SRM3

High precision guided rodless cylinder

ø25/ø32/ø40/ø63

Overview

High precision rodless cylinder (ø25 to ø63) with two integrated high precision linear guides. Ideal for high-precision transfer of parts.

Features

Thin design resistant to bending moment

Safety (Position locking unit is available as option)

A position locking unit that can mechanically lock at a desired point in the full stroke can be installed, increasing machinery safety.

Fixing the full stroke adjusting unit

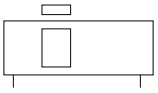
The full stroke adjusting unit with shock absorber is securely fixed with a special flat nut to prevent displacement at the stroke end. No spacer is necessary for a gap between the unit and cover.

CONTENTS

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

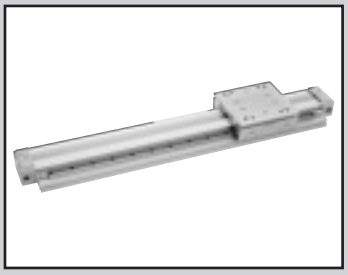
Series variation

High precision guided rodless cylinder SRM3 Series

Variation	Model No. JIS symbol	Bore size (mm)	Standard stroke (mm)													
			200	300	400	500	600	700	800	900	1000	1100	1200	1300	1400	
Double acting	SRM3 	ø25 equivalent/ ø32 equivalent	●	●	●	●	●	●	●	●	●					
		ø40 equivalent/ ø63 equivalent	●	●	●	●	●	●	●	●	●	●	●	●	●	
Double acting/ position locking	SRM3-Q	ø25 equivalent/ ø32 equivalent	●	●	●	●	●	●	●	●	●					
		ø40 equivalent/ ø63 equivalent	●	●	●	●	●	●	●	●	●	●	●	●	●	

●: Standard, ◎: Option, : Not available

Standard stroke (mm)							Min. stroke (mm)	Max. stroke (mm)	Custom stroke (per mm)	Cushion				Option								Switch	Page
										Without cushion	Both sides cushioned	R side cushioned	L side cushioned	Both side full stroke adjustable with shock absorber	R side full stroke adjustable with shock absorber	L side full stroke adjustable with shock absorber	Full stroke adjustable with adjusting bracket to be added later	Both side full stroke adjustable with light-load shock absorber	R side full stroke adjustable with light-load shock absorber	L side full stroke adjustable with light-load shock absorber	Copper and PTFE free		
	1500	1600	1700	1800	1900	2000				N	B	R	L	A	A1	A2	A3	E	E1	E2	P6		
							50	1000	1	●	●	●	●	◎	◎	◎	◎	◎	◎	◎	●	◎	1676
	●	●	●	●	●	●	80	2000		●	●	●	●	◎	◎	◎	◎	◎	◎	◎	●		
							50	1000	1	●	●	●	●	◎	◎	◎	◎	◎	◎	◎	●	◎	1676
	●	●	●	●	●	●	80	2000		●	●	●	●	◎	◎	◎	◎	◎	◎	◎	●		

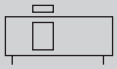


High precision guided rodless cylinder

Double acting **SRM3** Series

Double acting/position locking **SRM3-Q** Series

● Bore size: ø25/ø32/ø40/ø63 or equiv.



RoHS CAD

Specifications

1 MPa ≈ 145.0 psi, 1 MPa = 10 bar

Item		SRM3				SRM3-Q			
		Standard/with switch				Position locking/with switch			
Bore size mm		ø25 or equiv.	ø32 or equiv.	ø40 or equiv.	ø63 or equiv.	ø25 or equiv.	ø32 or equiv.	ø40 or equiv.	ø63 or equiv.
Actuation		Double acting				Double acting/position locking			
Working fluid		Compressed air							
Max. working pressure MPa		0.7 (≈100 psi, 7 bar)							
Min. working pressure MPa		0.15 (≈22 psi, 1.5 bar)		0.1		0.15 (≈22 psi, 1.5 bar)		0.1	
Proof pressure MPa		1.05 (≈150 psi, 10.5 bar)							
Ambient temperature °C		5 (41°F) to 60 (140°F)							
Port size	Cylinder body port	Rc1/8	Rc1/4		Rc3/8	Rc1/8	Rc1/4		Rc3/8
	Position locking port	-				Rc1/8			
Stroke tolerance mm		$^{+2.0}_{0}$ (to 1000)				$^{+2.5}_{0}$ (to 2000)			
Working piston speed mm/s		50 to 1500 (*1, *2)							
Cushion		Air cushion							
Lubrication		Not required							
Repeat stopping accuracy mm		±0.03							
Position locking mechanism		-				Attached to R side of cover			
Holding force N		-				Max. thrust x 0.7			

*1: For common port piping, working piston speed varies depending on stroke. Contact CKD.
*2: (1) When the piston moves at 500 to 1500 mm/s, reduce the speed when entering the position locking mechanism to 500 mm/s or less
(2) To reduce the speed, add an external shock absorber or deceleration circuit.
(3) Apply grease regularly to the sliding part of the lock lever.

Allowable absorbed energy

Bore size (mm)	Cushioned		Without cushion	With shock absorber (initial set point)	
	Allowable absorbed energy (J)	Cushion stroke (mm)	Allowable absorbed energy (J)	Absorbed energy (J)	Effective stroke (mm)
ø25 or equiv.	1.40	20.9	0.015	10	9
ø32 or equiv.	2.57	23.5	0.030	18	13
ø40 or equiv.	4.27	23.9	0.050	50	16.5
ø63 or equiv.	17.4	29.6	0.138	86	21

Stroke

Bore size (mm)	Standard stroke (mm)	Max. stroke (mm)	Min. stroke (mm)
ø25, ø32 or equiv.	200, 300, 400, 500, 600, 700, 800, 900, 1000	1000	50
ø40, ø63 or equiv.	200, 300, 400, 500, 600, 700, 800, 900, 1000, 1100, 1200, 1300, 1400, 1500, 1600, 1700, 1800, 1900, 2000	2000	80

Note: The custom stroke is available in 1 mm increments.

Number of installed switches and min. stroke (mm)

Switch quantity	1		2		3		4		5		6		7		8		9	
Switch model No. / Bore size (mm)	T*V	T*H	T*V	T*H	T*V	T*H	T*V	T*H	T*V	T*H	T*V	T*H	T*V	T*H	T*V	T*H	T*V	T*H
ø25 or equiv.	50	50	50	50	90	100	135	150	180	200	225	250	270	300	315	350	360	400
ø32 or equiv.	50	50	50	50	90	100	135	150	180	200	225	250	270	300	315	350	360	400
ø40 or equiv.	80	80	80	80	90	100	135	150	180	200	225	250	270	300	315	350	360	400
ø63 or equiv.	80	80	80	80	90	100	135	150	180	200	225	250	270	300	315	350	360	400

Switch specifications

● 1-color/2-color LED/for AC magnetic field proof

Item	2-wire proximity		3-wire proximity		2-wire reed							2-wire proximity
	T2YH/ T2YV	T2WH/ T2WV	T3YH/ T3YV	T3WH/ T3WV	TOH/TOV		T5H/T5V		T8H/T8V			T2YD/ T2YDT (*4)
Applications	Dedicated for programmable controller		For programmable controller, relay		For programmable controller, relay		For programmable controller, relay (no lamp), serial		For programmable controller, relay			Dedicated for programmable controller
Output method	-		NPN output		-							
Power supply voltage	-		10 to 28 VDC		-							
Load voltage	10 to 30 VDC	24 VDC ±10%	30 VDC or less		12/24 VDC	110 VAC	5/12/24 VDC	110 VAC	12/24 VDC	110 VAC	220 VAC	24 VDC ±10%
Load current	5 to 20 mA (*2)		50 mA or less		5 to 50 mA	7 to 20 mA	50 mA or less	20 mA or less	5 to 50 mA	7 to 20 mA	7 to 10 mA	5 to 20 mA
Indicator	Red/green LED (Lit when ON)		Red/green LED (Lit when ON)		LED (Lit when ON)		No indicator lamp		LED (Lit when ON)			Red/green LED (Lit when ON)
Leakage current	1 mA or less		10 μA or less		0 mA							1 mA 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: 61 3 m: 166 5 m: 272

*1 : After shipment, modification from reed switch to proximity switch or vice versa is not possible.
If the cylinder switch is not specified (i.e., blank), a reed switch will be attached to the cylinder body.
*2 : Refer to Ending Page 1 for detailed switch specifications and dimensions.
*3 : Switches other than the above models, such as switches with connectors, are also available. Refer to Ending Page 1.
*4 : 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)
*5 : Switch for AC magnetic field (T2YD/T2YDT) cannot be used in DC magnetic field.

Cylinder weight

Unit: kg

Bore size (mm)	Weight for 0 mm stroke			Additional weight per St = 100mm
	Basic (SRM3)	Position locking (SRM3-Q)	Switch weight	
ø25 or equiv.	2.4	2.9	Refer to the weight in the switch specifications.	0.59
ø32 or equiv.	3.3	4.2		0.72
ø40 or equiv.	4.8	6.0		1.20
ø63 or equiv.	15.1	17.8		1.99

Theoretical thrust table

(Unit: N)

Bore size (mm)	Operating direction	Working pressure MPa							
		0.1	0.15	0.2	0.3	0.4	0.5	0.6	0.7
ø25	Push/Pull	-	81.4	$1.08x10^2$	$1.63x10^2$	$2.17x10^2$	$2.71x10^2$	$3.25x10^2$	$3.80x10^2$
ø32	Push/Pull	-	$1.21x10^2$	$1.63x10^2$	$2.44x10^2$	$3.26x10^2$	$4.07x10^2$	$4.88x10^2$	$5.70x10^2$
ø40	Push/Pull	-	$1.90x10^2$	$2.53x10^2$	$3.80x10^2$	$5.06x10^2$	$6.33x10^2$	$7.60x10^2$	$8.86x10^2$
ø63	Push/Pull	$3.14x10^2$	$4.70x10^2$	$6.27x10^2$	$9.41x10^2$	$1.25x10^3$	$1.57x10^3$	$1.88x10^3$	$2.20x10^3$

How to order

No switch (built-in magnet for switch)

SRM3 - 25 B - 500 —— C0 — A

With switch (built-in magnet for switch)

SRM3 - 25 B - 500 - T0H - R - A

Ⓐ Model No. Ⓑ Bore size Ⓒ Cushion Ⓓ Stroke Ⓔ Switch model No. *2 Ⓕ Switch quantity Ⓖ Option *3 *4 *5

Code	Description
Ⓐ Model No.	
SRM3	Standard
SRM3-Q	Position locking

Ⓑ Bore size (mm)	
25	ø25
32	ø32
40	ø40
63	ø63

Ⓒ Cushion	
B	Both sides cushioned
R	R side cushioned
L	L side cushioned
N	Without cushion

Ⓓ Stroke (mm)

Bore size	Stroke (*1)	Custom stroke
ø25	**50 to 1000**	**In 1 mm increments**
ø32	**50 to 1000**	
ø40	**80 to 2000**	
ø63	**80 to 2000**	

Ⓔ Switch model No.

Axial lead wire	Radial lead wire	Contact	Voltage AC	Voltage DC	Indicator	Lead wire
T0H*	**T0V***	Reed	●	●	1-color LED	2-wire
T5H*	**T5V***	Reed	●	●	No indicator lamp	
T8H*	**T8V***	Reed	●	●	1-color LED	2-wire
T2WH*	**T2WV***	Proximity		●	2-color LED	2-wire
T2YH*	**T2YV***	Proximity		●		
T3WH*	**T3WV***	Proximity		●		3-wire
T3YH*	**T3YV***	Proximity		●		
T2YD*	**-**	Proximity		●	2-color LED for AC magnetic field	2-wire
T2YDT*	**-**	Proximity		●		

*** Lead wire length**	
Blank	1 m (standard)
3	3 m (option)
5	5 m (option)

*** Select only when the switch model No. is not specified *6**	
C0	With integrated magnet for reed switch
C1	With integrated magnet for proximity switch

Ⓕ Switch quantity	
R	1 on R side
L	1 on L side
D	2
T	3
4	4 (when there are more than 4 switches, indicate switch quantity.)

Ⓖ Option

Bore size (ø)				25	32	40	63
A	Full stroke adjustable	With shock absorber on both sides		●	●	●	●
A1	Full stroke adjustable	With shock absorber on R side		●	●	●	●
A2	Full stroke adjustable	With shock absorber on L side		●	●	●	●
A3	Full stroke adjustable	Adjusting bracket to be added later		●	●	●	●
E	Full stroke adjustable	With light-load shock absorber - both sides		●	●	●	●
E1	Full stroke adjustable	With light-load shock absorber - R side		●	●	●	●
E2	Full stroke adjustable	With light-load shock absorber on L side		●	●	●	●
Blank	Port position	F (Standard)	F (Standard)	●	●	●	●
R	Port position	R (Common port)	F	●	●	●	
B	Port position	F	B	●	●	●	●
T	Port position	R (Common port)	B	●	●	●	
D	Port position	D	F	●	●	●	●
S	Port position	D	D		●	●	●

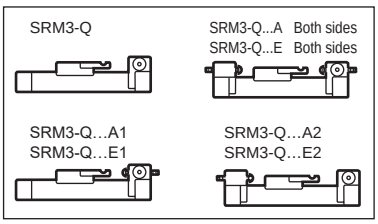
Precautions for model No. selection

*1 : Refer to page 1676 for the min. stroke with switch.

*2 : Switches other than Ⓔ Switch model No. are also available. (Made to order) Refer to Ending Page 1 for details.

*3 : To install the full stroke adjusting bracket later, you need to remove the cover and attach a flat nut. A flat nut is attached to option "A3" to enable retrofitting the full stroke adjusting bracket.

*4 : The full stroke adjusting bracket on R side is provided as standard for the position locking. Therefore, if "A1" or "E1" is selected, a shock absorber only is added to R side. In the case of "A", R side is position locking and full stroke adjustable with shock absorber, and L side is full stroke adjustable with shock absorber. (Figure below)



*5 : Copper and PTFE free as standard. (except for type with shock absorber)

*6 : The built-in magnet cannot be changed after shipment.

*7 : Square nuts (two types, eight pieces each) are supplied for use of the T-groove.

