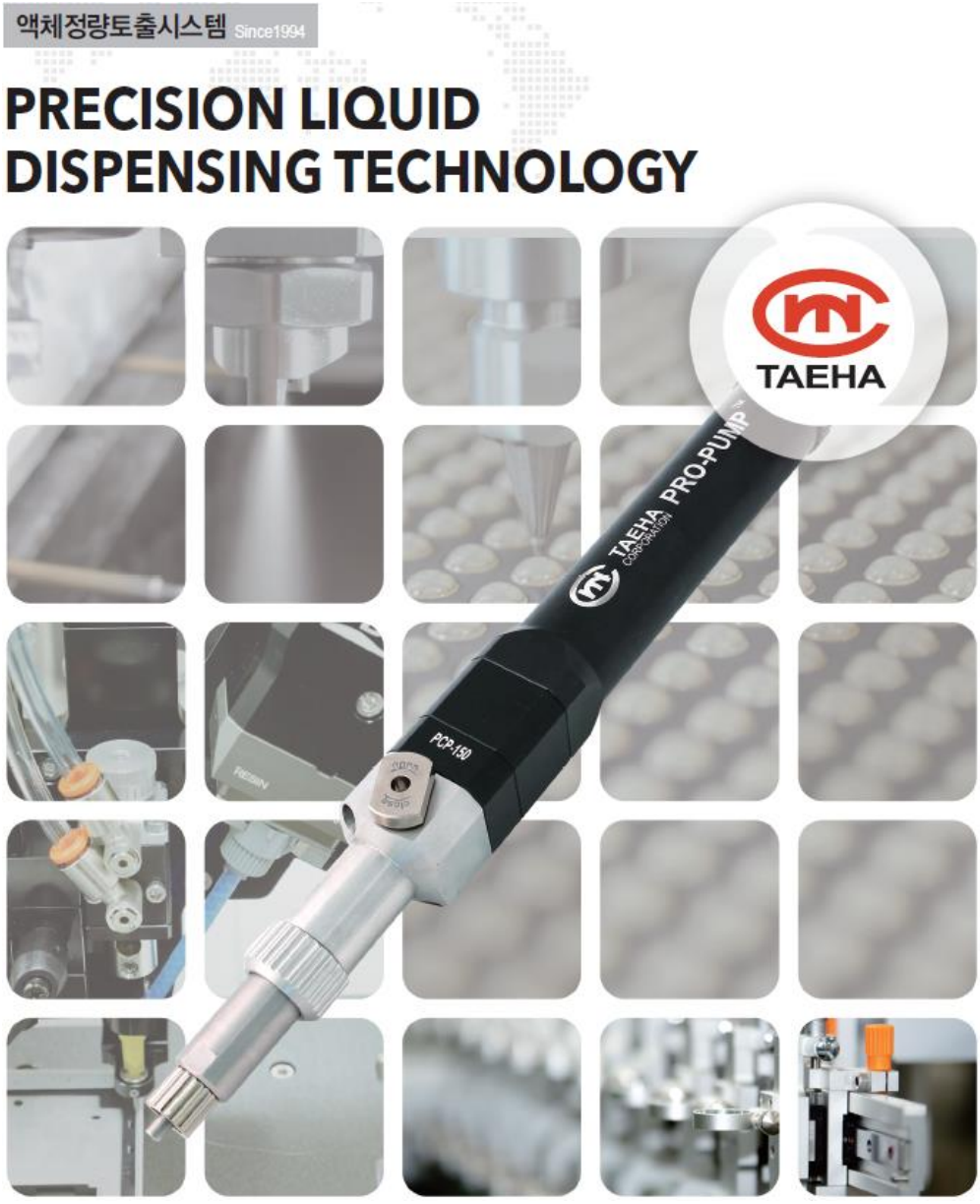
TDV-300T Manual



User Manual

TAEHA Corporation

Contents

1 Safety Precautions

This manual applies to products manufactured and sold by Taeha Corp. (hereinafter referred to as "the company"). A partial or full copy may not be used without permission of the company.

This manual explains the specifications, installation, wiring, maintenance checks, abnormal occurrences, and measures to be taken for the company's products. When using this product, please read this manual carefully. Pay appropriate attention to the safety precautions to handle the product properly.

The safety precautions have been classified into "Danger" and "Caution."

"Danger": When handled incorrectly, dangerous situations may occur, and death or serious injury may result.

"Caution": When handled incorrectly, hazardous situations may occur, and serious injury or property damage may result.

In addition, even when "Caution" is indicated, serious consequences may result depending on the situation. Since this is important for the user's safety, please be sure to follow the instructions.

Electric Shock Precautions

Danger
1. This equipment is kept under high pressure for some time even after the main power supply has been cut off. When performing wiring work or an inspection that touches all terminals of the terminal block, leave it for at least five minutes after shutting off the power before starting work. 2. To prevent electric shock or malfunction, use grade 3 grounding (100 Ω or less, with a wire diameter of ∅ 1.6 mm or more). 3. The inspection and maintenance of this equipment must be performed by a qualified technician (specialist). 4. Do not inspect equipment with wet hands, when the floor is wet, or if there is too much moisture. Electric shock may result. 5. Be careful not to damage the cable, place heavy objects on it, or fold it. If it is damaged, electric shock may result.

Fire Safety Precautions

Danger
1. Do not install this equipment near inflammables, combustible organic solvents, or vapors. Heat and electrical operation can cause a fire. 2. If this equipment malfunctions, disconnect the equipment's main power supply. The high current may cause a fire.

Wiring Precaution

Danger
1. Before conducting wiring work for maintenance, etc., be sure to shut off all external power supplies used by the equipment. Failure to do so may result in electric shock or damage to the equipment.

