

# SHORT STROKE & COMPACT BODY SPACE SAVING ACTUATOR STANDARD

# JIG CYLINDERS

## ● Available in a wide variety of standard sizes and cylinder bore sizes

Five standard type to meet various mounting styles and operations.  
Choose from a wide range of bore sizes from  $\phi 12 \sim \phi 100$ .

## ● Compact Design

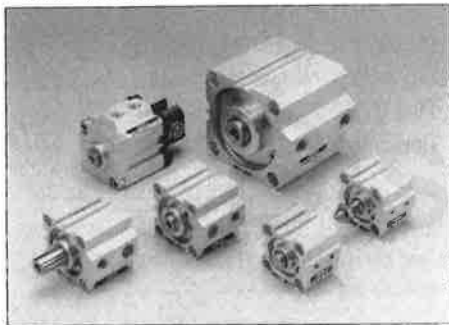
Body design minimizes total length.  
Realize miniaturization of machinery with our space-saving mounting styles.

## ● A Wide Range of Options

Choose from an improved range of options - bumpers, heat-resistant cylinder, threaded male rod, without thread specification, foot bracket, flange bracket, etc.

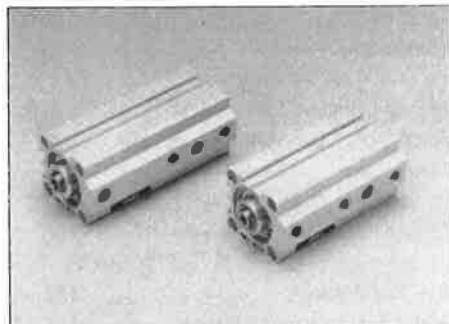
## Standard Types and Composition

### ■ Jig Cylinders



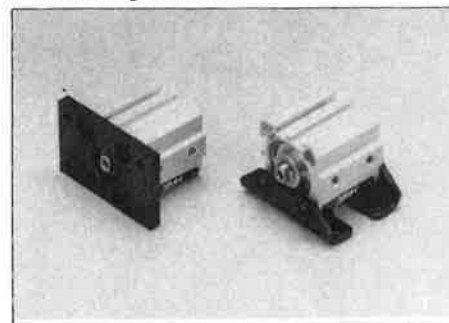
- Double acting type ● Single acting push type
- Single acting pull type

### ■ Tandem Cylinders



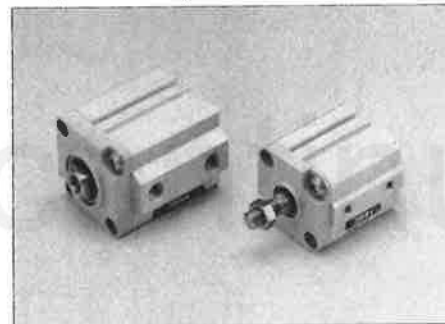
- Double acting type ● Single acting push type

### ■ Mounting Brackets



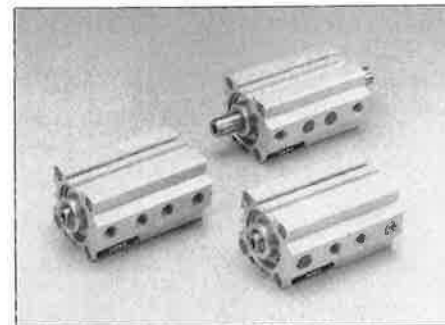
- Foot bracket ● Pivot bracket

### ■ Square Rod Cylinders



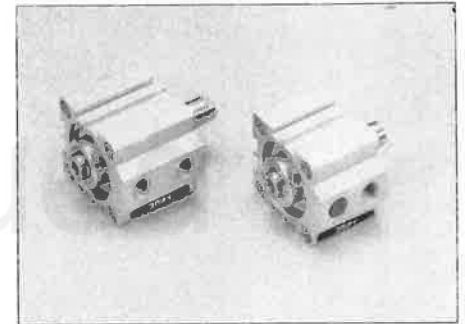
- Double acting type

### ■ Dual Stroke Cylinders



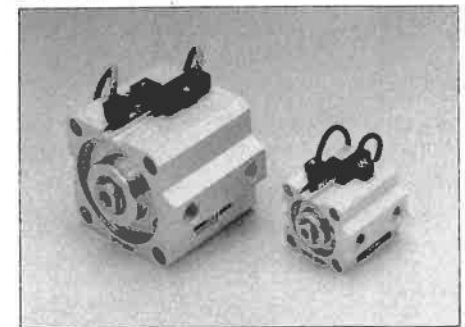
- Double acting type ● Single acting push type
- Single acting pull type

### ■ Double Rod Cylinders



- Double acting type ● Single acting type

### ■ Sensor Switches



- Solid state type ● Reed switch type

### ■ Selection Chart (Please refer to each "how to order" for further details)

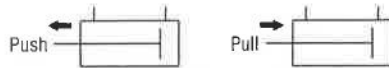
Item	Operation			Cylinder Specifications		Rod end type			With bumpers	Dev's mounting type	Mounting type		
	Double acting type	Single acting push type	Single acting pull type	Cylinder with magnets	heat resistant type	Female thread	Male thread	Without thread	(Not available with heat resistant type)		Standard mounting type	Foot mounting type	Flange mounting type
Standard cylinders	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Square rod cylinders	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Double rod cylinders	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Tandem cylinders	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Dual stroke cylinders	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

## Cylinder Thrust

Select appropriate cylinder bore size by calculating the necessary cylinder thrust based on load and air pressure.

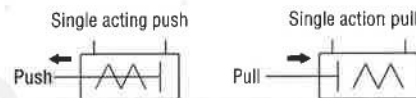
The chart below gives the calculated values. We recommend a bore size with a "load rate" of 70% or lower (Load rate = weight/calculated value) or a load rate of 50% or lower on high speed cycles.

### ● Double acting type



Cylinder bore size mm	Rod diameter mm	Action	Pressure area mm <sup>2</sup>	Air pressure MPa						
				0.1	0.2	0.3	0.4	0.5	0.6	0.7
12	6	Push side	113	—	22.6	33.9	45.2	56.5	67.8	79.1
		Pull side	84.8	—	16.96	25.44	33.92	42.4	50.88	59.36
16	6	Push side	201	—	40.2	60.3	80.4	100.5	120.6	140.7
		Pull side	173	—	34.6	51.9	69.2	86.5	103.8	121.1
20	8	Push side	314	—	62.8	94.2	125.6	157	188.4	219.8
		Pull side	264	—	52.8	79.2	105.6	132	158.4	184.8
25	10	Push side	490	—	98	147	196	245	294	343
		Pull side	412	—	82.4	123.6	164.8	206	247.2	288.4
32	12	Push side	804	—	160.8	241.2	321.6	402	482.4	562.8
		Pull side	690	—	138	207	276	345	414	483
40	16	Push side	1256	125.6	251.2	376.8	502.4	628	753.6	879.2
		Pull side	1055	105.5	211	316.5	422	527.5	633	738.5
50	20	Push side	1963	196.3	392.6	588.9	785.2	981.5	1177.8	1374.1
		Pull side	1649	164.9	329.8	494.7	659.6	824.5	989.4	1154.3
63	20	Push side	3117	311.7	623.4	935.1	1246.8	1558.5	1870.2	2181.9
		Pull side	2803	280.3	560.6	840.9	1121.2	1401.5	1681.8	1962.1
80	25	Push side	5062	506.2	1012.4	1518.6	2024.8	2531	3037.2	3543.4
		Pull side	4536	453.6	907.2	1360.8	1814.4	2268	2721.6	3175.2
100	32	Push side	7853	785.3	1570.6	2355.9	3141.2	3926.5	4711.8	5497.1
		Pull side	7049	704.9	1409.8	2114.7	2819.6	3524.5	4229.4	4934.3

### ● Single acting type



Action	Cylinder bore size mm	Piston rod diameter mm	Pressure area mm <sup>2</sup>	Air pressure MPa						
				0.1	0.2	0.3	0.4	0.5	0.6	0.7
Single acting push type	12	6	113	—	4.19	15.49	26.79	38.09	49.39	60.69
	16	6	201	—	28.73	37.33	57.43	77.53	97.63	117.73
	20	8	314	—	51.04	70.64	102.04	133.44	164.84	196.24
	25	10	490	—	76.43	103.83	152.83	201.83	250.83	299.83
	32	12	804	—	114.71	149.01	229.41	309.81	390.21	470.61
	40	16	1256	17.75	197.25	268.95	394.55	520.15	645.75	771.35
Single acting pull type	50	20	1963	111.94	350.44	504.54	700.84	897.14	1093.4	1289.7
	12	6	84.8	—	13.75	16.23	24.71	33.19	41.67	50.15
	16	6	173	—	23.13	40.43	57.73	75.03	92.33	109.63
	20	8	264	—	41.04	67.44	93.84	120.24	146.64	173.04
	25	10	412	—	60.83	102.03	143.23	184.43	225.63	266.83
	32	12	690	—	91.91	160.91	229.91	298.91	367.91	436.91
	40	16	1055	51.57	157.07	262.57	368.07	473.57	579.07	684.57
	50	20	1649	122.74	275.87	440.77	605.67	770.57	935.47	1100.4

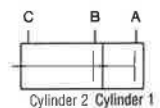
### ● Spring Force

Cylinder bore size mm	Stroke mm	Zero stroke mm	Stroke end	N			
				Cylinder bore size mm	Stroke mm	Zero stroke mm	Stroke end
12	×5	7.3	9.2	32	×5	34.3	46.1
	×10	5.3			×10	24.5	
	×15	3.3			×15	14.7	
	×20	5.3			×20	24.5	
	×25	4.3			×25	19.6	
	×30	3.3			×30	14.7	
16	×5	9.1	11.5	40	×5	37.3	53.9
	×10	7.0			×10	27.5	
	×15	4.8			×15	17.7	
	×20	7.0			×20	27.5	
	×25	5.9			×25	22.6	
	×30	4.8			×30	17.7	
20	×5	9.8	11.8	50	×10	34.3	42.2
	×10	7.8			×10	30.4	
	×15	5.9			×20	26.5	
	×20	7.8			×25	32.4	
	×25	6.9			×30	30.4	
	×30	5.9			×40	26.5	
25	×5	17.7	21.6				
	×10	13.7					
	×15	9.8					
	×20	13.7					
	×25	11.8					
	×30	9.8					

### ● Reading cylinder thrust force chart

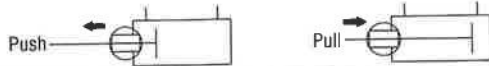
● For double acting double rod cylinder thrust, see pulling side of double acting cylinder thrust chart. For single acting cylinder thrust, use single acting pull cylinder thrust chart.

● Tandem cylinders: when air is supplied to ports A and B simultaneously, cylinder thrust of a standard type will be doubled in each actuation if it is within the stroke of cylinder 1. If air is supplied to only one port, the resulting thrust will be the same as standard type.



● Dual cylinders: same thrust as standard type in each operation.

## ● Square Rod Cylinders



N

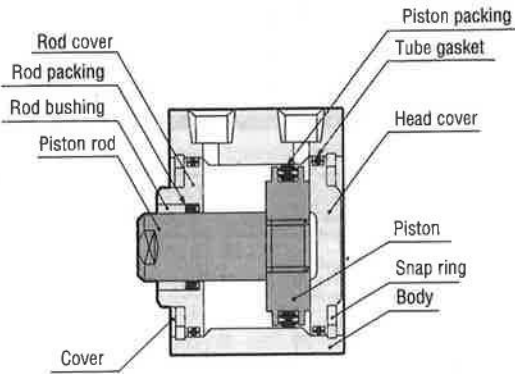
Cylinder bore size mm	Piston rod diameter mm	Action	Pressure area mm <sup>2</sup>	Air pressure MPa						
				0.1	0.2	0.3	0.4	0.5	0.6	0.7
20	□7.4	Push side	314	31.4	62.8	94.2	125.6	157	188.4	219.8
		Pull side	259	25.9	51.8	77.7	103.6	129.5	155.4	181.3
Push side		490	49	98	147	196	245	294	343	
Pull side		436	43.6	87.2	130.8	174.4	218	261.6	305.2	
25	□13	Push side	804	80.4	160.8	241.2	321.6	402	482.4	562.8
		Pull side	635	63.5	127	190.5	254	317.5	381	444.5
Push side		1256	125.6	251.2	376.8	502.4	628	753.6	879.2	
Pull side		1087	108.7	217.4	326.1	434.8	543.5	652.2	760.9	
32	□18	Push side	1963	196.3	392.6	588.9	785.2	981.5	1177.8	1374.1
		Pull side	1639	163.9	327.8	491.7	655.6	819.5	983.4	1147.3
Push side		3117	311.7	623.4	935.1	1246.8	1558.5	1870.2	2181.9	
Pull side		2792	279.2	558.4	837.6	1116.8	1396	1675.2	1954.4	
40	□18	Push side	3117	311.7	623.4	935.1	1246.8	1558.5	1870.2	2181.9
50		Pull side	2792	279.2	558.4	837.6	1116.8	1396	1675.2	1954.4
63	□18	Push side	3117	311.7	623.4	935.1	1246.8	1558.5	1870.2	2181.9
		Pull side	2792	279.2	558.4	837.6	1116.8	1396	1675.2	1954.4

Discontinued

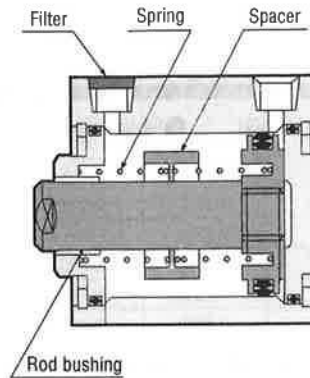


## Inner Construction and Major Parts

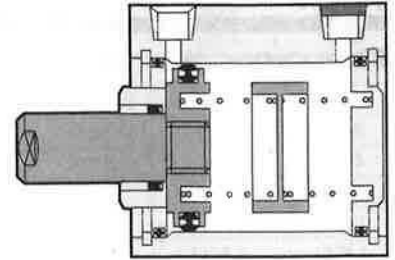
### ● Double acting type (JDA)



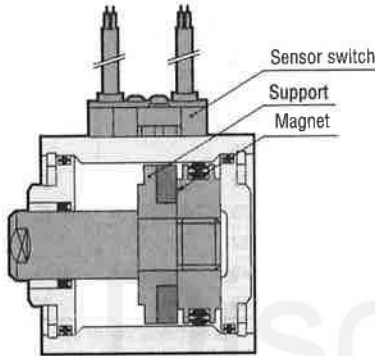
### ● Single acting push type (JSA)



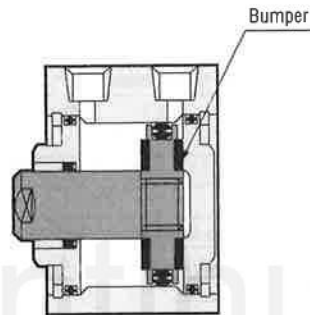
### ● Single acting pull type (JTA)



### ● Cylinder with magnets (double acting type shown in example below)



### ● With bumper



## Materials of Major Parts

Item	12	16	20	25	32	40	50	63	80	100
Body	aluminum alloy									
Piston	aluminum alloy (note)									
Piston rod	stainless steel				hard steel (chrome plated)					
Packing	synthetic rubber (NBR)									
Rod bushing	None	double acting type: oil permeated bronze; single acting type: dry bearing								
Rod cover	Phosphor bronze	aluminum alloy								
Head cover	aluminum alloy									
Snap ring	Hard steel (nickel plated)									
Spring	Piano wire							—		
Spacer	Spacer: aluminum alloy									
Filter	Filter: Porous aluminum									
Bumper	—				Synthetic rubber (NBR)					
Magnet	Resinous magnet									
Support	Aluminum (special anti-rust treatment)									

Note: Stainless steel used for single acting type with bores of 20 and 25.

## List of Packing

Item	Rod packing		Piston packing		Tube gasket
	Single acting push type	Double acting type: Single acting pull type	Double acting type	Single acting type	Double acting type Single acting type
Cylinder bore size mm	Number	1	1	1	2 (1)
12	—	MYR-6	PSD-12	PSD-12	S-14
18	—	MYR-6	PSD-16	PSD-16	1.5X14.5
20	—	MYR-8	PSD-20	MYA-16	1.5X22.5
25	—	MYR-10	PSD-25	MYA-21	1.5X25.5
32	—	MYR-12	PSD-32	PSD-32	1.5X31.5
40	—	MYR-16	PSD-40	PSD-40	1.5X39.5
50	—	MYR-20	PSD-50	PSD-50	1.5X49.5
63	—	MYR-20	PSD-63	—	1.5X62.5
80	—	PNY-25	PSD-80	—	1.5X79.5
100	—	PNY-32	PSD-100	—	2X98.5

Note: Figure in parenthesis is for single acting type bores 12 and 16.

## Weight

### ● Double acting type

9

Cylinder bore size	Zero stroke weight		Added weight per 5 mm stroke <sup>Note1</sup>	Added weight of cylinder with magnets	Weight of mounting bracket		Added weight of sensor switch <sup>Note2</sup>		
	Standard type	Clevis mounting type			Foot bracket	Flange bracket	CS9H□, ZB430□	CS3H□, CS4H□, CS5H□	ZB33□□, ZB13□□
12	36	84.5	6.5	2	50	55	30	20	40
16	46.5	118.5	9	4.5	62	71			
20	62	172	12	6	84	101			
25	87	239	16.5	15	104	160			
32	133	367	19.5	23	126	186			
40	195	474	28	53	160	335			
50	314	761.5	38	95	220	447			
63	446	1184.5	46.5	128	300	591			
80	848	2496.5	72	191	644	1414			
100	1530	4076	102	350	1172	2606			

Note 1: The above chart shows standard strokes.

2: Lead wires for sensor switches are available in two lengths:

A: 1,000 mm B: 3,000 mm

Above sensor switch weights are for A type.

JIG CYLINDERS

### ● Single acting push type

9

Cylinder bore size	Standard weights <sup>Note1</sup>							Added weight of cylinder with magnets		Weight of mounting brackets		Added weight of sensor switches <sup>Note2</sup>		
	Stroke mm	5	10	15	20	25	30	40	5, 10, 15, (10~20 for ø50)	20~30 (25-40 for ø50)	Foot bracket	Flange bracket	CH9H□, ZB430□	CS3H□, CS4H□, CS5H□
12	53.5	60	66.5	103	109.5	116	—	2	8.5	50	55	30	20	40
16	59.5	68.5	77.5	127	136	145	—	4.5	12	62	71			
20	79	91	103	169	181	193	—	6	18	84	101			
25	113	129	146	220	237	253	—	15	32	104	160			
32	151	170	190	311	331	350	—	23	43	126	186			
40	224	252	280	481	509	537	—	53	81	160	335			
50	—	393	431	469	798	836	912	95	95	220	447			

Note 1: The above chart shows standard strokes.

2: Lead wires for sensor switches are available in two lengths:

A: 1,000 mm B: 3,000 mm

Above sensor switch weights are for A type.

### ● Single acting pull type

9

Cylinder bore size	Standard weights <sup>Note1</sup>							Added weight of cylinder with magnets		Weight of mounting brackets		Added weight of sensor switches <sup>Note2</sup>		
	Stroke mm	5	10	15	20	25	30	40	5, 10, 15, (10~20 for ø50)	20~30 (25-40 for ø50)	Foot bracket	Flange bracket	CH9H□, ZB430□	CS3H□, CS4H□, CS5H□
12	52.5	59	65.5	88	94.5	101	—	2	8.5	50	55	30	20	40
16	61	70	79	110	119	128	—	4.5	12	62	71			
20	81	93	105	147	159	171	—	6	18	84	101			
25	112	128	145	192	209	225	—	15	32	104	160			
32	172	191	211	278	298	317	—	23	43	126	186			
40	224	252	280	379	407	435	—	53	81	160	335			
50	—	392	430	468	611	649	725	95	95	220	447			

Note 1: The above chart shows standard strokes.

2: Lead wires for sensor switches are available in two lengths:

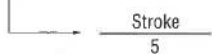
A: 1,000 mm B: 3,000 mm

Above sensor switch weights are for A type.

Calculation example: Weight of a double acting cylinder with magnets, cylinder bore 25 mm,

stroke 30 mm, and two sensor switches (CS3HA) =

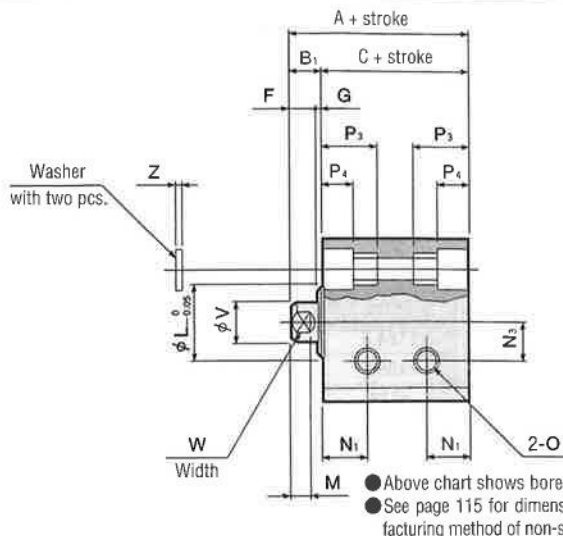
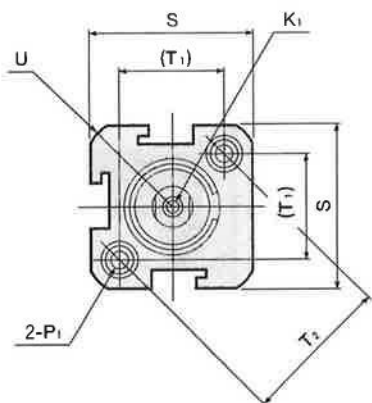
$$87 + (16.5 \times 6) + 15 + (20 \times 2) = 241g$$



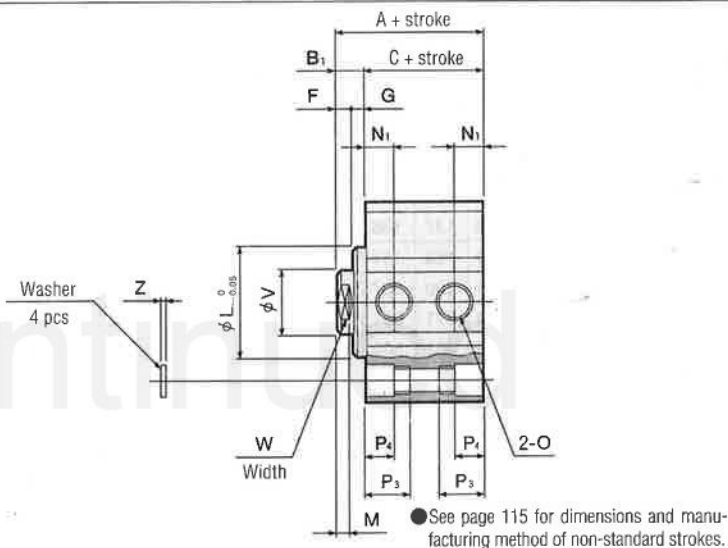
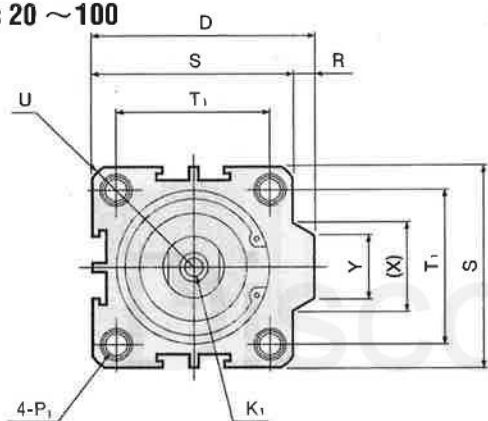
# Dimensions of Double Acting Type (JDA, JDAS)

(Unit : mm)

## ● Bores 12 & 16



## ● Bores 20 ~ 100



Type	Standard Cylinders (JDA)						Cylinders with magnets (JDAS)						O			
	Symbol	A	B <sub>1</sub>	C	A	B <sub>1</sub>	C	D	F	G	K <sub>1</sub>	L		M	N <sub>1</sub>	N <sub>2</sub>
12		22	5	17	27	5	22	—	4	1	M3×0.5 depth 6	11	3	6.5	6	M5×0.8
16		24	5.5	18.5	34	5.5	28.5	—	4	1.5	M3×0.5 depth 6	11	3	7	6.5	M5×0.8
20		25	5.5	19.5	35	5.5	29.5	36	4	1.5	M4×0.7 depth 8	15	3	7.5	—	M5×0.8
25		27	6	21	37	6	31	42	4	2	M5×0.8 depth 10	17	3	8	—	M5×0.8
32		31.5	7	24.5	41.5	7	34.5	50	4	3	M6×1 depth 12	22	3	9 [7]	—	Rc1/8
40		33	7	26	43	7	36	58.5	4	3	M8×1.25 depth 12	28	3	10 [7.3]	—	Rc1/8
50		37	9	28	47	9	38	71.5	5	4	M10×1.5 depth 15	38	3	10	—	Rc1/4
63		41	9	32	51	9	42	84.5	5	4	M10×1.5 depth 15	40	3	12	—	Rc1/4
80		52	11	41	62	11	51	104	6	5	M14×1.5 depth 20	45	4	12.5	—	Rc3/8
100		63	12	51	73	12	61	124	7	5	M18×1.5 depth 20	55	4	17	—	Rc3/8

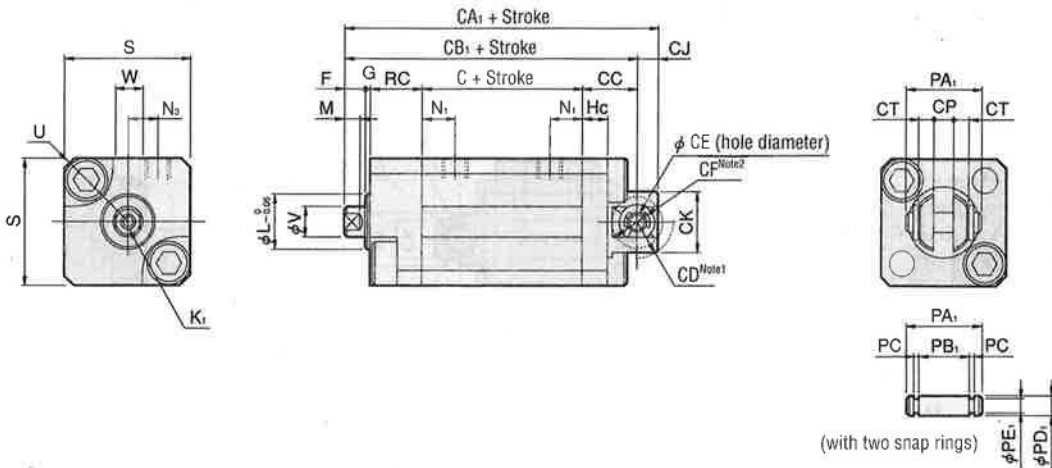
Bore size	Symbol	P <sub>1</sub>										P <sub>3</sub>	P <sub>4</sub>	R	S	T <sub>1</sub>	T <sub>2</sub>	U	V	W	X	Y	Z
		A	B <sub>1</sub>	C	D	F	G	K <sub>1</sub>	L	M	N <sub>1</sub>												
12		φ 3.5 (thru-hole)	spot facing φ 6.5 (both sides)	and M5×0.8 (both sides)	—	—	—	—	—	—	—	—	—	—	—	—	—	R16	6	5	—	—	1
16		φ 3.5 (thru-hole)	spot facing φ 6.5 (both sides)	and M5×0.8 (both sides)	—	—	—	—	—	—	—	—	—	—	—	—	—	R19	6	5	—	—	1
20		φ 3.5 (thru-hole)	spot facing φ 6.5 (both sides)	and M5×0.8 (both sides)	—	—	—	—	—	—	—	—	—	—	—	—	—	R22	8	6	12.3	10	1
25		φ 4.6 (thru-hole)	spot facing φ 8 (both sides)	and M6×1 (both sides)	—	—	—	—	—	—	—	—	—	—	—	—	—	R25	10	8	12.3	10	1
32		φ 4.6 (thru-hole)	spot facing φ 8 (both sides)	and M6×1 (both sides)	—	—	—	—	—	—	—	—	—	—	—	—	—	R29.5	12	10	22.9	16	1
40		φ 5.7 (thru-hole)	spot facing φ 9.5 (both sides)	and M8×1.25 (both sides)	—	—	—	—	—	—	—	—	—	—	—	—	—	R35	16	14	23.5	16	1.6
50		φ 6.8 (thru-hole)	spot facing φ 11 (both sides)	and M8×1.25 (both sides)	—	—	—	—	—	—	—	—	—	—	—	—	—	R41	20	17	31	20	1.6
63		φ 6.8 (thru-hole)	spot facing φ 11 (both sides)	and M8×1.25 (both sides)	—	—	—	—	—	—	—	—	—	—	—	—	—	R50	20	17	31	20	1.6
80		φ 9.2 (thru-hole)	spot facing φ 14 (both sides)	and M12×1.75 (both sides)	—	—	—	—	—	—	—	—	—	—	—	—	—	R62	25	22	37.5	26	1.6
100		φ 11.3 (thru-hole)	spot facing φ 6.5 (both sides)	and M14×2 (both sides)	—	—	—	—	—	—	—	—	—	—	—	—	—	R75	32	27	37.5	26	2

Note: Figures in brackets are for strokes of 5 mm.  
 ● See page 80 for dimensions of male rod thread type.  
 ● See page 107 for sensor switch dimensions.