[Example of model No.]

SRM3-25B-500-T0H-R-A

Model: High precision guided rodless cylinder

Ⓐ Model No. : Standard
Ⓑ Bore size : ø25 mm
Ⓒ Cushion : Both sides cushioned
Ⓓ Stroke : 500 mm
Ⓔ Switch model No. : Reed T0H switch
Ⓕ Switch quantity : 1 on R side
Ⓖ Option : Both-side full stroke adjustable, with shock absorber

How to order switch

● Switch body only

SW - T0H

→ Switch model No.
(Item Ⓔ on page 1678)

How to order discrete shock absorber

Model	Discrete shock absorber model No.	
	Standard (-A)	Light-load (-E)
SRM3-25	NCK-00-1.2	NCK-00-0.7-C
SRM3-32	NCK-00-2.6	NCK-00-1.2
SRM3-40	NCK-00-7	NCK-00-2.6
SRM3-63	NCK-00-12	NCK-00-7

How to order repair parts

SRM3 - 40 K - 200

Bore size (Item Ⓑ on page 1678)

Stroke (Item Ⓓ on page 1678)

How to order full stroke adjusting bracket kit (Applies to option code A3.)

SRM3 - 40 - A1 (Full stroke adjusting bracket kit with shock absorber)
E1 (Full stroke adjusting bracket kit with light-load shock absorber)

Bore size (Item Ⓑ on page 1678)

(For configurations, refer to “Full stroke adjusting bracket kit” on page 1686.)

Specifications for rechargeable battery

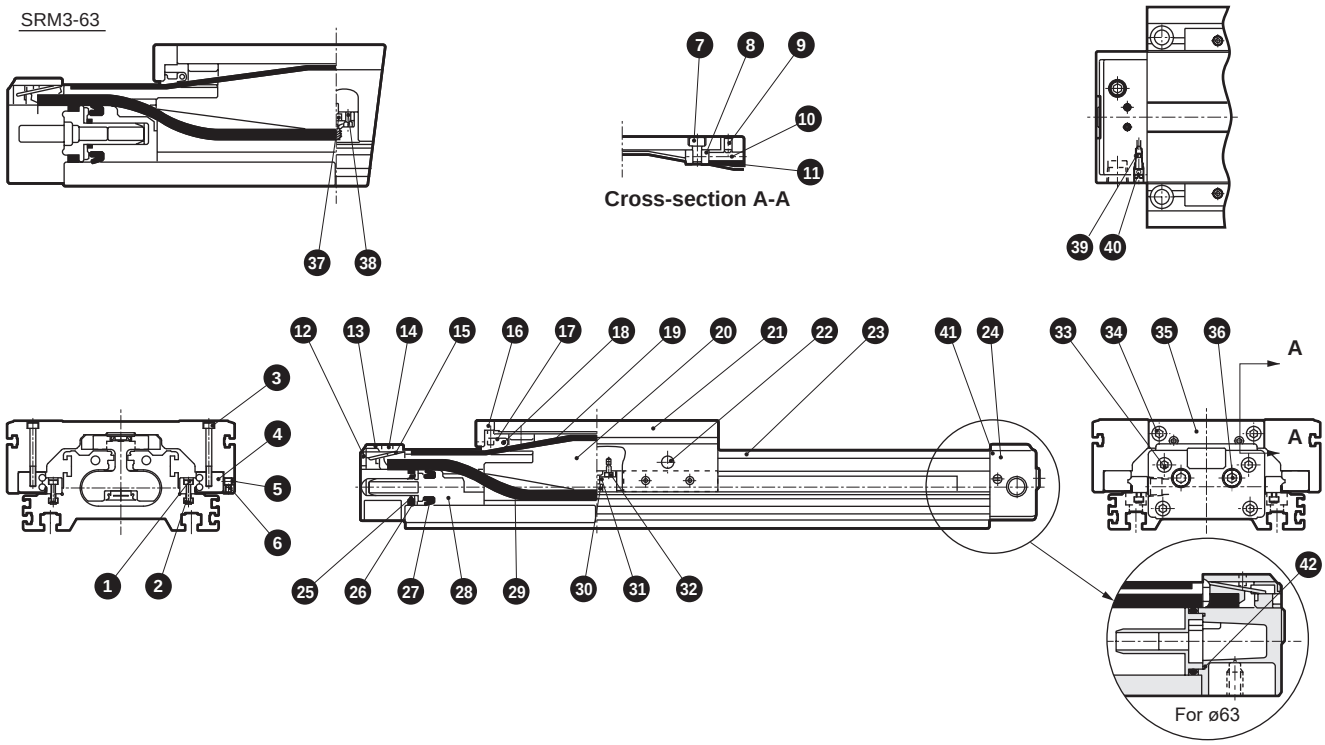
(Catalog No. CC-1226A)

● Design compatible with rechargeable battery manufacturing process

SRM3 - ····· - P4*

SRM3 - Q - ····· - P4*

Internal structure and parts list (ø25 or ø63 equiv.)



No.	Part name	Material	Remarks	No.	Part name	Material	Remarks
1	Hexagon socket head cap screw	Alloy steel	Black finish	22	Grease nipple (ball bowl)	Copper	Nickel plating
2	Nut rail	Steel	Black finish	23	Cylinder tube	Aluminum alloy	Alumite
3	Hexagon socket head cap screw	Alloy steel	Black finish	24	Cover (R) assembly		
4	High precision guide	Steel		25	Cushion packing	Urethane rubber	
5	Hexagon socket set screw	Alloy steel	Zinc chromate	26	Cylinder gasket	Nitrile rubber	
6	Hexagon socket set screw	Alloy steel	Zinc chromate	27	Piston packing	Nitrile rubber	
7	Hexagon socket head cap screw	Alloy steel	Zinc chromate	28	Piston	Acetal resin	
8	Yoke holder	Steel	Black finish	29	Seal belt	Urethane rubber	
9	Hexagon socket set screw	Alloy steel	Zinc chromate	30	Magnet		
10	Hexagon socket set screw	Alloy steel	Zinc chromate	31	Magnet case	Polyamide	
11	Dust wiper	Acetal resin		32	Hexagon socket head cap screw	Stainless steel	
12	Belt cover	Polyamide		33	Hexagon socket head cap screw	Alloy steel	Zinc chromate
13	Cover (L) assembly			34	Hexagon socket head cap screw	Alloy steel	Zinc chromate
14	Hexagon socket set screw	Alloy steel	Zinc chromate	35	Table cover	Steel	Zinc chromate
15	Belt spacer	Steel	Zinc chromate	36	Plug	Steel	Zinc chromate
16	Spring	Steel	Black finish	37	Spacer	Aluminum alloy	
17	Belt holder	Acetal resin		38	Hexagon socket head cap screw	Stainless steel	
18	Parallel pin	Steel	Zinc chromate	39	Needle gasket	Nitrile rubber	
19	Dust-proof belt	Stainless steel + nitrile rubber		40	Cushion needle	Steel	Zinc chromate
20	Yoke	Aluminum alloy	Alumite	41	O-ring for common port	Nitrile rubber	
21	Table	Aluminum alloy	Alumite	42	Cushion ring gasket	Nitrile rubber	ø63 only

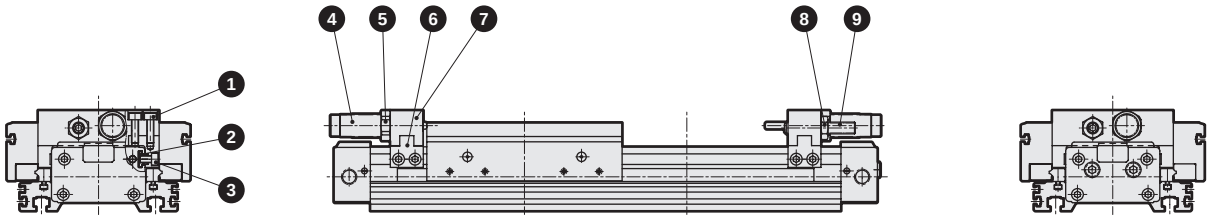
Repair parts list

No./part name / Bore size (mm)	Kit No.	Repair parts No.
ø25 or equiv.	SRM3-25K-*	⑪ ⑲ ㉕ ㉖ ㉗ ㉙ ㊴ ㊶
ø32 or equiv.	SRM3-32K-*	
ø40 or equiv.	SRM3-40K-*	
ø63 or equiv.	SRM3-63K-*	⑪ ⑲ ㉕ ㉖ ㉗ ㉙ ㊴ ㊶ ㊷

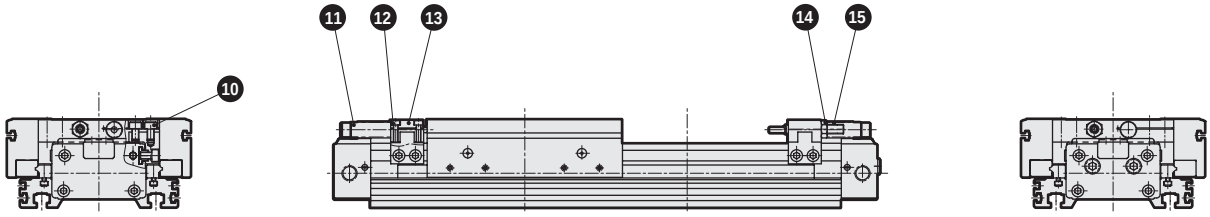
● *1: Specify the kit No. when placing an order. Specify the stroke for *.

Internal structure and parts list: with shock absorber (ø25 to ø63 equiv.)

● Full stroke adjustable with standard shock absorber (SRM3-**-***-A)



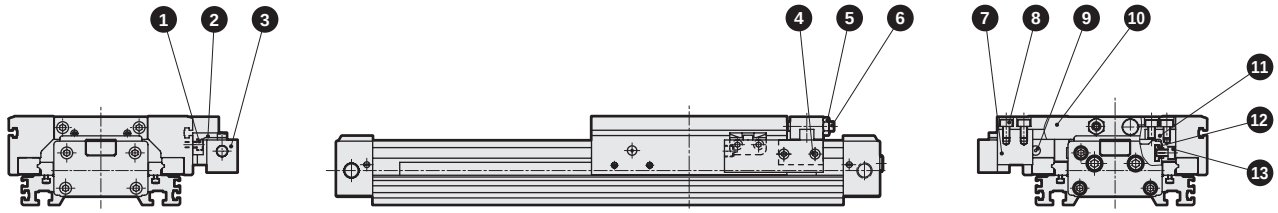
● Full stroke adjustable with light-load shock absorber (SRM3-**-***-E)



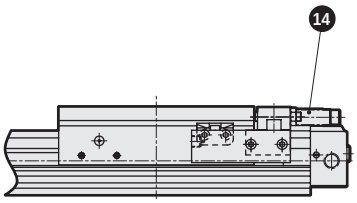
No.	Part name	Material	Remarks	No.	Part name	Material	Remarks
1	Hexagon socket head cap screw	Alloy steel	Galvanizing	9	Hexagon socket set screw	Alloy steel	Galvanizing
2	Adaptor nut	Steel	Black finish	10	Hexagon socket head cap screw	Alloy steel	Galvanizing
3	Hexagon socket head cap screw	Alloy steel	Galvanizing	11	Shock absorber		
4	Shock absorber			12	Hexagon socket head cap screw	Alloy steel	Galvanizing
5	Hexagon nut	Steel	Galvanizing	13	Plate (3)	Aluminum alloy	Alumite
6	Adaptor	Steel	Galvanizing	14	Hexagon nut	Steel	Galvanizing
7	Plate (1)	Aluminum alloy	Alumite	15	Hexagon socket set screw	Alloy steel	Galvanizing
8	Hexagon nut	Steel	Galvanizing				

Internal structure and parts list: with position locking (ø25 to ø63 equiv.)

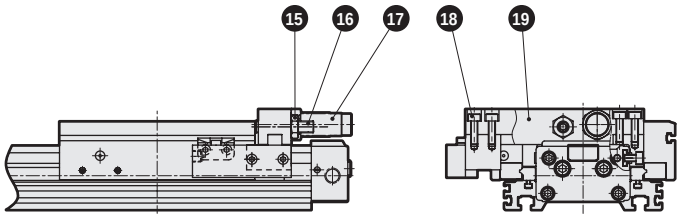
● With position locking (SRM3-Q)



● Position locking/full stroke adjustable with light-load shock absorber (SRM3-Q-**-***-E1)



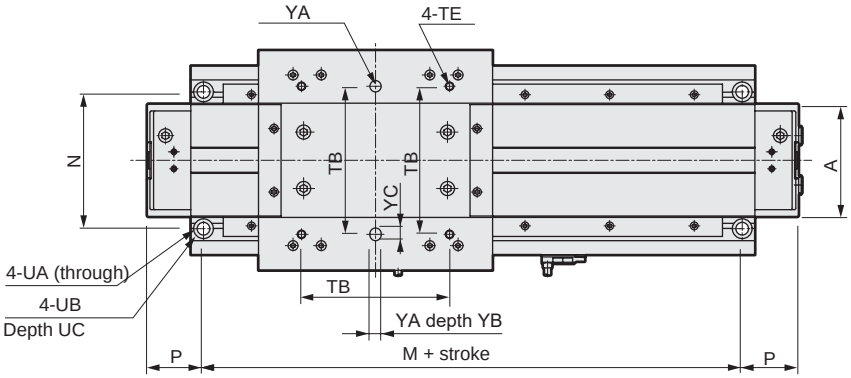
● Position locking/full stroke adjustable with standard shock absorber (SRM3-Q-**-***-A1)

