




## Dimensions of Panel and Insert Mount Type (mm)

**NSA** Bore size × Stroke

**NSA** Bore size × Stroke **-N**

**NSA** Bore size × Stroke **-6**

  $\phi$  6 : NSA-06  
 $\phi$  10 : NSA-10  
 $\phi$  16 : NSA-16

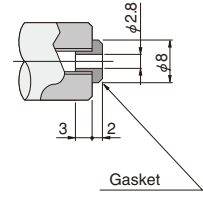
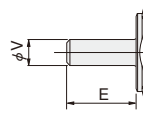
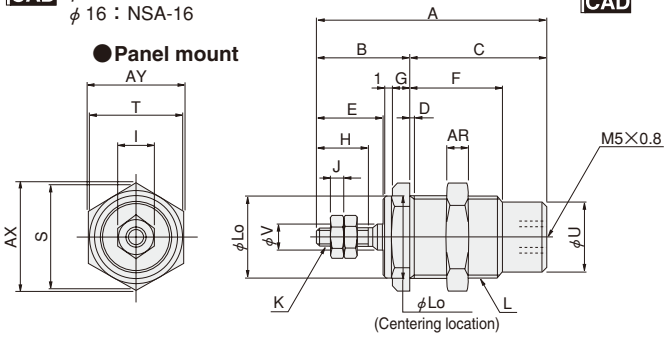
 NSA-N

 NSA-INS

● **Panel mount**

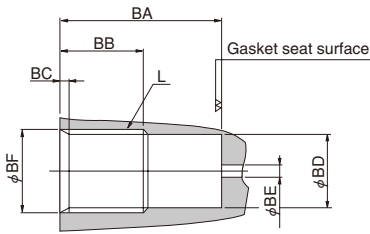
● **Plain rod**

● **Insert mount**



Code Stroke Bore	A			B	C			D	E	F			G	H	I	J	K	L	Lo	S	T	U	V	AR	AX	AY
	5	10	15		5	10	15			5	10	15														
<b>6</b>	29	36	43	13	16	23	30	1.5	9	11.5	13	13	2.5	7	5.5	1.8	M3×0.5	M10×1	10 <sub>-0.05</sub> <sup>0</sup>	13.9	12	8.5	3	3	13.9	12
<b>10</b>	34.5	41	48	16.5	18	24.5	31.5	1.5	12	13.5	16.5	16.5	3	10	7	2.4	M4×0.7	M14×1.25	14 <sub>-0.05</sub> <sup>0</sup>	18.5	16	12.3	5	4	19.6	17
<b>16</b>	39.5	45.5	52	19.5	20	26	32.5	2	14	15.5	18	18	4	12	8	3.2	M5×0.8	M22×1.5	22 <sub>-0.05</sub> <sup>0</sup>	27.7	24	20	6	5	31.2	27


