

COMPACT GUIDED CYLINDER

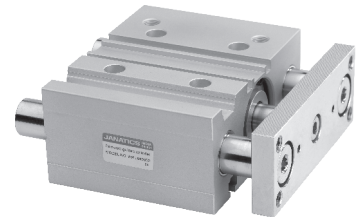
Series A91AL

Cat No A91AL - 01 - 01 - A

COMPACT GUIDED CYLINDER WITH ADJUSTABLE CUSHIONING (Bushing type) - Ø16, 20, 25, 32, 40, 50, 63mm

Features

- ❑ For ease of loading & unloading workpiece at restriction
- ❑ Compact cylinders with strong clamping force, Ø16 to 63mm
- ❑ Improved mounting accuracy. Guide bush and positioning pin hole ensure high-precision mounting
- ❑ Body machined from extruded aluminium that mounts directly to equipment for rigid, secure mounting in small space
- ❑ Compact equipment design is possible. Suited for electronic parts inspection clamps. Ideal for use in small mounting space



Technical Specifications

Series	A91AL						
Bearing type	Bushing						
Cylinder bore Ø (mm)	16	20	25	32	40	50	63
Standard stroke * (mm)	25, 50, 75, 100, 125, 150, 175, 200						
Working pressure (bar)	1.5 to 10						
Medium	Compressed air - Filtered - Non-lubricated (without moisture)						
Ambient temperature C	-10° to +60°						
Medium temperature C	+5° to +50°						
Materials of construction	Aluminium, Brass, Nitrile, Steel, Gunmetal, Polyurethane						
Cushion	Adjustable cushioning on both ends						
Stroke length tolerance (mm)	+1.5 0						

Output force (force in N : 1N = 0.1 kgf)

Bore dia (mm)	Rod size (mm)	Operating direction	Piston area (mm ²)	Operating pressure in bar								
				2	3	4	5	6	7	8	9	10
16	8	OUT	201	40	60	80	101	121	141	161	181	201
		IN	151	30	45	60	76	91	106	121	136	151
20	10	OUT	314	63	94	126	157	188	220	251	283	314
		IN	236	47	71	94	118	142	165	189	212	236
25	12	OUT	491	98	147	196	246	295	344	393	442	491
		IN	378	76	113	151	189	227	265	302	340	378
32	16	OUT	804	161	241	322	402	482	563	643	724	804
		IN	603	121	181	241	302	362	422	482	543	603
40	16	OUT	1257	251	377	503	629	754	880	1006	1131	1257
		IN	1056	211	317	422	528	634	739	845	950	1056
50	20	OUT	1963	393	589	785	982	1178	1374	1570	1767	1963
		IN	1649	330	495	660	825	990	1154	1319	1484	1649
63	20	OUT	3117	623	935	1247	1559	1870	2182	2494	2805	3117
		IN	2803	561	841	1121	1402	1682	1962	2242	2523	2803

(Above values have been worked out taking frictional loss into consideration)

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Standard Stroke

Model		Standard stroke (mm)	Intermediate stroke
A91AL Bushing	16	25, 50, 75, 100	Contact Janatics
	20, 25, 32, 40, 50, 63	25, 50, 75, 100, 125, 150, 175, 200	

Weight Table - Bushing Type

Unit : (kg)

Bore dia (mm)	Model	Stroke (mm)							
		25	50	75	100	125	150	175	200
16	A91AL	0.51	0.69	0.78	0.91	-	-	-	-
20		0.89	1.14	1.34	1.54	1.74	1.94	2.13	2.33
25		1.23	1.60	1.87	2.14	2.41	2.68	2.95	3.23
32		1.98	2.51	2.77	3.15	3.53	3.91	4.29	4.68
40		2.34	2.91	3.21	3.64	4.06	4.49	4.92	5.34
50		3.92	4.75	5.29	5.93	6.57	7.21	7.85	8.49
63		4.94	5.89	6.54	7.29	8.05	8.81	9.56	10.3

CAUTION NOTES

Be sure to read before handling

Precautions

1. Never place your hands or fingers between the plate and the body

Be very careful to prevent your hands or fingers from getting caught in the gap between the cylinder body and the plate when the air is applied.

Caution

1. Do not scratch or gouge the sliding portion of the piston rod and the guide rod

Damaged seals, etc., will result in leakage or malfunction.

2. Bottom of cylinder

The guide rods may protrude from the bottom of the cylinder at the end of the retracting stroke. Therefore, wherever the cylinder is to be bottom mounted, it is necessary to provide bypass ports in the mounting surface of the guide rods, as well as holes for the hexagon socket head screws, which are used for mounting. Moreover, in applications where impact occurs from a stopper, etc., the mounting bolts should be inserted to a depth of 2d or more (1.5d or more for standard).

Warning

1. Do not open the cushion valve excessively.

Air leakage will occur if operated after opening by 4 rotations or more. Furthermore, a stopper mechanism is provided for the cushion valve, and it should not be forced open beyond that position. Be aware that the cushion valve may jump up from the cover when the air is supplied.

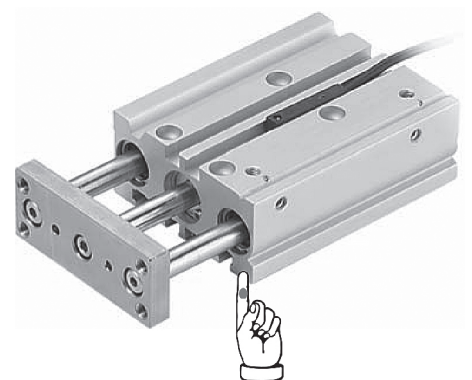
Caution

1. Be sure to use the cylinder after the air cushion has been adjusted appropriately.

First, fully close the cushion valve. Starts the operation at the cylinder speed to be used with the load applied, and then open the cushion valve gradually to make the adjustment. The optimal adjustment is that the piston reaches its stroke end and the collision sound is minimized. If the cushion valve is used without adjusting the air cushion appropriately, this may cause damage to the retaining ring or piston.

2. Be sure to operate a cylinder equipped with air cushion to the end of the stroke.

If it is not operated to the end of the stroke, the effect of the air cushion will not be fully exhibited. Consequently, in cases where the stroke is regulated by an external stopper etc., caution must be exercised, as the air cushion may become completely ineffective.



