EQ VA20 Volumetric Valve

2084141

Operating Manual

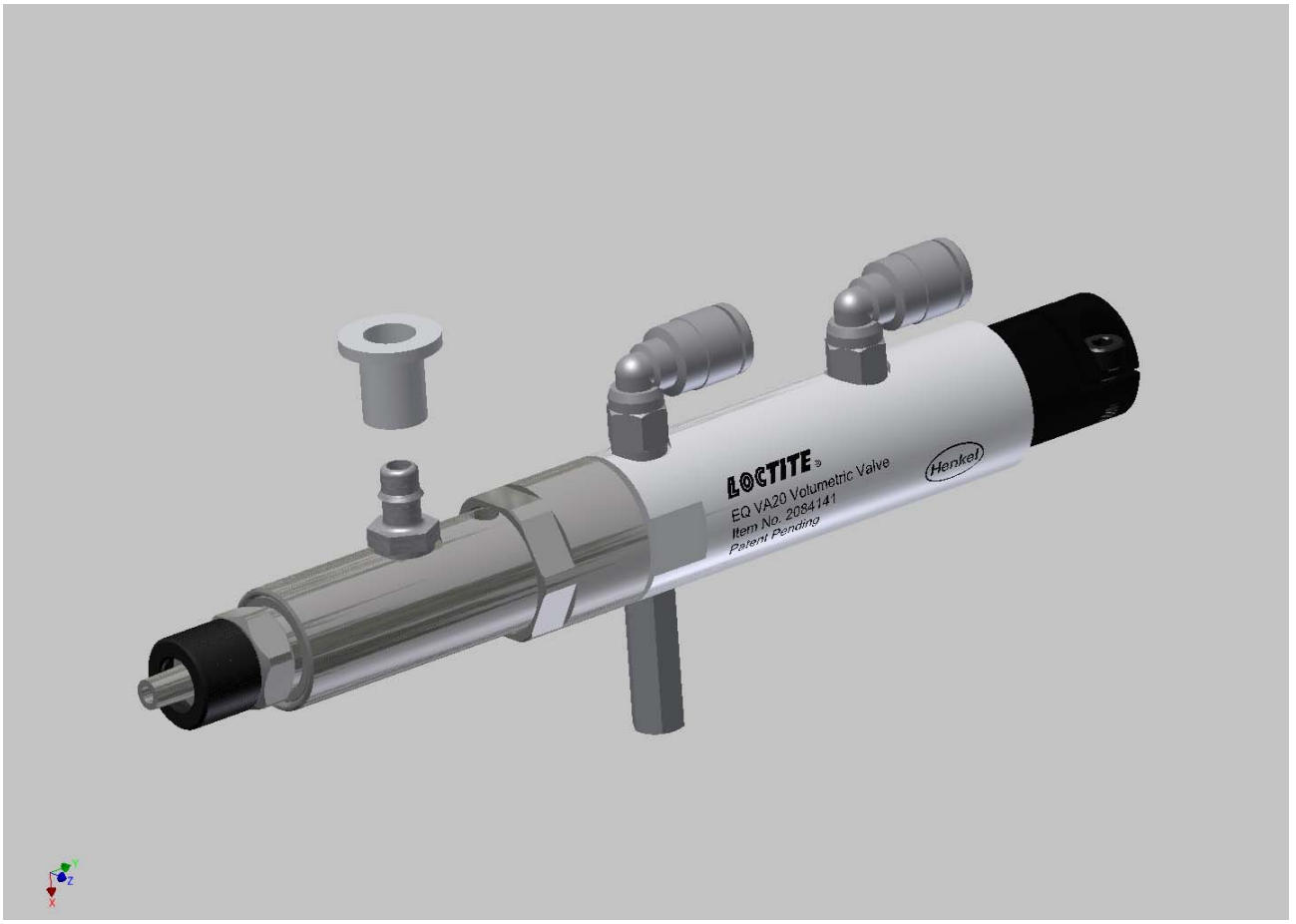

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Table of Contents

1 Please Observe The Following

1.1 Emphasized Sections

⚠ **Warning!**

Refers to safety regulations and requires safety measures that protect the operator or other persons from injury or danger to life.

