

### 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**

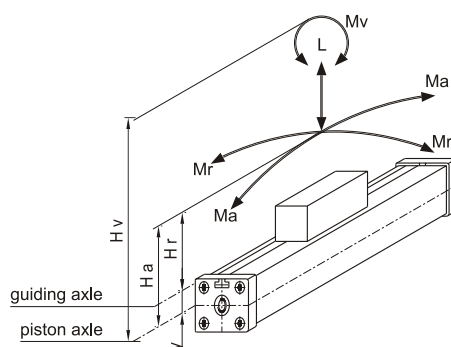
Model	Type	Piston seals	Tube I.D.	Stroke	Grease lubrication	Accessory
MCRPL	90 standard type 98 long piston type ※only for MCRPL	— NBR ( for piston speeds $V \leq 1$ m/s ) V VITON ( for piston speeds $V > 1$ m/s )	16 25 32 40 50 63	100~5600 mm ( four codes )	— standard S slow motion grease	※Please refer to S-06 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



$$Ma = F \times Ha$$

$$Mr = F \times Hr$$

$$Mv = F \times Hv$$

### MCRPL

Cylinder	Effect force (N) at 6 bar	Cushion (mm)	Max. allowed load (N)	Max. allowed bending moment (Nm)		Max. allowed torque (Nm)
$\phi$ 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 exceedings 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)
$\phi$ 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 exceedings of the values. In case of undefinable situations the above max. values have to be reduced by 10~20%.

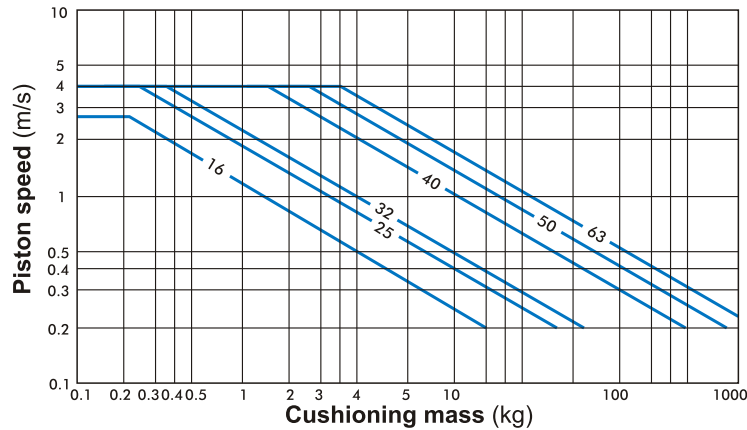
### Cylinder weight

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

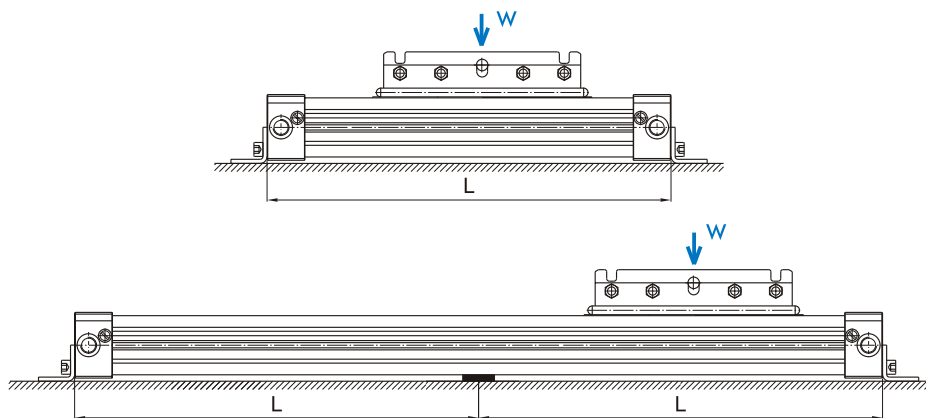
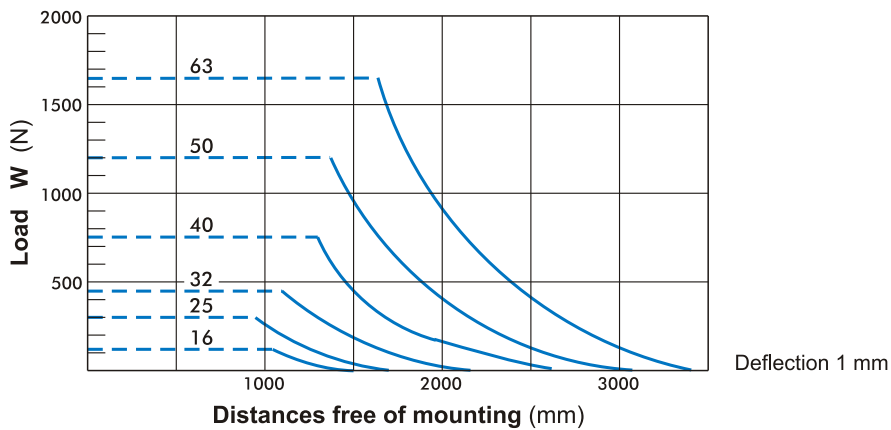
### Cushioning diagram