2. To supply power or operate the equipment after wiring, be sure to attach the covers inside and outside the equipment. Failure to do so may result in injury and electric shock.

Caution

1. Do not permit the supply of main power at voltages other than that specified in this operation manual. Doing so may cause a malfunction.
2. Ensure that the terminal connections and wiring are correct. Failure to do so may cause a malfunction.
3. Do not change the wiring or detach the connector while electric current is being applied. Injury or equipment failure may result.
4. If there is a problem with the power wiring of the driving part, malfunction thereof may result in injury or equipment failure.

Precautions During Installation

Caution

1. Do not install, store, or use in places exposed to conductive dust, corrosive gases, flammable gases, high temperatures, condensation, wind and rain, etc.
2. Prolonged exposure to direct sunlight will degrade the accuracy of the equipment. Do not install, store, or use in areas exposed to direct sunlight.
3. When installing in an enclosed space, install a separate cooling fan to allow outside air to flow in and out in order to maintain the temperature around the equipment at 40°C or less. Overheating may cause a fire or other accidents.

Precautions During Use

Caution

1. Never modify this equipment. Doing so may cause electric shock, injury, fire, or breakdown.
2. Defects will not be covered by our warranty if this equipment has been modified.
3. Before use, be sure to check that all covers are properly installed and verify that there is no foreign material inside the equipment. Depending on the circumstances, an unexpected operation could occur and may result in injury.
4. If an alarm occurs during use, inspect the cause of the alarm and verify that everything is safe before proceeding.

Danger

1. If robots (multi-joint robot, Cartesian coordinate robots, or desktop robots) are being used in conjunction with the company's equipment, please install a safety net around the robots' operation area and do not approach this area during their operation.
2. The company's equipment includes driving and rotating parts. Install a safety net around the rotating parts and do not approach the area during operation.

Precautions for Maintenance and Inspection

Caution

1. When cleaning or repairing the equipment, ensure that the power is turned off and check that the internal power supply has completely discharged before having it carried out by a qualified maintenance specialist. Maintenance by non-specialists may result in breakdown.
2. In the event that breakdown of the equipment occurs, do not disassemble the equipment. Please contact our customer support team for any inquiries.
3. If dust accumulates on the equipment, it may cause a malfunction. Clean the

equipment periodically. When cleaning the equipment, shut off the external power completely and check that the equipment has been fully discharged. There is a danger of electric shock.

Precautions for Disposal

Caution
1. When this equipment is disposed of, treat it as industrial waste.

2 General Information

2.1 General Information

This user manual provides the user and the equipment maintenance specialist with essential information for operating the equipment. Therefore, a thorough understanding of this user manual is strongly recommended.

In order to allow easy access to this user manual, it must be placed near the equipment where it can be easily seen.

2.2 Warranty

With the exception of separate agreements and the following cases, the warranty period in the event of defects will be one year. (Excluding consumables)

- Following -

1. Modification of the equipment without permission from Taeha Corp.
2. Modification or repair of the equipment by someone other than technical support personnel of Taeha Corp. without using the designated parts.
3. Use of any spare parts for the product other than those specified by Taeha Corp.
4. Defects due to intentional damage.
5. Defects due to natural disaster.

2.3 Technical Support

If necessary, Taeha Corp. will provide technical support service for customers. Please contact us by phone or fax.

Head Office

Phone: +82(0)31 552 5300

Fax: +82(0)31 552 5400

Gumi Branch Office

Phone: +82(0)54 463 0014

Fax: +82(0)54 463 0017

Tianjin Branch Office in China

Phone: +86(0)22 2388 8851~2

Fax: +86(0)22 2388 8853

Shenzhen Branch Office in China

Phone: +86 755 2373 3819

Fax: +86 755 2373 3519

Suzhou Branch in China

Phone: +86 512 6251 2825

Fax: +86 512 6805 2921

2.4 Precautions

Danger
1. Be sure to use the designated power supply. The basic power of the equipment is designated as AC 220 V, 50/60 Hz. 2. Be sure to use the designated air pressure. The basic air pressure of the equipment is designated as 5 kgf/cm^2. 3. Do not operate with wet hands. There is a risk of electric shock. 4. During operation, do not turn off the power or shut off the air pressure unless a Danger/Caution situation occurs. Serious problems may arise during the use of the equipment. 5. Contact us if the equipment has serious errors.

3 TDV-300T Features

The TDV-300T has a poppet-type structure, and is a multi-purpose air pressure valve that can be used with a wide range of materials from low viscosity to medium and high viscosity.

Especially when the Valve is closed, there is a Suck-back effect, keeping it clean since liquid condensation does not occur at the end of the Needle after the viscous liquid (liquid with silicone RTV, Epoxy, rubber-base Bond, Grease, and Filler) is dispensed. The diaphragm between the driving unit and the material contacting unit also improves the Valve life and reduces maintenance.

