Flexoseal® 350
Lap-Gluing System

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This manual was written and designed at Valco Cincinnati, Inc., 411 Circle Freeway Drive, Cincinnati, Ohio 45246.

Part Number: MY001

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Valco Cincinnati Incorporated
411 Circle Freeway Drive
Cincinnati, Ohio 45246
TEL: (513) 874-6550
FAX: (513) 874-3612

Valco Cincinnati Limited
Hortonwood 32
Telford, TF1 4 EU, England
TEL: (+44) 1952-677911
FAX: (+44) 1952-677945

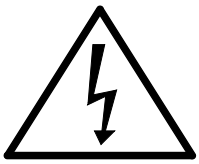
Valco GmbH
Storkower Str.
15749 Gallun,Germany
TEL: (+49) 337 648 700
FAX: (+49) 337 648 7070

About this manual

Valco Cincinnati has prepared this manual as a general guide for installing, operating and servicing Flexoseal® systems. Some components are customized for special machines. Others are designed for a customer's special requirements. This does not permit exact definition of some parts within this manual. Additional operation manuals are available for specific equipment.

Should you need more information, or have problems with the system, please contact your Valco Cincinnati sales representative. If your question is urgent, we encourage you to directly contact our corporate office in Cincinnati, Ohio, U.S.A. at (513) 874-6550, or Valco Europe in the United Kingdom at +44 1952 677911. If the problem cannot be resolved on the telephone, Valco will promptly arrange to have a technical representative visit your facility. Any charges for a service call will be quoted at that time.

The following safety symbols are used throughout this manual to alert the reader to potential safety hazards.



This symbol is used to alert the user to the presence of uninsulated dangerous voltage within the product's enclosure that may be of sufficient magnitude to constitute a risk of fire or electric shock. Failure to observe precaution may result in personal injury, death and/or equipment damage.

This symbol is used to alert the user to the presence of important operating and/or maintenance information. Failure to observe precaution may result in personal injury and/or damage to equipment.

Warranty

Valco Cincinnati, Inc. warrants its equipment worldwide against defects in material and workmanship as follows:

Cold-glue equipment and electronic controls
One (1) year from the date of shipment by Valco Cincinnati.

Hot-melt units, hoses, valves and related equipment
All components except cast-in heating elements are warranted for a period of six (6) months from the date of shipment by Valco Cincinnati. Cast-in heaters carry an additional, pro-rated warranty not to exceed three (3) years from the date of shipment by Valco Cincinnati.

Liability of the company is limited to repair of the product, or replacement of any part shown to be defective, and does not extend to defects caused by accidents, misuse, abuse, neglect, tampering or deterioration by corrosion. This warranty does not cover those items determined by Valco Cincinnati, Inc. to be normal wear items such as seals, O-rings, diaphragms, springs, etc.

Reconditioned equipment, unless specified otherwise at the time of purchase, will be warranted as described above for a period of ninety (90) days from the date of shipment by Valco Cincinnati.

Components purchased by Valco Cincinnati, Inc. from others for inclusion in its products are warranted only to the extent of the original manufacturer's warranty. In no event shall Valco Cincinnati, Inc. be liable for indirect or consequential damages arising out of the use of Valco Cincinnati products. This warranty is conditioned upon the prepaid return of the equipment claimed to be defective to Valco Cincinnati, Inc. for examination and verification. If claimed defect is verified, repairs or replacements will be made F.O.B. Cincinnati, Ohio, U.S.A. If the inspection of the equipment does not disclose any defect of workmanship or material, repairs, if necessary, will be made at a reasonable charge and return transportation will be charged.

For claims in Europe, contact Valco Cincinnati, United Kingdom Office, Unit D8, Road 7, Hortonwood Industrial Estate, Telford, TF1 4GP, England.

This is the only authorized Valco Cincinnati, Inc. warranty and is in lieu of all other expressed or implied warranties, representations or any other obligations on the part of Valco Cincinnati, Inc.

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Chapter 1 contents

CHAPTER 1
Function and use of the Flexoseal® system

Introduction

The Flexoseal® system is an electronically-controlled lap gluing system. Using an enclosed extrusion glue system, the Flexoseal® equipment applies precise glue patterns to inside or outside laps at speeds up to 1200 feet per minute (366 meters per minute).

The Flexoseal® system consists of three components:

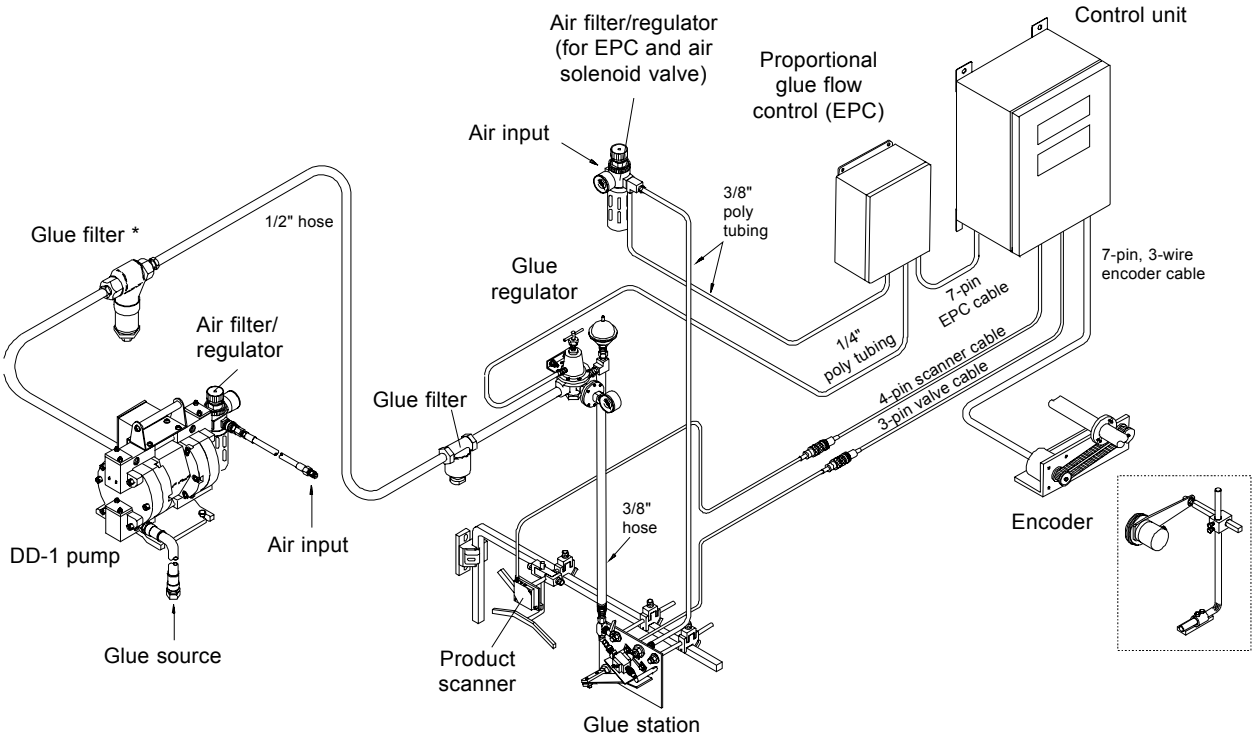
- Pumping system
- Applicator system
- Control system

High-quality sealing at all parent machine speeds (up to 1200 feet/366 meters per minute) is possible. Very little maintenance is required. The system produces good mechanical seals due to the adhesive penetration caused by the direct application of the glue. The bond is excellent due to the uniform pattern application.

Operator attention is minimal. Because the system is enclosed, it stays clean. The Flexoseal® system requires very little cleaning.

The system is modular in design. Quick-disconnect fittings are used for the applicator assemblies. The glue pattern is programmed by using two sets of switches on the front panel of the control.

Typical Flexoseal® system



* This filter is necessary only when using a central pumping system for more than one parent machine.

Functional description

The Flexoseal® system applies glue only when a box is present, and only when the machine is running faster than the minimum speed. The line shaft of the parent machine drives the shaft encoder. The encoder supplies machine speed information to the Flexoseal® control system. The control system adjusts the glue pressure and pattern dimension for precise glue application.

The gluing cycle is started when a box is detected by the scanner. The control system begins measuring the box. The measuring phase ends as the leading edge of the box (front flap) reaches the glue applicator.

The “Flap” and “Glue” switches on the front panel of the control are set by the operator. The “Flap” value represents the point at which the glue should begin on the box. The “Glue” value represents the point at which the glue should stop. Once these values are set, the system requires only occasional inspection of the glue level and the quality of the application.

Safety

Although the Flexoseal® system has few moving parts, the components are mounted on machinery with many moving parts. Therefore, the following safety guidelines should be used:

1. Turn the parent machine off before working on the Flexoseal® system.

2. Use extreme caution when working with the encoder.

    - Never touch the encoder, the pulleys or belt while the parent machine is running.

    - Never touch the line shaft of the parent machine.

    - Always cover the shaft encoder when service is complete.

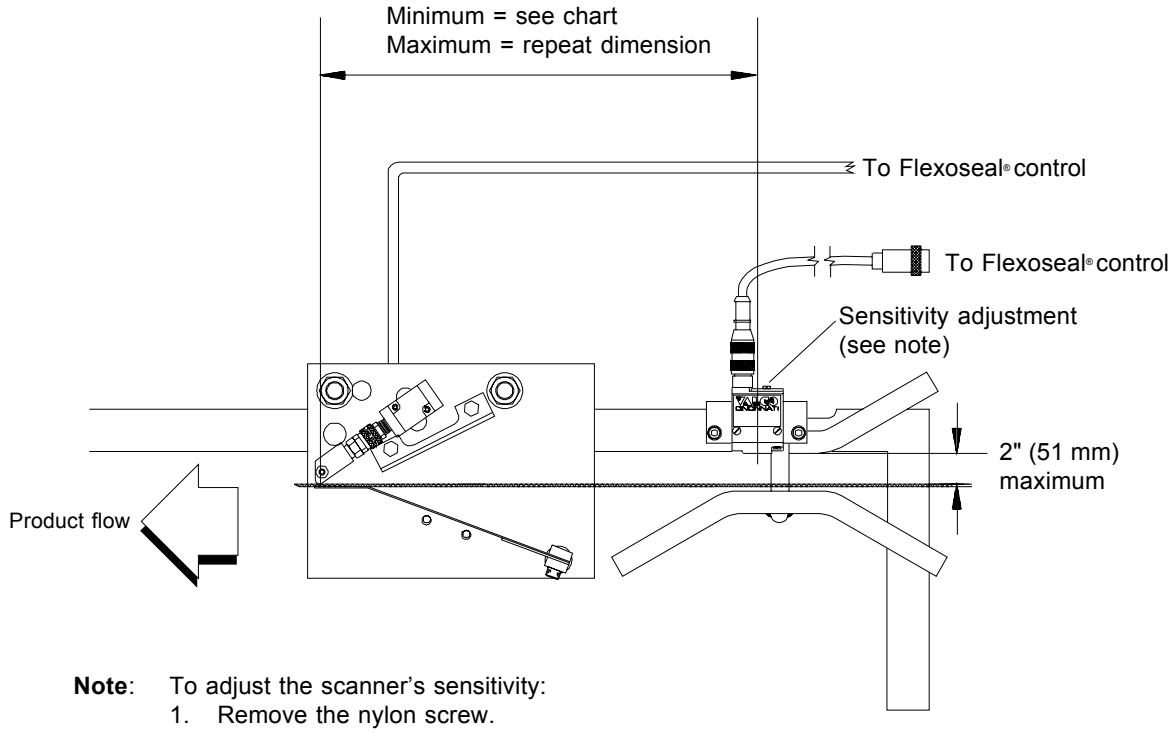
3. If you have questions about the operation or safe use of the system, please contact Valco Cincinnati for assistance.

Scanner position

The distance between the scanner and the valve's nozzle cannot exceed the distance from the leading edge of one product to the leading edge of the next product (repeat dimension).

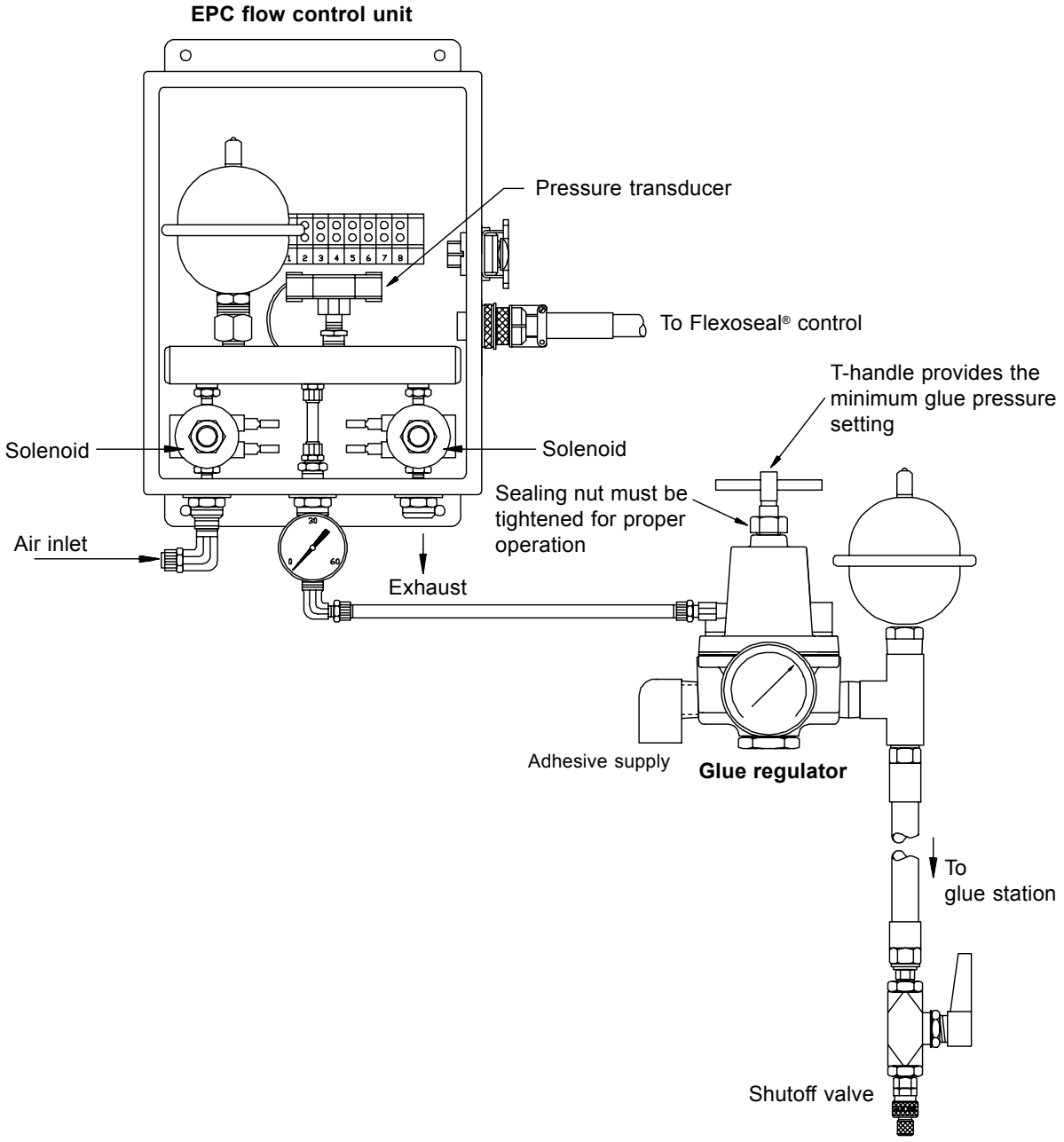
The minimum distance allowed between the scanner and the valve will be greater at high machine speeds. The following is a general guide.

Speed	Minimum distance
100 ft/min (30.48 m/min)	1" (25.4 mm)
500 ft/min (152.4 m/min)	2" (51 mm)
1000 ft/min (304.8 m/min)	4" (102 mm)
1250 ft/min (381 m/min)	5" (127 mm)
1500 ft/min (457 m/min)	6" (152 mm)

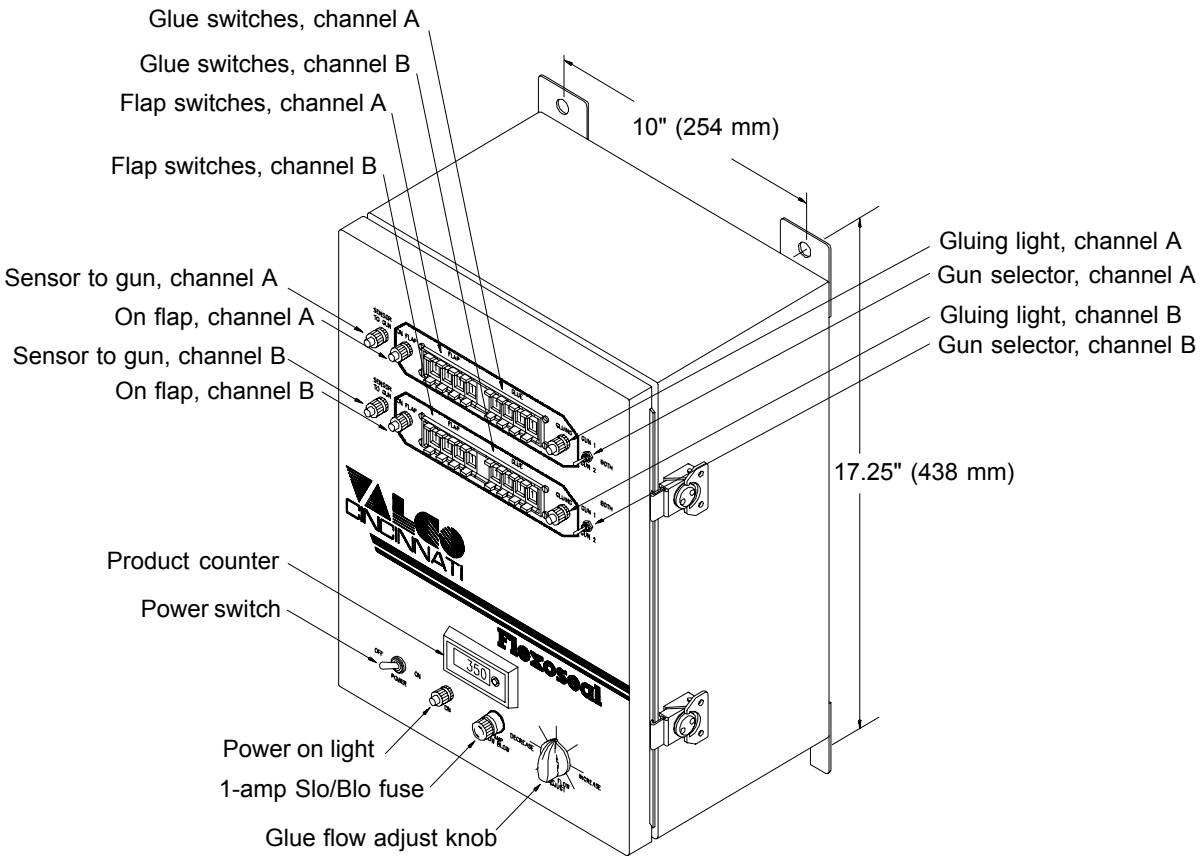


Note: To adjust the scanner's sensitivity:
1. Remove the nylon screw.
2. Turn clockwise to increase sensitivity.
   Turn counterclockwise to decrease sensitivity.
3. Replace screw after making adjustment.

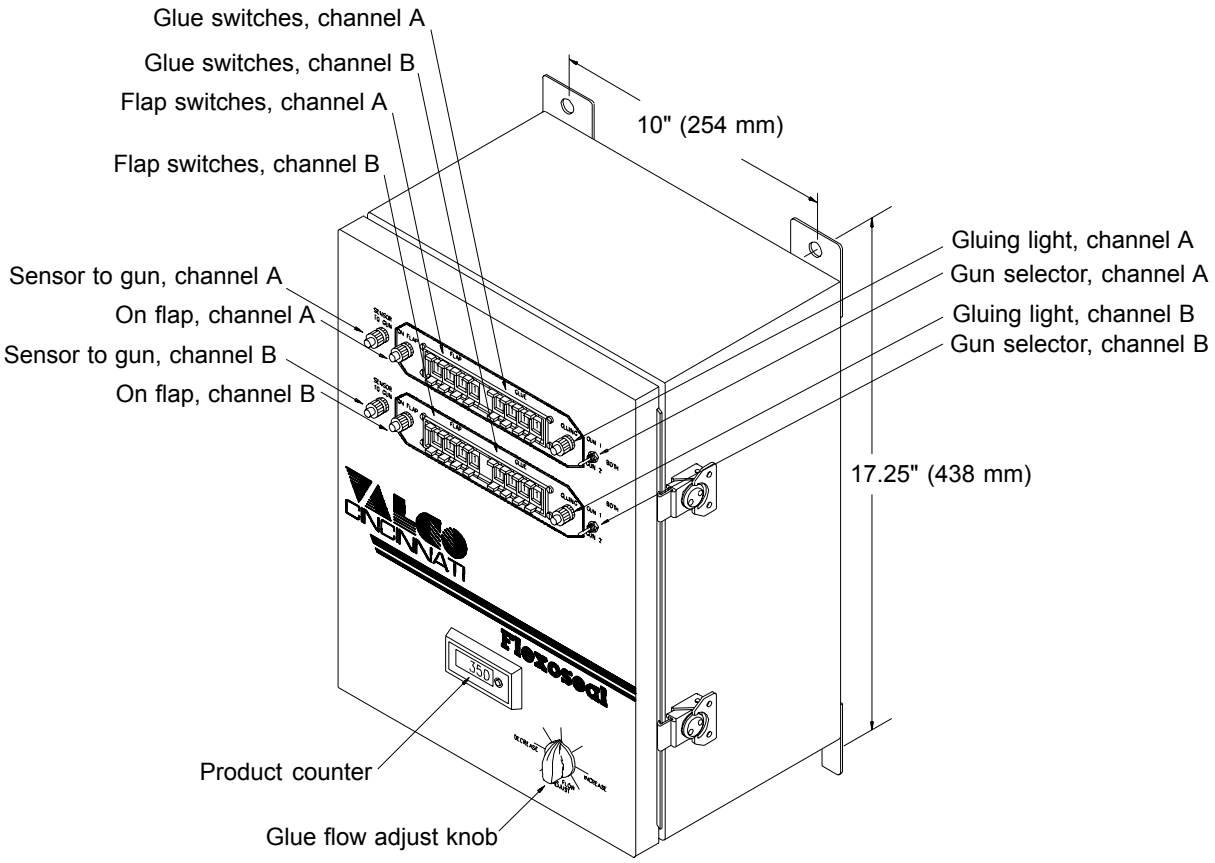
Automatic glue flow control (EPC)



Control cabinet (non-CE)



Control cabinet (CE)



Control panel features

Flap switches (start of pattern)
Used to set the start point of the glue pattern. Values can be entered up to:
99.9 inches for 3-digit imperial systems
99.99 inches for 4-digit imperial systems
999 millimeters for 3-digit metric systems
3999 millimeters for 4-digit metric systems

Glue switches (end of pattern)
Used to set the point at which the glue pattern will end. Values can be entered up to:
99.9 inches for 3-digit imperial systems
99.99 inches for 4-digit imperial systems
999 millimeters for 3-digit metric systems
3999 millimeters for 4-digit metric systems

On flap light
When lighted, this light indicates that the product has reached the applicator head but gluing has not yet started.

Sensor (cell) to gun light
When lighted, this light indicates that the product has been seen by the scanner. The measuring cycle is in progress.

Product counter
Indicates the number of products that have been glued.

Power switch
When this switch is in the ON position, AC power is supplied to the control.

Power on
When lighted, the light indicates that AC power is being supplied to the control.

Glue flow adjust knob
Allows fine adjustment of glue volume.

Gluing light
When lighted, the light indicates that glue is being applied to the product.

Note: If the parent machine is below the minimum speed setting, the gluing light will not illuminate and glue will not be applied to the product.

Gun (valve) selector switch
Allows for the selection of valve 1, valve 2, or both.

Testing the system

Refer to the adjustment section (Chapter 2) of this manual for further information.

1. Set the sensor (cell)-to-gun dimension (scanner to applicator head).
2. Turn on the glue supply valve, or fill the drum/glue vat and turn on the pump.
3. Turn on the petcock valve off at the glue valve.
4. Remove the glue plug from the glue valve and install the applicator head.
5. Turn on the system air pressure and adjust to 80 psi (6.5 bar) at the regulator.
6. Disconnect the glue line and shutoff valve from the glue valve and open the glue line into a bucket. Bleed all air from the glue lines.
7. Turn the petcock valve off and reconnect the line to the glue valve.
8. Open the petcock valve after connecting the line.
9. Adjust the applicator laterally for proper position.
10. Turn the control system on. Set the applicator switch in the proper position (gun 1, gun 2, or both).
11. Set the “Flap” and “Glue” switches.
12. Adjust the glue pressure on the fluid regulator to 5-10 psi (1.3-1.7 bar) with the parent machine off.
13. Trial run:
    a. Operate the parent machine just above the minimum speed. Check the glue pattern and adjust if necessary.
    b. Operate the parent machine at 65% of maximum speed. If necessary, adjust the glue pattern using the potentiometers inside the control box.

Pressure settings

Air pressure settings		
	Contact extrusion	**Non-contact extrusion**
Pressurized tank	60 psi / 5.1 bar / 515 kPa	70-120 psi / 5.8-9.2 bar / 583-929 kPa
DD-1 pump	80 psi / 6.5 bar / 653 kPa	80 psi / 6.5 bar / 653 kPa
2:1 ratio pump	80 psi / 6.5 bar / 653 kPa	80 psi / 6.5 bar / 653 kPa
5:1 ratio pump	40 psi / 3.7 bar / 377 kPa	40 psi / 3.7 bar / 377 kPa
Adhesive flow control (EPC)	80 psi / 6.5 bar / 653 kPa	60-80 psi / 5.1-6.5 bar / 515-653 kPa
Glue valves	80 psi / 6.5 bar / 653 kPa	Not applicable

Note 1: Pressures listed above indicate the minimum pressure setting while the parent machine is idle. Actual pressure may vary slightly depending on glue viscosity.

Note 2: For pumping systems that include piston pumps (2:1 or 5:1), be sure to add lubricant to air-line oiler and pump packing cup if needed.

Glue pressure settings		
	Contact extrusion	**Non-contact extrusion**
Fluid regulator output	10-15 psi / 1.7-2 bar	20-30 psi / 2.4-3.1 bar

Setup

1. Bleed adhesive through the system until no air is present at the shutoff valve. Remove any trapped air in the fluid regulator by turning the “T” handle completely clockwise. Then turn the handle completely counterclockwise as adhesive travels from the regulator to the glue valve. Repeat this procedure twice.

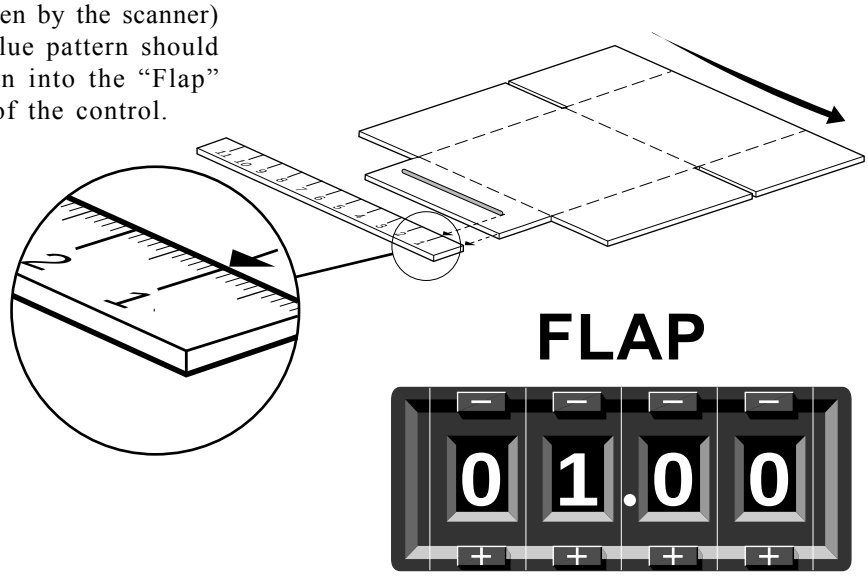
2. With the parent machine idle, set the fluid regulator to 10 psi (1.7 bar). Install the shutoff valve on the applicator valve.

3. Bleed adhesive through the glue valve. Manually activate the air solenoid.

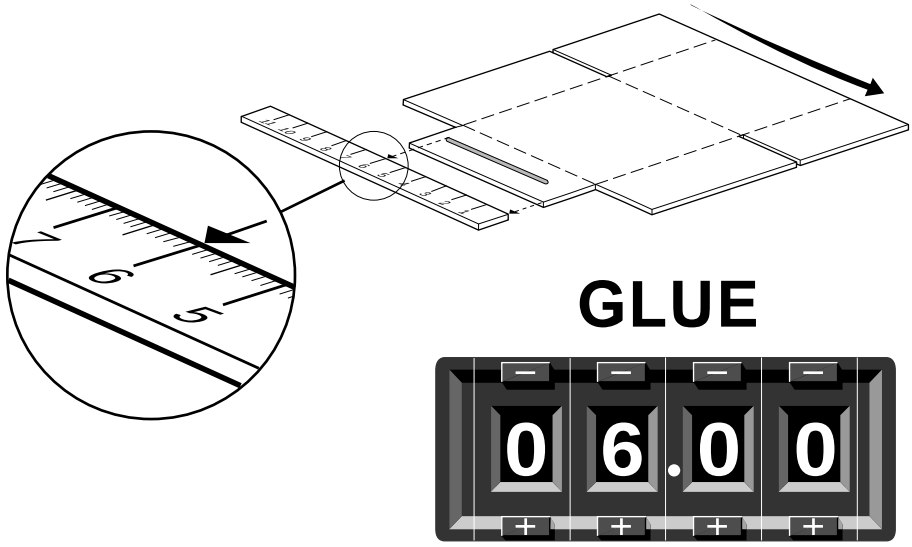
4. Operate the parent machine until a product reaches the glue station. Stop the parent machine. Check the angle of the applicator. Check the spring tension. Adjust the angle and tension if necessary.

5. Set the glue flow control knob (located on the control door) to the vertical (12 o’clock) position. Select the appropriate position for the valve (“Gun”) selector switch. Turn control power on.

6. Measure the distance from the leading edge of the product (first edge seen by the scanner) to the point at which the glue pattern should begin. Enter this dimension into the “Flap” setting on the front panel of the control.



7. Measure the distance from the leading edge (first edge seen by the scanner) to the point at which the glue pattern should stop. Enter this dimension into the “Glue” setting on the front panel of the control.



8. Check that the gun select switch is in the correct position (gun 1, gun 2, or both).

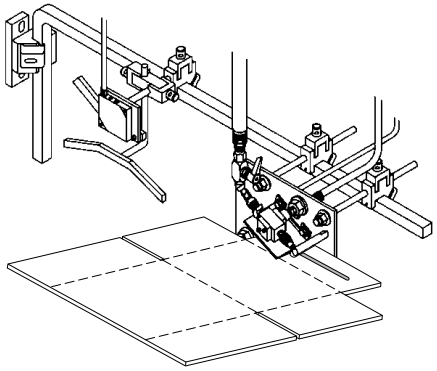
9. Run a sample product through the glue station. Stop the parent machine before the product is folded and examine the glue pattern.

   Note:
   The parent machine must operate above the minimum speed setting in order for the valve to operate. The minimum speed can be verified by the minimum speed LED on the V401 (V451) card.

10. Compare the length of actual glue pattern to the dimension settings on the front panel of the control. (The difference between the "Flap" and "Glue" settings is the length of the pattern.) Refer to the Troubleshooting section of this manual if there is a significant difference between the actual pattern and the dimensions on the front panel.

11. If the pattern is okay, but does not begin at the proper flap setting, the cell-to-gun setting on the V401 (V451) card is incorrect. Increase the cell-to-gun setting to move the pattern further back on the product. Decrease the setting to move the pattern forward (pattern will start sooner).

12. Increase the speed of the parent machine to approximately 80% of maximum. Check the product for any pattern shift. Refer to the "Adjustment" section of this manual if the pattern is shifting.

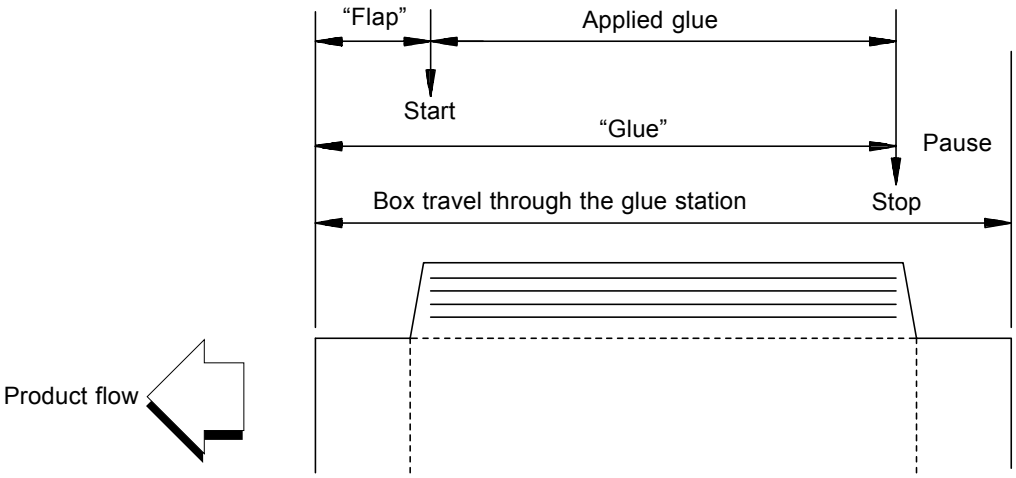


13. Use the “Flap” and “Glue” switches to fine-tune the length and placement of the glue pattern.

14. Repeat the setup procedure for each glue pattern.

15. Use the glue flow adjustment on the front panel of the control to fine-tune the volume of adhesive.

16. Adjust the “T” handle on the fluid regulator for proper adhesive volume at low parent machine speed. Tighten the sealing nut after the adjustment is complete.



Maintenance

A regular maintenance program will allow the system a longer life and efficient operation. Just a few moments of maintenance will greatly reduce downtime.

System start-up

Check all air and glue pressure settings at the beginning of each shift.

Glue pressure

Install the applicator head onto the glue valve. Purge adhesive until no air is present and the glue flows evenly.

The glue valves can be purged manually by means of an activator located on the solenoid-operated air valve.

System shutdown

For short periods of time, such as order change-over, apply lithium grease or petroleum jelly to the orifice of the applicator head (contact extrusion valve) to prevent dried adhesive from clogging the valve. The valve must be wiped clean before restarting production.

For longer periods of downtime, remove the applicator head (contact extrusion valves) and flush clean with water. Be sure to install a stopper onto the glue valve in place of the applicator head.

If the system is idle for 30 days or longer, the entire glue supply system (including the pump or tank) should be flushed clean with water. (See the "Adhesive system flush" section in this manual.)

System lubrication

1. Use lithium grease on all machined threads and fittings when servicing the system.

2. Grease quick-disconnect fittings frequently to prevent dried glue from causing premature wear and/or failure.

In-line glue filters

Normally one in-line glue filter will be installed at the glue source (pump) and one at each machine.

Inspect and clean the filter screens regularly. For new installations, the screens should be inspected once a week during the first month in order to determine specific maintenance requirements. Service intervals should not exceed 14 days.

Frequent clogging of the filter screens indicate that the entire glue piping system requires cleaning. See the "Adhesive system flush" section in this manual.

Adhesive system flush

The fluid delivery system must be flushed in the following cases:

1. Changing adhesives if the formulas are not compatible. (Always consult the adhesive supplier regarding the compatibility of adhesives.)

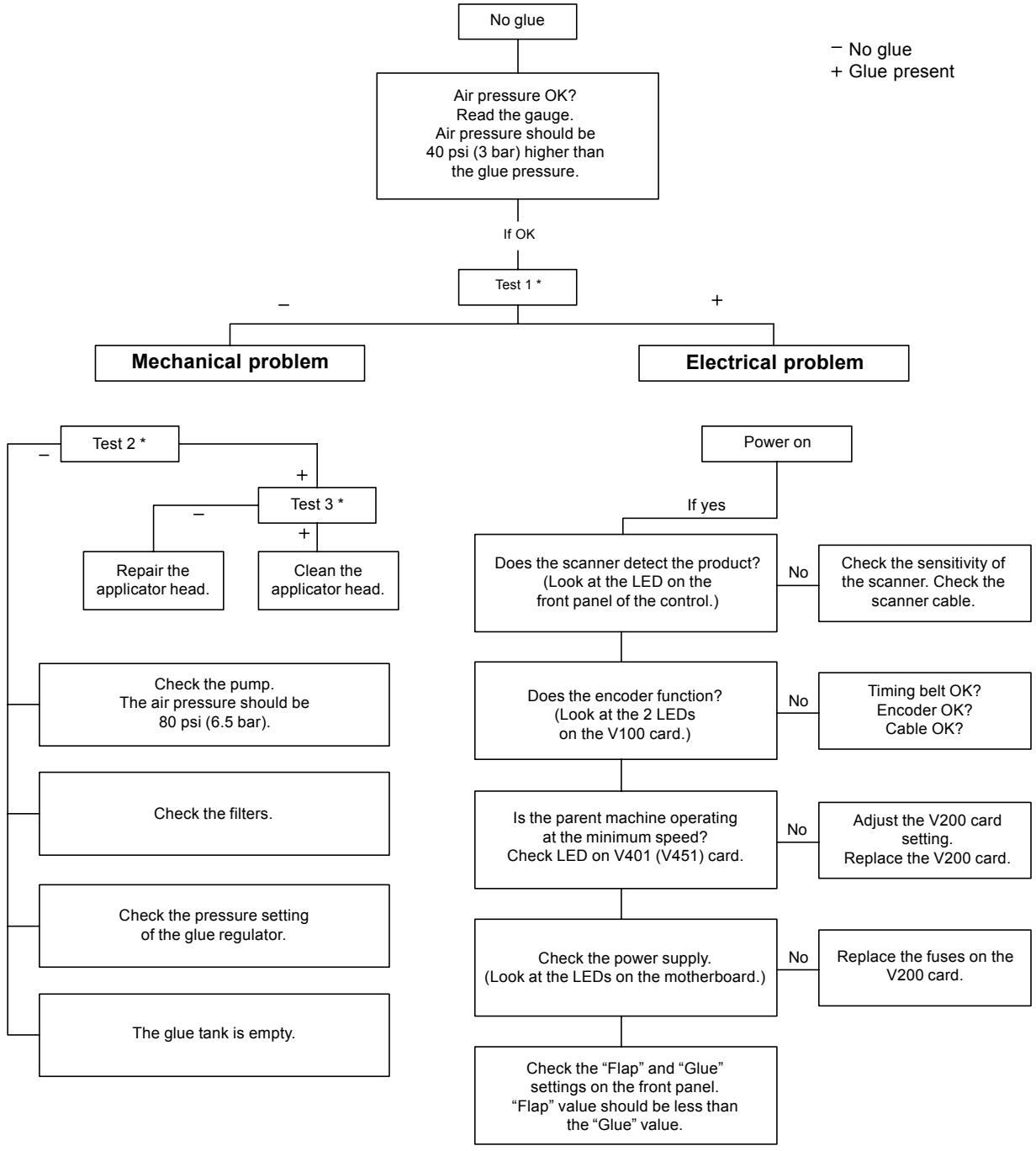
2. For periods of shutdown that exceed 30 days.

