

Compact, lightweight,
space saving air cylinder
with sensor

- Switch Set Cylinders having piston with built-in magnet.
- Non-rotating types are available.
- Separable type convenient for maintenance.
- Female and male threaded rod ends are available.
- For $\phi 12$ to $\phi 32$, stainless steel (hard chrome plated) piston rods are used.



Cylinder specifications

Series variations	Double acting single rod	Double acting double rod	Single acting spring return type (SR type)
Type	Switch Set		
Cylinder bore (mm)	$\phi 12 \cdot \phi 16 \cdot \phi 20 \cdot \phi 25 \cdot \phi 32 \cdot \phi 40$ $\phi 50 \cdot \phi 63 \cdot \phi 80 \cdot \phi 100 \cdot \phi 125$		$\phi 12 \cdot \phi 16 \cdot \phi 20 \cdot \phi 25$ $\phi 32 \cdot \phi 40 \cdot \phi 50$
Working fluid	Air		
Lubrication	Unnecessary (but possible)		
Working pressure range	$\phi 12 \cdot \phi 16$: 0.07 to 1 MPa $\phi 20$ to $\phi 125$: 0.05 to 1 MPa		$\phi 12 \cdot \phi 16$: 0.2 to 1 MPa $\phi 20 \cdot \phi 25$: 0.18 to 1 MPa $\phi 32$ to $\phi 50$: 0.12 to 1 MPa
Proof test pressure	1.5 MPa		
Working temperature range	-10 to +70°C (no freezing)		
Structure of cushioning	$\phi 12$ and $\phi 16$: None $\phi 20$ to $\phi 125$: With cushion pad		$\phi 12$ and $\phi 16$: None $\phi 20$ to $\phi 125$: With cushioning pad on cap side
Tolerance for thread	JIS 6H/6g		
Tolerance of stroke	+1.0 0 mm		
Note) Mounting style	SD (basic style) or ST (tapped on both sides) LA · LB · FA · FB · CA · CB	SD (basic style) or ST (tapped on both sides) LA · LB · FA	SD (basic style) or ST (tapped on both sides) LA · LB · FA · FB · CA · CB
Rod end threads	Female thread and male thread		

Specifications / non-rotating rod

Series variations	Double acting single rod	Double acting double rod
Type	Switch Set	
Cylinder bore (mm)	$\phi 20 \cdot \phi 25 \cdot \phi 32 \cdot \phi 40 \cdot \phi 50 \cdot \phi 63 \cdot \phi 80 \cdot \phi 100$	
Working fluid	Air	
Lubrication	Unnecessary (but possible)	
Working pressure range	0.1 to 1 MPa	
Proof test pressure	1.5 MPa	
Working temperature range	-10 to +70°C (no freezing)	
Structure of cushioning	With cushion pad	
Allowable rotating angle	$\phi 20 \cdot \phi 25$: $\pm 1.5^\circ$ $\phi 32$ to $\phi 63$: $\pm 1^\circ$ $\phi 80 \cdot \phi 100$: $\pm 0.8^\circ$	
Allowable torque	$\phi 20 \cdot \phi 25$: 0.49N · m $\phi 32 \cdot \phi 40$: 0.98N · m $\phi 50 \cdot \phi 63$: 3.33N · m $\phi 80 \cdot \phi 100$: 9.61N · m	
Tolerance for thread	JIS 6H/6g	
Tolerance of stroke	+1.0 0 mm	
Note) Mounting style	SD (basic style) or ST (tapped on both sides) LA · LB · FA · FB · CA · CB	SD (basic style) or ST (tapped on both sides) LA · LB · FA
Rod end threads	Female thread and male thread	

(Notes)

- SD (basic) style cylinders are not tapped, and mounting accessories cannot be fitted to them. When requiring only the cylinder with mounting accessories, place an order for ST (tapped on both sides).
- Mounting accessories can be fitted to standard double acting type cylinders having bores of $\phi 40$ to $\phi 125$ and non-rotating double acting type cylinders having bores of $\phi 40$ to $\phi 100$. (Double rod cylinders of mounting styles FB, CA and CB are not available.) Single acting cylinders are available only with bores of $\phi 40$ and $\phi 50$.
- All rod end attachments are for male thread type. The rod eye and rod clevis with pin are applicable to $\phi 12$ to $\phi 125$, the rod eye with spherical bearing is applicable to $\phi 20$ to $\phi 100$, and the floating joint is applicable to $\phi 20$ to $\phi 125$.
- When the sensor is installed at the intermediate position, the cylinder max. speed must be less than 300 mm/s for reasons of the response speed of the load relay.