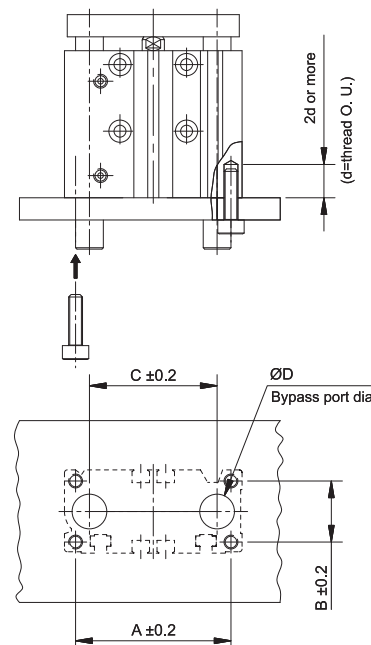
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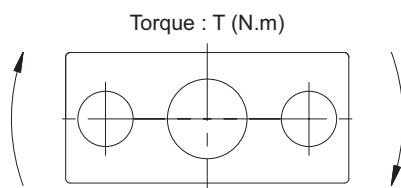
Standard Type

Bore dia (mm)	A	B	C	D	Hex. socket head cap screw
16	56	22	46	12	M5x0.8
20	72	24	54	14	M5x0.8
25	82	30	64	18	M6x1.0
32	98	34	78	22	M8x1.25
40	106	40	86	22	M8x1.25
50	130	46	110	27	M10x1.5
63	142	58	124	27	M10x1.5



Operating Condition

Allowable Rotational Torque of Plate

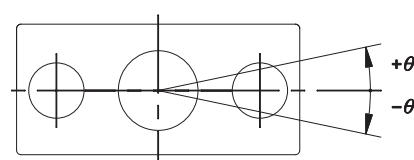


Bore dia (mm)	Stroke (mm)							
	25	50	75	100	125	150	175	200
16	0.53	0.38	0.69	0.58	-	-	-	-
	1.27	0.86	0.65	0.52	-	-	-	-
20	0.99	0.75	1.88	1.63	1.44	1.28	1.16	1.06
	2.66	1.94	1.52	1.25	1.34	1.17	1.03	0.93
25	1.64	1.25	2.96	2.57	2.26	2.02	1.83	1.67
	4.08	3.02	2.38	1.97	2.05	1.78	1.58	1.41
32	6.35	5.13	5.69	4.97	4.42	3.98	3.61	3.31
	5.95	4.89	5.11	4.51	6.34	5.79	5.33	4.93
40	7.00	5.66	6.27	5.48	4.87	4.38	3.98	3.65
	6.55	5.39	5.62	4.96	6.98	6.38	5.87	5.43
50	13.0	10.8	12.0	10.6	9.50	8.60	7.86	7.24
	9.17	7.62	9.83	8.74	11.6	10.7	9.83	9.12
63	14.7	12.1	13.5	11.9	10.7	9.69	8.86	8.16
	10.2	8.48	11.0	9.74	13.0	11.9	11.0	10.2

1 N.m = 10.2 kgf.cm

Non-Rotating Accuracy of Plate

Non-rotating accuracy θ when retracted and when no load is applied should be not more than the values shown in the table.



Bore dia (mm)	Non-rotating accuracy θ
16	$\pm 0.08^\circ$
20	$\pm 0.07^\circ$
25	

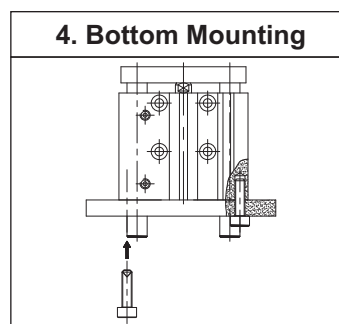
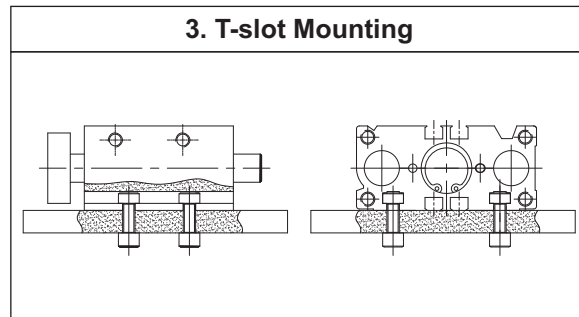
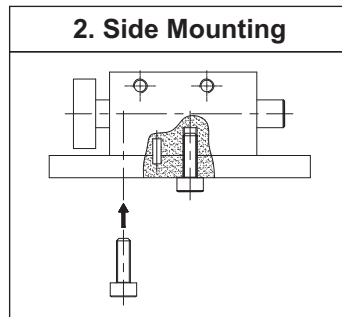
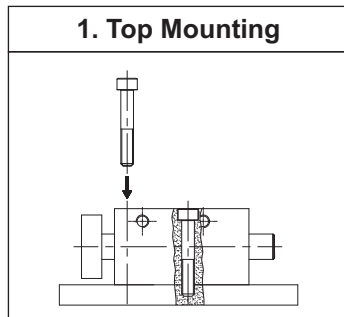
Bore dia (mm)	Non-rotating accuracy θ
32	$\pm 0.06^\circ$
40	
50	$\pm 0.05^\circ$
63	

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Four Mounting Style



Easy positioning

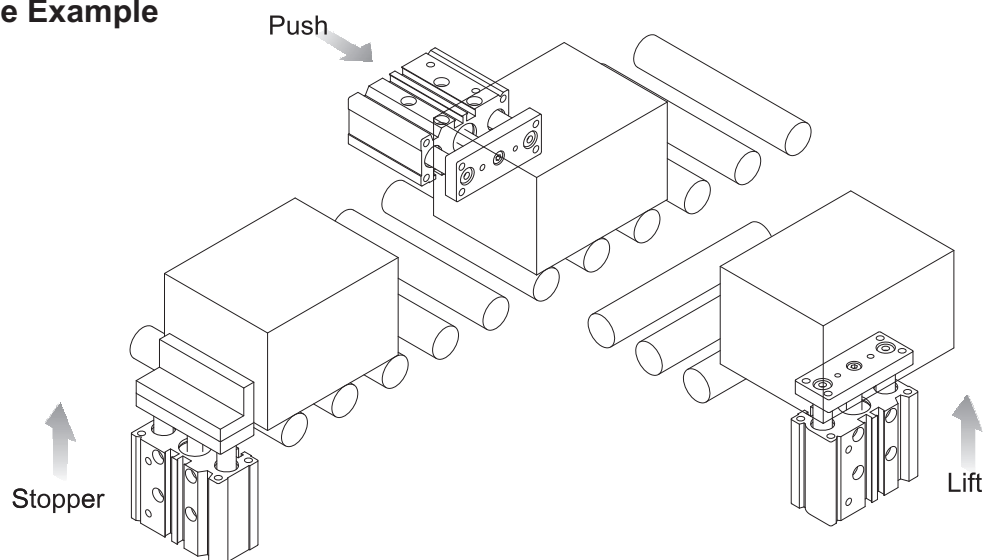
Knock pin holes provided on each mounting surface.

