

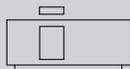


Magnet rodless cylinder

- Basic (combined guide) **MRL2 Series**
- Simplified guide 1 piston **MRL2-G Series**
- Simplified guide 2 piston **MRL2-W Series**

● Bore size:  $\phi 6/\phi 10/\phi 16/\phi 20/\phi 25/\phi 32$

JIS symbol



## Structure and material restriction

	Structure	Material restriction			Model No.
P7 Series	Low particle generation				<b>P72</b>
P5 Series (custom order product)	Low particle generation	Copper-based materials prohibited	Silicon-based materials prohibited	Halogen-based materials prohibited (fluorine, chlorine, bromine)	<b>P52</b>

## Specifications

Descriptions	MRL2-(L)-P72/P52, MRL2-G(L)-P72/P52, MRL2-W(L)-P72/P52						
Bore size	mm	$\phi 6$	$\phi 10$	$\phi 16$	$\phi 20$	$\phi 25$	$\phi 32$
Actuation		Double acting					
Working fluid		Compressed air					
Max. working pressure	MPa	0.7					
Min. working pressure	MPa	0.3		0.2			
Proof pressure	MPa	1.05					
Ambient temperature	°C	-10 to 60 (no freezing)					
Port size		M5				Rc1/8	
Stroke tolerance	mm	$+1.5$ 0 (to 1000)			$+2.0$ 0 (to 1500)		
Working piston speed	mm/s	50 to 500					
Cushion		Rubber cushion					
Lubrication		Not available					
Magnet holding force (*1)	N	19	63	166	294	350	574
Adjustable stroke range (single side) (*2)	mm	3	4	6	8.5	10	10

\*1: The simplified guide 2 piston will be a 2-fold value.

\*2: The stroke length of MRL2 (basic) cannot be adjusted.

## Stroke length

Bore size (mm)	Standard stroke length (mm)	Max. stroke length (mm)	Max. stroke with switch (mm)	Max. stroke length (mm) of centralized pipe laying with switch	Min. stroke length (mm)
$\phi 6$	50, 100, 150, 200	300	200	-	1
$\phi 10$	50, 100, 150, 200, 250, 300	500	300	300	
$\phi 16$	100, 150, 200, 250, 300, 400, 500	1000	500	500	
$\phi 20$	200, 250, 300, 350, 400, 500, 600, 700	1500	700	700	
$\phi 25$	200, 250, 300, 350, 400, 500, 600, 700	1500	700	700	
$\phi 32$	200, 250, 300, 350, 400, 500, 600, 700	1500	700	700	

■ The custom stroke length is available by 1 mm increments.

## Number of installed T switches and the min. stroke length (mm)

Switch quantity	1				2				3				4			
	Switch model No.				Switch model No.				Switch model No.				Switch model No.			
Bore size (mm)	T*V	T*H	T*YV	T*YH												
$\phi 6$ equiv.	5	5	5	5	20	50	40	70	40	85	71	115	60	120	101	160
$\phi 10$ equiv.	5	5	5	5	20	50	40	70	40	85	71	115	60	120	101	160
$\phi 16$ equiv.	5	5	5	5	20	50	40	70	40	85	71	115	60	120	101	160
$\phi 20$ equiv.	5	5	5	5	20	50	40	70	40	85	71	115	60	120	101	160
$\phi 25$ equiv.	5	5	5	5	20	50	40	70	40	85	71	115	60	120	101	160
$\phi 32$ equiv.	5	5	5	5	20	50	40	70	40	85	71	115	60	120	101	160

### Switch specifications

- 1-color/2-color display

Descriptions	Proximity 2-wire				Proximity 3-wire			
	T1H/T1V	T2H/T2V	T2YH/T2YV	T2WH/T2WV	T3H/T3V	T3PH/T3PV	T3YH/T3YV	T3WH/T3WV
Applications	Programmable controller relay, small solenoid valve	Programmable controller			Programmable controller, relay			
Output method	-				NPN output	PNP output	NPN output	NPN output
Power supply voltage	-				10 to 28 VDC			
Load voltage	85 to 265 VAC	10 to 30 VDC		24 VDC ±10%	30 VDC or less			
Load current	5 to 100 mA	5 to 20 mA (*2)			100 mA or less		50 mA or less	
Indicator lamp	LED (Lit when ON)	LED (Lit when ON)	Red/green LED (Lit when ON)	Red/green LED (Lit when ON)	LED (Lit when ON)	Yellow LED (Lit when ON)	Red/green LED (Lit when ON)	Red/green LED (Lit when ON)
Leakage current	1 mA or less with 100 VAC 2 mA or less with 200 VAC	1 mA or less			10 µA or less			
Weight g	1 m: 33 3 m: 87 5 m: 142	1 m: 18 3 m: 49 5 m: 80	1 m: 33 3 m: 87 5 m: 142	1 m: 18 3 m: 49 5 m: 80	1 m: 18 3 m: 49 5 m: 80	1 m: 33 3 m: 87 5 m: 142	1 m: 18 3 m: 49 5 m: 80	