3.1 TDV-300T Appearance and Description

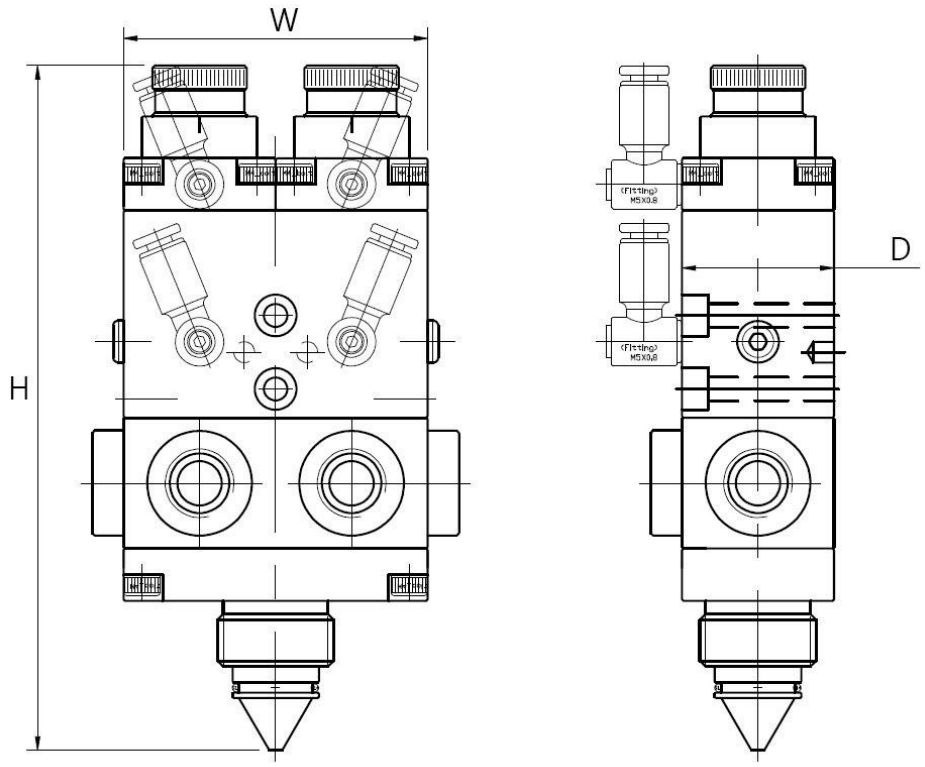


Figure 2. TDV-300T Profile map

Category	Specification
Name	TDV-300T
Size (H×W×D)	130 mm × 58 mm × 29 mm
Weight	560 g
Valve structure	Poppet-type
Operational air pressure	4.0–6.0 kgf/cm² (typically 4.0 kgf/cm²)
Material transfer pressure	Max 6.0 kgf/cm²
Maximum number of operation cycles	300 cycles/min (for a half stroke)
Flow rate (KV value)	Max 2.4 L/min
Application viscosity	1,000–150,000 cPs
Drive air input	M5 * P0.8, ∅6 Urethane Hose
Material input port	PT 1/8”
Material output port	PT 1/4”
Mounting hole	M5 * P0.8 * DP8
Operating Temperature	0–50°C (Avoid direct sunlight)
Operating humidity	10–85%RH (without condensation)
Vibration resistance	0.5 g or less

Table 2. TDV-300T Specifications

Category		Materials
Driving unit	Body	AL Hard Anodizing (Black)
	Piston	SUS303
	Rod	SUS303
	Piston Seal	NBR
Material Contacting unit	Chamber	AL Hard Anodizing (Black)
	Cap	AL Hard Anodizing (Black)
	Diaphragm	UHMW_PE
	Valve Seat	UHMW_PE
	O-Ring (Cap)	Viton
	* Option: Chamber. The material of the Cap (Head) can be changed to SUS303, PEEK, Acetal, etc.	

Table 3. Materials of TDV-300T

4 Operation of TDV-300T

4.1 Names of each part of TDV-300T

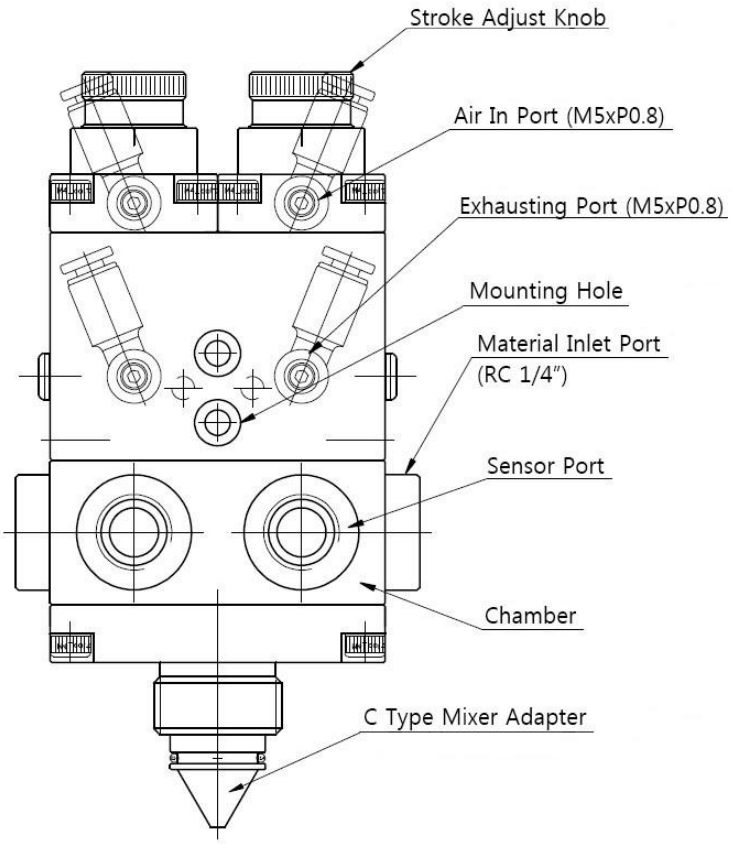
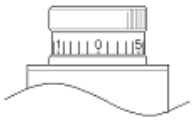
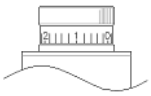
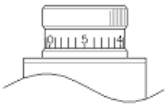
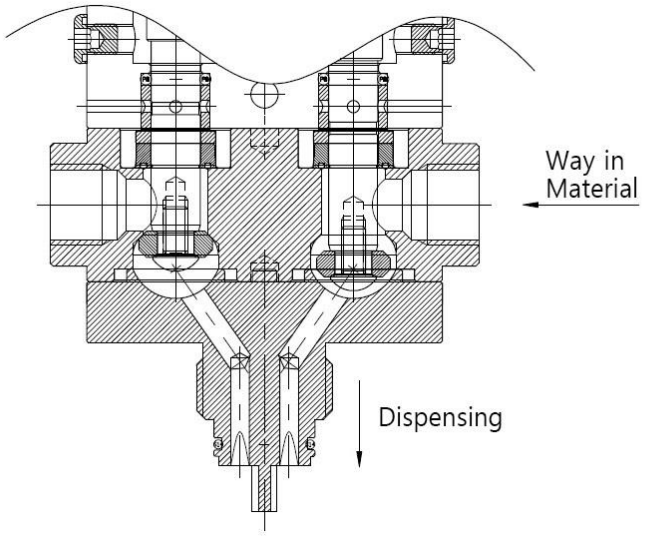


