TECHCON

TS5540-MS Micro Spray Valve

User Guide

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1. SAFETY

1.1 Intended Use:

WARNING: Use of this equipment in ways other than those described in this User Guide may result in injury to person or damage to property. Use this equipment only as described in this User Guide.

OK International cannot be responsible for injuries or damages resulting from unintended applications of its equipment. Unintended uses may result from taking the following actions:

- Making changes to equipment that has not been recommended in the User Guide
- Using incompatible or damaged replacement parts
- Using unapproved and/or unsafe accessories, auxiliary equipment and attachment materials and methodology

1.2 Safety Precautions:

- Do not operate this unit in excess of maximum ratings/settings
- Always wear appropriate personal protective eyewear, clothing or apparel when operating or cleaning/servicing the equipment
- The fluid being dispensed may be toxic and/or hazardous. Refer to Material Safety Data Sheet for proper handling and safety precautions

2. SPECIFICATIONS

Size	122 x 28.5 mm (4.8” x 1.1”)
Weight	331 g (0.73 lbs.)
Fluid Inlet Port	1/8” NPT female
Air Inlet Port	10-32 UNF-2B
Atomize Air Inlet Port	10-32 UNF-2B
Fluid Pressure	100 psi (6.9 bar) maximum
Activation Pressure	70 psi (4.8 bar) minimum
Wetted Parts	303 stainless steel, Teflon®
Air Cylinder Material	303 stainless steel
Operating Frequency	Exceeds 400 cycles/min.

Teflon® is a registered trademark of E.I. DuPont

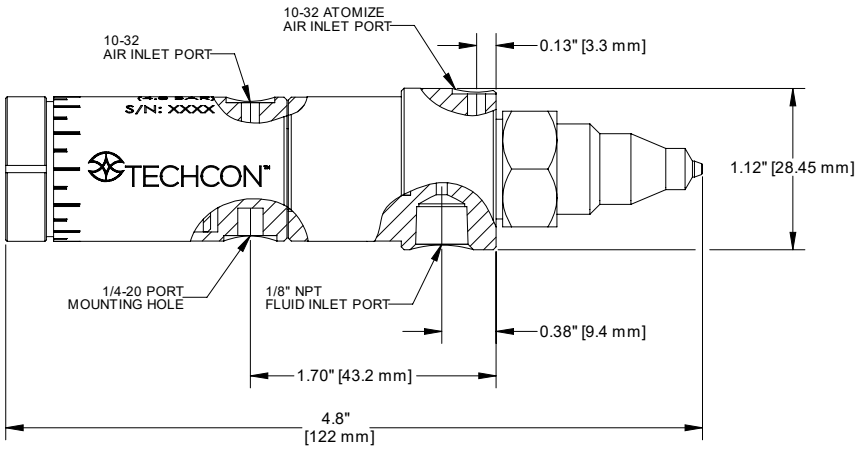


Figure 1.0

3. FEATURES

Items #	Description
1	Stroke Control Adjustment Knob
2	Valve-actuating Air Inlet Port
3	Atomize Air Inlet Port
4	Locking Nut
5	Spray Cap/Needle Guide *(not visible)*
6	Needle/Tip
7	Fluid Inlet Port

