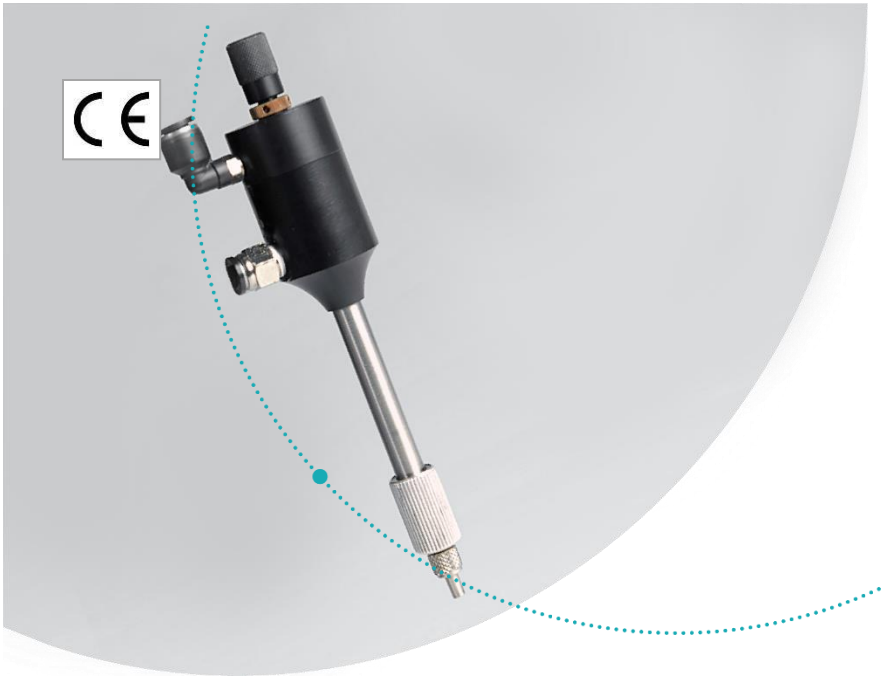

Model 400 Handheld Needle Dispensing Valve

User Guide

DYMAX®

About Dymax

Light-curable adhesives. Systems for light curing, fluid dispensing, and fluid packaging.

Dymax manufactures industrial adhesives, light-curable adhesives, epoxy resins, cyanoacrylates, and activator-cured adhesives. We also manufacture a complete line of manual fluid dispensing systems, automatic dispensing systems, and light-curing systems. Light-curing systems include LED light sources, spot, flood, and conveyor systems designed for compatibility and high performance with Dymax adhesives. Dymax adhesives and light-curing systems optimize the speed of automated assembly, allow for 100% in-line inspection, and increase throughput. System designs enable stand-alone configuration or integration into your existing assembly line.

Please note that most dispensing and curing system applications are unique. Dymax does not warrant the fitness of the product for the intended application. Any warranty applicable to the product, its application, and use is strictly limited to that contained in the Dymax standard Conditions of Sale. Dymax recommends that any intended application be evaluated and tested by the user to ensure that desired performance criteria are satisfied. Dymax is willing to assist users in their performance testing and evaluation. Data sheets are available for valve controllers or pressure pots upon request.

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Introduction

This guide describes how to assemble, use, and maintain the Dymax Model 400 handheld needle valve safely and efficiently.

Intended Audience

Dymax prepared this user guide for experienced process engineers, maintenance technicians, and manufacturing personnel. If you are new to pneumatically operated fluid dispensing equipment and do not understand the instructions, contact Dymax Application Engineering to answer your questions before using the equipment.

Where to Get Help

Dymax Customer Support and Application Engineering teams are available in the United States, Monday through Friday, from 8:00 a.m. to 5:30 p.m. Eastern Standard Time. You can also email Dymax at info@dymax.com. Contact information for additional Dymax locations can be found on the back cover of this user guide.

