



Specification

| Model | MCRPL | | | MCRPLF | | | |
|--------------------------|--------------------------------------|------|-------|---------------|------|----------|------|
| Acting type | Double acting | | | Double acting | | | |
| Tube I.D.(mm) | 16 | 25 | 32,40 | 16 | 25 | 32,40,50 | 63 |
| Port size | M5 | G1/8 | G1/4 | M5 | G1/8 | G1/4 | G3/8 |
| No. of port | 3 | | | | | | |
| Medium | Air | | | | | | |
| Operating pressure range | 0.1~0.78 MPa | | | | | | |
| Stroke range (※1) | φ 16 | | | 100~3300 mm | | | |
| | φ 25~63 | | | 100~5600 mm | | | |
| Ambient Temperature | - 10℃~+ 80℃ (No freezing) | | | | | | |
| Lubrication | With or Without lubrication | | | | | | |
| Cushion | With adjustable cushion at both ends | | | | | | |
| Sensor Switch | RCAL | | | | | | |
| Sensor Switch Holder | HPL | | | | | | |



- ※1. Minimum stroke unit 1mm.
- ※2. The tube isn't airtight, so the cylinder is allowed little leakage. Before the cylinder is sale, it has passed the standard of leakage test.

Features

- Equal forces on both ends of the piston.
- High cantilever and direct loads can be taken on piston.
- Multi ported endcaps as standard.
- Self guiding.
- High temperature seals available as a standard option.
- Many mounting options available.
- 50% space saving when compared to conventional cylinders.
- Reed switches available.
- Magnetic as standard.
- Simple construction enables rapid servicing of cylinder.
- Slow speed grease available as option to enable very slow and smooth piston movement.

Order example

MCRPL — 90V — 25 — 0850 — S — 24/2

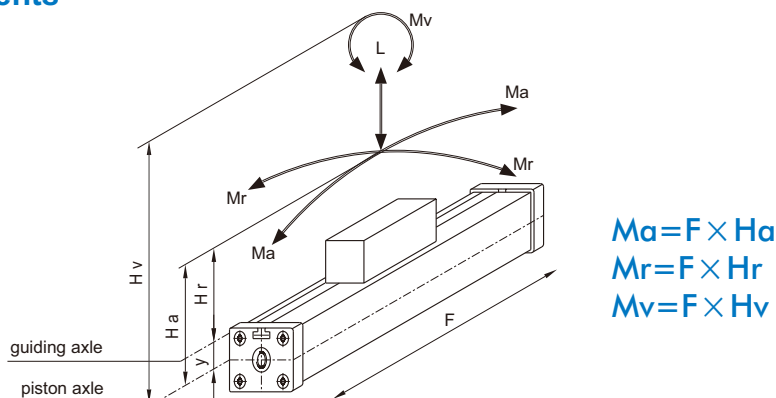
| Model | Type | Piston seals | Tube I.D. | Stroke | Grease lubrication | Accessory |
|--|---|---|--|---------------------------------|---|----------------------------------|
| MCRPL  | 90 standard type 98 long piston type ※ Only for MCRPL | — NBR (for piston speeds $V \leq 1$ m/s) V VITON (for piston speeds $V > 1$ m/s) | 16 25 32 40 50 63 | 100~5600 mm (4 codes) | — Standard S Slow motion grease | ※ Please refer to 6-7 page code. |
| MCRPLF  | | | } for MCRPLF | | | |

※ Speed range for the different greases.

- **Standard grease**
 NBR piston seals: $0.2 \text{ m/s} \leq V \leq 1 \text{ m/s}$
 VITON piston seals: $1 \text{ m/s} < V$
- **Slow motion grease**
 NBR piston seals: $V < 0.2 \text{ m/s}$
 VITON piston seals: $V < 0.2 \text{ m/s}$

RODLESS CYLINDER

Forces and moments



MCRPL

| Cylinder | | Effect force (N) at 6 bar | Cushion (mm) | Max. allowed load (N) | Max. allowed bending moment (Nm) | | Max. allowed torque (Nm) |
|----------|----|---------------------------|--------------|-----------------------|----------------------------------|-----------|--------------------------|
| ϕ | y | F | S | L | Ma axial | Mr radial | Mv central |
| 16 | 9 | 110 | 15 | 120 | 4 | 0.3 | 0.5 |
| 16L | 9 | 110 | 15 | 120 | 5 | 0.4 | 0.6 |
| 25 | 14 | 250 | 21 | 300 | 15 | 1.0 | 3.0 |
| 25L | 14 | 250 | 21 | 300 | 20 | 1.5 | 6.0 |
| 32 | 18 | 420 | 26 | 450 | 30 | 2.0 | 4.5 |
| 32L | 18 | 420 | 26 | 450 | 60 | 3.5 | 10.0 |
| 40 | 23 | 640 | 32 | 750 | 60 | 4.0 | 8.0 |
| 40L | 23 | 640 | 32 | 750 | 130 | 7.0 | 20.0 |

- 16L~40L: cylinder with long piston for heavy bending, torque moments and vertical movement.
- The figures above are max. values based on light shock free duty and speed of $V \leq 0.2\text{m/s}$. Max. pressure 6 bar.
- An exceeding of the values in dynamic operations, even for short moments, has to be avoided.
- Attention: Resulting forces could lead to extreme exceeding of the values. In case of undefinable situations the above max. values have to be reduced by 10~20%.

