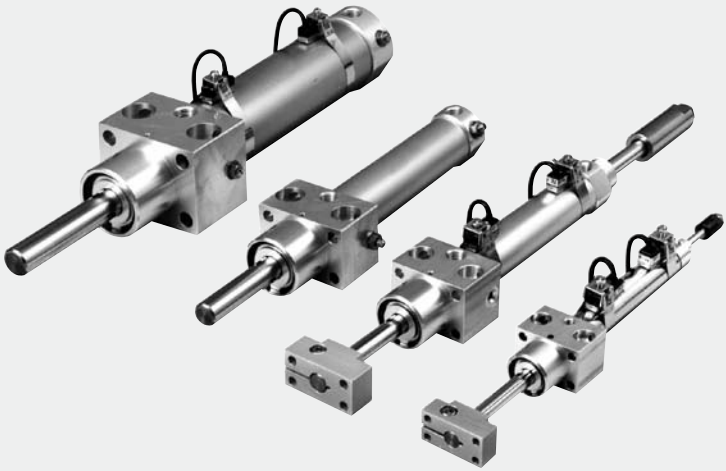
F CYLINDER

JKX Series

Registration of Utility Model



INDEX★

F CYLINDER

JKX Series

High Accuracy Actuator integrating Ball-Spline!

Ball Spline

High-accuracy Ball Spline is adopted.

With Spigot Joint

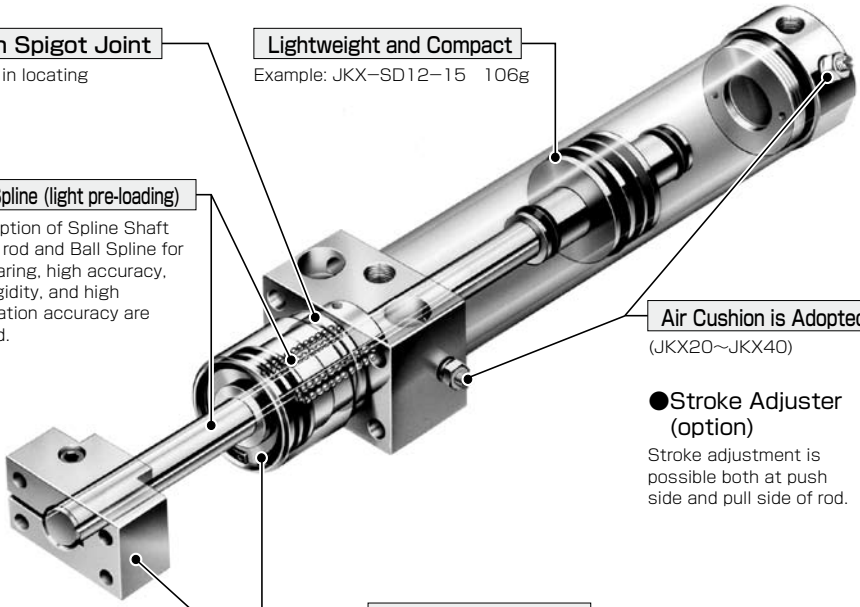
Useful in locating

Lightweight and Compact

Example: JKX–SD12–15 106g

Ball Spline (light pre-loading)

By adoption of Spline Shaft for the rod and Ball Spline for the bearing, high accuracy, high rigidity, and high nonrotation accuracy are realized.



Air Cushion is Adopted

(JKX20~JKX40)

●Stroke Adjuster (option)

Stroke adjustment is possible both at push side and pull side of rod.

Special Rod Seal

The rod seal is developed to fit the shape of Spline Shaft.

Seal Shape

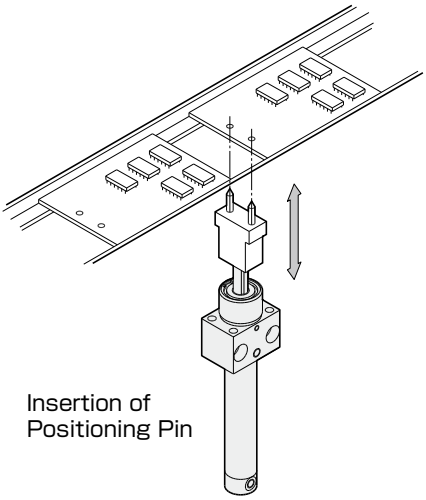
Rod End

Three types of the rod end, flange rod end, male thread, and female thread are available as options.

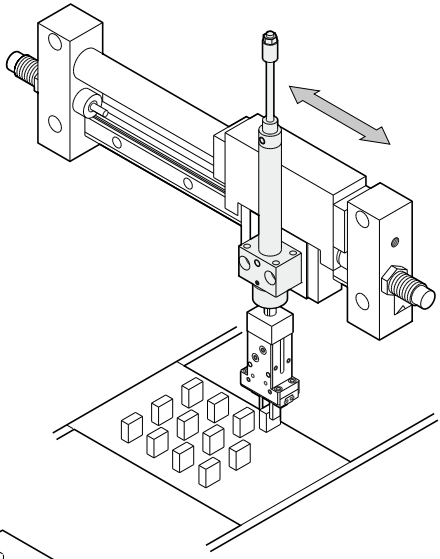
Summary of The F CYLINDER

The JKX Series, which is a result of change from the air cylinder-based to the guide-based concept, employs a mechanism that directly drives the high-accuracy ball spline itself. This structure allows the high accuracy of a ball spline to be fully brought out with a compact unit.
As with ordinary cylinders, it has a round shape and models can be manufactured to have a stroke in increments of 1 mm.
Also refer to the GXA Series with a square body (p. 947).

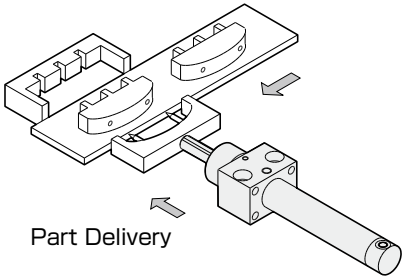
■Application Examples : F CYLINDER



Insertion of
Positioning Pin



Workpiece Transfer

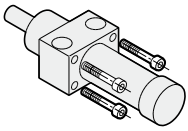


Part Delivery

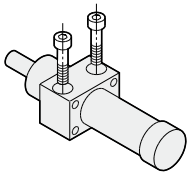
■MAIN BODY INSTALLATION

(Bolt as shown in the figure are not supplied with products)

Front Mounting
(Thru Hole used)



Top Mounting
(Thru Hole used)



Custom Made Hollow Rod 871 Page
Rigidity Up JKXB Series 905 Page
Clean Type JKXN Series 877 Page

Model Code Example

JKXS-SD32-100-ZTZES-RP12LA

Series Name

Support system

SD	Standard

Magnet

No Code	None
S	with Magnet

A magnet is required when mounting switches.

Bore Size

12	ϕ12
16	ϕ16
20	ϕ20
25	ϕ25
32	ϕ32
40	ϕ40

Stroke

Standard Stroke
☞Page 870

Maximum Stroke Unit: mm

Bore Size	Maximum Stroke
ϕ12	100
ϕ16	100
ϕ20	550
ϕ25	650
ϕ32	650
ϕ40	700

Minimum Stroke Unit: mm

Bore Size	JKX	JKXS
ϕ12	14	10
ϕ16	10	10

As to the orders for shorter strokes than the above. please contact us separately.

Switch Mountable Minimum Stroke Unit: mm

Switch Mounting Detail		Stroke
With one piece		10
With two pieces	On a straight line	30
	Not on a straight line	15
With three pieces	On a straight line	50
	Not on a straight line	40

Cable Length

No Code	1.5m
LA	5m

Number of Switches

1	1
2	2

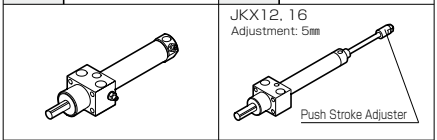
Switch

No Code	None
RP1	AC100V/DC24V(with contact)
RP4	DC10~30V(without contact)
RP5	AC100V/DC24V(with contact·without indicator light)

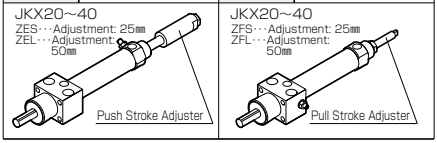
For details ☞Page 1070, 1071

Stroke Adjuster

No Code	Without Stroke Adjuster	ZES	With Push Stroke Adjuster

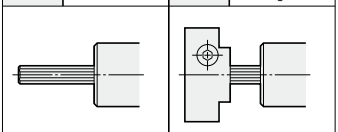


ZES, ZEL	With Push Stroke Adjuster	ZFS, ZFL	With Pull Stroke Adjuster

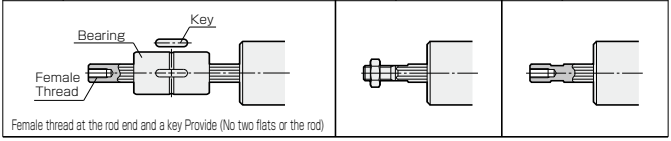


Rod End Shape

No Code	Standard	ZT	With Flange Rod End



FN	With Bearing for Floating Mechanism	WT	Male Thread Rod End	WS	Female Thread Rod End



Two Flats will be any position on the rod circumference.

SPECIFICATIONS

Bore Size(㎜)	φ12	φ16	φ20	φ25	φ32	φ40
Rod Size(㎜)	φ6	φ8	φ10	φ13	φ13	φ16
Maximum Stroke(㎜)	100	100	550	650	650	700
Piping Size	M5×0.8		Rc1/8			Rc1/4
Guide Mechanism	Ball Spline					
Type of Operation	Double acting					
Fluid	Air					
Maximum Operating Pressure	0.7MPa		1.0MPa			
Minimum Operating Pressure	0.1MPa		0.07MPa			
Minimum Operating Pressure (in case of optional ZES and ZEL)	0.15MPa					
Proof Pressure	1.05MPa		1.5MPa			
Operating Temperature	5~60℃					
Maximum Operating Speed	50~700㎜/s					
Lubrication	Not required					
Cushioning	Rubber Cushion		Air Cushion			

GUIDE TYPE(BALL SPLINE)

Model	Type
JKX12	THK　LT6
JKX16	THK　LT8
JKX20	THK　LT10
JKX25	THK　LT13
JKX32	THK　LT13
JKX40	THK　LT16

Pre-load:Zero or slightly pre-loaded

OPTIONAL PARTS CODES

Name	Switch with Contact	Switch without Contact	Switch with Contact (without Indicator Light)	Switch Mounting Fixture
PARTS CODE Note PARTS CODE Note	RP1(JKX□) Cable Length:1.5m RP1LA(JKX□) Cable Length:5m	RP4(JKX□) Cable Length:1.5m RP4LA(JKX□) Cable Length:5m	RP5(JKX□) Cable Length:1.5m RP5LA(JKX□) Cable Length:5m	BD(JKX□) Fill in □ as bore size.
Content	 with fixture	 with fixture	 with fixture	

Flange Rod End	Repair Parts Kit Standard	With Push Stroke Adjuster	With Pull Stroke Adjuster
ZT(JKX□) Fill in □ as bore size.	HQ(JKX□) For four (six) groove spline	HQ(JKX□ZE) For four (six) groove spline	HQ(JKX□ZF) For four (six) groove spline
	Fill in □ as bore size. For details ☞ Page 841	Fill in □ as bore size. For details ☞ Page 842	Fill in □ as bore size. For details ☞ Page 843

※Currently, the number of rod spline grooves has changed from 3 to 4 for all models other than JKX40, which has 6 grooves.

MASS

●Standard Type

Unit: g

Model	Standard Mass	Additional Mass
JKX12	100	0.4
JKX16	134	0.7
JKX20	270	1.1
JKX25	400	1.5
JKX32	440	1.8
JKX40	985	2.5

METHOD TO CALCULATE THE MASS

Ex. JKXS–SD20–100–ZTZES–RP12

Standard Mass····· 415g
Additional Mass·····1.8×100=180g
Flange Rod End····· 30g
Switch····· 35×2=70g

415+180+30+70=695g

●Push Stroke Adjuster Type (ZES, ZEL)

Unit: g

Model	Standard Mass		Additional Mass
	ZES	ZEL	
JKX12	121	—	0.5
JKX16	150	—	0.9
JKX20	415	470	1.8
JKX25	570	650	2.4
JKX32	630	710	2.7
JKX40	1295	1395	4.1

●Pull Stroke Adjuster Type (ZFS, ZFL)

Unit: g

Model	Standard Mass		Additional Mass
	ZFS	ZFL	
JKX12	—	—	—
JKX16	—	—	—
JKX20	315	325	1.1
JKX25	450	460	1.5
JKX32	495	505	1.8
JKX40	1075	1095	2.5

●Options

Unit: g

Model	With Bearing for Floating Mechanism (FN)	Flange Rod End (ZT)
JKX12	24	15
JKX16	30	17
JKX20	72	30
JKX25	92	50
JKX32	92	50
JKX40	250	85

●Switch

Unit: g

Switch Type	Mass
RP1, RP4, RP5	35
RP1LA, RP4LA, RP5LA	70

Mass of switch fixture is included.

