MRG2

Rodless

Magnet rodless cylinder with high precision guide

ø10/ø16/ø25



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The cylinder switches T2YH, T2YV, T3YH, and T3YV are scheduled for end of production at the end of December 2023.

SCP*3

CMK2

CMA2

SCM

SCG

SCA2

SCS2

CKV2

CAV2/

COVP/N2

SSD2

SSG

SSD

CAT

MDC2

MVC

SMG

MSD/ MSDG

FC*

STK

SRL3

SRG3

SRM3

SRT3

MRL2

MRG2

SM-25

ShkAbs

FJ

FK Spd Contr

SCP*3

CMK2

CMA2

SCM

SCG

SCA2

SCS2

CKV2

COVP/N2

SSD2

SSG

SSD

CAT

MDC2

MVC

SMG

MSD/ MSDG

FC*

STK

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SRM3

SRT3

MRL2

MRG2

SM-25

ShkAbs

FJ

FK

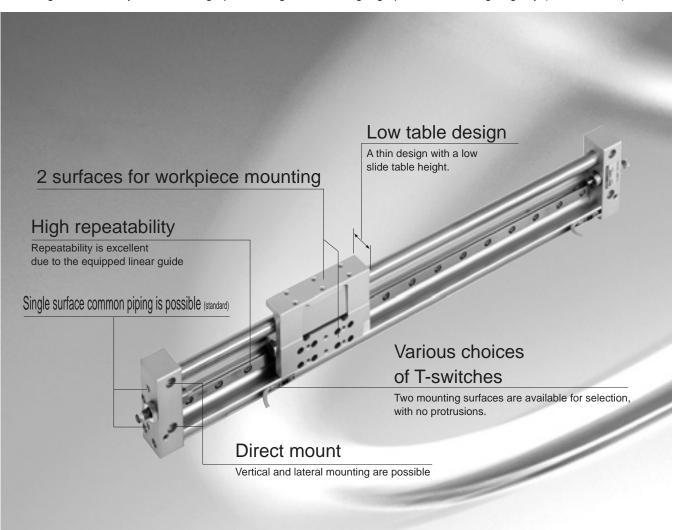
Spd

Spa

Ending

Uses a guide with a rated load 1.5 times greater than previous models!

The use of an innovative lubricating mechanism has significantly improved the service life and operating stability. Magnet rodless cylinder with high precision guide boasting high precision and high rigidity (ø10/ø16/ø25).



Durability is doubled

(in-house comparison)

Lubricating mechanism: lube keeping structure

A fiber assemblage (lube keeping structure) soaked with grease is mounted on the sliding portions of the piston and slider.

This enables stable supply of lubrication over a long period of time to suppress the progression of wear.

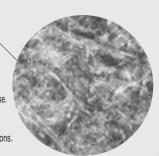
A significant improvement of service life (by more than 2-fold compared to our previous models) and stabilization of operation have been realized.

Lubrication supplying/absorbing function

Due to the effects of the capillary phenomenon, the soaked grease can be evenly applied to the sliding surface in a stable manner while absorbing any excess grease.

Dust wiper function

As well as dust, the powder from packing wear, etc., is captured within the fiber assemblage to reduce dirt from accumulating on the sliding portions



Series variation

Bore

size

(mm)

ø10

ø16

ø25

Standard stro

200

300

100

150

50

Model

No.

MRG2

Variation

Double

acting

Magnet rodless cylinder high precision guide MRG2 Series

				• : S	Stand	ard, (): O	ption	, 🔃 :	Not a	vailable	
							(Optio	n			
	ke (mm)				Min. stroke	Max. stroke	With both-sided full stroke, adjustable brackets	With R side full stroke, adjustable bracket	With L side full stroke, adjustable bracket	Switch	Page	
	400	500	600	700	(mm)	(mm)	Α	A1	A2			
						300						
• •					50	500	0				1766	

700

SCP*3

CMK2

CMA2

SCM

SCG

SCA2

SCS2

CKV2

CAV2/

COVP/N2

SSD2

SSG

SSD

CAT

MDC2

MVC

SMG

MSD/

MSDG

FC*

STK

SRL3

SRG3

SRM3

SRT3

MRL2

MRG2

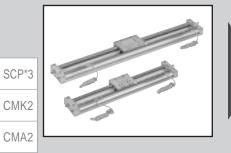
SM-25

ShkAbs

FJ

FK

Spd Contr



Magnet rodless cylinder with high precision guide

MRG2 Series

● Bore size: ø10, ø16, ø25

JIS symbol







Specifications

SCM

SCG

SCA2

SCS2

CKV2 CAV2/ COVP/N2 SSD2

SSG

SSD

CAT

MDC2

MVC

SMG MSD/ MSDG FC*

STK

SRL3

SRG3

SRM3

SRT3

MRL2

MRG2

SM-25

ShkAbs

Specifications											
Item			MRG2								
Bore size	mm	ø10	ø16	ø25							
Actuation			Double acting								
Working fluid			Compressed air								
Max. working pressure	MPa		0.7 (≈100 psi, 7 bar)								
Min. working pressure	MPa	0.3 (≈44 psi, 3 bar)	0.2 (≈29 ټ	osi, 2 bar)							
Proof pressure	MPa		1.05 (≈150 psi, 10.5 bar)								
Ambient temperature	°C		5 (41°F) to 60 (140°F)								
Port size		N	15	Rc1/8							
Stroke tolerance	mm		+1.5								
	mm		0								
Working piston speed	mm/s		50 to 1000								
Cushion			Shock absorber								
Lubrication		Not required (u	Not required (use turbine oil ISO VG32 if necessary for lubrication)								
Magnet holding force	N	63	166	350							
Allowable absorbed energy	J	2.1	5.3	8.7							

^{*1:} Due to resistance of the shock absorber, it will take time to reach the stroke end. Take this into consideration upon use.