#### Pay attention to the following points

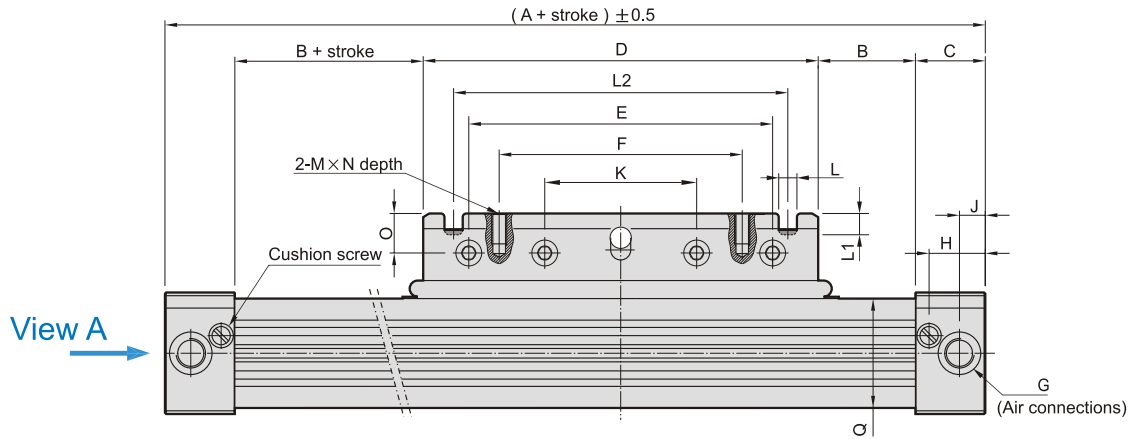
- If the limits above are exceeded additional shock absorbers are necessary.
- For piston speeds  $< 0.2\text{m/s}$  slow speed lubrication is necessary.
- Maximum seal life will be achieved when piston speeds do not exceed  $1\text{m/s}$ .

### Positioning of cylinder mountings



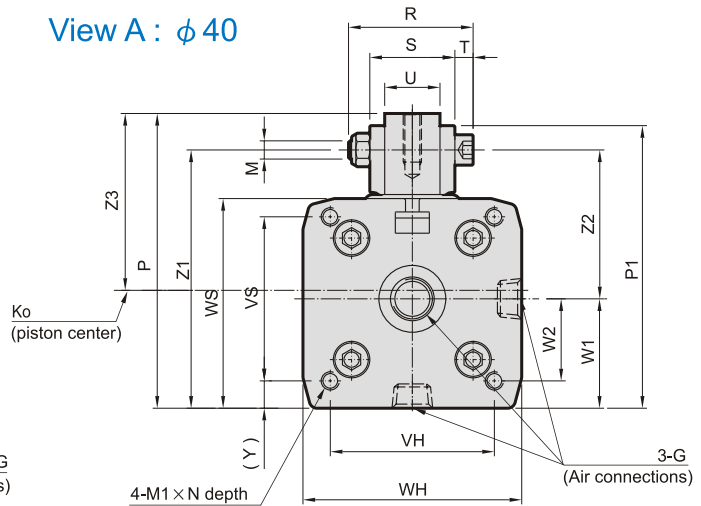
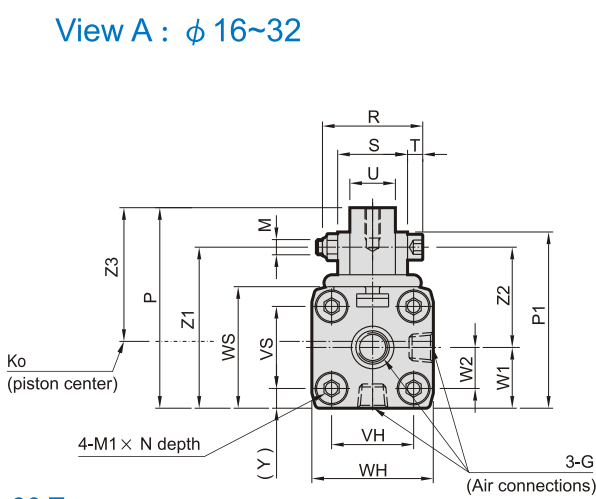
#### Diagram information