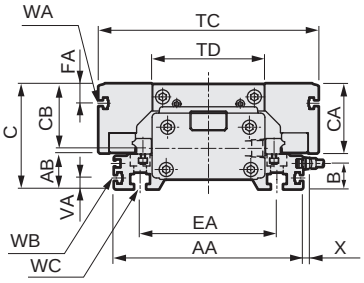


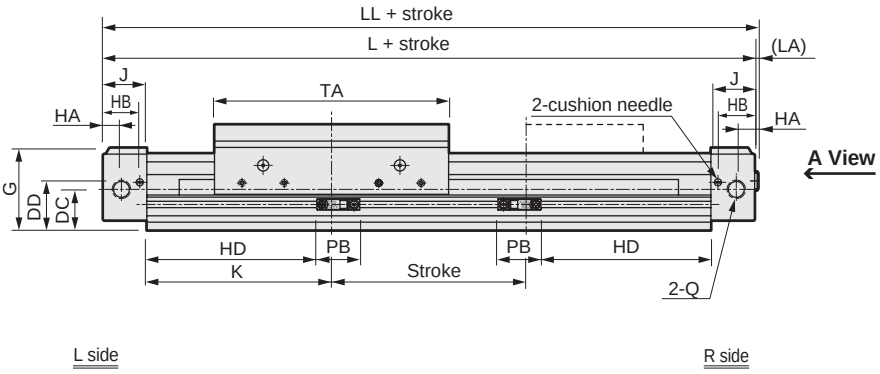
No.	Part name	Material	Remarks	No.	Part name	Material	Remarks
1	Hexagon socket head cap screw	Alloy steel	Galvanizing	10	Plate (4)	Aluminum alloy	Alumite
2	Lock lever	Steel	Galvanizing	11	Adaptor	Steel	Galvanizing
3	Position locking mechanism assembly			12	Adaptor nut	Steel	Black finish
4	Hexagon socket head cap screw	Alloy steel	Galvanizing	13	Hexagon socket head cap screw	Alloy steel	Galvanizing
5	Hexagon nut	Steel	Galvanizing	14	Shock absorber		
6	Hexagon socket set screw	Alloy steel	Galvanizing	15	Hexagon nut	Steel	Galvanizing
7	Installation block	Aluminum alloy	Alumite	16	Hexagon socket set screw	Alloy steel	Galvanizing
8	Hexagon socket head cap screw	Alloy steel	Galvanizing	17	Shock absorber		
9	Grease nipple (ball bowl)	Copper	Nickel plating (not included in SRM-Q-25)	18	Hexagon socket head cap screw	Alloy steel	Galvanizing
				19	Plate (2)	Aluminum alloy	Alumite

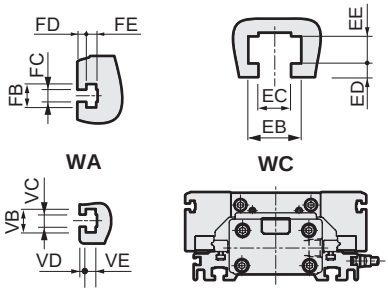
Dimensions CAD

● With cylinder switch SRM3-**-**-***-T*V*
(L-shaped lead wire)

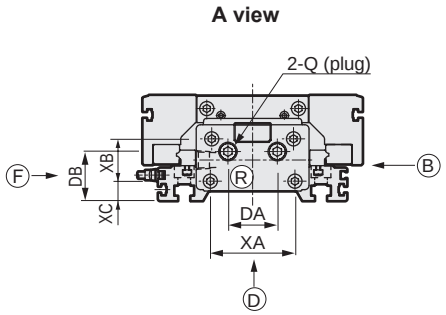








Note: WB part is not included in SRM3-25 and 32.



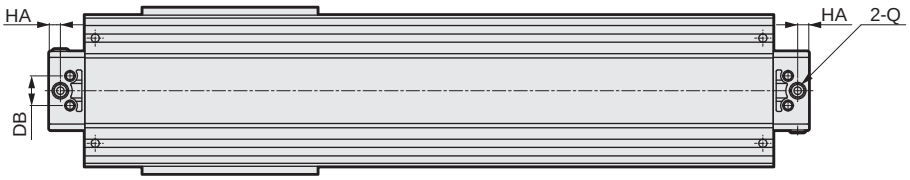
Code / Bore size (mm)	A	AA	AB	B	C	CA	CB	DA	DB	DC	DD	EA	EB	EC	ED
ø25 or equiv.	53	102	18	11.3	57	39	37	26	22	20	21.9	71	9.5	5.5	2.5
ø32 or equiv.	66	116	20	13.3	62	41.5	39.5	27	25	22.5	25.5	80	11	6.6	2.5
ø40 or equiv.	80	134	25	18.3	75	49.5	46	35	35	29	34	97	14.5	9	3.5
ø63 or equiv.	118	188	31.5	24.8	100	68	62.5	39	44.5	37.5	45.5	140	18	11	4

Code / Bore size (mm)	EE	FA	FB	FC	FD	FE	G	HA	HB	HE	J	K	L	LA	LL
ø25 or equiv.	4.5	10	8.5	4.5	3	3.7	43.5	7.5	20	-	24	98	244	2	246
ø32 or equiv.	6	10	8.5	4.5	3	3.7	47.5	10	23.5	17	28	106	268	2.5	270.5
ø40 or equiv.	7.5	14	8.5	4.5	3	3.7	58.5	13	26	22.3	31	131	324	2.5	326.5
ø63 or equiv.	9	20	9.5	5.5	3	4.5	76.5	15	32	31	39	187	452	2.5	454.5

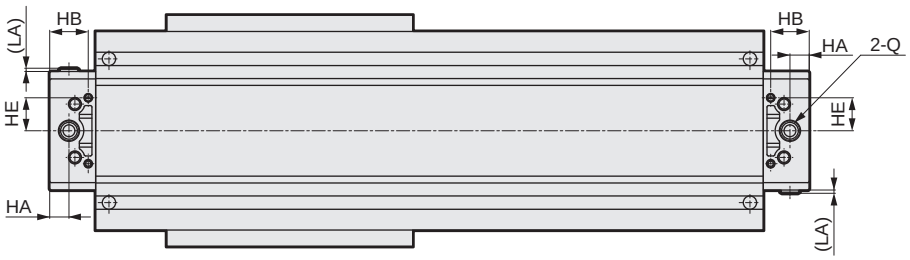
*1: After shipment, modification from reed switch to proximity switch or vice versa is not possible.
*2: Option S is not available for ø25.

Dimensions

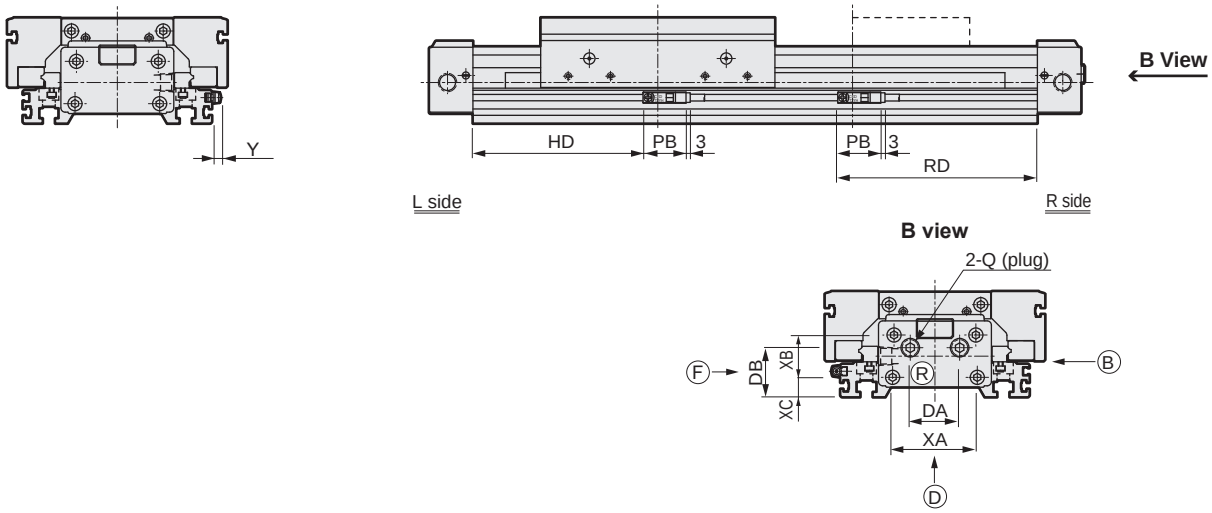
● Bottom piping (option: D/S)
·ø25 or equiv.



· ø32 or equiv. to ø63 or equiv.



● With cylinder switch SRM3-**-**-***-T*H*
(Axial lead wire)



Code / Bore size (mm)	LL	M	N	P	Q	TA	TB	TC	TD	TE	UA	UB
ø25 or equiv.	246	182	71	31	Rc1/8	118	75	112	61	M5 depth 12	5.5	9.5 spot face depth 6.5
ø32 or equiv.	270.5	196	80	36	Rc1/4	132	85	128	65	M6 depth 13	6.6	11 spot face depth 6.5
ø40 or equiv.	326.5	244	97	40	Rc1/4	166	105	156	81	M6 depth 15	9	14 spot face depth 8.5
ø63 or equiv.	454.5	350	140	51	Rc3/8	250	160	224	118	M8 depth 20	11	17.5 spot face depth 10.5

Code / Bore size (mm)	VA	VB	VC	VD	VE	XA	XB	XC	YA	YC
ø25 or equiv.	-	-	-	-	-	38	23	8.5	$6^{+0.07}_{+0.02}$ depth 6	7
ø32 or equiv.	-	-	-	-	-	48	25	10	$6^{+0.07}_{+0.02}$ depth 6	7
ø40 or equiv.	8	8.5	4.5	2	3.7	60	30	14	$8^{+0.07}_{+0.02}$ depth 8	9
ø63 or equiv.	10	9.5	5.5	2.5	4.5	96	42	16.5	$10^{+0.07}_{+0.02}$ depth 10	12

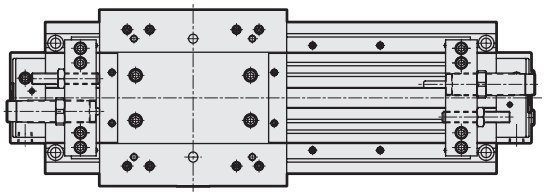
Code	With switch																			
Bore size (mm)	T0H/V, T5H/V					T1H/V, T2Y*H/V, T3Y*H/V, T2YD					T8H/V					T2WH/V, T3WH/V				
	RD	HD	X	Y	PB	RD	HD	X	Y	PB	RD	HD	X	Y	PB	RD	HD	X	Y	PB
ø25 or equiv.	107.5	88.5	4	0.5	22.5	108.5	87.5	9.3(14.5)	6.3(11.5)	30.5(29.5)	102.5	81.5	9.3	6.3	30.5	105.5	90.5	4	0.5	22.5
ø32 or equiv.	115.5	96.5	4	0.5	22.5	116.5	95.5	9.3(14.5)	6.3(11.5)	30.5(29.5)	110.5	89.5	9.3	6.3	30.5	113.5	98.5	4	0.5	22.5
ø40 or equiv.	140.5	121.5	4	0.5	22.5	141.5	120.5	9.3(14.5)	6.3(11.5)	30.5(29.5)	135.5	114.5	9.3	6.3	30.5	138.5	123.5	4	0.5	22.5
ø63 or equiv.	196.5	177.5	4	0.5	22.5	197.5	176.5	9.3(14.5)	6.3(11.5)	30.5(29.5)	191.5	170.5	9.3	6.3	30.5	194.5	179.5	4	0.5	22.5

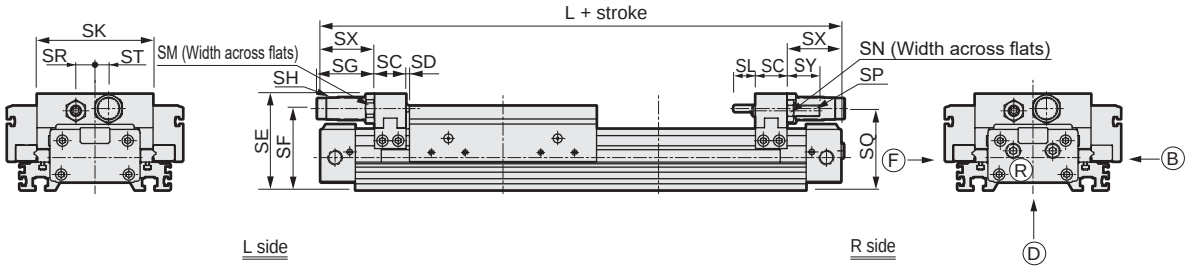
*1: Values in ( ) are for T1H/V, strong magnetic field proof.

Dimensions

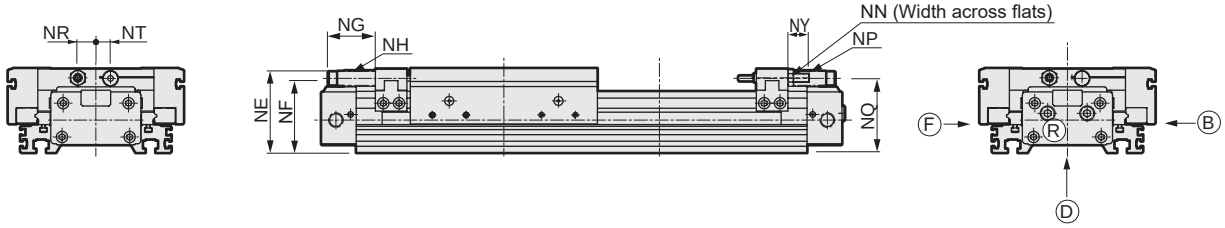
● Full stroke adjustable with standard shock absorber (SRM3-**-***-A)

Note: In SRM3-25-A, the shock absorber is installed inside the cover.





