VIPER
Auto VIPER-X®

AIR-ASSISTED AUTOMATIC SPRAY GUN
OPERATING INSTRUCTION

IMPORTANT: **Before assembly and start-up, please read and clearly understand all the documents relating to this equipment (professional use only)**

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1. Function and characteristics

Auto VIPER-X® air-assisted gun is a combination of traditional air sprayingand airless spraying technology. It atomization precisely to produce a stable coating spray surface. It can form a uniform coating furface on the work piece with high transfer efficiency and fine spraying quality.

Auto VIPER-X® **recommended for spraying:**
Vernishes, lacquers, colors, solvent and water-based paint, high solid materials paint. And it is also suitable for one component and twop component paint.

2. Spray parameter

Model	Auto VIPER-X®
Air Cap	**R24/R124 (spray with unadjustable)**
Maximum working air pressure	**6 bar (87 psi)**
Maximum usage fluid pressure	**25Mpa (250bar, 3600psi)**
Fluid Output	**Depending on tip size**
Maximum operating temperature	**50°C**
Air consumption	**385 L/min (±10)**
Transfer Efficiency	**87 (±2%)**
Watted Parts	**Stainless steel**
Fluid connector	**1/4 NPS**
Air connector	**1/4 PF**
Quick pipe coupler	**Ø4xØ6 mm**
Spray air consumption	**3.0-4.5 bar (43.5-65 psi)**
Control piston air consumption	**3.5-4.0 bar (50.7-58 psi)**
Noise level	**80 dBa (±2)**
Spray Distance	**200 mm**
Weight	**820g (1.8 lbs)**

Testing conditions:
Paint pressure=60-100 bar
Viscosity=20 s
Air pressure=3.5 bar
Temperature=20°C
Relative humidity=60%

3. Safety instructions

⚠ CAUTION: when use the equipment, if you do not fouow this manual stipulation it will cause danger. Please read fully of this operation manual before operating your equipment. Only trained operators can use this equipment.

The foreman must ensure the operator has understood the safety instructions of this equipment as well as the instructions in the manuals for the different parts and accessories.
Read carefully of this instruction manuals, labels before operating the equipment. Incorrect use may result in injury. This equipment if for professional use only. It must be used for what it has been designed form.
Never modify the equipment. The parts and accessories supplied must be regularly inspected. Defective or worn parts must be replaced.









1. Install a conductive fluid hose or a conductive air hose on the air-assisted spray gun to ground the gun;
2. It is required that an air relief valve be fitted in the air supply circuit to the pump to prevent over pressurization. This safety feature, ensures that it is not possible to supply the pump with excessive air pressure that may cause injury;
3. Please ensure that a material drain valve is fitted in the fluid circuit to drain and depressurize the circuit. Once depressurized and drained, work/servicing may then commence on the equipment. Please remember to close these valves when restarting the system;
4. Never exceed the maximum operating pressures of the equipment components;
5. Never try to stop the spray fan with any part of the body (hands, fingers...) or with rags. Never point the spray gun at anyone or at any part of the body;
6. Never wipe the end of the nozzle with the fingers;
7. The operator will need medical attention if the high pressure material spray is in contact with the body (eyes, fingers...);
8. Always use the equipment in a well ventilated area to protect health and to minimize the risks from fire and explosions;
9. To protect the operator, protective clothing (gloves, respirator mask, glasses, clothes...) are required;
10. Always depressurize air and hoses before carrying out any servicing on the gun;
11. Use the equipment in a properly ventilated area;

4. Pump requirements

Before carrying out any work, it is imperative to read and clearly understand the disassembly and reassembly instructions before servicing. The operator must undestand the equipment and the safety instructions.