- 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

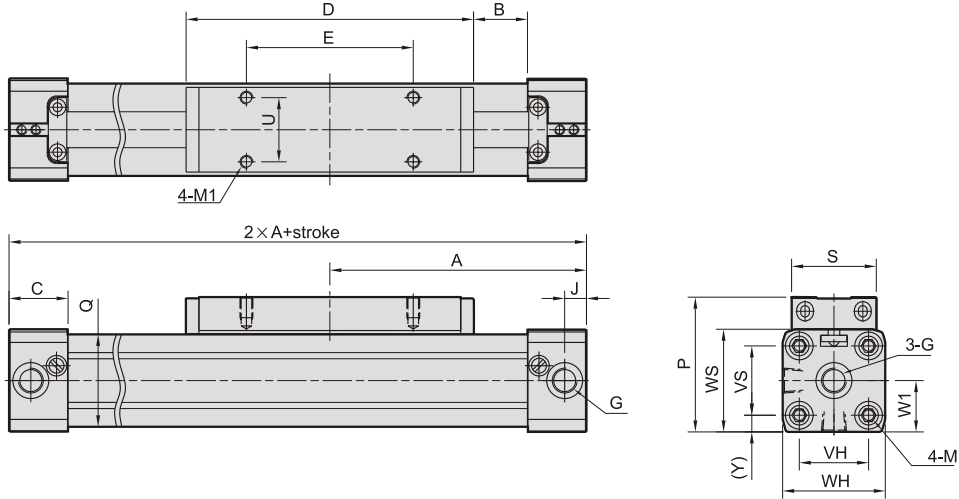
● 16L~40L: cylinder with long piston for heavy bending and torque moments.

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



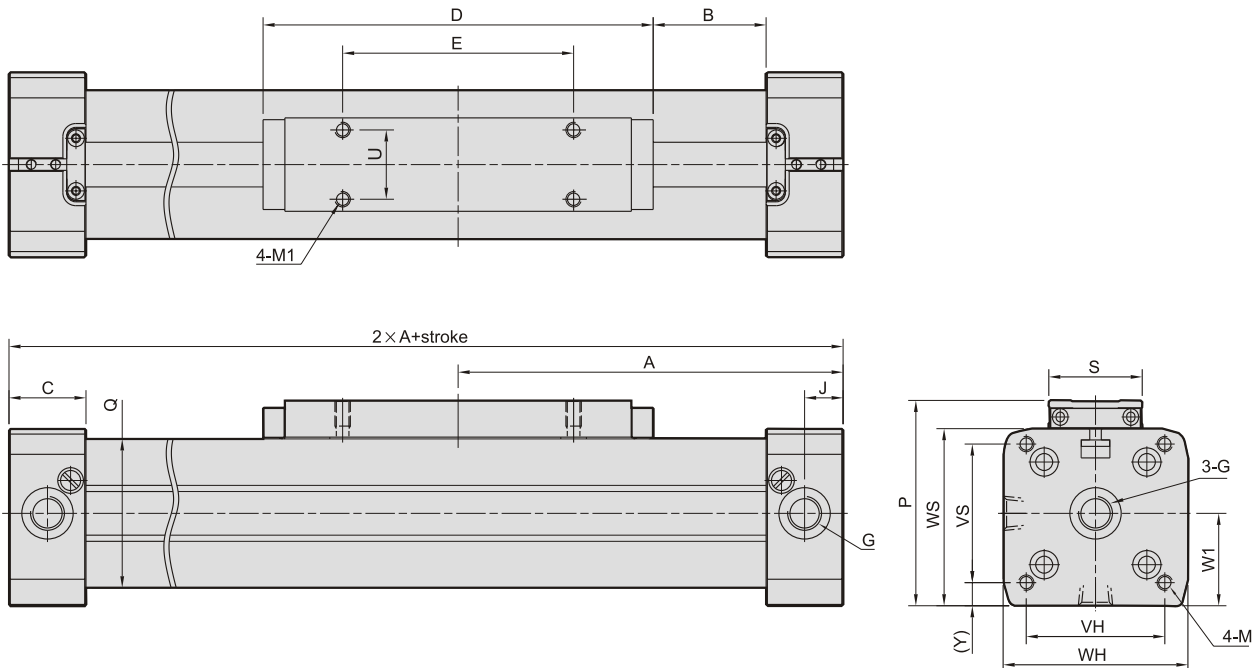
## RODLESS CYLINDER

$\phi 16 \sim \phi 32$



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	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	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	M6×8depth	66.5	48×52	36	27	36	40	52	56	30	8