MCRPLF

| Cylinder | | Effect force (N) at 6 bar | Cushion (mm) | Max. allowed load (N) | Max. allowed bending moment (Nm) | | Max. allowed torque (Nm) |
|----------|----|---------------------------|--------------|-----------------------|----------------------------------|-----------|--------------------------|
| ϕ | y | F | S | L | Ma axial | Mr radial | Mv central |
| 16 | 9 | 110 | 15 | 120 | 4 | 0.45 | 0.5 |
| 25 | 14 | 250 | 21 | 300 | 15 | 1.5 | 3.0 |
| 32 | 18 | 420 | 26 | 450 | 30 | 3.0 | 4.5 |
| 40 | 23 | 640 | 32 | 750 | 60 | 6.0 | 8.0 |
| 50 | 28 | 1000 | 32 | 1200 | 115 | 10.0 | 15.0 |
| 63 | 36 | 1550 | 40 | 1650 | 200 | 12.0 | 24.0 |

- The figures above are max. values based on light shock free duty and speed of $V \leq 0.2\text{m/s}$. Max. pressure 6 bar.
- An exceeding of the values in dynamic operations, even for short moments, has to be avoided.
- Attention: Resulting forces could lead to extreme exceeding of the values. In case of undefined situations the above max. values have to be reduced by 10~20%.

Cylinder weight

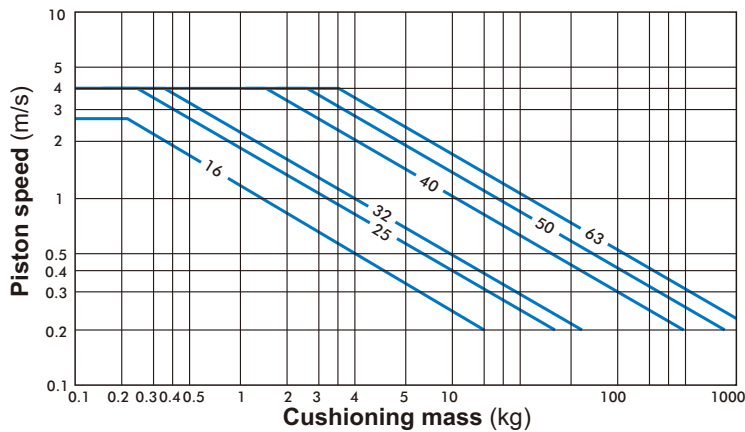
Unit: g

| Model | Basic weight MCRPL | Stroke 100 mm MCRPL |
|-----------|--------------------|---------------------|
| Tube I.D. | | |
| $\phi 16$ | 240 | 92 |
| $\phi 25$ | 760 | 294 |
| $\phi 32$ | 1,670 | 379 |
| $\phi 40$ | 2,760 | 594 |

| Model | Basic weight MCRPLF | Stroke 100 mm MCRPLF |
|-----------|---------------------|----------------------|
| Tube I.D. | | |
| $\phi 16$ | 230 | 92 |
| $\phi 25$ | 710 | 294 |
| $\phi 32$ | 1,150 | 379 |
| $\phi 40$ | 2,700 | 594 |
| $\phi 50$ | 4,000 | 648 |
| $\phi 63$ | 7,360 | 1,182 |

RODLESS CYLINDER

Cushioning diagram



Pay attention to the following points

- If the limits above are exceeded additional shock absorbers are necessary.
- For piston speeds $< 0.2\text{m/s}$ slow speed lubrication is necessary.
- Maximum seal life will be achieved when piston speeds do not exceed 1m/s .

