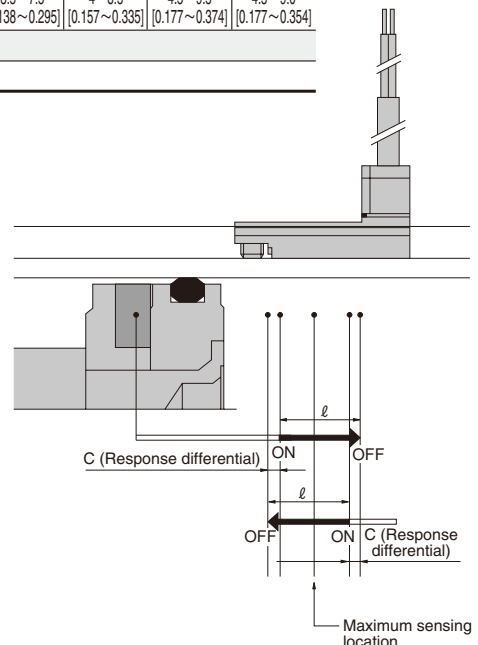
| Item \ Bore | 6 [0.236] | 8 [0.315] | 10 [0.394] | 12 [0.472] | 16 [0.630] | 20 [0.787] | 25 [0.984] | 32 [1.260] | 40 [1.575] | 50 [1.969] | 63 [2.480] | 80 [3.150] | 100 [3.940] |
|---------------------------|--------------------------|--------------------------|--------------------------|----------------------|----------------------|--------------------------|----------------------|----------------------|--------------------------|--------------------------|------------------------|--------------------------|--------------------------|
| Operating range : ℓ | 1.8~3.0 [0.071~0.118] | 1.8~3.0 [0.071~0.118] | 2.0~3.2 [0.079~0.126] | 2~4 [0.079~0.157] | 2~5 [0.079~0.197] | 3.5~7.5 [0.138~0.295] | 4~8 [0.157~0.315] | 3~7 [0.118~0.276] | 3.5~7.5 [0.138~0.295] | 3.5~7.5 [0.138~0.295] | 4~8.5 [0.157~0.335] | 4.5~9.5 [0.177~0.374] | 4.5~9.0 [0.177~0.354] |
| Response differential : C | 0.2 [0.008] or less | | | | 0.5 [0.02] or less | | | | | | | | |
| Maximum sensing location | 6 [0.236] | | | | | | | | | | | | |

Remark: The above table shows reference values.

● Reed switch type

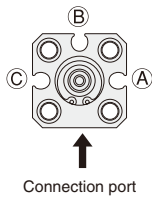
| ● Reed switch type | | | | | | | | | | mm [in.] |
|---------------------------|--------------------------|--------------------------|-------------------------|--------------------------|-----------------------|-------------------------|-----------------------|------------------------|------------------------|--------------------------|
| Item \ Bore | 12 [0.472] | 16 [0.630] | 20 [0.787] | 25 [0.984] | 32 [1.260] | 40 [1.575] | 50 [1.969] | 63 [2.480] | 80 [3.150] | 100 [3.940] |
| Operating range : ℓ | 4.5~8.5 [0.177~0.335] | 5.5~9.5 [0.217~0.374] | 9~13.5 [0.354~0.531] | 10~15.5 [0.394~0.610] | 8~12 [0.315~0.472] | 8.5~14 [0.335~0.551] | 9~15 [0.354~0.591] | 10~16 [0.394~0.630] | 11~16 [0.433~0.630] | 11~16.5 [0.433~0.650] |
| Response differential : C | 1.0 [0.039] or less | 2.0 [0.079] or less | | | | | | 3.0 [0.118] or less | 2.5 [0.098] or less | |
| Maximum sensing location | 10 [0.394] | | | | | | | | | |

Remark: The above table shows reference values.

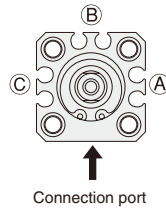


Mounting Sensor Switch

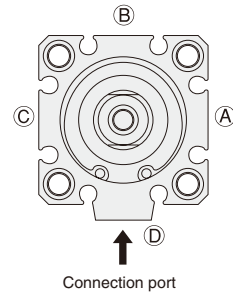
● $\phi 6 \sim \phi 12$



● $\phi 16$



● $\phi 20 \sim \phi 100$



● The drawing is for $\phi 32$.

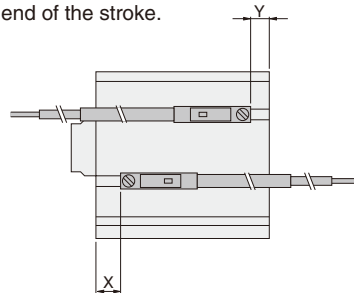
The standard mounting positions at shipping for the end of stroke detection on the rod side is either surface (A) or surface (C), while the end of stroke detection on the head side is surface (B).
If mounting sensor switches on the same surface for detection of both ends is required, consult us.
(The sensor switch may sometimes protrude from the cylinder body.)

Mounting on any of surfaces (A), (B), or (C) allows detection of the end of stroke on the rod side and head side.
(The sensor switch may sometimes protrude from the cylinder body.)

Mounting on any of surfaces (A), (B), (C), or (D) allows detection of the end of stroke on the rod side and head side.
(The sensor switch may sometimes protrude from the cylinder body.)
However, the ZE2□ sensor switches cannot be mounted on the (D) position in $\phi 32$, $\phi 40$, and $\phi 50$.

Mounting Location of End of Stroke Detection Sensor Switch

When the sensor switch is mounted in the position shown in the diagram below (figures in the tables are reference values), the magnet reaches the sensor switch's maximum sensing location at the end of the stroke.



● Standard cylinder, Non-rotating cylinder

■ Solid state type

● Double acting type

| ● Double acting type | | | | | | | | | | | | | | | mm [in.] | | |
|----------------------|------------------|----------------|----------------|----------------|---------------|---------------|----------------|---------------|-----------------|-----------------|-----------------|---------------|---------------|---------------|----------|--|--|
| Code \ Bore | | 6 | 8 | 10 | 12 | 16 | 20 | 25 | 32 | 40 | 50 | 63 | 80 | 100 | | | |
| X | Standard type | 7.2 [0.283] | 8 [0.315] | 8.3 [0.327] | 7 [0.276] | 7 [0.276] | 11 [0.433] | 11 [0.433] | 13.5 [0.531] | 14.5 [0.571] | 12.5 [0.492] | 15 [0.591] | 20 [0.787] | 25 [0.984] | | | |
| | With bumper (-R) | — | — | — | 10 [0.394] | 10 [0.394] | 15 [0.591] | 16 [0.630] | 15.5 [0.610] | 16.5 [0.650] | 15.5 [0.610] | 15 [0.591] | 20 [0.787] | 25 [0.984] | | | |
| Y | Standard type | 1 [0.039] | 0.3 [0.012] | 1 [0.039] | 4 [0.157] | 4 [0.157] | 7.5 [0.295] | 9 [0.354] | 8.5 [0.335] | 10.5 [0.413] | 14.5 [0.571] | 16 [0.630] | 20 [0.787] | 25 [0.984] | | | |
| | With bumper (-R) | — | — | — | 6 [0.236] | 6 [0.236] | 8.5 [0.335] | 9 [0.354] | 6.5 [0.256] | 8.5 [0.335] | 11.5 [0.453] | 16 [0.630] | 20 [0.787] | 25 [0.984] | | | |