THEORETICAL THRUST

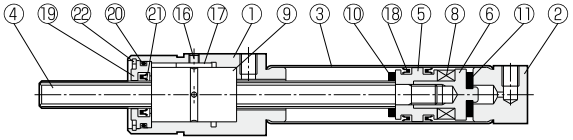
Unit: N

Bore Size (mm)	Working Direction	Operating Pressure MPa								
		0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
φ12	Push	23	34	45	57	68	79	—	—	—
	Pull	17	26	34	43	51	60	—	—	—
φ16	Push	40	60	80	100	120	140	—	—	—
	Pull	30	45	60	76	91	106	—	—	—
φ20	Push	63	94	130	160	190	220	250	280	310
	Pull	47	71	94	120	140	170	190	210	240
φ25	Push	98	150	200	250	300	340	390	440	490
	Pull	72	110	140	180	220	250	290	320	360
φ32	Push	160	240	320	400	480	560	640	720	800
	Pull	130	200	270	340	400	470	540	600	670
φ40	Push	250	380	500	630	750	880	1000	1100	1300
	Pull	210	320	420	530	630	740	840	950	1100

1MPa=10.2kgf/^{2}
1N= 0.102kgf

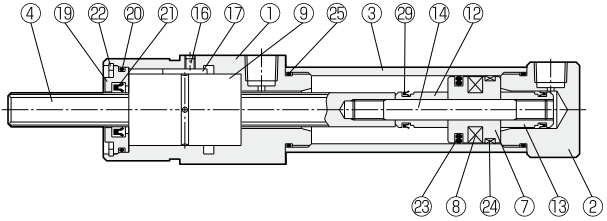
STRUCTURE AND PRINCIPAL COMPONENTS

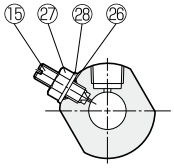
JKX12, 16 Standard



Disassembling is impossible.
(The rod seal can be replaced.)

JKX20, 25, 32, 40 Standard





PRINCIPAL COMPONENTS

No.	Name	Material	Remarks	No.	Name	Material	Remarks
1	Rod Cover	Aluminum Alloy	Alumite Treatment	10	Front Cushion Rubber	Urethane Rubber	JKX12, 16
2	Head Cover	Aluminum Alloy	Alumite Treatment	11	Rear Cushion Rubber	Urethane Rubber	JKX12, 16
3	Tube	Stainless Steel	JKX12, 16	12	Front Cushion Rubber	Aluminum Alloy	JKX20~40
		Aluminum Alloy	JKX20~40	13	Rear Cushion Rubber	Aluminum Alloy	JKX20~40
4	Spline Rod	High Carbon Chrome Bearing Steel	Hard Chromium Plated	14	Piston Shaft	Stainless Steel	JKX20~40
5	Piston A	Phosphor Bronze	JKX12, 16	15	Needle	Steel	Nickel Plating
6	Piston B	Brass	JKXS12, 16	16	Fixing Screw	Steel	Nickel Plating
7	Piston	Aluminum Alloy	JKX20~40	17	Key	Steel	
8	Magnet	Resin Bound Magnet	Only with Magnet	18	Piston seal	NBR	JKX12, 16
9	Ball Spline	Steel, Resin,etc					

REPAIR PARTS

JKX12, 16

No.	Name	Material	Qty	Remarks
19	Rod Seal Holder	Aluminum Alloy	1	Alumite Treatment
20	O-ring	NBR	1	
21	Spline Seal	Urethane Rubber	1	
22	Circlip	Steel	1	Nickel Plating

JKX20, 25, 32, 40

No.	Name	Material	Qty	Remarks
19	Rod Seal Holder	Aluminum Alloy	1	Alumite Treatment
20	O-ring	NBR	1	
21	Spline Seal	Urethane Rubber	1	
22	Circlip	Steel	1	Nickel Plating
23	Piston Seal	NBR	1	
24	Wear Ring	Synthetic Resin	1	
25	O-ring	NBR	2	
26	O-ring	NBR	2	
27	Nut	Steel	2	Nickel Plating
28	Plain Washer	Steel	2	Nickel Plating
29	Cushion Seal	NBR	2	

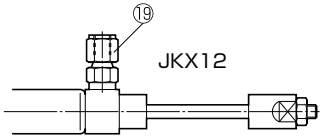
Notes

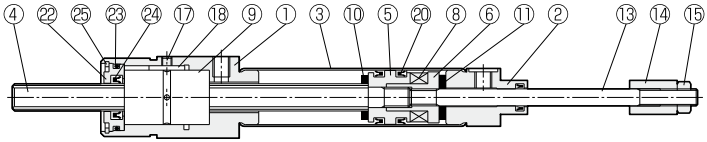
Currently, the number of rod spline grooves has changed from 3 to 4 for all models other than JKX40, which has 6 grooves.
Note that the former types have a spline seal in a different shape.

STRUCTURE AND PRINCIPAL COMPONENTS

JKX12, 16 Stroke Adjustment Type (Push Stroke Adjustment)

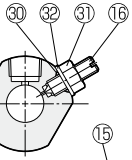
Disassembling is impossible.
(The rod seal can be replaced.)

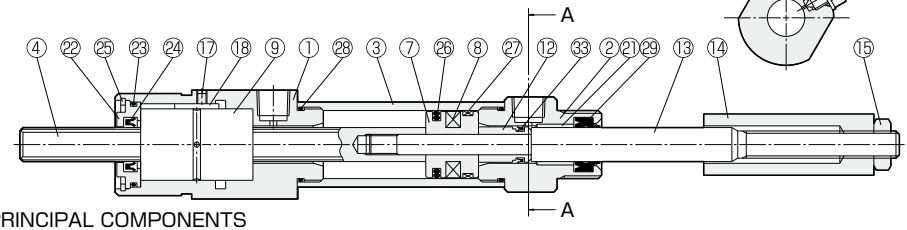




JKX20, 25, 32, 40 Stroke Adjustment Type (Push Stroke Adjustment)

Section A-A





PRINCIPAL COMPONENTS

No.	Name	Material	Remarks
1	Rod Cover	Aluminum Alloy	Alumite Treatment
2	Cover for Stroke Adjustment	Aluminum Alloy	Alumite Treatment
3	Tube	Stainless Steel	JKX12, 16
		Aluminum Alloy	JKX20~40
4	Spline Rod	High Carbon Chrome Bearing Steel	Hard Chromium Plated
5	Piston A	Phosphor Bronze	JKX12, 16
6	Piston B	Brass	JKXS12, 16
7	Piston	Aluminum Alloy	JKX20~40
8	Magnet	Resin Bound Magnet	Only with Magnet
9	Ball Spline	Steel, Resin,etc	
10	Front Cushion Rubber	Urethane Rubber	JKX12, 16
11	Rear Cushion Rubber	Urethane Rubber	JKX12, 16

No.	Name	Material	Remarks
12	Cushion Collar	Aluminum Alloy	JKX20~40
13	Push Stroke Adjustment Rod	Stainless Steel	JKX12~25
		Carbon Steel	JKX32, 40
14	Stopper for Stroke Adjustment	Steel	Nickel Plating
15	Nut	Steel	Nickel Plating
16	Needle	Steel	Nickel Plating
17	Fixing Screw	Steel	Nickel Plating
18	Key	Steel	
19	Universal Joints	Copper Alloy	Nickel Plating
20	Piston seal	NBR	JKX12, 16
21	Bush	Steel、PTFE	JKX20~40

REPAIR PARTS

JKX12, 16

No.	Name	Material	Qty	Remarks
22	Rod Seal Holder	Aluminum Alloy	1	Alumite Treatment
23	O-ring	NBR	1	
24	Spline Seal	Urethane Rubber	1	
25	Circlip	Steel	1	Nickel Plating

JKX20, 25, 32, 40

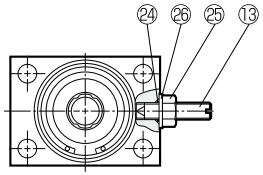
No.	Name	Material	Qty	Remarks
22	Rod Seal Holder	Aluminum Alloy	1	Alumite Treatment
23	O-ring	NBR	1	
24	Spline Seal	Urethane Rubber	1	
25	Circlip	Steel	1	Nickel Plating
26	Piston Seal	NBR	1	
27	Wear Ring	Synthetic Resin	1	
28	O-ring	NBR	2	
29	Rod Seal	NBR	1	
30	O-ring	NBR	1	
31	Nut	Steel	1	Nickel Plating
32	Plain Washer	Steel	1	Nickel Plating
33	Cushion Seal	NBR	1	

Notes

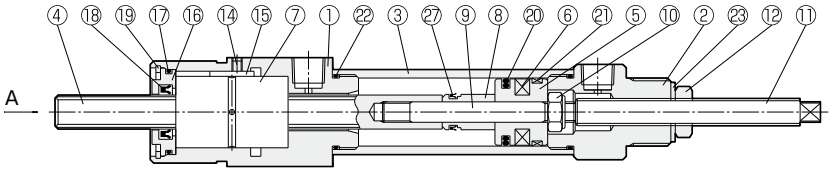
Currently, the number of rod spline grooves has changed from 3 to 4 for all models other than JKX40, which has 6 grooves.
Note that the former types have a spline seal in a different shape.

STRUCTURE AND PRINCIPAL COMPONENTS

JKX20, 25, 32, 40　Stroke Adjustment Type(Pull Stroke Adjustment)



View A



PRINCIPAL COMPONENTS

No.	Name	Material	Remarks	No.	Name	Material	Remarks
1	Rod Cover	Aluminum Alloy	Alumite Treatment	9	Piston Shaft	Stainless Steel	
2	Head Cover	Aluminum Alloy	Alumite Treatment	10	U-nut	Steel	Nickel Plating
3	Tube	Aluminum Alloy	Hard Alumite	11	Pull Stroke Adjustment Rod	Steel	Nickel Plating
4	Spline Rod	High Carbon Chrome Bearing Stee	Hard Chromium Plated	12	Nut	Steel	Nickel Plating
5	Piston	Aluminum Alloy		13	Needle	Steel	Nickel Plating
6	Magnet	Resin Bound Magnet	Only with Magnet	14	Fixing Screw	Steel	Nickel Plating
7	Ball Spline	Steel, Resin,etc		15	Key	Steel	
8	Cushion Collar	Aluminum Alloy					

REPAIR PARTS

JKX20, 25, 32, 40

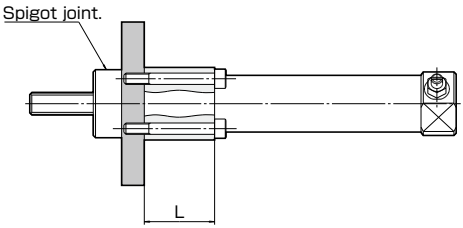
No.	Name	Material	Qty	Remarks
16	Rod Seal Holder	Aluminum Alloy	1	Alumite Treatment
17	O-ring	NBR	1	
18	Spline Seal	Urethane Rubber	1	
19	Circlip	Steel	1	Nickel Plating
20	Piston Seal	NBR	1	
21	Wear Ring	Synthetic Resin	1	
22	O-ring	NBR	2	
23	Seal Washer	NBR, Steel	1	
24	O-ring	NBR	1	
25	Nut	Steel	1	Nickel Plating
26	Plain Washer	Steel	1	Nickel Plating
27	Cushion Seal	NBR	1	

Notes

Currently, the number of rod spline grooves has changed from 3 to 4 for all models other than JKX40, which has 6 grooves.
Note that the former types have a spline seal in a different shape.

