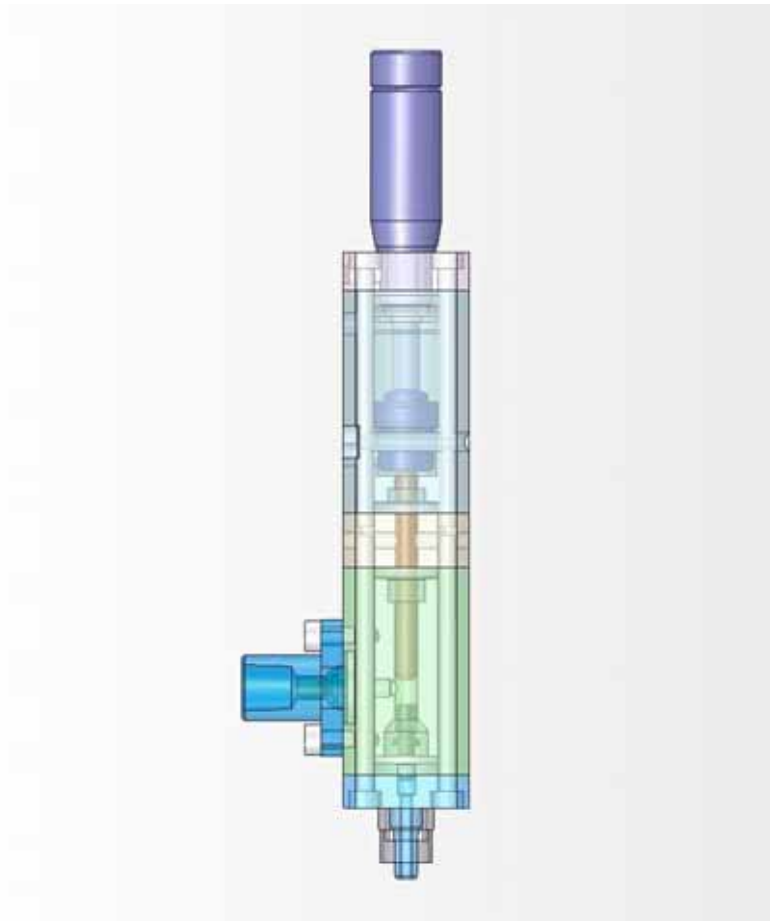


DISPENSING VALVE

MODEL VDP150

◀ INSTRUCTION MANUAL ▶



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1. INTRODUCTION

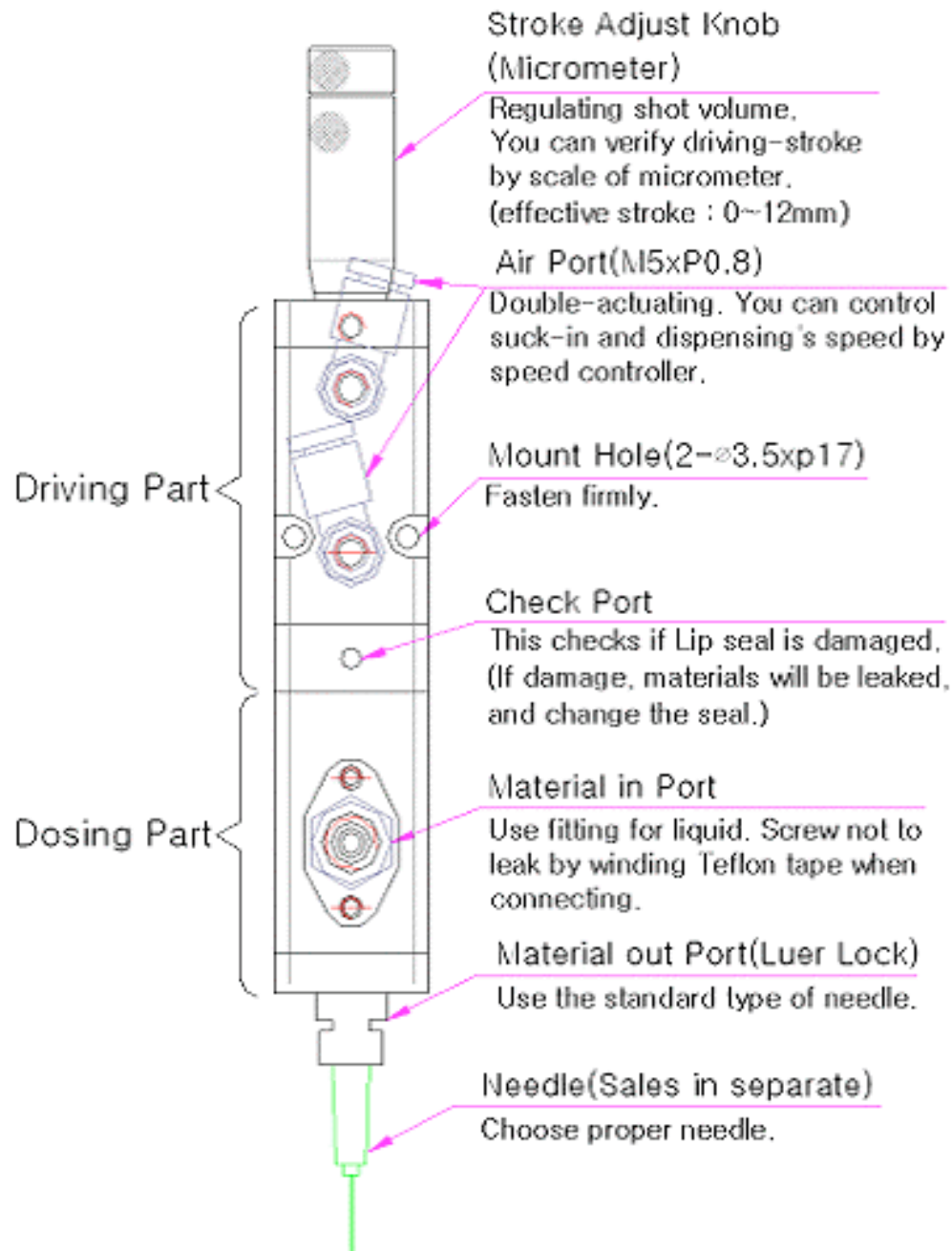
VDP150 Plunger Pump is a pneumatically operated positive displacement valve designed for dispensing constant volume shots of low to medium viscosity materials. For low viscosity no fluid pressure is required, as the material is sucked-in by the plunger into the valve chamber. Low fluid pressure is required for medium viscosity materials.

Shot sizes may be fine tuned by turning the adjustment knob at the top of the valve. The wetted parts of the VDP150 double-acting valve are made of durable material, making the valve ideal for filled materials, extending the valve life and reducing valve maintenance.

2. SPECIFICATIONS

Operating Air Pressure	4.0~6.0kgf/cm ² (60-90PSI)
Material Delivery Pressure	Spring wire diameter: \varnothing 0.3mm → Max 0.3kgf/cm ²
	Spring wire diameter: \varnothing 0.5mm → Max 1.2kgf/cm ²
Cycle Rate	120cycles/min (standard in full stroke)
Minimum Shot Size	0.005cc
Maximum Shot Size	0.15cc/cycle
Valve Structure	Plunger type
Weight	320g (11.3oz)
Driving Part Materials	Cylinder Body, CAP: AL Hard Anodizing (BLACK) Piston: SUS303 Check Body: SUS303, RULON
Wetted Part Materials	Chamber: SUS303 Plunger: SUS420 (Tin Coating) CAP, CV Body: SUS303 Check Valve: PEEK O-Ring: Purfluore
Connecting Ports	Operating Air Inlet: M5*P0.8 Material Inlet: BSPT1/8" Material Outlet: Luer Lock

