CKD

SM-1683-A

# NSTRUCTDN MANUAL

# SPEED CONTROLLER

# SC1-6·8·10·15

- 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.

2nd

CKD Corporation

# For Safety Use

To use this product safety, 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 operation manual carefully for proper operation.**



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# INDEX

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Speed Controller
Manual No. SM-1683-A





Sep.30.1996
Revision : Jan.9.2001

# 1. PRODUCT

## 1.1 Specifications

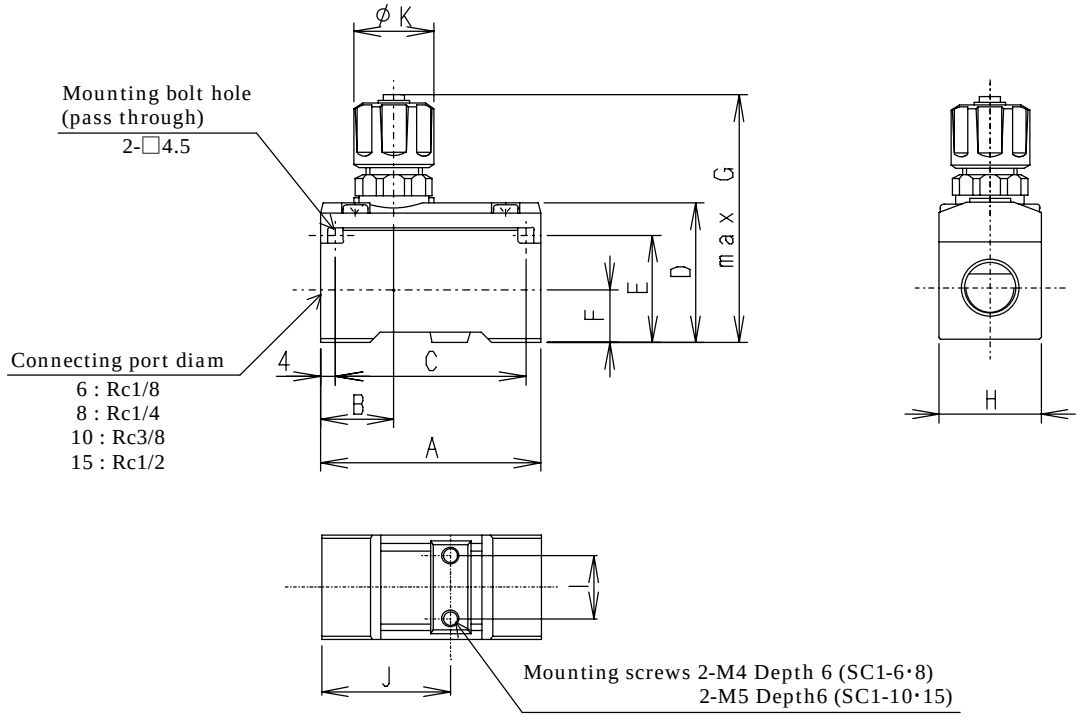
| Item | | Universal Type | High Temperature Type |
|---|---|---|---|
| Media | | Compressed air | |
| Proof pressure | MPa | 1.5 | |
| Working pressure range | MPa | 0.05 to 1.0 | |
| Fluid temperature | ℃ | 5 to 60 | 5 to 120 |
| Ambient temperature | ℃ | 0 to 60 (Not to be frozen) | 5 to 120 (Not to be frozen) |
| Cracking pressure | MPa | 0.05 or less | |

Effective sectional area

| Model No. / Effective sectional area ($mm^2$) | SC1-6 | SC1-8 | SC1-10 | SC1-15 |
|---|---|---|---|---|
| Free flow | 11 | 14 | 39 | 43 |
| Controlled flow | 8 | 13 | 22 | 36 |

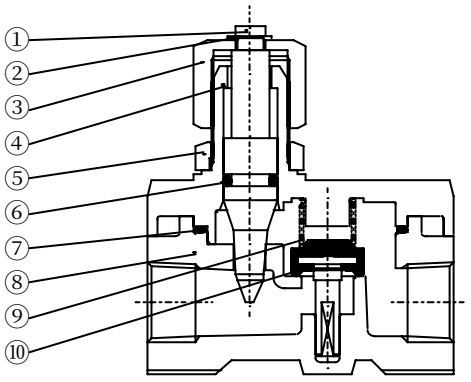
## 1.2 External dimensions, Internal structure and JIS symbol

### 1) External dimensions



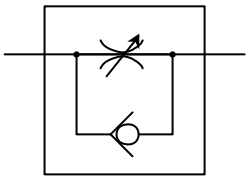

| Markings / Model code | A | B | C | D | E | F | G | H | I | J | K |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SC1-6, 8 | 50 | 20 | 42 | 31 | 23 | 11 | 67 | 22 | 12 | 31 | 19 |
| SC1-10, 15 | 63 | 21 | 55 | 40 | 31 | 15 | 83 | 30 | 18 | 37 | 23 |