● Full stroke adjustable with light-load shock absorber (SRM3-**-***-E)

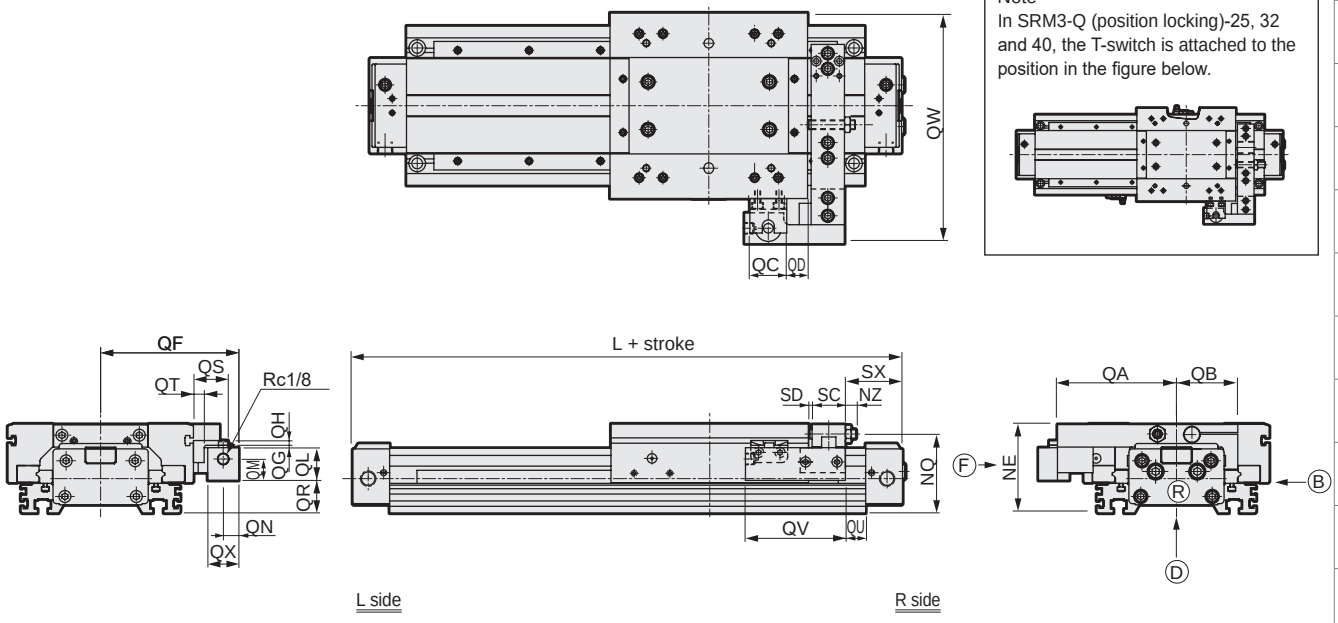


Code / Bore size (mm)	SC	SD	SE	SF	SG			SH		SK	SL	SM	SN	SP	SQ	SR	ST
					At max.	At min.	Adj range	O.D. thread	Max. absorbed energy (J)								
ø25 or equiv.	24	2	66	54.5	22.5	12.5	10	M12x1.0	12	78	11	17	10	M6	53	12	10
ø32 or equiv.	24	2	70.5	59.5	47	37	10	M14x1.5	26	86	15	19	13	M8	57.5	14	12
ø40 or equiv.	28	3	85.5	72.5	51	41	10	M20x1.5	70	103	19.5	24	17	M10	70.5	17	12
ø63 or equiv.	36	4	114.5	96	68	58	10	M25x1.5	120	150	25	32	24	M16	91.5	25	20

Code / Bore size (mm)	SX	SY	NE	NF	NG			NH		NN	NP	NQ	NR	NT	NY	L
					At max.	At min.	Adj range	O.D. thread	Max. absorbed energy (J)							
ø25 or equiv.	37	14	56.5	50	24	14	10	M10x1.0	7	10	M6	50	11	8	14	244
ø32 or equiv.	42	24	61.5	54	22.5	12.5	10	M12x1.0	12	10	M6	54	12	11	14	268
ø40 or equiv.	48	29	74.5	66	42	32	10	M14x1.5	26	13	M8	66.5	16	13	19	324
ø63 or equiv.	61	40	99.5	87.5	42	32	10	M20x1.5	70	19	M12	88	16	20	30	452

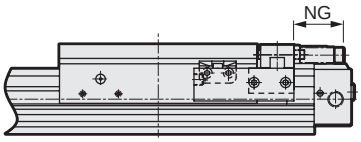
Dimensions

● Position locking (SRM3-Q)

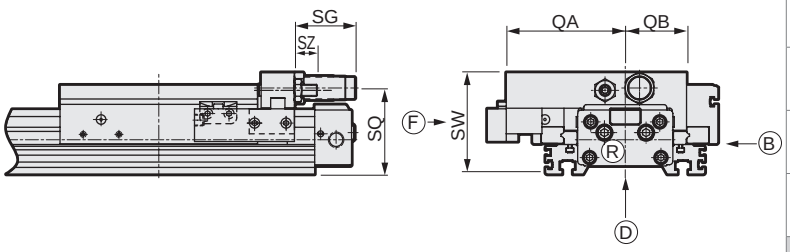


Note
In SRM3-Q (position locking)-25, 32 and 40, the T-switch is attached to the position in the figure below.

● Position locking/full stroke adjustable with light-load shock absorber (SRM3-Q-**-***-E1)



● Position locking/full stroke adjustable with standard shock absorber (SRM3-Q-**-***-A1)



Code / Bore size (mm)	QA	QB	QC	QD	QF	QG	QH	QL	QM	QN	QR	QS	QT	QV	QU
ø25 or equiv.	78	39	31	26.5	94	2	4	27.5	18	13	13	29	9	84	17
ø32 or equiv.	86	43	31	26.5	102	2	4	27.5	18	13	16.5	29	9	84	18
ø40 or equiv.	100	51.5	31	17.5	116	2	4	27.5	18	13	27.5	29	9	84	17
ø63 or equiv.	140	75	34	20.5	156	2	5	33	21.5	15	41	36	12	100	22

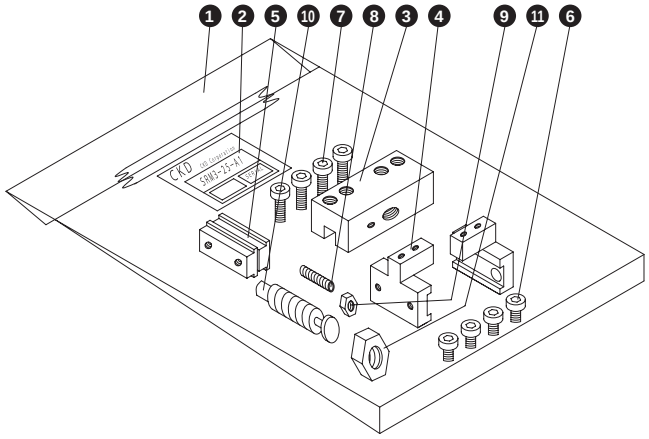
Code / Bore size (mm)	QX	QW	NE	NG	NQ	NZ	SC	SD	SW	SG	SQ	SX	SZ	L
ø25 or equiv.	26	150	56.5	24	50	4	24	2	66	22.5	53	37	4	244
ø32 or equiv.	26	166	61.5	22.5	54	4	24	2	69.5	47	57.5	42	9	268
ø40 or equiv.	26	194	74.5	42	66.5	9	28	3	85.5	51	70.5	48	19	324
ø63 or equiv.	30	268	99.5	42	88	15	36	4	114.5	68	91.5	61	20	452

Full stroke adjusting bracket kit

● Full stroke adjusting bracket kit (with shock absorber)

SRM3 - 25 - A1

Bore size
(Item Ⓑ on page 1678)

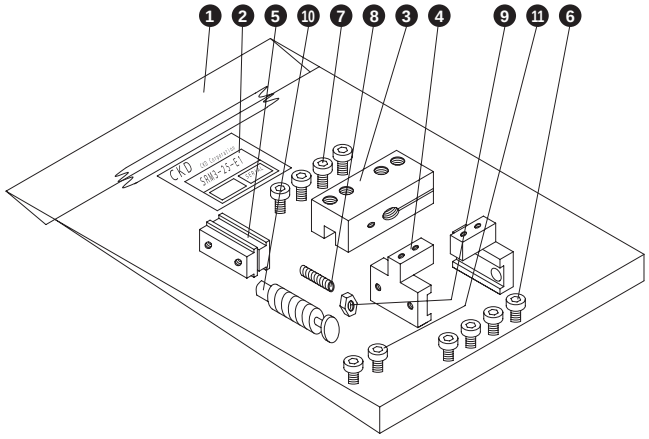


No.	Part name	Quantity
1	Plastic bag	1
2	Package label	1
3	Plate (1)	1
4	Adaptor	2
5	Adaptor nut	2
6	Hexagon socket head cap screw	4
7	Hexagon socket head cap screw	4
8	Hexagon socket set screw	1
9	Hexagon nut	1
10	Shock absorber	1
11	Hexagon nut	1

● Full stroke adjusting bracket kit (with light-load shock absorber)

SRM3 - 25 - E1

Bore size
(Item Ⓑ on page 1678)



No.	Part name	Quantity
1	Plastic bag	1
2	Package label	1
3	Plate (3)	1
4	Adaptor	2
5	Adaptor nut	2
6	Hexagon socket head cap screw	4
7	Hexagon socket head cap screw	4
8	Hexagon socket set screw	1
9	Hexagon nut	1
10	Shock absorber	1
11	Hexagon nut	1

Kit weight list

Repair parts kit

Kit No.	Weight (g)
SRM3-25K-□	29 + 10 x stroke/100
SRM3-32K-□	33 + 10 x stroke/100
SRM3-40K-□	66 + 18 x stroke/100
SRM3-63K-□	115 + 18 x stroke/100

Full stroke adjusting bracket kit (with light-load shock absorber)

Kit No.	Weight (g)
SRM3-25-E1	174
SRM3-32-E1	207
SRM3-40-E1	349
SRM3-63-E1	930

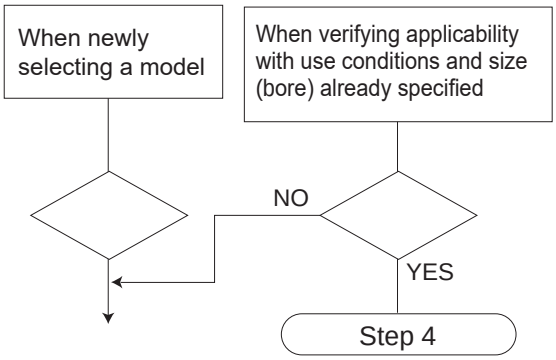
Full stroke adjusting bracket kit (with shock absorber)

Kit No.	Weight (g)
SRM3-25-A1	247
SRM3-32-A1	298
SRM3-40-A1	581
SRM3-63-A1	1316

SRM3 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 the selection guide.

1 Step 1



2 Step 2 Confirming working conditions

1. Working pressure (P) (MPa)
2. Load weight (M) (kg)
3. Applied load (F_L) (N)
4. Mounting orientation
5. Stroke (L) (mm)
6. Travel time (t) (s)
7. Operation speed (V) (m/s)

Formula of the cylinder's average operation speed V

$$V=\frac{L}{t}\times\frac{1}{1000}(m/s)$$

[Load weight]

Value of (weight of transported object + jig weight)

[Mounting orientation]

Operating direction: Horizontal + vertical

Mounting direction: With table upward, with table downward

3 Step 3 Selection of approximate size of cylinder

● Formula for calculating cylinder size (bore size)

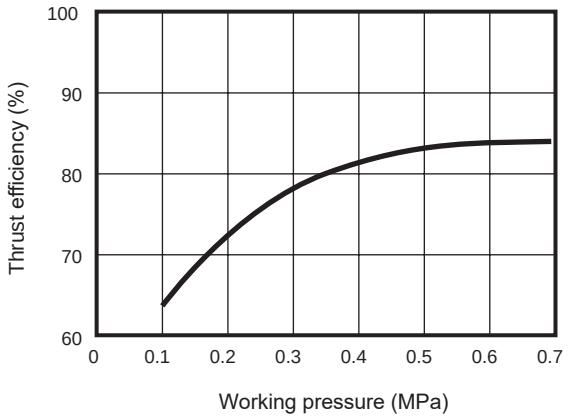
$$F=\frac{\pi}{4}xD^2xPx\quad(N)\frac{a}{100}$$

$$\therefore D=\sqrt{\frac{4F}{\pi\cdot P\cdot a}}\ (mm)$$

D : Cylinder bore size (mm)
P : Working pressure (MPa)
a : Thrust efficiency (%) (Refer to Fig. 1)
F : Cylinder theoretical thrust (N)

D= ø

Figure 1 Trends of thrust efficiency of SRM3



● When calculating from the theoretical thrust value in Table 1

Approximate required thrust ≥ Applied load x 2

("x 2" in "Applied load x 2" is for when the load factor is approx. 50% as a safety coefficient)

[Example] Working pressure 0.5 MPa

Applied load 20 N

* Required thrust is 20 x 2 = 40 N

The bore size selected from Table 1 with theoretical thrust of 40 N and over at working pressure of 0.5 MPa will be ø25.

D= ø25

[Cylinder theoretical thrust]

Table 1 Cylinder theoretical thrust value Unit: N

Bore size (mm)	Pressurized area (mm^2)	Working pressure MPa							
		0.1	0.15	0.2	0.3	0.4	0.5	0.6	0.7
ø25 or equiv.	542	-	81.4	108	163	217	271	325	380
ø32 or equiv.	814	-	121	163	244	326	407	488	570
ø40 or equiv.	1266	-	190	253	380	506	633	760	886
ø63 or equiv.	3137	314	470	627	941	1255	1568	1882	2196

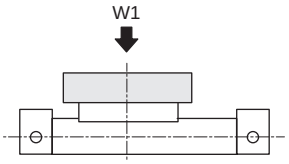
Note: Values in Table 1 do not include thrust efficiency.

4 Step 4 Calculation of load (W) and moments

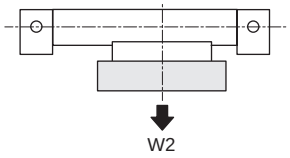
Vertical load and static moment work according to the cylinder mounting direction and the position of center of gravity of load.

