CKD

SM-227265-A

INSTRUCTION MANUAL

SUPER MICRO CYLINDER

SCM-M

- Please read this instruction manual carefully before using this product, particularly the section describing safety.
- Retain this instruction manual with the product for further consultation whenever necessary.

CKD Corporation

For Safety Use

To use this product safely, basic knowledge of pneumatic equipment, including materials, piping, electrical system and mechanism, is required (to the level pursuant to JIS B 8370 Pneumatic System Rules).

We do not bear any responsibility for accidents caused by any person without such knowledge or arising from improper operation.

Our customers use this product for a very wide range of applications, and we cannot keep track of all of them. Depending on operating conditions, the product may fail to operate to maximum performance, or cause an accident. Thus, before placing an order, examine whether the product meets your application, requirements, and how to use it.

This product incorporates many functions and mechanisms to ensure safety. However, improper operation could result in an accident. To prevent such accidents, read this instruction manual carefully for proper operation.

Observe the cautions on handling described in this manual, as well as the following instructions :

⚠ Precautions

- Before performing an overhaul inspection on the actuator, deactivate residual pressure completely.
- While the actuator is operating, do not step into or place hands in the driving mechanism.
- To prevent an electric shock, do not touch the electric wiring connections (exposed live parts) of the actuator equipped with a solenoid valve or switch.
  Perform an overhaul inspection with the power off. Also, do not touch these live parts with wet hands.

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SCM-M
Super micro Cylinder
Double acting, non-rotating type
Manual No. SM-227265-A

NOTE : Letters & figures enclosed within Gothic style bracket (examples such as [C2-4PP07] · [V2-503-B] etc.) are editorial symbols being unrelated with contents of the book.

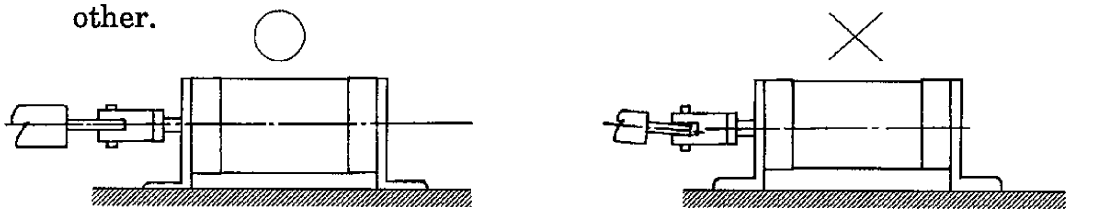
1. UNPACKING

1) Make sure that the type No. on the nameplate of the delivered Rotary Clamp Cylinder matches the type No. you ordered.
2) Check the appearance for any damage.
3) Stop up the piping port with a sealing plug to prevent the entry of foreign substances into the cylinder.
   Remove the sealing plug before piping.

2. INSTALLATION

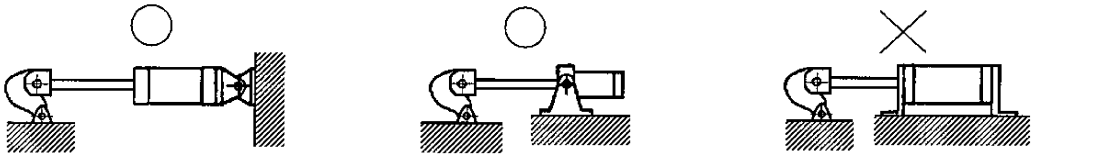
2.1 Installation

1) The ambient temperature range for this cylinder is −10~60°C.
2) Use cylinder with bellows over its rod within the area with much dust.
3) Carefully avoid other object from hitting the tube. Otherwise, it may get the tube distorted and cause malfunction of the cylinder.
4) When cylinder is fixed and rod end is guided:
   In case the piston rod of cylinder and the load are misaligned, the bushes and packings of the cylinder are extremely worn out. Hence, connect them with CKD floating connector (spherical bearing).
5) When cylinder is fixed and rod end is connected with pin joint:
   In case the load acting direction is not parallel with the rod axial center, the rod and tube may get entangled causing seizure, etc. Hence, make sure that the rod axial center and the load transfer direction are aligned to each other.



[C1-409-A]

6) When the load acting direction changes with the cylinder operation:
   Use an oscillating cylinder (clevis type or trunnion type) capable of making revolution to a certain angle. Furthermore, install the rod and connecting metal (knuckle) so that it moves in the same direction as the cylinder main body does.



[C1-409-B]

Clevise type　　Trunnion type　　Foot type

2.2 Piping

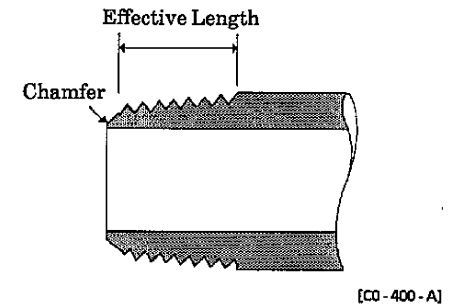
1) For piping beyond the filter, use pipes that are tough against corrosion such as galvanized pipes, nylon tubes, rubber tubes, etc.

2) See to it that the pipe connecting cylinder and solenoid valve has an effective sectional area which is needed for the cylinder to drive at the specified speed.