Stroke corresponding list - stroke variations

Bearing type	Bore dia (mm)	Stroke (mm)							
		25	50	75	100	125	150	175	200
A91AL Bushing	16	●	●	●	●	-	-	-	-
	20	●	●	●	●	●	●	●	●
	25	●	●	●	●	●	●	●	●
	32	●	●	●	●	●	●	●	●
	40	●	●	●	●	●	●	●	●
	50	●	●	●	●	●	●	●	●
	63	●	●	●	●	●	●	●	●

(●) Standard stroke, for intermediate stroke please contact with us for detailed dimensions.

Multipurpose Example

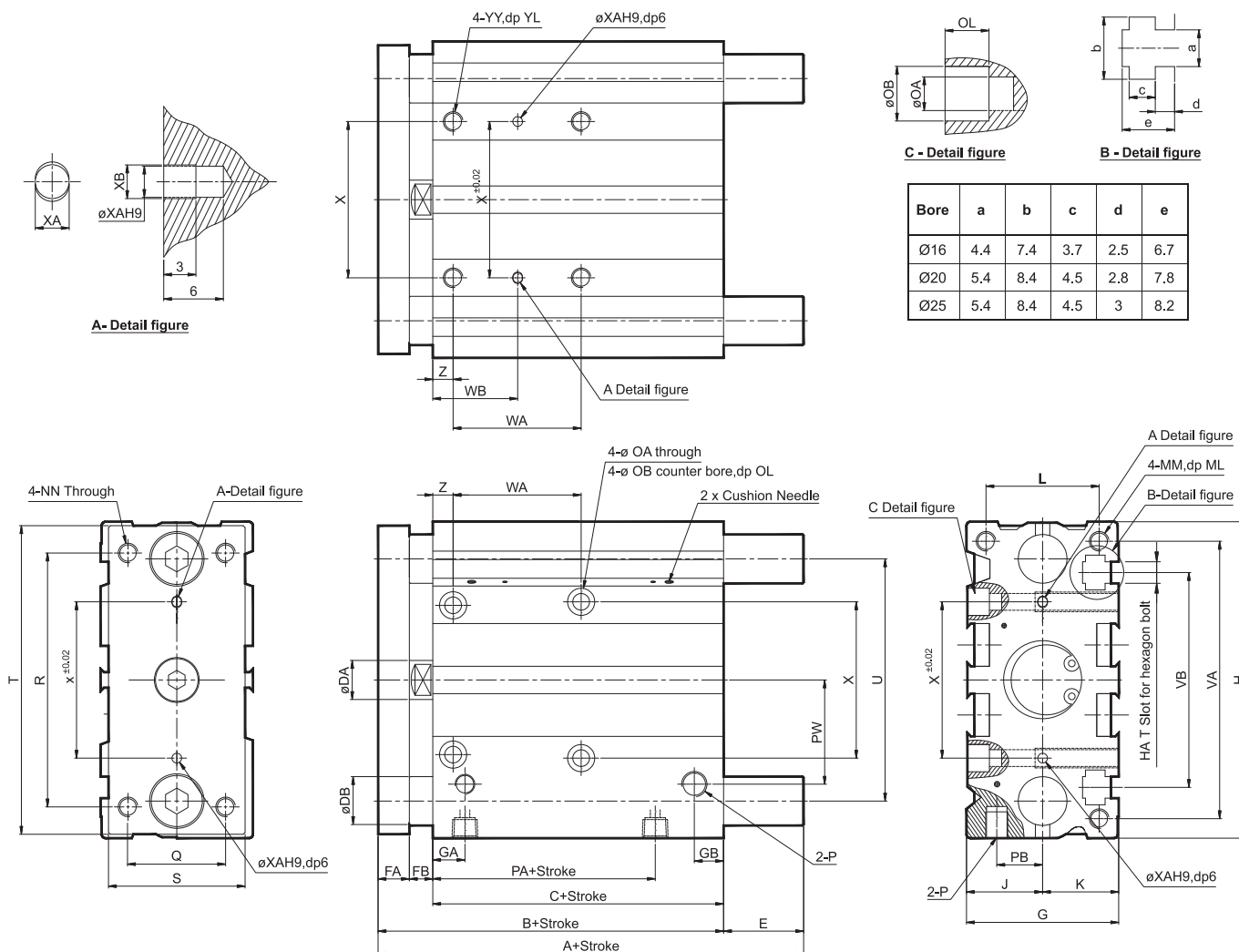


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Series A91AL

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Basic Dimensions



A91AL Common Dimensions

Bore	B	C	DA	FA	FB	G	GA	GB	H	HA	J	K	L	MM	ML	NN	OA	OB	OL	P	PA	PB	PW
Ø16	71	58	8	8	5	30	13	9.5	64	M4	15	15	22	M5x0.8	12	M5x0.8	4.3	8	4.5	M5x0.8	39.5	10	19
Ø20	78	62	10	10	6	36	10.5	10.5	83	M5	18	18	24	M5x0.8	13	M5x0.8	5.3	9.5	5.5	G1/8	38.5	10.5	25
Ø25	78.5	62.5	12	10	6	42	11.5	11	93	M5	21	21	30	M6x1.0	15	M6x1.0	5.3	9.5	5.5	G1/8	37.5	13.5	28.5

Bore	Q	R	S	T	U	VA	VB	WA (stroke)				WB (stroke)				X	XA	XB	YY	YL	Z
								From 25 stroke to less than 100 stroke	From 100 stroke to less than 200 stroke	From 200 stroke to less than 300 stroke	From 300 stroke to 400 stroke	From 25 stroke to less than 100 stroke	From 100 stroke to less than 200 stroke	From 200 stroke to less than 300 stroke	From 300 stroke to 400 stroke						
Ø16	16	54	25	62	46	56	38	44	110	200	-	27	60	105	-	24	3	3.5	M5x0.8	10	5
Ø20	18	70	30	81	54	72	44	44	120	200	300	39	77	117	167	28	3	3.5	M6x1.0	12	17
Ø25	26	78	38	91	64	82	50	44	120	200	300	39	77	117	167	34	4	4.5	M6x1.0	12	17