[Vertical load]

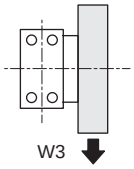
[W1 (Horizontal upward, vertical)]

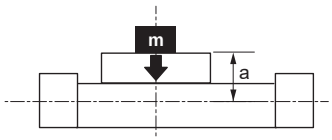


[W2 (Horizontal downward)]



[W3 (Horizontal lateral)]



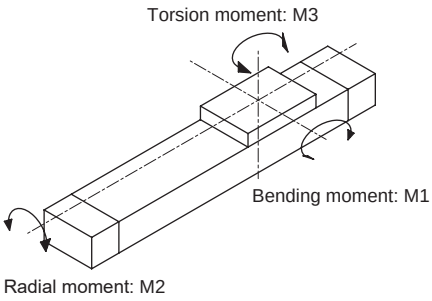


Value of a

Bore size	a(m)
ø25 or equiv.	0.057
ø32 or equiv.	0.040
ø40 or equiv.	0.046
ø63 or equiv.	0.063

[Static moment]

● Types of moment caused by load

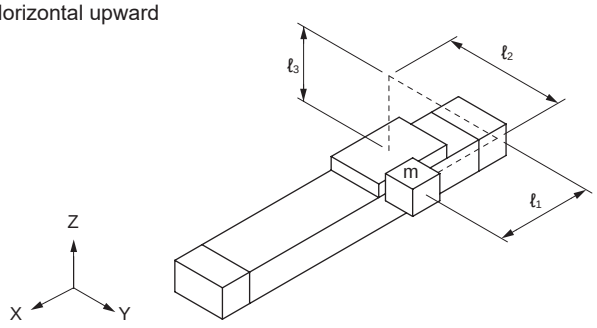


Unit: N·m

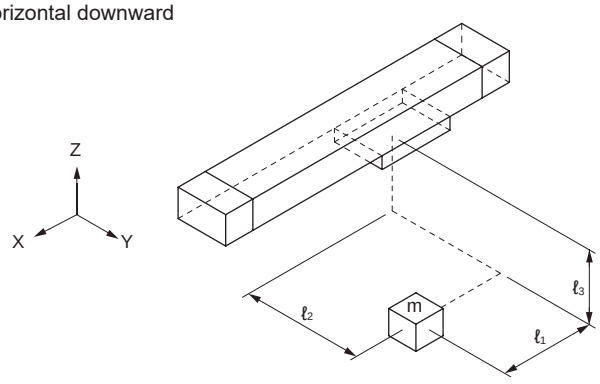
Mounting orientation		Horizontal upward	Horizontal downward	Horizontal lateral	Vertical
Vertical load W		mx9.8			-
Static moment	M1	W×ℓ_1	W×ℓ_1	-	W×(ℓ_3+a)
	M2	W×ℓ_2	W×ℓ_2	W×(ℓ_3+a)	-
	M3	-	-	W×ℓ_1	W×ℓ_2

m : Load weight [kg]
ℓ_1 : Length along the stroke direction from the center of table to the center of gravity of load [m]
ℓ_2 : Length in the width direction from the center of table to the center of gravity of load [m]
ℓ_3 : Length in the vertical direction from the center of table to the center of gravity of load [m]

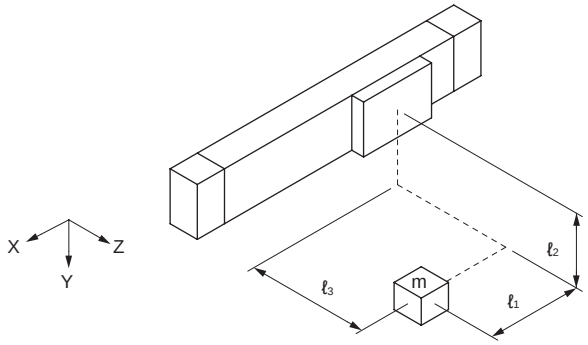
Horizontal upward



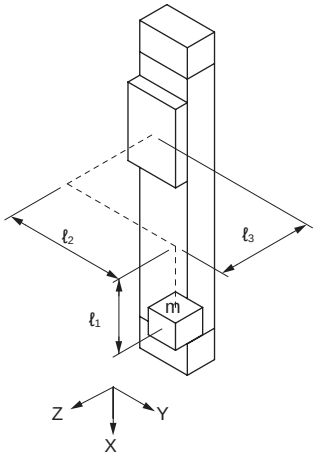
Horizontal downward



Horizontal lateral



Vertical



5 Step 5 Calculation of load and resultant moment

● Divide each load by the allowable value read from Figure 3 to Figure 8 to find load/moment ratio, and confirm that the total value is 1.0 or less.

Formula

$$\frac{W}{Wmax'} + \frac{M1}{M1max'} + \frac{M2}{M2max'} + \frac{M3}{M3max'} \leq 1.0$$

Wmax', M1max', M2max' and M3max' are values read from Figure 2 to Figure 7.

● If the total value is more than 1.0,
1. Review the load
2. Use a cylinder with wider bore size, etc., for revision.

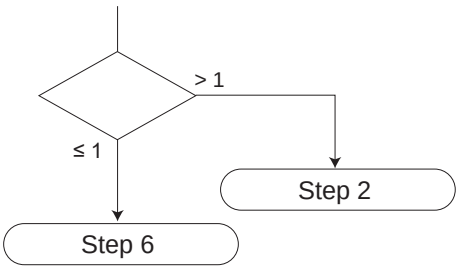


Figure 2 Allowable W1, W2 and W3 loads for SRM3-25 and 32

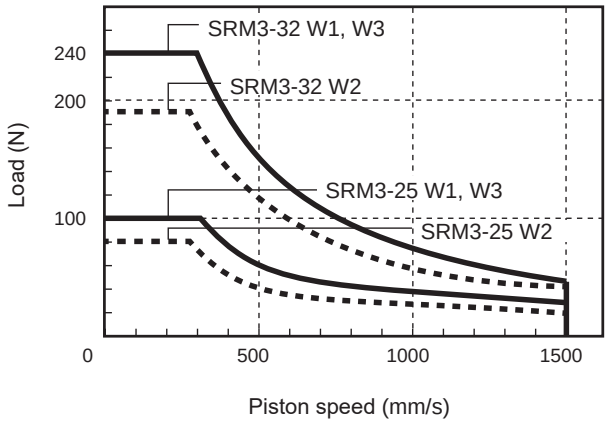


Figure 3 Allowable W1, W2 and W3 loads for SRM3-40 and 63

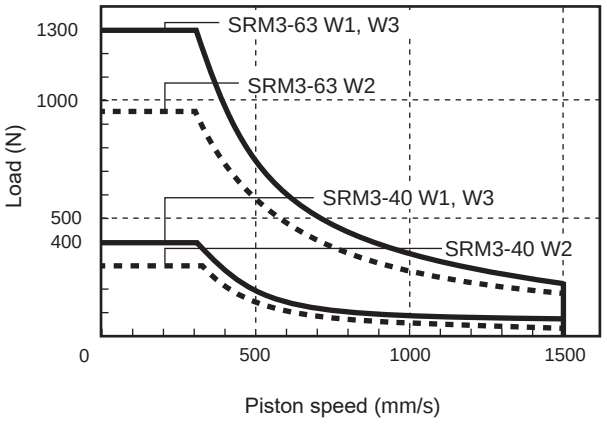


Figure 4 Allowable M1 and M3 moments for SRM3-25 and 32

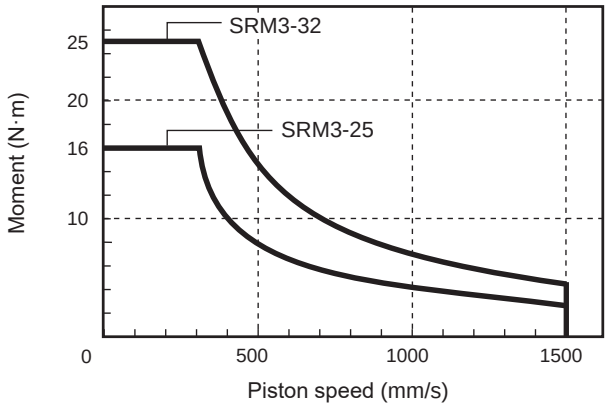


Figure 5 Allowable M1 and M3 moments for SRM3-40 and 63

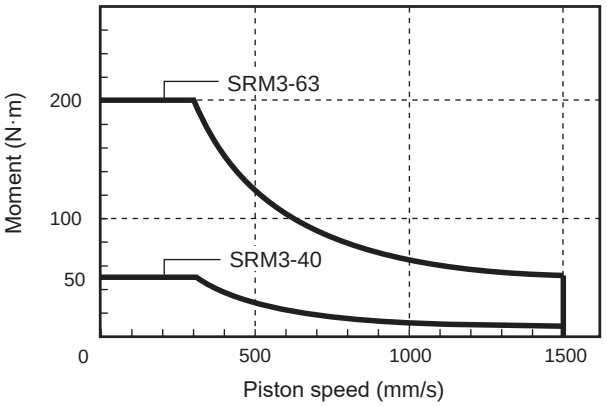


Figure 6 Allowable M2 moment for SRM3-25 and 32

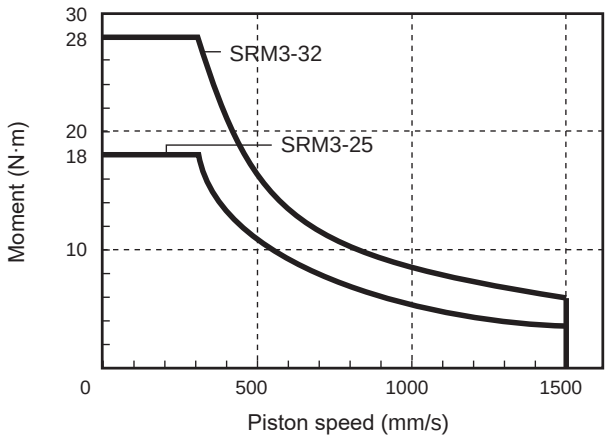
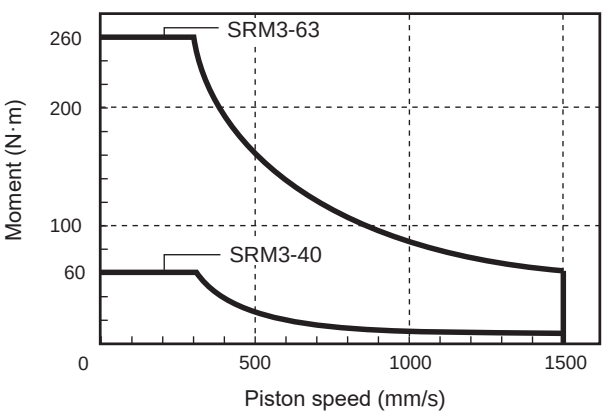


Figure 7 Allowable M2 moment for SRM3-40 and 63



6 Step 6 Calculation of required thrust

Calculate the required cylinder thrust (F_N).

1. For horizontal operation
   $F_N = Wx0.2(N)$

2. For vertical operation
   $F_N = W(N)$

7 Step 7 Calculation of load factor

● Determine the load factor by taking into account the status of utilization such as stability, margin and service life of the cylinder.

● Formula of load factor (α)

$$\alpha = \frac{\text{Required thrust } (F_N)}{\text{Thrust of cylinder } (F)} \times 100\%$$

$$F = \frac{\pi}{4} xD^2xPx \frac{\mu}{100} (N)$$

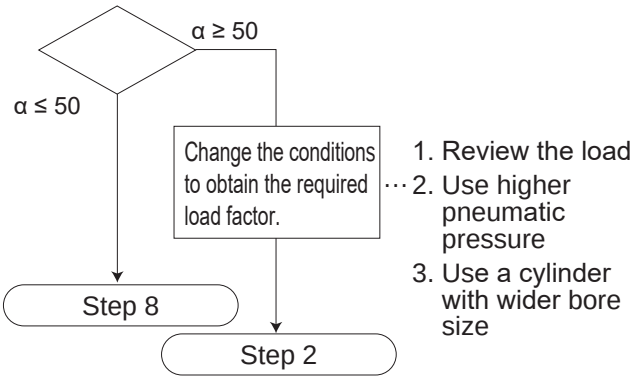
D: Cylinder bore size (mm)

$\frac{\pi}{4} \times D^2$ = Pressurized area (mm^2)

● The cylinder theoretical thrust value in Table 4 can be used as the $\frac{\pi}{4} xD^2xP$ value.

P: Working pressure (MPa)

μ: Thrust efficiency (Use the values in Figure 1.)



[Appropriate range of load factor]

● The piston speed differs depending on the load factor. In normal use, the values in Table 2 are recommended.

Table 2 (Appropriate range of load factor - reference value)

Working pressure MPa	Load factor %
0.2 to 0.3	α ≤ 40
0.3 to 0.6	α ≤ 50
0.6 to 0.7	α ≤ 60

[Example] Size of the cylinder used: ø25 or equiv.

Required thrust 4 N

Working pressure 0.5 MPa

$$\alpha = \frac{4}{542x0.5x \frac{83}{100}} x100$$

= 2%

Appropriate since the result is α ≤ 50%.

8 Step 8 Confirming cushion capacity

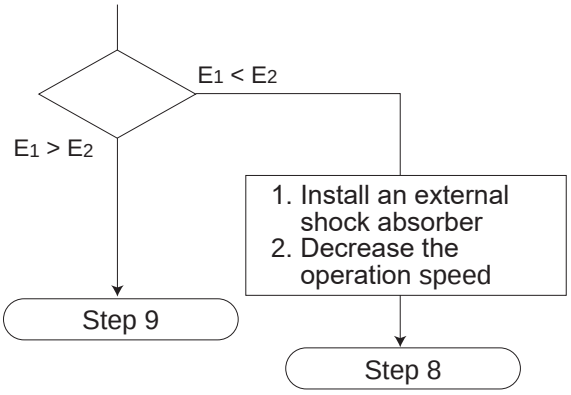
Check if the kinetic energy generated by an actual load can be absorbed by the cylinder cushion.

[Allowable absorbed energy of cylinder]

● The kinetic energy absorption performance of the cylinder's cushion depends on the cylinder bore size. For SRM3, use the values in Table 3 for comparison.

Table 3 SRM3 allowable absorbed energy (E_1)

Bore size (mm)	Allowable absorbed energy (J)
ø25 or equiv.	1.40
ø32 or equiv.	2.57
ø40 or equiv.	4.27
ø63 or equiv.	17.4



[Piston kinetic energy]

● Formula for calculating the piston kinetic energy (E_2)

$$E_2 = \frac{1}{2} \times M \times Va^2 \quad (J)$$

M : Applied load weight (kg)

Va : Speed of the piston entering the cushion (m/s)

$$Va = \frac{L}{t} \times \left(1 + 1.5 \times \frac{\alpha}{100}\right)$$

L: Stroke (m)

t : Operating time (S)

α :Load factor (%)

9 Step 9 Confirmation of inertia load

● Check whether the inertia force of the load caused by the piston operation is within the allowable range of the cylinder.

