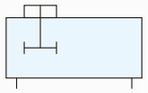
Symbol



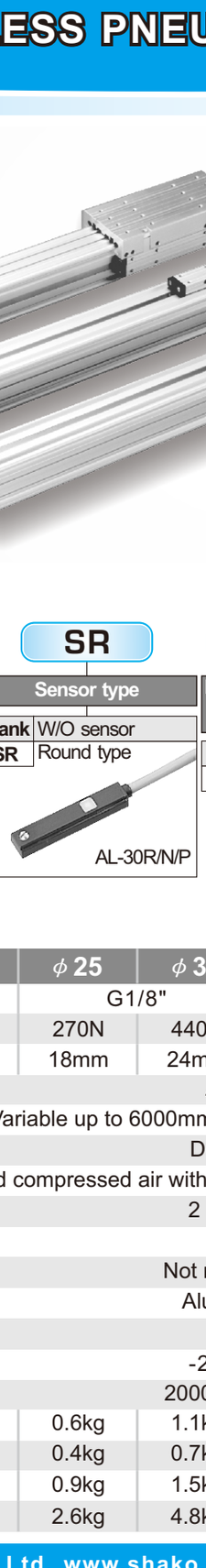
How to order

ZF	32	B	50	SR	1
Rodless pneumatic cylinder	Bore size		Stroke	Sensor type	Number of sensor

ZS	Standard type
ZF	Guiding type
ZK	Short type

18	ϕ 18
25	ϕ 25
32	ϕ 32
40	ϕ 40
50	ϕ 50
63	ϕ 63

Blank	W/O sensor
SR	Round type



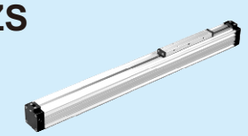
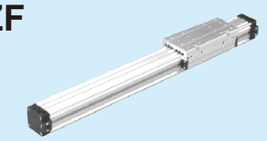
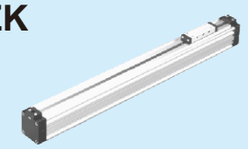
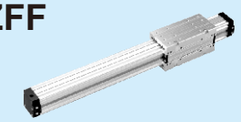
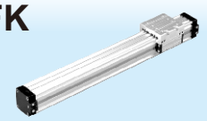
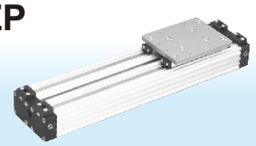
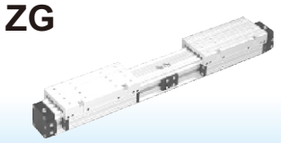
1	1 pcs
2	2 pcs

Stroke table

Bore size	Standard stroke (mm)
ϕ 18	50, 100, 150, 200, 250, 300,350,
ϕ 25	400, 450, 500, 550, 600, 650,
ϕ 32	700, 750, 800, 850, 900, 950,
ϕ 40	1000, 1050, 1100, 1150, 1200,
ϕ 50	1250, 1300, 1350, 1400,1450,
ϕ 63	1500, 1550, 1600, 1650, 1700,
	1750, 1800, 1850, 1900, 1950,
	2000

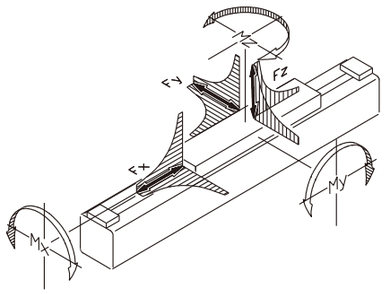
Specifications

Bore size	ϕ 18	ϕ 25	ϕ 32	ϕ 40	ϕ 50	ϕ 63
Port size	M5	G1/8"		G1/4"		G3/8"
Carrying force	140N	270N	440N	680N	1060N	1680N
Cushioning	15mm	18mm	24mm	34mm	40mm	49mm
Cushion	Adjustable					
Stroke	Variable up to 6000mm, option for longer than 6000mm					
Acting	Double acting					
Fluid	Filtered compressed air without lubricant, or slightly lubricated only					
Operating pressure range	2 ～ 8 kgf/cm²					
Max operating pressure	8 kgf/cm²					
Lubrication	Not required or few					
Barrel material	Aluminum alloy					
Magnet	Built-in					
Ambient temperature	-20℃ ～ 80℃					
Piston speed	2000mm/Sec(Max)					
Weight of ZS carriage	0.3kg	0.6kg	1.1kg	1.8kg	3.2kg	5.6kg
Weight of ZK carriage	0.2kg	0.4kg	0.7kg	1.2kg	2.0kg	3.2kg
Weight of ZF carriage	0.4kg	0.9kg	1.5kg	2.8kg	4.9kg	8.0kg
Weight of stroke 1000mm barrel	1.5kg	2.6kg	4.8kg	6kg	7.4kg	10kg