Product lineup

Unit: mm

Series Variations		$\phi 12$	$\phi 16$	$\phi 20$	$\phi 25$	$\phi 32$	$\phi 40$	$\phi 50$	$\phi 63$	$\phi 80$	$\phi 100$	$\phi 125$
Standard	Double acting single rod 10S-1R	●	●	●	●	●	●	●	●	●	●	●
	Double acting double rod 10S-1RD	●	●	●	●	●	●	●	●	●	●	●
	Single acting spring return 10S-1RSR	●	●	●	●	●	●	●				
Non-rotating	Double acting single rod 10S-1RG			●	●	●	●	●	●	●	●	●
	Double acting double rod 10S-1RGD			●	●	●	●	●	●	●	●	●

Single acting spring return type spring force

Unit: N

Bore (mm)	Load	Cylinder stroke (mm)									
		5	10	15	20	25	30	35	40	45	50
$\phi 12$	Initial load	9.8	7.8	8.8	7.8	—	—	—	—	—	—
	End load	11.8		14.7		—	—	—	—	—	—
$\phi 16$	Initial load	14.7	10.8	12.7	11.8	—	—	—	—	—	—
	End load	17.7				—	—	—	—	—	—
$\phi 20$	Initial load	18.6	15.7	17.7	16.7	15.7	14.7	—	—	—	—
	End load	21.6					—	—	—	—	—
$\phi 25$	Initial load	23.5	19.6	24.5	22.6	20.6	19.6	—	—	—	—
	End load	28.4		29.4			—	—	—	—	—
$\phi 32$	Initial load	33.3	28.4	35.3	33.3	31.4	29.4	—	—	—	—
	End load	39.2		41.2			—	—	—	—	—
$\phi 40$	Initial load	43.1	38.2	48.1	46.1	44.1	43.1	41.2	40.2	38.2	37.3
	End load	48.1		53.0							
$\phi 50$	Initial load	—	56.9	65.7	63.7	60.8	58.8	58.8	53.9	51.0	49.0
	End load	—	73.5								

● How to order

● Standard/non-rotating 10S-1R

Standard

10S-1R : Double acting single rod
10S-1RD : Double acting double rod
10S-1RSR : Single acting spring return

Non-rotating

10S-1RG : Double acting single rod
10S-1RGD : Double acting double rod

Mounting style

(Notes) ● Since cylinders with the mounting style SD (basic style) do not have tapped holes, mounting accessories cannot be fitted to the cylinders.
When requiring only the cylinder with mounting accessories, place an order for ST (tapped on both sides).
However, LA or LB accessories cannot be fitted to ST (tapped on both sides) style cylinders having the following strokes.
Place an order for LA or LB style cylinder.

Bore	Stroke
φ80	10, 15
φ125	10, 15, 20

- For the mounting styles LA, LB, FA, FB, CA and CB, the cylinder bore is φ40 to φ125.
- When purchasing ST style cylinder (tapped on both sides) of mounting style FA, change the dimension WF to the following value.

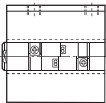
Female thread	φ40 to φ63	13.5
	φ80 to φ125	21.5
Male thread	φ40 to φ63	15
	φ80 to φ125	21.5

★ Notice

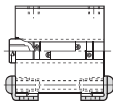
- In the following case, the cylinder will be fabricated as a semi-standard type.
 - Rod end modification
(Dimensional symbol: WF, A or KK)

Mounting style

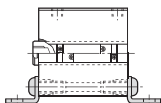
[SD] Basic style



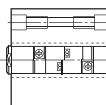
[LA] Side lugs



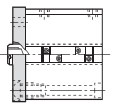
[LB] End angles



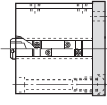
[ST] Basic style/tapped on both sides



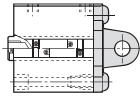
[FA] Rod rectangular flange



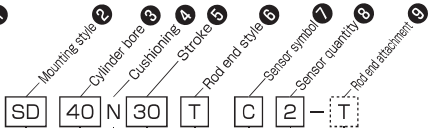
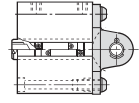
[FB] Cap rectangular flange



[CA] Cap eye



[CB] Cap clevis



- [T] Rod eye (T-end)
- [S] Rod eye with spherical bearing (S-end)
- [Y] Rod clevis (Y-end)
- [F] Floating joint (F-end)

(Note) Rod end attachments are for male thread type.