$\phi 40\sim\phi 63$

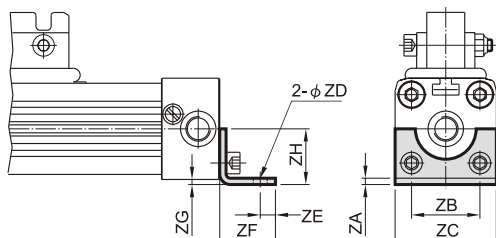


Code Tube I.D.	A	B	C	D	E	G	J	M	M1	P	Q	S	U	VH	VS	WH	WS	W1	Y
40	150	44	30	152	90	G1/4	15	M6×15depth	M6×10depth	80	58×58	36.4	27	54	54	72	69	36	9
50	175	42	33	200	110	G1/4	11.7	M6×15depth	M6×10depth	89	77×76	56	27	70	70	80	80	43.6	5
63	215	47.5	50	235	155	G3/8	25	M8×17depth	M8×14depth	123	102×102	50	36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

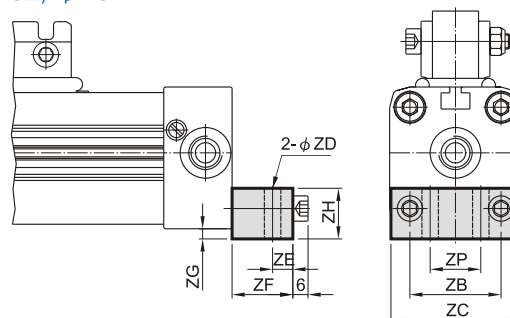


### End cover bracket (foot) for MCRPL / MCPRLF

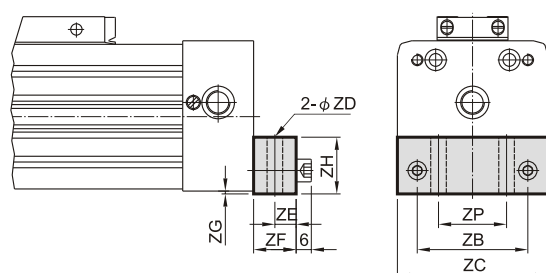
$\phi 16, \phi 25$



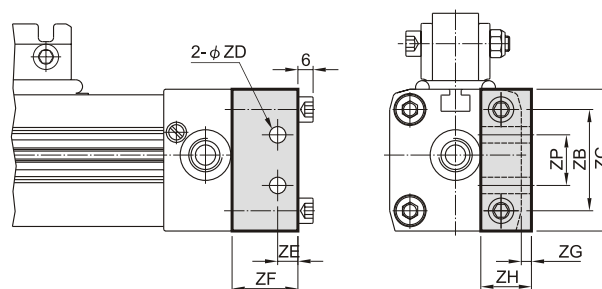
$\phi 32, \phi 40$



$\phi 50, \phi 63$



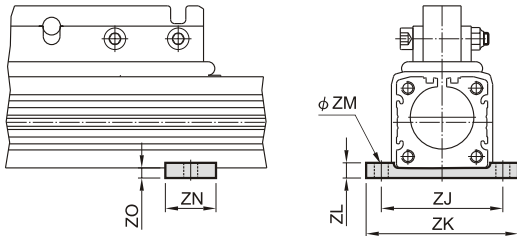
$\phi 32\ast$



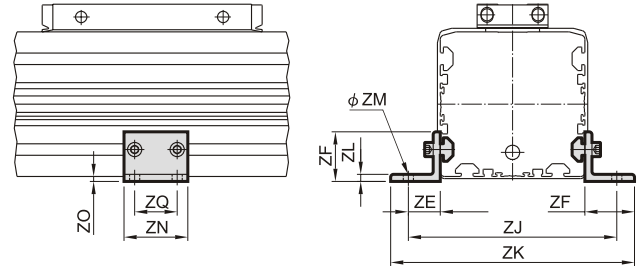
Code Tube I.D.	ZA	ZB	ZC	ZD	ZE	ZF	ZG	ZH	ZP	Weight (g)	Order number
16	1.6	18	26	3.6	4	14	1.5	12.5	—	16	PL 24/1
25	2.5	27	40	5.5	6	22	2	18	—	55	PL 24/2
32	—	36	51	6.5	8	24	4	20	20	153	PL 24/3
32*	—	40	56	6.5	8	26	4	20	20	177	PL 24/3.1
40	—	54	71	9	11.5	24	2	20	30	198	PL 24/4
50	—	70	80	9	12.5	25	2	25	45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