1. The air compressor is designed to be mounted with a pump. Never modify any components or couplings. When operating, please keep hands away from moving parts. Never try to stop the moving parts with other articles. The moving parts should keep clean. Before starting up the equipment, please read the PRESSURE RELIEF instructions. Please ensure that any relief or drain valves fitted are in good working order;
2. The user can not move the equipment at will, should move it in appropriate way. To avoid any risk of turning over and crushing, it should be carried out by professionals;
3. Protect the whole againstdust, water trickling, dampness and shocks;
4. The machine is installed on a stable horizontal floor;
5. The machine shall be made stable by the use of holding down bolts or by the use of other anchoring methods, strong enough to prevent unintended bodily movement of the equipment;
6. To avoid risks caused by static electricity, the equipment as well as its components must be grounded;
7. Do not store unnecessary inflammables in the work area;
8. A filter should be installed at the coating suction of pump;

5. Hose requirements

1. Fluid hose and air hose connected spray gun with pump must be conductive;
2. Air hose must be conductive;
3. All the joints must be high pressure-resisted;
4. Never expose product hoses to temperature higher than +60° C or lower than 0°C;
5. Keep hoses out of circulation areas, moving parts or hot surfaces;
6. Never pull or use the hoses to move the equipment;
7. Tighten all fittings as well as the hoses before operating the equipment;
8. Check the hoses regularly; change them if they are demaged;
9. Never exceed the maximum working pressure (MWP) indicated on the hose;

6. Risks requirements

Considering the wide variety of products that are available and can be used in our equipment it is impossible to check and make reccomendations for all chemical data, regarding the risks of possible chemical attack and their long term chemical reaction MANUFACTURER can not be held liable for:

1. Guards (pump and spray gun cover, coupling shields, connectors,...) have been designed for a safe of the equipment. The manufacturer will not be held responsible for bodily injury or failure and/or property damage due to destruction, the overshadowing or the partial or total removal of the guards;
2. It is the responsability of the user to know and prevent any possible risks such as toxic vapours, fires or explosions. He shall determine the risks of immediate reactions or pursuant to repeated exposures of the staff;
3. Risks to staff and the surroundings;
4. Compatibility of wetted parts;
5. For worn of defective parts, for faulty equipment or units, or the quility of final product;
6. MANUFACTURER shall not be liable for physical injurier, direct or indirect material damages caused by the use of chemicals;

7. Automatic airless gun disassembly/reassembly

⚠ **CAUTION: Before any intervention on the gun, shut off the compressed air supply and depressurize the circuits controlling the opening of the gun.**

Before removing a component of the gun, some precautions have to be a taken:

1. Empty out the paint inside the cup or the receiver;
2. Fill the cup or the receiver with cleaning solvent;
3. Decrease the supply air pressure of the gun;
4. Spray the solvent until it runs clear;
5. Shut off the supply air pressure of the gun;
6. Trigger the gun to depressurize the circuit;
7. Remove the part to be cleaned or changed;

Before reassembly the different pomponents, some precautions must be taken:

1. Clean all the parts with the appropriate cleaning solvent and a brush;
2. Install new seals if it is necessary after haviong lubricated them with PTFE grease;
3. Install new parts if it is necessary;

8. Installation

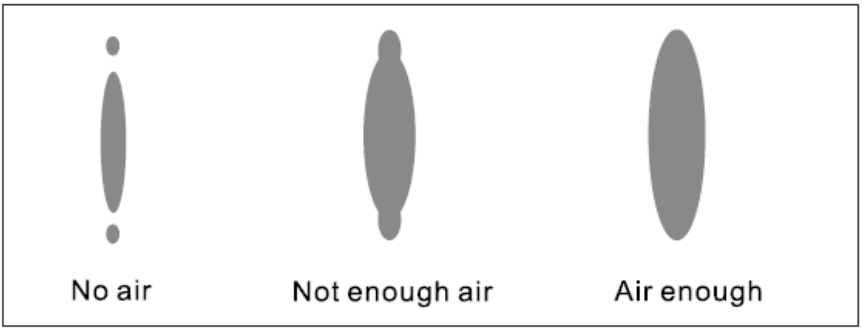
1. Prepare the paint (according to the coating parameter table mixing and filtering the paint, let the paint reach a suitable viscosity);
2. The air supply to the equipment must be (clean dry air, maximum air pressure=6bar/87psi);
3. Select a spray nozzle (refer to AIR-ASSISTED SPRAY GUN nozzle chart);
4. Let the rabbet of nozzle alignment air cap, locating pin, install the spray nozzle on air cap;
5. After set up the nozzle into air cap, let the air cap alignment the head of gun body screw thread screw the air cap on spray gun;
6. adjust the pump air pressure (red regulator) for the desired flow rate;