Positioning of cylinder mountings

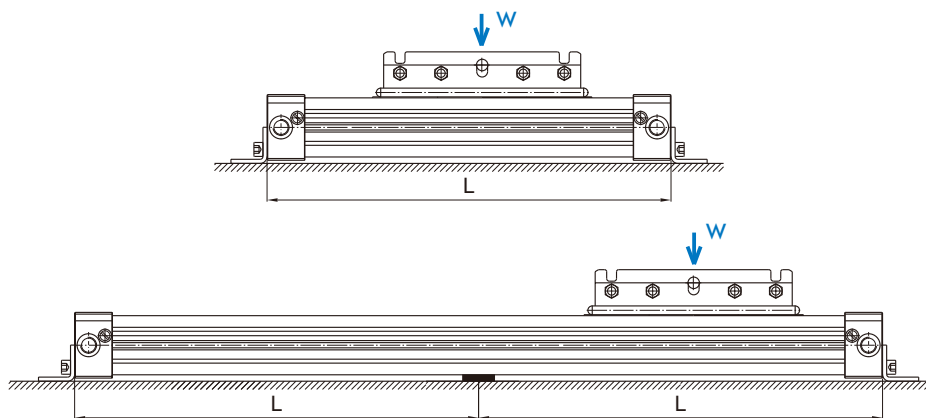
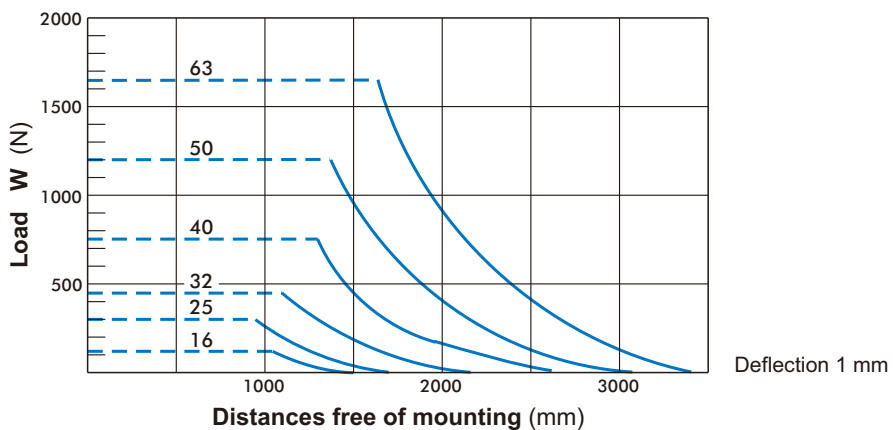
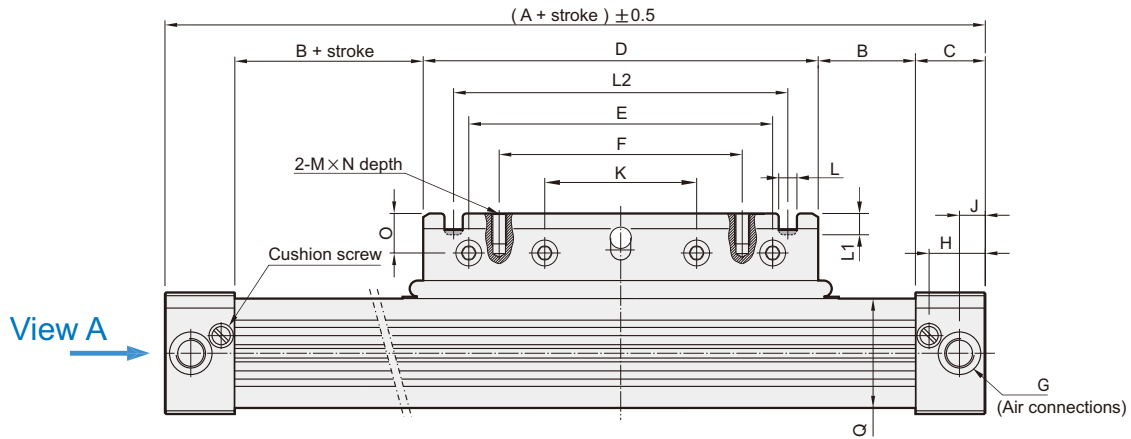


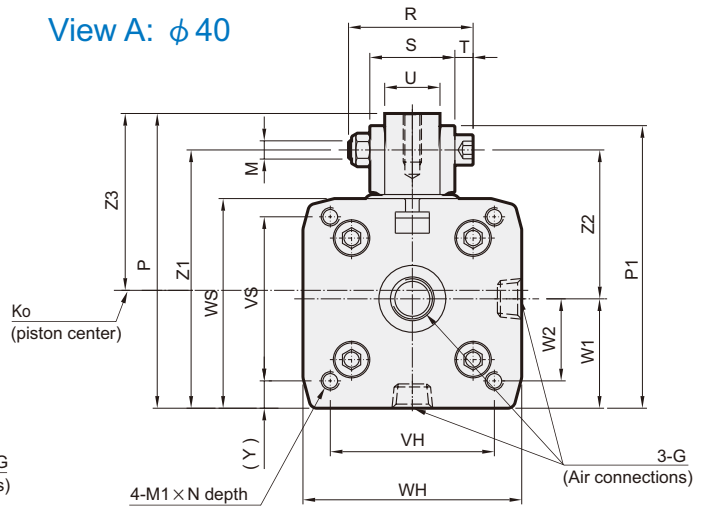
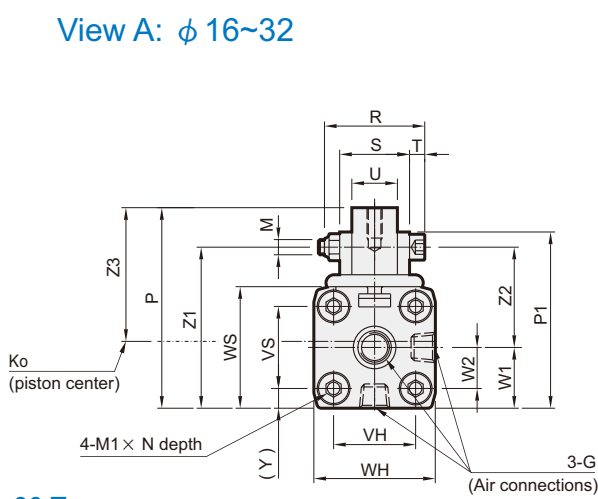
Diagram information