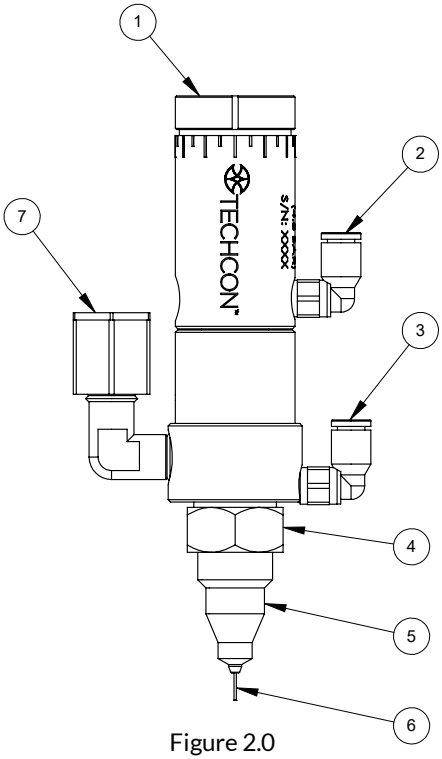


Figure 2.0

4. CONNECTING THE VALVE

Item #	Description
1	From Air Source
2	Air Filter
3	Constant Air Flow
4	Valve Air Hose (included)
5	Atomize Air Hose (included)
6	Fluid Feed Hose (optional)
7	Fluid Reservoir (TS1258 - optional)
8	Valve Controller (TS566R)

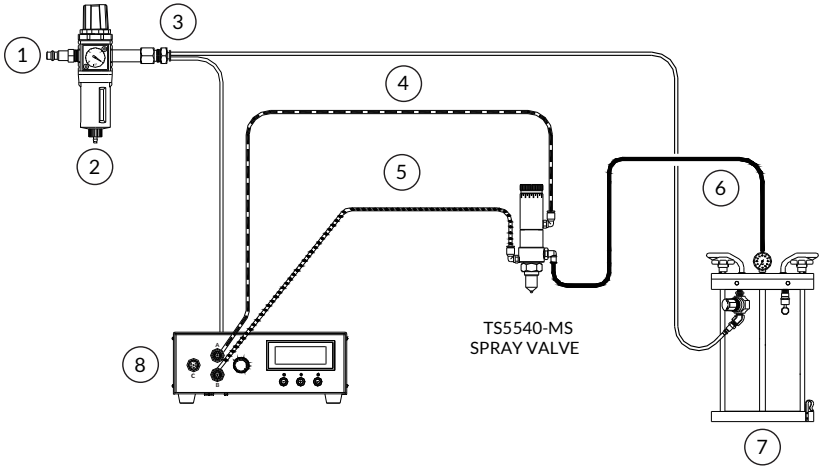
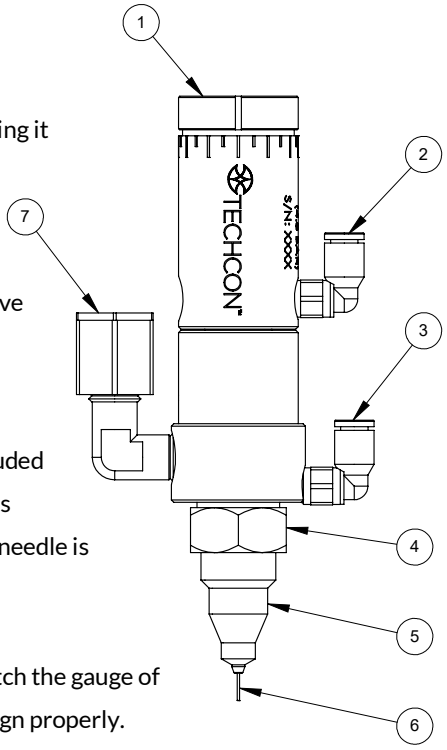


Figure 3.0

5. OPERATING INSTRUCTIONS

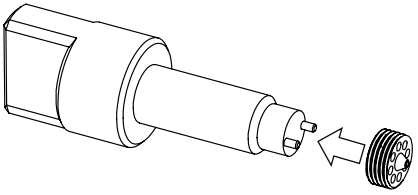


1. Remove the Locking Nut (4) by turning it counterclockwise
2. Pull the Spray Cap (5) away from the valve body
3. Install desired Needle/Tip to the valve

Needle Guide

For operations requiring precise vertical needle alignment, a Needle Guide is included with TS5540-MS. Using a Needle Guide is optional but does ensure the dispensing needle is accurately aligned with the valve.

The gauge of the Needle Guide must match the gauge of the dispensing needle for the guide to align properly. TS5540-MS comes with a 25-gauge Needle Valve and installation tool. Other gauges are also available (see page 16).