A91AL (Bushing) A / DB / E Dimensions

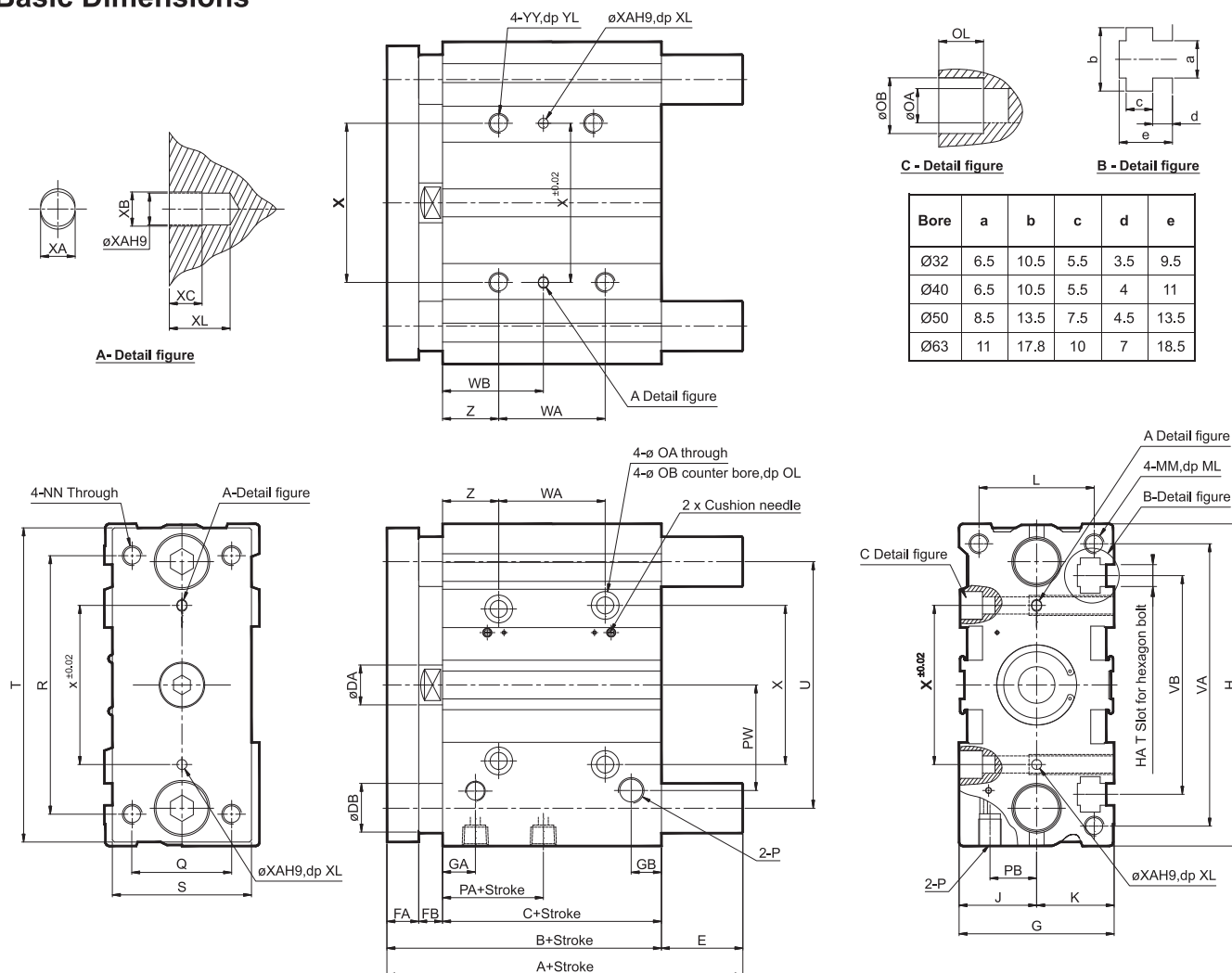
Bore	A (stroke)			DB	E (stroke)		
	From 25 stroke to less than 125 stroke	From 125 stroke to less than 250 stroke	From 250 stroke to 400 stroke		From 25 stroke to less than 125 stroke	From 125 stroke to less than 250 stroke	From 250 stroke to 400 stroke
Ø16	71	92.5	92.5	10	0	21.5	21.5
Ø20	78	78	110	12	0	0	32
Ø25	78.5	78.5	109.5	16	0	0	31

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Series A91AL

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Basic Dimensions



A91AL Common Dimensions

Bore	B	C	DA	FA	FB	G	GA	GB	H	HA	J	K	L	MM	ML	NN	OA	OB	OL	P	PA	PB	PW
Ø32	59.5	37.5	16	12	10	48	12.5	11.5	112	M6	24	24	34	M8x1.25	20	M8x1.25	6.6	11	7.5	G1/8	31.5	15	34
Ø40	66	44	16	12	10	54	15	15	120	M6	27	27	40	M8x1.25	20	M8x1.25	6.6	11	7.5	G1/8	38	18	38
Ø50	72	44	20	16	12	64	15.5	14.5	148	M8	32	32	46	M10x1.5	22	M10x1.5	8.6	14	9.5	G1/4	34	21.5	47
Ø63	77	49	20	16	12	78	16.5	15	162	M10	39	39	58	M10x1.5	22	M10x1.5	8.6	14	9.5	G1/4	38	28	58

Bore	Q	R	S	T	U	VA	VB	WA (stroke)				WB (stroke)				X	XA	XB	XC	XL	YY	YL	Z
								From 25 stroke to less than 100 stroke	From 100 stroke to less than 200 stroke	From 200 stroke to less than 300 stroke	From 300 stroke to 400 stroke	From 25 stroke to less than 100 stroke	From 100 stroke to less than 200 stroke	From 200 stroke to less than 300 stroke	From 300 stroke to 400 stroke								
Ø32	30	96	44	110	78	98	63	48	124	200	300	45	83	121	171	42	4	4.5	3	6	M8x1.25	16	21
Ø40	30	104	44	118	86	106	72	48	124	200	300	46	84	122	172	50	4	4.5	3	6	M8x1.25	16	22
Ø50	40	130	60	146	110	130	92	48	124	200	300	48	86	124	174	66	5	6	4	8	M10x1.5	20	24
Ø63	50	130	70	158	124	142	110	52	128	200	300	50	88	124	174	80	5	6	4	8	M10x1.5	20	24

A91AL (Bushing) A / DB / E Dimensions

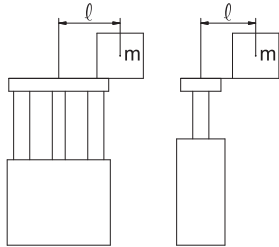
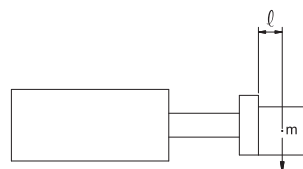
Bore	A (stroke)			DB	E (stroke)		
	From 25 stroke to less than 50 stroke	From 50 stroke to less than 250 stroke	From 250 stroke to 400 stroke		From 25 stroke to less than 50 stroke	From 50 stroke to less than 250 stroke	From 250 stroke to 400 stroke
Ø32	84.5	93.5	129.5	20	0	9	45
Ø40	91	93.5	129.5	20	0	2.5	38.5
Ø50	97	109.5	150.5	25	0	12.5	53.5
Ø63	102	109.5	150.5	25	0	7.5	48.5