3. PART DESCRIPTION



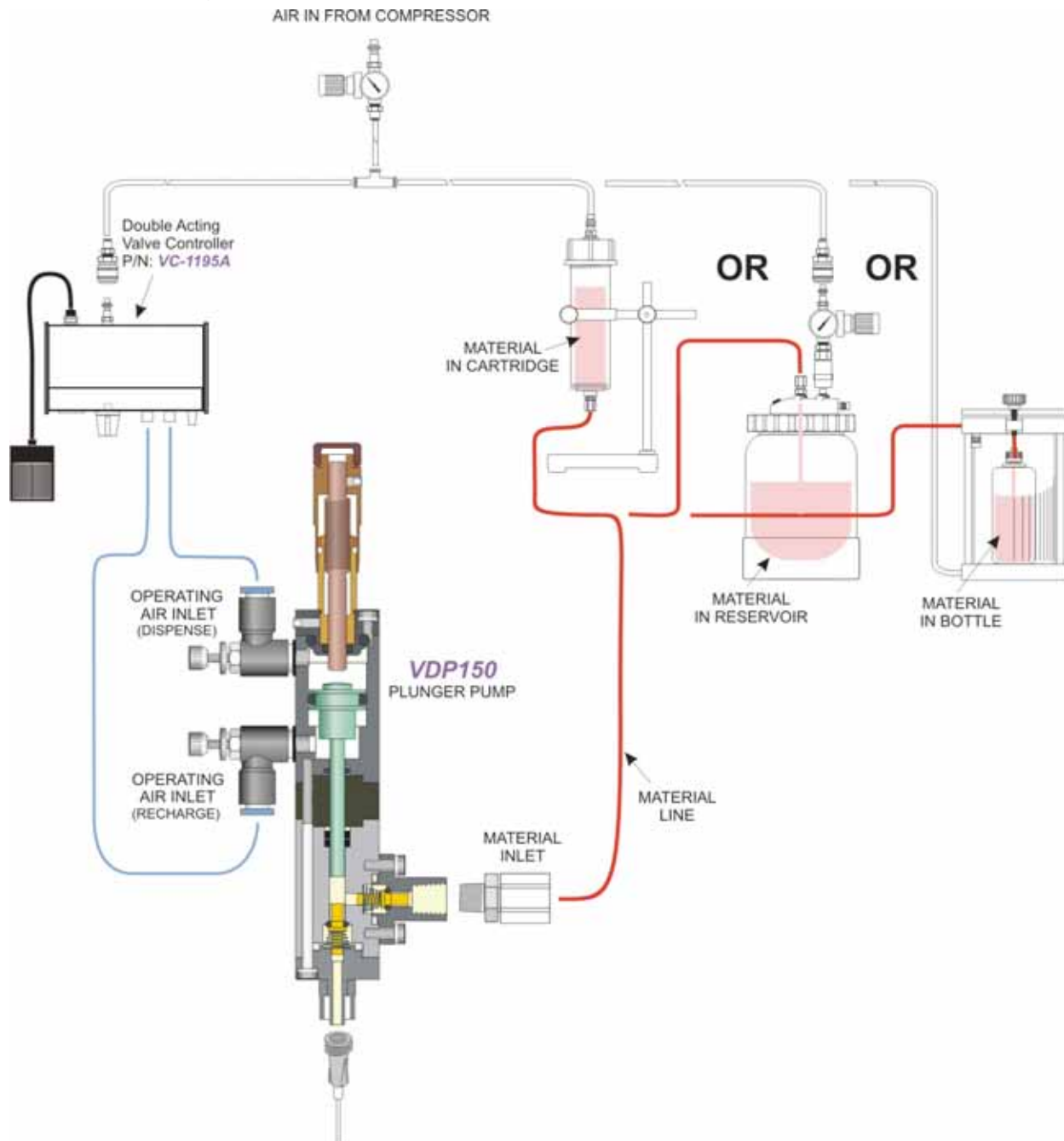
4. OPERATING PRINCIPLES

Dispensing OFF	Dispensing ON
<ul style="list-style-type: none"> ▶ Plunger → Up ▶ Check valve of CV Body → open ▶ Check valve of Chamber CAP → close 	<ul style="list-style-type: none"> ▶ Plunger → Down ▶ Check valve of CV Body → close ▶ Check valve of Chamber CAP → open
When plunger goes up, material is sucked into the valve chamber because of the negative pressure.	When the plunger goes down, the material sucked into the valve chamber is dispensed.
<p>▶ Calculation for Sucked-in amount & Shot volume</p> <p>If Plunger's outer diameter is $\varnothing 4(\text{mm})$ and Micrometer's scale is 5mm:</p> $V(\text{shot volume}) = A(\text{cross-section area}) \times S(\text{micrometer's stroke})$ $= \frac{1}{4}\pi \times 4^2 \times 5\text{mm}$ $= 62.8\text{mm}^3 = 0.0628\text{cc}$	
<p>⚠ Important</p> <p>The above calculation is abstract. The actual shot size can be affected by an air bubble sucked-in, condition of seal, viscosity and suck-in speed.</p>	