Figure 3. Names of each part of TDV-300T

4.2 Operation Description

<table>
<tr><th>Dispensing OFF</th><th colspan="5">Dispensing ON</th></tr>
<tr><td>  </td><td>  </td><td>Small</td><td rowspan="2">Stroke
Dispensing Volume</td><td>Large</td><td>  </td></tr>
<tr><td colspan="2">Small</td><td>Large</td><td></td></tr>
<tr><td colspan="6"> 
</td></tr>
<tr><td colspan="3">The Valve Seat is closed when set to Normal, so dispensing cannot occur.</td><td colspan="3">When 'Air' is entered, the Valve Seat is opened so as to dispense the material.</td></tr>
<tr><td colspan="3">Air is not input to the driving unit, so the flow path is turned off and the material is not dispensed.</td><td colspan="3">If 'Air' is input to the driving unit, the discharged material is the material transferred by the drop of the Valve Seat depending on the amount of rotation of the flow control Knob.

As the flow path changes with the Stroke adjustment, the flow rate increases.

✓ The adjustment range of the Stroke is up to 3 mm (6 turns).
✓ If there is no difference in the discharging</td></tr>
</table>

	volume even when turned more than six turns, fix it with a fixing screw after Setting.

Table 4. Description of operation of TDV-300T

4.3 TDV-300T Usage

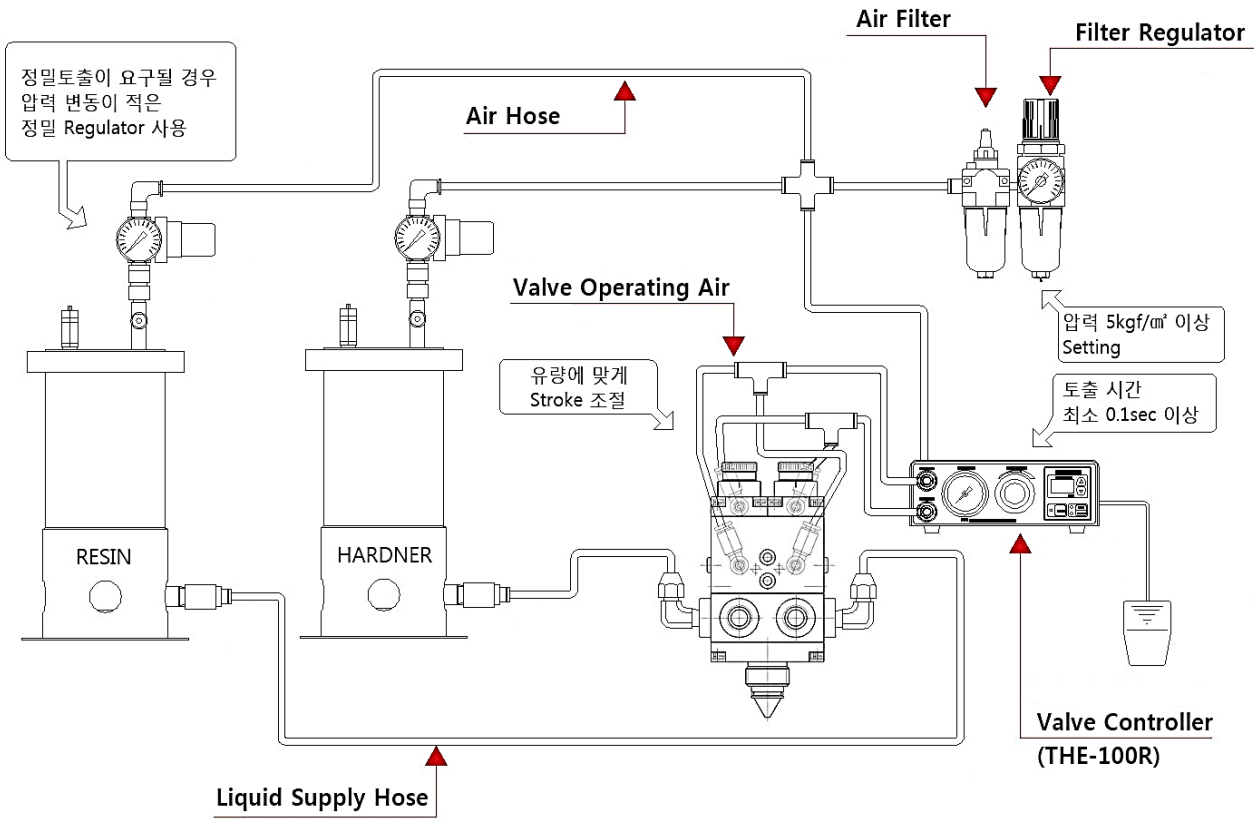


Figure 4. TDV-300T Typical Installation Example

1. Connect the Air Hose (∅6 Urethane) to the Air In Port and Controller. The Valve drive pressure is at least 4.0 kgf/cm².
   - ✓ If the Valve closing speed is slow as single-acting, use it as double-acting.
   - ✓ Single-acting: Closes the Valve with the built-in Spring
2. Connect the Fitting for the liquid supply and the Needle with an appropriate thickness.
3. Adjust the flow control Knob to match the flow rate, and then secure it with the fixing screw.
   - ✓ When the valve is closed, Suck-back occurs and the material is sucked in.
   - ✓ Suck-back: When the Valve is closed, the Valve Seat moves up, so a change in volume is caused and the material is sucked up.
   - ✓ This phenomenon can be controlled by the viscosity of the material, the feed pressure of the material, the moving Stroke size of the Valve, etc.

