

MCRPL(F)2 series

RODLESS CYLINDER



MCRPLF2
User manual



Technical data



Caution for safety
(Read before installing)



Features

- 50% space saving when compared to conventional cylinders.
- Multi ported endcaps as standard.
- Reed switches available.
- Magnetic as standard.

Specification

Model	MCRPL2				MCRPLF2			
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				3			
Medium	Air				Air			
Operating pressure range	0.1~0.78 MPa				0.1~0.78 MPa			
Ambient temperature	-10°C~+80°C (No freezing)				-10°C~+80°C (No freezing)			
Lubrication	With or without lubrication				With or without lubrication			
Cushion	With adjustable cushion at both ends				With adjustable cushion at both ends			
Sensor switch	RDT, RQT				RDT, RQT			
Sensor switch holder	HPL2	—	HPL2	—	HPL2	—	HPL2	—

* 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.

Table for standard stroke

Tube I.D.	Stroke (mm)	Max. stroke (mm)	
		Standard (90)	Long piston (98)
ø16	100 ~	2950	2900
ø25, 32		5600	5600
ø40		5600	5500
ø50, 63		5600	—

* Minimum stroke unit 1mm.

Order example

MCRPL2 — 90V — 25 — 0850 — S —					
Model	Type	Tube I.D.	Stroke	Grease lubrication	Port thread
	90 Standard type	16	0100~5600 mm (4 digits)	— Standard	— M5×0.8
	98 Long piston type * Only for MCRPL2	25		S Slow motion	(for ø16)
	Piston seals	32			— G thread
		40			RC Rc thread
	— NBR	50	for MCRPLF2		NPT NPT thread
	V VITON	63			Made to order
					(for ø25~63)

Available speed range

Piston seals	Grease lubrication	Available speed range (mm/s)
NBR	Slow motion	50~100
	Standard	Within 101~1000
VITON	Slow motion	50~200
	Standard	201~1000 above

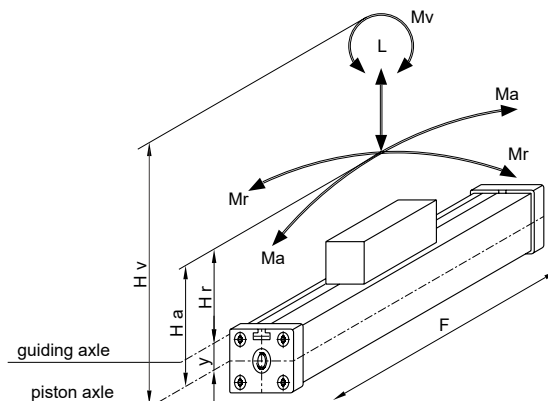
* Maximum seal life will be achieved when piston speeds do not exceed 1000mm/s.

* The suitable grease type can be selected according to the actual use.

Order example of mounting accessories

Code	LB (LB×2)	LB1 (LB1×2)	MS (Mid section support)	AC (Articulated carrier)
Mounting				
Tube I.D.				
ø16	LB-P1-16x2	—	MS-P1-16	—
ø25	LB-P1-25x2	—	MS-P1-25	—
ø32	LB-P1-32x2	LB1-P1-32x2	MS-P1-32	—
ø40	LB-P1-40x2	—	MS-P1-40	—
ø50	LB-P1-50x2	—	—	MS-P1-50x2
ø63	LB-P1-63x2	—	—	MS-P1-63x2

Forces & Moments



Formulas

$$M_a = F \times H_a$$

$$M_r = F \times H_r$$

$$M_v = F \times H_v$$

MCRPL2

Cylinder		Effect force (N) at 6 bar	Cushion (mm)	Max. allowed load (N)	Max. allowed bending moment (Nm)		Max. allowed torque (Nm)
ø	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

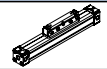
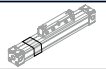
- 16L~40L: cylinder with long piston for heavy bending, torque moments and vertical movement.
- The figures above are max. values based on light shock free duty and speed of $V \leq .2\text{m/s}$. Max. pressure 6 bar.
- An exceeding of the values in dynamic operations, even for short moments, has to 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%.

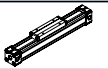
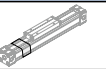
MCRPLF2

Cylinder		Effect force (N) at 6 bar	Cushion (mm)	Max. allowed load (N)	Max. allowed bending moment (Nm)		Max. allowed torque (Nm)
ø	y	F	S	L	Ma axial	Mr radial	Mv central
16	9	110	15	120	4	0.3	0.5
25	14	250	21	300	15	1	3.0
32	18	420	26	450	30	2	4.5
40	23	640	32	750	60	4	8.0
50	28	1000	32	1200	115	7	15.0
63	36	1550	40	1650	200	8	24.0