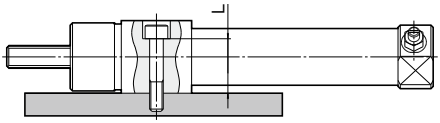
BODY INSTALLATION

Front mounting(Thru Hole used)



Model	Bolt Size	Thru Hole Length L(mm)	Fastening Torque N·m
JKX12	M4	24	2.5
JKX16	M4	24	2.5
JKX20	M5	31	5.1
JKX25	M6	32	8.6
JKX32	M6	32	8.6
JKX40	M8	45	22

Top mounting(Thru Hole used)



Model	Bolt Size	Thru Hole Length L(mm)	Fastening Torque N·m
JKX12	M5	15.9	5.1
JKX16	M5	17.9	5.1
JKX20	M6	24	8.6
JKX25	M8	26	22
JKX32	M8	29	22
JKX40	M10	39	43

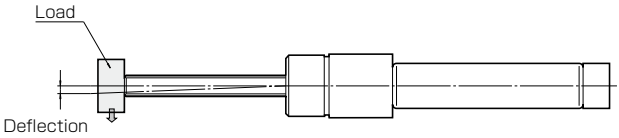
MATTERS TO BE NOTED FOR DESGINING

⚠Caution

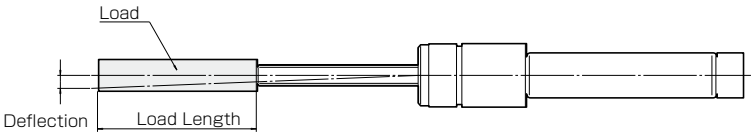
Rod End Deflection in case of Horizontal Use

Deflection is generated due to the load mounted at the rod end.

See the graphs on pages 848 for allowable load mass and deflection.



When the load length is long, the deflection at the load end is larger than that at the rod end.



In this case, read the deflection from the graph taking the length of the load length plus cylinder stroke as cylinder stroke.

Example: Cylinder Stroke·····100㎜

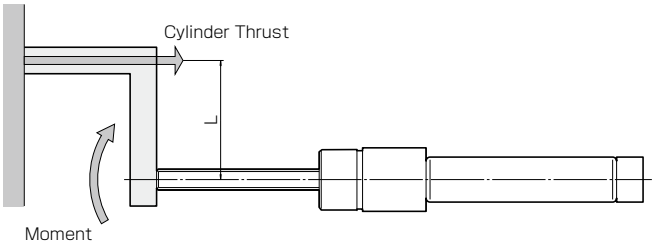
Load Length·····50㎜

Assuming 100+50=150mm as cylinder stroke,
read the deflection at the point (100+50)mm of cylinder stroke from the graph.

Moment Generated by Cylinder Thrust in case of Offset Contact

When a load/work is put into contact at an offset point from the rod as shown, a large moment is generated due to cylinder thrust.

Check the table of allowable moment in page 847.



Moment=Cylinder thrust x L(offset distance)

When an external force (lateral load) acts on the rod

In case where an external force (lateral load) acts temporarily on the rod end when the cylinder stopped, read deflection from the broken lines on the graphs

Rod Deflection

In case where a load is light, but the stroke is long, or a load at the rod end is large, the rod deflection may sometimes become unexpectedly large.
Select a model referring to the graphs of deflection.

Rod Vibration

In case where stroke is long, or load mass at the rod end is large, rod vibration may be generated at the cylinder push end.
Then, decrease the speed or select a model with a size larger dia. rod.
Also, when the rigidity of the base for mounting the cylinder is not sufficient, enhance the rigidity of the base.

Mounting of Load

When mounting a load by using a male or female thread at the rod end, set a spanner on the across flats of the rod to prevent the tightening torque from being applied to the bearing.

Cushion Needle Adjustment

The air cushion provided for JKX 20 to 40 is adjusted before shipping but can be adjusted by turning the needle according to the condition of use.
After adjustment, be sure to secure by tightening the lock nut.
If the cushion needle is opened too much, the air cushion does not function and excessive impact may be applied to the piston at the stroke end, causing damage or failure.

Rolling Feel in Bearing

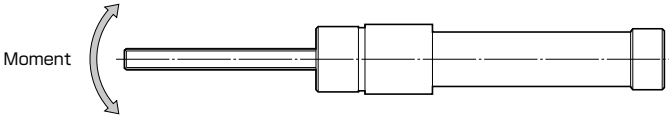
The bearing (ball spline) of this product is slightly preloaded. Accordingly, when the rod is moved by hand, rolling of balls inside the bearing may cause slight feel of operation discontinuity or difference in the rolling resistance between products. This is due to preload of the bearing and does not affect the performance.

Stroke Adjustment of Push-out Adjustment Types (ZES and ZEL)

When adjusting the stroke, loosen the lock nut and turn the stopper for stroke adjustment.
When loosening the lock nut, set a spanner on the across flats of both the lock nut and the stopper for stroke adjustment.
Turning the stopper for stroke adjustment without loosening the lock nut causes the torque to be applied to the push-out adjustment rod as well, which may cause loosening of the connection between the rod and the piston, leading to failure.
After stroke adjustment, lock by setting a spanner on the across flats of both the lock nut and the stopper for stroke adjustment.
Use a spanner of an appropriate size.
Use of a monkey or pipe wrench may hinder correct adjustment, causing failure.

ALLOWABLE MOMENT

In case where a moment load is applied to the rod end



In case where the cylinder is operated under constant moment

Model	Allowable Moment N·m
JKX12	0.32
JKX16	0.40
JKX20	1.2
JKX25	1.5
JKX32	1.5
JKX40	4.7

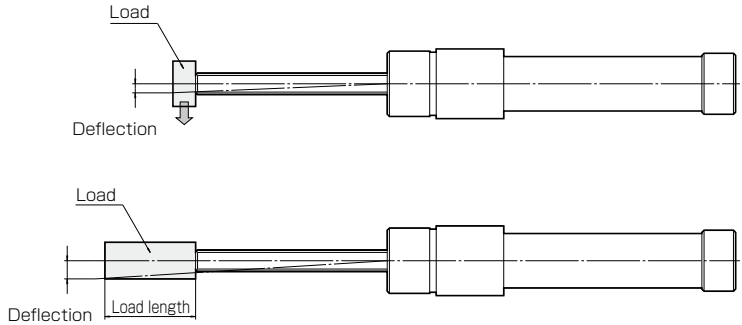
In case where a moment is applied temporarily while the cylinder stopped

Model	Allowable Moment N·m
JKX12	0.98
JKX16	1.2
JKX20	3.1
JKX25	3.9
JKX32	3.9
JKX40	14

ALLOWABLE LOAD MASS, ALLOWABLE LATERAL LOAD AND ROD DEFLECTION

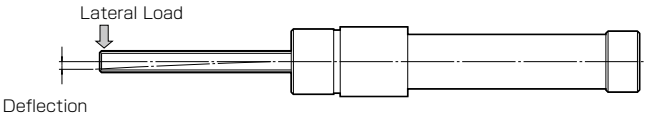
●Load Mass and Rod Deflection

In case of horizontal usage of the cylinder, deflection is generated in the rod due to the load mounted at the rod end. The relation between allowable load mass and deflection is shown in the graphs below. Applied load mass shall be within the range indicated by each solid line correspondent to each stroke length. (Please refer ☞page 845)

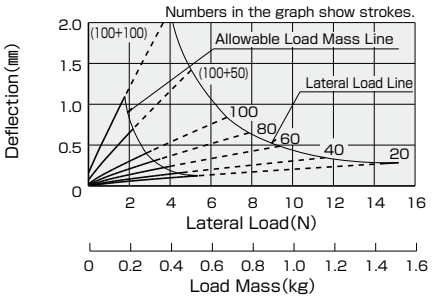


●Lateral Load Rod Deflection

Under the condition that the cylinder is stopped the relation between deflection due to an external force (lateral load) acting temporarily on the rod and allowable load mass is shown in the graphs below.
Applied lateral load shall be smaller than the value indicated by each broken line correspondent to each stroke length. If an external force acts on constantly, see the values of allowable load mass in the graphs.



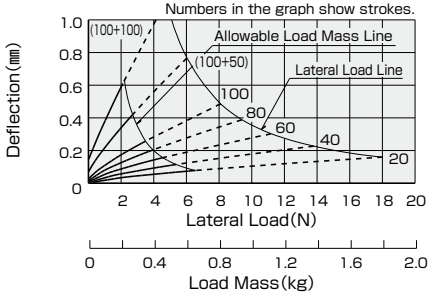
JKX12



Stroke (mm)	Allowable Load Mass (kg)	Allowable Lateral Load (N)
20	0.55	15
40	0.45	11
60	0.38	9.4
80	0.33	7.9
100	0.29	6.8
(100+50)	0.22	5.0
(100+100)	0.18	4.0

Quotation ( ) indicates (Stroke + Load Length)

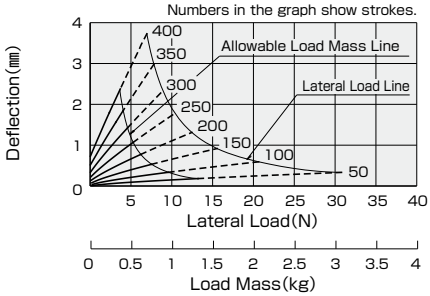
JKX16



Stroke (mm)	Allowable Load Mass (kg)	Allowable Lateral Load (N)
20	0.67	18
40	0.55	14
60	0.47	11
80	0.40	9.4
100	0.36	8.1
(100+50)	0.28	6.0
(100+100)	0.23	4.8

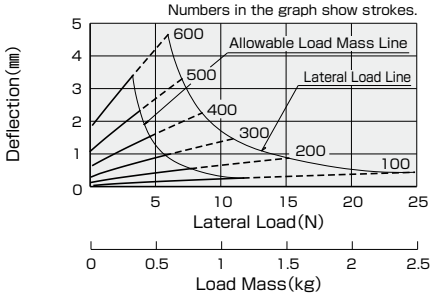
Quotation ( ) indicates (Stroke + Load Length)

JKX20



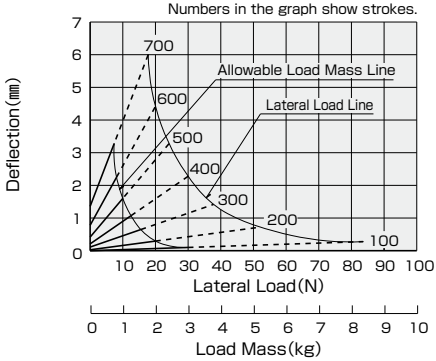
Stroke (mm)	Allowable Load Mass (kg)	Allowable Lateral Load (N)
50	1.3	31
100	0.98	21
150	0.77	16
200	0.63	13
250	0.54	10
300	0.47	8.9
350	0.41	7.8
400	0.37	6.9

JKX25
JKX32



Stroke (mm)	Allowable Load Mass (kg)	Allowable Lateral Load (N)
100	1.2	24
200	0.79	15
300	0.59	11
400	0.47	8.5
500	0.39	7.0
600	0.33	6.0

JKX40



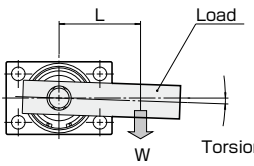
Stroke (mm)	Allowable Load Mass (kg)	Allowable Lateral Load (N)
100	3.3	83
200	2.0	52
300	1.5	38
400	1.2	30
500	0.98	25
600	0.83	21
700	0.72	18

ALLOWABLE TORQUE AND TORSION ANGLE OF ROD

Torsion angle at the rod end when the rod is pushed out

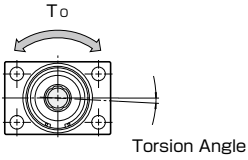
●In case where the cylinder is operated under constant torque (dynamic allowable torque)

A torsional moment (torque) is generated when a load in eccentric condition is mounted at the rod end as shown below.
When the cylinder is operated in this condition. the torque shall be smaller than the value indicated by each solid line in the graphs below.



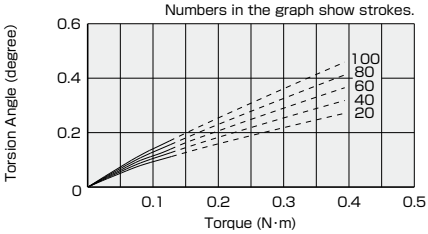
●when a torque is applied temporarily while the cylinder stopped (static allowable torque)

When a torque (To) is applied temporarily to the rod from outside while the cylinder stopped, the torque shall be smaller than the value indicated by each broken line in the graphs below.