Number of sensors

Sensor symbol

(Note) Select the applicable sensor symbol from the sensor list.

! Notes on ordering Switch Set

- The sensors are shipped together, but not assembled.

[F] Female thread

[T] Male thread

Cylinder stroke (mm)

With cushion pad

Cylinder bore (mm)

Sensor list

Type	Sensor symbol	Load voltage range	Load current range	Max. switching capacity	Protective circuit	Indicating lamp	Wiring method	Cable length	Applicable load
Reed sensor	 ZR2	DC:5 to 50V AC:5 to 120V	DC:3 to 40mA AC:3 to 20mA	DC:1.5W AC:2VA	None	LED (lights in red when sensing)	0.2 mm ² , 2-core, external diameter φ3, upper wiring	1.5m	Small relay programmable controller
	 ZR25							5m	
	 ZR3							1.5m	
	 ZR35	5m							
	 ZR2N	DC: 50 V or less AC: 120 V or less	DC: 40 mA or less AC: 20 mA or less			None	0.3 mm ² , 2-core, external diameter φ3, upper wiring	1.5m	
	 ZR3N	1.5m							
Solid state sensor	 ZS201	DC: 30 V or less	200 mA or less (NPN open collector output)	Supply voltage (DC): 5 to 10 V	Provided	LED (lights in red when sensing)	0.2 mm ² , 3-core, external diameter φ3, upper wiring	1.5m	Small relay programmable controller
	 ZS205							5m	
	 ZS301							1.5m	
	 ZS305							5m	
	 ZS211	DC: 30 V or less	200 mA or less (NPN open collector output)	Supply voltage (DC): 10 to 30 V	Provided	LED (lights in green when sensing)	0.2 mm ² , 3-core, external diameter φ3, upper wiring	1.5m	
	 ZS215							5m	
	 ZS311							1.5m	
	 ZS315							5m	
	 KS211M	DC:10 to 30V	6 to 70mA	—	Provided	LED (lights in red when sensing)	0.3 mm ² , 2-core, external diameter φ3.4, upper wiring	1.5m	
	 KS215M							5m	

- (Notes) ● When any induction load (relay or the like) is used for a sensor without a protective circuit, fit a protective circuit (SK-100) to the load without fail.
● For handling of the sensors, read the sensor specifications at the end of this catalog.
● When sensors are connected in series, it is recommended to use AND Unit (AU Series).
For the details, see AND Unit at the end of this catalog.
● ZR2* and ZS2* types are designed for cylinder bores of φ 12 to φ 32, and ZR3*, ZS3* and KS types for φ 40 to φ 125.

● ZR and ZS type sensor

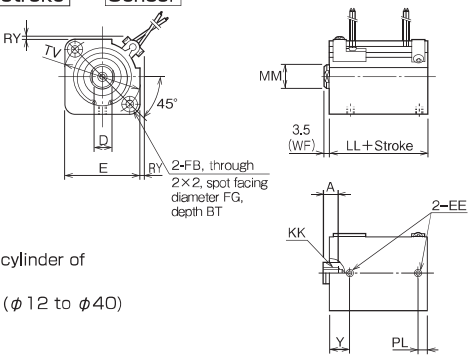
● KS type sensor



10S-1/TAS1 ☐ Bore ☐ CAD/DATA is available. ☐

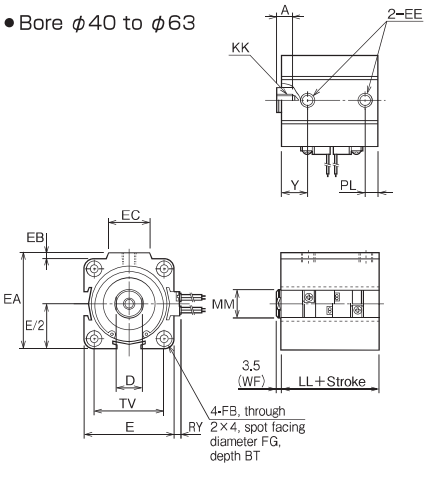
SD
Standard/double acting single rod
10S-1R SD ☐ Bore ☐ N ☐ Standard stroke ☐ Sensor