● **Insert mounting hole**



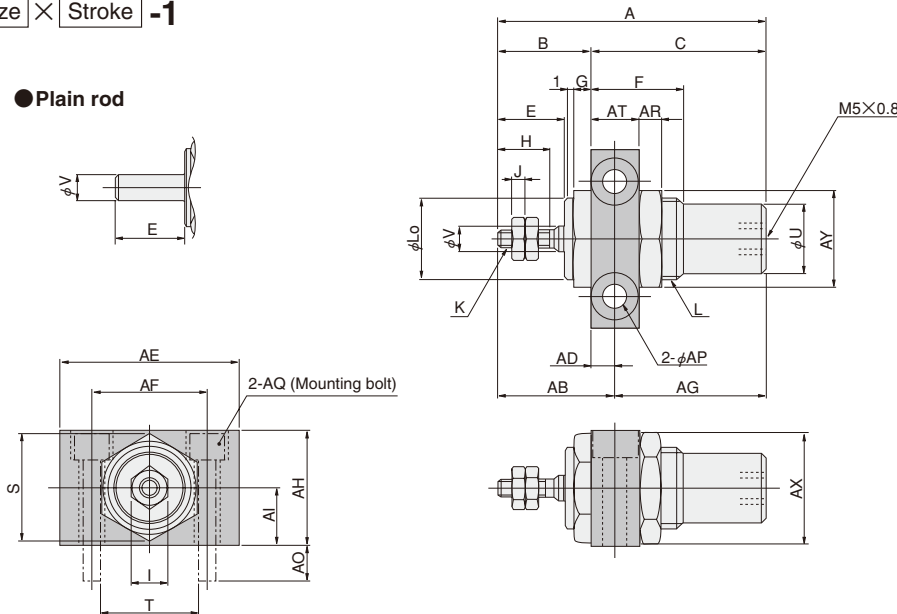
Code Stroke Bore	BA			BB			BC	BD	BE	BF
	5	10	15	5	10	15				
<b>6</b>	17.4±0.2	24.4±0.2	31.4±0.2	13 or more	15 or more	15 or more	2	9	4 or less	10 <sub>+0.05</sub> <sup>+0.15</sup>
<b>10</b>	19.4±0.2	25.9±0.2	32.9±0.2	15 or more	18 or more	18 or more	2	12.7	4 or less	14 <sub>+0.05</sub> <sup>+0.15</sup>
<b>16</b>	21.4±0.2	27.4±0.2	33.9±0.2	17 or more	20 or more	20 or more	2.5	20.4	4 or less	22 <sub>+0.05</sub> <sup>+0.15</sup>

## Dimensions of Foot Mount Type (mm)

**NSA** Bore size × Stroke **-1**

 NSA-FOOT

● **Plain rod**



Code Stroke Bore	A			B	C			E	F			G	H	I	J	K	L	Lo	S	T	U	V	AB	AD	AE
	5	10	15		5	10	15		5	10	15														
<b>6</b>	29	36	43	13	16	23	30	9	11.5	13	13	2.5	7	5.5	1.8	M3×0.5	M10×1	10 <sub>-0.05</sub> <sup>0</sup>	13.9	12	8.5	3	17.5	4.5	22
<b>10</b>	34.5	41	48	16.5	18	24.5	31.5	12	13.5	16.5	16.5	3	10	7	2.4	M4×0.7	M14×1.25	14 <sub>-0.05</sub> <sup>0</sup>	18.5	16	12.3	5	21	4.5	32
<b>16</b>	39.5	45.5	52	19.5	20	26	32.5	14	15.5	18	18	4	12	8	3.2	M5×0.8	M22×1.5	22 <sub>-0.05</sub> <sup>0</sup>	27.7	24	20	6	25.5	6	42

Code Stroke Bore	AF	AG			AH	AI	AO	AP			AQ			AR	AT	AX	AY
		5	10	15				(Comes with foot mounting bracket)			(Comes with foot mounting bracket)						
<b>6</b>	14	11.5	18.5	25.5	14	7	(5.3)	$\phi$ 3.4	Counterbore	$\phi$ 6.2	Depth 3.3	Hexagon socket head bolt M3 × 0.5	Below head length 16	3	9	13.9	12
<b>10</b>	20	13.5	20	27	20	10	(6.4)	$\phi$ 4.5	Counterbore	$\phi$ 7.8	Depth 4.4	Hexagon socket head bolt M4 × 0.7	Below head length 22	4	9	19.6	17
<b>16</b>	30	14	20	26.5	32	16	(8.4)	$\phi$ 5.5	Counterbore	$\phi$ 9.5	Depth 5.4	Hexagon socket head bolt M5 × 0.8	Below head length 35	5	12	31.2	27

# SENSOR SWITCHES

Solid State Type, Reed Switch Type

## Symbol



## Order Codes (For Sensor Switches Only)

	DC Voltage	Sensor switch model	Option Lead wire length	With sensor holder
Solid state type With indicator lamp	DC10~28V	ZC130	A B	-NDAS
Solid state type With indicator lamp	DC4.5~28V	ZC153		
Reed switch type Without indicator lamp	DC5~28V AC85~115V	CS5T		
Reed switch type With indicator lamp	DC10~28V	CS11T		