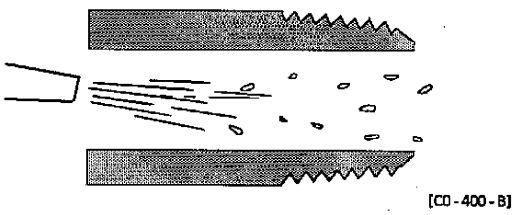
3) Install filter preferably adjacent to the upper-stream to the solenoid valve for eliminating rust and foreign substances in the drain of the pipe.

4) Be sure to adhere to the effective thread length of gas pipe and make a chamfer of approx. 1/2 pitch from the threaded end.

5) Flush air into the pipe to blow out foreign substances and chips before piping.

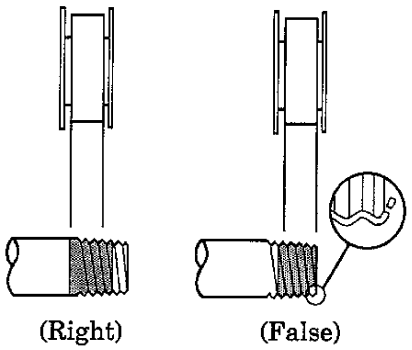


[C0-400-A]

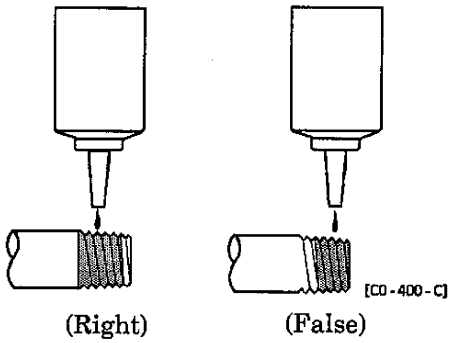

[C0-400-B]

6) Refrain from mapplying sealant or sealing tape approx. two pitches of thread off the tip of the pipe to avoid residual substances from falling into the piping system.

● Seal Tape


(Right) (False)

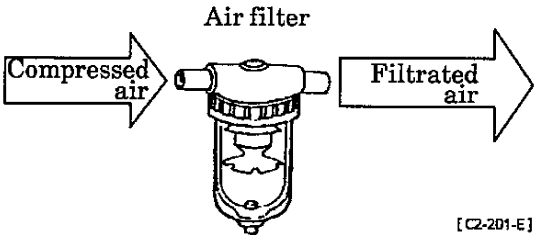
● Sealant (Paste or liquid)


[C0-400-C]

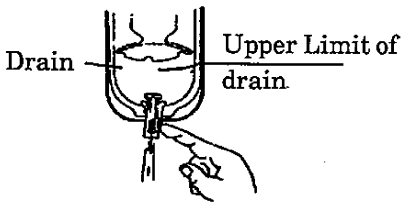
(Right) (False)

2.3 Fluid

1) It is necessary to use dehumidified air that has been filtered from compressed air. Carefully select an adequate filter that has an adequate filtration rate (preferably 5μm or less), flow rate and its mounting location (as nearest to the directional control valve as possible).



[C2-201-E]



[C2-201-F]

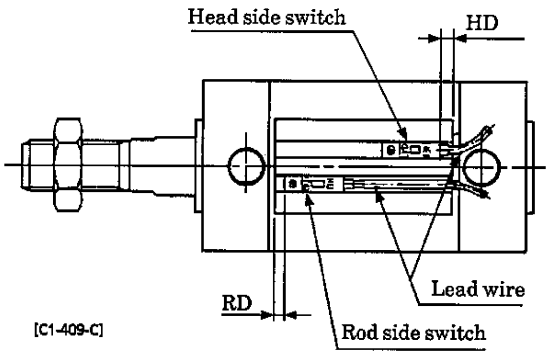
2) Be sure to drain out the accumulation in the filter periodically.

3) Note that the intrusion of carbide for the compressor oil (such as carbon or tarry substance) into the circuit causes malfunction of the solenoid valve and the cylinder. Be sure to carry out thorough inspection and maintenance of the compressor.

4) This cylinder does not require lubrication. It is recommended, however, to use Turbine oil Grade 1, ISO VG32 as a lubricant, if and when lubrication is needed.

2.4 Location of mounting Switch

1) Location



[C1-409-C]

(1) At the stroke end

Refer the illustration above. Mount switches within the rod side dimension RD as well as the head side dimension HD for the purpose of having switches function at the points of the highest sensitivity.(See Table 1.)

(2) Intermediate of stroke

Move the piston where it is anticipated to stop and fix it tentatively Slide a switch carefully along the side of cylinder over the piston to find out the spot where switch turns on. This type spot shoule be located on both side of piston. The intermediate spot between those points is of the highest sensitivity and where the switch is supposed to be installed.

(3) Relocation of switch

Slide switch body along cylinder tube after loosening mounting screws and tighten screws when located the most sensitive position.

(Apply tightening torque of 0.1~0.2N · m {1~2kgf · cm})

(4) Replacing switch

Take out switch out of groove after loosening mounting screws. Slide new replacing switch into groove and tighten screws upon placing the switch at the most sensitive position.

(Apply tightening torque of 0.1~0.2N · m {1~2kgf · cm})

2) Motion limit

The range where switch turns on first and turns off as the piston moves along its stroke is called motion limit.

The center of the range is the mostly sensitive position. Setting switch at this point eliminates majority of external disturbance and provides the most stabile actuation of switch.

3) Mounting the switch rail

If your cylinder is equipped with an optional switch rail or such a switch rail is separately prepared, mount the switch rail according to the "Switch Rail Mounting Instructions" attached to it.

4) Hysteresis

The distance is called hysteresis between the positions where switch turns ON as piston slides long and where switch turns OFF due to reversing stroke of piston.