■ Reed switch type

● Double acting type

| ● Double acting type | | | | | | | | | | | mm [in.] | |
|----------------------|------------------|------------------|------------------|-----------------|-----------------|---------------|---------------|---------------|-----------------|-----------------|-----------------|--|
| Code \ Bore | | 12 | 16 | 20 | 25 | 32 | 40 | 50 | 63 | 80 | 100 | |
| X | Standard type | 2.5 [0.098] | 2.5 [0.098] | 6.5 [0.256] | 6.5 [0.256] | 9 [0.354] | 10 [0.394] | 8 [0.315] | 10.5 [0.413] | 15.5 [0.610] | 20.5 [0.807] | |
| | With bumper (-R) | 5.5 [0.217] | 5.5 [0.217] | 10.5 [0.413] | 11.5 [0.453] | 11 [0.433] | 12 [0.472] | 11 [0.433] | 10.5 [0.413] | 15.5 [0.610] | 20.5 [0.807] | |
| Y | Standard type | -0.5 [-0.020] | -0.5 [-0.020] | 3 [0.118] | 4.5 [0.177] | 4 [0.157] | 6 [0.236] | 10 [0.394] | 11.5 [0.453] | 15.5 [0.610] | 20.5 [0.807] | |
| | With bumper (-R) | 1.5 [0.059] | 1.5 [0.059] | 4 [0.157] | 4.5 [0.177] | 2 [0.079] | 4 [0.157] | 7 [0.276] | 11.5 [0.453] | 15.5 [0.610] | 20.5 [0.807] | |

● Single acting push type

| | | mm [in.] | | | | | | | | | |
|------|------------------|-----------------|----------------|-----------------|---------------|---------------|----------------|-----------------|-----------------|-----------------|-----------------|
| Code | Bore | 6 | 8 | 10 | 12 | 16 | 20 | 25 | 32 | 40 | 50 |
| X | Standard type | 17.2 [0.677] | 18 [0.709] | 18.3 [0.720] | 15 [0.591] | 15 [0.591] | 14 [0.551] | 14.5 [0.571] | 15.5 [0.610] | 17.5 [0.689] | 17 [0.669] |
| | With bumper (-R) | 1 [0.039] | 0.3 [0.012] | 1 [0.039] | 1 [0.039] | 1 [0.039] | 4.5 [0.177] | 5.5 [0.217] | 6.5 [0.256] | 7.5 [0.295] | 10.5 [0.413] |

● Single acting push type

| ● Single acting push type | | | | | | | | mm [in.] |
|---------------------------|------|----------|----------|---------|---------|---------|---------|----------|
| Code | Bore | 12 | 16 | 20 | 25 | 32 | 40 | 50 |
| X | | 10.5 | 10.5 | 9.5 | 10 | 11 | 13 | 12.5 |
| | | [0.413] | [0.413] | [0.374] | [0.394] | [0.433] | [0.512] | [0.492] |
| Y | | -3.5 | -3.5 | 0 | 1 | 2 | 3 | 6 |
| | | [-0.138] | [-0.138] | [0] | [0.039] | [0.079] | [0.118] | [0.236] |

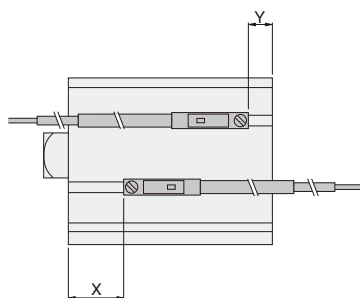
● Single acting pull type

| | | mm [in.] | | | | | | | | | |
|------|------------------|----------------|-----------------|----------------|--------------|--------------|-----------------|---------------|-----------------|-----------------|-----------------|
| Code | Bore | 6 | 8 | 10 | 12 | 16 | 20 | 25 | 32 | 40 | 50 |
| X | Standard type | 7.2 [0.283] | 8 [0.315] | 8.3 [0.327] | 7 [0.276] | 7 [0.276] | 11 [0.433] | 11 [0.433] | 13.5 [0.531] | 14.5 [0.571] | 12.5 [0.492] |
| | With bumper (-R) | 11 [0.433] | 10.3 [0.406] | 11 [0.433] | 9 [0.354] | 9 [0.354] | 12.5 [0.492] | 14 [0.551] | 13.5 [0.531] | 15.5 [0.610] | 14.5 [0.571] |

● Single acting pull type

| ● Single acting pull type | | | | | | | | mm [in.] |
|---------------------------|---------|---------|---------|---------|---------|---------|---------|----------|
| Code \ Bore | 12 | 16 | 20 | 25 | 32 | 40 | 50 | |
| X | 2.5 | 2.5 | 6.5 | 6.5 | 9 | 10 | 8 | |
| | [0.098] | [0.098] | [0.256] | [0.256] | [0.354] | [0.394] | [0.315] | |
| Y | 4.5 | 4.5 | 8 | 9.5 | 9 | 11 | 10 | |
| | [0.177] | [0.177] | [0.315] | [0.374] | [0.354] | [0.433] | [0.394] | |

● Square rod cylinders with magnet



■ Solid state type

● Double acting type

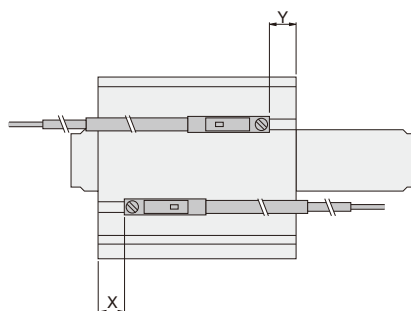
| Code \ Bore | | 20 | 25 | 32 | 40 | 50 | 63 |
|-------------|------------------|-----------------|-----------------|-----------------|-----------------|-----------------|---------------|
| X | Standard type | 17.5 [0.689] | 17.5 [0.689] | 22.5 [0.886] | 24.5 [0.965] | 27.5 [1.083] | 30 [1.181] |
| | With bumper (-R) | 21.5 [0.846] | 22.5 [0.886] | 24.5 [0.965] | 26.5 [1.043] | 30.5 [1.201] | 30 [1.181] |
| Y | Standard type | 10 [0.394] | 9 [0.354] | 14 [0.551] | 14.5 [0.571] | 14.5 [0.571] | 16 [0.630] |
| | With bumper (-R) | 8.5 [0.335] | 9 [0.354] | 6.5 [0.256] | 8.5 [0.335] | 11.5 [0.453] | 16 [0.630] |

■ Reed switch type

● Double acting type

| Code \ Bore | | 20 | 25 | 32 | 40 | 50 | 63 |
|-------------|------------------|---------------|----------------|---------------|---------------|---------------|-----------------|
| X | Standard type | 13 [0.512] | 13 [0.512] | 18 [0.709] | 20 [0.787] | 23 [0.906] | 25.5 [1.004] |
| | With bumper (-R) | 17 [0.669] | 18 [0.709] | 20 [0.787] | 22 [0.866] | 26 [1.024] | 25.5 [1.004] |
| Y | Standard type | 5 [0.197] | 4.5 [0.177] | 4 [0.157] | 6 [0.236] | 10 [0.394] | 11.5 [0.453] |
| | With bumper (-R) | 4 [0.157] | 4.5 [0.177] | 2 [0.079] | 4 [0.157] | 7 [0.276] | 11.5 [0.453] |

● Double rod cylinders with magnet



■ Solid state type

● Double acting type

| Code \ Bore | | 6 | 8 | 10 | 12 | 16 | 20 | 25 | 32 | 40 | 50 | 63 | 80 | 100 |
|-------------|------------------|----------------|----------------|----------------|---------------|---------------|---------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| X | Standard type | 7.2 [0.283] | 8 [0.315] | 8.3 [0.327] | 7 [0.276] | 7 [0.276] | 11 [0.433] | 11 [0.433] | 13.5 [0.531] | 14.5 [0.571] | 12.5 [0.492] | 15.5 [0.610] | 20.5 [0.807] | 25 [0.984] |
| | With bumper (-R) | — | — | — | 10 [0.394] | 10 [0.394] | 15 [0.591] | 16 [0.630] | 15.5 [0.610] | 16.5 [0.650] | 14 [0.551] | 15 [0.591] | 20.5 [0.807] | 25 [0.984] |
| Y | Standard type | 5.5 [0.217] | 5.8 [0.228] | 6 [0.236] | 10 [0.394] | 10 [0.394] | 14 [0.551] | 14.5 [0.571] | 15.5 [0.610] | 17.5 [0.689] | 16.5 [0.650] | 18 [0.709] | 26.5 [1.043] | 31.5 [1.240] |
| | With bumper (-R) | — | — | — | 12 [0.472] | 12 [0.472] | 15 [0.591] | 14.5 [0.571] | 6.5 [0.256] | 15.5 [0.610] | 15 [0.591] | 18 [0.709] | 26.5 [1.043] | 31.5 [1.240] |