\*1: Refer to page 309 for detailed switch specifications and Dimensions.

\*2: Max. load current: 20mA at 25°C. The current is lower than 25 mA if the operating ambient temperature around the switch is higher than 20°C. (60 to 5 mA at 10°C)

### Cylinder weight

Unit (g)

Model No.	Without switch		With switch		common piping with switch.	
	Weight for 0 mm stroke length	Additional weight per S = 100 mm	Weight for 0 mm stroke length	Additional weight per S = 100 mm	Weight for 0 mm stroke length	Additional weight per S = 100 mm
MRL2-6	73	13	103	39	-	-
MRL2-10	143	28	169	48	-	-
MRL2-16	278	43	313	63	-	-
MRL2-20	542	85	587	105	-	-
MRL2-25	954	98	1017	128	-	-
MRL2-32	1230	195	1301	225	-	-
MRL2-G-6	193	28	223	54	-	-
MRL2-G-10	368	53	394	73	411	41
MRL2-G-16	635	85	670	105	691	41
MRL2-G-20	1197	155	1242	175	1269	41
MRL2-G-25	1852	196	1915	226	1997	93
MRL2-G-32	2297	390	2368	420	2455	93
MRL2-W-6	203	28	233	54	-	-
MRL2-W-10	398	53	424	73	441	41
MRL2-W-16	710	85	745	105	766	41
MRL2-W-20	1367	155	1412	175	1439	41
MRL2-W-25	2206	196	2269	226	2351	93
MRL2-W-32	2859	390	2930	420	3017	93

\*1: The weight of the switch is not included in the product weight of the model equipped with a switch and the common piping with switch.

### Theoretical thrust table

- MRL2, MRL2-G

(Unit: N)

Bore size (mm)	Operating direction	Working pressure MPa					
		0.2	0.3	0.4	0.5	0.6	0.7
ø6	Push/Pull	-	8.48	11.3	14.1	17.0	19.8
ø10	Push/Pull	-	23.6	31.4	39.3	47.1	55.0
ø16	Push/Pull	40.2	60.3	80.4	1.01 × 10 <sup>2</sup>	1.21 × 10 <sup>2</sup>	1.41 × 10 <sup>2</sup>
ø20	Push/Pull	62.8	94.2	1.26 × 10 <sup>2</sup>	1.57 × 10 <sup>2</sup>	1.88 × 10 <sup>2</sup>	2.20 × 10 <sup>2</sup>
ø25	Push/Pull	98.2	1.47 × 10 <sup>2</sup>	1.96 × 10 <sup>2</sup>	2.45 × 10 <sup>2</sup>	2.95 × 10 <sup>2</sup>	3.44 × 10 <sup>2</sup>
ø32	Push/Pull	1.61 × 10 <sup>2</sup>	2.41 × 10 <sup>2</sup>	3.22 × 10 <sup>2</sup>	4.02 × 10 <sup>2</sup>	4.83 × 10 <sup>2</sup>	5.63 × 10 <sup>2</sup>

- MRL2-W

(Unit: N)

Bore size (mm)	Operating direction	Working pressure MPa					
		0.2	0.3	0.4	0.5	0.6	0.7
ø6	Push/Pull	-	17.0	22.6	28.3	33.9	39.6
ø10	Push/Pull	-	47.1	62.8	78.5	94.2	1.10 × 10 <sup>2</sup>
ø16	Push/Pull	80.4	1.21 × 10 <sup>2</sup>	1.61 × 10 <sup>2</sup>	2.01 × 10 <sup>2</sup>	2.41 × 10 <sup>2</sup>	2.81 × 10 <sup>2</sup>
ø20	Push/Pull	1.26 × 10 <sup>2</sup>	1.88 × 10 <sup>2</sup>	2.51 × 10 <sup>2</sup>	3.14 × 10 <sup>2</sup>	3.77 × 10 <sup>2</sup>	4.40 × 10 <sup>2</sup>
ø25	Push/Pull	1.96 × 10 <sup>2</sup>	2.95 × 10 <sup>2</sup>	3.93 × 10 <sup>2</sup>	4.91 × 10 <sup>2</sup>	5.89 × 10 <sup>2</sup>	6.87 × 10 <sup>2</sup>
ø32	Push/Pull	3.22 × 10 <sup>2</sup>	4.83 × 10 <sup>2</sup>	6.43 × 10 <sup>2</sup>	8.04 × 10 <sup>2</sup>	9.65 × 10 <sup>2</sup>	1.13 × 10 <sup>3</sup>

