

LOCTITE®

EQUIPMENT Operation Manual



Loctite® Micro Needle Valve Part Number 98084

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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.


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.

 Always wear goggles when operating with pressurized air.

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

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

1.3 Unpacking and Inspection

Carefully unpack the valve and examine the items contained in the carton. Inspect the valve 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

Micro Needle Valve

Accessory Pack consisting of:

Sample Needle Kit

Sample Fluid Line, 6 Ft.

Air line Tubing, 5 Ft.

Fluid Fitting 1/8 NPT x 1/4 tube

Operation Manual

1 Please Observe The Following (continued)

1.5 Features

- Provides extreme accuracy of drop size
- Shot sizes down to a fraction of a microliter
- Compact design allows for mounting flexibility
- Secondary seal/shut off for easy dispense tip changes
- Adaptable to optional reservoirs based on package size
- Syringe barrels mount directly onto valve
- Used in semi or fully automatic process applications

1.6 Usage

The Micro Needle Valve is designed to dispense low to medium viscosity UV curing products with very precise deposits over a wide range of shot and bead sizes down to a fraction of a microliter. A short opening stroke provides extremely fast, positive shut-off. An external stroke control adjustment makes it easy for the operator to fine tune shot sizes. The valve's compact design allows for mounting flexibility and easy integration into automated applications.

The Micro Needle Valve is easily adapted to a variety of reservoirs. It is capable of connecting to syringe barrels as small as 5ml to 30 ml. Change the luer fitting to a tube fitting and any size pressure reservoir can be used. The Micro Needle Valve provides productive solutions to many types of applications.

2 Description

2.1 Operating Elements and Construction

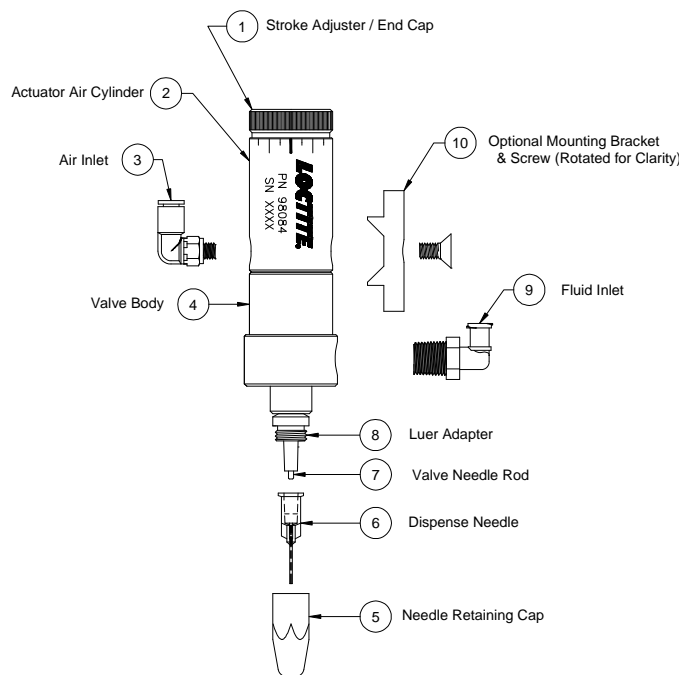


Figure 1


2. Description (continued)


1. **End Cap** is used as a flow control adjustment. Turn the end cap counterclockwise to increase material flow rate.
2. **Air Cylinder** - This design utilizes a single acting spring return air cylinder.
3. **Air Inlet** - The fitting supplied is a collet type fitting which accepts a 4mm tube.
4. **Valve Body** - Stainless steel construction.
5. **Needle Retaining Cap** - Captures the dispense needle and positions the dispense needle cannula against the valve shut off needle.
6. **Dispense Tip** - The Micro Needle Valve is specifically designed to use Loctite® stainless steel cannula needles (15 gauge or smaller).
7. **Valve needle rod Shut-Off** - Stainless steel construction.
8. **Luer Adapter** - Accepts Loctite® stainless steel cannula needles.
9. **Fluid Inlet** - Two fittings are supplied: 1/8" NPT x Luer connector and 1/8" NPT x 1/4" tube.
10. **Bracket and Screw** - Optional hardware PN 985281.