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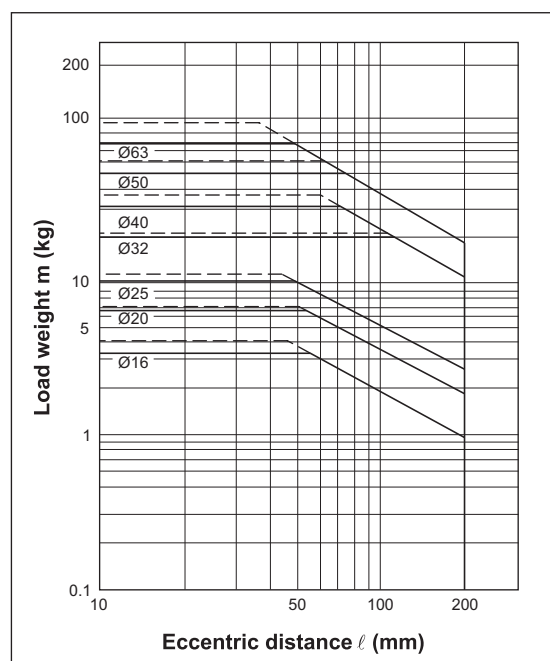
Cat No A91AL - 01 - 01 - A

Model Selection

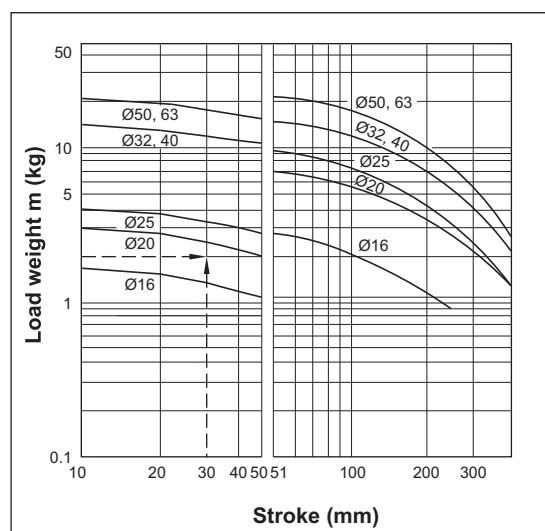
Mounting orientation	Vertical		Horizontal	
				
Max speed (mm/s)	200	400	200	400
Graph (bushing type)	(A), (B)	(C), (D)	(M), (N)	(O), (P)

Selection example 1 (Vertical mounting)	Selection example 1 (Horizontal mounting)
Selection conditions Mounting : Vertical Bearing type : Bushing Stroke : 30mm Max. speed : 200 mm/s Load weight (m): 3kg Eccentric distance (l): 90mm Find the point of intersection for the load weight of 3kg and the eccentric distance of 90mm on graph (A), based on vertical mounting with bushing type. The stroke is 30mm while the speed is 200 mm/s. So A91AL25x30 is selected.	Selection conditions Mounting : Horizontal Bearing type : Bushing Distance between plate and load centre of gravity (l): 50mm Max. speed : 200 mm/s Load weight (m): 2kg Stroke : 30mm Find the point of intersection for the load weight of 2kg and stroke 30mm on graph (M), based on horizontal mounting with bushing type. The distance is 50mm between the plate and load centre of gravity while the speed is 200 mm/s. So A91AL20x30 is selected.

Graph (A) 50mm stroke or less, V=200mm/s



Graph (M) l=50mm, V=200mm/s



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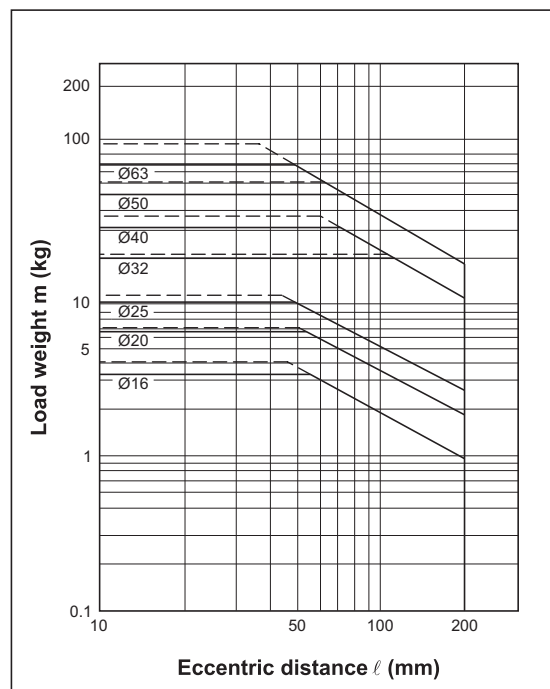
Cat No A91AL - 01 - 01 - A

Vertical mounting (Bushing)