■ Reed switch type

● Double acting type

| Code \ Bore | | 12 | 16 | 20 | 25 | 32 | 40 | 50 | 63 | 80 | 100 |
|-------------|------------------|----------------|----------------|-----------------|-----------------|---------------|---------------|-----------------|-----------------|---------------|-----------------|
| X | Standard type | 2.5 [0.098] | 2.5 [0.098] | 6.5 [0.256] | 6.5 [0.256] | 9 [0.354] | 10 [0.394] | 8 [0.315] | 10.5 [0.413] | 16 [0.630] | 20.5 [0.807] |
| | With bumper (-R) | 5.5 [0.217] | 5.5 [0.217] | 10.5 [0.413] | 11.5 [0.453] | 11 [0.433] | 12 [0.472] | 9.5 [0.374] | 10.5 [0.413] | 16 [0.630] | 20.5 [0.807] |
| Y | Standard type | 5.5 [0.217] | 5.5 [0.217] | 9.5 [0.374] | 10 [0.394] | 11 [0.433] | 13 [0.512] | 12 [0.472] | 13.5 [0.531] | 22 [0.866] | 27 [1.063] |
| | With bumper (-R) | 7.5 [0.295] | 7.5 [0.295] | 10.5 [0.413] | 10 [0.394] | 2 [0.079] | 11 [0.433] | 10.5 [0.413] | 13.5 [0.531] | 22 [0.866] | 27 [1.063] |

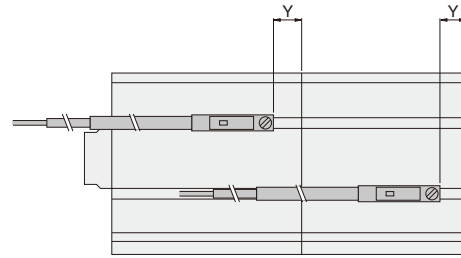
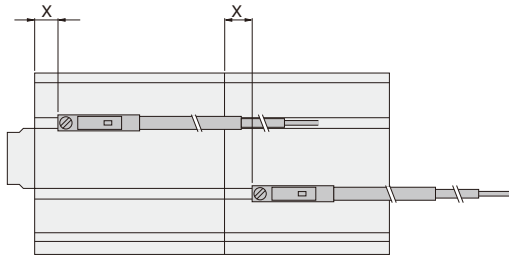
● Single acting type

| Code \ Bore | | 12 | 16 | 20 | 25 | 32 | 40 | 50 |
|-------------|------------------|---------------|---------------|---------------|-----------------|-----------------|-----------------|-----------------|
| X | Standard type | 15 [0.591] | 15 [0.591] | 14 [0.551] | 14.5 [0.571] | 15.5 [0.610] | 17.5 [0.689] | 16.5 [0.650] |
| | With bumper (-R) | 7 [0.276] | 7 [0.276] | 11 [0.433] | 11 [0.433] | 13.5 [0.531] | 14.5 [0.571] | 12.5 [0.492] |

● Single acting type

| Code \ Bore | | 12 | 16 | 20 | 25 | 32 | 40 | 50 |
|-------------|------------------|-----------------|-----------------|----------------|----------------|---------------|---------------|---------------|
| X | Standard type | 10.5 [0.413] | 10.5 [0.413] | 9.5 [0.374] | 10 [0.394] | 11 [0.433] | 13 [0.512] | 12 [0.472] |
| | With bumper (-R) | 2.5 [0.098] | 2.5 [0.098] | 6.5 [0.256] | 6.5 [0.256] | 9 [0.354] | 10 [0.394] | 8 [0.315] |

● Tandem cylinders with magnet



■ Solid state type

● Double acting type

| | | mm [in.] | | | | | | | | | |
|------|------------------|---------------|---------------|----------------|---------------|-----------------|-----------------|-----------------|---------------|---------------|---------------|
| Code | Bore | 12 | 16 | 20 | 25 | 32 | 40 | 50 | 63 | 80 | 100 |
| X | Standard type | 7 [0.276] | 7 [0.276] | 11 [0.433] | 11 [0.433] | 13.5 [0.531] | 14.5 [0.571] | 12.5 [0.492] | 15 [0.591] | 20 [0.787] | 25 [0.984] |
| | With bumper (-R) | 10 [0.394] | 10 [0.394] | 15 [0.591] | 16 [0.630] | 15.5 [0.610] | 16.5 [0.650] | 15.5 [0.610] | 15 [0.591] | 20 [0.787] | 25 [0.984] |
| Y | Standard type | 4 [0.157] | 4 [0.157] | 7.5 [0.295] | 9 [0.354] | 8.5 [0.335] | 10.5 [0.413] | 14.5 [0.571] | 16 [0.630] | 20 [0.787] | 25 [0.984] |
| | With bumper (-R) | 6 [0.236] | 6 [0.236] | 8.5 [0.335] | 9 [0.354] | 6.5 [0.256] | 8.5 [0.335] | 11.5 [0.453] | 16 [0.630] | 20 [0.787] | 25 [0.984] |

● Single acting push type

| | | mm [in.] | | | | | | |
|------|------|---------------|---------------|----------------|-----------------|-----------------|-----------------|-----------------|
| Code | Bore | 12 | 16 | 20 | 25 | 32 | 40 | 50 |
| X | | 15 [0.591] | 15 [0.591] | 14 [0.551] | 14.5 [0.571] | 15.5 [0.610] | 17.5 [0.689] | 16.5 [0.650] |
| Y | | 1 [0.039] | 1 [0.039] | 4.5 [0.177] | 5.5 [0.217] | 6.5 [0.256] | 7.5 [0.295] | 10.5 [0.413] |

■ Reed switch type

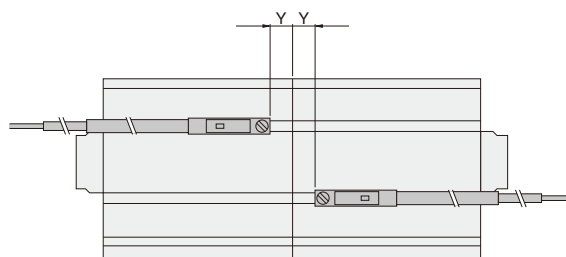
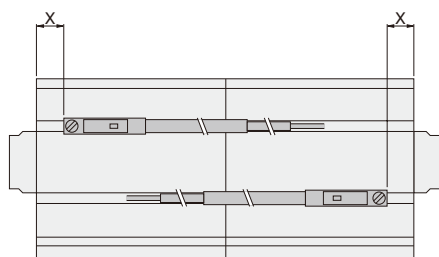
● Double acting type

| ● Double acting type | | | | | | | | | | | mm [in.] | |
|----------------------|------------------|------------------|------------------|-----------------|-----------------|---------------|---------------|---------------|-----------------|-----------------|-----------------|--|
| Bore | | 12 | 16 | 20 | 25 | 32 | 40 | 50 | 63 | 80 | 100 | |
| Code | | | | | | | | | | | | |
| X | Standard type | 2.5 [0.098] | 2.5 [0.098] | 6.5 [0.256] | 6.5 [0.256] | 9 [0.354] | 10 [0.394] | 8 [0.315] | 10.5 [0.413] | 15.5 [0.610] | 20.5 [0.807] | |
| | With bumper (-R) | 5.5 [0.217] | 5.5 [0.217] | 10.5 [0.413] | 11.5 [0.453] | 11 [0.433] | 12 [0.472] | 11 [0.433] | 10.5 [0.413] | 15.5 [0.610] | 20.5 [0.807] | |
| Y | Standard type | -0.5 [-0.020] | -0.5 [-0.020] | 3 [0.118] | 4.5 [0.177] | 4 [0.157] | 6 [0.236] | 10 [0.394] | 11.5 [0.453] | 15.5 [0.610] | 20.5 [0.807] | |
| | With bumper (-R) | 1.5 [0.059] | 1.5 [0.059] | 4 [0.157] | 4.5 [0.177] | 2 [0.079] | 4 [0.157] | 7 [0.276] | 11.5 [0.453] | 15.5 [0.610] | 20.5 [0.807] | |