Additional resources are available to ensure a trouble-free experience with our products:

- Detailed product information on www.dymax.com
- Dymax adhesive Product Data Sheets (PDS) on our website
- Safety Data Sheets (SDS) provided with shipments of Dymax adhesives

Safety

WARNING! *If you use this fluid dispensing equipment without first reading and understanding the information in this guide, personal injury can result from the uncontrolled release of high-pressure gas, injection injury, or exposure to chemicals. To reduce the risk of injury, read and understand this guide before assembling and using Dymax fluid dispensing equipment.*

General Safety Considerations

All users of Dymax fluid dispensing equipment should read and understand the user guide before assembling and using the equipment.

To learn about the safe handling and use of dispensing fluids, obtain and read the SDS for each fluid before using it. Dymax includes an SDS with each adhesive sold. SDS for Dymax products can be requested through the Dymax website.

Specific Safety Considerations

Using Safe Operating Pressures

Pressurizing the components in the dispensing system beyond the maximum recommended pressure can result in the rupturing of components and serious personal injury. To minimize the risk of rupturing components and injury, do not exceed the maximum operating pressure of the components in your fluid dispensing system (see system specifications on page 13).

Preventing Injection Injury

Discharging fluids or compressed air with a dispensing tip against your skin can cause very serious injection injury. To minimize the risk of injection injury, do not place the dispensing tip in contact with your skin.

Product Overview

Description of the Model 400 Dispensing Valve

The Model 400 handheld, pneumatic needle valve is designed to deliver precise volumes of low- to medium-viscosity fluids. Air pressure through the valve retracts the needle assembly from the seat allowing fluid to flow from the valve fluid inlet to the dispensing tip. When the air pressure is eliminated, the spring to returns the needle back to its position, closing the fluid path and ending the dispense cycle. The valve also features a flow adjustment knob which allows for fine-tuning of the dispense volume, ensuring precise and consistent deposits. The Model 400 is ideally suited for a wide range of applications including dispensing cyanoacrylates, inks, and UV light-curable adhesives.

Figure 1.
Model 400 Component Diagram

Assembly and Setup

Unpacking and Inspecting Your Shipment

When your Model 400 dispensing valve arrives, inspect the boxes and notify the shipper of any damage immediately.

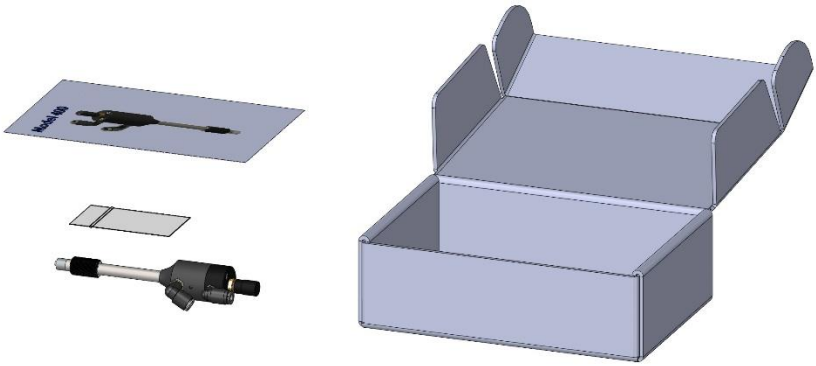
Open each box and check for equipment damage. If parts are damaged, notify the shipper and submit a claim for the damaged parts. Contact Dymax so that new parts can be shipped to you immediately.

Check that the parts included in your order match those listed below. If parts are missing, contact your local Dymax representative or Dymax Customer Support to resolve the problem.