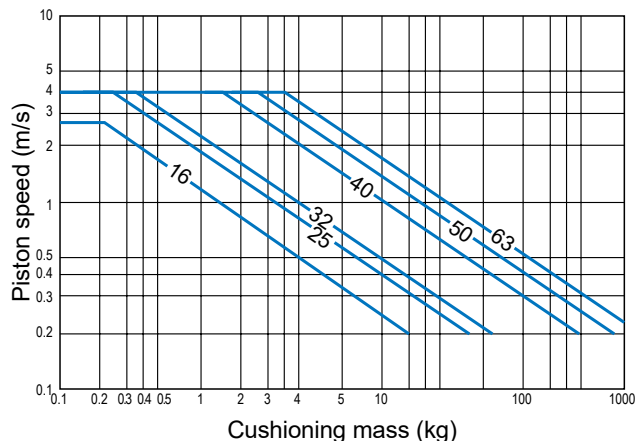
- The figures above are max. values based on light shock free duty and speed of $V \leq 0.45\text{m/s}$. Max. pressure 6 bar.
- An exceeding of the values in dynamic operations, even for short moments, has to be avoided.
- Attention: Resulting forces could lead to extreme exceeding of the values. In case of undefined situations the above max. values have to be reduced by 10~20%.

Cylinder weight

Model	Basic weight MCRPL2	Stroke 100 mm MCRPL2
Tube I.D.		
ø16	240	92
ø25	760	294
ø32	1,670	379
ø40	2,760	594

Unit: g		
Model	Basic weight MCRPLF2	Stroke 100 mm MCRPLF2
Tube I.D.		
ø16	230	92
ø25	710	294
ø32	1,150	379
ø40	2,700	594
ø50	4,000	648
ø63	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 of more than ≥ 1 m/s viton seals are recommended.
- For piston speeds ≤ 0.1 m/s (NBR), ≤ 0.2 m/s (VITON) slow speed lubrication is necessary see at sperpart kids.
- Maximum seal life will be achieved when piston speeds do not exceed 1m/s.

Positioning of cylinder mountings

The illustration below explains that installing with the load corresponding to the specified support interval will result in a cylinder deviation of 1 mm.

For example, when installed with a diameter of ø50, a support interval of 1500 mm, and a load of 1000 N, the cylinder deviation will reach 1 mm.

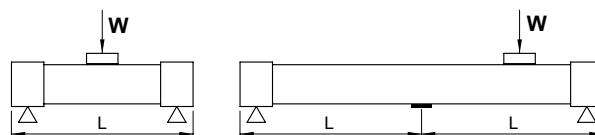
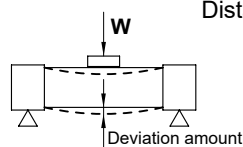
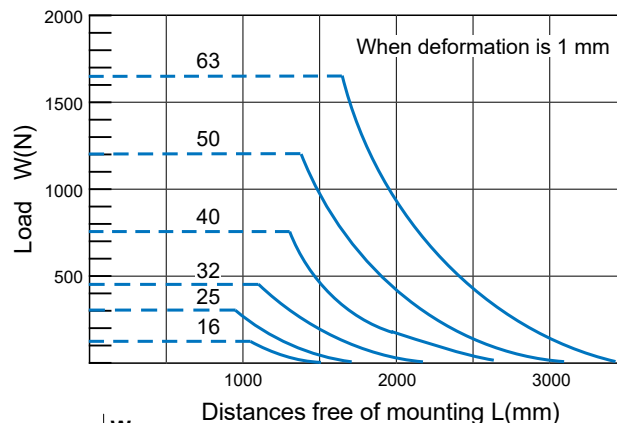


Diagram information

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

Order example of Component kits & Repair kits

Component kits	CP	—	MCRPL2	—	90V	—	25	—
Repair kits	PS	—	MCRPL2	—	98V	—	25	—

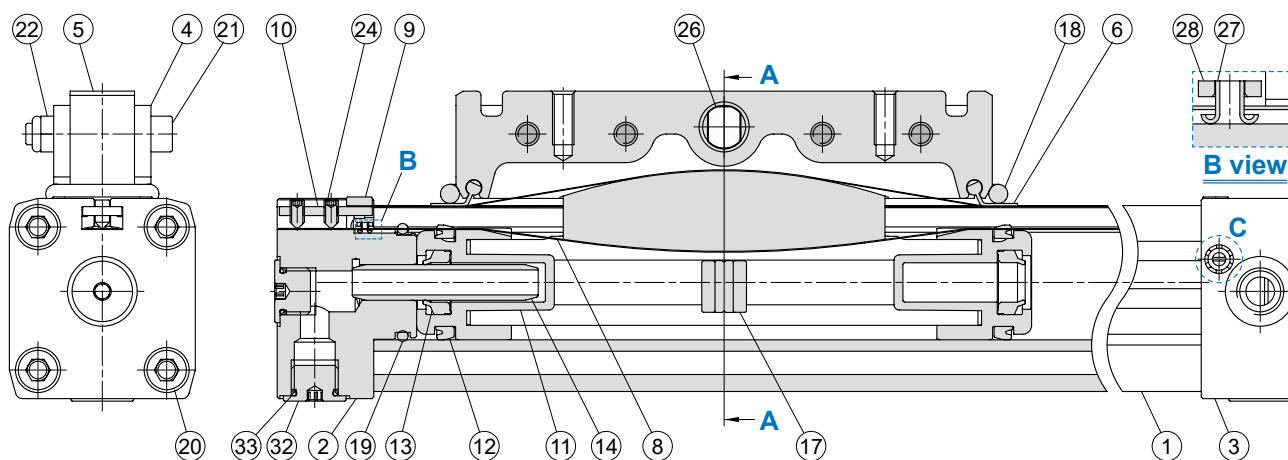
① Model	② Type	③ Tube I.D.	④ Port thread
MCRPL2	90 Standard type	16	— M5×0.8 (for ø16)
MCRPLF2	98 Long piston type (only for MCRPL2)	25	RC Rc thread (for ø25~63)
	Piston seals	32	NPT NPT thread (for ø25~63)
	— NBR	40	
	V VITON	50	
		63	