Model	Summary	Order
ZS 	**ZS Standard cylinder** With identical fitting length as existing cylinders without piston. 0-stroke compatible.	Standard
ZF 	**ZF Guiding cylinder** With external and adjustable slide guide. For high loads.	Standard
ZK 	**ZK Short cylinder** With extremely shortened fitting length. 0-stroke up to 42% shorter.	Standard
ZFF 	**ZFF Guiding cylinder** With external and adjustable slide guide. For high loads.	Option
ZFK 	**ZFK Guiding cylinder** With external and adjustable slide guide. For high loads.	Option
ZP 	**ZP Parallel cylinder** For high loads and movements in every direction double action force central port.	Option
ZG 	**ZG Gripping cylinder** Gripping and clamping functions. Opening & closing function.	Option
ZT 	**ZT Tandem cylinder** For high movements in longitudinal direction.	Option
ZD 	**ZD Double action cylinder** Double action force pressing, embossing, punching...etc.	Option

PNEUMATIC CYLINDER

Loads



$$\Sigma F = Fzul = \sqrt{Fx^2 + Fy^2 + Fz^2}$$

Note:
All data concerning forces and torques refer to a speed of V<0.35m/s.
Observation keeping the indicated values ensures maximum service life, minimum noise and optimum noise and optimum operating results.
Higher speeds reduce the admissible forces.

ZS Standard cylinder

Piston	Vmax ≤ 0.35m/s			Admissible loading force (Fzul)			Torques		
	Fx(N) Acting force of 6 bar	Fy(N)	Fz(N)	0.75 m/s	1 m/s	1.5 m/s	Mx(Nm) Fy/Fz	My(Nm) Fx/Fz	Mz(Nm) Fx/Fy
ϕ 18	140	80	300	80	40	20	1	3	3
ϕ 25	270	110	480	155	90	40	2	13	13
ϕ 32	440	165	650	280	155	70	3.5	25	25
ϕ 40	680	225	800	500	290	125	5.5	40	40
ϕ 50	1060	325	1060	790	420	195	10	65	65
ϕ 63	1680	435	1680	1500	850	370	16	100	100

ZK Short cylinder

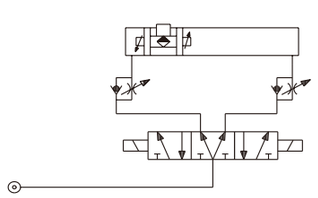
Piston	Vmax ≤ 0.35m/s			Admissible loading force (Fzul)			Torques		
	Fx(N) Acting force of 6 bar	Fy(N)	Fz(N)	0.75 m/s	1 m/s	1.5 m/s	Mx(Nm) Fy/Fz	My(Nm) Fx/Fz	Mz(Nm) Fx/Fy
ϕ 18	140	40	300	80	40	20	0.4	0.7	0.7
ϕ 25	270	55	230	90	50	25	0.7	2.7	2.7
ϕ 32	440	70	320	200	110	45	1	5	5
ϕ 40	680	100	400	420	240	110	2	8.5	8.5
ϕ 50	1060	140	480	750	440	190	3.5	13	13
ϕ 63	1680	180	590	1500	850	380	50	18	18

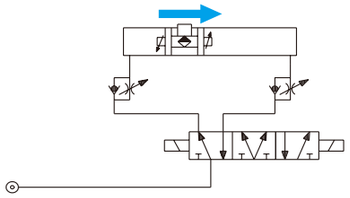
ZF Guiding cylinder

Piston	Vmax ≤ 0.35m/s			Admissible loading force (Fzul)			Torques		
	Fx(N) Acting force of 6 bar	Fy(N)	Fz(N)	0.75 m/s	1 m/s	1.5 m/s	Mx(Nm) Fy/Fz	My(Nm) Fx/Fz	Mz(Nm) Fx/Fy
ϕ 18	140	370	370	100	58	26	3.5	6	6
ϕ 25	270	800	800	280	160	65	10	20	20
ϕ 32	440	200	200	510	300	140	25	45	45
ϕ 40	680	1600	1600	1000	550	250	40	75	75
ϕ 50	1060	2100	2100	1500	850	380	80	150	150
ϕ 63	1680	2800	2800	2500	1400	610	110	250	250