Parts Included in the Model 400 Dispensing Valve

- Model 400 needle valve
- Model 400 user guide
- Assorted dispensing tip kit

Figure 2.
Model 400 Handheld Needle Valve Unpacking Diagram



System Interconnect

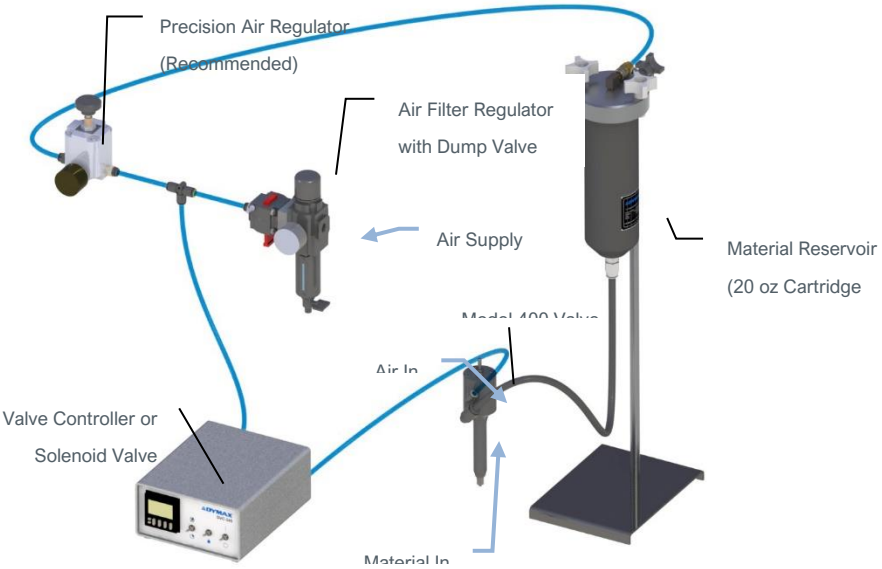
Air

The Model 400 needle valve requires a Model 345 valve controller or a 2-position, 4-way air solenoid valve to actuate the air section. The valve should be operated with clean, dry air between 80-100 psi [5.5 - 7 bar]. One #10-32 threaded air port is located on the valve. This port is used to open the valve when air pressure is applied and close the valve when air pressure is relieved. A quick-connect air fitting is typically supplied with the Model 400 to fit 0.16" [4 mm] tubing.

Fluid

The Model 400 needle valve requires a material reservoir or pressure tank to draw material from. The material reservoir should be connected to the Model 400 valve through the 1/8" [3.2 mm] NPT port located on the valve.

Figure 2.
Valve Interconnect Diagram



Operation

Start Up

At the beginning of the day or a shift, it is necessary to properly start the Model 400 to begin normal operation. To start the dispensing valve, follow the instructions below.

1. Apply air pressure by turning on the pressure to the Controller.
2. Remove the Luer Lock Plug from the Luer Adapter and discard.
3. Place a new Dispense Tip onto the Luer Adapter.
4. Apply fluid pressure to the valve by turning on the pressure to the Material Reservoir.
5. Cycle the Valve to the open position to bleed all air that may have become trapped when changing the Dispense Tip.

   Note: Operating air pressure must be applied before turning on fluid pressure.

Dispense

If any problems are encountered, refer to the troubleshooting section of this manual or call Dymax Customer Support.

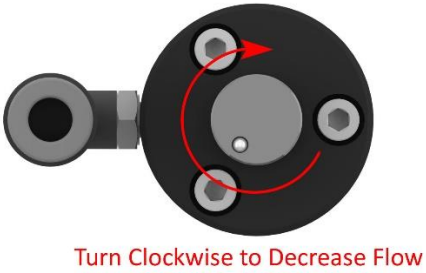
1. Plumb the valve as outlined in the setup procedures.
2. Regulate the air pressure to between 80-100 psi (5.5 – 7 bar).
3. Pressurize the Fluid Delivery System.
4. Cycle the valve to the open position to purge. Fluid should begin to dispense from the tip of the valve.
5. Check the Fluid Connection for leaks. If the valve is leaking or dripping, refer to the troubleshooting section of this manual.
6. Adjust the material pressure until the desired flow rate is achieved.
7. Thread a Dispense Tip onto the Luer Adapter of the Valve to fine tune the flow rate of the fluid.