CAUTION: maximum usage fluid pressure 25Mpa (250bar, 3600psi)

NB: Increase fluid pressure until the spray fan is correct. Stop adjustment when the spray fan is giving the best results.

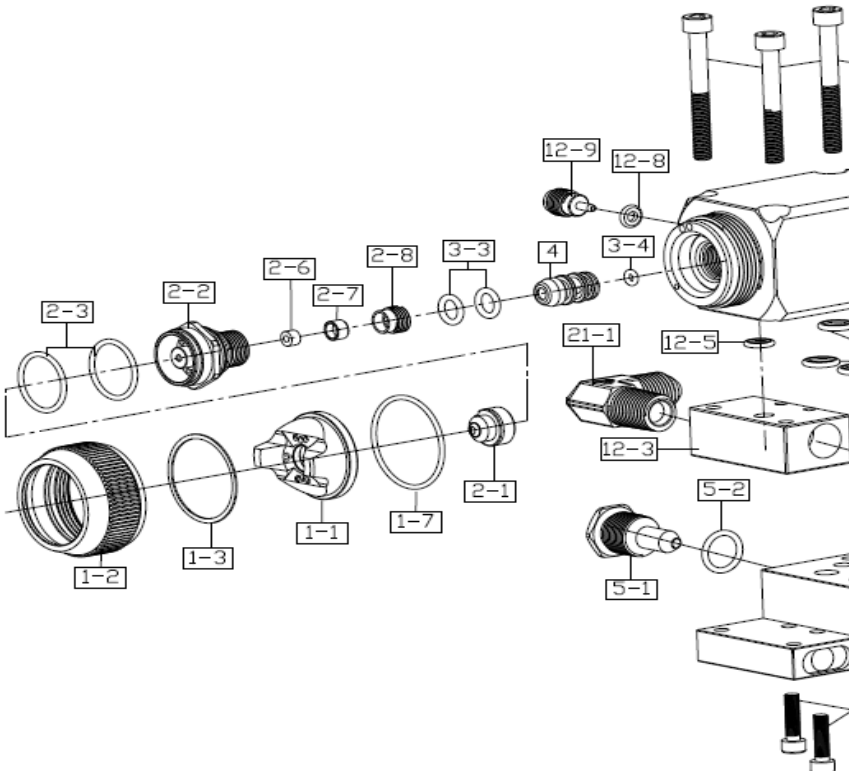
7. Adjust the atomizing air regulator until the pattern stable;

NB: The below picture show out fan pattern and spraying air pressure relationship;

