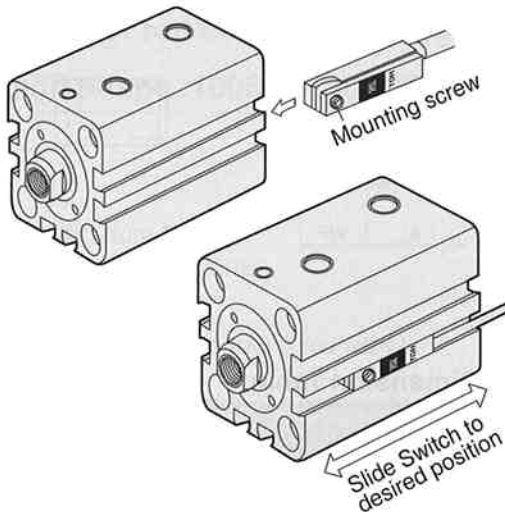


## HOW TO ADJUST SWITCH POSITIONS

### T TYPE SWITCH (for $\phi 20 \cdot \phi 25$ )



1. Put switch in to the gutter like a drawing.
2. Slide the switch to the desired position.  
The center is the most stable position.
3. If the cylinder stroke end is selected, install the switch at dimension UX (best position setting).
4. Fix mounting screw after mount correct position.

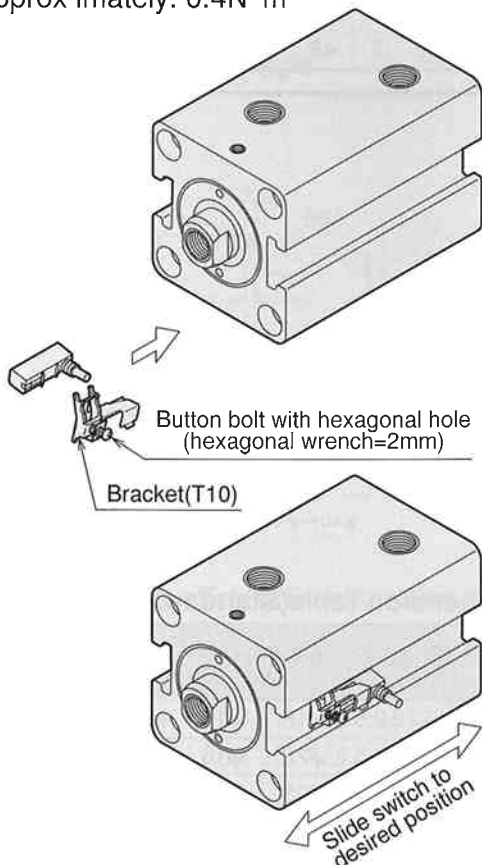
### TORQUE OF MOUNTING SCREW

Switch code	T0·T5·T2·T3	T2Y
Size of thread of mounting screw	M2.5	M3
Tool for mounting screw	Precision screwdriver(-)	Screwdriver(+)
Clamp torque	About 0.1~0.2N·m	About 0.4N·m

Note: If the clamp torque is not correct, the position of the switch may shift or the switch itself may become damaged.