• Bore ϕ 12 to ϕ 32

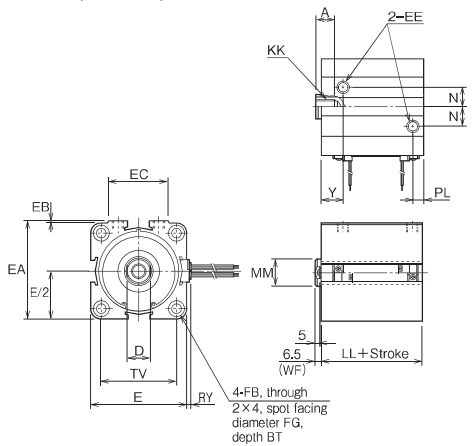


• This drawing shows the outline of a cylinder of stroke 10 or more (with 2 sensors).
• When stroke 5, one sensor is fitted. (ϕ 12 to ϕ 40)

• Bore ϕ 40 to ϕ 63



• Bore ϕ 80 to ϕ 125

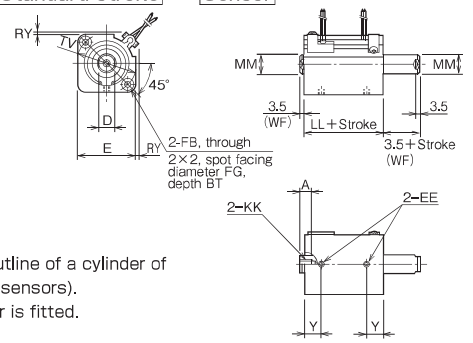


Dimensional table

Symbol Bore	A	BT	D	E	EA	EB	EC	EE	FB	FG	KK	LL	MM	N	PL	RY	TV	Y
ϕ 12	6	3.5	5	□25	—	—	—	M5×0.8	ϕ 3.4	ϕ 6.5	M3×0.5	27	ϕ 6	—	5	5.5	ϕ 22	10
ϕ 16	6	3.5	5	□29	—	—	—	M5×0.8	ϕ 3.4	ϕ 6.5	M3×0.5	27	ϕ 6	—	5	5	ϕ 28	10
ϕ 20	7	5.5	8	□37	—	—	—	M5×0.8	ϕ 5.5	ϕ 9.5	M5×0.8	30	ϕ 10	—	6	4	ϕ 36	11
ϕ 25	7	5.5	8	□40	—	—	—	M5×0.8	ϕ 5.5	ϕ 9.5	M5×0.8	31	ϕ 10	—	6	3.5	ϕ 40	12
ϕ 32	12	5.5	14	□45	—	—	—	M5×0.8	ϕ 5.5	ϕ 9.5	M8×1.25	35	ϕ 16	—	6	3.5	ϕ 48	13
ϕ 40	12	5.5	14	53	57	4	28	Rc1/8	ϕ 5.5	ϕ 9.5	M8×1.25	40	ϕ 16	—	8.5	6.5	□40	16.5
ϕ 50	15	6.5	18	64	68	4	30	Rc1/8	ϕ 6.6	ϕ 11	M10×1.5	42	ϕ 20	—	9	6.5	□50	18
ϕ 63	15	8.6	18	77	84	7	35	Rc1/4	ϕ 9	ϕ 14	M10×1.5	46	ϕ 20	—	11	6.5	□60	19
ϕ 80	20	16.5	22	100	101.5	1.5	62	Rc1/4	ϕ 11	ϕ 17.5	M16×2	56.5	ϕ 25	21	11	4.5	□77	21.5
ϕ 100	20	18	22	117	117	—	—	Rc1/4	ϕ 11	ϕ 17.5	M16×2	63	ϕ 25	29	13	6	□94	25
ϕ 125	25	19.5	29	144	144	—	—	Rc3/8	ϕ 14	ϕ 20	M20×2.5	69.5	ϕ 32	37	16	6	□116	28