# MRL2/MRL2-G Series

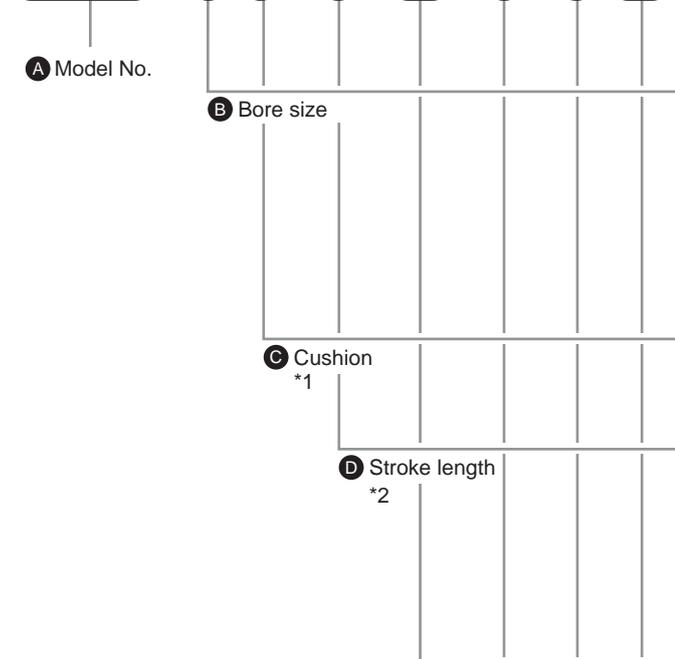
## How to order

Without switch (No magnet for switch)

**MRL2-W - 10 C - 50 P72**

With switch (Magnet for switch incorporated)

**MRL2-WL - 10 C - 50 - T2H - R - R P72**



### ⚠ Precautions for model No. selection

- \*1: In the case of MRL2-G, W with the "C" rubber-air cushion, the stopper is protruding from the end plate by approximately 1 mm when being shipped. Further note that care must be taken as moving the stopper and adjusting the stroke length may cause the rubber-air cushion to become ineffective.
- \*2: Refer to the following table for max. stroke length with switch.
- \*3: Switches other than **E** switch model No. are available. Custom order: Refer to Ending 309 for details.
- \*4: "P52" is a custom order product.
- \*5: **When selecting a centralized pipe laying type with an "R" switch, select the model No. with a switch (MRL2-L).**

Bore size (mm)	Max. stroke length with switch (mm)
ø6	200
ø10	300
ø16	500
ø20	700
ø25	700
ø32	700

### [Example of model No.]

**MRL2-WL-10-50-T2H-R-RP72**

Model: Rodless cylinder

- A** Model No. : Simplified guide 2 piston
- B** Bore size : ø10 mm
- C** Cushion : Rubber cushioned
- D** Stroke length : 50 mm
- E** Switch model No. : Proximity T2H switch
- F** Switch quantity : 1 on R-side
- G** Option : Common piping with switch.
- H** Clean room specifications : Low dust specifications

Code	Content	
<b>A Model No.</b>		
<b>Basic</b>	MRL2	Without switch
	MRL2-L	With switch
<b>Simplified guide 1 piston</b>	MRL2-G	Without switch
	MRL2-GL	With switch
<b>Simplified guide 2 piston</b>	MRL2-W	Without switch
	MRL2-WL	With switch

<b>B Bore size (mm)</b>	
<b>6</b>	ø6
<b>10</b>	ø10
<b>16</b>	ø16
<b>20</b>	ø20
<b>25</b>	ø25
<b>32</b>	ø32