5 TDV-300T Disassembly and Partlist

5.1 TDV-300T Disassembly

This section describes how to disassemble the TDV-300T for maintenance.

1) Disassemble the Mix Cap by turning it counterclockwise.

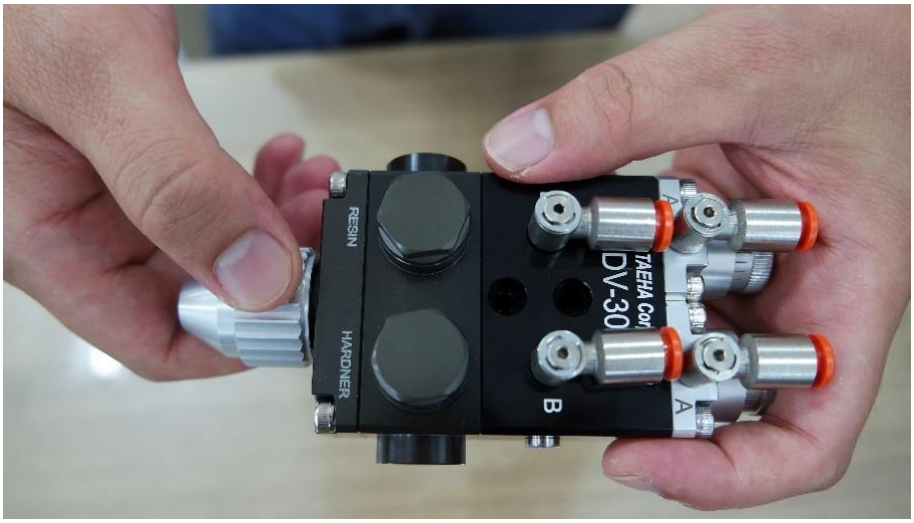


Figure 5.

2) Disassemble the Mix Adapter by turning the four wrench bolts (M4×10) counterclockwise.

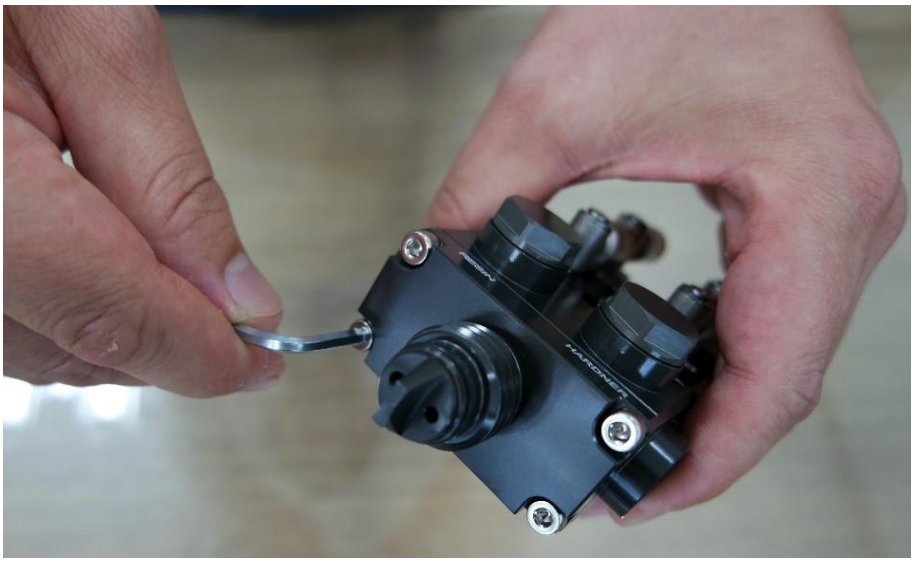


Figure 6.

3) Disassemble the sensor cap using a spanner. (When not using pressure sensor)

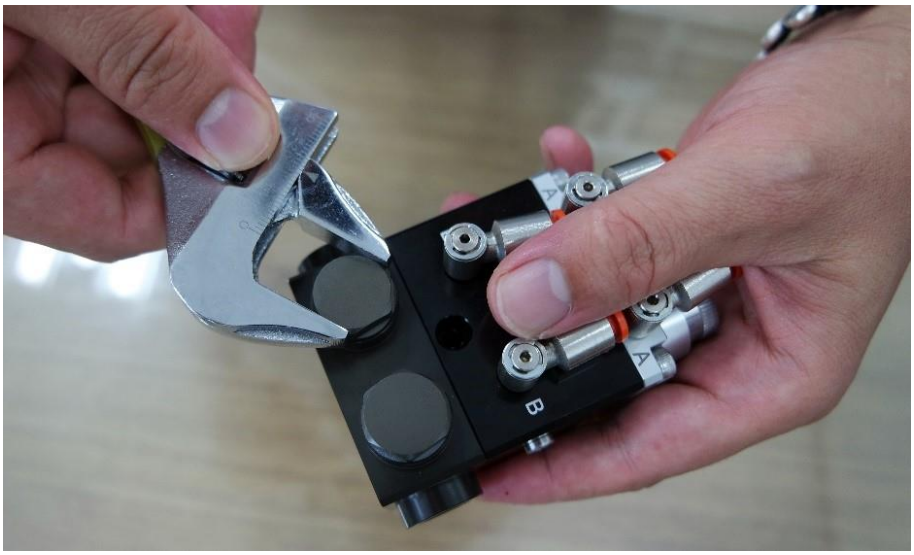


Figure 7.