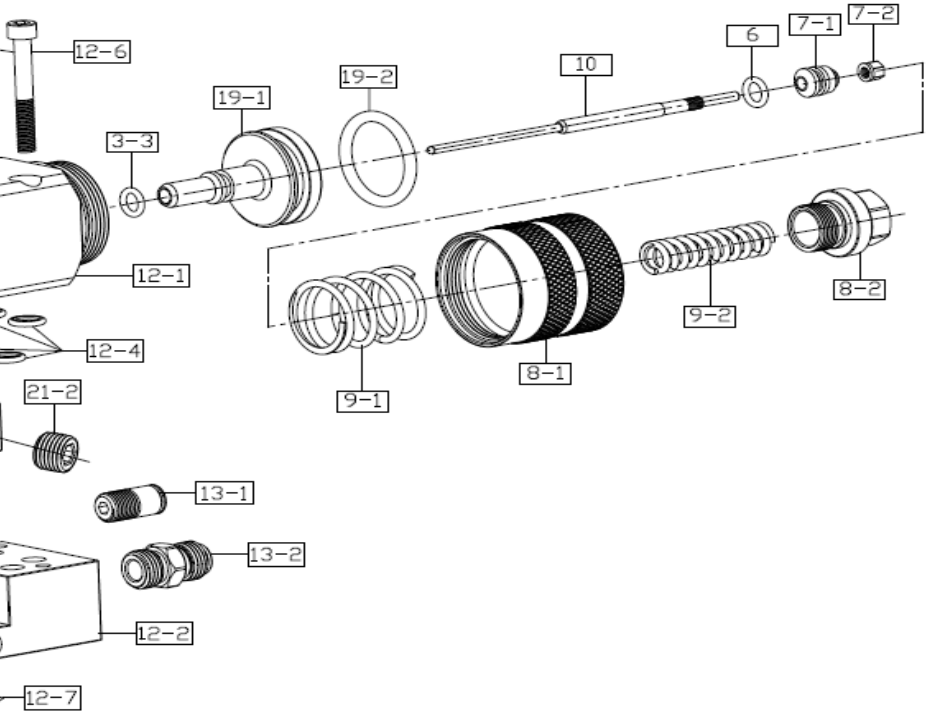


Do not increase spraying air pressure once the correct fan is obtained.

9. Air-assisted spray gun parts list



No	Description	Q'ty
1-1	Air cap	1
1-2	Cap nut	1
1-3	Cap packing	1
1-7	Cap fixing packing	1
2-1	Nozzle set	1
2-2	Nozzle connector	1
2-3	Nozzle connector packing 1	2
2-6	Needle seal seat packing	1
2-7	Needle seal seat	1
2-8	Needle seal seat nut	1
3-3	P7-O ring	3
3-4	C092-O ring (Ø2.24xØ1.8)	1
4	needle packing screw set	1
5-1	Pattern adjusting set seal screw	1
5-2	C092-O ring (Ø11.2xØ1.8)	1
6	C092-O ring (Ø6.3xØ1.8)	1
7-1	Needle rod	1
7-2	needle rod screw	1
8-1	Adjustment knob guide	1



No	Description	Q'ty
8-2	Adjustment knob set	1
9-1	Needle spring 1	1
9-2	Needle spring 2	1
10	Needle set	1
12-1	Gun body	1
12-2	Body base	1
12-3	Fluid base	1
12-4	Air hole seal	4
12-5	Fluid hole seal	1
12-6	Gun body lock screw	4
12-7	Fluid base lock screw	2
12-8	Located screw packing	1
12-9	Located screw	1
13-1	Quick pipe coupler	1
13-2	Air connector	1
19-1	Air adjusting valve	1
19-2	O ring (Ø26xØ3.5)	1
21-1	Fluid elbow pipe	1
21-2	Fluid hole seal screw	1

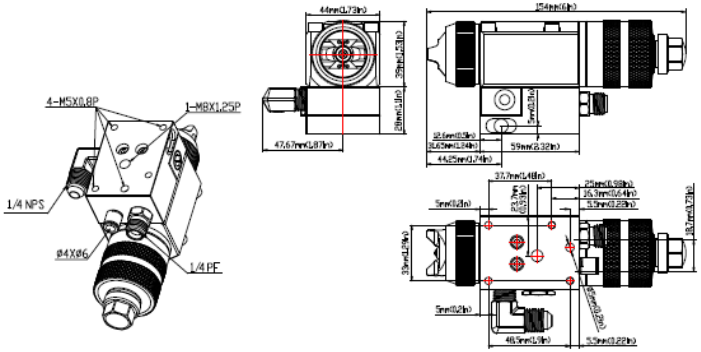
10. Maintenance

1. Clean the spray gun after very time use. Don't dip the whole spray gun into the thinner or solvent;
2. Do not damage the air cap, nozzle, noccle coupler and needle. Metal objects shall not be used for cleaning the holes of air cap, noccle and nozzle coupler;
3. Air cap, nozzle, nozzle coupler and fliter. Can be cleaned with a brush dipped in a thinner;
4. Spray cleaning the paint in passages with thinner;
5. Clean the parts before reassembling the spray gun;
6. Add lubricating oil to air adjusting valve and piston cylinder inner wall and needle set of spray gun;