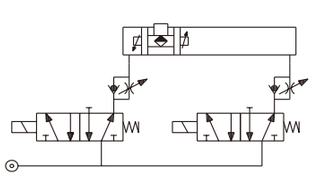
Controls

5/3 WAY VALVES

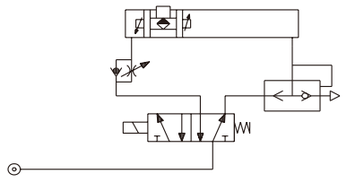




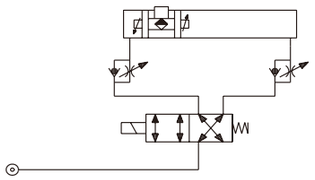
5/2 WAY VALVES



5/2 WAY VALVES

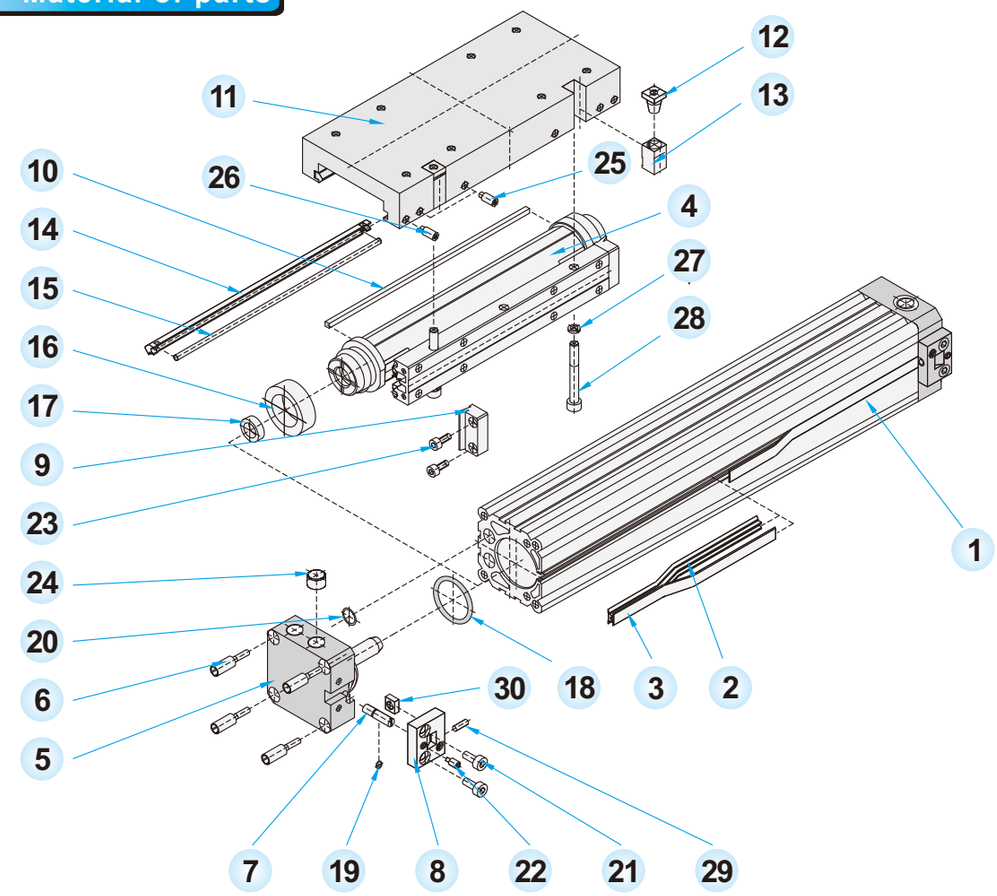


4/2 WAY VALVES



- Strike cylinder always with pressure on both sides, bleed until in movement direction.
- Speed regulation by exhaust restrictor(one-way flow restrictor) A control of the cylinder without flow restriction causes an enormous acceleration. The resulting kinetic energy can destroy the cylinder and the whole equipment.
- Slow run; at 6 bar reduced by flow restrictor up to 0.05m/sec.
- Operation speed up to 2m/sec depending on loads.

Material of parts



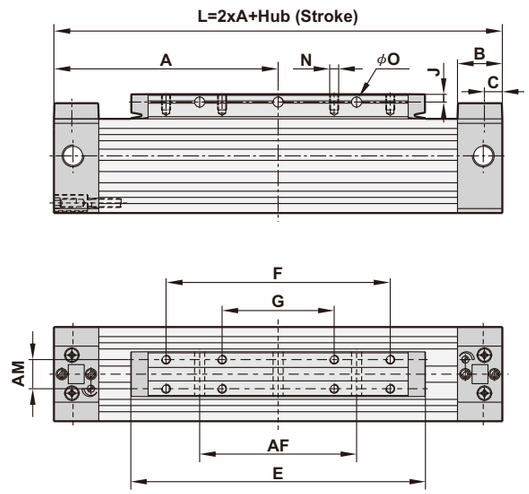
No.	Description	Material
1	Tube	Al anodized
2	Sealing strip	PU
3	Cover strip	Stainless steel
4	Yoke	Al anodized/POM
5	End cap	Al anodized
6	Special screw	Zinc-plated steel
7	Cushioning pin	Stainless steel
8	Strip cover	POM
9	Head wiper	POM
10	Wiper	POM
11	Carriage	Al anodized
12	Cone nut	Zinc-plated steel
13	Clamp wedge	Al anodized
14	Guiding bar	POM
15	Press bar	Stainless steel
16	Piston seal	PU

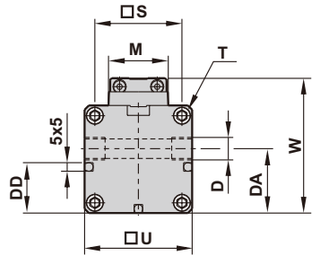
No.	Description	Material
17	Cushion ring	NBR
18	O-ring	NBR
19	O-ring	NBR
20	Flat seal	NBR
21	Countersink screw	Zinc-plated steel
22	Grub screw with pin	Zinc-plated steel
23	Cylinder head screw	Zinc-plated steel
24	Plug screw	Zinc-plated steel
25	Grub screw	Browned steel
26	Grub screw with pin	Browned steel
27	Plain washer	Zinc-plated steel
28	Cylinder head screw	Zinc-plated steel
29	Grub screw	Browned steel
30	Square nut	Zinc-plated steel

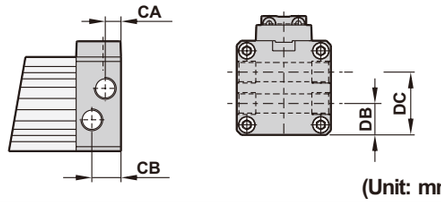
Features

- High-strength aluminum-extruded section to reduce deflection and increase the slot width.
- Front and side wipers on the yoke.
- Grooves in tube profile for fixing various additional components.
- Fixation at the front can be turned by 4 x 90°.
- New pin type cushioning.
- Large clamping surface on the yoke.
- Guiding over the entire stroke length.
- One-side connections possible.
- Torsion-proof.
- Exchangeable wear parts.
- High section modulus in all load directions.
- Adjustable slide guides save additional guiding systems.
- Carriage can be installed at a later date.