3. When glue-line buildup causes excessive pressure drops.

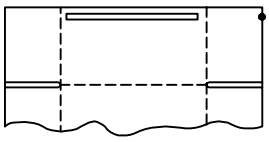
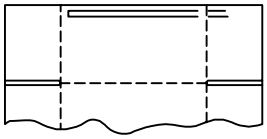
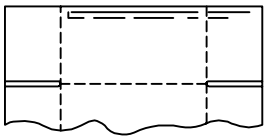
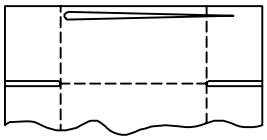
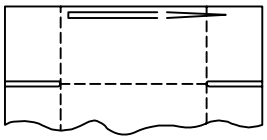
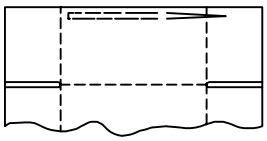
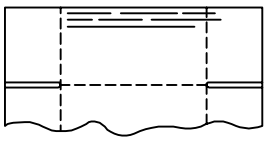
4. When excessive filter screen maintenance is necessary due to dirty adhesive.

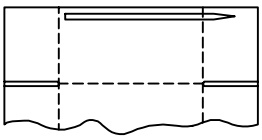
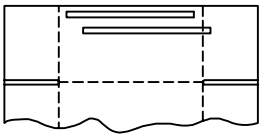
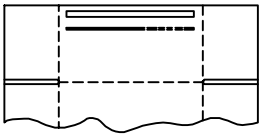
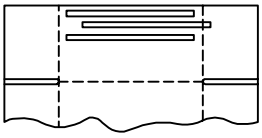
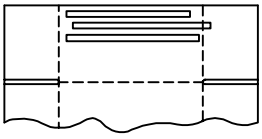
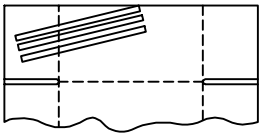
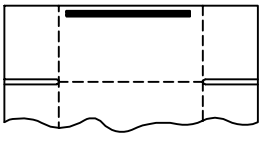
Use a mild vinegar and water solution (1 part vinegar to 10 parts water) to clean the system. Water alone can be used when simply changing adhesives or preparing the system for an extended period of downtime.

Troubleshooting



* Test 1: Manually activate the 3-way air solenoid and check for glue flow.
* Test 2: Open the shutoff glue valve over a container.
* Test 3: Identical to test 1, but remove the applicator head.

	PROBLEM	CAUSE/SOLUTION
	A drop of glue at the end of the product.	• No vacuum. • Defective O-ring. • Too much guide spring tension (too much product move ment at the glue station).
	An interruption of the glue pattern on the perforation of the product.	Glue pattern is too close to the perforation. Shorten the glue pattern.
	Poor glue pattern.	Air bubbles are in the glue system. Run adhesive through the glue line. Purge air from the glue line. Flush system if necessary.
	Glue pattern begins thick and trails off.	• The angle of the applicator head is too steep. Adjust the angle to 35°. • Air pressure to the 3-way valve too high. Lower to 25 psi (2.7 bar) higher than the highest operation glue pressure.
	Normal glue pattern start with trailing at the end.	• The angle of the applicator head is not steep enough. Adjust the angle to 35°. • Worn O-ring in the swivel fitting.
	Glue pattern consists of drops of glue with trailing.	Contact between the product and the spring guide is poor. Increase the tension of the spring.
	Differences in glue stripes.	The glue lap crusher setting is too narrow. The glue station is not in line with the product.

	PROBLEM	CAUSE/SOLUTION
	Good pattern with trailing.	Glue pressure is too high. Check that the pressure is 10-15 psi (1.7-2 bar).
	Good pattern position at slow parent machine speed. Delayed pattern at higher speed.	Glue may be present in the air solenoid valve. Change air solenoid. Reset “Lead” and “Trail” settings. (See “V401/451 card.”)
	Good pattern at slow parent machine speed. Thin pattern (not enough glue) at higher speed.	Increase EPC pressure with either the glue flow knob on the front panel of the EPC or with the volts potentiometer on the V200 card. EPC increase solenoid may be clogged.
	Pattern length is acceptable but the pattern position shifts.	Adjust the sensitivity of the product scanner. Check the position of the scanner. Scanner may detect a machine’s sheet transporter instead of the product.
	Pattern length and position vary.	• Encoder belt loose. • Gear is loose. • Parent machine drive is faulty. • Encoder is damaged. • Slippage of discs between the folding belts.
	Pattern skewed and positioned too close to the leading edge of the product.	• Guide spring tension too high. • Not enough pressure between folding belts. • Loose glue station. • Low panel boxes with deep slots may be deforming the product.
	Too much glue after the parent machine is stopped then restarted.	Glue pressure regulator may not close properly. • Check ball and seat for dirt. • Repair regulator. • Add a dump valve.

Initial checks of the VC300-series control

1. Check that the control is on. The “Power on/ off” light should illuminate.

2. Check the “Flap” and “Glue” settings. The “Glue” setting must be a larger number than the “Flap” setting.

3. Check that the valve (“Gun”) selector switch is in the correct position.

Air pressure to glue pump (or tank)

DD-1 pump: 80-100 psi (5.5 - 7 bar)

Glue flow

1. Check the minimum pressure setting of the glue regulator while the parent machine is idle. The gauge should indicate:

   Approximately 10 psi (1.7 bar) for direct-contact glue valves.

   Note:
   This setting may vary slightly depending on adhesive viscosity and individual glue pattern requirements.

2. Be sure that the sealing nut on the glue regulator “T” handle is tight.

3. Turn off the shutoff valve and remove it from the glue valve.

4. Place the shutoff valve over a container and open the valve. Observe the glue flow. The glue should flow evenly.

If the glue flow is not even, there is air in the glue line. All air must be purged from the glue line before the system can operate properly.

If the glue flow is significantly reduced, the glue line is blocked. Blockage is commonly caused by dirty glue filter screens at the pump and/or at the glue station. Inspect the filter screens and clean or replace if necessary.

Air pressure

Input air pressure to the EPC and all air-activated glue valves:
70-80 psi (5 - 5.5 bar).

Control check

The VC300 Series controls have numerous LEDs which can be used to quickly isolate problems with the system. The following steps must be performed in order. Complete the checks listed on the previous pages before checking inside the control.

1. Turn the control power on and open the control box door. (It is not necessary to operate the parent machine.)

2. Two red LEDs and two fuses (F1 and F2) are on the right-hand side of the motherboard. Both LEDs should be illuminated. If not, check the fuse located directly below the LED that is not illuminated.

   Note:
   Use 1 amp slow-blow (standard valve driver) or 2 amp slow-blow (non-contact valve driver).

If the fuse is good and the LED is not lit, or if the new fuse blows immediately, perform the following checks:

F1 A. Check the glue valve, valve interconnect cables, EPC, and EPC interconnect cable for shorts.

B. Replace the V200 card.

F2 A. Replace the V200 card.

B. Replace the motherboard.

3. There are two more LEDs on the mother board. One is located above terminal number 7 on the top terminal strip (+12V). The other LED is located below terminal number 5 on the lower terminal strip (-12V). Both of these lights should be illuminated. If either one is not lit, or if both LEDs are not lit, replace the V200 card.

4. Operate the parent machine at a typical production speed. Do not run product.

5. The two red LEDs (“ENC TEST”) located on the bottom of the V100 card should be lit. Both LEDs should be equally bright. If not, see the “Encoder check” section of the manual.

6. If the red LEDs (“ENC TEST”) are operating properly, the red LED (“PO TEST”) located at the top of the V100 card will glow brighter when parent machine speed increases.

7. If the “PO TEST” LED is not illuminated, replace the V100 card. The problem can also be the encoder. See “Encoder check.”

8. The red LED (“MIN SPEED”) on the V401 (V451) card should be illuminated. If not, adjust the minimum speed potentiometer located on the V200 card. Turn the potentiometer clockwise until the LED comes on. This LED must be on before the glue valves will operate. If this LED is not on, the problem may be the V100 card, V200 card, or the encoder.

9. Pass an object under the scanner.

10. The red LED on the scanner will illuminate, and the red LED ("SCANNER OP") on the V401 (V451) card will go out when the scanner is triggered. If not, see "Scanner check."

11. When the scanner is triggered, the three red LEDs on the front panel of the control ("C/G, Flap, Glue") will illuminate in sequence. (The parent machine must be operating above the minimum speed setting.)

    C/G - Sensor (Cell)-to-Gun
    This light will illuminate when the scanner detects a product. The product has not reached the glue station.

    Flap
    This light illuminates when the product has reached the glue station. The valve has not been activated.

    Glue
    This light illuminates when a signal is sent to the valves.

12. Observe the three LEDs located at the top of the V401 (V451) card.

    First LED - Glue enable
    This LED will illuminate when a signal is sent to activate the glue valves. (Parent machine must be operating at or above the minimum speed setting.) The “Gluing” light on the front panel of the control will light simultaneously.

    Second LED - minimum speed
    This LED indicates that the parent machine is operating at or above the minimum speed setting. The minimum speed adjustment is located on the V200 card. This LED must be on before the glue valves will operate.

    Third LED - scanner output
    This LED will go out when the scanner is triggered. If not, see “Scanner check.”

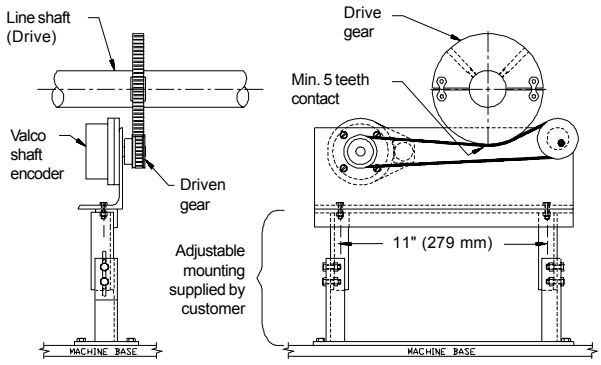
13. **For units with an optional valve driver card assembly.**
    If the control has an optional valve driver card assembly, the card will be mounted inside the top of the control box. When the red LED (“GLUE ENABLE”) on the V401 (V451) card illuminates, a signal is transferred to the valve driver board which in turn activates the glue valves.

Encoder check

The parent machine must be operated in order to verify the operation of the encoder. (It is not necessary to run product.) The -12V LED (located above terminal number 5 on the motherboard) must be illuminated. If not, replace the V200 card. If the LED is lit, observe the two red LEDs on the bottom of the V100 card. Both LEDs should glow equally bright. If not, check for the following:

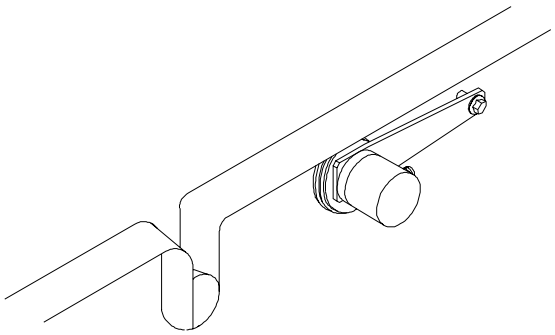
Line-shaft encoder assembly

- Worn timing belt and/or gears *
- Improper belt tension *
- Damaged encoder cable
- Loose cable connections



Measuring-wheel encoder assembly

- Worn measuring-wheel O-rings *
- Improper tension between the wheel and the drive belt *
- Damaged encoder cable
- Loose cable connections



Replace the encoder if the checks listed above fail to solve the problem.

* These items should always be checked when troubleshooting the glue system. These items may cause the LEDs to falsely indicate proper encoder operation.

Scanner check

It is not necessary to operate the parent machine in order to verify scanner operation. The red +12V LED (located above terminal number 7 on the motherboard) must be illuminated. If not, check the +18V fuse located on the bottom right side of the motherboard. If the fuse is okay, replace the V200 card.

The red LED on the scanner will illuminate when the scanner is triggered. If not, check and adjust the scanner sensitivity. The red LED on the V401 (V451) card ("SCANNER OP") will go out when the scanner is triggered.

If the sensitivity adjustment fails to illuminate the LED on the scanner, or if the red LED on the scanner is lit but the LED on the V401 (V451) card does not go out, check the following:

- Damaged cable
- Loose cable connections
- Replace scanner

Glue valve check

1. Verify that the control switches are set correctly.

2. Verify that the air pressure settings are correct.

3. Verify that there is proper glue flow.

4. Verify that there is an output signal to the valve.

Direct-contact valves

Valve will not activate:

Damaged cable	Replace
Loose cable connections	Tighten
Clogged applicator head	Clean or replace
Clogged air line to the solenoid-operated air valve. (This can be checked by removing the solenoid from the glue valve and manually activating the solenoid.)	Replace
Defective solenoid	Rebuild or replace
Dried glue in the valve's air inlet and/or the air solenoid	Rebuild or replace

Valve is activating erratically:

Improper angle of the applicator head	Readjust with a head-angle gauge
Worn quick-disconnect fittings	Replace
Worn applicator head	Replace
Worn glue valve	Rebuild or replace
Dried glue in the valve's air inlet and/or the air solenoid	Rebuild or replace

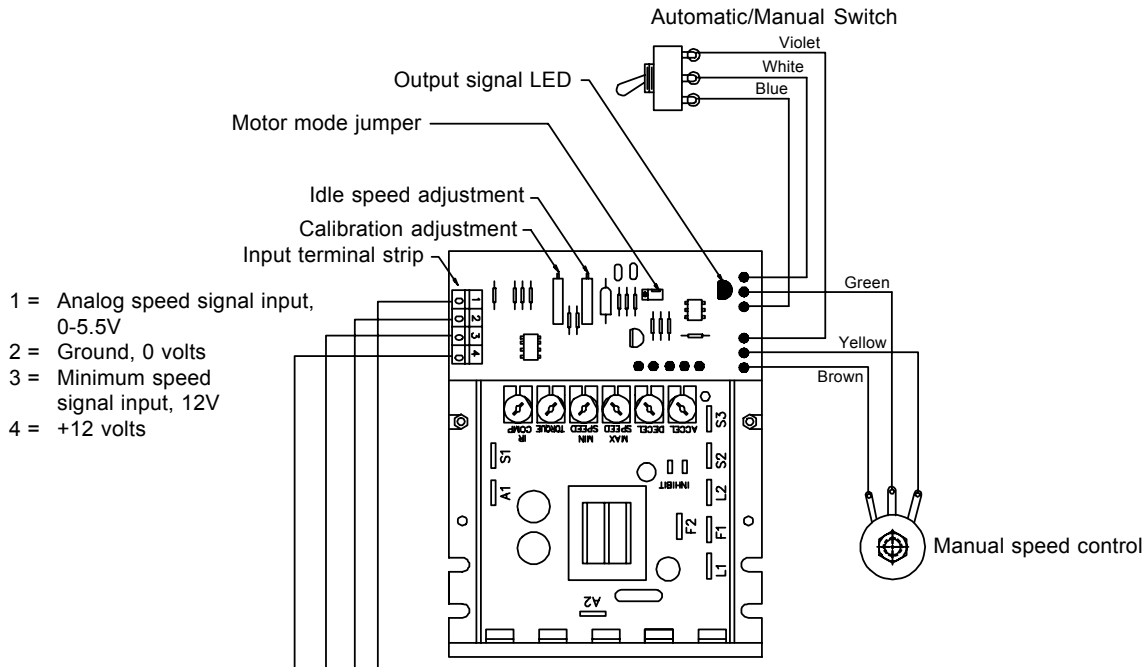
Hot-melt (motor-speed control)

This section applies to gluing systems which incorporate motor-driven hot-melt units.

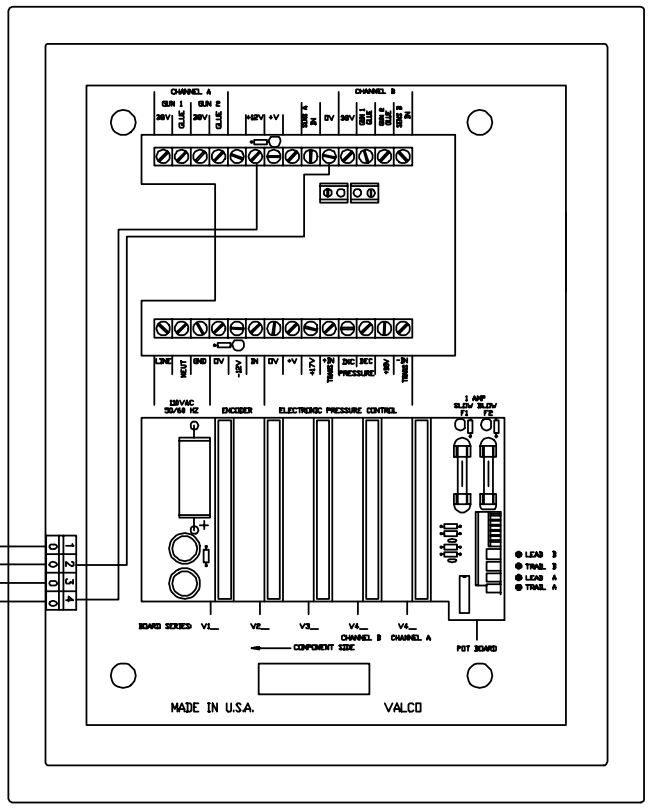
The hot-melt unit will be equipped with a motor speed control circuit card (see illustration) which interfaces with the VC350 Series control to provide uniform adhesive output throughout the speed range of the parent machine. All control system adjustments remain the same except the internal circuit card adjustments for the V300 card.

When used in conjunction with a hot-melt system, the V300 card becomes a motor-stop circuit that can interrupt power to the hot-melt motor when the parent machine is operated below a preset minimum speed. To bypass the motor-stop circuit simply remove the V300 card from the control. It is not required for system operation.

Motor-speed control circuit card



Flexoseal® Control (internal view)



	Wire Number		Circuit card terminal number
	5000 Series	DM-2 Series	
220VAC power	8	1091	L2
	10	1083	L1
Motor field	11	1103	-F2
	12	1102	+F1
Motor armature	13	1104	-A2
	14	1101	+A1

Adjustments

Part of the Motor-Speed Control circuit board operates at 240 volts. Make sure power has been disconnected from the board before making adjustments.

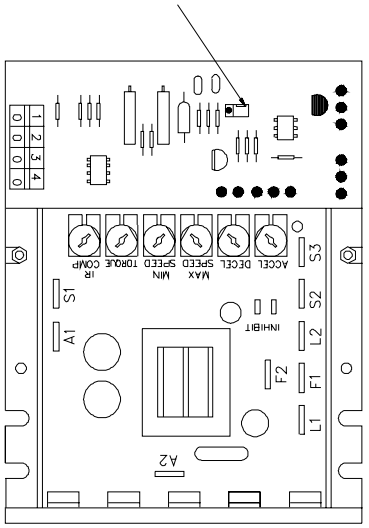
For most applications the factory settings should not be changed. However, since hot-melt systems use different kinds and sizes of pumps and motors, it may become necessary in some cases to balance motor performance with respect to a particular application.

Motor stop/motor idle jumper

The motor-speed control features a circuit that will either stop the hot-melt motor, or cause it to idle when the machine reaches the minimum speed setting. A mode select jumper on the speed control circuit card (located inside the hot-melt unit) can be positioned according to individual requirements. Unless specified, units will be shipped with the jumper in the "Motor stop" position.

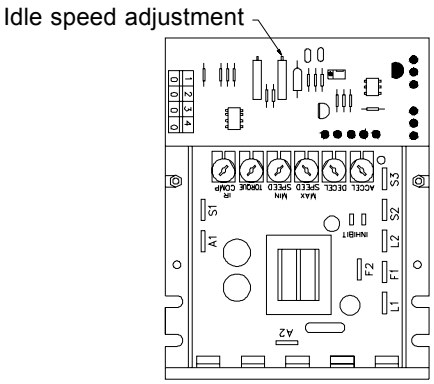
If the Motor Idle mode is selected, idle speed can be increased or decreased by adjusting the idle speed potentiometer located on the speed control circuit board. A clockwise rotation will increase idle speed. This adjustment will have no effect if the unit is in the Motor Stop mode.

Mode Select Mini Jumper
A and B = Stop below minimum speed
B and C = Idle below minimum speed



Idle speed adjustment

If the Motor Idle mode is selected (see previous page) idle speed can be increased or decreased by adjusting the idle speed potentiometer located on the speed control circuit board. A clockwise rotation will increase idle speed. This adjustment will have no effect if the unit is in the Motor Stop mode.



Calibration potentiometer

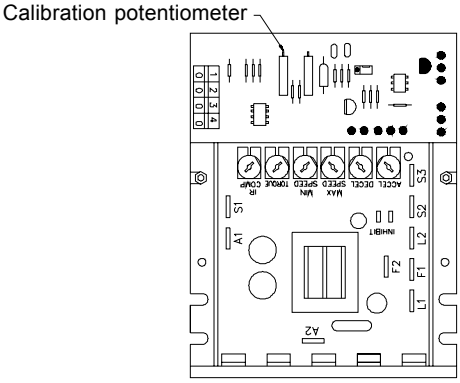
This feature protects the unit against excessive motor voltage when a system is in the automatic mode. Adjust as follows:

1. Place selector switch in the AUTO position.

2. Set glue flow knob on the front panel of the flow control module to a full clockwise position.

3. Run the parent machine at the highest production speed (the fastest speed at which glue will be applied).

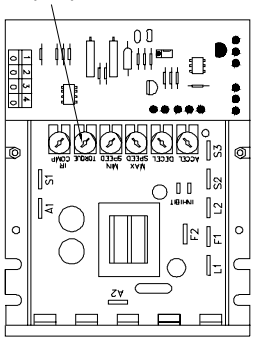
4. The calibration potentiometer should be adjusted so that armature voltage reads 180VDC (circuit board terminals A1 and A2). A clockwise rotation will increase the voltage.



Torque potentiometer

This feature protects both the motor and control against high surge currents. It will be factory set to match the horsepower of a particular motor. This should not be field adjusted. Adjustment is required only if the hot-melt motor is being changed to a different horsepower rating. Consult Valco's engineering department for adjustment procedures.

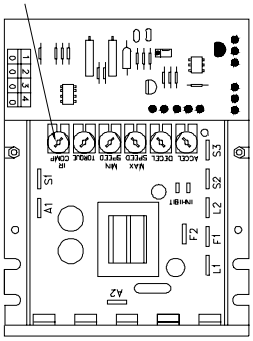
Torque potentiometer



IR compensation potentiometer

For automatic mode only. IR Compensation (IR Comp) is provided to substantially improve load regulation. If the load presented to the motor does not vary substantially, the IR Comp may be set at a minimum level - approximately one-quarter of the full setting. If superior performance is desired (less than 2% speed change of base speed from zero to full load), the IR Comp should be adjusted as follows:

IR compensation potentiometer



1. Set the IR Potentiometer at approximately 50% of travel. Run the motor at approximately one-third speed and record the revolutions per minute.

2. Run the motor with a maximum load and adjust the IR Potentiometer so that the motor speed under the load equals the unloaded speed (see step one above).

3. Remove the load and recheck the unloaded revolutions per minute. If the unloaded revolutions per minute have shifted, repeat step two for more exact regulation.

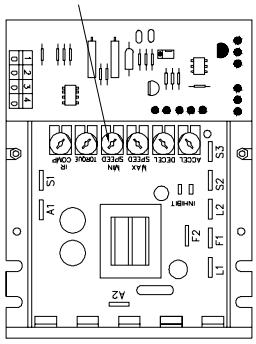
The control is now compensated to provide minimal speed change under large variations of applied load. If the IR Compensation is set too high, unstable motor operation will occur. This will be evident if the motor speed increase and decreases in a cycle. To correct this problem, rotate the IR Compensation Potentiometer counterclockwise.

Minimum speed potentiometer

For manual mode only. Adjust as follows:

1. Place selector switch in the manual position.
2. Set the glue flow knob on the hot-melt unit to the full counterclockwise position.
3. Adjust the minimum speed potentiometer to the desired motor speed. A clockwise rotation will increase the motor speed.

Minimum speed potentiometer

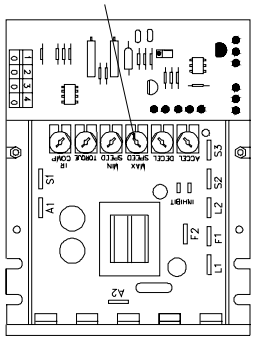


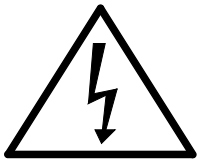
Maximum speed potentiometer

For manual mode only. Adjust as follows:

1. Place the selector switch in the manual position.
2. Set the glue flow knob on the hot-melt unit to the full clockwise position.
3. Adjust the maximum speed potentiometer to the desired motor speed. A clockwise rotation will increase the motor speed.

Maximum speed potentiometer



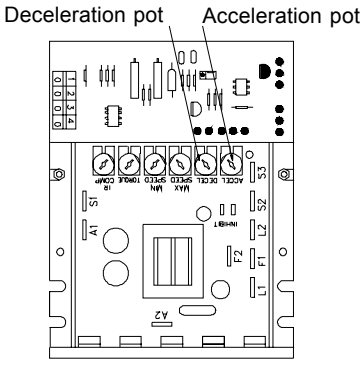


Do not exceed 180VDC armature voltage (circuit board terminals A1 and A2).

Note:
The minimum speed adjustment will affect the maximum speed setting. Therefore, it is necessary to readjust the maximum speed after the minimum speed has been adjusted. It may also be necessary to repeat the operations until both the minimum and maximum speeds are set to the desired levels.

Deceleration/acceleration potentiometers

This feature provides a means of adjusting the length of time it takes for the motor to accelerate (Accel) and decelerate (Decel) in response to parent machine speed changes. Both potentiometers should be fully counterclockwise.



V300 card minimum speed

The "Transducer Zero Adjust" potentiometer on the V300 card will adjust the level of speed at which the circuit will be activated. A counterclockwise turn will increase the minimum speed level. A clockwise turn will decrease the minimum speed level.

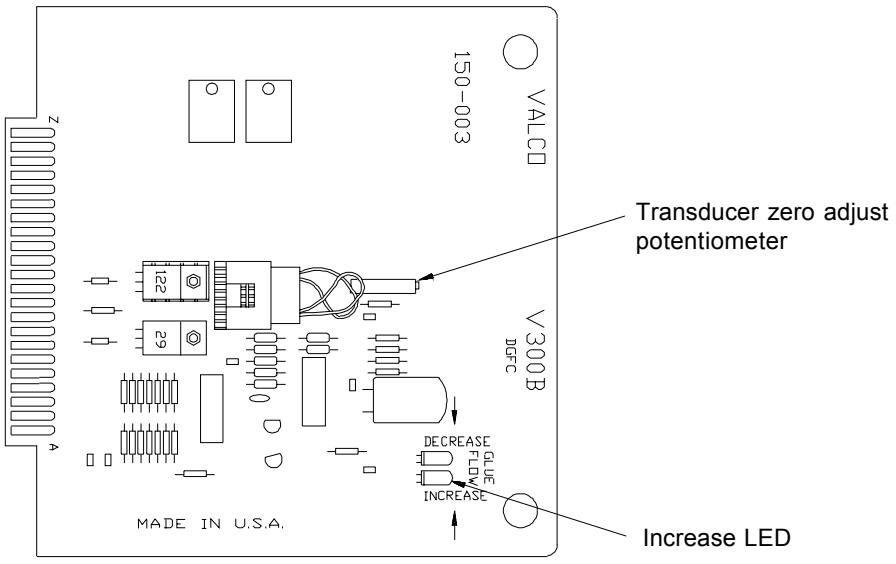
1. Operate the parent machine at the speed at which hot-melt flow is not required. (This may be when the parent machine is idle.)

2. Observe the increase LED on the V300 card.

   If the LED is illuminated,
   turn the "Transducer zero adjust" potentiometer slowly clockwise. Stop turning when the light goes out.

   If the LED is not illuminated,
   turn the "Transducer zero adjust" potentiometer counterclockwise. Stop turning when the LED illuminates. Then slowly turn the potentiometer clockwise. Stop when the light goes out.

V300 card



Chapter 2

Maintenance and adjustments

Chapter 2 contents

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Maintenance and adjustments

Introduction

The Flexoseal® system is an electronically-controlled lap gluing system. Using an enclosed extrusion glue system, the Flexoseal® equipment applies precise glue patterns to inside or outside laps at speeds up to 1200 feet per minute (366 meters per minute).

The Flexoseal® system consists of three components:

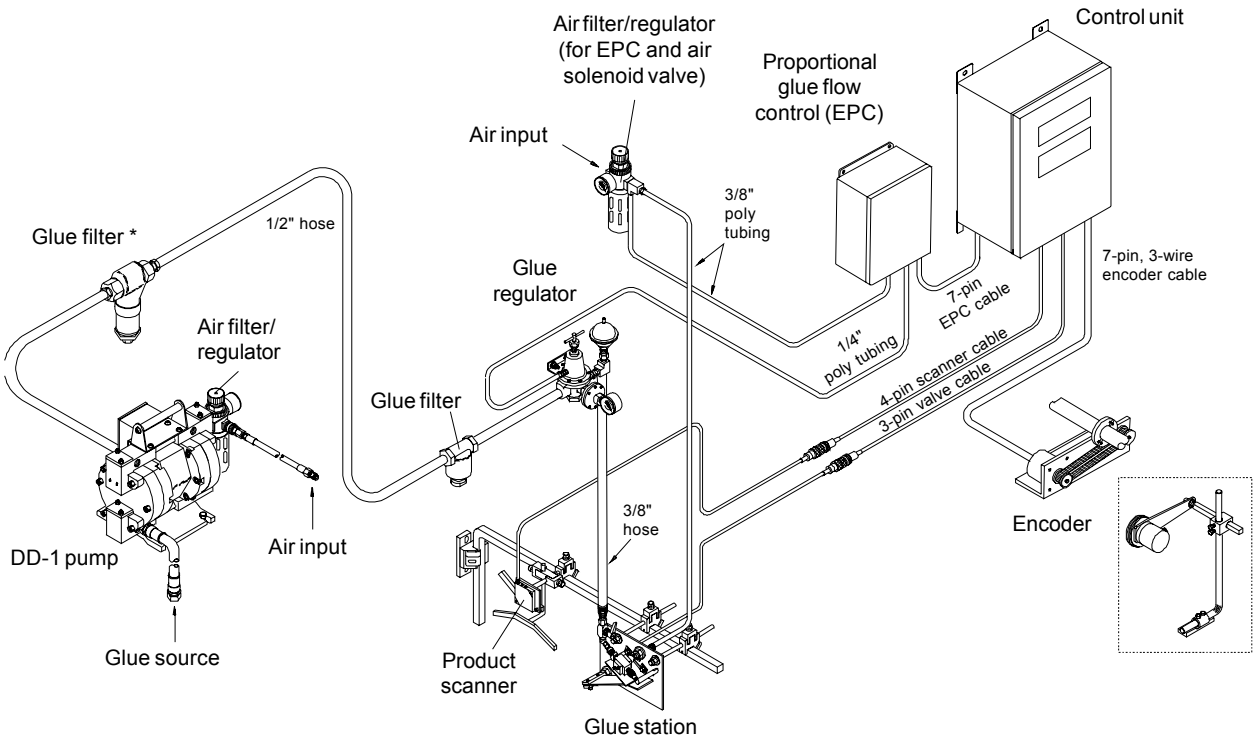
- Pumping system
- Applicator system
- Control system

High-quality sealing at all parent machine speeds (up to 1200 feet/366 meters per minute) is possible. Very little maintenance is required. The system produces good mechanical seals due to the adhesive penetration caused by the direct application of the glue. The bond is excellent due to the uniform pattern application.

Operator attention is minimal. Because the system is enclosed, it stays clean. The Flexoseal® system requires very little cleaning.

The system is modular in design. Quick-disconnect fittings are used for the applicator assemblies. The glue pattern is programmed by using two sets of switches on the front panel of the control.

Typical Flexoseal® system



* This filter is necessary only when using a central pumping system for more than one parent machine.

Functional description

The Flexoseal® system applies glue only when a box is present, and only when the machine is running faster than the minimum speed. The line shaft of the parent machine drives the shaft encoder. The encoder supplies machine speed information to the Flexoseal® control system. The control system adjusts the glue pressure and pattern dimension for precise glue application.

The gluing cycle is started when a box is detected by the scanner. The control system begins measuring the box. The measuring phase ends as the leading edge of the box (front flap) reaches the glue applicator.

The “Flap” and “Glue” switches on the front panel of the control are set by the operator. The “Flap” value represents the point at which the glue should begin on the box. The “Glue” value represents the point at which the glue should stop. Once these values are set, the system requires only occasional inspection of the glue level and the quality of the application.

Safety

Although the Flexoseal® system has few moving parts, the components are mounted on machinery with many moving parts. Therefore, the following safety guidelines should be used:

1. Turn the parent machine off before working on the Flexoseal® system.

2. Use extreme caution when working with the encoder.

    - Never touch the encoder, the pulleys or belt while the parent machine is running.

    - Never touch the line shaft of the parent machine.

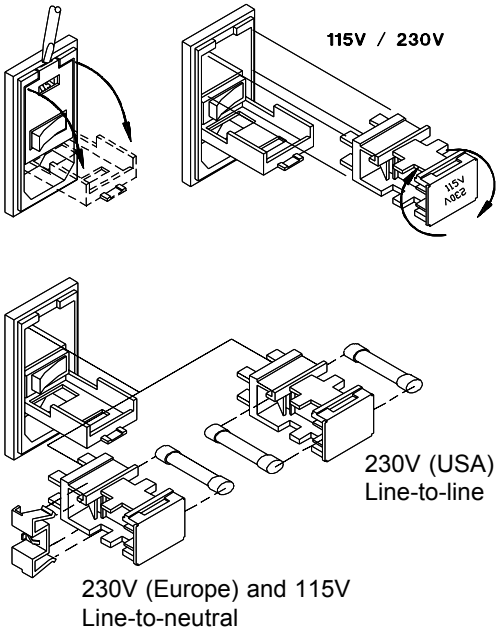
    - Always cover the shaft encoder when service is complete.

3. If you have questions about the operation or safe use of the system, please contact Valco Cincinnati for assistance.

Voltage and fuse selection

The fuse holder on the bottom panel contains the fuse drawer which allows for 115 or 230VAC operation.

1. Remove all electric power from the unit.
2. Remove the power cord.
3. Use a small screwdriver to open the hinged door of the fuse holder.
4. Remove the fuse drawer. Make sure that the fuses in the holder remain in place.
5. The drawer is labeled “230V” and “115V.” Rotate the drawer to the appropriate voltage. The operating voltage will be seen through the window in the fuse holder door.
6. For line-to-neutral operation, use the shorting clip (jumper) and one fuse. The shorting clip must be on the left side (when rotated to read the correct voltage). For line-to-line operation, use two fuses.
7. Replace the drawer in the fuse holder and close the door of the fuse holder.



The line cord supplied can be directly wired to a branch circuit or, with the proper plug type, plugged into a 115 or 230 VAC outlet socket. The wire colors of the supplied line cord are as follows:

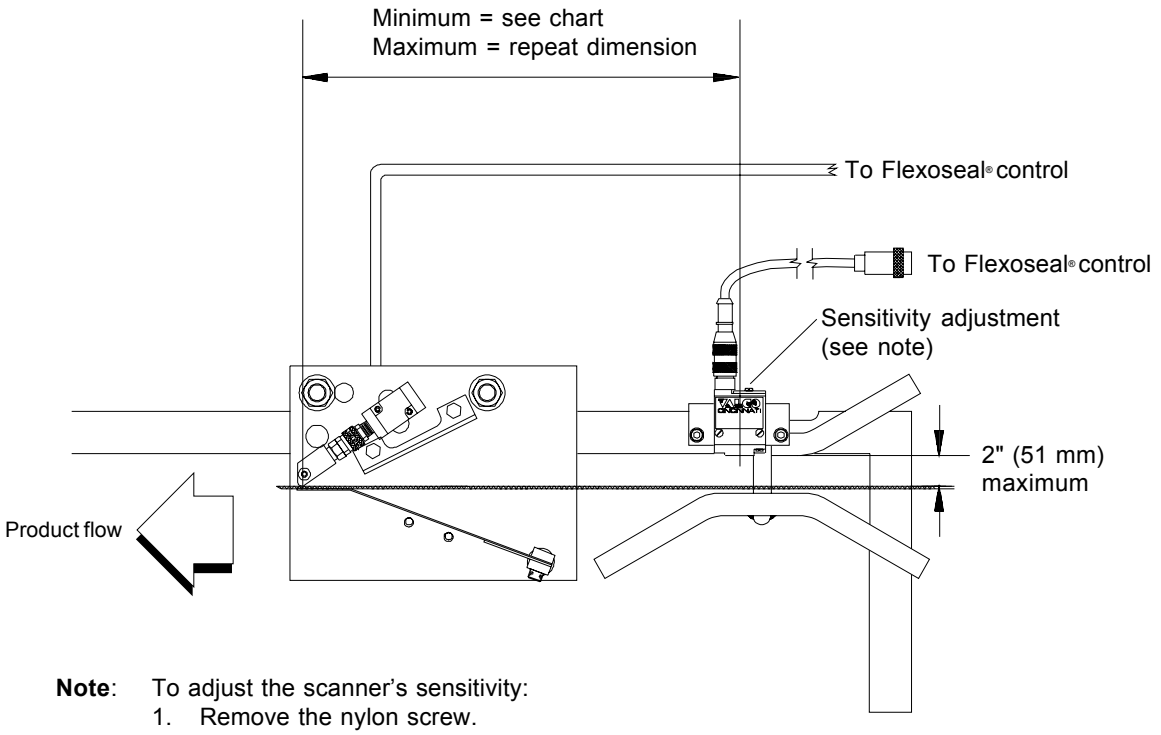
	International Line Cord	North American Line Cord
Line	Brown	Black
Neutral	Blue	White
Ground	Green/Yellow	Green

Scanner position

The distance between the scanner and the valve's nozzle cannot exceed the distance from the leading edge of one product to the leading edge of the next product (repeat dimension).

The minimum distance allowed between the scanner and the valve will be greater at high machine speeds. The following is a general guide.

Speed	Minimum distance
100 ft/min (30.48 m/min)	1" (25.4 mm)
500 ft/min (152.4 m/min)	2" (51 mm)
1000 ft/min (304.8 m/min)	4" (102 mm)
1250 ft/min (381 m/min)	5" (127 mm)
1500 ft/min (457 m/min)	6" (152 mm)



Note: To adjust the scanner's sensitivity:
1. Remove the nylon screw.
2. Turn clockwise to increase sensitivity.
   Turn counterclockwise to decrease sensitivity.
3. Replace screw after making adjustment.

Initial checks of the Flexoseal® control

Perform these initial checks:

1. Make sure that the control is turned on and the line fuse is okay (the power light is illuminated).

2. Set the “Flap” and “Glue” switches.

3. Select the correct valve (“Gun”).

Operation

Changeover

The changeover procedure includes replacing the applicator assembly and applicator head, and positioning the assembly for proper pattern placement.

Warning: Do not adjust the width of the folding section of the parent machine unless the machine is open between the roll and the folding sections. The glue station may be torn off of the machine.

Changing the applicator assembly

1. Turn off the parent machine.
2. Close and disconnect the glue line at the applicator head and at the machine's main shutoff.
3. Disconnect the air line from the assembly.
4. Disconnect the solenoid air valve at the quick-disconnect fitting.
5. Remove the applicator head and install the stopper.

6. Clean the applicator head.
7. Remove the applicator assembly.
8. Install the proper assembly.
9. Reconnect the solenoid cable, glue line, and air line.
10. Position the assembly for the proper pattern placement.

Changing the applicator head

Select the applicator head. The glue pattern width is determined by adding 6 mm to the center-to-center distance between the two outer veins. This allows for approximately 3 mm of excess on each side of the pattern. When changing applicator heads, be sure to clean the head thoroughly after it is removed. The head is connected with a quick-disconnect fitting. Hold the backup spring away from the assembly and fit the head into position.

Setting the lateral position of the assembly

1. Adjust the main brackets to the approximate position.

2. Run a box into the glue station.

3. Set the actual position.

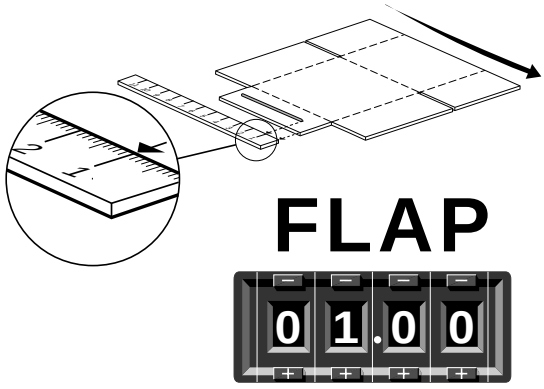
4. Tighten all bolts.