2) Internal structure and major parts list



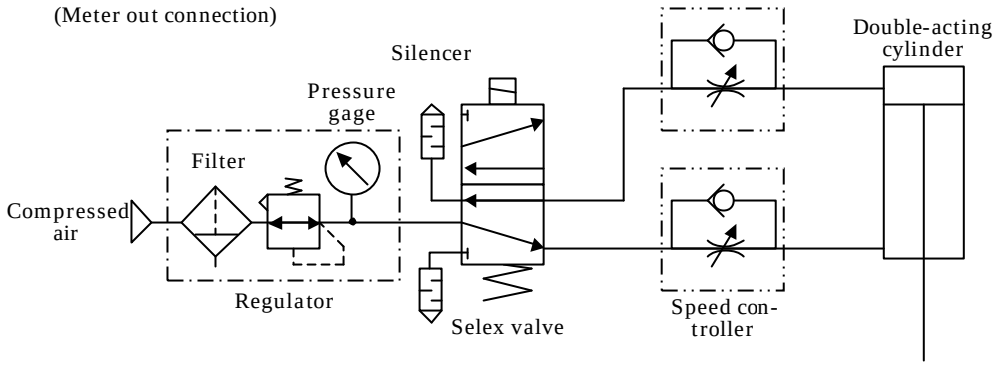

| No. | Part name | Material | Remark |
|---|---|---|---|
| 1 | Needle | C3604BD | However, for the high-temperature type, the material (NBR) for Parts Nos. 6, 7 & 10 should be "FKM". |
| 2 | E type snap ring | SK5 | |
| 3 | Knob | ZDC2 | |
| 4 | Needle guide | ADC12 | |
| 5 | Lock nut | ZDC2 | |
| 6 | O ring | NBR | |
| 7 | Gasket | NBR | |
| 8 | Body | ADC12 | |
| 9 | Spring | SUS304WP | |
| 10 | Valve seat | NBR,C3604BD | |

3) JIS Symbol



## 1.3 Fundamental circuit diagram

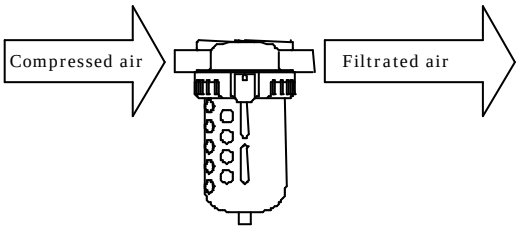
The fundamental circuit diagram for speed controller is as per shown below.



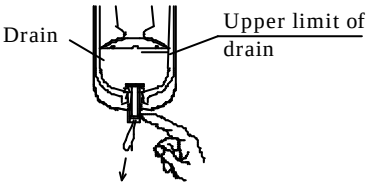
# 2. CAUTION

## 2.1 Fluid

1) Use the compressed air, filtrated and dehumidified. Carefully select a filter of an adequate filtration rate (5 μm or lower preferred), flow rate and its mounting location (asclosest to directional control valve as possible)



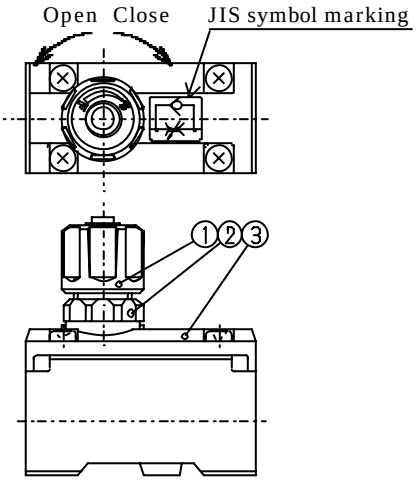

2) Be sure to drain out the accumulation in filter periodically.




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

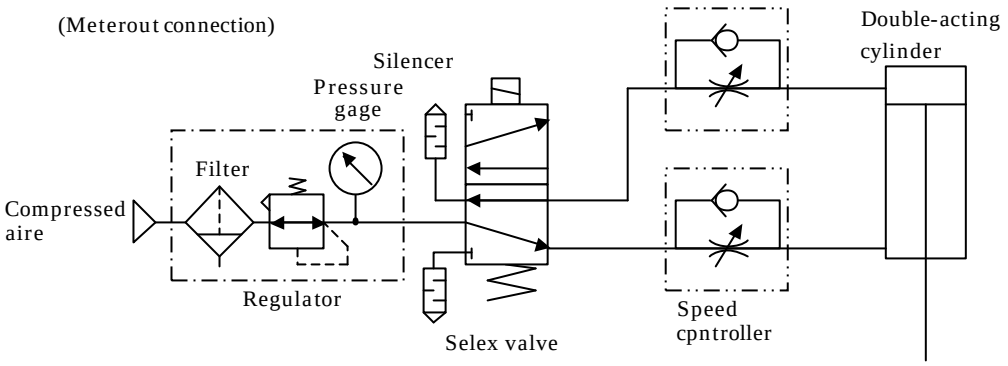
# 3. OPERATION

Setting the cylinder speed




Turning the handle ① clockwise reduces the speed of cylinder, finally closing the controller, while turning it counterclockwise increases the speed of cylinder. To build a meter out circuit, close the controller first by turning its handle ① clockwise, then connect it to the piping so that the casted JIS symbol on the body ③ matches with the direction of flow as per designed schematic.