(1) Obtain the G coefficient from the speed of entering the cushion (Va) and Figure 8 (Trend of inertia force coefficient for SRM3). Use the speed of entering the cushion (Va) calculated in Step 8.

Va: Speed of the piston entering the cushion (m/s)

$$Va = \frac{L}{t} \times \left(1 + 1.5 \times \frac{\alpha}{100}\right)$$

L : Stroke (m)
t : Operating time (S)
α : Load factor (%)

(2) Obtain the bending moment (M1i) and torsion moment (M3i) of the inertia force.

Unit: N·m

Mounting orientation		Horizontal upward	Horizontal downward	Vertical	Horizontal lateral
Dynamic moment	M1i	Wx(ℓ3+a)xG			
	M2i	M2i dynamic moment is not generated.			
	M3i	Wxℓ2xG			

Moment of inertia force can be calculated with the formulas above regardless of the mounting direction.

(3) Add the moments of static load (M1 and M3) and the moments of inertia force (M1i and M3i) and check that the resultant values are within the max. allowable values in Table 4.

M1 + M1i ≤ M1max
M3 + M3i ≤ M3max

M1max and M3max are the values in Table 4.

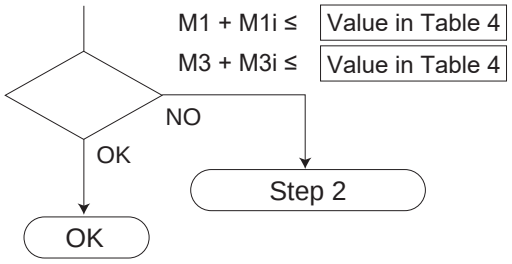


Figure 8 Trend of inertia force coefficient of SRM3

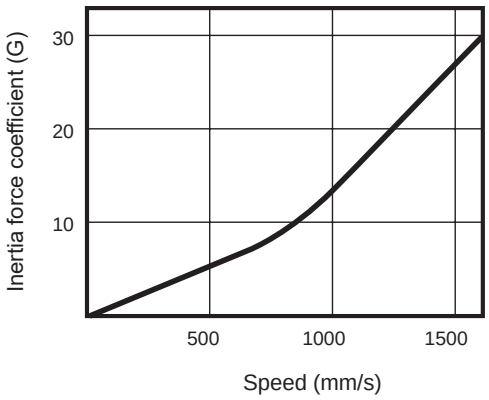


Table 4 Applied loads/max. allowable moments

Item / Bore size (mm)	Vertical load: W1max(N)	Vertical load: W2max(N)	Vertical load: W3max(N)
ø25 or equiv.	100	80	100
ø32 or equiv.	240	190	240
ø40 or equiv.	400	320	400
ø63 or equiv.	1300	1000	1300

Item / Bore size (mm)	Bending moment M1max (N·m)	Radial moment M2max (N·m)	Torsion moment M3max (N·m)
ø25 or equiv.	16	18	16
ø32 or equiv.	25	28	25
ø40 or equiv.	50	60	50
ø63 or equiv.	200	260	200

Table 4 shows the max. allowable values. The allowable values at specific operating speeds are as shown in Figure 2 to Figure 7. (The cylinder can be used in the range below and to the left of the characteristics curves of Figure 2 to Figure 7.)

1 Cushion performance and kinetic energy

(1) Cushion

● Cushion

The cushion absorbs piston kinetic energy by using air compressibility and prevents the piston and cover from colliding at the stroke end. Therefore, the cushion itself does not reduce the piston speed at the stroke end.

Table 5 shows kinetic energy that can be absorbed by the cushion. If kinetic energy exceeds these values or bounding due to air compression should be avoided, select the type with shock absorber or add a separate shock absorber.

(Refer to Step 8 above.)

● SRM3 cushion performance

Table 5 Allowable absorbed energy of cushion (E_1)

Bore size (mm)	Effective cushion length (mm)	Allowable absorbed energy (J)	
		With cushion	Without cushion
ø25 or equiv.	20.9	1.40	0.015
ø32 or equiv.	23.5	2.57	0.030
ø40 or equiv.	23.9	4.27	0.050
ø63 or equiv.	29.6	17.4	0.138

● Formula for kinetic energy calculation (E2)

$$E_2 = \frac{1}{2} \times M \times V^2 \quad (J)$$

M: Load weight (kg)

V : Speed of the piston entering the cushion Rush speed (m/s)

L : Cylinder stroke (m)

t : Piston operation time (s)

α : Cylinder load factor (%)

$$\alpha = \frac{\text{Applied load}}{\text{Thrust of cylinder}} \times 100$$

$$V = \frac{L}{t} \times \left(1 + 1.5 \times \frac{\alpha}{100}\right)$$

(2) Shock absorber

Shock absorbers used for SRM3 are shown in Table 7.

Use within the specifications for shock absorbers in Table 6.

Table 6 Specifications

Shock absorber model No. / Item		NCK-00-0.7-C	NCK-00-1.2	NCK-00-2.6	NCK-00-7	NCK-00-12
Type/Classification		Spring return without adjuster				
Max. energy absorption	J	7	12	26	70	120
Stroke	mm	8	10	15	20	25
Max. absorbed energy per hour	kJ/hr.	12.6	21.6	39.0	84.0	86.4
Max. colliding speed	m/s	1.5	2.0		2.5	3.0
Max. operating frequency	Cycle/min.	30		25	20	12
Ambient temperature	°C	-10 to 80				
Required mounting strength	N	6150	8400	12100	24400	33500
Return time	S	0.3 or less			0.4 or less	
Product weight	kg	0.02	0.04	0.07	0.2	0.3
Return spring force	When extended N	2.0	2.9	5.9	9.8	16.3
	When compressed N	4.3	5.9	11.8	21.6	33.3

● The allowable absorbed energy of SRM3 changes depending on the colliding speed. Keep it within 1/2 of the max. energy absorption in Table 9 at 1000 mm/s to 1500 mm/s colliding speed.

Table 7 Model numbers of applicable shock absorbers

Model	Model numbers of applicable shock absorbers	
	Standard (-A)	Light-load (-E)
SRM3-25	NCK-00-1.2	NCK-00-0.7-C
SRM3-32	NCK-00-2.6	NCK-00-1.2
SRM3-40	NCK-00-7	NCK-00-2.6
SRM3-63	NCK-00-12	NCK-00-7

● Confirmation of allowable colliding energy of shock absorber

Calculate the colliding object equivalent weight Me and the colliding energy E from the formula in the table below. Confirm that Me and E are within the allowable values shown in Figure 9. Also confirm that the operating frequency, colliding speed and other specifications are within the allowable values in the table.

Note that the allowable colliding object equivalent weight Me and allowable colliding energy E change depending on the colliding speed.

● Code

E : Colliding energy (J)
Me : Colliding object equivalent weight (kg)
m : Workpiece weight (kg)
F : Cylinder thrust (N)
V : Colliding speed (m/s)
St : Shock absorber stroke (m)
g : Gravity acceleration 9.8 (m/s²)

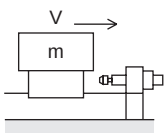
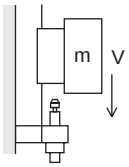
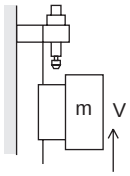
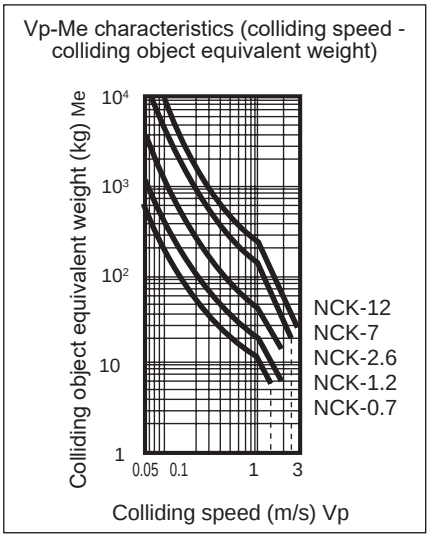
	Horizontal movement	Vertical down	Vertical up
Applications			
Colliding equivalent weight Me (kg)	$Me = m + \frac{2F \cdot St}{V^2}$	$Me = m + \frac{2 \cdot St\,(F+mg)}{V^2}$	$Me = m + \frac{2 \cdot St\,(F-mg)}{V^2}$
Energy E (J)	$E = \frac{mV^2}{2} + F \cdot St$	$E = \frac{mV^2}{2} + (F+mg) \cdot St$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

Figure 9 Allowable colliding object equivalent weight

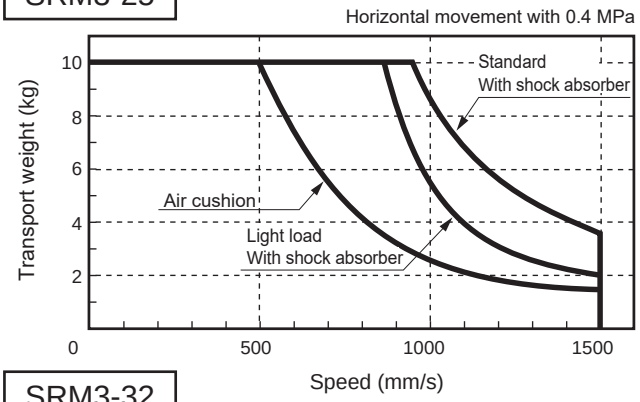


● With cushion/shock absorber Transfer weight - speed characteristics

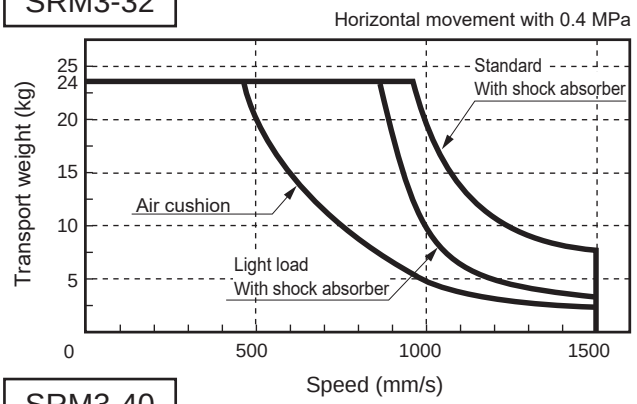
The figures below show the transfer weight and speed characteristics. They differ depending on the use conditions. Confirm that they are within the allowable values in Table 6.

SRM3 with cushion/shock absorber Transport weight and speed characteristics

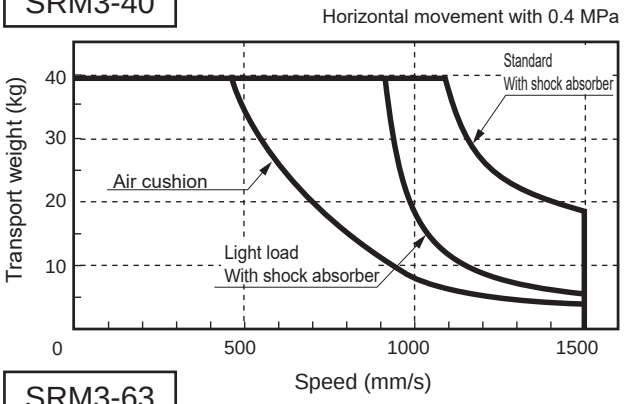
SRM3-25



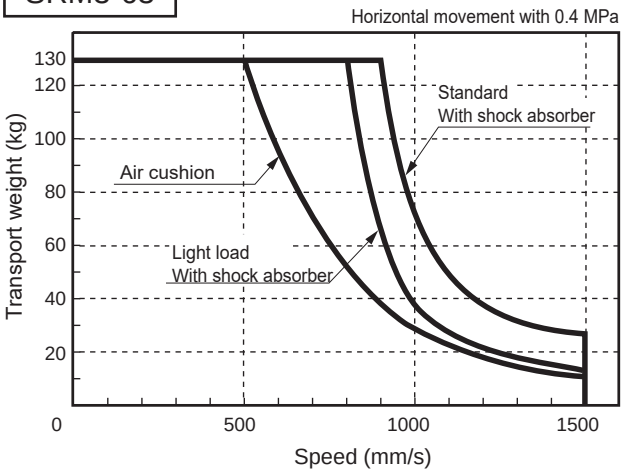
SRM3-32



SRM3-40



SRM3-63

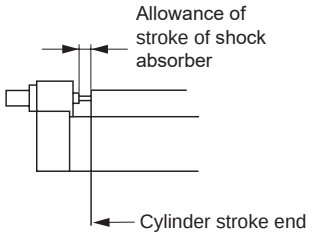


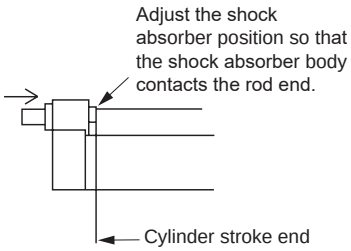
Precautions for use

A shock absorber can absorb the rated energy at the rated stroke. However, the initial shock absorber installation position is adjusted to have a stroke allowance at the cylinder's stroke end. Therefore, the absorbed energy will be less than the allowable absorbed energy (Table 11). If the rated absorbed energy is required, adjust the shock absorber so that the full stroke can be used.

Table 11 Initial set point of the type with shock absorber

Model	Standard (-A)		Light-load (-E)	
	Absorbed energy (J)	Effective stroke (mm)	Absorbed energy (J)	Effective stroke (mm)
SRM3-25	10	9	5.7	7
SRM3-32	18	13	10	9
SRM3-40	50	16.5	18	13
SRM3-63	86	21	50	16.5





(Note) This explanation applies to the shock absorber supplied with the full stroke adjustable.

Adjusting the shock absorber

Change the operational stroke of the shock absorber to adjust its absorbed energy.