● Single acting push type

| | | mm [in.] | | | | | | |
|------|------|------------------|------------------|----------------|---------------|---------------|---------------|---------------|
| Code | Bore | 12 | 16 | 20 | 25 | 32 | 40 | 50 |
| X | | 10.5 [0.413] | 10.5 [0.413] | 9.5 [0.374] | 10 [0.394] | 11 [0.433] | 13 [0.512] | 12 [0.472] |
| Y | | -3.5 [-0.138] | -3.5 [-0.138] | 0 [0] | 1 [0.039] | 2 [0.079] | 3 [0.118] | 6 [0.236] |

● Dual stroke cylinders with magnet



■ Solid state type

● Double acting type

| Code \ Bore | | 12 | 16 | 20 | 25 | 32 | 40 | 50 | 63 | 80 | 100 |
|-------------|------------------|---------------|---------------|----------------|---------------|-----------------|-----------------|-----------------|---------------|---------------|---------------|
| X | Standard type | 7 [0.276] | 7 [0.276] | 11 [0.433] | 11 [0.433] | 13.5 [0.531] | 14.5 [0.571] | 12.5 [0.492] | 15 [0.591] | 20 [0.787] | 25 [0.984] |
| | With bumper (-R) | 10 [0.394] | 10 [0.394] | 15 [0.591] | 16 [0.630] | 15.5 [0.610] | 16.5 [0.650] | 14 [0.551] | 15 [0.591] | 20 [0.787] | 25 [0.984] |
| Y | Standard type | 4 [0.157] | 4 [0.157] | 7.5 [0.295] | 9 [0.354] | 8.5 [0.335] | 10.5 [0.413] | 14.5 [0.571] | 16 [0.630] | 20 [0.787] | 25 [0.984] |
| | With bumper (-R) | 6 [0.236] | 6 [0.236] | 8.5 [0.335] | 9 [0.354] | 6.5 [0.256] | 8.5 [0.335] | 13.5 [0.531] | 16 [0.630] | 20 [0.787] | 25 [0.984] |

● Single acting push type

| Code \ Bore | | 12 | 16 | 20 | 25 | 32 | 40 | 50 |
|-------------|------------------|---------------|---------------|----------------|-----------------|-----------------|-----------------|-----------------|
| X | Standard type | 15 [0.591] | 15 [0.591] | 14 [0.551] | 14.5 [0.571] | 15.5 [0.610] | 17.5 [0.689] | 16.5 [0.650] |
| | With bumper (-R) | 1 [0.039] | 1 [0.039] | 7.5 [0.295] | 5.5 [0.217] | 6.5 [0.256] | 7.5 [0.295] | 10.5 [0.413] |

● Single acting pull type

| Code \ Bore | | 12 | 16 | 20 | 25 | 32 | 40 | 50 |
|-------------|------------------|--------------|--------------|-----------------|---------------|-----------------|-----------------|-----------------|
| X | Standard type | 7 [0.276] | 7 [0.276] | 11 [0.433] | 11 [0.433] | 13.5 [0.531] | 14.5 [0.571] | 12.5 [0.492] |
| | With bumper (-R) | 9 [0.354] | 9 [0.354] | 12.5 [0.492] | 14 [0.551] | 13.5 [0.531] | 15.5 [0.610] | 14.5 [0.571] |

■ Reed switch type

● Double acting type

| Code \ Bore | | 12 | 16 | 20 | 25 | 32 | 40 | 50 | 63 | 80 | 100 |
|-------------|------------------|------------------|------------------|-----------------|-----------------|---------------|---------------|----------------|-----------------|-----------------|-----------------|
| X | Standard type | 2.5 [0.098] | 2.5 [0.098] | 6.5 [0.256] | 6.5 [0.256] | 9 [0.354] | 10 [0.394] | 8 [0.315] | 10.5 [0.413] | 15.5 [0.610] | 20.5 [0.807] |
| | With bumper (-R) | 5.5 [0.217] | 5.5 [0.217] | 10.5 [0.413] | 11.5 [0.453] | 11 [0.433] | 12 [0.472] | 9.5 [0.374] | 10.5 [0.413] | 15.5 [0.610] | 20.5 [0.807] |
| Y | Standard type | -0.5 [-0.020] | -0.5 [-0.020] | 3 [0.118] | 4.5 [0.177] | 4 [0.157] | 6 [0.236] | 10 [0.394] | 11.5 [0.453] | 15.5 [0.610] | 20.5 [0.807] |
| | With bumper (-R) | 1.5 [0.059] | 1.5 [0.059] | 4 [0.157] | 4.5 [0.177] | 2 [0.079] | 4 [0.157] | 9 [0.354] | 11.5 [0.453] | 15.5 [0.610] | 20.5 [0.807] |

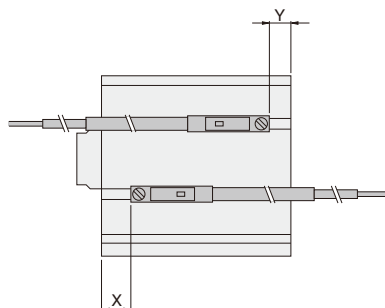
● Single acting push type

| Code \ Bore | | 12 | 16 | 20 | 25 | 32 | 40 | 50 |
|-------------|------------------|------------------|------------------|----------------|---------------|---------------|---------------|---------------|
| X | Standard type | 10.5 [0.413] | 10.5 [0.413] | 9.5 [0.374] | 10 [0.394] | 11 [0.433] | 13 [0.512] | 12 [0.472] |
| | With bumper (-R) | -3.5 [-0.138] | -3.5 [-0.138] | 3 [0.118] | 1 [0.039] | 2 [0.079] | 3 [0.118] | 6 [0.236] |

● Single acting pull type

| Code \ Bore | | 12 | 16 | 20 | 25 | 32 | 40 | 50 |
|-------------|------------------|----------------|----------------|----------------|----------------|--------------|---------------|---------------|
| X | Standard type | 2.5 [0.098] | 2.5 [0.098] | 6.5 [0.256] | 6.5 [0.256] | 9 [0.354] | 10 [0.394] | 8 [0.315] |
| | With bumper (-R) | 4.5 [0.177] | 4.5 [0.177] | 8 [0.315] | 9.5 [0.374] | 9 [0.354] | 11 [0.433] | 10 [0.394] |