11. Troubleshooting and maintenace

Problem	Cause	The solution
 When spraying sometimes no paint out	1. Nozzle (2-1) loose or O-ring (2-1) broken; 2. Fluid needle packing screw set (4) dry not lubrication or wear, or fluid needle packing screw set (4) loose cause the air come into fluid passage way; 3. Fluid elbow pipe (21-1) or fluid connect pipe loose;	1. Tightening air cap set (1-2) or change the O-ring (2-1); 2. To lubrication or change the fluid needle packing screw set (4); 3. Tightening fluid connector pipe set (22) and fluid connect pipe set
 The pattern bent and deformed	1. The nozzle (2-1) blocking; 2. Air cap (1-1) atomization blocking or deformed;	1. Cleaning or change Fluid nozzle (2-1), at the same time also clean the fluid passageway; 2. Change or clean air cap (1-1);
 Middle of pattern too thin	1. Atomization air pressure too high	1. Reduce air pressure, or adjust the pattern valve set (5) to get good pattern;
 Middle of pattern too thick	1. Atomization air pressure too low; 2. The paint too thick; 3. Fluid pressure too high;	1. Turn up atomization air pressure; 2. Turn dawn fluid viscosity; 3. Turn dawn fluid paint pressure;
 Nozzle leakage	1. Fluid needle (10) wear or have dirty things; 2. Fluid needle seal set (2-7) ear or have dirty things; 3. Fluid needle spring (9-2) power not enough;	1. Change or clean fluid needle set (10); 2. Change or clean fluid needle seal set (2-7); 3. Change fluid needle spring (9-2);
The spray gun head leakage	1. Air valve packing (19-1) wear or have dirty thing; 2. Air valve spring (9-1) power not enough;	1. Change or clean air valve set (9-1): 2. Change air valve spring (9-1);

12. Spray gun size diagram



13. Nozzle model and specification comparison table

Tip number	Orifice mm (in)	Fluid output		Spray angle and max fan width at gun target distance of 10"(25cm) from substrate										
		3.5Mpa 35bar 500psi	7mpa 70bar 1000psi	10°	18°	30°	40°	45°	50°	60°	67°	75°	82°	90°
				3.5	5"	7"	9"	9.5	10	12	13	15	18	22
		l/min	l/min	9cm	13cm	18cm	23cm	24cm	25cm	31cm	33cm	38cm	46cm	60cm
02	0.127(0.005)	0.04	0.10	106 (02-03)	206 (02-05)									
03	0.178(0.007)	0.10	0.15	107 (03-03)	207 (03-05)	307 (03-07)								
04	0.229(0.009)	0.15	0.20	1.09 (04-03)	209 (04-05)	309 (04-07)	409 (04-09)	04-10	509 (04-11)	609 (04-13)				
06	0.279(0.011)	0.20	0.33	111 (06-03)	211 (06-05)	311 (06-07)	411 (06-09)	06-10	511 (06-11)	611 (06-13)	06-15			
09	0.330(0.013)	0.30	0.45	113 (09-03)	213 (09-05)	313 (09-07)	413 (09-09)	09-10	513 (09-11)	613 (09-11)	09-15			
12	0.381(0.015)	0.35	0.60	115	215 (12-05)	315 (12-07)	415 (12-09)	12-10	515 (12-11)	615 (12-13)	12-15	715 (12-17)		
14	0.406(0.016)	0.40	0.72	116 (14-03)	216 (14-05)	316 (14-07)	416 (14-09)	14-10	516 (14-11)	616 (14-13)	14-15	716 (14-17)		
18	0.457(0.018)	0.45	0.85		218 (18-05)	318 (18-07)	418 (18-09)	18-10	518 (18-11)	618 (18-16)	18-15	718 (18-17)		
20	0.508(0.020)	0.50	1.10			320 (20-07)	420 (20-09)	20-10	520 (20-11)	620 (20-13)	20-15	720 (20-17)	820 (20-19)	
25	0.559(0.022)	0.65	1.30			322 (25-07)	422 (25-09)	25-10	522 (25-11)	622 (25-13)	25-15	722 (25-17)		
30	0.610(0.024)	0.75	1.60			324 ()30-07)	424 (30-09)	30-10	524 (30-11)	624 (30-13)	30-15	724 (30-17)	824 (30-19)	
40	0.686(0.027)	0.99	2.00				427 (40-09)	40-10	527 (40-11)	627 (40-13)	40-15	727 (40-17)	827 (40-19)	927 (40-21)
45	0.737(0.029)	1.15	2.30					45-10	529 (45-11)	629 (45-13)	45-15	729 (45-17)	829 (45-19)	929 (45-21)
60	0.787(0.031)	1.28	2.60					60-10	531 (60-11)	631 (60-13)	60-15	731 (60-17)	831 (60-19)	931 (60-21)