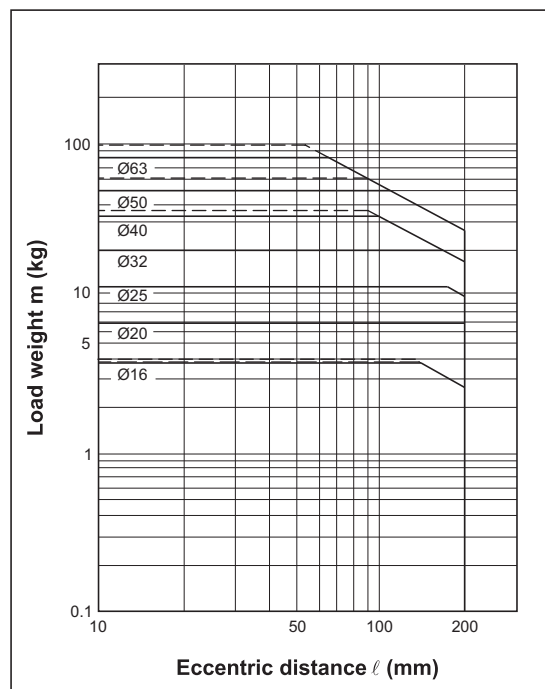
- A91AL Ø16 to 63mm

————— Operating pressure 4 bar
----- Operating pressure 5 bar or above

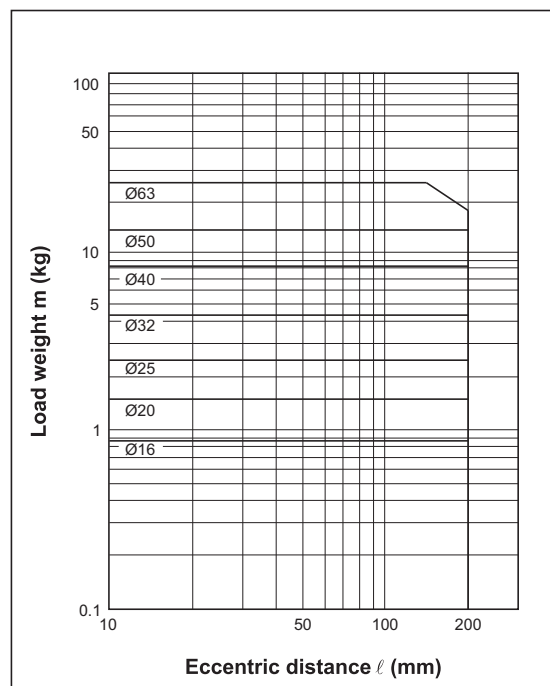
(A) 50mm stroke or less, V=200mm/s



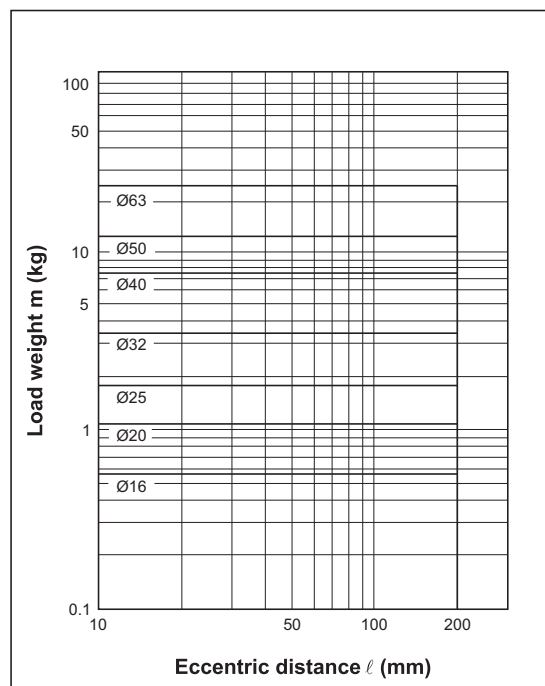
(B) Over 50 stroke, V=200mm/s



(C) 50mm stroke or less, V=400mm/s



(D) Over 50 stroke, V=400mm/s



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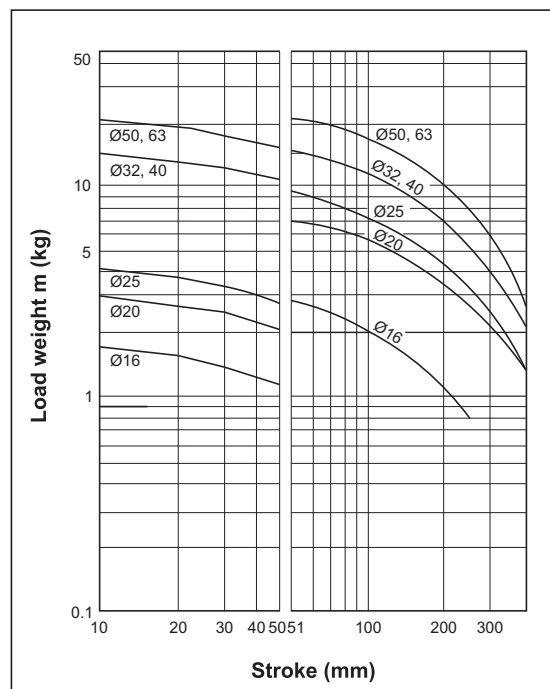
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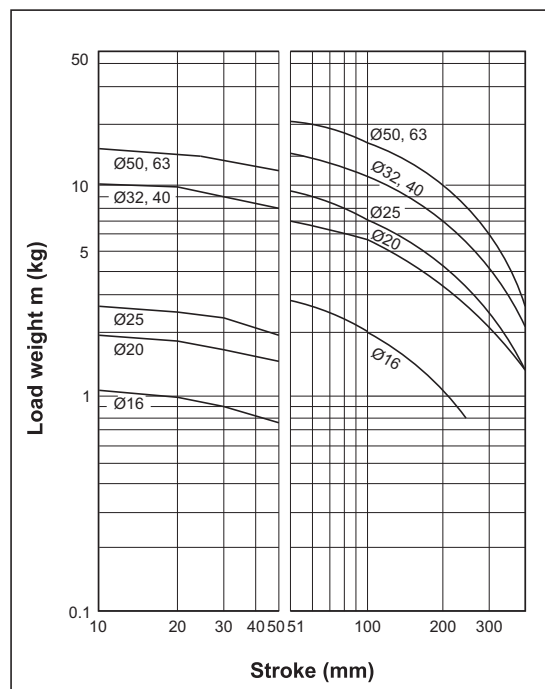
Horizontal mounting (Bushing)
- A91AL Ø16 to 63mm

Operating pressure 4 bar

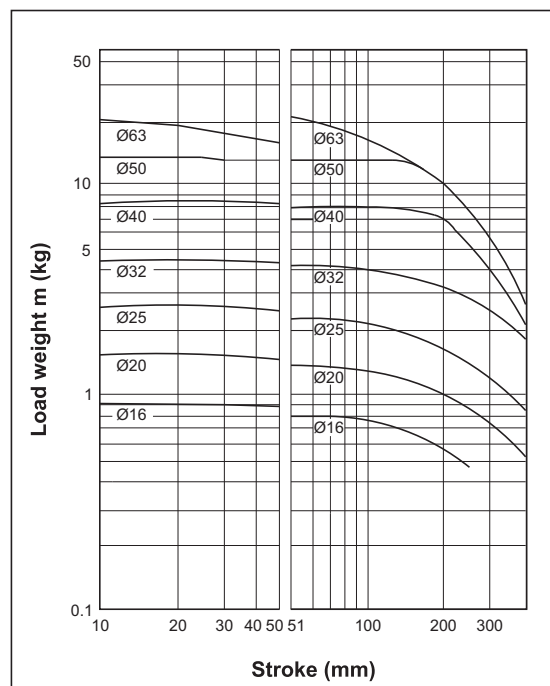
(M) $\ell=50\text{mm}$, $V=200\text{mm/s}$