- Calculated deflections without support of $0.5\text{-}1\text{ mm}$ allow exceeding of the approved limits.
- Calculated deflections without support of $> 1\text{-max.}1.5\text{mm}$ require reduction of approved limits.



View A: $\phi 16\sim 32$

View A: $\phi 40$



90 Type

| Code Tube I.D. | A | B | C | D | E | F | G | H | J | K | L | L1 | L2 | M | M1 | N | O | P | P1 |
|-------------------|-----|----|----|-----|-----|----|------|------|------|----|----|----|-----|----|----|----|----|------|------|
| 16 | 130 | 12 | 15 | 76 | 64 | 48 | M5 | 12 | 5.5 | 32 | -- | -- | -- | M4 | M3 | 7 | 6 | 43.5 | 42.3 |
| 25 | 200 | 17 | 23 | 120 | 100 | 80 | G1/8 | 18.5 | 8.5 | 50 | 6 | 7 | 100 | M5 | M5 | 11 | 13 | 66 | 58 |
| 32 | 250 | 23 | 27 | 150 | 110 | 90 | G1/4 | 22 | 10.5 | 55 | 6 | 7 | 130 | M6 | M6 | 14 | 12 | 86 | 82 |
| 40 | 300 | 45 | 30 | 150 | 110 | 90 | G1/4 | 24 | 15 | 55 | 6 | 7 | 130 | M6 | M6 | 15 | 12 | 97 | 93 |

| Code Tube I.D. | Q | R | S | T | U | VH | VS | WH | WS | W1 | W2 | Y | Z1 | Z2 | Z3 |
|-------------------|---------|----|----|---|----|----|----|----|----|------|------|-----|------|----|------|
| 16 | 25×24.5 | 27 | 18 | 4 | 10 | 18 | 18 | 27 | 27 | 13.5 | 9 | 4.5 | 37.5 | 24 | 28.8 |
| 25 | 36×36 | 35 | 23 | 5 | 15 | 27 | 27 | 40 | 40 | 20 | 13.5 | 6.5 | 53 | 33 | 38.8 |
| 32 | 48×52 | 41 | 27 | 6 | 18 | 36 | 40 | 52 | 56 | 30 | 22 | 8 | 74 | 44 | 53.5 |
| 40 | 58×58 | 41 | 28 | 6 | 18 | 54 | 54 | 72 | 69 | 36 | 27 | 9 | 85 | 49 | 58.2 |

98 Type

| Code Tube I.D. | A | B | C | D | E | F | G | H | J | K | L | L1 | L2 | M | M1 | N | O | P | P1 |
|-------------------|-----|----|----|-----|-----|-----|------|------|------|-----|----|----|-----|----|----|----|----|------|------|
| 16L | 180 | 37 | 15 | 76 | 64 | 48 | M5 | 12 | 5.5 | 32 | -- | -- | -- | M4 | M3 | 7 | 6 | 43.5 | 42.3 |
| 25L | 300 | 67 | 23 | 120 | 100 | 80 | G1/8 | 18.5 | 8.5 | 50 | 6 | 7 | 100 | M5 | M5 | 11 | 13 | 66 | 58 |
| 32L | 400 | 23 | 27 | 300 | 240 | 180 | G1/4 | 22 | 10.5 | 120 | -- | -- | -- | M6 | M6 | 14 | 12 | 86 | 82 |
| 40L | 500 | 70 | 30 | 300 | 240 | 180 | G1/4 | 24 | 15 | 120 | -- | -- | -- | M6 | M6 | 15 | 12 | 97 | 93 |

| Code Tube I.D. | Q | R | S | T | U | VH | VS | WH | WS | W1 | W2 | Y | Z1 | Z2 | Z3 |
|-------------------|---------|----|----|---|----|----|----|----|----|------|------|-----|------|----|------|
| 16L | 25×24.5 | 27 | 18 | 4 | 10 | 18 | 18 | 27 | 27 | 13.5 | 9 | 4.5 | 37.5 | 24 | 28.8 |
| 25L | 36×36 | 35 | 23 | 5 | 15 | 27 | 27 | 40 | 40 | 20 | 13.5 | 6.5 | 53 | 33 | 38.8 |
| 32L | 48×52 | 41 | 27 | 6 | 18 | 36 | 40 | 52 | 56 | 30 | 22 | 8 | 74 | 44 | 53.5 |
| 40L | 58×58 | 41 | 28 | 6 | 18 | 54 | 54 | 72 | 69 | 36 | 27 | 9 | 85 | 49 | 58.2 |