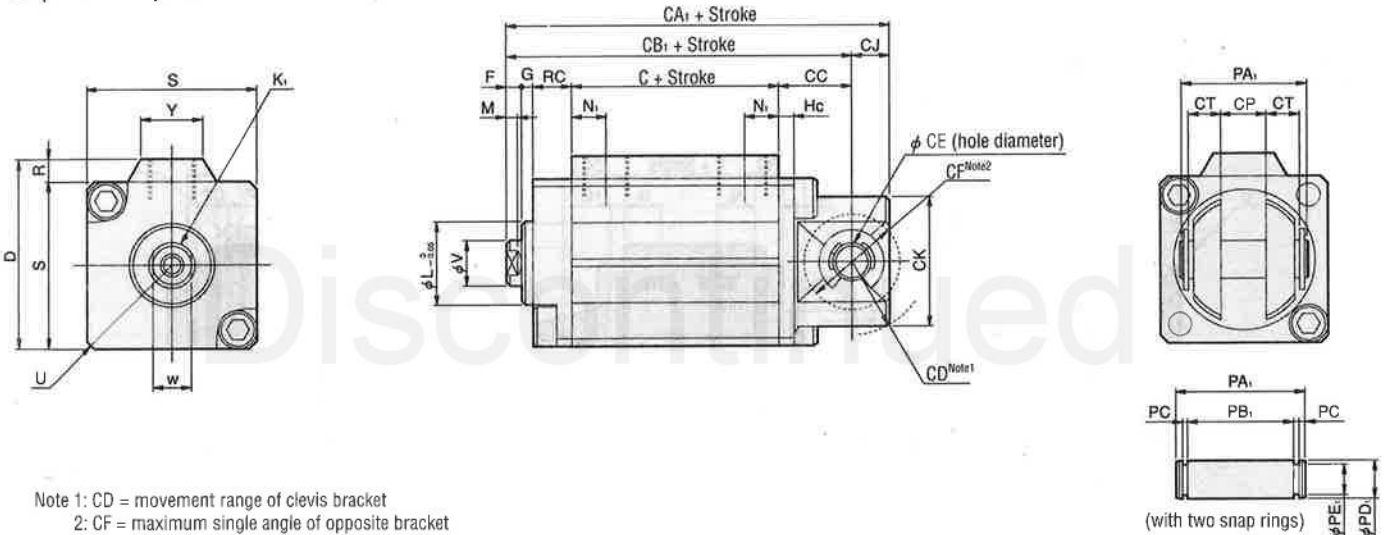
# Dimensions of Clevis Mounting Type

(Unit : mm)

●  $\phi 12 \sim \phi 16$



●  $\phi 20 \sim \phi 40$



Note 1: CD = movement range of clevis bracket  
 Note 2: CF = maximum single angle of opposite bracket

Cylinder bore size	Symbol	Standard cylinders			Cylinder with magnets			CC	CD	CE	CF	CJ	CK	CP	CT	D	F	G	K <sub>1</sub>
		BT	C	CA <sub>1</sub>	CB <sub>1</sub>	C	CA <sub>1</sub>												
12	—	17	47	43	22	52	48	11	R7.5	4 <sup>+0.03</sup> <sub>0</sub>	R5	4	12	4 <sup>+0.2</sup> <sub>+0.1</sub>	3	—	4	1	M3×0.5 depth 6
16	—	18.5	51	46	28.5	61	56	12	R10	5 <sup>+0.03</sup> <sub>0</sub>	R6	5	16	5 <sup>+0.2</sup> <sub>+0.1</sub>	3.5	—	4	1.5	M3×0.5 depth 6
20	—	19.5	60	52	29.5	70	62	17	R14	8 <sup>+0.04</sup> <sub>0</sub>	R11	8	22	8 <sup>+0.4</sup> <sub>+0.2</sub>	5.2	36	4	1.5	M4×0.7 depth 8
25	—	21	62	54	31	72	64	17	R16	8 <sup>+0.04</sup> <sub>0</sub>	R11	8	26	8 <sup>+0.4</sup> <sub>+0.2</sub>	5.2	42	4	2	M5×0.8 depth 10
32	—	24.5	70.5	60.5	34.5	80.5	70.5	19	R20	10 <sup>+0.04</sup> <sub>0</sub>	R12.5	10	34	12 <sup>+0.4</sup> <sub>+0.2</sub>	8	50	4	3	M6×1 depth 12
40	—	26	72	62	36	82	72	19	R20	10 <sup>+0.04</sup> <sub>0</sub>	R12.5	10	34	12 <sup>+0.4</sup> <sub>+0.2</sub>	8	58.5	4	3	M8×1.25 depth 12

Cylinder bore size	Symbol	L	M	N <sub>1</sub>	N <sub>3</sub>	O	PA <sub>1</sub>	PB <sub>1</sub>	PC	PD <sub>1</sub>	PE <sub>1</sub>	R	Rc	Hc	S	U	V	W	Y
12	—	11	3	6.5	6	M5×0.8	15	10.6	0.7	4f8	2.5	—	10	4	25	R16	6	5	—
16	—	11	3	7	6.5	M5×0.8	17	12.6	0.7	5f8	3	—	10	4	29	R19	6	5	—
20	—	15	3	7.5	—	M5×0.8	24.4	19.6	0.9	8f8	6	2	10	4	34	R22	8	6	10
25	—	17	3	8	—	M5×0.8	24.4	19.6	0.9	8f8	6	2	10	4	40	R25	10	8	10
32	—	22	3	9(7)	—	Rc1/8	34	29.2	0.9	10f8	8	6	10	4	44	R29.5	12	10	16
40	—	28	3	10(7.3)	—	Rc1/8	34	29.2	0.9	10f8	8	6.5	10	4	52	R35	16	14	16

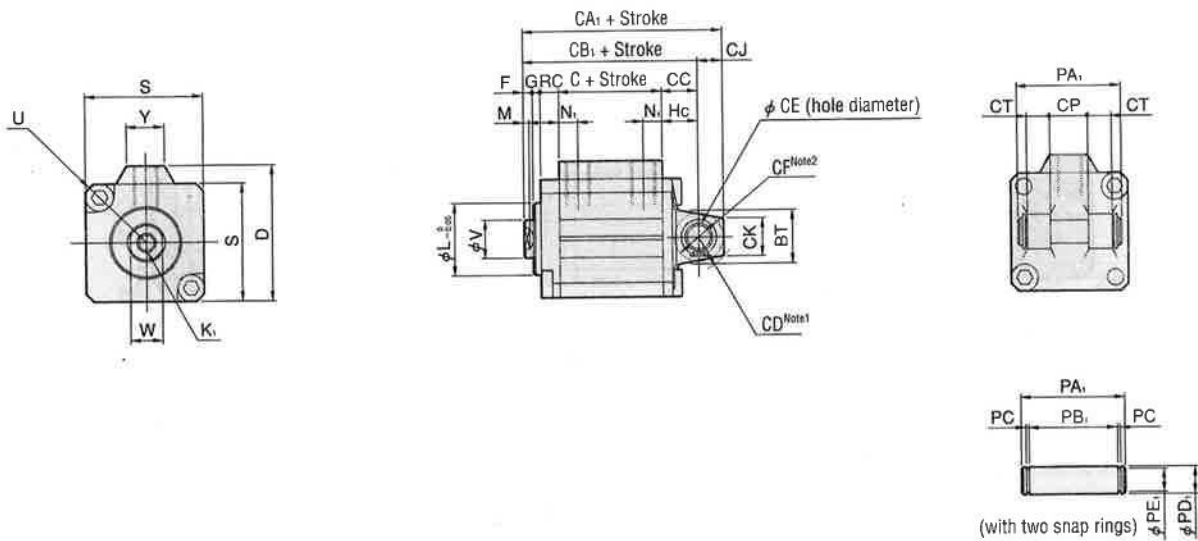
Note: Figures in parentheses apply to strokes of 5 mm.  
 ● See page 80 for dimension of male rod thread type  
 ● See page 107 for sensor switch dimensions.

JIG CYLINDERS

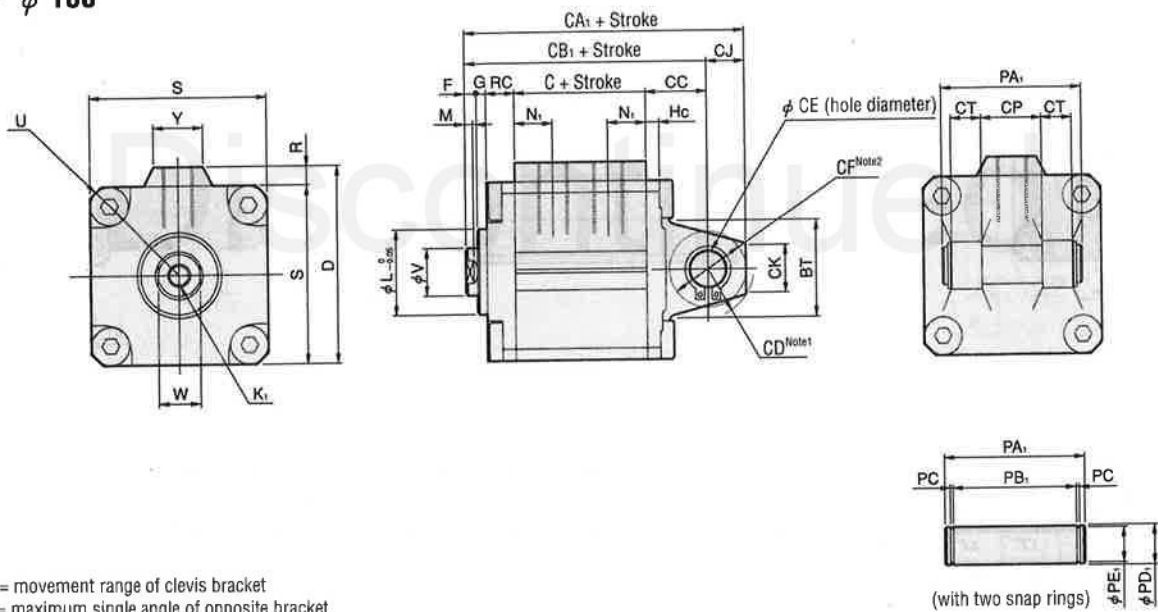
# Dimensions of Clevis Mounting Type

(Unit: mm)

## ● $\phi 50$



## ● $\phi 63 \sim \phi 100$



Note 1: CD = movement range of clevis bracket  
 2: CF = maximum single angle of opposite bracket

Symbol	Standard cylinders				Cylinder with magnets														
	BT	C	CA <sub>1</sub>	CB <sub>1</sub>	C	CA <sub>1</sub>	CB <sub>1</sub>	CC	CD	CE	CF	CJ	CK	CP	CT	D	F	G	K <sub>1</sub>
50	28	28	79	66	38	89	76	19	R17	14 <sup>+0.08</sup> <sub>0</sub>	R14	13	20	20 <sup>+0.6</sup> <sub>+0.3</sub>	12.5	71.5	5	4	M10×1.5 depth 15
63	35	32	83	70	42	93	80	19	R17	14 <sup>+0.08</sup> <sub>0</sub>	R14	13	20	20 <sup>+0.6</sup> <sub>+0.3</sub>	15	84.5	5	4	M10×1.5 depth 15
80	48	41	119	99	51	129	109	32	R24	20 <sup>+0.1</sup> <sub>0</sub>	R20	20	25	32 <sup>+0.6</sup> <sub>+0.3</sub>	16	104	6	5	M14×1.5 depth 20
100	55	51	135	115	61	145	125	32	R24	20 <sup>+0.1</sup> <sub>0</sub>	R21	20	25	32 <sup>+0.6</sup> <sub>+0.3</sub>	16	124	7	5	M18×1.5 depth 20

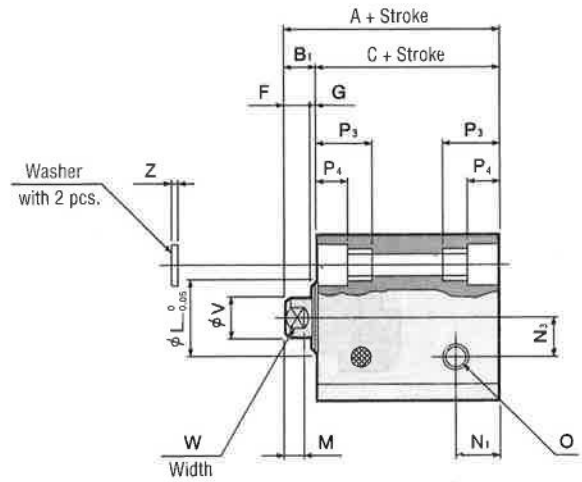
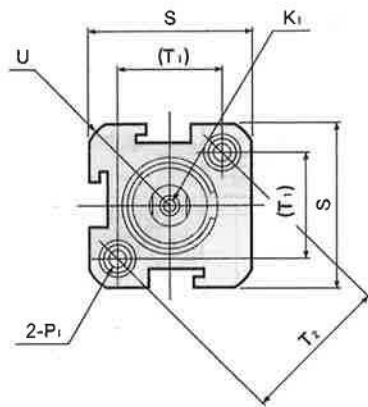
Cylinder bore size	Symbol	L	M	N <sub>1</sub>	N <sub>3</sub>	O	PA <sub>1</sub>	PB <sub>1</sub>	PC	PD <sub>1</sub>	PE <sub>1</sub>	R	Rc	Hc	S	U	V	W	Y
		50	38	3	10	—	Rc1/4	55	47	1.15	14 <sup>-0.030</sup> <sub>-0.070</sub>	13.4	9.5	10	7	62	R41	20	17
63	40	3	12	—	Rc1/4	60	52	1.15	14 <sup>-0.030</sup> <sub>-0.070</sub>	13.4	9.5	10	8	75	R50	20	17	20	
80	45	4	12.5	—	Rc3/8	74	66	1.35	20 <sup>-0.040</sup> <sub>-0.084</sub>	19	10	15	10	94	R62	25	22	26	
100	55	4	17	—	Rc3/8	74	66	1.35	20 <sup>-0.040</sup> <sub>-0.084</sub>	19	10	20	10	114	R75	32	27	26	

- See page 80 for dimension of male rod thread type
- See page 107 for sensor switch dimensions.

# Dimensions of Double Acting-Push Type (JSA, JSAS)

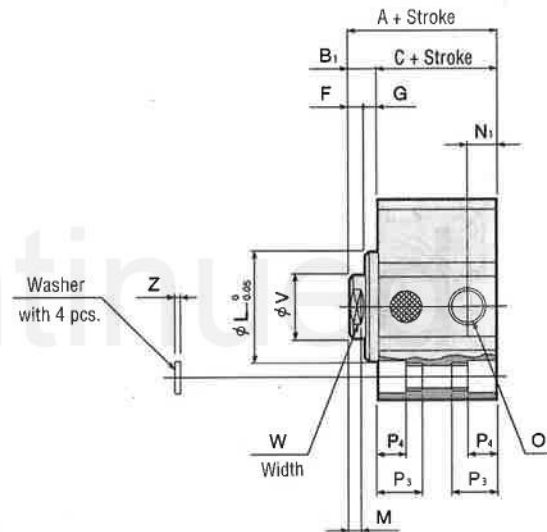
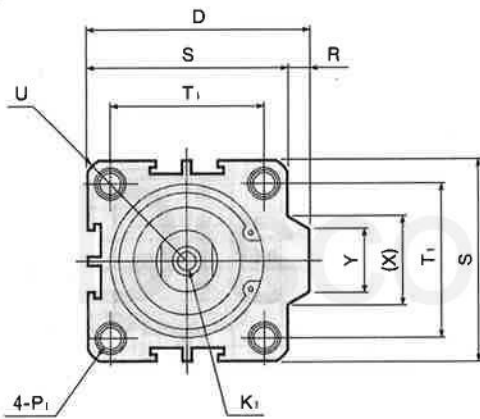
(Unit : mm)

●  $\phi 12, \phi 16$



- Diagrams show 12 bore
- See page 115 for manufacturing method and dimension of non-standard strokes

●  $\phi 20 \sim \phi 50$



- See page 115 for manufacturing method and dimension of non-standard strokes

Type	Standard cylinders (JSA)						Cylinders with magnets (JSAS)						D	F	G	K1	L	M			
	5~15(10~20 for $\phi 50$ )			16~30(21~40 for $\phi 50$ )			5~15(10~20 for $\phi 50$ )			16~30(21~40 for $\phi 50$ )											
Stroke	A	B <sub>1</sub>	C	A	B <sub>1</sub>	C	A	B <sub>1</sub>	C	A	B <sub>1</sub>	C	A	B <sub>1</sub>	C	D	F	G	K1	L	M
12	27	5	22	37	5	32	32	5	27	42	5	37	—	4	1	—	4	1.5	M3 × 0.5 depth 6	11	3
16	29	5.5	23.5	39	5.5	33.5	34	5.5	28.5	44	5.5	38.5	—	4	1.5	—	4	1.5	M3 × 0.5 depth 6	11	3
20	25	5.5	19.5	40	5.5	34.5	35	5.5	29.5	50	5.5	44.5	36	4	1.5	—	4	1.5	M4 × 0.7 depth 8	15	3
25	27	6	21	42	6	36	37	6	31	52	6	46	42	4	2	—	4	2	M5 × 0.8 depth 10	17	3
32	31.5	7	24.5	46.5	7	39.5	41.5	7	34.5	56.5	7	49.5	50	4	3	—	4	3	M6 × 1 depth 12	22	3
40	33	7	26	48	7	41	43	7	36	58	7	51	58.5	4	3	—	4	3	M8 × 1.25 depth 12	28	3
50	37	9	28	52	9	43	47	9	38	62	9	53	71.5	5	4	—	5	4	M10 × 1.5 depth 15	38	3

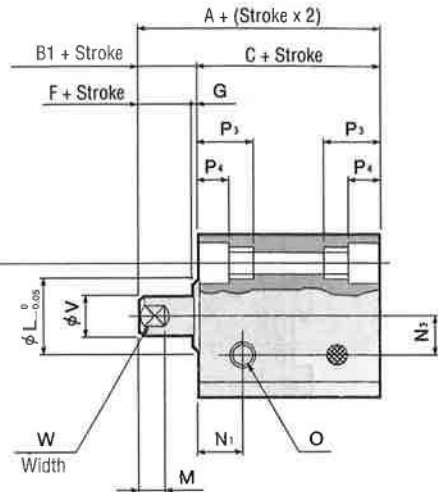
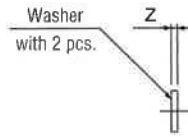
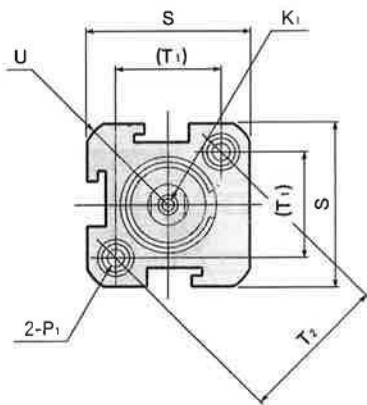
Bore size	Symbol	N <sub>1</sub>	N <sub>3</sub>	O	P <sub>1</sub>				P <sub>3</sub>	P <sub>4</sub>	R	S	T <sub>1</sub>	T <sub>2</sub>	U	V	W	X	Y	Z
					$\phi 3.5$ (thru hole) spot facing $\phi 6.5$ (both sides) and M5 × 0.8 (both sides)	$\phi 3.5$ (thru hole) spot facing $\phi 6.5$ (both sides) and M5 × 0.8 (both sides)	$\phi 3.5$ (thru hole) spot facing $\phi 6.5$ (both sides) and M5 × 0.8 (both sides)	$\phi 4.6$ (thru hole) spot facing $\phi 8$ (both sides) and M6 × 1 (both sides)												
12	6.5	6	M5 × 0.8	$\phi 3.5$ (thru hole) spot facing $\phi 6.5$ (both sides) and M5 × 0.8 (both sides)	$\phi 3.5$ (thru hole) spot facing $\phi 6.5$ (both sides) and M5 × 0.8 (both sides)	$\phi 3.5$ (thru hole) spot facing $\phi 6.5$ (both sides) and M5 × 0.8 (both sides)	$\phi 4.6$ (thru hole) spot facing $\phi 8$ (both sides) and M6 × 1 (both sides)	9.5	4.5	—	25	16.2	23	R16	6	5	—	—	—	1
16	7	6.5	M5 × 0.8	$\phi 3.5$ (thru hole) spot facing $\phi 6.5$ (both sides) and M5 × 0.8 (both sides)	$\phi 3.5$ (thru hole) spot facing $\phi 6.5$ (both sides) and M5 × 0.8 (both sides)	$\phi 3.5$ (thru hole) spot facing $\phi 6.5$ (both sides) and M5 × 0.8 (both sides)	$\phi 4.6$ (thru hole) spot facing $\phi 8$ (both sides) and M6 × 1 (both sides)	9.5	4.5	—	29	19.8	28	R19	6	5	—	—	—	1
20	7.5	—	M5 × 0.8	$\phi 3.5$ (thru hole) spot facing $\phi 6.5$ (both sides) and M5 × 0.8 (both sides)	$\phi 3.5$ (thru hole) spot facing $\phi 6.5$ (both sides) and M5 × 0.8 (both sides)	$\phi 3.5$ (thru hole) spot facing $\phi 6.5$ (both sides) and M5 × 0.8 (both sides)	$\phi 4.6$ (thru hole) spot facing $\phi 8$ (both sides) and M6 × 1 (both sides)	9.5	4.5	2	34	24	—	R22	8	6	12.3	10	1	1
25	8	—	M5 × 0.8	$\phi 4.6$ (thru hole) spot facing $\phi 8$ (both sides) and M6 × 1 (both sides)	$\phi 4.6$ (thru hole) spot facing $\phi 8$ (both sides) and M6 × 1 (both sides)	$\phi 4.6$ (thru hole) spot facing $\phi 8$ (both sides) and M6 × 1 (both sides)	$\phi 4.6$ (thru hole) spot facing $\phi 8$ (both sides) and M6 × 1 (both sides)	11.5	5.5	2	40	28	—	R25	10	8	12.3	10	1	1
32	9 [7]	—	Rc1/8	$\phi 4.6$ (thru hole) spot facing $\phi 8$ (both sides) and M6 × 1 (both sides)	$\phi 4.6$ (thru hole) spot facing $\phi 8$ (both sides) and M6 × 1 (both sides)	$\phi 4.6$ (thru hole) spot facing $\phi 8$ (both sides) and M6 × 1 (both sides)	$\phi 4.6$ (thru hole) spot facing $\phi 8$ (both sides) and M6 × 1 (both sides)	11.5	5.5	6	44	34	—	R29.5	12	10	22.9	16	1	1
40	10 [7.3]	—	Rc1/8	$\phi 5.7$ (thru hole) spot facing $\phi 9.5$ (both sides) and M8 × 1.25 (both sides)	$\phi 5.7$ (thru hole) spot facing $\phi 9.5$ (both sides) and M8 × 1.25 (both sides)	$\phi 5.7$ (thru hole) spot facing $\phi 9.5$ (both sides) and M8 × 1.25 (both sides)	$\phi 5.7$ (thru hole) spot facing $\phi 9.5$ (both sides) and M8 × 1.25 (both sides)	15.5	7.5	6.5	52	40	—	R35	16	14	23.5	16	1.6	1.6
50	10	—	Rc1/4	$\phi 6.8$ (thru hole) spot facing $\phi 11$ (both sides) and M8 × 1.25 (both sides)	$\phi 6.8$ (thru hole) spot facing $\phi 11$ (both sides) and M8 × 1.25 (both sides)	$\phi 6.8$ (thru hole) spot facing $\phi 11$ (both sides) and M8 × 1.25 (both sides)	$\phi 6.8$ (thru hole) spot facing $\phi 11$ (both sides) and M8 × 1.25 (both sides)	16.5	8.5	9.5	62	48	—	R41	20	17	31	20	1.6	1.6

- Note: Figures in brackets are for 5 mm strokes
- See page 80 for dimensions of male rod thread type
  - See page 107 for sensor switch dimensions

# Dimensions of Single Acting-Pull Type (JTA, JTAS)

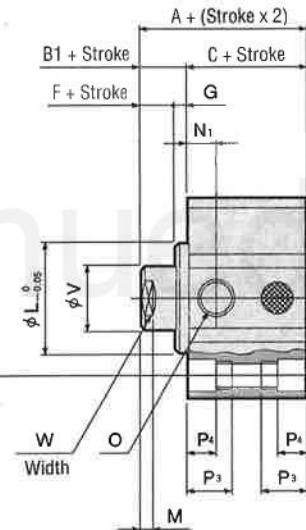
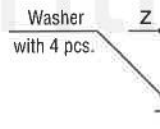
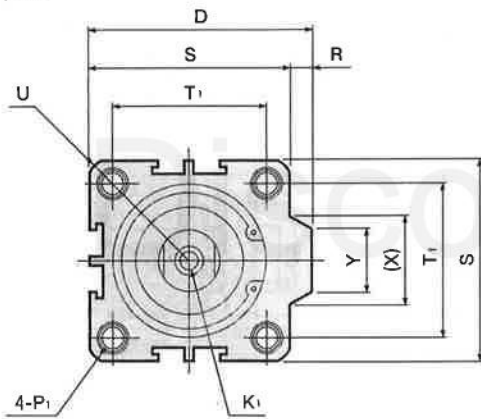
(Unit : mm)

●  $\phi 12$ ,  $\phi 16$



- Diagrams show 12 bore
- See page 115 for manufacturing method and dimension of non-standard strokes

●  $\phi 20 \sim \phi 50$



- See page 115 for manufacturing method and dimension of non-standard strokes

Type	Standard cylinders (JT A)						Cylinders with magnets (JT A S)						D	F	G	K1	L	M	
	Stroke	5 ~ 15 (1 ~ 20 for $\phi 50$ )		16 ~ 30 (21 ~ 40 for $\phi 50$ )		5 ~ 15 (1 ~ 20 for $\phi 50$ )		16 ~ 30 (21 ~ 40 for $\phi 50$ )											
Bore size	Symbol	A	B1	C	A	B1	C	A	B1	C	A	B1	C	D	F	G	K1	L	M
12		27	5	22	37	5	32	32	5	27	42	5	37	—	4	1	M3 X 0.5 depth 6	11	3
16		29	5.5	23.5	39	5.5	33.5	34	5.5	28.5	44	5.5	38.5	—	4	1.5	M3 X 0.5 depth 6	11	3
20		25	5.5	19.5	40	5.5	34.5	35	5.5	29.5	50	5.5	44.5	36	4	1.5	M4 X 0.7 depth 8	15	3
25		27	6	21	42	6	36	37	6	31	52	6	46	42	4	2	M5 X 0.8 depth 10	17	3
32		31.5	7	24.5	46.5	7	39.5	41.5	7	34.5	56.5	7	49.5	50	4	3	M6 X 1 depth 12	22	3
40		33	7	26	48	7	41	43	7	36	58	7	51	58.5	4	3	M8 X 1.25 depth 12	28	3
50		37	9	28	52	9	43	47	9	38	62	9	53	71.5	5	4	M10 X 1.5 depth 15	38	3