● Lateral load resistant cylinders with magnet



■ Solid state type

● Double acting type

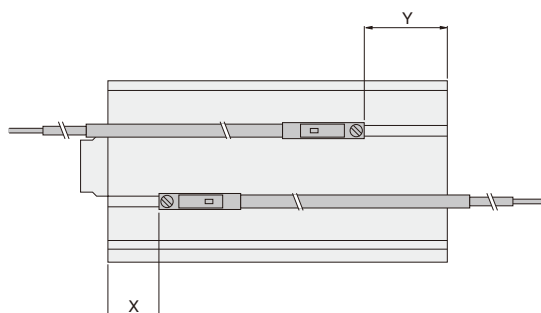
| Code \ Bore | | 12 | 16 | 20 | 25 | 32 | 40 | 50 | 63 | 80 | 100 |
|-------------|------------------|---------------|---------------|----------------|---------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| X | Standard type | 10 [0.394] | 10 [0.394] | 15 [0.591] | 16 [0.630] | 15.5 [0.610] | 16.5 [0.650] | 15.5 [0.610] | 17.5 [0.689] | 26.5 [1.043] | 31.5 [1.240] |
| | With bumper (-R) | 6 [0.236] | 6 [0.236] | 8.5 [0.335] | 9 [0.354] | 6.5 [0.256] | 8.5 [0.335] | 11.5 [0.453] | 13.5 [0.531] | 18.5 [0.728] | 23.5 [0.925] |

■ Reed switch type

● Double acting type

| Code \ Bore | | 12 | 16 | 20 | 25 | 32 | 40 | 50 | 63 | 80 | 100 |
|-------------|------------------|----------------|----------------|-----------------|-----------------|---------------|---------------|---------------|---------------|---------------|---------------|
| X | Standard type | 5.5 [0.217] | 5.5 [0.217] | 10.5 [0.413] | 11.5 [0.453] | 11 [0.433] | 12 [0.472] | 11 [0.433] | 13 [0.512] | 22 [0.866] | 27 [1.063] |
| | With bumper (-R) | 1.5 [0.059] | 1.5 [0.059] | 4 [0.157] | 4.5 [0.177] | 2 [0.079] | 4 [0.157] | 7 [0.276] | 9 [0.354] | 14 [0.551] | 19 [0.748] |

● Long stroke cylinders with magnet



■ Solid state type

● Double acting type

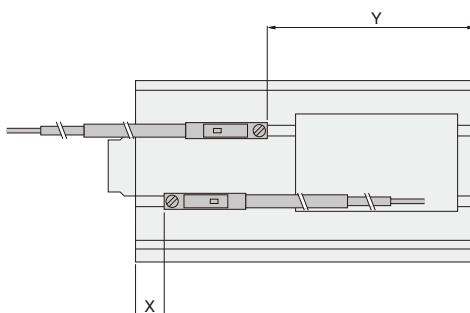
| Code \ Bore | 12 | 16 | 20 | 25 | 32 | 40 | 50 | 63 | 80 | 100 |
|-------------|---------------|---------------|---------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| X | 15 [0.591] | 15 [0.591] | 20 [0.787] | 21 [0.827] | 20.5 [0.807] | 21.5 [0.846] | 20.5 [0.807] | 22.5 [0.886] | 31.5 [1.240] | 36.5 [1.437] |
| Y | 12 [0.472] | 12 [0.472] | 15 [0.591] | 14.5 [0.571] | 13.5 [0.531] | 15.5 [0.610] | 12.5 [0.492] | 13.5 [0.531] | 18.5 [0.728] | 23.5 [0.925] |

■ Reed switch type

● Double acting type

| Code \ Bore | 12 | 16 | 20 | 25 | 32 | 40 | 50 | 63 | 80 | 100 |
|-------------|-----------------|-----------------|-----------------|-----------------|---------------|---------------|---------------|---------------|---------------|---------------|
| X | 10.5 [0.413] | 10.5 [0.413] | 15.5 [0.610] | 16.5 [0.650] | 16 [0.630] | 17 [0.669] | 16 [0.630] | 18 [0.709] | 27 [1.063] | 32 [1.260] |
| Y | 7.5 [0.295] | 7.5 [0.295] | 10.5 [0.413] | 10 [0.394] | 9 [0.354] | 11 [0.433] | 8 [0.315] | 9 [0.354] | 14 [0.551] | 19 [0.748] |

● End keep cylinder with magnet



■ Solid state type

● Head side end keep

| Code \ Bore | 16 | 20 | 25 | 32 | 40 | 50 | 63 |
|-------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| X | 15.5 [0.610] | 20.5 [0.807] | 21.5 [0.846] | 20.5 [0.807] | 21.5 [0.846] | 20.5 [0.807] | 22.5 [0.886] |
| Y | 36.5 [1.437] | 34.5 [1.358] | 34.5 [1.358] | 43.5 [1.713] | 45.5 [1.791] | 51.5 [2.028] | 54.5 [2.146] |

■ Solid state type

● Rod side end keep

| Code \ Bore | 16 | 20 | 25 | 32 | 40 | 50 | 63 |
|-------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| X | 35.5 [1.398] | 35.5 [1.398] | 36.5 [1.437] | 45.5 [1.791] | 46.5 [1.831] | 55.5 [2.185] | 57.5 [2.264] |
| Y | 11.5 [0.453] | 14.5 [0.571] | 14.5 [0.571] | 13.5 [0.531] | 15.5 [0.610] | 11.5 [0.453] | 13.5 [0.531] |

■ Reed switch type

● Head side end keep

| Code \ Bore | 16 | 20 | 25 | 32 | 40 | 50 | 63 |
|-------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| X | 11 [0.433] | 16 [0.630] | 17 [0.669] | 16 [0.630] | 17 [0.669] | 16 [0.630] | 16 [0.630] |
| Y | 32 [1.260] | 30 [1.181] | 30 [1.181] | 39 [1.535] | 41 [1.614] | 47 [1.850] | 50 [1.969] |

■ Reed switch type

● Rod side end keep

| Code \ Bore | 16 | 20 | 25 | 32 | 40 | 50 | 63 |
|-------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| X | 31 [1.220] | 31 [1.220] | 32 [1.260] | 41 [1.614] | 42 [1.654] | 51 [2.008] | 53 [2.087] |
| Y | 7 [0.276] | 10 [0.394] | 10 [0.394] | 9 [0.354] | 11 [0.433] | 7 [0.276] | 9 [0.354] |

Handling Instructions and Precautions

Body mounting

Jig cylinder mounting holes include both through holes with female mounting thread, and dedicated female mounting threads, for a variety of mountings. For details, see the diagrams below.

Standard cylinders, Double rod cylinders

- Standard cylinders
- Long stroke cylinders

- Double rod cylinders
- End keep cylinders

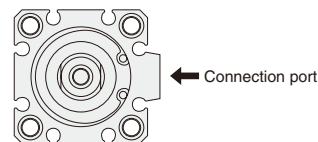
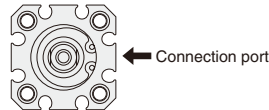
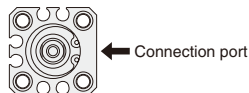
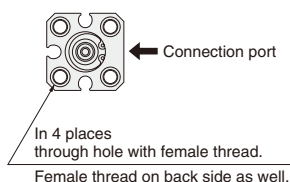
- Lateral load resistant cylinders

● $\phi 6 \sim \phi 12$

● $\phi 16$

● $\phi 20, \phi 25$

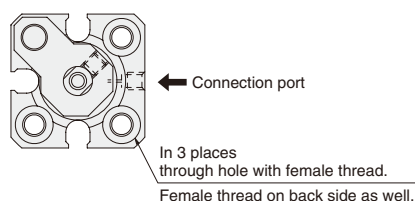
● $\phi 32 \sim \phi 100$



Remark: Mounting methods are the same regardless of bore sizes.

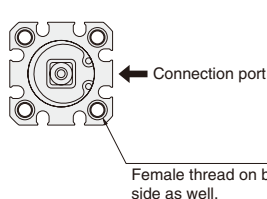
Non-rotating cylinders

● $\phi 6, \phi 8, \phi 10$

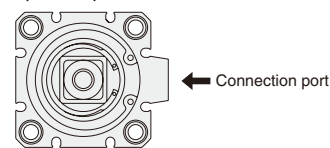


Square rod cylinders

● $\phi 20, \phi 25$



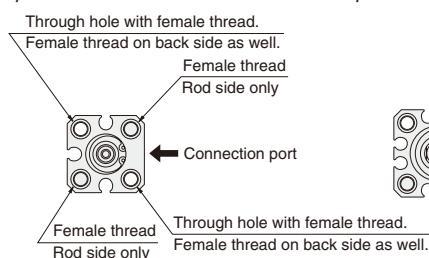
● $\phi 32 \sim \phi 63$



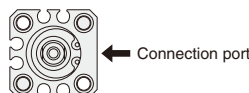
Remark: Mounting methods are the same regardless of bore sizes. However, the mounting method for "with centering location" differs from the figure above. See p.153.