<b>C Cushion</b>	
<b>Blank</b>	Rubber cushion
<b>C</b>	Rubber-air cushion

<b>D Stroke length (mm)</b>		
Bore size	Stroke length	Custom stroke length
ø6	<b>1 to 300</b>	<b>By 1 mm increments</b>
ø10	<b>1 to 500</b>	
ø16	<b>1 to 1000</b>	
ø20 to ø32	<b>1 to 1500</b>	

<b>E Switch model No.</b>						
Lead wire straight	Lead wire L-shaped	Contact	Voltage		Display	Lead wire
			AC	DC		
<b>T1H*</b>	<b>T1V*</b>	Proximity	●	□	1-color display	2 wires
<b>T2H*</b>	<b>T2V*</b>		□	●		
<b>T3H*</b>	<b>T3V*</b>		□	●		2-color display
<b>T2WH*</b>	<b>T2WV*</b>		□	●		
<b>T2YH*</b>	<b>T2YV*</b>		□	●		
<b>T3WH*</b>	<b>T3WV*</b>		□	●	1-color display (custom order)	3 wires
<b>T3YH*</b>	<b>T3YV*</b>	□	●			
<b>T3PH*</b>	<b>T3PV*</b>	□	●			

<b>* Lead wire length</b>	
<b>Blank</b>	1m (standard)
<b>3</b>	3 m (option)
<b>5</b>	5 m (option)

<b>F Switch quantity</b>	
<b>R</b>	1 on R side
<b>L</b>	1 on L side
<b>D</b>	2
<b>T</b>	3
<b>4</b>	4 (indicate switch quantity for more than 4 switches.)

<b>G Option</b>	
<b>R</b>	Centralized pipe laying type with switch (The basic and ø6 cannot be selected.)

<b>H Clean room specifications</b>		
	Structure	Material restriction
<b>P72</b>	Low dust specifications	-
<b>P52</b>	Low dust specifications	Copper-based/silicon-based/halogen-based materials (fluorine, chlorine, bromine) are prohibited

**G** Option Note 5

**H** Clean room specifications \*4

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# MEMO

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SCPD3

SCM

SSD2

MDC2

SMG

LCM

LCR

LCG

LCX

STM

STG

STR2

**MRL2**

GRC

Cylinder  
Switch

MN3E  
MN4E

4GA/B

M4GA/B

MN4GA/B

F.R. (module  
unit)