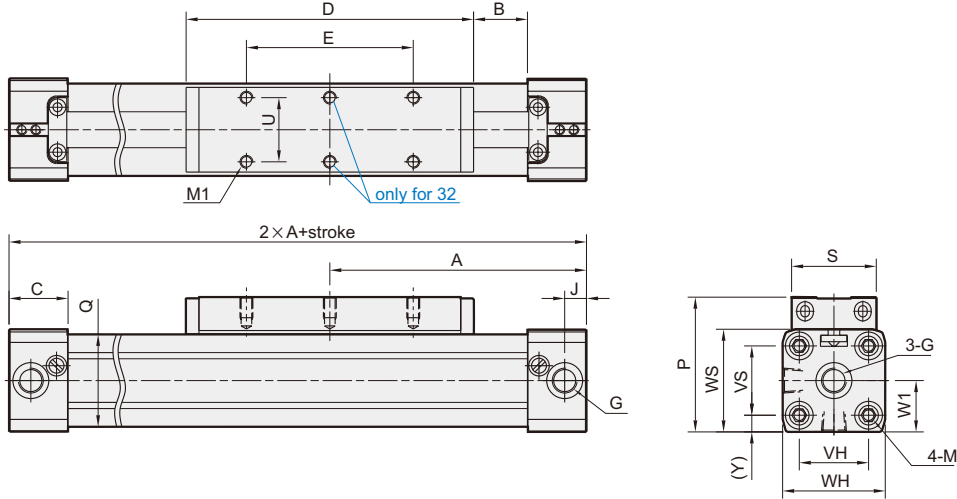
● 16L~40L: Cylinder with long piston for heavy bending and torque moments.