Dimensions







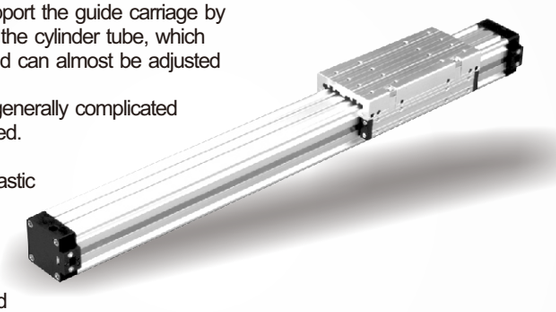
(Unit: mm)

Bore size	A	AF	AM	B	C	CA	CB	D	DA	DB	DC	DD	E
ϕ**18**	80	50	10	16.5	6.5	–	–	M7x1/6	15.5	–	–	–	103
ϕ**25**	100	70	13	20	8.5	7	13	G1/8x8	25.5	14	28	18.5	131
ϕ**32**	120	100	16	20	8.5	7	13	G1/8x8	32	16	34.5	21	171
ϕ**40**	150	140	22	23	13	11	14.5	G1/4x12	37.5	18.5	41	29.5	220
ϕ**50**	180	180	29	23	13	12	14	G1/4x12	47.5	22.5	47.5	37	280
ϕ**63**	215	215	40	29	13	12.5	15.5	G3/8x12	59.5	24.5	59.5	44.5	333

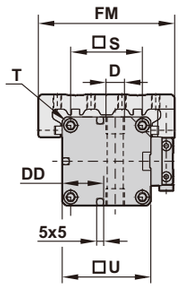
Bore size	F	FE	G	J	M	N	O	S	T	U	W
ϕ**18**	75	90	–	3	15.5	M3x6	3.5	23.5	M3x7	30	39
ϕ**25**	100	116	50	3.5	20	M4x7	4.5	33	M4x9	42	53
ϕ**32**	140	156	70	4.5	25	M5x9	5.5	41	M5x10	52	65
ϕ**40**	180	220	90	5	33	M6x10	7	51	M6x12	63	79
ϕ**50**	220	260	110	6.5	42	M8x12.5	7	63	M8x12	78	96
ϕ**63**	280	313	140	8	54	M8x15	9	78	M8x12	93	113.5

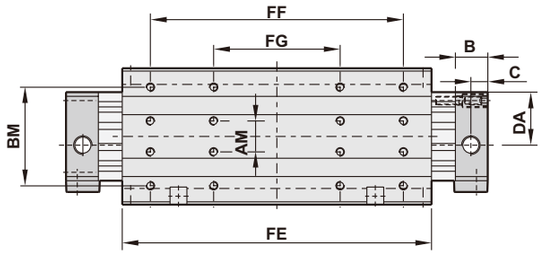
Features

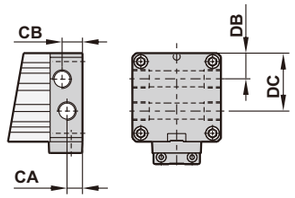
- Accuracy and high loading capacity.
- The cylinder provides V-guide grooves on outer side which support the guide carriage by means of slide bars, the guide carriage is fitted to the sides of the cylinder tube, which means that the increase of the sloth width has no influence and can almost be adjusted without backlash.
- As the guide grooves are integrated into the cylinder tube,the generally complicated and expensive installation of additional guide profiles is eliminated.
- The adjustable slide bars are made of high-strength plastic. In combination with the anodized surface of the cylinder, these plastic gibes ensure a very favorable sliding effect.
- Exceptionally compact and space saving.
- Suitable for lower end supports, center supports, solenoid switch systems.
- Utilizing cross supports, two guiding cylinders can be connected to form portal support systems with infinitely chosen stroke, which is applicable to variety of applications.
- Provide highly versatile linear drive element which allows all designers and machine makers to implement future-oriented concepts at reasonable prices.