Stroke

	Bore size (mm)	Standard stroke (mm)	Max. stroke (mm)	Min. stroke (mm)	Min. stroke with switch (mm)
-	ø10	50, 100, 150, 200, 300	300		50
	ø16	50, 100, 150, 200, 300, 400, 500	500	50	50
+	ø25	50, 100, 150, 200, 300, 400, 500, 600, 700	700		(with 2 pcs.) *2

^{*1:} Products other than standard stroke are made-to-order products.

FK

FJ

Spd Contr

^{*2:} Products other than standard stroke are made-to-order products.

 $^{^{*}2}$: The min. stroke for T1H, T2YH and T3YH with two switches is 70.

Specifications

Switch specifications

● 1-color/2-color LED

	2-wir	e proxin	nity			3-wire p	roximity	,	2-wire	e reed	CMK
Item	T1H/T1V	T2H/ T2V	T2YH/ T2YV	T2WH/ T2WV	T3H/ T3V	T3PH/ T3PV	T3YH/ T3YV	T3WH/ T3WV	тон/тоv	T5H/T5V	CMA
Applications	For programmable controller, relay, compact solenoid valve	progran	edicated f				rammable er, relay		For programmable controller, relay	For programmable controller, relay IC circuit (without indicator lamp), serial connection	SCM
Output method - NPN output PNP output NPN output NPN output -								-	SCG		
Pwr. supp. V.		-				10 to 2	28 VDC			=	
Load voltage	85 to 265 VAC	10 to 3	0 VDC	24 VDC ±10%	30 VDC or less				12/24 VDC 110 VAC	5/12/24 VDC 110 VAC	SCA
Load current	5 to 100 mA	5 to	o 20 mA (*3)	100 mA	or less	50 mA	or less	5 to 50 mA 7 to 20 mA	50 mA or less 20 mA or less	000
Indicator	LED (Literature CN)	LED (Lit when	Red/green LED	Red/green LED	LED (Lit when	Yellow LED	Red/green LED	Red/green LED	LED (Literature CNI)	No indicator lamp	SCS
	(Lit when ON)	ON)	(Lit when ON)	(Lit when ON)	ON)	(Lit when ON)	(Lit when ON)	(Lit when ON)	(Lit when ON)		CKV
Leakage current	1 mA or less with 100 VAC, 2 mA or less with 200 VAC	1	mA or les	SS	10 μA or less				0	mA	CAV2/ COVP/N
Maight g	1 m:33	1 m:18	1 m:33	1 m:18		n:18	1 m:33	1 m:18	1 m:10 2 m	o.40	SSD
Weight g	3 m:87 5 m:142	3 m:87			n:49 n:80	3 m:87 5 m:142	3 m:49 5 m:80	1 m:18 3 n	n:49 5 m:80	SSG	

^{*1:} Refer to Ending Page 1 for detailed switch specifications and dimensions.

Cylinder weight

Unit (g)

	No s	witch	Switch weight	Additional weight		
Туре	Product weight when stroke S = 0 mm	Additional weight per S = 100mm	per 1 grommet	per full stroke adjustable bracket		
MRG2-10	610	180	g. ee.	75		
MRG2-16	1170	280	18	110		
MRG2-25	3270	490		200		

Theoretical thrust table

(Unit: N)

Bore size	Operating		Working pressure MPa										
(mm)	direction	0.2	0.3	0.4	0.5	0.6	0.7						
ø10	Push/Pull	-	23.6	31.4	39.3	47.1	55.0						
ø16	Push/Pull	40.2	60.3	80.4	1.01x10 ²	1.21x10 ²	1.41x10 ²						
ø25	Push/Pull	98.2	1.47x10 ²	1.96x10 ²	2.45x10 ²	2.95x10 ²	3.44x10 ²						

Specifications for rechargeable battery (Catalog No. CC-1226A)