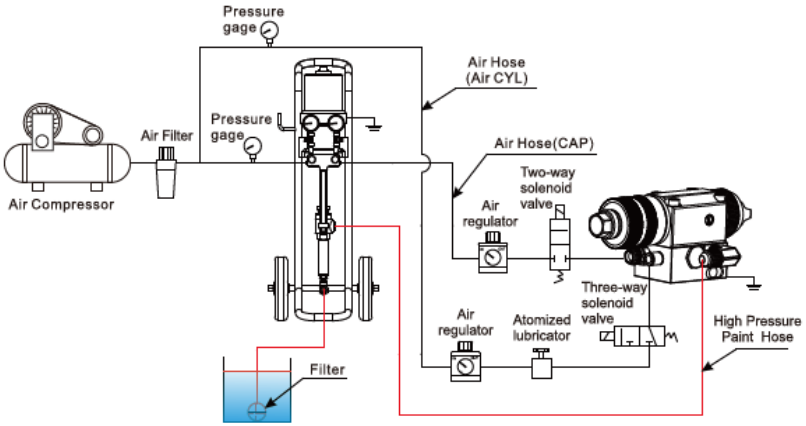
3 13
- Nozzle tip diameter is 0.013in (0.33mm).
- Spray angles is 30°. The bigger of diameter digit means the bigger angleand longer spray pattern.

09-07
- Spray pattern length is about 7 in (177.8mm) for preciswe spray pattern length pls refer to the table.
- Nozzle 09 is equivalent to 0.013in (0.33mm)

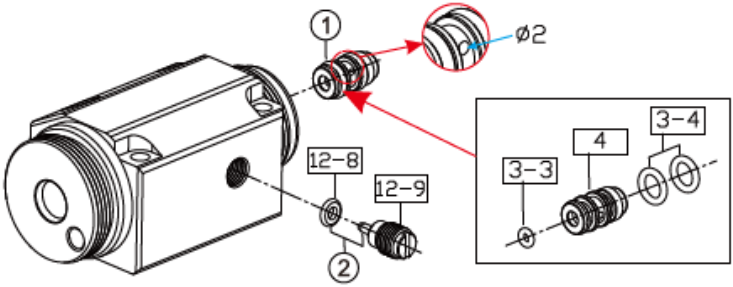
Nozzle tip 313 and 09-07 are same diameter with same spray pattern length. However, various brands of nozzles have different structures and cannot be used interchangeably. Few brands have no corresponding specifications or models.

* The amount of paint output is to use water for testing, water output data is only as reference to choose nozzle orifice, for the specific paint output, the actual spraying shall prevail.