4) Use a Phillips head screwdriver to remove the two bolts inside the chamber.

Figure 8.

5) Remove the four outer wrench bolts (M4×50) on the cylinder cap portion.
(Chamber and 2 seats are separated.)

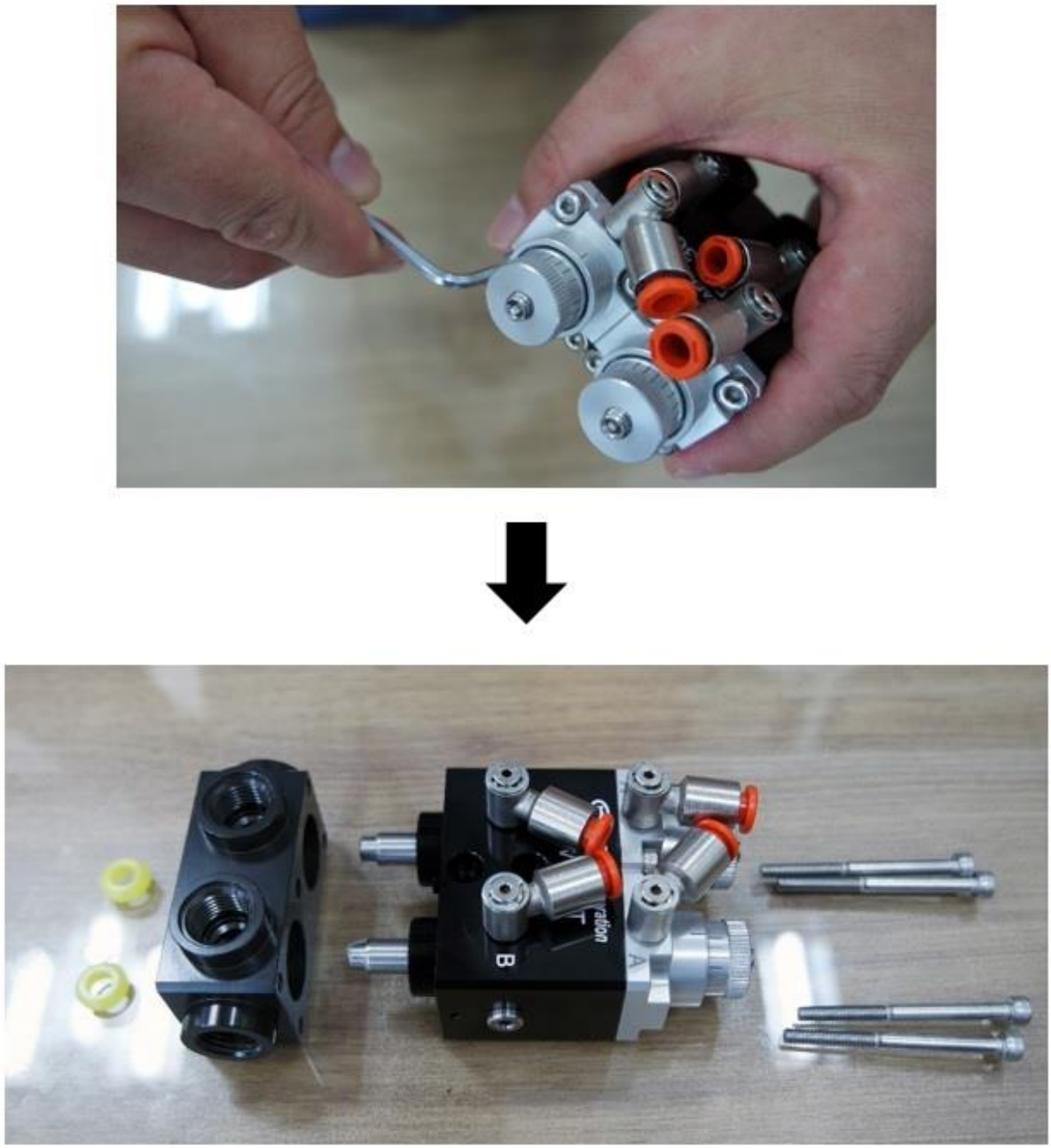


Figure 9.

6) Remove the four remaining wrench bolts (M4×10) inside the cylinder cap.
(2 Pistons and 2 Lip Seals are separated.)

