DISPENSING VALVE

MODEL VMS400

INSTRUCTION MANUAL
CONTENTS

1 Introduction ........................................ Page 3

2 Specifications ....................................... Page 3

3 Explanation of Parts ................................ Page 4

4 Operating Principles ................................ Page 5

5 Operating Procedure...................................
   5-1 Setup ............................................ Page 6
   5-2 Maintenance ...................................... Page 8
   5-3 Other Information ............................... Page 9

6 Sectional Drawing & Dimensions .................. Page 10

7 Exploded View & Parts List ......................... Page 11
1. INTRODUCTION

The VMS400 is a multipurpose mini-spool pneumatic valve, which can dispense low to high viscosity materials.
The VMS400 has a maximum material pressure is 50kgf/cm².
The VMS400 has a "Suck-back effect" that eliminates lumping at the end of needle after dispensing.
The Lip Seal and Spool are coated in Tin to increase valve life.

2. SPECIFICATIONS

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating Air Pressure</td>
<td>4.0~6.0kgf/cm²</td>
</tr>
<tr>
<td>Material Pressure</td>
<td>Max 50kgf/cm²</td>
</tr>
<tr>
<td>Cycle Rate</td>
<td>400cycles/min</td>
</tr>
<tr>
<td>Flow Rate (KV value)</td>
<td>5.0ℓ/minute</td>
</tr>
<tr>
<td>Valve Type</td>
<td>Spool</td>
</tr>
<tr>
<td>Weight</td>
<td>255g</td>
</tr>
<tr>
<td>Driving Part Materials</td>
<td>Cylinder Body: SUS303</td>
</tr>
<tr>
<td></td>
<td>Spool Assy: SUS303 (PISTON)</td>
</tr>
<tr>
<td></td>
<td>SUS420 (Spool): Tin Coating</td>
</tr>
<tr>
<td></td>
<td>CAP: AL (Hard coated)</td>
</tr>
<tr>
<td>Dosing Part Materials</td>
<td>Check Body: SUS303</td>
</tr>
<tr>
<td></td>
<td>Valve Chamber: SUS303</td>
</tr>
<tr>
<td></td>
<td>Chamber Cap: SUS303</td>
</tr>
<tr>
<td></td>
<td>Seal: UHMW-PE Lip Seal</td>
</tr>
<tr>
<td>Connecting Ports</td>
<td>Air Input: M5*P0.8 ø6 Urethane</td>
</tr>
<tr>
<td></td>
<td>Exhaust Port: M5*P0.8</td>
</tr>
<tr>
<td></td>
<td>Material In Port: PT 1/8&quot;</td>
</tr>
<tr>
<td></td>
<td>Material Out Port: PT 1/8&quot;</td>
</tr>
</tbody>
</table>
3. EXPLANATION OF PARTS

- **Driving Part**
  - *Material Inner Port (PT1/8")*
  - Screw not to leak by winding teflon tape to fitting.

- **Dosing Part**
  - *Needle Adapter (Sales in separate)*
  - *Needle (Sales in separate)*

- **Suck-back Adjust Knob**
  - This controls the quantity of suck-back.

- **Air In Port (M5xF0.8)**
  - This is air connecting port which is linked to dosing head.

- **Exhausting Port (M5xF0.8)**
  - Exhausting Port in case of single-actuating. Air Port in case of double-actuating.

- **Mounting hole ø3.5x6ea**

- **Check Port**
  - This checks if Lao seal is damaged. (In case of damage materials will be leaked)

- **Material of inner port (PT1/8")**
  - Connect needle adapter (PT1/8") or fitting.
### 4. OPERATION PRINCIPLES

<table>
<thead>
<tr>
<th>Suck-back: small</th>
<th>Suck-back: large</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1" alt="Diagram" /></td>
<td><img src="image2" alt="Diagram" /></td>
</tr>
</tbody>
</table>

If you rotate the Suck-back Knob clockwise, the change in the spool’s position between dispensing and resting is smaller. This decreases the amount of suck-back because of a lower negative pressure.

If you rotate the Suck-back Knob counter-clockwise (max. 2 rotations), the change in the spool’s position between dispensing and resting is larger. This increases the amount of suck-back because of a higher negative pressure.

The amount of suck-back is changed by controlling the Suck-back knob and affected by the material’s viscosity and the thickness of the needle.

*Adjust the amount of suck-back while dispensing the material.
5. OPERATING PROCEDURE

5-1. Setup

▶ example for general installation
5-1-1) Firmly fasten the valve by using the mounting hole (2-Ø3.5-D, pitch16).

5-1-2) Connect the air hose (Ø4urethane) to the Air In Port.

⚠️ **Notice**
If the valve uses a built-in spring to close, it is classified as a single-actuating valve. If the closing speed of a single-actuating valve is too slow, replace it with a double-actuating valve (if dispensing at a high speed or if the dispensing speed is low because of a high viscosity material). (refer to 5-1.Setup)

5-1-3) Connect the liquid supply fitting and tubing to the Material In Port (PT1/8”). Connect a tip of desired thickness to the Material Out Port (PT1/8”).