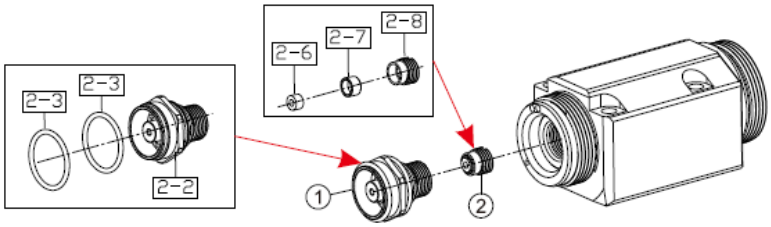
14. Installation diagram



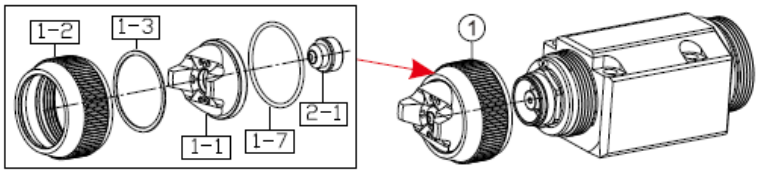
15. Assembly diagram



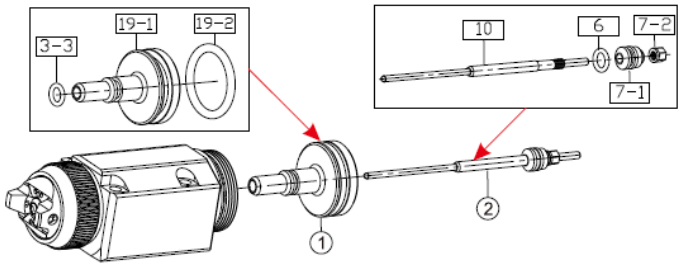
No.	Description	Q'ty	Tools and instruction	Process
3-3	P7-O ring	2	PTFE Grease	1. Set 2 pcs of O-RING (3-3) on the needle packing screw (4); 2. Set 1 pcs O-RING (3-4) into the needle packing screw (4); 3. Grease O-RING (3-3) (3-4), press horizontally the needle packing screw set 1 into the gun body; 4. Set seal (12-8) into the gun body, ensure the Ø2 hole of 1 is horizontal, then screw the Fluid leakage detector (12-9) and lock 1;
3-4	C092 O ring (Ø2.24xØ1.8)	1		
4	Needle packing screw	1	-	
12-8	Located screw packing	1		
12-9	Located screw	1	1. Slotted screwdriver; 2. (12-9) conetowards the Ø2 hole of 1	



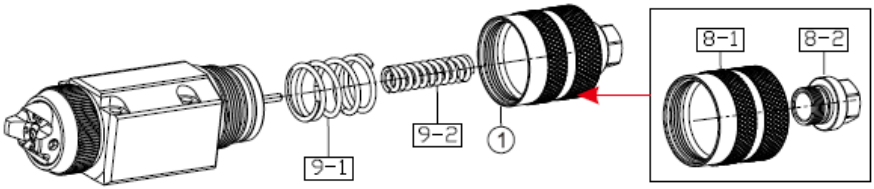
No.	Description	Q'ty	Tools and instruction	Process
2-2	Nozzle connector	1	1. H21 hexagon wrench; 2. No glue on the thread;	1. Set 2 pcs Nozzle connector packing 1 (2-3) to the mating recesses of Noozle connector (2-2): 2. Set noozle connector packing 2 (2-6) into the mating recesses of needle seal seat (2-7). Then put them into the mating recesses of needle seal seat nut (2-8); 3. Screw needle seal seat set 2 into the Nozzle connector set 1 with slotted screwdriver.; 4. Srew 1 2 into the body with H21 Hexagon wrench;
2-3	Nozzle connector packing 1	2	-	
2-6	Needle seal seat packing	1		
2-7	Needle seal seat	1		
2-8	Needle sela seat nut	1	1. Slotted screwdriver 2. No glue on the thread	



