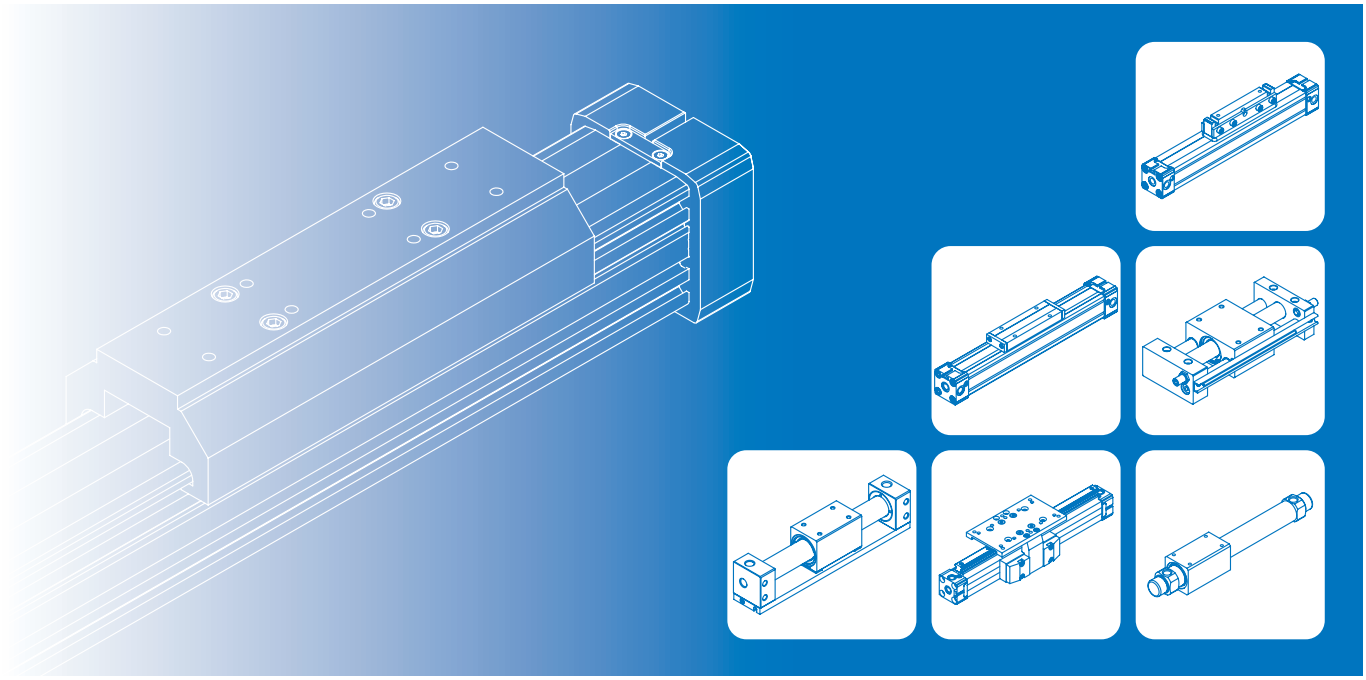
RODLESS CYLINDER



MCRPL(F)2 series

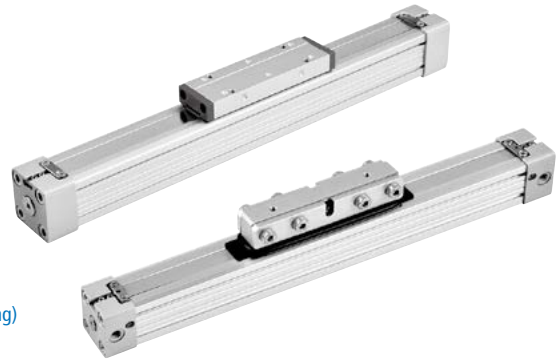
RODLESS CYLINDER

mindman

MCRPLF2
User manual

Technical data

Caution for safety
(Read beforeinstalling)



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						
Medium		Air						
Operating pressure range		0.1~0.78 MPa						
Stroke range (*1)	ø16	100~3000 mm						
	ø25~63	100~5600 mm						
Ambient temperature		-10°C~+80°C (No freezing)						
Lubrication		With or without lubrication						
Cushion		With adjustable cushion at both ends						
Sensor switch		RDT, RQT						
Sensor switch holder		HPL2	–		HPL2	–		

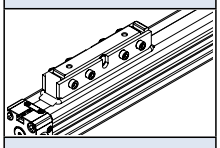
*1. Minimum stroke unit 1mm.
*2. The tube isn't airtight, so the cylinder is allowed little leakage.
Before the cylinder is sale, it has passed the standard of leakage test.

Order example

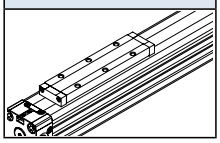
MCRPL2 – 90V – 25 – 0850 – S –

Model

MCRPL2



MCRPLF2



Type

90	Standard type
98	Long piston type * Only for MCRPL2

Piston seals

–	NBR
V	VITON

Tube I.D.

16, 25, 32, 40, 50, 63 (for MCRPLF2)

Stroke

0100~5600 mm (4 digits)

Grease lubrication

–	Standard
S	Slow motion

Port thread

–	M5×0.8 (for ø16)
–	G thread
RC	Rc thread
NPT	NPT thread

Made to order

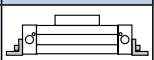
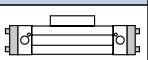
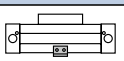
(for ø25~63)

Available speed range

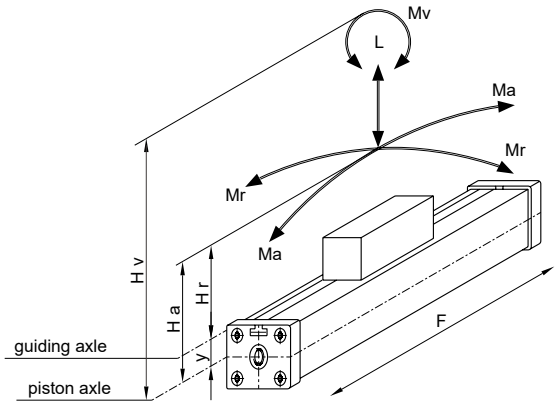
Piston seals	Grease lubrication	Available speed range (mm/s)
NBR	Slow motion	50~100
	Standard	Within 100~1000
VITON	Slow motion	50~200
	Standard	200~1000 above

* 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	AC-P1-16
ø25	LB-P1-25x2	–	MS-P1-25	AC-P1-25
ø32	LB-P1-32x2	LB1-P1-32x2	MS-P1-32	AC-P1-32
ø40	LB-P1-40x2	–	MS-P1-40	AC-P1-32
ø50	LB-P1-50x2	–	MS-P1-50	AC-P1-50
ø63	LB-P1-63x2	–	MS-P1-63	AC-P1-63

Forces & Moments



Formulas
Ma = F × Ha
Mr = F × Hr
Mv = F × Hv

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 ≤ .2m/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%.

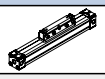
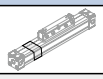
MCRPLF2

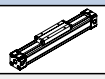
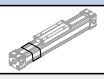
Cylinder		Effect force (N) at 6 bar	Cushion (mm)	Max. allowed load (N)	Max. allowed bending moment (Nm)		Max. allowed torque (Nm)
ø	y	F	S	L	Ma axial	Mr radial	Mv central
16	9	110	15	120	4	0.3	0.5
25	14	250	21	300	15	1	3.0
32	18	420	26	450	30	2	4.5
40	23	640	32	750	60	4	8.0
50	28	1000	32	1200	115	7	15.0
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 ≤ 0.45m/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%.

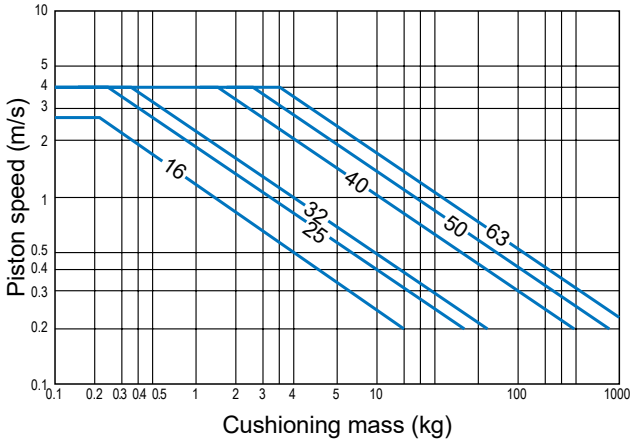
Cylinder weight

Unit: g

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

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



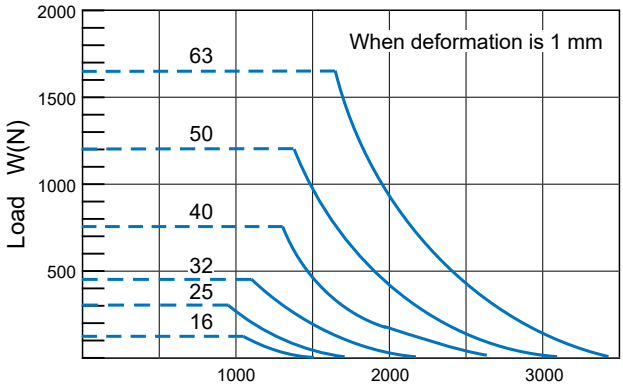
Pay attention to the following points

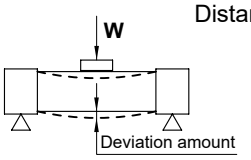
- If the limits above are exceeded additional shock absorbers are necessary.
- For piston speeds of more than ≥ 1m/s viton seals are recommended.
- For piston speeds ≤ 0.1m/s (NBR), ≤ 0.2m/s (VITON) slow speed lubrication is necessary see at sperpart kids.
- Maximum seal life will be achieved when piston 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.





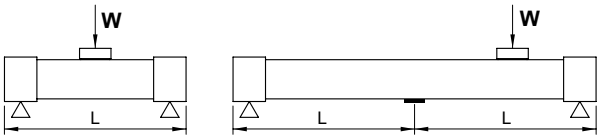


Diagram information

- 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		②		③		④

① **Model**

MCRPL2
MCRPLF2

② **Type**

90	Standard type
98	Long piston type (only for MCRPL2)

Piston seals

—	NBR
V	VITON

③ **Tube I.D.**

16
25
32
40
50
63

Only for MCRPLF2

④ **Port thread**

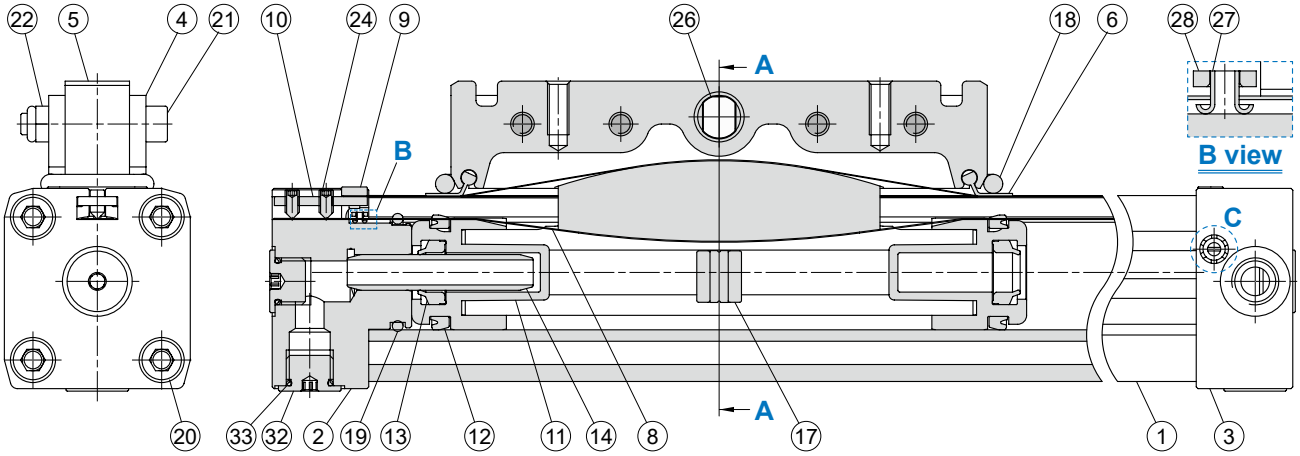
—	M5×0.8

(for ø16)

—	G thread
RC	Rc thread
NPT	NPT thread

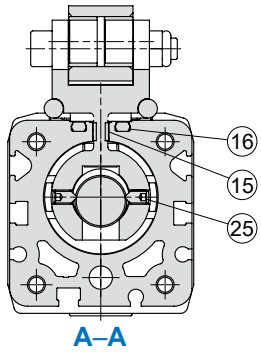
Made to order

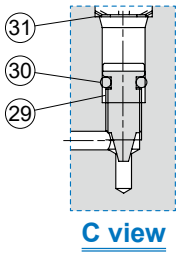
(for ø25~63)



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	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	●		
		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	●	●	





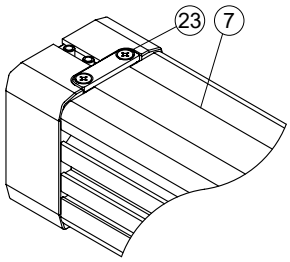
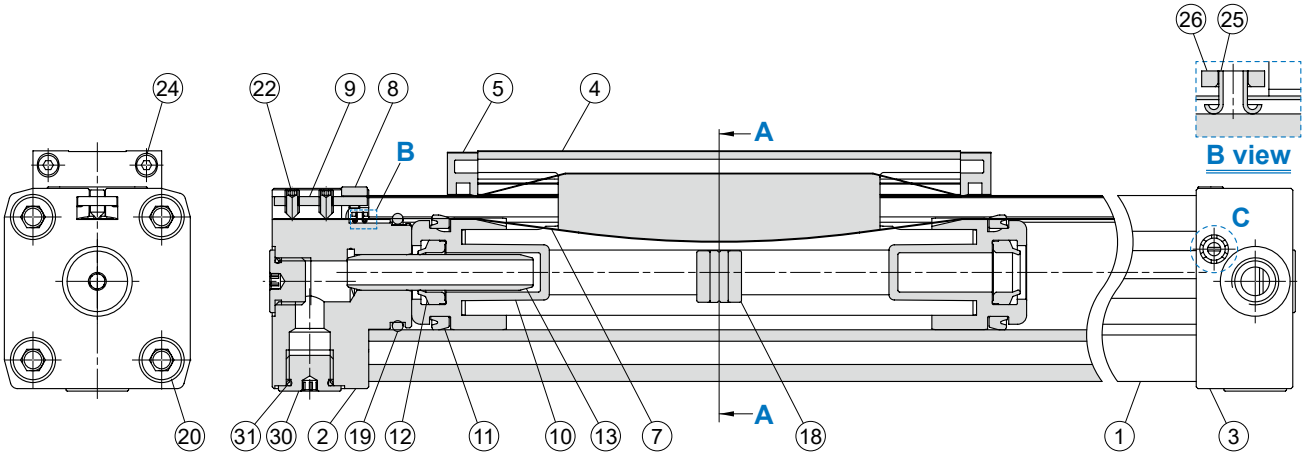