Switch is apt to be disturbed its accuracy by external effect when piston stops within this range. Carefully avoid designing stopping location of piston.

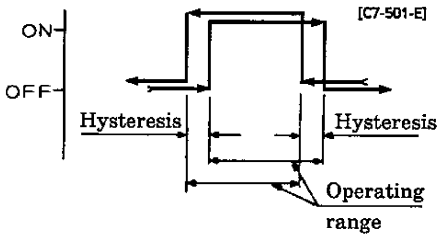


Table 1 (mm)

Tube bore	Non contact type switch (T2H/V, T3H/V)				Contact type switch (T0H/V, T5H/V)			
	Maximum sensitive position		Operating range	Hysteresis	Maximum sensitive position		Operating range	Hysteresis
	HD	RD			HD	RD		
ϕ20	5.3	6.2	3~8	1.5 or ress	2.3	5.2	6~14	3 or ress
ϕ25	4.3	7.2	3~9		1.3	6.2	5~14	
ϕ32	5.3	8.2	3~8		2.3	7.2	5~12	
ϕ40	7.3	10.2	3~9		4.3	9.2	6~14	
ϕ50	9.8	11.7			6.8	10.7		
ϕ63							7~15	

3. OPERATION

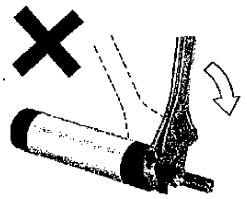
3.1 Operating the Cylinder

1) See to it that the air supply pressure to the cylinder is as shown in the "Specification". Operate the cylinder within this pressure range.
2) A rubber cushion is used as the cushion.
Adjust the piston speed with the speed controller mounted.

Table 2 : Table of cushion characteristics

Tube bore (mm)	Rubber cushion
	Allowable energy absorption (J){$\times 10^{-1}$kgf · m}
ϕ20	0.11
ϕ25	0.2
ϕ32	0.53
ϕ40	0.91
ϕ50	1.6
ϕ63	1.6

3) Adjust the piston speed with the speed controller mounted.
4) Do not use the cylinder in such a manner that a rotating torque is applied to the piston rod. The bush for non-rotation will be deformed and its life will be reduced considerably.
5) Ensure that the load is always applied to the axial direction of the piston rod.
6) To fix the work on the tip of the piston rod, retract the piston rod to the stroke end, set a spanner on the portion which is outside the parallel portion of the rod, and tighten the nut in a manner that the tightening torque is not applied to the cylinder body.



Note that the bush rotates if a rotating torque exceeding the value of the following table is applied to the piston rod.

Tube bore (mm)	ϕ20	ϕ25	ϕ32	ϕ40	ϕ50	ϕ63
Allowable rotating torque N · m {kgf · m}	0.2 {0.020}	0.25 {0.026}		0.45 {0.046}		

3.2 Operating the Switches

3.2.1 General Cautions

1) Magnetic environment

Avoid usage of these switches within the area where strong magnetic field or large current exisis (such as a large magnet or spot welding equipment). Position censoring errors will be resulted when installing many cylinders with switches in parallel or magnetized piece come across the cylinder due to intervention among each other.

2) Protection of lead cord

Pay consideration to eliminate rapeating bending stress or stretching of lead cord while laying the cord. To the moving portion, use such cord of flexibility as for building a robot.

3) Service temperature

It is unsuitable to operate it in high temperature (above 60°C) due to thermal characteristics of magnetic parts and electronic parts. Eliminate operation in such high temperature.

4) Intermediate position sensing

Beware of unstable respondence of relay when piston speed is excessive in the event of intending actuation of switch in the way of piston stroke.

5) Shock

Carefully avoid big shock or vibration during transportation of cylinder of mounting and adjusting switch.

6) Changing switch lead wire colors

The colors of the switch lead wires have been changed, as shown in the following table, in response to the revision of the JIS standard and the subsequent revision of the NECA (Nippon Electric Controllers Association) standard.

		Before change	After change
M, S, R A, T, K V, H Series	2-wire type	White (+)	Brown (+)
		Black (−)	Blue (−)
	3-wire type	Red (+)	Brown (+)
		White (output)	Black (output)
		Black (−)	Blue (−)
T, K Series (equipped with preventive maintenance output)	3-wire type	White (+)	Brown (+)
		Yellow(preventive maintenance output)	Orange(preventive maintenance output)
		Black (−)	Blue (−)
	4-wire type	Red (+)	Brown (+)
		White (regular output)	Black (regular output)
		Yellow(preventive maintenance output)	Orange(preventive maintenance output)
		Black (−)	Blue (−)

3.2.2 Operational Cautions, Non contact type switch (T2, T3)

1) Connection of lead cord

Comply with the color coding specified on the illustrations. Be sure to turn the power off before starting connecting work.

An erroneous wiring or short circuiting of load causes damage to not only switches, but also load side circuit. Wiring work without shutting electricity off may cause damage to the load side circuit.

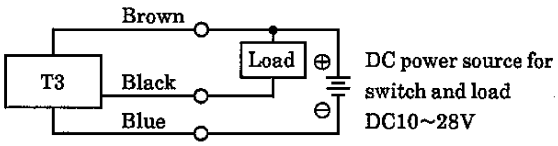


Fig.1 Basic Circuit Example (1)
(The same power source is used for switch and load.)