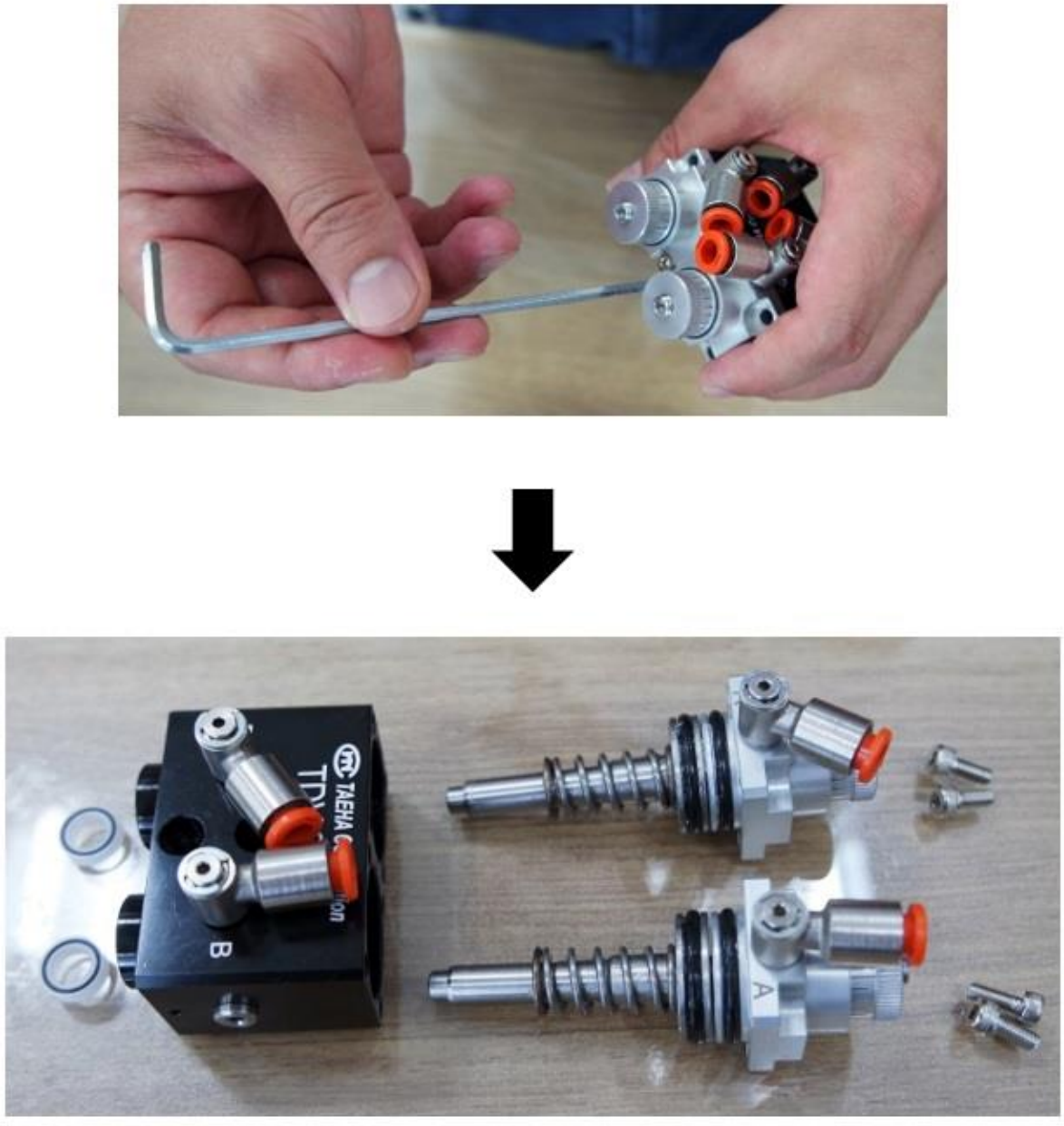


Figure 10.

