CKD

SM－292475－A

# INSTRUCTION MANUAL

# METERING VALVE WITH SILENCER

# SMW2

- 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 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.**



[SM-292475-A]

# INDEX

SMW2
Metering valve with silencer
Manual No. SM-292475-A

# 1. PRODUCT

## 1.1 Specifications

| Model / Media | | SMW2-6A | SMW2-8A |
|---|---|---|---|
| Proof pressure | | Compressed air | |
| Maximum working pressure | MPa | 0.7 | |
| Minimum working pressure | MPa | 0 | |
| Working pressure range | MPa | 1.05 | |
| Fluid temperature | ℃ | 5 to 60 Note2 | |
| Ambient temperature | ℃ | −10 to 60 (Not frozen) | |
| Ambient humidity | %RH | 85 or less | |
| Connecting pipe size | R | 1/8 | 1/4 |
| Mass | g | 4.5 | 5 |
| Tube bore of host cylinder | mm | φ20 to φ50 | φ32 to φ75 |
| Needle speed of rotation | | 9 | |
| Damping effect Note3 | dB[A] | 23 or more | 28 or more |
| Free flow Note1 | ℓ/min.(ANR) | 370 | 660 |
| Effective sectional area | $mm^2$ | 5.6 | 9.9 |

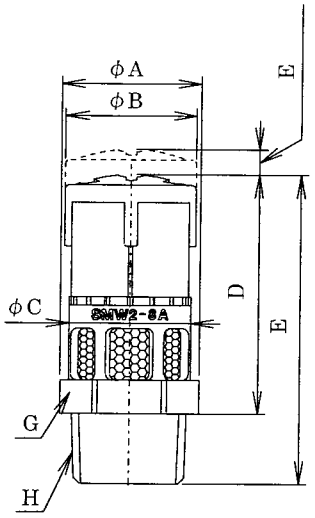
Note 1. The flow rate atmospheric conversion rate at 0.5MPa.

Note 2. The adiabatic expansion may cause freezing depending on the quality (dew point) of the air.

Note 3. The damping effect at the maximum flow is indicated above.

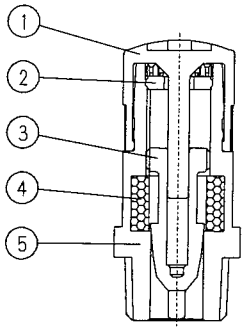
## 1.2 External dimensions, Internal structure and JIS symbol

### 1) External dimensions



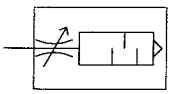

| Markings / Model code | A | B | C | D | E | F | G Width across flats | H Port size |
|---|---|---|---|---|---|---|---|---|
| SMW2-6A | 13.5 | 14.9 | 13.8 | 27.4 | 35.4 | 2.9 | 12 | R1/8 |
| SMW2-8A | 15.8 | | | | | | 14 | R1/4 |

## 2) Internal structure and major parts list




| No. | Part name | Material |
|---|---|---|
| 1 | Knob | Polybutylene terephthalate |
| 2 | Guidering | Polyamide |
| 3 | Needle | Polyamide |
| 4 | Element | Polypropylene sintering |
| 5 | Body | Polyamide |

## 3) JIS Symbol



# 2. CAUTION

## 2.1 When designed and selected

**⚠ CAUTION :**

1) Use the product within the specification range unique to the product.
   Where the product is used outside the range of specifications and in special applications, contact us as to the operating specifications.
   - If the product is used outside the specification range, no product function can be performed and no safety can be maintained.
   - The product may be unusable in special applications and environment; for examples, where it is used in nuclear power, railway, air navigation, vehicle, medical equipment, beverage, equipment coming into direct contact with foodstuff, entertainment equipment, emergency shutdown circuit, press machine, brake circuit and applications in which safety is required, including safety measures.
2) Prior to use, ensure that the product can withstand the operating environment.
   - The product cannot be used in the environment subject to functional trouble; for example, it cannot be used in a particular environment which high temperatures, chemical atmosphere, chemicals, vibration, moisture, water droplets and gaseous atmosphere or the like exist.

## 2.2 When the product is attached, set up and adjusted

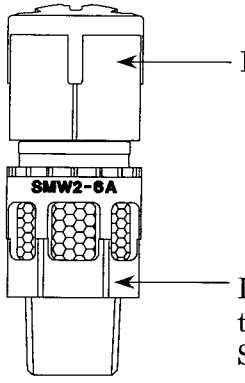
**⚠ CAUTION :**

1) Before speed adjustment, gradually open the needle from the closed condition.
   If the needle is open, the actuator will suddenly spring out, which could be dangerous.
2) Needle opening and closing are set so that the needle rotates by slight finger force.
   It should be noted that excessive turning of the needle may cause internal damage when the needle is fully open and closed in particular.
3) Since some leakage is allowed in view of product specifications, this product cannot be used as a stop valve requiring zero leakage.
   Avoid unnecessarily excessive closing of the needle; otherwise, failure or malfunctioning may occur.
4) After speed adjustment, ensure that the needle is locked firmly. If the needle is not locked, the actuator may run away during operations work, which could be dangerous.
5) Mount this product to the piping port always to the specified tightening torque; otherwise, screw looseness, air leaking and damage may occur.
6) During piping work, tighten the product on the hexagonal surface under the exhaust window, using a tool.
   Avoid tightening and detaching the product, using the knob portion; otherwise, internal damage may occur.
7) Attach this valve in the direction in which silencer exhaust air does not strike against the eyes directly.
8) When attaching or after completion of installation, do not apply lateral load to the main body.