   Note: Using a smaller gauge Dispense Tip will reduce the flow rate while using a larger gauge Dispense Tip will increase the flow rate.

Adjusting Material Flow

Material flow can be easily adjusted by turning the Flow Adjustment Knob on the top of the valve. To reduce material flow, turn the Flow Adjustment Knob clockwise. To increase material flow, turn the Flow Adjustment Knob counterclockwise.

Figure 3.
Material Flow Adjustment



Shutdown

At the end of the day or shift, it is necessary to shut down the Model 400 dispensing system properly in order to keep material from curing inside the dispensing valve.

1. Remove the disposable Dispense Tip from the Luer Adapter and discard.
2. Thread a Luer Lock Plug onto the Luer Adapter.
3. Relieve fluid pressure on the valve by turning off air pressure at the Material Reservoir.
4. Relieve the air pressure operating the valve by turning off the air pressure to the Controller.

Cleaning and Maintenance

Replacing the Needle Seat

1. Unthread the Luer Adapter from the valve.
2. Remove the Needle Seat O-Ring.
3. Insert a new O-Ring.
4. Reinstall the Luer Adapter on the valve.

Troubleshooting

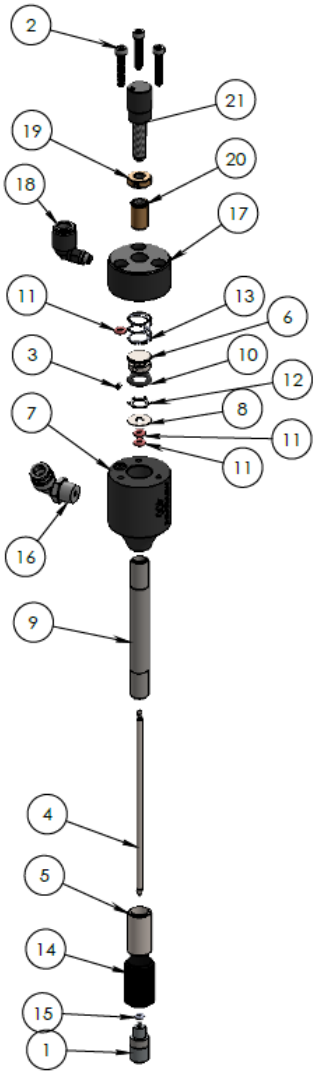
Table 1.
Troubleshooting Chart for Model 400 Dispensing Valve

Problem	Possible Cause	Corrective Action
Valve does not dispense anything	The fluid pressure is too low	Increase the fluid pressure above 15 psi
	Material is cured in the fluid section	Disassemble and clean the valve
	Air pressure is too low	Adjust air pressure accordingly
Dispense rate too fast	The fluid pressure is set too high	Decrease the fluid pressure
	The dispense tip gauge is too large	Replace the dispense tip with a smaller size tip
Dispense rate too slow	The fluid pressure is set too low	Increase the fluid pressure
	The dispense tip gauge is too small	Replace the dispense tip with a larger gauge
Air bubbles in fluid	The valve is not properly purged	Point the valve up and cycle it until any air bubbles are removed
	There is a problem with the material reservoir and fluid delivery system	Diagnose and repair
	Fluid pressure is too high	Adjust fluid pressure accordingly
Material leaks from Valve Tip	Air bubbles are trapped in the fluid section of the body or in the dispense tip	Point the valve up and cycle it until any air bubbles are removed

Spare Parts and Accessories

Item	Part Number
Air Regulators	
Air Filter Regulator with Dump Valve	T16307
High-Precision Air Regulator	T16629
Controllers	
DVC-345 Digital Valve Controller	T11146
Stands	
Valve Stand	T15466
Rebuild Kits	
Valve Rebuild Kit	T17305

Figure 4.
Model 400 Replacement Parts



Notes:

1. Must use Molykote 55 or equivalent on items 10 & 11.
2. Apply thread locker ANL-71 to item 3.

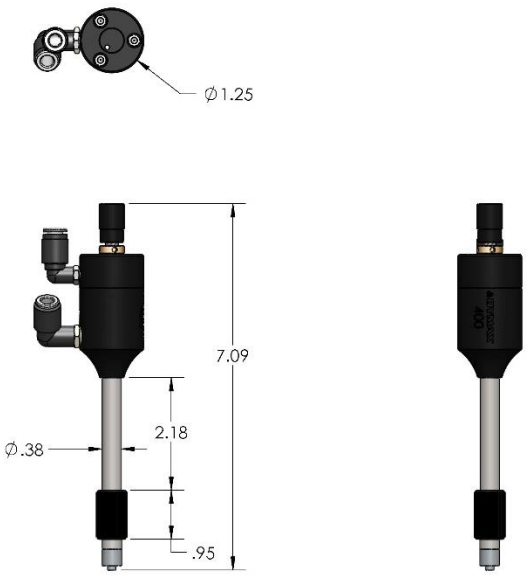
Item	Part Number	Description	Qty.
1*	T11819	Fitting, 1/4-28 to Lock, 316 SS	1
2	T14204	SHC Screw, 6-32, 0.75, SS	3
3	T14855	Set Screw, 4-40 X 1/8, 18-8	1
4	T17388	Model 400 Shaft	1
5	T17390	Model 400 Tip	1
6	T17391	Model 400 Piston	1
7	T17387	Model 400 Body	1
8*	T17392	Model 400 Washer	1
9	T17395	Model 400 Tube	1
10*	T17396	O-Ring, Buna, 2-109	1
11*	T18275	O-Ring, Silicone, 2-006	3
12*	T17398	Retaining Ring, Int, 1/5 Bore	1
13*	T18200	Spring Comp., .48 Dia X .50	1
14	T17604	Grip	1
15*	T17628	Teflon O-Ring, -004	1
16	T17830	Fitting L, 1/4" X 1/8 NPT, SST	1
17	T17401	Model 400 Adjustable Cap	1
18	T11711	Fitting, ¼ OD Tube, 10-32, Elbow	1
19	T12454	Locknut, 1/4-80, Brass	1
20	T17402	Bushing, 1/4-80 X .57, Press	1
21	T17403	Adjustment Screw, 1/4-80 X 1	1

*Parts included in Model 400 Valve Rebuild Kit

Specifications

Property	Specification
Part Numbers	**T17384**
Valve Type	Pneumatic needle valve, normally closed
Wetted Materials	Silicone, SS, Delrin®, Teflon®
Operating Air Pressure	80-100 psi (5.5 – 7 bar)
Maximum Fluid Pressure	80 psi (5.5 bar)
Activation	DVC-345 controller or 2-position, 4-way solenoid valve
Dimensions (W x H x D)	7.09 in x 1.25 in
Weight	0.35 lbs (0.16 kg)
Unit Warranty	One year from purchase

Figure 5.
Model 400 Dimensional Drawing



Warranty

From date of purchase, Dymax Corporation offers a one-year warranty against defects in material and workmanship on all system components with proof of purchase and purchase date. Unauthorized repair, modification, or improper use of equipment may void your warranty benefits. The use of aftermarket replacement parts not supplied or approved by Dymax Corporation, will void any effective warranties and may result in damage to the equipment.

IMPORTANT NOTE: *DYMAX CORPORATION RESERVES THE RIGHT TO INVALIDATE ANY WARRANTIES, EXPRESSED OR IMPLIED, DUE TO ANY REPAIRS PERFORMED OR ATTEMPTED ON DYMAX EQUIPMENT WITHOUT WRITTEN AUTHORIZATION FROM DYMAX. THOSE CORRECTIVE ACTIONS LISTED ABOVE ARE LIMITED TO THIS AUTHORIZATION.*

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