! Caution!

Emphasizes what must be done or avoided so that the unit or other property is not damaged.

☞ **Notice:**

A notice gives recommendations for better handling of the unit during operation or adjustment as well as for service activities.

1.2 For Your Safety

⚠ For safe and successful operation of the unit, read these instructions completely. If the instructions are not observed, the manufacturer can assume no responsibility.

⚠ Do not expose the connecting plastic lines to heat, oil, or sharp edges.

⚠ Make sure the Unit stands stable and secure.

⚠ Use only original equipment replacement parts.

⚠ Always disconnect the power supply before servicing the unit.

⚠ Always disconnect the pneumatic supply before servicing the unit.

⚠ Observe general safety regulations for the handling of chemicals such as Loctite® adhesives and sealants. Observe the manufacturer's instructions as stated in the Safety Data Sheet.

☞ While under warranty, the unit may be repaired only by an authorized Loctite service representative.

1.3 Unpacking and Inspection

Carefully unpack the Loctite® EQ VA20 Volumetric Valve and examine the items contained in the carton. Inspect the unit for any damage that might have occurred in transit. If such damage has occurred, notify the carrier immediately. Claims for damage must be made by the consignee to the carrier and should be reported to the manufacturer.

1.4 Items supplied

- Loctite EQ VA20 Volumetric Valve 2084141
- Equipment Manual
- PTFE lined tubing, 6.4mm OD, 2 meters long
- Air Line 4mm OD, blue, 2 meters
- Air Line 4mm OD, yellow, 2 meters
- Needle Sample Kit

1.5 Features

- Volumetric displacement
- Dosing range, 1.5 – 12 microliters
- Cycle rate, 180/minute
- Patent Pending priming system
- Innovative Rod and Seal design
- Slim design
- Fluid inlet fitting – barbed stainless steel
- Field Repairable

1.6 Usage

The Loctite EQ VA20 Volumetric Valve is a positive displacement metering valve which dispenses a precise drop of adhesive with each cycle. Positive displacement is not influenced by variations in pressure, time, temperature or adhesive viscosity therefore making it a better choice for drop applications. The Loctite EQ VA20 Volumetric Valve is specifically design to dispense low to medium viscosity Loctite Light Cure Adhesives.

2 Description

The Loctite® EQ VA20 Volumetric Valve is a positive displacement metering valve which dispenses a precise volumetric drop of adhesive with each cycle. The EQ VA20 is designed with a flooded chamber and a single check valve that allows for quick priming and minimizes the need for re-priming. The priming system utilizes a patent pending check valve design which improves the speed and reliability of priming. The innovative displacement rod and seal of the VA20 design provide long dispensing life before rebuild is needed. The Loctite® EQ VA20 is specifically design to dispense drops of Loctite Light Cure Adhesives with precise dosing in the range of 1.5 to 12 microliters.

The Loctite® EQ VA20 Volumetric Valve has a diameter of 19mm [0.748”] and an overall length of 15.3 cm [6.0”]. This compact dispense valve is stackable at 19mm centers. The fluid body is made of 316 stainless steel and the actuator is anodized aluminum. The actuator is a double acting cylinder with a hardened rod and a Delrin® piston for long life. The Loctite® EQ VA20 Volumetric Valve is capable of dispense rates up to 3 cycles a second.