MCRPL2 Inside structure & Parts list ø16~ø40

RODLESS CYLINDER



Mindman



Material

No.	Part name	Material	Q'ty	Component parts (inclusion)	Repair kits (inclusion)	Note
1	Cylinder tube	Aluminum alloy	1			
2	End cap A	Aluminum alloy	1	●		
3	End cap B	Aluminum alloy	1	●		
4	Piston axle	Aluminum alloy	1	●		
5	Floating bracket platform	Aluminum alloy	1	●		
6	Scraper	Resin	2	●		
7	Outer seal strip	Stainless steel	1			
8	Inner seal strip	Stainless steel	1			
9	Outer seal strip fixing piece	Stainless steel	2	●		
10	Inner seal strip fixing piece	Stainless steel	2	●		
11	Piston	Resin	2	●		
12	Piston seal	NBR	2	●	●	
13	Cushion seal	NBR	2	●	●	
14	Cushion axle	Aluminum alloy	2	●		
15	Wear sheet	Resin	Table 1	●		
16	Magnet stripe	Magnet material	2			
17	Magnet set	Magnet material	1	●		
18	Platform seal	NBR	1	●	●	
19	End cap seal	NBR	2	●	●	
20	End cap screw	ø16~ø32 Carbon steel	8	●		ø25~ø40 only
		ø40 Stainless steel	8	●		
21	Platform screw	Stainless steel	4	●		
22	Platform nut	Stainless steel	4	●		
23	Outer seal strip screw	Stainless steel	4	●		
24	Inner seal strip screw	Stainless steel	4	●		
25	Magnet fixing screw	Carbon steel	2	●		ø25~ø40 only
26	Bush	Bearing alloy	2	●		
27	Rivet	Copper alloy	2	●		
28	Rivet clip	Copper alloy	2	●		
29	Needle valve	Copper alloy	2	●		
30	Needle valve seal	NBR	2	●	●	
31	Needle valve washer	Carbon steel	2	●		ø25~ø40 only
32	Hold plug	Copper alloy	4	●		
33	Plug seal	NBR	4	●	●	

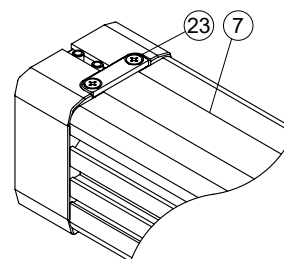
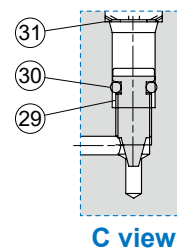
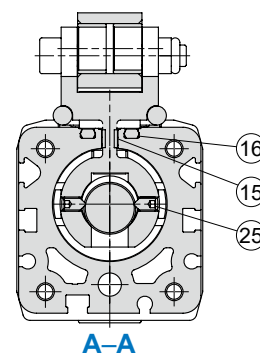
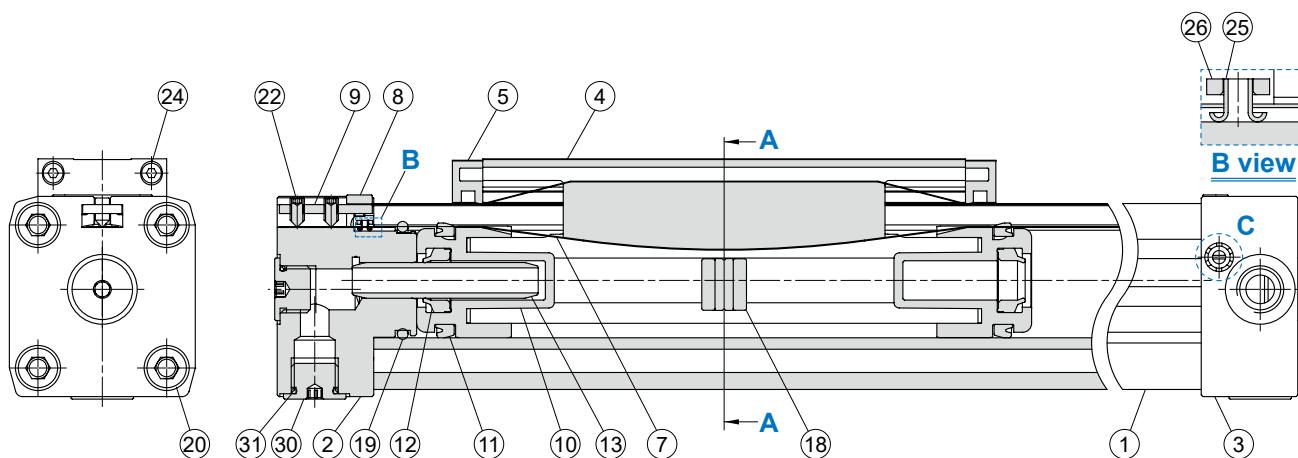


