

High-quality stainless steel cylinders ahead of all others

SLIM CYLINDERS

Use durable piston seals.

The two piston seals are the durable PPY type. This prevents inner air leakage, and achieves smooth operation from low-speed to high-speed ranges.

Sensor switches can be installed anytime after cylinder installation.

Magnets as standard equipment across the entire series allow sensor switches to be installed anytime after the cylinder has been installed.

High installation accuracy and simple mounting operations.

A centering location on the rod cover improves mounting precision. Moreover, the mounting nut's improved thread precision means that holding the cylinder body in place by hand is sufficient for mounting nut tightening operations. Mounting in hard-to-reach places is easy.

Criteria for Selection: Slim Cylinder Allowable Kinetic Energy

Slim cylinders (with the exception of heat resistant specifications) include a cushioning mechanism.

This mechanism is intended to reduce as much as possible the impact of pistons with high kinetic energy when they stop at the end of the stroke. There are two types of cushions, as shown below.

● Rubber bumpers (Standard equipment)

Rubber bumpers installed on both sides of the piston soften the impact at the end of the stroke, and absorb the impact noise during stopping, in response to high-frequency and high-speed operations. They are standard equipment across the whole series, with the exception of heat resistant specifications.

Note that a certain amount of rebound will occur at the end of the stroke on the cylinder with the rubber bumpers.

● Variable cushions

Use variable cushions for large load or high-speed operations that rubber bumpers cannot adequately absorb. The impact is absorbed by compressing air, when the piston stops at the end of the stroke. Since the cushioning stroke is included within the cylinder stroke, be careful to ensure that the cushion is not excessively performed during cylinder applications of 25mm strokes or less. An excessively performed cushion can result in too much time for each stroke, reducing efficiency. When operated at or below the absorbable kinetic energy shown in the table below, the cushion seal life is 1 million operations or more.

The load kinetic energy can be obtained through the formulas shown below.

$$E_x = \frac{m}{2} v^2$$

Ex: Kinetic energy (J)
m: Load mass (kg)
v: Piston speed (m/s)

$$E'x = \frac{W}{2g} v'^2$$

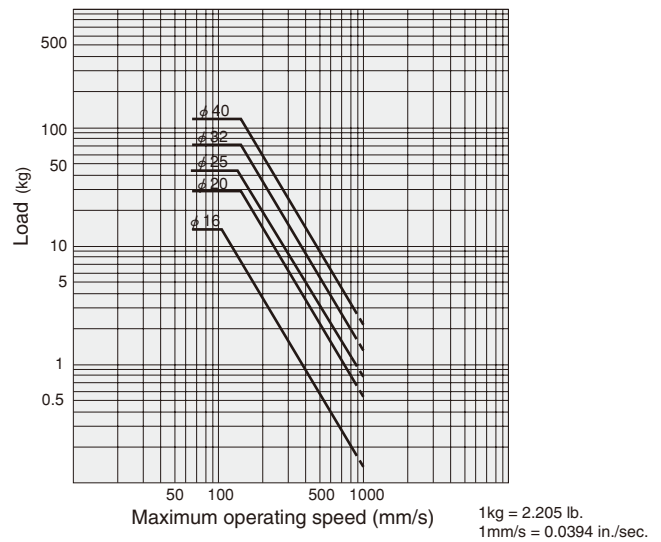
E'x: Kinetic energy [ft·lbf]
W: Load [lbf.]
v': Piston speed [ft./sec.]
g: Acceleration of gravity 32.2 [ft./sec.²]

Operating speed range

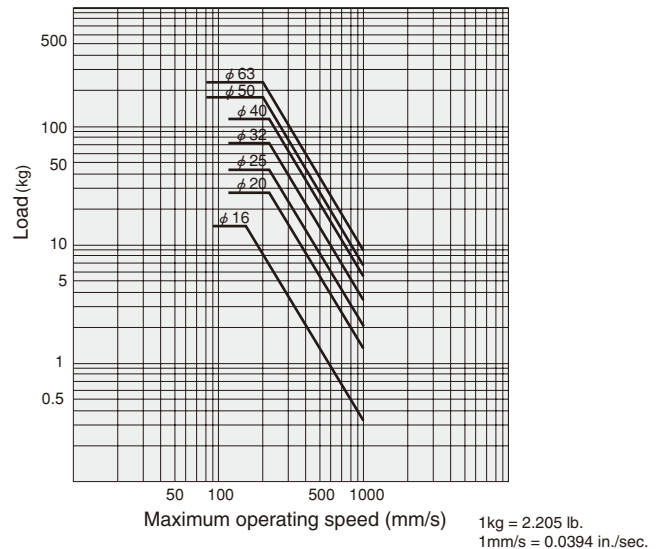
- Rubber bumper 30~800mm/s [1.2~31.5in./sec.]
- Variable cushion 30~1000mm/s [1.2~39.4in./sec.]

Bore size mm [in.]	Allowable kinetic energy J [ft·lbf]	
	With rubber bumpers	With variable cushion
16 [0.630]	0.07 [0.052]	0.18 [0.13]
20 [0.787]	0.27 [0.20]	0.7 [0.52]
25 [0.984]	0.40 [0.30]	1.05 [0.77]
32 [1.260]	0.65 [0.48]	1.8 [1.33]
40 [1.575]	1.2 [0.89]	2.8 [2.07]
50 [1.969]	—	3.5 [2.58]
63 [2.480]	—	4.5 [3.32]

Rubber bumper (Graph 1)



Variable cushion (Graph 2)



How to read the graphs

From Graph 1, the capacity of the rubber bumpers limits the maximum speed to 500mm/s [19.7in./sec.] or less when a φ32 Slim Cylinder is used to carry a load of 5kg [11.0lb.]. From Graph 2, a φ32 cylinder with variable cushion can be selected to carry a load of 8kg [17.6lb.] at a maximum speed of 600mm/s [23.6in./sec.].

SLIM CYLINDERS

Double Acting Type



Symbols

- Without variable cushion
- With variable cushion



Specifications

Item		Bore size mm [in.]	20, 25 [0.787, 0.984]	32, 40 [1.260, 1.575]	50, 63 [1.969, 2.480]
Operation type		Double acting type			
Media		Air			
Mounting type		Basic type, Foot type, Flange type, Pivot type, Head trunnion type, Rod trunnion type			Basic type, Foot type, Flange type, Pivot type
Operating pressure range MPa [psi.]	Standard cylinder	0.04~0.9 [6~131]			0.04~0.7 [6~102]
	Cylinder with variable cushion	0.15~0.9 [22~131]	0.1~0.9 [15~131]		
Proof pressure	MPa [psi.]	1.32 [191]			1.03 [149]
Operating temperature range	°C [°F]	0~70 [32~158]			
Operating speed range	mm/s [in./sec.]	30~800 [1.2~31.5] (With variable cushion is 30~1000 [1.2~39.4])			30~500 [1.2~19.7]
Cushion	Standard cylinder	Fixed type (Rubber bumper)			Variable type as standard (Stroke 12mm [0.472in.])
	Cylinder with variable cushion	Variable type (12mm [0.472in.] stroke)			
Lubrication		Not required			
Port size	Rc	1/8			1/4

Bore Size and Stroke

Bore size	Standard strokes	Maximum stroke		Maximum available stroke	
		No bellows	With bellows	No bellows	With bellows
20	25 50 75 100 125 150	200		1050	740
25	25 50 75 100 125 150 200	250			
32	25 50 75 100 125 150 200	300			
40	25 50 75 100 125 150 200 250 300	400	300	900	740
50	25 50 75 100 150 200 [250 300 350 400]	300[500]	300		
63	25 50 75 100 150 200 [250 300 350 400 500]	300[600]	300		

- Remarks: 1. Stroke tolerance $^{+1}_{0} [^{+0.039}_{0}\text{in.}]$
 2. For non-standard strokes, consult us.
 3. Items in parentheses [] are for cases when foot mounting brackets are used for mounting.
 4. The minimum operating pressure when the stroke is over the maximum stroke at bore sizes of $\phi 20 \sim \phi 40$ is 0.2MPa [29psi.].

Order Codes

DA [] [] **20×50** - [] - [] - [] - [] - [] - [] - []

Bore size
 ×
Stroke

Non-ion specification
 Blank — Standard
 NCU — Non-ion specification

Bellows or scraper
 Blank — No bellows
 J — With bellows (Made to order)
 Y — With scraper (Made to order; available at $\phi 50$ and $\phi 63$ only)

With or without variable cushion
 Blank — Standard cylinder
 C — Cylinder with variable cushion (Available at $\phi 20 \sim \phi 40$ only) (Standard equipment for $\phi 50$ and $\phi 63$)

Mounting type
 Blank — Basic type
 1 — Double foot mounting type
 3 — Flange mounting type
 8B — Pivot mounting type with bushing ($\phi 50$ and $\phi 63$ only)
 8E — Pivot mounting type with supporting bracket (with pin) ($\phi 20 \sim \phi 40$ only)
 8B-8E — Pivot mounting type with bushing and supporting bracket ($\phi 50$ and $\phi 63$ only)
 11 — Head trunnion type*
 12 — Rod trunnion type*
 11-11T — Head trunnion type, with supporting bracket*
 12-12T — Rod trunnion type, with supporting bracket*
 ● For the pivot mounting type with bushing at $\phi 20 \sim \phi 40$, see made to order specifications on p.414.
 ● Trunnion type is available at $\phi 20 \sim \phi 40$ only. Moreover, it is not available for the variable cushion type.
 ● Mounting brackets are included at shipping. (Except pivot type and pivot type with bushing)
 ※ A head cover for the standard is a short head. Order code "A" is not required.

Rod end accessory
 Blank — No rod end accessory
 I — I type knuckle
 Y — Y type knuckle (with pin)
 ● For the cylinder joint and cylinder rod end, see p.1568.