3 Specifications

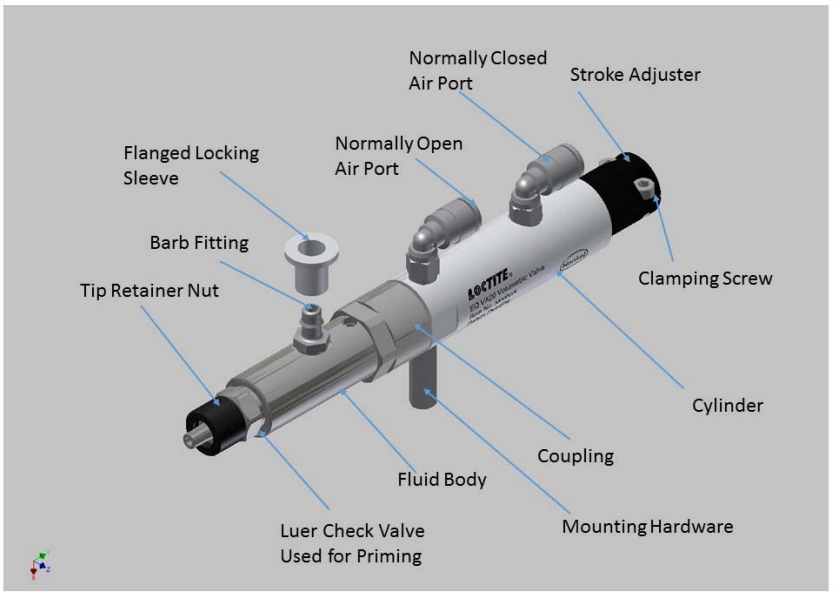
Dimensions (L x OD)	15.3 cm [6.0”] long X 19 mm [0.748”] OD
Total weight: lbs. (Kg)	0.13Kg
Viscosity Range:	1 to 10000cP
Operating Air Pressure:	4 to 7 bar [60 -100 Psi]
Operating Product Pressure:	2 to 5 bar [30 to 70 Psi]
Wetted Components:	316 Stainless Steel, TiN
Fluid Inlet Thread	#10-32
Threaded Hole-Mounting	M4 x 0.7mm

4 Installation

The Loctite® EQ VA20 Volumetric Valve requires a four way pneumatic solenoid valve to actuate the cylinder section. The pneumatic valve must be operated with clean dry air at 4 to 7 bars of pressure. The 4-way pneumatic solenoid valve has a normally open port and a normally closed port. Use the supplied 4 mm OD tubing to connect the air ports to the EQ VA20 Volumetric Valve.

The adhesive is supplied from a pressure reservoir to the barbed fitting located on the fluid body of the Loctite® EQ VA20 Volumetric Valve. Use the supplied 6.4 mm OD tubing, insert the tube over the barbed fitting, than insert the flange locking sleeve over the tube. Secure the tubing to the reservoir with a compression fitting which allows the tubing to pass through the fitting into the adhesive container.

Supply clean, dry, regulated air to the reservoir and set the pressure at 2 bar [30 psi]. The reservoir pressure setting is to insure adhesive product will flow into the Loctite EQ VA20 Volumetric Valve at a rate which allow the EQ VA20 to operate at 180 cycle per minute.



Loctite EQ VA20 Volumetric Valve – Annotated Drawing

5 Operation

- The Loctite EQ VA20 Volumetric Valve Air is ready to dispense - control lines are installed, pressure reservoir is loaded with adhesive and a feed line is attached to the fluid body. The pneumatic pressure to the controller is set at 4 bars and the reservoir pressure is set at 2 bars. The system is now ready to set- up for drop dispensing:

1. A dispense tip is inserted onto the Luer Check Valve and secured with the Tip Retainer Nut.
2. The drop size is determined by the length of the stroke which the displacement rod travels into the displacement chamber. The drop decreases as the stroke is shorten. The stroke is set by loosening the clamping screws and rotating the stroke adjuster clockwise to decrease the stroke. The maximum stroke is approximately 9.5 mm [0.374 inch] and the minimum stroke is approximately 1 mm [0.039 inch].
3. To prime the Loctite EQ VA20 Volumetric Valve rotate the Luer Check Valve counterclockwise 2 1/4 rotations. When a steady flow of adhesive is observed rotate the Luer Check Valve clockwise and tighten.
4. The Loctite EQ VA20 Volumetric Valve is ready to dispense. Set actuation rate at greater than or equal to 0.166 seconds.
5. Cycle the Loctite EQ VA20 Volumetric Valve 5 -10 times than measure drop size. Adjust stroke to suit.

