FC100

FRONT CLOSING DISPENSE VALVE

Version: B12-1686

Operation Manual

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FC100

Front Closing Stainless Steel Dispense Valve

Thank you for purchasing the FC100 dispensing valve from PVA. Before attempting to operate the FC100, we recommend that you take a few minutes and read the following operation and setup manual. This will assist in familiarizing you with the product and ensure a successful installation.

As always, if any questions or problems arise, do not hesitate to contact PVA's Valve Service Department for support. This department can be reached at PVA headquarters via telephone or e-mail.

Again, thank you for your purchase, and we look forward to assisting you in the future as you continue to improve your dispensing processes.

Theory of Operation

The FC100 is a high pressure, front closing stainless steel dispensing valve that can be used in a wide variety of applications. Applications include general dispensing of dots, potting, bead placement, and gaskets.

The FC100 has a divorced design comprising of two major sections. These include:

1) Air section (red anodized portion)

2) Fluid section (stainless steel portion)

The air section is an aluminum body with a simple piston/cylinder combination used to open and close the valve. A stroke adjustment bolt in the upper air body controls how far the piston and needle assembly can retract thus regulating the rate of fluid flow.

The fluid section is a stainless steel body, which includes a needle and seat combination to control fluid flow. Fluid dispenses as the needle retracts out of the seat, then stops as the needle moves back into the seat. The stroke adjustment bolt regulates the distance that the needle can retract out of the seat thus controlling the orifice size and rate of fluid flow. Fluids can include but are not limited to solvents, epoxies, UV adhesives, silicones, RTV, grease, etc.

Wetted parts on the FC100 include:

- 303, 304 stainless steel

- Teflon

- Kalrez

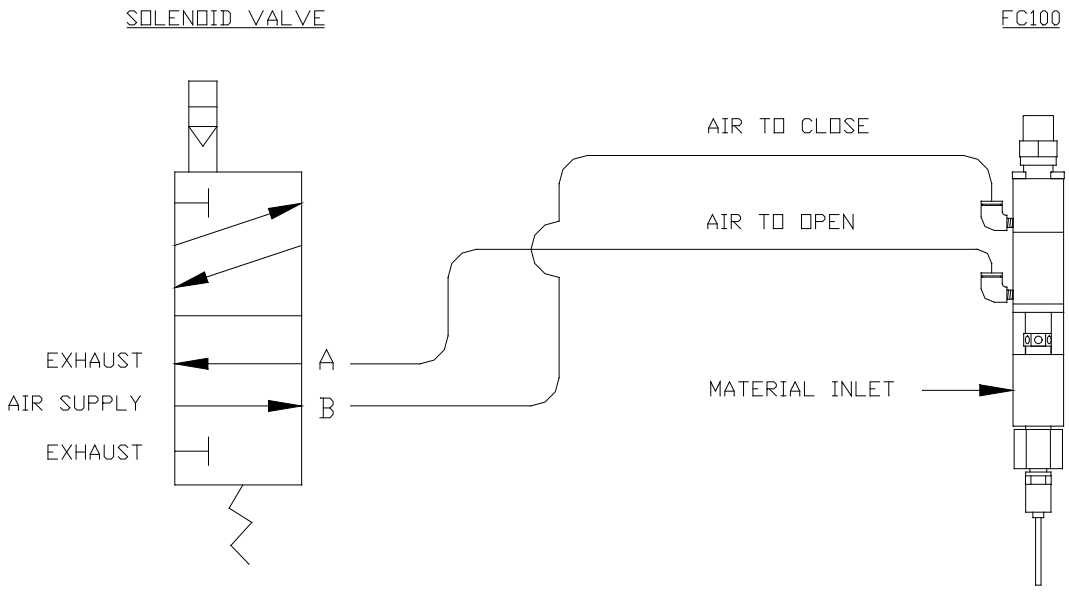
Safety

Due to material contents being under pressure eye protection is required for operators. Refer to MSDS sheets on material being dispensed for other precautions.

Setup

The FC100 requires a 2-position, 4-way air solenoid valve to actuate the air section. The valve should be operated with clean, dry air between 60-100psi. Two #10-32 threaded air ports are located on the air section of the valve. The port located furthest from the midsection of the valve is air to close the valve. The port located closest to the mid-section of the valve is air to open the valve. Quick connect air fittings are typically supplied with the FC100 to fit 5/32" tubing. Note that the valve should be normally in the closed position.

Fluid is supplied to the FC100 through the 1/8"npt port located on the stainless steel fluid section of the valve.