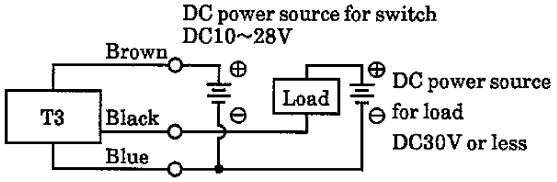


Fig.3 Basic Circuit Example (3) (Different power sources are used for switch and load.)

2) Protection of output circuit

Install some protective circuit as illustrated in Fig. 3 when inducing type load (Relay or solenoid valve) are to be used because those types apt to generate surge current switch off.

Install some protective circuit as illustrated in Fig. 4 when capacitor type load (Capacitor type) are to be used, because these types apt to generate a dash current when turning the switch ON.

Install some protective circuit as illustrated in Fig. 5 or 6 (in case of model T2) and Fig 7 (in case of model T3).

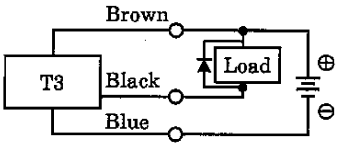


Fig.3 An example of using inducing load together with surge absorptive element (diode). (Hitachi Mfg. made diode V06C or equivalent is recommended.)

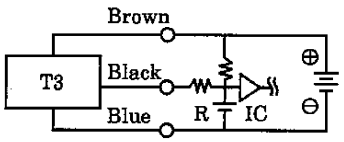


Fig.4 An example of using capacitor type load together with current regulating resister R. Comply with the following formula to figure out required R. $\frac{V}{0.10} = R(\Omega)$

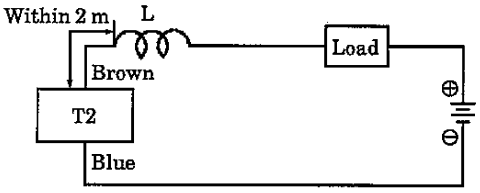


Fig.5 • Choke coil
L= a couple hundred μH ~ a couple mH surpassing high frequency characteristic
• Install it nearby the switch (within 2 m).

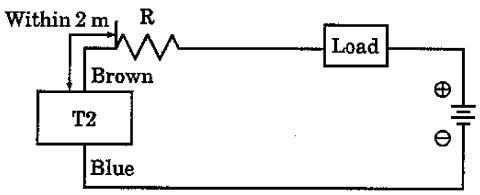


Fig.6 • Dash current restriction resister
R= As much large resister as the load circuit can afford.
• Install it nearby the switch (within 2 m).

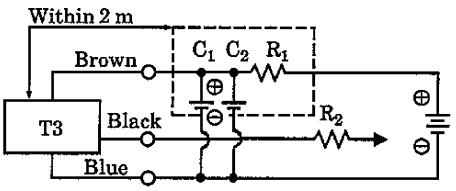


Fig.7

- Electric power noise absorptive circuit
  C_1=20~50μF electrolytic capacitor
  (withstanding 50V or more)
  C_2=0.01~0.1μF ceramic capacitor
- Dash current restriction resister
  R_1=20~30Ω
  R_2=As much large resister as the load circuit can afford.
- Install it nearby the switch (within 2 m).

3) Connection to a programmable controller (Sequencer)

Type of connection varies depending upon the model of the programmable controller. Refer to the following Fig. 8~12 respectively.

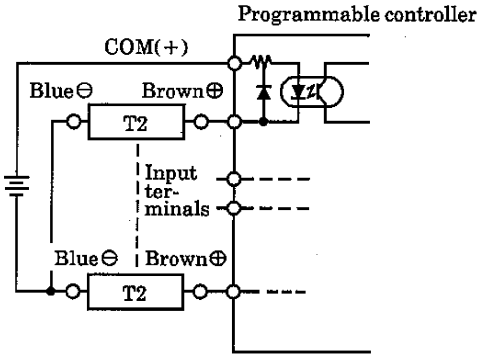


Fig.8 An example of T2 connection to source input type (an external power source)

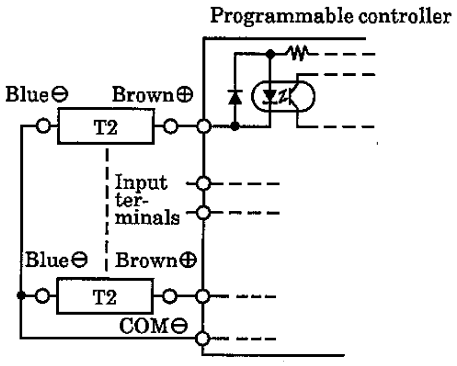


Fig.9 An example of T2 connection to source input type (an internal power source)

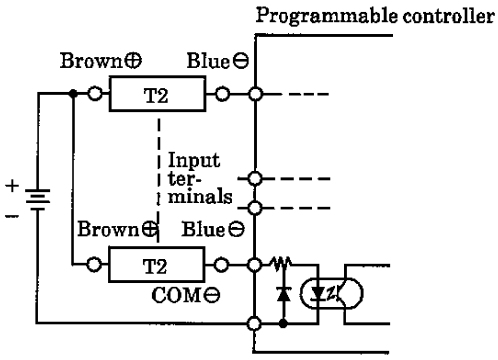


Fig.10An example of T2 connection to sink input type

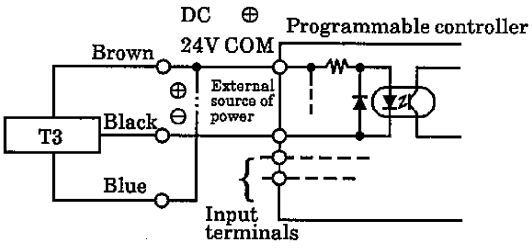


Fig.11An example of T3 connection to source input type (an external power source)

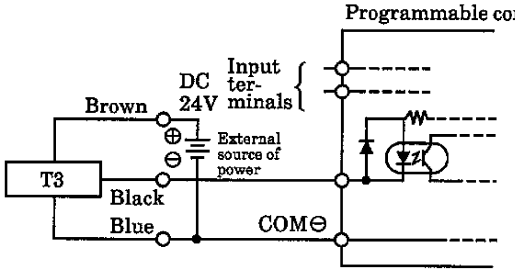


Fig.14An example of T3 connection to source input type (an internal power source)

4) Series connection

The total voltage will decrease when the T2 switches connections have a leak. Therefore, confirm the input specifications for the programmable controllers, which are the connecting load. However, dimming or total failure of the lamp may exist.