Design compatible with rechargeable battery manufacturing process

SCP*3

SSD

CAT MDC2

MVC

SMG MSD/

MSDG FC*

STK

SRL3 SRG3

SRM3

SRT3

MRL2

MRG2

SM-25

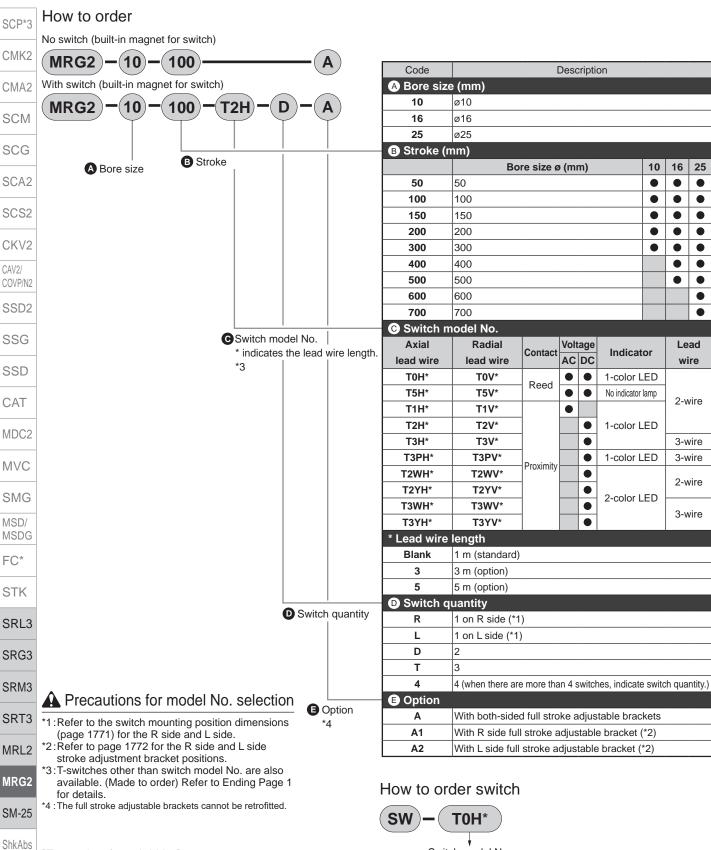
ShkAbs

FJ

FΚ Spd Contr

^{*2:} Switches other than the above models, such as switches with connectors, are also available. Refer to Ending Page 1.

^{*3 :} The max. load current is 20 mA at 25°C. The current is lower than 20 mA if the operating ambient temperature around the switch is higher than 25°C. (5 to 10 mA at 60°C)



[Example of model No.]

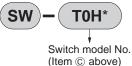
MRG2-10-100-T2H-D-A

Model: Rodless cylinder high precision guide

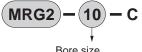
A Bore size B Stroke : 100 mm

Switch model No. : Proximity switch T2H D Switch quantity : 2 pcs. included

Option : With both sided full stroke adjustable brackets



How to order discrete shock absorber



Bore size (Item (A) above)

FJ

FΚ

Spd

Contr

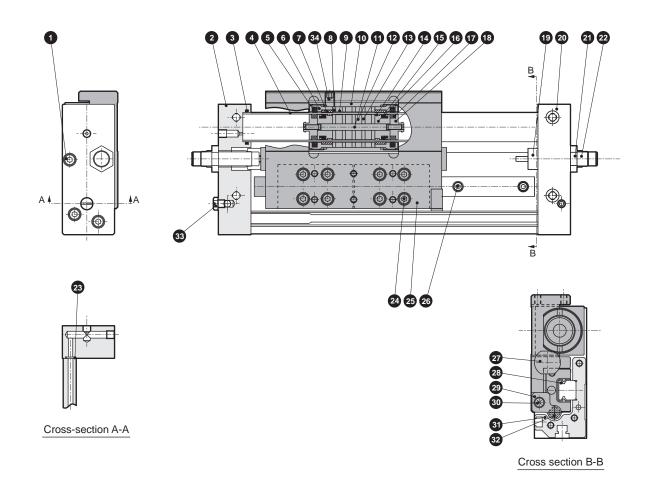
Ending

FC*

Internal structure and parts list

Internal structure and parts list

MRG2 (High precision guide)



Cannot be disassembled

MRG2 (High precision guide)

No.	Part name	Material	Remarks	No.	Part name	Material	Remarks
1	Hexagon socket head cap screw	Stainless steel		18	Piston (2)	Aluminum alloy	Chromate
2	End plate (L)	Aluminum alloy	Alumite	19	Stopper cap	Stainless steel	
3	O-ring	Nitrile rubber		20	End plate (R)	Aluminum alloy	Alumite
4	Cylinder tube	Stainless steel		21	Hexagon nut	Steel	Galvanizing
5	Lube keeping structure (for slider)	Special rubber		22	Shock absorber		
6	Slider cover	Aluminum alloy	Chromate	23	O-ring	Nitrile rubber	
7	Slider wear ring	Polyacetal resin		24	Hexagon socket head cap screw	Stainless steel	
8	Slider yoke	Steel	Galvanizing	25	Table	Aluminum alloy	Alumite
9	Magnet	Special alloy		26	Hexagon socket head cap screw	Stainless steel	
10	Slider	Aluminum alloy	Chromate	27	Rod bearer	Stainless steel	
11	Piston shaft	Stainless steel		28	Linear guide		
12	Magnet	Special alloy		29	Magnet holder	Polyacetal resin	
13	Piston yoke	Steel	Galvanizing	30	Cross-recessed pan head machine screw	Stainless steel	
14	Piston wear ring	Polyacetal resin		31	Base	Aluminum alloy	Alumite
15	Piston (1)	Aluminum alloy	Chromate	32	Magnet	Special alloy	
16	Piston packing	Nitrile rubber		33	Plug	Copper alloy or steel	
17	Lube keeping structure (for piston)	Special rubber		34	Hexagon socket set screw	Stainless steel	ø25 only