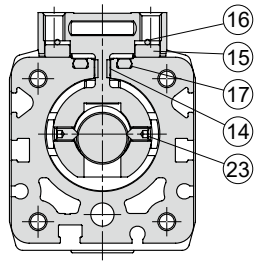
Table 1. The amount of wear sheet

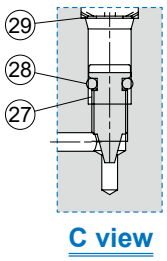
Tube I.D. / Type	16	25	32	40
MCRPL2-90	2	2	4	4
MCRPL2-98	4	4	6	6



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	ø16~ø32 Carbon steel	8	●		
		ø40~ø63 Stainless steel	8	●		
21	Outer seal strip screw	Stainless steel	4	●		
22	Inner seal strip screw	ø16~ø40 Stainless steel	4	●		
		ø50,ø63 Carbon steel	4	●		
23	Magnet fixing screw	Carbon steel	2	●		ø25~ø40 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	●		ø25~ø63 only
30	Hold plug	Copper alloy	4	●		
31	Plug seal	NBR	4	●	●	





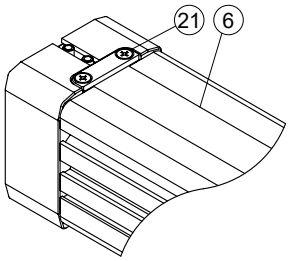
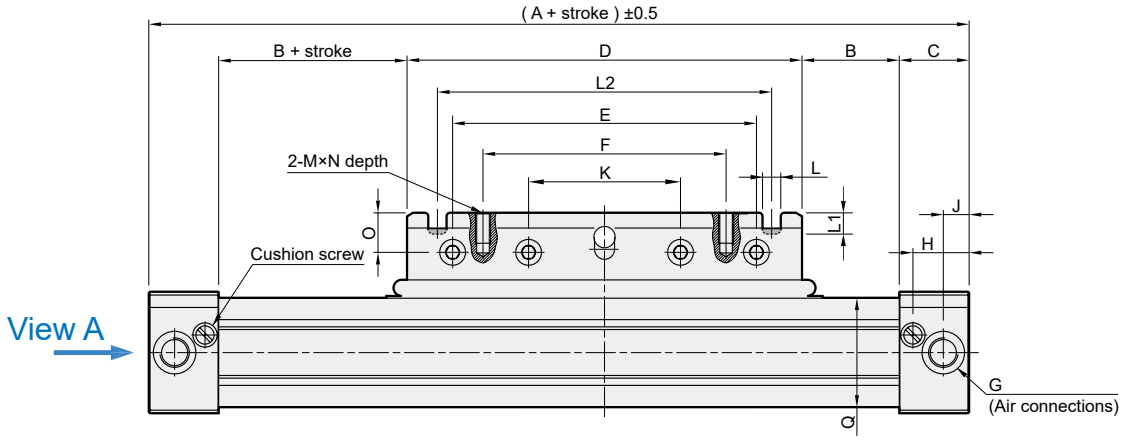
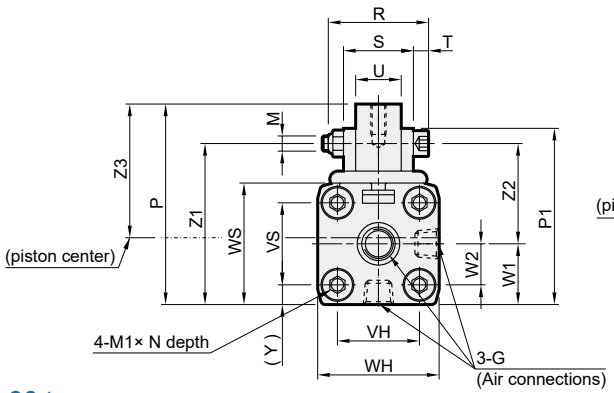


Table 1. The amount of wear sheet

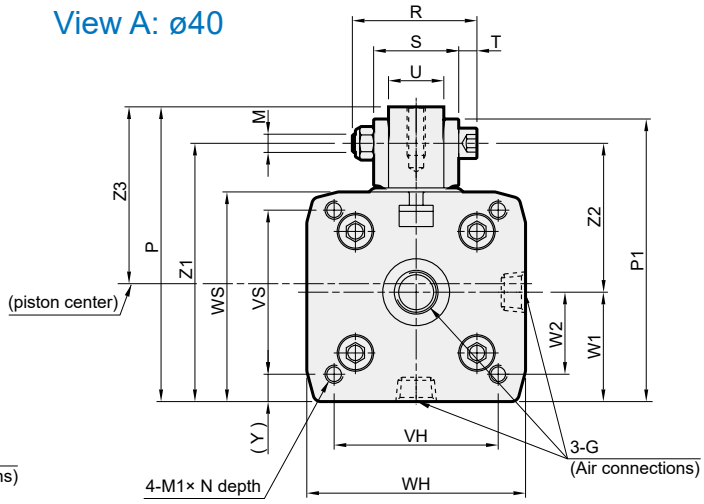
Tube I.D.	16	25	32	40	50	63
Q'y	2	2	4	4	2	2



View A: ø16~32



View A: ø40



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

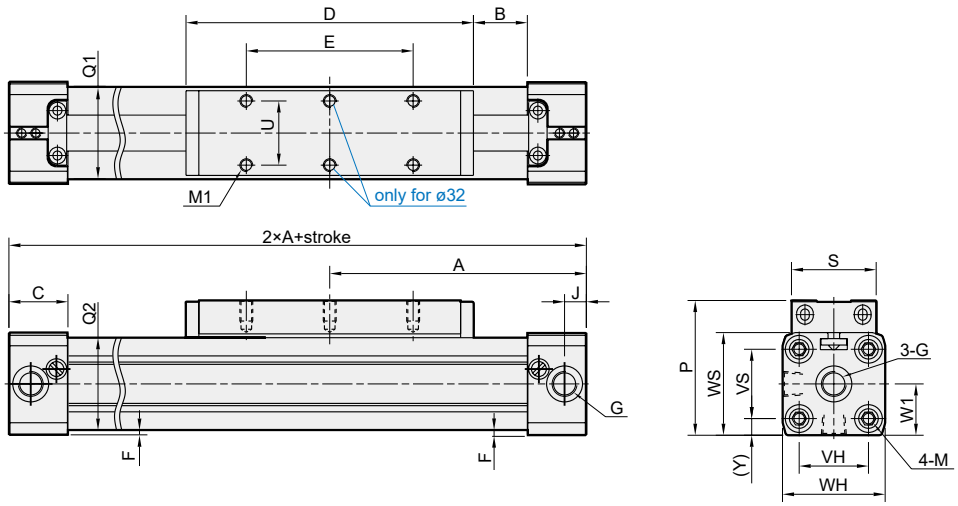
98 type

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

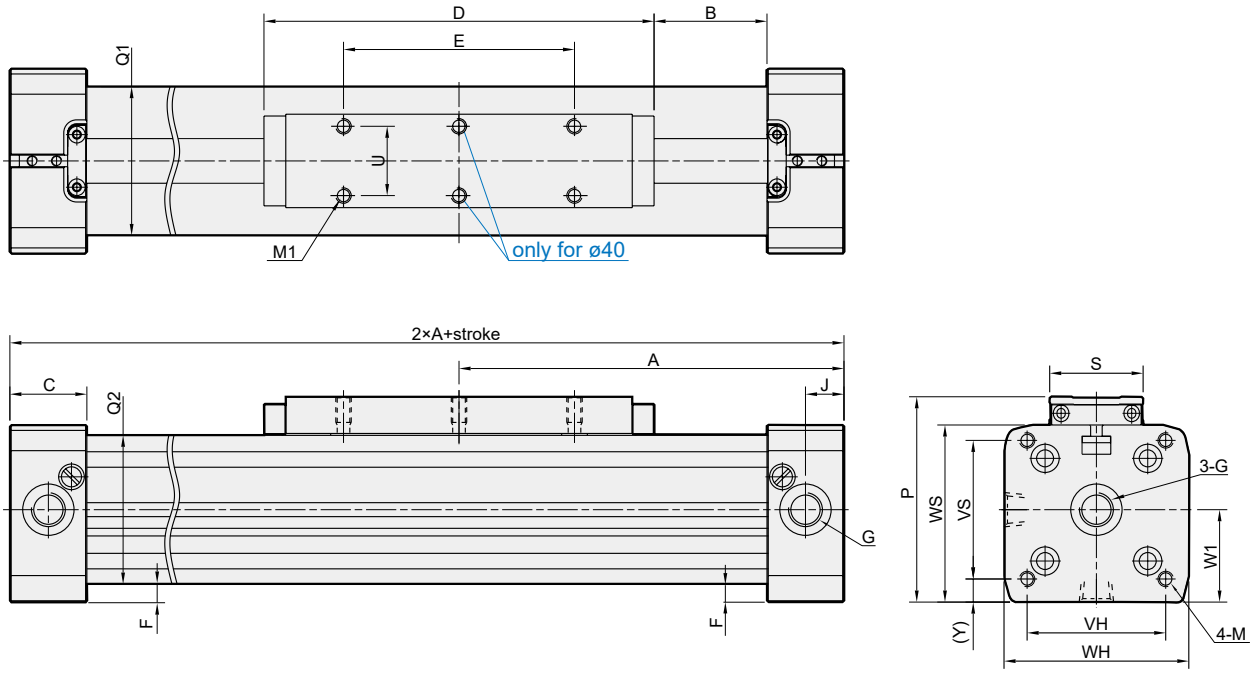
- 16L~40L: Cylinder with long piston for heavy bending and torque moments.

ø16~ø32



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

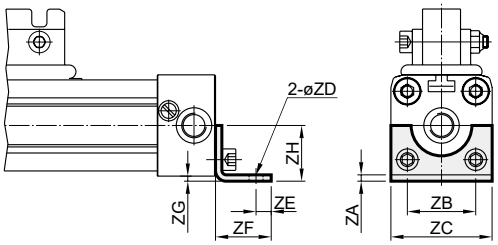
ø40~ø63



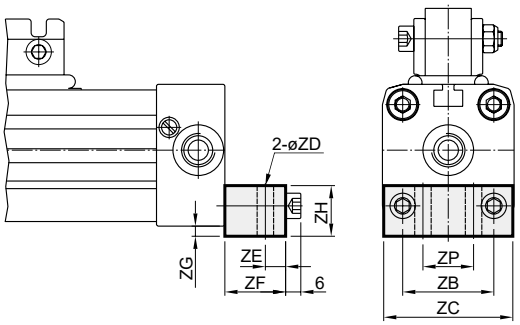
Code / Tube I.D.	A	B	C	D	E	F	G	J	M	M1	P	Q1×Q2	S	U	VH	VS	WH	WS	W1	Y
40	150	44	30	152	90	6.5	G1/4	15	M6×15depth	6-M6×10depth	80	59×58.5	36.4	27	54	54	72	69	36	9
50	175	42	33	200	110	0.5	G1/4	11.7	M6×15depth	4-M6×10depth	89	76×77	56	27	70	70	80	80	43.6	4
63	215	47.5	50	235	155	1.5	G3/8	25	M8×17depth	4-M8×14depth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

LB End cover bracket (foot)

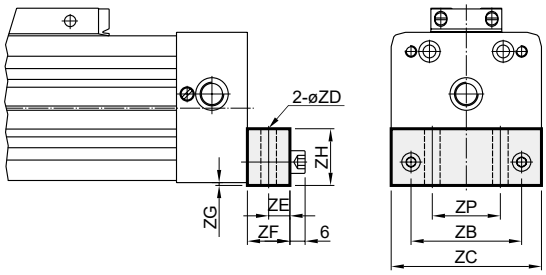
ø16, ø25
Material: Carbon steel



ø32, ø40
Material: Aluminum alloy

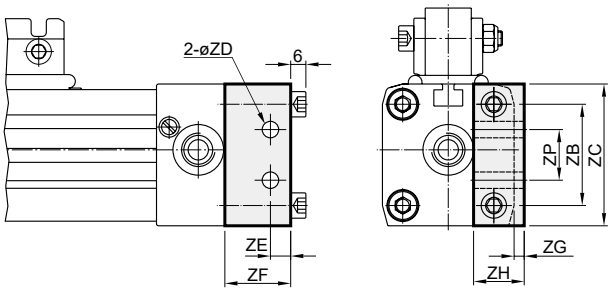


ø50, ø63
Material: Aluminum alloy



LB1 End cover bracket (foot)

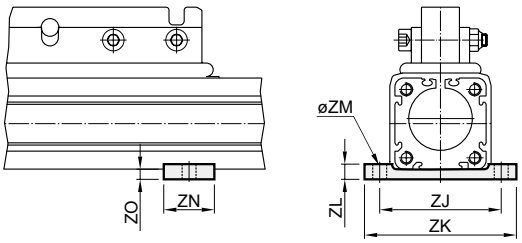
ø32*
Material: Aluminum alloy



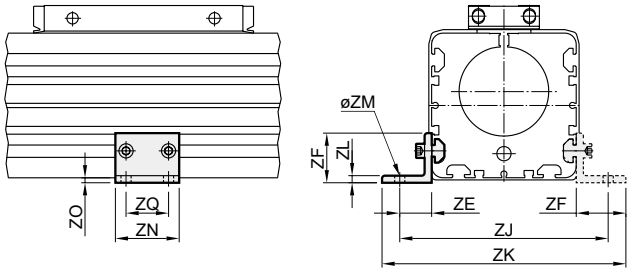
Code / Tube I.D.	ZA	ZB	ZC	ZD	ZE	ZF	ZG	ZH	ZP	Weight (g)
16	1.6	18	26	3.6	4	14	1.5	12.5	–	16
25	2.5	27	40	5.5	6	22	2.5	18	–	61
32	–	36	51	6.5	8	24	4	20	20	165
32*	–	40	56	6.5	8	26	4	20	20	189
40	–	54	71	9	11.5	24	2	20	30	210
50	–	70	80	9	12.5	25	2	25	45	293
63	–	78	106	11	15	30	2	40	48	730