Clean  
F.R

Precision  
R

Press gauge  
Diff. press gauge

Electro-  
pneumatic R

Speed  
controller

Auxiliary  
valve

Fitting/  
tube

Clean  
air unit

Pressure  
sensor

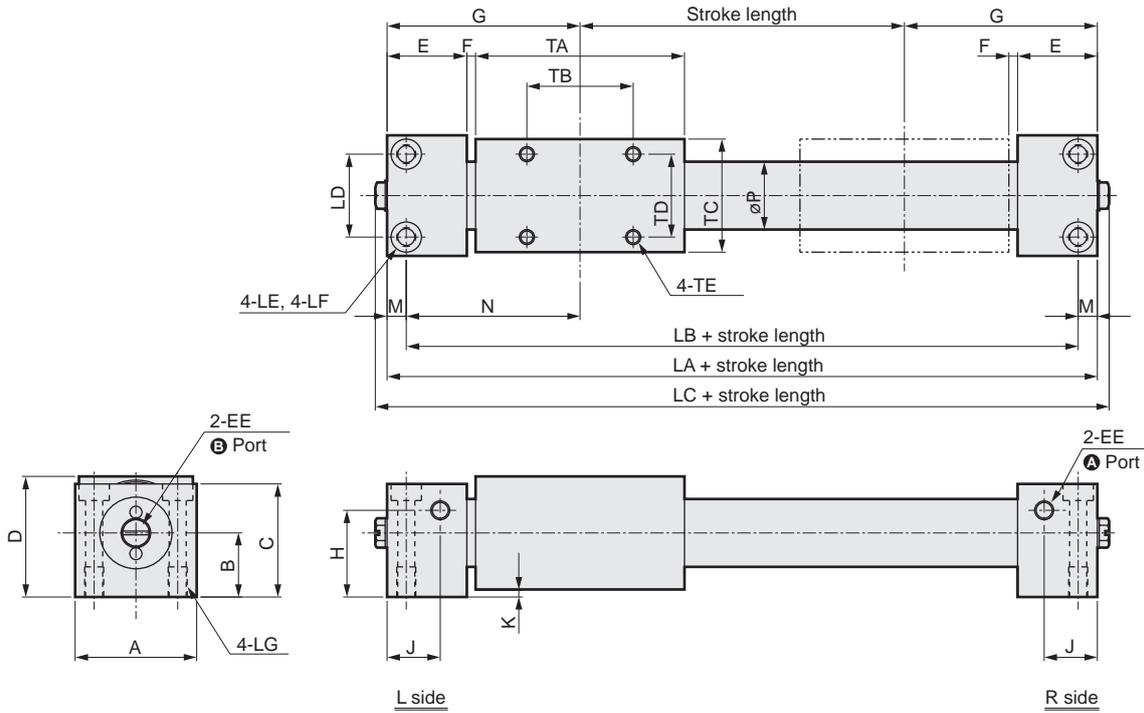
Flow rate  
sensor

Valve for  
air blow

Ending

## Dimensions: MRL2 (basic)

• MRL2 (basic) without switch



Note: It is possible to select **A**, **B** for the air piping port.  
 The unit will be shipped with the plug assembled onto port **B**.

- ø6 to ø20: Plug (FPL-M5)
- ø25, ø32: Hexagon socket head tapered screw plug

Code	Dimensions					Installation dimensions								
	LA	LC	A	C	D	LB	LD	LE	LF	LG	TB	TD	TE	
Code	General dimensions													
Bore size (mm)	B	E	EE	F	G	H	J	K	M	N	P	TA	TC	
ø6	11	15	M5 depth 4	2	37	9	9.5	2	3	34	7.6	40	18	
ø10	14	18	M5 depth 4	2	40	5.5	10	2	4	36	12	40	24	
ø16	17	21	M5 depth 4	2.5	51	23	14	2	5	46	18	55	30	
ø20	20	24	M5 depth 4	3	64	28	15.5	2	6	58	23	74	36	
ø25	25.5	27	Rc1/8	3	65	29	17	3	6	59	28	70	45	
ø32	29.5	27	Rc1/8	3	69	37	17	3	7	62	35	78	53	

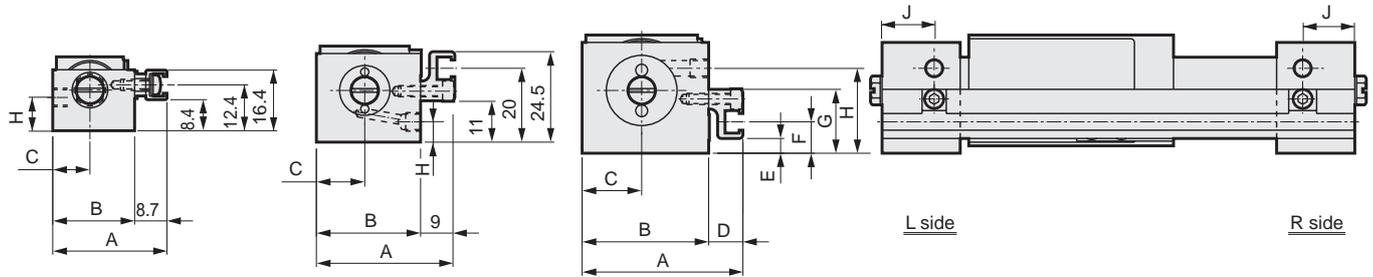
## Dimensions: MRL2 (basic)

● MRL2-L (basic) with switch

● For  $\varnothing 6$

● For  $\varnothing 10$

● For  $\varnothing 16$  to  $\varnothing 32$



Code	A	B	C	D	E	F	G	H	J
<b>Bore size (mm)</b>									
$\varnothing 6$	30.7	22	10	–	–	–	–	9	9.5
$\varnothing 10$	37	28	13	–	–	–	–	5.5	10
$\varnothing 16$	43	34	16	9.0	4	8.5	17.3	23	14
$\varnothing 20$	49	40	19	9.0	9	13.5	22.3	28	15.5
$\varnothing 25$	60.7	52	26	8.7	2	7.5	21	29	17
$\varnothing 32$	68.7	60	30	8.7	10	15.5	29	37	17

SCPD3

SCM

SSD2

MDC2

SMG

LCM

LCR

LCG

LCX

STM

STG

STR2

**MRL2**

GRC

Cylinder

Switch

MN3E

MN4E

4GA/B

M4GA/B

MN4GA/B

F.R. (module

unit)