Table 1. The amount of wear sheet

Tube I.D. Type	16	25	32	40
MCRPL2-90	2	2	4	4
MCRPL2-98	4	4	6	6

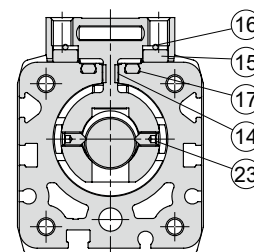
MCRPLF2 Inside structure & Parts list $\varnothing 16 \sim \varnothing 63$

RODLESS CYLINDER

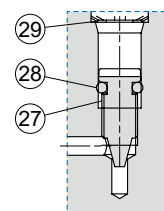


Material

No.	Part name	Material	Q'y	Component parts (inclusion)	Repair kits (inclusion)	Note
1	Cylinder tube	Aluminum alloy	1			
2	End cap A	Aluminum alloy	1	●		
3	End cap B	Aluminum alloy	1	●		
4	Piston axle	Aluminum alloy	1	●		
5	Scraper	Resin	2	●		
6	Outer seal strip	Stainless steel	1			
7	Inner seal strip	Stainless steel	1			
8	Outer seal strip fixing piece	Stainless steel	2	●		
9	Inner seal strip fixing piece	Stainless steel	2	●		
10	Piston	Resin	2	●		
11	Piston seal	NBR	2	●	●	
12	Cushion seal	NBR	2	●	●	
13	Cushion axle	Aluminum alloy	2	●		
14	Wear sheet	Resin	Table 1	●		
15	Side support plate	Resin	2	●		
16	Side sealing strip	NBR	2	●	●	
17	Magnet stripe	Magnet material	2			
18	Magnet set	Magnet material	1	●		
19	End cap seal	NBR	2	●	●	
20	End cap screw	$\varnothing 16 \sim \varnothing 32$ Carbon steel	8	●		
		$\varnothing 40 \sim \varnothing 63$ Stainless steel	8	●		
21	Outer seal strip screw	Stainless steel	4	●		
22	Inner seal strip screw	$\varnothing 16 \sim \varnothing 40$ Stainless steel	4	●		
		$\varnothing 50, \varnothing 63$ Carbon steel	4	●		
23	Magnet fixing screw	Carbon steel	2	●		$\varnothing 25 \sim \varnothing 40$ only
24	Scraper fixing screw	Carbon steel	4	●		
25	Rivet	Copper alloy	2	●		
26	Rivet clip	Copper alloy	2	●		
27	Needle valve	Copper alloy	2	●		
28	Needle valve seal	NBR	2	●	●	
29	Needle valve washer	Carbon steel	2	●		$\varnothing 25 \sim \varnothing 63$ only
30	Hold plug	Copper alloy	4	●		
31	Plug seal	NBR	4	●	●	



A-A



C view

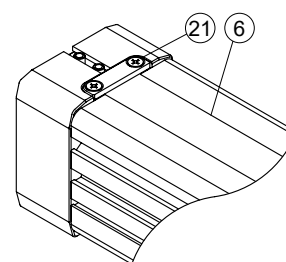
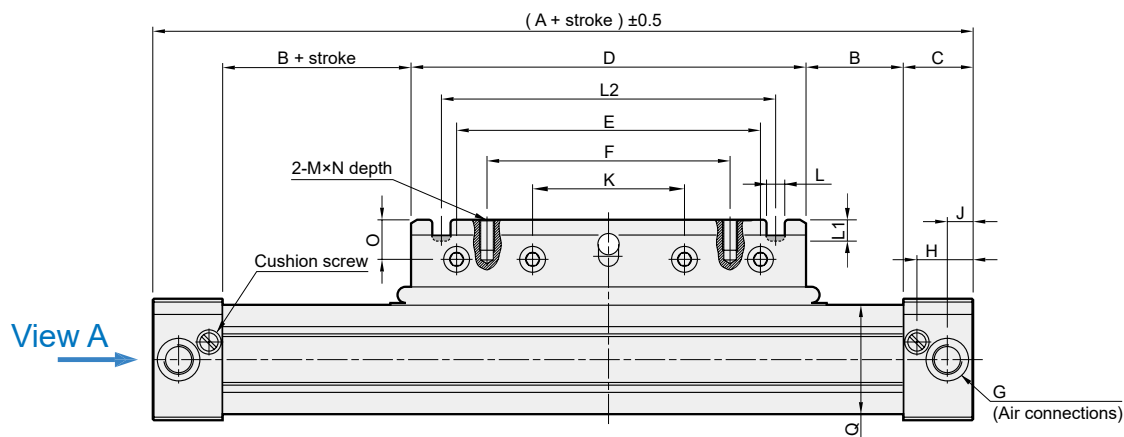