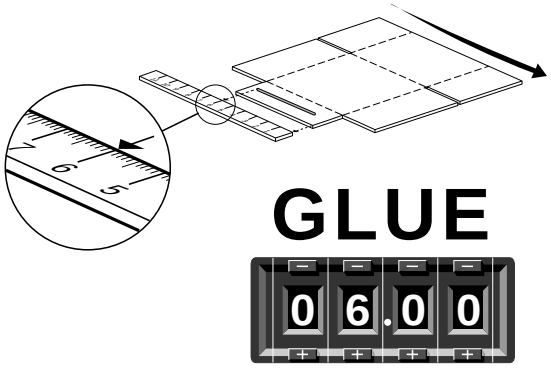
Setting the glue pattern control

1. Use a ruler to measure the distance from the leading edge of the box flap to:
   - the starting point of the pattern, and
   - the stopping point of the pattern.

2. Set the “Flap” and “Glue” switches on the front panel of the control.

   Note: The “Flap” switches should always indicate a lower number than the “Glue” switches.

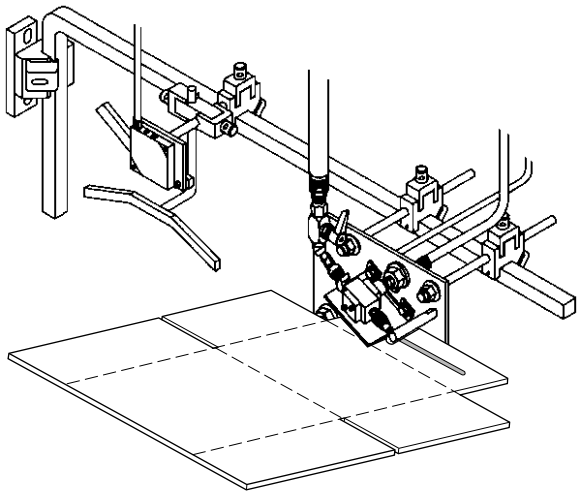




Checking the adjustment

1. Run a few boxes and check the pattern. (The parent machine must operate at or above the minimum speed setting.)

2. Make any adjustments required and recheck the pattern.



Adhesives

Rules for selecting an adhesive for use in the Flexoseal® system:

1. Use a good, machineable grade of water-resistant adhesive.

2. Viscosity;
   Contact applications,
   1500-2000 cps (mps) at 72-75°F (22-23°C)
   Non-contact applications,
   300-800 cps (mps) at 72-75°F (22-23°C)

3. Never use adhesives with extenders or fillers.

4. Never use a latex-based adhesive.

   Note: Never mix resin-based and dextrin-based adhesives. Always check adhesive compatibility before mixing. If in doubt of compatibility, flush the entire system before adding the adhesive.

Adhesive storage

1. Protect the adhesive from freezing.

2. Store adhesives away from outside walls.

3. Store the adhesive at room temperature for 3-4 days before use.

Pressure settings

Air pressure settings		
	Contact extrusion	**Non-contact extrusion**
Pressurized tank	60 psi / 5.1 bar / 515 kPa	70-120 psi / 5.8-9.2 bar / 583-929 kPa
DD-1 pump	80 psi / 6.5 bar / 653 kPa	80 psi / 6.5 bar / 653 kPa
2:1 ratio pump	80 psi / 6.5 bar / 653 kPa	80 psi / 6.5 bar / 653 kPa
5:1 ratio pump	40 psi / 3.7 bar / 377 kPa	40 psi / 3.7 bar / 377 kPa
Adhesive flow control (EPC)	80 psi / 6.5 bar / 653 kPa	60-80 psi / 5.1-6.5 bar / 515-653 kPa
Glue valves	80 psi / 6.5 bar / 653 kPa	Not applicable

Note 1: Pressures listed above indicate the minimum pressure setting while the parent machine is idle. Actual pressure may vary slighlty depending on glue viscosity.

Note 2: For pumping systems that include piston pumps (2:1 or 5:1), be sure to add lubricant to air-line oiler and pump packing cup if needed.

Glue pressure settings		
	Contact extrusion	**Non-contact extrusion**
Fluid regulator output	10-15 psi / 1.7-2 bar	20-30 psi / 2.4-3.1 bar

System start-up

1. Bleed adhesive through the system until no air is present at the shutoff valve. Remove any trapped air in the fluid regulator by turning the "T" handle fully clockwise, then fully counterclockwise while the adhesive travels from the regulator to the shutoff valve. (Repeat this procedure twice.)

2. While the parent machine is idle, set the fluid regulator at 10 psi (1.7 bar) for contact extrusion. Install a shutoff valve onto the applicator valve.

3. Bleed adhesive through the glue valve. Manually activate the air solenoid (contact valves) or activate the purge/test switch (non-contact valves).

4. Run a product through the machine until it reaches the glue station. Check the angle of the applicator head and the spring tension. Adjust if necessary.

5. Set the glue flow knob (located on the front of the control panel) to a vertical (12 o'clock) position. Select the proper position for the valve ("Gun") select switch. Turn on power to the control.

6. Measure the distance from the scanner to the glue valve and enter this dimension on the V401 (V451) card. The measurement should be from the point at which the scanner detects the product to the point at which adhesive exits the valve.

7. Turn the turn on and off compensation potentiometers (potentiometer card) fully counterclockwise.

8. Adjust the zero transducer potentiometer (V300 card) while observing the pressure gauge on the EPC. Adjust the potentiometer until the gauge indicates slightly more than zero. This adjustment should be performed while the parent machine is idle.

9. Set the “Flap” and “Glue” switches on the front panel of the control. (The longest possible pattern length will provide the best sample for calibration.)

10. Run several samples at the slowest possible speed. Check the actual pattern length with the values entered for “Flap” and “Glue.” (The difference between the two settings should be the length of the pattern.) If the length of the pattern does not match the settings, adjust the ratio compensation setting (V100 card).

    Increase the ratio compensation setting in order to decrease the pattern length.

    Decrease the ratio compensation setting in order to increase the pattern length.

11. Fine-tune the cell-to-gun setting (V401/V451 card) in order to match the start of the actual glue pattern with the “Flap” setting on the control.

12. Adjust the “T” handle of the fluid regulator for proper adhesive volume at low parent machine speed. Be sure to retighten the sealing nut after adjusting.

13. Increase the speed of the parent machine to approximately 80% of maximum speed. Check the product of any pattern shift. Adjust the turn on and off compensation potentiometers (potentiometer card) to compensate for pattern shifts.

14. Check the volume of adhesive at high parent machine speed. Adjust the volts potentiometer (V200 card) if necessary. The glue flow knob (located on the front panel of the control) should be in the vertical (12 o’clock) position.

15. Adjust the minimum speed potentiometer (V200 card) if necessary.

Adjustment

Warning: All dimensions and gauge settings listed in this section should be set before operating the Flexoseal® system. Variations in product and adhesive may require further adjustment.

Glue pump and pressure system

The following adjustments are for a DD-1 pump system.

The DD-1 system uses a pneumatic pump to supply glue to a fluid regulator. The regulator controls the flow of glue to the applicator assembly. Under the control of an electronic, proportional flow control unit (EPC), the regulator raises or lowers the glue pressure to compensate for changes in parent machine speed.

Air Setting

The air pressure at the pump should be set to 80 psi (5.5 bar) minimum in order to provide adequate glue flow.

Warning: For proper operation, clean, dry air must be supplied to the pump. Never allow the pump to operate if there is no glue in the vat or barrel. The pump may be damaged if allowed to operate without adhesive.

Setting the glue flow control (EPC)

1. Set the glue flow knob (located on the front panel of the control) to a vertical (12 o'clock) position.

2. Turn on the air supply.

3. Operate the parent machine just above the minimum speed.

   - Observe the quantity of glue being applied.
   - Adjust the volume of applied glue by turning the "T" handle on the fluid regulator.
   - Increase the speed of the parent machine to 50-60% of maximum speed. Fine-tune the glue volume by adjusting the glue flow knob located on the front panel of the control.

4. Make sure that the glue volume remains stable after adjustment. If the system is not stable, see the troubleshooting section for corrective measures.

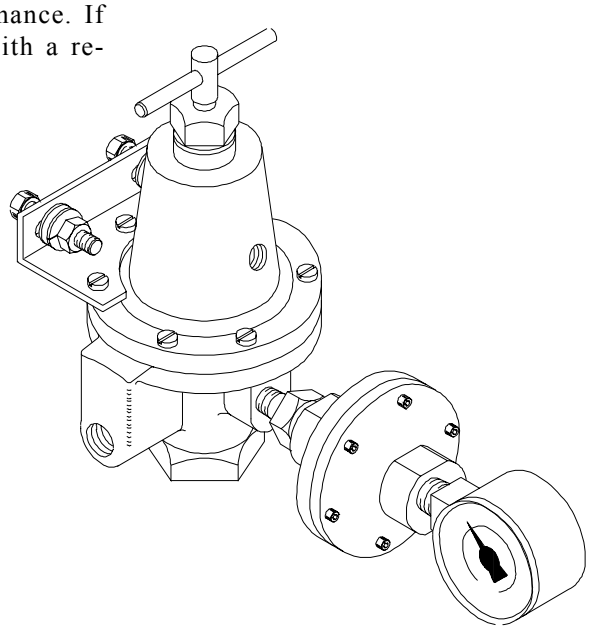
Fluid regulator

The fluid regulator is pneumatically controlled and consists of:

- the fluid regulator, and
- a pressure gauge.

The regulator operates in conjunction with the EPC. The regulator is manually set to its minimum pressure with a “T” handle. The air line from the EPC allows the regulator to increase glue pressure up to the maximum glue source pressure.

The gauge normally requires no maintenance. If required, the regulator can be rebuilt with a repair kit (593xx038).



Applicator assembly

There are four versions of the applicator assembly which permit glue to be applied to the top, bottom, left side, or right side of the box. The applicator assembly consists of an air solenoid valve, a glue valve, and an applicator head. Mounting brackets hold the assembly in place. The top and bottom application versions use the same mounting position to facilitate service. The applicator head applies glue through a series of veins. The veins are normally on 6.35 mm centers. Special patterns are available upon request.

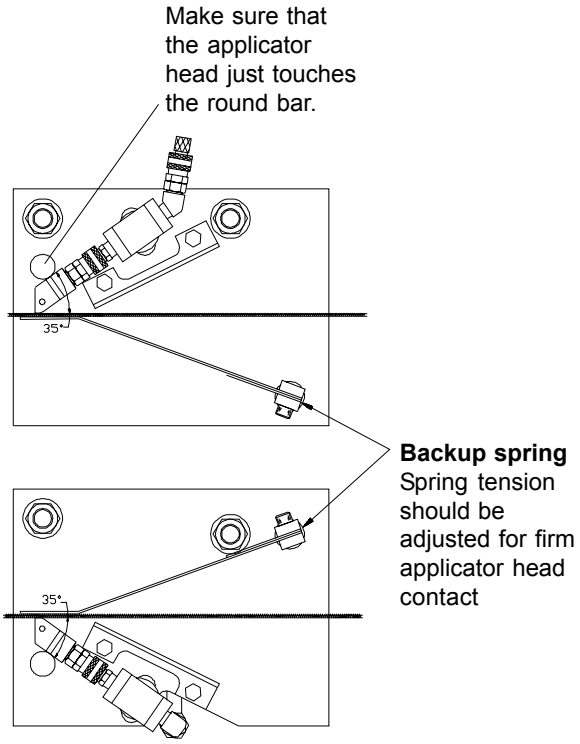
Setting the head angle

1. Stop the parent machine with a box under the applicator head.

2. Use the head angle gauge (supplied with the system) to check the angle of the applicator head.

3. If the angle is incorrect:

    - loosen the valve and support bracket
    - set the angle of the applicator head and lock into place
    - Position the support bracket against the applicator head and tighten the bolts. The aluminum back plate may be marked for future reference.



Backup spring

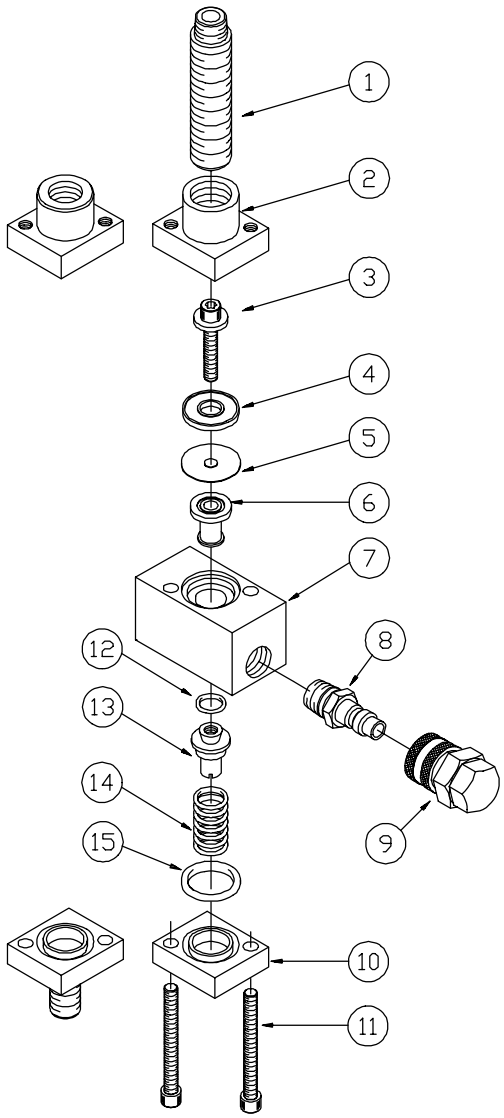
The backup spring holds the box against the applicator head. The spring locks into position on the mounting shaft with two nuts. To set the tension, place a box between the applicator head and the spring. Loosen the mounting nut and press the spring firmly against the box. Tighten the spring into position and check that it does not hold the box too tightly. The box must be held firmly without restricting the movement through the glue station.

Glue valve

The air-opened glue valve is controlled through the air solenoid valve. The glue valve allows glue to flow to the applicator head.

Cleaning the valve

1. A valve seal kit should be available in case defective or worn parts are found.
2. Place the valve on a work bench or other solid surface.
3. Loosen the two screws (11), the lower retainer (10), and the pilot inlet (2).
4. Remove the stem bottom (13) from the stem screw (3).
5. Remove and disassemble all parts from the stem screw (3).
6. Clean all parts with clean water.
7. Inspect all of the parts and replace any worn or defective parts.
8. To reassemble, place the diaphragm (4) on the stem screw (3) and hold into position. Place the diaphragm protector (5) on the stem screw (3). Screw the stem top (6) to the stem screw (3) and tighten with fingers.
9. Install the parts into the body over the spring (14).
10. Place the valve seat (12) over the stem bottom (13) and screw the stem bottom onto the stem screw (3) for a tight fit.
11. Install the lower retainer (10) and pilot inlet (2) onto the body (7) using the two assembly screws (11).
12. Replace the valve onto the applicator assembly.



Air solenoid valve

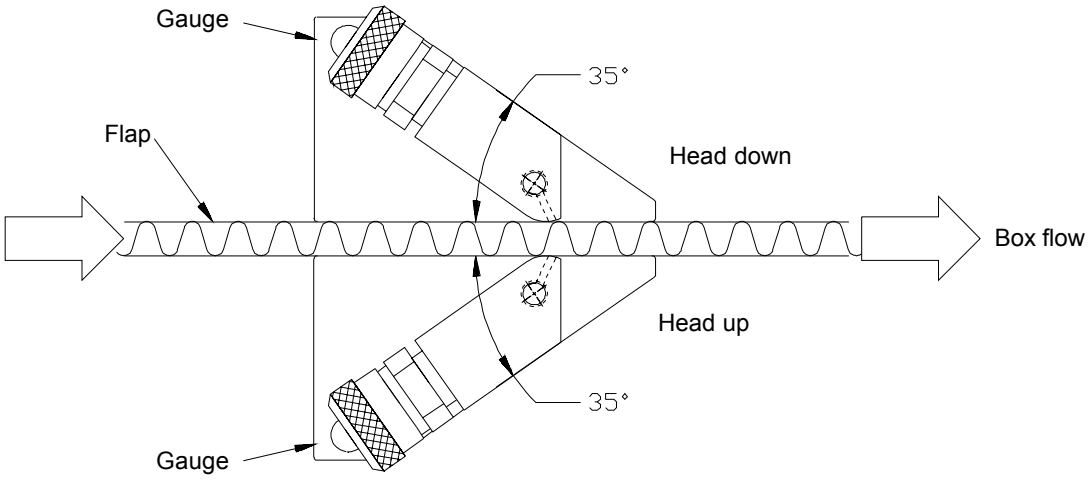
To check the air flow of the solenoid valve, disconnect it from the glue valve. If glue is present in the solenoid or its exhaust, the glue valve's diaphragm has ruptured. The glue valve must be repaired and the air solenoid valve must be disassembled and cleaned before the valve can be used again.

Head angle gauge

The applicator heads must be adjusted to the proper angle to prevent poor adhesive patterns and/or dripping.

Each applicator head should be adjusted with a box flap in the application position. Place the gauge on the box flap. Compare the angle with the illustration seen below.

If the glue pattern is not acceptable after adjusting the head angle, see the troubleshooting section for further details.



Control panel features

Flap switches (start of pattern)
Used to set the start point of the glue pattern. Values can be entered up to:
99.9 inches for 3-digit imperial systems
99.99 inches for 4-digit imperial systems
999 millimeters for 3-digit metric systems
9999 millimeters for 4-digit metric systems

Glue switches (end of pattern)
Used to set the point at which the glue pattern will end. Values can be entered up to:
99.9 inches for 3-digit imperial systems
99.99 inches for 4-digit imperial systems
999 millimeters for 3-digit metric systems
9999 millimeters for 4-digit metric systems

On flap light
When lighted, this light indicates that the product has reached the applicator head but gluing has not yet started.

Sensor (cell) to gun light
When lighted, this light indicates that the product has been seen by the scanner. The measuring cycle is in progress.

Product counter
Indicates the number of products that have been glued.

Power switch
When this switch is in the ON position, AC power is supplied to the control.

Power on light
When lighted, the light indicates that AC power is being supplied to the control.

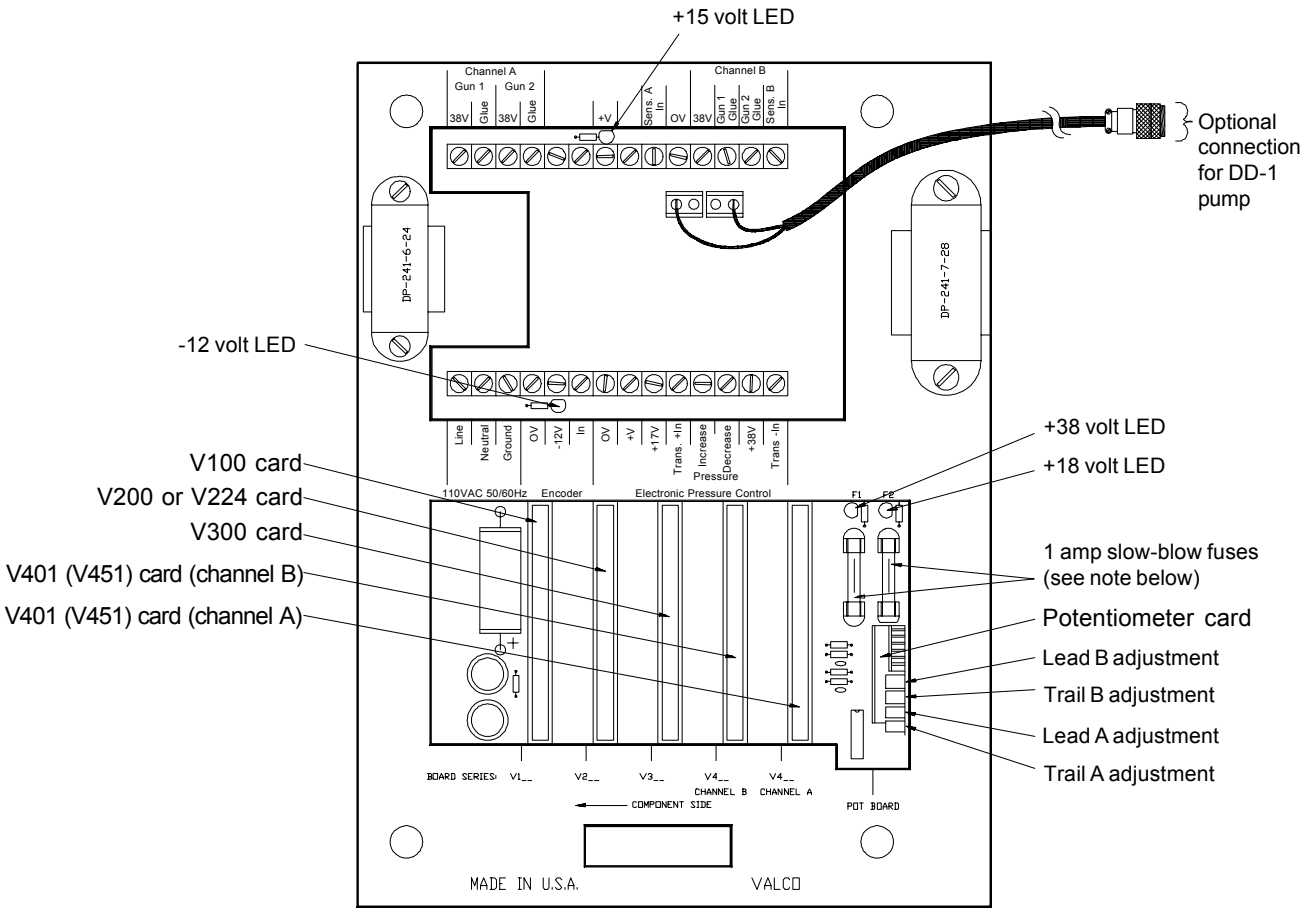
Glue flow adjust knob
Allows fine adjustment of glue volume.

Gluing light
When lighted, the light indicates that glue is being applied to the product.

Note: If the parent machine is below the minimum speed setting, the gluing light will not illuminate and glue will not be applied to the product.

Gun (valve) selector switch
Allows for the selection of gun 1, gun 2, or both.

Internal controls

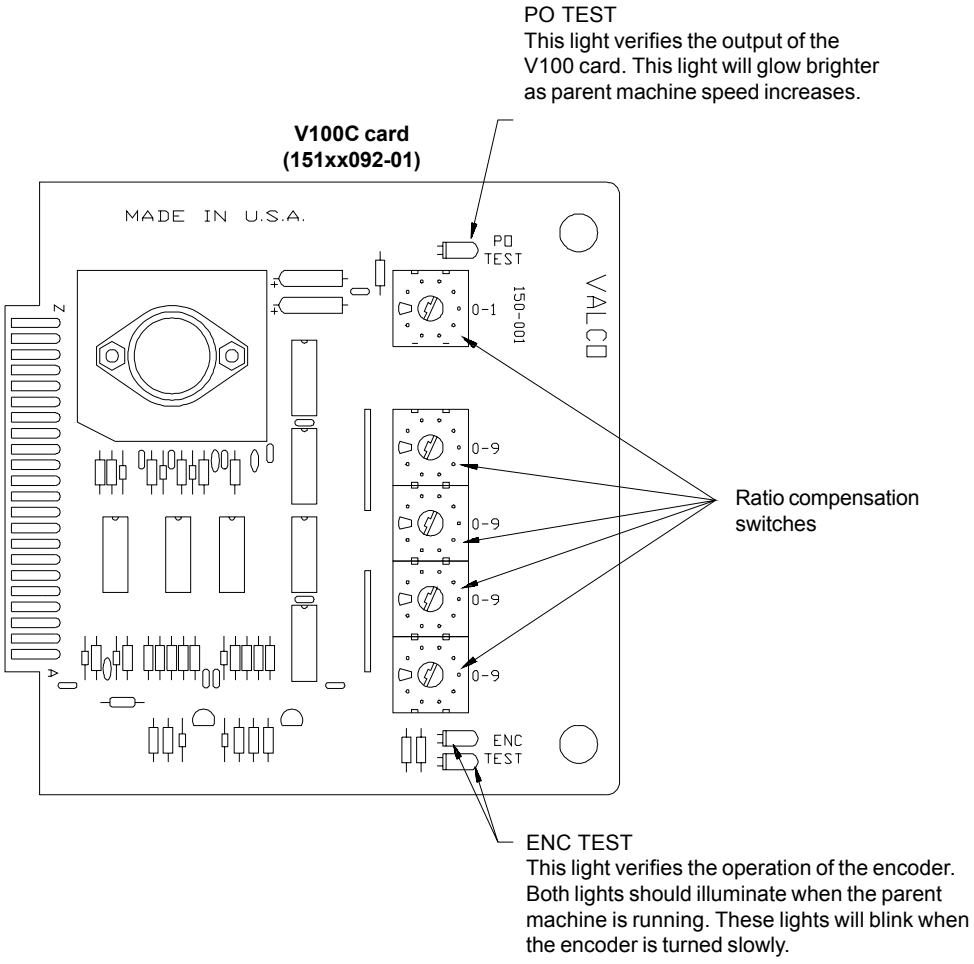


Motherboard

Note: Use a 2-amp slow-blow fuse (085xx017) if this card is used with a high-speed, non-contact valve driver (153xx001)

V100C card

The V100C card is an interface card between the Flexoseal® control and the parent machine. The encoder produces "counts per inch or millimeter." Since the encoder produces less than the 100 counts per inch/millimeter required by the control, the V100C card multiplies the encoder count by a "ratio compensation" which is selected via the switches on the card. The larger the ratio compensation value, the shorter the pattern. The smaller the value, the longer the pattern.



Ratio compensation setting calculation (imperial)

Ê _____ ÷ _____ x _____ = n

Number of teeth of the line shaft pulley

Number of teeth of the encoder pulley

"5" if the encoder is a VCE250
"10" if the encoder is a VCE500
"20" if the encoder is a VCE1000

Ë _____ ÷ n = **Ratio compensation setting**

Material travel in inches per revolution of the drive shaft

(Enter this value into the ratio compensation switches on the V100C card.)

Example
If you have a line shaft pulley with 92 teeth, an encoder pulley with 28 teeth, a VCE250 encoder, and the material travel is 17 inches, the ratio compensation setting is 1.0348, calculated as follows:

Ê 92 ÷ 28 x 5 = 16.429

Ë 17 ÷ 16.429 = **1.0348**

The highest number available on the V100 card is 1.9999.
If your calculation results in a number higher than 1.9999, you must switch to the next highest encoder or change the pulley size. The ideal ratio compensation setting is between 1.0000 and 1.2500.

Ratio compensation setting calculation (metric)

Ê _____ ÷ _____ x _____ = **n**

Number of teeth of the line shaft pulley

Number of teeth of the encoder pulley

"250" if the encoder is a VCE250
"500" if the encoder is a VCE500
"1000" if the encoder is a VCE1000

Ë _____ ÷ **n** =

Material travel in millimeters per revolution of the drive shaft

Ratio compensation setting
(Enter this value into the ratio compensation switches on the V100C card.)

Example (standard resolution, 1 pulse per millimeter)
If you have a line shaft pulley with 72 teeth, an encoder pulley with 24 teeth, a VCE250 encoder, and the material travel is 884 mm, the ratio compensation setting is 1.1787, calculated as follows:

Ê 72 ÷ 24 x 250 = 750

Ë 884 ÷ 750 = **1.1787**

The highest number available on the V100 card is 1.9999.
If your calculation results in a number higher than 1.9999, you must switch to the next highest encoder or change the pulley size. The ideal ratio compensation setting is between 1.0000 and 1.2500.

V200 (V224) card

The V200 card is the power supply card. The V200 card contains a valve driver circuit and is used with a 3-way or 4-way valve. The V224 does not contain a valve driver circuit and is used as a valve interface.

The card can be used to adjust the reponse time of the EPC (pulse width adjustment), the glue pressure at high machine speed (volts adjustment), and the parent machine minimum speed threshold.

Pulse width adjustment

The pulse width adjustment controls the minimum speed response time of the automatic glue flow system (EPC). The response of the EPC can be increased by turning the adjustment slightly clockwise. This adjustment is set at the factory and should not be adjusted.

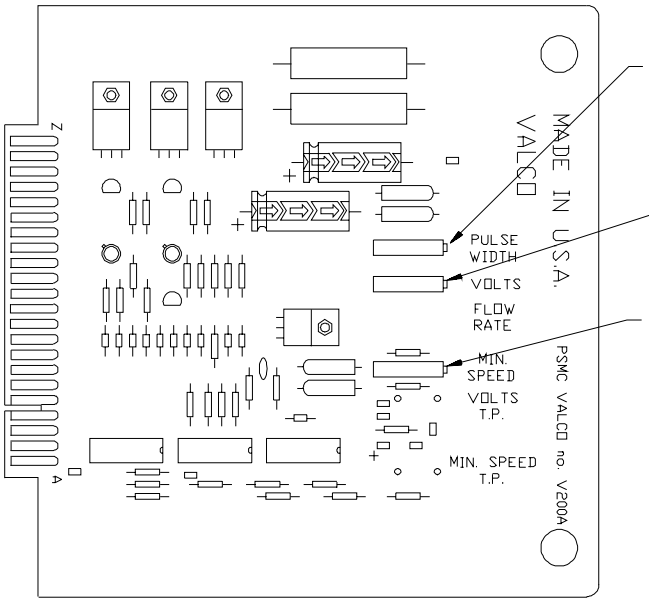
Volts adjustment

This adjustment controls the glue pressure at high machine speed. When making this adjustment, the parent machine must be operating at 50% or more of maximum speed. The glue flow adjust knob (located on the front panel of the control) must be vertical (12 o'clock position).

Minimum speed

This adjustment controls the minimum parent machine speed at which gluing will begin. This adjustment is normally set at approximately 5% of maximum machine speed. An LED on the V401/V451 circuit card will illuminate when the parent machine is operating above the minimum speed setting (see "V401/V451 card" in this section of the manual).

V200 card
(151xx002-01)



Pulse width
The normal setting is fully counterclockwise. The response of the pressure regulating system may be increased by turning this potentiometer slightly clockwise.

Volts
This adjustment controls the glue application pressure at high machine speed. When making this adjustment the parent machine must be operating at 50% or higher of maximum speed and the glue flow knob (located on the front panel of the control) must be in a vertical (12 o'clock) position.

Min. (minimum) speed
This potentiometer is used to adjust the speed at which the glue valve will stop gluing. This potentiometer is factory-set and should not be adjusted. An LED on the V401 (V451) card will illuminate when the parent machine is operating above the minimum speed set by this potentiometer.

Note: V200 cards will not operate with units containing a TPS-400 photocell and light source. The unit must be updated to use a current scanner.

V300 card

This card automatically adjusts the glue pressure in relation to the speed of the parent machine.

Zero transducer

This potentiometer calibrates an individual pressure transducer to the system. This adjustment should be made while the control is on and the parent machine is idle. It should be adjusted so that the EPC pressure gauge indicates zero and neither the increase or decrease LEDs are illuminated.

Decrease

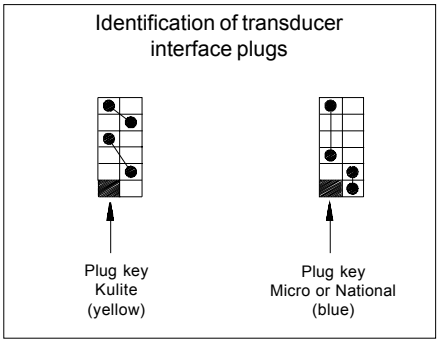
This light illuminates when the EPC exhaust solenoid is activated.

Increase

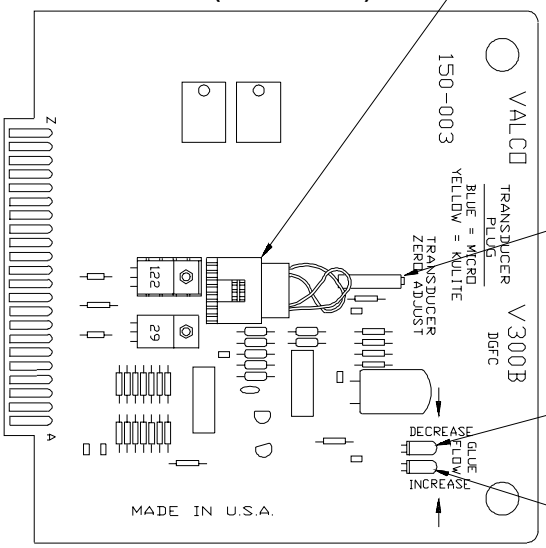
This light illuminates when the EPC inlet solenoid is activated.

Plug-in socket

The plug-in socket is provided to allow the V300 card to be used with a variety of pressure transducers.



V300B card (151xx003-01)



Plug-in socket
For use with a variety of pressure transducers.

Zero transducer
Calibrates an individual pressure transducer to the system. It should be adjusted while the control is on and the parent machine is idle. It should be adjusted so that the EPC pressure gauge indicates zero and neither the increase or decrease LEDs are illuminated.

Decrease
This light illuminates when the EPC exhaust solenoid is activated.

Increase
This light illuminates when the EPC inlet solenoid is activated.

Note: All new EPC-5 units, and all replacement transducers for older units use a microswitch transducer. Use the plug with blue wiring for proper EPC operation.

V401 (V451) card

The V401 (V451 for metric systems) card calculates all length measuring functions.

Cell (sensor)-to-gun switches

The distance between the product scanner and applicator head. Increasing this value will shift the entire glue pattern back. Decreasing this value will shift the entire glue pattern forward.

401 card (inches)
Enter the value in tenths of inches.
Example: 13-1/2" is entered as 135.

451 card (millimeters)
Enter the value in millimeters.
Example: 100 mm is entered as 0100.

Glue enable light

This light will illuminate when glue is being applied to the product. (The V401/V451 card activates the gun-driving transistor on the V200 card.)

Minimum speed light

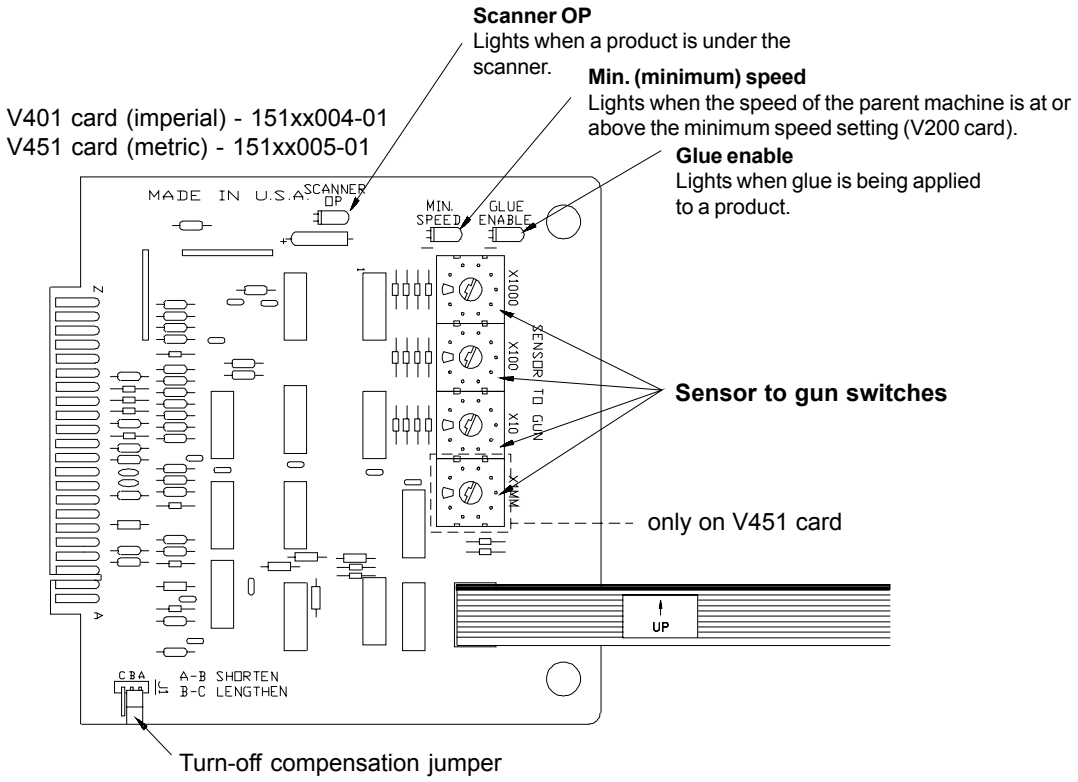
This light will illuminate when the parent machine is operating above the minimum threshold speed set on the V200 card.

Scanner op light

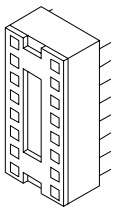
This light will illuminate when the product is detected by the scanner.

Turn-off compensation jumper

This jumper is used to change the effect of the turn-off compensation (Trail A and Trail B) on the potentiometer card. The “A/B” combination will shorten glue patterns when the Trail A or Trail B potentiometers (located on the potentiometer card) are turned clockwise. The “B/C” combination will lengthen glue patterns when the Trail A or Trail B potentiometers are turned clockwise. (See “Potentiometer card.”)



Note: When using V401 (V451) cards with the green, 16-pin ribbon cable connector on older Flexoseal® controls (COPAR), an adapter must be used to connect the old thumbwheel switch connector with the new connector on the card.



This adapter (16-pin, low-profile DIP-IC socket) can be purchased through most local electronics stores.

Potentiometer card

The potentiometers on this card are used to adjust pattern shifts at high machine speed. The pattern shifts are normally the result of belt and drive slippage and not variations in the electronic control.

Lead A

This adjustment is used to adjust the start point of the channel A glue pattern at high machine speed. This potentiometer should be fully counterclockwise to begin the adjustment.

- Operate the parent machine at approximately 50% of maximum machine speed.
- Check the glue pattern on the product. The length of the glue pattern should be the same as the value of the front-panel switches.
- Operate the parent machine at high speed.
- Check the glue pattern on the product. If the glue pattern has shifted, turn the Lead A adjustment clockwise to correct the position of the glue pattern.

Trail A

This adjustment is used to adjust the end point of the channel A glue pattern at high machine speed. This potentiometer should be fully counterclockwise to begin the adjustment.

- Adjust the Lead A potentiometer according to the instructions above (see “Lead A adjustment”).
- If the glue pattern is too long, turn the Trail A adjustment clockwise until the desired pattern appears on the product.

Lead B

This adjustment is used to adjust the start point of the channel B glue pattern at high machine speed. Use the same procedure listed for channel A (“Lead A”).

Trail B

This adjustment is used to adjust the end point of the channel B glue pattern at high machine speed. Use the same procedure listed for channel A (“Trail A”).