Dimensions







(Unit: mm)

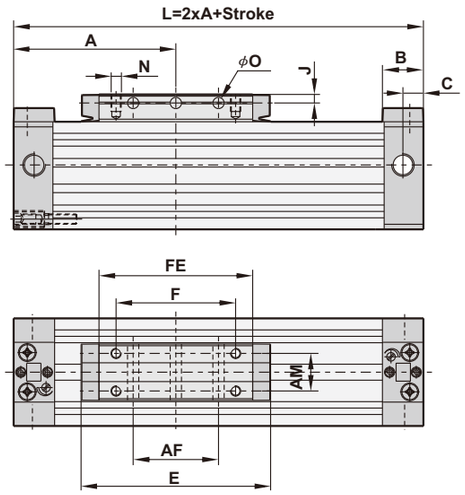
Bore size	A	AM	B	BM	C	CA	CB	D	DA	DB	DC
ϕ**18**	80	10	16.5	35	6.5	–	–	M7x1/6	17.5	–	–
ϕ**25**	100	13	20	45	8.5	7	13	G1/8x8	25.5	14	28
ϕ**32**	120	16	20	55	8.5	7	13	G1/8x8	32	17.5	34.5
ϕ**40**	150	22	24	70	13	9.5	14.5	G1/4x12	37.5	20	42
ϕ**50**	180	29	24	85	13	9.5	14	G1/4x12	47.5	26	52
ϕ**63**	215	40	30	105	13	11	18.5	G3/8x12	59.5	30	62

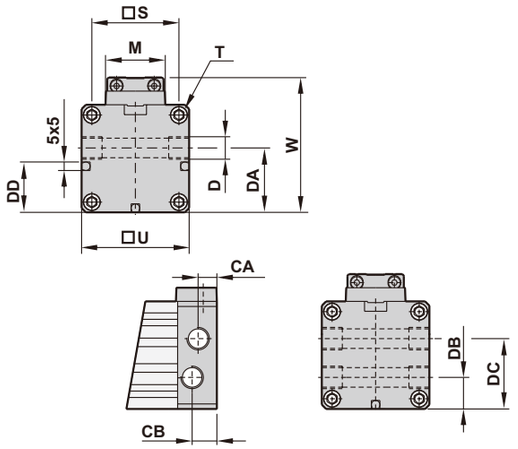
Bore size	DD	FE	FF	FG	FM	FW	N	S	T	U
ϕ**18**	–	103	75	–	50	39	M4x7.5	23.5	M3x7	30
ϕ**25**	18.5	131	100	50	66	53	M4x8	33	M4x9	42
ϕ**32**	21	171	140	70	80	65	M5x10	41	M5x10	52
ϕ**40**	29.5	220	180	90	97	79	M6x12	51	M6x12	63
ϕ**50**	37	280	220	110	116	96	M8x16	63	M8x12	78
ϕ**63**	44.5	333	280	140	136	113.5	M8x16	78	M8x12	93

Features

* Basic length (0-stroke) up to 42% shorter.
* Space-saving also in comparison to short-stroke standard cylinders with piston rod.
* Shorter total fitting length.
* Money-saving compact construction.

Dimensions





(Unit: mm)

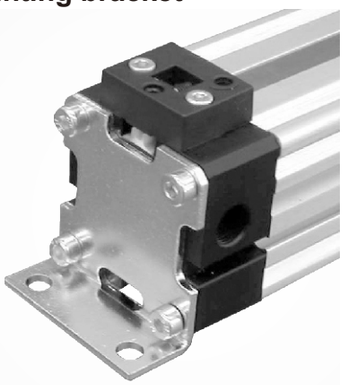
Bore size	A	AF	AM	B	C	CA	CB	D	DA	DB	DC	DD	E
ϕ18	57.5	15	10	16.5	6.5	–	–	M7x1/6	17.5	–	–	–	58
ϕ25	67.5	19	13	20	8.5	7	13	G1/8x8	25.5	14	28	18.5	66
ϕ32	77.5	35	16	20	8.5	7	13	G1/8x8	32	17.5	34.5	21	86
ϕ40	95	50	22	23	13	9.5	14.5	G1/4x12	37.5	20	42	29.5	110
ϕ50	105	46	29	23	13	9.5	14.5	G1/4x12	47.5	26	52	37	130
ϕ63	125	70	40	29	13	11	18.5	G3/8x12.5	59.5	30	62	44.5	153

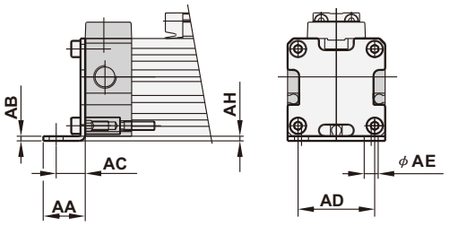
Bore size	F	FE	J	M	N	O	S	T	U	W
ϕ18	30	45	3	15.5	M3x6	3.5	23.5	M3x7	30	39
ϕ25	35	51	3.5	20	M4x7	4.5	33	M4x9	42	53
ϕ32	55	71	4.5	25	M5x9	5.5	41	M5x10	52	65
ϕ40	70	90	5	33	M6x10	7	51	M6x12	63	79
ϕ50	70	110	6.5	42	M8x12.5	7	63	M8x12	78	96
ϕ63	100	133	8	54	M8x15	9	78	M8x12	93	113.5

SHAKO RODLESS PNEUMATIC CYLINDER

Dimension of mounting parts

FB Mounting bracket

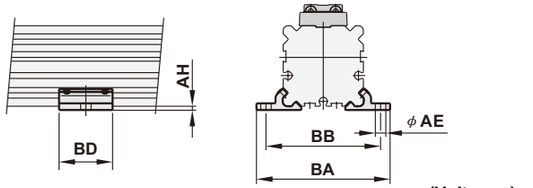




(Unit: mm)