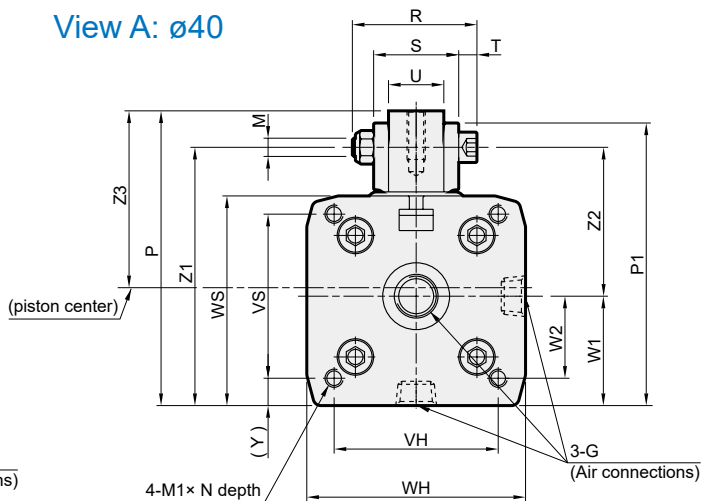
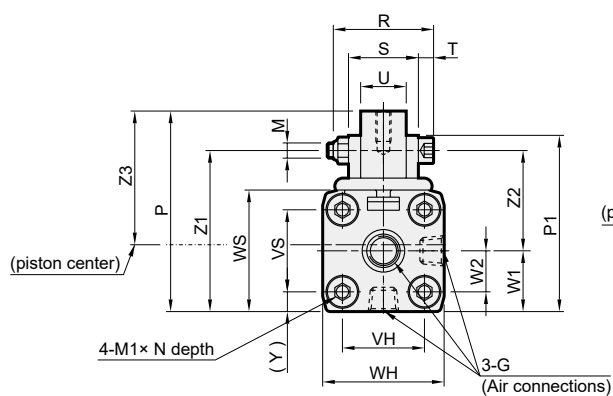
Table 1. The amount of wear sheet

Tube I.D.	16	25	32	40	50	63
Q'y	2	2	4	4	2	2



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	51×52	41	27	6	18	36	40	52	56	30	22	8	74	44	53.5
40	59×58.5	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	51×52	41	27	6	18	36	40	52	56	30	22	8	74	44	53.5
40L	59×58.5	41	28	6	18	54	54	72	69	36	27	9	85	49	58.2

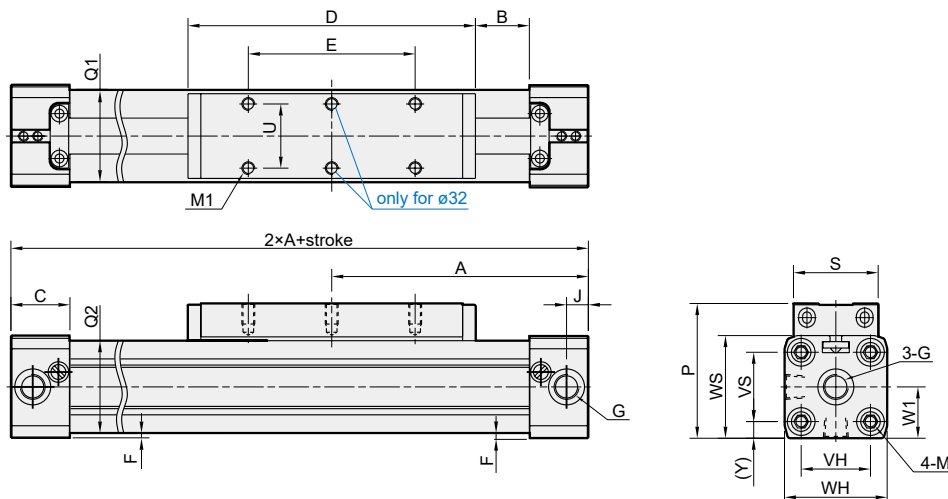
• 16L~40L: Cylinder with long piston for heavy bending and torque moments.