Tandem cylinders

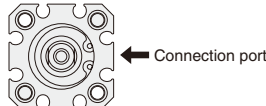
● $\phi 12$



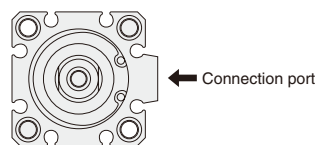
● $\phi 16$



● $\phi 20, \phi 25$



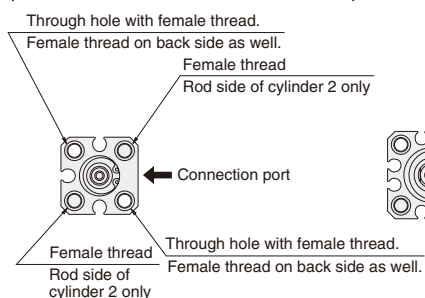
● $\phi 32 \sim \phi 100$



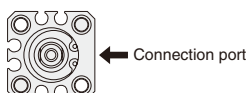
Remark: Mounting methods are the same regardless of bore sizes.

Dual stroke cylinders

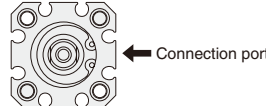
● $\phi 12$



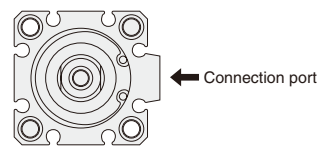
● $\phi 16$



● $\phi 20, \phi 25$



● $\phi 32 \sim \phi 100$



Remark: Mounting methods are the same regardless of bore sizes.

- Notes: 1. Avoid applying lateral loads on the piston rod, with the exception of Lateral load resistant cylinders, Long stroke cylinders, and End keep cylinders.
2. When using through holes for mounting, always use the supplied dedicated washers. (except $\phi 6, \phi 8$, and $\phi 10$)
3. Mount an external stopper, etc., to prevent the cylinder from being subjected to direct shocks during operation.

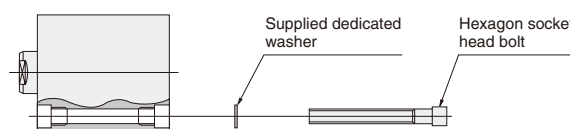
Tightening thread of the end of piston rod

Since a tool (thin wrench) has been prepared for holding the piston rod when tightening the rod end thread, consult us.

Order code: L115069



- Always use the supplied dedicated washer whenever using a through bolt to directly mount the cylinder body in place.* Use the bolts shown in the table below to mount in place. And for bolts used for direct mounting, see p.209.



*Washer not available for bore sizes $\phi 6, \phi 8$, and $\phi 10$.

| Bore size mm [in.] | 6 | 8 | 10 | 12 | 16 | 20 | 25 | 32 | 40 | 50 | 63 | 80 | 100 |
|---|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| | [0.236] | [0.315] | [0.394] | [0.472] | [0.630] | [0.787] | [0.984] | [1.260] | [1.575] | [1.969] | [2.480] | [3.150] | [3.940] |
| Hexagon socket head bolt nominal size | M3 | M3 | M3 | M3 | M3 | M3 | M4 | M4 | M5 | M6 | M6 | M8 | M10 |

Bracket mounting

- Foot mounting brackets cannot be installed on tandem cylinders and dual stroke cylinders.
- Flange mounting brackets cannot be installed on the head side of tandem cylinders and the stroke 1 side of dual stroke cylinders.
- Clevis mounting brackets cannot be installed on anything except for lateral load resistant cylinders, long stroke cylinders, and end keep cylinders.

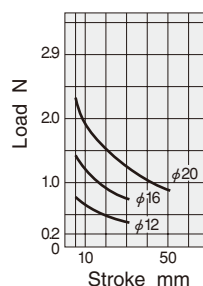
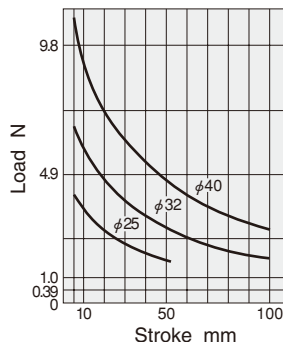
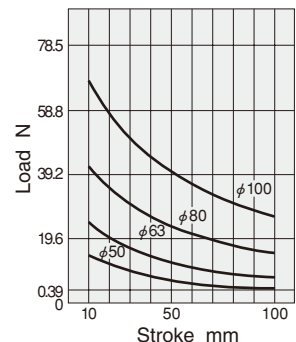
Non-standard stroke

- In most cases, body cutting is used for the manufacturing for non-standard strokes. However, body cutting is not used for strokes of less than 5mm for $\phi 12$ [0.472in.]~ $\phi 40$ [1.575in.], and strokes of less than 10mm for $\phi 50$ [1.969in.]~ $\phi 100$ [3.940in.]. The collar packed is used for these cases. Moreover, sizes $\phi 6$ [0.236in.]~ $\phi 10$ [0.394in.] are collar packed only. For delivery, consult us. Rod side end keep cylinders cannot be collar packed.
- Dimensions
 1. Additional strokes obtained by body cutting remain classed as non-standard strokes.
 2. Additional strokes obtained by collar packed are classed as standard strokes in the longer one.

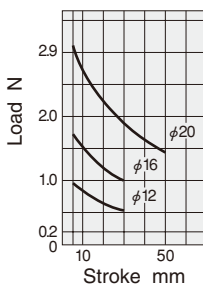
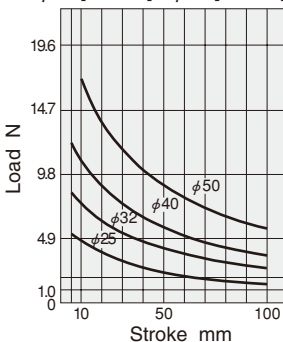
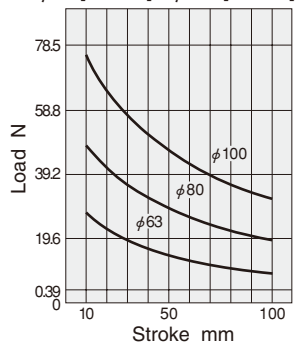
Lateral Load

- Keep the lateral load on the rod end of the lateral load resistant cylinder, long stroke cylinder, and end keep cylinder, at or below the values shown in the graphs below.

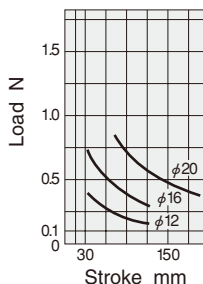
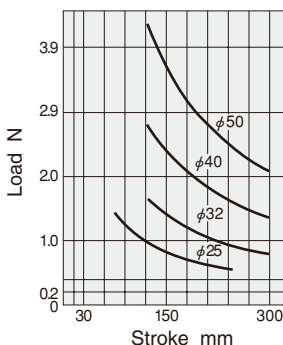
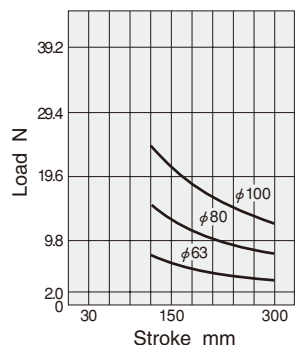
Note: Avoid applying lateral load on any cylinder types other than the lateral load resistant cylinder, long stroke cylinder, and end keep cylinder.