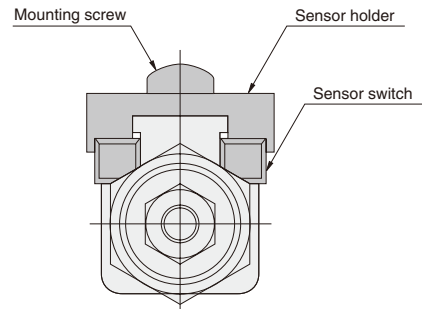
- A : 1000mm [39in.]
- B : 3000mm [118in.]

- The same sensor holder is used for  $\phi 6$ ,  $\phi 10$ , and  $\phi 16$ .

- For sensor switch details, see p.1544.
- ★ Order code for the sensor holder only. C1-NDAS

## Moving Sensor Switch

- Loosening mounting screw allows the sensor switch to be moved freely in the cylinder's axial direction.
- Tighten the mounting screw with a tightening torque of 19.6N·cm [1.73in·lbf] or less.



## Minimum Cylinder Stroke When Using Sensor Switch

Bore size	Solid state type sensor switch		Reed switch type sensor switch	
	Mounting 2 pcs.	Mounting 1 pc.	Mounting 2 pcs.	Mounting 1 pc.
6 [0.236]	5	5	10	5
10 [0.394]	[0.197]	[0.197]	[0.394]	[0.197]
16 [0.630]				

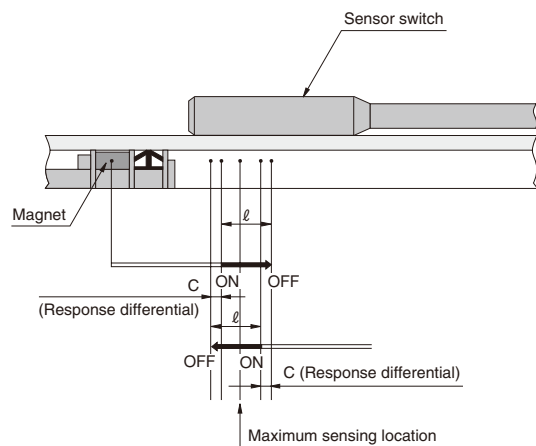
Remark: In the reed switch type sensor switch, 1 sensor switch installation is standard for the 5mm cylinder stroke.

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

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

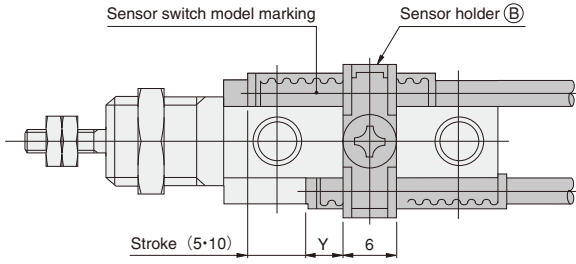
Bore size	ZC130□, ZC153□		CS5T□, CS11T□	
	Operating range	Response differential	Operating range	Response differential
6 [0.236]	2.5~4.0 [0.098~0.157]	0.3 [0.012] or less	3.5~7.5 [0.138~0.295]	1.3 [0.051] or less
10 [0.394]	2.0~4.0 [0.079~0.157]	0.3 [0.012] or less	3.5~8.5 [0.138~0.335]	1.6 [0.063] or less
16 [0.630]	2.5~4.0 [0.098~0.157]	0.3 [0.012] or less	5.0~10.5 [0.197~0.413]	1.9 [0.075] or less

Remark: The above table shows reference values.