5. OPERATING PROCEDURE

5-1. Setup

- ▶ example for general installation



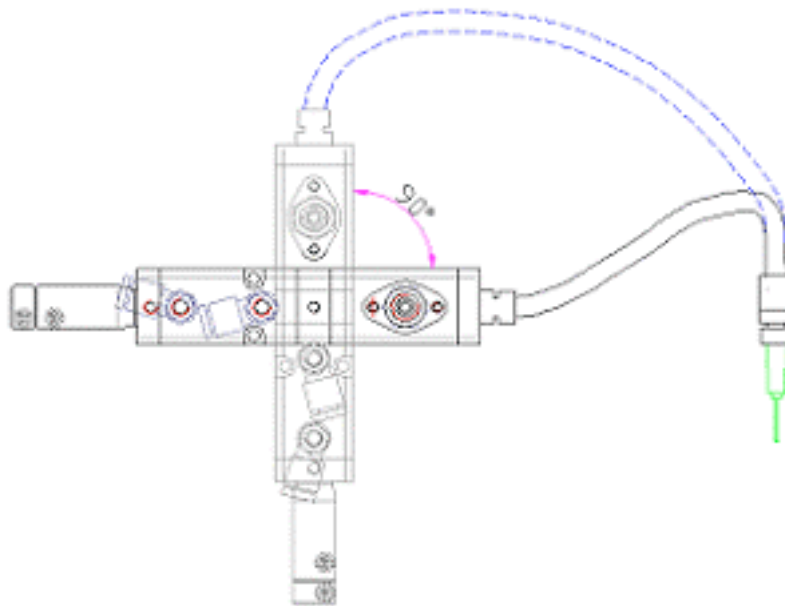
5-2. Operating Procedure in Details

5-2-1) Material put-in & Remove Air

- 1) When material is transferred into the container, be careful not to introduce air bubbles. (Remove air when needed)
- 2) Remove air in pump.
 - 2-1) Point the valve upward.
 - 2-2) Regulate 0[mm] on stroke control knob (micrometer)'s scale.
 - 2-3) Bleed air from the valve by dispensing continuously at low material pressure.

Notice

- ① Remove all air from the material before using the valve.
- ② Set up the valve as shown below if there is still air in the valve
($0^{\circ} < \text{setting angle} < 90^{\circ}$)
***90° is the ideal angle**

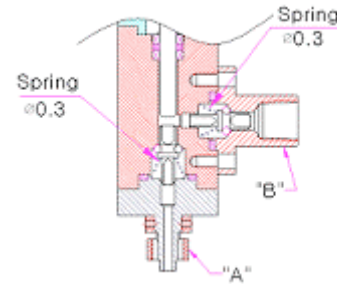


5-2-2) Set-up by viscosity

1) For low viscosity materials (less than 5,000cps):

1-1) No fluid pressure is required when dispensing low viscosity materials, as the material is sucked-in by the plunger into the valve chamber.