Number of sensor switches
 1 — With 1 sensor switch
 2 — With 2 sensor switches
 3 — With 3 sensor switches
 : — :
 :

Lead wire length
 (Applies to all except CS□F)
 A — 1000mm [39in.]
 B — 3000mm [118in.]

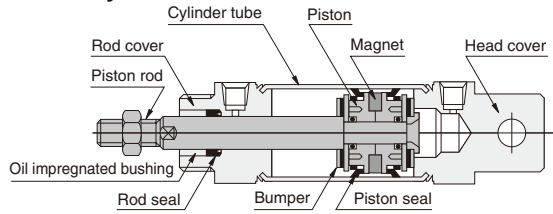
Sensor switch (for cylinders with sensor switches)
 Blank — No sensor switch
 ZG530 — 2-lead wire Solid state type with indicator lamp DC10~28V
 ZG553 — 3-lead wire Solid state type with indicator lamp DC4.5~28V
 CS3M — Reed switch type with indicator lamp AC85~230V
 CS4M — Reed switch type with indicator lamp DC10~30V
 CS5M — Reed switch type without indicator lamp AC85~115V
 CS2F — Reed switch type with indicator lamp AC85~230V
 CS3F — Reed switch type with indicator lamp DC10~30V
 CS4F — Reed switch type with indicator lamp DC10~30V
 CS5F — Reed switch type without indicator lamp DC3~30V
 ● For details of sensor switches, see p.1544.
 ● CS□F comes with DIN connector. All others are grommet type.

Head cover specification
 Blank — Standard head
 A — Short head (For the basic type and flange mounting type only)

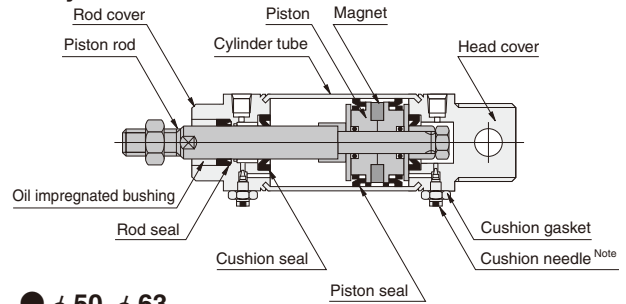
Slim double acting cylinder

Inner Construction and Major Parts (cannot be disassembled)

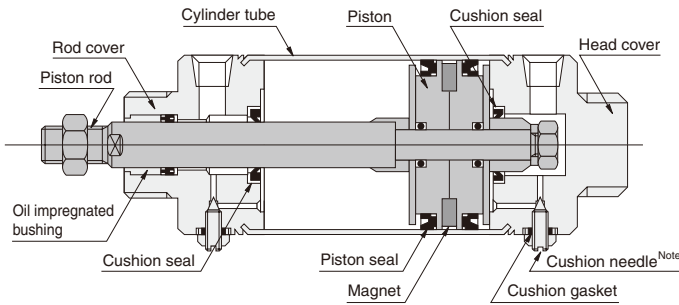
● $\phi 20 \sim \phi 40$ Standard cylinder



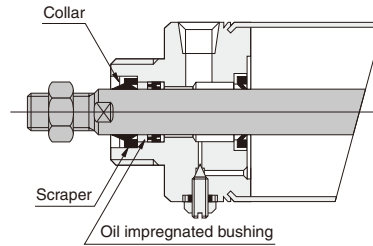
● $\phi 20 \sim \phi 40$ Cylinder with variable cushion



● $\phi 50, \phi 63$ Standard cylinder



● $\phi 50, \phi 63$ With scraper



Note: Set the cushion needle tightening torque to 1.0N·m [8.85in·lbf] or less.

Major Parts and Materials

Parts	Bore size	20	25~40	50, 63
Cylinder tube		Stainless steel		
Piston		Plastic		
Piston rod		Steel (hard chrome plated)		
Rod cover		Aluminum alloy (anodized)		
Head cover				
Seal		Synthetic rubber (NBR)		
Bumper		Synthetic rubber (NBR)	—	
Scraper		—		Synthetic rubber (NBR)
Collar		—		Aluminum (anodized)
Magnet		Plastic magnet		
Bellows		Nylon tarpaulin (heat resistant temperature 70°C [158°F])		
Y type knuckle, I type knuckle Pivot mounting with supporting bracket		Mild steel (zinc plated)		

Seals

Note: Seals cannot be replaced.

Parts	Rod seal					Piston seal					Cushion seal					Cushion gasket					Scraper									
	Quantity					1					2					2					2					1				
20 [0.787]	1					NY-12×8×3.5					PPY-20					GYH-9					DT-1-4					—				
25 [0.984]	1					NY-14×10×3.5					PPY-25					GYH-11					DT-1-4					—				
32 [1.260]	1					NY-17×12×4					PPY-32					PCS-14					DT-1-4					—				
40 [1.575]	1					NY-22×16×5					PPY-40					PCS-18					DT-1-4					—				
50 [1.969]	1					NY-22×16×5					PGY-50					PCS-20					DT-1-5					SCB-16				
63 [2.480]	1					NY-22×16×5					PGY-63					PCS-20					DT-1-5					SCB-16				

Mass

Bore size mm [in.]	Zero stroke mass				Additional mass for each 1mm [0.0394in.] stroke	Mass of mounting bracket				
	Standard head type	Short head type	Pivot mounting type	Trunnion type		Foot bracket	Flange bracket	Pivot bracket	Y type knuckle	I type knuckle
20 [0.787]	0.16 [0.35] (0.14 [0.31])	0.15 [0.33] (0.13 [0.29])	—	0.35 [0.77]	0.0008 [0.0018]	0.14 [0.31]	0.08 [0.18]	0.06 [0.13]	0.041 [0.090]	0.036 [0.079]
25 [0.984]	0.21 [0.46] (0.18 [0.40])	0.20 [0.44] (0.17 [0.37])	—	0.39 [0.86]	0.0011 [0.0024]	0.16 [0.35]	0.08 [0.18]	0.06 [0.13]	0.075 [0.165]	0.070 [0.154]
32 [1.260]	0.33 [0.73] (0.30 [0.66])	0.31 [0.68] (0.28 [0.62])	—	0.50 [1.10]	0.0015 [0.0033]	0.19 [0.42]	0.10 [0.22]	0.14 [0.31]	0.075 [0.165]	0.070 [0.154]
40 [1.575]	0.49 [1.08] (0.43 [0.95])	0.45 [0.99] (0.39 [0.86])	—	0.65 [1.43]	0.0024 [0.0053]	0.29 [0.64]	0.13 [0.29]	0.14 [0.31]	0.120 [0.265]	0.132 [0.291]
50 [1.969]	0.91 [2.01]	0.86 [1.90]	0.83 [1.83]	—	0.0028 [0.0062]	0.55 [1.21]	0.28 [0.62]	0.24 [0.53]	0.120 [0.265]	0.132 [0.291]
63 [2.480]	1.24 [2.73]	1.20 [2.65]	1.17 [2.58]	—	0.0033 [0.0073]	0.73 [1.61]	0.37 [0.82]	0.24 [0.53]	0.120 [0.265]	0.132 [0.291]

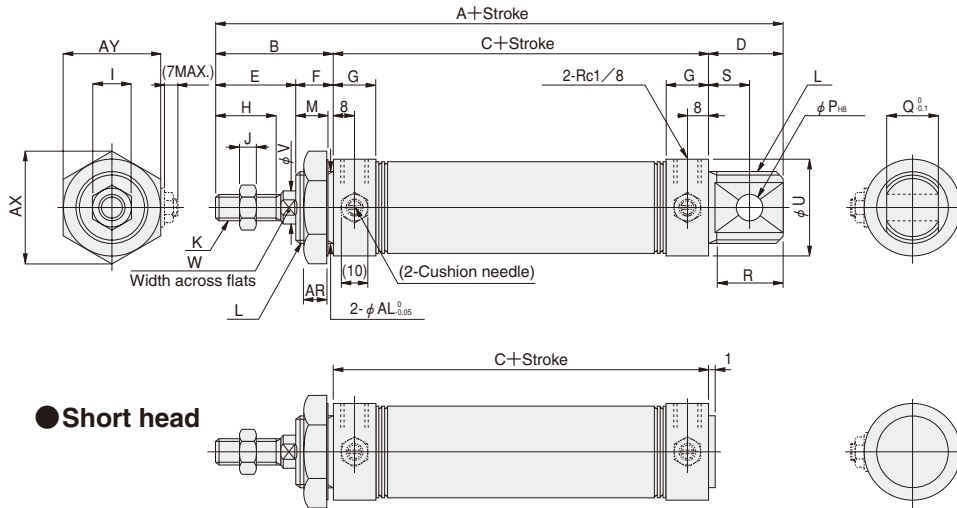
Note: Figures in parentheses () are for cylinders with variable cushions of bore sizes $\phi 20 \sim \phi 40$.
 Calculation example: For foot mounting type of 32mm bore size and 100mm stroke
 $0.33 + 0.19 + (0.0015 \times 100) = 0.67\text{kg}$ [1.48lb.]

Dimensions of Basic Type (mm)

● $\phi 20 \sim \phi 40$ DA Bore size Stroke

● Figures in parentheses () are for type with variable cushion.