Bore size	Symbol	N1	Na	O	P1	P3	P4	R	S	T1	T2	U	V	W	X	Y	Z
12		6.5	6	M5 X 0.8	$\phi 3.5$ (thru hole) spot facing $\phi 6.5$ (both sides) and M5 X 0.8 (both sides)	9.5	4.5	—	25	16.2	23	R16	6	5	—	—	1
16		7	6.5	M5 X 0.8	$\phi 3.5$ (thru hole) spot facing $\phi 6.5$ (both sides) and M5 X 0.8 (both sides)	9.5	4.5	—	29	19.8	28	R19	6	5	—	—	1
20		7.5	—	M5 X 0.8	$\phi 3.5$ (thru hole) spot facing $\phi 6.5$ (both sides) and M5 X 0.8 (both sides)	9.5	4.5	2	34	24	—	R22	8	6	12.3	10	1
25		8	—	M5 X 0.8	$\phi 4.6$ (thru hole) spot facing $\phi 8$ (both sides) and M6 X 1 (both sides)	11.5	5.5	2	40	28	—	R25	10	8	12.3	10	1
32		9 [7]	—	Rc1/8	$\phi 4.6$ (thru hole) spot facing $\phi 8$ (both sides) and M6 X 1 (both sides)	11.5	5.5	6	44	34	—	R29.5	12	10	22.9	16	1
40		10 [7.3]	—	Rc1/8	$\phi 5.7$ (thru hole) spot facing $\phi 9.5$ (both sides) and M8 X 1.25 (both sides)	15.5	7.5	6.5	52	40	—	R35	16	14	23.5	16	1.6
50		10	—	Rc1/4	$\phi 6.8$ (thru hole) spot facing $\phi 11$ (both sides) and M8 X 1.25 (both sides)	16.5	8.5	9.5	62	48	—	R41	20	17	31	20	1.6

Note: Figures in brackets are for 5 mm strokes

- See page 80 for dimensions of male rod thread type
- See page 107 for sensor switch dimensions

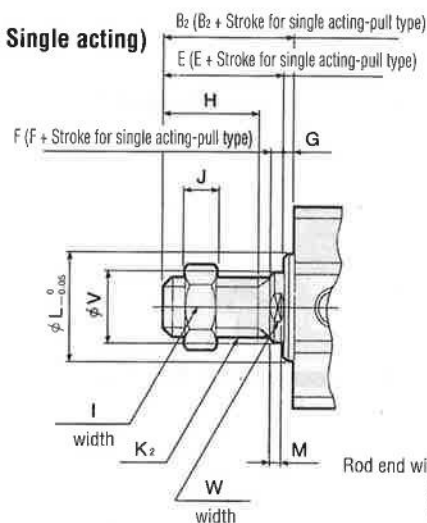
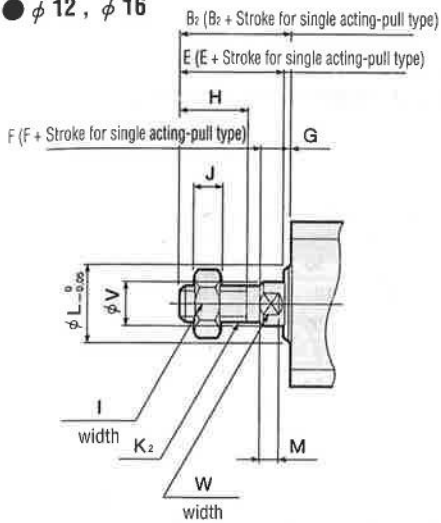
# Dimensions of Male Rod Thread Type

(Unit : mm)

## ● Double Acting Type; Single Acting-Push Type; Single Acting-Pull Type

●  $\phi 12, \phi 16$

●  $\phi 20 \sim \phi 100$   
( $\phi 20 \sim \phi 50$  for Single acting)



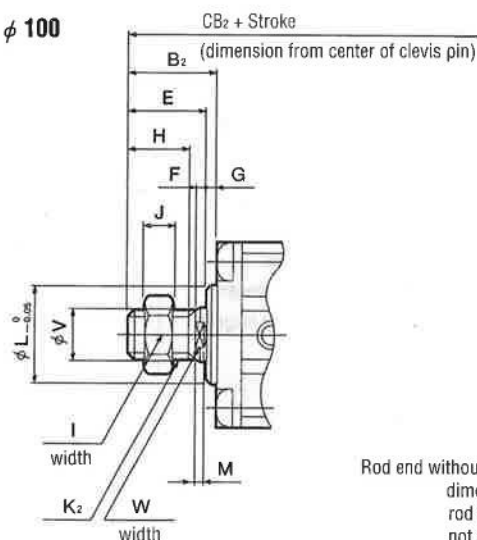
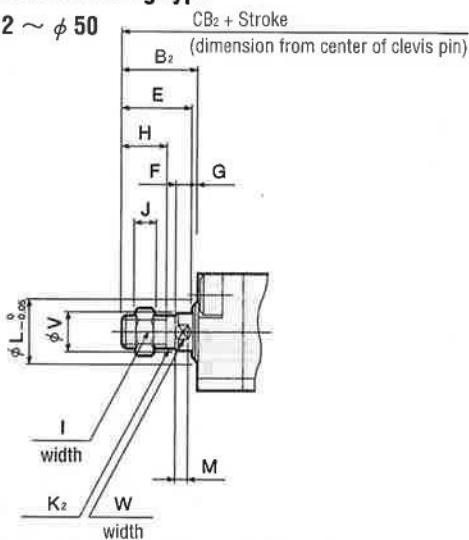
Rod end without thread type :  
dimensions identical to female  
rod thread type. Female thread  
not available.

Bore size	Symbol	B <sub>2</sub>	E	F	G	H	I	J	K <sub>2</sub>	L	M	V	W
12		17	16	4	1	10	8	4	M5 × 0.8	11	3	6	5
16		17.5	16	4	1.5	10	8	4	M5 × 0.8	11	3	6	5
20		20.5	19	4	1.5	13	10	5	M6 × 1	15	3	8	6
25		23	21	4	2	15	12	5	M8 × 1	17	3	10	8
32		25	22	4	3	15	14	6	M10 × 1.25	22	3	12	10
40		35	32	4	3	25	19	8	M14 × 1.5	28	3	16	14
50		37	33	5	4	25	27	11	M18 × 1.5	38	3	20	17
63		37	33	5	4	25	27	11	M18 × 1.5	40	3	20	17
80		44	39	6	5	30	32	13	M22 × 1.5	45	4	25	22
100		50	45	7	5	35	36	14	M26 × 1.5	55	4	32	27

## ● Clevis mounting type

●  $\phi 12 \sim \phi 50$

●  $\phi 63 \sim \phi 100$



Rod end without thread type :  
dimensions identical to female  
rod thread type. Female thread  
not available.

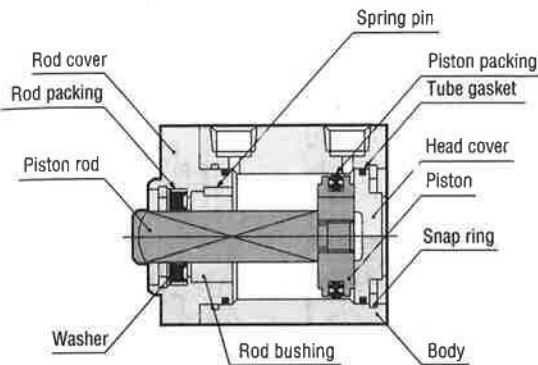
Bore size	Symbol	Standard cylinders		E	F	G	H	I	J	K <sub>2</sub>	L	M	V	W	
		CB <sub>2</sub>	Cylinder with magnets CB <sub>2</sub>												
12		17	55	60	16	4	1	10	8	4	M5 × 0.8	11	3	6	5
16		17.5	58	68	16	4	1.5	10	8	4	M5 × 0.8	11	3	6	5
20		20.5	67	77	19	4	1.5	13	10	5	M6 × 1	15	3	8	6
25		23	71	81	21	4	2	15	12	5	M8 × 1	17	3	10	8
32		25	78.5	88.5	22	4	3	15	14	6	M10 × 1.25	22	3	12	10
40		35	90	100	32	4	3	25	19	8	M14 × 1.5	28	3	16	14
50		37	94	104	33	5	4	25	27	11	M18 × 1.5	38	3	20	17
63		37	98	108	33	5	4	25	27	11	M18 × 1.5	40	3	20	17
80		44	132	142	39	6	5	30	32	13	M22 × 1.5	45	4	25	22
100		50	153	163	45	7	5	35	36	14	M26 × 1.5	55	4	32	27

JIG CYLINDERS

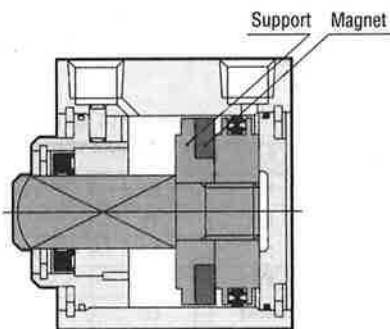


## Inner Construction and Major Parts

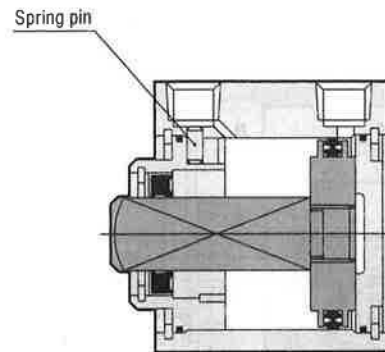
●  $\phi 20 \sim \phi 32$



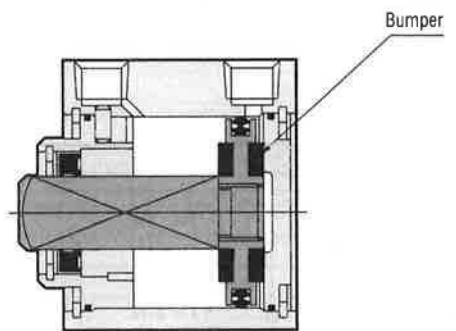
● **Cylinders with magnets**



●  $\phi 40 \sim \phi 63$



● **With bumper ( $\phi 40 \sim \phi 63$ )**



### Materials of Major Parts

Item	Cylinder bore size	20~32	40~63
Body		aluminum alloy	
Piston		aluminum alloy	
Piston rod		Hard steel (chrome plated)	
Packing		Synthetic rubber (NBR, rod packing: urethane)	
Rod Bushing		Oil permeated bronze	
Rod cover		aluminum alloy	
Head cover		aluminum alloy	
Set screw		Hard steel	
Washer		Green plated steel	
Snap ring		Hard steel (nickel plated)	
Bumper		—	Synthetic rubber (NBR)
Magnet		Resinous magnet	
Support		Aluminum (special anti-rust treatment)	

### List of Packing

Item	Number	Road packing	Piston packing	Tube gasket
		1	1	2
20		KC-7.4	PSD-20	1.5×22.5
25		KC-7.4	PSD-25	1.5×25.5
32		KC-13	PSD-32	1.5×31.5
40		KC-13	PSD-40	1.5×39.5
50		KC-18	PSD-50	1.5×49.5
63		KC-18	PSD-63	1.5×62.5

### Weight

#### ● Double acting type

Cylinder bore size mm	Zero stroke weight	Added weight per 5mm stroke	Added weight of cylinder with magnets	Weight of mounting bracket		Added weight of sensor switch <sup>note 2</sup>		
				Foot bracket	Flange bracket	CS9H□, ZB430□	CS3H□, CS4H□, CS5H□	ZB33□□, ZB13□□
20	80	11	29	—	—	30	20	40
25	110	14	40	—	—			
32	166	21	47	—	—			
40	235	25	68	160	335			
50	434	36	110	220	447			
63	620	52	155	300	591			

Note 1: Above chart depicts standard strokes  
 2: Lead wires for sensor switch are available in 2 lengths:  
 A: 1,000 mm B: 3,000 mm  
 Above sensor switch weights are for A type.

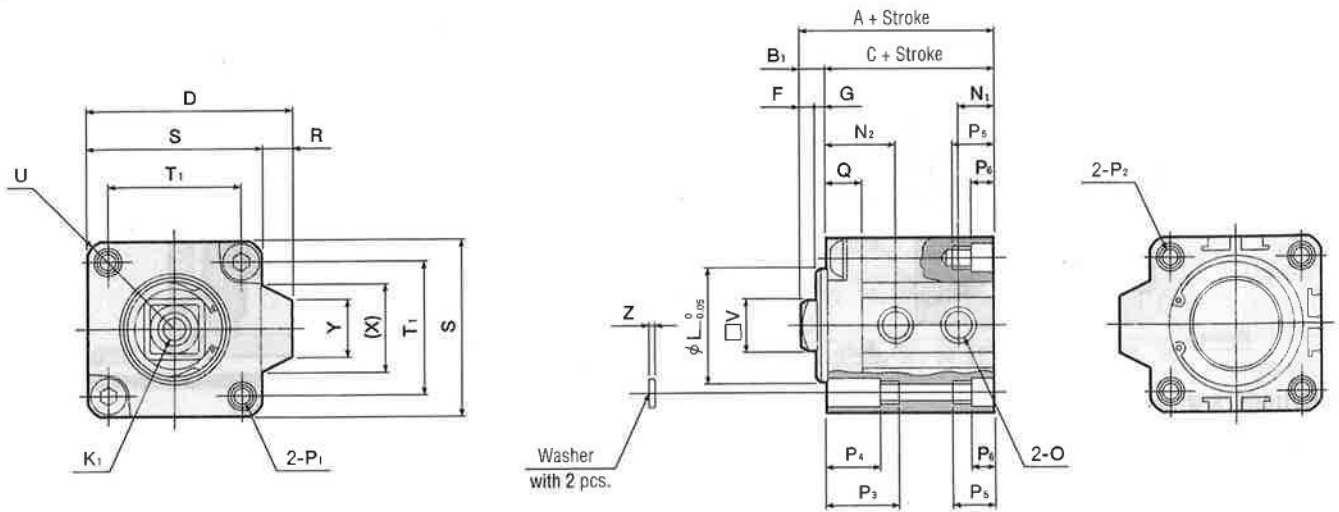
Calculation example: Weight of 32 mm bore double acting cylinder with magnet with 40 mm stroke and two (CS3H) sensor switches:  
 $166 + (21 \times 8) + 47 + (20 \times 2) = 421\text{g}$

Stroke  
5

# Dimensions of Double Acting Square Rod Cylinders (JDAL, JDALS)

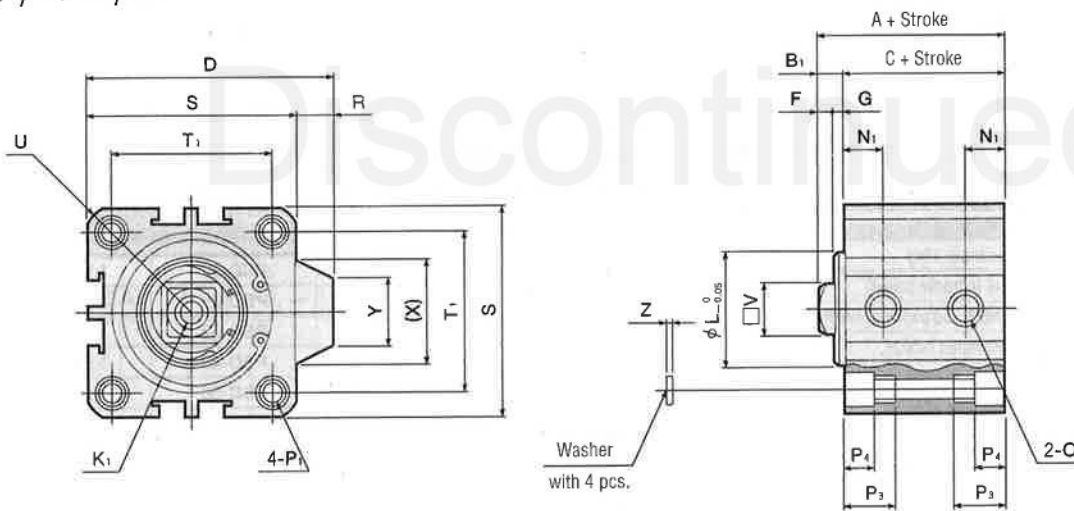
(Unit : mm)

## ● $\phi 20 \sim \phi 32$



● See page 115 for manufacturing method and dimensions of non-standard strokes.

## ● $\phi 40 \sim \phi 63$



● See page 115 for manufacturing method and dimensions of non-standard strokes.

Type	Standard cylinder (JDAL)			Cylinder with magnets (JDALS)			D	F	G	K <sub>1</sub>	L	N <sub>1</sub>	N <sub>2</sub>	O
Bore size	A	B <sub>1</sub>	C	A	B <sub>1</sub>	C								
20	32	6	26	42	6	36	36	4	2	M4×0.7 depth 8	18	7.5	14	M5×0.8
25	33.5	6	27.5	43.5	6	37.5	42	4	2	M4×0.7 depth 8	18	8	14.5	M5×0.8
32	40.5	7	33.5	50.5	7	43.5	50	4	3	M8×1.25 depth 12	28	9 [7]	18 [16]	Rc1/8
40	43	7	36	53	7	46	58.5	4	3	M8×1.25 depth 12	28	10	—	Rc1/8
50	48.7	10.7	38	58.7	10.7	48	71.5	5	5.7	M10×1.5 depth 15	38	10	—	Rc1/4
63	51.2	9.2	42	61.2	9.2	52	84.5	5	4.2	M10×1.5 depth 15	40	12	—	Rc1/4

Bore size	Symbol	P <sub>1</sub>	P <sub>2</sub>	P <sub>3</sub>	P <sub>4</sub>	P <sub>5</sub>	P <sub>6</sub>	Q	R	S	T <sub>1</sub>	U	V	X	Y	Z
20		$\phi 3.5$ (thru-hole) spot facing $\phi 6.5$ and M5×0.8		16	11	9.5	4.5	6.5	2	34	24	R22	7.4	12.3	10	1
25		$\phi 4.6$ (thru-hole) spot facing $\phi 8$ and M6×1		18	12	11.5	5.5	6.5	2	40	28	R25	7.4	12.3	10	1
32		$\phi 4.6$ (thru-hole) spot facing $\phi 8$ and M6×1		20.5	14.5	11.5	5.5	9	6	44	34	R29.5	13	22.9	16	1
40		$\phi 5.7$ (thru-hole) spot facing $\phi 9.5$ (both sides) and M8×1.25(both sides)	—	15.5	7.5	—	—	—	6.5	52	40	R35	13	23.5	16	1.6
50		$\phi 6.8$ (thru-hole) spot facing $\phi 11$ (both sides) and M8×1.25(both sides)	—	16.5	8.5	—	—	—	9.5	62	48	R41	18	31	20	1.6
63		$\phi 6.8$ (thru-hole) spot facing $\phi 11$ (both sides) and M8×1.25(both sides)	—	16.5	8.5	—	—	—	9.5	75	60	R50	18	31	20	1.6

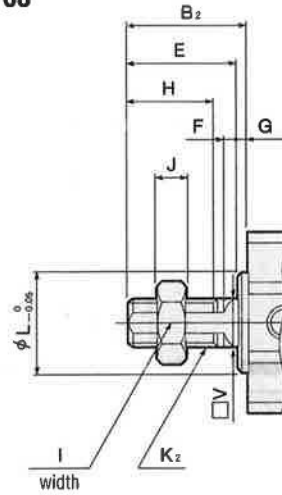
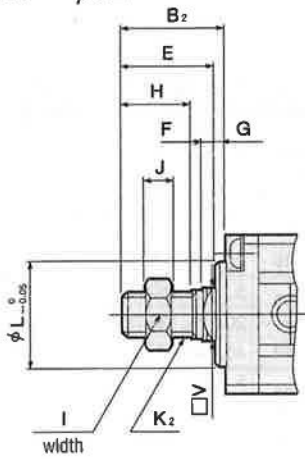
Note : Figures in brackets are for 5 mm strokes.

# Dimensions of Male Rod Thread Type

(Unit : mm)

●  $\phi 20 \sim \phi 32$

●  $\phi 40 \sim \phi 63$



Bore size	Symbol	B <sub>2</sub>	E	F	G	H	I	J	K <sub>2</sub>	L	V
20		21	19	4	2	13	10	5	M6 ×1	18	7.4
25		23	21	4	2	15	12	5	M8 ×1	18	7.4
32		30	27	4	3	20	17	7	M12 ×1.25	28	13
40		35	32	4	3	25	19	8	M14 ×1.5	28	13
50		38.7	33	5	5.7	25	27	11	M18 ×1.5	38	18
63		37.2	33	5	4.2	25	27	11	M18 ×1.5	40	18

Discontinued

JIG CYLINDERS

# JIG DOUBLE ROD CYLINDERS

Double Acting Type, Single Acting Type



## Symbols

● Double acting, Double rod type (JDAD) ● Single acting, Double rod type (JSAD)



## Specifications

Item	Cylinder bore size mm									
	12	16	20	25	32	40	50	63	80	100
Operation	Double acting type, Single acting type					Double acting type				
Fluid	Air									
Operating pressure range MPa(kgf/cm <sup>2</sup> )	0.2~0.7 {2.0~7.1}		0.15~0.7{1.5~7.1}			0.1~0.7{1~7.1}				
Proof pressure MPa(kgf/cm <sup>2</sup> )	1.03{10.5}									
Operating temperature range °C	0~60{150 °C for heat resistant type}									
Operating speed range mm/s	Double acting type					30~500		30~350		30~250
	Single acting type					100~500				
Bumper	Double acting type					Not available		Rubber bumper (Optional)		
	Single acting type					Not available				
Lubrication	Not required (If lubrication is used, apply class 1 Turbine oil [ISOVG32] or equivalent)									
Port size	M5×0.8			Rc1/8		Rc1/4		Rc3/8		

Note : See page 114 for handling instructions and points to be considered.

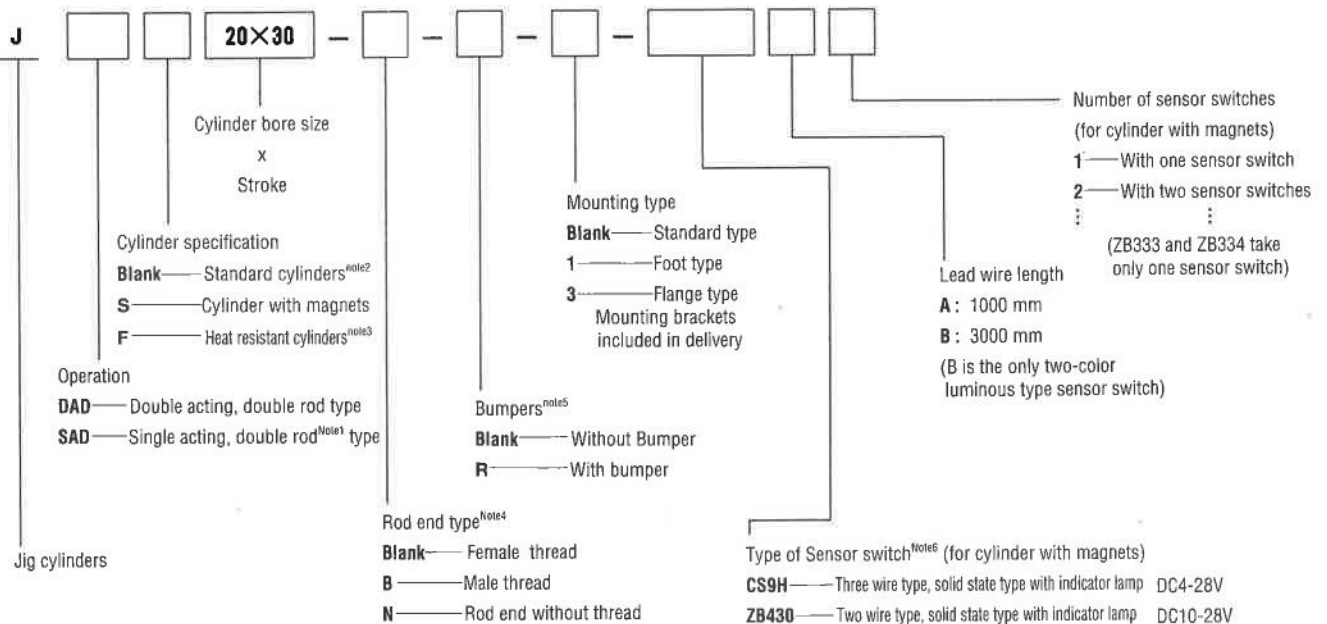
## Cylinder Bore Sizes and Strokes

See page 115 for non-standard strokes

Operation	Cylinder bore size	Standard stroke		Maximum stroke
		Standard cylinders	cylinder with magnets	
Double acting type	12	5, 10, 15	5, 10, 15	50(45)
	16	20, 25, 30	20, 25, 30	50(40)
	20	5, 10, 15	5, 10, 15	60
		20, 25, 30	20, 25, 30	
	25	40, 50	40, 50	100
	32	5, 10, 15	5, 10, 15	
		20, 25, 30	20, 25, 30	
	40	40, 50, 75	40, 50, 75	
		100	100	
	50	10, 15, 20, 25, 30, 40	50, 75, 100	
63	10, 20, 30, 40, 50, 75		100	
80	100			
100				
Single acting type	12			30
	16			
	20	5, 10, 15	5, 10, 15	
	25	20, 25, 30	20, 25, 30	
	32			
	40			
	50	10, 15, 20, 25, 30, 40		

Note: Figures in parenthesis are for cylinders with magnets.  
Remark1 : Stroke tolerance %  
2: Please consult us on cylinders with less than a 10mm stroke.

## Order Example



Note 1 : Same in pull and push types. However, as ø12 and ø16 cylinders have two mounting holes, the mounting hole positions will differ by 90° degrees.  
2 : Sensor switch magnet is not built into standard cylinder.  
3 : Not available on cylinder with magnets or cylinder with bumpers.  
4 : Same specifications for both sides.  
5 : Double acting type available in ø40 - ø100 mm; not available on the heat resistant type.  
6 : See page 616 for further details on sensor switches.

# Weight

## ● Double acting type

9

Cylinder bore size mm	Zero stroke weight	Added weight per 5mm stroke	Added weight of cylinder with magnets	Weight of mounting bracket		Added weight of sensor switch <sup>Note2</sup>		
				Foot bracket	Flange bracket	CS9H□, ZB430□	CS3H□, CS4H□, CS5H□	ZB33□□, ZB13□□
12	41	7.5	2	50	55	30	20	40
16	49.5	10.5	4.5	62	71			
20	66	14	6	84	101			
25	94	19.5	15	104	160			
32	144	24	19	126	186			
40	212	36	52	160	335			
50	352	51	90	220	447			
63	506	59	113	300	591			
80	1037	91.5	187	644	1414			
100	1760	134	400	1172	2606			

Note 1 : Chart depicts standard stroke.

2 : Two lengths of lead wires:

A : 1000mm ; B : 3000mm.

Weight for sensor switch in above chart assumes use of A-type lead wire.

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## ● Single acting type

9

Item stroke mm Cylinder bore size mm	Basic weight							Added weight of cylinder with magnets		Weight of mounting brackets		Added weight of sensor switches <sup>Note2</sup>		
	5	10	15	20	25	30	40	5,10,15 (10-20 for ø50)	5,10,15 (25-40 for ø50)	Foot bracket	Flange bracket	CS9H□, ZB430□	CS3H□, CS4H□, CS5H□	ZB33□□, ZB13□□
12	59.5	67	74.5	109	116.5	124	—	2	9.5	50	55	30	20	40
16	64	74.5	85	131	141.5	152	—	4.5	13	62	71			
20	85	99	113	175	189	203	—	6	20	84	101			
25	123	142	162	230	250	269	—	15	35	104	160			
32	166	190	214	327	351	375	—	19	43	126	186			
40	249	285	321	506	542	578	—	52	88	160	335			
50	—	457	508	559	862	913	1015	90	90	220	447			

Note 1 : Chart depicts standard stroke

2 : Two lengths of lead wire:

A : 1000mm ; B : 3000mm.