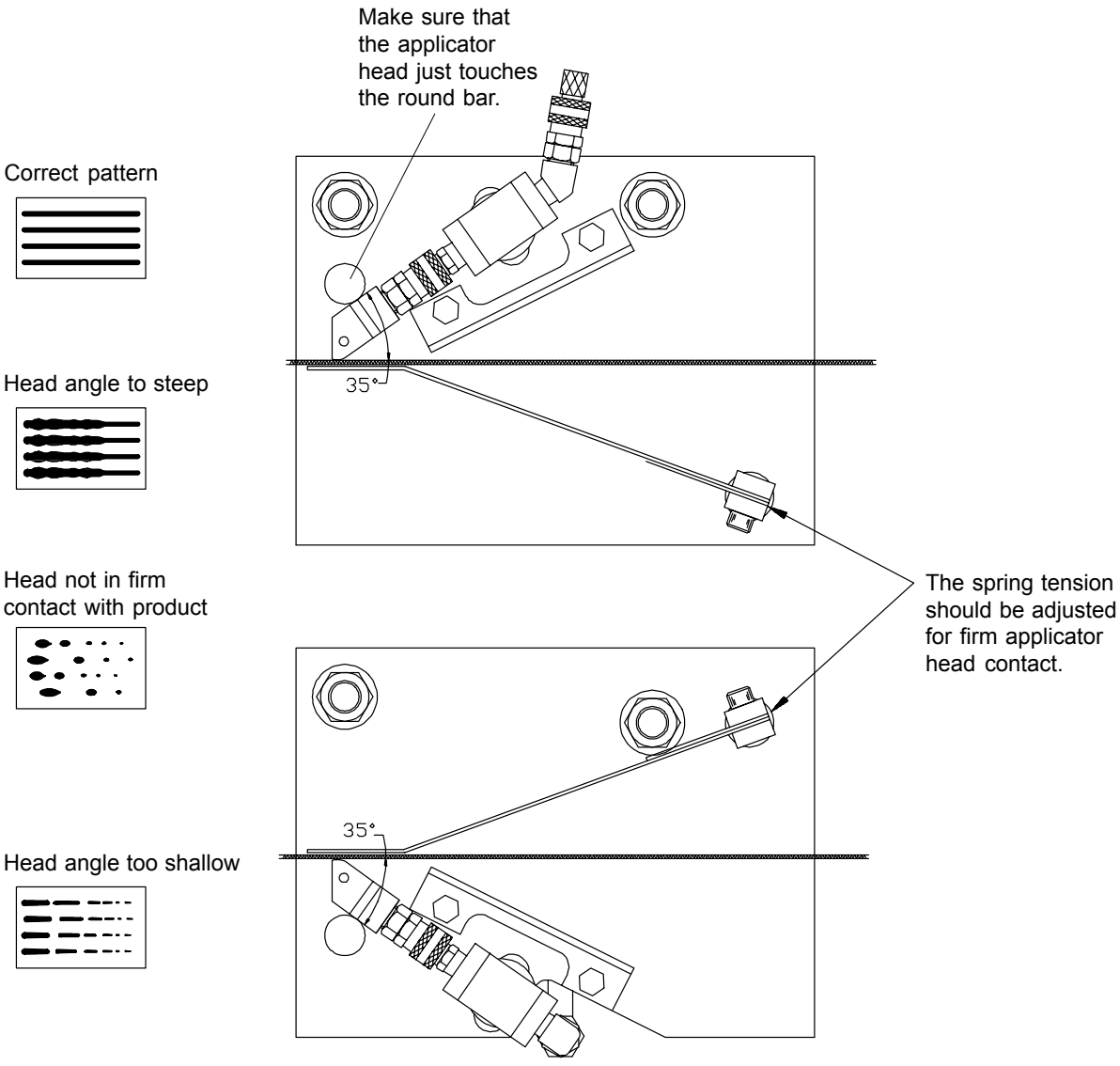
EPC (Electropneumatic control)

The EPC raises or lowers glue application pressure by controlling the boost pressure in the dome of the fluid regulator. The reference pressure in the system is set by adjusting the volts potentiometer on the V200 card while the parent machine is operating at 50% or higher of maximum speed.

The increase or decrease in voltage activates the EPC solenoids in order to increase or decrease the air pressure in the dome of the regulator. Once the reference pressure is set, the dome pressure will be automatically regulated as machine speed increase or decreases.

The rate of air flow into and out of the dome of the fluid regulator is controlled by adjustable orifices at the base of the increase and decrease solenoids in the EPC box. The orifice adjustment screw is the larger of the two screws in the base of each solenoid. The adjustment screws allow the rate of flow to be increased or decreased. These screws are set at the factory to be barely cracked open. Erratic operation of the EPC may result if the screws are opened too far.

Applicator head angle adjustment and typical glue patterns



Fluid regulator

Disassembly

1. Shut off the inlet pressure and purge the pressure in the inlet and outlet lines to zero.

2. Turn the "T" handle (1) counterclockwise until all of the pressure is removed from the spring (6). The regulator can be disassembled without removing it from the fluid line.

3. Remove the bonnet screws (4), bonnet (3), upper spring rest (5), spring (6), lower spring rest (7), diaphragm (8), and diaphragm protector (9). Lift out the valve pin (10), then unscrew the valve seat (11) using a socket wrench.

4. Remove the bottom plug (17), O-ring or gasket (16), spring (15) and ball (13).

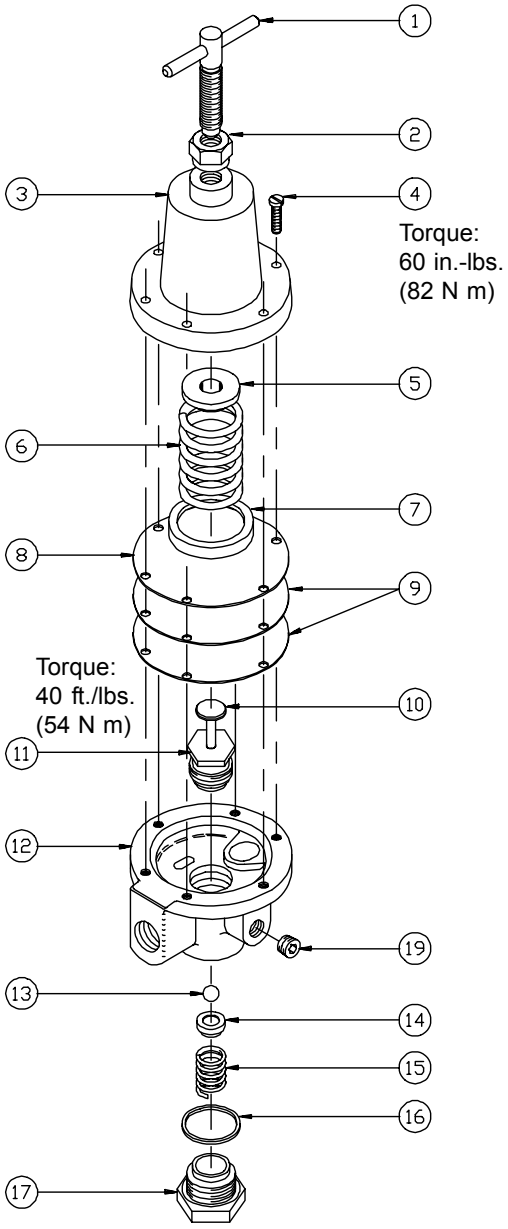
Assembly

1. Assemble the parts in the reverse order of the disassembly. Use two diaphragm protectors for the reassembly.

2. Apply a small amount of lubricant 110 (or equivalent) evenly to the full length of the threads and tip of the adjusting screw (1).

3. Refer to torque specifications when installing the valve seat (11) and bonnet screws (4).

Note:
The stainless-steel bottom plug (17) will accept an O-ring in place of the metal gasket used with the old brass bottom plug. Both the O-ring and the metal gasket are included with the regulator repair kits. Discard one, depending on which bottom plug is being installed. (The stainless-steel plug can be installed into brass regulators.)



Fluid regulator automatic glue pressure relief (variable speed systems)

A glue valve may be installed to the fluid regulator in order to purge glue from the regulator. The valve (Model 366) is installed with a tee fitting on the discharge side of the regulator. The valve is activated by a 24VDC, 3-way solenoid which is connected to the exhaust circuit of the EPC. Normally the mini 3-way (411xx069) is used for single glue regulator systems. A 3-way for multiple regulators is also available (411xx000). Each regulator must have a glue valve on the discharge side.

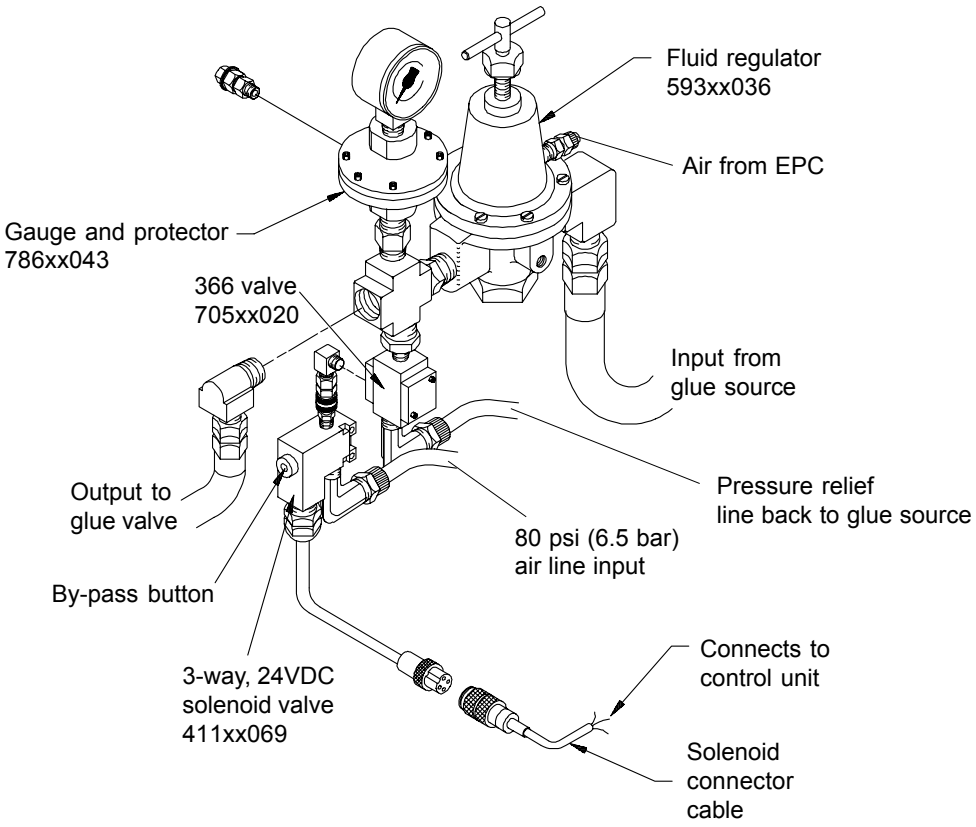
The output of the glue valve must be routed to a location that is airtight so that the glue does not dry. Dry glue may cause the valve to remain open. A short length of tubing submersed in a bucket of water is recommended. Or the tubing may be routed back to the glue supply and submerged in the glue. After the system is installed, purge all the air from the tubing by activating the 3-way bypass button until the line is full of glue and no air is present.

(See next page for layout illustration.)

A typical assembly includes the following:

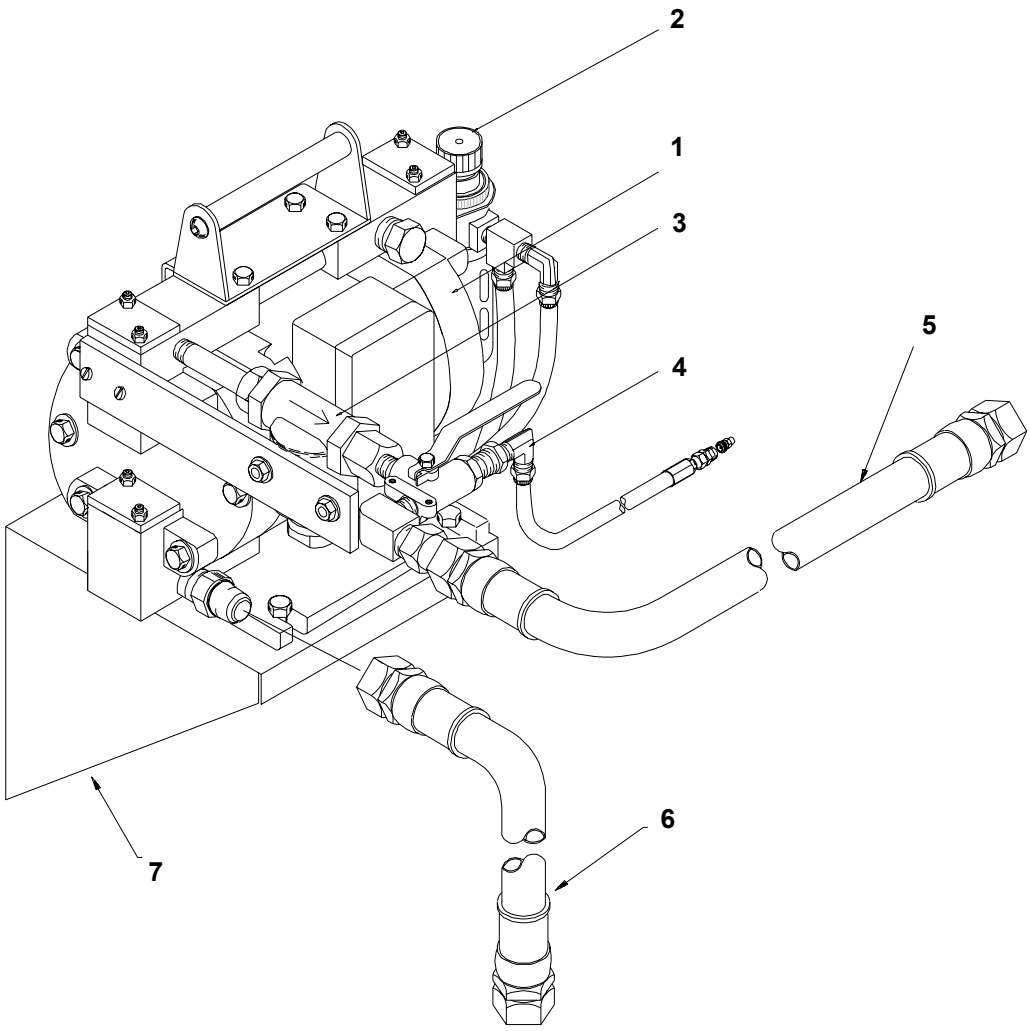
- 3-way air valve (411xx069)
- Air valve connector cable, 33 ft. (10 m) (030xx005)
- Air tubing/fittings kit (753xx701)
- Model 366 glue valve (705xx020)
- Hex nipple reducer, 1/2" NPT x 1/8" NPT (797xx072)
- Male connector, 3/8" x 1/8" NPT (797xx328)
- Poly tubing, 3/8", 25 ft. (7.6 m) (755xx033)

Note:
The entire length of the poly tubing is not used for a single installation. Use the shortest possible length. Keep the rest of the tubing for future maintenance. The discharge line should be inspected frequently to ensure that there is no obstruction.

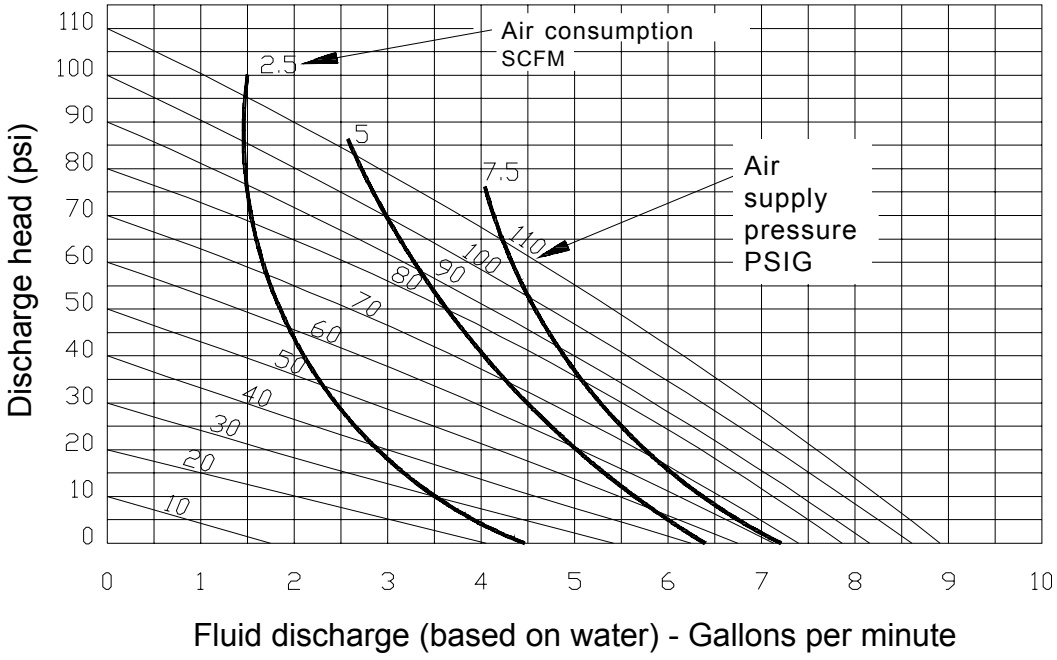


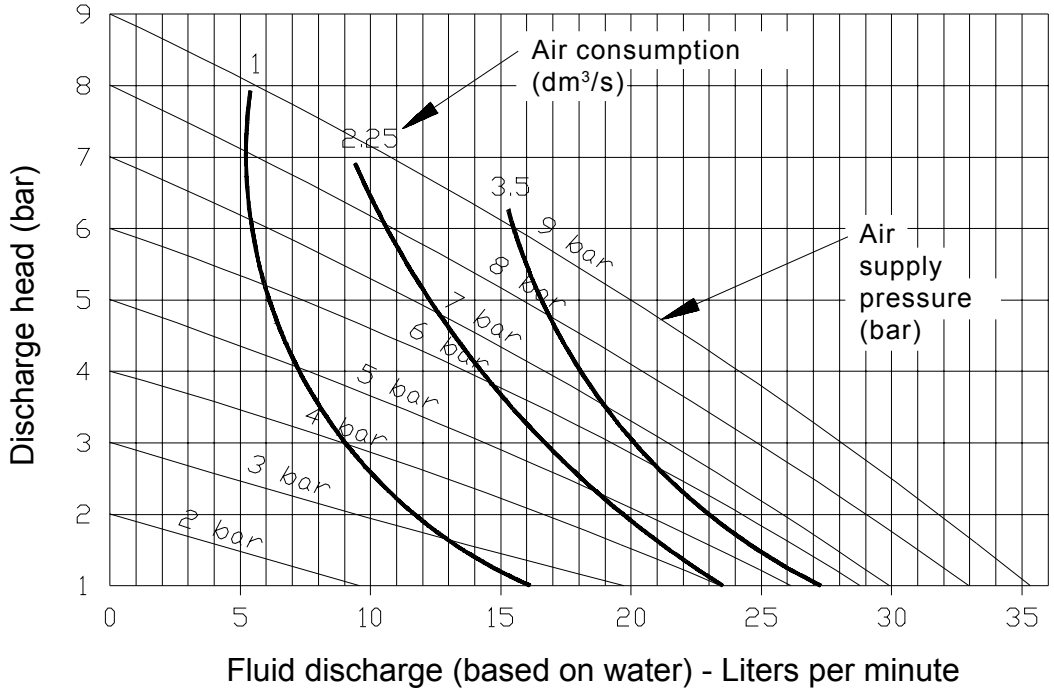
DD-1 pump

1. DD-1 pump
2. Air filter/regulator assembly
3. Fluid filter assembly
4. Air-purge valve assembly
5. Output hose
6. Suction hose
7. Wall-mount bracket



DD-1 pump specifications





Glossary

Indicator light	Any small bulb, object, device or component which emits light to indicate operation.
LED	Light Emitting Diode (see “Indicator light”)
Card, PC board	Printed circuit board
Process pump	A pump which can operate at variable flow rates based on the demands of the system.
Proximity switch	A switch that is actuated without physical contact. Proximity switches are generally magnetic or pneumatic. A proximity switch is also called a “reed switch.”
Transfer pump	A pump used to move fluid from one container to another.
Reed switch	See “Proximity switch.”

Description

The DD-1 pump is a process pump that is air-driven, and electronically-controlled. The pump features two interchangeable diaphragm assemblies operated by plant air.

Fundamentals of operation

The DD-1 diaphragm pump is designed to deliver fluid continuously or intermittently. Two interchangeable diaphragm assemblies are mounted within a frame. The shafts of each diaphragm assembly are coupled. As one diaphragm is operated to deliver fluid, the other diaphragm is being refilled with fluid.

The DD-1 pump cycles electronically rather than mechanically. Two proximity switches are mounted in a control box. The switches are activated by a magnet which is attached to the shaft coupler (chain link). The signal from the proximity switch passes to an electronic control circuit which is mounted in the control box. The signal operates standard 3-way air valves. Fluid flow is controlled by check valves (ball-type) that are mounted in the corner sections.

Features

The pump starts dependably, runs smoothly, and operates at lower pressures and temperatures than ordinary mechanically-controlled diaphragm pumps due to its electronic control system. The pump does not use a spool valve that can stick or shorten the stroke of the pump. The proximity switches are either open or closed. Therefore the pump starts from any position at an inlet air pressure sufficient to overcome internal friction and system head pressure. Lower temperature operation is also achieved because there is no rapid expansion of drive air inside the pump. The 3-way valves exhaust air directly into the atmosphere. Reversal cannot occur until a proximity switch is tripped. Electronic reversal is also fast. The speed of reversal and the consistency of volume on each stroke contribute to a smooth flow of fluid.

The diaphragm assemblies are interchangeable and individually accessible, making service simple. Each check valve is externally accessible and the air valves are standard devices that are coupled directly to the diaphragm housing with quick-disconnect fittings. Most service can be performed without removing the pump from the system.

Indicator lights are provided on the pump's PC board to facilitate troubleshooting.

Optional features include a level alarm and automatic shutoff.

Power requirements

Electrical

Normally the pump includes a remote power supply which requires 100/120VAC, 1A maximum, single-phase power with ground. 200/240VAC and 24VAC control assemblies are also available.

Pneumatic

The pump requires filtered and regulated plant air, 125 psi (9.6 bar) maximum.

Safety precautions

General precautions

1. Route all electrical wires away from personnel and moving machine parts.

2. Disconnect electrical power and air before servicing. Depressurize all fluid lines if check valve or diaphragms are to be serviced.

3. Promptly repair or replace all worn or damaged electrical wiring and mechanical parts.

4. Stay clear of moving mechanical parts. Do not touch the circuit boards or wire connections.

5. Keep the electrical enclosures closed except during service and check procedures.

6. Use correct fuses.

7. A ground fault circuit interrupter can be installed for safety when standing water is present.

Specific precautions
All diaphragms can experience failure. Fluid can enter the air chambers and be exhausted through the air valves. It is also possible for the compressed air to mix with the pumped fluid and be expelled through the pump's discharge line. This situation can be hazardous. Controlling exhausted liquids and vapors may be required with certain fluids. Some fluids are toxic. Check with the following persons and organizations regarding fluid handling:

- your company's safety policy
- fluid suppliers
- persons skilled in handling hazardous fluids
- local, state and federal agencies

Exclusions

Valco Cincinnati is not responsible for the following:

1) Misuse of the pump or accessories including,
   a) over-pressurization
   b) modification of parts
   c) use of excessively worn parts
   d) use of damaged parts

2) Improper installation including,
   a) lack of containment equipment
   b) lack of safety and control devices
   c) workmanship

3) Improper service.

4) Improper use of hazardous fluids.
   a) Vaporization or splashing due to mechanical failure or accidents such as,
      1) diaphragm failure
      2) fitting failure
      3) hose failure
      4) human error
   b) Damage or injury caused by static discharge from ungrounded equipment.
   c) An environment that is not maintained.
      1) improper ventilation
      2) spillage
      3) leaks
   d) Unprotected personnel.
   e) Ignorance or avoidance or local, state, and federal guidelines for use, storage, cleaning, and disposal.

5) Use of fluids incompatible with the pump's wetted parts.

Operating instructions

To avoid accidents, disconnect the electrical power and air supply from the pump when the system is idle for a long period of time.

The pump will not be damaged if operated dry or if the pump temporarily stops. The pump will automatically begin to cycle when flow is needed. The solenoid may become warm, but this is a normal condition.

Beginning pump operation

1. Make sure that the pressure setting for the air filter/regulator is at zero psi. Pull up on the pressure adjustment knob to unlock it, then turn the knob counterclockwise to reduce the pressure.

2. Connect the electrical power.

3. Turn on the air supply to the pump.

4. Turn the regulator knob slowly clockwise to increase air pressure.

Note:
If the pump speeds up significantly (air pressure increases) without a corresponding increase in glue flow, the pump may be cavitating. Check for possible restriction in the suction lines. The diameter of the suction line may need to be increased.

If the suction lines are okay, stop the cavitation by turning the regulator knob counterclockwise to reduce the air pressure. For the most efficient operation, adjust the air pressure to the lowest cycling rate that does not decrease the flow rate. This may be the maximum flow rate for your particular application.

Cleaning the pump

Keep the electrical enclosure closed except during service and check procedures. This will prolong the life of your electrical equipment. The outside of the enclosure can be cleaned with a mild soap and water solution. Use a soft cloth. Automotive wax may be used to protect the finish.

Do not clean the pump with water from a hose. Do not clean the pump with steam. If the area around the pump is to be cleaned with water or steam, remove the electrical enclosure and completely cover the pump with waterproof material.

Disassembly

1. Shutdown procedure

    a) Disconnect the electrical power.

    b) Disconnect the air line from the pressure regulator.

    c) Depressurize the pump's discharge line if check valves or diaphragms are to be serviced.

    Warning:
    There will be a small amount of material remaining in the manifold and fluid chamber. This material will be released as the diaphragm assemblies or lower check valves are removed. Have rags on hand to facilitate cleaning. Use caution, if necessary, when working with hazardous fluids.

2. Diaphragm

   a. Follow the shutdown procedure listed above.

   b. Remove the guard assembly.

   c. Remove the control box and valve assembly from the pump body. The control box is mounted to the pump frame with two screws. Remove the solenoid (MAC) valves via the quick-disconnect fittings on the back of the pump.

   d. Remove the magnet bracket “T” and chain-link shaft coupler.

   e. Remove the four bolts that pass through the frame lugs at the end of the housing. Remove the diaphragm housing from the frame.

   f. Remove the remaining two bolts in the diaphragm housing and open.

   g. Turn the shaft bearing and wiper assembly out of the housing cover with a spanner wrench. Replace the O-ring at the bottom of the threaded bore in the housing cover.

Check valve (ball-type)

1. Follow the shutdown procedure listed above.

   Warning: The discharge line must be depressurized before removing the check valves.

2. Remove the cap to access the individual check balls. The lower check balls will fall out as the caps are removed. The upper check balls can be removed by the careful use of a small screwdriver or piece of wire.

3. Inspect the valve seat and replace the cap O-rings when servicing the check valves.

Magnet and proximity switches

The positions of the proximity switches and the magnet bracket assembly are critical for proper operation. The shaft travel should be the same from both sides of the center line. The total stroke length from one side to the other should be about 13/16" (20 mm) long.

The magnet should be positioned as close as possible to the control box without touching it. To adjust the magnet, use a screwdriver to turn the screw to the desired position.

Adjustment of the proximity switches

1. Open the electrical control box door.

2. Set the pump air pressure to 10 psi (1.7 bar) so that the pump can cycle slowly.

3. Loosen the set screw that holds the left proximity switch. Slide the switch completely to the left side.

4. Slowly slide the proximity switch back to the right until the pump just begins to stroke.

5. Repeat the procedure listed above for the right proximity switch. Move the right switch completely to the right side. Slowly slide the switch back to the left until the pump begins to stroke.

6. The pump should now be cycling evenly and slowly.

7. Move both switches in toward the center another 1/8" (3 mm) and tighten the screws.

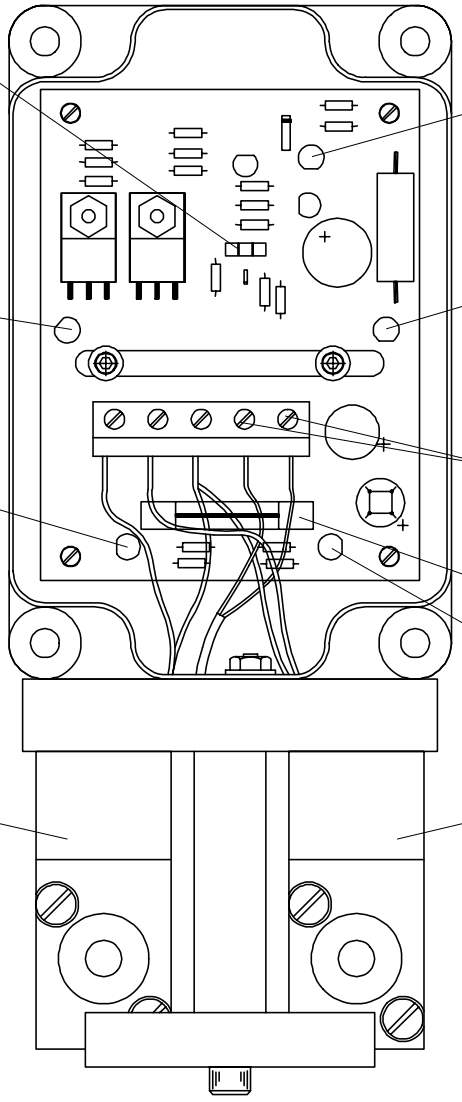
Troubleshooting

Start-up jumper
- Jumper first and second pins: On start-up, left 3-way activates and shaft is pulled to the left.
- Jumper second and third pins: On start-up, right 3-way activates and shaft is pulled to the right.

Yellow Hall-effect LED (left)
This light will come on when the left-hand hall-effect switch is operating. (Activated by presence of magnet.)

Yellow 3-way LED (left)
This light will come on when the left-hand 3-way air valve is energized.

3-way air valve (left)
Activated by the right-hand hall-effect switch. Moves magnet toward the left hand hall-effect switch.



Green power LED
This light will come on when circuit board power is supplied. This light should be lit if power supply and fuse are operating properly.

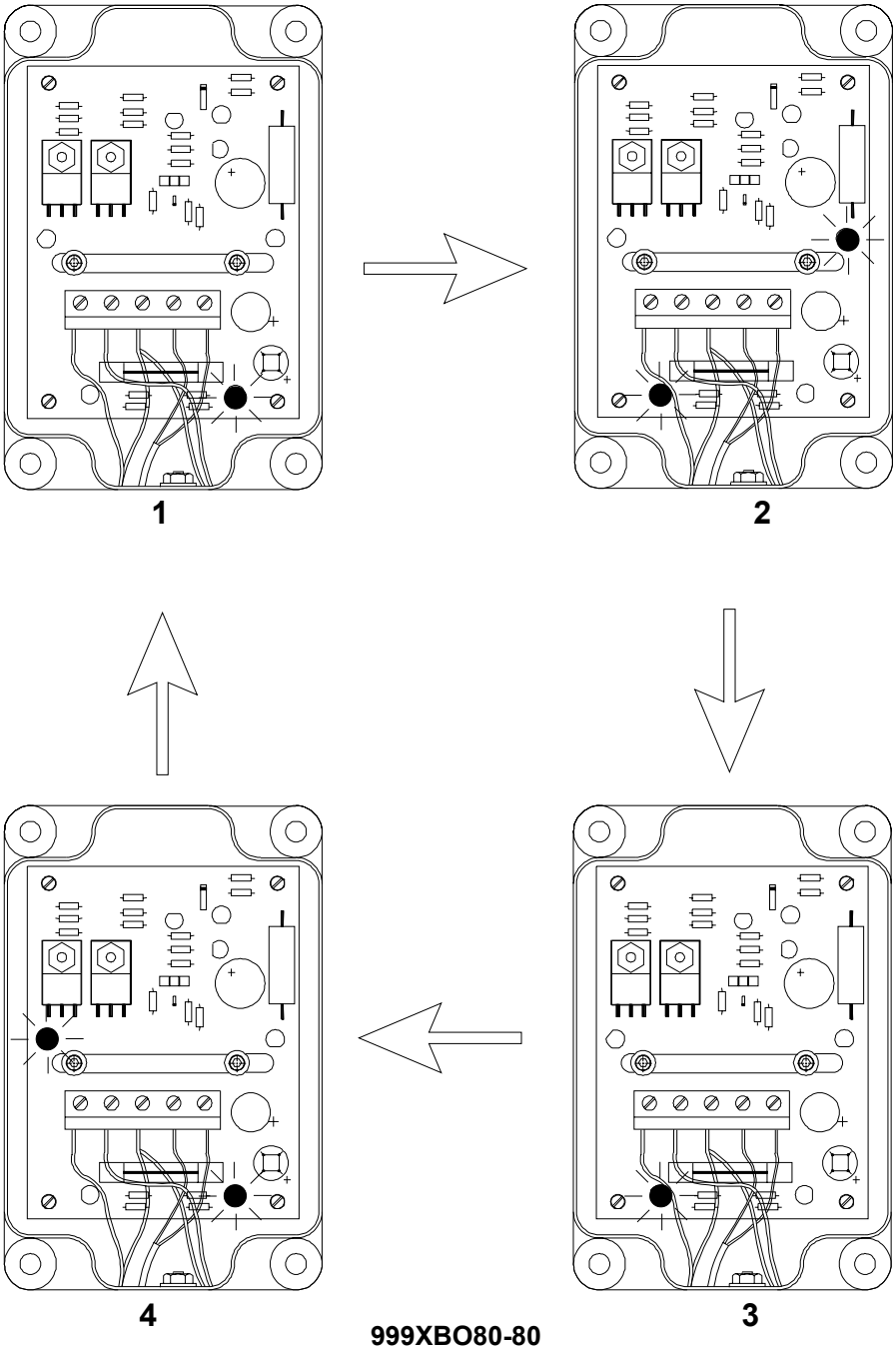
Yellow Hall-effect LED (right)
This light will come on when the right-hand hall-effect switch is operating. (Activated by presence of magnet.)

Power connections
Black wire - 4
White wire - 5

1 amp slow-blow fuse

Yellow 3-way LED (right)
This light will come on when the right-hand 3-way air valve is energized.

3-way air valve (right)
Activated by the left-hand hall-effect switch. Moves magnet toward the right-hand hall-effect switch.



1. The right-hand 3-way valve is energized. The magnet moves toward the right-hand hall-effect switch.
2. The right-hand hall-effect switch senses the magnet and transfers power to the left-hand 3-way valve.
3. The left-hand 3-way valve is energized. The magnet moves toward the left-hand hall-effect switch.
4. The left-hand hall-effect switch senses the magnet and transfers power to the right-hand 3-way valve.

Checklist

Pump does not start:

Electrical:	Refer to drawing 999XB080-80 (previous page) for the LED sequence during the pump cycle.
Upper LED is out	Check the line fuses. Check the plant's power supply. Replace the PC board/transformer assembly.
No electrical service	Check the plant's power supply.
Faulty cable	Repair or replace.
Line fuses are out	Replace.
3-way valve's fuse is out	Replace. Check the solenoid cables. Test the solenoids for short circuits. Replace if necessary
Faulty reed switch	Test. Replace if necessary.
Pneumatic:	
Regulator pressure gauge indicates zero	Check the plant's air supply. Open the master air valve. Turn the regulator adjusting knob clockwise.
Regulator pressure gauge not zero	Check air lines to valves.
Solenoid valves not operating	Check air lines to valves.
Mechanical:	
Pumped fluid is solidified	Check the strainers and filters, if used. Service the suction and discharge lines. Service the check valves. Service the pump.

Fluid flow is not even:

Suction leakage	Test and repair the suction components.
One or more check valves not seating correctly	Shut off the pump and service the check valves.
Diaphragm failure	Check the 3-way valve exhaust for contamination. Determine which diaphragm has failed. Replace diaphragm.

Pump operates without fluid flow:

Suction leakage	Test and repair the suction components.
Blocked suction line	Check and clean the suction strainer, if used. Check the installation of the suction line.
Failure of one or more check valves	Shut off the pump and service the check valves.
Diaphragm failure	Replace.

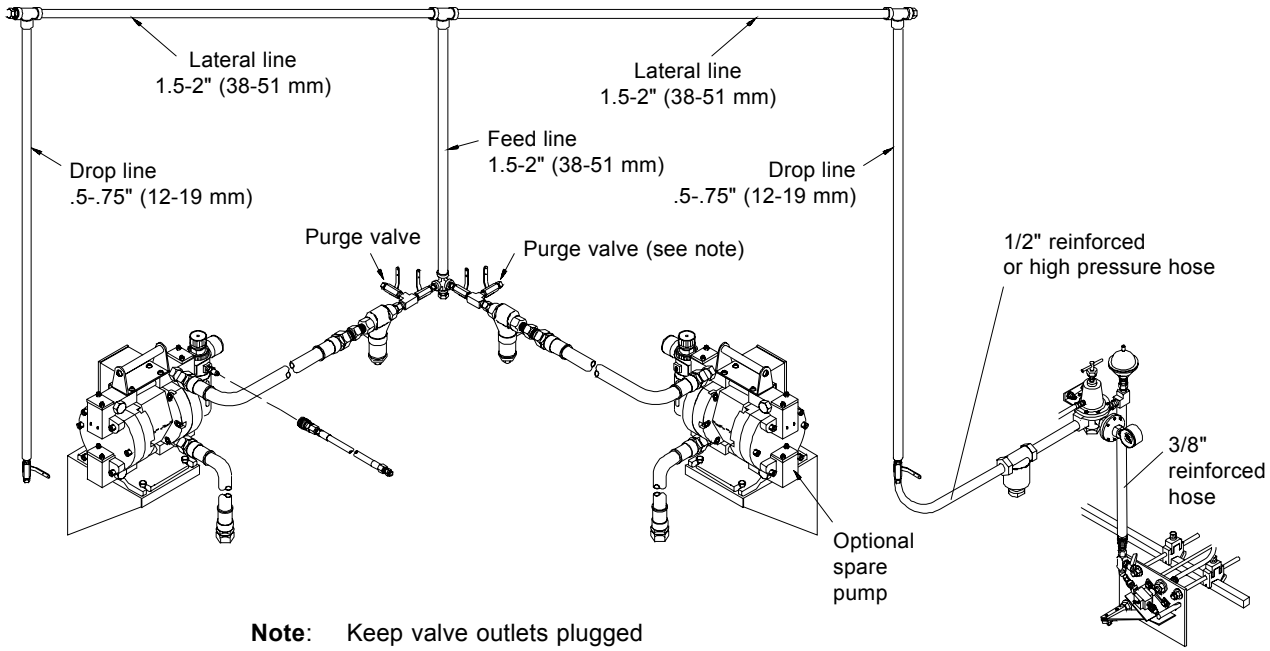
Glue supply installation

Central glue supply system
Install a 1/2" reinforced hose if you are using a diaphragm pump. Install a 1/2" high pressure hose if you are using a 2:1 or 5:1 piston pump. Install the hose on the output of the drop line feeding the fluid filter and regulator assembly. Attach a 3/8" reinforced hose from the output of the fluid regulator to the glue valve.

Material:
stainless-steel pipe
schedule 40 (black pipe)
schedule 80 PVC (threaded or glued)

Note 1: For long runs, position the pump in the middle of the system.

Note 2: Use “T” connections, no “L” connections.



Note: Keep valve outlets plugged except when using valve to purge system.

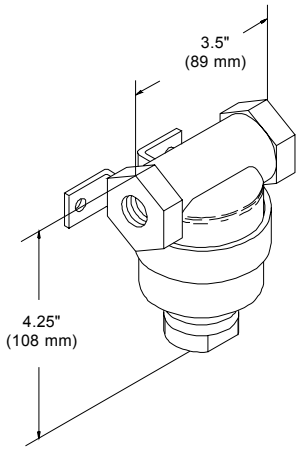
The glue supply lines must run from the shutoff valve to the fluid pressure regulator.

Install the small in-line glue filter between the shutoff valve (located at the end of the drop line) and the fluid regulator. It is possible to install the filter directly onto the input of the regulator assembly. (This will eliminate the need for a hose between the filter and regulator.)

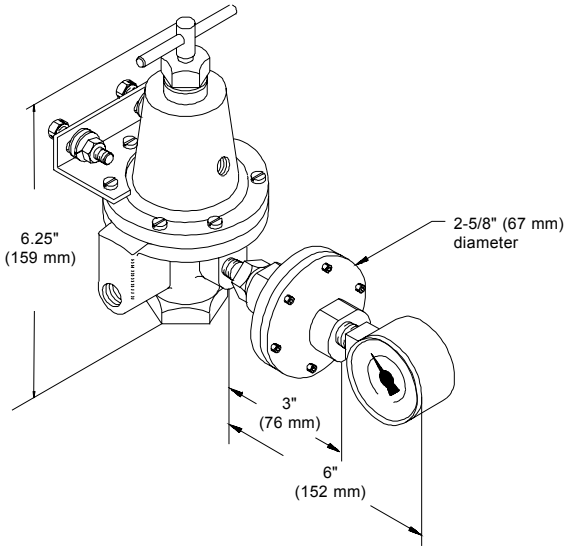
Connect the applicator supply hose to the output of the fluid pressure regulator. Be sure to close the small valve on the end of the line.