T3 switches hardly ever leak. When less than 10μA, then leakage may occur. Usually dimming and failure of the lamp do not occur.

3.2.3 Operational Cautions, Contact type switch (T0, T5)

1) Connection of lead cord

Instead of connecting the cord to the power source directly, always connect to the load in series. In case of model T0 connection, pay the following precautions.

Ⓐ For DC connection, use such polarities of cords as white ⊕ and black ⊖. The switch still functions right with reversed polarities but lamp is not lit.

Ⓑ For AC connection to either relay or input terminal to programmable controller, Switch lamp sometimes is not lit in case when half-wave rectification is being carried out. Lamp is lit, in this occasion, when polarities of cords for switch is reversed.

2) Capacity of contact points

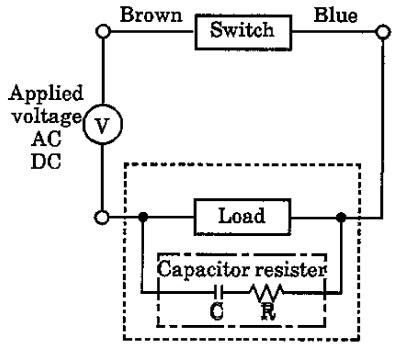
Avoid using a load exceeding the max. capacity of contact points. On the other hand, in case of T0 model, switch lamp may not be lit sometimes when current is lower than the rated current.

3) Protection of contact point

Install such a protective circuit as illustrated in either Fig 1 or 2, as follows, when inducing a type load such as a relay is to be used.

Provide a contact protection circuit as shown in Figs. 3 and 4 if the wiring length exceeds the length shown in below table.

Voltage	Wire length
DC	100m
AC	10m

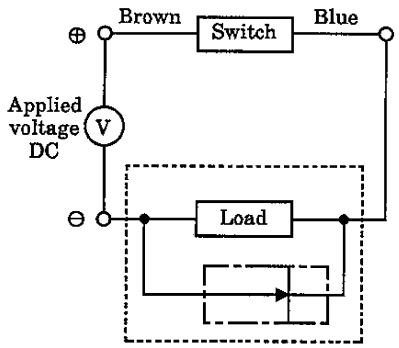


User circuit

Protective circuit (Spark absorbing circuit)

Recommended value
C (Capacitor) = 0.033~0.1μF
R (Resister) = 1~3kΩ
XEB1K1 Okaya Denki Mfg. or equivalent

Fig.1 When capacitor resister is used.

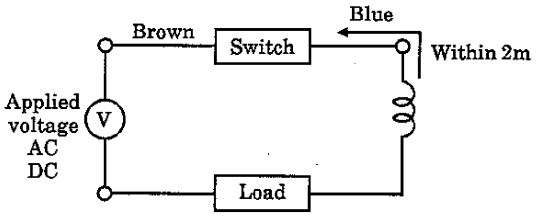


User circuit

Protective circuit

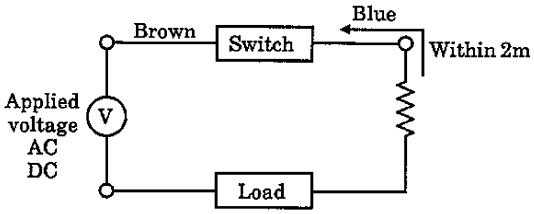
Rectifying diode, general use
Hitachi Mfg. product V06C or equivalent

Fig.2 When diode is used.



- Choke coil
  L= a couple hundred μH ~ a couple mH surpassing high frequency characteristic
- Install it near by a switch (within 2 m).

Fig.3



- Dash current restriction resister
  R= As much large resister as the load circuit can afford.
- Install it near by a switch (within 2 m).

Fig.4

4) Relay

Use such products as specified below or equivalent.

○OMRON Corporation	Model MY
○FUJI ELECTRIC CORP	Model HH5
○Matsushita Electric Works Ltd.	Model HC

5) Serial connection

Total voltage loss, when connected T0 switches in series, equals to the sum of respective voltage loss of each switch.

The total voltage loss becomes equivalent to one T0 (approx. 2.4V) when connecting the combination of one T0 for actuation confirming and rest of T5 switches.

Lamp is lit only when all switches turn on.

6) Parallel connection

There is no restriction in parallel connection number of switches of these types. Multi number connection of model T0, sometimes, cause a dimmed lamp or complete lamp failure.

4. MAINTENANCE

4.1 Periodical Inspection

1) In order to upkeep the cylinder in optimum condition, carry out periodic inspection once or twice a year.
2) Inspection items
   ⓐ Check the bolts and nuts fitting the piston rod end fittings and supporting fittings for slackening.
   ⓑ Check to see that the cylinder operates smoothly.
   ⓒ Check any change of the piston speed and cycle time.
   ⓓ Check for internal and/or external leakage.
   ⓔ Check the piston rod for flaw (scratch) and deformation.
   ⓕ Check the stroke for abnormality.