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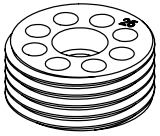
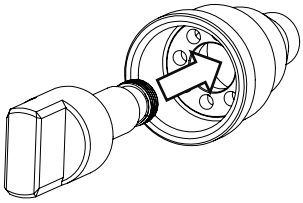


4. To install the (optional) Needle Guide, place the Needle Guide onto the Needle Guide Installation Tool (7509-1770) as shown, with the top of the guide against the tool.

NOTE: The holes in the Needle Guide are evenly spaced, so there is no specific rotation you must match. Just ensure the two pegs of the Installation Tool fit into two holes in the Guide.



5. Using the Installation tool, fit the Needle Guide into the Spray Cap (5) as shown. Rotate the threaded guide clockwise until it stops and remove the Installation Tool.
6. Reinstall the Spray Cap and Locking Nut back onto the valve body.
7. Set valve air pressure at Valve Controller to 70 psi (4.8 bar).
8. Set the atomize air pressure at Valve Controller according to the viscosity of fluid being spray.
9. Set fluid pressure at Fluid Reservoir according to the viscosity of fluid being sprayed; do not exceed 100 psi (6.9 bars).
10. Place a waste bucket under the valve outlet and purge the valve until the fluid flows steadily

Spray coverage is determined by:

- Stroke control adjustment – Rotate Stroke Control Knob clockwise to decrease flow rate and counterclockwise to increase flow rate. DO NOT rotate the knob beyond the “Line Marker” which is labeled on the knob shaft.
- Length of actuation as set at Valve Controller (the “valve-on” time)
- Fluid reservoir pressure
- Fluid viscosity
- Distance between the needle/tip and the sprayed surface
- Needle/tip size

SPRAY AREA COVERAGE BY 1/4" LONG NEEDLE*

Needle Part Number	Needle Size	Spray Distance		
		0.5"	1"	1.5"
		Spray Area Coverage (Diameter)		
TE723025	23G x 1/4"	.260" (6.60 mm)	.320" (8.13 mm)	.375" (9.53 mm)
TE725025	25G x 1/4"	.240" (6.10 mm)	.280" (7.11 mm)	.350" (8.89 mm)
TE727025	27G x 1/4"	.200" (5.08 mm)	.270" (6.86 mm)	.300" (7.62 mm)
TE730025	30G x 1/4"	.190" (4.83 mm)	.240" (6.10 mm)	.275" (6.99 mm)
TE732025	32g x 1/4"	.180" (4.57 mm)	.220" (5.59 mm)	.260" (6.60 mm)

SPRAY AREA COVERAGE BY 1/2" LONG NEEDLE*

Needle Part Number	Needle Size	Spray Distance		
		0.5"	1"	1.5"
		Spray Area Coverage (Diameter)		
TE723050	23G x 1/2"	.280" (7.11 mm)	.430" (10.92 mm)	.600" (15.24 mm)
TE725050	25G x 1/2"	.240" (6.10 mm)	.330" (8.38 mm)	.400" (10.16 mm)
TE727050	27G x 1/2"	.220" (5.59 mm)	.300" (7.62 mm)	.375" (9.53 mm)
TE730050	30G x 1/2"	.200" (5.08 mm)	.280" (7.11 mm)	.350" (8.89 mm)

**Spray area coverage shown in the charts above is for reference only. Actual coverage area depends on fluid viscosity and other characteristics.*

6. TROUBLESHOOTING

PROBLEM	POSSIBLE CAUSE	CORRECTION
No fluid flow	Fluid pressure is too low	Increase fluid pressure at Fluid Reservoir
	Needle (tip) is clogged	Replace needle (tip)
	Operating pressure is too low	Increase air pressure to 70 psi (4.8 bars) at Valve Controller
	Valve is not actuating	Check Valve Controller for air pressure level to valve
	Fluid cured in valve chamber	Disassemble and clean valve thoroughly
	Stroke control adjustment not activating or engaged	Engage by rotating the Stroke Control Adjustment Knob counterclockwise (but not beyond the "Line Marker")
Inconsistent fluid flow	Fluid pressure fluctuating	Make sure fluid pressure is constant
	Valve operating pressure is too low	Increase valve pressure to 70 psi (4.8 bars) at Valve Controller
	Valve opening time is not consistent	Check to make sure the Valve Controller is providing a consistent air pressure output
Fluid drools after the valve closes, eventually stopping	Air trapped in needle (tip)	Purge air from valve
	Post-spray time is too short	Increase post-spray time at Valve Controller
Fluid flows through needle but will not spray	Atomize pressure is too low	Increase atomizing pressure at Valve Controller
Steady drip	Needle (tip) is not properly installed	Tighten retaining nut
	Needle(tip) is damaged	Replace with new Needle (Tip)
	Seat is worn or damaged	Replace worn or damaged part
	Stroke adjustment cap is opened too far	Turn Stroke adjustment cap clock wise until leaking stop