MS Mid section support

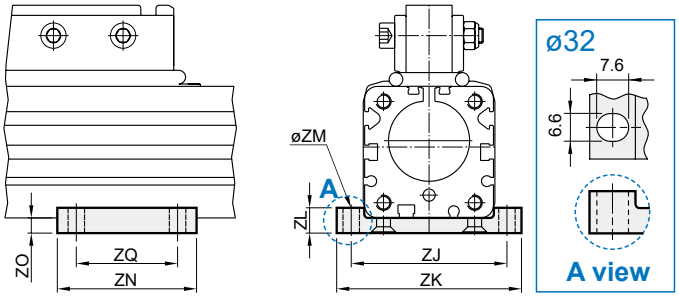
ø16, ø25 (1 pc)
Material: Aluminum alloy



ø50, ø63 (1 pc)
Material: Aluminum alloy



ø32, ø40 (1 pc)
Material: Aluminum alloy



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

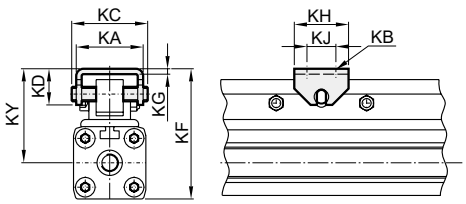
( ) Reference

* If mounting hole for ø32, ø40 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

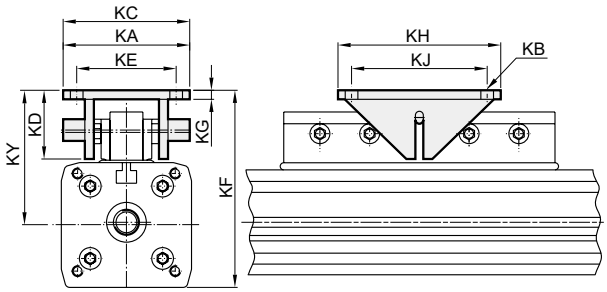
MCRPL2 ø16, ø25



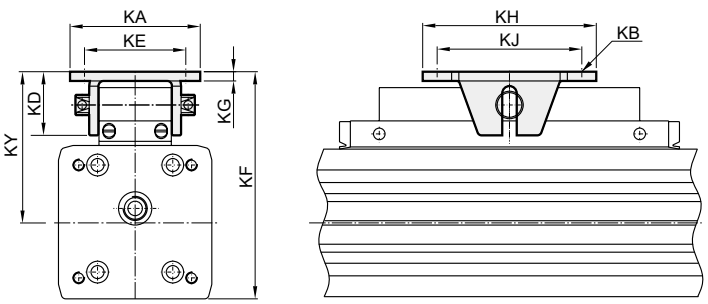
Code / Tube I.D.	KA	KB	KC	KD	KE	KF**	KG	KH	KJ	KY**	Weight (g)
MCRPL2-16	25	4.5	28	13	–	46.5-47.5	2	20	10	33-34	36
MCRPL2-25	37	5.5	42	20	–	71.5-73.5	3	30	16	51.5-53.5	117
MCRPL2-32	70	6.5	70	38	55	94.5-96.5	5	90	75	66.5-68.5	446
MCRPL2-40	70	6.5	70	38	55	108-110	5	90	75	73.5-75.5	446
MCRPLF2-50	90	9	–	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 ø32, ø40

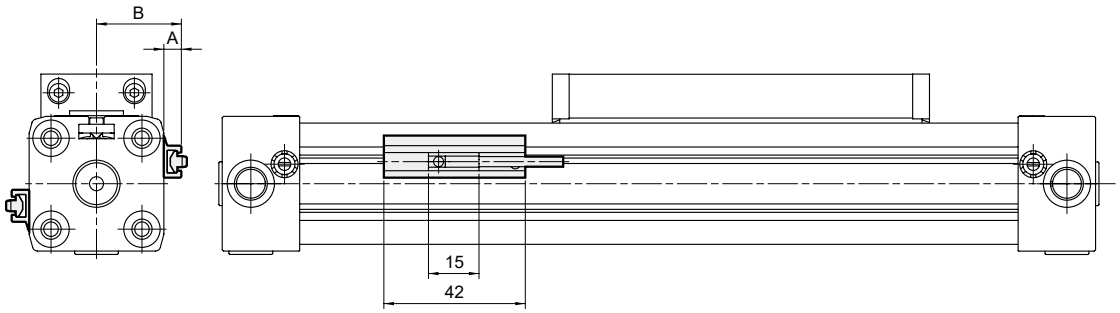


MCRPLF2 ø50, ø63



Sensor switch holder

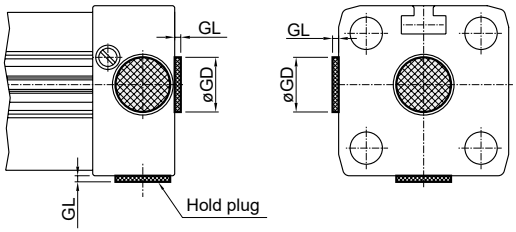
ø16, ø25



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

Hold plug

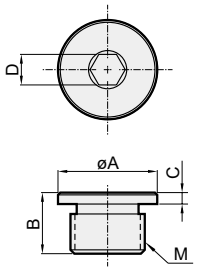
Piping port **M** thread and **G** thread.



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



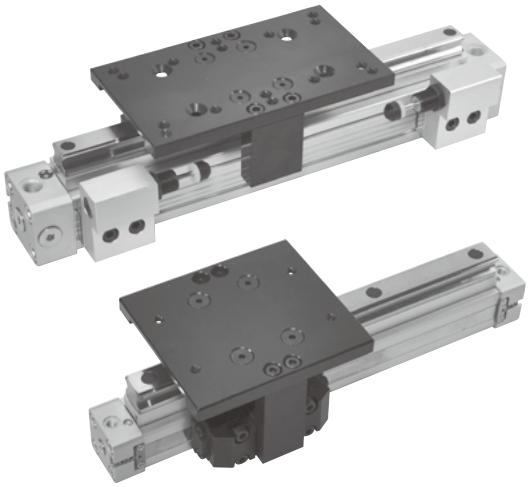
Code / Tube I.D.	A	B	C	D	E
16	7.5	5.3	1.3	2	M5×0.8
25	13	8	1.5	4	G1/8
32~50	18	10	1.5	4	G1/4
63	22	14	1.5	6	G3/8

MCRPLK series

RODLESS CYLINDER WITH LINEAR GUIDE

Technical data

Caution for safety
(Read beforeinstalling)



Features

- 50% space saving when compared to conventional cylinders.
- End caps with 3 air connections and adjustable cushioning.
- Load strength is higher than MCRPLF series (about 4 Multiple).
- Magnetic as standard.

Specification

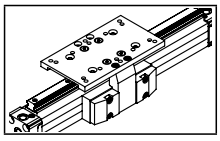
Model	MCRPLK			
Acting type	Double acting			
Tube I.D.(mm)	16	25	32	40
Port size	M5	G1/8	G1/4	G1/4
No. of port	3			
Medium	Air			
Operating pressure range	0.1~0.78 MPa			
Ambient temperature	-10°C ~ +80°C (No freezing)			
Lubrication	With or without lubrication			
Cushion	With adjustable cushion at both ends			
Stroke range (*1)	ø16: 100~3000 mm			
	ø25~40: 100~3600 mm			
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.

Order example

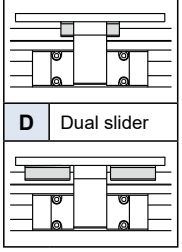
MCRPLK — D — 25 — 0850 — L V S

Model



Slider

—	Single slider
D	Dual slider



* D-type is not suitable for ø16.

Tube I.D.

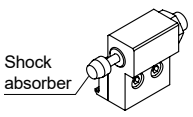
16
25
32
40

Stroke

0100~3600 mm (4 digits)

(*1) Shock absorber set

—	Without absorber set
L	Light
M	Medium
H	Powerful



* It needs to be assembled by the original factory, and we don't suggest that you assemble by yourself.

Piston seals

—	NBR
V	VITON

Grease lubrication

—	Standard
S	Slow motion

*1. Shock absorber

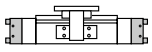
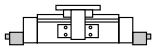
Model	Shock absorber			
	Model	L	M	H
MCRPLK-16	MAC-1005-	1	2	3
MCRPLK-25	MAC-1210-	1	2	3
MCRPLK-32	MAC-1412-	1	2	3
MCRPLK-40	MAC-1412-	1	2	3

Available speed range

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

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

Order example of mounting accessories

Code	LB (LB×2)	LB1 (LB1×2)
Mounting / Tube I.D.		
ø16	LB-P1-16x2	–
ø25	LB-P1-25x2	–
ø32	LB-P1-32x2	LB1-P1-32x2
ø40	LB-P1-40x2	–

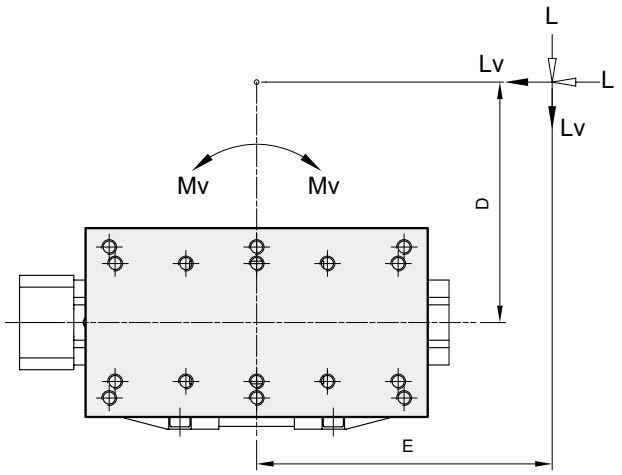
1. The below mentioned moments (Ma max, Mr max, Mv max.) are related to the guide rail center. The load force (L) is the summary of all single forces related to the common center of the mass. The center of the mass can be placed inside or outside the surface area of the carriage.
2. Normally the carriage would experience a dynamic load, which has to be considered with the calculation of needed piston force (F) and capacity of the ball guided system.

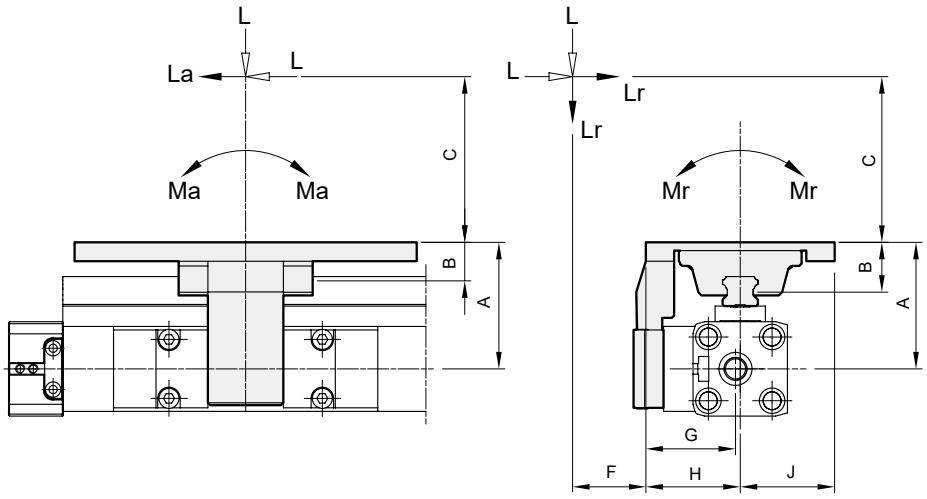
Use the following calculation formula:

$$\frac{Ma}{Ma\ max.} + \frac{Mr}{Mr\ max.} + \frac{Mv}{Mv\ max.} + \frac{L}{L\ max.} \le 1$$

Forces and moments

Tube I.D. / Code			16	25	32	40
Effect forces F		(N)	110	250	420	640
Cushioning		(mm)	15	21	26	32
A		(mm)	48.2	53.2	64	69
B		(mm)	21	21	24.4	24.4
C / D / E / F		(mm)	Dimensions according			
G		(mm)	38	38	55	54.5
H		(mm)	40	40	57.5	57.5
J		(mm)	40	40	57.5	57.5
Single slider	Load forces	L(N)	500	1500	2950	3960
	Moment forces	La, Lr, Lv (N)	500	1500	2950	3960
	Axial moments	Ma (Nm)	4	40	61	115
	Radial mom ents	Mr (Nm)	6	14	30	52
	Torsion moments	Mv (Nm)	11	40	62	70
Dual slider	Load forces	L (N)	—	1550	3020	4030
	Moment forces	La, Lr, Lv (N)	—	1550	3020	4030
	Axial moments	Ma (Nm)	—	85	85	130
	Radial moments	Mr (Nm)	—	20	45	65
	Torsion moments	Mv (Nm)	—	80	90	100

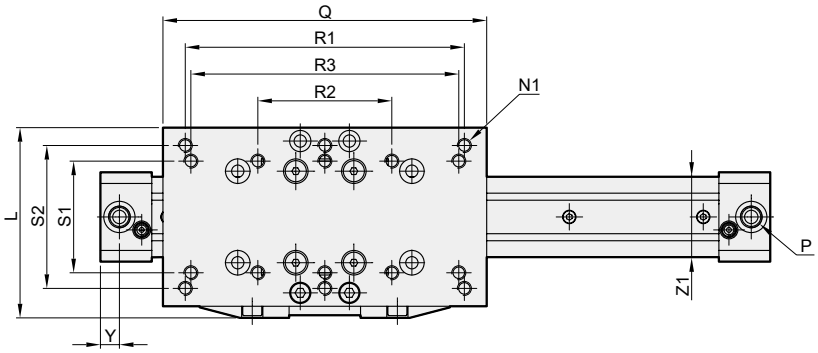




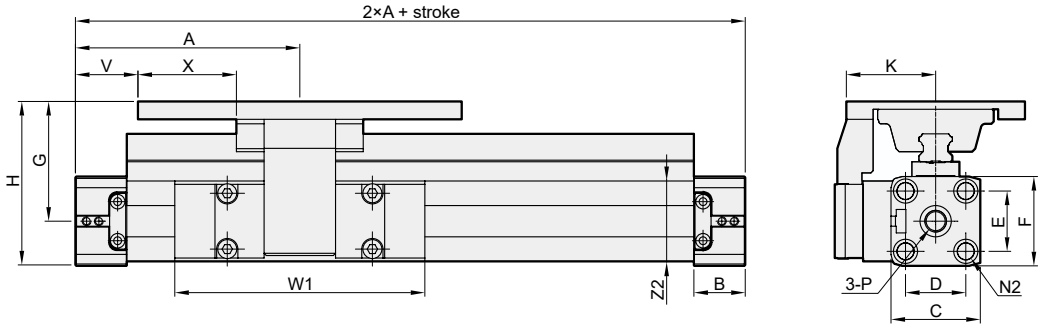
Weight

Unit: g

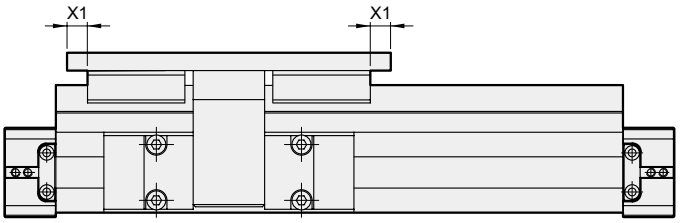
Tube I.D.	Without absorber		With absorber		Stroke 100 mm
	Single slider basic weight	Dual slider basic weight	Single slider basic weight	Dual slider basic weight	
16	932	–	1082	–	255
25	1698	1908	2032	2242	457
32	4082	4278	4635	4831	569
40	5709	5905	6260	6456	787