Note: It may be necessary to fabricate parent machine mounting brackets for the glue regulator assembly, the encoder assembly, and the glue filter assembly.

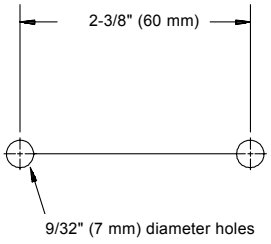
Glue filter



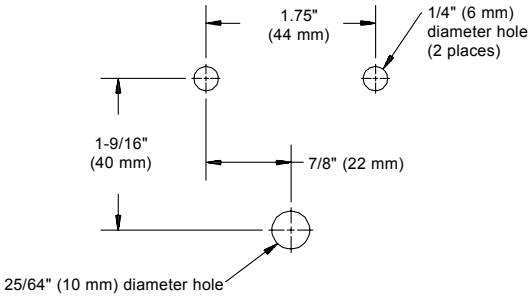
Glue regulator with gauge and protector



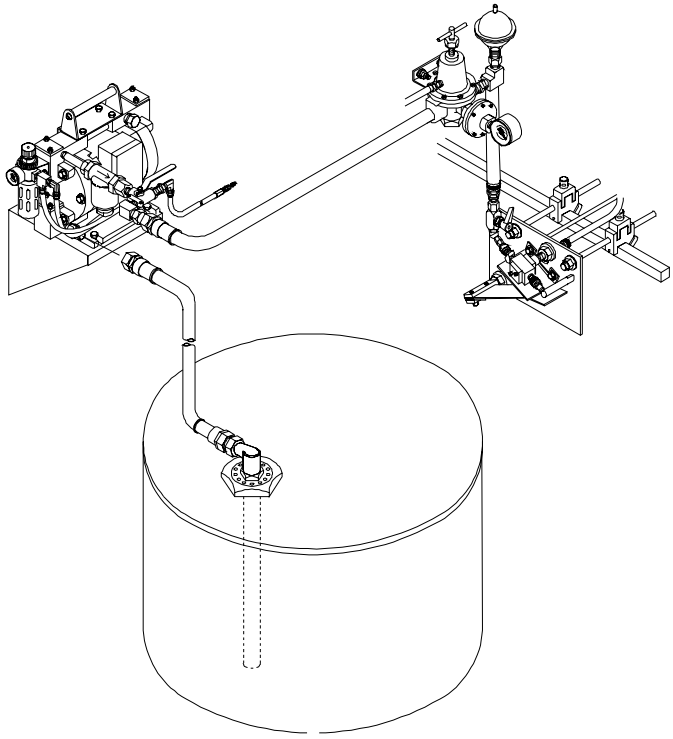
Glue filter mounting hole dimensions



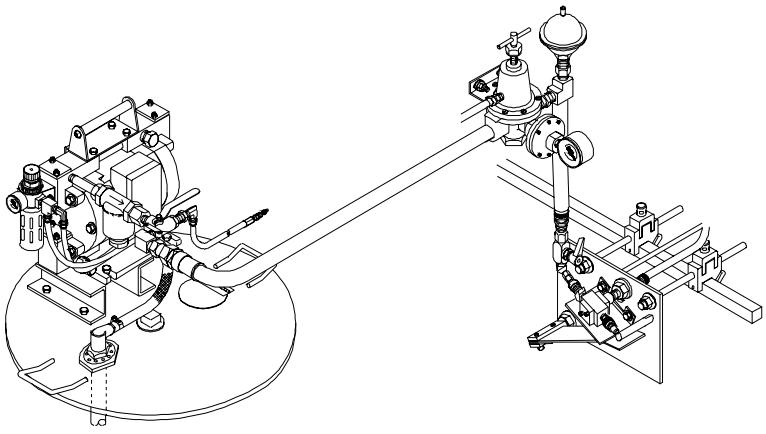
Regulator mounting hole dimensions



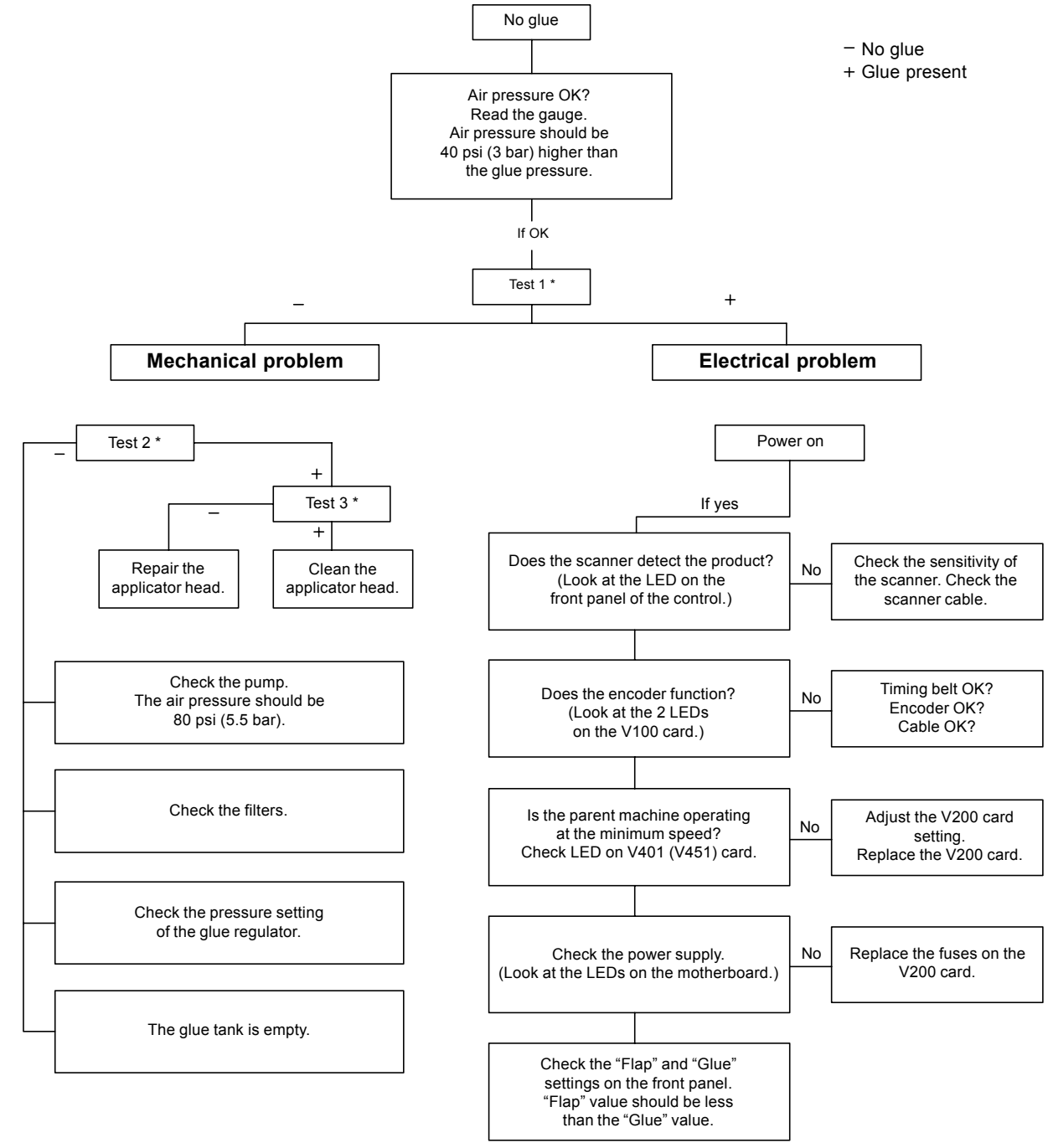
Wall-mounted pump installation



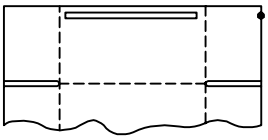
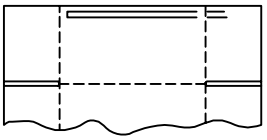
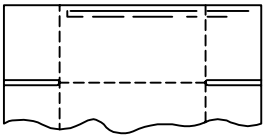
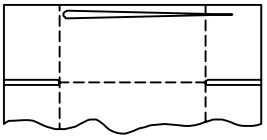
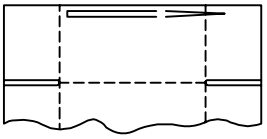
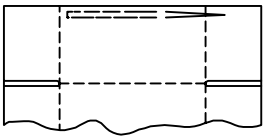
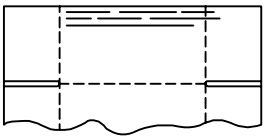
Drum-mounted pump installation

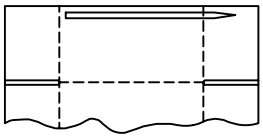
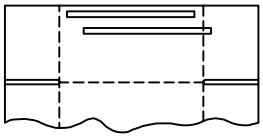
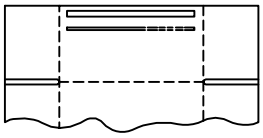
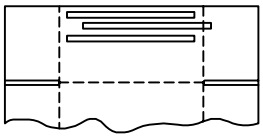
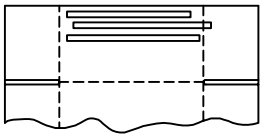
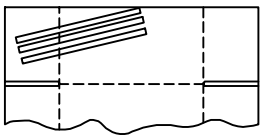
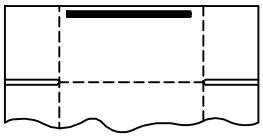


Troubleshooting



* Test 1: Manually activate the 3-way air solenoid and check for glue flow.
* Test 2: Open the shutoff glue valve over a container.
* Test 3: Identical to test 1, but remove the applicator head.

	PROBLEM	CAUSE/SOLUTION
	A drop of glue at the end of the product.	• No vacuum. • Defective O-ring. • Too much guide spring tension (too much product move ment at the glue station).
	An interruption of the glue pattern on the perforation of the product.	Glue pattern is too close to the perforation. Shorten the glue pattern.
	Poor glue pattern.	Air bubbles are in the glue system. Run adhesive through the glue line. Purge air from the glue line. Flush system if necessary.
	Glue pattern begins thick and trails off.	• The angle of the applicator head is too steep. Adjust the angle to 35°. • Air pressure to the 3-way valve too high. Lower to 25 psi (2.7 bar) higher than the highest operation glue pressure.
	Normal glue pattern start with trailing at the end.	• The angle of the applicator head is not steep enough. Adjust the angle to 35°. • Worn O-ring in the swivel fitting.
	Glue pattern consists of drops of glue with trailing.	Contact between the product and the spring guide is poor. Increase the tension of the spring.
	Differences in glue stripes.	The glue lap crusher setting is too narrow. The glue station is not in line with the product.

	PROBLEM	CAUSE/SOLUTION
	Good pattern with trailing.	Glue pressure is too high. Check that the pressure is 10-15 psi (1.7-2 bar).
	Good pattern position at slow parent machine speed. Delayed pattern at higher speed.	Glue may be present in the air solenoid valve. Change air solenoid. Reset “Lead” and “Trail” settings. (See “V401/451 card.”)
	Good pattern at slow parent machine speed. Thin pattern (not enough glue) at higher speed.	Increase EPC pressure with either the glue flow knob on the front panel of the EPC or with the volts potentiometer on the V200 card. EPC increase solenoid may be clogged.
	Pattern length is acceptable but the pattern position shifts.	Adjust the sensitivity of the product scanner. Check the position of the scanner. Scanner may detect a machine’s sheet transporter instead of the product.
	Pattern length and position vary.	• Encoder belt loose. • Gear is loose. • Parent machine drive is faulty. • Encoder is damaged. • Slippage of discs between the folding belts.
	Pattern skewed and positioned too close to the leading edge of the product.	• Guide spring tension too high. • Not enough pressure between folding belts. • Loose glue station. • Low panel boxes with deep slots may be deforming the product.
	Too much glue after the parent machine is stopped then re-started.	Glue pressure regulator may not close properly. • Check ball and seat for dirt. • Repair regulator. • Add a dump valve.

Initial checks of the VC300 series control

1. Check that the control is on. The “Power on/ off” light should illuminate.

2. Check the “Flap” and “Glue” settings. The “Glue” setting must be a larger number than the “Flap” setting.

3. Check that the valve (“Gun”) selector switch is in the correct position.

Air pressure to glue pump (or tank)

DD-1 pump: 80-100 psi (5.5 - 7 bar)

Glue flow

1. Check the minimum pressure setting of the glue regulator while the parent machine is idle. The gauge should indicate approximately 10 psi (1.7 bar) for direct-contact glue valves.

   Note: This setting may vary slightly depending on adhesive viscosity and individual glue pattern requirements.

2. Be sure that the sealing nut on the glue regulator “T” handle is tight.

3. Turn off the shutoff valve and remove it from the glue valve.

4. Place the shutoff valve over a container and open the valve. Observe the glue flow. The glue should flow evenly.

If the glue flow is not even, there is air in the glue line. All air must be purged from the glue line before the system can operate properly.

If the glue flow is significantly reduced, the glue line is blocked. Blockage is commonly caused by dirty glue filter screens at the pump and/or at the glue station. Inspect the filter screens and clean or replace if necessary.

Air pressure

Input air pressure to the EPC and all air-activated glue valves: 70-80 psi (5.5 - 7 bar).

Control check

The VC300 Series controls have numerous LEDs which can be used to quickly isolate problems with the system. The following steps must be performed in order. Complete the checks listed on the previous pages before checking inside the control.

1. Turn the control power on and open the control box door. (It is not necessary to operate the parent machine.)

2. Two red LEDs and two fuses (F1 and F2) are on the right-hand side of the motherboard. Both LEDs should be illuminated. If not, check the fuse located directly below the LED that is not illuminated.

Note: Use 1 amp slow-blow (standard valve driver) or 2 amp slow-blow (non-contact valve driver).

If the fuse is good and the LED is not lit, or if the new fuse blows immediately, perform the following checks:

F1

A. Check the glue valve, valve interconnect cables, EPC, and EPC interconnect cable for shorts.

B. Replace the V200 card.

F2

A. Replace the V200 card.

B. Replace the motherboard.

3. There are two more LEDs on the mother board. One is located above terminal number 7 on the top terminal strip (+12V). The other LED is located below terminal number 5 on the lower terminal strip (-12V). Both of these lights should be illuminated. If either one is not lit, or if both LEDs are not lit, replace the V200 card.

4. Operate the parent machine at a typical production speed. Do not run product.

5. The two red LEDs (“ENC TEST”) located on the bottom of the V100 card should be lit. Both LEDs should be equally bright. If not, see the “Encoder check” section of the manual.

6. If the red LEDs (“ENC TEST”) are operating properly, the red LED (“PO TEST”) located at the top of the V100 card will glow brighter when parent machine speed increases.

7. If the “PO TEST” LED is not illuminated, replace the V100 card. The problem can also be the encoder. See “Encoder check.”

8. The red LED (“MIN SPEED”) on the V401 (V451) card should be illuminated. If not, adjust the minimum speed potentiometer located on the V200 card. Turn the potentiometer clockwise until the LED comes on. This LED must be on before the glue valves will operate. If this LED is not on, the problem may be the V100 card, V200 card, or the encoder.

9. Pass an object under the scanner.

10. The red LED on the scanner will illuminate, and the red LED (“SCANNER OP”) on the V401 (V451) card will go out when the scanner is triggered. If not, see “Scanner check.”

11. When the scanner is triggered, the three red LEDs on the front panel of the control (“C/G, Flap, Glue”) will illuminate in sequence. (The parent machine must be operating above the minimum speed setting.)

    C/G - Sensor (Cell)-to-Gun
    This light will illuminate when the scanner detects a product. The product has not reached the glue station.

    Flap
    This light illuminates when the product has reached the glue station. The valve has not been activated.

Glue
This light illuminates when a signal is sent to the valves.

12. Observe the three LEDs located at the top of the V401 (V451) card.

    First LED - glue enable
    This LED will illuminate when a signal is sent to activate the glue valves. (Parent machine must be operating at or above the minimum speed setting.) The “Gluing” light on the front panel of the control will light simultaneously.

    Second LED - minimum speed
    This LED indicates that the parent machine is operating at or above the minimum speed setting. The minimum speed adjustment is located on the V200 card. This LED must be on before the glue valves will operate.

    Third LED - scanner output
    This LED will go out when the scanner is triggered. If not, see “Scanner check.”

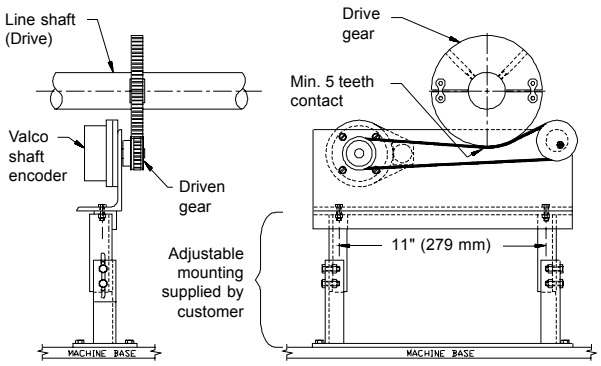
13. **For units with an optional valve driver card assembly.**
    If the control has an optional valve drive card assembly, it will mounted inside the top of the control box. When the red LED (“GLUE ENABLE”) on the V401 (V451) card illuminates, a signal is transferred to the valve driver board which in turn activates the glue valves.

Encoder check

The parent machine must be operated in order to verify the operation of the encoder. (It is not necessary to run product.) The -12V LED (located above terminal number 5 on the motherboard) must be illuminated. If not, replace the V200 card. If the LED is lit, observe the two red LEDs on the bottom of the V100 card. Both LEDs should glow equally bright. If not, check for the following:

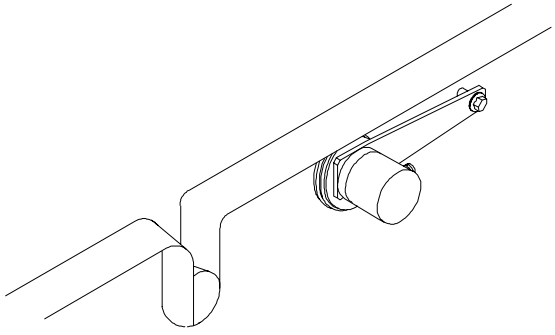
Line-shaft encoder assembly

- Worn timing belt and/or gears *
- Improper belt tension *
- Damaged encoder cable
- Loose cable connections



Measuring-wheel encoder assembly

- Worn measuring-wheel O-rings *
- Improper tension between the wheel and the drive belt *
- Damaged encoder cable
- Loose cable connections



Replace the encoder if the checks listed above fail to solve the problem.

* These items should always be checked when troubleshooting the glue system. These items may cause the LEDs to falsely indicate proper encoder operation.

Scanner check

It is not necessary to operate the parent machine in order to verify scanner operation. The red +12V LED (located above terminal number 7 on the motherboard) must be illuminated. If not, check the +18V fuse located on the bottom right side of the motherboard. If the fuse is okay, replace the V200 card.

The red LED on the scanner will illuminate when the scanner is triggered. If not, check and adjust the scanner sensitivity. The red LED on the V401 (V451) card ("SCANNER OP") will go out when the scanner is triggered.

If the sensitivity adjustment fails to illuminate the LED on the scanner, or if the red LED on the scanner is lit but the LED on the V401 (V451) card does not go out, check the following:

- Damaged cable
- Loose cable connections
- Replace scanner

Glue valve check

1. Verify that the control switches are set correctly.

2. Verify that the air pressure settings are correct.

3. Verify that there is proper glue flow.

4. Verify that there is an output signal to the valve.

Direct-contact valves

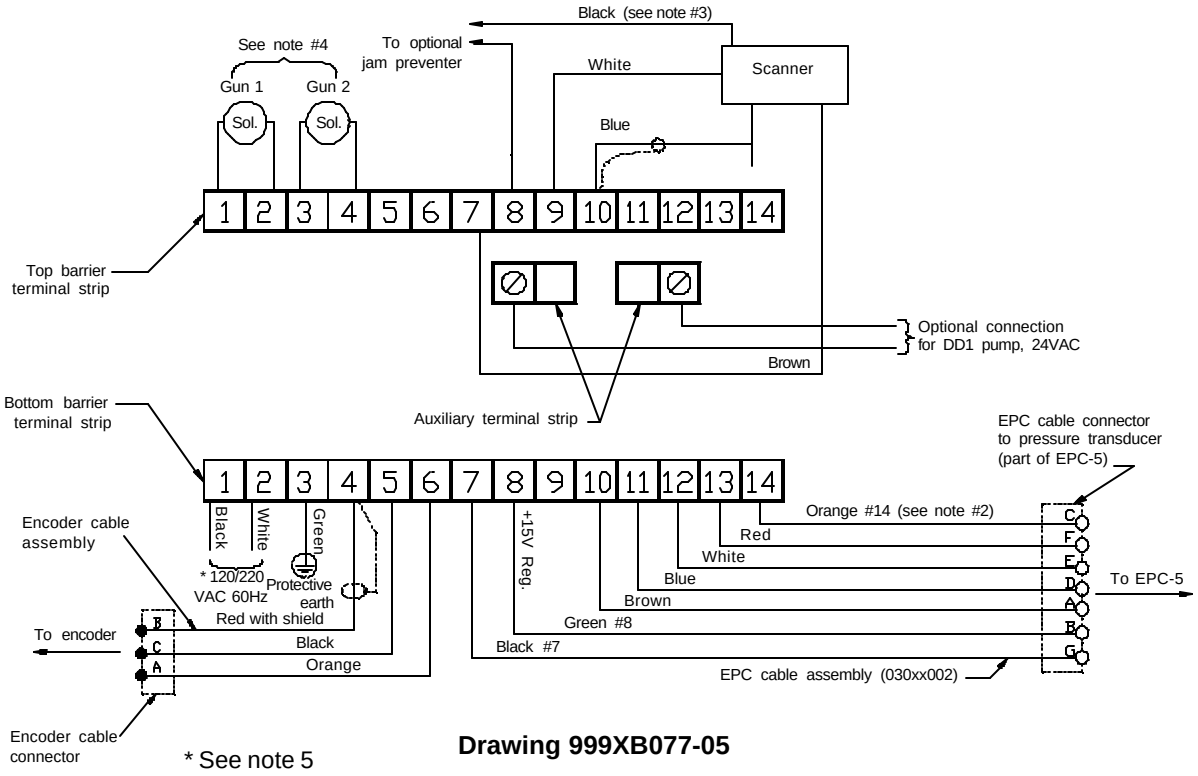
Valve will not activate:

Damaged cable	Replace
Loose cable connections	Tighten
Clogged applicator head	Clean or replace
Clogged air line to the solenoid-operated air valve. (This can be checked by removing the solenoid from the glue valve and manually activating the solenoid.)	Replace
Defective solenoid	Rebuild or replace
Dried glue in the valve's air inlet and/or the air solenoid	Rebuild or replace

Valve is activating erratically:

Improper angle of the applicator head	Readjust with a head-angle gauge
Worn quick-disconnect fittings	Replace
Worn applicator head	Replace
Worn glue valve	Rebuild or replace
Dried glue in the valve's air inlet and/or the air solenoid	Rebuild or replace

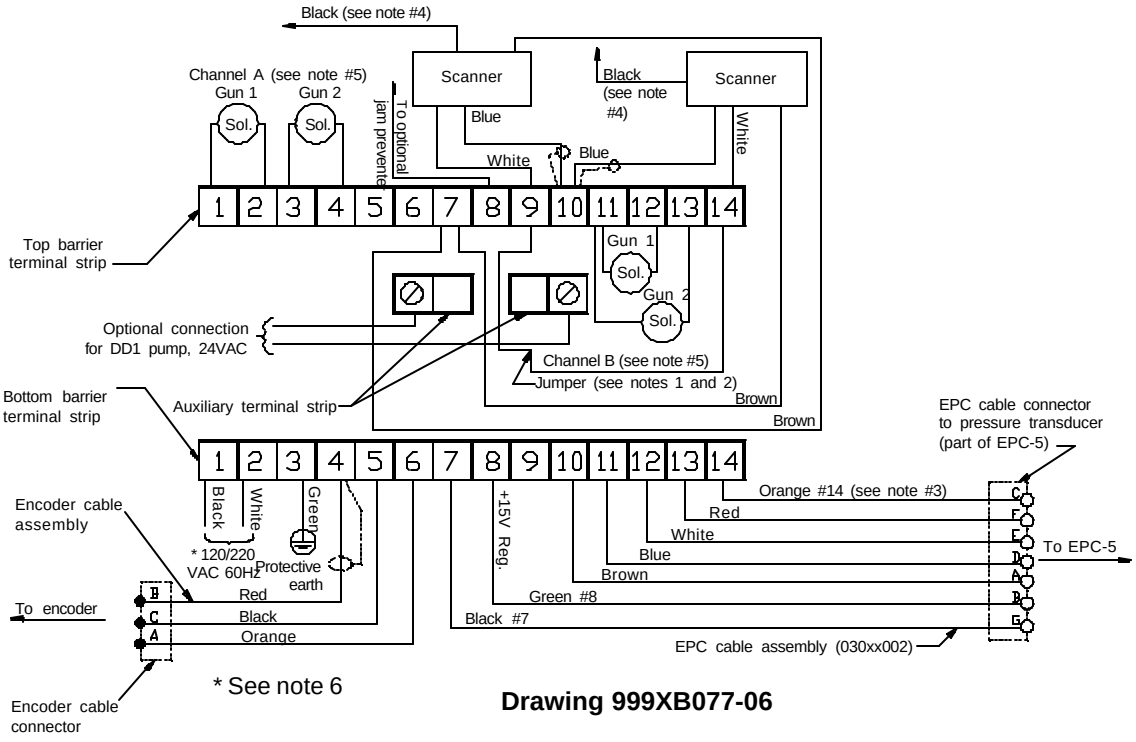
VC349/VC350 customer connections



Drawing 999XB077-05

Note 1:	EPC cable assembly 030xx002 connected to pin 7 through 14 (bottom barrier terminal strip) is omitted on VC349-type controls.
Note 2:	If the EPC cable assembly has a black with white tracer wire instead of an orange wire, connect to terminal #14 on the bottom terminal strip.
Note 3:	Black wire from scanner is used when installing an optional production counter or jam preventer. Attach the black wire from the scanner to the white wire of the production counter. For jam preventer hookup, refer to manual MC006, illustration 999XC077-23.
Note 4:	If the control has an optional valve driver board assembly, refer to drawing 999XB151-48 or 999XB082-12.
Note 5:	These terminals have no connection when a power entry module is installed in the bottom of the cabinet.

VC352 customer connections



Drawing 999XB077-06

Note 1: When using a 2-channel control with one scanner, a jumper must be installed between #9 and #14 on the top barrier terminal strip.

Note 2: When using a 2-channel control with two scanners, no jumper is used between #9 and #14 on the top barrier terminal strip.

Note 3: If the EPC cable assembly has a black with white tracer wire instead of an orange wire, connect to terminal #14 on the bottom terminal strip.

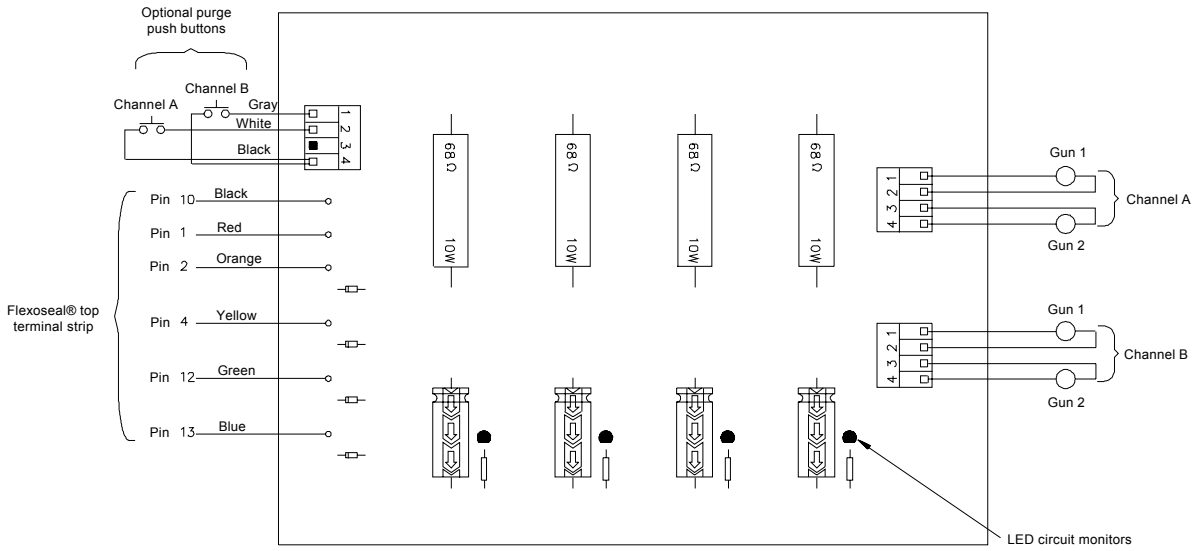
Note 4: Black wire from scanner is used when installing an optional production counter or jam preventer. Attach the black wire from the scanner to the white wire of the production counter. For jam preventer hookup, refer to manual MC006, illustration 999XC077-23.

Note 5: If the control has an optional valve driver board assembly, refer to drawing 999XB151-48 or 999XB082-12.

Note 6: These terminals have no connection when a power entry module is installed in the bottom of the cabinet.

Note 7: For a pattern-skip-pattern setup using one valve, one scanner and two channels, place a jumper between #9 and #14 and between #2 and #12 (top barrier terminal strip). Both front-panel thumbwheel switches and card V401 (V451) must be installed for this configuration.

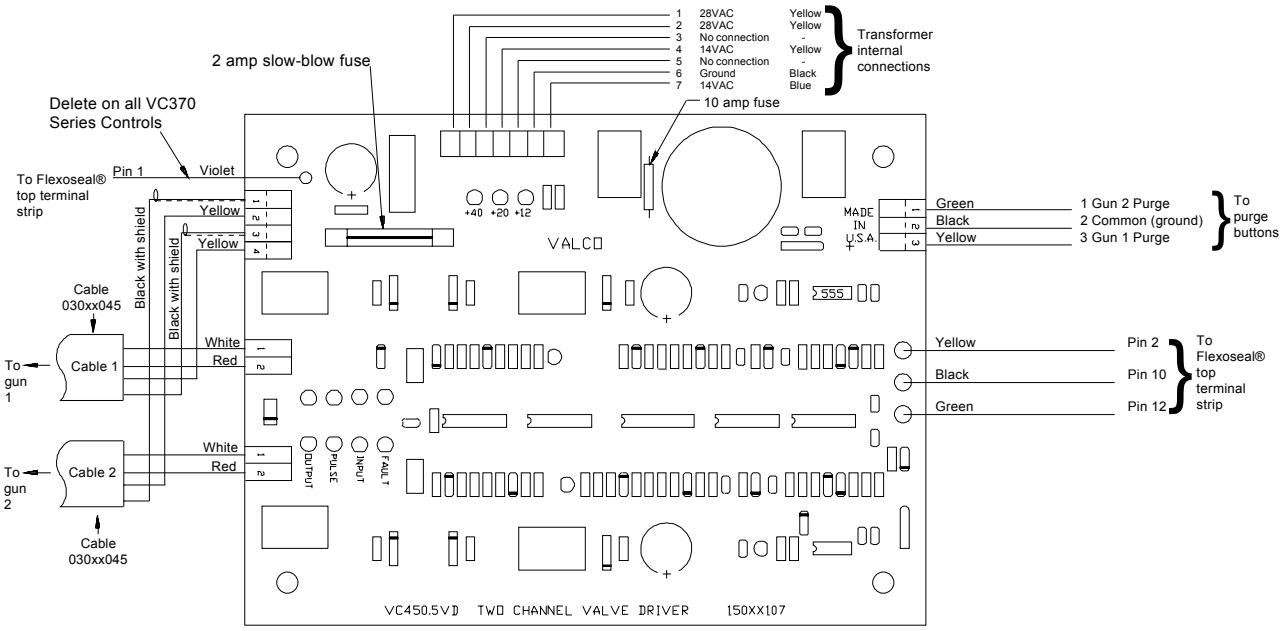
Valve interface board



Valve Interface Board, 151xx067
Illustration 999XB151-48

Note 1:	This card is used with Mac valves or 56 ohm non-contact valves.
Note 2:	A V224 card must be used with this valve interface card.

Customer connections, non-contact gun cable with remote purge buttons



= Drain wire

Valve Driver Board, 151xx107 - 18VDC, 151xx170 - 11VDC
Illustration 999XB082-12

Note 1: Wiring connections for a non-contact valve cable with a remote purge button (030xx045):

1 Connect the red and white wires to the valve terminals.
2 Connect the yellow, black and drain wires to the valve's purge terminal on the left side of the circuit board.

Note 2: When installing this board assembly, both the V224 and V200 cards can be used, since this driver board requires its own transformer.

Choosing the correct valve interface for your system

1. For customers using 24VDC, 3-way air solenoids (366 valve) who wish to add more than two solenoids to their system, order the following:

   Low-speed driver board 151xx067
   V224 board assembly 151xx057

2. For customers who wish to convert a system from contact extrusion to non-contact extrusion using the Model 585 valve, order the following:

   VC350/352 control
   Conversion kit assembly 153xx010
   assembly includes:
   Driver board assembly 151xx170
   Transformer assembly 036xx094
   Installation manual ME-002

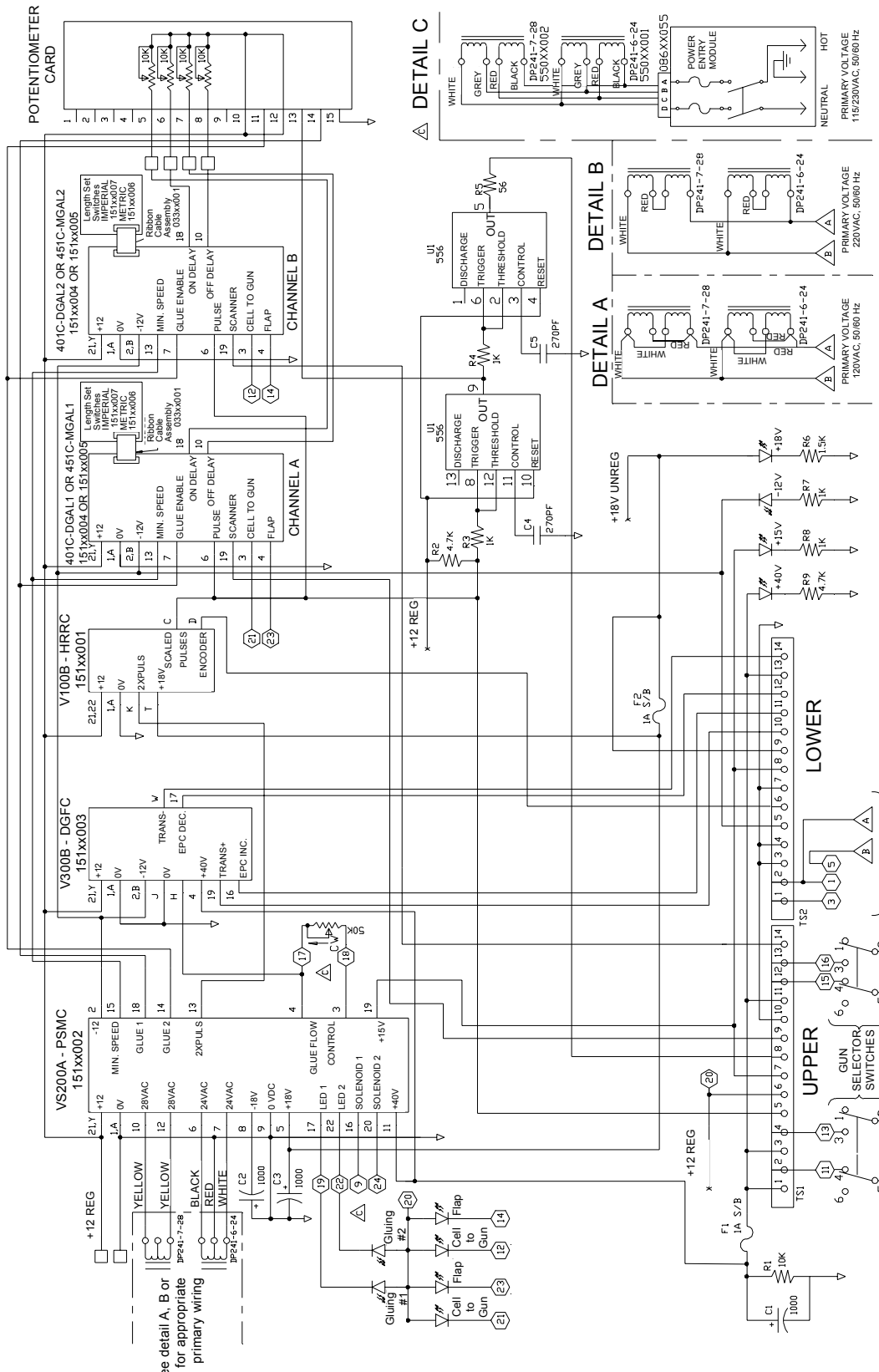
   VC370/372 control
   Conversion kit assembly 153xx009
   assembly includes:
   Driver board assembly 151xx170
   Transformer assembly 036xx094
   Installation manual ME-003

   VC373/374 control
   Conversion kit assembly 153xx011
   assembly includes:
   Driver board assembly 151xx170
   Transformer assembly 036xx095
   Installation manual ME-003

3. **IMPORTANT !**
   When ordering board assemblies for controls that have been updated, check the following part numbers:

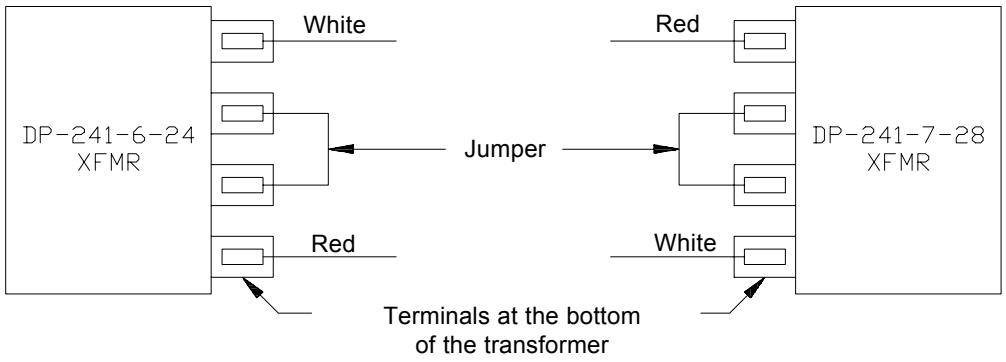
   When using valve 480 or 9020
   Driver board assembly ..... 151xx107, or
   Driver board assembly 151xx170

   When using valve 585
   Driver board assembly 151xx170


POTENTIOMETER CARD
DETAIL C
DETAIL B
DETAIL A
CHANNEL A
CHANNEL B
401C-DGAL2 OR 451C-MGAL2 151xx004 OR 151xx005
401C-DGAL1 OR 451C-MGAL1 151xx004 OR 151xx005
V100B - HRRC 151xx001
V300B - DGFC 151xx003
VS200A - PSMC 151xx002
+12 REG
+18V UNREG
UPPER
LOWER
GUN SELECTOR SWITCHES
NOT USED WITH DETAIL C
See detail A, B or C for appropriate primary wiring
Gluing #1
Gluing #2
Cell to Gun
Cell Flap
PAD ON MOTHERBOARD
PIN NUMBER ON DOOR CONNECTOR
TRANSFORMER TERMINAL
Block wiring diagram 999XC151-16, imperial and metric

Transformer wiring diagram, 220VAC and 120VAC (non-CE)