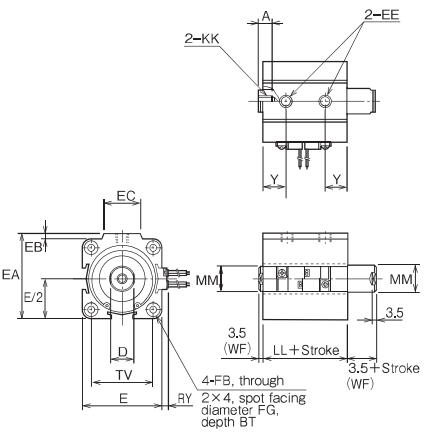
SD
Standard/double acting double rod
10S-1RD SD ☐ Bore ☐ N ☐ Standard stroke ☐ Sensor

• Bore ϕ 12 to ϕ 32

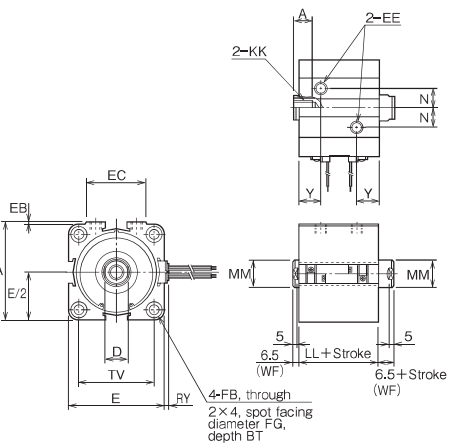


• This drawing shows the outline of a cylinder of stroke 10 or more (with 2 sensors).
• When stroke 5, one sensor is fitted.

• Bore ϕ 40 to ϕ 63



• Bore ϕ 80 to ϕ 125



Dimensional table

Symbol Bore	A	BT	D	E	EA	EB	EC	EE	FB	FG	KK	LL	MM	N	RY	TV	WF	Y
ϕ 12	6	3.5	5	□25	—	—	—	M5×0.8	ϕ 3.4	ϕ 6.5	M3×0.5	37	ϕ 6	—	5.5	ϕ 22	3.5	10
ϕ 16	6	3.5	5	□29	—	—	—	M5×0.8	ϕ 3.4	ϕ 6.5	M3×0.5	37	ϕ 6	—	5	ϕ 28	3.5	10
ϕ 20	7	5.5	8	□37	—	—	—	M5×0.8	ϕ 5.5	ϕ 9.5	M5×0.8	40	ϕ 10	—	4	ϕ 36	3.5	11
ϕ 25	7	5.5	8	□40	—	—	—	M5×0.8	ϕ 5.5	ϕ 9.5	M5×0.8	41	ϕ 10	—	3.5	ϕ 40	3.5	12
ϕ 32	12	5.5	14	□45	—	—	—	M5×0.8	ϕ 5.5	ϕ 9.5	M8×1.25	45	ϕ 16	—	3.5	ϕ 48	3.5	13
ϕ 40	12	5.5	14	53	57	4	28	Rc1/8	ϕ 5.5	ϕ 9.5	M8×1.25	55	ϕ 16	—	6.5	□40	3.5	16.5
ϕ 50	15	6.5	18	64	68	4	30	Rc1/8	ϕ 6.6	ϕ 11	M10×1.5	57	ϕ 20	—	6.5	□50	3.5	18
ϕ 63	15	8.6	18	77	84	7	35	Rc1/4	ϕ 9	ϕ 14	M10×1.5	61	ϕ 20	—	6.5	□60	3.5	19
ϕ 80	20	16.5	22	100	101.5	1.5	62	Rc1/4	ϕ 11	ϕ 17.5	M16×2	71.5	ϕ 25	21	4.5	□77	6.5	21.5
ϕ 100	20	18	22	117	117	—	—	Rc1/4	ϕ 11	ϕ 17.5	M16×2	78	ϕ 25	29	6	□94	6.5	25
ϕ 125	25	19.5	29	144	144	—	—	Rc3/8	ϕ 14	ϕ 20	M20×2.5	84.5	ϕ 32	37	6	□116	6.5	28