While giving pressure to the circuit, turn the handle ① of controller counterclockwise until the required speed of the cylinder is set. Once the position of the handle ① is set, make sure to tighten up the lock nut ②.




Note :

The cylinder will no longer gain its speed after the handle ① is turned approx. 8 to 10 times from the fully closed position as the controller gets out of the controllable range of speed.

# 4. INSTALLATION

## 4.1 Piping

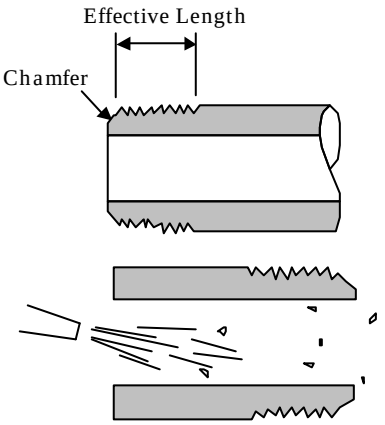
1) For piping beyond the filter, use pipes that are tough against corrosion such as galvanized pipes, nylon tubes, rubber tubes, etc. (Refer to Selection Guide Table for Related Equipment.)

2) See to it that the pipe connecting cylinder and solenoid valve has effective sectional area which is needed for the cylinder to drive at the specified speed. (Refer to Selection Guide Table for Related Equipment.)

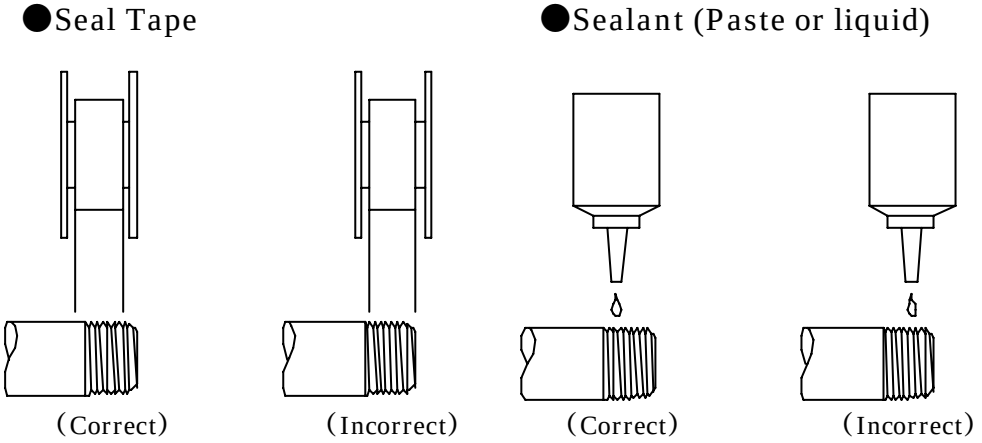
3) Install filter preferably adjacent to the upper-stream to the solenoid valve for eliminating rust, foreign substance in the drain of the pipe.

4) Be sure observe the effective thread length of gas pipe and give a chamger of approx. 1/2 pitch from the threaded end.

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




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



7) For the prevention of the leakage and breakage, tighten the screw within the limits of the adequate tightening torque mentioned below.

Tightening torque

| Connection screw | Tightening torque N•m |
|---|---|
| Rc1/8 | 3 to 5 |
| Rc1/4 | 6 to 8 |
| Rc3/8 | 13 to 15 |
| Rc1/2 | 16 to 18 |

# 5. MAINTENANCE

## 5.1 Trouble shootig

| Trouble | Causes | Remedies |
|---|---|---|
| Turning the handle of controller does not influence to the speed of cylinder | 1. The controller is installed in the erroneous direction per specified on the schematics. | Reaffirm the direction of flow and correct it if found the connection is incorrect. |
| | 2. Foreign particle is caught by packing | Blow away the foreign particle by means of air flushing. |

# 6. HOW TO ORDER

SC1 – 6 – X1

(a) (b)

| (a) Port size | | (b) Option | |
|---|---|---|---|
| 6 | Rc1/8 | No code | No option |
| 8 | Rc1/4 | X1 | High-temperature specification |
| 10 | Rc3/8 | | |
| 15 | Rc1/2 | | |