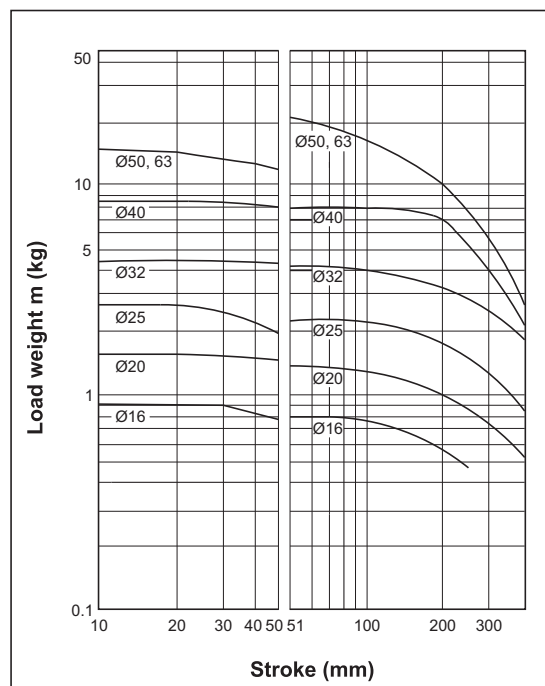
(N) $\ell=100\text{mm}$, $V=200\text{mm/s}$



(O) $\ell=50\text{mm}$, $V=400\text{mm/s}$



(P) $\ell=100\text{mm}$, $V=400\text{mm/s}$



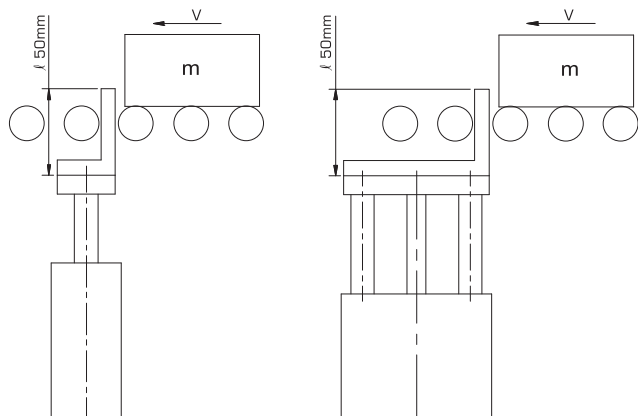
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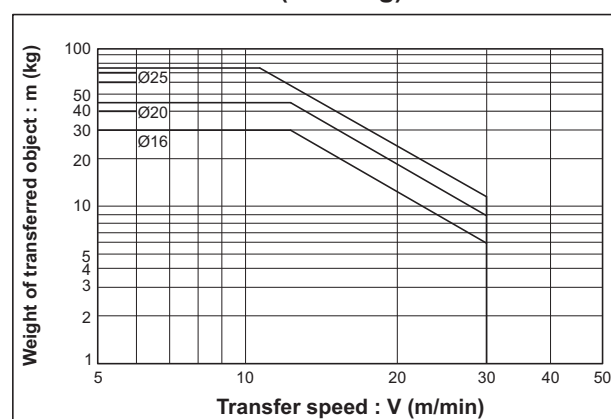
Operating range when used as stopper

Cylinder bore size Ø16 to 25mm (Bushing)



When selecting a model with a longer (ℓ) dimension, be sure to choose a bore size which is sufficiently large.

A91AL Ø16 to 25mm (Bushing)

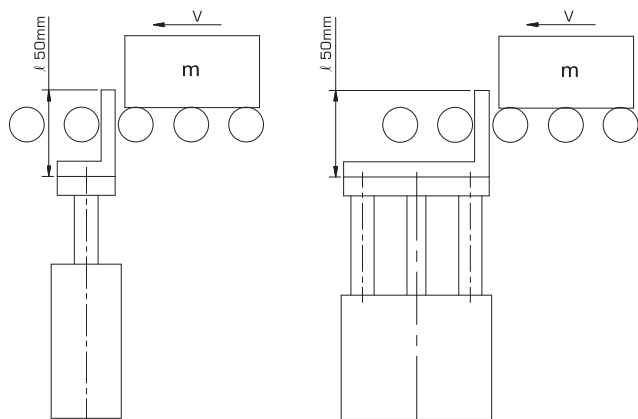


Caution

Caution on handling

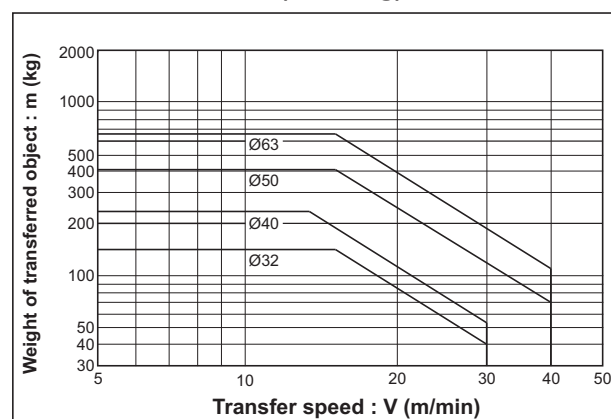
Note 1 : When using as a stopper, select a model with 30 stroke or less.

Cylinder bore size Ø32 to 63mm (Bushing)



When selecting a model with a longer (ℓ) dimension, be sure to choose a bore size which is sufficiently large.

A91AL Ø32 to 63mm (Bushing)



Caution

Caution on handling

Note 1 : When using as a stopper, select a model with 30 stroke or less.