   See "Trouble shooting", 5, should there be any trouble found, also carry out additional tightening if bolts, nuts, etc. are slackened.

4.2 Disassembly Procedure

This cylinder is able to be disassembled.

1) Replace component parts listed in Expendable parts List by disassembling cylinder referring to internal structure diagram when air leakage is ever occurred.

(1) Shut off the fluid and remove the residual pressure.
(2) Disconnect cylinder from piping and load.
(3) Tuck a cover, either head cover ⑮ or rod cover ⑤, onto a pair of vise.
(4) Remove the cover by holding the unfixed width across the flats of the cover with a spanner or monkey wrench.
   For tools required to remove the cover, see Table 3.

Table 3

Tube bore (mm)	Pair face of cover	Recommended hand tools
ϕ20	24	Spanner 24 Adjustable wrench 250 Pipe wrench 250
ϕ25	29	〃 29 〃 250 〃 350
ϕ32	36	〃 36 〃 375 〃 350
ϕ40	44	〃 375 〃 450
ϕ50	55	〃 600
ϕ63	69	〃 900

Note • Pipe wrench may sometimes give defects to cover.

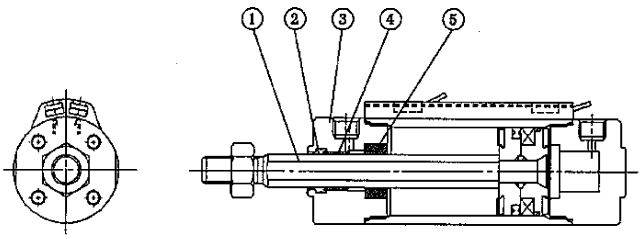
(5) Remove rod packing ③, piston packing ⑩, cylinder gasket ⑥ & wear ring ⑬ using sharp pointed tool such as ⊖ tip screw driver or bodkin.

4.3 Assembly Procedure

1) Clean each component parts.
2) Take reversed sequence of disassembly to assemble cylinder after cleaning parts. Carefully avoid giving damage to packings to prevent malfunction or air leakage.
3) Apply a film of high grade grease (Litium alkali base) over the inner surface of cylinder tube, outer surface of piston and packings.
4) When tightly assembling rod cover and head cover onto tube, make sure, for tight finishing, to turn the cover approx. 2° beyond former position before disassembling. (As for both foot mounting type, carefully select tight finishing position so as to have both mounting faces of bracket become flat.)

4.4 Internal structure drawings and Expendable parts list

1) Internal structure drawing of double-acting, non-rotating type cylinder and consumable parts list (with rubber cushion)



No.	Parts name	Material	Remarks
1	Piston rod	ϕ20, ϕ25, ϕ32 : Stainless steel ϕ40, ϕ50, ϕ63 : Steel	ϕ40, ϕ50, ϕ63 : Industrial chrome plated
2	Rod packing	Nitril rubber	
3	Rod cover	Aluminum alloy	ϕ20~ϕ40: Black finish almite ϕ50, ϕ63 : Painting
4	Bushing	Oil inpregnated bearing alloy	Available only in diameters of ϕ32 mm, ϕ40 mm, ϕ50 mm, ϕ63 mm. (Not available in diameters of ϕ20 mm and ϕ25 mm)
5	Bushing	Oil inpregnated bearing alloy	Available only in diameters of ϕ20 mm, ϕ25mm , ϕ32mm. (Not available in diameters of ϕ40 mm, ϕ50 mm, ϕ63 mm)

Expendable parts list

Tube bore (mm) \ Parts name / Kit No.		Rod packing	Cylinder gasket	Piston packing	Wear ring
ϕ 20	SCM-M-20DK	F4-194836	O ring ϕ20×ϕ1.3	PSD-20	F4-125610
ϕ 25	SCM-M-25DK	F4-194837	O ring ϕ24.99×ϕ1.27	PSD-25	F4-161716
ϕ 32	SCM-M-32DK	F4-194837	O ring ϕ31.93×ϕ1.35	PSD-32	F4-161733
ϕ 40	SCM-M-40DK	F4-164776	AS568-030	PSD-40	F4-650239
ϕ 50	SCM-M-50DK	F4-164777	AS568-033	PSD-50	F4-650240
ϕ 63	SCM-M-63DK	F4-164777	AS568-037	PSD-63	F4-650241

Note : Specify the kit No. on your purchase order.

5. TROUBLE SHOOTING

1) Cylinder

Trouble	Cause	Countermeasure
Does not operate	No pressure or inadequate pressure	Provide an adequate pressure source.
	Signal is not transmitted to direction control valve	Correct the control circuit.
	Improper or misalignment of installation	Correct the installation state and/or change the supporting system.
	Broken piston packing	Replace the cylinder.
Does not function smoothly	Speed is below the low speed limit	Reduce the load.
	Improper or misalignment of installation	Correct the installation state and/or change the supporting system.
	Exertion of transverse (lateral) load	Install a guide. Revise the installation state and/or change the supporting system.
	Excessive load	Increase the pressure itself and/or the inner diameter of the tube.
	Speed control valve is built in the way of "Meter in" circuit	Change the installation direction of the speed control valve.
Breakage and/or deformation	Impact force due to high speed operation	Turn the speed down. Reduce the load and/or install a mechanism with more secured cushion effect (e.g. external cushion mechanism).
	Exertion of transverse load	Install a guide. Reverse the installation state and/or change the supporting system.