2.2 Theory of Operation (refer to Figure 2)

The Micro Needle Valve is a pneumatically operated, normally closed, adjustable opening, needle and seat valve which is designed to be used in conjunction with a pressure-time dispense system. A pressure-time dispense system is made up of a controller/timer, a dispense valve, and a pressure reservoir. The controller directs pressurized air to the actuator of the valve through the inlet air port (1) for a pre-determined period of time. The resulting action is to retract the needle rod assembly (2) from the seat inside the dispensing tip (3) allowing material to flow from the material inlet (4) to the dispensing tip (5). At the end of the cycle the controller relieves the input air pressure which allows the spring (6) to return the needle rod back to its position to close the material path.

The Micro Needle Valve is capable of interfacing with pressure reservoirs or syringe barrels. When using a pressure reservoir the adhesive is placed into a reservoir and a feed tube passes through the lid of the reservoir into the adhesive bottle. The other end of the feed tube is connected to the material inlet port of the dispense valve. When the reservoir is pressurized the adhesive flows into the valve. The higher the pressure the greater the flow rate. The adhesive contacts the pressurized air thus making the air quality a critical component of the system. Loctite recommends filtered dry air for each system.

 Many of the Loctite® UV curing adhesive products are packaged in 30 ml syringe barrels. The Micro Needle Valve is delivered with a luer type of fitting to accommodate syringe barrels. The syringe barrel attaches directly to the Luer fitting and acts as a pressure reservoir. An airline adapter is attached to the syringe barrel and should be connected to a filter regulator, which delivers pressurized air to the syringe barrel. The pressurized air forces the adhesive directly into the dispense valve.

 The pressure and the time settings are the two predominate variables controlling the amount of adhesive that is dispensed from the valve. Secondary variables are the flow control adjustment which regulates the distance the needle rod travels and the orifice size of the dispense tip. When determining a suitable dispense dose it is advised to set a pressure and vary the time until the proper dose is achieved. If the time setting is too great, increase product pressure, this will allow for a shorter time element to obtain the same dose.