### Mid section support for MCRPL / MCPRLF

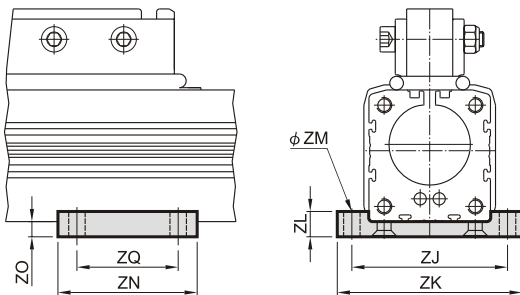
$\phi 16$   $\phi 25$



$\phi 50, \phi 63$



$\phi 32, \phi 40$



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

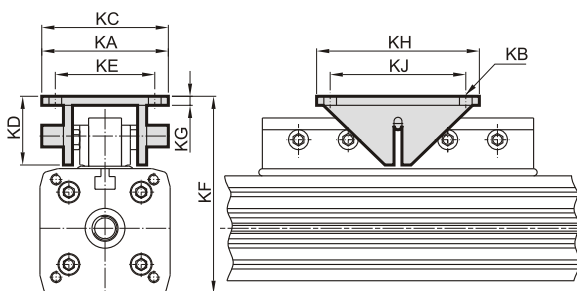
**MCRPL**  $\phi 16, \phi 25$



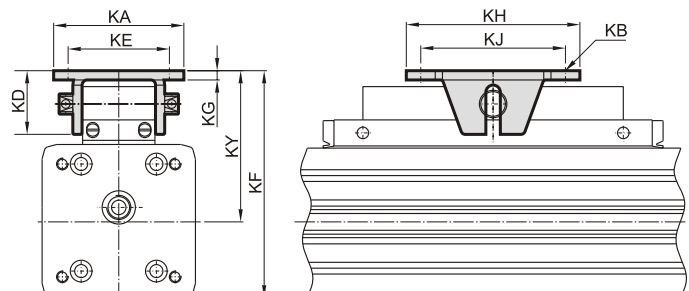
Code Tube I.D.	KA	KB	KC	KD	KE	KF**	KG	KH	KJ	KY**	Weight (g)	Order number
MCRPL-16	25	4.5	28	13	-	47-50	2	20	10	33	36	PL 225/1
MCRPL-25	37	5.5	42	20	-	72-75	3	30	16	50	114	PL 225/2
MCRPL-32	70	6.5	70	38	55	91-100	5	90	75	102.3	450	PL 225/3
MCRPL-40	70	6.5	70	38	55	111-120	5	90	75	102	-	PL 225/3
MCRPLF-50	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**  $\phi 32, \phi 40$



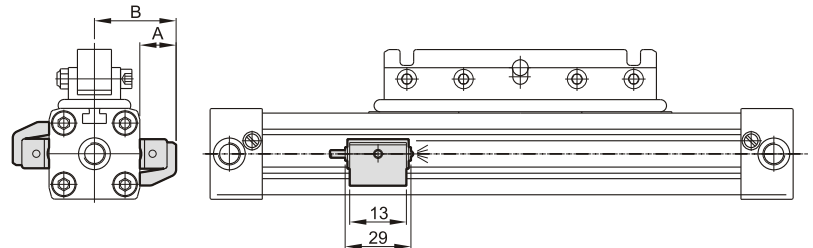
**MCRPLF**  $\phi 50, \phi 63$



## Sensor switch

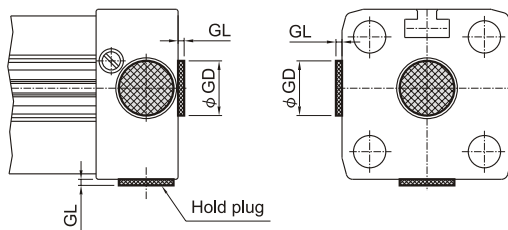
### Specification

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.