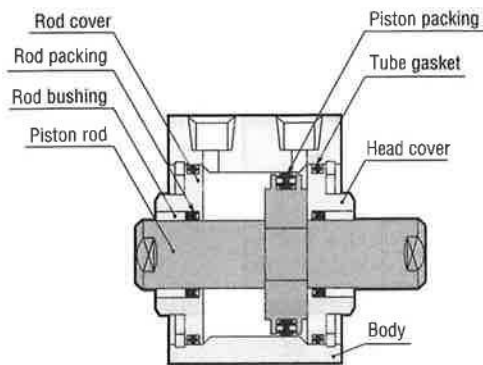
Weight for sensor switch in above chart assumes use of A-type lead wire.

Calculation example: The weight of a double acting type cylinder with magnets with a 25mm bore and 30mm stroke, and two CS3HA sensor switches is:  
 $94 + (19.5 \times 5) + 15 + (20 \times 2) = 246.5g$

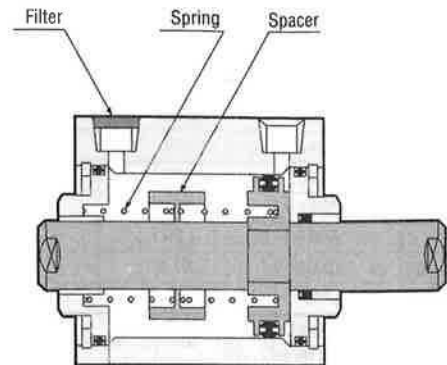


## Inner Construction and Major Parts

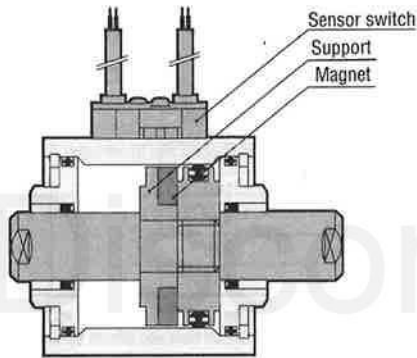
### ● Double acting, double rod type (JDAD)



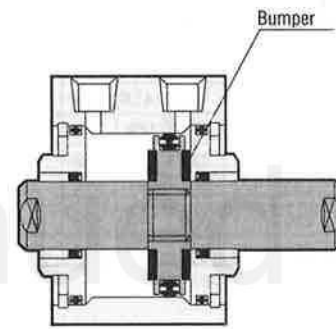
### ● Single acting, double rod type (JSAD)



### ● Cylinder with magnets (Diagram depicts double acting type)



### ● With bumper



## Materials of Major Parts

Item	12	16	20	25	32	40	50	63	80	100
Body	Aluminum alloy									
Piston	Aluminum alloy Note									
Piston	Stainless steel					Hard steel (chrome plated)				
Packing	Synthetic rubber									
Rod bushing	Phosphor bronze	Double acting type: Oil permeated bronze; Single acting type: Dry bearing								
Rod cover	Phosphor bronze	Aluminum alloy								
Head cover	Aluminum alloy									
Snap ring	Hard steel (nickel plated)									
Spring	Piano wire							—		
Spacer	Aluminum alloy							—		
Filter	Porous aluminum							—		
Bumper	—				Synthetic rubber					
Magnet	Resinous magnet									
Support	Aluminum alloy (anti-rust treatment)									

Note : Stainless steel for  $\phi 20$  and  $\phi 25$  of single acting type.

## List of packing

Item	Rod packing		Piston packing		Tube gasket
	Double acting type	Single acting type	Double acting type	Single acting type	Double acting type
Operation	Double acting type	Single acting type	Double acting type	Single acting type	Double acting type
Number	2 (1)	1	1	1	2 (1) <sup>Note2</sup>
12	MYR-6	PSD-12	PSD-12	PSD-12	S-14
16	MYR-6	PSD-16	PSD-16	PSD-16	1.5×14.5
20	MYR-8	PSD-20	MYA-16	MYA-16	1.5×22.5
25	MYR-10	PSD-25	MYA-21	MYA-21	1.5×25.5
32	MYR-12	PSD-32	PSD-32	PSD-32	1.5×31.5
40	MYR-16	PSD-40	PSD-40	PSD-40	1.5×39.5
50	MYR-20	PSD-50	PSD-50	PSD-50	1.5×49.5
63	MYR-20	PSD-63	—	—	1.5×62.5
80	PNY-25	PSD-80	—	—	1.5×79.5
100	PNY-32	PSD-100	—	—	2×98.5

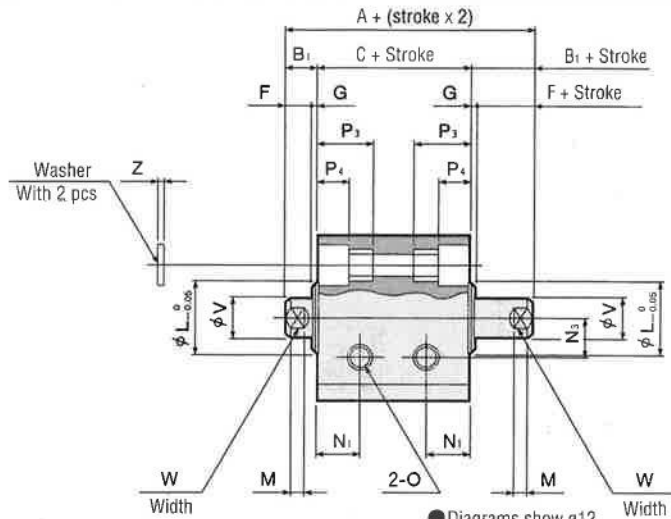
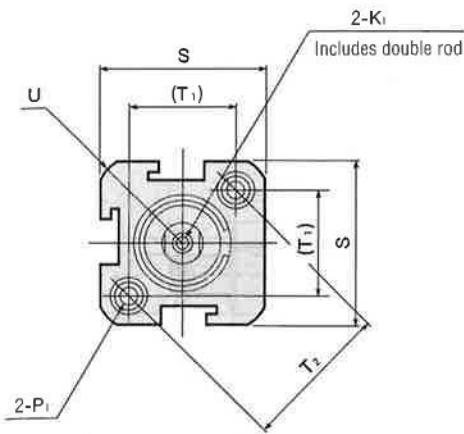
Note 1 : The figure in parenthesis is for single acting type.

2 : The figure in parenthesis is for single acting type  $\phi 12$  and  $\phi 16$ .

# Dimensions of Double Acting, Double Rod Type (JDAD,JDADS)

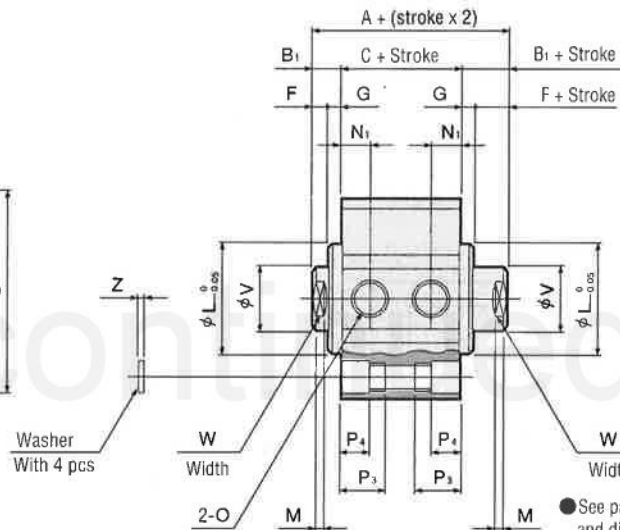
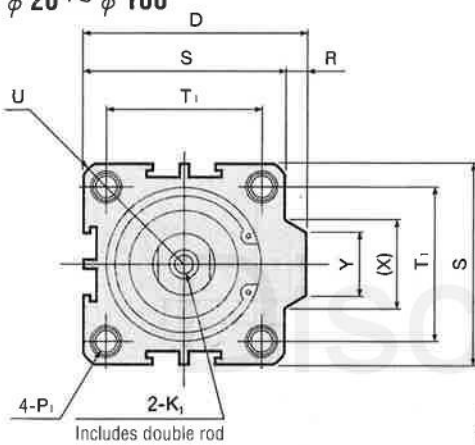
(Unit : mm)

●  $\phi 12, \phi 16$



● Diagrams show  $\phi 12$   
 ● See page 115 for manufacturing method and dimensions of non-standard strokes.

●  $\phi 20 \sim \phi 100$



● See page 115 for manufacturing method and dimensions of non-standard strokes.

Type	Standard cylinder (JDAD)	Cylinder with magnets (JDADS)															
Bore size	Symbol	A	B <sub>1</sub>	C	A	B <sub>1</sub>	C	D	F	G	K <sub>1</sub>		L	M	N <sub>1</sub>	N <sub>3</sub>	O
12		27	5	17	32	5	22	—	4	1	M3×0.5	Depth 6	11	3	6.5	6	M5×0.8
16		29.5	5.5	18.5	39.5	5.5	28.5	—	4	1.5	M3×0.5	Depth 6	11	3	7	6.5	M5×0.8
20		30.5	5.5	19.5	40.5	5.5	29.5	36	4	1.5	M4×0.7	Depth 8	15	3	7.5	—	M5×0.8
25		33	6	21	43	6	31	42	4	2	M5×0.8	Depth 10	17	3	8	—	M5×0.8
32		38.5	7	24.5	48.5	7	34.5	50	4	3	M6×1	Depth 12	22	3	9 [7]	—	Rc1/8
40		40	7	26	50	7	36	58.5	4	3	M8×1.25	Depth 12	28	3	10 [7.3]	—	Rc1/8
50		46	9	28	56	9	38	71.5	5	4	M10×1.5	Depth 15	38	3	10	—	Rc1/4
63		50	9	32	60	9	42	84.5	5	4	M10×1.5	Depth 15	40	3	12	—	Rc1/4
80		68	11	46	78	11	56	104	6	5	M14×1.5	Depth 20	45	4	12.5	—	Rc3/8
100		80	12	56	90	12	66	124	7	5	M18×1.5	Depth 20	55	4	17	—	Rc3/8

Bore size	Symbol	P <sub>1</sub>										P <sub>3</sub>	P <sub>4</sub>	R	S	T <sub>1</sub>	T <sub>2</sub>	U	V	W	X	Y	Z
12		$\phi 3.5$ (thru hole) spot facing $\phi 3.5$ (both sides) and M5×0.8 (both sides)										9.5	4.5	—	25	16.2	23	R16	6	5	—	—	1
16		$\phi 3.5$ (thru hole) spot facing $\phi 3.5$ (both sides) and M5×0.8 (both sides)										9.5	4.5	—	29	19.8	28	R19	6	5	—	—	1
20		$\phi 3.5$ (thru hole) spot facing $\phi 3.5$ (both sides) and M5×0.8 (both sides)										9.5	4.5	2	34	24	—	R22	8	6	12.3	10	1
25		$\phi 4.6$ (thru hole) spot facing $\phi 8$ (both sides) and M6×1 (both sides)										11.5	5.5	2	40	28	—	R25	10	8	12.3	10	1
32		$\phi 4.6$ (thru hole) spot facing $\phi 8$ (both sides) and M6×1 (both sides)										11.5	5.5	6	44	34	—	R29.5	12	10	22.9	16	1
40		$\phi 5.7$ (thru hole) spot facing $\phi 9.5$ (both sides) and M8×1.25 (both sides)										15.5	7.5	6.5	52	40	—	R35	16	14	23.5	16	1.6
50		$\phi 6.8$ (thru hole) spot facing $\phi 11$ (both sides) and M8×1.25 (both sides)										16.5	8.5	9.5	62	48	—	R41	20	17	31	20	1.6
63		$\phi 6.8$ (thru hole) spot facing $\phi 11$ (both sides) and M8×1.25 (both sides)										16.5	8.5	9.5	75	60	—	R50	20	17	31	20	1.6
80		$\phi 9.2$ (thru hole) spot facing $\phi 14$ (both sides) and M12×1.75 (both sides)										22.5	10.5	10	94	74	—	R62	25	22	37.5	26	1.6
100		$\phi 11.3$ (thru hole) spot facing $\phi 17.5$ (both sides) and M14×2 (both sides)										27	13	10	114	90	—	R75	32	27	37.5	26	2

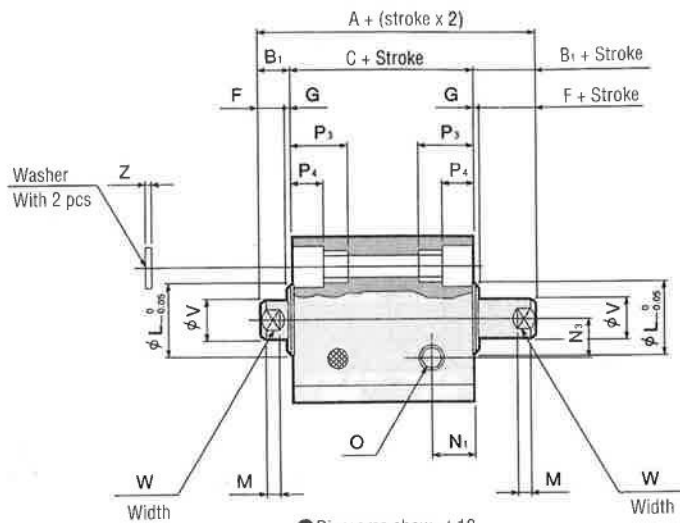
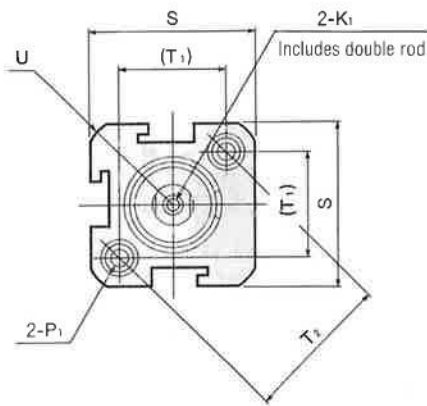
Note: The figures in the brackets are for 5mm stroke.

● See page 90 for male rod thread dimensions. See page 107 for sensor switch dimensions.

# Dimensions of Single Acting, Double Rod Type (JSAD,JSADS)

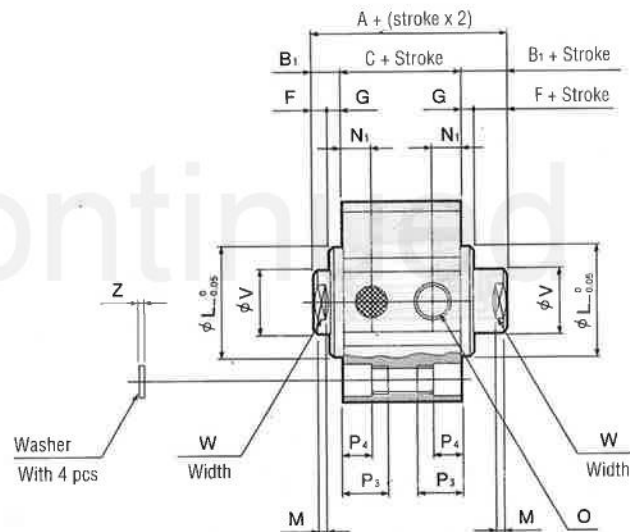
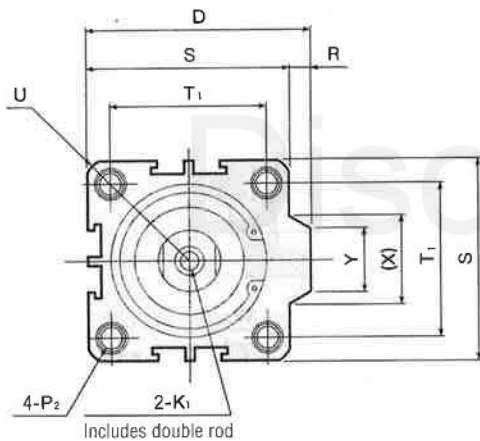
(Unit : mm)

●  $\phi 12$  ,  $\phi 16$



- Diagrams show  $\phi 12$
- See page 115 for manufacturing method and dimensions of non-standard strokes.

●  $\phi 20 \sim \phi 50$



- See page 115 for manufacturing method and dimensions of non-standard strokes.

Type	Standard cylinder (JSAD)						Cylinder with magnets (JSADS)						D	F	G	K <sub>1</sub>	L	M	
	5~15(5-20 for $\phi 50$ )			16~30(21-40 for $\phi 50$ )			5~15(10-20 for $\phi 50$ )			16~30(21-40 for $\phi 50$ )									
Stroke	A	B <sub>1</sub>	C	A	B <sub>1</sub>	C	A	B <sub>1</sub>	C	A	B <sub>1</sub>	C	A	B <sub>1</sub>	C				
12	32	5	22	42	5	32	37	5	27	47	5	37	—	4	1	M3×0.5	Depth 6	11	3
16	34.5	5.5	23.5	44.5	5.5	33.5	39.5	5.5	28.5	49.5	5.5	38.5	—	4	1.5	M3×0.5	Depth 6	11	3
20	30.5	5.5	19.5	45.5	5.5	34.5	40.5	5.5	29.5	55.5	5.5	44.5	36	4	1.5	M4×0.7	Depth 8	15	3
25	33	6	21	48	6	36	43	6	31	58	6	46	42	4	2	M5×0.8	Depth 10	17	3
32	38.5	7	24.5	53.5	7	39.5	48.5	7	34.5	63.5	7	49.5	50	4	3	M6×1	Depth 12	22	3
40	40	7	26	55	7	41	50	7	36	65	7	51	58.5	4	3	M8×1.25	Depth 12	28	3
50	46	9	28	61	9	43	56	9	38	71	9	53	71.5	5	4	M10×1.5	Depth 15	38	3

Bore size	Symbol	N <sub>1</sub>	N <sub>2</sub>	O	P <sub>1</sub>				P <sub>3</sub>	P <sub>4</sub>	R	S	T <sub>1</sub>	T <sub>2</sub>	U	V	W	X	Y	Z		
					$\phi 3.5$ (thru hole)	spot facing $\phi 6.5$ (both sides) and M5×0.8 (both sides)	$\phi 3.5$ (thru hole)	spot facing $\phi 6.5$ (both sides) and M5×0.8 (both sides)													$\phi 3.5$ (thru hole)	spot facing $\phi 6.5$ (both sides) and M5×0.8 (both sides)
12		6.5	6	M5×0.8	$\phi 3.5$ (thru hole)	spot facing $\phi 6.5$ (both sides) and M5×0.8 (both sides)	$\phi 3.5$ (thru hole)	spot facing $\phi 6.5$ (both sides) and M5×0.8 (both sides)	$\phi 3.5$ (thru hole)	spot facing $\phi 6.5$ (both sides) and M5×0.8 (both sides)	9.5	4.5	—	25	16.2	23	R16	6	5	—	—	1
16		7	6.5	M5×0.8	$\phi 3.5$ (thru hole)	spot facing $\phi 6.5$ (both sides) and M5×0.8 (both sides)	$\phi 3.5$ (thru hole)	spot facing $\phi 6.5$ (both sides) and M5×0.8 (both sides)	$\phi 3.5$ (thru hole)	spot facing $\phi 6.5$ (both sides) and M5×0.8 (both sides)	9.5	4.5	—	29	19.8	28	R19	6	5	—	—	1
20		7.5	—	M5×0.8	$\phi 3.5$ (thru hole)	spot facing $\phi 6.5$ (both sides) and M5×0.8 (both sides)	$\phi 3.5$ (thru hole)	spot facing $\phi 6.5$ (both sides) and M5×0.8 (both sides)	$\phi 3.5$ (thru hole)	spot facing $\phi 6.5$ (both sides) and M5×0.8 (both sides)	9.5	4.5	2	34	24	—	R22	8	6	12.3	10	1
25		8	—	M5×0.8	$\phi 4.6$ (thru hole)	spot facing $\phi 8$ (both sides) and M6×1 (both sides)	$\phi 4.6$ (thru hole)	spot facing $\phi 8$ (both sides) and M6×1 (both sides)	$\phi 4.6$ (thru hole)	spot facing $\phi 8$ (both sides) and M6×1 (both sides)	11.5	5.5	2	40	28	—	R25	10	8	12.3	10	1
32		9 [7]	—	Rc1/8	$\phi 4.6$ (thru hole)	spot facing $\phi 8$ (both sides) and M6×1 (both sides)	$\phi 4.6$ (thru hole)	spot facing $\phi 8$ (both sides) and M6×1 (both sides)	$\phi 4.6$ (thru hole)	spot facing $\phi 8$ (both sides) and M6×1 (both sides)	11.5	5.5	6	44	34	—	R29.5	12	10	22.9	16	1
40		10 [7,3]	—	Rc1/8	$\phi 5.7$ (thru hole)	spot facing $\phi 9.5$ (both sides) and M8×1.25(both sides)	$\phi 5.7$ (thru hole)	spot facing $\phi 9.5$ (both sides) and M8×1.25(both sides)	$\phi 5.7$ (thru hole)	spot facing $\phi 9.5$ (both sides) and M8×1.25(both sides)	15.5	7.5	6.5	52	40	—	R35	16	14	23.5	16	1.6
50		10	—	Rc1/4	$\phi 6.8$ (thru hole)	spot facing $\phi 11$ (both sides) and M8×1.25(both sides)	$\phi 6.8$ (thru hole)	spot facing $\phi 11$ (both sides) and M8×1.25(both sides)	$\phi 6.8$ (thru hole)	spot facing $\phi 11$ (both sides) and M8×1.25(both sides)	16.5	8.5	9.5	62	48	—	R41	20	17	31	20	1.6

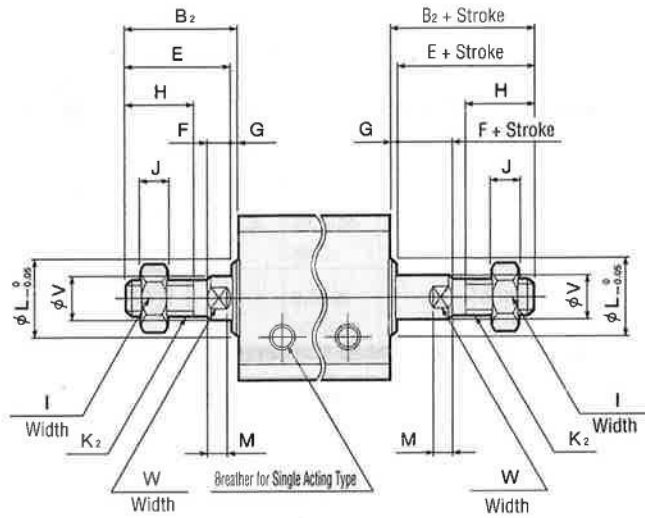
Note: The figures in the brackets are for 5mm stroke.

● See page 90 for male rod thread dimensions. See page 107 for sensor switch dimensions.

# Dimensions of Male Rod Thread Type

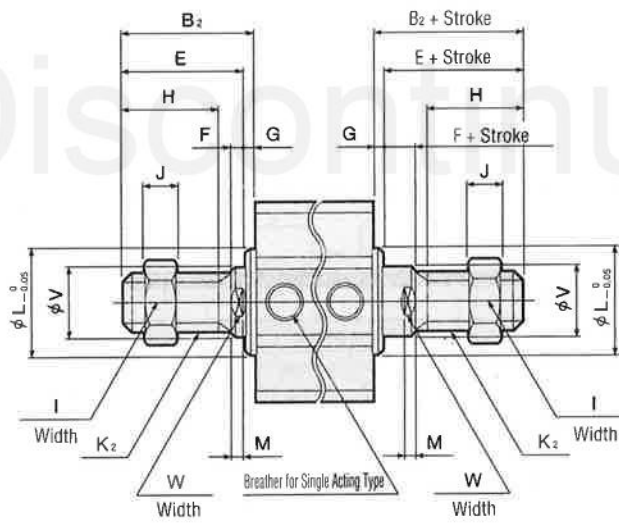
(Unit : mm)

●  $\phi 12, \phi 16$



Plain rod end (-N) type: Dimensions are identical to female thread; Not available on female thread.

●  $\phi 20 \sim \phi 100$  (thru  $\phi 50$  for single acting type)



Plain rod end (-N) type: Dimensions are identical to female thread; Not available on female thread.

Bore size	Symbol	$B_2$	$E$	$F$	$G$	$H$	$I$	$J$	$K_1$	$L$	$M$	$V$	$W$
12		17	16	4	1	10	8	4	M5 $\times$ 0.8	11	3	6	5
16		17.5	16	4	1.5	10	8	4	M5 $\times$ 0.8	11	3	6	5
20		20.5	19	4	1.5	13	10	5	M6 $\times$ 1	15	3	8	6
25		23	21	4	2	15	12	5	M8 $\times$ 1	17	3	10	8
32		25	22	4	3	15	14	6	M10 $\times$ 1.25	22	3	12	10
40		35	32	4	3	25	19	8	M14 $\times$ 1.5	28	3	16	14
50		37	33	5	4	25	27	11	M18 $\times$ 1.5	38	3	20	17
63		37	33	5	4	25	27	11	M18 $\times$ 1.5	40	3	20	17
80		44	39	6	5	30	32	13	M22 $\times$ 1.5	45	4	25	22
100		50	45	7	5	35	36	14	M26 $\times$ 1.5	55	4	32	27



# Cylinder Bore Size and Stroke

See 115 for non-standard strokes.

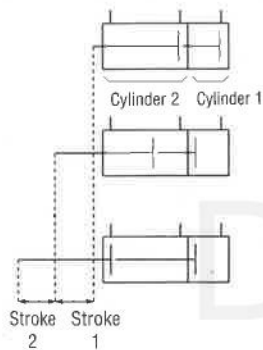
Operation	Stroke1 (standard)	mm										Maximum stroke (Stroke 1 + Stroke 2)
	Cylinder bore size	5 <sup>Note2</sup>	10	15	20	25	30	40	50	75	100	
Double acting type JDAT JDATS	12,16	0,5,10 15,20,25	0,5,10 15,20	0,5,10 15	0,5,10	0,5	0	—	—	—	—	30
	20,25,32,40	0,5,10 15,20,25 35,45	0,5,10 15,20 30,40	0,5,10 15,25,35	0,5,10 20,30	0,5,15 25	0,10,20	0, 10	0	—	—	50
	50	—	0,5,10 15,20,30 40,65,90	0,5,10 15,25,35 60,85	0,5 20,30,55 80	0,5,10 15,25,50 75	0,10,20 45,70	0,10,35 60	0,25,50	0,25	0	100
	63,80,100	—	0,5,10 20,30,40 65,90	—	0,10,20 30,55,80	—	0,10,20 45,70	0,10,35 60	0,25,50	0,25	0	100
Single acting type JSAT JSATS	12,16,20 25,32,40	0,5,10	0,5	0	—	—	—	—	—	—	—	15
	50	—	0,5,10	0,5	0	—	—	—	—	—	—	20

Note 1 : The figures in the above chart are stroke 2 (standard) corresponding to stroke 1 (standard)

2 : Not available for cylinder with magnets. Please consult us for cylinders with magnets with less than 10mm stroke.