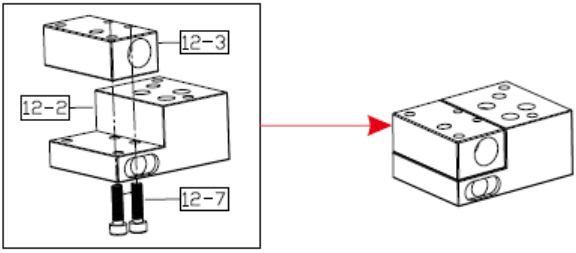
No.	Description	Q'ty	Process
1-1	Air cap	1	1. Insert the cap packing (1-3), air cap (1-1) into the cap nut (1-2), then set cap fixing packing (1-7) into mating recesses of the cap nut (1-2); 2. Press the nozzle (2-1) into the air cap back being certain the locating pins are aligned with mating recesses of the nozzle; Please refer to installation diagram (A). 3. Finally, screw the whole set of AIRCAP SET CD to the gun body to ensure that it is fully tightened;
1-2	Cap nut	1	
1-3	Cap packing	1	
1-7	Cap fixing packing	1	
2-1	Noozle set	1	



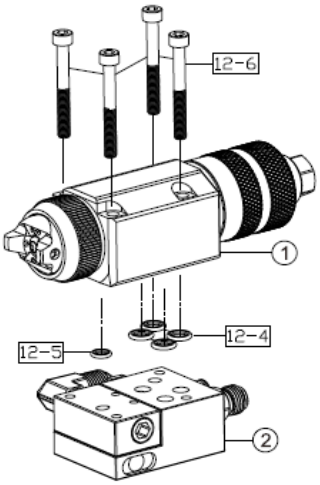
No.	Description	Q'ty	Tools and instruction	Process
3-3	P7-O ring	1	PTFE grease	1. Insert 0-RING (3-3),(19-2) into the mating recesses of air valve,as well as grease the 0-ring; 2. Insert 0-RING (6) into the needle rod, as well as grease the 0-ring; 3. Set needle rod (7-1) to the needle, apply low strength glue to the thread of needle rod screw,then screw tight the needle with H6 Hexagon wrench; 4. Grease the needle set 2, set the needle guide set 1 and needle set 2 into the gun body in in sequence;
6	C092-O ring (Ø6.3xØ1.8)	1		
7-1	Needle rod	1	-	
7-2	Needle rod screw	1	1. H6 hexagon wrench 2. Apply low strength glue to the thread	
10	Needle set	1	PTFE grease	
19-1	Air adjusting valve	1	-	
19-2	O ring (Ø26xØ3.5)	1	PTFE grease	



No.	Description	Q'ty	Process
8-1	Adjustment knob guide	1	1. Apply low strength anaerobic glue to the thread of adjustment knob set (8-2) , screw tight the adjustment knob guide (8-1) to (8-2) with H17 Hexagon wrench; 2. Apply lubricating oil to the thread and inside of the guide ; 3. Press needle spring 1&2 (9-1) (9-2) to the adjustment knob guide set(D, screw tighten whole set of parts into the gun body;
8-2	Adjustment knob set	1	
9-1	Needle spring 1	1	
9-2	Needle spring 2	1	



No.	Description	Q'ty	Tools and instruction	Process
12-2	Body base	1	-	Put the fluid base (12-3) on the body base, fix the 2 screws (12-7).
12-3	Fluid base	1		
12-7	Fluid base lock screw	2	H3 hexagon wrench	



No.	Description	Q'ty	Tools and instruction	Process
12-4	Air hole seal	4	-	Put air hole seal (12-4) to each of the fluid hole; put fluid hole seal (12-5) to fluid hole, screw tighten the body 1 and base 2 with H4 Hexagon wrench.
12-5	Fluid hole seal	1		
12-6	Gun body lock screw	4	H4 hexagon wrench	