MCRPLF Dimensions $\phi 16 \sim \phi 63$



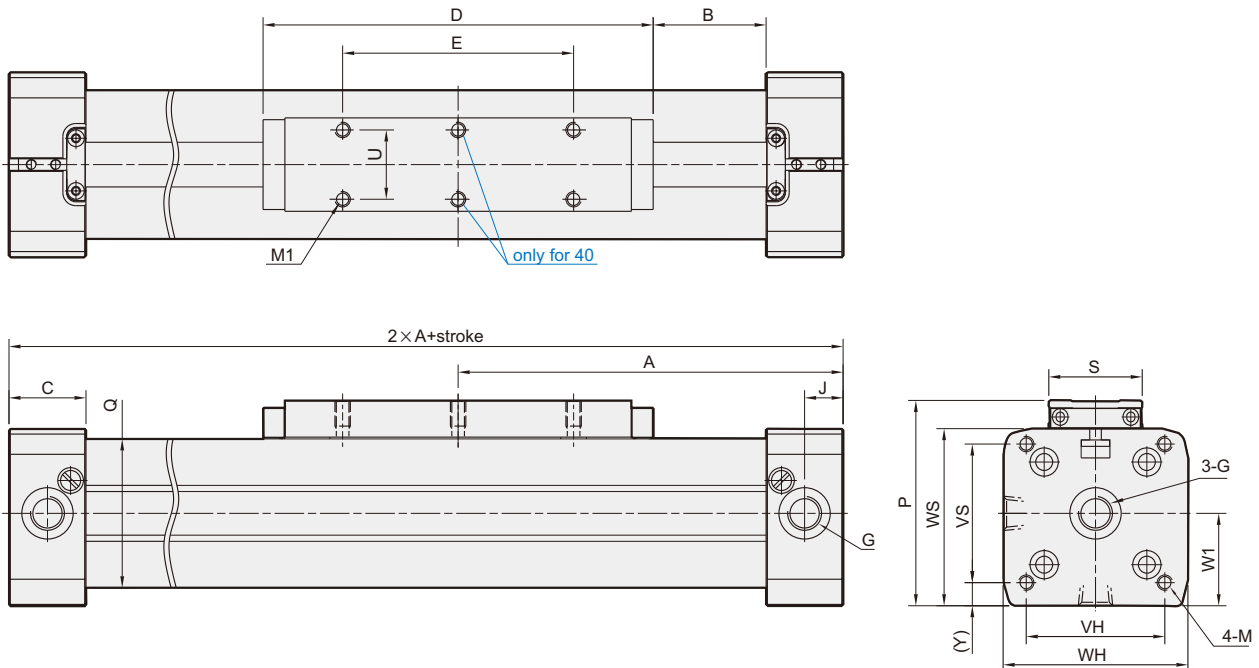
RODLESS CYLINDER

$\phi 16 \sim \phi 32$



| Code Tube I.D. | A | B | C | D | E | G | J | M | M1 | P | Q | S | U | VH | VS | WH | WS | W1 | Y |
|-------------------|-----|------|----|-----|----|------|------|------------|-------------|------|---------|----|------|----|----|----|----|------|-----|
| 16 | 65 | 15.5 | 15 | 69 | 36 | M5 | 5.5 | M3×7depth | 4-M4×7depth | 36.5 | 25×24.5 | 22 | 16.5 | 18 | 18 | 27 | 27 | 13.5 | 4.5 |
| 25 | 100 | 21.5 | 23 | 112 | 65 | G1/8 | 8.5 | M5×12depth | 4-M5×8depth | 52.5 | 36×36 | 33 | 25 | 27 | 27 | 40 | 40 | 20 | 6.5 |
| 32 | 125 | 22.0 | 27 | 152 | 90 | G1/4 | 10.5 | M6×15depth | 6-M6×8depth | 66.5 | 48×52 | 36 | 27 | 36 | 40 | 52 | 56 | 30 | 8 |

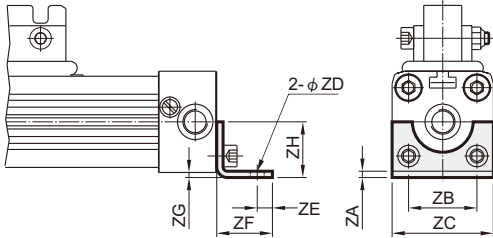
$\phi 40 \sim \phi 63$



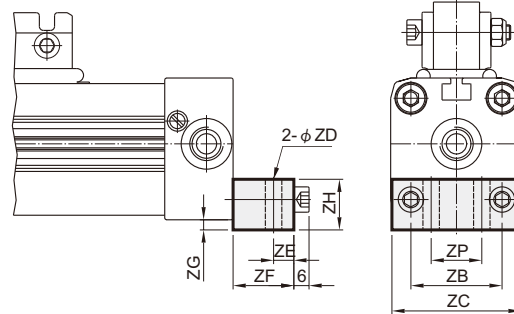
| Code Tube I.D. | A | B | C | D | E | G | J | M | M1 | P | Q | S | U | VH | VS | WH | WS | W1 | Y |
|-------------------|-----|------|----|-----|-----|------|------|------------|--------------|-----|---------|------|----|----|----|-----|-----|------|------|
| 40 | 150 | 44 | 30 | 152 | 90 | G1/4 | 15 | M6×15depth | 6-M6×10depth | 80 | 58×58 | 36.4 | 27 | 54 | 54 | 72 | 69 | 36 | 9 |
| 50 | 175 | 42 | 33 | 200 | 110 | G1/4 | 11.7 | M6×15depth | 4-M6×10depth | 89 | 77×76 | 56 | 27 | 70 | 70 | 80 | 80 | 43.6 | 5 |
| 63 | 215 | 47.5 | 50 | 235 | 155 | G3/8 | 25 | M8×17depth | 4-M8×14depth | 123 | 102×102 | 50 | 36 | 78 | 78 | 106 | 106 | 62.5 | 14.5 |