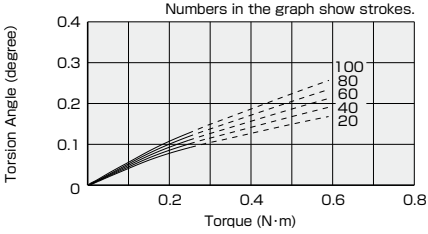
T=L×W
T: Torsional moment
L: Distance between the rod center and the center of gravity of a load
W: Load mass

JKX12



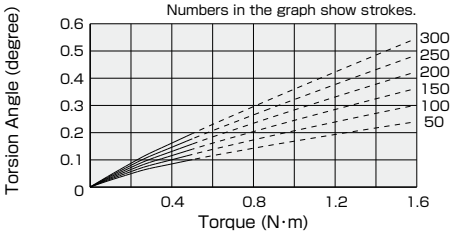
Dynamic Allowable Torque	Static Allowable Torque
0.13N·m	0.39N·m

JKX16



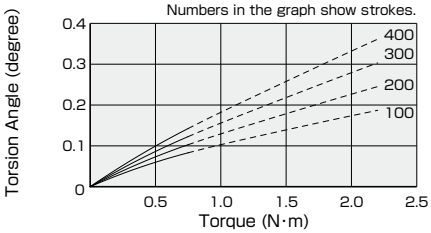
Dynamic Allowable Torque	Static Allowable Torque
0.25N·m	0.59N·m

JKX20



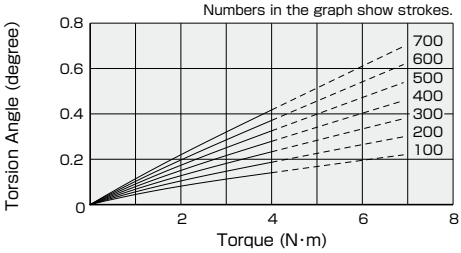
Dynamic Allowable Torque	Static Allowable Torque
0.50N·m	1.6N·m

JKX25
JKX32



Dynamic Allowable Torque	Static Allowable Torque
0.75N·m	2.2N·m

JKX40



Dynamic Allowable Torque	Static Allowable Torque
4.0N·m	6.9N·m

BEARING FOR FLOATING MECHANISM(option code FN)

●Prevention of damage when work installation fails

In case where work installation fails due to incomplete location, defective parts, etc. and the work is bumped, the floating mechanism will prevent the work from damage by absorbing the shock.

●Softening of impact force at work installation

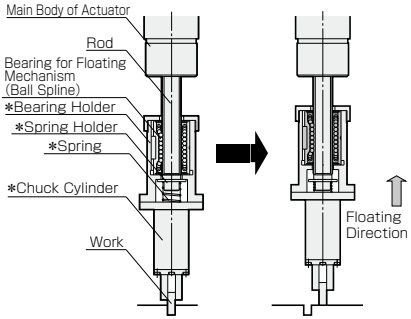
In case where an impact force due to actuator velocity may cause breakage of work or defective assembling at work installation. the floating mechanism will prevent the work from such damage by softening the impact force and help to achieve smooth work installation and press fit.

●Work installation at different levels

In case where works are installed at the positions of different levels. only one actuator can perform the operation by setting floating stroke by level difference in advance.

●The bearing for floating mechanism incorporates the high precision and high, rigidity ball spline.

●Construction and Application Example



●As for the parts (parts marked * in the figure above) other than the bearing for floating mechanism, it is required to design and produce the construction and parts fitting with the machine at your side.

■MATTERS TO BE NOTED FOR DESIGNING

⚠Caution

①Specific resistance of Bearing

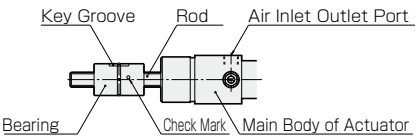
The bearing for floating mechanism has the specific resistance respectively. Pay attention to the setting load value of the spring. (The spring force shall be determined from a viewpoint of the mechanism as a whole)

Unit: N

Model	Specific Resistance	Model	Specific Resistance
JKX12	2.5	JKX25	4
JKX16	3	JKX32	4
JKX20	3.5	JKX40	5

②Direction of Bearing key groove and check mark

The check mark means the digit indicated in the optional place on the outside of the bearing. The digit are optional and mean nothing. When the bearing is mounted to the rod, insert straight so that the key groove of the bearing locates at the air inlet port side of actuator and the check mark at the body side of actuator. If it is inserted forcibly, the balls inside the bearing may come off.



③Tolerance of the housing inside dia. for the bearing

Generally, the tolerance between the bearing for floating mechanism and the housing shall be by transition fit (J6). In case where accuracy is not so required, it shall be by loose fit (H7).

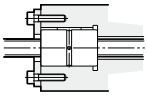
Tolerance of Housing Inside Dia.	General Service Conditions	J6
	Accuracy is not required	H7

④Combination of the bearing and the rod

The bearing for floating mechanism and the rod are combinedly supplied. If other bearing, which is ordered additionally, attached to other actuator (including the part of the same specification), or purchased from somewhere afterward, is mounted to the rod, this may cause malfunction or poor accuracy. Be sure to use bearing attached to the actuator. The check mark (See clause 2 of this note.) on the bearing has nothing to do with the combination with rod. Even if the check mark on the bearing is the same, the combination of the bearing and the rod is another matter.

⑤Mounting of the bearing

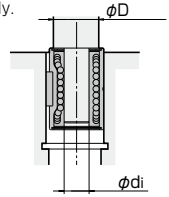
The right figure shows a mounting example of the bearing for floating mechanism. Fixing strength in the axial direction is not so required, but only driving fit is not enought to hold and another measures shall be taken.



⑥Insertion of the bearing

When the bearing for floating mechanism is mounted, use a jig and not to tilt the cylinder to be parallel against the rod and insert carefully.

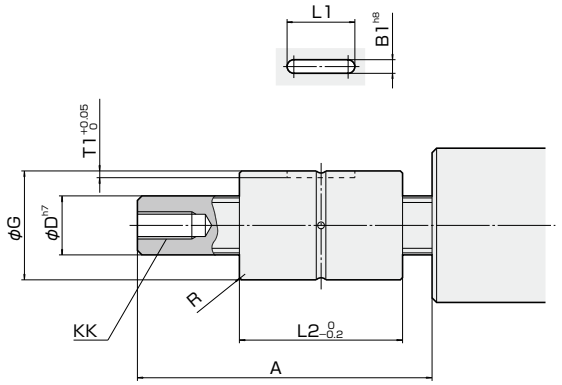
Model	di	D
JKX12	ϕ 5.0	13.5
JKX16	ϕ 7.0	15.5
JKX20	ϕ 8.5	20.5
JKX25, 32	ϕ11.5	23.5
JKX32	ϕ14.5	30.5



⑦Actual stroke of the actuator

The length of actuator stroke minus floating stroke is the stroke by which the work actually shifts. Be careful to select stroke.

DIMENSIONS OF ROD END WITH BEARING FOR FIOATING MECHANISM(Option code FN)



Female Thread Rod End(KK)
Fastening Torque

Unit: N·m

Model	Fastening Torque
JKX12	1.1
JKX16	1.7
JKX20	4.8
JKX25	6.6
JKX32	6.6
JKX40	20

Bearing Mass

Unit: g

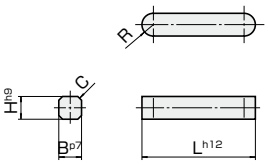
Model	Mass
JKX12	17
JKX16	18
JKX20	50
JKX25	55
JKX32	55
JKX40	165

Unit: mm

Model	A	B1	D	G	KK	L1	L2	R	T1
JKX12	50	2.5	φ 6	φ14 0 -0.011	M3×0.5 depth 6	10.5	25	0.5	1.2
JKX16	50	2.5	φ 8	φ16 0 -0.011	M4×0.7 depth 8	10.5	25	0.5	1.2
JKX20	60	3	φ10	φ21 0 -0.013	M5×0.8 depth10	13	33	0.5	1.5
JKX25	65	3	φ13	φ24 0 -0.013	M6×1 depth12	15	36	0.5	1.5
JKX32	65	3	φ13	φ24 0 -0.013	M6×1 depth12	15	36	0.5	1.5
JKX40	85	3.5	φ16	φ31 0 -0.013	M8×1.25depth13	17.5	50	0.5	2

Note 1. The rod projection length (mark A in the figure) is longer than the standard type. Pay attention to the overall length of the cylinder.
Note 2. JKX40 is different from the above figure for the groove shape of the rod spline.
See pages 854～869 for other detailed dimensions of the entire product.
Note 3. A bolt and a washer are attached at the female thread rod end (mark KK in the figure) to prevent the bearing from coming off when delivered. They shall be removed when the cylinder is used. (Adhesive is not used.)

■DIMENSIONS of KEY (A KEY IS ATTACHED TO THE PRODUCT.)



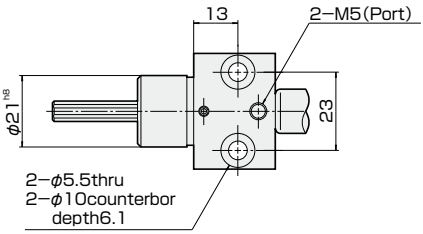
Unit: mm

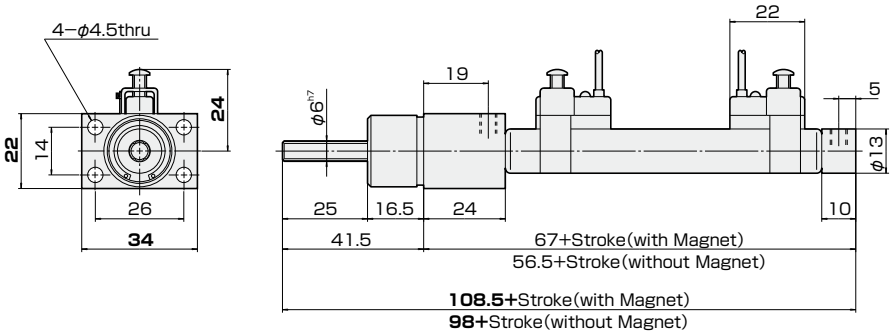
Model	B	C	H	L	R
JKX12	2.5	0.5	2.5	10.5	1.25
JKX16	2.5	0.5	2.5	10.5	1.25
JKX20	3	0.5	3	13	1.5
JKX25	3	0.5	3	15	1.5
JKX32	3	0.5	3	15	1.5
JKX40	3.5	0.5	3.5	17.5	1.75

DIMENSIONS(mm) JKX12 STANDARD TYPE

JKX(S)−SD12−(Stroke)

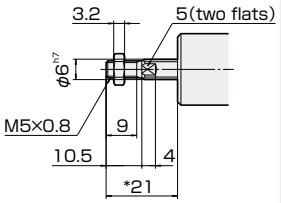
Bore Size





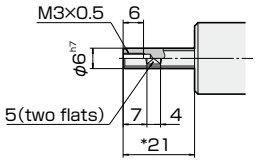
Note: Fixing screw which is to fix the key of bearing jumps out 0.3mm on the port surface of rod cover.

Male Thread Rod End(WT)



Pay attention that the dimension marked * is different from the standard type.

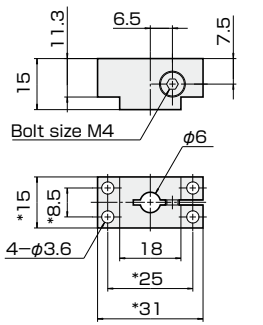
Female Thread Rod End(WS)



Pay attention that the dimension marked * is different from the standard type.

Flange Rod End(ZT)

Optional parts code ZT(JKX12)

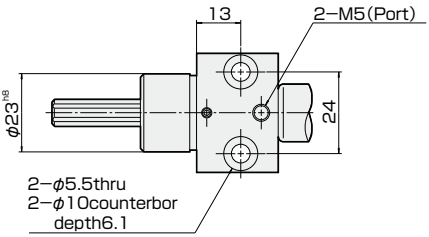


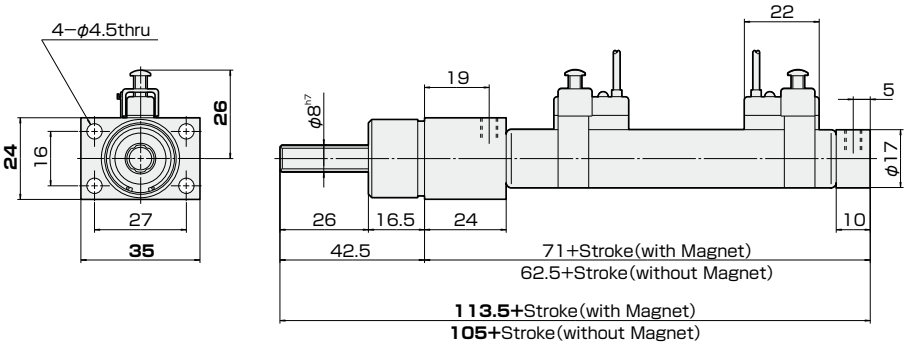
Note: Pay attention that the dimension marked * is diferent from previous type flange rod end ZS.