SCP*3

CMK2

CMA2

SCM

SCG SCA2

SCS2

CKV2

CAV2/ COVP/N2

SSD2

SSG

SSD

MDC2

MVC

SMG

MSD/ MSDG

FC*

STK

SRL3

SRG3

SRM3

SRT3 MRL2

MRG2

SM-25

ShkAbs

FJ

FK Spd Contr

Dimensions

SCP*3

CMK2

CMA2

SCM

SCG

SCA2

SCS2

CKV2

CAV2/

COVP/N2

SSD2

SSG

SSD

CAT

MDC2

MVC

SMG MSD/ MSDG FC*

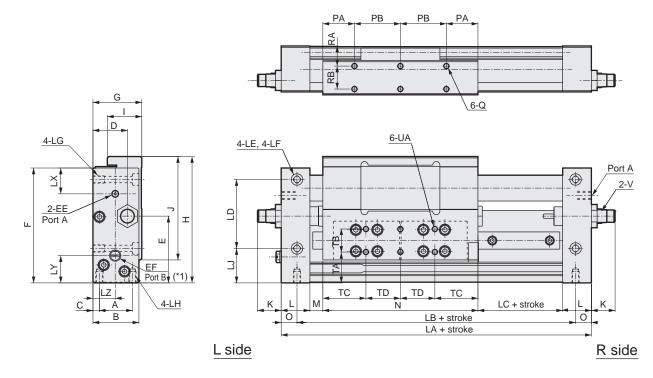
STK

SRL3

SRG3



MRG2 (High precision guide)



Code	Dimen	sions				Mount	Mounting dimensions										
Bore size (mm)	LA	В	G	F	Н	0	LB	LD	LJ	LE	LF			L	G	LH	
ø10	138	26	28	70	74	4 11	116 40 22		ø4.5	8 spot	face de	oth 4.4	M5 depth 8		M4 depth 8		
ø16	166	32	34	80	88	3 11	144 48 24			ø4.5	8 spot	face de	oth 4.4	M5 de	epth 8	M5 depth 8	
ø25	214	44	46	100	11	4 15	15 184 62 32				9.5 spot face depth 5.4			M6 de	pth 12	M6 depth 10	
Code	Mount	ing din	nensior	าร													
Bore size (mm)	Α	С	PA	РВ	R	A RB	3 Q			TA	ТВ	TC	TD	UA			
ø10	18	4	16	24	12	2 12	N	14 depth	6	19.5	13	24	16		M4 depth 6		
ø16	23	4.5	22	32	14	4 16	٨	14 depth	6	21.5	16	30	24	M4 depth 6			
ø25	23	5.5	34	40	20	20	N	16 depth	8	23	22	38	36	M6 depth 8			
Code	Gener	al dime	nsions														
Bore size (mm)	D	LX	EE		LY	EF	LZ	Е	ı	J	K	L	M	N	LC	V	
ø10	19	18	M5 dep	th 4	17	M5 depth 4	11.5	38.5	20	58	14	20	9	80	9	MRG2-10-C	
ø16	24	18	M5 dep	th 4	19	M5 depth 4	15	46.5	24	72	16.5	20	9	108	9	MRG2-16-C	
ø25	32.5	23	Rc1/	8	21.5	Rc1/8	23	55	32	98	19	25	8	148	8	MRG2-25-C	

^{*1:} When using single surface common piping, use by removing the plug of port B and attaching this plug to port A on the R side.

SRM3 SRT3

MRL2

MRG2

SM-25

ShkAbs

FJ

FK

Spd Contr

Dimensions

SCP*3

CMK2

CMA2

SCM

SCG

SCA2

SCS2

CKV2

CAV2/ COVP/N2 SSD2

SSG

SSD

CAT

MDC2

MVC

SMG

MSD/ MSDG

FC*

STK

SRL3

SRG3

SRM3

SRT3

MRL2

MRG2

SM-25

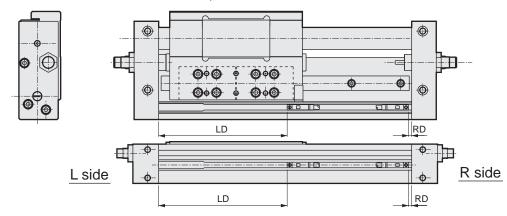
ShkAbs

FJ

FK Spd Contr

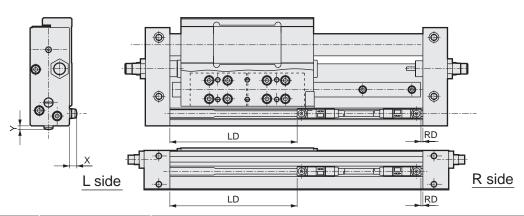
Switch mounting position dimensions

• MRG2- (switch: $T0^{H}/v$, $T5^{H}/v$, $T2^{H}/v$, $T3^{H}/v$, $T2W^{H}/v$, $T3W^{H}/v$)



	Code	T0 ^H /v	,T5 ^H /v	T2 ^H /v	,T3 ^H /v	T2W ^H /v	,T3W ^H /v
	Bore size (mm)	RD	LD	RD	LD	RD	LD
	ø10	1.5	75.5	2.5	76.5	4.5	78.5
MRG2	ø16	1.5	103.5	2.5	104.5	4.5	106.5
	ø25	0.5	142.5	1.5	143.5	3.5	145.5
	ø10	26.5	100.5	27.5	101.5	29.5	103.5
MRG2-*-A	ø16	26.5	128.5	27.5	129.5	29.5	131.5
	ø25	50.5	192.5	51.5	193.5	53.5	195.5
	ø10	51.5	75.5	52.5	76.5	54.5	78.5
MRG2-*-A1	ø16	51.5	103.5	52.5	104.5	54.5	106.5
	ø25	100.5	142.5	101.5	143.5	103.5	145.5
	ø10	1.5	125.5	2.5	126.5	4.5	128.5
MRG2-*-A2	ø16	1.5	153.5	2.5	154.5	4.5	156.5
	ø25	0.5	242.5	1.5	243.5	3.5	245.5

■ MRG2- (switch: T1^H/v, T2Y^H/v, T3Y^H/v)