6 Application Hints

The Loctite® EQ VA20 is specifically design to dispense drops of Loctite Light Cure Adhesive. This adhesive cures in the presents of light. Caution should be used to protect the dispense tip from ambient light.

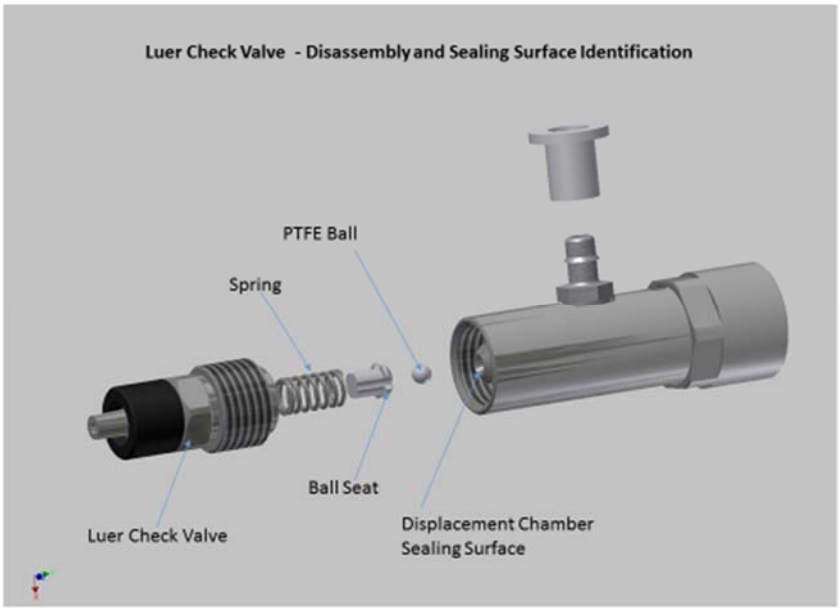
7 Troubleshooting

Problem	Possible Cause	Correction
No liquid flow	• If pneumatic valve operating pressure is to low, the valve will not shift. • The reservoir pressure may not be high enough • Displacement rod may be in forward position • The dispense tip may be clogged.	• Increase air pressure to 60 psi (4 bars) minimum • Increase pressure • Insure that the normally open airport is energized • Replace tip
Fluid drools after the volumetric valve is cycled, eventually stopping.	• This is caused by air coming from the reservoir into the fluid body and pumped out into the lure check valve. The air will expand after the check valve closes, causing product to extrude out the dispense tip until the air reaches atmospheric pressure.	• Prime the Loctite EQ VA20 Volumetric Valve by rotating the Luer Check Valve counterclockwise 2 1/4 rotations. When a steady flow of adhesive is observed rotate the Luer Check Valve clockwise and tighten.
Liquid drips at a steady rate after the valve closes.	• A steady drip can be caused by excessive reservoir pressure. • The Luer Check Valve is not closing fully due to particle build up on the ball and seat.	• Check reservoir pressure to ensure it is not above 70 psi (4.8 bar) • Remove the luer check valve body, inspect sealing surfaces and ball surface. Clean or replace ball if contaminated with particulate.
Liquid flows out of the drain hole	• Fluid leaking out of the drain hole indicates a seal failure.	• Replace seal in accordance with maintenance instructions

8 Care and Maintenance

The Loctite EQ VA20 Volumetric Valve is designed to provide continuous dispensing service without any special maintenance. The Loctite EQ VA20 Volumetric Valve is a robust design that will delivery over a million cycles with minimal maintenance. Adhesives and/or small particles may build up on the sealing surfaces within the Luer Check Valve.