2.2.1 Valve Sectional Views

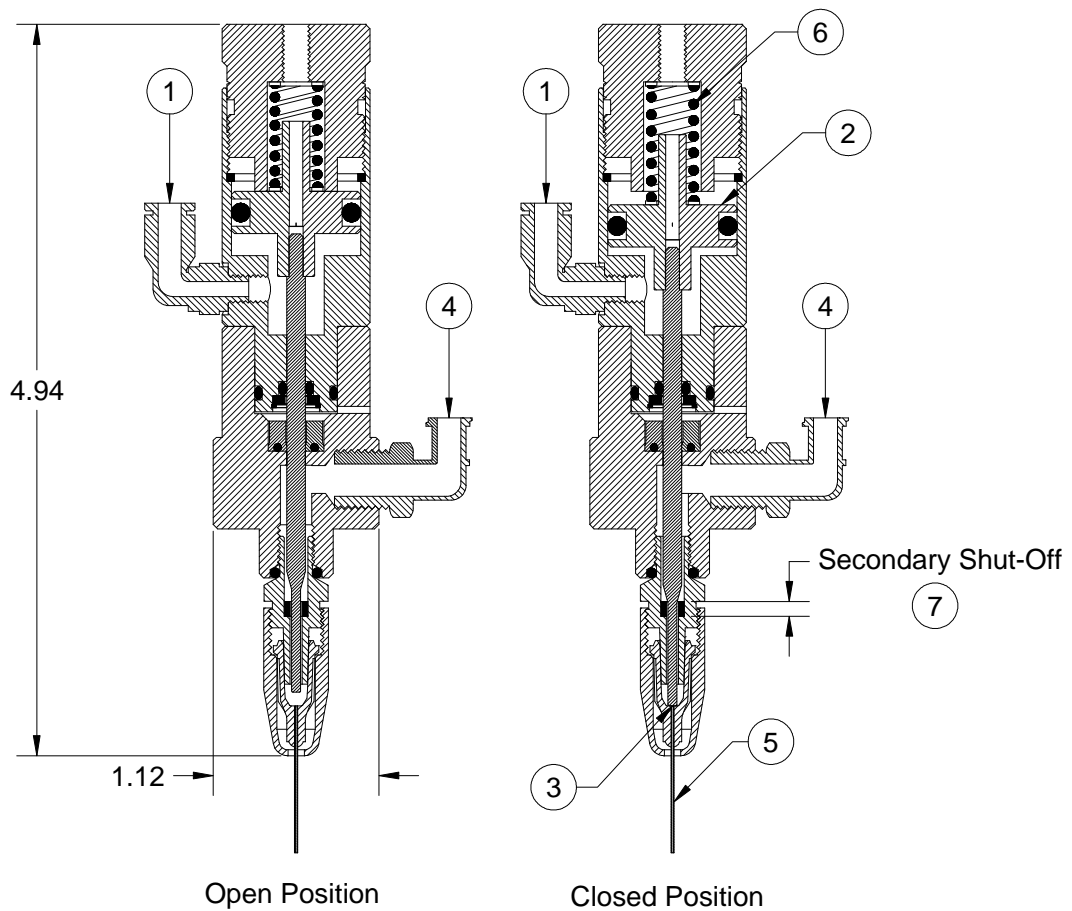


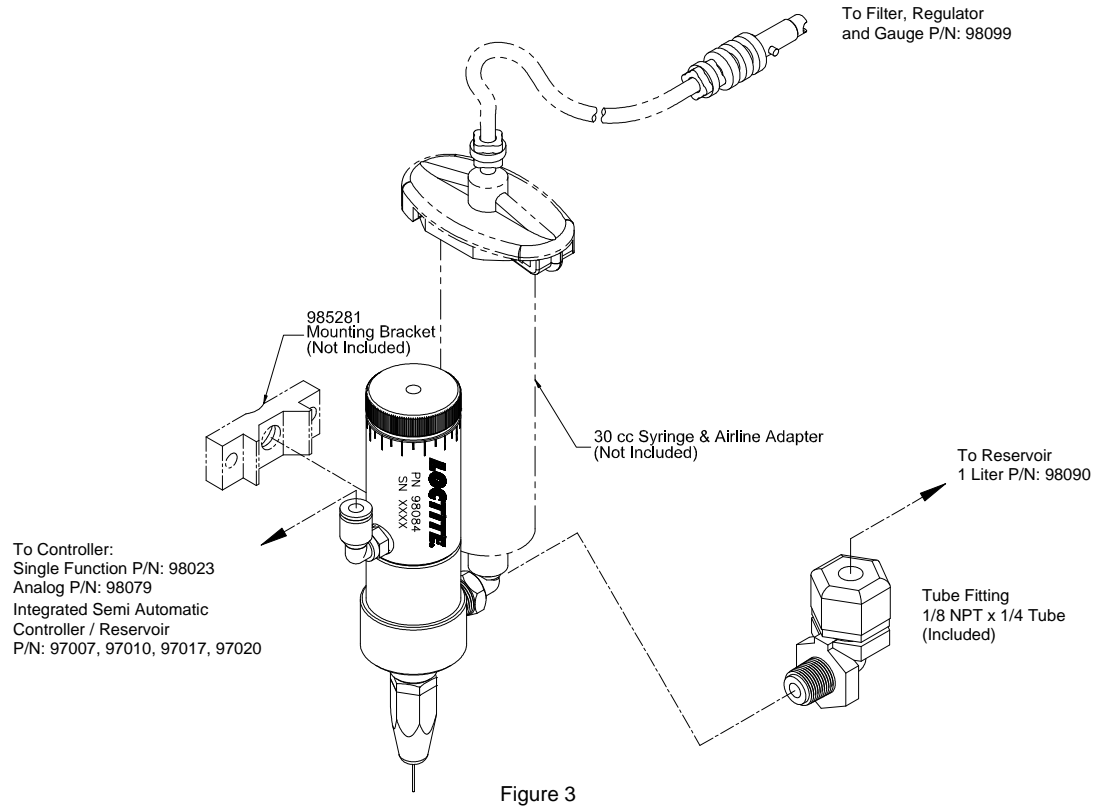
Figure 2

3 Technical Data

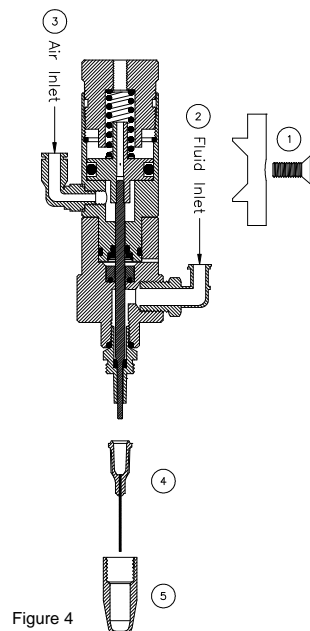
Size: Length -	5 inches (127 mm)
Diameter -	1.1 inches (28.5 mm)
Weight:	8-oz. (227 g)
Port Size: Fluid Inlet:	1/8" N.P.T.
Air Inlets:	10-32 UNF-2B
Fluid Outlet:	Male Luer Lock
Max Fluid Pressure:	100 psi (7 bar)
Pneumatic Supply	min. 60 psi (4.8 Bar)
	max 100 psi (7 Bar)
Air Quality:	Filtered 10µm, oil free, non-condensing
Wetted Parts:	303 Series Stainless Steel, Teflon®

4 Installation


4.1 Typical Pressure Time Set Up



4.1.1 Connecting the Airline and Product Feed Line




4 Installation (continued)

 **Note:** This installation uses luer lock adapters shipped with the valve. Any approved material line with 1/8" N.P.T. connections will work.

Refer to Figure 4.

1. If desired, mount the valve to the bracket (1) option.
2. Connect syringe to product inlet port (2) or connect material feed line to inlet port (2).
3. Connect valve actuating airline to air inlet port (3) and to an approved valve controller.
4. Pressurize material reservoir (Material pressure not to exceed 100 psi).
5. Activate the valve until all air has been purged from material line. It may be helpful to turn the valve upside down to purge air. Attach desired dispense tip (4) to the outlet luer lock adapter.
6. Secure the dispense tip with the valve needle retaining cap (5).