	Code		T2Y ^H /v,	T3Y ^H /v	
	Bore size (mm)	RD	LD	Х	Υ
	ø10	1.5	75.5	6(11.5)	3(8.5)
MRG2	ø16	1.5	103.5	6(11.5)	3(8.5)
	ø25	0.5	142.5	6(11.5)	3(8.5)
	ø10	26.5	100.5	6(11.5)	3(8.5)
MRG2-*-A	ø16	26.5	128.5	6(11.5)	3(8.5)
	ø25	50.5	192.5	6(11.5)	3(8.5)
	ø10	51.5	75.5	6(11.5)	3(8.5)
MRG2-*-A1	ø16	51.5	103.5	6(11.5)	3(8.5)
	ø25	100.5	142.5	6(11.5)	3(8.5)
	ø10	1.5	125.5	6(11.5)	3(8.5)
MRG2-*-A2	ø16	1.5	153.5	6(11.5)	3(8.5)
	ø25	0.5	242.5	6(11.5)	3(8.5)

*1: Values in () are for T1 $^{\text{H}}$ /v.

'- Ending

Dimensions



SCP*3

CMK2

CMA2

SCM

SCG

SCA2

SCS2

CKV2

CAV2/ COVP/N2

SSD2

SSG

SSD

CAT

MDC2

MVC

SMG

MSD/

MSDG

FC*

STK SRL3

SRG3

SRM3

SRT3

MRL2

MRG2

SM-25

ShkAbs

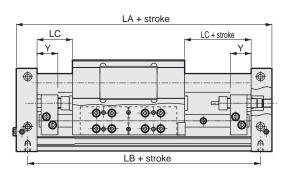
FJ

FΚ

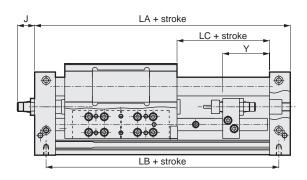
Spd

Contr Ending

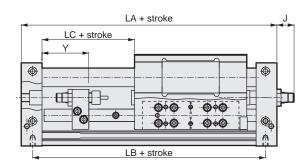
MRG2-*-A (high	precision quide	with both	sided full	stroka	adjustable	hrackets)



• MRG2-*-A1 (high precision guide, with R side full stroke adjustable brackets)



■ MRG2-*-A2 (high precision guide, with L side full stroke adjustable brackets)

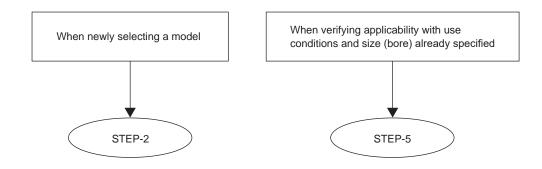


Code	LA			LB			LC			Υ			J		
Bore size (mm)	Α	A1	A2	Α	A1	A2	Α	A1	A2	Α	A1	A2	Α	A1	A2
ø10	188		166		34	59		20	45		-	1	4		
ø16	216		194		34	59		20	45		-	16.5			
ø25		314		284		58	108		41	91		-	19		

MRG2 Series selection guide

As the selection conditions are different from those of general air cylinders, confirm whether the model is adequate or not according to selection guide.

STEP-1



STEP-2

Confirming working conditions

1. Working pressure (P) (MPa)

2. Applied load (W) (applied load = workpiece load + jig load)

3. Mounting orientation Horizontal / vertical (Refer to Fig. 1 below)

4. Stroke (L) (m)

5. Travel time (t) (S)

6. Average speed (Va) (m/s)

Formula for cylinder average speed Va

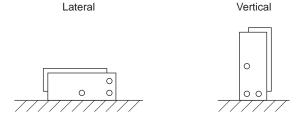
$$Va = \frac{L}{t} (m/s)$$

[Mounting orientation]

Operating direction Horizontal, vertical - up, vertical - down

Mounting direction Lateral, vertical (refer to Fig. 1)

Fig. 1



SCP*3

CMK2

CMA2

SCM

SCG

SCA2

SCS2

CKV2

CAV2/ COVP/N2

SSD2

SSG

SSD

CAT

MDC2

MVC

SMG

MSD/ MSDG

FC*

STK

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SRG3

SRM3

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FΚ

Spd Contr

Ending

STEP-3

Calculation of required thrust

Calculate the required thrust (F_N) of the cylinder.

1. For horizontal operation

$$F_N=Wx0.2^* =$$
 (N)

2. For vertical operation

F_N=W =[] (N)

* This is the frictional resistance value of the guide, etc., when a load is placed on the slider. Consider separately when there is further external resistance.

STEP-4

Selection of approximate size of cylinder

Required thrust of cylinder $F_N \le$ theoretical thrust x 100 100

(refer to Fig. 2.) μ: Thrust efficiency (%)

α: Load factor (%) (refer to Fig. 2.)

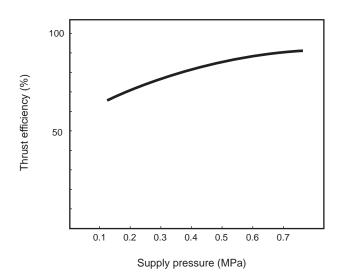
Select a cylinder size which satisfies this condition.

Table 1. Theoretical thrust value

(N)

Bara siza (mm)	Working pressure MPa						
Bore size (mm)	0.2	0.3	0.4	0.5	0.6	0.7	
ø10	-	24	31	39	47	55	
ø16	40	60	80	101	121	141	
ø25	98	147	196	245	295	344	

Fig. 2 Thrust efficiency µ



Load factor a: For general use, the value within the range in Table 2 is desirable.