MCRPLF2 Dimensions $\phi 16 \sim \phi 63$

RODLESS CYLINDER

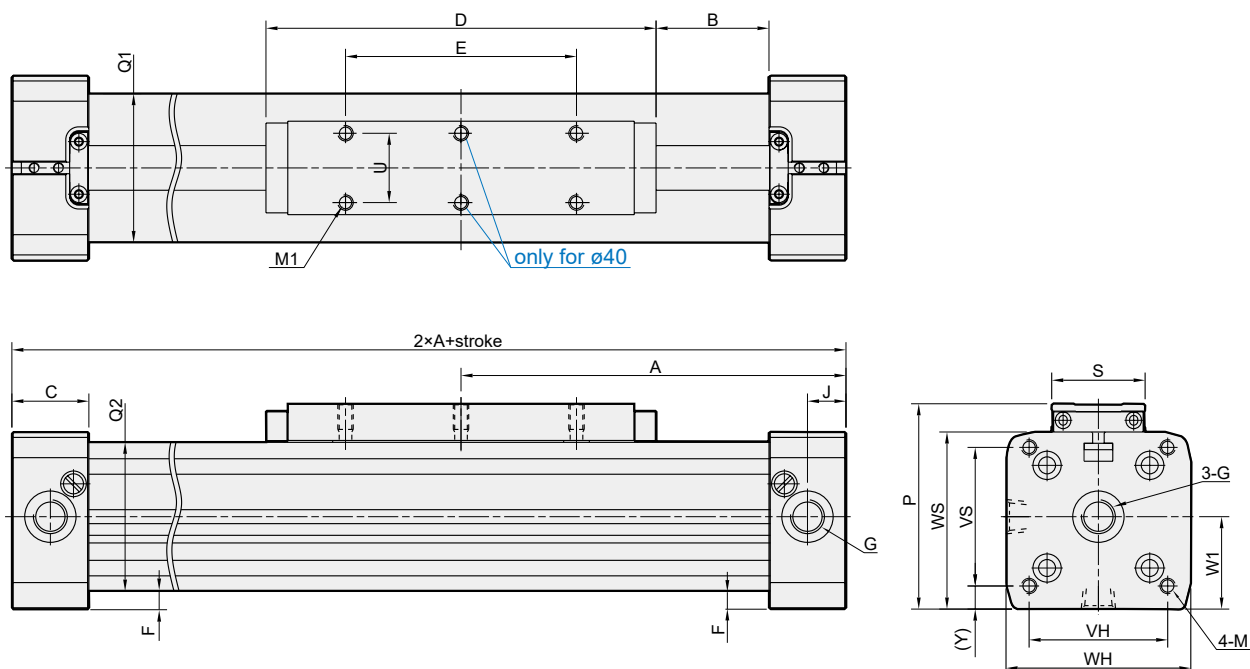


$\phi 16 \sim \phi 32$



Code Tube I.D.	A	B	C	D	E	F	G	J	M	M1	P	Q1×Q2	S	U	VH	VS	WH	WS	W1	Y
16	65	15.5	15	69	36	1	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	2	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	2	G1/4	10.5	M6×15depth	6-M6×8depth	66.5	51×52	36	27	36	40	52	56	30	8

$\phi 40 \sim \phi 63$



Code Tube I.D.	A	B	C	D	E	F	G	J	M	M1	P	Q1×Q2	S	U	VH	VS	WH	WS	W1	Y
40	150	44	30	152	90	6.5	G1/4	15	M6×15depth	6-M6×10depth	80	59×58.5	36.4	27	54	54	72	69	36	9
50	175	42	33	200	110	0.5	G1/4	11.7	M6×15depth	4-M6×10depth	89	76×77	56	27	70	70	80	80	43.6	4
63	215	47.5	50	235	155	1.5	G3/8	25	M8×17depth	4-M8×14depth	123	102×102	50	36	78	78	106	106	62.5	14.5

MCRPL(F)2 Mounting accessories $\phi 16 \sim \phi 63$

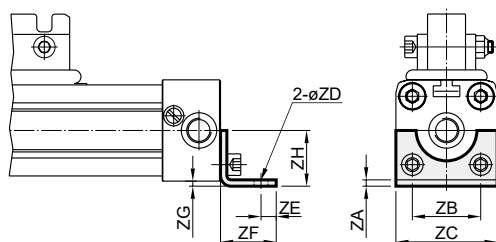
RODLESS CYLINDER



LB End cover bracket (foot)