# 3. INSTALLATION

## 3.1 SMW2 Mounting

1) After loosely tightening this valve to the port for mounting by hand, use a tool to tighten it on the hexagonal surface under the exhaust window. At this time, avoid tightening this valve, holding the knob part; otherwise, internal damage may occur.




Do not tighten the SMW2, holding the knob.

During piping connections, tighten the product on this hexagonal surface. (The figure indicates Model SMW2-6A.)

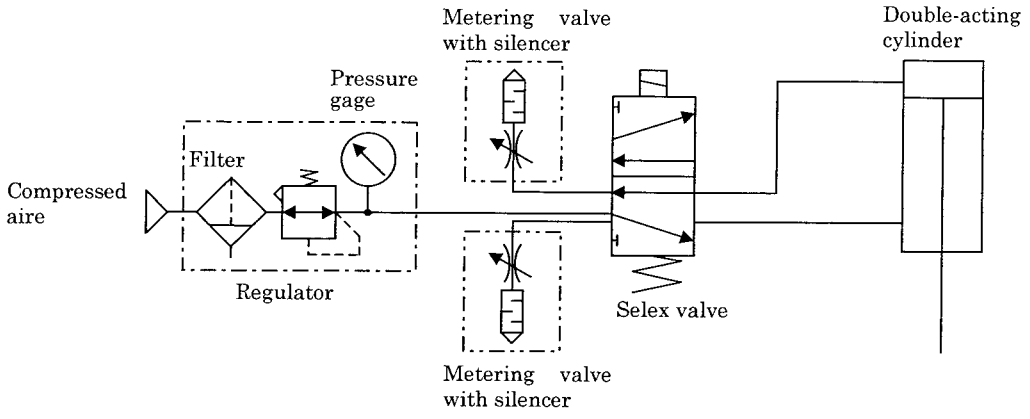
2) The tightening torque in mounting the valve to the port should be 0.5 to 1.0 N/m.
A screw is easy to get loose at high temperatures; where this valve is used at the ambient temperature 40 deg. C or more, therefore, mount it on the torque upper limit side (1.0 N/m).

3) The threaded portion is not provided with sealant. Even if it is used as it is, no screw gets loose, but some leakage will occur. Since the speed may become unstable when it is used in the low flow rate range, for example where the actuator setting speed is low, use this product with a sealing tape wound around the threaded portion as needed.

# 4. OPERATION

## 4.1 Fundamentad circuit diagram

The fundamental circuit diagram for wetering valve with silencer is as per shown below



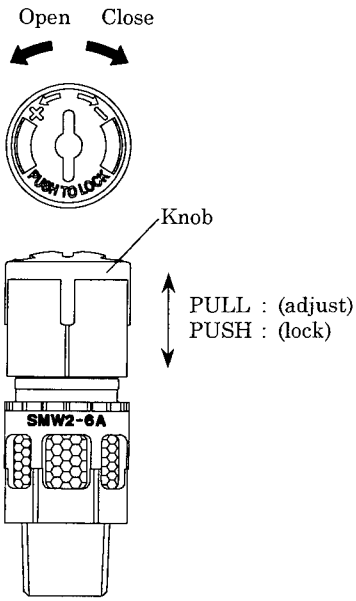

## 4.2 Basic Operation

The needle is closed by turning the knob clockwise and opened by turning it counterclockwise.

Consequently, the cylinder speed is reduced by turning clockwise, and reduced by turning counterclockwise.

The needle is locked by pushing and pulling the knob: by pulling the knob, needle lock is released, thus making it possible to adjust the flow (rate), and by pushing it, the needle is to be locked.

## 4.3 Directions for Use in Basic Circuitry




1) Attach the SMW2 to the solenoid valve.
2) Pull the knob to release the lock, and by turning the knob until it stops lightly in the clockwise direction, place the needle in the closed condition.
3) Pressurize air.
4) Turn the knob counterclockwise until the required cylinder speed is reached.
5) When the knob position has been determined, push the knob to lock the needle.
6) After locking the needle, turn the knob lightly, and ensure that the needle is firmly locked.

NOTE)

When the knob is hard to insert to the full depth when the needle is locked, pull the knob once, then re-push it once again.

# 5. MAINTENANCE

## 5.1 Trouble shootig

| Trouble | Causes | Remedies |
|---|---|---|
| The cylinder speed becomes unstable. | Internal clogging with dust or dirt. | Eliminate dust or dirt by interior air brushing. |
| | Air leaking from the connecting threaded portion. | Wind the sealing tape around the connecting threaded portion. |
| | The piping between the cylinder and solenoid valve is long. | Make the piping short or change to the speed control method that the speed controller is mounted directly to the cylinder. |
| No flow | The needle is in the fully closed position. | By turning the knob counterclockwise, open the needle valve. |
| No knob can be locked. | The engagement position of claw for locking is unfavorable. | Pull the knob once to move it just a little, and re-push the knob once again. |

# 6. HOW TO ORDER

SMW2 – (a)

| (a) Connecting pipe size | |
|---|---|
| 6A | R1/8 |
| 8A | R1/4 |