5-1-4) The Suck-back effect occurs when the valve is closed. After dispensing (when the front of the valve frees itself from lip seal), suck-back is caused by the change in capacity when the spool returns to its original position. The amount of Suck-back can be controlled with the suck-back control knob, located on top of the valve.

<table>
<thead>
<tr>
<th>Suck-back control Knob</th>
<th>Clockwise.</th>
<th>Suck-back decreases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Counter-clockwise.</td>
<td>Suck-back increases</td>
<td></td>
</tr>
</tbody>
</table>

5-1-5) It’s possible to change the position of the Air In Port and the Material In Port with a 90° pitch as long as it is mounted in the proper position.
5-2. Maintenance

5-2-1) Washing
① Wash valve thoroughly after using if the dispensed material has tendency to cure or has the possibility to damage the dosing part of the valve.
② Dispense all material from the pressure container, liquid supply hose and dosing part of the valve until only air comes out.
③ Remove material from the inside of the valve by using a small amount of the proper solvent.
④ Use pressurized air to remove the solvent from the valve, and repeat as needed until the valve is clean.

5-2-2) Disassembly
① If the valve has to be disassembled for cleaning or replacing a part, please refer to "7.Exploded View & Parts List".
② Remove the chamber cap by unscrewing the 4 bolts using a #2.5 L-wrench/Hex-key
③ Disassemble the chamber first, then the check body from the bottom up to the dispensing section.
④ Take extra care when removing and handling the lip seals.

Push softly

Push softly in vertically

(Less than ø3(Rod)

Flat ground

(Lip Seal)

(Disassembly)

(Assembly)
5-2-3) Assembly

① Insert the 2 lip seals into the chamber (refer to the "Disassembly" picture above).

⚠️ Notice
Be careful to insert the lip seals properly.

② Insert the Cylinder Body first, then the Chamber, and finally the Chamber Cap.
③ Screw in the 4 bolts after checking the direction of Chamber's Material Out Port.

5-3. Other Information

① When assembling or disassembling, be careful not to damage the lip seal's diameter or spool.
② The function of the Suck-back control knob is to regulate the amount of air sucked in after dispensing. You can control the amount dispensed through material supply pressure, dispensing time, or a combination of the two.
③ Check to make sure that there are no air bubbles in the material or in the Material In Line. If there are air bubbles, turn the valve upside-down and purge the valve of material until the air bubbles are removed.
6. SECTIONAL DRAWING & DIMENSION

▶ Cross-sectional View

![Cross-sectional View]

Driving Part  Dosing Part

▶ Dimensions

![Dimensions]

Mount Hole(2-∅3.5) 34

117(MAX.)
115(MIN.)
# 7. EXPLODED VIEW & PARTS LIST

## Exploded View

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
<th>Q'TY</th>
<th>Part Number</th>
<th>Description</th>
<th>Q'TY</th>
</tr>
</thead>
<tbody>
<tr>
<td>VMS400-1</td>
<td>CHAMBER</td>
<td>1</td>
<td>VMS400-12</td>
<td>O-RING (P4)(NBR)</td>
<td>1</td>
</tr>
<tr>
<td>VMS400-2</td>
<td>CHECK BODY</td>
<td>1</td>
<td>VMS400-13</td>
<td>BACK UP RING</td>
<td>2</td>
</tr>
<tr>
<td>VMS400-3</td>
<td>CYLINDER BODY</td>
<td>1</td>
<td>VMS400-14</td>
<td>SPRING</td>
<td>1</td>
</tr>
<tr>
<td>VMS400-4</td>
<td>CYLINDER CAP</td>
<td>1</td>
<td>VMS400-15</td>
<td>BACK UP RING</td>
<td>2</td>
</tr>
<tr>
<td>VMS400-5</td>
<td>CHAMBER CAP</td>
<td>1</td>
<td>VMS400-16</td>
<td>O-RING (P16)(NBR)</td>
<td>1</td>
</tr>
<tr>
<td>VMS400-6</td>
<td>BUSH</td>
<td>1</td>
<td>VMS400-17</td>
<td>DAMPER</td>
<td>1</td>
</tr>
<tr>
<td>VMS400-7</td>
<td>SPOOL</td>
<td>1</td>
<td>VMS400-18</td>
<td>STOPPER</td>
<td>1</td>
</tr>
<tr>
<td>VMS400-8</td>
<td>PISTON</td>
<td>1</td>
<td>VMS400-19</td>
<td>O-RING (P3)(NBR)</td>
<td>1</td>
</tr>
<tr>
<td>VMS400-9</td>
<td>STROKE ADJUST KNOB</td>
<td>1</td>
<td>561964</td>
<td>ELBOW FITTING</td>
<td>1</td>
</tr>
<tr>
<td>VMS400-10</td>
<td>STROKE ADJUST NUT</td>
<td>1</td>
<td>VMS400-21</td>
<td>BOLT (M3*35)</td>
<td>4</td>
</tr>
<tr>
<td>VMS400-11</td>
<td>LIP SEAL</td>
<td>2</td>
<td>VMS400-22</td>
<td>BOLT (M3*10)</td>
<td>4</td>
</tr>
</tbody>
</table>