COMPACT GUIDED CYLINDER

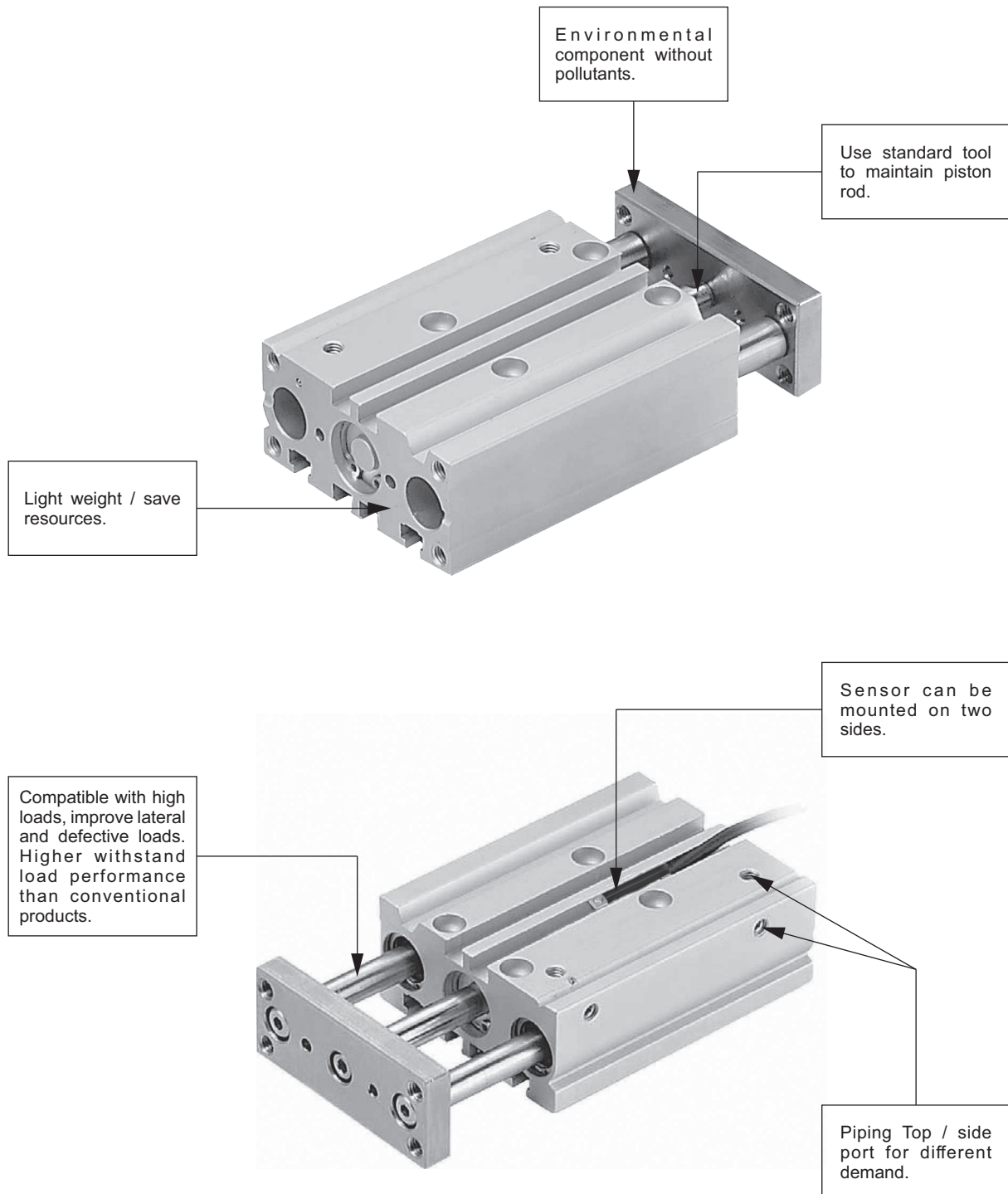
Series A91AL

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Sensors can be mounted on two sides

Bushing type

The lateral withstand load is more than twice that of a traditional stopper cylinder (round bar type) and is usable for use with lateral loads accompanied by impact.

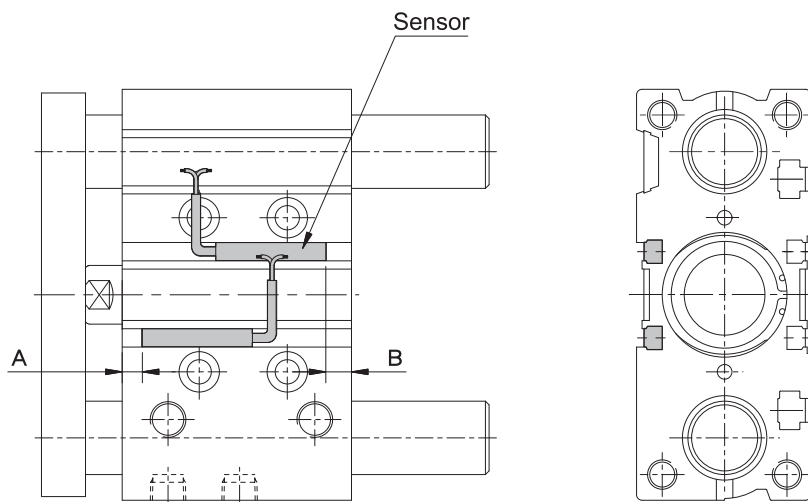


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Series A91AL

Cat No A91AL - 01 - 01 - A

Proper sensor mounting position (Detection at stroke end) and its mounting height



Proper mounting

Cylinder Bore dia (mm)	A	B
16	1.5	1
20	4.5	2
25	2	7

Cylinder Bore dia (mm)	A	B
32	0	7
40	2.5	12
50	10	4.5
63	10.5	9

Reed Switch Mounting

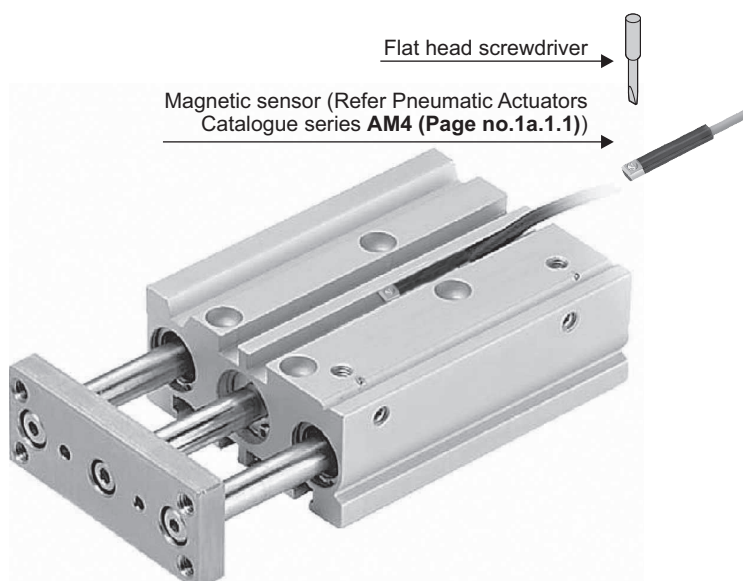
Caution

Application tool

To tighten the fixed screws on the reed switch, please use Ø5~Ø6 flat head screwdriver.

Torque to tighten

Please tighten when the output is 0.05 to 0.1 Nm (0.51 to 1.02 kgf/cm) then turn round 90° before feeling tight.



COMPACT GUIDED CYLINDER

Series A91AL

Cat No A91AL - 01 - 01 - A

How to order

A91	A	L	020	100	
Cushioning type		Bearing type		Bore dia (mm)	Stroke (mm)
A	Adjustable cushioning	L	Bushing	016 - Ø16	25 to 100
				020 - Ø20	25 to 200
				025 - Ø25	
				032 - Ø32	
				040 - Ø40	
				050 - Ø50	
				063 - Ø63	

Ordering Example:

Compact guided cylinder adjustable cushioning with bore Ø20mm, stroke 100 mm, bushing type : **A91AL020100**