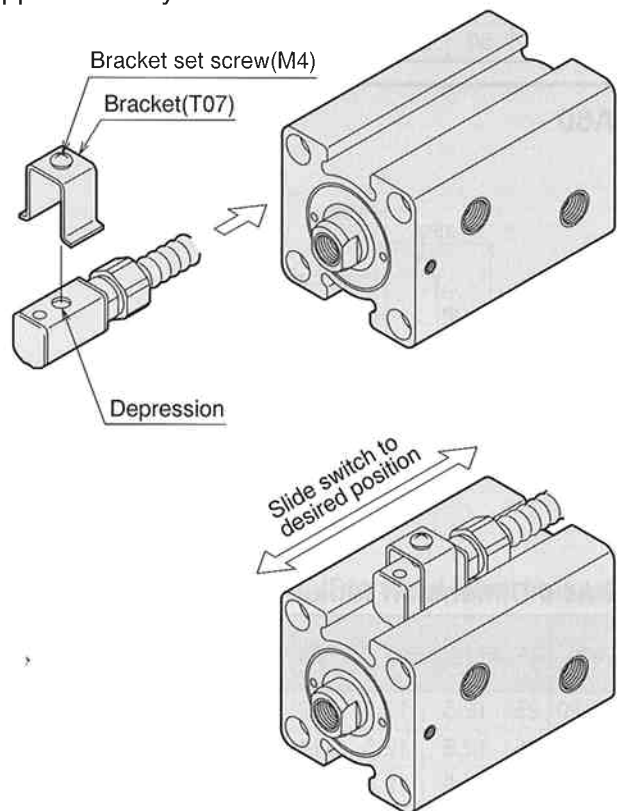
### AX·AZ TYPE SWITCH (for $\phi 32 \sim \phi 100$ )

AX·AZ type bracket set screw clamp torque approx imately. 0.4N·m



### WR·WS TYPE SWITCH (for $\phi 32 \sim \phi 100$ )

WR·WS Type bracket set screw clamp torque approx imately. 0.6N·m



1. Loosen the bracket set screw and place the bracket in the center of the switch.
2. With the switch and bracket assembled, insert it into the switch installation area of the cylinder body.
3. Slide the switch to the desired position. The center is the most stable position.
4. If the cylinder stroke end is selected, install the switch at dimension UX (best position setting).
5. After sliding the switch to the desired position, tighten the bracket set screw.

**Note:** If the clamp torque is not correct, the position of the switch may shift or the switch itself may become damaged.

**HANDLING PRECAUTIONS**

- When using with the rod push output, make sure that the rod is screwed in all the way to its end face so that no force is applied to the threaded portion of piston rod.
- During installation, make adjustments carefully because a lateral load (eccentric load) can not be applied to the piston rod.
- When operating the cylinder for the first time, be sure to bleed the air from the piping. After bleeding the air, operate the cylinder at the low pressure, and gradually increase the pressure to reach the operating pressure.

**Note:** The 100S-1 series cylinders are not provided with the air vent. Therefore, exhaust the air from the piping.

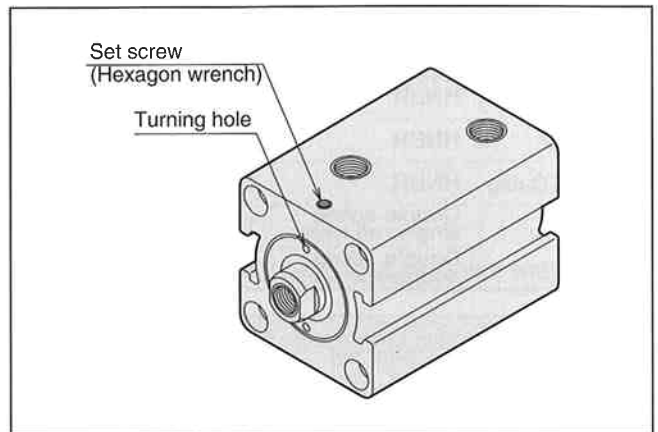
- To install the cylinder, 4 hexagon socket bolts (JIS B1176, strength classification of 10.9 or more) shall be used.
- When using the mounting bolts, screw 80% or more of the threaded portion of bolts into the material to be mounted. The material to be mounted must have the strength that is equivalent to the SS400 material quality.
- To tighten the mounting bolts with nuts, use steel nuts with the strength classification of 6 or more. (However, do not use type 3.)
- When screwing mounting bolts into the cylinders, be sure to tighten them using the torque values indicated in the table below.