Remark : Stroke tolerance  $^{+1}_0$

### ● How to specify stroke 1 and stroke 2



Stroke 1 = Cylinder 1 Stroke  
Stroke 2 = Cylinder 2 Stroke - Cylinder 1 Stroke

Discontinued

## Weight

Cylinder bore size mm	Zero stroke weight		Added weight				Weight of mounting brackets	Added weight of sensor switches (including holder) <sup>Note2</sup>		
	Double acting type	Single acting-push type	Added weight per 5mm stroke 1	Added weight per 5mm stroke 2	Added weight of cylinder with magnets		Flange bracket	CS9H□, ZB430□	CS3H□,CS4H□, CS5H□	ZB33□□, ZB13□□
					Double acting type	Single acting push type				
12	75	94	17.5	6.5	6	10.5	30	20	40	
16	96	99	24	9	10	18				
20	128	132	31.5	12	13	24				
25	181	190	45	16.5	33	47				
32	273	256	55.5	19.5	49	66				
40	402	379	85	28	110	134				
50	648	568	122	38	195	190				
63	914	—	137.5	46.5	259	—				
80	1740	—	216.5	72	389	—				
100	3142	—	321	102	712	—				

Note 1: The above chart shows standard strokes

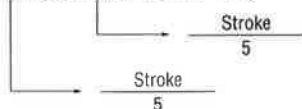
2: Two lengths of lead wires:

A: 1000mm; B: 3000mm

Sensor switch weight in above chart assumes use of A-type lead length.

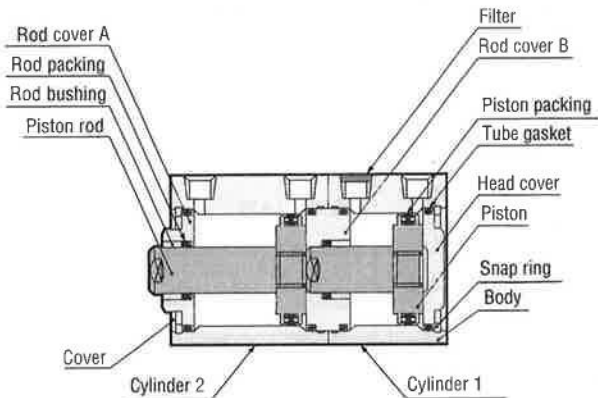
Calculation example: The weight of a double acting cylinder with magnets with a 25mm bore size, 30mm stroke 1 and a 10mm stroke 2, and three CS3H sensor switches is

$$181 + (45 \times 6) + (16.5 \times 2) + 33 + (20 \times 3) = 578g$$

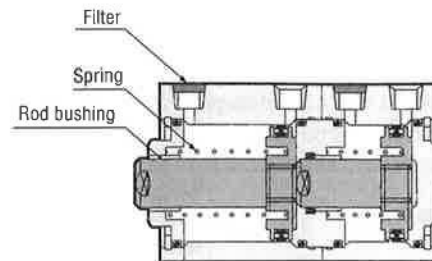


## Inner Construction and Major Parts

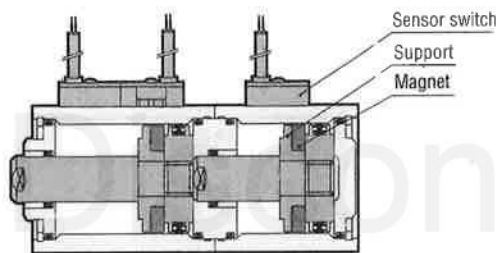
### ● Double Acting Type (JDAT)



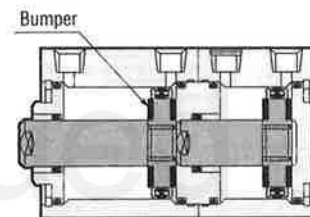
### ● Single acting push type (JSAT)



### ● Cylinder with magnets (Diagram shows double acting type)



### ● With bumper



## Materials of Major Parts

Item	Cylinder bore size mm	12	16	20	25	32	40	50	63	80	100		
Body		Aluminum alloy											
Piston		Aluminum alloy <sup>Note</sup>											
Piston rod		Stainless steel				Hard steel (chrome plated)							
Packing		Synthetic rubber											
Rod bushing		Phosphorous bronze	Double acting type : Oil permeated bronze							Single acting type : Dry bearing			
Rod cove		Phosphorous bronze	Aluminum alloy										
Head cover		Aluminum alloy											
Snap ring		Hard steel (nickel plated)											
Spring		Piano wire							—				
Filter		Porous aluminum											
Bumper		—							Synthetic rubber				
Magnet		Resinous magnet											
Support		Aluminum alloy (anti-rust treatment)											

Note : Stainless steel for  $\phi$  20 and  $\phi$  25 single acting type

## List of packing

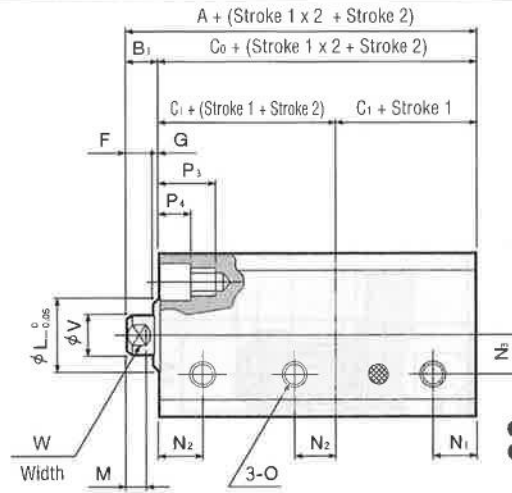
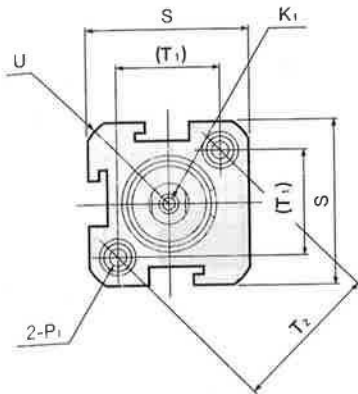
Item	Rod packing		Piston packing		Tube gasket	
	Double acting type	Single acting type	Double acting type	Single acting type	Double acting type Single acting type	
Operation						
Cylinder bore size mm	Number	2	1	2	2	4 (2) <sup>Note</sup>
12		MYR-6	MYR-6	PSD-12	PSD-12	S-14
18		MYR-6	MYR-6	PSD-16	MYA-12	1.5×14.5
20		MYR-8	MYR-8	PSD-20	MYA-16	1.5×22.5
25		MYR-10	MYR-10	PSD-25	MYA-21	1.5×25.5
32		MYR-12	MYR-12	PSD-32	PSD-32	1.5×31.5
40		MYR-16	MYR-16	PSD-40	PSD-40	1.5×39.5
50		MYR-20	MYR-20	PSD-50	PSD-50	1.5×49.5
63		MYR-20	MYR-20	PSD-63	PSD-63	1.5×62.5
80		PNY-25	PNY-25	PSD-80	PSD-80	1.5×79.5
100		PNY-32	PNY-32	PSD-100	PSD-100	2×98.5

Note : The figure in parenthesis is for single acting  $\phi$  12 and  $\phi$  16.

# Dimensions of Double Acting Tandem Type (JDAT, JDATS)

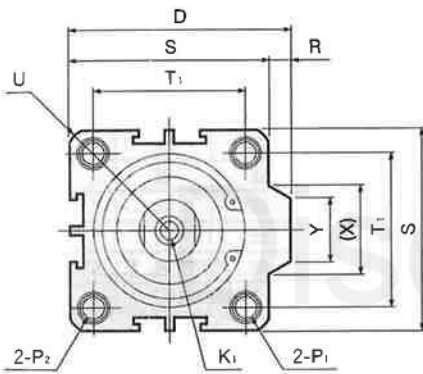
(unit : mm)

●  $\phi 12, \phi 16$

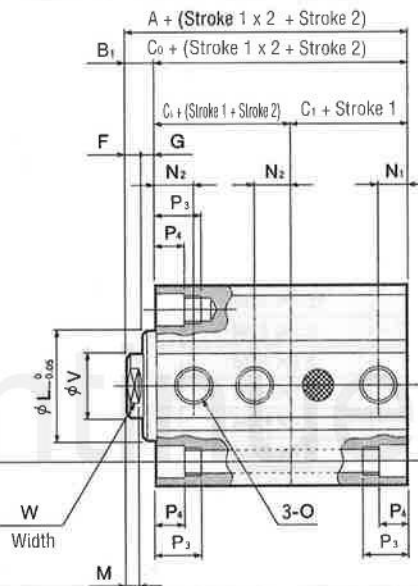


● Diagram shows  $\phi 12$ .  
● See page 115 for manufacturing method and dimensions of non-standard strokes.

●  $\phi 20 \sim \phi 100$



Washer with 2pcs



● See page 115 for manufacturing method and dimensions of non-standard strokes.

Type	Standard Cylinders (JDAT)				cylinder with magnets (JDATS)														
Bore size	Symbol	A	B <sub>1</sub>	C <sub>0</sub>	C <sub>1</sub>	A	B <sub>1</sub>	C <sub>0</sub>	C <sub>1</sub>	D	F	G	K <sub>1</sub>	L	M	N <sub>1</sub> <sup>Note1</sup>	N <sub>2</sub> <sup>Note2</sup>	N <sub>3</sub>	O
12		39	5	34	17	49	5	44	22	—	4	1	M3 × 0.5 depth 6	11	3	6.5	6.5	6	M5 × 0.8
16		42.5	5.5	37	18.5	62.5	5.5	57	28.5	—	4	1.5	M3 × 0.5 depth 6	11	3	7	7	6.5	M5 × 0.8
20		44.5	5.5	39	19.5	64.5	5.5	59	29.5	36	4	1.5	M4 × 0.7 depth 8	15	3	7.5	7.5	—	M5 × 0.8
25		48	6	42	21	68	6	62	31	42	4	2	M5 × 0.8 depth 10	17	3	8	8	—	M5 × 0.8
32		56	7	49	24.5	76	7	69	34.5	50	4	3	M6 × 1 depth 12	22	3	9 [7]	9 [7]	—	Rc1/8
40		59	7	52	26	79	7	72	36	58.5	4	3	M8 × 1.25 depth 12	28	3	10 [7.3]	10 [7.3]	—	Rc1/8
50		65	9	56	28	85	9	76	38	71.5	5	4	M10 × 1.5 depth 15	38	3	10	10	—	Rc1/4
63		73	9	64	32	93	9	84	42	84.5	5	4	M10 × 1.5 depth 15	40	3	12	12	—	Rc1/4
80		93	11	82	41	113	11	102	51	104	6	5	M14 × 1.5 depth 20	45	4	12.5	12.5	—	Rc3/8
100		114	12	102	51	134	12	122	61	124	7	5	M18 × 1.5 depth 20	55	4	17	17	—	Rc3/8

Bore size	Symbol	P <sub>1</sub>	P <sub>2</sub>	P <sub>3</sub>	P <sub>4</sub>	R	S	T <sub>1</sub>	T <sub>2</sub>	U	V	W	X	Y	Z
12		—	M5 × 0.8 and Spot facing $\phi 6.5$	9.5	4.5	—	25	16.2	23	R16	6	5	—	—	—
16		—	M5 × 0.8 and Spot facing $\phi 6.5$	9.5	4.5	—	29	19.8	28	R19	6	5	—	—	—
20		$\phi 3.5$ (thru hole) spot facing $\phi 6.5$ (both sides) and M5 × 0.8 (both sides)	M5 × 0.8 and Spot facing $\phi 6.5$	9.5	4.5	2	34	24	—	R22	8	6	12.3	10	1
25		$\phi 4.6$ (thru hole) spot facing $\phi 8$ (both sides) and M6 × 1 (both sides)	M6 × 1 and Spot facing $\phi 8$	11.5	5.5	2	40	28	—	R25	10	8	12.3	10	1
32		$\phi 4.6$ (thru hole) spot facing $\phi 8$ (both sides) and M6 × 1 (both sides)	M6 × 1 and Spot facing $\phi 8$	11.5	5.5	6	44	34	—	R29.5	12	10	22.9	16	1
40		$\phi 5.7$ (thru hole) spot facing $\phi 9.5$ (both sides) and M8 × 1.25 (both sides)	M8 × 1.25 and Spot facing $\phi 9.5$	15.5	7.5	6.5	52	40	—	R35	16	14	23.5	16	1.6
50		$\phi 6.8$ (thru hole) spot facing $\phi 11$ (both sides) and M8 × 1.25 (both sides)	M8 × 1.25 and Spot facing $\phi 11$	16.5	8.5	9.5	62	48	—	R41	20	17	31	20	1.6
63		$\phi 6.8$ (thru hole) spot facing $\phi 11$ (both sides) and M8 × 1.25 (both sides)	M8 × 1.25 and Spot facing $\phi 11$	16.5	8.5	9.5	75	60	—	R50	20	17	31	20	1.6
80		$\phi 9.2$ (thru hole) spot facing $\phi 14$ (both sides) and M12 × 1.75 (both sides)	M12 × 1.75 and Spot facing $\phi 14$	22.5	10.5	10	94	74	—	R62	25	22	37.5	26	1.6
100		$\phi 11.3$ (thru hole) spot facing $\phi 17.5$ (both sides) and M14 × 2 (both sides)	M14 × 2 and Spot facing $\phi 17.5$	27	13	10	114	90	—	R75	32	27	37.5	26	2

Note 1 : The figure in brackets is for a 5mm stroke 1

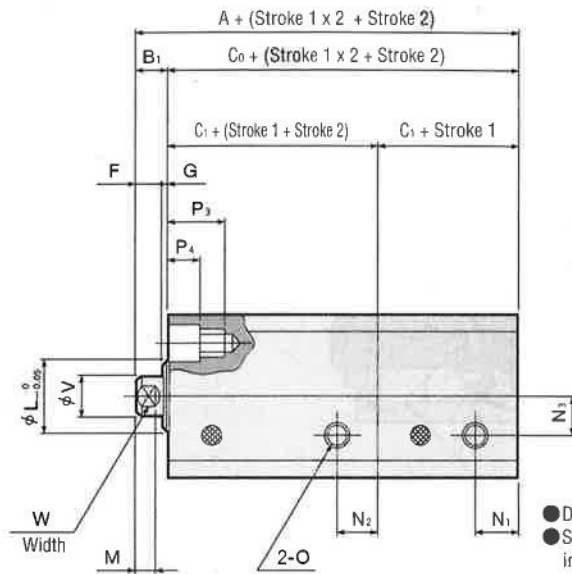
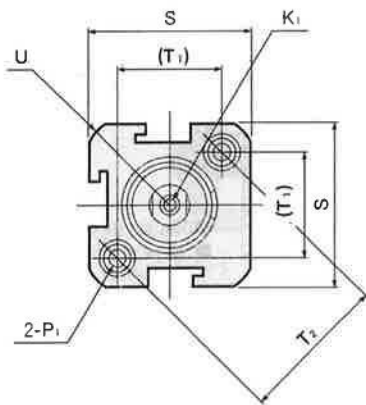
2 : The figure in brackets is for a 5mm stroke 1 and 0mm stroke 2.

See page 96 for male thread type dimensions and page 107 for sensor switch dimensions.

# Dimensions of Single Acting-Push Tandem Type(JSAT, JSATS)

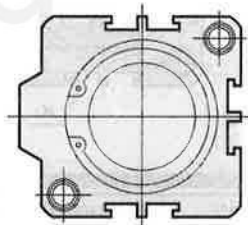
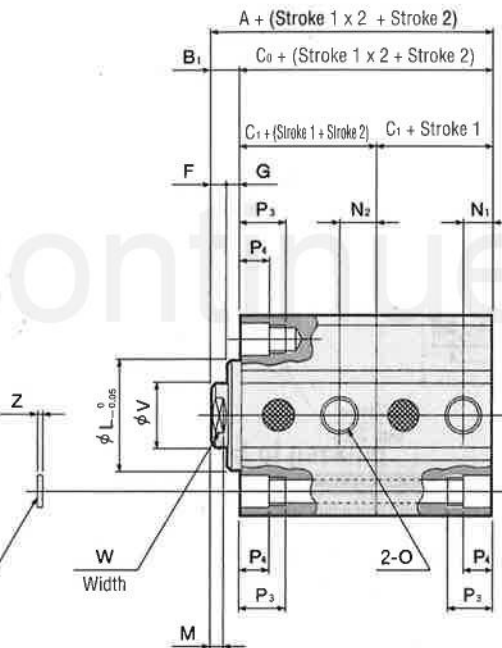
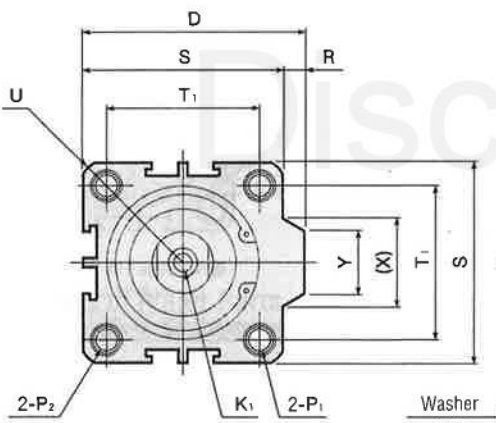
(unit : mm)

## ● $\phi 12, \phi 16$



● Diagram shows  $\phi 12$ .  
 ● See page 115 for manufacturing method and dimensions of non-standard strokes.

## ● $\phi 20 \sim \phi 50$



● See page 115 for manufacturing method and dimensions of non-standard strokes.

Type	Symbol	Standard Cylinders (JSAT)				cylinder with magnets (JSATS)				D	F	G	K <sub>1</sub>	L	M	N <sub>1</sub> <sup>Note1</sup>	N <sub>2</sub> <sup>Note2</sup>	N <sub>3</sub>	O
		A	B <sub>1</sub>	C <sub>0</sub>	C <sub>1</sub>	A	B <sub>1</sub>	C <sub>0</sub>	C <sub>1</sub>										
12		49	5	44	22	59	5	54	27	—	4	1	M3 × 0.5 depth 6	11	3	6.5	6.5	6	M5 × 0.8
16		52.5	5.5	47	23.5	62.5	5.5	57	28.5	—	4	1.5	M3 × 0.5 depth 6	11	3	7	7	6.5	M5 × 0.8
20		44.5	5.5	39	19.5	64.5	5.5	59	29.5	36	4	1.5	M4 × 0.7 depth 8	15	3	7.5	7.5	—	M5 × 0.8
25		48	6	42	21	68	6	62	31	42	4	2	M5 × 0.8 depth 10	17	3	8	8	—	M5 × 0.8
32		56	7	49	24.5	76	7	69	34.5	50	4	3	M6 × 1 depth 12	22	3	9 [7]	9 [7]	—	Rc1/8
40		59	7	52	26	79	7	72	36	58.5	4	3	M8 × 1.25 depth 12	28	3	10 [7.3]	10 [7.3]	—	Rc1/8
50		65	9	56	28	85	9	76	38	71.5	5	4	M10 × 1.5 depth 15	38	3	10	10	—	Rc1/4

Bore size	Symbol	P <sub>1</sub>	P <sub>2</sub>	P <sub>3</sub>	P <sub>4</sub>	R	S	T <sub>1</sub>	T <sub>2</sub>	U	V	W	X	Y	Z
12		—	M5 × 0.8 and Spot facing $\phi 6.5$	9.5	4.5	—	25	16.2	23	R16	6	5	—	—	—
16		—	M5 × 0.8 and Spot facing $\phi 6.5$	9.5	4.5	—	29	19.8	28	R19	6	5	—	—	—
20		$\phi 3.5$ (thru hole) spot facing $\phi 6.5$ (both sides) and M5 × 0.8 (both sides)	M5 × 0.8 and Spot facing $\phi 6.5$	9.5	4.5	2	34	24	—	R22	8	6	12.3	10	1
25		$\phi 4.6$ (thru hole) spot facing $\phi 8$ (both sides) and M6 × 1 (both sides)	M6 × 1 and Spot facing $\phi 8$	11.5	5.5	2	40	28	—	R25	10	8	12.3	10	1
32		$\phi 4.6$ (thru hole) spot facing $\phi 8$ (both sides) and M6 × 1 (both sides)	M6 × 1 and Spot facing $\phi 8$	11.5	5.5	6	44	34	—	R29.5	12	10	22.9	16	1
40		$\phi 5.7$ (thru hole) spot facing $\phi 9.5$ (both sides) and M8 × 1.25(both sides)	M8 × 1.25 and Spot facing $\phi 9.5$	15.5	7.5	6.5	52	40	—	R35	16	14	23.5	16	1.6
50		$\phi 6.8$ (thru hole) spot facing $\phi 11$ (both sides) and M8 × 1.25(both sides)	M8 × 1.25 and Spot facing $\phi 11$	16.5	8.5	9.5	62	48	—	R41	20	17	31	20	1.6

Note 1 : The figure in brackets is for a 5mm stroke 1

2 : The figure in brackets is for a 5mm stroke 1 and 0mm stroke 2.

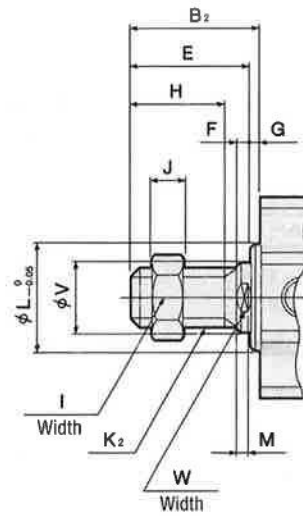
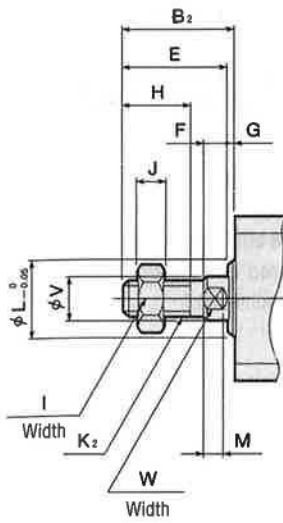
See page 96 for male thread type dimensions and page 107 for sensor switch dimensions.

# Dimensions of Male Thread Type

(unit : mm)

●  $\phi 12, \phi 16$

●  $\phi 12 \sim \phi 100$  (thru 50 for single acting type)



Rod end without thread type : Dimensions are identical to female thread type.  
However, not available on female thread.

Bore size	Symbol	$B_2$	E	F	G	H	I	J	K <sub>2</sub>	L	M	V	W
12		17	16	4	1	10	8	4	M5 × 0.8	11	3	6	5
16		17.5	16	4	1.5	10	8	4	M5 × 0.8	11	3	6	5
20		20.5	19	4	1.5	13	10	5	M6 × 1	15	3	8	6
25		23	21	4	2	15	12	5	M8 × 1	17	3	10	8
32		25	22	4	3	15	14	6	M10 × 1.25	22	3	12	10
40		35	32	4	3	25	19	8	M14 × 1.5	28	3	16	14
50		37	33	5	4	25	27	11	M18 × 1.5	38	3	20	17
63		37	33	5	4	25	27	11	M18 × 1.5	40	3	20	17
80		44	39	6	5	30	32	13	M22 × 1.5	45	4	25	22
100		50	45	7	5	35	36	14	M26 × 1.5	55	4	32	27

# JIG DUAL STROKE CYLINDERS

Double Acting Type, Single Acting-Push Type, Single Acting-Pull Type



## Symbols

● Double Acting Type (JDAW) ● Single Acting-Push Type (JSAW) ● Single Acting-Pull Type (JTAW)



## Specifications

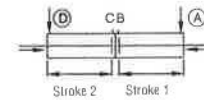
Item	Cylinder bore size mm	12	16	20	25	32	40	50	63	80	100
Operation		Double acting type, Single acting type						Double acting type			
Fluid		Air									
Operating pressure range MPa(kgf/cm <sup>2</sup> )		0.2~0.7 {2.0~7.1}		0.15~0.7{1.5~7.1}				0.1~0.7{1~7.1}			
Proof pressure MPa(kgf/cm <sup>2</sup> )		1.03{10.5}									
Operating temperature range °C		0~60(120 °C for heat resistant type <sup>Note</sup> )									
Operating speed range mm/s	Double acting type	30~500						30~350	30~250		
	Single acting type	100~500									
Bumper	Double acting type	Not available				Rubber bumper (Optional)					
	Single acting type	Not available									
Lubrication		Not required (If lubrication is used, apply class 1 Turbine oil [ISOVG32] or equivalent)									
Port size		M5×0.8			Rc1/8		Rc1/4		Rc3/8		

Remark: See page 114 for handling instructions and points to be considered

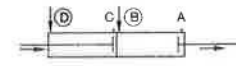
Note: Please consult us for heat resistant type

## Operation of Dual Stroke Cylinders

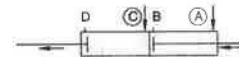
The dual stroke cylinder is constructed of two cylinders connected "back to back." When mounted onto the cylinder body, both strokes can be controlled separately. When mounted onto one rod end, a two-step or a three-step stroke can be achieved.



Apply air to the A and D-ports, both strokes 1 and 2 are pulled.



Apply air to the B and D ports, rod operates one stroke.



Apply air to the A and C ports, rod operates two strokes.



Apply air to the B and C ports, rod operates one and two strokes.

## Cylinder Bore Size and Strokes

See page 115 for non-standard strokes

Operation	Cylinder bore size	Standard stroke		Maximum stroke
		Standard cylinders	cylinder with magnets	
Double acting type	12	5, 10, 15	10, 15, 20	50(45)
	16	20, 25, 30	25, 30	50(40)
	20	5, 10, 15	10, 15, 20	60
		20, 25, 30	25, 30, 40	
	25	40, 50	50	100
	32	5, 10, 15	10, 15, 20	
		20, 25, 30	25, 30, 40	
	40	40, 50, 75	50, 75, 100	
		100		
	50	10, 15, 20, 25, 30, 40	50, 75, 100	
Single acting type	12			30
	16			
	20	5, 10, 15	10, 15, 20	
	25	20, 25, 30	25, 30	
	32			
	40			
	50	10, 15, 20, 25, 30, 40		

Note: Figures in parenthesis are for cylinders with magnets.

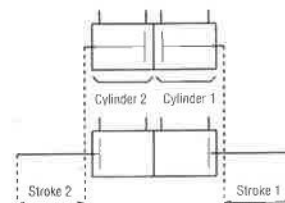
Remark1: Stroke tolerance<sup>1)</sup>

2: Please consult us on cylinders with less than a 10mm stroke.

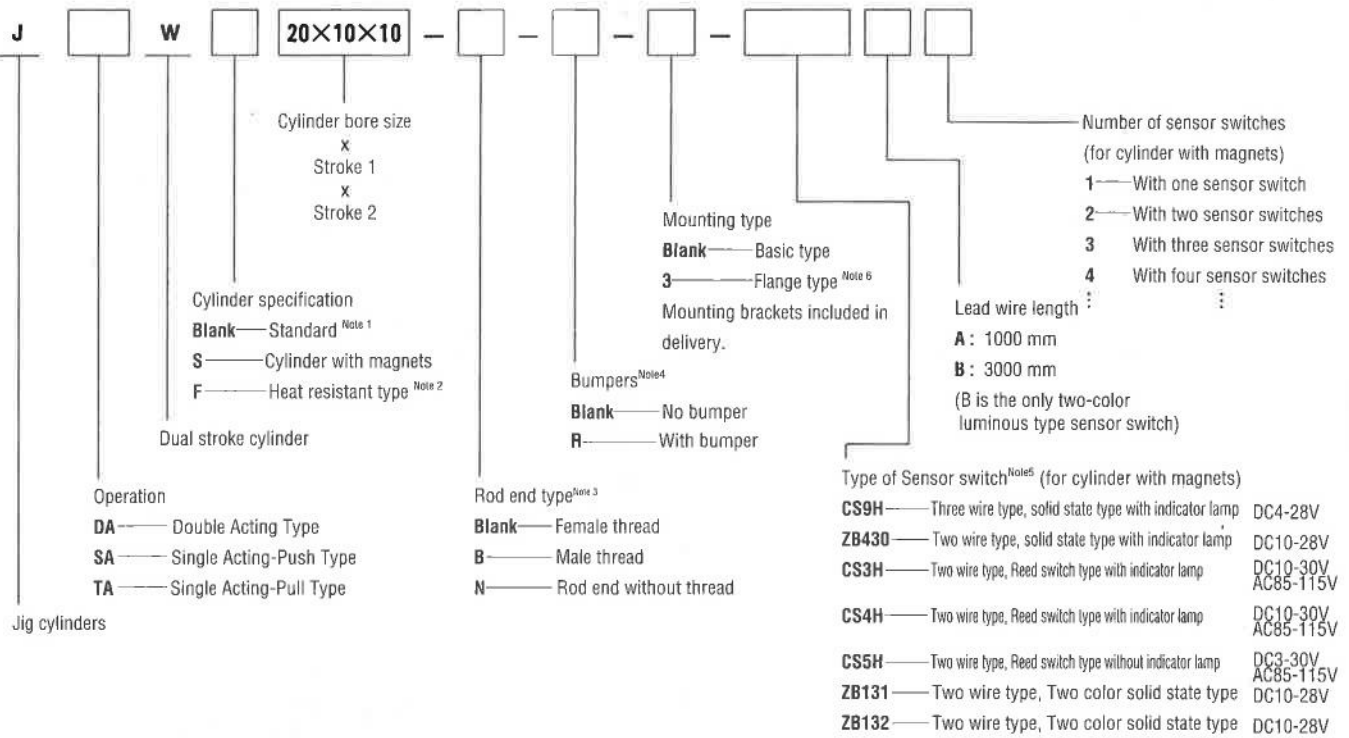
Remark 1: Stroke tolerance

2: The left chart applies to both strokes 1 and 2

3: Please consult us for cylinders with magnets with less than 10mm stroke.