Single slider



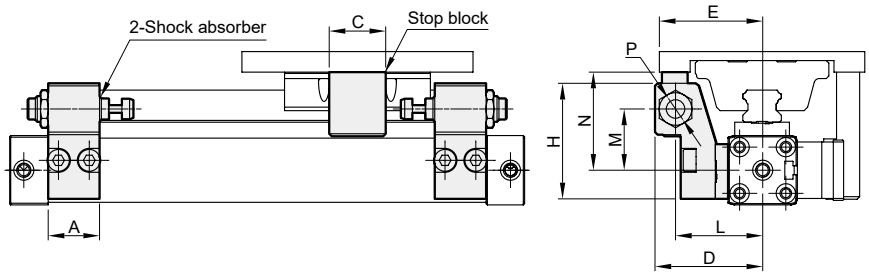
Dual slider



Code / Tube I.D.	A	B	C	D	E	F	G	H	K	L	N1	N2	P	Q	R1	R2
16	65	15	27	18	18	27	48.2	61.7	40	80	M4×0.7 thru	M3×0.5×7 dp	M5	90	–	–
25	100	23	40	27	27	40	53.2	73.2	40	85	M6×1.0 thru	M5×0.8×12 dp	G1/8	145	125	60
32	125	27	56	40	36	52	64	90.0	57.5	115	M8×1.25×12.5 dp	M6×1.0×15 dp	G1/4	190	164	–
40	150	30	69	54	54	72	69	105.0	57.5	115	M8×1.25×12.5 dp	M6×1.0×15 dp	G1/4	190	164	–

Code / Tube I.D.	R3	S1	S2	V	W1	X	X1	Y	Z1×Z2
16	70	36	–	20	69	16.5	–	5.5	25×24.5
25	120	50	64	28	112	44.0	13.5	8.5	36×36
32	–	–	96	30	152	64.3	16.8	10.5	48×52
40	–	–	96	55	152	64.3	16.8	16.0	58×58

Shock absorber set

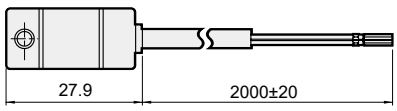


Code / Tube I.D.	A	C	D	E	H	L	M	N	P
16	20	22	42	40	45	34	23.8	38.2	M10×1.0
25	35	32	44.7	40	45	33.7	24.35	43.7	M12×1.0
32,40	40	60	54.7	57.5	45	43.7	26.35	41.11	M14×1.5

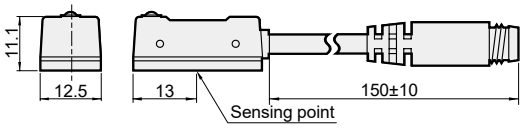
Sensor switch specification

Model	RCAL
Switch type	Reed switch
Contracts	Normal open
Voltage range	DC/AC 5~240V
Current range	100 mA max.
Switch range	10W max.
Shock resistance	30 G
Voltage drop	2.5V max.
Response time	Max. 1ms
Temperature	-10~70°C
Lead wire	ø4, 2C, PVC
Lead wire length	3 m
Indicator lamp	LED lights up when ON
Enclosure classification	IP 67 (NEMA 6)
Indicator	Green LED

Standard lead wire



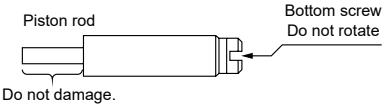
QD connector



With shock absorber

❶ Do not rotate the screw set on bottom of shock absorber.
This is not the screw for adjusting. If this screw is rotated, it may cause oil leakage.

❷ Do not scratch the exposed portion of the piston rod.
Decrease in life or malfunction may result.



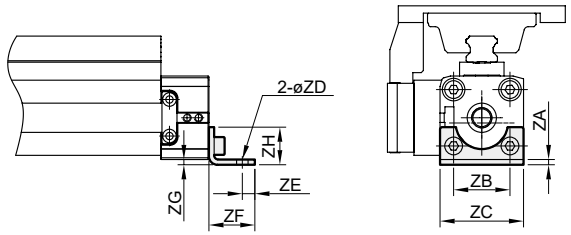
❸ Shock absorber is considered a consumable component. When energy absorption is decreased, replace it.

Model	Shock absorber			
	Model	L	M	H
MCRPLK-16	MAC1005-	1	2	3
MCRPLK-25	MAC1210-	1	2	3
MCRPLK-32	MAC1412-	1	2	3
MCRPLK-40	MAC1412-	1	2	3

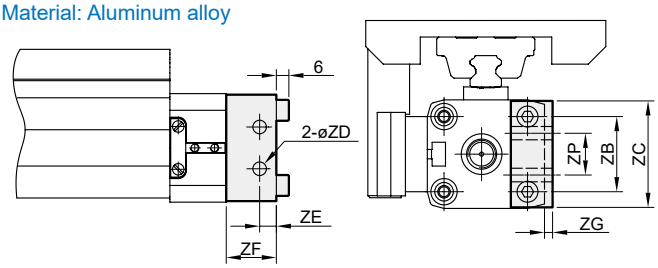
Mounting accessories

LB End cover bracket (foot)

ø16, ø25
Material: Carbon steel

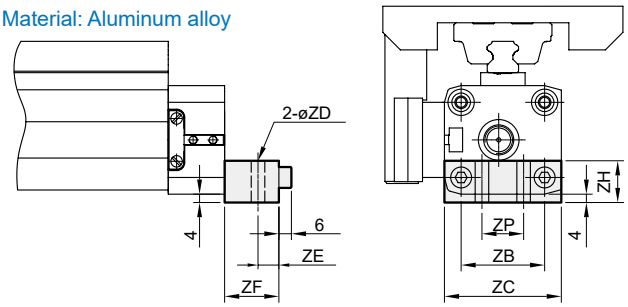


ø32, ø40
Material: Aluminum alloy



LB1 End cover bracket (foot)

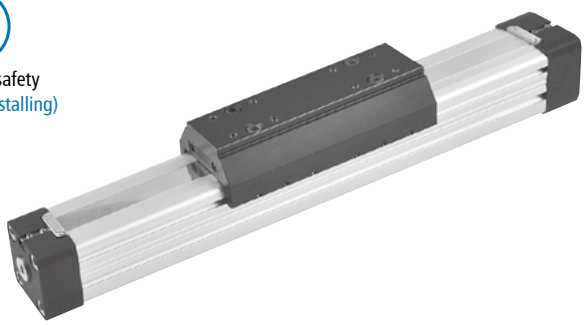
ø32*
Material: Aluminum alloy



Code / Tube I.D.	ZA	ZB	ZC	ZD	ZE	ZF	ZG	ZH	ZP
16	1.6	18	26	3.6	4	14	1.5	12.5	--
25	2.5	27	40	5.5	6	22	2.5	18	--
32	--	36	51	6.5	8	24	4	20	20
32*	–	40	56	6.5	8	26	4	20	20
40	–	54	71	9	11.5	24	2	20	30

Technical data

Caution for safety
(Read beforeinstalling)



Features

- High resistance to wear.
- Ability to take high loads & moments in all directions.
- Low weight.
- Ability to take shock loadings and vibrations against blows and vibrations.

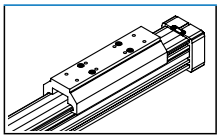
Specification

Model	MCRPLS			
Acting type	Double acting			
Tube I.D. (mm)	32	40	50	63
Port size	G1/4			G3/8
No. of port	3			
Medium	Air			
Operating pressure range	0.05~0.8 MPa			
Stroke range	100~2000 mm (*1)			
Ambient temperature	-10~+80°C (No freezing)			
Lubrication	With or without lubrication			
Cushion	With adjustable cushion at both ends			
Sensor switch	RNI / RPI	RCAL		
Sensor switch holder	–	HPL		

*1. In increments of 1mm, long strokes on request.
*2. The tube isn't airtight, so the certain leakage is allowed.
Before delivery, all products has passed the standard of leakage test.

Order example

MCRPLS – 90 V – 32 – 0850 – S

Model	Type	Piston seals	Tube I.D.	Stroke	Grease lubrication
	**90** Standard type	– NBR **V** VITON	**32** **40** **50** **63**	**0100~2000** mm (4 digits)	– Standard **S** Slow motion

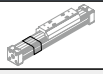
Available speed range

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

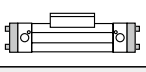
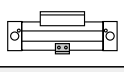
* The suitable grease type can be selected according to the actual use.

Cylinder weight

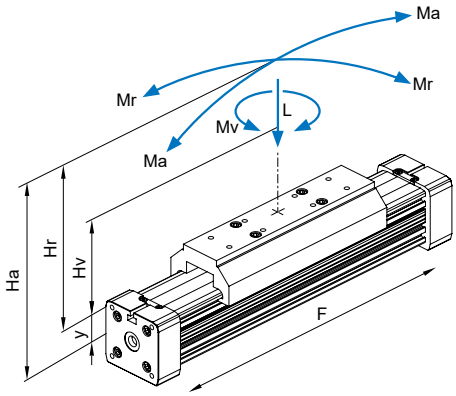
Unit: g

Model	Basic weight **MCRPLS**	Stroke 100 mm **MCRPLS**
Tube I.D.		
ø32	2,160	379
ø40	3,880	594
ø50	5,400	648
ø63	10,840	1,182

Order example of mounting accessories

Code	**LB** (LB×2)	**LB1** (LB1×2)	**MS** (Mid section support)
Mounting / Tube I.D.			
ø32	**LB-P1-32x2**	**LB1-P1-32x2**	**MS-P3-32**
ø40	**LB-P1-40x2**	–	**MS-P3-40**
ø50	**LB-P1-50x2**	–	**MS-P1-50**
ø63	**LB-P1-63x2**	–	**MS-P1-63**

* The dimensions of **LB** and **LB1** mounting accessories, please refer to MCRPL(F)2 series.



Formulas
Ma = F × Ha
Mr = F × Hr
Mv = F × Hv

Cylinder ø	Effect force (N) 0.6 MPa	La,Lr,Lv max (N)
32	420	495
40	640	825
50	1000	1320
63	1550	1815

Cylinder ø	Ma max. (Nm)	Mr max. (Nm)	Mv max.(Nm)
32	35	10	35
40	75	20	75
50	170	58	170
63	305	95	305

$$\frac{Ma}{Ma\ max.} + \frac{Mr}{Mr\ max.} + \frac{Mv}{Mv\ max.} + \frac{L}{L\ max.} \leq 1$$

- The above mentioned moments (Ma max, Mr max, Mv max.) are related to the guide rail center. The load force (L) is the summary of all single forces related to the common center of the mass. The center of the mass can be placed inside or outside the surface area of the carriage.
- Normally the carriage would experience a dynamic load, which has to be considered with the calculation of needed piston force (F) and capacity of the guided system. Use the following calculation formular.

Deflection diagram

- Max. distance (SL) in m — for ø32~63mm

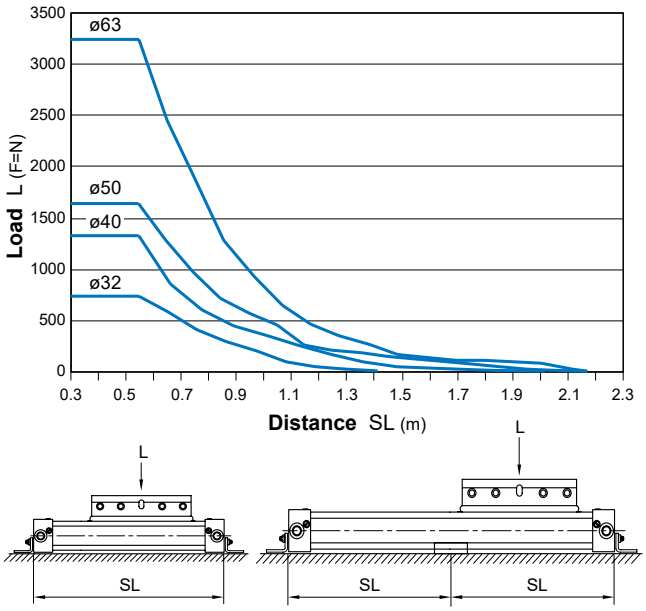
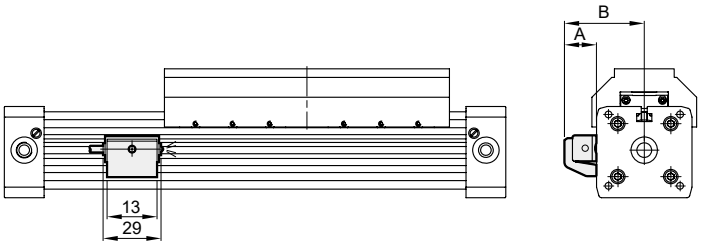


Diagram information

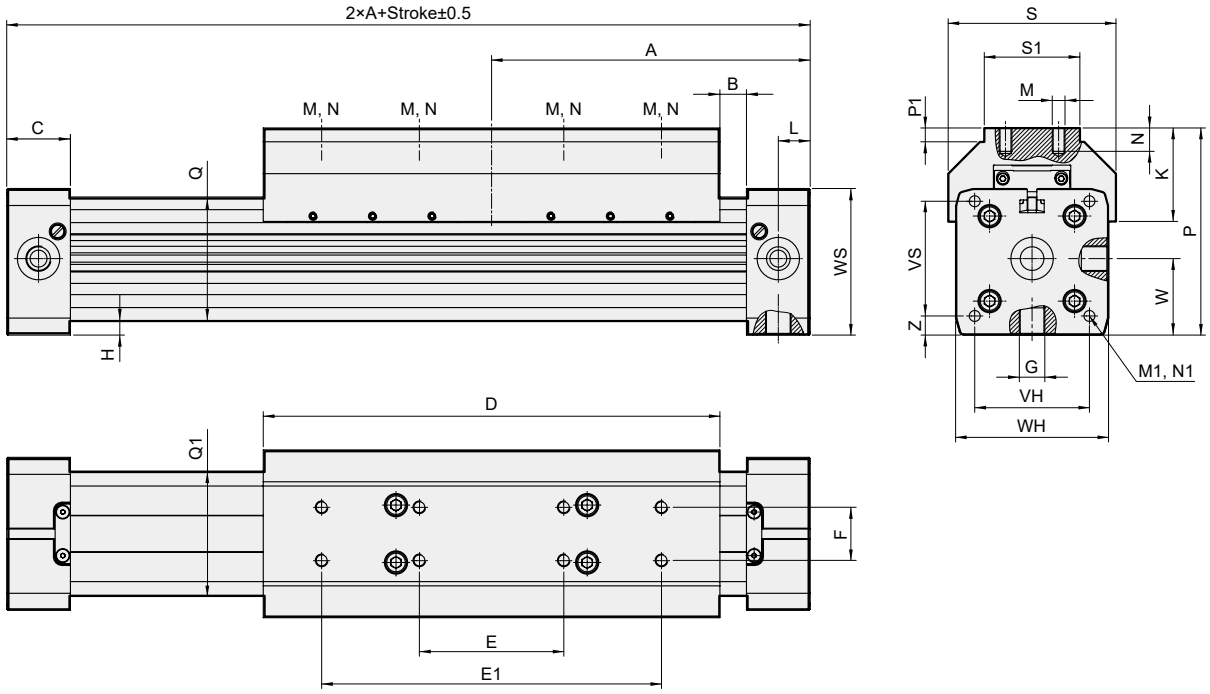
- Calculated deflections without support of 0.5~1 mm allow exceeding of supporting distance.
- Calculated deflections without support of 1 mm ~ max. 1.5 mm require reduction of the supporting distance.