5.2 TDV-300T Exploded View and Partlist

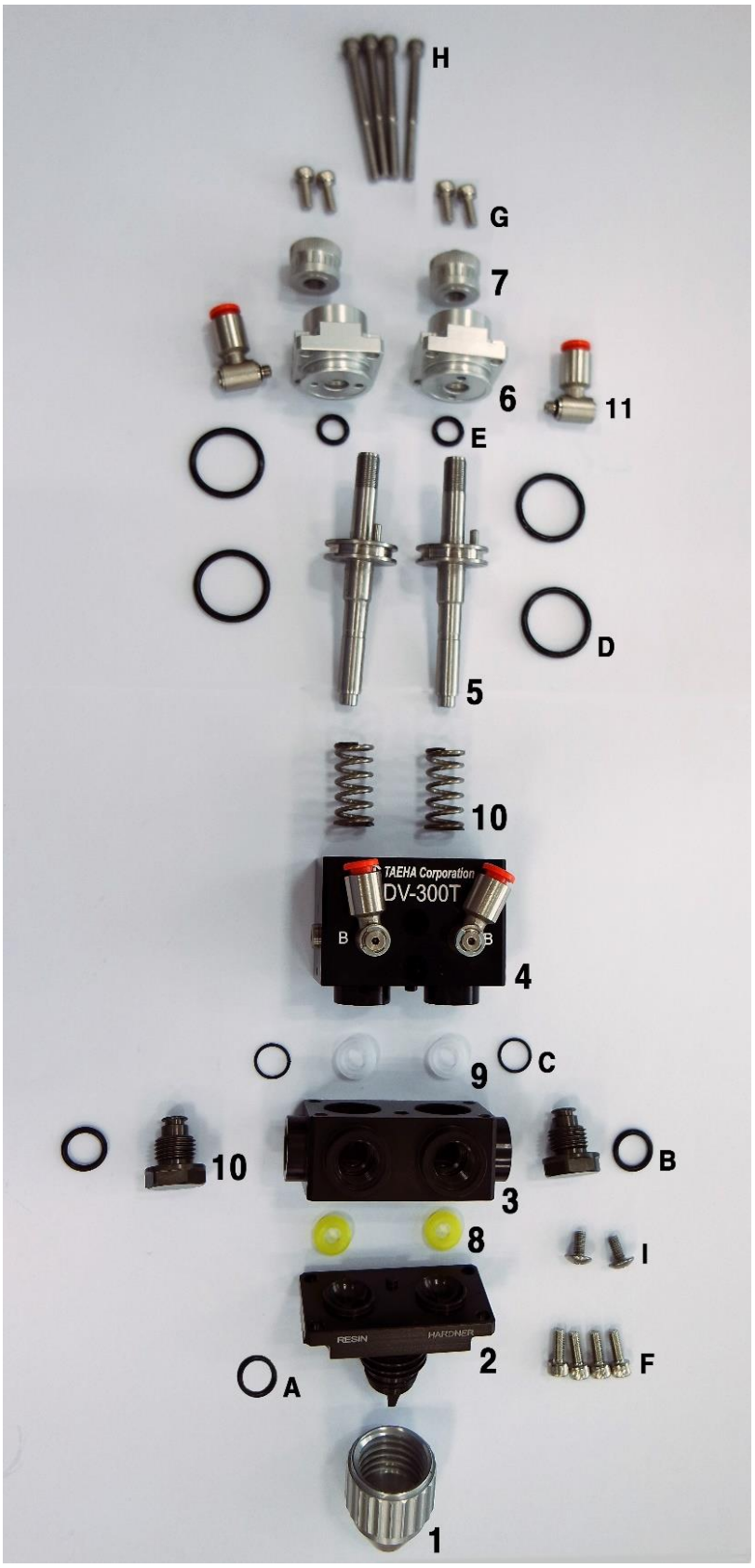


Figure 11. TDV-300T Exploded View

No.	Part No.	Item Name	Qty	Material	Guarantee
1	TDV-300T-1	Mix Cap	1	AL6061	One year
2	TDV-300T-2	Mix Adapter	1	AL6061	One year
3	TDV-300T-3	Chamber	1	AL6061	One year
4	TDV-300T-4	Cylinder Body	1	AL6061	One year
5	TDV-300T-5	Piston	2	AL6061	One year
6	TDV-300T-6	Cap	2	AL2024	One year
7	TDV-300T-7	Knob Body	2	AL2024	One year
8	TDV-300T-8	Seat	2	UHMW_PE	Six months
9	TDV-300T-9	Lip Seal	2	UHMW_PE	Six months
10	TDV-300T-10	Spring	2	-	One year
11	TDV-300T-11	Fitting	2	-	-
A	TDV-300T-A	O-Ring (S14)	1	FFKM	Six months
B	TDV-300T-B	O-Ring (S6)	1	FFKM	Six months
C	TDV-300T-C	O-Ring (S)	1	FFKM	Six months
D	TDV-300T-D	O-Ring (P21)	4	FFKM	Six months
E	TDV-300T-E	O-Ring (P8)	2	FFKM	Six months
F	TDV-300T-F	Bolt (M4×10)	4	-	-
G	TDV-300T-G	Bolt (M4×10)	4	-	-
H	TDV-300T-H	Bolt (M4×50)	4	-	-
I	TDV-300T-I	Phillips Truss Head Bolt (9×8)	2	-	-

Table 5. TDV-300T Partlist

6 Maintenance

In order to prevent malfunctions caused by various factors, please perform occasional (user-determined) and periodic (within one year) inspections.

Danger
Be sure to take necessary measures such as the manual mode of the equipment, emergency stop, power off, etc. before performing maintenance and inspection. If the power is not turned off, the sensor may detect the inspector or a random object inside the equipment and cause operation to occur. This may also result in electric shock.

6.1 Precautions

Number	Precautions
1	If air bubbles exist between the Valve's Material In and Out Ports, or if air bubbles exist within the material itself, liquid draining may deteriorate after dispensing, resulting in liquid condensation. (Suck-back effect decreases)
2	Remove air bubbles before use.
3	Point the end of the Needle upwards to lower the dispensing pressure, and continuously dispense the liquid sufficiently. If it is difficult to turn the valve 180° to point the end of the Needle upwards, lower the dispensing pressure in this state and continuously dispense the liquid sufficiently.

Table 6. Cautions when using TDV-300T

6.2 Maintenance Methods

Maintenance	Methods
Cleaning	1. For liquid that naturally hardens after using the Valve or liquid that may damage the material of the Valve material contacting units, be sure to clean it. 2. First, dispense all liquid inside the pressurized container, the liquid supply Hose, and the Valve material contacting unit until the air comes out sufficiently. 3. Rinse the liquid inside the Valve with an appropriate amount of a suitable Solvent. 4. Then clean it until it is clean enough in order of Air -> Solvent -> Air -> Solvent.
Disassembly	1. When disassembling for cleaning or replacement of parts, refer to the Exploded View and Partlist. 2. Separate the Chamber Cap using two spanners. 3. Separate the Valve Seat using a hex wrench. (Please note that there is an insertion direction). 4. Using a spanner, separate the Cylinder Body and Valve Chamber.
Assembly	＊ It is performed in the reverse order of "Disassembly." The following are precautions for assembly. 1. Insert the Valve Seat in the correct direction, insert the Bolt, and tighten it with a hex wrench. (As shown in the picture on the right, with the Shot Volume Control Knob separated, turn the hex wrench slowly until it is 4 mm.) 2. When assembling the Cylinder Body and Valve Chamber, tighten the reference mark of the Valve Chamber and the Check Port (∅2 hole) of the Cylinder Body to be in a straight

	line. 3. Please note that there is a Valve Seat insertion direction.

Table 7. TDV-300T Maintenance Method

6.3 Inspection and Measures

Inspection Item	Inspection Cycle	Inspection and Measures	Remarks
Ambient Environment	Occasionally	Confirm that it meets the usage standards of the equipment.	
Power Supply Voltage	Occasionally	Check that the power is AC 220 V, 50/60 Hz.	
Appearance of the Equipment	Periodically	Check whether the connection parts (connector, terminal block, etc.) are loose, and tightly fasten any loose parts.	
Cabling	Periodically	Check whether there is peeling or severe bending of the cover.	
Internal State of the Equipment	Periodically	Keep clean to prevent contamination by dust and so that the solution does not interfere with the operation of the equipment.	
Supplied Air	Occasionally	Ensure that there are no leaks in the connections of the pipes so that the supplied air maintains a normal pressure.	
Purge Condition	Occasionally	If the equipment is stopped for more than 10 minutes, dispense a certain volume depending on the set time so that hardening does not occur at the end of the valve.	
Other	Periodically	Tightness of fixed parts and joints in the equipment. Connections and tightness of the wiring.	

		Organization and tidiness around the equipment.	

Table 8. Inspection and Measure