Tool Kit

PVA offers standard tool kits for all dispensing valves. The tool kit for the FC100 is part number **B12-1829**, which includes all necessary tools and lubricating grease to perform maintenance on this dispense valve:

B12-1829 Includes:

Qty	Part Number	Description
2	0266244	8” Adjustable Wrench
2	26563	3/32” Allen Key
1	26561	5/64” Allen Key
1	5516A18	Tweezers
1	B62-0752	2.5cc Mineral Oil Lubrication Kit
1	B62-2048	2.5cc Silicone Lubricant
1	9570K71	Hook and Pick Set
1	0266255	Pliers
2	53085A61	Soft Plastic Covers for Pliers
1	MM115	Removable Thread Locker

Operation

Refer to assembly drawing **112-2229** for part reference numbers.

1) Plumb up the valve as outlined above in the **Setup** procedures.
2) Regulate the air pressure operating the valve between 60-100psi.
3) Making sure that the valve is not aimed toward anyone, cycle the valve several times. When the valve is cycling, the piston can be heard hitting the stroke adjustment bolt, and the needle (3) can be seen going up and down in the center. If the valve is not cycling properly, refer to the **Troubleshooting** section.
4) When the fluid delivery system is connected to the valve, pressurize the material to be dispensed.
5) Once again, cycle the valve open to purge. Fluid should begin to dispense from the tip of the valve, continue dispensing until all air is removed.
6) Check fluid connection and packing nut (6) for leaks. If the valve is leaking, refer to the **Troubleshooting** section.
7) Turn the stroke adjustment bolt (21) until the desired flow rate is achieved. Turning the adjustment clockwise will decrease the material flow rate and counter-clockwise will increase the material flow rate. If the stroke adjustment bolt is turned all the way down it will stop the flow of fluid entirely.
8) Once the stroke adjustment setting is determined, use the adjustable wrench to tighten the lock nut (22) up against the upper air body (11).

Note: Refer to **Troubleshooting** section for any problems.

Periodic Maintenance

1) Lubricate the packing (5) on the FC100 valve every 200 hrs by placing a few drops of mineral oil or other light oil inside the packing nut.
   *Note: PVA offers a 2.5cc mineral oil lubrication kit; Part#: B62-0752
2) The packing nut (6) will require occasional tightening, as wear occurs in order to prevent leaks through the packing.

Routine Cleaning and Disassembly

Cleaning and rebuilding the valve will be required from time to time. A spare parts kit, part # **FC1-SP** is available with all the normal wear parts included.

1) Begin disassembly by removing air and fluid pressure from the valve.
2) Remove all pneumatic tubing and fluid delivery fittings, hoses, etc. from the valve.
3) Using the tip of a 3/32" Allen key, loosen the packing nut (6).
4) Using the same 3/32" Allen key, evenly remove the two machine screws (14) that are located on the same corners as the fluid section standoffs (4). Note during removal that there is a spring (17) forcing the air section away from the fluid section.
5) Pull the air section (red anodized portion) away from the fluid section (stainless steel portion).
6) Clean off the tip of the stainless steel needle (3).
7) From the fluid section of the valve, unthread and remove the packing nut (6), and the packing (5).
8) Unthread and remove the luer adapter (19) and washer (21).
9) Unthread and remove the needle adapter (1) from the fluid section (4).
10) Using pliers pull the seat (2) out of the fluid section (4) and remove the 006 Kalrez o-ring (15) from the seat. Note: If stuck, the seat can be pushed through from the opposite side of the fluid section.
11) Clean all of the wetted parts thoroughly with an appropriate solvent.
12) On the air section, use a standard 3/32" Allen Key to evenly remove the final two machine screws (13) that thread into the end cap (7). Note: During removal that the spring (17) will force the air section apart.
13) Separate the upper air body (11) from the lower air body (8) to remove the spring (17) then slide the end cap(7) off of the needle (3).
14) Holding the lower air body (8) in one hand, grab the needle (3) and push the needle and piston (10) assembly out of the lower air body.
15) Remove the 004 Buna o-ring (16) from the lower air body (8).
16) Hold the piston (10) with an adjustable wrench then use a 5/64" Allen key to unthread and remove the set screw (18) to remove the needle(3) then remove the 014 Buna o-ring (9) from the piston (10).

17) Remove the 014 Buna o-ring (9) from the upper air body (11) and the 008 Buna o-ring from the stroke adjust bolt (21).
18) Unthread the stroke adjust bolt (21) from the upper air body (11) and remove the 008 Buna o-ring (12).

- Replace components with spares provided in the spare parts kit.

Assembly Instructions

General

- All o-rings must be lubricated with a small amount of silicone grease.
- A small amount of removable thread locker should be applied to the set screw (18).
- Assemble the air section and fluid section separately prior to connecting the two assemblies.