There is a $\varnothing 0.3(\text{mm})$ spring in the check valve "A" (Chamber Cap) and in the check valve "B" (CV Body).



1-2) Although fluid pressure is not required when dispensing low viscosity materials, you can apply very low material pressure (less than $0.3\text{kgf}/\text{cm}^2$).

2) For medium viscosity materials (5,000 – 20,000cps):

2-1) Low fluid pressure (less than $1.2\text{kgf}/\text{cm}^2$) is required for medium viscosity materials. Change the "A" (Chamber Cap) check valve spring and the "B" (CV Body) check valve spring to $\varnothing 0.5(\text{mm})$.

2-2) Carefully adjust the fluid pressure to prevent the liquid from dripping from the material outlet.

Notice

When dispensing medium viscosity materials (5,000 – 20,000cps), lower the speed of the plunger as it goes up and adjust the fluid pressure to allow enough time for the material to fill up the valve chamber.

5-3. Notice for Use

5-3-1) Remove all air from the material before using the valve in order to maintain shot size precision.

5-3-2) The VDP150 plunger pump will slightly vibrate during operation. Fasten firmly the valve using the mounting holes.

5-3-3) 5 micron filtered dry air must be used.

5-4. Disassembly, Assembly, Cleaning

5-4-1) Cleaning

Wash the valve thoroughly after using if dispensing material which has a tendency to harden.

- ① Dispense all liquid entirely from the material container.
- ② If needed, please clean the valve after disassembling the wetted partst (Refer to 5-4-2, 3 Disassembly, Assembly).

Refer to the table below for chemical compatibility with cleaning agents

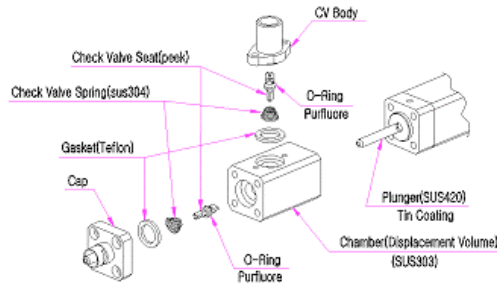
	Wetted Part Material			
	SUS	PEEK	Teflon	Purfluore
Ethyl Alcohol	A	A	A	A
Methyl ethyl Ketone	A	A	A	A
Acetone	B	A	A	B
Toluene	A	A	A	A
Trichloroethylene	A	A	A	A

*Normal temperature condition “A” : No problem “B” : Possible to use (Don't immerse for a long time in case of “B”)

5-4-2) Disassembly

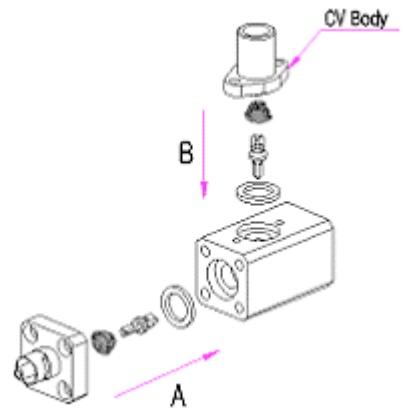
Refer to the picture below.

[Wetted parts]



5-4-3) Assembly

- ① Assemble in the following order: Gasket→Check Valve→Seat→Spring→Chamber Cap (displacement volume) at side “A”.
- ② Insert Check Valve Seat and spring into the Check Valve body (CV body).
- ③ Insert Gasket in valve chamber (displacement volume) at side “B”. Fasten CV Body.