7. MAINTENANCE AND CLEANING

Tool/Material required (one each):

- Open-end wrench
- Snap-ring pliers
- Soft brush
- Ring grease
- Wooden dowel

Cleaning agent recommended: Isopropyl Alcohol or equivalent solvent.

7.1 Thorough Cleaning (See Figure 4.0)

1. Release fluid pressure at Fluid Reservoir.
2. Disconnect fluid line and valve air hoses from valve.
3. Remove Stroke Control Adjustment Knob (19) by rotating it counterclockwise beyond the "Line Marker;" the knob is loosened as it is pushed by the Compression Spring.
4. Remove the Compression Spring (1) and the two Mylar Washers (18) on each end of the Compression Spring.
5. Remove the Locking Nut (8) and then pull the Air Cap (11) and needle/tip (10) away from the Fluid Housing (7)
6. Using the open-end wrench to remove the Needle (tip) adapter (9); replace O-ring (13) if it is damaged.
7. Hold Fluid Housing (7) and rotate the Air Cylinder (2) counterclockwise. When completely un-threaded, pull the two valve segments straight apart to separate.
8. Remove fluid inlet fitting from the fluid housing (7)
9. Using a soft brush to clean Fluid Housing (7), Needle/Piston Assembly (17) and Needle (tip) adapter (9) with Isopropyl Alcohol or equivalent solvent.
10. Lubricate O-ring (6) with grease then reassemble the Air Cylinder/Needle Assembly (2) into Fluid Housing (7).

11. Reinstall Needle (tip) adapter (9), Air Cap (11) and Locking Nut (8) into Fluid Housing (7).
12. To reinstall Compression Spring (1) by first placing one Mylar Washer over the Needle/Piston Assembly (17), then the other Mylar Washer into the Stroke Control Adjustment Knob (18) and followed by the Compression Spring.
13. Reinstall the Stroke Control Adjustment Knob (19) by rotating it clockwise until it stops and then counterclockwise to the desired setting BUT NOT beyond the "Line Marker" on the knob shaft.

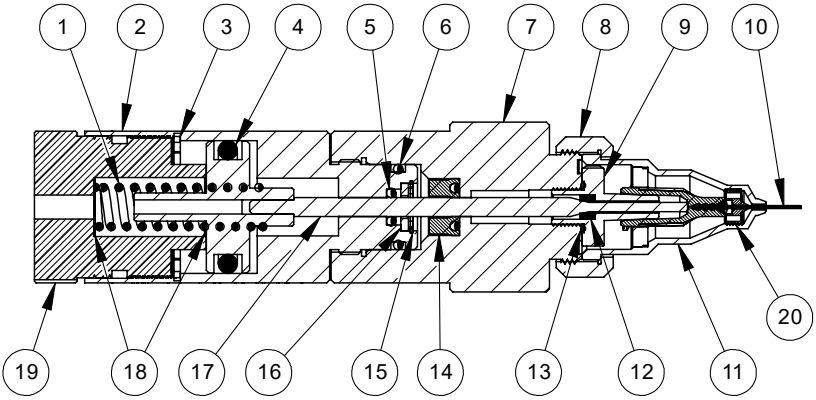


Figure 4.0

7.2 Needle/Piston Assembly and Seal Replacement (See Figure 4.0)

1. Follow Step# 1-7 in previous section (Section 7.1).
2. Replace O-ring (6) if damaged.
3. Using a soft rod (such as a wooden dowel) to remove Cup Seal (14) from Fluid Housing (7)
4. Use the snap-ring pliers to remove the large Retaining Ring (3)