Luer Check Valve Disassembly and Surface Cleaning



1. Vent air pressure from product reservoir.
2. Use Equipment Flushing Solvent (item #12121) or Isopropyl Alcohol (IPA) to clean parts.
3. Remove luer check valve and submerge parts in cleaning solvent.
4. Use a cotton tip applicator and cleaning solvent to clean the Displacement Chamber surface.
5. Remove luer check valve body, spring and ball seat from cleaning solvent and insure that parts are clean. Allow solvent to dry off.
6. Remove ball from solvent and inspect. Insure that the surface of the ball is clean and free of all containments. If there are particles imbedded into the surface of the ball, replace ball.

7. Reassembly luer check valve
    a. Insert ball seat into spring
    b. Place spring and ball seat into luer check valve body.
    c. Place ball into the ball seat
8. The Loctite EQ VA20 Volumetric Valve is ready to dispense.

Dispense Valves Flushing & Cleaning Procedure

If the dispensing system (reservoir, dispense valve, etc.) will not be used for one or more weeks, it is recommended that the feed line and dispense valve be flushed clean with the proper solvent. This procedure will describe the process.

1. Turn off the reservoir pressure and verify that pressure has been exhausted from the reservoir.
2. Remove the reservoir lid and remove the adhesive container.
3. Replace it with a container of Equipment Flushing Solvent (item # 12121).
4. Replace the reservoir lid and tighten all wing nuts so the lid is secure.
5. Adjust the air pressure regulator to 5 psi.
6. Place a beaker or similar container under the dispense valve.
7. Rotate the Luer Check Valve counterclockwise 2 ¼ rotations and allow the Equipment Flushing Solvent to flow into the container.
8. Note: this may take a few moments (or minutes) depending upon the viscosity of the adhesive in the feed line.
9. While the **solvent** is flowing, be sure to cycle the volumetric valve in order to simulate an “agitation” effect.
10. Continue this process of opening and closing the valve every 5 seconds for a total of two (2) minutes **or** until the solvent is clear.
11. Once you are satisfied that all adhesive has been removed from the feed line and dispense valve, shut off the air and remove the flushing solvent.
12. Re-install the reservoir lid and adjust the pressure regulator to approx. 70 % of its maximum value.
13. Allow air to continually flow out of the dispense valve.

14. CAUTION: the vapors from the flushing solvent will be emitted and should be directed into a paper towel or similar cloth. If an exhaust hood or fume filtration system is available, it should be used.
15. Continue to dispense air for approx. 1 minute or until all solvent has been removed from the feed lines.
16. While the air is being forced thru the feed lines, lightly tap the feed line leading from the reservoir to the dispense valve.
17. Once you are confident that all of the remaining solvent has been purged from the feed line and valve, the process is complete.
18. Rotate the Luer Check Valve clockwise until tight.

NOTE: the operator must wear Safety glasses and proper gloves while this procedure is being performed.

9 Accessories and Spare Parts

Optional Accessories and System Components (sold separately):

Dispensing From a Reservoir

- Loctite® Dual Channel Integrated Semi-Automatic Control Dispenser: PN 1390321 & 1390322
- Loctite® Bond-A-Matic 3000 Reservoirs, 0 to 100 psi : PN 982723, 982724, 982727