Table 2. Load factor guidelines

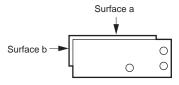
	g
Working pressure MPa	α (%)
0.2 to 0.3	α ≤ 40
0.3 to 0.6	α ≤ 50
0.6 to 0.7	α ≤ 60

Selection guide

STEP-5

Calculate the vertical load and value for each moment

Calculate the vertical loads (W1, W2) and the moments (M1, M2, M3) depending on the load cylinder mounting status.



	Mounting on surface a	Mounting on surface b	Calculation results	sc
Vertical load W1 W2	W1	₩1 ₩1 • • • • • • • • • • • • • • • • • • •	W1= W2=	SC
Bending moment M1=F1xℓ1	F1 F1 X is the distance from the surface of the slider to the working point of the force	F1 F1 F1 O O O O O O O O O O O O O O O O	M1=	SS SS SS
Radial moment M2=F2x{2	F2 C.L F2 F2 F2 F2 F2 F2 F2 F2 C.L indicates the center point between the set screws on surface a	F2 C.L 12	M2=	ME MY SM MS MS FC ST
Torsion moment M3=F3xt3	F3 F3 F3 F3 F3 F3 F3	F3 F	M3=	SR SR SR MF MF

Table 3. Values of each parameter

		(111)
Bore size (mm)	С	D
ø10	0.016	0.012
ø16	0.020	0.014
ø25	0.026	0.020

SCP*3

CMK2

CMA2

SCM

SCG

FJ

FΚ Spd

Contr Ending STEP-6

SCP*3

CMK2

CMA2

SCM

SCG

SCA₂

SCS₂

CKV2

CAV2/ COVP/N2

SSD2

SSG

SSD

CAT

MDC2

MVC

SMG

MSD/

MSDG

FC*

STK

SRL3

SRG3

SRM3

SRT3

MRL2

MRG2

SM-25

ShkAbs

FJ

FΚ Spd

Contr

Ending

When the total value is greater than 1.0 1. Review the load

W1 (or W2)

W1 (or W2) max

2. Use a cylinder with wider bore size, etc., for revision.

M1

M1max

M2 М3 ≤ 1.0 M3max M2max

Divide each load with the max. allowable values listed in Table 4 and confirm that the total value thereof is 1.0 or less.

→ Increase cylinder bore size

Table 4. Max. allowable values of vertical load and moments

Confirmation of the vertical load and the composite value for each moment

Bore size (mm)	W1max(N)	W2max(N)	M1max (N·m)	M2max (N·m)	M3max (N·m)
ø10	44	35	2.2	1.2	2.2
ø16	103	91	7.4	3.2	7.4
ø25	176	176	18.3	7.3	18.3

STEP-7

Confirmation of kinetic energy

Calculate the kinetic energy from load weight m (kg) and speed V (m/s) to confirm that the value is within the range of the specifications of the shock absorber. If the kinetic energy exceeds the specifications, increase the cylinder size or install an external shock absorber.

(1) Formula for kinetic energy calculation

E1: Kinetic energy (J)

m: Load weight (kg) V : Speed (m/s) (N)

W: Applied load L : Cylinder stroke (m)

t : Operating time (s) a : Cylinder load factor (%)

F_N: Required thrust (N) μ : Thrust efficiency (%)

(2) Shock absorber

The shock absorber used with MRG2 is shown in Table 5.

Table 5. Shock absorber specifications

Model	MRG2-10	MRG2-16	MRG2-25
Shock absorber model No.	MRG2-10-C	MRG2-16-C	MRG2-25-C
Shock absorber model No.	(NCK-00-0.3 used)	(NCK-00-0.7 used)	(NCK-00-1.2 used)
Max. absorbed energy (J) *1	2.1	5.3	8.7
Stroke (mm) *1	5	7	8.5
Absorbed energy per hour (kJ/hour)	6.3	12.6	21.6
Max. operating frequency (cycle/min)	35	30	30

^{*1)} As a stopper cap is used to stop the piston before the stroke end, the energy and stroke are both smaller than standard products.

Selection guide

Confirmation of allowable colliding energy of shock absorber

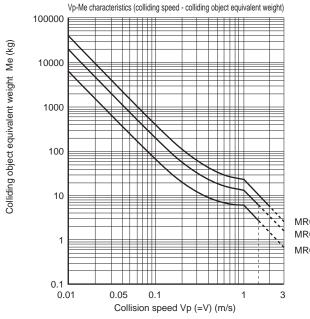
Calculate colliding object equivalent weight Me and colliding energy E with the formula listed in the table below and confirm that Me and E are less than or equal to the allowable values listed in Fig. 4 and Table 5. Also confirm that the repetition frequency is less than or equal to the allowable value according to Table 5.