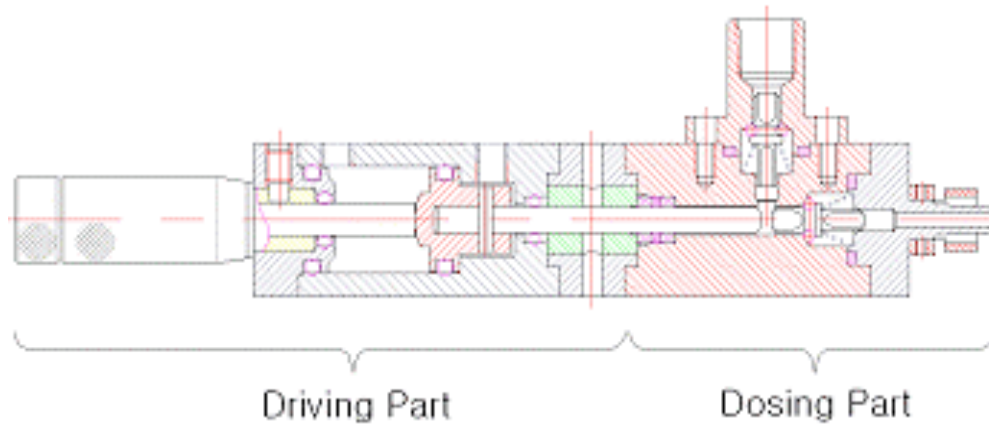


⚠ Notice for Disassembly & Assembly

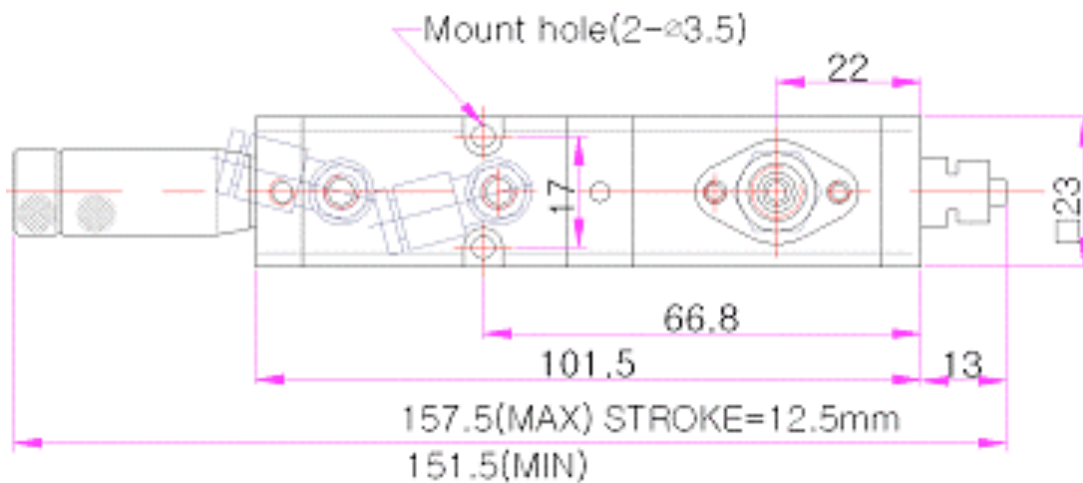
- ① Be sure to install the Check valve seat and the spring in the correct orientation.
- ② Be sure not to damage the Plunger, Check Valve Seat and Chamber (displacement volume). Leakage may occur.