# Order Example



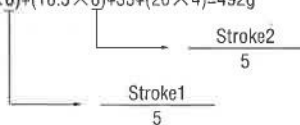
- Note 1 : Magnet for sensor switch is not built in standard cylinders.  
 2 : Not available on cylinders with magnets and cylinders with bumpers.  
 3 : Same specifications for both rod types.  
 4 : Double Acting type in bore sizes 40 thru 100; not available on heat resistant types.  
 5 : See page 616 for further details on sensor switch.  
 6 : Flange bracket can only be mounted to the rod-end of stroke 2.

## Weight

Cylinder bore size mm	Zero stroke weight			Added weight				Weight of mounting brackets Flange bracket	Added weight of sensor switches (including holder) <sup>Note 2</sup>		
	Double Acting Type	Single Acting-Push Type	Single Acting-Pull Type	Added weight per 5mm stroke 1	Added weight per 5mm stroke 2	Added weight of cylinder with magnets			CS9H□, ZB430□	CS3H□, CS4H□, CS5H□	ZB13□□
12	75	97.5	95.5	6.5	6.5	6	5.5	55	30	20	40
16	96	103.5	108	9	9	10	10	71			
20	128	137.5	143.5	12	12	13	13	101			
25	181	199	198	16.5	16.5	33	33	160			
32	273	269	310	19.5	19.5	49	48	186			
40	402	404	404	28	28	110	110	335			
50	648	654	652	38	38	195	195	447			
63	914	—	—	46.5	46.5	259	—	591			
80	1740	—	—	72	72	389	—	1414			
100	3142	—	—	102	102	712	—	2606			

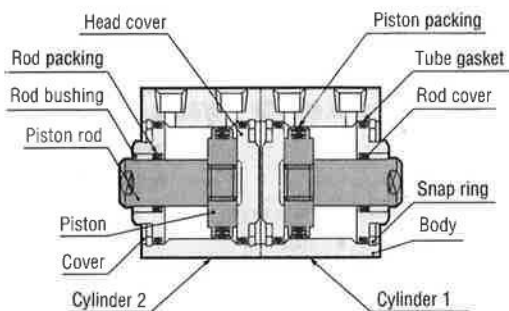
- Note 1 : The above chart depicts standard strokes  
 2 : Two lengths of lead wires:  
 A: 1000mm; B: 3000mm  
 Weight for sensor switch of above chart using A-type lead wire.

Calculation example: The weight of a double-acting cylinder with magnets with a 25mm bore size and 30mm stroke 1 and a 30mm stroke 2, together with four CS3H sensor switches is:  
 $181 + (16.5 \times 6) + (16.5 \times 6) + 33 + (20 \times 4) = 492g$

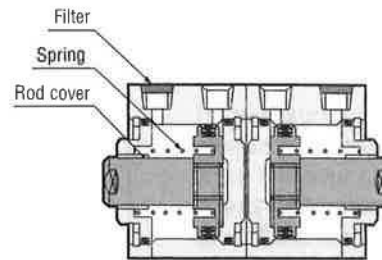


## Inner Construction and Major Parts

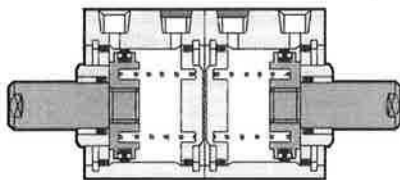
### ● Double Acting Type (JDAW)



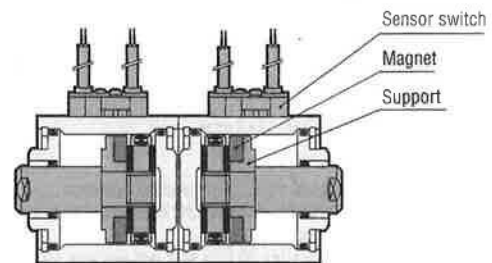
### ● Single Acting-Push Type (JSAW)



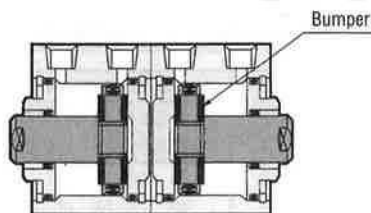
### ● Single Acting-Pull Type (JTAW)



### ● Cylinder with magnets (Chart shows double acting type)



### ● With bumper



Discontinued

## Materials of Major Parts

Item	Cylinder bore size mm										
	12	16	20	25	32	40	50	63	80	100	
Body	Aluminum alloy										
Piston	Aluminum alloy <sup>Note</sup>										
Piston rod	Stainless steel					Hard steel (chrome plated)					
Packing	Synthetic rubber										
Rod bushing	Phosphorous bronze	Double acting type : Oil permeated bronze					Single acting type : Dry bearing				
Rod cover	Phosphorous bronze	Aluminum alloy									
Head cover	Aluminum alloy										
Snap ring	Hard steel (nickel plated)										
Spring	Piano wire							—			
Filter	Porous aluminum							—			
Bumper	—					Synthetic rubber					
Magnet	Resinous magnet										
Support	Aluminum alloy (anti-rust treatment)										

Note : Stainless steel for  $\phi$  20 and  $\phi$  25 single acting type

## List of packing

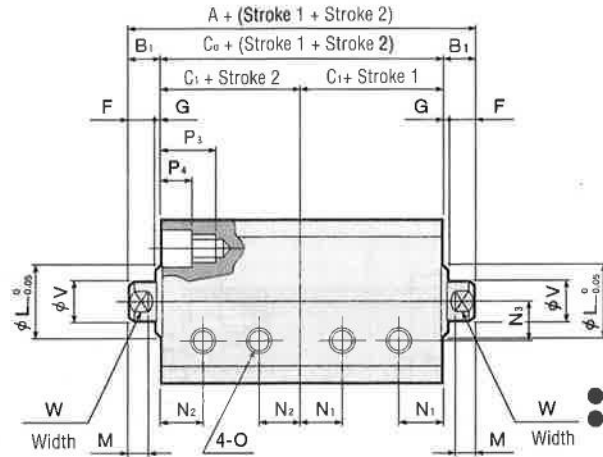
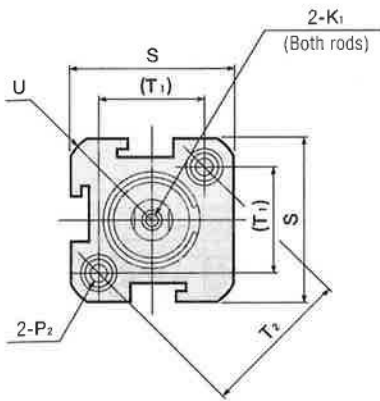
Item	Rod packing		Piston packing		Tube gasket
	Single Acting-Push Type	Double Acting Type Single Acting-Pull Type	Double Acting Type	Single acting type	Double acting type Single acting type
Operation	—	2	2	2	4 (2) <sup>Note</sup>
Cylinder bore size mm	Number	—	2	2	4 (2) <sup>Note</sup>
12	—	MYR-6	PSD-12	PSD-12	S-14
16	—	MYR-6	PSD-16	PSD-16	1.5×14.5
20	—	MYR-8	PSD-20	MYA-16	1.5×22.5
25	—	MYR-10	PSD-25	MYA-21	1.5×25.5
32	—	MYR-12	PSD-32	PSD-32	1.5×31.5
40	—	MYR-16	PSD-40	PSD-40	1.5×39.5
50	—	MYR-20	PSD-50	PSD-50	1.5×49.5
63	—	MYR-20	PSD-63	—	1.5×62.5
80	—	PNY-25	PSD-80	—	1.5×79.5
100	—	PNY-32	PSD-100	—	2×98.5

Note : The figure in parenthesis is for single acting  $\phi$  12 and  $\phi$  16.

# Dimensions of Double Acting Dual Stroke Type (JDAW, JDAWS)

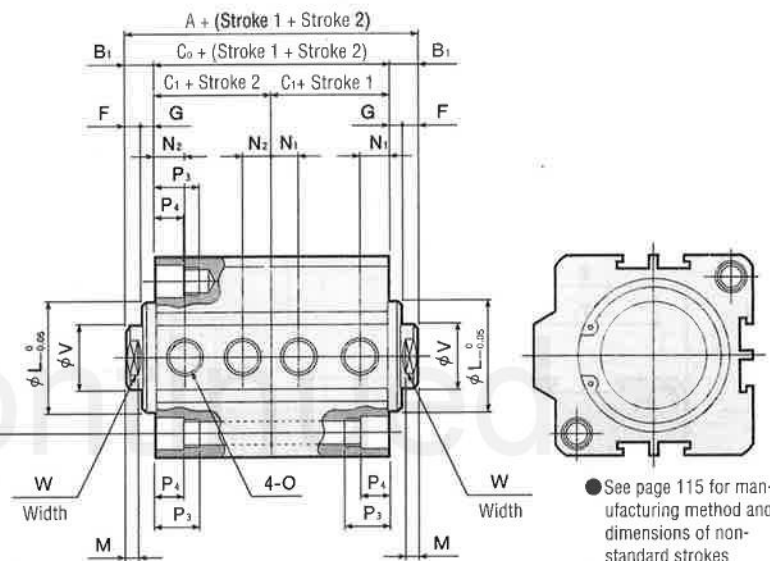
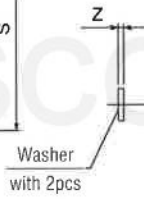
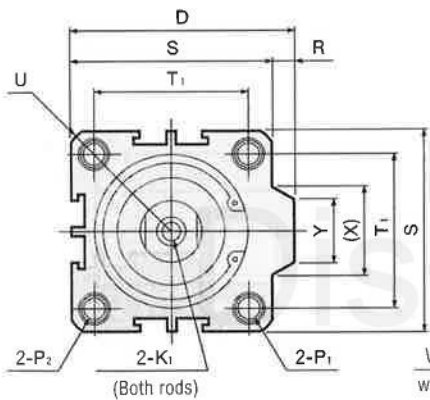
(unit : mm)

●  $\phi 12$  ,  $\phi 16$



● Diagram depicts bore 12.  
● See page 115 for manufacturing method and dimensions of non-standard strokes

●  $\phi 20 \sim \phi 100$



● See page 115 for manufacturing method and dimensions of non-standard strokes

Type	Standard Cylinder (JDAW)				Cylinder with magnets (JDAWS)														
Bore size	Symbol	A	B <sub>1</sub>	C <sub>0</sub>	C <sub>1</sub>	A	B <sub>1</sub>	C <sub>0</sub>	C <sub>1</sub>	D	F	G	K <sub>1</sub>	L	M	N <sub>1</sub> Note1	N <sub>2</sub> Note2	N <sub>3</sub>	O
12		44	5	34	17	54	5	44	22	—	4	1	M3 × 0.5 Depth6	11	3	6.5	6.5	6	M5 × 0.8
16		48	5.5	37	18.5	68	5.5	57	28.5	—	4	1.5	M3 × 0.5 Depth6	11	3	7	7	6.5	M5 × 0.8
20		50	5.5	39	19.5	70	5.5	59	29.5	36	4	1.5	M4 × 0.7 Depth8	15	3	7.5	7.5	—	M5 × 0.8
25		54	6	42	21	74	6	62	31	42	4	2	M5 × 0.8 Depth10	17	3	8	8	—	M5 × 0.8
32		63	7	49	24.5	83	7	69	34.5	50	4	3	M6 × 1 Depth12	22	3	9[7]	9[7]	—	Rc1/8
40		66	7	52	26	86	7	72	36	58.5	4	3	M8 × 1.25 Depth12	28	3	10[7.3]	10[7.3]	—	Rc1/8
50		74	9	56	28	94	9	76	38	71.5	5	4	M10 × 1.5 Depth15	38	3	10	10	—	Rc1/4
63		82	9	64	32	102	9	84	42	84.5	5	4	M10 × 1.5 Depth15	40	3	12	12	—	Rc1/4
80		104	11	82	41	124	11	102	51	104	6	5	M14 × 1.5 Depth20	45	4	12.5	12.5	—	Rc3/8
100		126	12	102	51	146	12	122	61	124	7	5	M18 × 1.5 Depth20	55	4	17	17	—	Rc3/8

Bore size	Symbol	P <sub>1</sub>	P <sub>2</sub>	P <sub>3</sub>	P <sub>4</sub>	R	S	T <sub>1</sub>	T <sub>2</sub>	U	V	W	X	Y	Z
12		—	M5 × 0.8 and Spot facing $\phi 6.5$	9.5	4.5	—	25	16.2	23	R16	6	5	—	—	—
16		—	M5 × 0.8 and Spot facing $\phi 6.5$	9.5	4.5	—	29	19.8	28	R19	6	5	—	—	—
20		$\phi 3.5$ (thru hole) Spot facing $\phi 6.5$ (both sides) and M5 × 0.8 (both sides)	M5 × 0.8 and Spot facing $\phi 6.5$	9.5	4.5	2	34	24	—	R22	8	6	12.3	10	1
25		$\phi 4.6$ (thru hole) Spot facing $\phi 8$ (both sides) and M6 × 1 (both sides)	M6 × 1 and Spot facing $\phi 8$	11.5	5.5	2	40	28	—	R25	10	8	12.3	10	1
32		$\phi 4.6$ (thru hole) Spot facing $\phi 8$ (both sides) and M6 × 1 (both sides)	M6 × 1 and Spot facing $\phi 8$	11.5	5.5	6	44	34	—	R29.5	12	10	22.9	16	1
40		$\phi 5.7$ (thru hole) Spot facing $\phi 9.5$ (both sides) and M8 × 1.25 (both sides)	M8 × 1.25 and Spot facing $\phi 9.5$	15.5	7.5	6.5	52	40	—	R35	16	14	23.5	16	1.6
50		$\phi 6.8$ (thru hole) Spot facing $\phi 11$ (both sides) and M8 × 1.25 (both sides)	M8 × 1.25 and Spot facing $\phi 11$	16.5	8.5	9.5	62	48	—	R41	20	17	31	20	1.6
63		$\phi 6.8$ (thru hole) Spot facing $\phi 11$ (both sides) and M8 × 1.25 (both sides)	M8 × 1.25 and Spot facing $\phi 11$	16.5	8.5	9.5	75	60	—	R50	20	17	31	20	1.6
80		$\phi 9.2$ (thru hole) Spot facing $\phi 14$ (both sides) and M12 × 1.75 (both sides)	M12 × 1.75 and Spot facing $\phi 14$	22.5	10.5	10	94	74	—	R62	25	22	37.5	26	1.6
100		$\phi 11.3$ (thru hole) Spot facing $\phi 17.5$ (both sides) and M14 × 2 (both sides)	M14 × 2 and Spot facing $\phi 17.5$	27	13	10	114	90	—	R75	32	32	37.5	26	2

Note 1 : The figure in brackets is for 5mm stroke 1.

2 : The figure in brackets is for 5mm stroke 2.

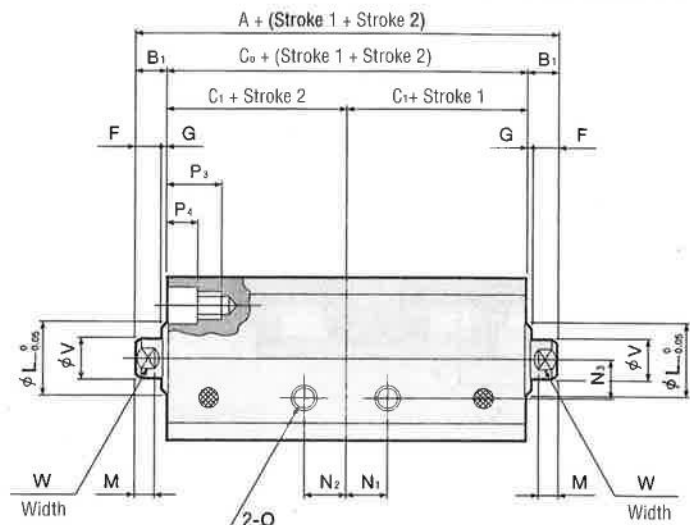
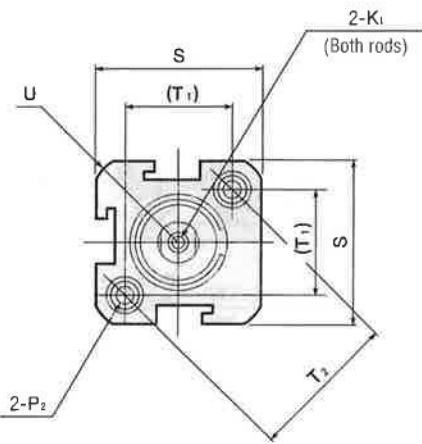
See page 103 for male rod thread type See page 107 for sensor switch dimensions

JIG CYLINDERS

# Dimensions of Single Acting-Push Dual Stroke Type (JSAW, JSAWS)

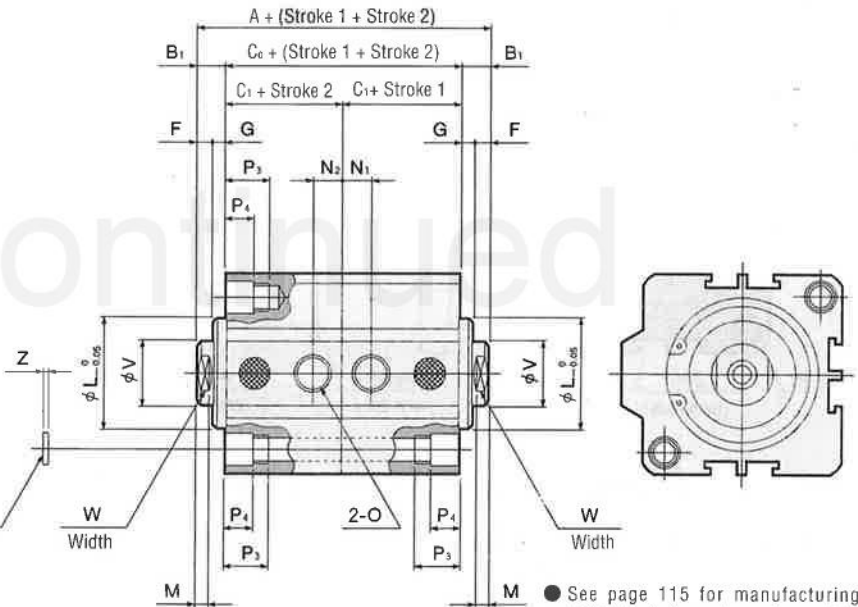
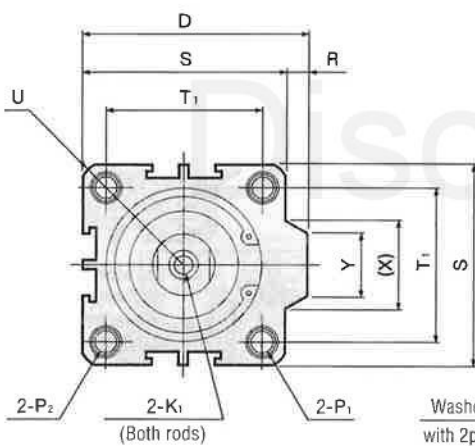
(unit : mm)

●  $\phi 12, \phi 16$



- Diagram depicts bore 12.
- See page 115 for manufacturing method and dimensions of non-standard strokes

●  $\phi 20 \sim \phi 50$



- See page 115 for manufacturing method and dimensions of non-standard strokes

Type	Standard Cylinder (JSAW)				Cylinder with magnets (JSAWS)															
	Bore size	Symbol	A	B <sub>1</sub>	C <sub>0</sub>	C <sub>1</sub>	A	B <sub>1</sub>	C <sub>0</sub>	C <sub>1</sub>	D	F	G	K <sub>1</sub>	L	M	N <sub>1</sub> Note1	N <sub>2</sub> Note2	N <sub>a</sub>	O
12			54	5	44	22	64	5	54	27	—	4	1	M3 × 0.5 Depth6	11	3	6.5	6.5	6	M5 × 0.8
16			58	5.5	47	23.5	68	5.5	57	28.5	—	4	1.5	M3 × 0.5 Depth6	11	3	7	7	6.5	M5 × 0.8
20			50	5.5	39	19.5	70	5.5	59	29.5	36	4	1.5	M4 × 0.7 Depth8	15	3	7.5	7.5	—	M5 × 0.8
25			54	6	42	21	74	6	62	31	42	4	2	M5 × 0.8 Depth10	17	3	8	8	—	M5 × 0.8
32			63	7	49	24.5	83	7	69	34.5	50	4	3	M6 × 1 Depth12	22	3	9[7]	9[7]	—	Rc1/8
40			66	7	52	26	86	7	72	36	58.5	4	3	M8 × 1.25 Depth12	28	3	10[7.3]	10[7.3]	—	Rc1/8
50			74	9	56	28	94	9	76	38	71.5	5	4	M10 × 1.5 Depth15	38	3	10	10	—	Rc1/4

Bore size	Symbol														
		P <sub>1</sub>	P <sub>2</sub>	P <sub>3</sub>	P <sub>4</sub>	R	S	T <sub>1</sub>	T <sub>2</sub>	U	V	W	X	Y	Z
12		—	M5 × 0.8 and Spot facing $\phi 6.5$	9.5	4.5	—	25	16.2	23	R16	6	5	—	—	—
16		—	M5 × 0.8 and Spot facing $\phi 6.5$	9.5	4.5	—	29	19.8	28	R19	6	5	—	—	—
20		$\phi 3.5$ (thru hole) Spot facing $\phi 6.5$ (both sides) and M5 × 0.8 (both sides)	M5 × 0.8 and Spot facing $\phi 6.5$	9.5	4.5	2	34	24	—	R22	8	6	12.3	10	1
25		$\phi 4.6$ (thru hole) Spot facing $\phi 8$ (both sides) and M6 × 1 (both sides)	M6 × 1 and Spot facing $\phi 8$	11.5	5.5	2	40	28	—	R25	10	8	12.3	10	1
32		$\phi 4.6$ (thru hole) Spot facing $\phi 8$ (both sides) and M6 × 1 (both sides)	M6 × 1 and Spot facing $\phi 8$	11.5	5.5	6	44	34	—	R29.5	12	10	22.9	16	1
40		$\phi 5.7$ (thru hole) Spot facing $\phi 9.5$ (both sides) and M8 × 1.25 (both sides)	M8 × 1.25 and Spot facing $\phi 9.5$	15.5	7.5	6.5	52	40	—	R35	16	14	23.5	16	1.6
50		$\phi 6.8$ (thru hole) Spot facing $\phi 11$ (both sides) and M8 × 1.25 (both sides)	M8 × 1.25 and Spot facing $\phi 11$	16.5	8.5	9.5	62	48	—	R41	20	17	31	20	1.6

Note 1 : The figure in brackets is for 5mm stroke 1.

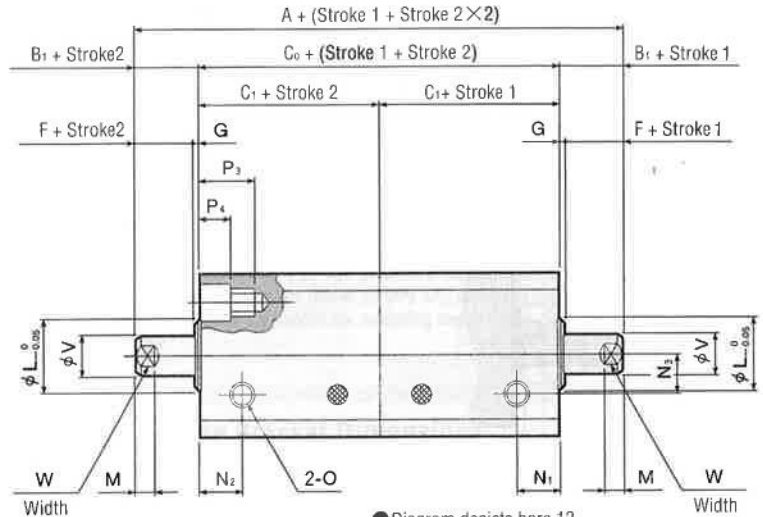
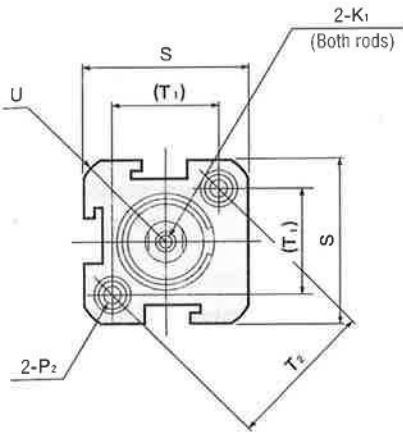
2 : The figure in brackets is for 5mm stroke 2.