Clean

F.R

Precision

R

Press gauge

Diff. press gauge

Electro-

pneumatic R

Speed

controller

Auxiliary

valve

Fitting/

tube

Clean

air unit

Pressure

sensor

Flow rate

sensor

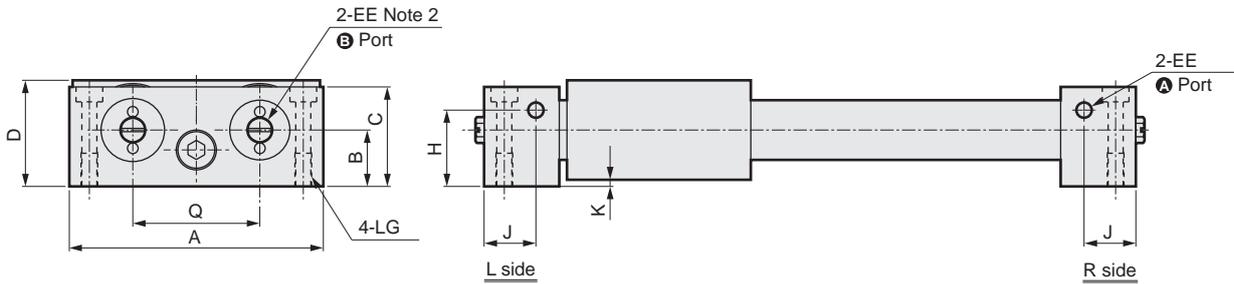
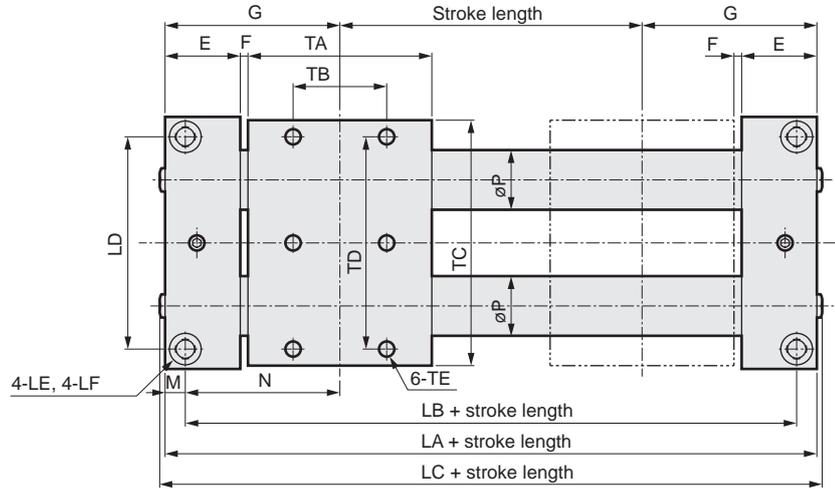
Valve for

air blow

Ending

## Dimensions: MRL2-G (simplified guide 1 piston)/MRL2-W (simplified guide 2 piston)

- MRL2-G (simplified guide 1 piston) without switch
- MRL2-W (simplified guide 2 piston) without switch



Note 1: It is possible to select **A**, **B** for the air piping port.  
 The unit will be shipped with the plug assembled onto port **B**.  
 •  $\phi 6$  to  $\phi 20$ : Plug (FPL-M5)  
 •  $\phi 25$ ,  $\phi 32$ : Hexagon socket head tapered screw plug

Note 2: MRL2-W will be "4-EE".