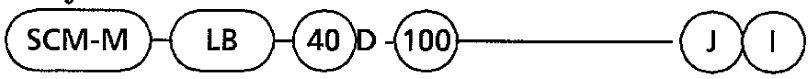
2) Switch

Trouble	Cause	Countermeasure
Lamp is not lit.	Deposited contact point	Replace switch.
	Excessive load than rated capacity	Replace the relay w/recommended one or replace the switch
	Damage to the lamp	Replace the lamp.
	Inadequate incoming signal	Review the external signal circuit and remove the causes
Switch does not function right.	Broken circuit	Replace the switch
	Inadequate incoming signal	Review the external signal circuit and remove the causes
	Improper voltage	Correct voltage to specified.
	Incorrect location of switch	Correct its location
	Aberrant position of switch	Set it back to original position
	Incorrect direction of switch mounting	Correct the direction of the switch.
	Relay is unable to respond properly within the piston stroke	Adjust speed slow Replace the relay
	Excessive load than rated capacity	Replace the relay with a recommended one or replace the switch
Switch does not return.	Piston is not moving	Correct to have piston move.
	Deposited contact point	Replace the switch
	Excessive load (relay) than rated capacity	Replace the relay with a recommended one or replace the switch
	Improper ambient temperature	Adjust the ambient temperature within the range of −10~60°C
	Existence of a foreign magnetic field	Shield the magnetic field.
	Inadequate incoming signal	Review the external signal circuit and remove the causes.

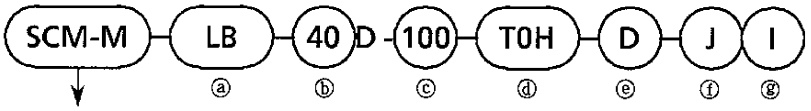
6. MODEL NO. CLASSIFICATION

6.1 Product Number Coding

● Cylinder without switch



● Cylinder with switch



Super micro cylinder
Double acting, non-rotating type

ⓐ Mounting style		ⓑ Tube bore		ⓒ Stroke		
00	Basic type	20	ϕ20	Standard stroke	Max. stroke	
LB	End angle type	25	ϕ25		Tube bore	Stroke
FA	Head rectangular flange type	32	ϕ32	25	ϕ20	1000
FB	Cap rectangular flange type	40	ϕ40	50	ϕ25	
CA	Cap eye type	50	ϕ50	75	ϕ32	
TA	Head trannion	63	ϕ63	100	ϕ40	1500
TB	Cap trannion type			125	ϕ50	
				150	ϕ63	
				200		
				250		
				300		

Note : Mounting brackets are shipped together with cylinder.

ⓓ Switch model				ⓔ Number of switches	
Lead wire straight type	Lead wire L-shaped type			R	1 ea.,Rod end
				H	1 ea.,Head end
T0H※	T0V※	Reed type	2-core	D	2 ea.
T5H※	T5V※			T	3 ea.
T2H※	T2V※	Proximity type		4	4 ea.
T3H※	T3V※		3-core	5	5 ea.
T2YH※	T2YV※	bi color proxmity type	2-core	Specify the number of switches if four or more switches are to be used.	
T3YH※	T3YV※				
T2YFH※	T2YFV※	Preventive maintenance output, Proximity type	3-core		
T3YFH※	T3YFV※		4-core		
T2YMH※	T2YMV※		3-core		
T3YMH※	T3YMV※		4-core		

※ mark specifies the length of lead cord.

※ Lead cord length	
No code	1m (Standard)
3	3m (Optional)
5	5m (Optional)

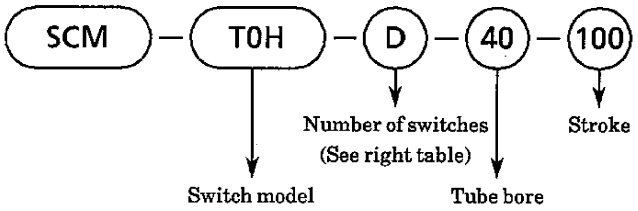
ⓕ Options	
J	Bellow: Polyolefine elastomer
K	Bellow: Neoprene sheet
L	Bellow: Silicone rubber glass cloth
N	Alteration in piston rod lug length and thread area
Q	Switch rail attached

ⓖ Accessories	
I	Rod eye
Y	Rod clevis
B2	Clevis bracket

6.2 Component parts Model coding

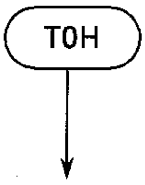
1) Switches

(1) Switch body + Set of mounting rail



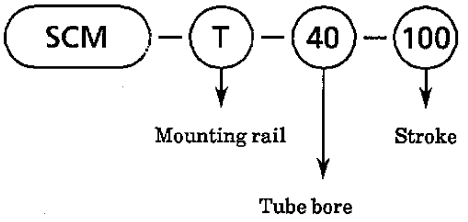
Number of switches	
R	1 ea.,Rod end
D	2 ea.
T	3 ea.

(2) Switch alone



Switch model
(Item ⓓ from preceding page)

(3) Mounting rail alone

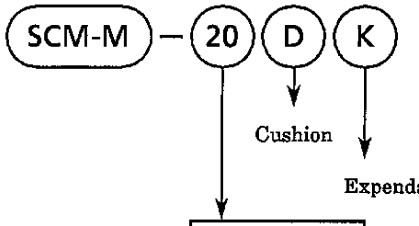


Note 1
Note 2

Note 1: When making an order for a single switch whose stroke is more than 300 mm, enter "×".