Bore size	Order code	AA	AB	AC	AD	AE	AH
ϕ18	1182-0001	15	2	10	20	6	2
ϕ25	1252-0001	18	2	12.5	30	6	2
ϕ32	1322-0001	20	2.5	13.5	40	7	3
ϕ40	1402-0001	30	3	17.5	50	9	3.5
ϕ50	1502-0001	28	3	20	60	9	3
ϕ63	1632-0001	30	3	21	75	11	4.5

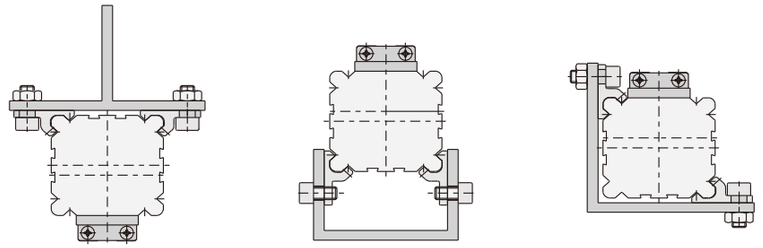
MB Middle support



(Unit: mm)

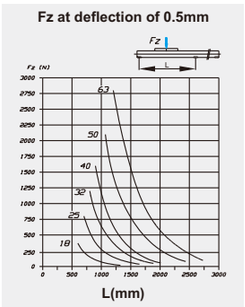
Bore size	Order code	AE	AH	BA	BB	BC	BD	BE	BF
ϕ18	1183-0001	6	2	56	46	36.5	23	2.5	8.25
ϕ25	1253-0001	6	2	70	60	50	28	3.5	11
ϕ32	1323-0001	7	3	85	73	61.5	33	4	13.8
ϕ40	1403-0001	9	3	105	90	75	38	4.5	16
ϕ50	1503-0001	9	3	122	106	91	43	5	19
ϕ63	1633-0001	11	4.5	144	125	107	48	6	22

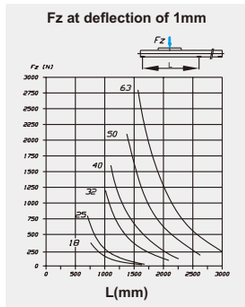
Mounting example for MB middle support



Deflection diagram

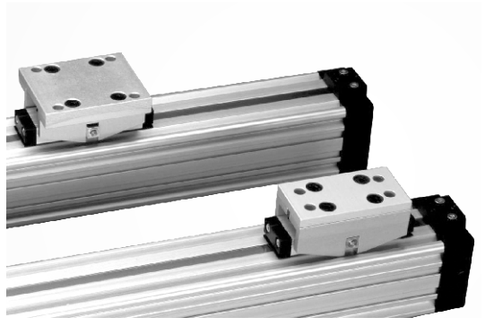
When using very long cylinders or applying heavy loads, the tube deflection is to be taken into consideration . One or more middle supports are to be used according to the admissible deflection.
Example:
A cylinder ϕ25 should deflect by a maximum of 0.5mm when applying a force FZ of 500N. According to the diagram the cylinder can be 750mm long. Longer cylinders must have a middle support.
Other possibilities
In case very long cylinders are installed without supports, and additional profile can be used as a support.
Examples: all versions with middle support and standard profiles.

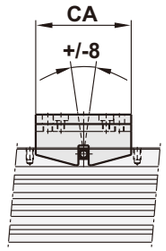




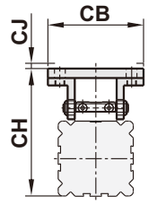
Dimensions

PB Swinging bridge

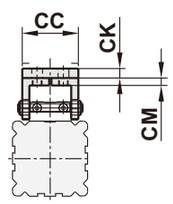




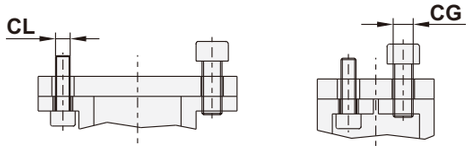
1XX5-0000

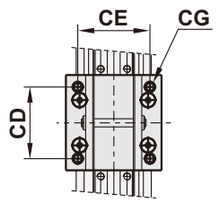


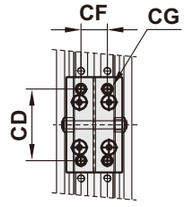
1XX5-0001



Mounting



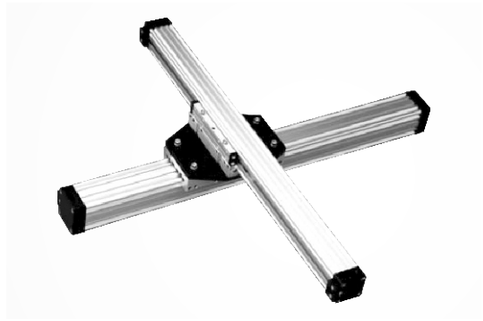


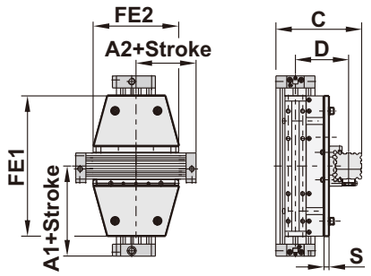


(Unit: mm)