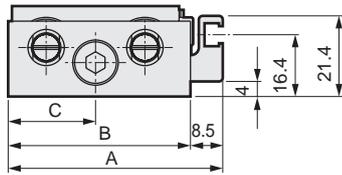
Code	Dimensions					Installation dimensions								
	LA	LC	A	C	D	LB	LD	LE	LF	LG	TB	TD	TE	
Bores size (mm)														
$\phi 6$	74	80.2	46	20	24	68	40	$\phi 3.5$	-	M4 depth 6	20	38	M3 depth 4.5	
$\phi 10$	83	87.2	64	24	26	74	54	$\phi 4.5$	$\phi 8$ spot face depth 4.4	M5 depth 10	20	55	M4 depth 6	
$\phi 16$	105	109.2	76	30	32	93	64	$\phi 5.5$	$\phi 9.5$ spot face depth 5.4	M6 depth 12	28	64	M5 depth 8	
$\phi 20$	131	135.2	90	36	38	119	77	$\phi 6.9$	$\phi 11$ spot face depth 6.5	M8 depth 12	44	78	M5 depth 8	
$\phi 25$	136	138	108	45	48	122	90	$\phi 6.9$	$\phi 11$ spot face depth 6.5	M8 depth 12	40	90	M6 depth 9	
$\phi 32$	144	146	126	53	56	130	108	$\phi 6.9$	$\phi 11$ spot face depth 6.5	M8 depth 12	40	104	M6 depth 9	
Code	General dimensions													
	B	E	EE	F	G	H	J	K	M	N	P	Q	TA	TC
Bores size (mm)														
$\phi 6$	13	15	M5 depth 4	2	37	9	9.5	2	3	34	7.6	26	40	44
$\phi 10$	14	19.5	M5 depth 4	2	41.5	5.5	11.5	2	4.5	37	12	34	40	62
$\phi 16$	17	22.5	M5 depth 4	2.5	52.5	23	15.5	2	6	46.5	18	38	55	74
$\phi 20$	20	25.5	M5 depth 4	3	65.5	28	17	2	6	59.5	23	46	74	88
$\phi 25$	25.5	30	Rc1/8	3	68	29	20	3	7	61	28	50	70	101
$\phi 32$	29.5	30	Rc1/8	3	72	37	20	3	7	65	35	60	78	119

## Dimensions: MRL2-G (simplified guide 1 piston)/MRL2-W (simplified guide 2 piston)

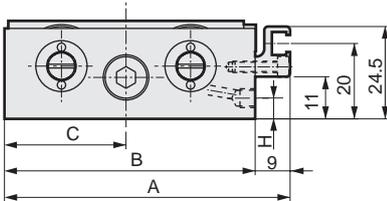
- MRL2-GL (simplified guide 1 piston) with switch
- MRL2-WL (simplified guide 2 piston) with switch



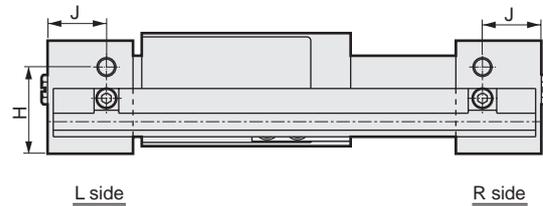
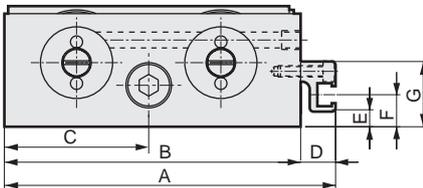
- For  $\phi 6$



- For  $\phi 10$



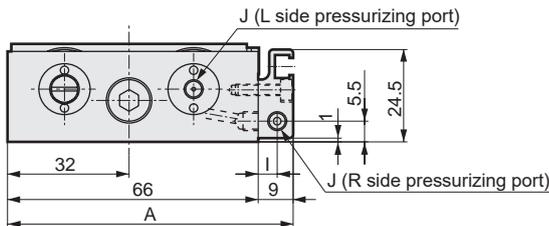
- For  $\phi 16$  to  $\phi 32$



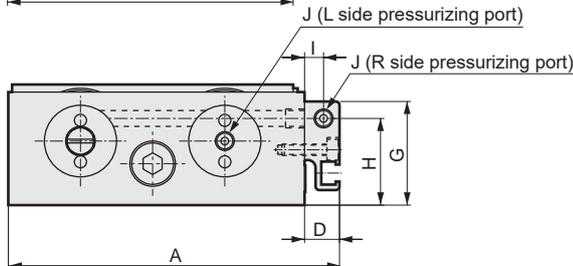
Code	A	B	C	D	E	F	G	H	J
<b>Bore size (mm)</b>									
$\phi 6$	56.5	48	23	-	-	-	-	9	9.5
$\phi 10$	75	66	32	-	-	-	-	5.5	11.5
$\phi 16$	87	78	38	9	4	8.5	17.3	23	15.5
$\phi 20$	101	92	45	9	9	13.5	22.3	28	17
$\phi 25$	116.7	108	54	8.7	2	7.5	21	29	20
$\phi 32$	134.7	126	63	8.7	10	15.5	29	37	20

- MRL2-GL-\*R (simplified guide 1 piston) common piping with switch.
- MRL2-WL-\*R (simplified guide 2 piston) common piping with switch.