5. Pull the Needle/Piston Assembly (17) straight out from the Air Cylinder (2)
6. Use the Snap-ring pliers to remove the small Retaining Ring (15)
7. Remove the Nylon Washer (16) and O-ring (5); replace these parts if damaged.
8. Reinstall O-ring (5), Nylon Washer (16) and secure with a small Retaining Ring (14).
9. Reinstall Needle/Piston Assembly (17) and secure with the large Retaining Ring (3).
10. Reinstall Cup Seal (14) into Fluid Housing (7) by using a soft rod (such as a wooden dowel).
11. Follow Steps #10-13 in the previous section (Section 7.1).

7.3 Needle/Tip Adapter and Air Cap Replacement (See Figure 4.0)

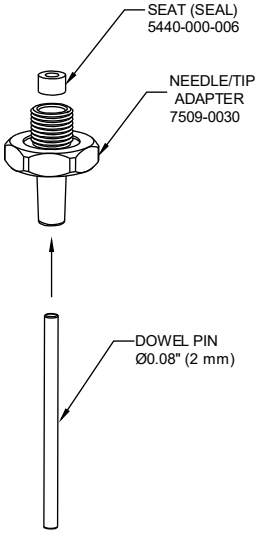
1. Remove Stroke Control Adjustment Knob (19) by rotating it counterclockwise and beyond the "Line Marker" position.
2. Remove the Compression Spring (1) and the two Mylar Washers (18) on each end of the Compression Spring.
3. Remove the Locking Nut (8) and then pull the Air Cap (11) and needle/tip (10) away from the Fluid Housing (7).
4. Using the open-end wrench to remove the Needle/Tip Adapter (9)
5. Reinstall the new Needle/Tip Adapter (9) and make sure the O-ring is on the Needle/Tip Adapter. Do not over tighten!
6. Install new Air Cap (11, shown with Needle Guide installed) and then secure it with the Locking Nut (8).

7.4 Seat Replacement (See Fig. 5.0 and 6.0)

Tools required:

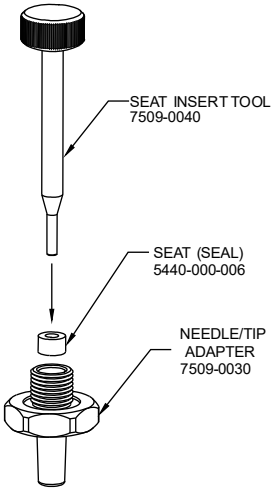
- 0.08" (2 mm) diameter Dowel Pin (not included)
- Seat/Seal insertion tool (not included, purchase separately)

1. Insert a Dowel pin with diameter of 0.08" (2 mm) from the outlet end of the Needle/Tip adapter to push out the Seat (Seal).
2. Place the new Seat/Seal inside the Needle/Tip adapter with the larger inside diameter facing up
3. Using the Seat insertion tool to push the Seat/Seal straight down into the Needle/Tip adapter. To ensure proper seat alignment, it is recommended that the seat installation is done on an Arbor Press.