Dispensing From a Syringe

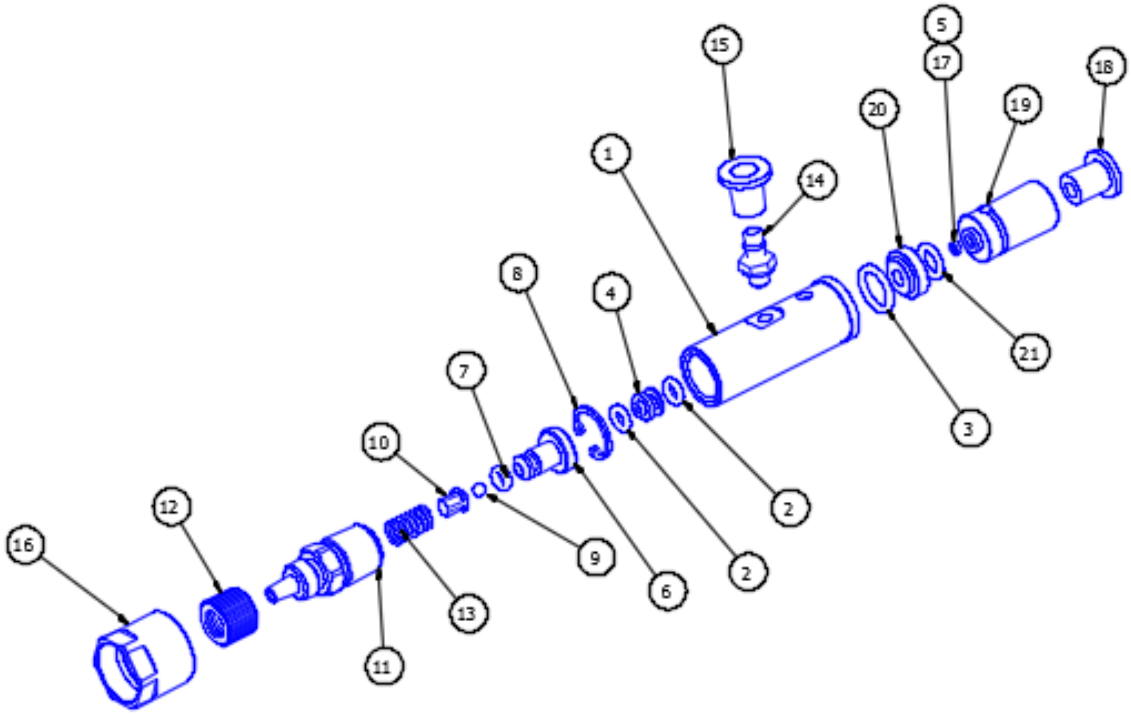
- Loctite® Precision Air Regulator: PN 98099 (IDH# 855974)
- Elbow fitting, 1/8” NPT male x male luer : PN 98095 (IDH# 698608)
- Stainless steel reducing adapter, 1/8” NPT female x #10-32 male: McMaster Carr part# 2684K19 or similar