● Lateral load resistant cylinders**● Standard type (CBDA)**● $\phi 12$ [0.472in.]~ $\phi 20$ [0.787in.]● $\phi 25$ [0.984in.]~ $\phi 40$ [1.575in.]● $\phi 50$ [1.969in.]~ $\phi 100$ [3.940in.]

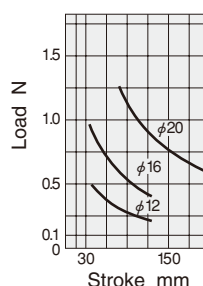
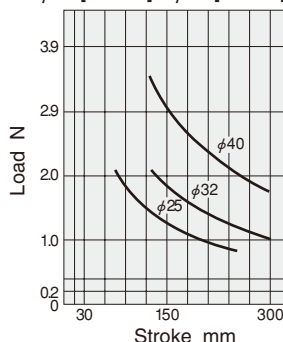
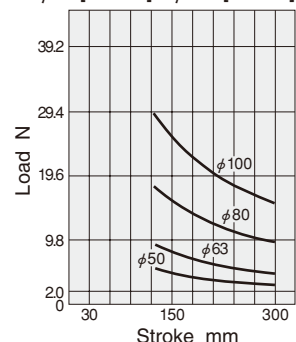
1N = 0.2248lbf.
1mm = 0.0394in.

● Cylinder with magnet (CBDAS)● $\phi 12$ [0.472in.]~ $\phi 20$ [0.787in.]● $\phi 25$ [0.984in.]~ $\phi 50$ [1.969in.]● $\phi 63$ [2.480in.]~ $\phi 100$ [3.940in.]

1N = 0.2248lbf.
1mm = 0.0394in.

● Long stroke cylinders, End keep cylinders**● Standard type (CCDA,CCDAK)**● $\phi 12$ [0.472in.]~ $\phi 20$ [0.787in.]● $\phi 25$ [0.984in.]~ $\phi 50$ [1.969in.]● $\phi 63$ [2.480in.]~ $\phi 100$ [3.940in.]

1N = 0.2248lbf.
1mm = 0.0394in.

● Cylinder with magnet (CCDAS, CCDAKS)● $\phi 12$ [0.472in.]~ $\phi 20$ [0.787in.]● $\phi 25$ [0.984in.]~ $\phi 40$ [1.575in.]● $\phi 50$ [1.969in.]~ $\phi 100$ [3.940in.]

1N = 0.2248lbf.
1mm = 0.0394in.

Handling Instructions and Precautions

Single acting cylinders

Standard cylinders single acting push type
Standard cylinders single acting pull type
Double rod cylinders single acting type
Tandem cylinders single acting push type
Dual stroke cylinders single acting push type
Dual stroke cylinders single acting pull type

If in the above types' application, air is being continuously applied from a connection port, and the spring remains in a compressed state for long periods of time, the piston may sometimes fail to return to its original position even after the air is exhausted. If equipment is to be used in this way over long periods of time, consult us.

End keep cylinder

● Control circuit

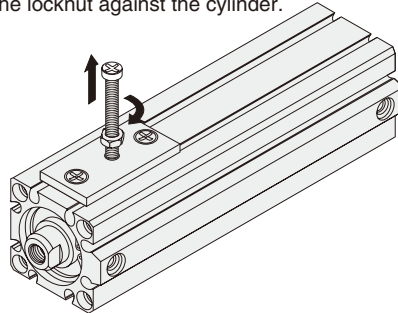
1. For control of Jig end keep cylinders, we recommend the use of 2-position, 4-, 5-port valves. Avoid the use of a control circuit of ABR connections (exhaust centers) with 3-position valves that exhaust air from 2 ports.
2. Always use meter-out control for speed control. Meter-in control may result in failure of the locking mechanism to release.

Notes: 1. It is dangerous to supply air to a connection port on a side with a locking mechanism while already exhausted, because the piston rod could suddenly extend (retract). In addition, it could also cause galling of the lock piston and piston rod, resulting in defective operation. Always supply air to the connection port on the opposite side to ensure back pressure is applied.

2. When restarting operations after air has been exhausted from the cylinder due to completion of operations or to an emergency stop, always start by supplying air to the connection port on the opposite side of the locking mechanism.
3. Connect the valve port A (NC) to the connection port on the side with the locking mechanism.

● Manual operation of the locking mechanism

While the locking mechanism is normally released automatically through cylinder operations, it can also be released manually. For manual release, insert an M3 × 0.5 screw that has 30mm [1.18in.] below head length into the manual override opening, thread it in about 3 turns into the internal lock piston, and then pull up the screw. To maintain the manual override for adjustment, etc., thread the locknut onto the screw and, with the locking mechanism in a released state, tighten the locknut against the cylinder.



- Notes: 1. It is dangerous to release the lock when a load (weight) is present on the piston rod, because it may cause a sudden fall or cause the unintended piston rod's extension (retraction). In this case, always supply air to the connection port opposite the one adjacent to the locking mechanism before releasing the locking mechanism.
2. If the locking mechanism cannot easily be released even with manual override, it could be the result of galling of the lock piston and piston rod. In this case, supply air to the connection port opposite the one adjacent to the locking mechanism before releasing the locking mechanism.
 3. Because water, oil, dust, etc., entering via the manual override opening could be a cause of defective locking or other erratic operation, use a cover, etc., for protection when using in locations subject to dripping water, dripping oil, or to large amounts of dust, etc.

Sensor switch

In the standard cylinder, a magnet for the sensor switch is not built-in.

To install a sensor switch, a cylinder with a built-in magnet for the sensor switch is required.

- Notes: 1. For the sensor switch mounting location and moving ranges, see p.199.
2. Contact protection measures are required for connecting inductive loads to reed sensor switches or for when capacitive surges are generated. For contact protection measures, see p.1566.

Piping

Always thoroughly blow off (use compressed air) the tubing before connecting it to the cylinder. Entering chips, sealing tape, rust, etc., generated during piping work could result in air leaks or other defective operation.

Atmosphere

1. If using in locations subject to dripping water, dripping oil, etc., or to large amounts of dust, use a cover to protect the unit.
2. The product cannot be used when the media or ambient atmosphere contains any of the substances listed below.
Organic solvents, phosphate ester type hydraulic oil, sulphur dioxide, chlorine gas, or acids, etc.

Lubrication

The product can be used without lubrication, if lubrication is required, use Turbine Oil Class 1 (ISO VG32) or equivalent.

Avoid using spindle oil or machine oil.