● Example of calculation (SRM3-25-A)

Applicable shock absorber NCK-00-1.2

● Example of calculation (1)

Rising and lowering

Working conditions

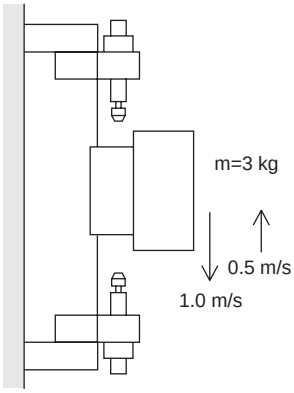
● Load weight m 3 kg

● Colliding speed

Rising 0.5 m/s

Lowering 1.0 m/s

● Working pressure 0.5 MPa (245 N)



(1) Kinetic energy when rising (E_1)

$$E_1 = \frac{3x0.5^2}{2} + (245 - 3x9.8)x0.01$$

$$= 2.5(J)$$

The kinetic energy (E1) is less than the max. energy absorption in Table 6 and can be absorbed.

$$Me = 3 + \frac{2x0.01x(245 - 3x9.8)}{0.5^2}$$

$$= 20(kg)$$

From Figure 10, Me of the shock absorber for SRM3-25-A:
The result is 32 kg at V = 0.5 m/s, which is allowable.

(2) Kinetic energy when falling (E_1)

$$E_1 = \frac{3x1.0^2}{2} + (245 + 3x9.8)x0.01$$

$$= 4.2(J)$$

The kinetic energy (E1) is less than 1/2 of the max. energy absorption in Table 6 and can be absorbed.

$$Me = 3 + \frac{2x0.01x(245 + 3x9.8)}{1.0^2}$$

$$= 8.5(kg)$$

From Figure 9, Me of the shock absorber for SRM3-25-A:
The Me value is 24kg at V = 1.0m/s, which is allowable.

● Example of calculation (2) Horizontal

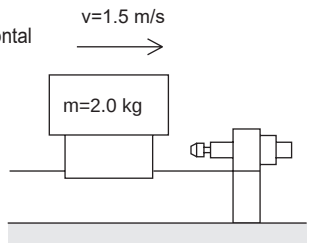
Working conditions

Load weight M 2 kg

Colliding speed

Horizontal 1.5 m/s

Working pressure 0.3 MPa (147 N)



Horizontal kinetic energy (E1)

$$E_1 = \frac{2x1.5^2}{2} + 147x0.01$$

$$= 3.7(J)$$

The kinetic energy (E1) is less than 1/2 of the max. energy absorption in Table 6 and can be absorbed.

$$Me = 2 + \frac{2x147x0.01}{1.5^2}$$

$$= 3.3(kg)$$

From Figure 9, Me at V = 1.5 (m/s) of the shock absorber for SRM3-25-A is 10 kg. Therefore the result of 3.4 < 10 is allowable.

(Note) Refer to the selection guide Step 9 (9 Confirmation of inertia load) and keep the inertia load within the allowable value.

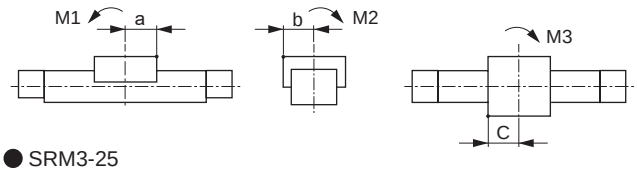
2 Sag of table (displacement at the table end)

The figures below show displacement at the table end when moment operates.
The table on the right shows the table end position.

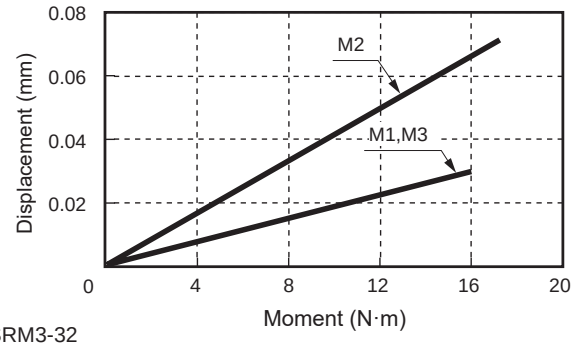
mm

Model	a	b	c
SRM3-25	50	50	50
SRM3-32	55	55	55
SRM3-40	70	70	70
SRM3-63	100	100	100

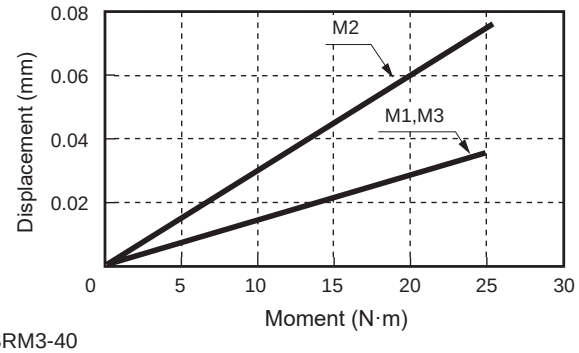
M1 moment M2 moment M3 moment



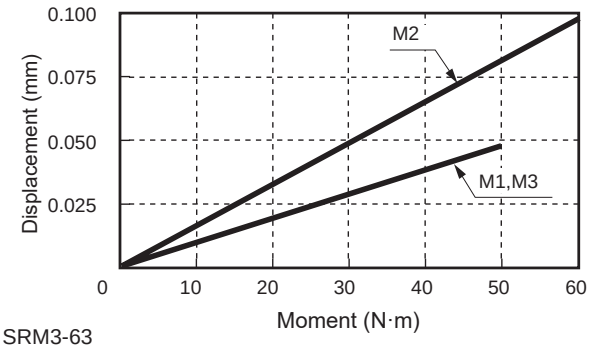
● SRM3-25



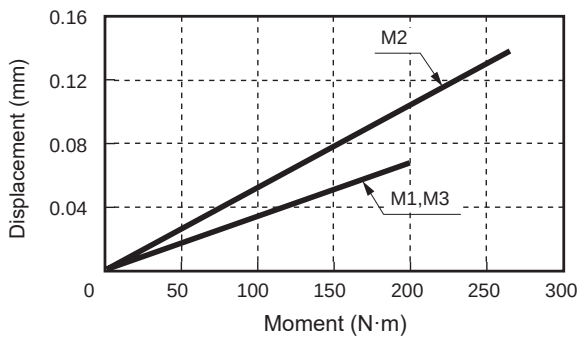
● SRM3-32



● SRM3-40



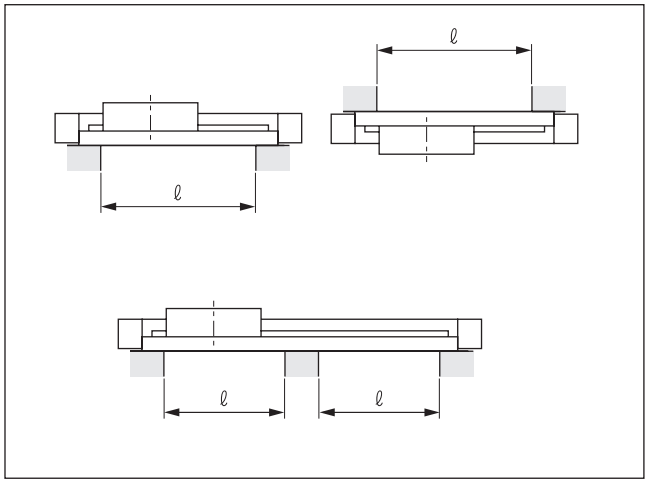
● SRM3-63



3 Support intervals

Sag increases with a longer stroke and larger bending moment. Use the intervals in the table below as a guide to fix the tube.

Model	Recommended support intervals (ℓ) mm
SRM3-25	400
SRM3-32	400
SRM3-40	500
SRM3-63	600



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: High precision guided rodless cylinder SRM3 Series

Design/selection

1. Common

⚠ CAUTION

■ Pay attention when designing the brake control circuit.
A slight amount of external leakage is inherent to the structure of SRL3 and other slit rodless cylinders. Therefore, brake control using a 3-position valve with all ports closed may fail to keep the stop position of the table. Use the control circuit with both sides pressurized with 3-position P/A/B connection valve. However, note that the table may deviate from origin if air pressure is applied in the de-energized state when starting after a pressure drop.

■ Basic circuit diagram

● Horizontal load
When piping is as shown in Fig. 1, equal pressure is applied to both ends of the piston when stopped to prevent the table from popping out when operation is restarted.

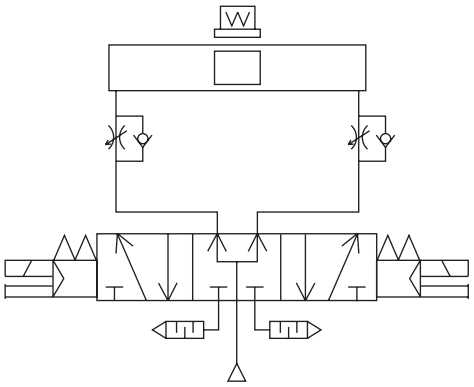


Fig. 1

● Vertical load
When vertical load works as shown in Figure 2, the table moves in the load direction. Install a regulator with check valve on the top to reduce thrust in the load direction to balance the load.

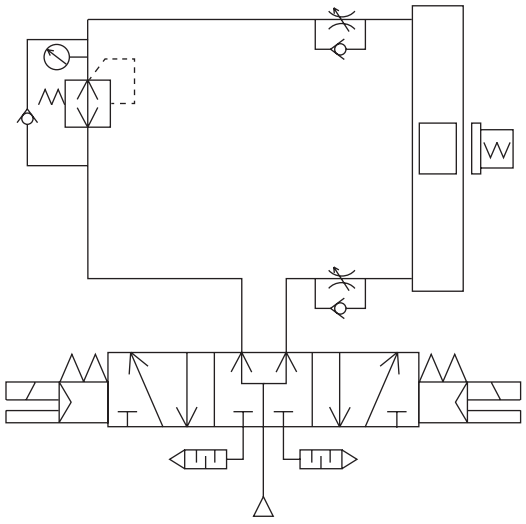
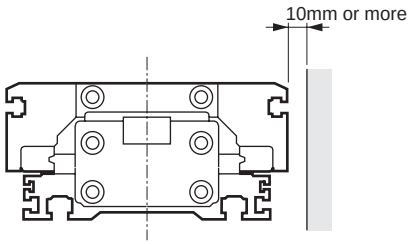


Fig. 2

■ The cylinder switch may malfunction if there is a magnetic substance such as a metal plate installed adjacently. Check that a distance of 10 mm is provided from the side surface of the table.



■ Do not use the cylinder in places where it is directly exposed to coolant, oil mist, etc.
Be sure to provide a protective cover, etc., if the cylinder must be installed in such a place.

■ Do not use this product where foreign matter such as cutting chips, dust, or spatter, etc., will contact or enter the cylinders.
Provide a protective cover, etc., if the cylinder must be installed in such a place. Be sure to consult with CKD for use in these environments.

■ Prevent negative pressure from occurring inside the cylinder tube. Using the cylinder as an air balancer or operating the table with external force or inertia force with all ports closed may cause negative pressure inside the cylinder, resulting in air leakage if the seal belt comes off. Do not use external force or inertia force, otherwise negative pressure will occur inside the cylinder.

2. Position locking SRM3-Q

⚠ CAUTION

■ Cylinder load factor must be 50% or less.
If the load factor is high, the lock may not be released, or the lock section may be damaged.

■ To operate the cylinder at 500 mm/s and over, reduce the speed when entering the position locking mechanism to 500 mm/s or less.
To reduce the speed, add an external shock absorber or deceleration circuit.

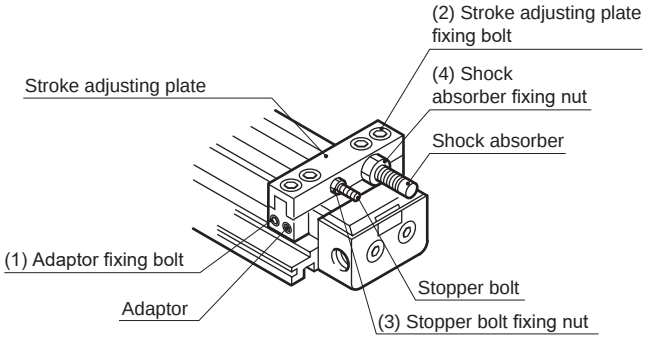
Mounting, installation and adjustment

1. Common

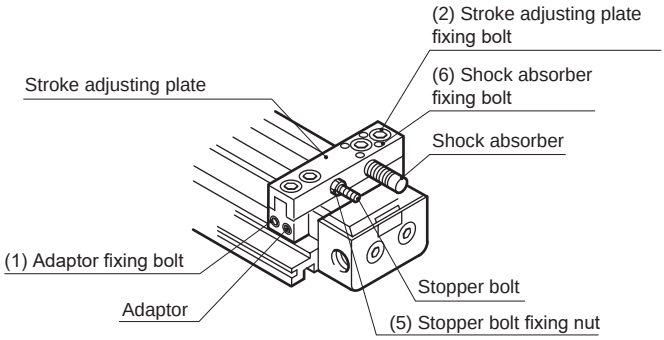
⚠WARNING

■How to adjust the stroke adjusting unit

Full stroke adjustable with standard shock absorber (SRM3-**-***-A1)



Full stroke adjustable with light-load shock absorber (SRM3-**-***-E1)



(1) Moving the stroke adjusting unit

● Loosen the adaptor fixing bolt and the stroke adjusting plate fixing bolt to move the stroke adjusting unit.

(2) Fixing the stroke adjusting unit

● After moving the stroke adjusting unit to the desired position, tighten the adaptor fixing bolt and the stroke adjusting plate fixing bolt with the value in Table 1 to fix the unit.

Table 1 Tightening torque of adaptor fixing bolt and stroke adjusting plate fixing bolt

Tightening torque / Model	Adaptor fixing bolt N·m	Stroke adjusting plate fixing bolt N·m
SRM3-25	6.2 to 7.6	6.2 to 7.6
SRM3-32	6.2 to 7.6	6.2 to 7.6
SRM3-40	10.4 to 12.8	10.4 to 12.8
SRM3-63	19.4 to 23.8	19.4 to 23.8

● To fix the stroke adjusting plate, tighten the fixing bolt with no gap between the adaptor and tube. Then tighten the adaptor fixing bolt.