Air Section

1) Assemble the stroke adjust (21) and lock nut (22) with the hex head toward the knurled end of the bolt.
2) Mount one 008 Buna o-ring (12) on the inside groove of the stroke adjust (21).
3) Thread the stroke adjustment assembly into the upper air body (11).
4) Mount one 014 Buna o-ring (9) on the end of the upper air body (11) and the other 008 Buna o-ring (12) on the end groove of the stroke adjust (21). Back out the stroke adjust by turning counter clockwise to the end of its travel.
5) Drop the needle (3) into the piston (10) and assemble with the set screw (18) using an adjustable wrench and 5/64" Allen key to tighten.
6) Mount the 014 Buna o-ring (9) onto the piston (10).
7) Apply a small amount of silicone grease to the inside of the lower air body (8) then drop in the piston and needle assembly.
8) Mount the 004 Buna o-ring (16) on the end of the needle and slide it down into the groove in the end of the lower air body (8).
9) Slide the end cap (7) onto the needle up to the lower air body (8), place the spring (17) on top of the piston (10), and assemble the two air bodies using two machine screws (13) tightening with a 3/32" Allen key. Note: Be sure the air holes are lined up on the same face and will align with the fluid inlet on the fluid section (4)

Fluid Section

1) Drop the packing (5) into the fluid section (4), and screw in the packing nut (6) but leave finger tight until assembled with the air section.
2) Mount the 006 Kalrez o-ring (15) on the seat (2) and push the seat into the bottom of the fluid section (4). When inserting the seat, work the o-ring into the fluid body with finger to prevent shearing of the edge of the o-ring.
3) Thread the needle adapter (1) onto the fluid body (4) and tighten with an adjustable wrench.
4) Place the small washer (20) into the end of the needle adapter (1), then thread the luer adapter (19) onto the needle adapter and tighten with an adjustable wrench.

Assemble Sections

1) Back out the stroke adjust bolt (21) by turning it counter clockwise until the end of its travel.
2) Apply a small amount of silicone grease to the end of the needle (3) and insert it into the packing nut (6) and slide the two sections together.
3) Align the air holes of the air section on the same face as the fluid inlet of the fluid section then connect the sections using the two machine screws (14) tightening them down evenly using a 3/32" Allen key.
4) Using the tip of a 3/32" Allen key, tighten the packing nut (6).

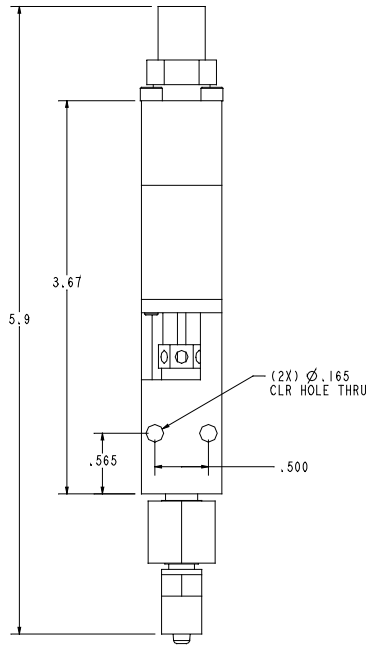
Spare Parts

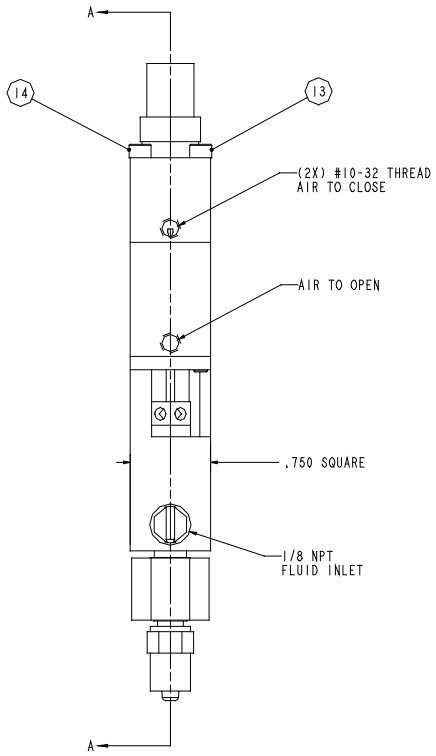
PVA offers standard spare parts kits for all dispensing valves. These kits are stocked for immediate shipment and allow replacement of all wearable parts of the valve.