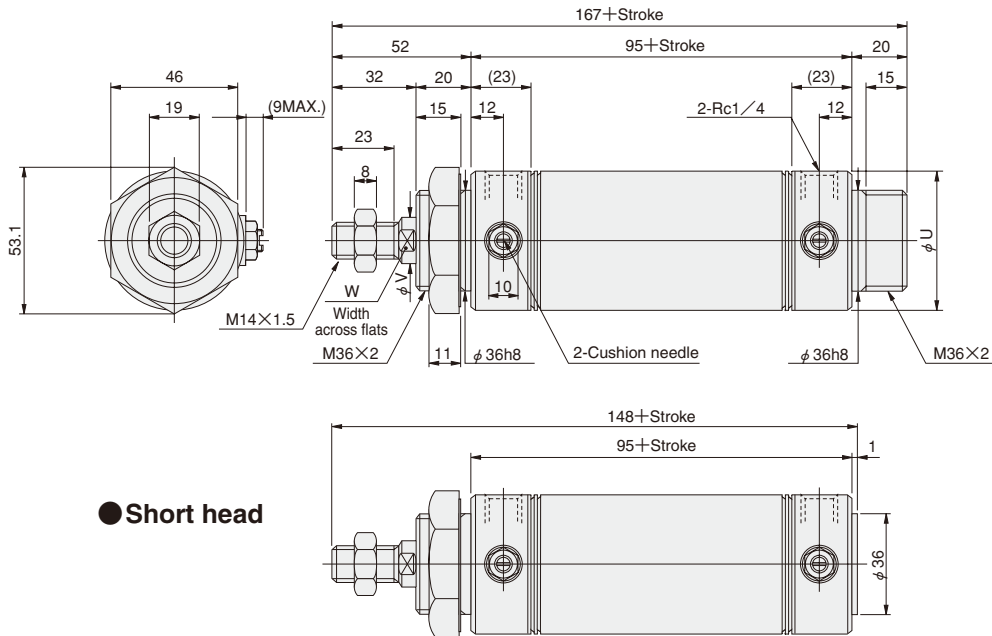
CAD DA- Bore size SLIM-A



Code	A	B	C	D	E	F	G	H	I	J	K	L	M	P	Q	R	S	U	V	W	AR	AX	AY	AL
20 [0.787]	132	35	76	21	23	12	16	15	12	5	M 8×1	M20×1.5	10	8	12	19	12	27	8	6	7.5	31.2	27	20
25 [0.984]	137	40	76	21	26	14	16	18	14	6	M10×1.25	M22×1.5	12	8	12	19	12	29	10	8	9.5	34.6	30	22
32 [1.260]	148	45	76	27	31	14	16	23	14	6	M10×1.25	M27×2	12	10	20	25	15	35	12	10	9.5	41.6	36	27
40 [1.575]	148	45	76	27	31	14	(14.5)	23	19	8	M14×1.5	M33×2	12	10	20	25	15	41.6	16	14	9.5	47.3	41	33

● $\phi 50, \phi 63$ DA Bore size Stroke

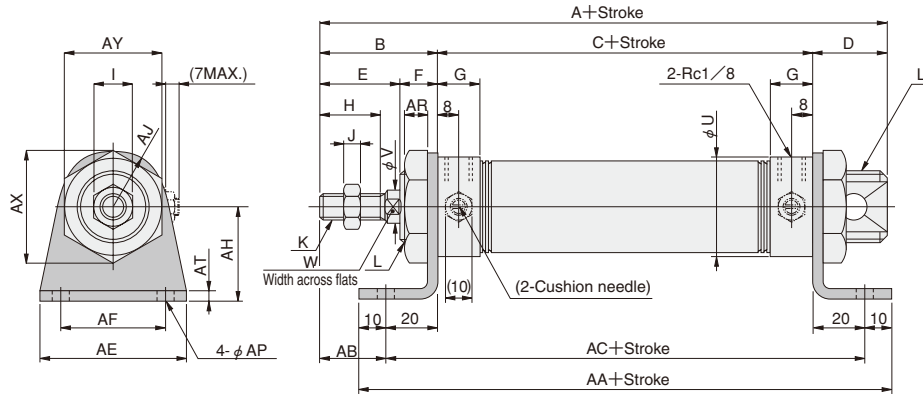
CAD DA- Bore size SLIM-A



Code	U	V	W
50 [1.969]	52	16	14
63 [2.480]	65.4	16	14

Dimensions of Foot Mounting Type (mm)

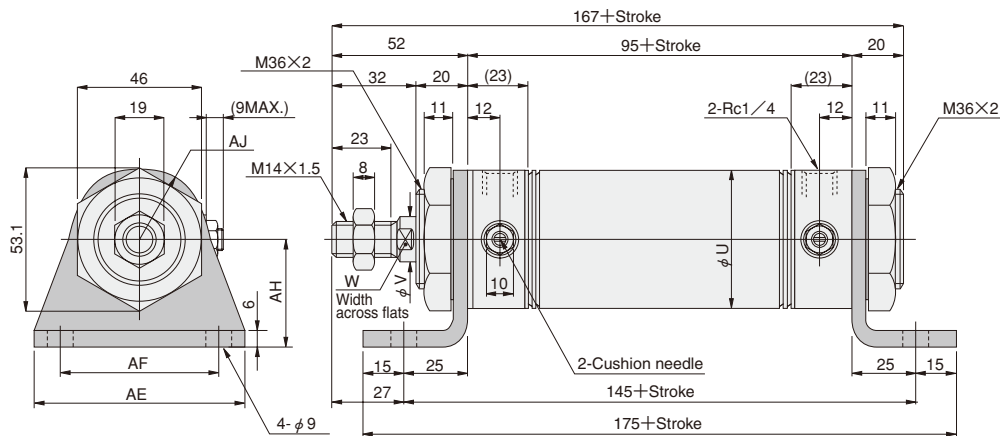
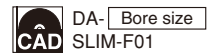
● $\phi 20 \sim \phi 40$ DA Bore size \times Stroke -1 ● Figures in parentheses () are for type with variable cushion.



Bore mm [in.]	Code	A	B	C	D	E	F	G	H	I	J	K	L	U	V	W
20 [0.787]		132	35	76	21	23	12	16	15	12	5	M 8×1	M20×1.5	27	8	6
25 [0.984]		137	40	76	21	26	14	16	18	14	6	M10×1.25	M22×1.5	29	10	8
32 [1.260]		148	45	76	27	31	14	16	23	14	6	M10×1.25	M27×2	35	12	10
40 [1.575]		148	45	76	27	31	14	(14.5)	23	19	8	M14×1.5	M33×2	41.6	16	14

Bore mm [in.]	Code	AA	AB	AC	AE	AF	AH	AJ	AP	AR	AT	AX	AY
20 [0.787]		136	15	116	55	40	25	15.5	6.8	7.5	3.2	31.2	27
25 [0.984]		136	20	116	55	40	30	17	6.8	9.5	3.2	34.6	30
32 [1.260]		136	25	116	55	40	35	20	6.8	9.5	3.2	41.6	36
40 [1.575]		136	25	116	75	55	40	23.5	9	9.5	4	47.3	41

● $\phi 50, \phi 63$ DA Bore size \times Stroke -1



Bore mm [in.]	Code	U	V	W	AE	AF	AH	AJ
50 [1.969]		52	16	14	80	60	40	26
63 [2.480]		65.4	16	14	95	74	45	32

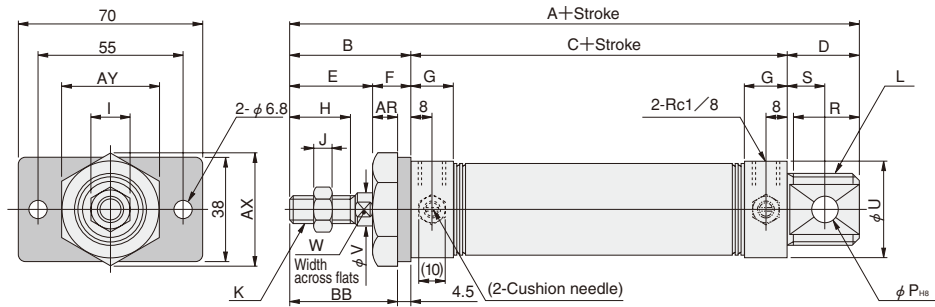
Dimensions of Flange Mounting Type (mm)

● $\phi 20 \sim \phi 40$ DA Bore size Stroke -3

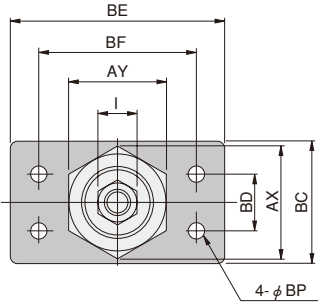
● Figures in parentheses () are for type with variable cushion.

 DA- Bore size
SLIM-FL3

● $\phi 20, \phi 25$




● $\phi 32, \phi 40$

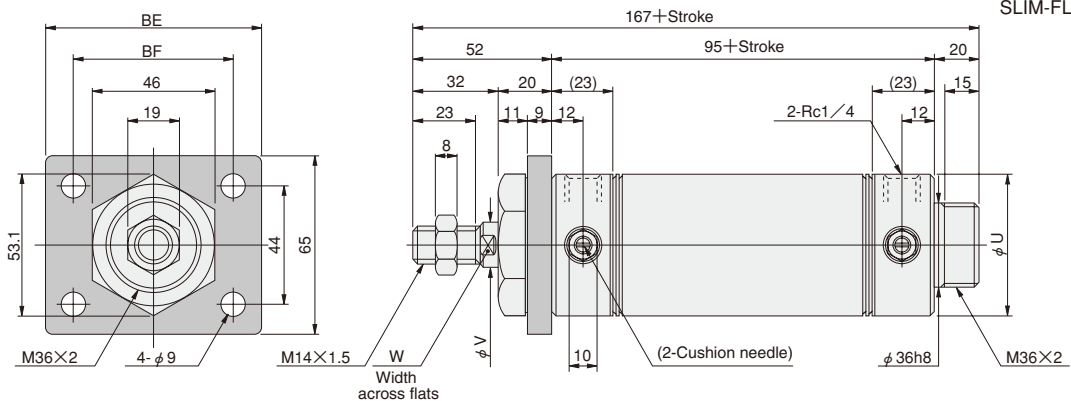


Bore mm [in.]	Code	A	B	C	D	E	F	G	H	I	J	K	L	P	R	S	U	V	W
20 [0.787]	132	35	76	21	23	12	16	15	12	5	M 8×1	M20×1.5	8	19	12	27	8	6	
25 [0.984]	137	40	76	21	26	14	16	18	14	6	M10×1.25	M22×1.5	8	19	12	29	10	8	
32 [1.260]	148	45	76	27	31	14	16	23	14	6	M10×1.25	M27×2	10	25	15	35	12	10	
40 [1.575]	148	45	76	27	31	14	(14.5)	23	19	8	M14×1.5	M33×2	10	25	15	41.6	16	14	