Code

E : Colliding energy	(J)
Me: Colliding object equivalent weight	(kg)
m : Load weight	(kg)
F : Cylinder thrust	(N)
V : Colliding speed	(m/s)
St : Shock absorber stroke	(m)
g : Gravity acceleration	9.8 (m/s^2)

	Horizontal movement	Vertical down	Vertical up
Applications	V • · · · · · · · · · · · · · · · · · ·	V	
Colliding object equivalent weight Me (kg)	$Me=m+\frac{2F\cdot St}{V^2}$	Me=m+ $\frac{2 \cdot \text{St (F+mg)}}{\text{V}^2}$	Me=m+ 2·St (F-mg) V ²
Energy E (J)	$E = \frac{mV^2}{2} + F \cdot St$	$E = \frac{mV^2}{2} + (F + mg) \cdot St$	$E = \frac{mV^2}{2} + (F-mg)\cdot St$

Fig. 4



MRG2-25(NCK-1.2) MRG2-16(NCK-0.7) MRG2-10(NCK-0.3) SCP*3

CMK2

CMA2

SCM

SCG

SCA2

SCS2

CKV2

COVP/N2

SSD2

SSG

SSD

CAT

MDC2

MVC

SMG

MSD/ MSDG

FC*

STK

SRL3

SRG3

SRM3

SRT3

MRL2

MRG2

....

SM-25

ShkAbs

FJ FK

Spd Contr

SCP*3

CMK2

CMA2

SCM

SCG

SCA2

SCS2

CKV2

CAV2/ COVP/N2

SSD2

SSG

SSD

CAT

MDC2

MVC

SMG MSD/

MSDG

FC*

STK

SRL3

SRG3

SRM3

SRT3

MRL2

SM-25

ShkAbs

FJ

FK Spd

Contr

Ending

STEP-8

Confirmation of inertia load

Inertia force functioning due to the load will operate at the end of the stroke.

Confirm whether this force is within the allowable range.

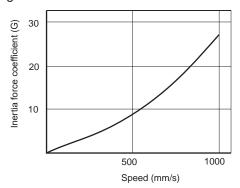
(1) Calculate inertia force Fi according to speed V and the inertia force coefficient shown in Fig. 5.

Fi=9.8xmxG(N)

m: Load weight (kg)

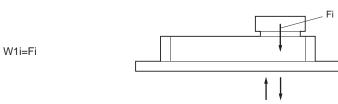
G: Inertia force coefficient

Fig. 5. Inertia force coefficient



(2) Calculate the moment and load that is generated due to the inertia force. (Example)





When vertically moving the entire cylinder

(3) Add the load and moment generated by static load and inertial force, divide each load with the allowable values listed in Table 4 and confirm that the total values thereof are 1.0 or less.

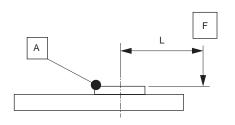
W1g=W1+W1i M1g=M1+M1i W2g=W2+W2i M2g=M2+M2i M3g=M3+M3i

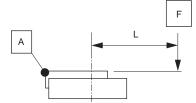
$$\frac{\text{W1g (or W2g)}}{\text{W1 (or W2) max}}$$
 + $\frac{\text{M1g}}{\text{M1 max}}$ + $\frac{\text{M2g}}{\text{M2 max}}$ + $\frac{\text{M3g}}{\text{M3 max}}$ ≤ 1.0

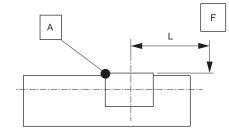
Technical data

MRG2 Table deflection (reference value)

Bending moment direction M1=FxL Radial moment direction M2=FxL Torsion moment direction M3=FxL

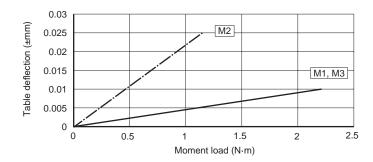




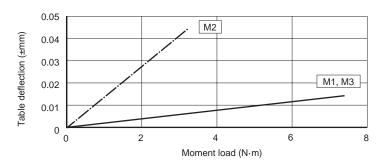


Displacement of A = Table deflection

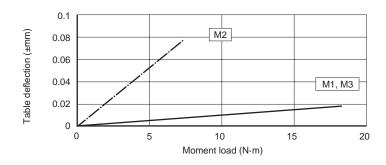
● MRG2-10



● MRG2-16



● MRG2-25



Note: The table deflection indicates a value for reference at the stroke end.

SCP*3

CMK2

CMA2

SCM

SCG

SCA2

SCS2

CKV2

CAV2/

COVP/N2 SSD2

SSG

SSD

CAT

MDC2

MVC

SMG

MSD/

MSDG FC*

STK

SRL3

SRG3

SRM3

SRT3

MRL2

MRG2

SM-25

OIVI-20

ShkAbs

FJ

FK

Spd Contr



SCP*3

CMK2

CMA2

SCM

SCG

SCA2

SCS2

CKV2

COVP/N2

SSD2

SSG

SSD

CAT

MDC2

MVC

SMG

MSD/

MSDG

FC*

STK

SRL3

SRG3

SRM3

SRT3

MRL2

MRG2

SM-25

ShkAbs

FJ

FK Spd Contr

Ending

Pneumatic components

Safety Precautions

Be sure to read this section before use.

Refer to Intro Page 73 for general information of the cylinder, and to Intro Page 80 for general information of the cylinder switch.

Product-specific cautions: Rodless cylinder MRG2 Series

Design/selection

▲ WARNING

- With the cylinder, there is the risk of the table popping out in cases when a change of force occurs due to disruption of the sliding portions of the machine.

 This could cause physical harm, such as pinched hands or feet, or mechanical damage. Adjust the machines so that they operate smoothly and design so that physical harm will be avoided.
- If requiring deceleration circuit and shock absorber If the driven object moves at high speeds or is very heavy, it may be difficult to absorb impact with the standardly provided shock absorber alone. Take measures to ease impact by installing a deceleration circuit before the shock absorber or by using an external shock absorber. The machine's rigidity must also be considered.