Bore size	Order code		CA	CB	CD	CE	CF	CG	CH	CJ	CK	CM	CL
ϕ**18**	1185-0000	1185-0001	50	41.5	30	34	9	M5	54	2.5	4	4	M4
ϕ**25**	1255-0000	1255-0001	60	50	40	38	14	M5	70	3	4	4	M4
ϕ**32**	1325-0000	1325-0001	70	60	50	48	16	M6	86	3.5	6	6	M5
ϕ**40**	1405-0000	1405-0001	80	80	60	60	22	M8	107	4.5	8	8	M6
ϕ**50**	1505-0000	1505-0001	90	95	70	70	30	M8	123	4.5	8	8	M6
ϕ**63**	1635-0000	1635-0001	100	120	80	80	40	M10	145.5	5	8	8	M8

KT Cross support





(Unit: mm)

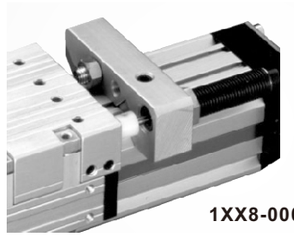
Bore size	Order code	A1	A2	C	D	FE1	FE2	S
ϕ**18**:ϕ**18**	1186-0000	80	80	84	54	103	103	6
ϕ**25**:ϕ**25**	1256-0000	100	100	114	72	131	131	8
ϕ**32**:ϕ**32**	1326-0000	120	120	140	88	171	171	10
ϕ**40**:ϕ**40**	1406-0000	150	150	168	105	220	220	10
ϕ**50**:ϕ**50**	1506-0000	180	180	204	126	280	280	12
ϕ**63**:ϕ**63**	1636-0000	215	215	239	146	333	333	12

Bore size	Order code	A1	A2	C	D	FE1	FE2	S
ϕ**25**:ϕ**25**	1256-0001	100	80	100	64	131	131	8
ϕ**32**:ϕ**32**	1326-0001	120	100	128	81	171	171	10
ϕ**40**:ϕ**40**	1406-0001	150	120	154	96.5	220	220	10
ϕ**50**:ϕ**50**	1506-0001	180	150	187	116.5	280	280	12
ϕ**63**:ϕ**63**	1636-0001	215	180	221.5	136	333	333	12

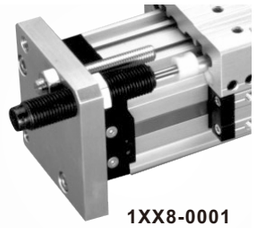
Bore size	Order code	A1	A2	C	D	FE1	FE2	S
ϕ**32**:ϕ**32**	1326-0002	120	80	112	71	171	103	8
ϕ**40**:ϕ**40**	1406-0002	150	100	142	142	220	131	10
ϕ**50**:ϕ**50**	1506-0002	180	120	171	171	280	171	10
ϕ**63**:ϕ**63**	1636-0002	215	150	204.5	204.5	333	220	12

Dimensions

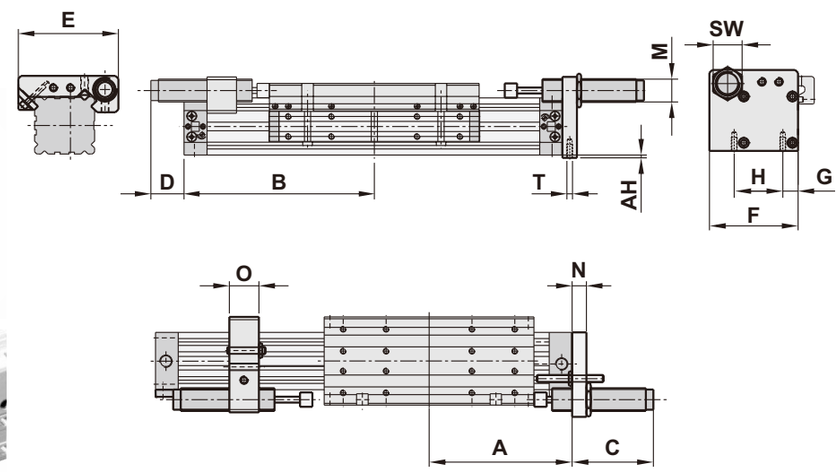
AS Stop adjustment



1XX8-0000



1XX8-0001



1XX8-0000 1XX8-0001

(Unit: mm)

Bore size	Order code		A		B			C	D	E	F	G	H	M	N	O	SW	T	Shock absorber
			ZF	ZFK	AH	ZF	ZFK												
ϕ**18**	1188-0000	1188-0001	80	57.5	2	113	90.5	32	Max25	57	43.5	8	23.5	M10x1.0	8	15	13	M3x10	DA1008-HP
ϕ**25**	1258-0000	1258-0001	100	67.5	2	117.5	85	37	Max40	72	57	12.5	33	M14x1.5	10	20	17	M4x10	DA1415-HP
ϕ**32**	1328-0000	1328-0001	120	77.5	3	135.5	90	70	Max30	84	70	14.5	41	M14x1.5	12	20	17	M5x12	DA1415-HP
ϕ**40**	1408-0000	1408-0001	150	95	3	165	110	65	Max50	105	93	16	51	M25x1.5	15	30	32	M6x15	DA2525-HP
ϕ**50**	1508-0000	1508-0001	180	105	3	195	140	80	Max65	126	102	22.5	63	M25x1.5	15	30	32	M8x20	DA2525-HP
ϕ**63**	1638-0000	1638-0001	215	125	4.5	250	160	80	65	140	118.5	20	78	M25x1.5	15	40	32	M8x20	DA2525-HP

Shock absorber is available in case of enquiry.