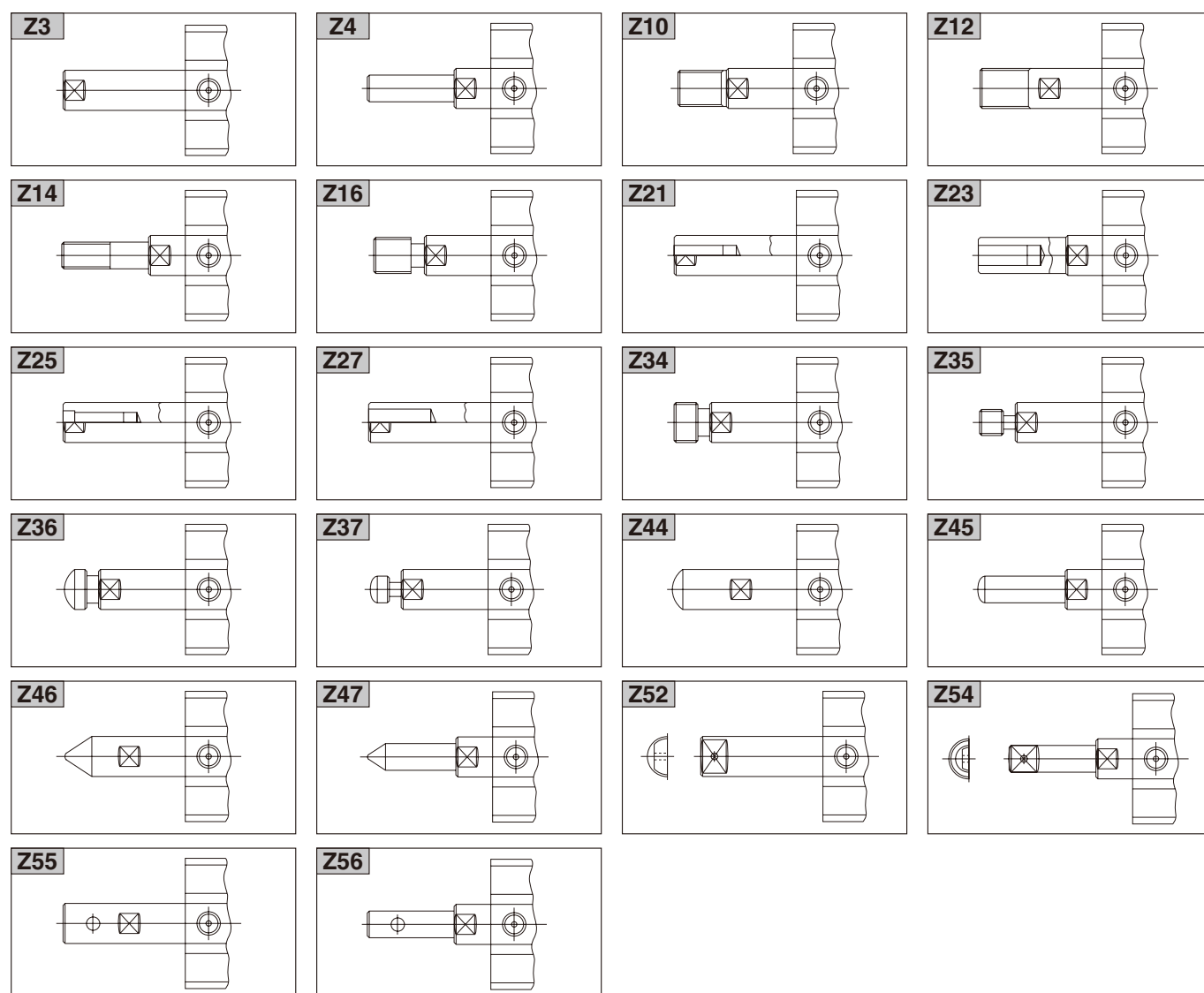
OPTIONAL ROD END SHAPE PATTERNS

Use an order form of rod end pattern and fill the items on the selected one from among 22 types of optional patterned shapes to obtain made-to-order cylinders of non-standard rod end shapes. The optional rod end shapes can be applied to the entire Jig Cylinders C Series. For the order form containing the optional patterned shapes, contact us.
(Except $\phi 6$, $\phi 8$, $\phi 10$)

Order Codes

| | | | | | | | | | | | |
|---|----------------------|----------------------|---|---|----------------------|---|--------------------------------|---|---|---------------|-------------------------------|
| C | <input type="text"/> | <input type="text"/> | <input type="text"/> | - | <input type="text"/> | - | <input type="text"/> | - | W | Remark column | <input type="text"/> |
| | | | Bore size × Stroke (For tandem and dual cylinders, use Bore size × Stroke1 × Stroke2) | | Bumper | | Sensor switch model and number | | | | Rod end shape pattern code |
| | | | Cylinder specification | | | | | | | | |
| | | | Cylinder type | | | | | | | | |

Piston Rod End Shape Pattern Diagrams (22 Types)



MOUNTING SCREWS FOR JIG CYLINDERS



● Some types of mounting screws specifically for the Jig Cylinders are available.

Use the order codes below to place orders.

List of Order Codes

- ① Mounting screw type: JIS B 1176 Hexagon socket head cap screws
② Surface treatment: Nickel plated

| Applicable cylinder bore size mm [in.] | Mounting screw order code | Screw size | Number of supplied screws |
|--|---------------------------|------------|---------------------------|
| 6 [0.236] 8 [0.315] 10 [0.394] 12 [0.472] 16 [0.630] 20 [0.787] | CRK124 | M3×25 | 2 |
| | CRK125 | M3×30 | |
| | CRK126 | M3×35 | |
| | CRK127 | M3×40 | |
| | CRK128 | M3×45 | |
| | CRK129 | M3×50 | 4 |
| | CRK130 | M3×30 | |
| | CRK131 | M3×35 | |
| | CRK132 | M3×40 | |
| | CRK133 | M3×45 | |
| 25 [0.984] 32 [1.260] | CRK134 | M3×50 | 4 |
| | CRK135 | M4×30 | |
| | CRK136 | M4×35 | |
| | CRK137 | M4×40 | |
| | CRK138 | M4×45 | |
| | CRK139 | M4×50 | |
| | CRK140 | M4×55 | |
| | CRK141 | M4×60 | |
| | CRK142 | M4×65 | |
| | CRK143 | M4×70 | |
| 40 [1.575] | CRK144 | M4×75 | 4 |
| | CRK145 | M5×35 | |
| | CRK146 | M5×40 | |
| | CRK147 | M5×45 | |
| | CRK148 | M5×50 | |
| | CRK149 | M5×55 | |
| | CRK150 | M5×60 | |
| | CRK151 | M5×65 | |
| | CRK152 | M5×70 | |
| | CRK153 | M5×75 | |
| | CRK154 | M5×80 | |
| | CRK155 | M5×85 | |
| | CRK156 | M5×90 | |
| | CRK157 | M5×100 | |
| | CRK158 | M5×110 | |
| 50 [1.969] 63 [2.480] | CRK159 | M6×40 | 4 |
| | CRK160 | M6×45 | |
| | CRK161 | M6×50 | |
| | CRK162 | M6×55 | |
| | CRK163 | M6×60 | |
| | CRK164 | M6×65 | |
| | CRK165 | M6×70 | |
| | CRK166 | M6×75 | |
| | CRK167 | M6×80 | |
| | CRK168 | M6×85 | |
| | CRK169 | M6×90 | |
| | CRK170 | M6×100 | |
| | CRK171 | M6×110 | |
| | CRK172 | M6×120 | |
| | CRK173 | M6×130 | |
| | CRK174 | M6×140 | |
| | CRK175 | M6×150 | |

| Applicable cylinder bore size mm [in.] | Mounting screw order code | Screw size | Number of supplied screws |
|--|---------------------------|------------|---------------------------|
| 80 [3.150] | CRK176 | M8×60 | 4 |
| | CRK177 | M8×65 | |
| | CRK178 | M8×70 | |
| | CRK179 | M8×75 | |
| | CRK180 | M8×80 | |
| | CRK181 | M8×85 | |
| | CRK182 | M8×90 | |
| | CRK183 | M8×95 | |
| | CRK184 | M8×100 | |
| | CRK185 | M8×110 | |
| | CRK186 | M8×120 | |
| | CRK187 | M8×130 | |
| | CRK188 | M8×140 | |
| | CRK189 | M8×150 | |
| | CRK190 | M8×160 | |
| 100 [3.940] | CRK191 | M8×170 | 4 |
| | CRK192 | M10×65 | |
| | CRK193 | M10×70 | |
| | CRK194 | M10×75 | |
| | CRK195 | M10×80 | |
| | CRK196 | M10×85 | |
| | CRK197 | M10×90 | |
| | CRK198 | M10×95 | |
| | CRK199 | M10×100 | |
| | CRK200 | M10×110 | |
| | CRK201 | M10×120 | |
| | CRK202 | M10×130 | |
| | CRK203 | M10×140 | |
| | CRK204 | M10×150 | |
| | CRK205 | M10×160 | |
| | CRK206 | M10×170 | |