End cover bracket (foot) for MCRPL / MCPRLF

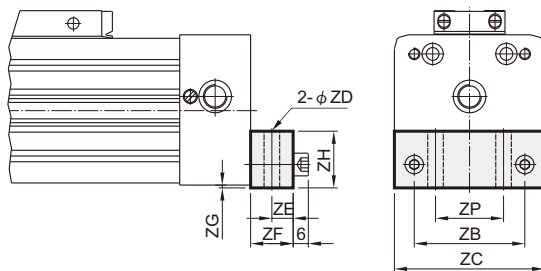
$\phi 16, \phi 25$



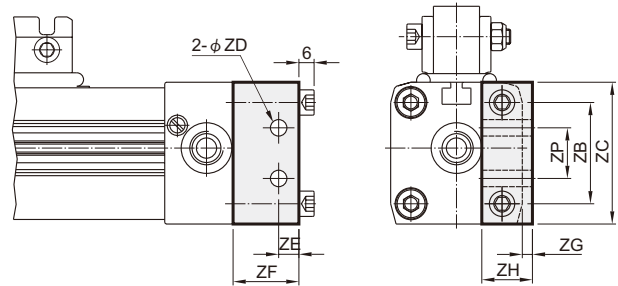
$\phi 32, \phi 40$



$\phi 50, \phi 63$



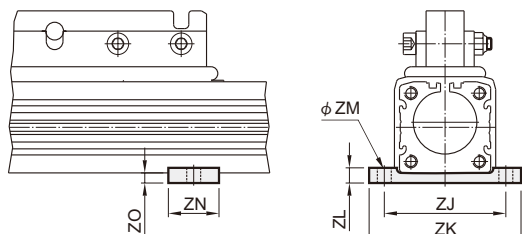
$\phi 32$ *



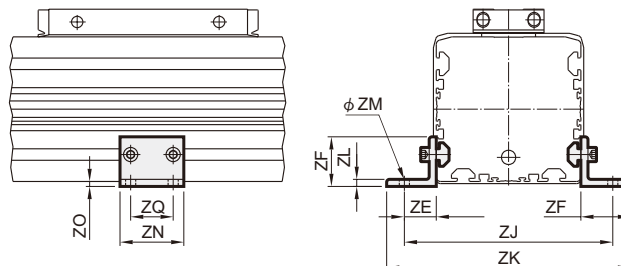
| Code Tube I.D. | ZA | ZB | ZC | ZD | ZE | ZF | ZG | ZH | ZP | Weight (g) | Order number |
|-------------------|-----|----|-----|-----|------|----|-----|------|----|---------------|-----------------|
| 16 | 1.6 | 18 | 26 | 3.6 | 4 | 14 | 1.5 | 12.5 | — | 16 | PL 24/1 |
| 25 | 2.5 | 27 | 40 | 5.5 | 6 | 22 | 2 | 18 | — | 55 | PL 24/2 |
| 32 | — | 36 | 51 | 6.5 | 8 | 24 | 4 | 20 | 20 | 153 | PL 24/3 |
| 32* | — | 40 | 56 | 6.5 | 8 | 26 | 4 | 20 | 20 | 177 | PL 24/3.1 |
| 40 | — | 54 | 71 | 9 | 11.5 | 24 | 2 | 20 | 30 | 198 | PL 24/4 |
| 50 | — | 70 | 80 | 9 | 12.5 | 25 | 2 | 25 | 45 | 283 | PL 24/5 |
| 63 | — | 78 | 106 | 11 | 15 | 30 | 2 | 40 | 48 | 715 | PL 24/6 |

Mid section support for MCRPL / MCPRLF

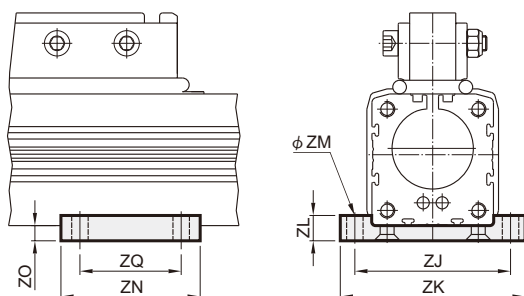
$\phi 16$ $\phi 25$



$\phi 50, \phi 63$



$\phi 32, \phi 40$

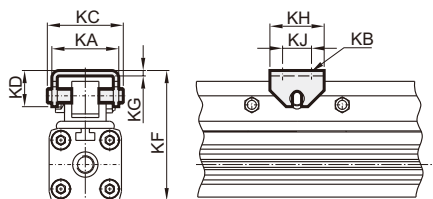


| Code Tube I.D. | ZE | ZF | ZJ | ZK | ZL | ZM | ZN | ZO | ZQ | Weight (g) | Order number |
|-------------------|------|----|-----|-----|-----|-----|----|-------|----|---------------|-----------------|
| 16 | -- | -- | 38 | 50 | 6 | 5.5 | 20 | 3 | -- | 10 | PL 25/1 |
| 25 | -- | -- | 48 | 60 | 6 | 5.5 | 20 | 4 | -- | 12 | PL 25/2 |
| 32 | -- | -- | 61 | 73 | 10 | 6.5 | 55 | 6 | 40 | 86 | PL 25/3 |
| 40 | -- | -- | 70 | 85 | 10 | 6.5 | 60 | (7.2) | 45 | 119 | PL 25/4 |
| 50 | 22.0 | 35 | 120 | 146 | 4.8 | 6.6 | 45 | (2.5) | 30 | 112 | PL 25/5 |
| 63 | 22.5 | 35 | 147 | 172 | 4.8 | 6.6 | 45 | 4 | 30 | 121 | PL 25/6 |