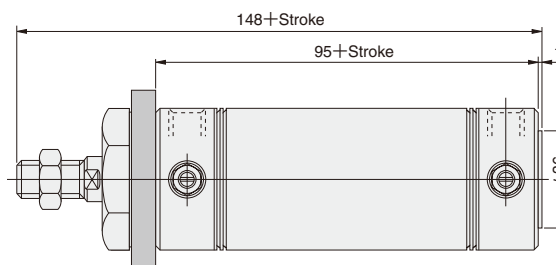
Bore mm [in.]	Code	AR	AX	AY	BB	BC	BD	BE	BF	BP
20 [0.787]		7.5	31.2	27	30.5	—	—	—	—	—
25 [0.984]		9.5	34.6	30	35.5	—	—	—	—	—
32 [1.260]		9.5	41.6	36	40.5	45	20	80	60	6.8
40 [1.575]		9.5	47.3	41	40.5	50	30	100	80	9

● $\phi 50, \phi 63$ DA Bore size Stroke -3

 DA- Bore size
SLIM-A
SLIM-FL3



● Short head

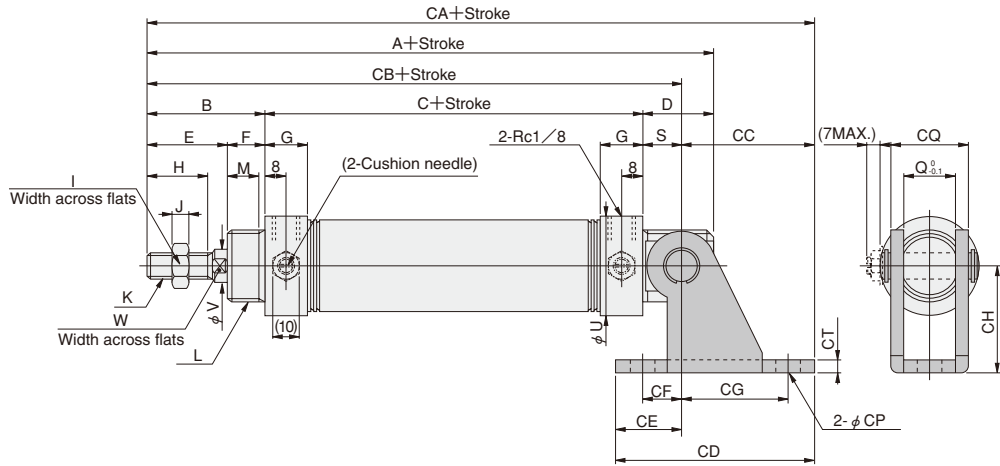


Bore mm [in.]	Code	U	V	W	BE	BF
50 [1.969]		52	16	14	80	60
63 [2.480]		65.4	16	14	100	80

Dimensions of Pivot Mounting Type (mm)

● $\phi 20 \sim \phi 40$ DA Bore size \times Stroke **-8E** ● Figures in parentheses () are for type with variable cushion.

CAD DA- Bore size SLIM-CL7

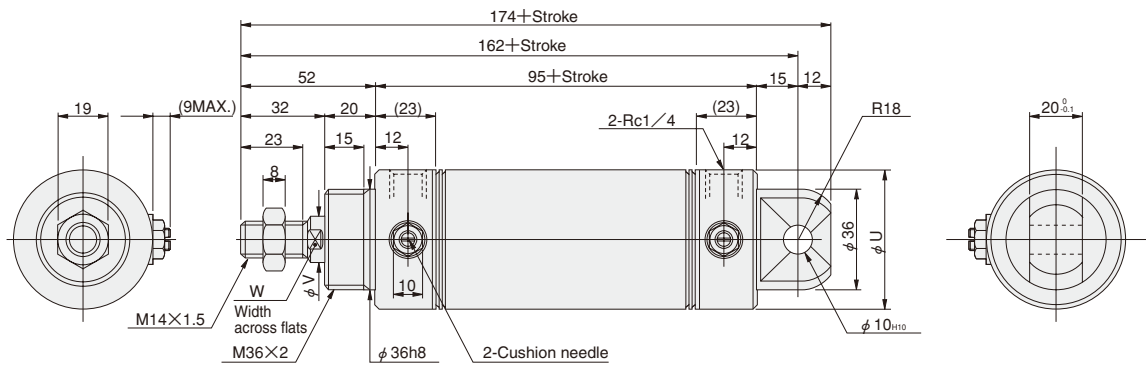


Bore mm [in.]	Code	A	B	C	D	E	F	G	H	I	J	K	L	M	Q	S	U	V	W
20 [0.787]		132	35	76	21	23	12	16	15	12	5	M 8×1	M20×1.5	10	12	12	27	8	6
25 [0.984]		137	40	76	21	26	14	16	18	14	6	M10×1.25	M22×1.5	12	12	12	29	10	8
32 [1.260]		148	45	76	27	31	14	16	23	14	6	M10×1.25	M27×2	12	20	15	35	12	10
40 [1.575]		148	45	76	27	31	14	(14.5)	23	19	8	M14×1.5	M33×2	12	20	15	41.6	16	14

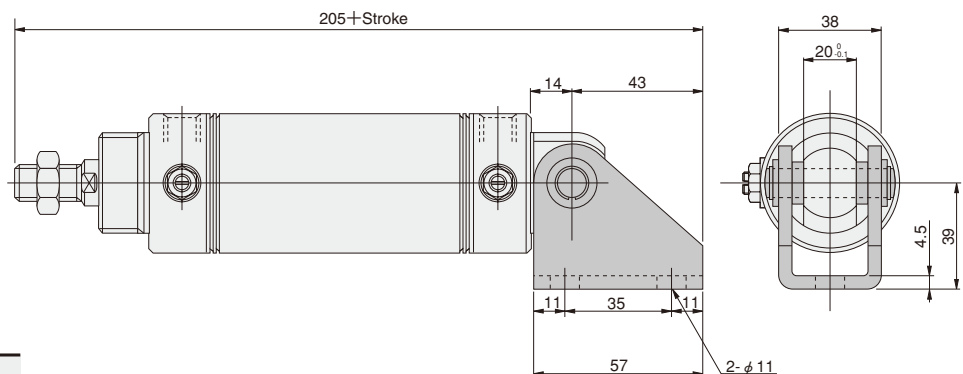
Bore mm [in.]	Code	CA	CB	CC	CD	CE	CF	CG	CH	CP	CQ	CT
20 [0.787]		160	123	37	59	22	15	30	30	6.8	18.4	3.2
25 [0.984]		165	128	37	59	22	15	30	30	6.8	18.4	3.2
32 [1.260]		186	136	50	75	25	15	40	40	9	28	4
40 [1.575]		186	136	50	75	25	15	40	40	9	28	4

● $\phi 50, \phi 63$

● Pivot mounting type with bushing DA Bore size \times Stroke **-8B**



● Pivot mounting type with bushing DA Bore size \times Stroke **-8B-8E**
(With supporting bracket)



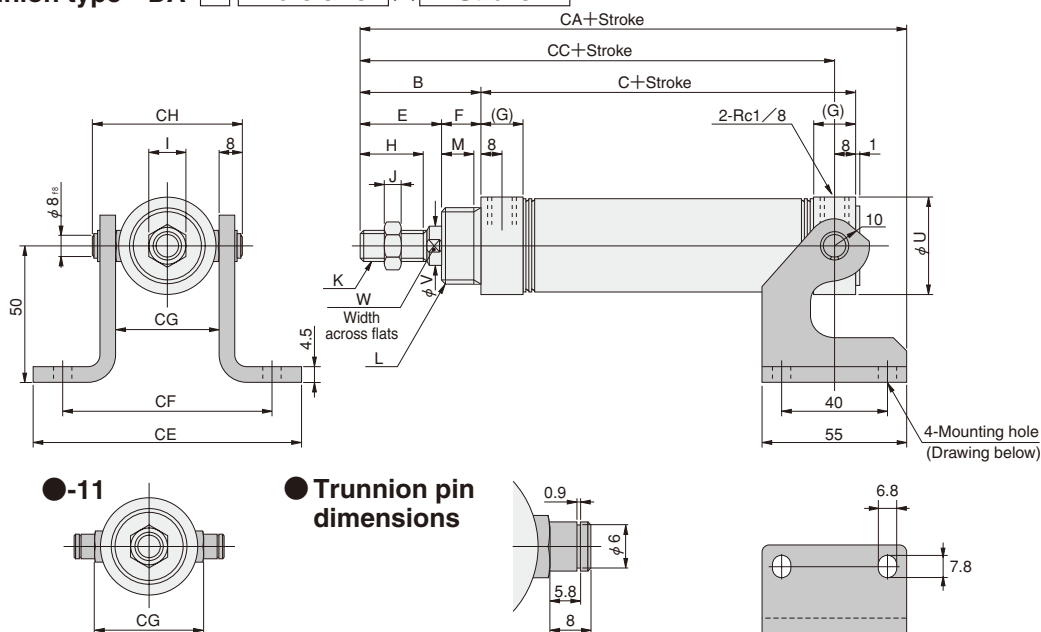
Bore mm [in.]	Code	U	V	W
50 [1.969]		52	16	14
63 [2.480]		65.4	16	14

Dimensions of Trunnion Type (mm)