DIMENSIONS(mm) JKX16 STANDARD TYPE

JKX(S)−SD16−(Stroke)

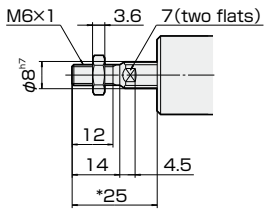
Bore Size





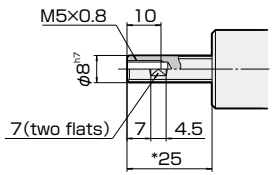
Note: Fixing screw which is to fix the key of bearing jumps out 0.3mm on the port surface of rod cover.

Male Thread Rod End(WT)



Pay attention that the dimension marked * is different from the standard type.

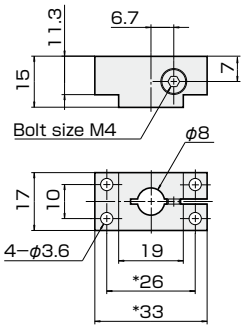
Female Thread Rod End(WS)



Pay attention that the dimension marked * is different from the standard type.

Flange Rod End(ZT)

Optional parts code ZT(JKX16)

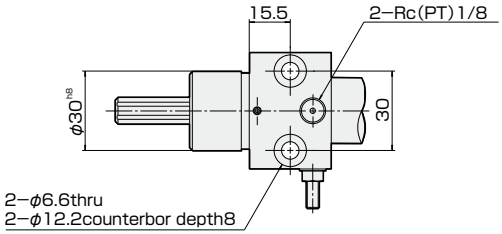


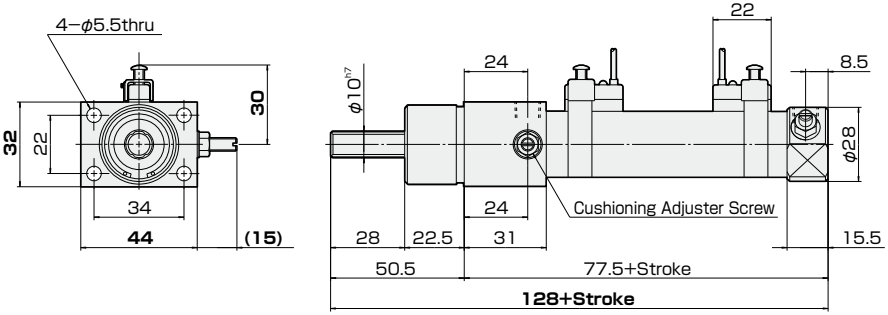
Note: Pay attention that the dimension marked * is diferent from previous type flange rod end ZS.

DIMENSIONS(mm) JKX20 STANDARD TYPE

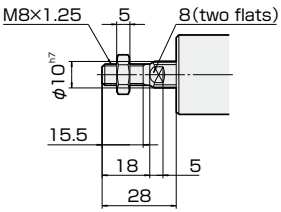
JKX(S)−SD20−(Stroke)

Bore Size

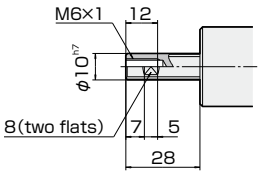




Male Thread Rod End(WT)

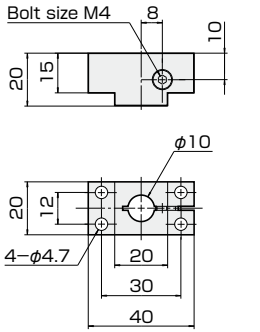


Female Thread Rod End(WS)



Flange Rod End(ZT)

Optional parts code ZT(JKX20)

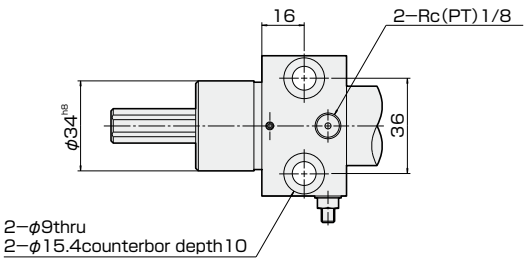


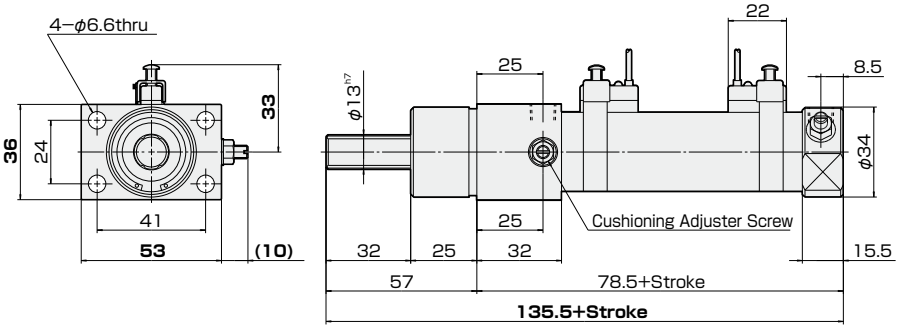
Note: Interchangeable with the previous type flange rod end ZS.

DIMENSIONS(mm)　JKX25　STANDARD TYPE

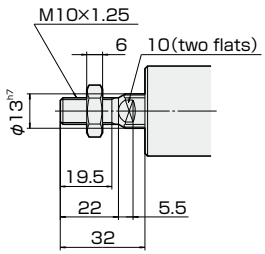
JKX(S)−SD25−(Stroke)

Bore Size

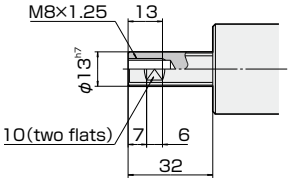




Male Thread Rod End(WT)

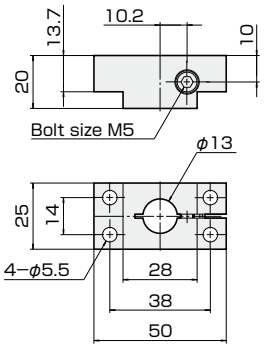


Female Thread Rod End(WS)



Flange Rod End(ZT)

Optional parts code　ZT(JKX25)

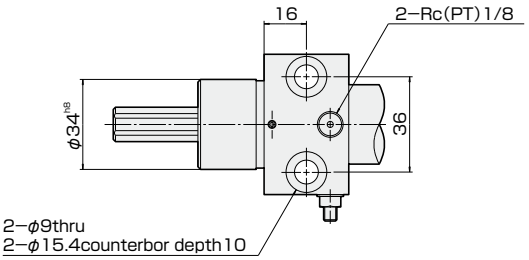


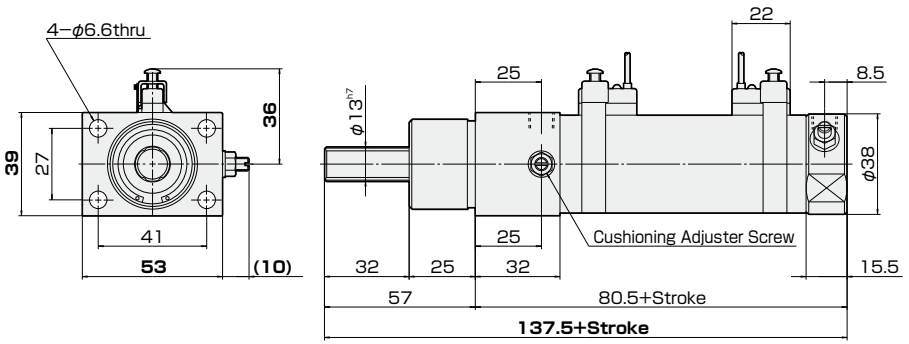
Note: Interchangeable with the previous type flange rod end ZS.

DIMENSIONS(mm) JKX32 STANDARD TYPE

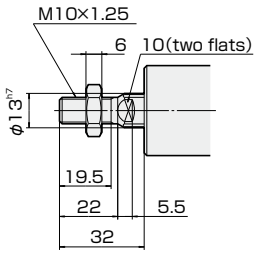
JKX(S)−SD32−(Stroke)

Bore Size

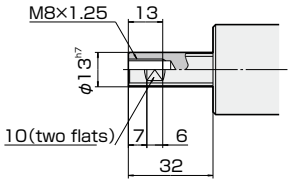




Male Thread Rod End(WT)

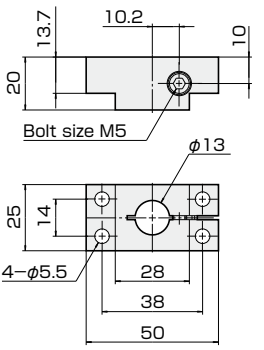


Female Thread Rod End(WS)



Flange Rod End(ZT)

Optional parts code ZT(JKX32)

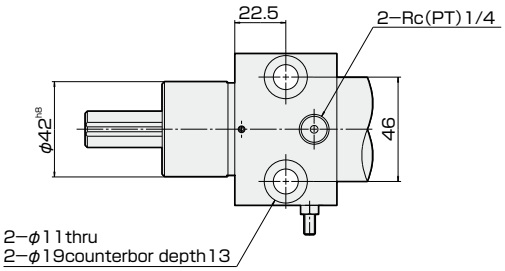


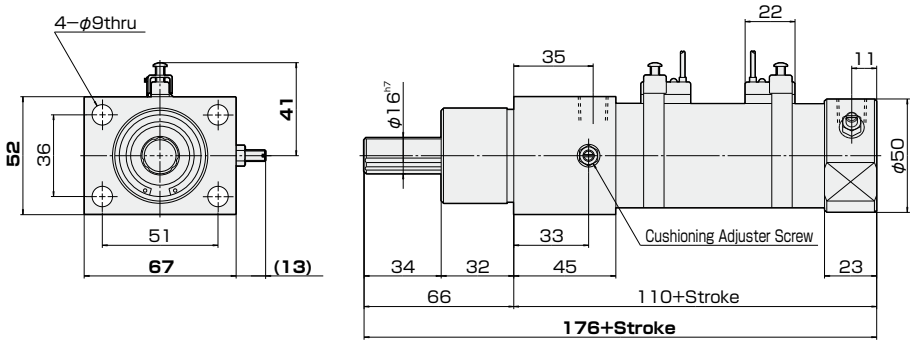
Note: Interchangeable with the previous type flange rod end ZS.