220VAC



120VAC

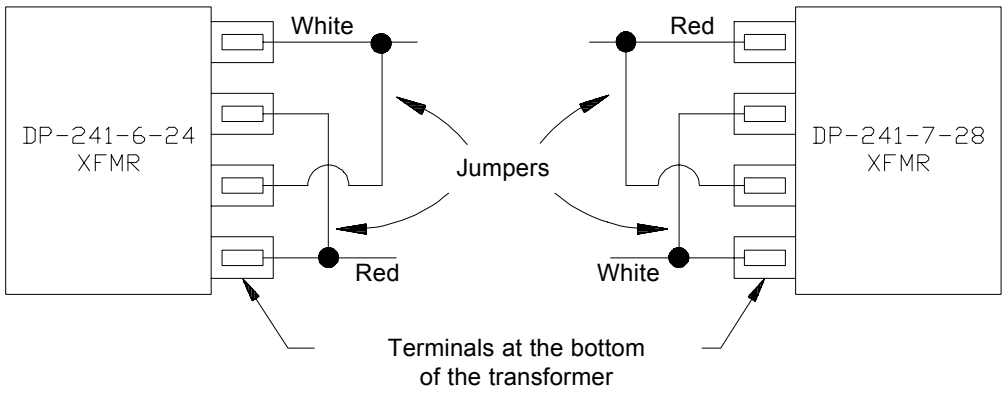
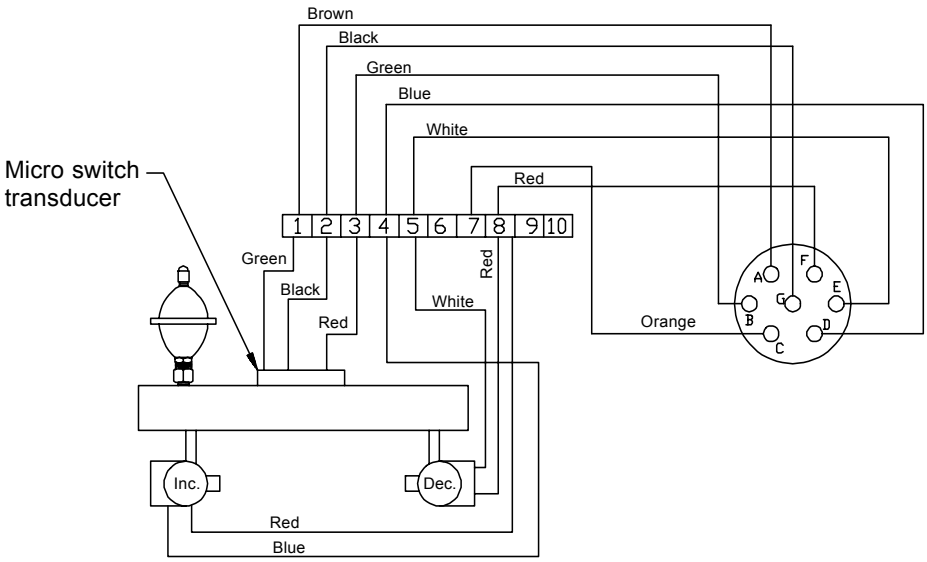


Illustration 999XA551-01

EPC-5 wiring diagram



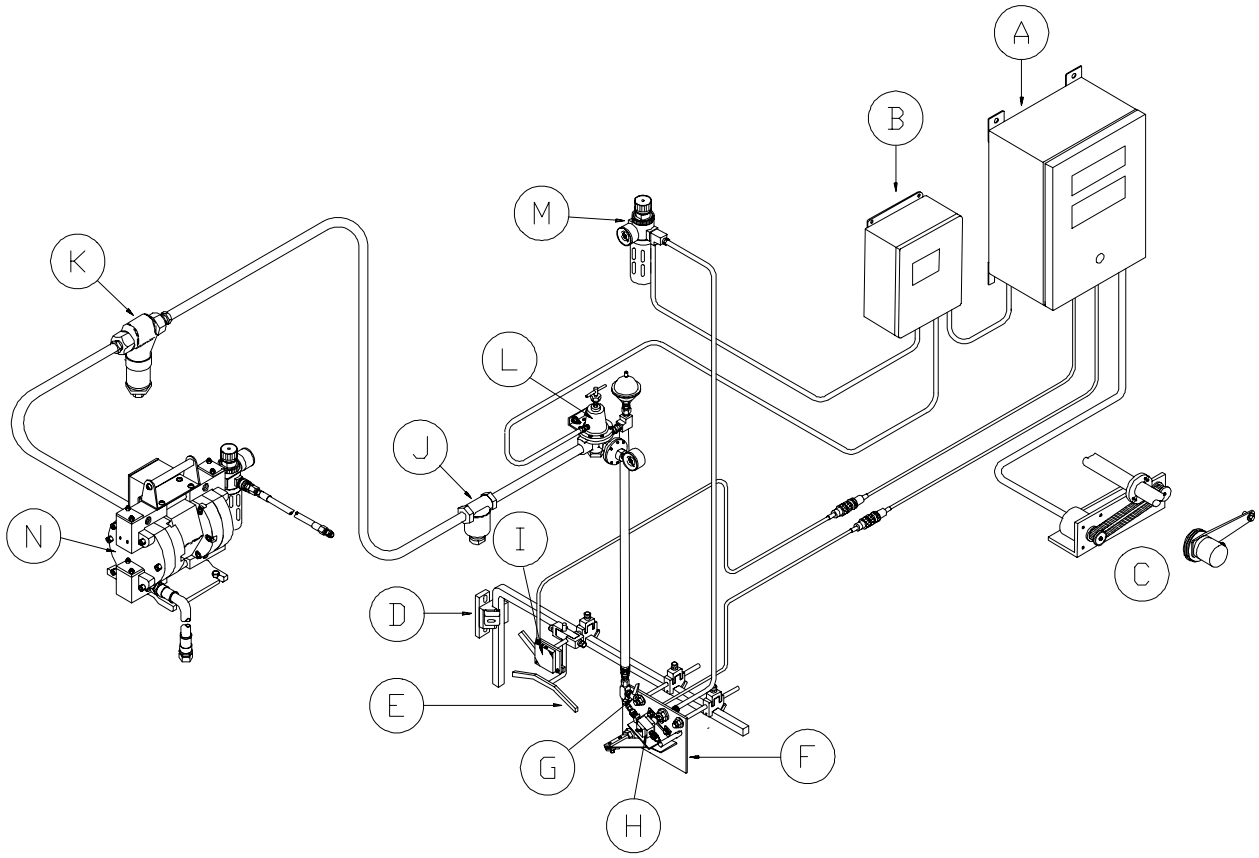
Chapter 3

Replacement parts

Chapter 3 contents

CHAPTER 3
Replacement parts

System layout illustration



List of illustrations

A VC-352 control box

Description	Part number
Illustration: VC-352 control box	998IS017
Parts list: VC-352 control box, imperial (inches)	077xx179
Parts list: VC-352 control box, metric	077xx187
Illustration: Motherboard	999XC077-13
Parts list: Motherboard	077xx504
Illustration: Block wiring diagram	999XC077-11
Illustration: V100C circuit card	151xx092-01
Illustration: V200A circuit card	151xx002-01
Illustration: V300B circuit card	151xx003-01
Illustration: V401 circuit card, imperial (inches)	151xx004-01
Illustration: V451 circuit card, metric	151xx005-01

B EPC-5

Description	Part number
Illustration: EPC-5	077xx305-01
Parts list: EPC-5	077xx305
Illustration: EPC-5 internal components	080xx286-01
Parts list: EPC-5 internal components	080xx286

C Shaft encoder assembly

Description	Part number
Illustration: Shaft encoder assembly	999XC155-02
Parts list: Shaft encoder assembly	155xx001

C Measuring-wheel encoder assembly

Description	Part number
Illustration: Measuring-wheel encoder bracket assembly	999XC155-03
Parts list: Measuring-wheel encoder bracket assembly	580xx357

D Mounting bracket assembly

Description	Part number
Illustration: Mounting bracket assembly	578xx530-01
Parts list: Mounting bracket assembly	578xx530

E Scanner bracket assembly

Description	Part number
Illustration: Scanner bracket assembly	578xx528-01
Parts list: Scanner bracket assembly	578xx528

F Glue station

Description	Part number
Illustration: Glue station (bottom-up)	578xx425-01
Parts list: Glue station (bottom-up)	578xx425
Parts list: Glue station (bottom-up) with air cylinder	578xx433
Illustration: Glue station (top-down)	578xx421-01
Parts list: Glue station (top-down)	578xx421
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Parts list: Air cylinder conversion	723xx003
Illustration: 3-way valve	411xx062-01
Parts list: 3-way valve	411xx062

G Glue shutoff valve

Description	Part number
Illustration: Glue shutoff valve	703xx298-01

H Glue valve

Description	Part number
Illustration: 366 glue valve	705xx035-01
Parts list: 366 glue valve	705xx035
Illustration: 366M glue valve	706xx036-01
Parts list: 366M glue valve	705xx036

I Scanner

Description	Part number
Illustration: Scanner	280xx105-01
Parts list: Scanner	280xx105

J Glue filter (small)

Description	Part number
Illustration: Glue filter (small 3/8)	593xx024-01
Parts list: Glue filter (small 3/8)	593xx024

K Glue filter (large)

Description	Part number
Illustration: Glue filter (large 3/4)	593xx060-01
Parts list: Glue filter (large 3/4), with bracket and bushings	593xx060
Parts list: Glue filter (large 3/4), with bracket	593xx027
Parts list: Glue filter (large 3/4), for spray systems	593xx026

L Glue regulator

Description	Part number
Illustration: Glue regulator	593xx036-01
Parts list: Glue regulator	593xx036
Illustration: Glue regulator	593xx120-01
Parts list: Glue regulator	593xx120

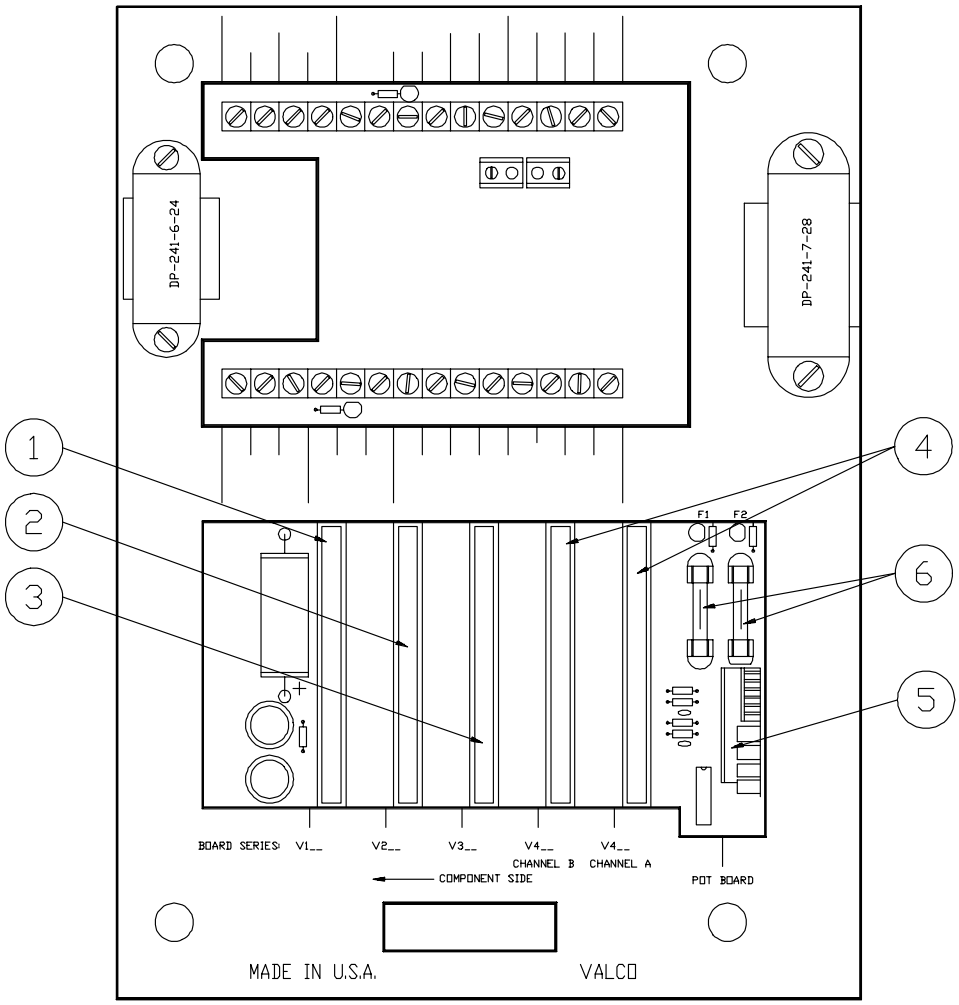
M Air filter

Description	Part number
Illustration: Air filter	594xx031-01
Parts list: Air filter	594xx031

N DD-1 Pump

Description	Part number
Illustration: DD-1 pump	562xx018-01
Parts list: DD-1 glue pump, Teflon diaphragms/check valves, single inlet/single outlet, no power supply, includes 33 ft. (10 m) cable for connection to 24VAC	562xx018
Parts list: DD-1 ink pump, Teflon diaphragms/check valves, dual inlet/dual outlet, 120/240VAC	562xx031
Parts list: DD-1 glue pump, Teflon diaphragms/check valves, single inlet/single outlet, 120/240VAC	562xx033
Parts list: DD-1 pump, EPDM diaphragms/Viton check valves, dual inlet/dual outlet, 120/240VAC	562xx035
Parts list: DD-1 pump, Teflon diaphragms/stainless-steel check valves, single inlet/single outlet, no power supply, includes 33 ft. (10 m) cable for connection to 24VAC	562xx036
Parts list: DD-1 pump, Teflon diaphragms/stainless-steel check valves, single inlet/single outlet, 120/240VAC	562xx037

Parts lists



Chassis assembly

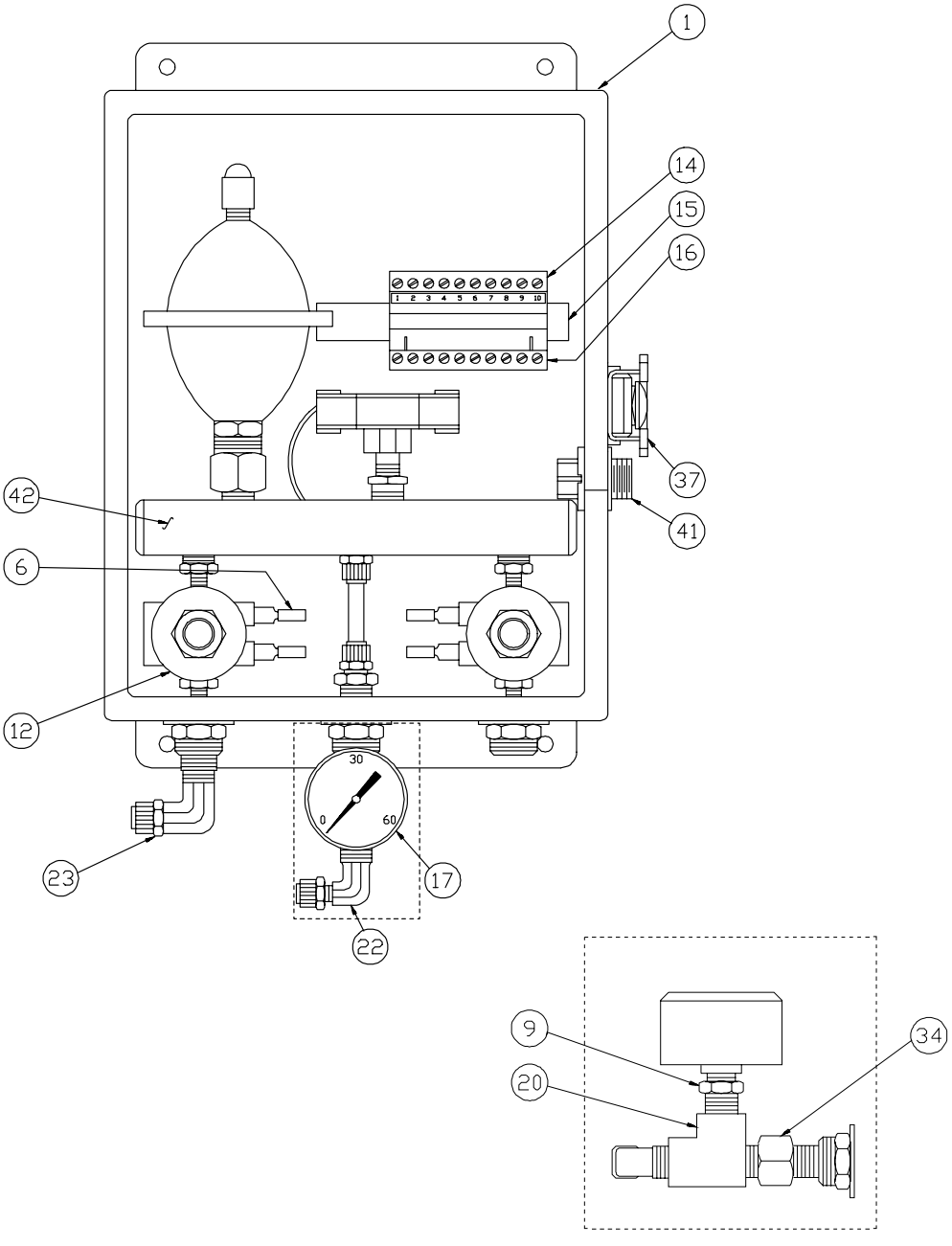
Illustration 999XC077-13

A Chassis

Description	Part number
Chassis CEM	077xx584
Chassis 120VAC	077xx504
Chassis 220VAC	077xx553

Chassis, 077xx504

Item	Description	Quantity	Part number
1	V100C card	1	151xx092
2	V200 card	1	151xx002
3	V300 card	1	151xx003
4	V401 card (imperial)	2	151xx004
	V451 card (metric)	2	151xx005
5	Potentiometer card	1	151xx008
6	Package of 5 fuses 1A		085xx005
	Complete card set (imperial)	1	151xx014
	Complete card set (metric)	1	151xx015
	Transformer 24V	1	551xx001
	Transformer 28V	1	551xx002

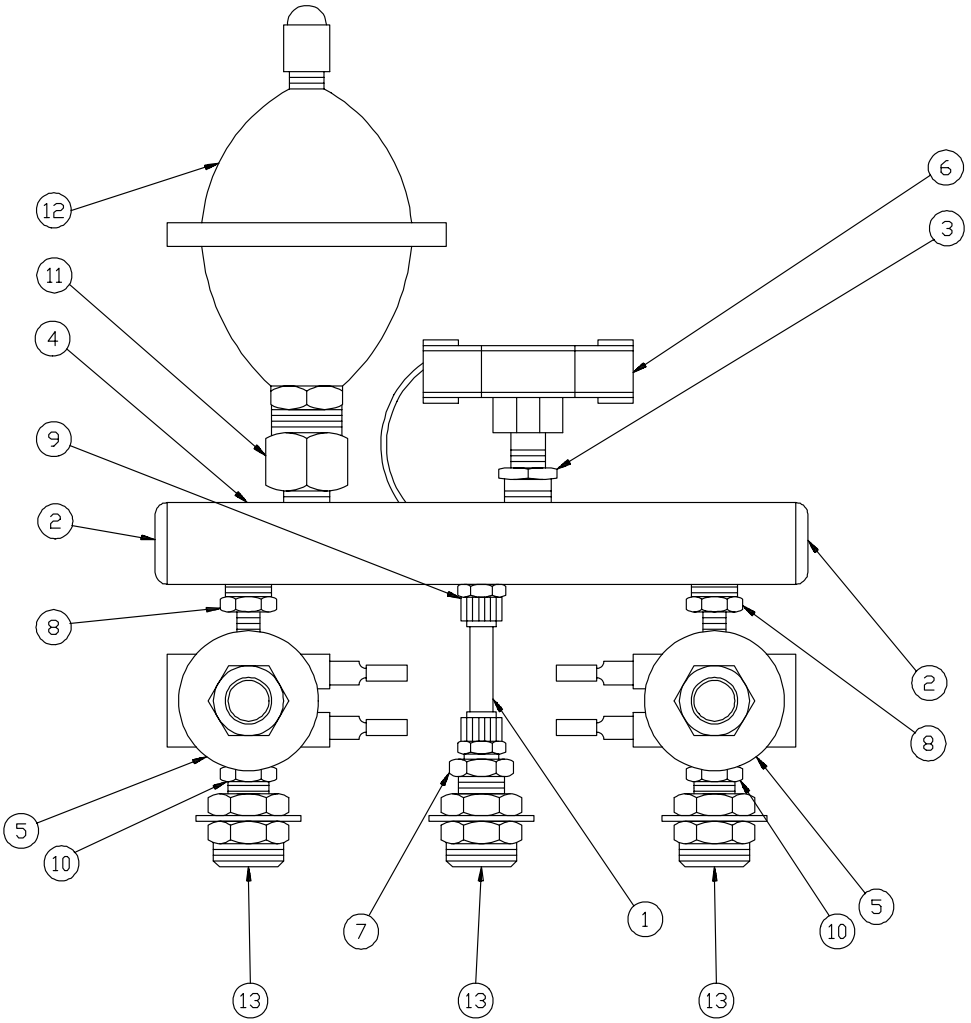


EPC-5, 077xx305

Illustration 077xx305-01

B EPC-5, 077xx305

Item	Description	Quantity	Part number
1	Cabinet	1	025xx068
4	Connector terminals (not shown)	3	075xx118
5	Lock washer, zinc #8 (not shown)	2	798xx776
6	Wire terminal	4	075xx217
7	Screw, 8-32 x 1/4 (not shown)	2	798xx459
8	Rivet (not shown)	4	091xx029
9	Bushing M-F 1/4 x 1/8	1	797xx045
12	Solenoid valve	2	411xx400
14	Terminal strip	1	070xx123
15	Terminal strip mounting rail	1	070xx130
16	Block	1	070xx103
17	Gauge, 960 LP, 0-60 psi	1	786xx001
20	T, F-F-M 1/4	1	797xx019
22	Male elbow fitting, 1/4 x 1/4	1	797xx339
23	Male elbow fitting, 3/8 x 1/4	1	797xx343
29	Wire, 20 gauge blue (not shown)	9.5" (241 mm)	540xx040
32	Wire, 20 gauge red (not shown)	19.5" (495 mm)	540xx036
34	Adapter, F-M 1/4 x 1/4	1	797xx031
37	Latch	1	091xx011
38	Rivet (not shown)	2	091xx030
39	Wire, 20 gauge white (not shown)	9.5 (241 mm)	540xx043
40	Tie wrap, small (not shown)	3	067xx007
41	Wiring harness	1	036xx027
42	Internal component assembly	1	080xx286
43	Marker strip	2	070xx084

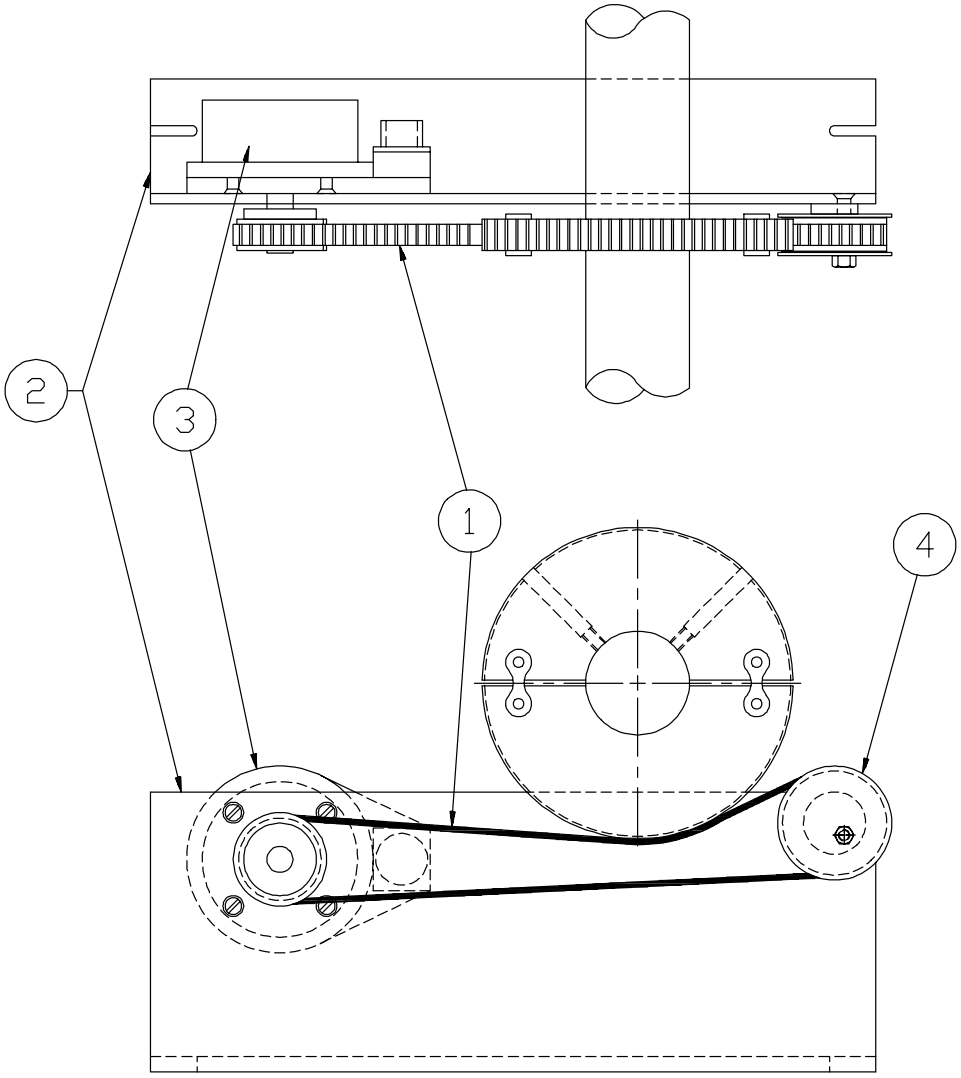


EPC-5 (internal components), 080xx286

Illustration 080xx286-01

B EPC-5 (internal components), 080xx286

Item	Description	Quantity	Part number
1	Tubing	2 inches	755xx007
2	Socket-head pipe plug	2	797xx042
3	Bushing M-F 1/4 x 1/8	1	797xx045
4	Manifold	1	077xx301
5	Solenoid valve	2	411xx400
6	Transducer	1	521xx004
7	Male connector 1/4 x 1/4	1	797xx324
8	Hex nipple M-M 1/8	2	797xx079
9	Male elbow 1/4 x 1/8	1	797xx338
10	Reducer fitting M-M 1/4 x 1/8	2	797xx069
11	Adapter F-M 1/2 x 1/4	1	797xx961
12	Shock arrestor	1	593xx104
13	Bulkhead connector	3	793xx001

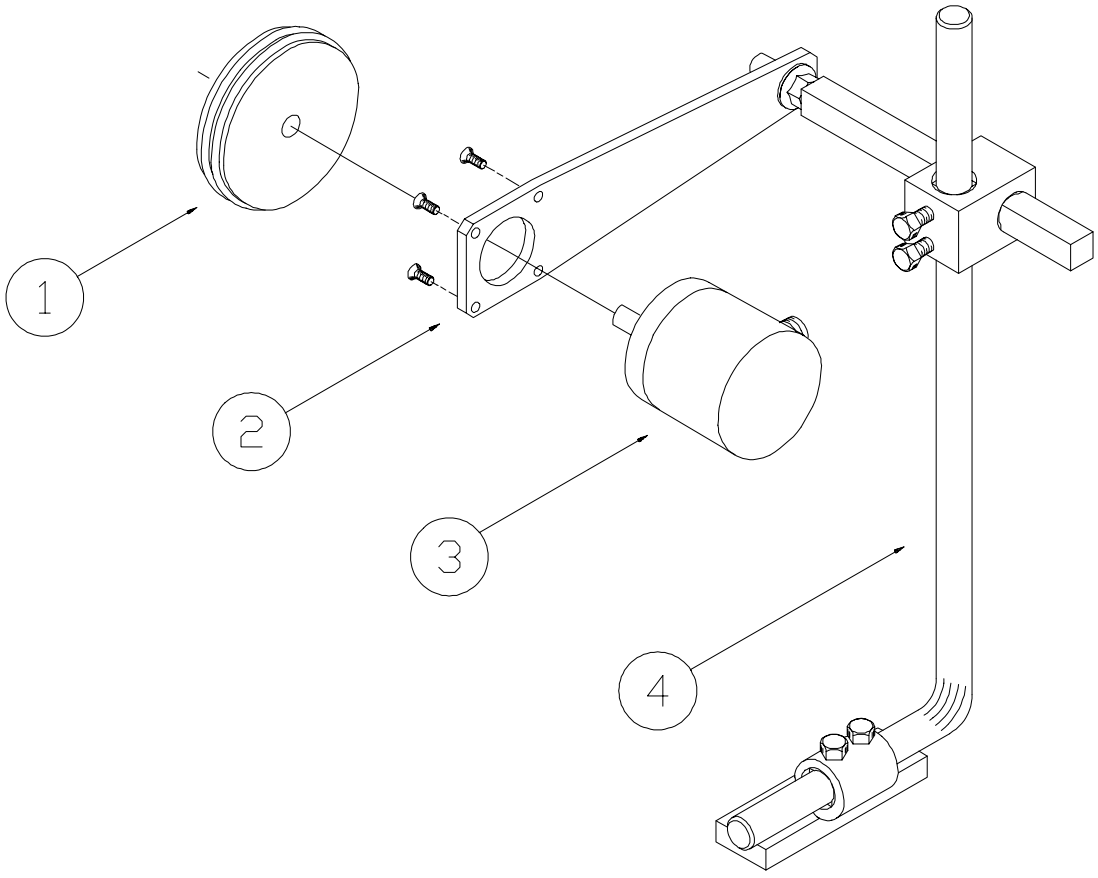


Shaft encoder assembly, 155xx001

Illustration 999XC155-02

C Shaft encoder assembly, 155xx001

Item	Description	Quantity	Part number
1	Timing belt	1	788xx300
2	Mounting bracket	1	578xx679
3	VCE-250 encoder	1	155xx027
4	Idler beading assembly	1	578xx198
5	Screw, 10-24 x 3/8 (not shown)	4	789xx056
	Encoder cable, 33 ft. (10 m)		030xx003
	Encoder cable, 66 ft. (22 m)		030xx008
	Encoder drive gear, 18 teeth		788xx118
	Encoder drive gear, 20 teeth		788xx120
	Encoder drive gear, 21 teeth		788xx121
	Encoder drive gear, 22 teeth		788xx122
	Encoder drive gear, 24 teeth		788xx124
	Encoder drive gear, 28 teeth		788xx128
	Encoder drive gear, 30 teeth		788xx130
	Encoder drive gear, 32 teeth		788xx232
	Encoder drive gear, 36 teeth		788xx236
	Encoder drive gear, 40 teeth		788xx240
	Encoder drive gear, 42 teeth		788xx242
	Encoder drive gear, 44 teeth		788xx244
	Encoder drive gear, 48 teeth		788xx248
	Encoder drive gear, 60 teeth		788xx260
	Split and linked gear, 48 teeth, 1.75" (44 mm) maximum bore size		788xx048
	Split and linked gear, 60 teeth, 2.375" (60 mm) maximum bore size		788xx060
	Split and linked gear, 72 teeth, 3.25" (83 mm) maximum bore size		788xx072
	Split and linked gear, 92 teeth, 4.5" (114 mm) maximum bore size		788xx092

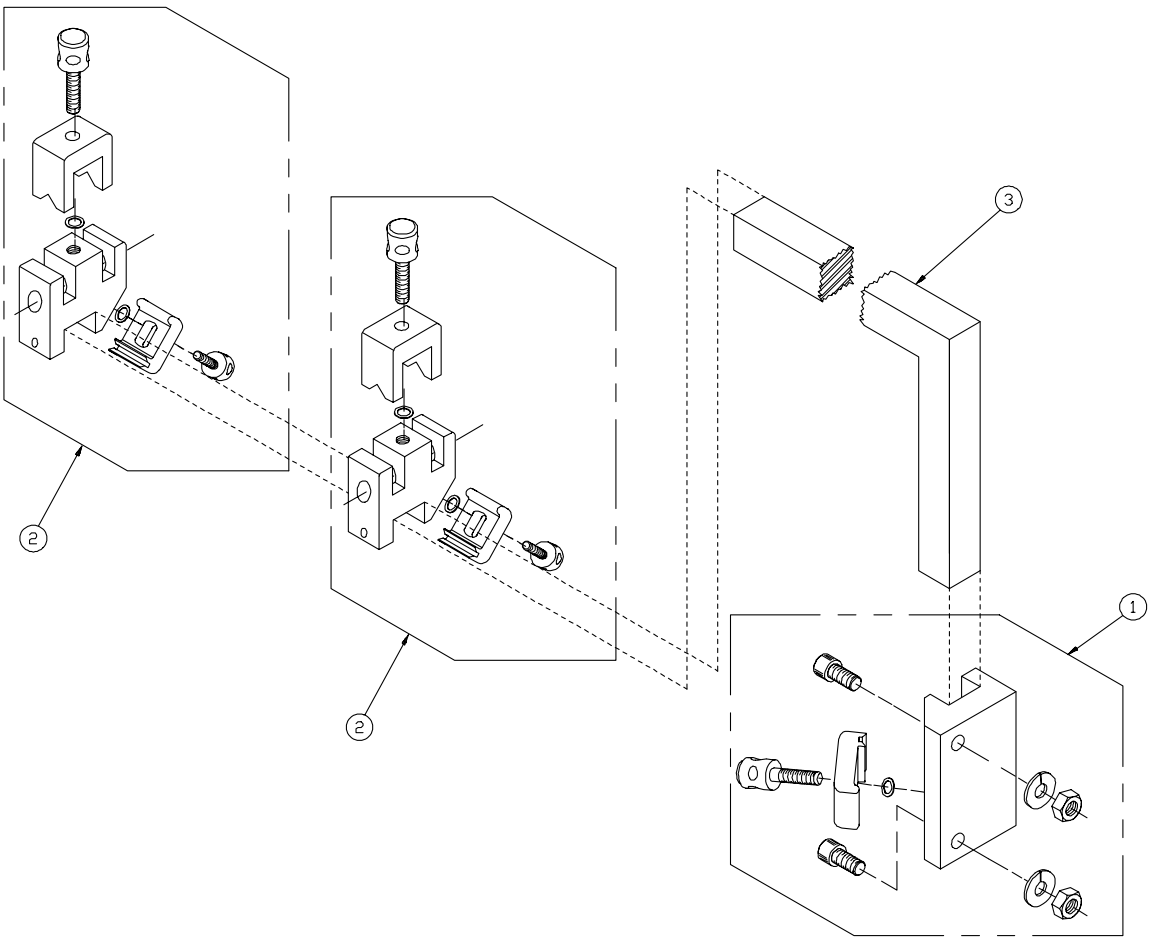


Measuring wheel encoder assembly

Illustration 999XC155-03

C Measuring wheel encoder assembly

Item	Description	Quantity	Part number
1	Measuring wheel	1	788xx553
2	Encoder bracket	1	580xx354
3	Encoder		
	VCE-250	1	155xx027
	VCE-500	1	155xx029
	VCE-1000	1	155xx031
4	Bracket assembly (includes item 2)	1	580xx357

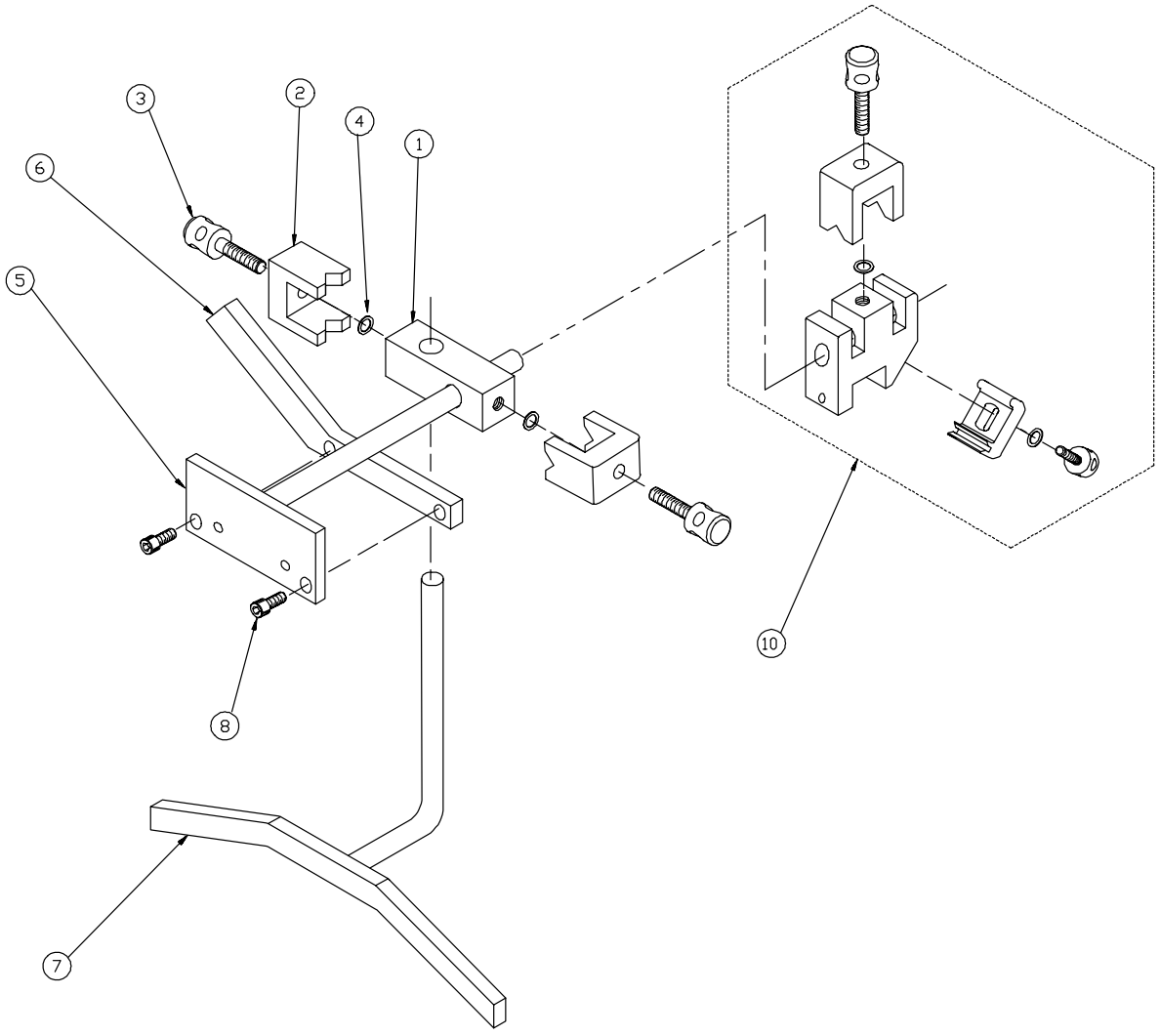


Mounting bracket assembly, 578xx530

Illustration 578xx530-01

D Mounting bracket assembly, 578xx530

Item	Description	Quantity	Part number
1	Mounting base assembly	1	578xx527
2	Clamp assembly	2	578xx526
3	Bracket bar	1	578xx517