Seat Removal

Figure 5.0



Seat Installation

Figure 6.0

8. SPARE PARTS AND ACCESSORIES

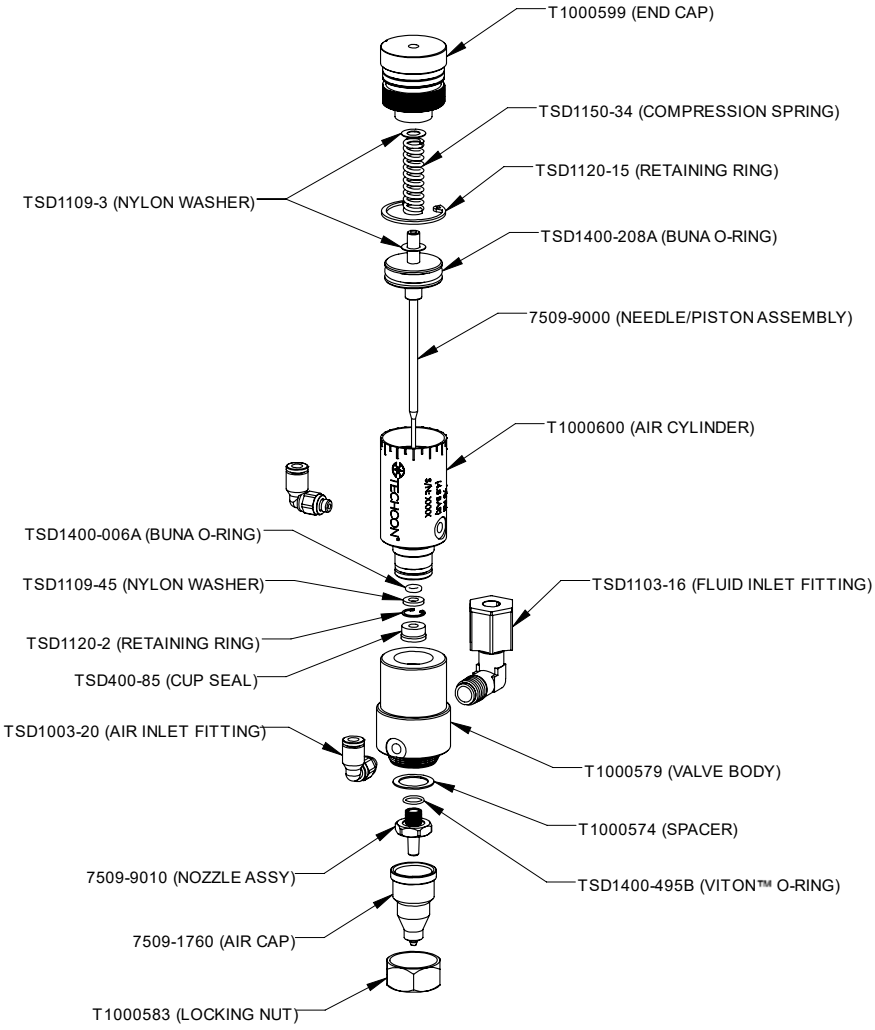


Figure 7.0

PART NUMBER	DESCRIPTION
T1000599	End Cap
TSD1150-34	Compression Ring
TSD1120-15	Retaining Ring
TSD1400-208A	Buna Ring
7509-9000	Needle/Piston Assembly
T1000600	Air Cylinder
TSD1103-16	Fluid Inlet Fitting
T1000579	Valve Body
T1000574	Spacer
TSD1400-495B	Viton O-Ring
T1000583	Lock Nut
7509-1760	Air Cap
7509-9010	Nozzle Assembly
TSD1003-20	Air Inlet Fitting
TSD400-85	Cup Seal
TSD1120-2	Retaining Ring
TSD1109-45	Nylon Washer
TSD1400-006A	Buna O-Ring
TSD1109-3	Nylon Washer

NEEDLE GUIDES	
5540-MS-23	23-Gauge Needle Guide
5540-MS-25	25-Gauge Needle Guide
5540-MS-27	27-Gauge Needle Guide
5540-MS-30	30-Gauge Needle Guide
5540-MS-32	32-Gauge Needle Guide

TOOLS	
7509-1770	Needle Guide Insertion Tool
7509-0040	Seat Insert Tool

9. LIMITED WARRANTY

Techcon warrants this product to the original purchaser for a period of one (1) year from the date of purchase to be free from material and workmanship defects but does not warrant normal wear-and-tear and damage to the equipment as the result of abuse or faulty installation. Defective product or subassembly and components under warranty will be repaired or replaced (at Techcon/OK International's option) free of charge. Customers with defective products under warranty must contact the nearest Techcon office or distributor to secure a return authorization prior to shipping the product to the assigned Techcon authorized service center. For the nearest Techcon office or distributor, please visit www.techcon.com.

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