Repair kits

Bore size	ZS	ZK	ZF
ϕ**18**	ZS-1189-0000-□□□□	ZK-2189-0000-□□□□	ZF-3189-0000-□□□□
ϕ**25**	ZS-1259-0000-□□□□	ZK-2259-0000-□□□□	ZF-3259-0000-□□□□
ϕ**32**	ZS-1329-0000-□□□□	ZK-2329-0000-□□□□	ZF-3329-0000-□□□□
ϕ**40**	ZS-1409-0000-□□□□	ZK-2409-0000-□□□□	ZF-3409-0000-□□□□
ϕ**50**	ZS-1509-0000-□□□□	ZK-2509-0000-□□□□	ZF-3509-0000-□□□□
ϕ**63**	ZS-1639-0000-□□□□	ZK-2639-0000-□□□□	ZF-3639-0000-□□□□

How to order

ZS — **1189-0000** — **0100**

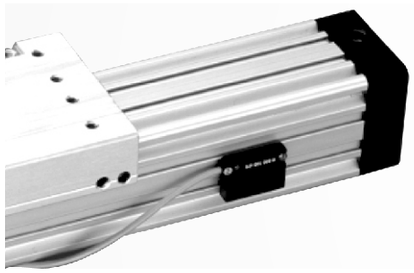
- **ZS**: ZS Standard cylinder
- **1189-0000**: Bore size

ϕ18	ϕ40
ϕ25	ϕ50
ϕ32	ϕ63

- **0100**: Stroke

Details included

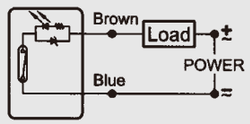
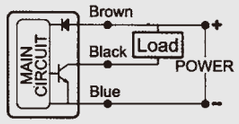
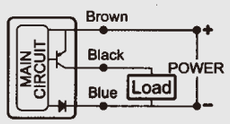
No.	Description	Qty.
1	Round profile/m	1
2	Sealing strip/m	1
3	Cover strip(Steel)/m	1
4	Head wiper	2
5	Wiper	2
6	Guiding bar	2
7	Piston seal	2
8	Cushion ring	2
9	End cap O-ring	2
10	Cushion pin O-ring	2
11	Cylinder head screw plain ISO4762	4



Technical information

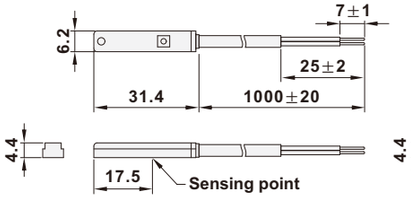
* The reed switch will be operated by the magnetic field of the permanent magnets inside the yoke.
* The magnetic piston will be built in as standard.
* The end positions and additional intermediate positions of the yoke can be read out.

Specifications

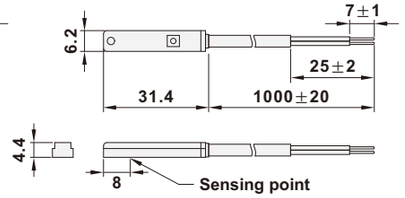
Model	AL-30R	AL-30N	AL-30P
Switching logic	SPST Normally open	Solid state output, Normally open	
Sensor type	Reed switch	NPN current sinking	PNP current sourcing
Operating voltage	5~120 VDC/AC	5~28 VDC	
Switching current	100mA	200mA	
Switching rating	10W(VA)	6W	
Current consumption	None	15mA max. at 24V(switch active)	16mA max. at 24V(switch active)
Voltage drop	2.5V max. at 40mA DC	1.5V at 200mA 24VDC	
Leakage current	None	0.01mA max.	
Indicator	Red LED	Red LED	Green LED
Cable	2.8 ϕ , 2C, Gray PVC	2.8 ϕ , 3C, Black PVC	
Sensitivity(note 1)	40 Gauss		
Max. Switching frequency	200Hz	1000Hz	
Temperature range	-10℃ ~ 70℃		
Shock (note 2)	30G	50G	
Vibration (note 3)	9G		
Enclosure classification	IP67 (NEMA6)		
Protection circuit	None	Reverse Polarity	
Sensor circuit diagram			

Dimensions

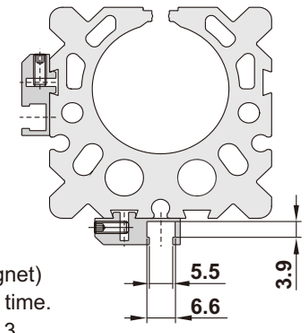
AL-30R



AL-30N, AL-30P



Sensor bracket



Note

1. Measure standard target: ϕ 15.5 x ϕ 8.5t(Anisotropy Rubber Magnet)
2. Sin wave/X.Y.Z 3 Dimensions/3 times each direction/ 11mS Each time.
3. Double amplitude 1.5mm/10 Hz~55Hz~10Hz(Sweep 1min)/X.Y.Z 3 Dimensions/ 1 Hour Each time.