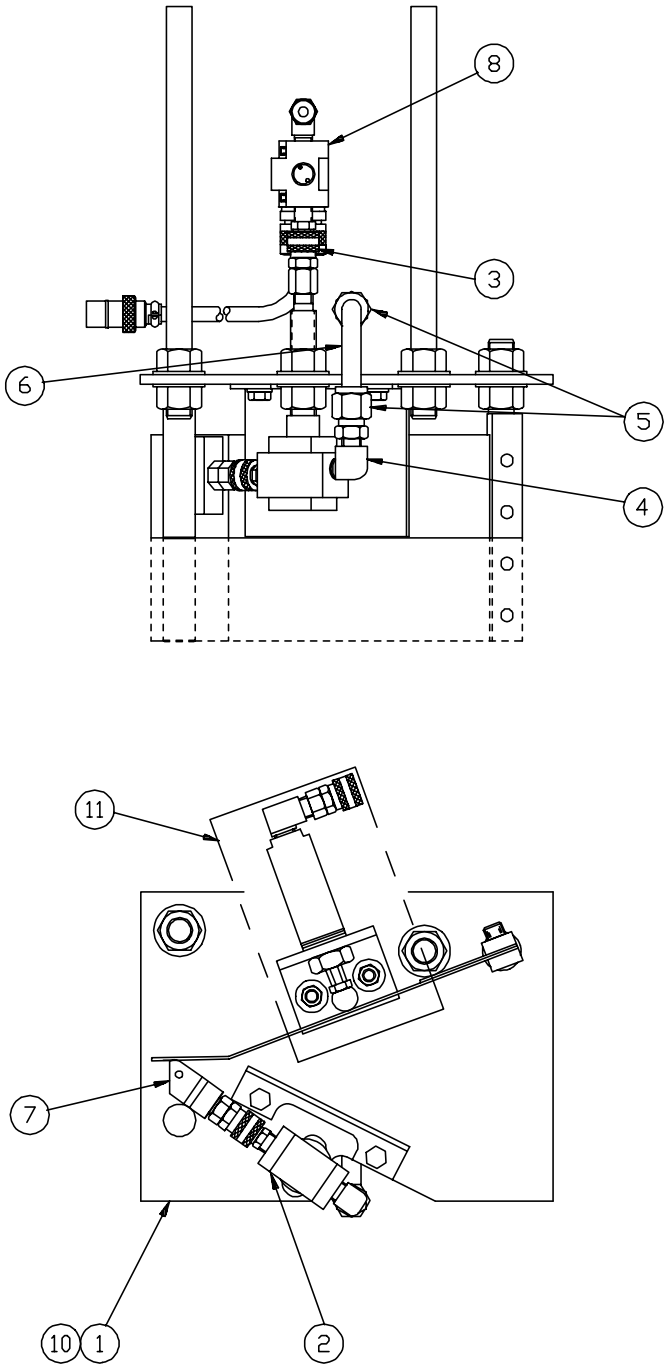


Scanner mounting bracket assembly, 581xx157

Illustration 578xx528-01

E Scanner mounting bracket assembly, 581xx157

Item	Description	Quantity	Part number
1	Knuckle	1	576xx021
2	Clamp	2	578xx497
3	Screw	2	798xx995
4	Retaining ring	2	793xx129
5	Mounting bracket	1	581xx126
6	Upper flap guide	1	578xx281
7	Lower flap guide	1	578xx282
8	Screw, 1/4-20 x 5/8	2	798xx109
10	Clamp assembly	1	578xx526



Glue station, bottom-up, fourth-panel side or drive side, 578xx425

Illustration 578xx425-01

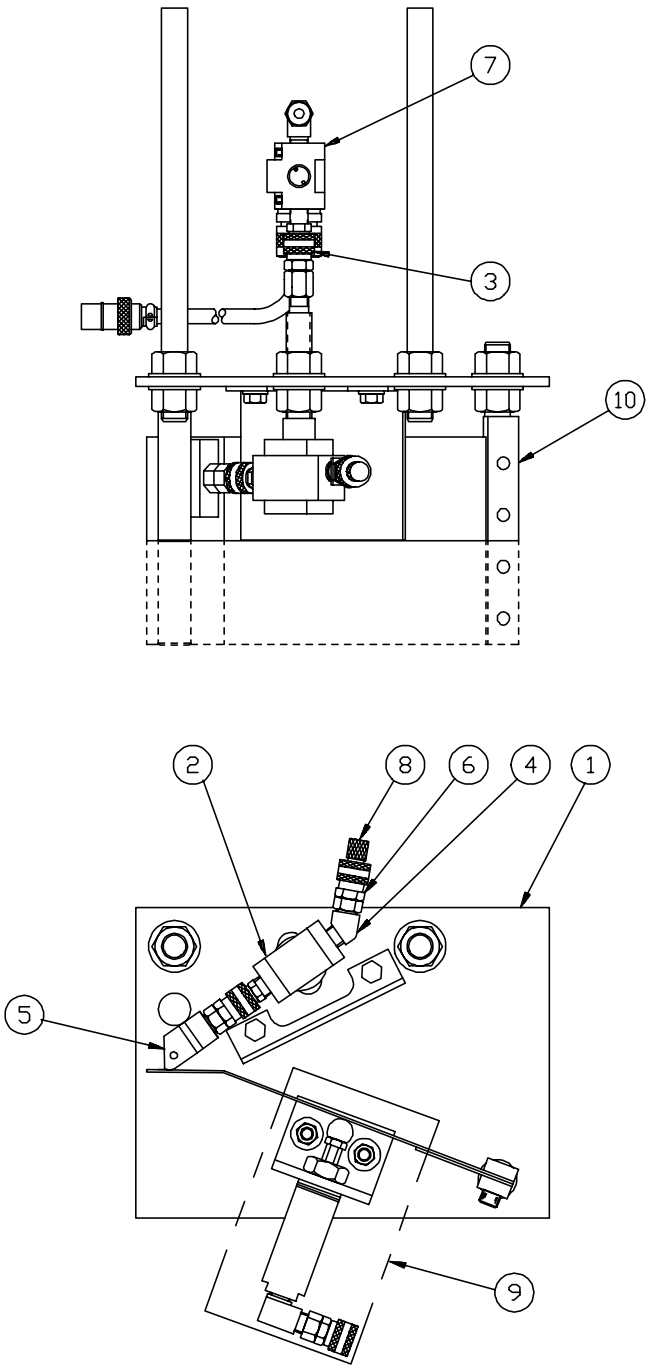
F

Glue station, 578xx425
bottom-up, fourth-panel side or drive side

Item	Description	Quantity	Part number
1	Glue station VO-700-0	1	578xx005
2	366 glue valve	1	705xx113
3	Female swivel fitting	2	750xx015
4	Elbow fitting M-F 1/8 x 1/8	1	797xx005
5	Male connector	2	797xx901
6	Tube	1	755xx021
7	Applicator head (sold separately)		
8	3-way valve	1	411xx062
9	Male stopper (not shown)	1	750xx013

Glue station (with air cylinder), 578xx433
bottom-up, fourth-panel side or drive side

Item	Description	Quantity	Part number
10	Glue station	1	578xx425
11	Conversion kit	1	723xx003



Glue station, top-down, fourth-panel side or drive side, 578xx421

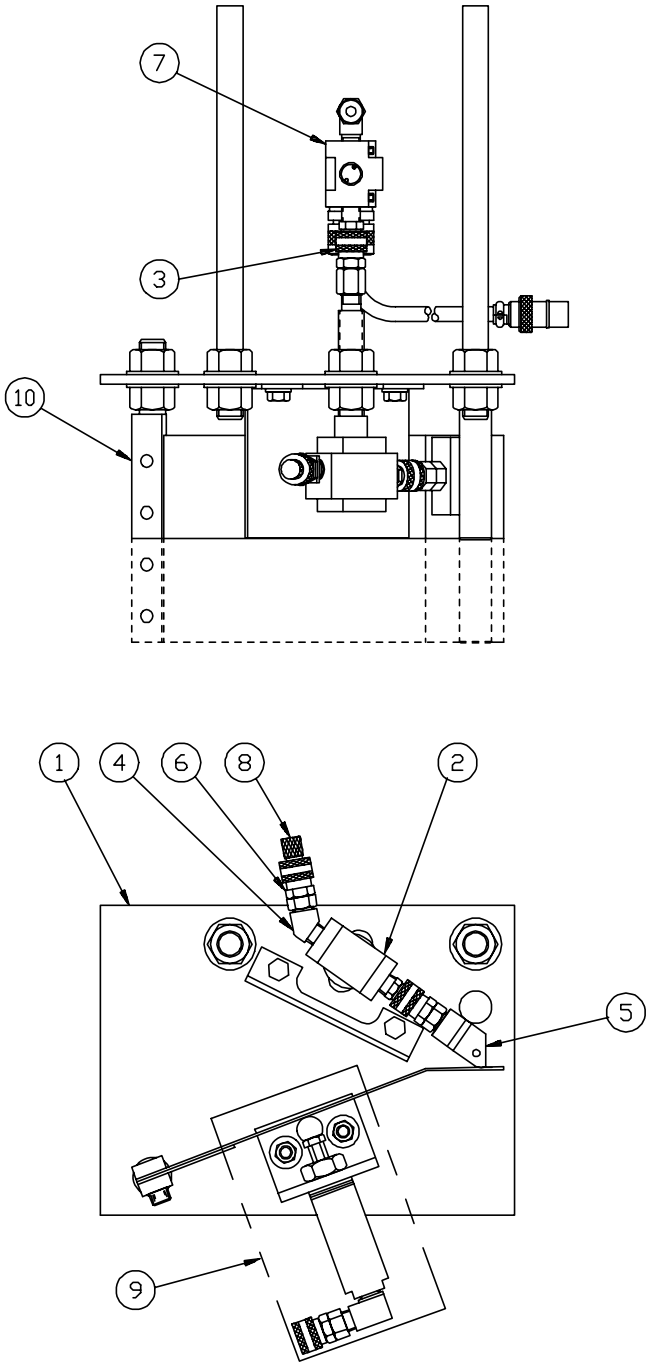
Illustration 578xx421-01

F Glue station, 578xx421 top-down, fourth-panel side or drive side

Item	Description	Quantity	Part number
1	Glue station	1	578xx000
2	366 glue valve	1	705xx113
3	Female swivel fitting	1	750xx015
4	Elbow fitting, 1/8NPT 45°	1	797xx011
5	Applicator head (sold separately)		
6	Female swivel fitting	1	750xx001
7	3-way valve	1	411xx062
8	Male stopper	1	750xx013

Glue station (with air cylinder), 578xx429 top-down, fourth-panel side or drive side

Item	Description	Quantity	Part number
9	Conversion kit	1	723xx003
10	Glue station	1	578xx421



Glue station, top-down, tab side, 578xx422

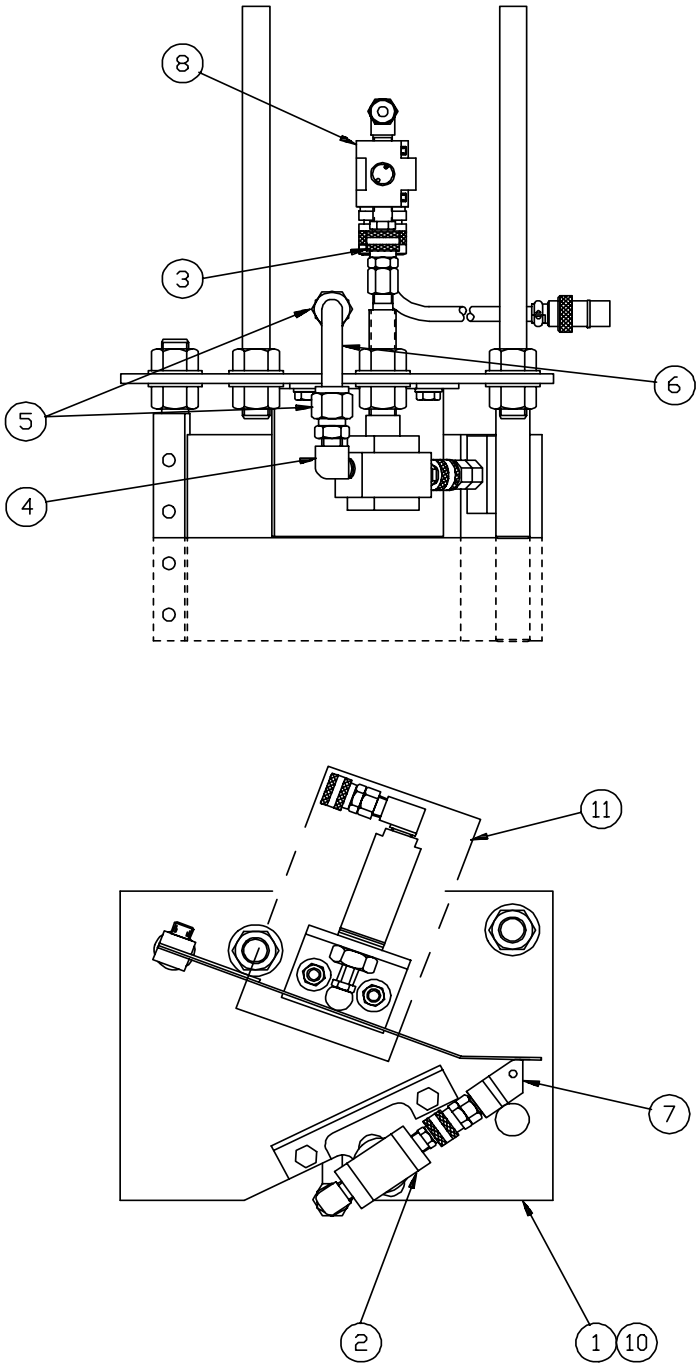
Illustration 578xx421-01

F Glue station, 578xx422 top-down, tab side

Item	Description	Quantity	Part number
1	Mounting bracket, V-75L	1	578xx680
2	366WGTL glue valve	1	705xx113
3	Female swivel fitting	1	750xx015
4	Elbow fitting, F-M 1/8NPT 45°	1	797xx011
5	Applicator head (sold separately)		
6	Female swivel fitting	1	750xx001
7	3-way valve	1	411xx062
8	Male stopper	1	750xx013

Glue station (with air cylinder), 578xx430 top-down, tab side

Item	Description	Quantity	Part number
9	Conversion kit	1	723xx003
10	Glue station	1	578xx422



Glue station, bottom-up, tab side, 578xx427

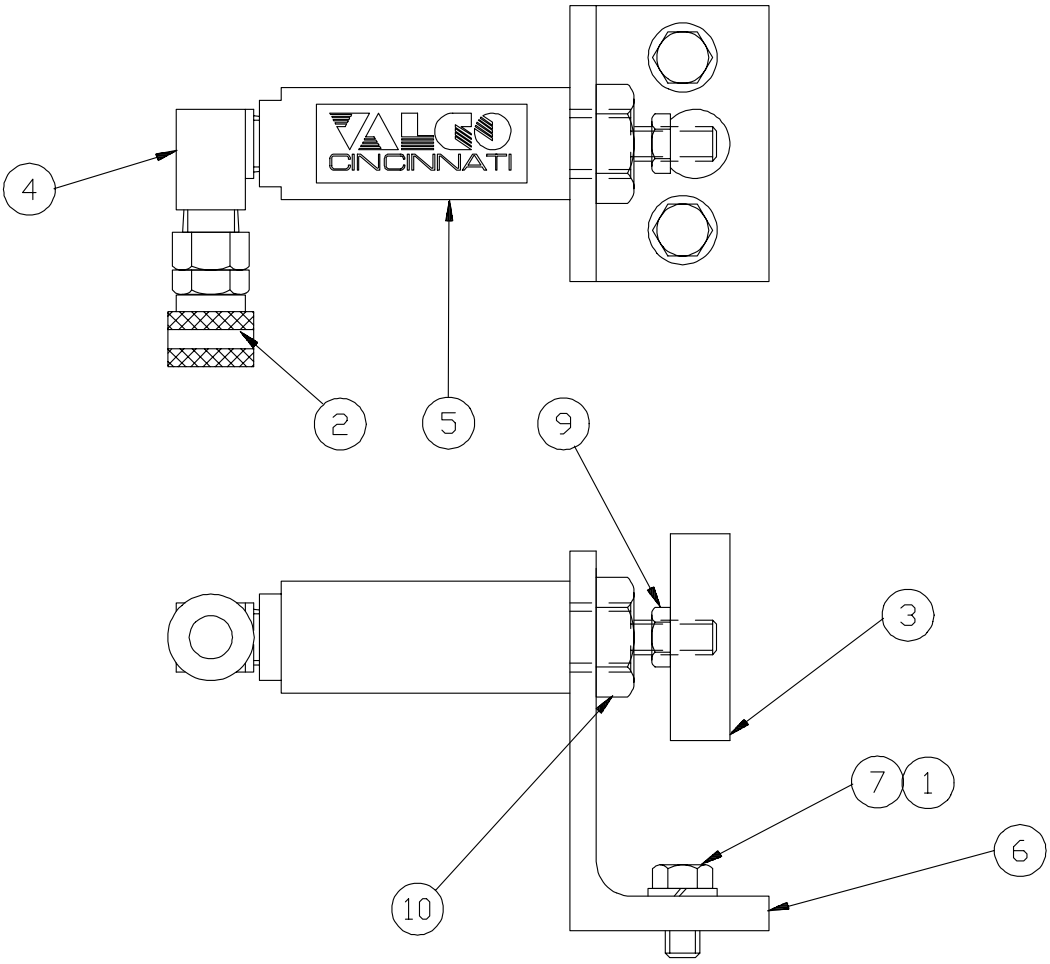
Illustration 578xx425-01

F Glue station, 578xx427 bottom-up, tab side

Item	Description	Quantity	Part number
1	Mounting bracket, VO-700L	1	578xx681
2	366WGTL glue valve	1	705xx113
3	Female swivel fitting	1	750xx015
4	Elbow fitting, F-M 1/8 x 1/8	1	797xx005
5	Male connector fitting, 3/8 x 1/8	2	797xx901
6	Tube	1	755xx021
7	Applicator head (sold separately)		
8	3-way valve	1	411xx062
9	Male stopper (not shown)	1	750xx013

Glue station (with air cylinder), 578xx434 bottom-up, tab side

Item	Description	Quantity	Part number
10	Bottom-up glue station	1	578xx427
11	Conversion kit	1	723xx003

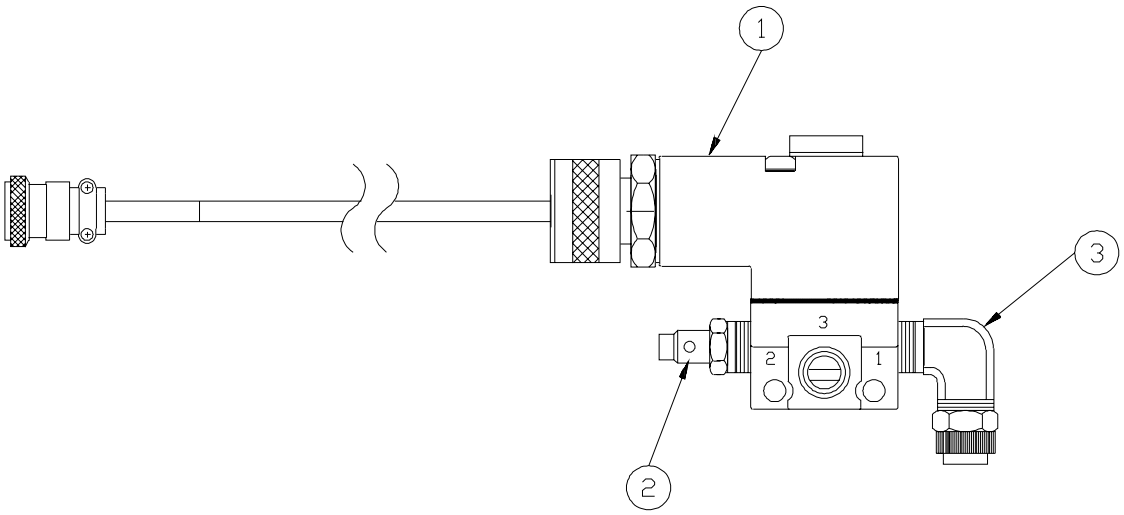


Conversion kit assembly, 723xx003

Illustration 723xx003-01

F Conversion kit assembly, 723xx003

Item	Description	Quantity	Part number
1	Lock washer, zinc 1/4"	2	798xx735
2	Female swivel fitting	1	750xx001
3	Pressure bar	1	578xx377
4	Elbow fitting, 90 M-F 1/8 x 1/8	1	797xx005
5	Air cylinder	1	795xx062
6	Mounting bracket	1	578xx039
7	Screw, zinc 1/4-20 x 1/2	2	798xx564
9	Hex nut, zinc 1/4-28	1	798xx689
10	Hex nut, zinc 1/2-20	1	798xx700

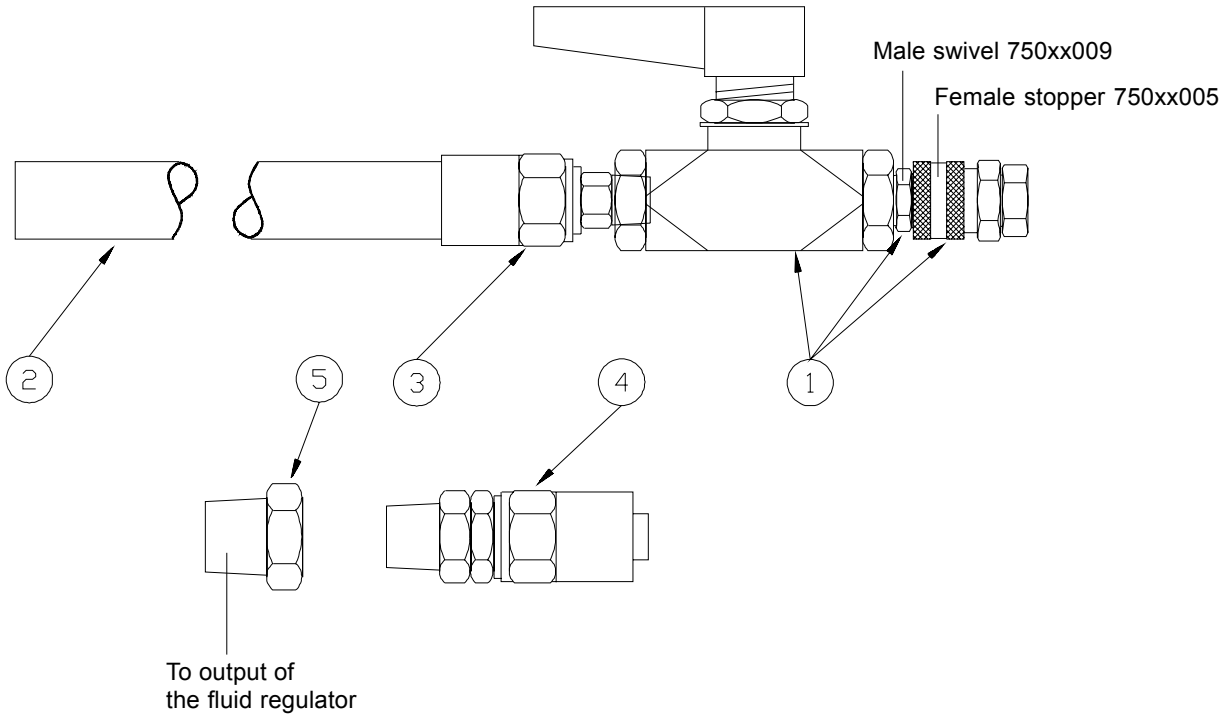


3-way valve - 24VDC, 411xx062

Illustration 411xx062-01

F 3-way valve - 24VDC, 411xx062

Item	Description	Quantity	Part number
1	3-way valve	1	411xx060
2	Male swivel fitting	1	750xx011
3	Male elbow fitting, 3/8 x 1/8	1	797xx342



Shutoff valve assembly

Illustration 703xx298-01

G Shutoff valve assemblies

Description	Part number
Shutoff valve with male swivel and 1/2" OD poly tubing connector	703xx029
Shutoff valve with 4' (1.2 m) 1/2" OD poly tubing	703xx002
Shutoff valve with 4' (1.2 m) 3/8" OD poly tubing	703xx031
Shutoff valve with 5' (1.5 m) 3/8" ID vinyl tubing	703xx298
Shutoff valve with 10' (3 m) 3/8" ID vinyl tubing	703xx299
Shutoff valve with 15' (4.6 m) 3/8" ID vinyl tubing	703xx300

Shutoff valve assembly, 703xx298

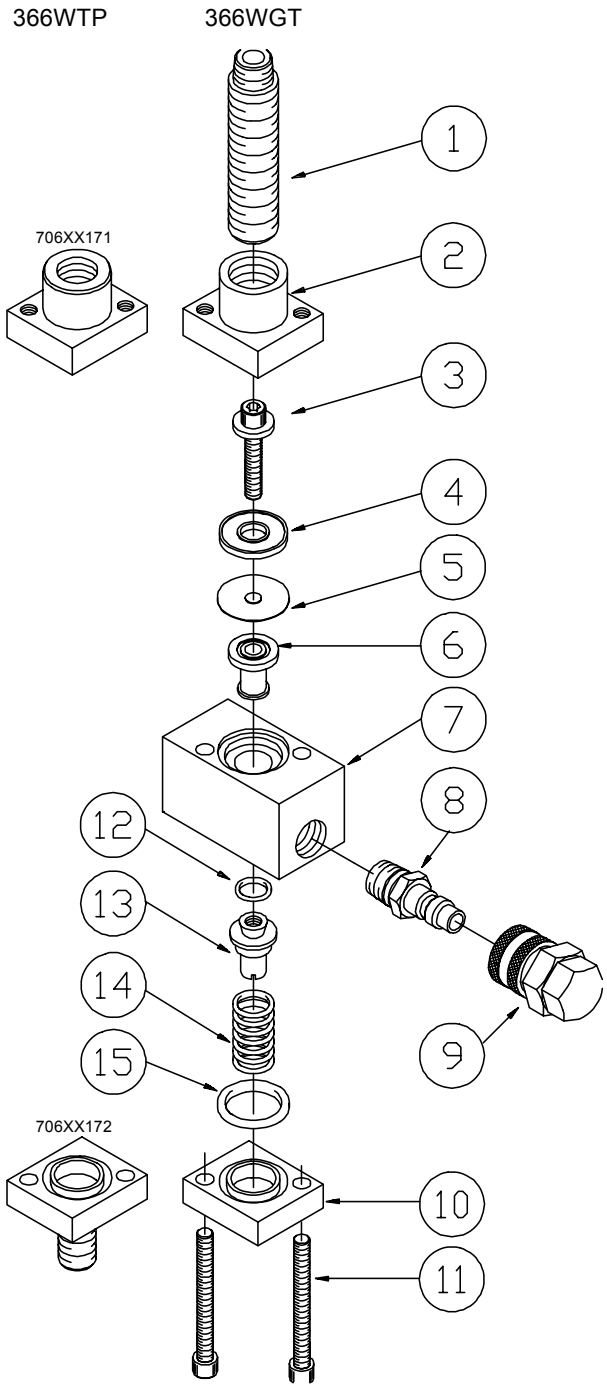
Item	Description	Quantity	Part number
1	Shutoff valve	1	703xx418
2	Hose, reinforced 3/8" (5' / 1.5 m)	1	755xx235
3	Straight fitting, 3/8 x 1/4 NPT	1	799xx101
4	Swivel fitting, 3/8 x 3/8 NPT	1	799xx102
5	Bushing, M-F 1/2 x 3/8	1	797xx050

H 366 glue valve assemblies (USA)

Description	Part number
366 valve (SS366WTPF) with fixed swivel and short mounting stud, for WPM palletizer	705xx015
366 valve (S366RT) with integral rotary fitting and special air inlet, for General and Universal tapers	705xx016
366 valve (366SH) with swivel fitting, two mounting studs and wing nuts, for Schroeder case sealers	705xx017
366 valve (366RRT) with integral rotary fitting, right-side glue inlet, for New Way	705xx018
366 valve (366RLT) with integral rotary fitting, left-side glue inlet, for New Way	705xx019
366 valve (366T) with no fittings or mounting stud, for PAK-Master machine	705xx020
366 valve with 1/8" MPT x 1/8" FPT adapter on glue outlet, for use on Pearson case sealers	705xx029
366 valve (366WTP) with swivel fitting and 3/8-16 wing nut, one of two styles used on labelers	705xx025
366 valve (366WTPF) with fixed swivel and 3/8-16 wing nut, one of two styles used on labelers	705xx026
366 valve assembled for V-75 (Flexoseal) top-down glue station, includes fittings and disconnects	705xx024
366 valve assembled for VO-700 (Flexoseal) bottom-up glue station, includes fittings and disconnects	705xx043
366 valve assembled for General Junior model taper	705xx047

H 366 glue valve assemblies (metric)

Description	Part number
366 glue valve (with 45 mm air connector)	705xx035
366M (without air connector, with metric mounting bolt)	705xx036

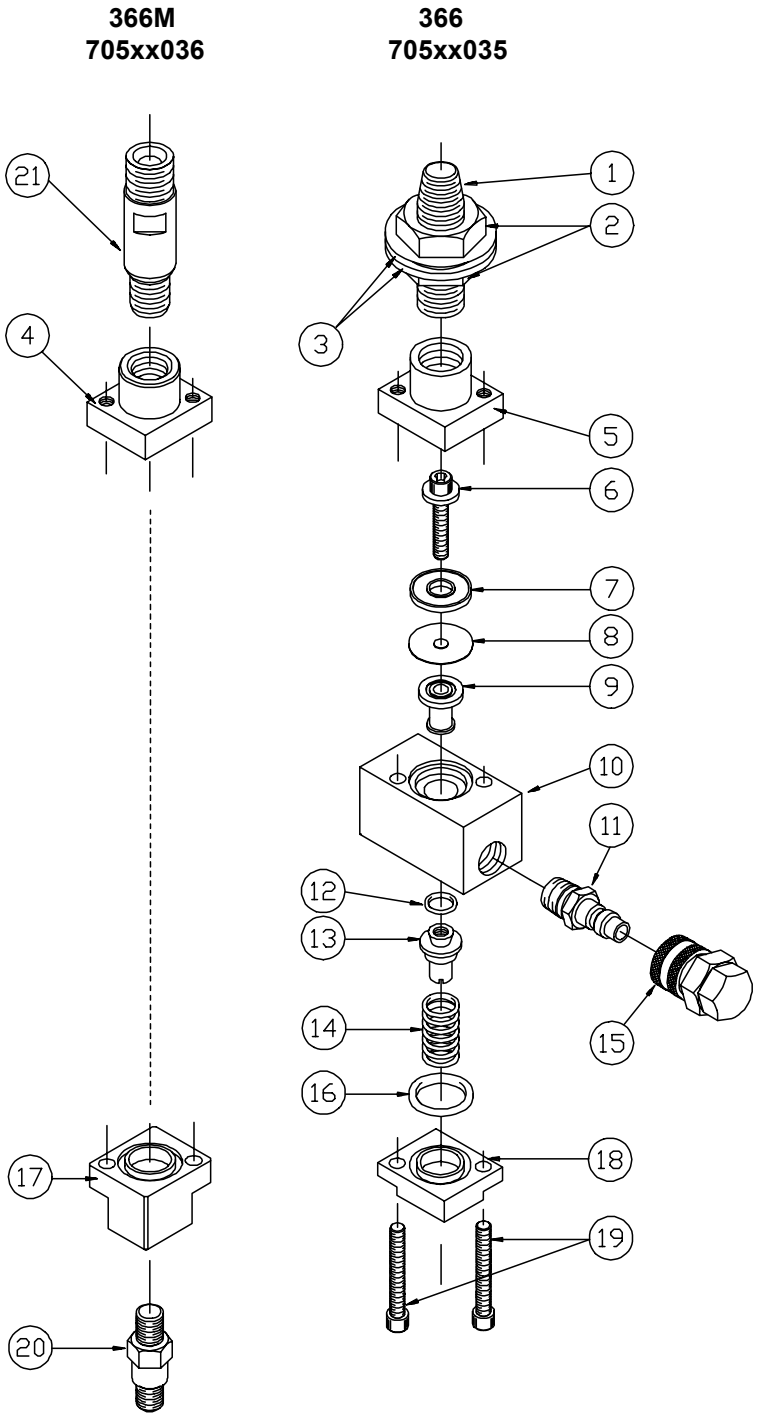


366 glue valve (USA), 705xx113

Illustration 999XB705-04

H 366 glue valve parts (USA), 705xx113

Item	Description	Quantity	Part number
1	“G” mounting stud (366WGT valve only)		
	1-1/2" stud with 1/8" NPT	1	701xx498
	2-3/4" stud with 1/8" NPT	1	701xx525
	4" stud with 1/2" NPT	1	701xx526
2	Pilot inlet:		
	366WGT valves	1	706xx170
	366WTP valves	1	706xx171
3	Stem screw diaphragm restrainer assembly	1	706xx177
4	Diaphragm	1	706xx100
5	Diaphragm protector	1	706xx101
6	Stem top	1	706xx175
7	Valve body	1	706xx166
8	Male swivel fitting	1	750xx009
	Non-rotating swivel	1	750xx011
9	Female stopper	1	750xx005
10	Lower retainer:		
	366WGT valves	1	706xx173
	366WTP valves	1	706xx172
11	Assembly screws:		
	366WGT valves	2	798xx043
	366WTP valves	2	798xx041
12	O-ring	1	745xx098
13	Stem bottom	1	706xx176
14	Valve spring	1	706xx102
15	Lower retainer O-ring	1	745xx066
	Valve seal kit		706xx178



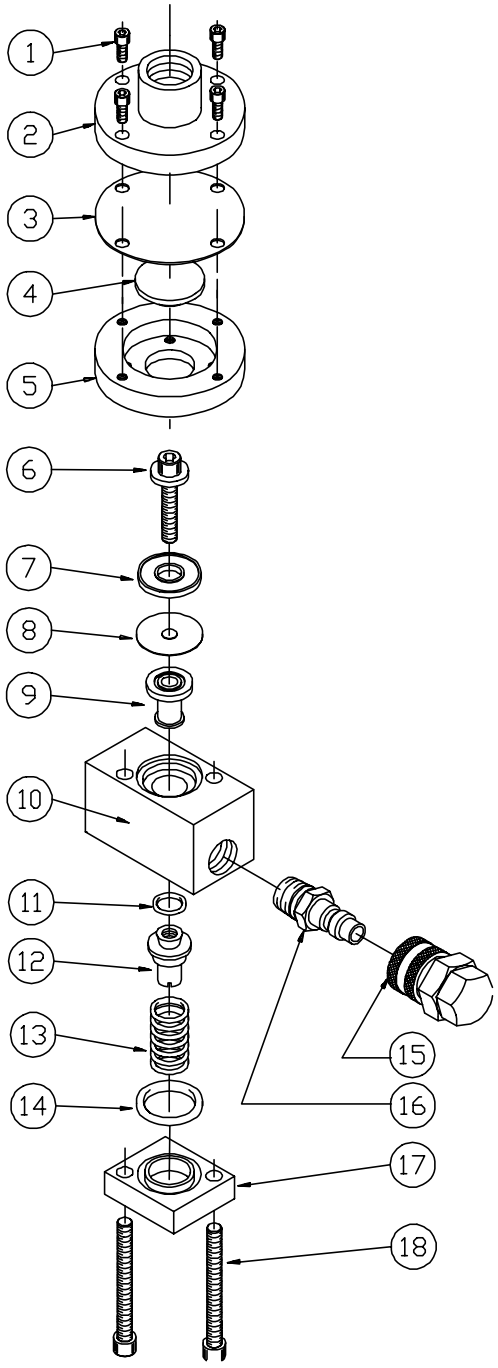
366/366M glue valve (metric), 705xx035 and 705xx036

Illustration 705xx305-01, 705xx306-01

H 366 glue valve parts (metric), 705xx035 and 705xx036

Item	Description	Quantity	Part number
1	G1/8" air connector, 45 mm	1	701xx498
2	Nut, 1/2" x 20	2	798xx983
3	Washer, 1/2"	2	798xx797
4	366M upper pilot inlet	1	706xx208
5	366 upper pilot inlet	1	706xx170
6	Stem screw assembly	1	706xx177
7	Diaphragm	1	706xx100
8	Diaphragm protector	1	706xx101
9	Stem top	1	706xx175
10	Valve body	1	706xx166
11	Fitting set	1	750xx009
12	O-ring	1	745xx098
13	Stem bottom	1	706xx176
14	Spring	1	706xx102
15	Plug swivel fitting	1	750xx005
16	O-ring	1	745xx066
17	366M lower retainer	1	706xx207
18	366 lower retainer	1	706xx173
19	Screw, 8-32 x 1-1/2	2	798xx043
20	Mounting bolt M8 (366M)	1	706xx206
21	Air connection G1/4" (Optional)	1	792xx128

	Valve seal kit		706xx178



LP366WGT low-pressure glue valve, 705xx112

Illustration 705xx112

H LP366WGT low-pressure valve parts, 705xx112

Item	Description	Quantity	Part number
1	Screw, 6-32 x 1/2	4	798xx005
2	Pilot inlet	1	706xx185
3	Diaphragm, 33282-R	1	701xx406
4	Disk	1	706xx186
5	Bottom cap	1	706xx187
6	Stem screw assembly	1	706xx177
7	Diaphragm	1	706xx100
8	Diaphragm protector	1	706xx101
9	Stem top	1	706xx175
10	Valve body	1	706xx166
11	O-ring	1	745xx098
12	Stem bottom	1	706xx176
13	Spring	1	706xx102
14	O-ring, 360-OR	1	745xx066
15	Female stopper	1	750xx005
16	Male swivel fitting	1	750xx009
17	Lower retainer	1	706xx173
18	Screw, 8-32 x 1-3/8	2	798xx869
	Mounting stud (not shown)	1	701xx498
	Jam nut, 1/2-20 (not shown)	1	798xx983
	Lock washer, 1/2 (not shown)	2	798xx799
	Label (not shown)	2	795xx614

H Applicator heads, Carbide (horizontal application)

1/4" (6 mm) veins on center, single lateral (9/64" diameter) swivel input fitting

Description	Part number
.040" (1.01 mm) diameter veins	
Single vein	651xx001
1/4" (6 mm)	651xx002
1/2" (13 mm)	651xx003
3/4" (19 mm)	651xx004
1" (25 mm)	651xx005
1-1/4" (32 mm)	651xx006
1-1/2" (38 mm)	651xx007
1-3/4" (44 mm)	651xx008
2" (51 mm)	651xx009
2-1/4" (57 mm)	651xx010
2-1/2" (64 mm)	651xx011
2-3/4" (70 mm)	651xx012
3" (76 mm)	651xx013
3-1/4" (83 mm)	651xx014
3-1/2" (89 mm)	651xx015
3-3/4" (95 mm)	651xx016
4" (102 mm)	651xx017
4-1/4" (108 mm)	651xx018
4-1/2" (114 mm)	651xx019
4-3/4" (121 mm)	651xx020
5" (127 mm)	651xx021
5-1/4" (133 mm)	651xx022
5-1/2" (140 mm)	651xx023
5-3/4" (146 mm)	651xx024
6" (152 mm)	651xx025

Description	Part number
.062" (1.57 mm) diameter veins	
Single vein	652xx001
1/4" (6 mm)	652xx002
1/2" (13 mm)	652xx003
3/4" (19 mm)	652xx004
1" (25 mm)	652xx005
1-1/4" (32 mm)	652xx006
1-1/2" (38 mm)	652xx007
1-3/4" (44 mm)	652xx008
2" (51 mm)	652xx009
2-1/4" (57 mm)	652xx010
2-1/2" (64 mm)	652xx011
2-3/4" (70 mm)	652xx012
3" (76 mm)	652xx013
3-1/4" (83 mm)	652xx014
3-1/2" (89 mm)	652xx015
3-3/4" (95 mm)	652xx016
4" (102 mm)	652xx017
4-1/4" (108 mm)	652xx018
4-1/2" (114 mm)	652xx019
4-3/4" (121 mm)	652xx020
5" (127 mm)	652xx021
5-1/4" (133 mm)	652xx022
5-1/2" (140 mm)	652xx023
5-3/4" (146 mm)	652xx024
6" (152 mm)	652xx025

H Applicator heads, Carbide (horizontal application)

1/8" (3 mm) veins on center, single lateral (9/64" diameter) swivel input fitting