Recommended Spare Parts / Accessories

- Loctite EQ VA20 Seal Kit IDH# 2084140
- Valve Mounting Bracket Kit 985281

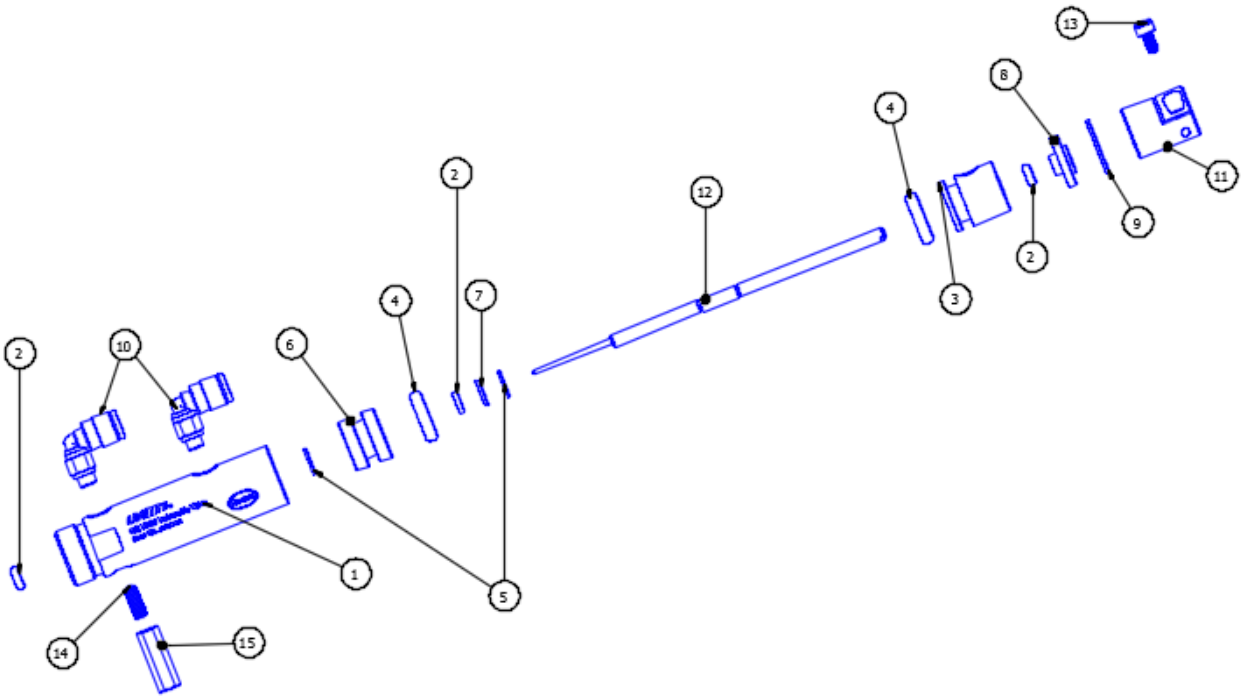
10 Diagrams

Loctite EQ VA 20 Volumetric Valve Fluid Body Sub- Assembly



Parts List- Loctite EQ VA 20 Volumetric Valve Fluid Body Sub- Assembly		
Item	Qty	Description
1	1	Fluid Body
2	2	O-ring AS568A-007
3	1	O-ring AS568A-012
4	1	Actuator Pin Fluid Seal
5	0.01ml	Krytox RFE
6	1	Displacement Chamber
7	1	O-ring AS568A-006 Viton EPT
8	1	Internal Retaining Ring
9	1	Ball 0.125, PTFE
10	1	Ball Seat
11	1	Luer Check Valve
12	1	Tip Retainer Nut
13	1	Compression Spring
14	1	Barbed Fitting, Mem-Co. Fitting Inc.; PN B4-0-316-Viton
15	1	Flanged Locking Sleeve, Mem-Co. Fitting Inc.; PN S-14
16	1	Coupling
17	1	Seal
18	1	Bearing
19	1	Seal Gland
20	1	Seal Gland Front
21	1	O-ring AS568A-010, Viton

Loctite EQ VA 20 Volumetric Valve Cylinder Sub- Assembly



Parts List- Loctite EQ VA 20 Volumetric Valve Cylinder Sub- Assembly		
Item	Qty	Description
1	1	EQ VA 20 Volumetric Valve Cylinder Housing
2	3	O-Ring MIL-P-25732-007, Buna -N
3	1	EQ VA 20 Volumetric Valve Air Port Insert
4	2	O-Ring #2-111 Buna N
5	2	External Retaining Ring, 4 mm shaft
6	1	EQ VA 20 Volumetric Valve Cylinder Piston
7	1	Shim
8	1	EQ VA 20 Volumetric Valve Stroke Hub
9	1	Internal Retaining Ring
10	2	Male Elbow, 4mm tube X M5
11	1	EQ VA 20 Volumetric Valve Stroke Adjuster
12	1	Pin and Rod Assembly
13	2	Socket Head Screw, M3 X 0.5 X 6mm
14	1	Set Screw, M4 X 0.7 X 10mm
15	1	Standoff, Female Threaded Hex M4 X 0.7 X 19mm

11 Warranty

Henkel expressly warrants that all products referred to in this Instruction Manual for (IDH # 2084141 Loctite® EQ VA 20 Volumetric Valve) (hereafter called “Products”) shall be free from defects in materials and workmanship. Liability for Henkel shall be limited, as its option, to replacing those Products which are shown to be defective in either materials or workmanship or to credit the purchaser the amount of the purchase price thereof (plus freight and insurance charges paid therefor by the user). The purchaser’s sole and exclusive remedy for breach of warranty shall be such replacement or credit.

A claim of defect in materials or workmanship in any Products shall be allowed only when it is submitted in writing within one month after discovery of the defect or after the time the defect should reasonably have been discovered and in any event, within (12) months after the delivery of the Products to the purchaser. This warranty does not apply to perishable items.. No such claim shall be allowed in respect of products which have been neglected or improperly stored,

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