Sensor switch specification

Model	RCAL
Switch type	Reed switch
Contracts	Normal open
Voltage range	DC/AC 5~240V
Current range	100 mA max.
Switch range	10W max.
Shock resistance	30 G
Voltage drop	2.5V max.
Response time	Max. 1ms
Temperature	-10~70°C
Lead wire	ø4, 2C, PVC
Lead wire length	3 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
40	10.5	46.5	HPL
50	16.5	56	
63	15.5	68.5	



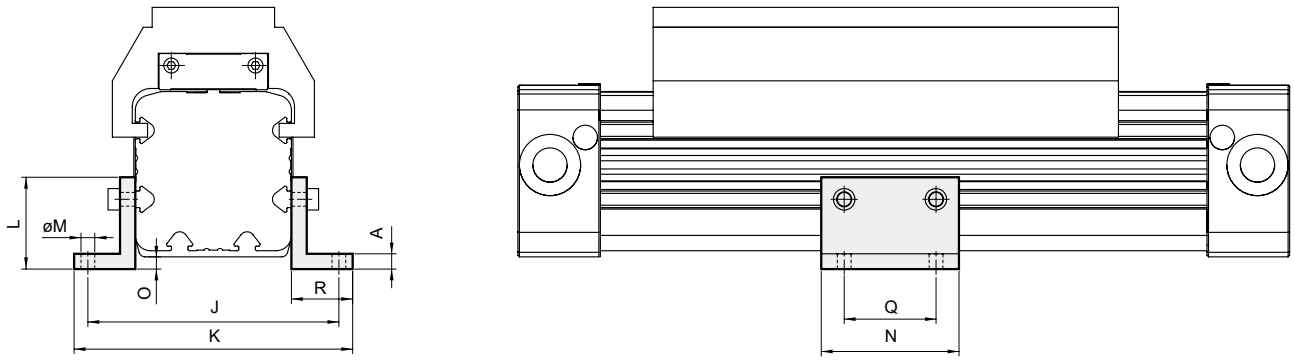
Code / Tube I.D.	A	B	C	D	E	E1	F	G	H	K	L	M	N	M1	N1
32	125	22.0	27	152	60	120	25	1/4	2.0	42.5	10.5	M5	10	M6	14
40	150	12.5	30	215	68	160	25	1/4	7.0	44.0	15.0	M8	10	M6	17
50	175	17.5	33	250	84	190	25	1/4	0.5	48.5	11.7	M8	10	M6	18
63	215	5.0	50	320	120	240	25	3/8	1.5	56.0	25.0	M8	14	M8	18

Code / Tube I.D.	P	P1	Q×Q1	S	S1	VH	VS	W	WH	WS	Z
32	81.5	6.5	52×51	66	40	36	40	30.0	52	56	8.0
40	97.5	6.5	58.5×59	79	45	54	54	36.0	72	69	9.0
50	110.0	6.5	77×78	92	50	70	70	43.5	80	80	4.0
63	137.0	5.0	102×102	116	50	78	78	62.5	106	106	14.5

MS Mid section support (2 pcs)

ø32, ø40

Material: Aluminum alloy



Code / Tube I.D.	A	J	K	L	M	N	O	Q	R	Weight (g)
32	5	82	91	30	ø4.5	45	6	30	20	53
40	5	90	99	25	ø4.5	45	8.5	30	20	47

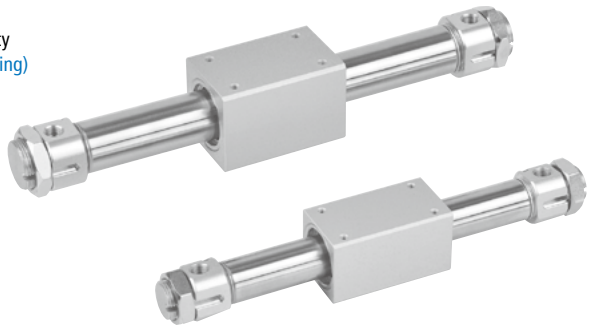
MCRPM series

MAGNETICALLY COUPLED **RODLESS CYLINDER**

mindman

Technical data

Caution for safety
(Read beforeinstalling)



Features

- 50% space saving.
- Magnetic transit design. Magnetic force transits the movement with piston side magnet and slider magnet.
- Stainless tube, light weighted and durable.

Specification

Model		MCRPM					
Acting type		Double acting					
Tube I.D. (mm)		10	15	20	25	32	40
Port size		M5×0.8		Rc1/8			Rc1/4
Medium		Air					
Max. operating pressure		0.7 MPa					
Min. operating pressure		0.18 MPa					
Proof pressure		1 MPa					
Ambient temperature		+5°C ~+60°C					
Lubricator		Without lubrication					
Available speed range		Standard grease: 100~500 mm/sec (*1)					
		Slow motion grease: 50~100 mm/sec (*1,2)					
Holding force (N)		53.9	137	231	363	588	922
Sensor switch	ø20,25,40	–		RDC(V), RQC(V), RDFE(V)			
	ø32	–		RDC, RQC, RDFE			

*1. The cylinder must be connected to a speed controller and gradually adjusted from fully closed to achieve the desired operating speed within the designed range.
*2. Between the speed range limit the actuator stroke must not exceed to 2m/minute.

Table for standard stroke

Tube I.D.	Stroke (mm)	Max. stroke	
		Cushion pad	Cushion air
ø10	100 ~ 500	500	–
ø15		900	900
ø20	100, 150, 200, 250, 300, 350, 400, 450, 500, 600, 700, 800	1500	1000
ø25		2000	1000
ø32, 40		2000	900

* Minimum stroke unit 1mm.

Order example

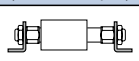
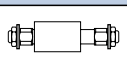
MCRPM — 20 — 100 M — A S — □

- MODEL
- TUBE I.D.
- STROKE
- CUSHION TYPE

Code	Description	Magnet	Tube I.D.
Blank	Cushion pad (Unadjustable)	×	ø10~ø40
A	Cushion air (Adjustable)	×	ø15
M-A		○	ø20~ø40

- GREASE LUBRICATION
  Blank: Standard
  S: Slow motion grease
- PORT THREAD
  Blank: M5×0.8 (for ø10, ø15)
  Blank: Rc thread
  G: G thread
  NPT: NPT thread (for ø20~ø40)

Order example of mounting accessories

Code	LB (Purchase 2 pcs)	FA (Purchase 2 pcs)
Mounting / Tube I.D.		
ø10	**LB-M4-16**	**FA-M4-16**
ø15	**LB-P2-15**	
ø20	**LB-M2-20**	**FA-M2-20**
ø25	**LB-M2-25**	**FA-M2-25**
ø32	**LB-P2-32**	
ø40	**LB-P2-40**	**FA-M2-40**

Weight

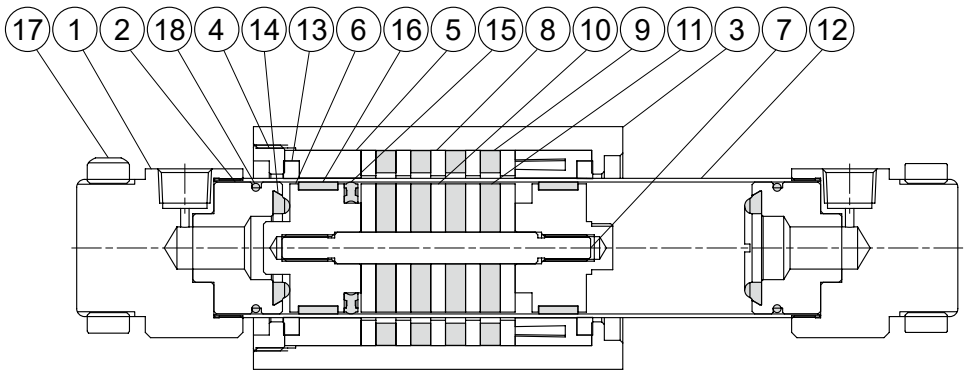
Cylinder

Model	Basic weight MCRPM	Stroke 100 mm MCRPM
Tube I.D.		
ø10	92	27
ø15	232	32
ø20	413	43
ø25	657	46
ø32	1,177	66
ø40	1,996	83

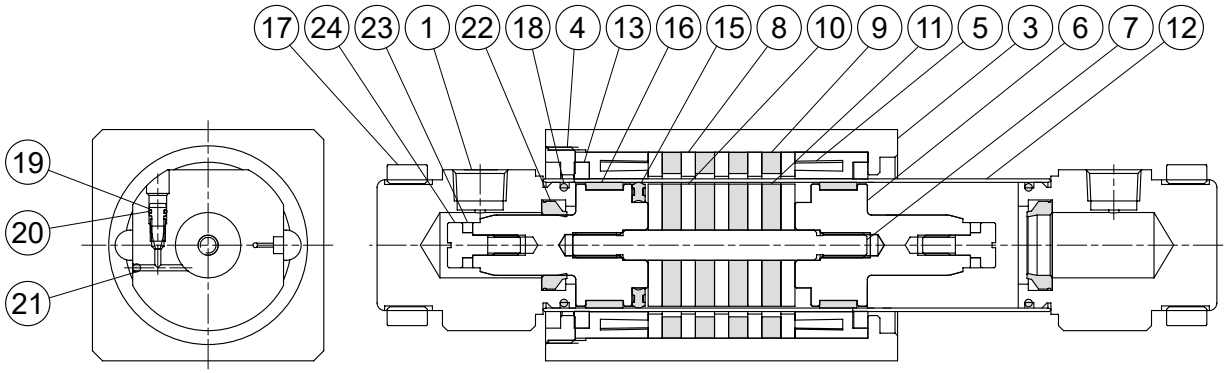
Accessoires Unit: g

LB	FA
	
21	13
27	13
64	68
66	75
108	75
179	129

Cushion pad Unadjustable



Cushion air Adjustable



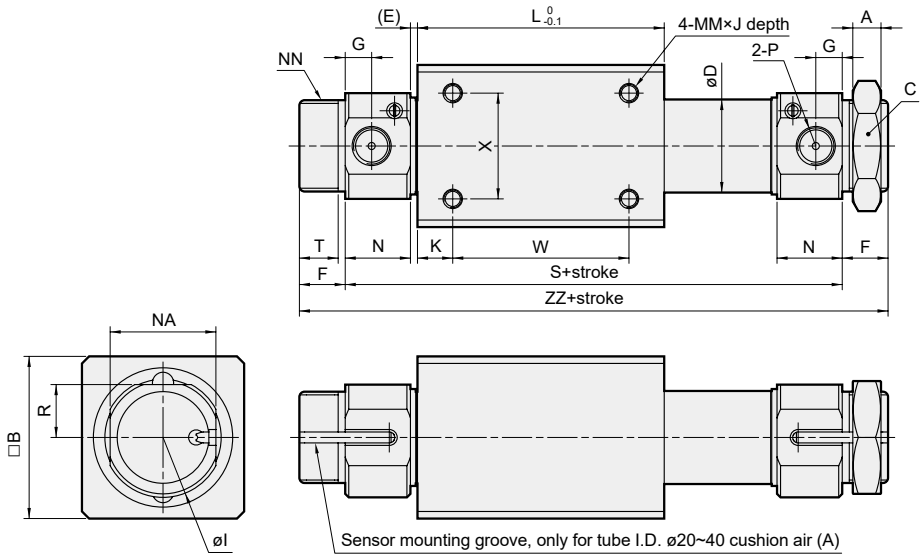
Material

No.	Cushion		Part name	Material	Note
	Air	Pad			
1	●	●	Cover	Aluminum alloy	Anodized
2		●	End collar *1	Aluminum alloy	
3	●	●	Slider body	Aluminum alloy	Anodized
4	●	●	Body cover	Aluminum alloy	Anodized
5	●	●	Body wear ring	Resin	
6	●	●	Piston	Aluminum alloy	
7	●	●	Shaft	Stainless steel	
8	●	●	Slider side yoke	Carbon steel	Ni plated
9	●	●	Slider side magnet	Magnet material	Ni plated
10	●	●	Piston side yoke	Carbon steel	Ni plated
11	●	●	Piston side magnet	Magnet material	Ni plated

*1. ø10, ø15 without end collar.