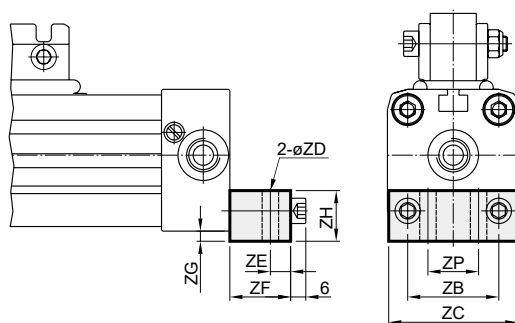
$\phi 16, \phi 25$

Material: Carbon steel



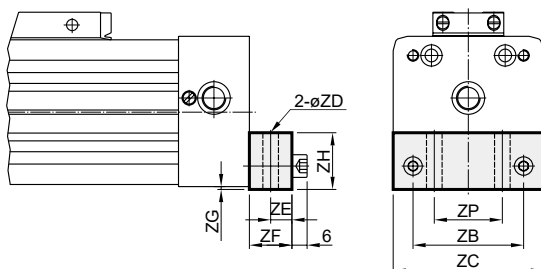
$\phi 32, \phi 40$

Material: Aluminum alloy



$\phi 50, \phi 63$

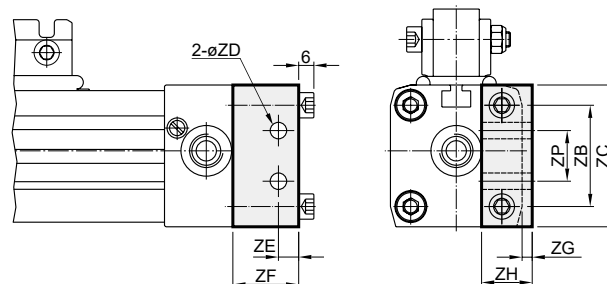
Material: Aluminum alloy



LB1 End cover bracket (foot)

$\phi 32^*$

Material: Aluminum alloy



Code Tube I.D.	ZA	ZB	ZC	ZD	ZE	ZF	ZG	ZH	ZP	Weight (g)
16	1.6	18	26	3.6	4	14	1.5	12.5	—	16
25	2.5	27	40	5.5	6	22	2.5	18	—	61
32	—	36	51	6.5	8	24	4	20	20	165
32*	—	40	56	6.5	8	26	4	20	20	189
40	—	54	71	9	11.5	24	2	20	30	210
50	—	70	80	9	12.5	25	2	25	45	293
63	—	78	106	11	15	30	2	40	48	730

MCRPL(F)2 Mounting accessories $\varnothing 16 \sim \varnothing 63$

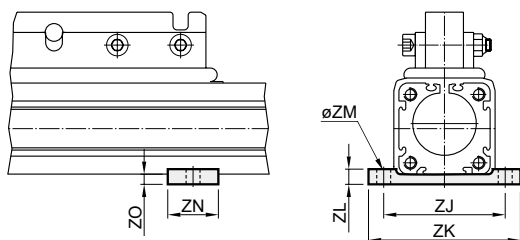
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MS Mid section support

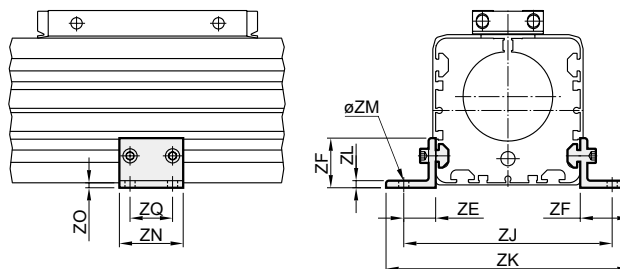
$\varnothing 16, \varnothing 25$

Material: Aluminum alloy



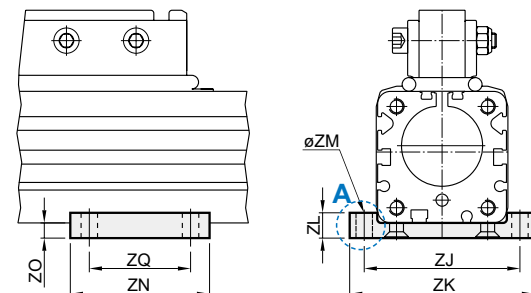
$\varnothing 50, \varnothing 63$

Material: Aluminum alloy

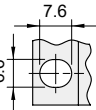


$\varnothing 32, \varnothing 40$

Material: Aluminum alloy



$\varnothing 32$



A view

Code Tube I.D.	ZE	ZF	ZJ	ZK	ZL	ZM	ZN	ZO	ZQ	Weight (g)
16	—	—	38	50	6	5.5	20	3	—	11
25	—	—	48	60	6	5.5	20	4	—	15
32	—	—	62	73	10	—	55	6	40	74
40	—	—	70	85	10	6.5	60	(7.2)	45	103
50	22.0	35	120	146	4.8	6.6	45	0.5	30	56
63	22.5	35	147	172	4.8	6.6	45	3.5	30	61

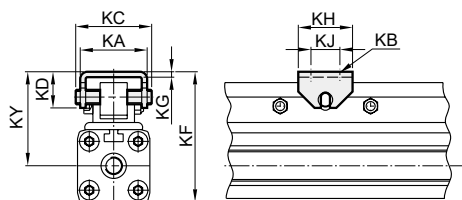
() Reference

* If mounting hole for $\varnothing 32, \varnothing 40$ mid section support bracket is required, please contact our sales representative for more information.