See page 103 for male rod thread type See page 107 for sensor switch dimensions

# Dimensions of Single Acting-Pull Dual Stroke Type (JTAW, JTAWS)

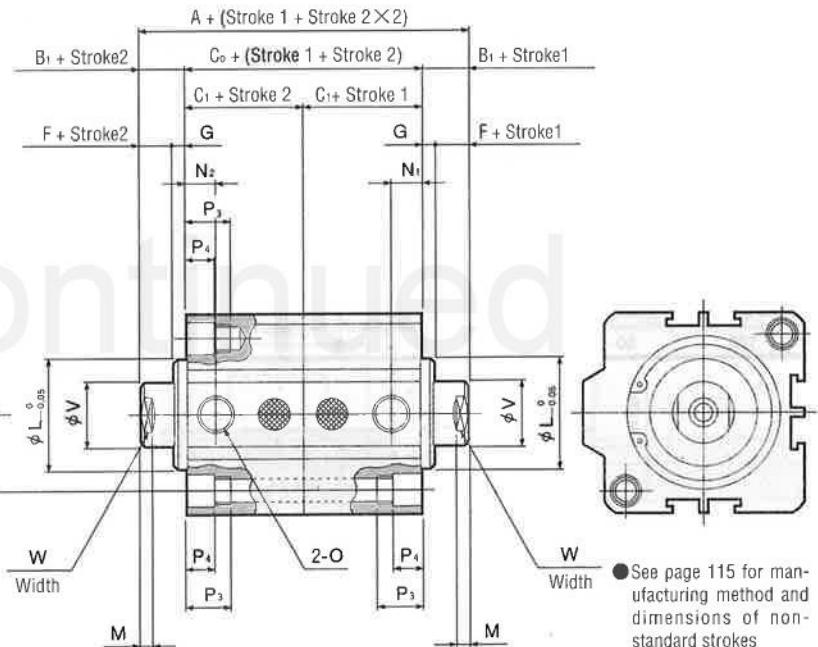
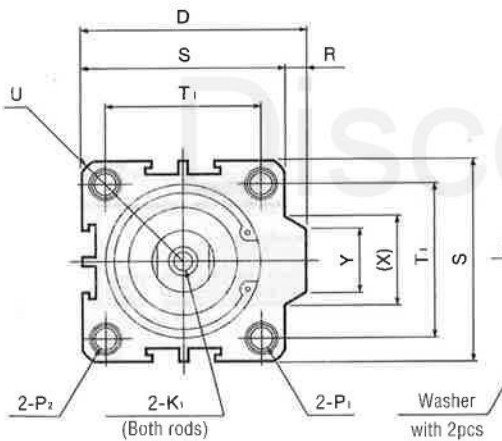
(unit : mm)

## ● $\phi 12, \phi 16$



- Diagram depicts bore 12.
- See page 115 for manufacturing method and dimensions of non-standard strokes

## ● $\phi 20 \sim \phi 50$



- See page 115 for manufacturing method and dimensions of non-standard strokes

Type	Standard Cylinder (JTAW)				Cylinder with magnets (JTAWS)															
Bore size	Symbol	A	B <sub>1</sub>	C <sub>0</sub>	C <sub>1</sub>	A	B <sub>1</sub>	C <sub>0</sub>	C <sub>1</sub>	D	F	G	K <sub>1</sub>		L	M	N <sub>1</sub> <sup>Note1</sup>	N <sub>2</sub> <sup>Note2</sup>	N <sub>3</sub>	O
12		54	5	44	22	64	5	54	27	—	4	1	M3 × 0.5	Depth6	11	3	6.5	6.5	6	M5 × 0.8
16		58	5.5	47	23.5	68	5.5	57	28.5	—	4	1.5	M3 × 0.5	Depth6	11	3	7	7	6.5	M5 × 0.8
20		50	5.5	39	19.5	70	5.5	59	29.5	36	4	1.5	M4 × 0.7	Depth8	15	3	7.5	7.5	—	M5 × 0.8
25		54	6	42	21	74	6	62	31	42	4	2	M5 × 0.8	Depth10	17	3	8	8	—	M5 × 0.8
32		63	7	49	24.5	83	7	69	34.5	50	4	3	M6 × 1	Depth12	22	3	9[7]	9[7]	—	Rc1/8
40		66	7	52	26	86	7	72	36	58.5	4	3	M8 × 1.25	Depth12	28	3	10[7.3]	10[7.3]	—	Rc1/8
50		74	9	56	28	94	9	76	38	71.5	5	4	M10 × 1.5	Depth15	38	3	10	10	—	Rc1/4

Bore size	Symbol	P <sub>1</sub>	P <sub>2</sub>	P <sub>3</sub>	P <sub>4</sub>	R	S	T <sub>1</sub>	T <sub>2</sub>	U	V	W	X	Y	Z
12		—	M5 × 0.8 and Spot facing $\phi 6.5$	9.5	4.5	—	25	16.2	23	R16	6	5	—	—	—
16		—	M5 × 0.8 and Spot facing $\phi 6.5$	9.5	4.5	—	29	19.8	28	R19	6	5	—	—	—
20		$\phi 3.5$ (thru hole) Spot facing $\phi 6.5$ (both sides) and M5 × 0.8 (both sides)	M5 × 0.8 and Spot facing $\phi 6.5$	9.5	4.5	2	34	24	—	R22	8	6	12.3	10	1
25		$\phi 4.6$ (thru hole) Spot facing $\phi 8$ (both sides) and M6 × 1 (both sides)	M6 × 1 and Spot facing $\phi 8$	11.5	5.5	2	40	28	—	R25	10	8	12.3	10	1
32		$\phi 4.6$ (thru hole) Spot facing $\phi 8$ (both sides) and M6 × 1 (both sides)	M6 × 1 and Spot facing $\phi 8$	11.5	5.5	6	44	34	—	R29.5	12	10	22.9	16	1
40		$\phi 5.7$ (thru hole) Spot facing $\phi 9.5$ (both sides) and M8 × 1.25 (both sides)	M8 × 1.25 and Spot facing $\phi 9.5$	15.5	7.5	6.5	52	40	—	R35	16	14	23.5	16	1.6
50		$\phi 6.8$ (thru hole) Spot facing $\phi 11$ (both sides) and M8 × 1.25 (both sides)	M8 × 1.25 and Spot facing $\phi 11$	16.5	8.5	9.5	62	48	—	R41	20	17	31	20	1.6

Note 1 : The figure in brackets is for 5mm stroke 1.

2 : The figure in brackets is for 5mm stroke 2.

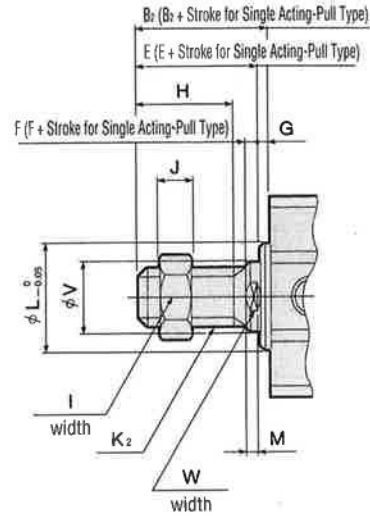
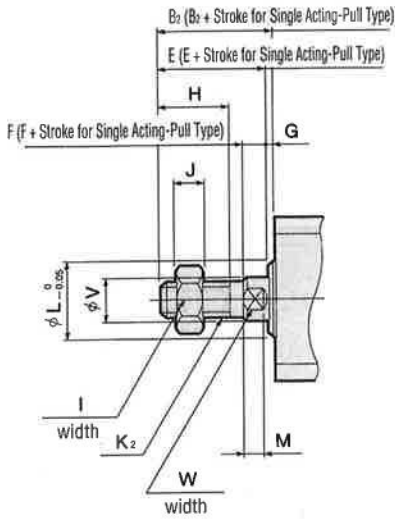
See page 103 for male rod thread type See page 107 for sensor switch dimensions

# Dimensions of Male Rod Thread Type

(unit : mm)

●  $\phi 12$ ,  $\phi 16$

●  $\phi 20 \sim \phi 100$  (thru 50 for Single Acting Type)



Rod end without thread type: Dimensions are identical to female rod thread type; however, is not available on a female thread.

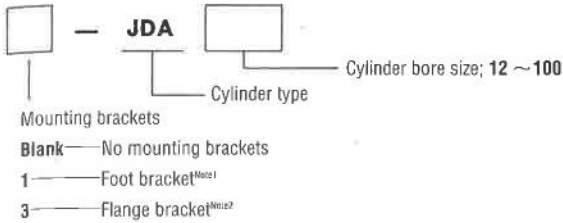
Bore size	Symbol	B <sub>2</sub>	E	F	G	H	I	J	K <sub>2</sub>	L	M	V	W
12		17	16	4	1	10	8	4	M5 × 0.8	11	3	6	5
18		17.5	16	4	1.5	10	8	4	M5 × 0.8	11	3	6	5
20		20.5	19	4	1.5	13	10	5	M6 × 1	15	3	8	6
25		23	21	4	2	15	12	5	M8 × 1	17	3	10	8
32		25	22	4	3	15	14	6	M10 × 1.25	22	3	12	10
40		35	32	4	3	25	19	8	M14 × 1.5	28	3	16	14
50		37	33	5	4	25	27	11	M18 × 1.5	38	3	20	17
83		37	33	5	4	25	27	11	M18 × 1.5	40	3	20	17
80		44	39	6	5	30	32	13	M22 × 1.5	45	4	25	22
100		50	45	7	5	35	36	14	M26 × 1.5	55	4	32	27

# Mounting Brackets

## Foot bracket, Flange bracket



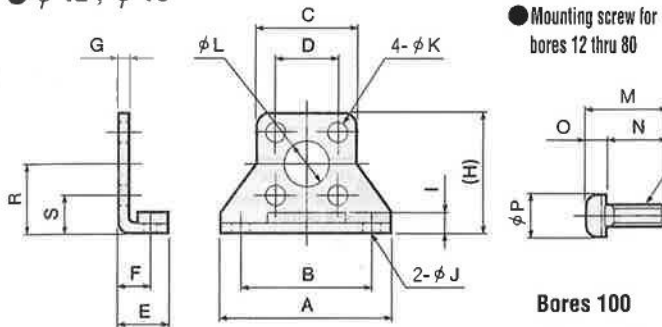
### Order Example (Mounting brackets only)



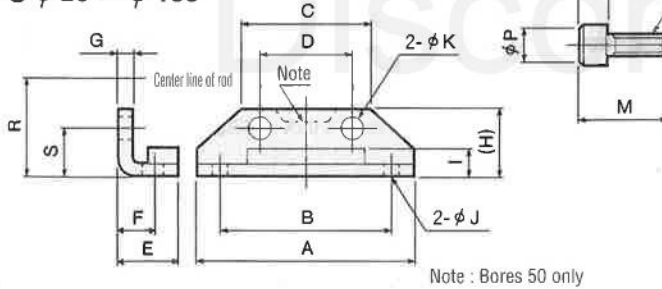
- Note 1 : Cannot be mounted to tandem, dual stroke cylinders, jig square rod cylinders (bores 20 thru 32), or clean system jig cylinders.  
 2 : Cannot be mounted to head side of tandem, stroke 1 side of dual stroke cylinders, rod side of jig square rod cylinders (bores 20 thru 32), or the rod side of clean system jig cylinders  
 3 : Two foot brackets are needed for mounting one cylinder. Please order [2] foot brackets per cylinder

### Foot Bracket Dimensions

#### ● $\phi 12, \phi 16$



#### ● $\phi 20 \sim \phi 100$



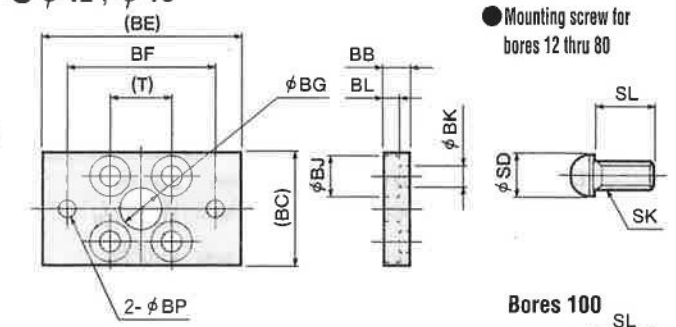
Material : Steel

Bore size	A	B	C	D	E	F	G	H	I	J
12	44	34	25	16.3	12.5	8	2	29.5	4.5	4.5
18	48	38	29	19.8	13	8	2	33.5	4.5	4.5
20	54	44	34	24	15	9.2	3.2	16.5	7	4.5
25	64	52	40	28	16.5	10.7	3.2	17.5	6	5.5
32	68	56	44	34	17	11.2	3.2	19	8	5.5
40	78	64	52	40	18.2	11.2	3.2	19	7	6.6
50	96	78	62	48	22.7	14.7	3.2	22	8	9
63	108	90	75	60	25.2	16.2	3.2	24	8.5	9
80	134	112	94	74	30.5	19.5	4.5	33	12	11
100	160	134	114	90	35.5	23	6	40	14	14

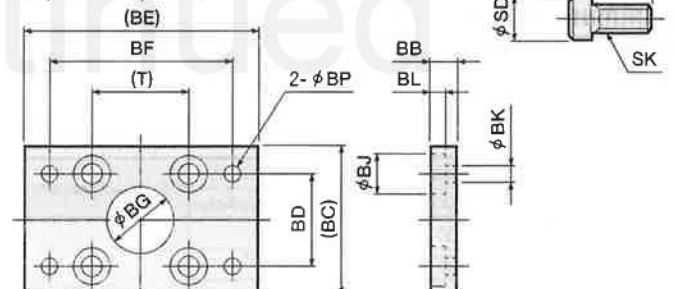
Bore size	K	L	M	N	O	P	Q	R	S	Weight g
12	5.5	11	15.5	12	2.7	9.5	M5	17	8.88	50
18	5.5	11	15.5	12	2.7	9.5	M5	19	9.1	62
20	5.5	—	15.5	12	2.7	9.5	M5	24	12	84
25	6.6	—	18	14	3.3	10.5	M6	26	12	104
32	6.6	—	18	14	3.3	10.5	M6	30	13	126
40	9	—	25	20	4.4	14	M8	33	13	160
50	9	—	25	20	4.4	14	M8	39	15	220
63	9	—	25	20	4.4	14	M8	46	16	300
80	—	—	32	25	6.6	21	M12	59	22	644
100	16	—	44	30	14	21	M14	71	26	1172

### Flange Bracket Dimensions

#### ● $\phi 12, \phi 16$



#### ● $\phi 20 \sim \phi 100$



Material : Steel

Bore size	T	BB	BC	BD	BE	BF	BG	BJ
12	16.3	6	28	—	50	38	11	10
18	19.8	6	32	—	54	42	11	10
20	24	6	36	24	58	46	15	10
25	28	8	42	28	68	54	17	11
32	34	8	48	34	72	58	22	11
40	40	8	58	40	84	68	28	15
50	48	8	66	40	102	82	38	15
63	60	8	78	50	116	96	40	15
80	74	12	100	70	142	118	45	22
100	90	20	116	80	170	142	55	23

Bore size	BK	BL	BP	SK	SL	SD	Weight g
12	5.5	3.6	4.5	M5	12	9.5	55
18	5.5	3.6	4.5	M5	12	9.5	71
20	5.5	3.6	4.5	M5	12	9.5	101
25	6.6	4.3	5.5	M6	14	10.5	160
32	6.6	4.3	5.5	M6	14	10.5	186
40	9	5.3	6.6	M8	20	14	335
50	9	5.3	9	M8	20	14	447
63	9	5.3	9	M8	20	14	591
80	14	7.3	11	M12	25	21	1414
100	16	15.2	14	M14	30	21	2606

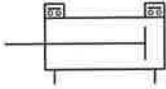
# SENSOR SWITCHES (GENERAL PURPOSE)

Solid State Type; Reed Switch Type

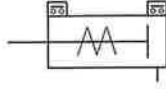


## Symbols

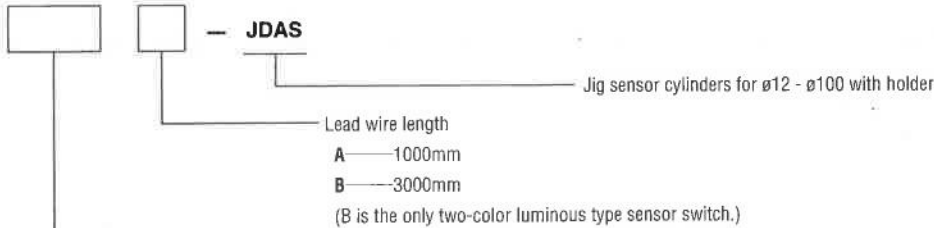
### ● Double acting type



### ● Single acting push type



## Order Example



Switch type

- |  |                       |   |          |
|--|-----------------------|---|----------|
| <b>CS9H</b> — Solid state type with indicator lamp | DC4-28V               | <b>ZB430</b> — Solid state type with indicator lamp               | DC10-28V |
| <b>CS3H</b> — Reed switch type with indicator lamp | DC10-30V<br>AC85-115V | <b>ZB131</b> — Solid state two color type with unstable output    | DC10-28V |
| <b>CS4H</b> — Reed switch type with indicator lamp | DC10-30V<br>AC85-115V | <b>ZB132</b> — Solid state two color type without unstable output | DC10-28V |
| <b>CS5H</b> — Reed switch type with indicator lamp | DC3-30V<br>AC85-115V  |   |          |

See page 616 for further details on sensor switches.

## Minimum Strokes for Sensor Switch Operation

### ● CS□H□type; ZB430□type

Cylinder bore size	Cylinder with two switches		Cylinders with one switch
	One mounting surface	Two mounting surfaces	
12	30	10	10
16	25	10	
20~100	10		

Remark : Please consult us for smaller strokes.

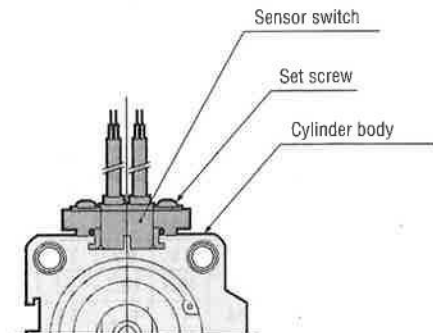
### ● ZB13□type (two color type)

Cylinder bore size	Cylinder with two switches		Cylinders with one switch
	One mounting surface	Two mounting surfaces	
12	—	20	20
16	—	15	15
20~100	10		10

Note : When mounting two switches on ø12 and ø16 cylinders, two mounting surfaces are necessary. If there is one mounting surface, it must be 40mm in size.

## Sensor Switch Movement

- By loosening the set screw, sensor switch can be moved along the groove on the cylinder body.
- Maximum torque for tightening the screw is 0.2N cm (2kgf/cm).



# Sensor Switch Operating Range / Response Differential / Ideal Sensing Location

## ● CS□H□type; ZB430□ type

### ● Operating range : $\ell$

The range between the point where the switch turns ON and the point where it turns OFF after the piston moves further in the same direction.

### ● Response differential : C

The distance between the point where the piston (magnet) turns the switch ON in one direction, and the point where the switch turns OFF as the piston (magnet) travels in the opposite direction.

### ● Solid state type (CS9H)

Item	Cylinder bore size	12	16	20	25	32	40	50	63	80	100
Operating range : $\ell$		2.3~4.9	2.6~5.5	3.1~6.5	3.3~7.0	2.9~6.2	3.2~6.9	3.1~6.6	3.3~6.9	3.5~7.3	3.5~7.3
Response differential : C		0.3 or less		0.5 or less		0.6 or less		0.5 or less		0.5 or less	
Ideal sensing location <sup>note</sup>		8									

Note : Dimension is measured from lead wire end of switch.

Remark : The above chart shows reference values.

### ● Solid state type (ZB430□)

Item	Cylinder bore size	12	16	20	25	32	40	50	63	80	100
Operating range : $\ell$		2.0~5.5	3.0~5.5	3.8~6.5	3.8~6.8	3.5~6.2	3.8~6.5	3.9~6.6	4.3~7.5	4.5~8.0	4.7~8.0
Response differential : C		0.3 or less					0.5 or less		0.5 or less		
Ideal sensing location <sup>note</sup>		8									

Note : Dimension is measured from lead wire end of switch.

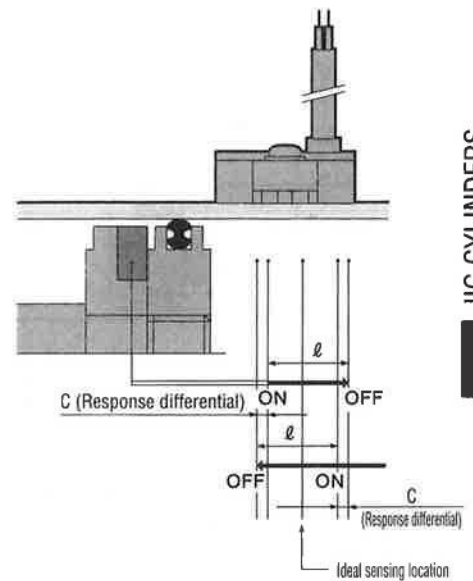
Remark : The above chart shows reference values.

### ● Reed switch types (CS3H, CS4H, CS5H)

Item	Cylinder bore size	12	16	20	25	32	40	50	63	80	100
Operating range : $\ell$		7.5~10	8.5~10	8.5~11	9~11	9~12	10~12	10~12	11~12	11~12	10.5~12
Response differential : C		1.0 or less			1.5 or less		1.2 or less		1.5 or less		1.5 or less
Ideal sensing location <sup>note</sup>		8									

Note : Dimension is measured from lead wire end of switch.

Remark : The above chart shows reference values.



JIG CYLINDERS

## ● ZB13□type (two color type)

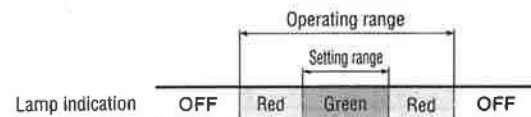
### ● Ideal sensing location determination procedure

#### ● Setting head side stroke end

1. Push type the piston in up to the stroke end.
2. Move the temporarily installed sensor switch until the indicator lamp turns green.  
Fix it with set screws within the range while the green lamp is ON.

#### ● Setting rod side stroke end

1. Pull the piston up to the rod side stroke end.
2. Move the temporarily installed sensor switch until the indicator lamp turns green.  
Fix it with set screws within the range while the green lamp is on.

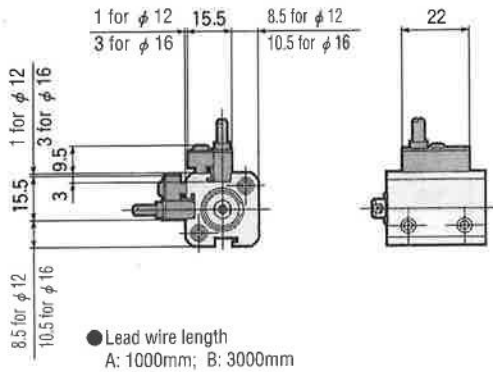


Cylinder bore size	Operating range	Setting range
12	4.1~7.1	2.3
16	4.4~7.8	3.3
20	5.0~8.2	3.9
25	6.3~8.6	4.2
32	4.8~8.1	3.7
40	4.8~8.5	3.9
50	5.2~8.6	4.1
50	5.6~9.5	4.8
50	5.7~9.9	5.1
63	5.7~10.2	5.3

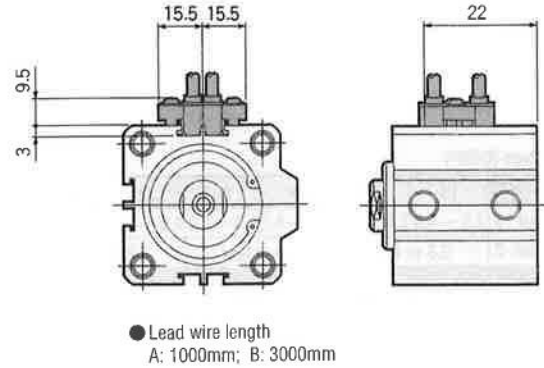
## Sensor Switch Dimensions

### ● CS□H□type; ZB430□type

#### ● $\phi 12$ , $\phi 16$



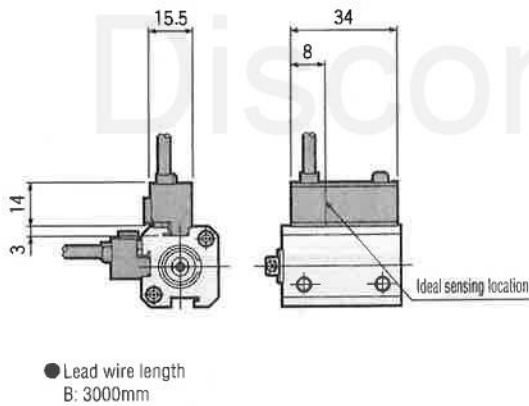
#### ● $\phi 20 \sim \phi 100$ (thru $\phi 50$ for single acting type)



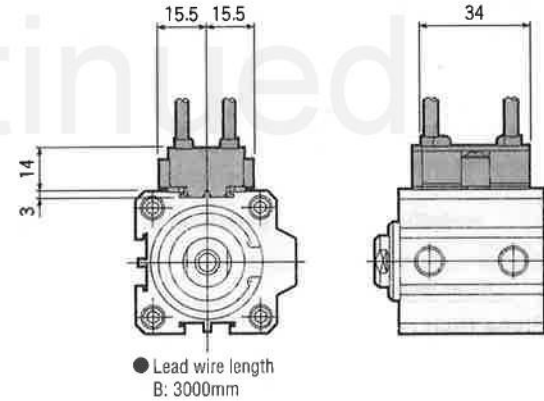
Note: Diagrams depict  $\phi 12$ . Mounting groove of  $\phi 16$  sensor switch is designed to be mounted in both directions. See page 108 concerning sensor switch mounting location.

### ● ZB13□type (two color type)

#### ● Mounting two surfaces ( $\phi 12$ , $\phi 16$ )

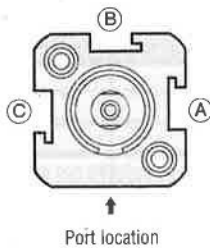


#### ● Mounting one surface ( $\phi 20 \sim \phi 100$ )

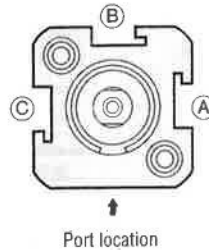


### ● Sensor switch mounting surfaces

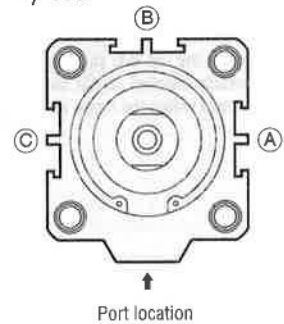
#### ● $\phi 12$



#### ● $\phi 16$



#### ● $\phi 20 \sim \phi 100$



To detect the front head stroke end, use surface A or C. To detect the rear head stroke end, surface B is the standard surface. When trying to detect both stroke ends on one surface please consult us. (Sensor switches may exceed the end of the cylinder)

Both stroke ends can be detected by using any two of the three surfaces A, B or C. When trying to detect both stroke ends on one surface, it is limited to the range indicated on the "Minimum Cylinder Strokes for Sensor Switch Operation" chart on page 105.

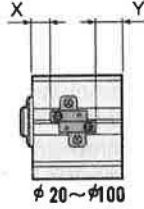
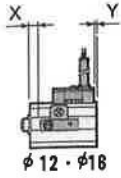
Both stroke ends can be detected by using surface A, B or C.

# Stroke End Detection Sensor Switch Mounting Location

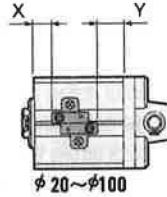
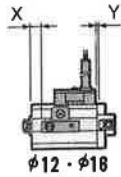
By mounting sensor switches as shown below (the figures in the parentheses are reference values), the piston magnet will achieve maximum sensing at the cylinder stroke end.

## ● Single rod sensor cylinders

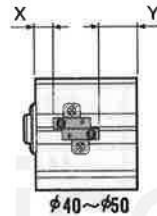
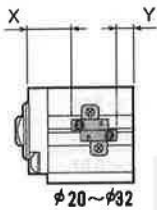
### Basic mounting type



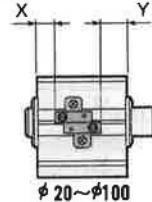
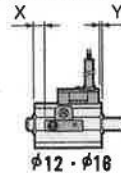
### Clevis mounting type



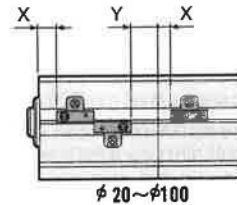
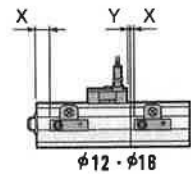
## ● Square rod sensor cylinders



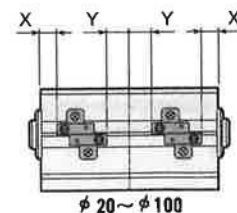
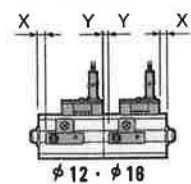
## ● Double rod sensor cylinders



## ● Tandem sensor cylinders



## ● Dual stroke sensor cylinders



### ● Double acting type / Clevis mounting type

Symbol \ Bore size	12	18	20	25	32	40	50	83	80	100
X	1	6	7	7	8	8	8	11	16	21
Y	5	6	7	9	11	12	14	15	18	25

### ● Single acting push type

Stroke	Symbol \ Bore size	12	18	20	25	32	40	50
15 or less	X	1	6	7	9	11	12	14
(20 or less for ø50)	Y	9	6	7	7	8	8	8
20 or more	X	1	16	22	24	26	27	29
(25 or more for ø50)	Y	19	6	7	7	8	8	8

### ● Single acting type pull type

Stroke	Symbol \ Bore size	12	18	20	25	32	40	50
15 or less	X	6	6	7	7	8	8	8
(20 or less for ø50)	Y	5	6	7	9	11	12	14
20 or more	X	16	6	7	7	8	8	8
(25 or more for ø50)	Y	5	16	22	24	26	27	29

### ● Double acting type

Symbol \ Bore size	20	25	32	40	50	83
X	13.5	13.5	17	18	18	21
Y	7	9	11	12	14	15

### ● Double acting type

Symbol \ Bore size	12	18	20	25	32	40	50	83	80	100
X	1	6	7	7	8	8	8	11	16	21
Y	5	6	7	9	11	12	14	15	18	25

### ● Single acting type (common for both push type and pull types)

Stroke	Symbol \ Bore size	12	18	20	25	32	40	50
15 or less	X	1	6	7	9	11	12	14
(20 or less for ø50)	Y	9	6	7	7	8	8	8
20 or more	X	1	16	22	24	26	27	29
(25 or more for ø50)	Y	19	6	7	7	8	8	8

### ● Double acting type

Symbol \ Bore size	12	18	20	25	32	40	50	83	80	100
X	1	6	7	7	8	8	8	11	16	21
Y	5	6	7	9	11	12	14	15	18	25

### ● Single acting push type

Symbol \ Bore size	12	18	20	25	32	40	50
X	1	6	7	9	11	12	14
Y	9	6	7	7	8	8	8

### ● Double acting type

Symbol \ Bore size	12	18	20	25	32	40	50	83	80	100
X	1	6	7	7	8	8	8	11	16	21
Y	5	6	7	9	11	12	14	15	18	25

### ● Single acting push type

Symbol \ Bore size	12	18	20	25	32	40	50
X	1	6	7	9	11	12	14
Y	9	6	7	7	8	8	8

### ● Single acting pull type

Symbol \ Bore size	12	18	20	25	32	40	50	83	80	100
X	6	6	7	7	8	8	8	11	16	21
Y	5	6	7	9	11	12	14	15	18	25

Remark 1 : Above chart shows standard strokes.