No.	Cushion		Part name	Material	Note
	Air	Pad			
12	●	●	Tube	Stainless steel	
13	●	●	Lub-retainer	Special resin	
14		●	Cushion	NBR	
15	●	●	Piston seal	NBR	
16	●	●	Wear ring	Resin	
17	●	●	Cover nut	Carbon steel	Ni plated
18	●	●	O ring	NBR	
19	●		Needle valve	Stainless steel *2	
20	●		O ring	NBR	
21	●		Steel ball	Stainless steel	
22	●		Cushion	NBR	
23	●		Magnet ring	Magnet material	For magnet
24	●		Fixing bolt	Stainless steel	For magnet

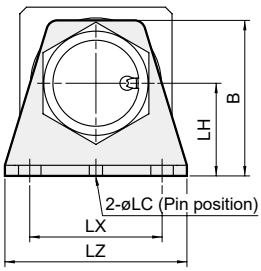
*2. Material: ø32,ø40 Carbon steel.

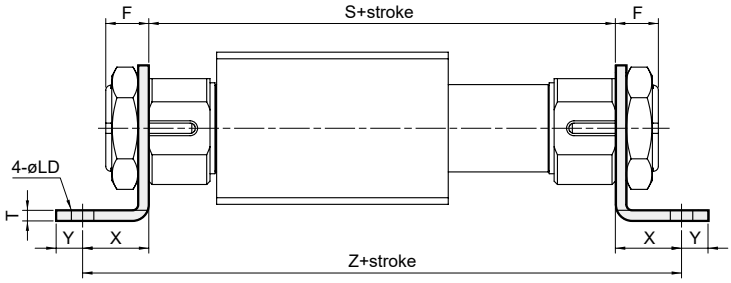


Code / Tube I.D.	A	B	C	D	E	F	G	I	J	K	L	MM	N	NA	NN	R	S	T	W	X	ZZ	P
10	4	25	14	12	1.5	9	5	16	4.5	4	38	M3×0.5	11	14	M10×1.0	7	63	7.5	30	16	81	M5×0.8
15	4	35	14	16.6	2	10	5.5	22	5	11	57	M4×0.7	11	20	M10×1.0	10	83	8.5	35	19	103	M5×0.8
20	8	36	26	21.6	2	13	7.5	28	6	8	66	M4×0.7	18	24	M20×1.5	12	106	10.5	50	25	132	Rc1/8
25	8	46	32	26.4	2	13	7.5	34	8	10	70	M5×0.8	18.5	30	M26×1.5	15	111	10.5	50	30	137	Rc1/8
32	8	60	32	33.6	2	16	8	40	8	15	80	M6×1.0	20	36	M26×1.5	18	124	14	50	40	156	Rc1/8
40	10	70	41	41.6	3	16	11	50	10	16	92	M6×1.0	26	46	M32×2.0	23	150	13	60	40	182	Rc1/4

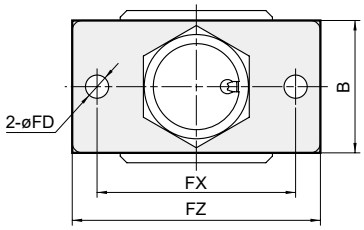
Accessories

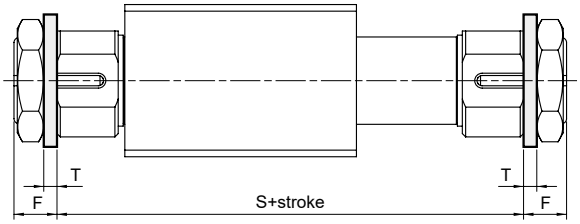
LB



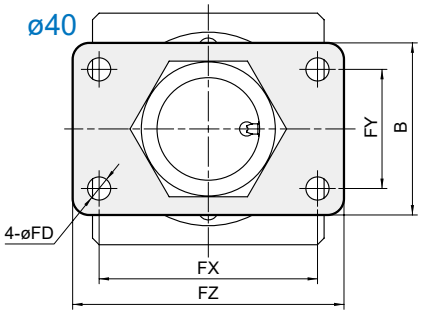


FA ø10~ø32





ø40



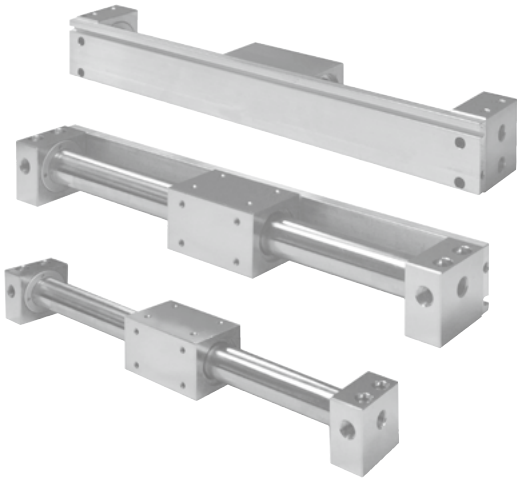
Code / Tube I.D.	B		F	FD	FX	FY	FZ	LC	LD	LH	LX	LZ	S	T		X	Y	Z
	LB	FA												LB	FA			
10	25	20	9	5.5	33	–	42	–	5.5	14	33	42	73	2.3	2.3	9	6	91
15	31	20	10	5.5	33	–	42	4	5.5	20	33	42	83	2.5	2.3	9	6	101
20	40	34	13	7	60	–	75	4	6.8	25	40	55	106	3.2	4	20	8	146
25	47	40	13	7	60	–	75	4	6.8	28	40	55	111	3.2	4	20	8	151
32	52	40	16	7	60	–	75	4	7	33	46	62	124	4	4	23	7	170
40	62	52	16	7	66	36	82	4	9	38	55	75	150	5	5	23	10	196

MCRPMD series

MAGNETICALLY COUPLED **RODLESS CYLINDER**

Technical data

Caution for safety
(Read beforeinstalling)



Features

- 50% space saving.
- Magnetic transit design. Magnetic force transits the movement with piston side magnet and slider magnet.
- Stainless tube, light weighted and durable.

Specification

Model	MCRPMD				
Acting type	Double acting				
Tube I.D. (mm)	10	15	20	25	32
Port size	M5×0.8		Rc1/8		
Medium	Air				
Max. operating pressure	0.7 MPa				
Min. operating pressure	0.18 MPa				
Proof pressure	1 MPa				
Ambient temperature	+5°C ~ +60°C				
Lubricator	Without lubrication				
Available speed range	Standard grease: 100~500 mm/sec (*1)				
	Slow motion grease: 60~100 mm/sec (*1,2)				
Holding force	53.9 N	137 N	231 N	363 N	588 N
Sensor switch ø10	RDC(V), RQC(V), RDFE(V)				
Sensor switch ø15~32	RCE, RCE1				

*1. The cylinder must be connected to a speed controller and gradually adjusted from fully closed to achieve the desired operating speed within the designed range.
*2. Between the speed range limit the actuator stroke must not exceed to 2m/minute.

Table for standard stroke

Type	Tube I.D.	Stroke (mm)	Max. stroke
Standard **G** type	ø10	100, 150, 200, 250, 300, 400, 500	500
	ø15		700
	ø20 ø25 ø32	100, 150, 200, 250, 300, 350, 400 450, 500, 600, 700, 800	1000
N type	ø10	100, 150, 200, 250, 300, 400, 500	500
	ø15		1000
	ø20	100, 150, 200, 250, 300, 350, 400	1500
	ø32	450, 500, 600, 700, 800	2000

* Minimum stroke unit 1mm.

Order example

MCRPMD — G — 20 — 100 — A S — G

MODEL

TYPE

Code		Port location	Magnets & switch rail
Blank		Standard	○
N		Standard	×
G		Centralized piping	○

TUBE I.D.

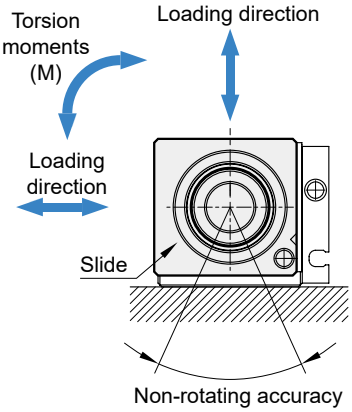
STROKE

GREASE LUBRICATION
Blank: Standard
S: Slow motion grease

Blank: Cushion pad (Unadjustable)
A: Cushion air (Adjustable)
(Only for ø15~ø32 and standard piping)

PORT THREAD
Blank: M5×0.8
(for ø10, 15)
Blank: Rc thread
G: G thread
NPT: NPT thread
(for ø20~ø32)

Maximum allowable directly load



Cylinder weight

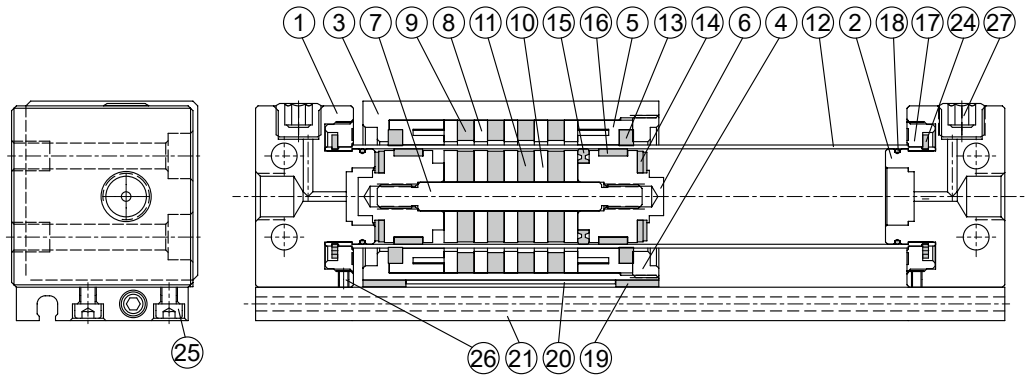
Unit: g

Model	Basic weight **MCRPMD**	Stroke 100 mm **MCRPMD**
Tube I.D.		
ø10	163	67
ø15	302	80
ø20	520	102
ø25	712	115
ø32	1235	150

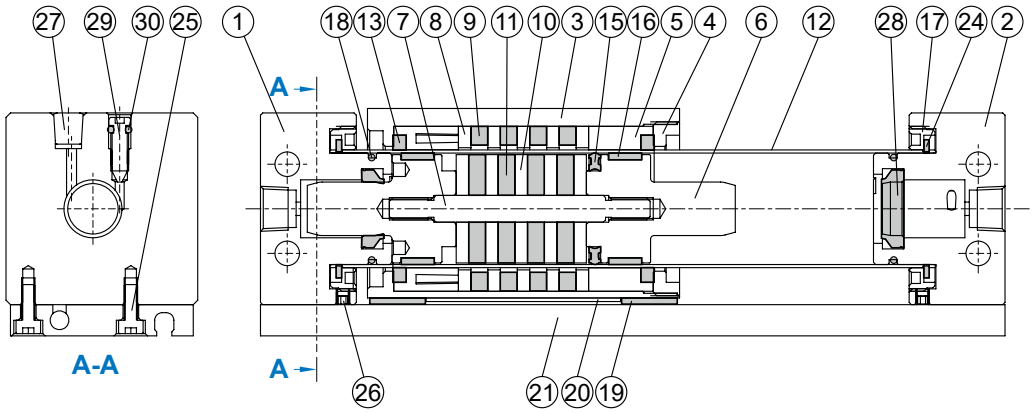
Tube I.D.	Max. allowable load (kg)	Non-rotating accuracy	Max. torsion moments	Non-rotating accuracy Allowable stroke
ø10	0.4	5°	0.05 N.m	100 mm
ø15	0.9	5°	0.18 N.m	200 mm
ø20	1.1	4°	0.23 N.m	300 mm
ø25	1.1	4°	0.40 N.m	300 mm
ø32	1.5	4°	0.12 N.m	400 mm

* Non-rotating angle accuracy will be reduced by distortion due to longer stroke and switch rail.

Cushion pad Unadjustable



Cushion air Adjustable

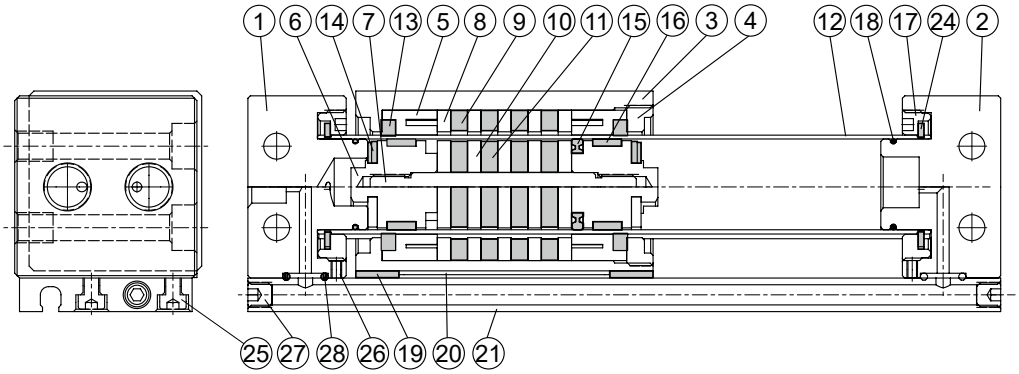


Material

No.	Part name	Material
1	Cover A	Aluminum alloy
2	Cover B	Aluminum alloy
3	Slider body	Aluminum alloy
4	Body cover	Aluminum alloy
5	Body wear ring	Resin
6	Piston	Aluminum alloy
7	Shaft	Stainless steel
8	Slider side yoke	Carbon steel
9	Slider side magnet	Magnet material
10	Piston side yoke	Carbon steel
11	Piston side magnet	Magnet material
12	Tube	Stainless steel
13	Lub-retainer	Special resin
14	Cushion	NBR
15	Piston seal	NBR

No.	Part name	Material
16	Wear ring	Resin
17	Tube fixed nut	Aluminum alloy
18	O-ring	NBR
19	Wear ring	Resin
20	Magnetic shielding plate	Carbon steel
21	Switch rail	Aluminum alloy
22	Magnet	Magnet material
23	Spring	Stainless steel
24	Snap ring	Spring steel
25	Bolt	SCM
26	Screw	SCM
27	Seal screw	Carbon steel
28	Cushion packing	NBR
29	Needle valve	Stainless steel
30	Needle valve packing	NBR