 Prior to installing the first needle tip on your valve, adjust the stroke approximately six turns counterclockwise from being fully seated to allow the needle hub to fully engage on the valves tapered luer adapter. (Note this is a spring actuated normally closed valve so the needle rod will appear to remain extended but it will retract when the needle retaining cap is assembled on the valve). The stroke adjustment must not be set to more than 4 to 5 turns counterclockwise when the valve is being operated. Setting the adjustment to more than 5 turns counterclockwise may result in damage to the valve.

4.2 Adjusting Dispense Quantity

Shot size is dependent on the following factors:

1. Flow control adjustment - Turn end cap counterclockwise to increase material flow rate.
2. Length of actuation, set at controller (valve open time).
3. Material supply pressure at reservoir.
4. Material viscosity.
5. Dispense tip size.

4.3 Shutdown

The valve does not need any special care for shut down periods of up to two weeks. If the valve is not going to be used for more than two weeks, cleaning the system out with Loctite® Equipment Flushing Solvent P/N 12121 is recommended.

5 Maintenance and Cleaning

The Micro Needle Valve is designed to dispense UV curing adhesives. Precautions have been made to protect the adhesive within the valve from exposure to UV light. Over time, curing may occur within the dispense tip and around the needle and luer assembly. Removing the luer adapter will force most of the cured adhesive off the needle.

5.1 Procedure for Replacing Luer Adapter

 **Warning!**

Disconnect all material and air pressure lines before performing any maintenance on this valve.

5 Maintenance and Cleaning (continued)

Disassembly, Refer to Figure 5.