- For  $\phi 10$



- For  $\phi 16$  to  $\phi 32$



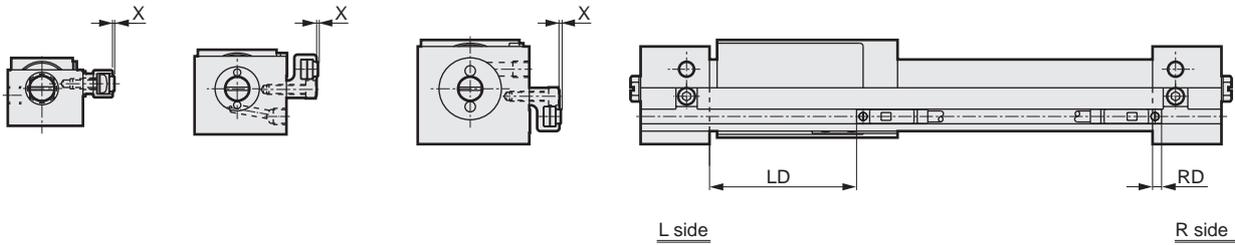
Code	A	D	G	H	I	J
<b>Bore size (mm)</b>						
$\phi 10$	75	-	-	-	5	M5 depth 4
$\phi 16$	87	9	27.5	23	5	M5 depth 4
$\phi 20$	101	9	32.5	28	5	M5 depth 4
$\phi 25$	122	14	45	29	7.5	Rc1/8
$\phi 32$	140	14	53	37	7.5	Rc1/8

- SCPD3
- SCM
- SSD2
- MDC2
- SMG
- LCM
- LCR
- LCG
- LCX
- STM
- STG
- STR2
- MRL2**
- GRC
- Cylinder Switch
- MN3E
- MN4E
- 4GA/B
- M4GA/B
- MN4GA/B
- F.R. (module unit)
- Clean F.R
- Precision R
- Press gauge
- Diff. press gauge
- Electro-pneumatic R
- Speed controller
- Auxiliary valve
- Fitting/tube
- Clean air unit
- Pressure sensor
- Flow rate sensor
- Valve for air blow
- Ending

## Switch mounting position dimensions

● MRL2-L-\* (switch: T2<sup>H/V</sup>, T3<sup>H/V</sup>, T2W<sup>H/V</sup>, T3W<sup>H/V</sup>)  
GL  
WL

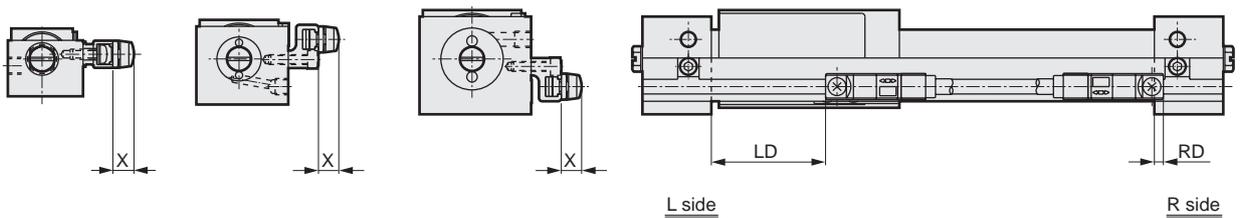
● For ø6      ● For ø10      ● For ø16 to ø32



Code	T2 <sup>H/V</sup> , T3 <sup>H/V</sup>			T2W <sup>H/V</sup> , T3W <sup>H/V</sup>		
	Bore size (mm)	LD	RD	X	LD	RD
ø6	27	3.5	0.5	29	1.5	0.5
ø10	27	2.5	0.5	29	0.5	0.5
ø16	44	2.5	0.5	46	0.5	0.5
ø20	63.5	1	0.5	65.5	-1	0.5
ø25	58	2	0.5	60	0	0.5
ø32	67.5	1.5	0.5	69	-0.5	0.5

● MRL2-L-\* (switch: T1<sup>H/V</sup>, T2Y<sup>H/V</sup>, T3Y<sup>H/V</sup>)  
GL  
WL

● For ø6      ● For ø10      ● For ø16 to ø32



Code	LD	RD	X
Bore size (mm)			
ø6	26	4.5	6 (11.5)
ø10	26	3.5	6 (11.5)
ø16	43	3.5	6 (11.5)
ø20	62.5	2	6 (11.5)
ø25	57	3	6 (11.5)
ø32	66	2.5	6 (11.5)

Note 1: The values within the brackets are for T1<sup>H/V</sup>.