Centralized piping

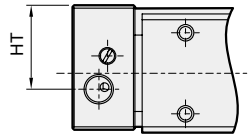


Material

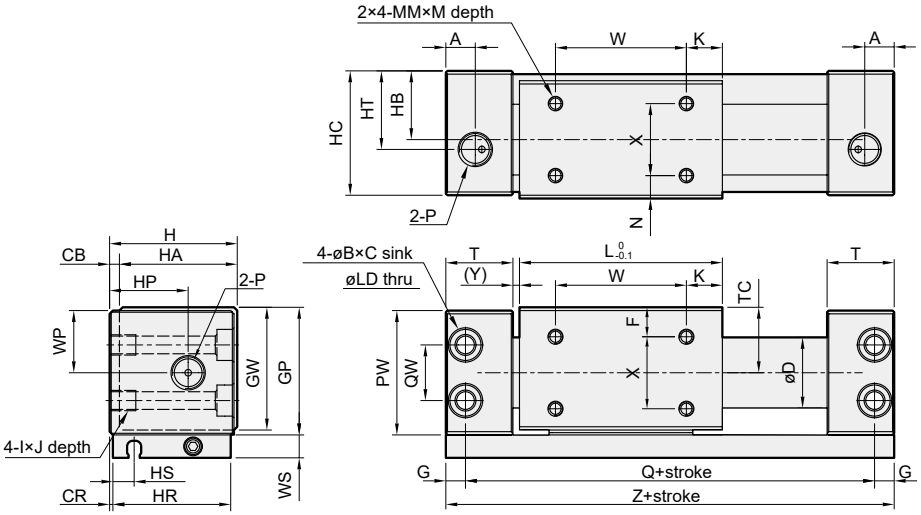
No.	Part name	Material
1	Cover A	Aluminum alloy
2	Cover B	Aluminum alloy
3	Slider body	Aluminum alloy
4	Body cover	Aluminum alloy
5	Body wear ring	Resin
6	Piston	Aluminum alloy
7	Shaft	Stainless steel
8	Slider side yoke	Carbon steel
9	Slider side magnet	Magnet material
10	Piston side yoke	Carbon steel
11	Piston side magnet	Magnet material
12	Tube	Stainless steel
13	Lub-retainer	Special resin
14	Cushion	NBR
15	Piston seal	NBR
16	Wear ring	Resin
17	Tube fixed nut	Aluminum alloy
18	O-ring	NBR
19	Wear ring	Resin
20	Magnetic shielding plate	Carbon steel
21	Switch rail	Aluminum alloy
22	Magnet	Magnet material
23	Spring	Stainless steel
24	Snap ring	Spring steel
25	Bolt	SCM
26	Screw	SCM
27	Screw	SCM
28	O-ring	NBR

Both sides piping

Adjustable cushion



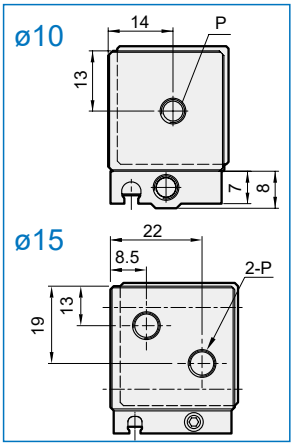
Code / Tube I.D	HT
15	10
20	24
25	29
32	35

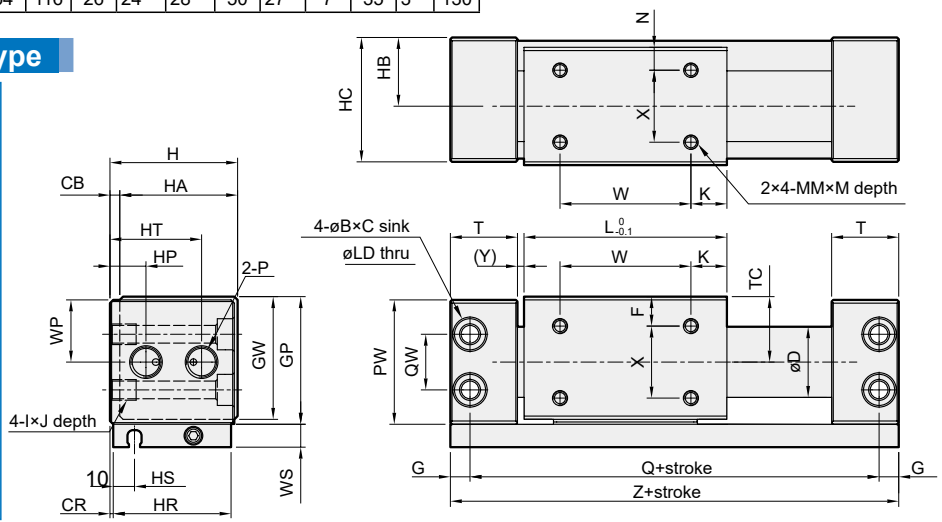


Code / Tube I.D	A	B	C	CB	CR	D	F	G	GP	GW	H	HA	HB	HC	HP	HR	HS	HT	I	J	K	L	LD	M
10	8.5	6.5	3.2	2	0.5	12	6.5	4	27	25.5	26	24	14	25	14	24	4.5	14	M4×0.7	6	9	38	3.3	4.5
15	9.5	8	4.2	2	0.5	16.6	8	5	33	31.5	32	30	17	31	17	30	4.9	17	M5×0.8	7	14	53	4.3	5
20	9	9.5	5.2	3	1	21.6	9	6	39	37.5	39	36	21	38	24	36	6.5	24	M6×1.0	8	11	62	5.4	5
25	9	9.5	5.2	3	1	26.4	8.5	6	44	42.5	44	41	23.5	43	23.5	41	6.5	23.5	M6×1.0	8	15	70	5.4	6
32	10.5	11	6.5	3	1.5	33.6	10.5	7	55	53.5	55	52	29	54	29	51	6	29	M8×1.25	10	13	76	6.8	7

Code / Tube I.D	MM	N	P	PW	Q	QW	T	TC	W	WP	WS	X	Y	Z
10	M3×0.5	4.5	M5×0.8	26	68	14	17.5	14	20	13	7	15	1.5	76
15	M4×0.7	6	M5×0.8	32	84	18	19	17	25	16	7	18	1.5	94
20	M4×0.7	7	Rc1/8	38	95	17	20.5	20	40	19	7	22	2	107
25	M5×0.8	6.5	Rc1/8	43	105	20	21.5	22.5	40	21.5	7	28	2	117
32	M6×1.0	8.5	Rc1/8	54	116	26	24	28	50	27	7	35	3	130

Centralized piping type





Code / Tube I.D	B	C	CB	CR	D	F	G	GP	GW	H	HA	HB	HC	HP	HR	HS	HT	I	J	K	L	LD	M
10	6.5	3.2	2	0.5	12	6.5	4	27	25.5	26	24	14	25	—	24	4.5	—	M4×0.7	6	9	38	3.3	4.5
15	8	4.2	2	0.5	16.6	8	5	33	31.5	32	30	17	31	—	30	4.9	—	M5×0.8	7	14	53	4.3	5
20	9.5	5.2	3	1	21.6	9	6	39	37.5	39	36	21	38	11	36	6.5	28	M6×1.0	8	11	62	5.4	5
25	9.5	5.2	3	1	26.4	8.5	6	44	42.5	44	41	23.5	43	14.5	41	6.5	33.5	M6×1.0	8	15	70	5.4	6
32	11	6.5	3	1.5	33.6	10.5	7	55	53.5	55	52	29	54	20	51	6	40	M8×1.25	10	13	76	6.8	7

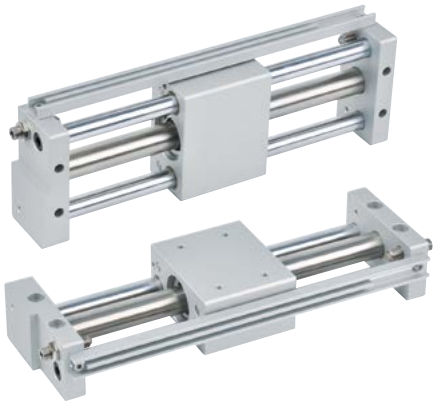
Code / Tube I.D	MM	N	P	PW	Q	QW	T	TC	W	WP	WS	X	Y	Z
10	M3×0.5	4.5	M5×0.8	26	68	14	17.5	14	20	—	7	15	1.5	76
15	M4×0.7	6	M5×0.8	32	84	18	19	17	25	—	7	18	1.5	94
20	M4×0.7	7	Rc1/8	38	95	17	20.5	20	40	19	7	22	2	107
25	M5×0.8	6.5	Rc1/8	43	105	20	21.5	22.5	40	21.5	7	28	2	117
32	M6×1.0	8.5	Rc1/8	54	116	26	24	28	50	27	7	35	3	130

MCRPMS series

MAGNETICALLY COUPLED **RODLESS CYLINDER**

Technical data

Caution for safety
(Read beforeinstalling)



Features

- 50% space saving, centralized piping ease of mounting.
- Magnetic transit design. Magnetic force transits the movement with piston side magnet and slider magnet.
- Stainless tube, light weighted and durable.
- The overall design of the cylinder and guide rods, can direct bear loads.

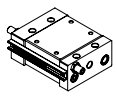
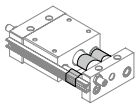
Table for standard stroke

Tube I.D.	Stroke (mm)	Max. stroke
ø10	50, 100, 150, 200, 250, 300	500
ø15	50, 100, 150, 200, 250, 300, 350, 400, 450, 500	750
ø20	100, 150, 200, 250, 300, 350, 400, 450, 500, 600, 700, 800	1000
ø25		1500
ø32		

* Minimum stroke unit 1mm.

Cylinder weight

Unit: g

Tube I.D.	Basic weight **MCRPMS**		Stroke 100 mm **MCRPMS**	
ø10		407		169
ø15		770		222
ø20		1360		342
ø25		1730		346
ø32		2980		520

Specification

Model	MCRPMS				
Acting type	Double acting				
Tube I.D. (mm)	10	15	20	25	32
Port size	M5×0.8		Rc1/8		
Medium	Air				
Operating pressure range — Standard	0.2~0.7 MPa				
Operating pressure range — Cushion (*1)	0.2~0.55	0.2~0.65 MPa			
Proof pressure	1 MPa				
Ambient temperature	+5° ~ +60°C				
Lubricator	Without lubrication				
Available speed range	Standard grease: 150~400 mm/sec (*2)				
	Slow motion grease: 80~150 mm/sec (*2, 3)				
Holding force	53.9 N	137 N	231 N	363 N	588N
Shock absorbers (*4)	MDSC-0806-3-N		MAC-1007-SN	MAC-1412-SN	MAC-2015-SN
Sensor switch	RDC(V), RQC(V), RCD, RDFE				

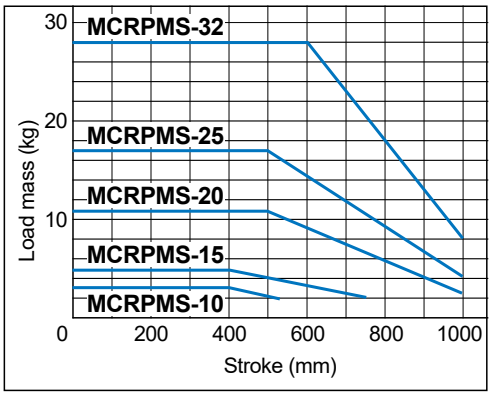
*1. Exceeding the allowable pressure will lead to the breaking of the magnetic coupling and cause the piston slider and external slider becoming separated.
*2. The cylinder must be connected to a speed controller and gradually adjusted from fully closed to achieve the desired operating speed within the designed range.
*3. Between the speed range limit the actuator stroke must not exceed to 2m/minute.
*4. Option: shock absorber MDSC, MAC.

Order example

MCRPMS — G — 10 — 100M — B S — G

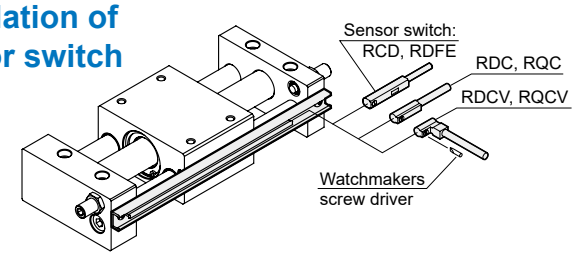
- MODEL
- TUBE I.D.
- STROKE
- PORT LOCATION
  - Blank: Bilateral piping
  - **G**: Centralized piping
- MAGNET
  - Blank: Without magnet
  - **M**: With magnet
  - **MD**: With magnet
- CUSHION
  - Blank: Bumper bolt
  - **B**: Shock absorber
  - **C**: Shock absorber + Bumper bolt
- GREASE LUBRICATION
  - Blank: Standard
  - **S**: Slow motion grease
- PORT THREAD
  - Blank: M5×0.8 (Only for ø10,15)
  - Blank: Rc thread
  - **G**: G thread
  - **NPT**: NPT thread (Only for ø20~32)

Maximum load mass

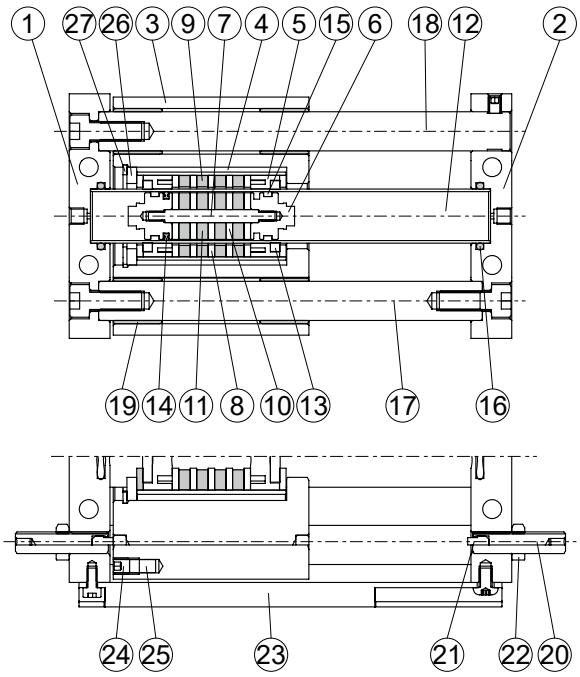


* Maximum load mass when horizontal mounting.