() Reference

Articulated carrier

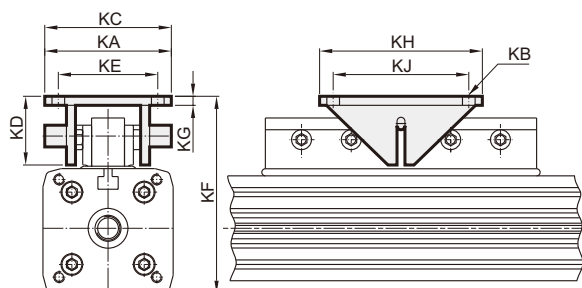
MCRPL $\phi 16, \phi 25$



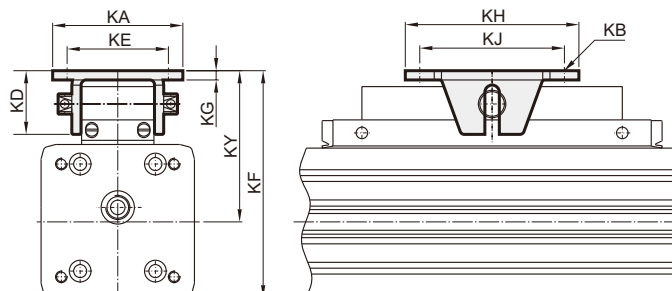
| Code Tube I.D. | KA | KB | KC | KD | KE | KF** | KG | KH | KJ | KY** | Weight (g) | Order number |
|-------------------|----|-----|----|------|----|---------|-----|-----|-----|--------|---------------|-----------------|
| MCRPL-16 | 25 | 4.5 | 28 | 13 | — | 47-50 | 2 | 20 | 10 | 33 | 36 | PL 225/1 |
| MCRPL-25 | 37 | 5.5 | 42 | 20 | — | 72-75 | 3 | 30 | 16 | 50 | 114 | PL 225/2 |
| MCRPL-32 | 70 | 6.5 | 70 | 38 | 55 | 91-100 | 5 | 90 | 75 | 102.3 | 450 | PL 225/3 |
| MCRPL-40 | 70 | 6.5 | 70 | 38 | 55 | 111-120 | 5 | 90 | 75 | 102 | — | PL 225/3 |
| MCRPLF-50 | 90 | 9 | — | 43.7 | 70 | 136-151 | 6.4 | 120 | 100 | 93-108 | — | PL 225/5 |
| MCRPLF-63 | 90 | 9 | — | 43.7 | 70 | 152 | 6.4 | 120 | 100 | 99 | — | PL 225/6 |

** KF / KY dimension are variable within the length of the slot of the load friction.

MCRPL $\phi 32, \phi 40$



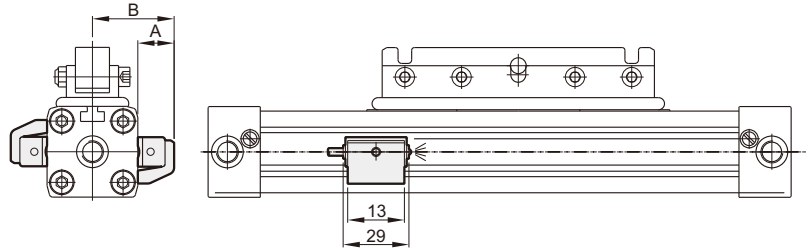
MCRPLF $\phi 50, \phi 63$



Sensor switch

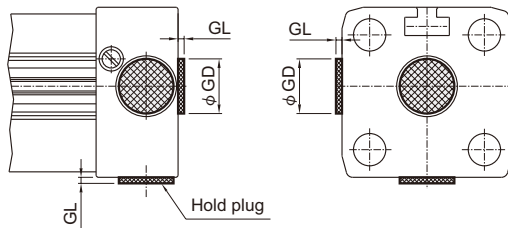
Specification

| Model | RCAL |
|--------------------------|-----------------------|
| Switch type | Reed switch |
| Contracts | Normal open |
| Voltage range | DC/AC 5~240V |
| Current range | 100mA max. |
| Switch range | 10W max. |
| Shock resistance | 30 G |
| Voltage drop | 2.5V max. |
| Response time | Max. 1ms |
| Temperature | -10~70°C |
| Lead wire | $\phi 4$, 2C, PVC |
| Lead wire length | 2 m |
| Indicator lamp | LED lights up when ON |
| Enclosure classification | IP 67 (NEMA 6) |
| Indicator | green LED |



| Code Tube I.D. | A | B | Switch holder |
|-------------------|------|------|---------------|
| 16 | 16 | 29.5 | HPL |
| 25 | 15.5 | 35.5 | |
| 32 | 15.5 | 41.5 | |
| 40 | 10.5 | 46.5 | |
| 50 | 16.5 | 56 | |
| 63 | 15.5 | 68.5 | |

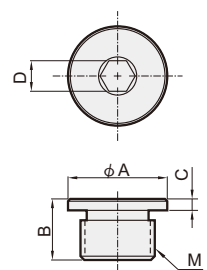
Hold plug



| Code Tube I.D. | GL | GD |
|-------------------|-----|-----|
| 16 | 0.7 | 7.5 |
| 25 | 1.0 | 13 |
| 32 | 0.7 | 18 |
| 40 | 0.7 | 18 |
| 50 | 0.8 | 18 |

Note. The dimension of end cap which lock hold plug.

Hold plug



| Code Tube I.D. | A | B | C | D | E |
|-------------------|-----|-----|-----|---|--------|
| 16 | 7.5 | 5.3 | 1.3 | 2 | M5×0.8 |
| 25 | 13 | 8 | 1.5 | 4 | G 1/8 |
| 32~50 | 18 | 10 | 1.5 | 4 | G 1/4 |