● $\phi 20 \sim \phi 40$

● Head trunnion type DA Bore size Stroke -11-11T

CAD DA- Bore size SLIM-TR



● -11

● Trunnion pin dimensions

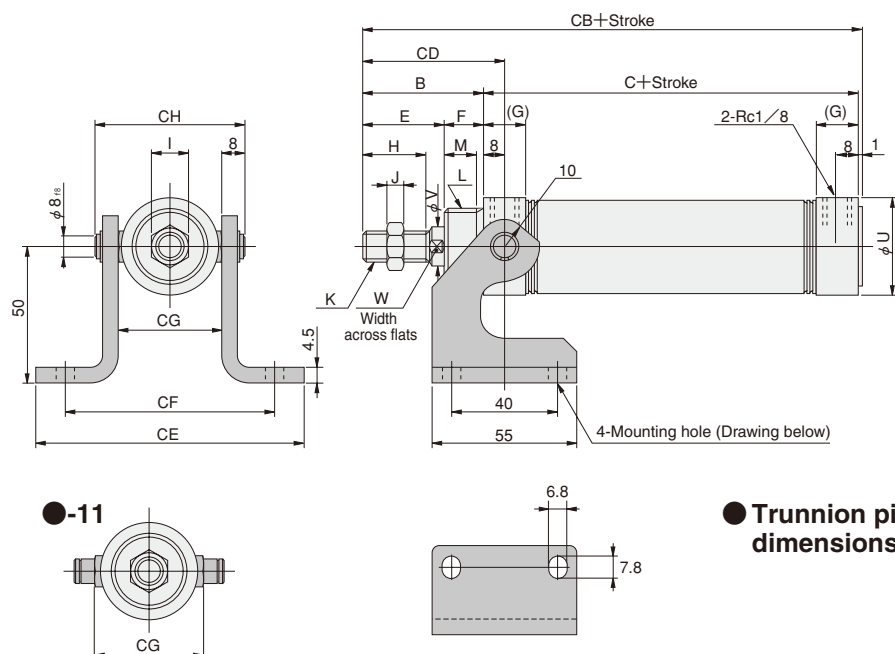
Bore mm [in.]	Code	B	C	E	F	G	H	I	J	K	L	M	U	V	W	CA	CE	CF	CG	CH	CC
20	[0.787]	35	76	23	12	16	15	12	5	M 8×1	M20×1.5	10	27	8	6	130.5	92	72	32	48	103
25	[0.984]	40	76	26	14	16	18	14	6	M10×1.25	M22×1.5	12	29	10	8	135.5	94	74	34	50	108
32	[1.260]	45	76	31	14	16	23	14	6	M10×1.25	M27×2	12	35	12	10	140.5	100	80	40	56	113
40	[1.575]	45	76	31	14	14.5	23	19	8	M14×1.5	M33×2	12	41.6	16	14	140.5	107	87	47	63	113

Remark : Head cover specification for the head trunnion type comes with a short head. Order code -A is not required.

● $\phi 20 \sim \phi 40$

● Rod trunnion type DA Bore size Stroke -12-12T

CAD DA- Bore size SLIM-TR



● -11

● Trunnion pin dimensions

Bore mm [in.]	Code	B	C	E	F	G	H	I	J	K	L	M	U	V	W	CB	CE	CF	CG	CH	CD
20	[0.787]	35	76	23	12	16	15	12	5	M 8×1	M20×1.5	10	27	8	6	112	92	72	32	48	43
25	[0.984]	40	76	26	14	16	18	14	6	M10×1.25	M22×1.5	12	29	10	8	117	94	74	34	50	48
32	[1.260]	45	76	31	14	16	23	14	6	M10×1.25	M27×2	12	35	12	10	122	100	80	40	56	53
40	[1.575]	45	76	31	14	14.5	23	19	8	M14×1.5	M33×2	12	41.6	16	14	122	107	87	47	63	53

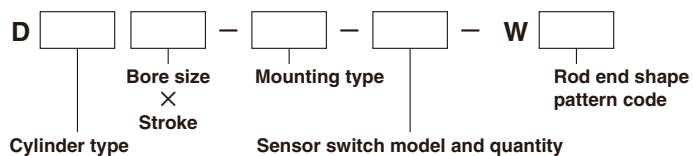
Remark : Head cover specification for the rod trunnion type comes with a short head. Order code -A is not required.

OPTIONAL ROD END SHAPE PATTERNS

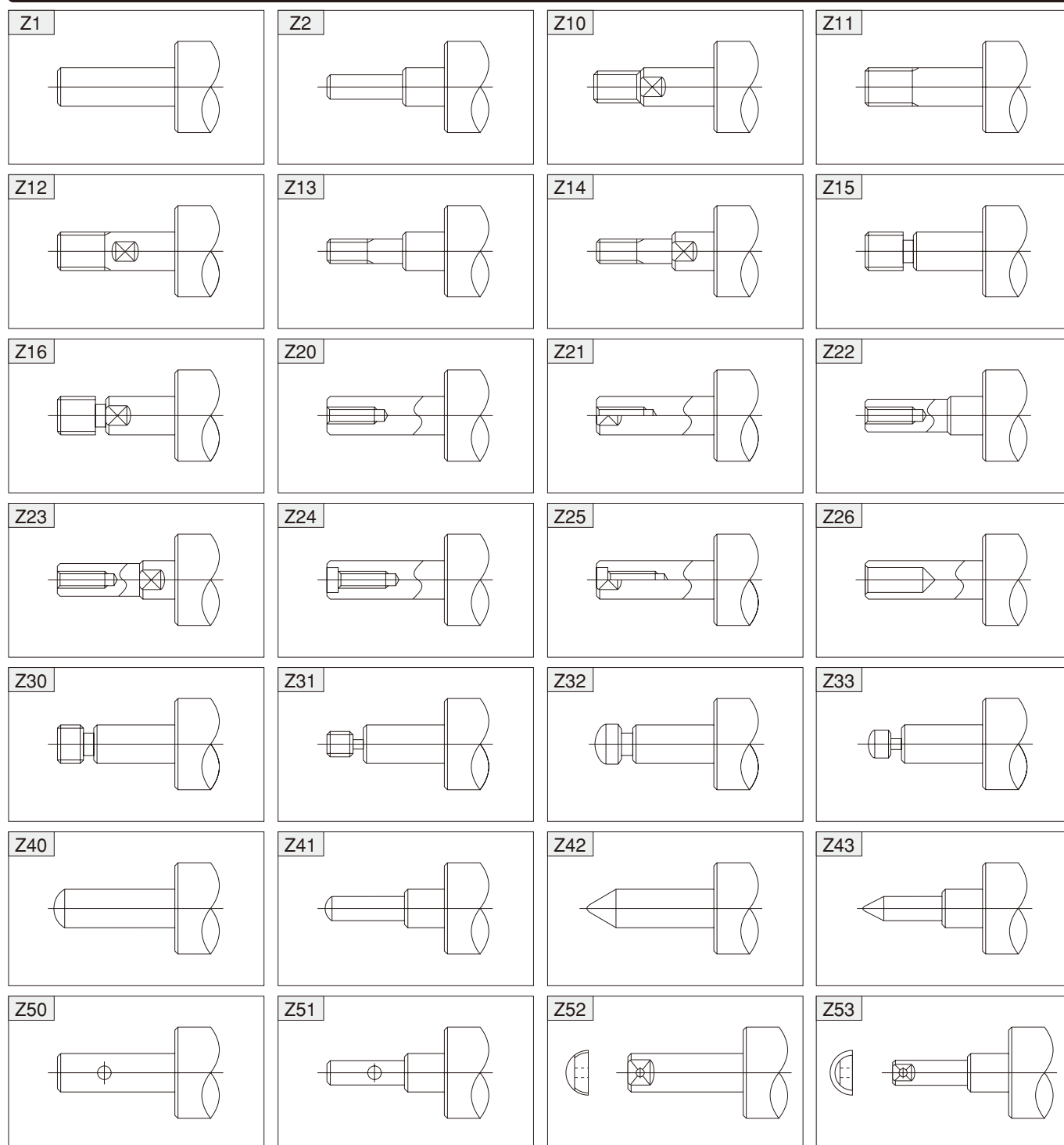
Use an order form of rod end pattern and fill the items on the selected one from among 28 types of optional patterned shapes to obtain made-to-order cylinders of non-standard rod end shapes.

The shapes can be applied to the entire Slim cylinders series with the exception of square rod cylinders and cylinders with bellows. For the order form containing the optional patterned shapes, consult us.

Order Codes



Piston Rod End Shape Pattern Diagram (28 Types)



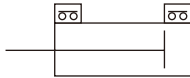
SENSOR SWITCHES

Solid State Type, Reed Switch Type

- Since a magnet is already standard on the Slim cylinders series^{Note}, mounting a sensor switch will enable use in sensor switch applications.

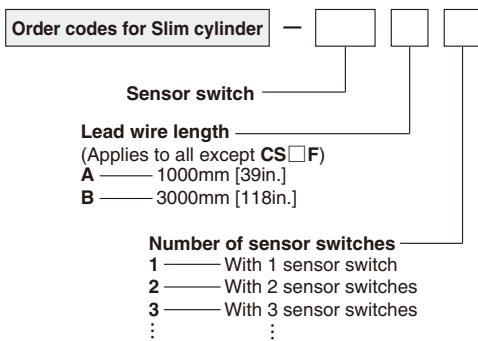
Note: Except the heat resistant specification cylinder.