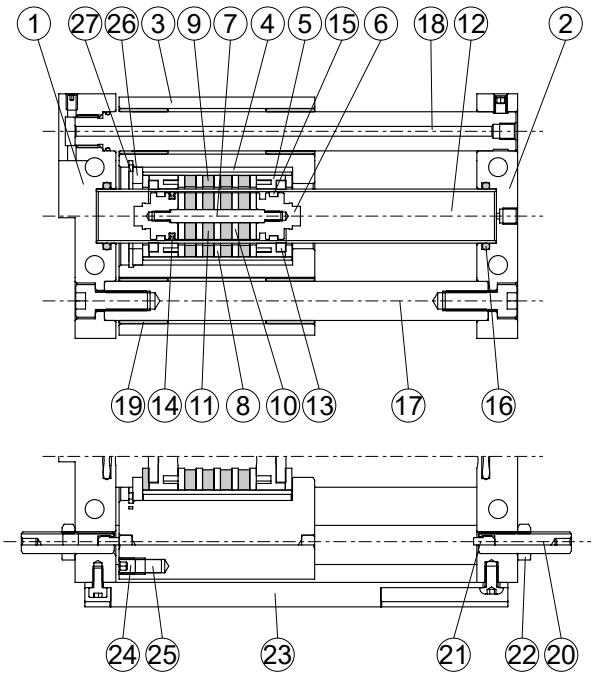
Installation of sensor switch



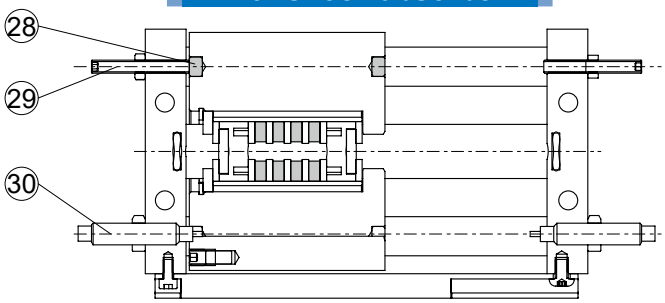
Bilateral piping



Centralized piping



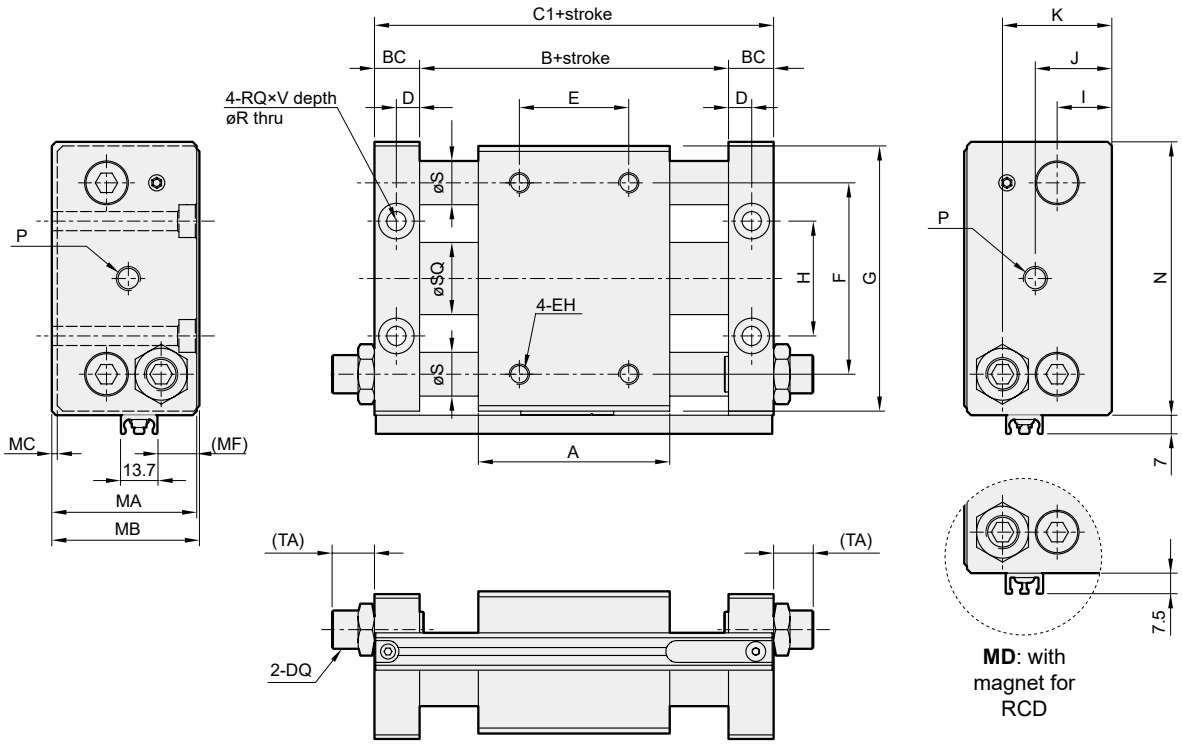
With shock absorber



Material

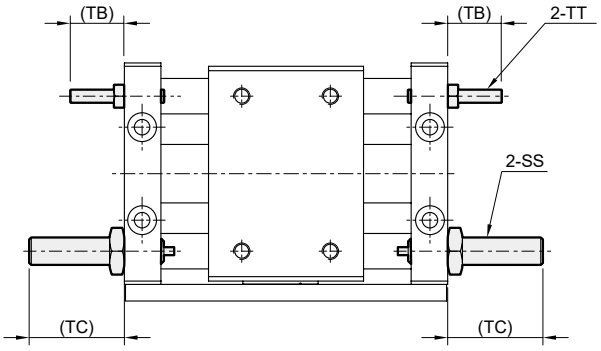
No.	Part name	Material	Note
1	Plate A	Aluminum alloy	Anodized
2	Plate B	Aluminum alloy	Anodized
3	Slider body	Aluminum alloy	Anodized
4	External slider tube	Aluminum alloy	
5	Body wear ring	Resin	
6	Piston	Aluminum alloy	
7	Shaft	Stainless steel	
8	Slider side yoke	Carbon steel	
9	Slider side magnet	Magnet material	
10	Piston side yoke	Carbon steel	
11	Piston side magnet	Magnet material	
12	Tube	Stainless steel	
13	Lub-retainer	Special resin	
14	Piston seal	NBR	
15	Wear ring	Resin	

No.	Part name	Material	Note
16	O-ring	NBR	
17	Guide shaft A	Carbon steel	
18	Guide shaft B	Carbon steel	
19	Bush	Copper	
20	Adjusting bolt	Carbon steel	
21	Cushion	PU	
22	Bolt	Carbon steel	
23	Switch rail	Aluminum alloy	for with magnet
24	Hex socket screws	Stainless steel	for with magnet
25	Magnet	Magnet material	for with magnet
26	Washer	Aluminum alloy	Anodized
27	Snap ring	Spring steel	
28	Cushion block	PU	for with shock absorber
29	Adjustment bolt	Carbon steel	for with shock absorber
30	Shock absorber	Composite material	for with shock absorber



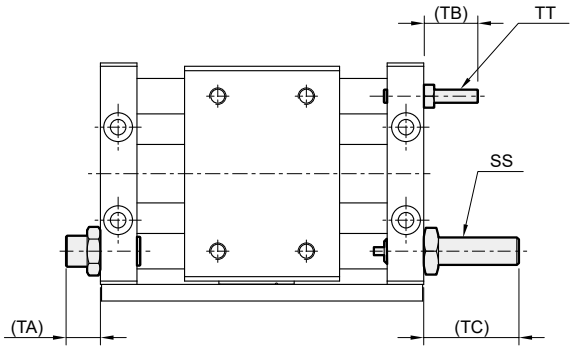
MCRPMS-*-B

With shock absorber



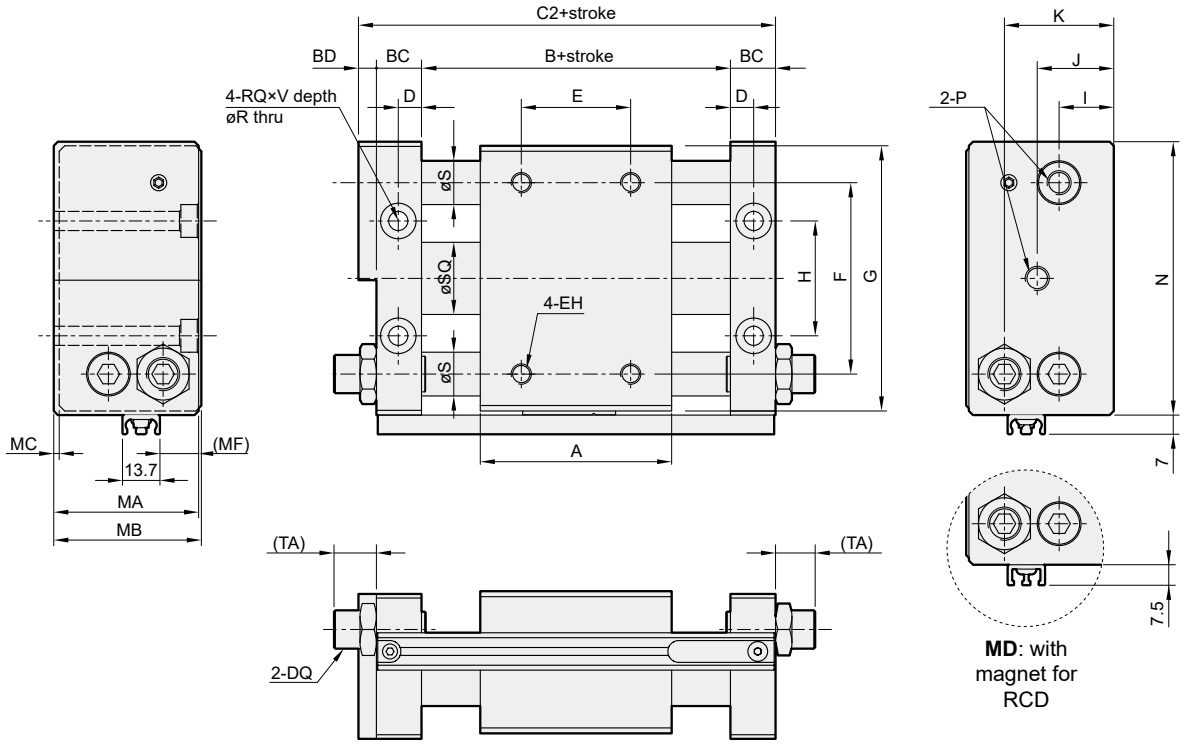
MCRPMS-*-C

With shock absorber + Adjustment bolt



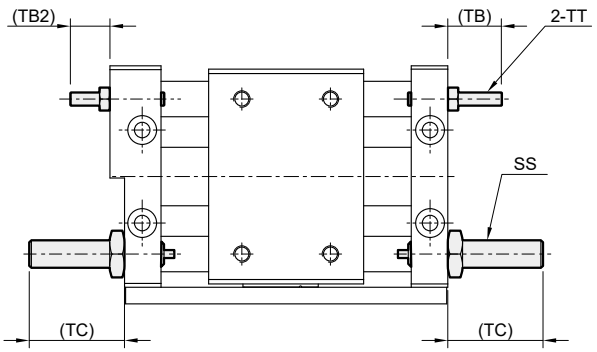
Code / Tube I.D.	A	B	BC	C1	D	DQ	E	EH	F	G	H	I	J	K	MA	MB	MC
10	45	47	12.5	72	6.5	M8×1.0	25	M4×0.7×6 depth	38	58	24	13.5	17	26	33	34	2.5
15	60	62	12.5	87	6.5	M8×1.0	30	M5×0.8×8 depth	50	73	30	15	20.5	29	39	40	2
20	70	73	16.5	106	8.5	M10×1.0	40	M6×1.0×10 depth	70	87	38	19	24	36	45	46	2
25	70	73	16.5	106	8.5	M14×1.5	40	M6×1.0×10 depth	70	96	42	21.5	27.5	40.5	53	54	2
32	85	91	18.5	128	9.5	M20×1.5	40	M8×1.25×12 depth	75	116	50	26	33	50	64	66	2

Code / Tube I.D.	MF	N	P	R	RQ	S	SQ	SS	TA	TB	TC	TT	V
10	4.2	60	M5×0.8	4.5	8	10	12	MDSC-0806-3-N	16.5	16.5	25	M4×0.7	4.4
15	6.1	75	M5×0.8	5.8	9.5	12	16.6	MDSC-0806-3-N	16.5	16.5	25	M4×0.7	5.5
20	8	89	Rc1/8	5.5	9.5	16	21.6	MAC-1007-SN	16.5	22	29	M6×1.0	5.5
25	13	98	Rc1/8	7	12	16	26.4	MAC-1412-SN	14.5	22	49	M6×1.0	6.5
32	18	118	Rc1/8	9	14	20	33.6	MAC-2015-SN	12	23.5	51.5	M8×1.25	8.6



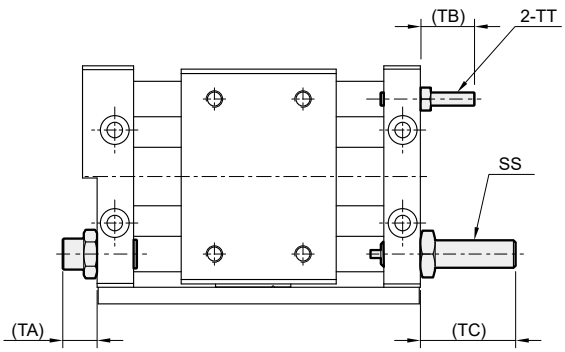
MCRPMS-G-*-B

With shock absorber



MCRPMS-G-*-C

With shock absorber + Adjustment bolt



Code / Tube I.D.	A	B	BC	BD	C2	D	DQ	E	EH	F	G	H	I	J	K	MA	MB	MC
10	45	47	12.5	4	76	6.5	M8×1.0	25	M4×0.7×6 depth	38	58	24	13.5	17	26	33	34	2.5
15	60	62	12.5	5	92	6.5	M8×1.0	30	M5×0.8×8 depth	50	73	30	15	20.5	29	39	40	2
20	70	73	16.5	5	111	8.5	M10×1.0	40	M6×1.0×10 depth	70	87	38	19	24	36	45	46	2
25	70	73	16.5	5	111	8.5	M14×1.5	40	M6×1.0×10 depth	70	96	42	21.5	27.5	40.5	53	54	2
32	85	91	18.5	6	134	9.5	M20×1.5	40	M8×1.25×12 depth	75	116	50	26	33	50	64	66	2

Code / Tube I.D.	MF	N	P	R	RQ	S	SQ	SS	TA	TB	TB2	TC	TT	V
10	4.2	60	M5×0.8	4.5	8	10	12	MDSC-0806-3-N	16.5	16.5	12.5	25	M4×0.7	4.4
15	6.1	75	M5×0.8	5.8	9.5	12	16.6	MDSC-0806-3-N	16.5	16.5	11.5	25	M4×0.7	5.5
20	8	89	Rc1/8	5.5	9.5	16	21.6	MAC-1007-SN	16.5	22	22	29	M6×1.0	5.5
25	13	98	Rc1/8	7	12	16	26.4	MAC-1412-SN	14.5	22	22	49	M6×1.0	6.5
32	18	118	Rc1/8	9	14	20	33.6	MAC-2015-SN	12	23.5	17.5	51.5	M8×1.25	8.6