The spare parts kit for this valve, product number **FC1-SP**, includes the following components:

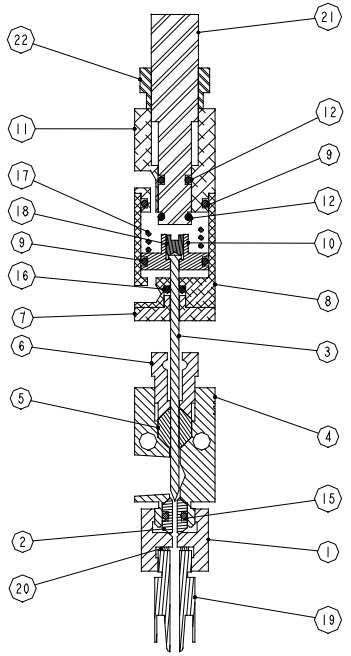
FC1-SP Includes:

Qty	Part Number	Description
1	V302	Seat
1	114-5247	Needle
1	V305	Packing, Teflon
2	VLV-014B	O-ring, Buna
2	VLV-008B	O-ring, Buna
1	VLV-006K	O-ring, Kalrez
1	VLV-004B	O-ring, Buna
1	V125	Washer





SECTION A-A



REV	REVISION DESCRIPTION	DRN BY	DATE	DESIGN	REV	REVISION DESCRIPTION	DRN BY	DATE	DESIGN
A	REF. BOM # B12-1686	RJB	11.02.07	RJB					

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
DECIMAL ANGULAR
.X ± 0.2 ± 0.5°
.XX ± 0.01
.XXX ± 0.005
.XXXX ± 0.0005

SURFACE FINISH:

MATERIAL:

FINISH:

PVA

TITLE: FC100

DWG#: 112-2229

QTY:- | SHEET 1 OF 1 | REV:A

BILL OF MATERIALS FOR FC100 (B12-1686):

Refer to Drawing #: 112-2229

Item	Part Number	Description	Quantity
1	V301	Needle Adapter	1
2	V302	Seat	1
3	114-5247	Needle	1
4	114-6933	Fluid Section	1
5	V305	Packing	1
6	V306	Packing Nut	1
7	V200	End Cap	1
8	V201	Lower Air Body	1
9	VLV-014B	O-Ring, Buna	2
10	V202	Piston	1
11	V228	Upper Air Body	1
12	VLV-008B	O-Ring, Buna	2
13	SH5-40x2.0”	Cap Screw	2
14	SH5-40x2.25”	Cap Screw	2
15	VLV-006K	O-Ring, Kalrez	1
16	VLV-004B	O-Ring, Buna	1
17	V050	Spring	1
18	V001	Set Screw	1
19	V300	Luer Adapter	1
20	V125	Washer	1
21	V230	Stroke Adjust	1
22	V229	Lock Nut	1

Troubleshooting

Problem	Possible Cause	Corrective Action
Valve does not cycle	- Air pressure to air section too low - Packing nut is too tight - Stroke adjustment bolt is bottomed out - Material is cured in the valve - Valve was assembled w/o lubricating the O-ring seals	- Increase air pressure to 60-100 psi - Loosen packing nut until valve just begins to cycle, retighten - Back out stroke adjustment bolt by turning it counter-clockwise - Disassemble and clean valve - Disassemble valve, lubricate seals and re-assemble
Material leaks from valve tip	- Packing nut is too tight - Needle and/or seat are worn - Air bubble trapped in fluid body or in dispense needle	- Loosen packing nut - Replace parts as necessary - Flip valve upside down and cycle until air bubbles are removed
Valve leaks from mid-section	- Packing nut is loose - Packing is worn	- Tighten packing nut until snug - Replace packing
Valve does not dispense anything	- Fluid pressure is too low - Material cured in fluid section - Stroke adjustment bolt is set too low	- Increase fluid pressure - Disassemble and clean valve - Back out stroke adjustment bolt by turning it counter-clockwise
Air bubbles in fluid	- Valve not properly purged - Problem with fluid delivery system	- Flip valve upside down and cycle until air bubbles are removed - Diagnose and repair.
Dispense rate too fast	- Stroke Adjustment bolt set out too far	- Turn stroke adjustment bolt clockwise
Dispense rate too slow	- Stroke Adjustment bolt set in too far	- Turn stroke adjustment bolt counter-clockwise

PVA Warranty Policy

PVA warrants the enclosed product against defects in material or workmanship on all components for one year from the date of shipment.

The warranty does not extend to components damaged due to misuse, negligence, or installation and operation that is not in accordance with the recommended factory instructions. Unauthorized repair or modification of the enclosed product, and/or the use of spare parts not directly obtained from PVA (or from factory authorized dealers) will void all warranties.

All PVA warranties extend only to the original purchaser. Third party warranty claims will not be honored at any time.

Prior to returning a product for a warranty claim, a return authorization must be obtained from PVA's customer service department. Authorization will be issued either via the telephone, facsimile, or in writing upon your request.

To qualify as a valid warranty claim, the defective product must be returned to the factory during the warranty period. Upon return, PVA will repair (or replace) all components found to be defective in material or workmanship.

(Retain this for your records)

Product Information:

PRODUCT: _____

SERIAL NUMBER: _____

DATE OF PURCHASE: _____