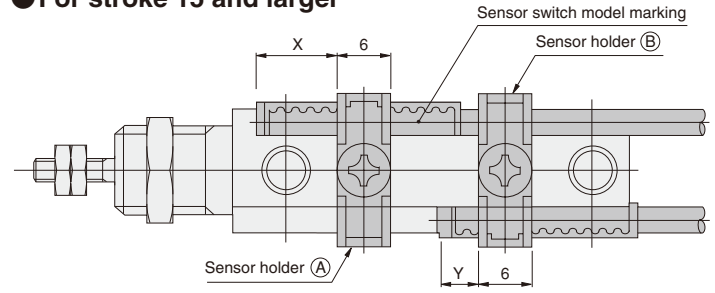


## Mounting Location of End of Stroke Detection Sensor Switch

### ● For strokes 5 and 10



### ● For stroke 15 and larger



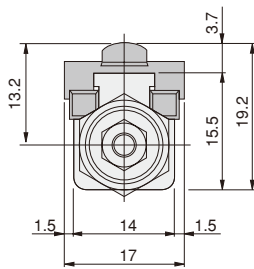
mm [in.]

Bore size	Mounting location	Sensor switch model			
		ZC130□	ZC153□	CS5T□	CS11T□
6, 10 [0.236, 0.394]	X	10 [0.394]	8.5 [0.335]	12 [0.472]	
	Y	5 [0.197]	3.5 [0.138]	7 [0.276]	
16 [0.630]	X	10.5 [0.413]	9 [0.354]	12.5 [0.492]	
	Y	5.5 [0.217]	4 [0.157]	7.5 [0.295]	

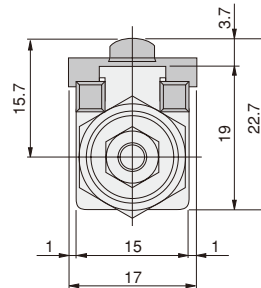
- Remarks:
1. The table at left gives reference values for the standard strokes. For the procedure to find-out the best position, see p.92.
  2. The above figures show the piping connection port when it has been turned to face upward.
  3. Mount the sensor switch so that the surface showing the model marking faces up.
  4. Sensor holder (A) is not available for the 5mm and 10mm strokes, and only sensor holder (B) is available. Two sensor switches can be mounted with a single sensor holder (B). In this case, the sensor switch mounting position on the rod side becomes the Y dimension (shown in the figure) + stroke.

## Dimensions of Sensor Switch Mounting (mm)

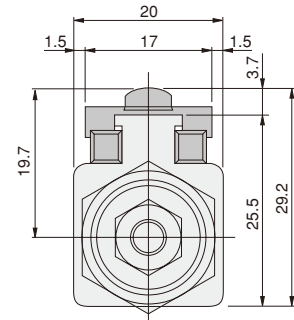
### ● $\phi$ 6 [0.236in.]



### ● $\phi$ 10 [0.394in.]



### ● $\phi$ 16 [0.630in.]





## Mounting

### Double acting type

- In applications with high load ratio or high speed, use an externally mounted stopper to prevent direct shock to the cylinder.
- Do not let the tightening torque for the mounting nut exceed the figures in the table below.

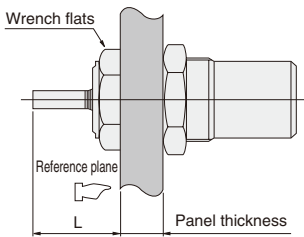
Bore size	Maximum tightening torque
6 [0.236in.]	1079 [95.5]
10 [0.394in.]	1275 [113]
16 [0.630in.]	1961 [174]

N-cm [in.-lbf]

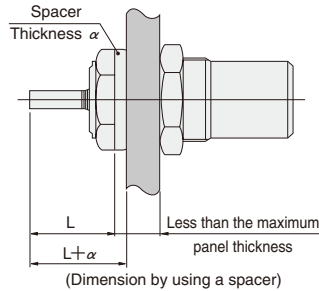
### Single acting push type

- Using the centering location on the body can improve mounting precision on panel mounting. In addition, set the end face of the wrench flat as a reference plane does not need any adjustment of the rod end position. Moreover, the rod end position can be freely set through the use of cylindrical spacer matching the outer diameter of the cylinder body. For the maximum thickness of the panel, use the values in the table below as guidelines.