■ The piston may become derailed if the unit is used in an environment of pressure greater than the max. working pressure or in cases when a load greater than the allowable value is applied.

Mounting, installation and adjustment

CAUTION

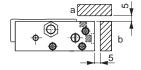
- Be careful of the gap between the end plate and the slider. Be careful when operating the cylinder as getting a hand or finger caught in the unit may lead to injury.
- Do not apply a load to the cylinder that is greater than or equal to the allowable load listed in the materials for selection.
- Do not use with the table fixed.

 Use the cylinder with the end plate fixed. Avoid use with the table fixed.
- Mount so that the table functions with the min. working pressure value of all processes. When the flatness of the surface for cylinder installation is po

When the flatness of the surface for cylinder installation is poor, the min. working pressure will rise due to guide unit torsion and cause early wear of the bearing section. For this reason, install the unit so that the table functions with the min. working pressure value or less of all processes. Although mounting mating surfaces should be highly flat, adjust with shims when this cannot be confirmed.

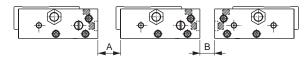
- Be careful to avoid scratching or denting the outer peripheral surface of the cylinder tube.
 This will cause damage to the lubricator and slider wear ring and may lead to defective operation.
- The cylinder switch may malfunction if there is a magnetic substance such as a metal plate installed adjacently. Be sure that more clearance than the dimensions listed below is provided.

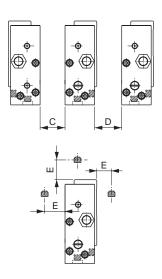
Magnetic substance such as a steel plate



Avoid simultaneous a and b.

When using cylinders adjacent with each other or when using other magnetic sensors nearby, in order to prevent malfunctioning due to the leaked magnetic field of the cylinder embedded magnet, separate the cylinder or magnetic sensors by at least the values listed below.





Unit: mm

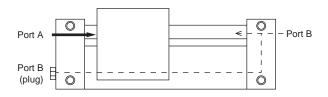
	Bore size	Α	В	С	D	Е
	ø10	20	10	10	10	20
	ø16	20	10	10	10	20
	ø25	50	20	20	20	50

When this distance is dimension E or less, malfunctions can be prevented by placing a magnetic substance (steel plate with thickness of 2 mm or above) between the unit and the table.

CKD

Product-specific cautions

■ Piping port position and operating direction



The slide table will move to the right side of the figure when port A is pressurized.

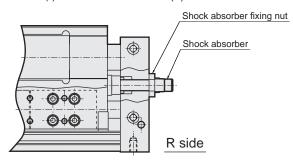
The slide table will move to the left side of the figure when port B is pressurized.

Port B (plug) is sealed with a plug at shipment. Common piping is possible by removing the plug and sealing port B on the right side.

■ CKD's shock absorber is a repair part.

Replace it when the energy absorption performance has degraded or the operation is not smooth.

■ Stroke adjusting procedure
Stroke (-) direction ←→ Stroke (+) direction



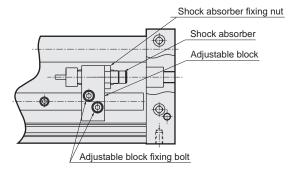
Adjustable stroke (one side)

Bore size (mm)	Stroke (-) direction	Stroke (+) direction
ø10	5	5
ø16	5	5
ø25	6	4

 Loosen the shock absorber fixing nut, make adjustments by turning the shock absorber until the slide table is at the intended position, and tighten the shock absorber fixing nut to fix the unit in place. The tightening torque is to be in accordance with the table on the right.

CAUTION

Although it is possible to adjust the stroke of the above table with adjustment of the shock absorber, take care as switch detection will become impossible on the R side only at the stroke end when adjusting the (+) stroke direction.



Full stroke adjustment volume (adjustment volume per full stroke adjustable bracket)

Bore size	A	4	Α	.1	А	.2
(mm)						Stroke (+)
	direction	airection	airection	direction	airection	airection
ø10	Stroke	0	Stroke	24	Stroke	24
ø16	Stroke	0	Stroke	24	Stroke	24
ø25	Stroke	15	Stroke	65	Stroke	65

Movement of adjustment block
 Loosen the adjustment block fixing bolt, and after moving the
 unit to a random position, fasten the adjustment block fixing bolt
 to fix the unit in place. The tightening torque is to be in
 accordance with the table below.

Fine adjustment of the shock absorber
 Loosen the shock absorber fixing nut and make adjustments by
 turning the shock absorber until the slide table is at the intended
 position. After adjustment, tighten the shock absorber fixing nut
 to fix the shock absorber. The tightening torque is to be in

accordance with the table below.

Tightening torque Bore size (mm)		Adjustable block fixing bolt (N-m)
ø10	1.2 to 2.0	2.2 to 3.0
ø16	3 to 4	2.2 to 3.0
g25	5 to 6	16 to 63

SCP*3

CMK2

CMA2

SCM

SCG

SCA2

SCS2 CKV2

CAV2/ COVP/N2

SSD2

SSG

SSD

CAT

MDC2

SMG

MSD/ MSDG

FC*

STK

SRL3

SRG3 SRM3

SRT3

MRL2

MRG2

SM-25

ShkAbs

FJ

FK

Spd Contr

Ending

Use/maintenance

ACAUTION

■ The magnetic strength of the embedded magnet is powerful. Do not disassemble.