1. Relieve reservoir product pressure.
2. Remove needle retaining cap (2).
3. Remove dispense tip.
4. Use a 7/16" wrench to remove luer adapter (3) and o-ring (5).
5. Examine valve needle rod (4) and clean off all cured material with Loctite® Equipment Flushing Solvent P/N 12121.
6. Replace luer adapter (3) and o-ring (5) or clean luer adapter with Loctite® Equipment Flushing Solvent P/N 12121.
7. Clean valve body (1) with Loctite® Equipment Flushing Solvent P/N 12121.

Reassembly, Refer to Figure 5.

1. Apply silicone grease (997569) onto o-ring (5) and install onto luer adapter (3).
2. Apply silicone grease (997569) onto the threads of the luer adapter (3) and install luer adapter to valve body (1).
3. Install new dispense tip.
4. Apply silicone grease (997569) onto thread of needle retaining cap (2) and install onto the luer adapter (3).

5.2 Procedure for Replacing Needle Valve Assembly

Tools required: 7/64" hex wrench, 7/16" open end wrench, snap ring pliers, O-ring tool.

 **Notice:** To prevent possible damage to seal components, please follow these instructions in the following sequence. Refer to Figure 5.

1. Relieve reservoir product pressure.
2. Remove all hoses and fittings from valve.
3. Unscrew the needle retaining cap (2) and remove the dispense needle.
4. Remove the three screws (17).
5. Pull the valve housing (1) away from the air cylinder (12).
6. Remove the luer adapter assembly (3) from the valve housing (1).
7. Clean and inspect the needle rod (4) and luer adapter assembly (3) for wear and damage. Replace parts as necessary.
8. Replace O-ring (8), if necessary. Make sure to lubricate new O-ring with silicone grease (997569).
9. Remove the end cap (15) by turning counterclockwise.
10. Carefully remove the spring (14) and the two nylon washers (16).
11. Remove the retaining ring (13).
12. Pull the needle rod and piston assembly (4) straight out from the air cylinder (12).
13. Replace O-ring (11), if necessary, and apply silicone grease (997569).
14. Remove the retainer ring (7), the nylon washer (9) and the o-ring (10) from the air cylinder (12).
15. Clean and visually inspect all parts for damage. Replace parts as necessary.
16. Reinstall the o-ring (10) and apply silicone grease (997569).
17. Insert the nylon washer (9) and secure with the retaining ring (6).
18. Reinstall the needle/piston assembly (4) in the air cylinder (12).
19. Reinstall the retaining ring (13).
20. Reinstall the spring (14) and the two nylon washer's (16).
21. Reinstall the end cap (15).
22. Reinstall the luer adapter assembly (3) to the valve housing (1).
23. Align the valve housing (1) to the air cylinder (12) and reinstall the three screws (17).

Notice: Alternately tighten the screws a little at a time until they are secure.

5.2.1 Valve Components

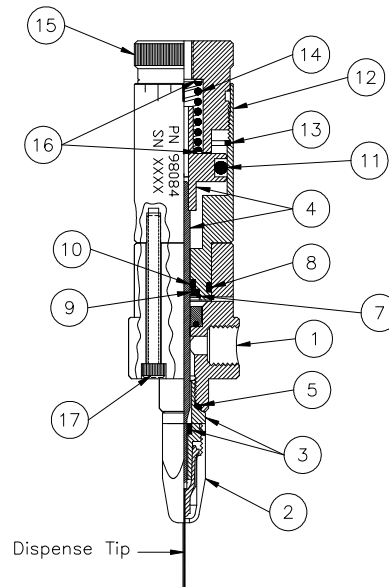


Figure 5

6 Troubleshooting

Type of Malfunction	Possible Cause	Correction
No material flow.	<ul style="list-style-type: none"> - Material pressure too low. - Valve air pressure too low. - Material cured or clogged in valve. - Material cured or clogged in dispense needle. - End cap fully closed. - The valve needle retaining cap may not have been tightened enough to unseat the valve needle rod from the secondary Teflon® seal. 	<ul style="list-style-type: none"> • Increase material pressure. • Increase valve air pressure to 60 psi. • Clean valve. • Replace dispense needle. • Turn end cap counterclockwise. • Tighten the retaining cap.
Inconsistent material flow.	<ul style="list-style-type: none"> - Inconsistent valve air pressure. - Length of actuation too short. - Check for curing in dispense needle. 	<ul style="list-style-type: none"> • Insure that air supply is set at 60 psi. • Adjust time. • Replace valve needle rod.
Steady drip.	<ul style="list-style-type: none"> - Cured material on valve needle rod. - Worn seat. - Worn valve needle rod. 	<ul style="list-style-type: none"> • Clean or replace valve needle rod. • Replace dispense needle. • Replace valve needle rod.