DIMENSIONS(mm)　JKX40　STANDARD TYPE

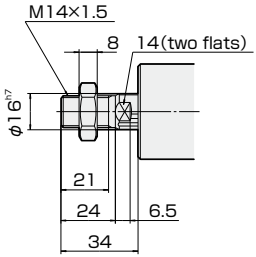
JKX(S)−SD40−(Stroke)

Bore Size

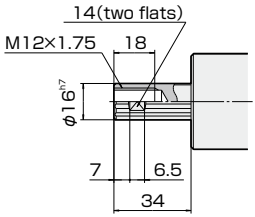




Male Thread Rod End(WT)

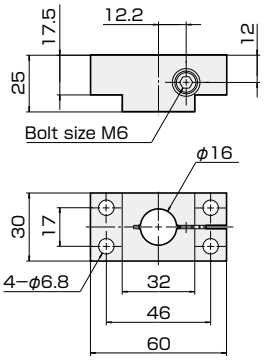


Female Thread Rod End(WS)



Flange Rod End(ZT)

Optional parts code　ZT(JKX40)



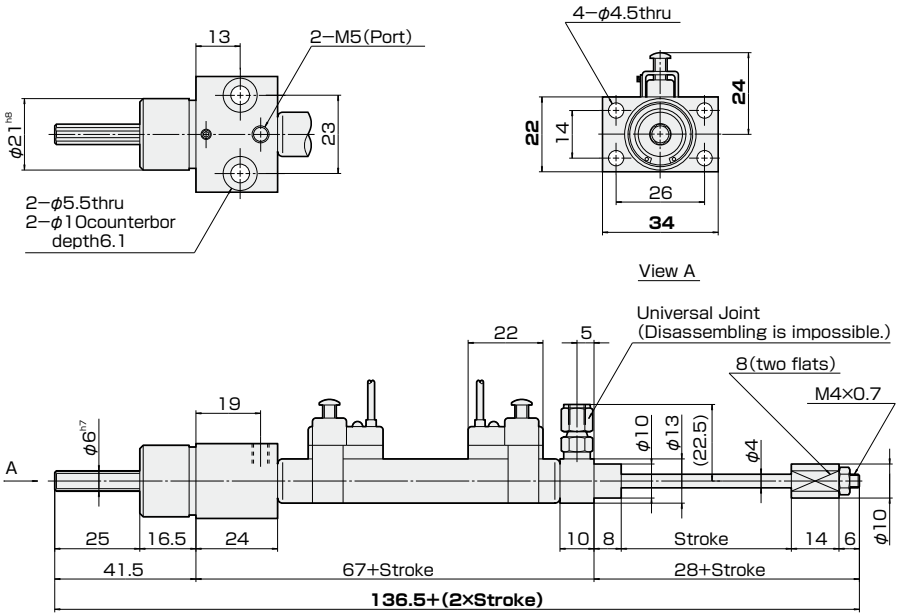
Note: Interchangeable with the previous type flange rod end ZS.

DIMENSIONS(mm) JKX12 WITH STROKE ADJUSTER TYPE (PUSH STROKE ADJUSTMENT)

JKX(S)−SD12−(Stroke)−ZES

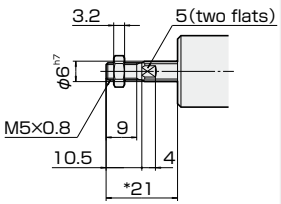
Bore Size

With Stroke Adjuster
Push Stroke Adjustment ZES···5mm



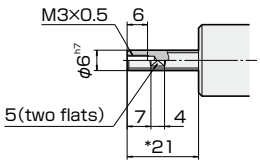
Note: In case of the stroke adjuster type, overall length of the cylinder is common to both with magnets (JKXS) and without magnets (JKX).
Fixing screw which is to fix the key of bearing jumps out 0.3mm on the port surface of rod cover.

Male Thread Rod End(WT)



Pay attention that the dimension marked * is different from the standard type.

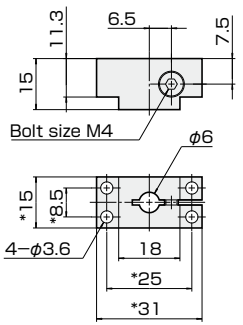
Female Thread Rod End(WS)



Pay attention that the dimension marked * is different from the standard type.

Flange Rod End(ZT)

Optional parts code ZT(JKX12)



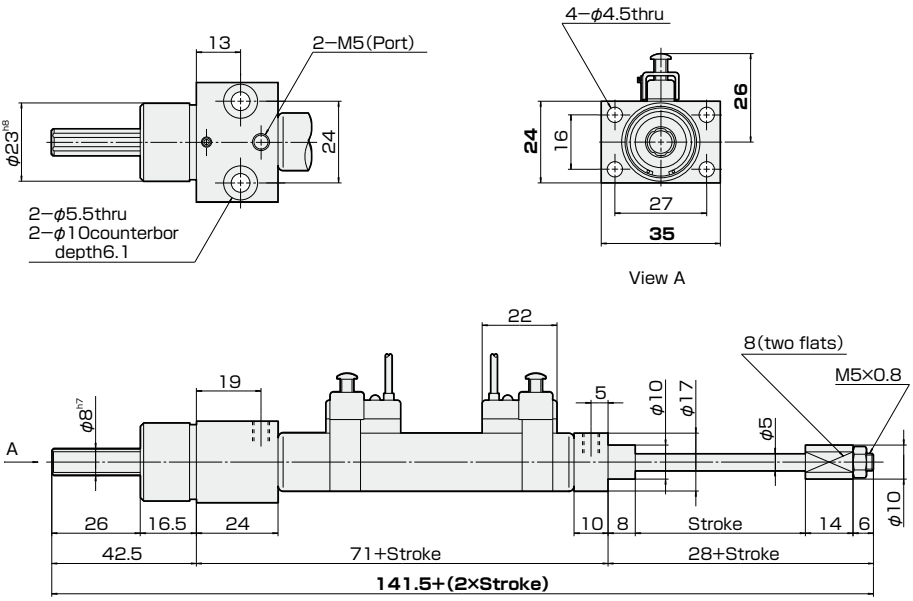
Note: Pay attention that the dimension marked * is diferent from previous type flange rod end ZS.

DIMENSIONS(mm) JKX16 WITH STROKE ADJUSTER TYPE (PUSH STROKE ADJUSTMENT)

JKX(S)−SD16−(Stroke)−ZES

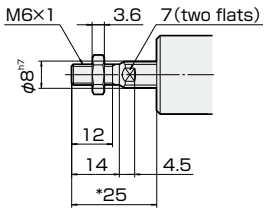
Bore Size

With Stroke Adjuster
Push Stroke Adjustment ZES···5mm



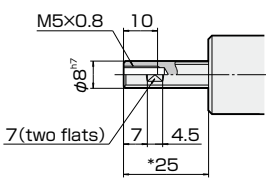
Note: In case of the stroke adjuster type, overall length of the cylinder is common to both with magnets (JKXS) and without magnets (JKX).
Fixing screw which is to fix the key of bearing jumps out 0.3mm on the port surface of rod cover.

Male Thread Rod End(WT)



Pay attention that the dimension marked * is different from the standard type.

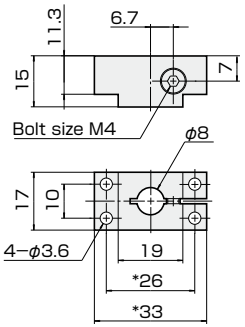
Female Thread Rod End(WS)



Pay attention that the dimension marked * is different from the standard type.

Flange Rod End(ZT)

Optional parts code ZT(JKX16)



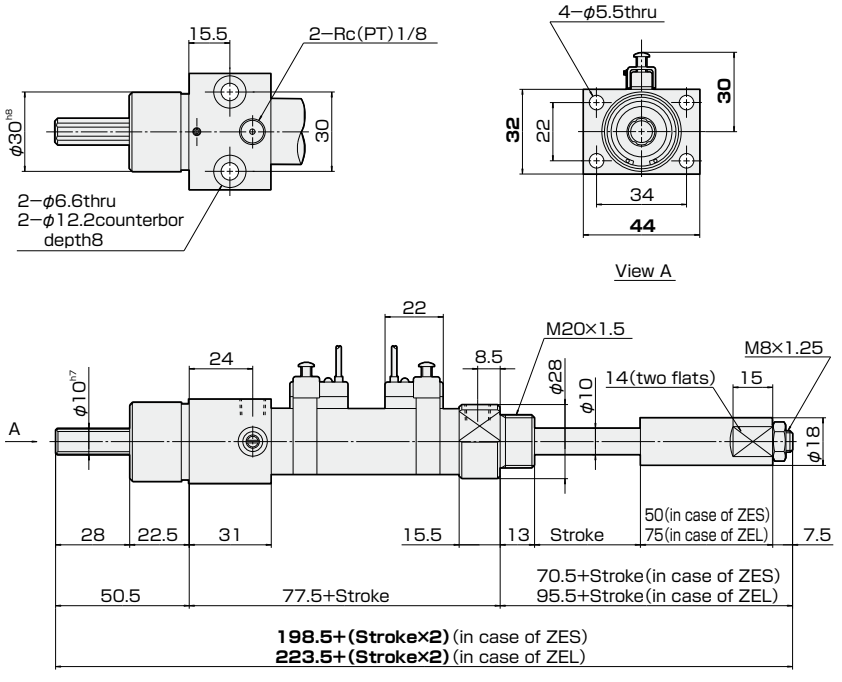
Note: Pay attention that the dimension marked * is diferent from previous type flange rod end ZS.

DIMENSIONS(mm) JKX20 WITH STROKE ADJUSTER TYPE (PUSH STROKE ADJUSTMENT)

JKX(S)−SD20−(Stroke)− ZES / ZEL

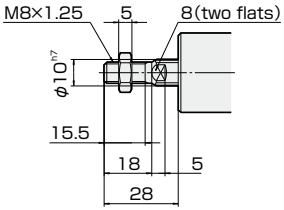
Bore Size

With Stroke Adjuster
Push Stroke Adjustment ZES···25mm
ZEL···50mm

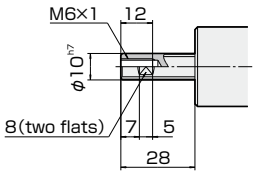


Air cushioning is available only at rod pull side.

Male Thread Rod End(WT)

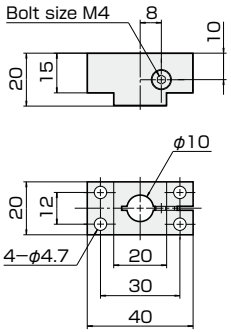


Female Thread Rod End(WS)



Flange Rod End(ZT)

Optional parts code ZT(JKX20)



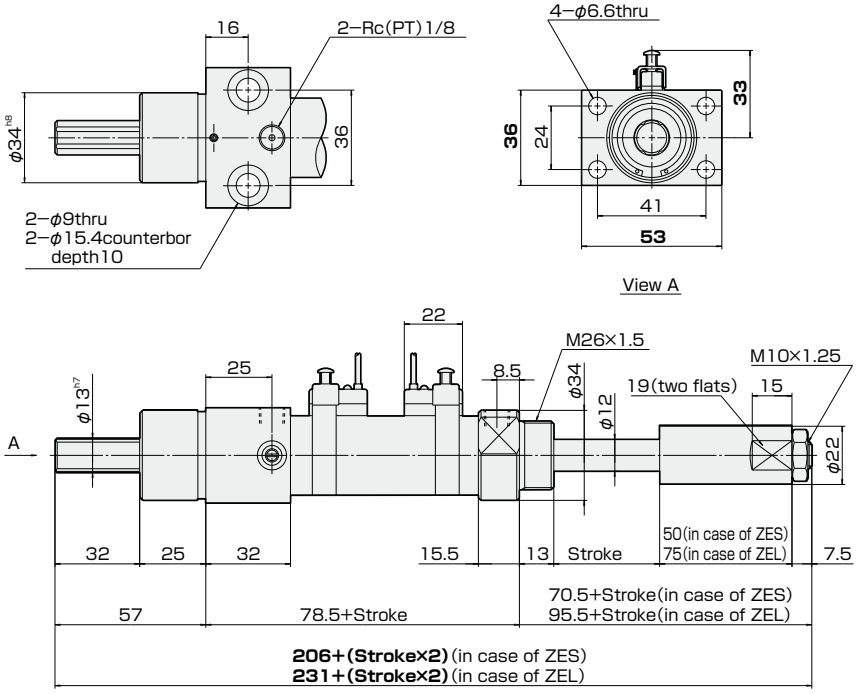
Note: Interchangeable with the previous type flange rod end ZS.

DIMENSIONS(mm) JKX25 WITH STROKE ADJUSTER TYPE (PUSH STROKE ADJUSTMENT)

JKX(S)−SD25−(Stroke)− ZES / ZEL

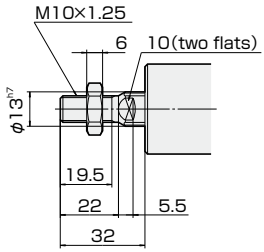
Bore Size

With Stroke Adjuster
Push Stroke Adjustment ZES···25mm
ZEL···50mm

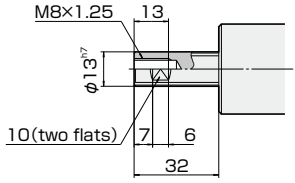


Air cushioning is available only at rod pull side.