2 : Reconfirm stroke end detection sensor switch mounting location for double rod cylinders by observing the direction of the label. Above diagrams are views of sensor switches, rotated clockwise by 90° (180° for ø32) from the right position.

# SHORT STROKE SENSOR SWITCHES

## Extra Short Type & Short Type

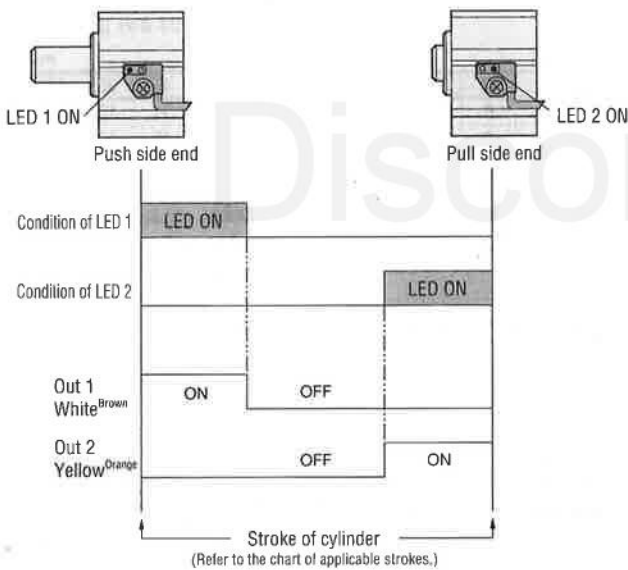


### Characteristics of Short Stroke Sensor Switches

In the past, two sensor switches were installed for detection at both ends of the cylinder, but now we can detect at both ends with one "short stroke sensor switch". In that way the number of cable wires decreases by half, wiring space and manhours are reduced, and wiring and manhours can be conserved. Furthermore, by mounting the "extra short type (ZB333)" designed for relatively short stroke cylinders, it is possible to detect at both ends of an approximately 3 mm short stroke without an overlap signal, a task which used to be difficult.

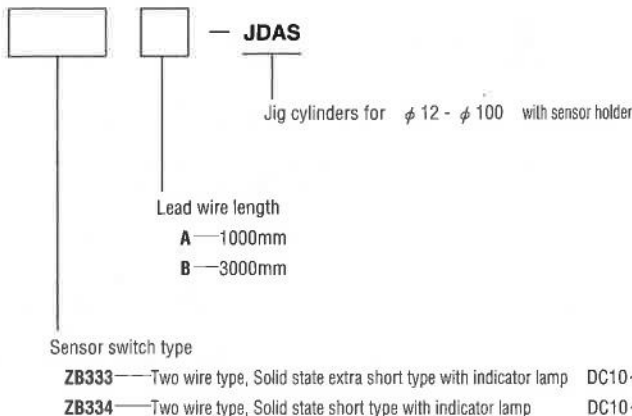
### Operation Summary of Short Stroke Sensor Switches

Short stroke sensor switch has two built-in LEDs and output for two channels to detect both rod-side and head-side stroke ends. The relationship between LED and OUT (output) is shown below. When OUT 1 is turned ON, LED 1 is turned ON, and when the OUT 2 is turned ON, the LED 2 is turned ON. The direction of the stroke corresponds to the LED indicator. Under the example of mounting method shown below, when LED 1 is ON, it will detect rod-side stroke end of the cylinder; and when LED 2 is ON, it will detect head-side stroke end of the cylinder.



Note: The color of lead wire will be changed to colors in the parentheses in 1993.

### Order Example (for sensor switch only)



### Selection Method

There are two types of short stroke sensor switches depending on the OFF range difference: super-short type, and short type. You can detect most

Step 1 : Short stroke sensor switches can be used when the stroke (actual stroke used) is 10mm or less. Measure cylinder bore size and actual stroke size.

Example : Cylinder bore size:  $\phi 32$  jig cylinder  
Actual stroke: 4mm

Step 2 : Decide on the cylinder type using step 1.

Example : If actual stroke is 4mm, use a 5mm standard stroke.  
Thus, cylinder model will be JDAS32x5.

Step 3 : Select either the super-short type or short type after checking the "Detectable actual stroke list." Note that super-short type (ZB333) and short type (ZB334) have different OFF ranges. (Refer to the chapters on sensor switch detection range and operating range.)

Example : For a  $\phi 32$  cylinder bore and actual stroke of 4mm, select a short type (ZB334) using the "Detectable actual stroke list."  
The model to order is JDAS32x5-ZB333□1.

### Detectable Actual Stroke List

Cylinder	Cylinder bore size	Actual stroke mm							
		3	4	5	6	7	8	9	10
Jig cylinder	12								
	16								
	20								
	25								
	32								
	40								
	50								
	63								
	80								
	100								

□ ZB333 (super-short type)    ■ ZB334 (short type)

Note 1 : The above chart shows detectable actual cylinder strokes measured within the OFF ranges of each ZB333 and ZB334 short stroke sensor switch.

2 : As shown in the chart, super-short type (ZB333) can be used for strokes of 5mm or more (6 to 11 mm □ parts). However the OFF range will become shorter and the ON range will lengthen. And, short type (ZB334) can be used for strokes of 10mm or less (6 to 9mm □ parts). However the OFF range will lengthen and the ON range will become shorter.

3 : See page 115 for non-standard strokes other than standard strokes of 5mm and 15mm.

4 : 5mm standard stroke not available for cylinder bores of 50,63,100mm.(PENDING)

5 : Cylinder bores of 63, 80, and 100mm are not available for single acting type pull type and single acting type double rod type cylinders.

6 : Square rod type cylinders are not offered in bore sizes 12, 16, 80, and 100mm.

7 : Please consult us separately when detecting 10mm or more strokes in ZB334 model (short type)

## Sensor Switch Detecting Range and Operation Range

### ● Maximum detecting range : $\ell$

This refers to the range from the position where the sensor switch OUT 1 is turned on to where OUT 1 is turned off; plus where OUT 2 is turned on by the piston movement in the same direction up to the point where OUT 2 is turned off.

### ● Operation range 1 and operation range 2

Operation range 1 refers to the range from the position where the sensor switch OUT 1 is turned on by the piston movement to the point where the switch OUT 1 is turned off. Operation range 2 refers to the range from the position where the switch OUT 2 is turned on to the point where it is turned off.

### ● OFF range

This refers to the range where both OUT 1 and OUT 2 are off (from the point where the switch OUT 1 is turned off to the point where the switch OUT 2 is turned on; and in the opposite direction, from the point where the switch OUT 2 is turned off to the point where the switch OUT 1 is turned on.)

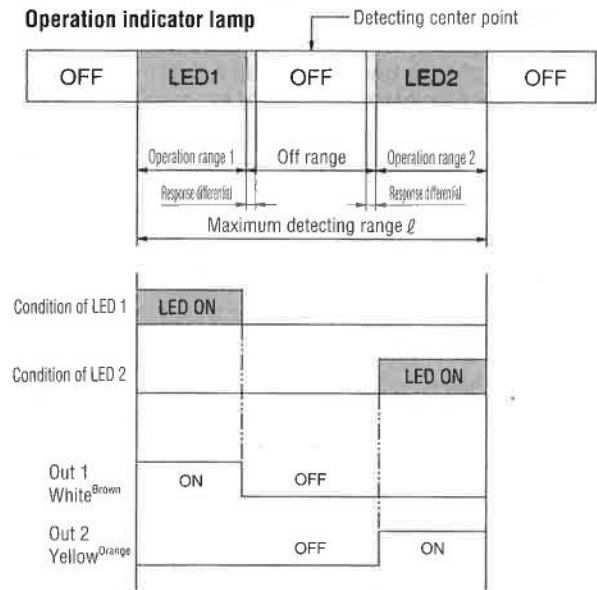
### ● Central detection point

This refers to the center point of the above mentioned OFF range.

### ● Response differential

This refers to the distance between the point where the piston (magnet) turns the switch ON, and the point where the switch turns OFF as the piston (magnet) travels in the opposite direction (see drawing). Response differential in the short stroke sensor switch indicates the values adjacent to the OFF range among the two response differentials of operation ranges 1 and 2.

### Operation indicator lamp



Note: The color of lead wire will be changed to colors in the parentheses in 1993.

### Extra short type (ZB333).

Bore size	Maximum detecting range	Operation range	OFF range	Response differential
12	14.0 ~ 16.0	6.5 ~ 8.5	0.4	0.5 or less
16	15.0 ~ 17.5	7.0 ~ 9.5	0.5	0.5 or less
20	17.5 ~ 19.0	7.5 ~ 11.0	0.6	0.6 or less
25	17.5 ~ 19.0	7.0 ~ 11.0	0.6	0.4 or less
32	16.0 ~ 18.5	7.0 ~ 9.5	0.6	0.6 or less
40	16.5 ~ 21.0	6.0 ~ 10.5	0.6	0.6 or less
50	17.5 ~ 20.0	7.0 ~ 10.5	0.6	0.6 or less
63	18.0 ~ 23.5	5.5 ~ 12.0	0.6	0.8 or less
80	15.5 ~ 24.5	4.5 ~ 11.5	0.7	0.6 or less
100	16.0 ~ 24.0	4.5 ~ 12.0	0.7	0.8 or less

Note: The chart shows reference values.

### Short type (ZB334).

Bore size	Maximum detecting range	Operation range 1(2)	OFF range	Response differential
12	13.5 ~ 16.5	5.5 ~ 7.5	2.5	0.8 or less
16	15.0 ~ 18.0	5.5 ~ 8.0	3.0	0.9 or less
20	16.5 ~ 19.5	6.0 ~ 9.0	4.0	1.0 or less
25	16.5 ~ 19.0	5.0 ~ 8.5	4.0	0.8 or less
32	16.0 ~ 18.5	6.0 ~ 8.0	3.5	0.9 or less
40	15.5 ~ 20.5	5.5 ~ 9.0	4.0	0.9 or less
50	17.0 ~ 20.0	6.0 ~ 8.5	4.0	0.9 or less
63	17.5 ~ 23.5	5.5 ~ 10.0	5.0	1.2 or less
80	16.5 ~ 23.5	6.5 ~ 9.5	5.0	1.1 or less
100	16.5 ~ 26.0	6.5 ~ 9.5	5.5	1.2 or less

Note: The chart shows reference values.

## Ideal Sensing Location Determination Procedure

Set the proper position of the sensor switch by the following two procedures:

### ● Using dimension chart

Set mounting location according to the "stroke end detection mounting location" chart. After mounting, move the piston to make sure that it correctly operates.

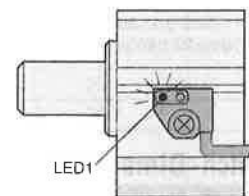
### ● Adjusting mounting location while operating

#### ■ If you desire correct positioning from the push side end then:

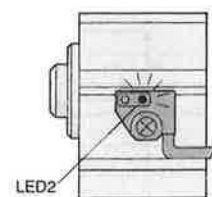
1. Pull the piston up to the rod side stroke end.
2. Move the temporarily installed sensor switch from the head side to the rod side until the LED indicator lamp (LED 1) is turned on in the direction of the rod side. Next, tighten the set screws at the point where the sensor switch returns 1-2mm toward the head side and turned the indicator lamp off. At this point LED1 is turned on again. (Refer to figure 1).
3. Push in the piston up to the head side stroke end. At this point reconfirm the head side LED indicator (LED 2) is turned on (with 1mm or more operating range.) (Refer to figure 2).

#### ■ If you desire correct positioning from the pull side end then:

1. Move the piston up to the head side stroke end.
2. Move the temporarily installed sensor switch from the rod side to head side until the LED indicator lamp (LED 2) is turned on in the direction of the head side. Next tighten set screws at the point where the sensor switch returns 1-2mm in the direction of the rod side and the indicator lamp is turned off. At this point LED 2 is turned on again. (refer to figure 2)
3. Move the piston up to the rod side stroke end. At this point reconfirm the rod side LED indicator (LED 1) is turned on (with 1mm or more operating range). (Refer to figure 1)



(Figure 1)



(Figure 2)

## Stroke End Detection Mounting Location

1. When the sensor switch is mounted in the position shown in the chart below (X or Y value), cylinder stroke end can be detected.
2. X and Y values (reference values) in the chart indicate the distance from the cylinder end (rod end or head end) to the sensor end when matching the detected center point of the sensor switch with the actual stroke center point.
3. The sensor switch might be longer than the cylinder body depending on mounting condition.

### ● Jig sensor cylinders

Double acting type

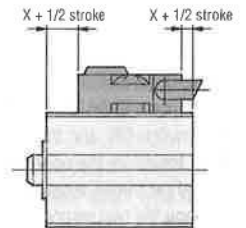
Symbol \ Bore size	12	16	20	25	32	40	50	63	80	100
X	-2	3	4	4	5	5	5	8	13	18
Y	2	3.5	3.5	5	7.5	9	11	12	16	21

Single acting push type

Symbol \ Bore size	12	16	20	25	32	40	50
X	-2	3	4	6	8	9	11
Y	6	3.5	3.5	3	4.5	5	5

Single acting pull type

Symbol \ Bore size	12	16	20	25	32	40	50
X	3	3	4	4	5	5	5
Y	2	3.5	3.5	5	7.5	9	11



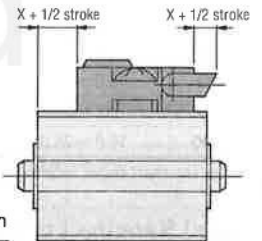
### ● Jig double rod type sensor cylinder

Double acting type

Symbol \ Bore size	12	16	20	25	32	40	50	63	80	100
X	-2	3	4	4	5	5	5	8	13	18
Y	2	3.5	3.5	5	7.5	9	11	12	16	21

Single acting type

Symbol \ Bore size	12	16	20	25	32	40	50
X	-2	3	4	6	8	9	11
Y	6	3.5	3.5	3	4.5	5	5



### ● Jig square rod type sensor cylinders

Double acting type

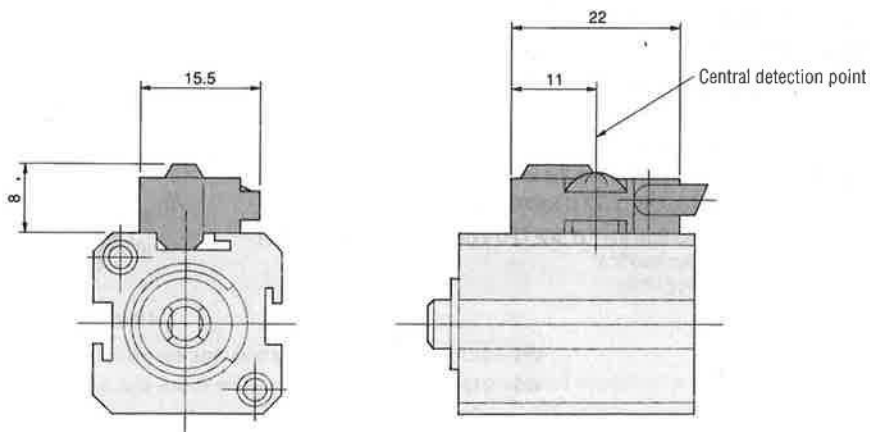
Symbol \ Bore size	12	16	20	25	32	40	50	63
X	-	-	10.5	10.5	14	15	15	18
Y	-	-	3.5	5	7.5	9	11	12

Remark 1: This chart shows standard strokes.

- 2: Check the mounting position of sensor switch to double rod type cylinders by observing the position of the cylinder label. Diagrams show the cylinder rotated 90° clockwise (180° for ø32) from the right position of the label.

## Sensor Switch Dimensions

(scale 1/1, unit:mm)



# Mounting Screws for Jig Cylinders

Handling Instruction - and Points to be Considered



Specially designed mounting screws are available for Jig Cylinders.  
To order, use the codes below.

**List of order codes** ①Shape of mounting screw : JIS B 1176 hexagon socket head, cap screw.  
②Surface treatment : Nickel plated

Applicable cylinder bore size mm	Order code of mounting screw	Screw size	Number in set	Applicable cylinder type and stroke size mm			
				JDA JDAD	JDAS JDADS	JSA JTA JSAD	JSAS JTAS JSADS
12	CRK124	M3×25	2	5			
	CRK125	M3×30		10		5	
	CRK126	M3×35		15	10	10	
	CRK127	M3×40		20	15	15	10
	CRK128	M3×45		25	20		15
	CRK129	M3×50		30	25		
16	CRK124	M3×25	2	5			
	CRK125	M3×30		10		5	
	CRK126	M3×35		15		10	
	CRK127	M3×40		20	10	15	10
	CRK128	M3×45		25	15		15
	CRK129	M3×50		30	20		
20	CRK130	M3×30	4	5		5	
	CRK131	M3×35		10		10	
	CRK132	M3×40		15		15	
	CRK133	M3×45		20	10		10
	CRK134	M3×50		25	15		15
25	CRK135	M4×30	4	5		5	
	CRK136	M4×35		10		10	
	CRK137	M4×40		15		15	
	CRK138	M4×45		20	10		10
	CRK139	M4×50		25	15		15
	CRK140	M4×55		30	20		
	CRK141	M4×60		35	25	20	
	CRK142	M4×65		40	30	25	
	CRK143	M4×70		45	35	30	20
	CRK144	M4×75		50	40		25
32	CRK135	M4×30	4	5		5	
	CRK136	M4×35		10		10	
	CRK137	M4×40		15		15	
	CRK138	M4×45		20	10		10
	CRK139	M4×50		25	15		15
	CRK140	M4×55		30	20		
	CRK141	M4×60		35	25	20	
	CRK142	M4×65		40	30	25	
	CRK143	M4×70		45	35	30	20
	CRK144	M4×75		50	40		25
40	CRK145	M5×35	4	5		5	
	CRK146	M5×40		10		10	
	CRK147	M5×45		15		15	
	CRK148	M5×50		20	10		10
	CRK149	M5×55		25	15		15
	CRK150	M5×60		30	20		
	CRK151	M5×65		35	25	20	
	CRK152	M5×70		40	30	25	
	CRK153	M5×75		45	35	30	20
	CRK154	M5×80		50	40		25
	CRK155	M5×85		55	45		30
	CRK156	M5×90		60	50		
	CRK157	M5×100		75	65		
	CRK158	M5×110		85	75		

Applicable cylinder bore size mm	Order code of mounting screw	Screw size	Number in set	Applicable cylinder type and stroke size mm			
				JDA	JDAS	JSA	JSAS
				JDAD	JDADS	JTAS	JSADS
50	CRK159	M6×40	4	10		10	
	CRK160	M6×45		15		15	
	CRK161	M6×50		20	10	20	10
	CRK162	M6×55		25	15		15
	CRK163	M6×60		30	20		20
	CRK164	M6×65		35	25		
	CRK165	M6×70		40	30	25	
	CRK166	M6×75		45	35	30	
	CRK167	M6×80		50	40	35	25
	CRK168	M6×85		55	45	40	30
	CRK169	M6×90		60	50		35
	CRK170	M6×100		65	55		40
	CRK171	M6×110		75	65		
	CRK172	M6×120		85	75		
	CRK174	M6×140		100	90		
	CRK175	M6×150		110	100		
63	CRK181	M6×50	4	10			
	CRK183	M6×60		20	10		
	CRK185	M6×70		30	20		
	CRK167	M6×80		40	30		
	CRK169	M6×90		50	40		
	CRK170	M6×100			50		
	CRK172	M6×120		75			
	CRK173	M6×130			75		
	CRK174	M6×140		100			
	CRK175	M6×150			100		

Applicable cylinder bore size mm	Order code of mounting screw	Screw size	Number in set	Applicable cylinder type and stroke size* mm	
				JDA	JDAS
				JDAD	JDADS
80	CRK178	M8×60	4	10	
	CRK177	M8×65		D 10	
	CRK178	M8×70		20	10
	CRK178	M8×75		D 20	D 10
	CRK180	M8×80		30	20
	CRK181	M8×85		D 30	D 20
	CRK182	M8×90		40	30
	CRK183	M8×95		D 40	D 30
	CRK184	M8×100		50	40
	CRK185	M8×110		D 50	D 40
	CRK185	M8×110			50
	CRK186	M8×120			D 50
	CRK187	M8×130		75	
	CRK187	M8×130		D 75	
	CRK188	M8×140			75
	CRK188	M8×140			D 75
	CRK189	M8×150		100	
	CRK180	M8×160		D 100	
	CRK190	M8×160			100
	CRK191	M8×170			D 100

※ Without D applies to single rod models  
With D applies to double rod models

Applicable cylinder bore size mm	Order code of mounting screw	Screw size	Number in set	Applicable cylinder type and stroke size* mm	
				JDA	JDAS
				JDAD	JDADS
100	CRK192	M10×65	4	10	
	CRK193	M10×70		D 10	
	CRK194	M10×75		20	10
	CRK195	M10×80		D 20	D 10
	CRK196	M10×85		30	20
	CRK197	M10×90		D 30	D 20
	CRK198	M10×95		40	30
	CRK199	M10×100		D 40	D 30
	CRK200	M10×110		50	40
	CRK200	M10×110		D 50	D 40
	CRK201	M10×120			50
	CRK201	M10×120			D 50
	CRK202	M10×130		75	
	CRK203	M10×140		D 75	
	CRK203	M10×140			75
	CRK204	M10×150			D 75
	CRK205	M10×160		100	
	CRK205	M10×160		D 100	
	CRK206	M10×170			100
	CRK206	M10×170			D 100

※ Without D applies to single rod models  
With D applies to double rod models

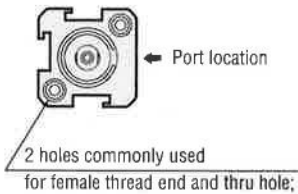
# Handling Instructions and Points to be Considered

## Mounting body

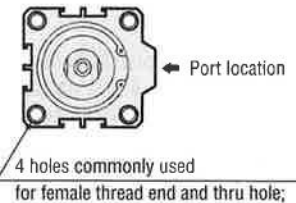
Jig cylinders have two types of mounting holes: common for thru and female thread, and tapped for female thread only. A wide variety of mountings are possible. Please see the following diagrams for further details.

### ● Standard cylinders (single and double rod types)

●  $\phi 12 \cdot \phi 16$

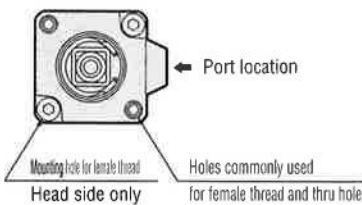


●  $\phi 20 \sim \phi 100$

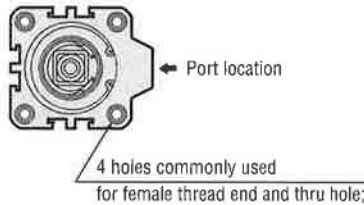


### ● Square rod cylinders

●  $\phi 20 \sim \phi 32$

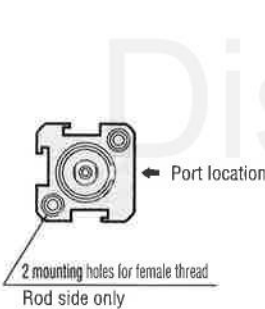


●  $\phi 40 \sim \phi 63$

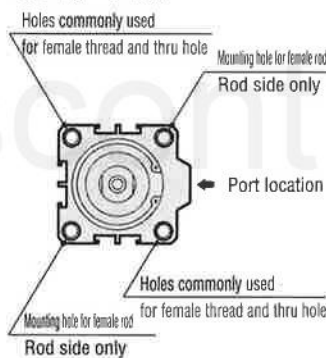


### ● Tandem cylinders

●  $\phi 12 \cdot \phi 16$

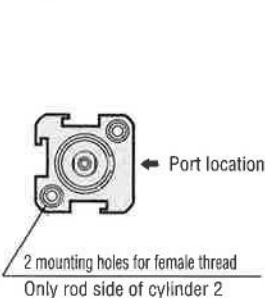


●  $\phi 20 \sim \phi 100$

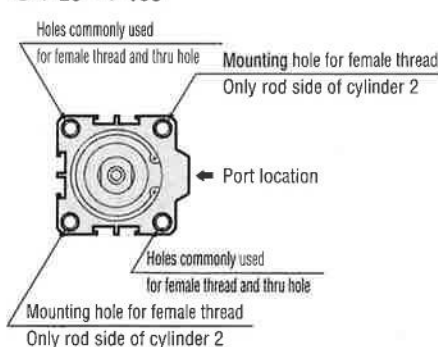


### ● Dual cylinders

●  $\phi 12 \cdot \phi 16$



●  $\phi 20 \sim \phi 100$



- Note 1: Do not use in applications that will put horizontal loads on piston rod (side-loading).  
 2: Use washers (provided) when mounting thru holes.  
 3: Avoid direct shock to the cylinders. Use shock absorbers.

### ● Fastening piston rod thread

When fastening piston rod thread, please consult us because there is a special tool to use (thin spanner).



Order code : L115069

## Mounting bracket

1. Foot brackets can not be mounted to tandem types, dual stroke cylinders, jig square rod cylinders (bores 20 thru 32) and clean system jig cylinders.
2. Flange brackets can not be mounted to head side of tandem types, stroke 1 of dual stroke types, rod side of jig square cylinders (bores 20 thru 32), and rod side of clean system jig cylinders.

Discontinued

## Non-Standard Strokes

### ● Manufacturing methods

The overall length of the cylinder specified with a non-standard stroke may vary depending on the manufacturing methods. When ordering, please pay special attention because without special instructions from the customer, the following method will be used.

Cylinder bore size mm	Manufacturing method
φ 12 thru φ 50	Collar packed
φ 63 thru φ 100	Tube cutting

Collar packed : Distance collar is added to longer non-standard strokes.

Tube cutting : By cutting cylinder tubes.

Remark 1: Consult us on tube cutting method for bores 12 thru 50, and collar packed manufacturing method of non-standard strokes for bores 63 thru 100.

2: Please consult us for changes in delivery times.

### ● Dimensions

1. Collar packed: Use the next longer standard stroke.
2. Tube cutting: Calculated in same manner as standard stroke.

## Piping

Flush pipes using compressed air before connecting to the cylinder. Entry of foreign matter such as cut scraps, seal tape, or rust during piping may diminish cylinder performance, cause leakage, or reduces lifespan.

## Atmosphere

1. When operating in conditions of excessive dust or exposure to water or oil particles, install appropriate protective devices such as covers.
2. When the media or environment contain the following substances, Jig Cylinders should not be used: organic solvents, phosphoric acid, aster-type machine oil, sulfurous acid gas, chlorine gas, or other acids.

## Lubrication

No lubrication is required; however, if lubrication is used, apply Class 1 turbine oil (ISO32), or equivalent. Do not use spindle oil or machine oil.

Discontinued