**CYLINDER MOUNTING BOLT TIGHTENING TORQUE TABLE**

Cylinder bore	Mounting bolt size	Tightening torque N·m
φ20	M5×0.8	4.8
φ25	M5×0.8	4.8
φ32	M6×1	5.9
φ40	M8×1.25	14.0
φ50	M10×1.5	28.0
φ63	M12×1.75	49.0
φ80	M14×2	77.0
φ100	M16×2	120.0

- To tighten the piston rod end threads of the double acting double rod type, make sure to use the width across flats of the rod to be tightened. Because the double rod type piston rod is joined by the threads, cautions shall be taken that the rotational force at both ends of the piston rod is not applied to the rod.

**DISASSEMBLY AND REASSEMBLY PRECAUTIONS**



- After removing the set screw, utilize the turning hole of the rod gland to remove the rod gland from the cylinder body. When removing a jig from the rod end threads, burrs may be created on the width across flats of the rod. In that case, use a file to remove the burrs; then, remove the rod gland.
- The piston rod and piston cannot be disassembled.
- If the cylinder has been disassembled, make sure to replace all sealing materials (seals and gaskets).
- During the reassembly of the cylinder, make sure that no dust or debris such as metal particles enter the cylinder.
- A urethane ball for protecting the threads of the rod gland is located below the set screw. This ball must be removed before tightening the rod gland.
- After tightening the rod gland, install the urethane ball that is included in the seal set and tighten the set screw.

**REPLACING THE SEALS**

- The general-purpose type (100S-1, 100S-1D, 100S-1R, 100S-1RD), piston seal, rod seal, dust wiper, and rod gland O-ring can be replaced.
- The cutting oil resistant type (100SW-1, 100SW-1D, 100SW-1R, 100SW-1RD), the piston seal, rod seal, and rod gland O-ring can be replaced. The dust wiper of the cutting oil resistant type is pressed into the rod gland; therefore, the dust wiper cannot be replaced individually. If the dust wiper is replaced, the rod gland must be replaced.
- The piston rod O-ring cannot be replaced because the piston and rod are tightening.

### 6 HNBR/100S-1, 100S-1R, 100S-1D, 100S-1RD

Parts	Material	Q'ty	Parts type			
			φ20	φ25	φ32	φ40
Piston seal	HNBR	1	NCHY-20	NCHY-25	NCHY-32	NCHY-40
Rod seal	HNBR	1(2)	UHY-12	UHY-14	UHR-18	UHR-22
Dust wiper	HNBR	1(2)	LPH-12	LPH-14	DHS-18	DHS-22
Rod gland O-ring	HNBR	1(2)	S-18	S-22.4	G-25	G-35
Seal set	Double acting single rod type	1 set	RS1/PKS6-020	RS1/PKS6-025	QS1/PKS6-032	QS1/PKS6-040
	Double acting double rod type	1 set	RS1D/PKS6-020	RS1D/PKS6-025	QS1D/PKS6-032	QS1D/PKS6-040

Parts	Material	Q'ty	Parts type			
			φ50	φ63	φ80	φ100
Piston seal	HNBR	1	NCHY-50	NCHY-63	NCHY-80	NCHY-100
Rod seal	HNBR	1(2)	UHR-28A	UHR-36	UHR-45	UHR-45
Dust wiper	HNBR	1(2)	DHS-28	DHS-36	DHS-45	DHS-56
Rod gland O-ring	HNBR	1(2)	G-45	G-58	G-75	G-95
Seal set	Double acting single rod type	1 set	QS1/PKS6-050	QS1/PKS6-063	QS1/PKS6-080	QS1/PKS6-100
	Double acting double rod type	1 set	QS1D/PKS6-050	QS1D/PKS6-063	QS1D/PKS6-080	QS1D/PKS6-100

- The figures in parentheses"( )"indicate the quantity for the double rod type.
- A urethane ball for protecting the threads of the rod gland is included in the seal set. Be careful not to lose it.