(3) Adjusting the stroke with a stopper bolt

To adjust the stroke, loosen the stopper bolt fixing nut and turn the stopper bolt. After adjustment, tighten the stopper bolt fixing nut with the value in Table 2 or Table 3 to fix the stopper bolt.

Table 2 Tightening torque of stopper bolt fixing nut and shock absorber fixing nut of model with standard shock absorber (SRM3-**-A, A1 and A2)

Table 3 Tightening torque of stopper bolt fixing nut and shock absorber fixing nut of model with light-load shock absorber (SRM3-**-E, E1 and E2)

Tightening torque / Model	Stopper bolt fixing nut N·m	Shock absorber fixing nut N·m
SRM3-25-A	4.5 to 6	4.6 to 6
SRM3-32-A	9 to 12	7.5 to 10
SRM3-40-A	22 to 30	22 to 30
SRM3-63-A	110 to 143	55 to 70

Tightening torque / Model	Stopper bolt fixing nut N·m	Shock absorber fixing bolt N·m
SRM3-25-E	4.5 to 6	1 to 1.2
SRM3-32-E	4.5 to 6	1 to 1.2
SRM3-40-E	9 to 12	2.3 to 2.8
SRM3-63-E	22 to 30	4.6 to 5.6

(4) Adjusting the shock absorber

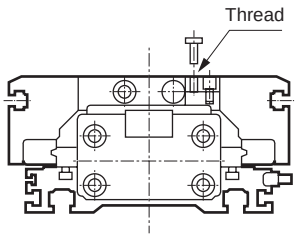
● With standard shock absorber

Change the operational stroke of the shock absorber to adjust its absorbed energy.

To adjust the operational stroke of the shock absorber, loosen the shock absorber fixing nut and turn the shock absorber. After adjustment, tighten the shock absorber fixing nut with the value in Table 2 to fix the shock absorber. Because the gap between the shock absorber and the stopper bolt is narrow, it is recommended to remove the stroke adjusting plate for adjustment.

● With light-load shock absorber

Tighten the shock absorber fixing bolt with the value in Table 3. If tightening too much has deformed the split part, screw a bolt into the thread part in the figure below to loosen the split part.



Model	Thread size
SRM3-25	M3
SRM3-32	M3
SRM3-40	M3
SRM3-63	M3

■Do not perform electric welding after installing the rodless cylinder.

⚠CAUTION

Otherwise electric current passes into the cylinder and causes sparks between the dust-proof belt and cylinder tube, which will damage the dust-proof belt.

■The cylinder body may be damaged or may malfunction if a unit with excessive inertia, etc., is moved. Use within the allowable range.

■Do not apply strong impact or excessive moment to the table.

■Carefully match the centers when connecting a load with an external guide mechanism.

● Displacement of the shaft center increases as the stroke becomes longer. Carefully decide the connection method (floating) so that the displacement can be absorbed.

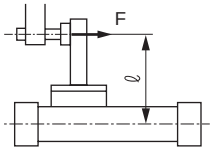
■ Keep moment, including inertia force caused by load transfer or stop, within the allowable load. Damage will occur if this value is exceeded.

(When the overhang load is large)

- When the overhang load is large and the cylinder is stopped at both ends by the piston, load inertia causes bending moment even if the energy is within the allowable absorbed energy of the internal cushion.
  If the kinetic energy is large and an external cushion is used, adjust so that the cylinder contacts with the center of gravity of workpiece or the closest point to it.

(When an external stopper is used)

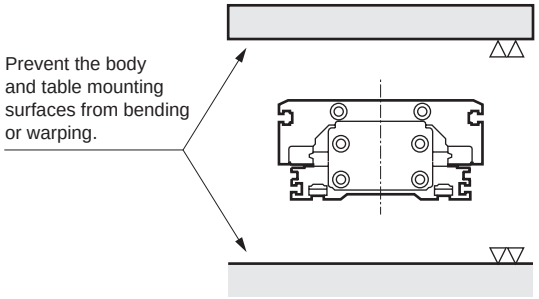
- When using an external stopper, make a selection considering bending moment due to the cylinder thrust.
- Moment that operates when the cylinder stops with an external stopper



M1 = F · ℓ

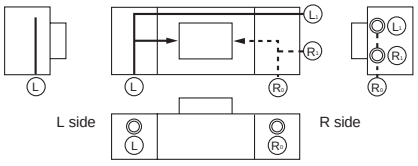
F : Cylinder thrust
ℓ : Length from the center of the cylinder to the stopper

■ Do not damage the surface flatness by denting or scratching the body (tube) mounting surface or the table mounting surface.



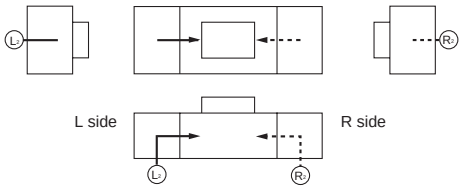
■ Piping port position and operating direction

● Option code (blank, R, B, T)



Ⓡ indicates the pressurized ports on Ⓡside and Ⓛ indicates the pressurized ports on Ⓛ side. When the product is shipped from the factory, ports other than one each of Ⓡand Ⓛ are sealed with plugs. Remove the plugs when piping to the plugged ports. Bottom piping is not possible. If bottom piping is necessary, select the option (D or S). $Ⓛ_1$port is available only for ø25, ø32 and ø40.
$Ⓛ_1$ port is not available for ø63.

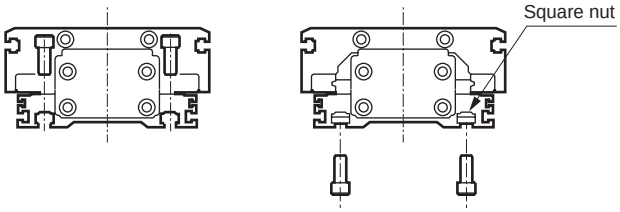
● Option (D, S) (bottom piping)

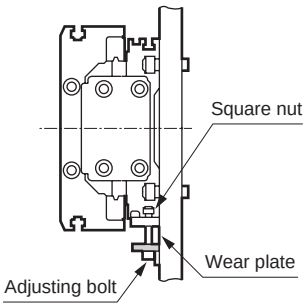


Ⓡindicates the pressurized ports on R side and Ⓛindicates the pressurized ports on L side. There are no ports for piping other than $Ⓡ_2$and $Ⓛ_2$.

■ Main body mounting

SRM3 can be installed in two directions as shown in the figure below. In addition, the T-groove enables flexible installation on the side surface. At that time, allow for level adjustment so that you can complete installation easily.





■ T-groove and square nuts

SRM3 has a T-groove where the square nuts can fit. The square nuts in the table below are supplied with the product as accessories.

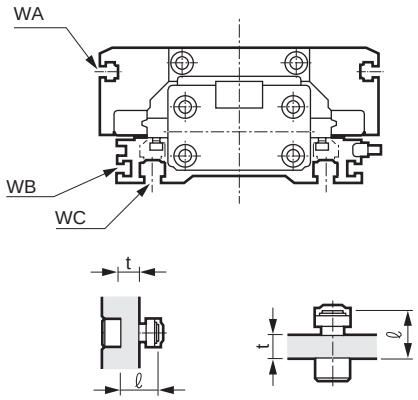
● Accessory square nuts (8 each)

Model	Accessory square nut	
SRM3-25	M4	M5
SRM3-32	M4	M6
SRM3-40	M4	M8
SRM3-63	M5	M10

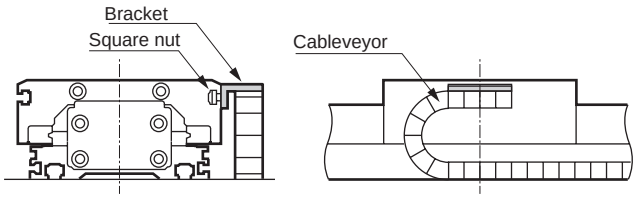
● The following dimensions are recommended for bolt length for T-groove (R).

mm

Model	WA	WB	WC
SRM3-25	M4 ℓ=t+6	-	M5 ℓ=t+6
SRM3-32	M4 ℓ=t+6	-	M6 ℓ=t+8
SRM3-40	M4 ℓ=t+6	M4 ℓ=t+6	M8 ℓ=t+10
SRM3-63	M5 ℓ=t+7	M5 ℓ=t+7	M10 ℓ=t+12



[Applications of table T-groove]

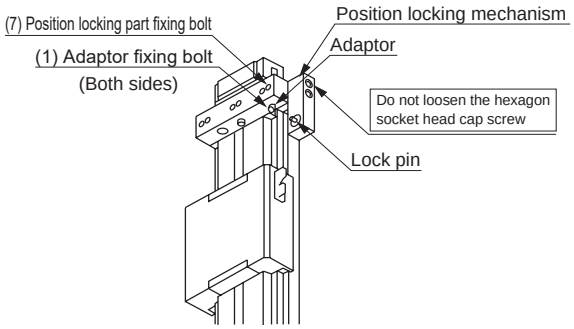


■ CKD's shock absorber is a repair part.
Replace when the energy absorption performance has degraded or the operation is not smooth.

2. Position locking SRM3-Q

⚠ WARNING

■ How to adjust the stroke adjusting unit



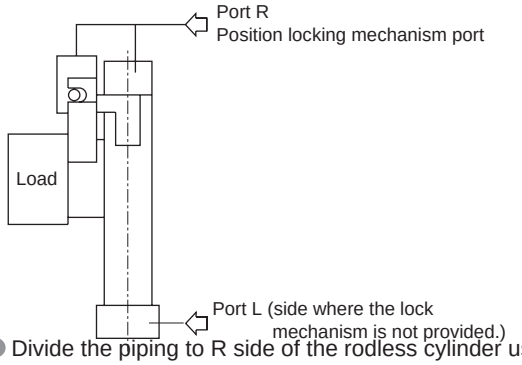
Loosen the (7) position locking part fixing bolt in the figure above to adjust the stroke. Do not loosen the hexagon socket head cap screw on the side in the figure above. Otherwise the position locking part lock pin will be displaced.

- Loosen the adaptor fixing bolt to move the position locking mechanism.
  The type with shock absorber (A, A1, E or E1) should be used in this case. Using the shock absorber to perform fine adjustment of the stroke will displace the position locking mechanism, which prevents secure locking. Therefore, use the adaptor fixing bolt for fine adjustment.
- After moving it to the desired position, tighten the adaptor fixing bolt with the value in the table below. If tightened with a value less than that in the table below, the position locking mechanism may be displaced.
- When setting a load, make sure to check that the lock mechanism functions before installing the product.

■ Piping

Model	(1) Adaptor fixing bolt tightening torque (7) Position locking part fixing bolt tightening torque
SRM3-Q-25	6.2 to 7.6
SRM3-Q-32	6.2 to 7.6
SRM3-Q-40	10.4 to 12.8
SRM3-Q-63	19.4 to 23.8

- Piping to the position locking mechanism is necessary.



- Divide the piping to R side of the rodless cylinder using a tee fitting, etc., and with the same kind of pipe, connect the piping to the position locking mechanism.
- When the piping to the position locking mechanism is long and thin, or when the speed controller is far away from the cylinder port, note that it takes time to engage the lock. Clogging in the silencer mounted on the EXH port of the valve may cause the same result.

■ Supply pressure equal to or higher than the min. working pressure to the position locking mechanism port.

■ Manual release

- Push in the lock pin of position locking mechanism using a stick. At this time, make sure to supply pressure to port L, and before unlocking, check that load is not applied to the lock mechanism.
- If pressure is supplied to port R when both ports R and L are exhausted and the piston is locked, the lock may be unlocked and the table may pop out. This can be extremely hazardous.

■ Valves

- Keeping the cylinder with pressure applied to the lock mechanism may cause the lock pin to come off, which is very dangerous. Do not use 3-position closed center and 3-position P/A/B connection valves.
- If back pressure is applied to the locking mechanism, the lock may be released. Use a discrete valve, or use an individual exhaust manifold.
- For usage where the drop rate is increased using the quick exhaust valve, the lock may not release normally because the cylinder body starts operating before the lock pin. For the position locking cylinder, do not use the quick exhaust valve.

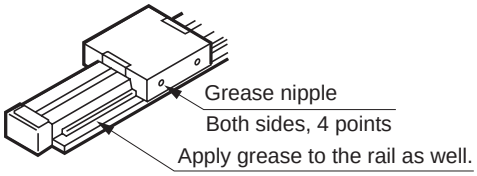
Use/maintenance

1. Common

⚠ CAUTION

■ The guide of SRM3 Series is already adjusted to the optimum pressure when shipped.
Do not adjust the pressurization unnecessarily.

■ Apply lithium grease to the guide of SRM3 Series when it reaches approximately 100 km of travel distance in normal use (approximately 6 months).
Recommended grease gun
Grease gun unit MG70 (THK)
Nozzle shape P type



2. Position locking SRM3-Q

⚠ WARNING

■ For safety purposes, prevent the load from falling under its own weight during maintenance.

■ In the case of the cylinder with air cushion, if the air cushion needle at the lock mechanism side is tightened excessively, the piston bounds at the stroke end, the lock lever contacts the lock pin violently and the lock mechanism may be damaged. Also, if the air cushion needle is opened too much, the piston bounces off at the stroke end, which may similarly damage the mechanism. Adjust the needle of the air cushion so that there is no bound.
When stopping the piston with an external buffer device (shock absorber, etc.), adjust it similarly so that there is no bound.
Inspect the piston once or twice a year to make sure there is no damage to the retainer caused by this phenomenon.

⚠ CAUTION

■ After the lock mechanism is manually operated, make sure to confirm manual operation and return the mechanism to the original state before use. Do not perform manual operation except for adjustment, as it is dangerous.

■ When mounting or adjusting the cylinder, release the lock. If mounting work, etc., is done while the lock is engaged, the lock part may be damaged.

■ Do not use multiple synchronized cylinders. Do not use so that 1 workpiece is moved by synchronizing 2 or more position locking cylinders. Lock release may fail for one of the cylinders.

■ Use the speed controller with meter-out. If the meter-in control is used, the lock may not be able to be released.

■ At the side where the lock mechanism is attached, be sure to use the cylinder from the stroke end. If the cylinder piston does not reach the stroke end, the lock may not be engaged or the lock may not be able to be released.

■ Apply grease regularly to the sliding part of the lock lever.