Symbol



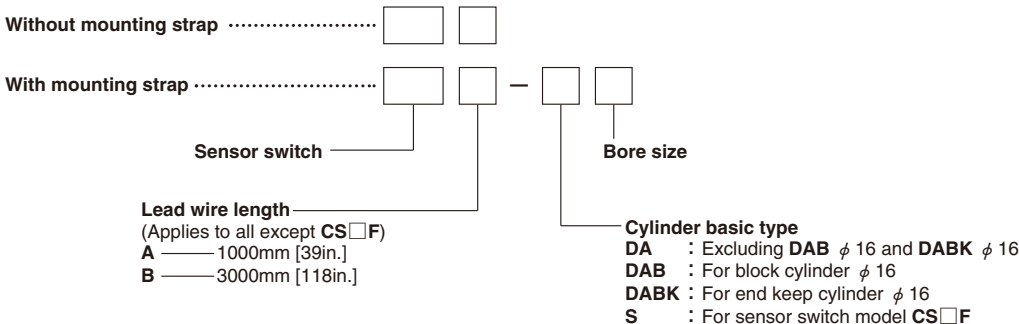
Order Codes

- Order codes for sensor switches mounted on the Slim cylinders

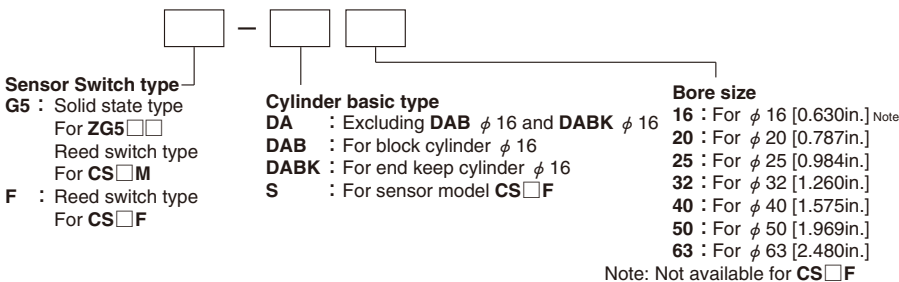


Sensor switch				
ZG530	Solid state type	For $\phi 16 \sim \phi 63$	with indicator lamp	DC10~30V
ZG553	Solid state type	For $\phi 16 \sim \phi 63$	with indicator lamp	DC4.5~28V
CS3M	Reed switch type	For $\phi 16 \sim \phi 63$	with indicator lamp	DC10~30V
CS4M	Reed switch type	For $\phi 16 \sim \phi 63$	with indicator lamp	AC85~230V
CS5M	Reed switch type	For $\phi 16 \sim \phi 63$	without indicator lamp	DC10~30V
CS2F	Reed switch type	For $\phi 20 \sim \phi 63$	with indicator lamp	AC85~115V
CS3F	Reed switch type	For $\phi 20 \sim \phi 63$	with indicator lamp	DC3~30V
CS4F	Reed switch type	For $\phi 20 \sim \phi 63$	with indicator lamp	AC85~230V
CS5F	Reed switch type	For $\phi 20 \sim \phi 63$	without indicator lamp	DC10~30V
				DC3~30V

- Order codes for sensor switch only



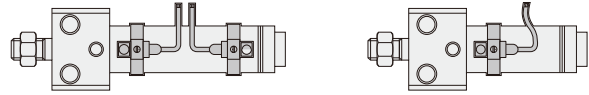
- Order codes for mounting strap only



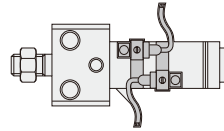
Minimum Cylinder Strokes When Using Sensor Switches

Sensor switch model	Bore size	mm		
		2 pcs. mounting		1 pc. mounting
		Along a straight line	In staggered positions	
ZG530	16	20	10	10
ZG553	20~63	20	10	10
CS□M	16~63	20	15	15
CS□F	20~63	40	21	15

- Two pieces mounting ● One piece mounting
- When mounted in-line

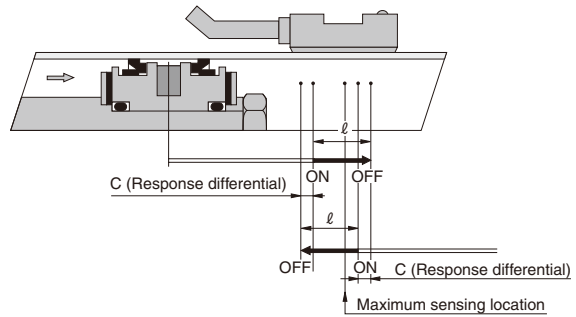


- When mounted in staggered positions



Sensor Switch Operating Range, Response Differential, and Maximum Sensing Location

- Operating range : ℓ
The distance the piston travels in one direction, while the switch is in the ON position.
- Response differential : C
The distance between the point where the piston turns the switch ON and the point where the switch is turned OFF as the piston travels in the opposite direction.



Item	Bore size	mm [in.]						
		16 [0.630]	20 [0.787]	25 [0.984]	32 [1.260]	40 [1.575]	50 [1.969]	63 [2.480]
Operating range : ℓ	ZG530□	2.5~4.1 [0.098~0.161]	2.5~4.2 [0.098~0.165]	2.6~4.3 [0.102~0.169]	3.0~4.8 [0.118~0.189]	3.1~5.0 [0.122~0.197]	3.3~5.4 [0.130~0.213]	3.5~5.7 [0.138~0.224]
	ZG533□	—	—	—	—	—	—	—
	CS□M	6.7~7 [0.264~0.276]	7~8.5 [0.276~0.335]	7~8.5 [0.276~0.335]	8~9 [0.315~0.354]	9~10.5 [0.354~0.413]	7~8 [0.276~0.315]	8~9.5 [0.315~0.374]
	CS□F	—	7~8.5 [0.276~0.335]	8.5~10 [0.335~0.394]	9~10.5 [0.354~0.413]	10.5~12 [0.413~0.472]	9~10 [0.354~0.394]	9~10.5 [0.354~0.413]
Response differential : C	ZG530	0.7 [0.028] or less	0.7 [0.028] or less	0.8 [0.031] or less	0.7 [0.028] or less	0.8 [0.031] or less	0.8 [0.031] or less	0.8 [0.031] or less
	ZG533	0.7 [0.028] or less	0.7 [0.028] or less	0.8 [0.031] or less	0.7 [0.028] or less	0.8 [0.031] or less	0.8 [0.031] or less	0.8 [0.031] or less
	CS□M	1 [0.039] or less	1 [0.039] or less	1 [0.039] or less	1 [0.039] or less	1 [0.039] or less	1.2 [0.047] or less	1.2 [0.047] or less
	CS□F	—	1.5 [0.059] or less	1.5 [0.059] or less	1.5 [0.059] or less	1.5 [0.059] or less	2 [0.079] or less	1.5 [0.059] or less
Maximum sensing location	ZG530, ZG533 ^{Note 1}	11 [0.433]	11 [0.433]	11 [0.433]	11 [0.433]	11 [0.433]	11 [0.433]	11 [0.433]
	CS□M ^{Note 1}	11 [0.433]	11 [0.433]	11 [0.433]	11 [0.433]	11 [0.433]	11 [0.433]	11 [0.433]
	CS□F ^{Note 2}	—	16 [0.630]	16 [0.630]	16 [0.630]	16 [0.630]	16 [0.630]	16 [0.630]

Remark: Figures in the table above are reference values.

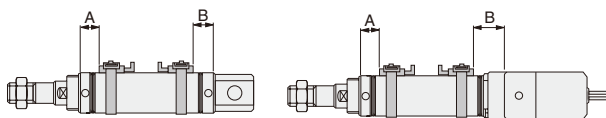
- Notes: 1. Figures are lengths measured from the switch's opposite end side to the lead wire.
2. Figures are lengths measured from the connector side's end surface to the lead wire.

Mounting Location of End of Stroke Detection Sensor Switch

When the sensor switch is mounted in the location shown in the diagram (figures in the table are reference values), the magnet comes to the sensor switch's maximum sensing location at the end of the stroke.

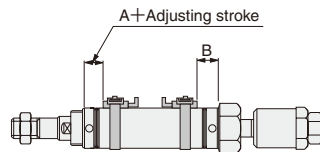
● Air cylinder, Low hydraulic cylinder, Valpack cylinder

● Air cylinder, Low hydraulic cylinder ● Valpack cylinder



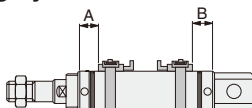
		mm [in.]													
Sensor switch model	Bore size Code	Air cylinder, Low hydraulic cylinder						Valpack cylinder							
		20	25	32	40	50	63	20	25	32	40				
ZG530 □ ZG553 □	A	27 [1.063]	27 [1.063]	27 [1.063]	27 [1.063]	36 [1.417]	36 [1.417]	27 [1.063]	27 [1.063]	27 [1.063]	27 [1.063]	27 [1.063]	27 [1.063]	27 [1.063]	27 [1.063]
	B	27 [1.063]	27 [1.063]	27 [1.063]	27 [1.063]	36 [1.417]	36 [1.417]	39 [1.535]	39 [1.535]	39 [1.535]	39 [1.535]	44 [1.732]	44 [1.732]	44 [1.732]	44 [1.732]
CS □ M	A	27 [1.063]	27 [1.063]	27 [1.063]	27 [1.063]	36 [1.417]	36 [1.417]	27 [1.063]	27 [1.063]	27 [1.063]	27 [1.063]	27 [1.063]	27 [1.063]	27 [1.063]	27 [1.063]
	B	27 [1.063]	27 [1.063]	27 [1.063]	27 [1.063]	36 [1.417]	36 [1.417]	39 [1.535]	39 [1.535]	39 [1.535]	39 [1.535]	44 [1.732]	44 [1.732]	44 [1.732]	44 [1.732]
CS □ F	A	22 [0.866]	22 [0.866]	22 [0.866]	22 [0.866]	32 [1.260]	32 [1.260]	22 [0.866]	22 [0.866]	22 [0.866]	22 [0.866]	22 [0.866]	22 [0.866]	22 [0.866]	22 [0.866]
	B	22 [0.866]	22 [0.866]	22 [0.866]	22 [0.866]	32 [1.260]	32 [1.260]	34 [1.339]	34 [1.339]	34 [1.339]	34 [1.339]	39 [1.535]	39 [1.535]	39 [1.535]	39 [1.535]