Male Thread Rod End(WT)

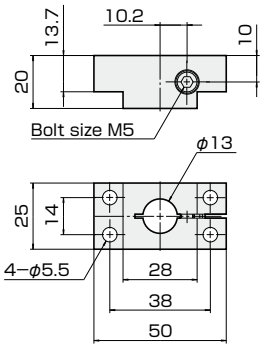


Female Thread Rod End(WS)



Flange Rod End(ZT)

Optional parts code ZT(JKX25)



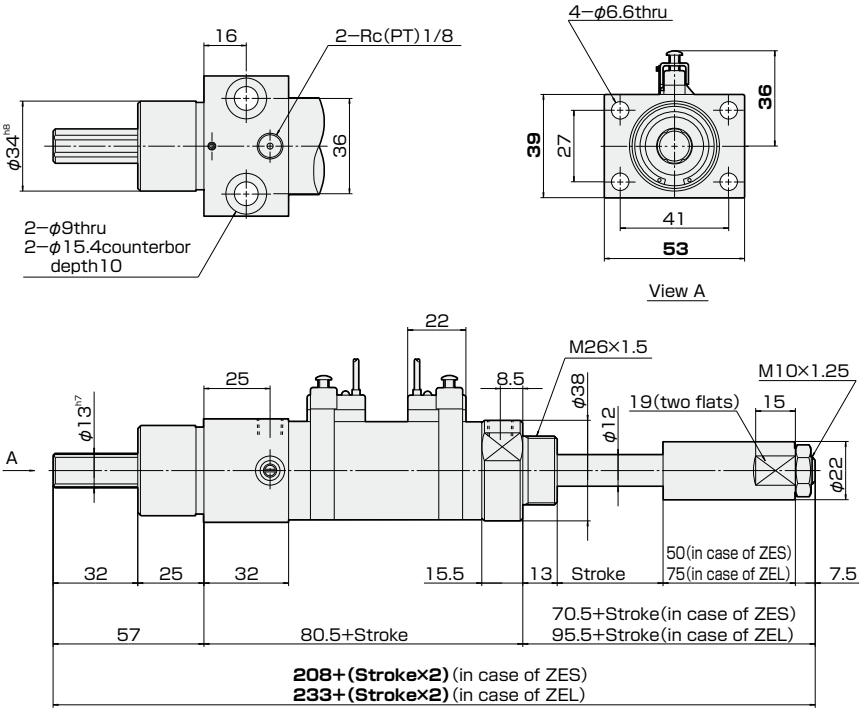
Note: Interchangeable with the previous type flange rod end ZS.

DIMENSIONS(mm) JKX32 WITH STROKE ADJUSTER TYPE (PUSH STROKE ADJUSTMENT)

JKX(S)−SD32−(Stroke)− ZES / ZEL

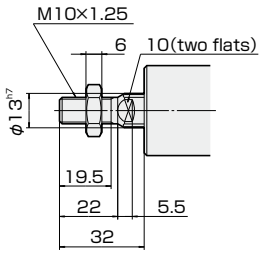
Bore Size

With Stroke Adjuster
Push Stroke Adjustment ZES···25mm
ZEL···50mm

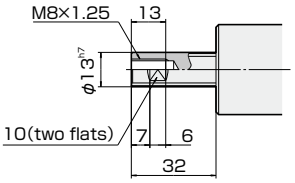


Air cushioning is available only at rod pull side.

Male Thread Rod End(WT)

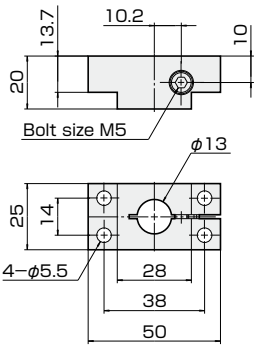


Female Thread Rod End(WS)



Flange Rod End(ZT)

Optional parts code ZT(JKX32)



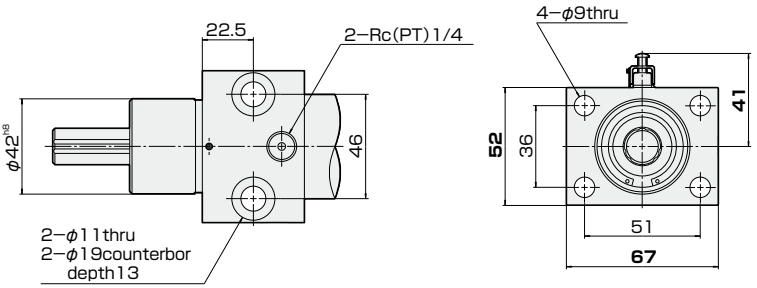
Note: Interchangeable with the previous type flange rod end ZS.

DIMENSIONS(mm) JKX40 WITH STROKE ADJUSTER TYPE (PUSH STROKE ADJUSTMENT)

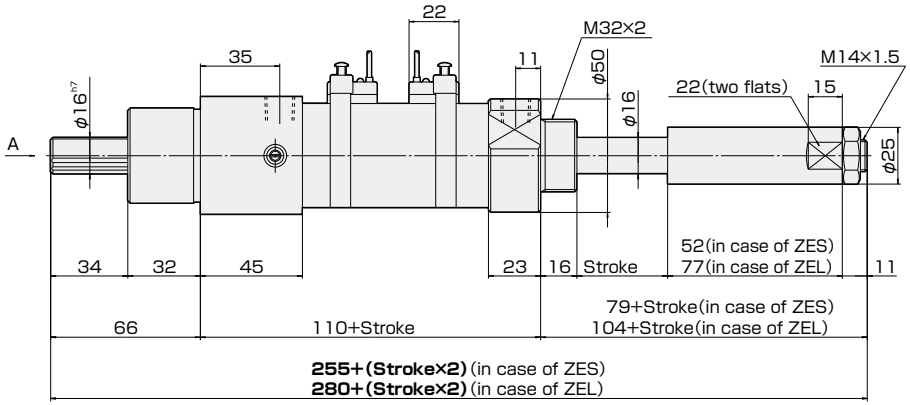
JKX(S)−SD40−(Stroke)− ZES / ZEL

Bore Size

With Stroke Adjuster
Push Stroke Adjustment ZES···25mm
ZEL···50mm

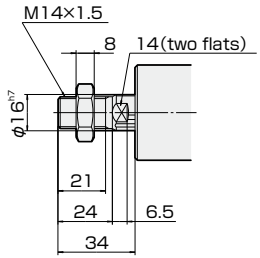


View A

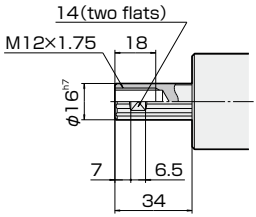


Air cushioning is available only at rod pull side.

Male Thread Rod End(WT)

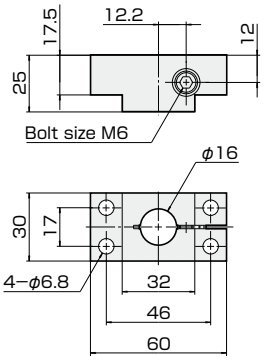


Female Thread Rod End(WS)



Flange Rod End(ZT)

Optional parts code ZT(JKX40)



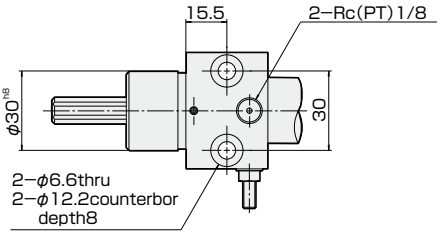
Note: Interchangeable with the previous type flange rod end ZS.

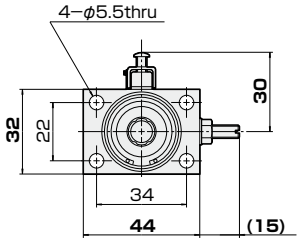
DIMENSIONS(mm) JKX20 WITH STROKE ADJUSTER TYPE (PULL STROKE ADJUSTMENT)

JKX(S)−SD20−(Stroke)− ZFS / ZFL

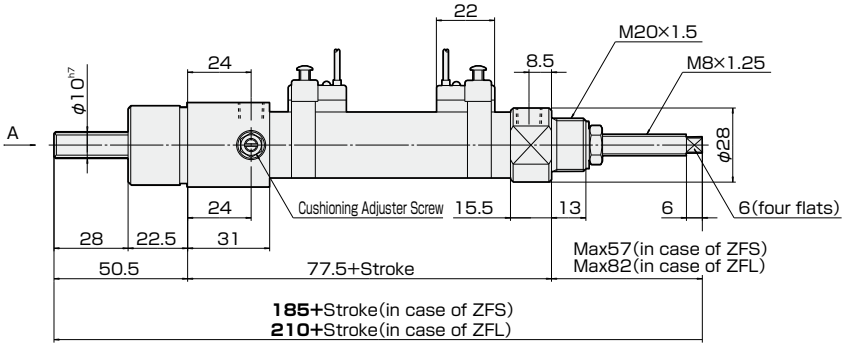
Bore Size

With Stroke Adjuster
Pull Stroke Adjustment ZFS···25mm
ZFL···50mm



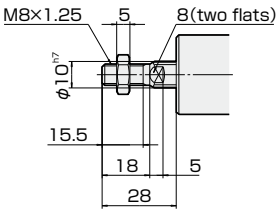


View A

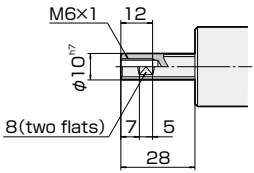


Air cushioning is available only at rod pull side.

Male Thread Rod End(WT)

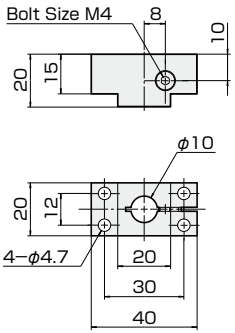


Female Thread Rod End(WS)



Flange Rod End(ZT)

Optional parts code ZT(JKX20)



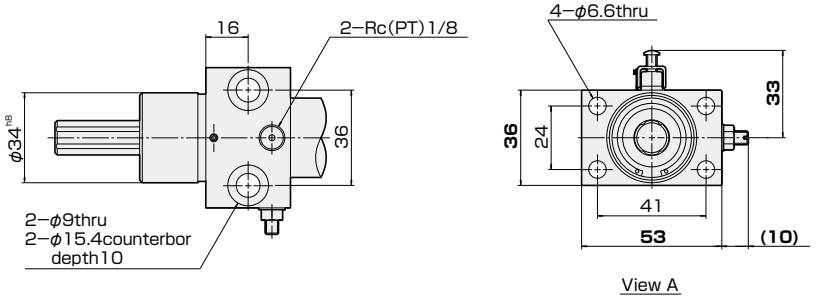
Note: Interchangeable with the previous type flange rod end ZS.

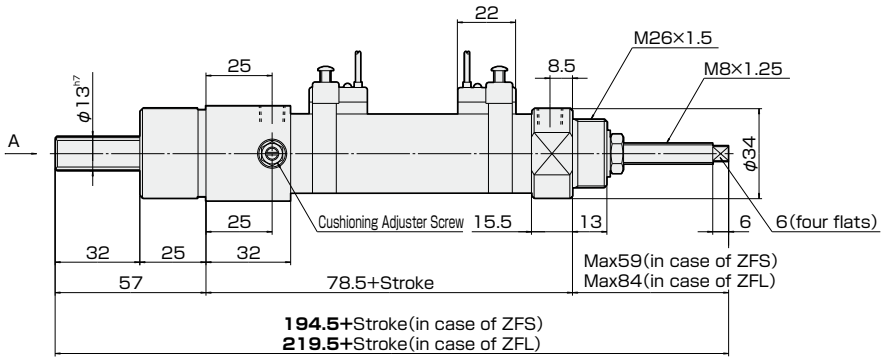
DIMENSIONS(mm) JKX25 WITH STROKE ADJUSTER TYPE (PULL STROKE ADJUSTMENT)

JKX(S)−SD25−(Stroke)−ZFS / ZFL

Bore Size

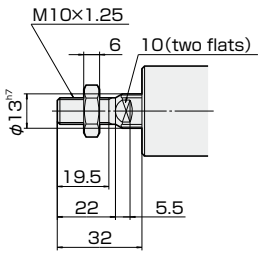
With Stroke Adjuster
Pull Stroke Adjustment ZFS···25mm
ZFL···50mm



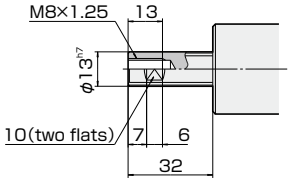


Air cushioning is available only at rod pull side.