### 3 FLUORIC RUBBER (SEMI-STANDARD)/100S-1, 100S-1R, 100S-1D, 100S-1RD

Parts	Material	Q'ty	Parts type					
			φ32	φ40	φ50	φ63	φ80	φ100
Piston seal	Fluoric rubber	1	P-26	P-34	P-44	P-53	P-70	P-90
Rod seal	Fluoric rubber	1(2)	UHR-18	UHR-22	UHR-28A	UHR-36	UHR-45	UHR-45
Dust wiper	Fluoric rubber	1(2)	DHS-18	DHS-22	DHS-28	DHS-36	DHS-45	DHS-56
Rod gland O-ring	Fluoric rubber	1(2)	G-25	G-35	G-45	G-58	G-75	G-95
Seal set	Double acting single rod type	1 set	QS1/PKS3-032	QS1/PKS3-040	QS1/PKS3-050	QS1/PKS3-063	QS1/PKS3-080	QS1/PKS3-100
	Double acting double rod type	1 set	QS1D/PKS3-032	QS1D/PKS3-040	QS1D/PKS3-050	QS1D/PKS3-063	QS1D/PKS3-080	QS1D/PKS3-100

- The figures in parentheses"( )"indicate the quantity for the double rod type.
- A urethane ball for protecting the threads of the rod gland is included in the seal set. Be careful not to lose it.

### 6 CUTTING OIL RESISTANT TYPE/100SW-1, 100SW-1R, 100SW-1D, 100SW-1RD

Parts	Material	Q'ty	Parts type					
			φ32	φ40	φ50	φ63	φ80	φ100
Piston seal	HNBR	1	NCHY-32	NCHY-40	NCHY-50	NCHY-63	NCHY-80	NCHY-100
Rod seal	HNBR	1(2)	UHR-18	UHR-22	UHR-28A	UHR-36	UHR-45	UHR-45
Dust wiper	HNBR	1(2)	DHS-18	DHS-22	DHS-28	DHS-36	DHS-45	DHS-56
Rod gland O-ring	HNBR	1(2)	G-25	G-35	G-45	G-58	G-75	G-95
Seal set	Double acting single rod type	1 set	QSW1/PKS6-032	QSW1/PKS6-040	QSW1/PKS6-050	QSW1/PKS6-063	QSW1/PKS6-080	QSW1/PKS6-100
	Double acting double rod type	1 set	QSW1D/PKS6-032	QSW1D/PKS6-040	QSW1D/PKS6-050	QSW1D/PKS6-063	QSW1D/PKS6-080	QSW1D/PKS6-100

- The figures in parentheses"( )"indicate the quantity for the double rod type.
- The seal set indicated above dose not contain the dust wiper. The dust wiper of the cutting oil resistant type is pressed into the bush and thus integrated with the bush;therefore,the dust wiper cannot be replaced individually. If the dust wiper is replaced, the bush shall be replaced.
- Do not lose the seal set as the urethane ball for protecting the threads of the bush is included in the seal set.

## DESCRIPTION OF OPERATING RANGE

### 1) The 100S-1 series conforms to the fatigue test classification A1.

- The JIS B 8367 (pending) stipulates the cylinder's fatigue strength classification.
- The A1 classification is awarded to the pressure device with the use life of over 10,000,000 times at the rated pressure.
- The 100S-1 series conforms to the A1 classification at 10MPa.

### 2) Method for determining the operating pressure range

- The fatigue life is determined in accordance with the fatigue tests of the actual body and the value with the test data treated statistically.
- The life distribution is obtained from the data of the fatigue tests performed on the actual body, and the value of, a 1% of fracture probability is set as the operating pressure range.

Note: According to the statistical analysis method, there is no point of 0%.

### 3) The operating pressure is the internal pressure that is generated in the cylinder.

- The operating pressure is not the set pressure of relief valve.
- The pressure that is higher than the set pressure of relief valve including the surge pressure at the change of valve is generated in the cylinder.
- The hydraulic circuit should be arranged to minimize the generation of surge pressure.