● Push side stroke adjusting cylinder



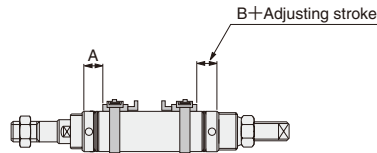
		mm [in.]			
Sensor switch model	Bore size Code	20 [0.787]	25 [0.984]	32 [1.260]	40 [1.575]
		ZG530 □ ZG553 □ CS □ M	A	27 [1.063]	27 [1.063]
CS □ F	A	22 [0.866]	22 [0.866]	22 [0.866]	22 [0.866]
	B	22 [0.866]	22 [0.866]	22 [0.866]	22 [0.866]

● Single acting cylinder



		mm [in.]				
Sensor switch model	Code	Stroke	20 [0.787]	25 [0.984]	32 [1.260]	40 [1.575]
			ZG530 □ ZG553 □ CS □ M	A	0~25	35 [1.378]
26~50	52 [2.047]	49 [1.929]			49 [1.929]	53 [2.087]
51~75	72 [2.835]	71 [2.795]			72 [2.835]	68 [2.677]
76~100	—	84 [3.307]			86 [3.386]	95 [3.740]
101~125	—	—			—	110 [4.331]
126~150	—	—			—	125 [4.921]
CS □ F	A	0~25	30 [1.181]	31 [1.220]	30 [1.181]	32 [1.260]
		26~50	47 [1.850]	44 [1.732]	44 [1.732]	48 [1.890]
		51~75	67 [2.638]	66 [2.598]	67 [2.638]	63 [2.480]
		76~100	—	79 [3.110]	81 [3.189]	90 [3.543]
		101~125	—	—	—	105 [4.134]
		126~150	—	—	—	120 [4.724]
CS □ F	B	—	22 [0.866]	22 [0.866]	22 [0.866]	22 [0.866]

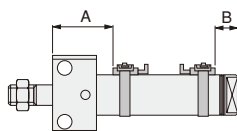
● Pull side stroke adjusting cylinder



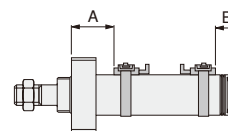
		mm [in.]			
Sensor switch model	Code	20 [0.787]	25 [0.984]	32 [1.260]	40 [1.575]
		ZG530 □ ZG553 □ CS □ M	A	27 [1.063]	27 [1.063]
CS □ F	A	22 [0.866]	22 [0.866]	22 [0.866]	22 [0.866]
	B	32 [1.260]	32 [1.260]	37 [1.457]	37 [1.457]

● Block cylinder

● Side mount



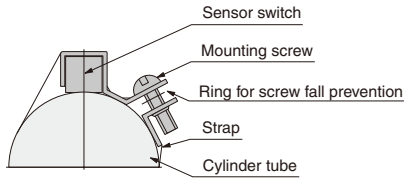
● Front mount



Mounting type		mm [in.]													
Bore size		16	20	25	32	40	50	63	16	20	25	32	40	50	63
ZG530 □ ZG553 □	A Rod side	32 [1.260]	39 [1.535]	41 [1.614]	47 [1.850]	57 [2.244]	67 [2.638]	67 [2.638]	23 [0.906]	27 [1.063]	27 [1.063]	27 [1.063]	29 [1.142]	37 [1.457]	37 [1.457]
	B Rod side	16 [0.630]	20 [0.787]	20 [0.787]	21 [0.827]	25 [0.984]	45 [1.772]	45 [1.772]	16 [0.630]	20 [0.787]	20 [0.787]	21 [0.827]	25 [0.984]	45 [1.772]	45 [1.772]
CS □ M	A Rod side	32 [1.260]	39 [1.535]	41 [1.614]	47 [1.850]	57 [2.244]	66 [2.598]	66 [2.598]	23 [0.906]	27 [1.063]	27 [1.063]	27 [1.063]	29 [1.142]	36 [1.417]	36 [1.417]
	B Rod side	16 [0.630]	20 [0.787]	20 [0.787]	21 [0.827]	25 [0.984]	44 [1.732]	44 [1.732]	16 [0.630]	20 [0.787]	20 [0.787]	21 [0.827]	25 [0.984]	44 [1.732]	44 [1.732]
CS □ F	A Rod side	—	36 [1.417]	38 [1.496]	44 [1.732]	52 [2.047]	64 [2.520]	64 [2.520]	—	24 [0.945]	24 [0.945]	24 [0.945]	24 [0.945]	34 [1.339]	34 [1.339]
	B Rod side	—	17 [0.669]	17 [0.669]	18 [0.709]	20 [0.787]	42 [1.654]	42 [1.654]	—	17 [0.669]	17 [0.669]	18 [0.709]	22 [0.866]	42 [1.654]	42 [1.654]

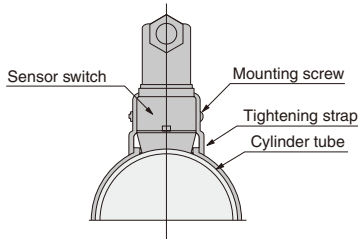
Moving Sensor Switch

- ZG530
- ZG553
- CS M



- Loosening the mounting screw allows the sensor switch to be moved freely along with the strap in the axial and circumferential direction. The sensor switch alone cannot be moved.
- To remove the sensor switch from the strap, first detach the strap from the cylinder tube and then remove the sensor switch from the strap.
- Tighten the mounting screw with a tightening torque of 49N·cm [4.3in·lbf].

- CS F

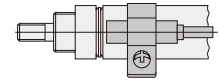
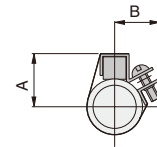


- Loosening the mounting screw allows the sensor switch to be moved freely in the axial and circumferential direction.
- Slightly loosening the mounting screw allows fine adjustment of the lead switch only, up to 5mm [0.2in.] in the axial direction. Tighten the mounting screw with a tightening torque of 68.6N·cm [6.1in·lbf].

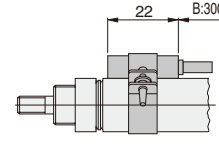
Dimensions of Sensor Switch (mm)

- ZG530
- ZG553
- CS M

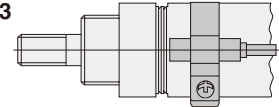
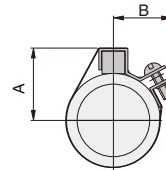
φ 16



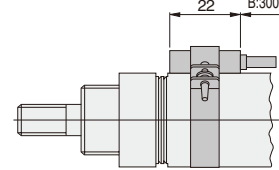
Lead wire length
A:1000mm [39in.]
B:3000mm [118in.]



φ 20 ~ φ 63



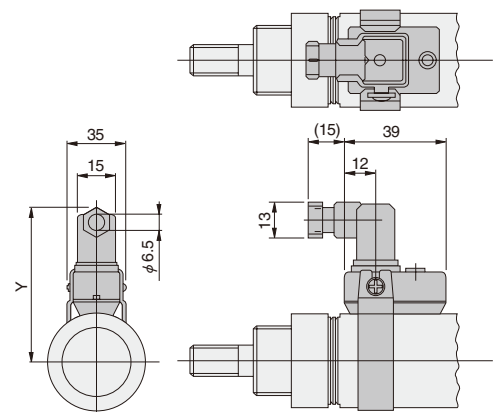
Lead wire length
A:1000mm [39in.]
B:3000mm [118in.]



		mm [in.]	
Bore	Code	A	B
16	16	15	15
[0.630]	[0.630]	[0.591]	[0.591]
20	19	17	17
[0.787]	[0.748]	[0.669]	[0.669]
25	20.5	17.5	17.5
[0.984]	[0.807]	[0.689]	[0.689]
32	25	19	19
[1.260]	[0.984]	[0.748]	[0.748]
40	29	—*	—*
[1.575]	[1.142]		
50	34	—*	—*
[1.969]	[1.339]		
63	41	—*	—*
[2.480]	[1.614]		

* At φ 40 or larger, dimension B is the radius of the cylinder tube. Therefore, the protrusion in the B direction of the mounting section disappears.

- CS F



		mm [in.]
Bore	Code	Y
20	59	59
[0.787]	[2.323]	[2.323]
25	61.5	61.5
[0.984]	[2.421]	[2.421]
32	65	65
[1.260]	[2.559]	[2.559]
40	69	69
[1.575]	[2.717]	[2.717]
50	76	76
[1.969]	[2.992]	[2.992]
63	83	83
[2.480]	[3.268]	[3.268]