6. SECTIONAL DRAWING & DIMENSION

► Cross-sectional View

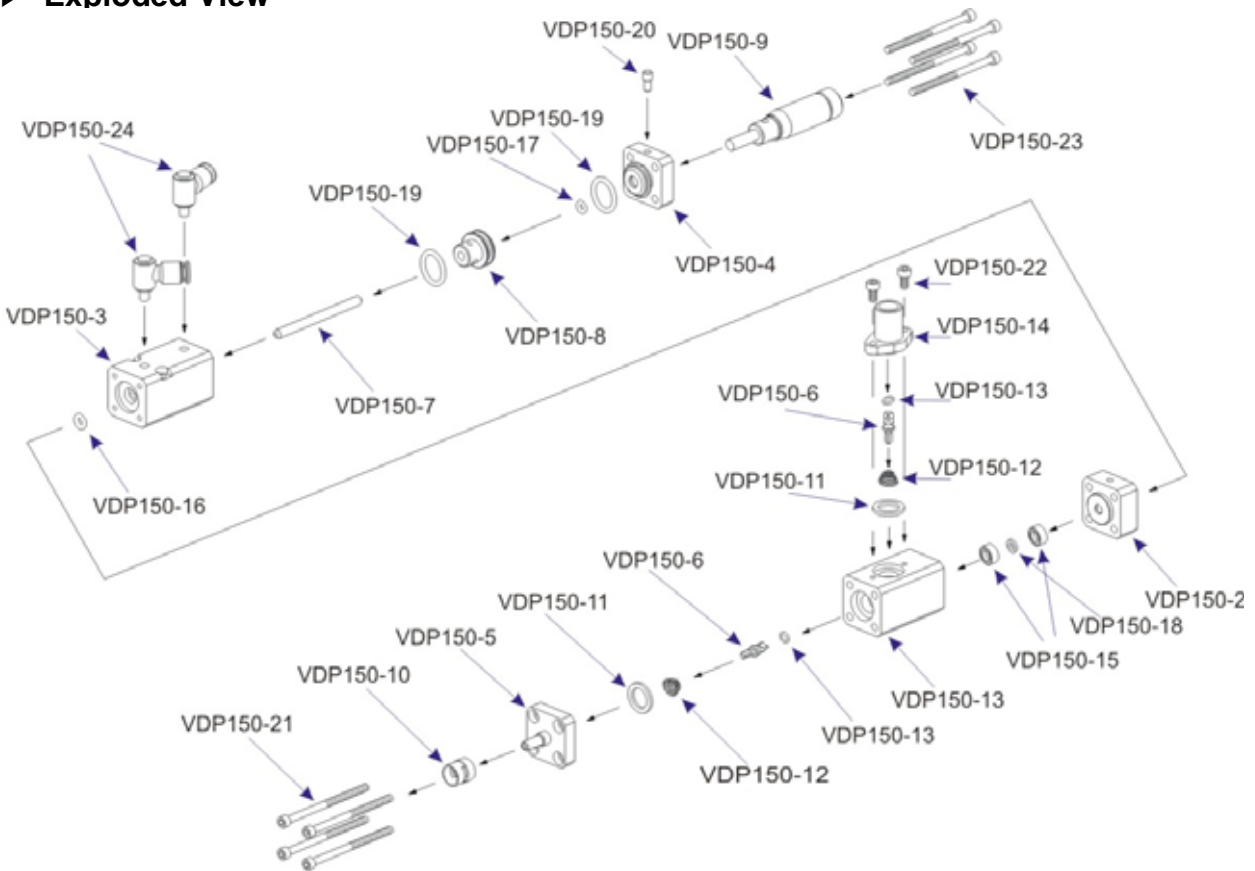


► Dimensions



7. EXPLODED VIEW & PARTS LIST

► Exploded View



► Parts List

No	Part Name	QTY	No	Part Name	QTY
VDP150-1	CHAMBER	1	VDP150-13	O-RING (AN006) (Purfluore)	2
VDP150-2	CHECK BODY	1	VDP150-14	CV BODY	1
VDP150-3	CYLINDER BODY	1	VDP150-15	LIP SEAL	2
VDP150-4	CYLINDER CAP	1	VDP150-16	O-RING (P4)	1
VDP150-5	CAP (LUER LOCK)	1	VDP150-17	O-RING (P5)	1
VDP150-6	CHECK SEAT	1	VDP150-18	BACK-UP RING	1
VDP150-7	PLUNGER	1	VDP150-19	O-RING (P12)	2
VDP150-8	PISTON	1	VDP150-20	SET SCREW	1
VDP150-9	MICROMETER HEAD	1	VDP150-21	BOLT (M3*55)	4
VDP150-10	COLLAR	1	VDP150-22	BOLT (M3*8)	2
VDP150-11	GASKET	1	VDP150-23	BOLT (M3*10)	4
VDP150-12	SPRING	1	VDP150-24	SPEED CONTROLLER	1