Male Thread Rod End(WT)

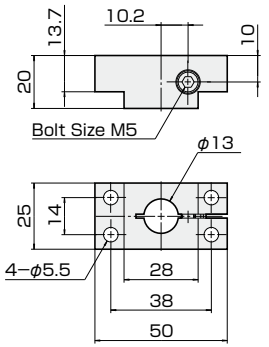


Female Thread Rod End(WS)



Flange Rod End(ZT)

Optional parts code ZT(JKX25)



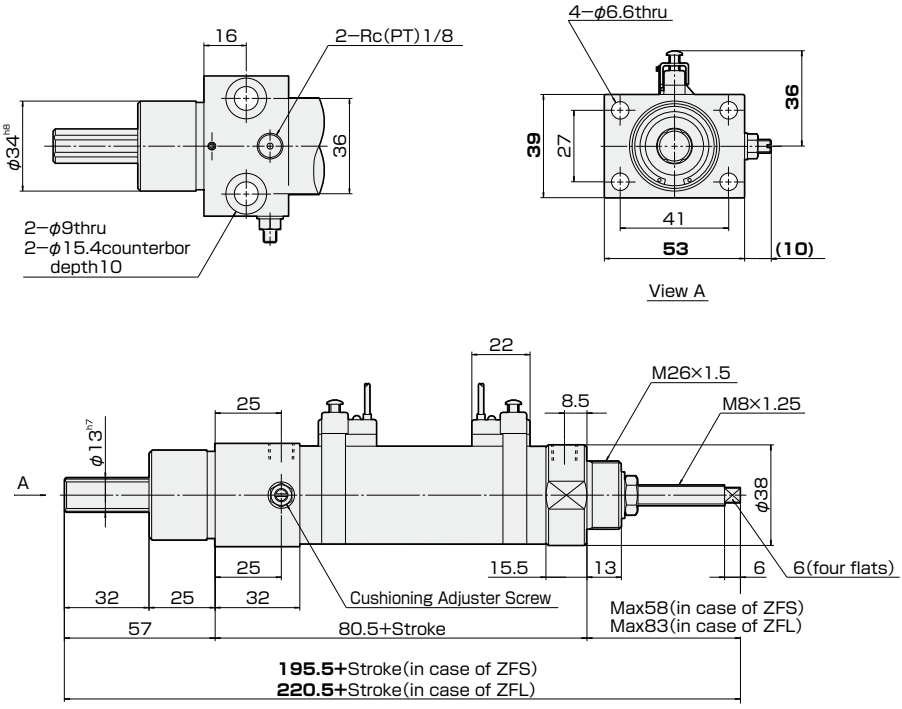
Note: Interchangeable with the previous type flange rod end ZS.

DIMENSIONS(mm) JKX32 WITH STROKE ADJUSTER TYPE (PULL STROKE ADJUSTMENT)

JKX(S)−SD32−(Stroke)− ZFS / ZFL

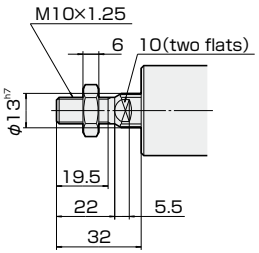
Bore Size

With Stroke Adjuster
Pull Stroke Adjustment ZFS···25mm
ZFL···50mm

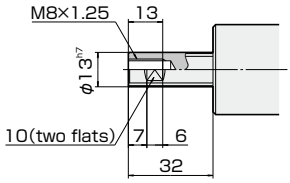


Air cushioning is available only at rod pull side.

Male Thread Rod End(WT)

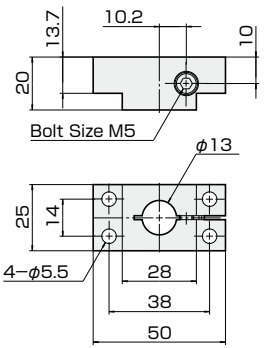


Female Thread Rod End(WS)



Flange Rod End(ZT)

Optional parts code ZT(JKX32)



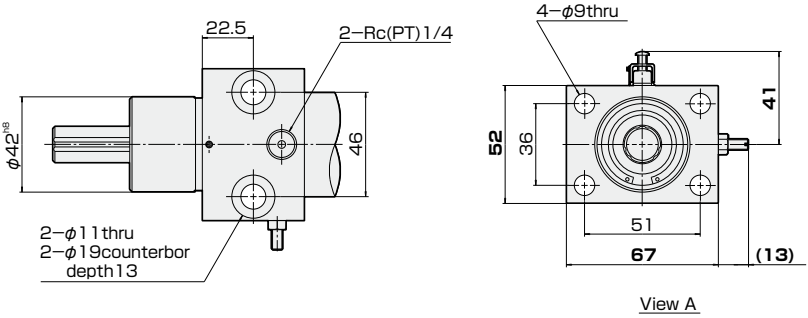
Note: Interchangeable with the previous type flange rod end ZS.

DIMENSIONS(mm) JKX40 WITH STROKE ADJUSTER TYPE (PULL STROKE ADJUSTMENT)

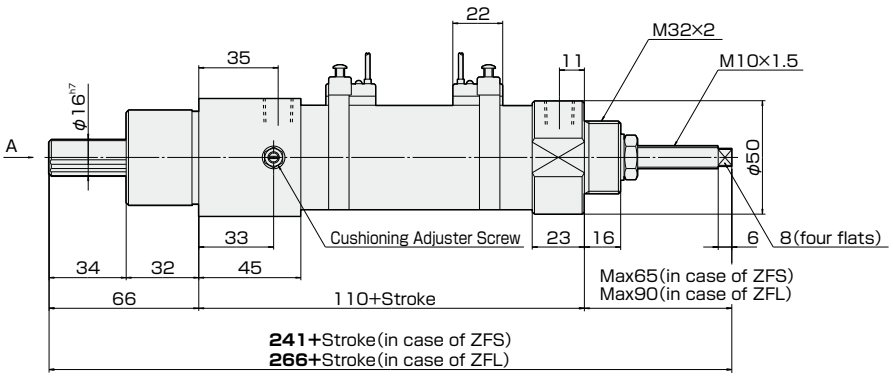
JKX(S)−SD40−(Stroke)−ZFS / ZFL

Bore Size

With Stroke Adjuster
Pull Stroke Adjustment ZFS···25mm
ZFL···50mm

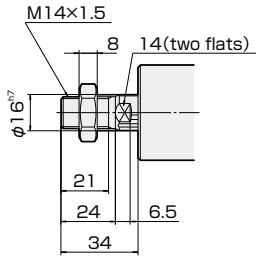


View A

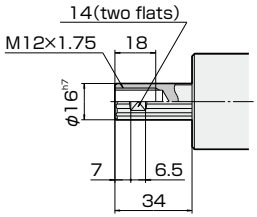


Air cushioning is available only at rod pull side.

Male Thread Rod End(WT)

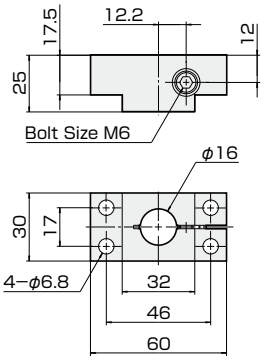


Female Thread Rod End(WS)



Flange Rod End(ZT)

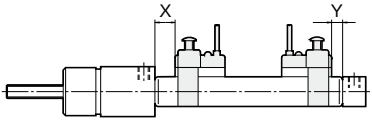
Optional parts code ZT(JKX40)



Note: Interchangeable with the previous type flange rod end ZS.

INSTALLATION OF SWITCH

■Switch Setting Position



RP1, 5 Switch

Unit: mm

Model	Switch Setting Position		On hold distance (ℓ)	Hysteresis (c)
	X	Y		
JKX12	9	5	7	2 or less
JKX16	14	5	8	
JKX20	7	6	9	
JKX25	7	6	9	
JKX32	7	6	8	
JKX40	11	13	9	

Note 1: In case of short stroke cylinder, the switch may not be turned off. or two switches may be turned on at the same time. Then, slide the switch outward from the pasition shown above.
Note 2: Since the values in the table are optimum. it is permitted to mount the switch apart a little from the paint specified.

RP4 Switch

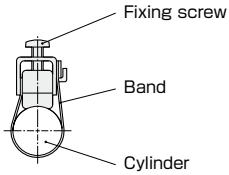
Unit: mm

Model	Switch Setting Position		On hold distance (ℓ)	Hysteresis (c)
	X	Y		
JKX12	7	3	3	2 or less
JKX16	12	3	3	
JKX20	5	4	2.5	
JKX25	5	4	3.5	
JKX32	5	4	3	
JKX40	9	11	3	

Explanation of hysteresis and on hold distance. ☞page 1084

■Switch Installation

The switch can be moved freely in the axial or peripheral direction by loosening the fixing screw. Mount the switch at the adequate position checking the operation by the indicator lamp.
The tightening torque of the fixing screw shall be 0.3N·m (3kgf·em) max.



STANDARD STROKE

Bore Size	Stroke (mm)										
	15	25	30	45	50	60	75	100	150	200	250
ϕ12	○		○	○	○	○	○	○	—	—	—
ϕ16	○		○	○	○	○	○	○	—	—	—
ϕ20		○	○		○		○	○	○	○	○
ϕ25		○			○		○	○	○	○	○
ϕ32		○			○		○	○	○	○	○
ϕ40		○			○		○	○	○	○	○

Bore Size	Stroke (mm)									Maximum Stroke Available
	300	350	400	450	500	550	600	650	700	
ϕ12	—	—	—	—	—	—	—	—	—	100
ϕ16	—	—	—	—	—	—	—	—	—	100
ϕ20	○	○	○	○	○	○	—	—	—	550
ϕ25	○	○	○	○	○	○	○	○	—	650
ϕ32	○	○	○	○	○	○	○	○	—	650
ϕ40	○	○	○	○	○	○	○	○	○	700

Those marked with a circle are standard stroke models.
For the stroke, models can be manufactured to have a stroke in increments of 1 mm. Range
For JKX12 and 16, the minimum stroke is limited. ☞ page 838

CUSTOM MADE

To each order, we will create a drawing of the product to be delivered based on the reference drawing shown below.
Contact us for the prices, how to order, time to delivery and detailed specification.

Hollow Rod Model·····Type with the hollow rods on both ends.

Optional·····With Stroke Adjustment Mechanism
With Bearing for Floating Mechanism
Rod End with Male/Female Thread

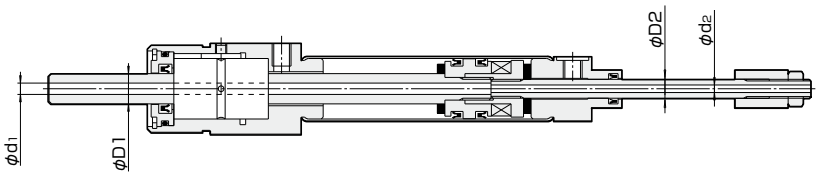
Application·····For Vacuum Suction, etc.

The rod and hollow diameters for respective models are as shown in the table below. (Unchangeable)

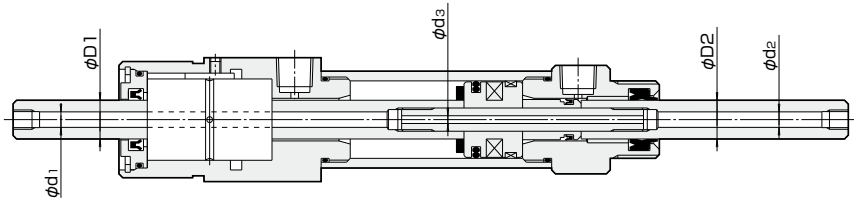
Unit: mm

Model	Spline Rod Diameter (D1)	Stroke Adjustment Rod Diameter (D2)	Spline Rod Hollow Diameter (d_1)	Stroke Adjustment Rod Hollow Diameter (d_2)	Piston Shaft Hollow Diameter (d_3)
JKX12	ϕ 6	ϕ 4	ϕ2.5	ϕ1.5	———
JKX16	ϕ 8	ϕ 6	ϕ3	ϕ2	———
JKX20	ϕ10	ϕ10	ϕ4	ϕ4	ϕ2
JKX25	ϕ13	ϕ12	ϕ5	ϕ3	ϕ3
JKX32	ϕ13	ϕ12	ϕ5	ϕ3	ϕ3
JKX40	ϕ16	ϕ16	ϕ7	ϕ5	ϕ4

JKX12, 16



JKX20~40



Note: Rubber cushion for the push-out side and air cushion for the draw-back side.

MEMO

MEMO

MEMO

MEMO

MEMO