7 Spare Parts – Micro Dispense Valve

Refer to Figure 5		
Valve Needle Rod Kit		98091
Needle Rod and Piston Sub-assembly	Item 4	
Piston O-ring	Item 10	
Flat Washer, Nylon	Item 15	
Needle Rod O-ring	Item 9	
Flat Washer, Nylon (retain washer)	Item 8	
Retaining Ring	Item 6	
Luer Adapter Assembly Kit		98092
(1) Luer Assembly	Item 3	
(1) O-ring	Item 5	
Polypak Seal, 1 pack	Item 1A	98093
Fitting Kits (10 pieces)		
Elbow, 1/8" NPT X 1/4" tube, 10 pack		985404
Elbow, 1/8" NPT X Luer, 10 pack		98095
Actuator Assembly		98096
End Cap	Item 14	
Air Cylinder	Item 11	
Compression Spring	Item 13	
Retaining Ring	Item 12	
O-ring	Item 7	
Needle Rod and Piston Sub-assembly	Item 4	
Piston O-ring	Item 10	
Flat Washer, Nylon	Item 15	
Needle Rod O-ring	Item 9	
Flat Washer, Nylon (needle retain washer)	Item 8	
Retaining Ring	Item 6	
Valve Body Assembly		98097
Body and Seal Sub-assembly	Item 1	
Luer Assembly	Item 3	
O-ring	Item 5	
Needle Retaining Cap	Item 2	
Socket Head Screws	Item 16	
Needle Retaining Cap, 5 pack	Item 2	98098
7.1 Accessories		
Bracket & Flat Head Screw		985281
Precision Air Regulator/Gauge/Valve, 0-30 psi with Syringe Adapter		98099
10 ml Syringe Airline adapter		97208
30 ml Syringe Airline Adapter		97245
Advancing Slide		984691
Silicone Grease		997569
7.1.1 Dispense Tip, Stainless Steel – 1/2" Straight		
Dispense Needle 30 Gauge (50 pcs/box), ID Size.006",	Lavender Hub	98104
Dispense Needle 25 Gauge (50 pcs/box), ID Size.010",	Red Hub	98404
Dispense Needle 22 Gauge (50 pcs/box), ID Size.016",	Blue Hub	98402
Dispense Needle 21 Gauge (50 pcs/box), ID Size.020",	Purple Hub	98424
Dispense Needle 20 Gauge (50 pcs/box), ID Size.023",	Pink Hub	98400
Dispense Needle 18 Gauge (50 pcs/box), ID Size.033",	Green Hub	98398
Dispense Needle 15 Gauge (50 pcs/box), ID Size .052",	Amber Hub	98396

Note: Only stainless steel needles 15 gauge or smaller can be used with the Micro Needle Valve.

8 Warranty

Henkel expressly warrants that all products referred to in this Instruction Manual the Micro Needle 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. No such claim shall be allowed in respect of products which have been neglected or improperly stored, transported, handled, installed, connected, operated, used or maintained. In the event of unauthorized modification of the Products including, where products, parts or attachments for use in connection with the Products are available from Henkel, the use of products, parts or attachments which are not manufactured by Henkel, no claim shall be allowed.

No Products shall be returned to Henkel for any reason without prior written approval from Henkel. Products shall be returned freight prepaid, in accordance with instructions from Henkel.

NO WARRANTY IS EXTENDED TO ANY EQUIPMENT WHICH HAS BEEN ALTERED, MISUSED, NEGLECTED, OR DAMAGED BY ACCIDENT, OR IF THE SYSTEM WAS USED TO DISPENSE ANY LIQUID MATERIAL OTHER THAN LOCTITE® PRODUCTS.

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