#### ● Panel mounting



#### ● Panel mounting



Bore size	Maximum panel thickness
6 [0.236]	8 [0.315]
10 [0.394]	9 [0.354]
16 [0.630]	10 [0.394]

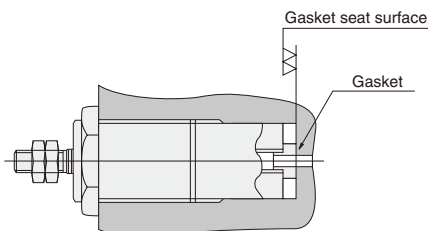
mm [in.]

- Do not let the tightening torque for the mounting nut exceed the figures in the table below.

Bore size	Maximum tightening torque
6 [0.236in.]	1226 [109]
10 [0.394in.]	1716 [152]
16 [0.630in.]	4903 [434]

N-cm [in.-lbf]

- Let the surface roughness of the bottom of the insert mounting hole (gasket seat surface) be of medium finish (▽▽). Moreover, mounting without a gasket can be done by applying a sealing agent to the thread of the body.

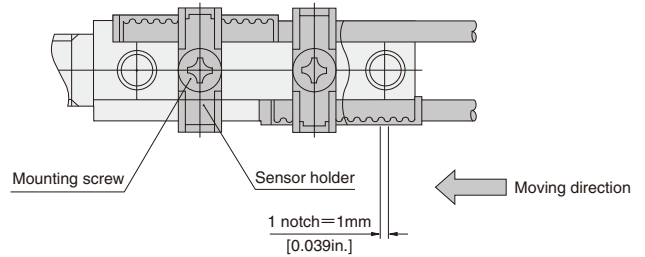


## Sensor switches

### Double acting type

#### ● Setting the head side stroke end

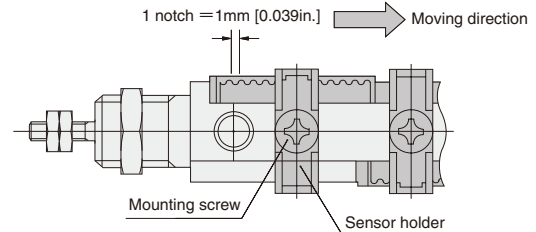
- Push piston rod to the fully retracted position.
- Install a sensor switch in a holder without tightening a mounting screw all the way, move the switch from head side to rod side until it turns ON (for **ZC130**, **ZC153**, **CS11T**, when the LED lights up), then move the switch 1 notch (= 1mm [0.039in.]) for **ZC130** and **ZC153**, or 2 notches (= 2mm [0.079in.]) for **CS5T** and **CS11T** toward the rod side, and tighten the mounting screw.



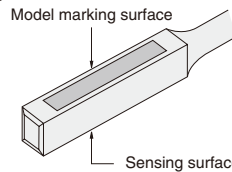
#### ● Setting the rod side stroke end

Conduct the same procedure as the head side, but on the reversed way.

- Pull piston rod to the fully extended position.
- Install a sensor switch in a holder without tightening a mounting screw all the way, move the switch from rod side to head side until it turns ON, then move the switch 1 notch (=1mm [0.039in.]) for **ZC130**, **ZC153**, or 2 notches (=2mm [0.079in.]) for **CS5T** and **CS11T** toward head side and tighten the mounting screw.

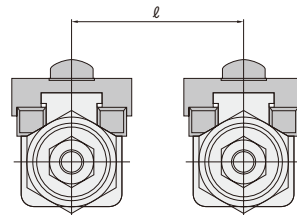


### Caution when installing cylinder with sensor switch



In the ZC type sensor switches, the opposite side from the model marking surface is the sensing surface side. Mount it so that the cylinder magnet comes to the sensing surface side.

When installing 2 or more knock cylinders with magnets, which are located close to each other in parallel, follow the conditions shown below.



Bore size	l dimension
6 [0.236in.]	23mm [0.906in.] or more
10 [0.394in.]	24mm [0.945in.] or more
16 [0.630in.]	26mm [1.024in.] or more