ROD END ACCESSORIES

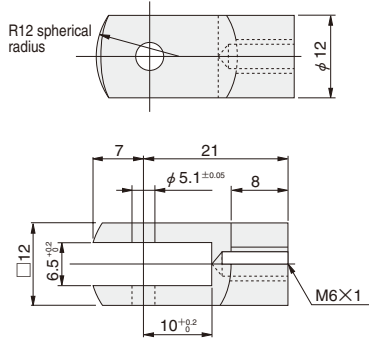
Option

Dimensions

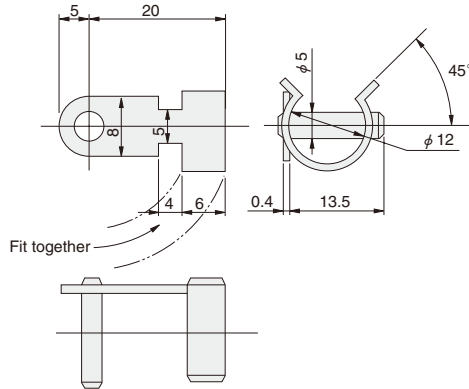
● $\phi 16$

● Y type

 SLIM-Y

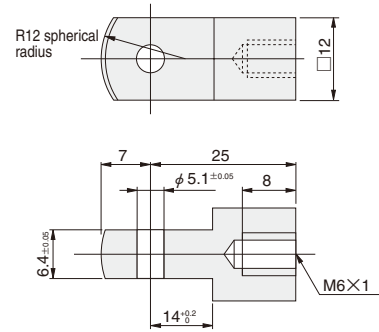


Pin for Y type knuckle



● I type

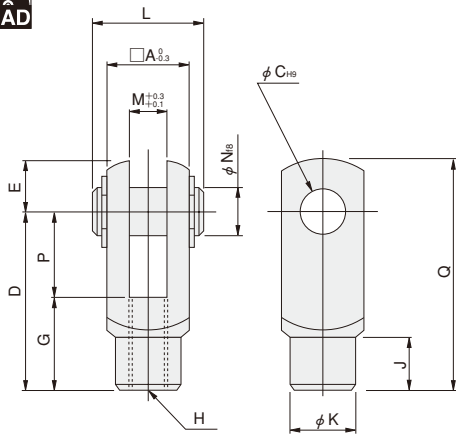
 SLIM-I



● $\phi 20 \sim \phi 63$

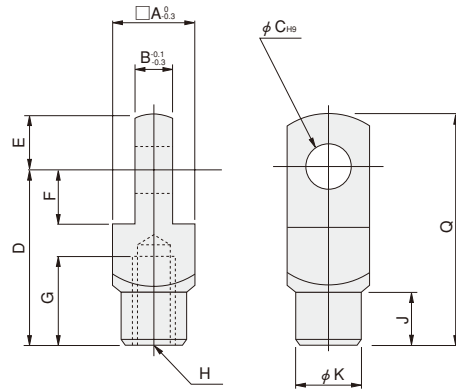
● Y type

 SLIM-Y



● I type

 SLIM-I



		mm [in.]														
Bore	Code	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q
20 [0.787], 25 [0.984]※		16	8	8	30	10	11	15	M8×1	10	14	21	8	8	15	40
25 [0.984], 32 [1.260]		19	10	10	40	12	13	20	M10×1.25	12	16	25	10	10	20	52
40 [1.575], 50 [1.969], 63 [2.480]		24	14	10	45	12	13	25	M14×1.5	15	22	30	14	10	20	57

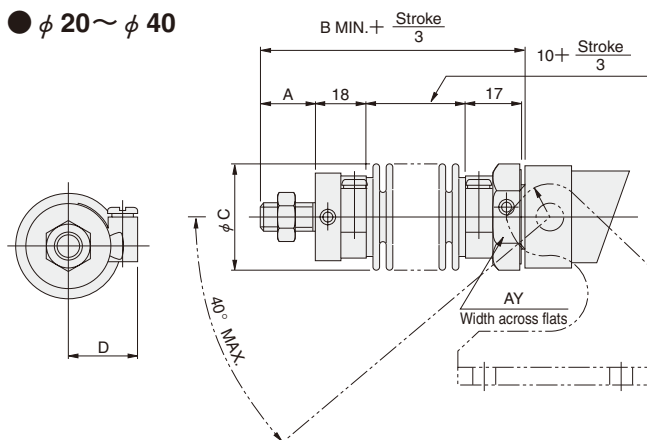
Note: Items marked with ※ are for the square rod cylinders.

BELLOWS, MOUNTING BRACKETS



Dimensions (For brake cylinders with bellows, see p.367.)

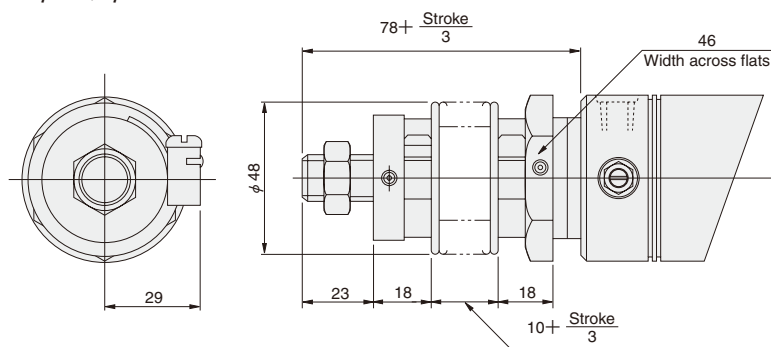
● $\phi 20 \sim \phi 40$



Bore	Code	A	B	C	D	AY
20	[0.787]	15 [0.591]	63 [2.480]	35 [1.378]	23 [0.906]	27 [1.063]
25	[0.984]	18 [0.709]	66 [2.598]	35 [1.378]	23 [0.906]	30 [1.181]
32	[1.260]	23 [0.906]	71 [2.795]	40 [1.575]	26 [1.024]	36 [1.417]
40	[1.575]	23 [0.906]	71 [2.795]	48 [1.890]	29 [1.142]	41 [1.614]

Note: Supporting brackets for the rod trunnion type with bellows should be mounted in the direction opposite to the case of no bellows shown in the diagram.

● $\phi 50, \phi 63$



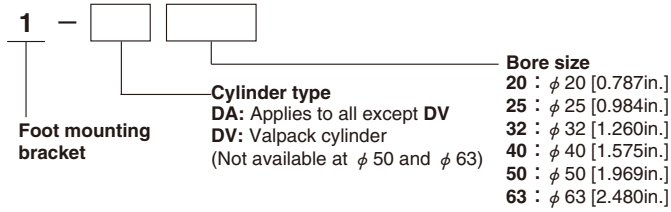
Mass of Slim Cylinder with Bellows

Bore size mm [in.]	Zero stroke mass				Additional mass for each 1mm [0.0394in.] stroke
	Standard head	Short head	Pivot mounting type	Trunnion type	
20 [0.787]	0.25 [0.55] (0.23 [0.51])	0.24 [0.53] (0.22 [0.49])	—	0.44 [0.97]	0.0009 [0.0020]
25 [0.984]	0.29 [0.64] (0.27 [0.60])	0.28 [0.62] (0.26 [0.57])	—	0.47 [1.04]	0.0013 [0.0029]
32 [1.260]	0.43 [0.95] (0.40 [0.88])	0.41 [0.90] (0.38 [0.84])	—	0.60 [1.32]	0.0018 [0.0040]
40 [1.575]	0.62 [1.37] (0.56 [1.23])	0.58 [1.28] (0.52 [1.15])	—	0.78 [1.72]	0.0029 [0.0064]
50 [1.969]	1.03 [2.27]	0.98 [2.16]	0.95 [2.09]	—	0.0033 [0.0073]
63 [2.480]	1.36 [3.00]	1.32 [2.91]	1.29 [2.84]	—	0.0038 [0.0084]

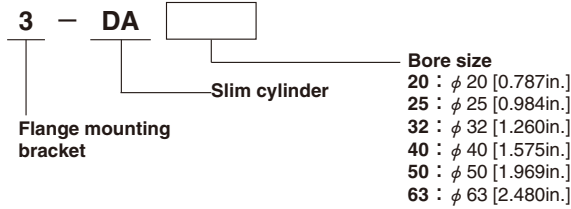
Note: Figures in parentheses () are for the cylinder with variable cushion.

Order Codes for Mounting Bracket

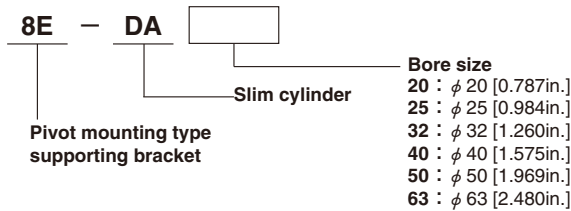
(1) Foot mounting bracket



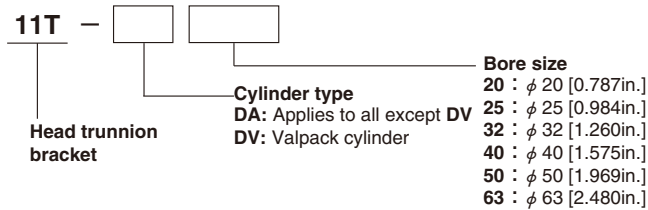
(2) Flange mounting bracket



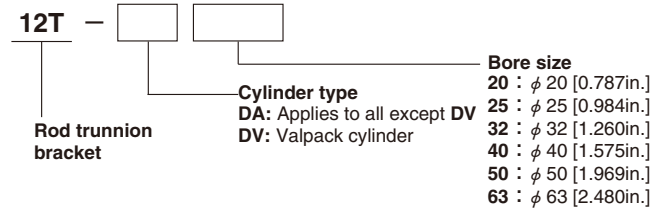
(3) Pivot mounting type supporting bracket



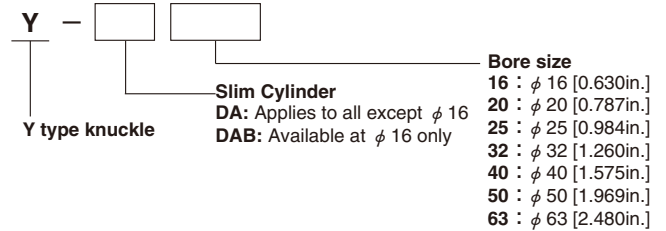
(4) Head trunnion bracket



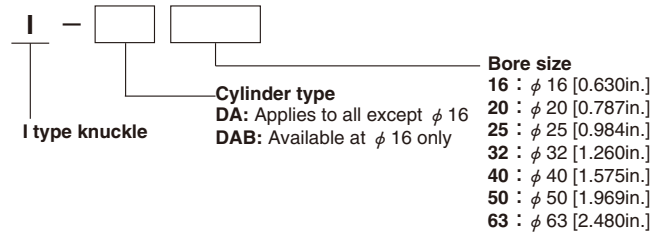
(5) Rod trunnion bracket



(6) Y type knuckle



(7) I type knuckle



SLIM CYLINDERS