Note 2: A short rail (switch's adjustable traveling distance: 100 mm) accompanies each switch with a stroke of more than 300 mm.
When making an order only for rails for switches represented by "×", the number of rails must be equivalent to the number of switches to be used.

2) Expendable parts



Tube bore	
20	ϕ20
25	ϕ25
32	ϕ32
40	ϕ40
50	ϕ50
63	ϕ63

3) Model coding of Mounting bracket

Tube bore (mm) / Mounting bracket	ϕ20	ϕ25	ϕ32	ϕ40
Foot type (LB)	SCM-LB-20	SCM-LB-25	SCM-LB-32	SCM-LB-40
Flange type (FA)	SCM-FA-20	SCM-FA-25	SCM-FA-32	SCM-FA-40
Cap eye type (CA)	SCM-CA-20	SCM-CA-25	SCM-CA-32	SCM-CA-40
Trunnion type (TA/TB)	SCM-TA-20	SCM-TA-25	SCM-TA-32	SCM-TA-40

Tube bore (mm) / Mounting bracket	ϕ50	ϕ63
Foot type (LB)	SCM-LB-50	SCM-LB-63
Flange type (FA)	SCM-FA-50	SCM-FA-63
Cap eye type (CA)	SCM-CA-50	SCM-CA-63
Trunnion type (TA/TB)	SCM-TA-50	SCM-TA-63

Note : Required mounting bolts are attached to each bracket.

7. SPECIFICATION

7.1 Specifications

Model code / Item		SCM-M					
Action		Double-acting, non-rotating type					
Media		Compressed Air					
Max. working pressure	MPa {kgf/cm²}	1.0 {10.2}					
Min. working pressure	MPa{kgf/cm²}	0.1 {1.02}				0.05 {0.51}	
Proof pressure	MPa {kgf/cm²}	1.6 {16.3}					
Ambient tempreature	℃	−10~60 (Not to be frozen)					
Tube bore	mm	φ20	φ25	φ32	φ40	φ50	φ63
Port size	Rc	1/8	1/8	1/8	1/8	1/4	1/4
負荷移転精度		±1° (2°)					
Stroke tolerance	mm	+1.4 0				+2.3 0	
Working piston speed	mm/s	30~1000 (Set the speed within the range of energy absorption.)					
Cushioning		Rubber cushion					
Lubrication		Not required (Use Turbine oil Class 1, ISO, VG32 if and when lubrication is needed)					

7.2 Switch Specifications

1) Type of switches and applications

Model code / Item			Application (Purpose)
Non contact type	2-core	T2H	for DC programmable controller, exclusive
		T2V	
	3-core	T3H	for DC programmable controller or Relay
		T3V	
Contact type	2-core	T0H	for AC/DC Relay or programmable controller
		T0V	
		T5H	for AC/DC programmable controller, relay or IC circuit (not including Lamp), for Series connection
		T5V	

Note 1:T※H designates Lead cord outlet is straight out type as well as T※V designates Lead cord outlet is L shape type.

2) Switch specifications

Kind and Model code	Contact point switch	
Item	T0H · T0V	T5H · T5V
Application	For Relay or Programmable controller	For AC/DC programmable controller, relay or IC circuit (not including Lamp), for Series connection
Voltage of source of power	——	
Load voltage and current	DC12/24V、5~50mA AC100V、7~20mA	DC 12/24V, 50mA or less AC100V, 20mA or less
Power consumption	——	
Internal voltage drop	2.4V or lower	0V
Lamp	LED (Lights while power is ON)	——
Current leak	0	
Length of lead cord (※1)	Standard 1m (Oil proof vinyl, Cabtyre cord, 2-core, 0.2mm²)	
Max. shock	294m/s² {30G}	
Insuration resistance	20MΩ or more by DC 500V megger	
Insuration voltage	No abnormalities upon charging AC1000V for one minute.	
Ambient temperature	−10~ + 60°C	
Protective structure	IEC Standard IP67, JIS C0920 (Intrusion type without water), Oil proof	

Kind and Model code	Proximity Switch			
Item	T2H · T2V	T2YH · T2YV	T3H · T3V	T3YH · T3YV
Application	For Programmable controller, exclusive		For Programmable controller or Relay	
Voltage of source of power	——		DC10~28V	
Load voltage and current	DC10~30V 5~25mA (※2)		DC 30V or lower, 100mA or less	DC 30V or lower, 50mA or less
Power consumption	——		10mA or less at DC24V (While Power is ON)	
Internal voltage drop	4V or less		0.5V or less by 100mA	0.5V or less
Lamp	LED (Lights while power is ON)	LED (Red/Green) (Lights while power is ON)	LED (Lights while power is ON)	LED (Red/Green) (Lights while power is ON)
Current leak	1mA or less		10μA or less	
Length of lead cord (※1)	Standard 1m (Oil proof vinyl, Cabtyre cord, 2-core, 0.2mm²)		Standard 1m (Oil proof vinyl, Cabtyre cord, 3-core, 0.2mm²)	
Max. shock	980m/s² {100G}			
Insuration resistance	20MΩ or more by DC 500V megger	100MΩ or more by DC 500V megger	20MΩ or more by DC 500V megger	100MΩ or more by DC 500V megger
Insuration voltage	No abnormalities upon charging AC1000V for one minute.			
Ambient temperature	−10~ +60°C			
Protective structure	IEC Standard IP67, JIS C0920 (Intrusion type without water), Oil proof			