AC Articulated carrier

The material of articulated carrier and pin: Carbon steel

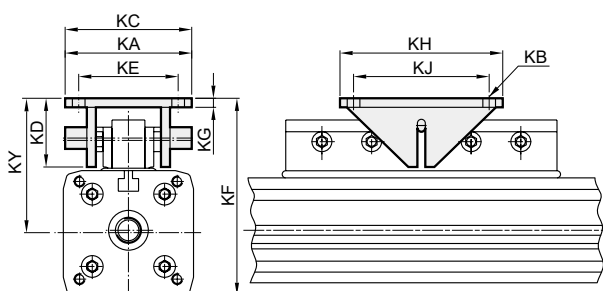
MCRPL2 $\varnothing 16, \varnothing 25$



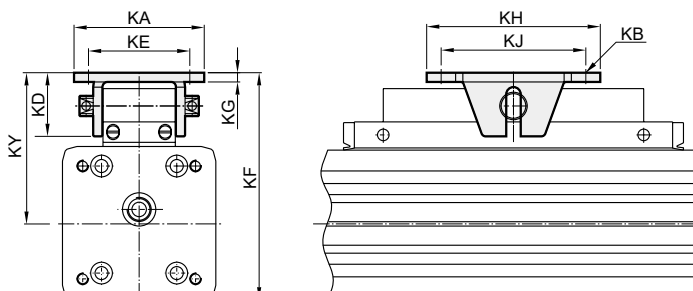
Code Tube I.D.	KA	KB	KC	KD	KE	KF**	KG	KH	KJ	KY**	Weight (g)
MCRPL2-16	25	4.5	28	13	—	46.5-47.5	2	20	10	33-34	36
MCRPL2-25	37	5.5	42	20	—	71.5-73.5	3	30	16	51.5-53.5	117
MCRPL2-32	70	6.5	70	38	55	94.5-96.5	5	90	75	66.5-68.5	446
MCRPL2-40	70	6.5	70	38	55	108-110	5	90	75	73.5-75.5	446
MCRPLF2-50	90	9	—	43.7	70	135-150	6.4	120	100	95-110	1576
MCRPLF2-63	90	9	—	43.7	70	155-170	6.4	120	100	102-117	1223

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

MCRPL2 $\varnothing 32, \varnothing 40$

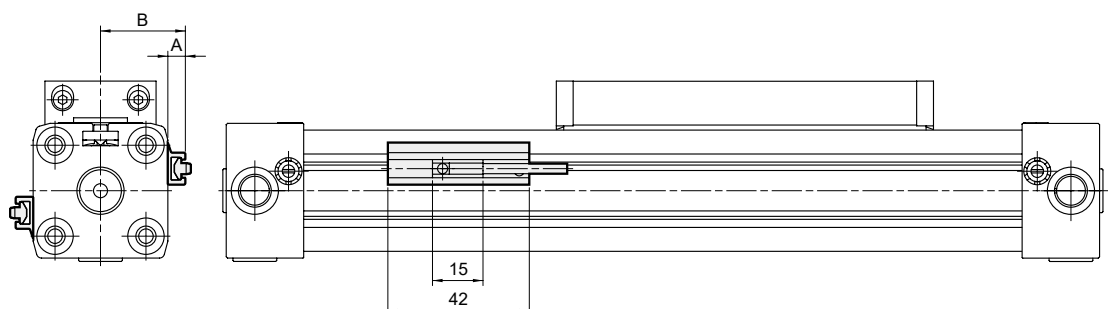


MCRPLF2 $\varnothing 50, \varnothing 63$



Sensor switch holder

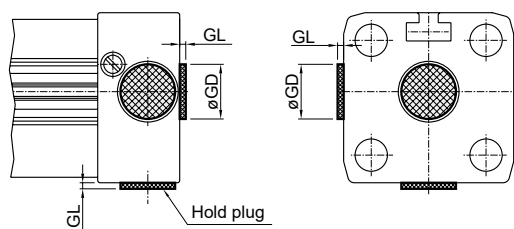
$\phi 16, \phi 25$



Code Tube I.D.	A	B	Switch holder
16	6.3	19.8	HPL2
25	5.3	25.3	

Hold plug

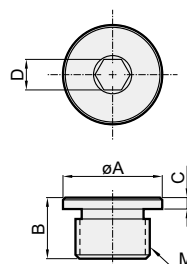
Piping port **M** thread and **G** thread.



Code Tube I.D.	GL	GD
16	0.7	7.5
25	1.0	13
32	0.7	18
40	0.7	18
50	0.7	18
63	1.0	22

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	G1/8
32~50	18	10	1.5	4	G1/4
63	22	14	1.5	6	G3/8