Description	Part number
.040" (1.01 mm) diameter veins	
1/8" (3 mm)	653xx002
1/4" (6 mm)	653xx003
3/8" (10 mm)	653xx004
1/2" (13 mm)	653xx005
5/8" (15 mm)	653xx006
3/4" (19 mm)	653xx007
7/8" (22 mm)	653xx008
1" (25 mm)	653xx009
1-1/8" (29 mm)	653xx010
1-1/4" (32 mm)	653xx011
1-3/8" (35 mm)	653xx012
1-1/2" (38 mm)	653xx013
1-5/8" (41 mm)	653xx014
1-3/4" (44 mm)	653xx015
1-7/8" (48 mm)	653xx016
2" (51 mm)	653xx017
2-1/8" (54 mm)	653xx018
2-1/4" (57 mm)	653xx019
2-3/8" (60 mm)	653xx020
2-1/2" (64 mm)	653xx021
2-5/8" (67 mm)	653xx022
2-3/4" (70 mm)	653xx023
2-7/8" (73 mm)	653xx024
3" (76 mm)	653xx025
3-1/8" (79 mm)	653xx026
3-1/4" (83 mm)	653xx027
3-3/8" (86 mm)	653xx028
3-1/2" (89 mm)	653xx029
3-5/8" (92 mm)	653xx030
3-3/4" (95 mm)	653xx031
3-7/8" (98 mm)	653xx032
4" (102 mm)	653xx033

Description	Part number
.062" (1.57 mm) diameter veins	
1/8" (3 mm)	654xx002
1/4" (6 mm)	654xx003
3/8" (10 mm)	654xx004
1/2" (13 mm)	654xx005
5/8" (15 mm)	654xx006
3/4" (19 mm)	654xx007
7/8" (22 mm)	654xx008
1" (25 mm)	654xx009
1-1/8" (29 mm)	654xx010
1-1/4" (32 mm)	654xx011
1-3/8" (35 mm)	654xx012
1-1/2" (38 mm)	654xx013
1-5/8" (41 mm)	654xx014
1-3/4" (44 mm)	654xx015
1-7/8" (48 mm)	654xx016
2" (51 mm)	654xx017
2-1/8" (54 mm)	654xx018
2-1/4" (57 mm)	654xx019
2-3/8" (60 mm)	654xx020
2-1/2" (64 mm)	654xx021
2-5/8" (67 mm)	654xx022
2-3/4" (70 mm)	654xx023
2-7/8" (73 mm)	654xx024
3" (76 mm)	654xx025
3-1/8" (79 mm)	654xx026
3-1/4" (826 mm)	654xx027
3-3/8" (86 mm)	654xx028
3-1/2" (89 mm)	654xx029
3-5/8" (92 mm)	654xx030
3-3/4" (95 mm)	654xx031
3-7/8" (98 mm)	654xx032
4" (102 mm)	654xx033

H Applicator heads, Carbide (horizontal application)

1/8" (3 mm) veins on center, single lateral (9/64" diameter) swivel input fitting

Description	Part number
.040" (1.01 mm) diameter veins	
4-1/8" (105 mm)	653xx034
4-1/4" (108 mm)	653xx035
4-3/8" (111 mm)	653xx036
4-1/2" (114 mm)	653xx037
4-5/8" (118 mm)	653xx038
4-3/4" (121 mm)	653xx039
4-7/8" (124 mm)	653xx040
5" (127 mm)	653xx041
5-1/8" (130 mm)	653xx042
5-1/4" (133 mm)	653xx043
5-3/8" (137 mm)	653xx044
5-1/2" (140 mm)	653xx045
5-5/8" (143 mm)	653xx046
5-3/4" (146 mm)	653xx047
5-7/8" (149 mm)	653xx048
6" (152 mm)	653xx049

Description	Part number
.062" (1.57 mm) diameter veins	
4-1/8" (105 mm)	654xx034
4-1/4" (108 mm)	654xx035
4-3/8" (111 mm)	654xx036
4-1/2" (114 mm)	654xx037
4-5/8" (118 mm)	654xx038
4-3/4" (121 mm)	654xx039
4-7/8" (124 mm)	654xx040
5" (127 mm)	654xx041
5-1/8" (130 mm)	654xx042
5-1/4" (133 mm)	654xx043
5-3/8" (137 mm)	654xx044
5-1/2" (140 mm)	654xx045
5-5/8" (143 mm)	654xx046
5-3/4" (146 mm)	654xx047
5-7/8" (149 mm)	654xx048
6" (152 mm)	654xx049

H Applicator heads, Titanium-coated, solid tool steel (horizontal application)

1/4" (6 mm) veins on center, single lateral (9/64" diameter) swivel input fitting

Description	Part number
.040" (1.01 mm) diameter veins	
Single vein	676xx001
1/4" (6 mm)	676xx002
1/2" (13 mm)	676xx003
3/4" (19 mm)	676xx004
1" (25 mm)	676xx005
1-1/4" (32 mm)	676xx006
1-1/2" (38 mm)	676xx007
1-3/4" (44 mm)	676xx008
2" (51 mm)	676xx009
2-1/4" (57 mm)	676xx010
2-1/2" (64 mm)	676xx011
2-3/4" (70 mm)	676xx012
3" (76 mm)	676xx013
3-1/4" (83 mm)	676xx014
3-1/2" (89 mm)	676xx015
3-3/4" (95 mm)	676xx016
4" (102 mm)	676xx017
4-1/4" (108 mm)	676xx018
4-1/2" (114 mm)	676xx019
4-3/4" (121 mm)	676xx020
5" (127 mm)	676xx021
5-1/4" (133 mm)	676xx022
5-1/2" (140 mm)	676xx023
5-3/4" (146 mm)	676xx024
6" (152 mm)	676xx025

Description	Part number
.062" (1.57 mm) diameter veins	
Single vein	677xx001
1/4" (6 mm)	677xx002
1/2" (13 mm)	677xx003
3/4" (19 mm)	677xx004
1" (25 mm)	677xx005
1-1/4" (32 mm)	677xx006
1-1/2" (38 mm)	677xx007
1-3/4" (44 mm)	677xx008
2" (51 mm)	677xx009
2-1/4" (57 mm)	677xx010
2-1/2" (64 mm)	677xx011
2-3/4" (70 mm)	677xx012
3" (76 mm)	677xx013
3-1/4" (83 mm)	677xx014
3-1/2" (89 mm)	677xx015
3-3/4" (95 mm)	677xx016
4" (102 mm)	677xx017
4-1/4" (108 mm)	677xx018
4-1/2" (114 mm)	677xx019
4-3/4" (121 mm)	677xx020
5" (127 mm)	677xx021
5-1/4" (133 mm)	677xx022
5-1/2" (140 mm)	677xx023
5-3/4" (146 mm)	677xx024
6" (152 mm)	677xx025

H Applicator heads, Titanium-coated, solid tool steel (horizontal application)

1/8" (3 mm) veins on center, single lateral (9/64" diameter) swivel input fitting

Description	Part number
.040" (1.01 mm) diameter veins	
1/8" (3 mm)	678xx002
1/4" (6 mm)	678xx003
3/8" (10 mm)	678xx004
1/2" (13 mm)	678xx005
5/8" (15 mm)	678xx006
3/4" (19 mm)	678xx007
7/8" (22 mm)	678xx008
1" (25 mm)	678xx009
1-1/8" (29 mm)	678xx010
1-1/4" (32 mm)	678xx011
1-3/8" (35 mm)	678xx012
1-1/2" (38 mm)	678xx013
1-5/8" (41 mm)	678xx014
1-3/4" (44 mm)	678xx015
1-7/8" (48 mm)	678xx016
2" (51 mm)	678xx017
2-1/8" (54 mm)	678xx018
2-1/4" (57 mm)	678xx019
2-3/8" (60 mm)	678xx020
2-1/2" (64 mm)	678xx021
2-5/8" (67 mm)	678xx022
2-3/4" (70 mm)	678xx023
2-7/8" (73 mm)	678xx024
3" (76 mm)	678xx025
3-1/8" (79 mm)	678xx026
3-1/4" (83 mm)	678xx027
3-3/8" (86 mm)	678xx028
3-1/2" (89 mm)	678xx029
3-5/8" (92 mm)	678xx030
3-3/4" (95 mm)	678xx031
3-7/8" (98 mm)	678xx032
4" (102 mm)	678xx033

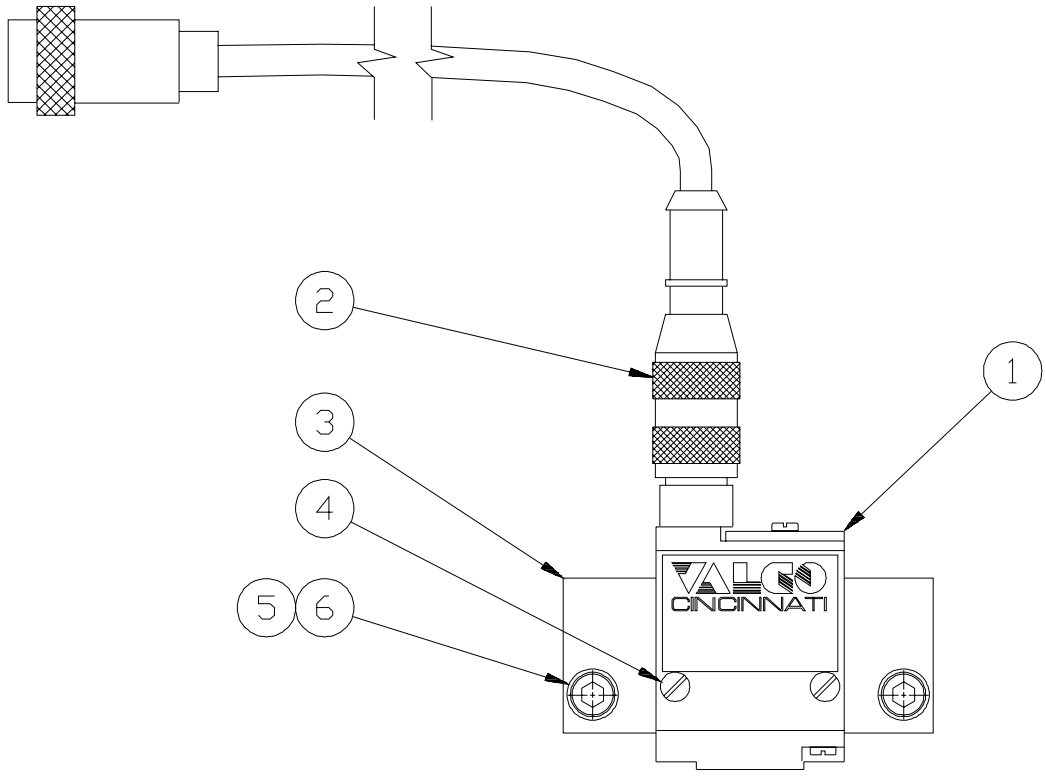
Description	Part number
.062" (1.57 mm) diameter veins	
1/8" (3 mm)	679xx002
1/4" (6 mm)	679xx003
3/8" (10 mm)	679xx004
1/2" (13 mm)	679xx005
5/8" (15 mm)	679xx006
3/4" (19 mm)	679xx007
7/8" (22 mm)	679xx008
1" (25 mm)	679xx009
1-1/8" (29 mm)	679xx010
1-1/4" (32 mm)	679xx011
1-3/8" (35 mm)	679xx012
1-1/2" (38 mm)	679xx013
1-5/8" (41 mm)	679xx014
1-3/4" (44 mm)	679xx015
1-7/8" (48 mm)	679xx016
2" (51 mm)	679xx017
2-1/8" (54 mm)	679xx018
2-1/4" (57 mm)	679xx019
2-3/8" (60 mm)	679xx020
2-1/2" (64 mm)	679xx021
2-5/8" (67 mm)	679xx022
2-3/4" (70 mm)	679xx023
2-7/8" (73 mm)	679xx024
3" (76 mm)	679xx025
3-1/8" (79 mm)	679xx026
3-1/4" (83 mm)	679xx027
3-3/8" (86 mm)	679xx028
3-1/2" (89 mm)	679xx029
3-5/8" (92 mm)	679xx030
3-3/4" (95 mm)	679xx031
3-7/8" (98 mm)	679xx032
4" (102 mm)	679xx033

H Applicator heads, Titanium-coated, solid tool steel (horizontal application)

1/8" (3 mm) veins on center, single lateral (9/64" diameter) swivel input fitting

Description	Part number
.040" (1.01 mm) diameter veins	
4-1/8" (105 mm)	678xx034
4-1/4" (108 mm)	678xx035
4-3/8" (111 mm)	678xx036
4-1/2" (114 mm)	678xx037
4-5/8" (118 mm)	678xx038
4-3/4" (121 mm)	678xx039
4-7/8" (124 mm)	678xx040
5" (127 mm)	678xx041
5-1/8" (130 mm)	678xx042
5-1/4" (133 mm)	678xx043
5-3/8" (137 mm)	678xx044
5-1/2" (140 mm)	678xx045
5-5/8" (143 mm)	678xx046
5-3/4" (146 mm)	678xx047
5-7/8" (149 mm)	678xx048
6" (152 mm)	678xx049

Description	Part number
.062" (1.57 mm) diameter veins	
4-1/8" (105 mm)	679xx034
4-1/4" (108 mm)	679xx035
4-3/8" (111 mm)	679xx036
4-1/2" (114 mm)	679xx037
4-5/8" (118 mm)	679xx038
4-3/4" (121 mm)	679xx039
4-7/8" (124 mm)	679xx040
5" (127 mm)	679xx041
5-1/8" (130 mm)	679xx042
5-1/4" (133 mm)	679xx043
5-3/8" (137 mm)	679xx044
5-1/2" (140 mm)	679xx045
5-5/8" (143 mm)	679xx046
5-3/4" (146 mm)	679xx047
5-7/8" (149 mm)	679xx048
6" (152 mm)	679xx049

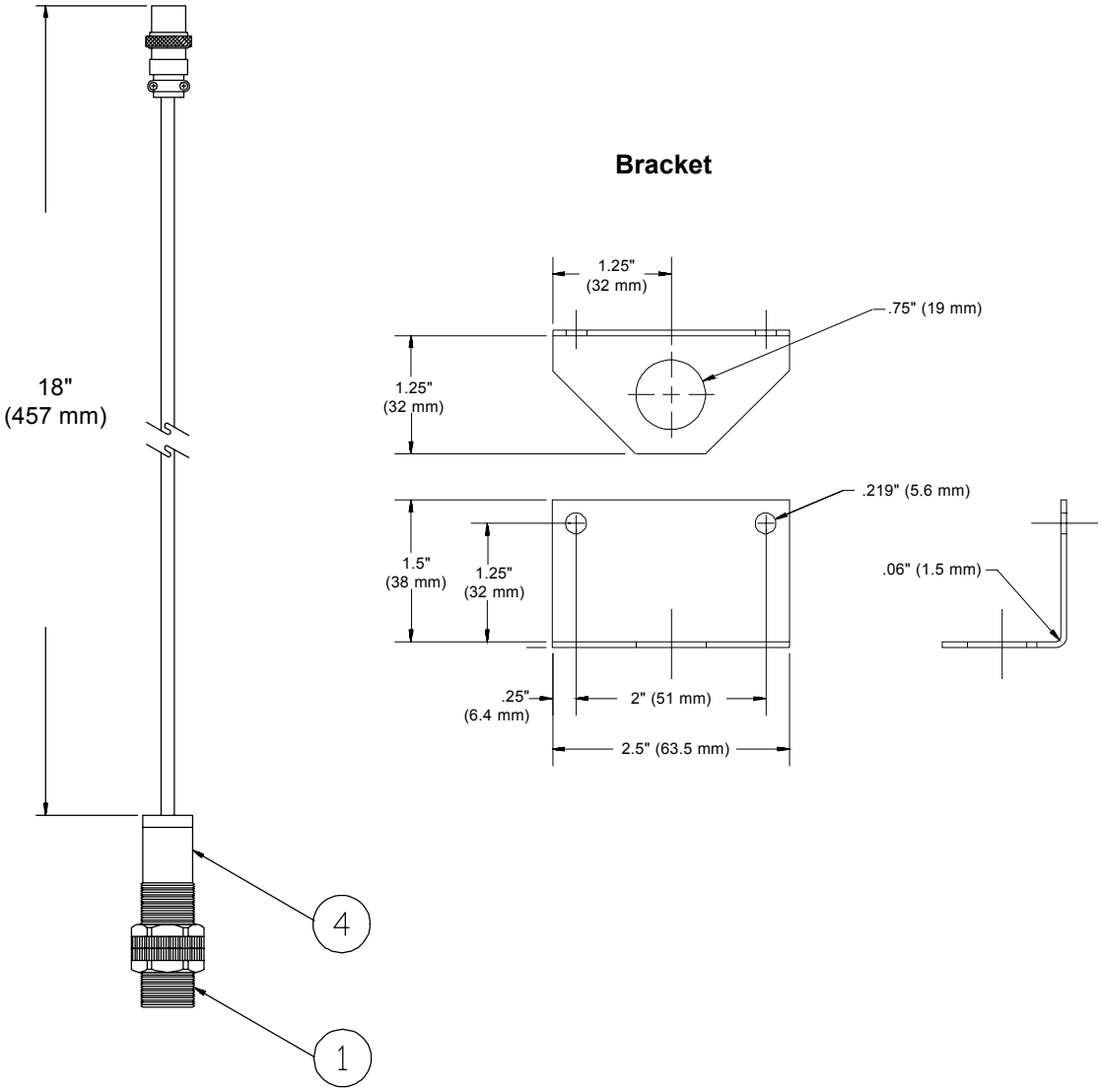


Scanner assembly, 280xx105

Illustration 280xx105-01

I Scanner assembly, 280xx105

Item	Description	Quantity	Part number
1	Scanner	1	280xx107
2	Cable assembly	18" (457 mm)	030xx345
3	Mounting bracket	1	581xx124
4	Screw, 4-40 x 5/8	2	798xx444
5	Screw, 10-32 x 1/2	2	798xx085
6	Retainer	2	798xx733



Fixed-field scanner assembly, 280xx093

Fixed-field scanner bracket, 578xx898

Illustration 280xx093 and 578xx898

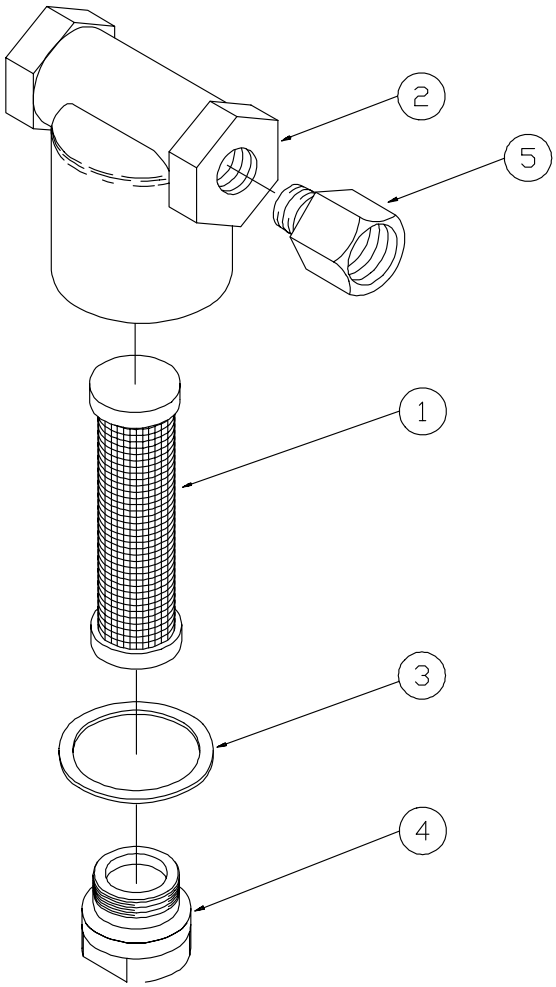
I Fixed-field scanner assembly, 280xx093

Item	Description	Quantity	Part number
1	Scanner	1	280xx092
4	Label	1	794xx836

Note: The fixed-field scanner (280xx093) is used when the product has dark colors, or when the product causes the standard scanner to double trigger. The fixed-field scanner is a non-color-sensitive scanner. Position the scanner 1/2" (12 mm) above the surface of the product.

Fixed-field scanner bracket, 578xx898

Description	Part number
Fixed-field scanner bracket	578xx898



Glue filter 529 (small), 593xx024

Illustration 593xx024-01

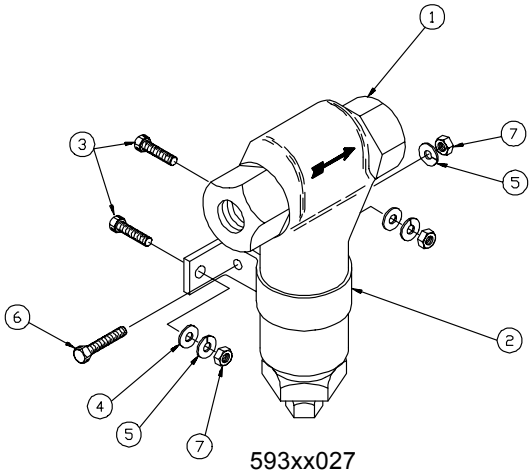
J

Glue filter assemblies
527 - large filter, 529 - small filter

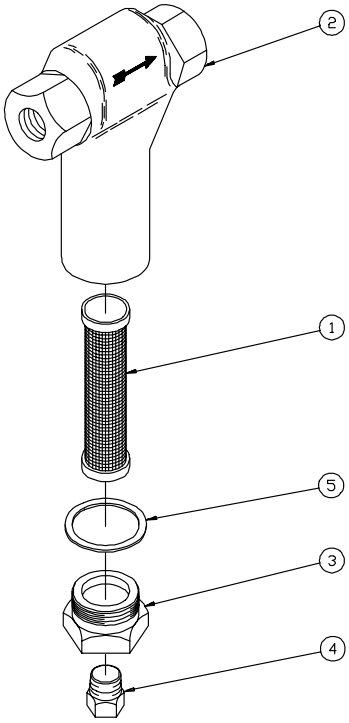
Description	Part number
Filter 527, 50 mesh	593xx026
Filter 527 with bracket, 50 mesh	593xx027
Filter 527 with bracket and fittings, 50 mesh	593xx060
Filter screen for 527 filter, 30 mesh	593xx096
Filter screen for filter 527, 50 mesh	593xx029
Filter gasket for filter 527	593xx147
Filter 529, 50 mesh	593xx024
Filter 529, 100 mesh	593xx088
Filter 529 with bracket, 50 mesh	593xx025
Filter 529 with bracket, 100 mesh	593xx089
Filter 529 with bracket and fittings, 50 mesh	593xx033
Filter screen for filter 529, 30 mesh	593xx095
Filter screen for filter 529, 50 mesh	593xx020
Filter screen for filter 529, 100 mesh	593xx087
Filter gasket for filter 529	745xx059

Glue filter 529 (small), 593xx024

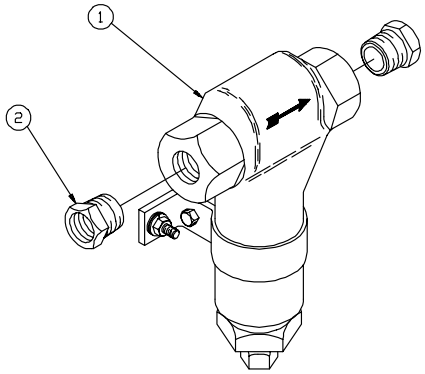
Item	Description	Quantity	Part number
1	Filter screen 529-C, 50 mesh	1	593xx020
2	Filter body	1	593xx021
3	O-ring	1	745xx059
4	Cap	1	593xx081
5	Adapter, 1/2 x 3/8 (not included in 593xx024 assembly)	2	797xx035



593xx027



593xx026



593xx060

Glue filter 527 (large)

Illustration 593xx060-01

K Glue filter assembly, 593xx027

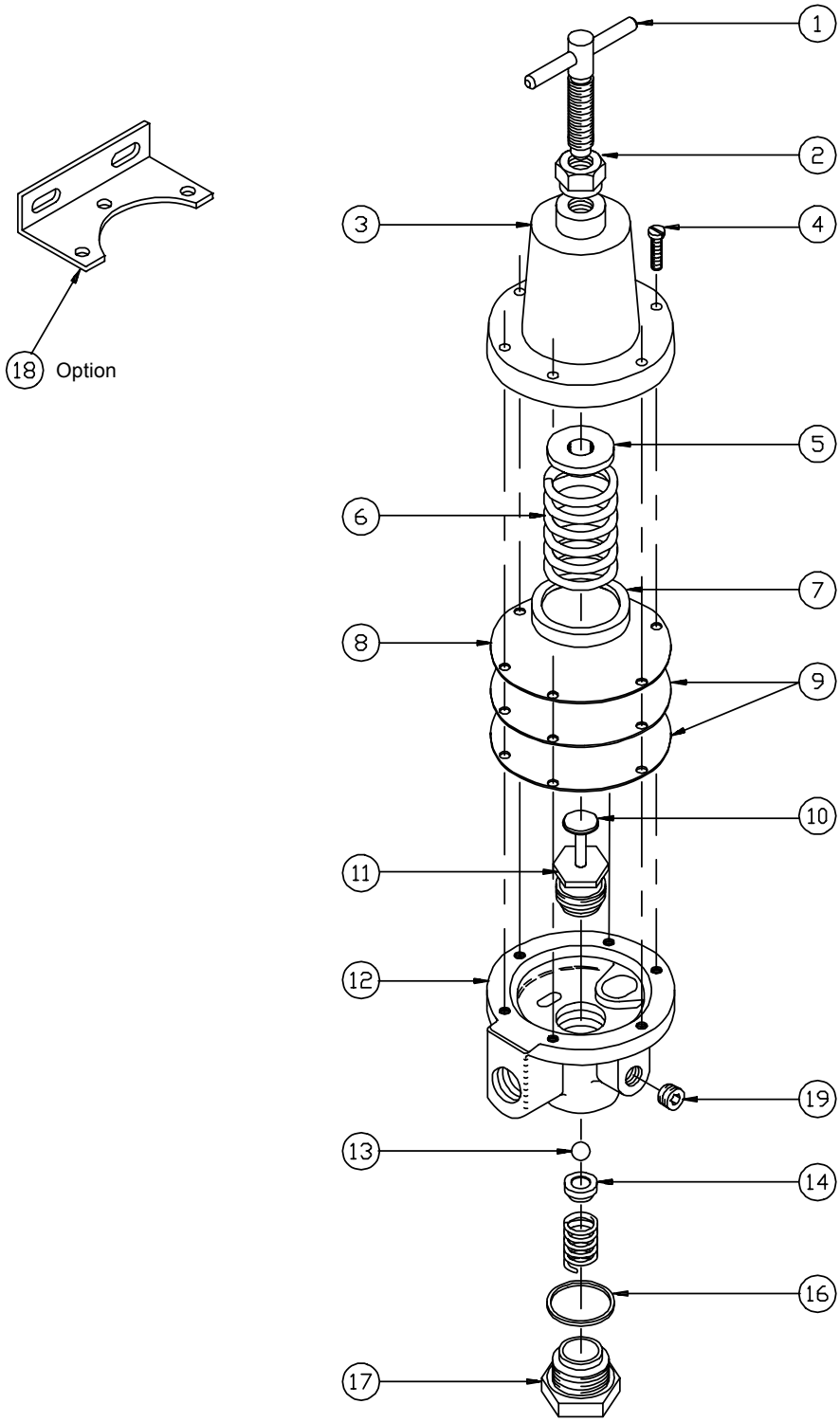
Item	Description	Quantity	Part number
1	Filter assembly 527 3/4, 50 mesh	1	593xx026
2	Mounting bracket	1	580xx017
3	Screw, zinc 1/4-20 x 1	2	798xx572
4	Flat washer, zinc 1/4	2	798xx758
5	Lock washer, zinc 1/4	3	798xx735
6	Screw, 1/4-20 x 1-1/4	1	798xx574
7	Hex nut, zinc 1/4-20	3	798xx688

Glue filter assembly, 593xx060

Item	Description	Quantity	Part number
1	Filter assembly, 50 mesh	1	593xx027
2	Bushing, M-F 3/4 x 1/2	2	797xx054

Glue filter assembly, 593xx026

Item	Description	Quantity	Part number
1	Filter screen, 50 mesh	1	593xx029
2	Filter body	1	593xx028
3	Cap	1	593xx031
4	Hex-head pipe plug	1	797xx040
5	O-ring	1	593xx147



Glue regulator

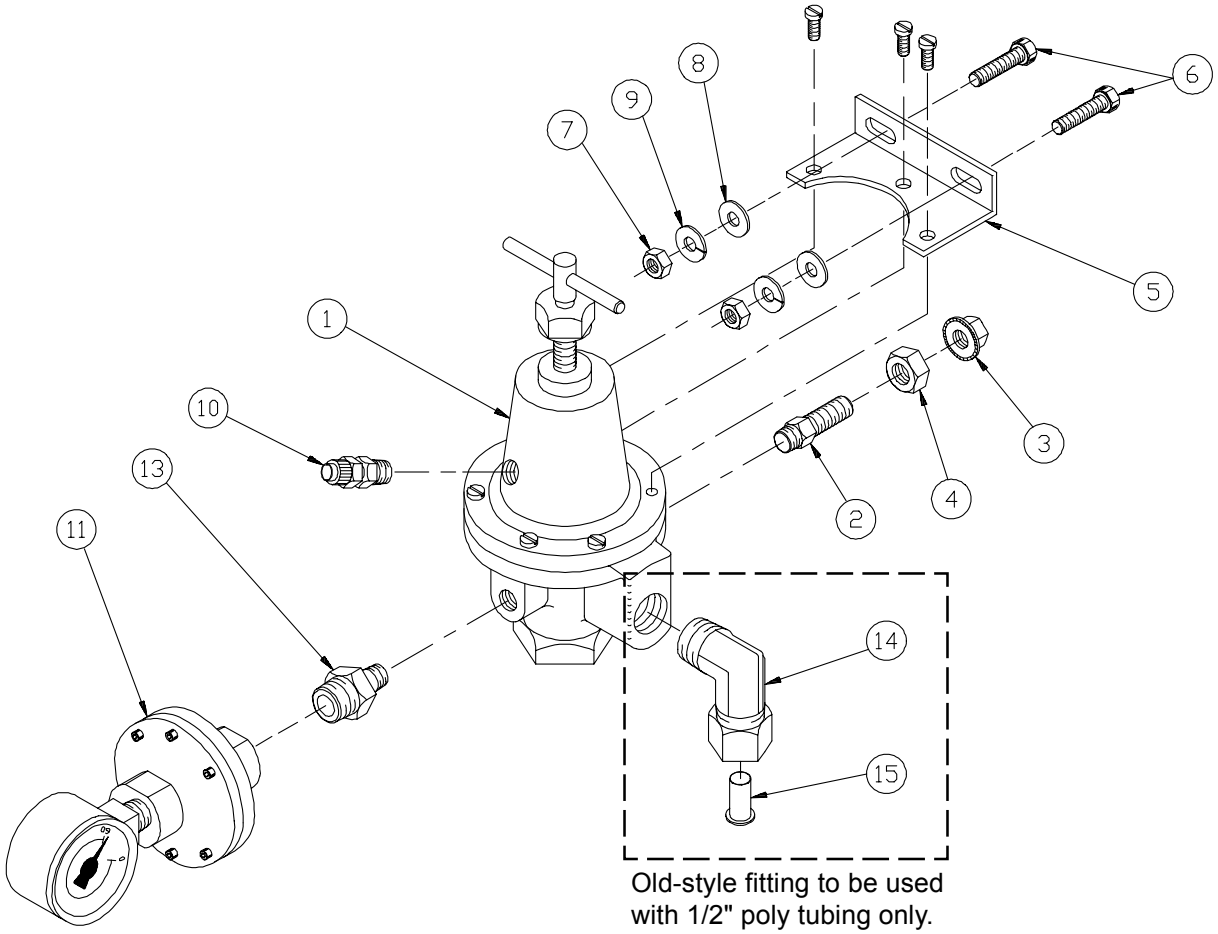
Illustration 593xx036-01

L Glue regulator assemblies

Description	Part number
Glue regulator, low pressure (0-60 psi/1-5 bar)	593xx036
Glue regulator, high pressure (0-160 psi/1-12 bar)	593xx039
Regulator repair kit, Model 832	593xx038
Regulator with gauge and protector	593xx120
Regulator with shock arrestor	593xx105
Shock arrestor	593xx104
Gauge and protector, 0-60 psi/1-5 bar	786xx043
Gauge and protector, 0-160 psi/1-12 bar	786xx044
Gauge, 0-60 psi/1-5 bar	786xx004
Gauge, 0-160 psi/1-12 bar	786xx005
Diaphragm kit (gauge protector)	786xx020

Glue regulator parts

Item	Description	Quantity	Part number
1	“T” handle	1	593xx042
2	Locknut	1	593xx043
3	Regulator housing - top	1	593xx044
4	Screw, 12-24 x 3/4	6	798xx928
5	Disc	1	593xx045
6	Spring, 0-60 psi/1-5 bar (593xx036 assembly)	1	593xx046
	Spring, 0-160 psi/1-12 bar (593xx039 assembly)	1	593xx061
7	Spring support	1	593xx047
8	Diaphragm (black)	1	593xx048
9	Diaphragm protector (white)	2	593xx049
10	Activator pin	1	593xx050
11	Ball seat	1	593xx130
12	Regulator housing - bottom	1	593xx052
13	Ball (ceramic)	1	593xx053
14	Ball support	1	593xx054
15	Spring	1	593xx055
16	O-ring	1	745xx080
17	Bottom plug	1	593xx057
18	Mounting bracket (option)		580xx018
19	Socket-head pipe plug	2	799xx039

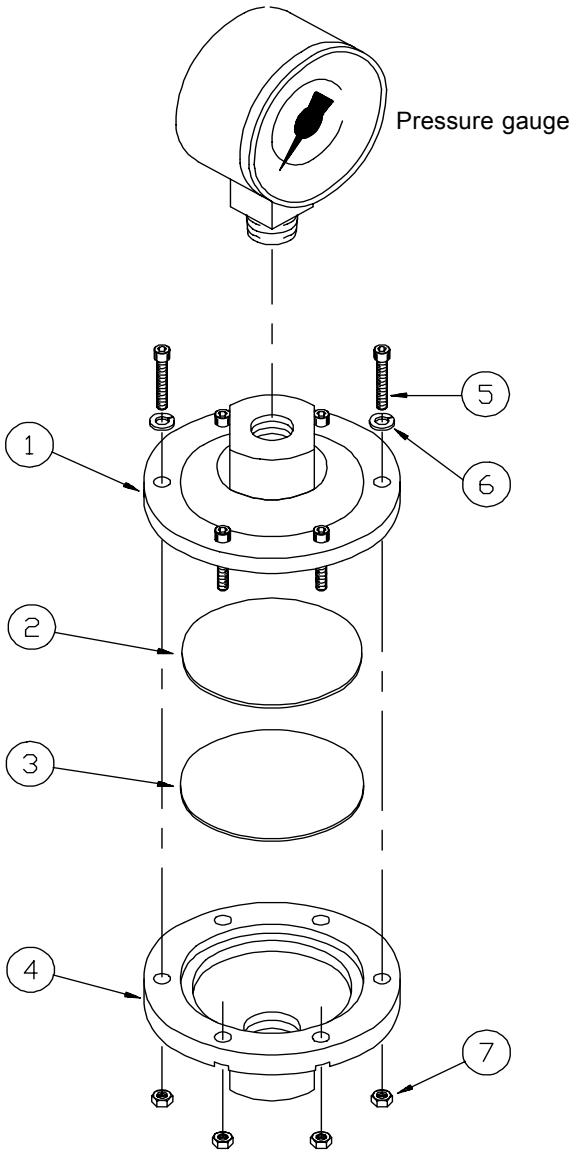


Glue regulator assembly (low pressure), 593xx120

Illustration 593xx120-01

L Glue regulator assembly (low pressure), 593xx120

Item	Description	Quantity	Part number
1	Regulator, 0-60 psi (1-5 bar)	1	593xx036
2	Mounting stud	1	580xx015
3	Flange nut, zinc 3/8-16	1	798xx693
4	Hex nut, zinc 3/8-16	1	798xx691
5	Mounting bracket	1	580xx018
6	Screw, zinc 1/4-20 x 1	2	798xx572
7	Hex nut, zinc 1/4-20	2	798xx688
8	Flat washer, zinc 1/4	2	798xx758
9	Lock washer, zinc 1/4	2	798xx735
10	Male connector fitting, 1/4 x 1/8	1	797xx323
11	Gauge and protector, 0-60 psi (1-5 bar)	1	786xx043
13	Reducer fitting, M-M 3/8 x 1/8	1	797xx070
14	Male elbow fitting, 1/2 x 1/2	1	797xx348
15	Brass insert, 1/2	1	797xx903



Fluid pressure gauge and protector

L Gauge protector assembly, 786xx022

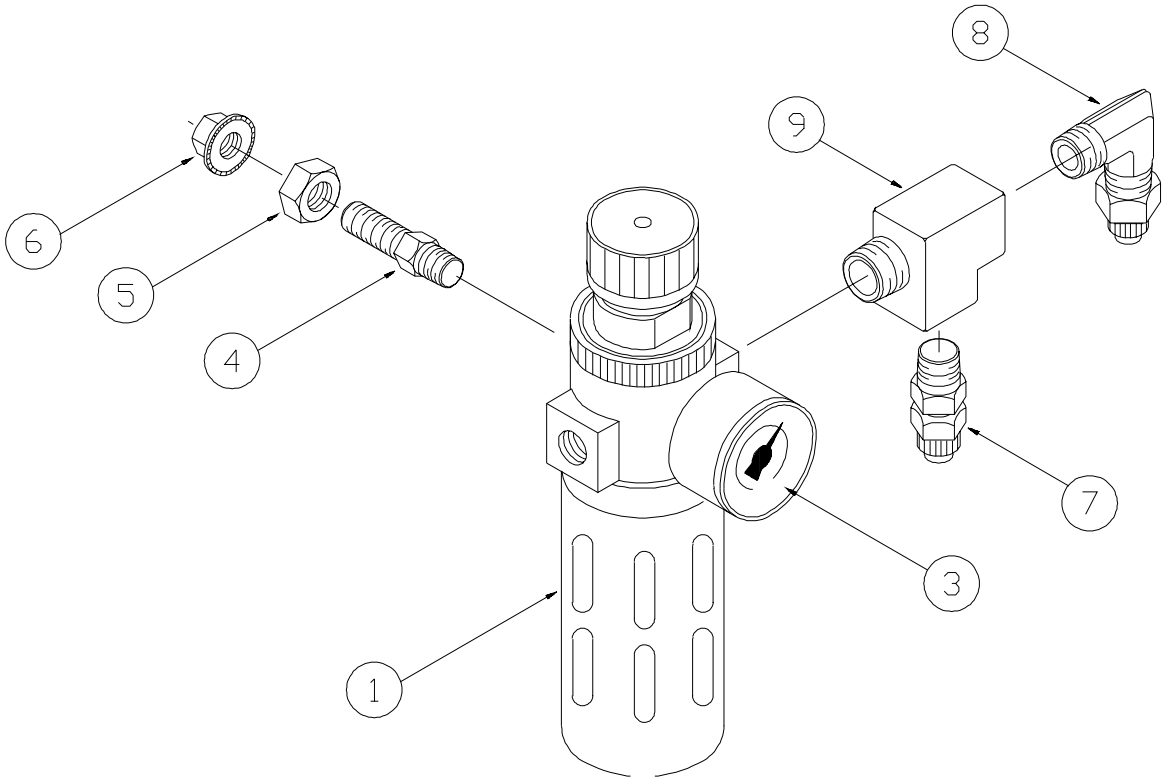
Item	Description	Quantity	Part number
1	Body - upper	1	786xx023
2	Diaphragm	1	786xx015
3	Diaphragm protector	1	786xx016
4	Body - lower	1	786xx024
5	Screw, stainless-steel 6-32 x 5/8	1	798xx007
6	Lockwasher, zinc #6	1	798xx729
7	Hex nut, stainless-steel 6-32	1	798xx721

Fluid pressure gauge/protector (low-pressure), 786xx043

Item	Description	Quantity	Part number
1	Gauge protector	1	786xx022
2	Gauge, 0-60 psi (1-5 bar)	1	786xx004

Fluid pressure gauge/protector (high-pressure), 786xx044

Item	Description	Quantity	Part number
1	Gauge protector	1	786xx022
2	Gauge, 0-160 psi (1-12 bar)	1	786xx005

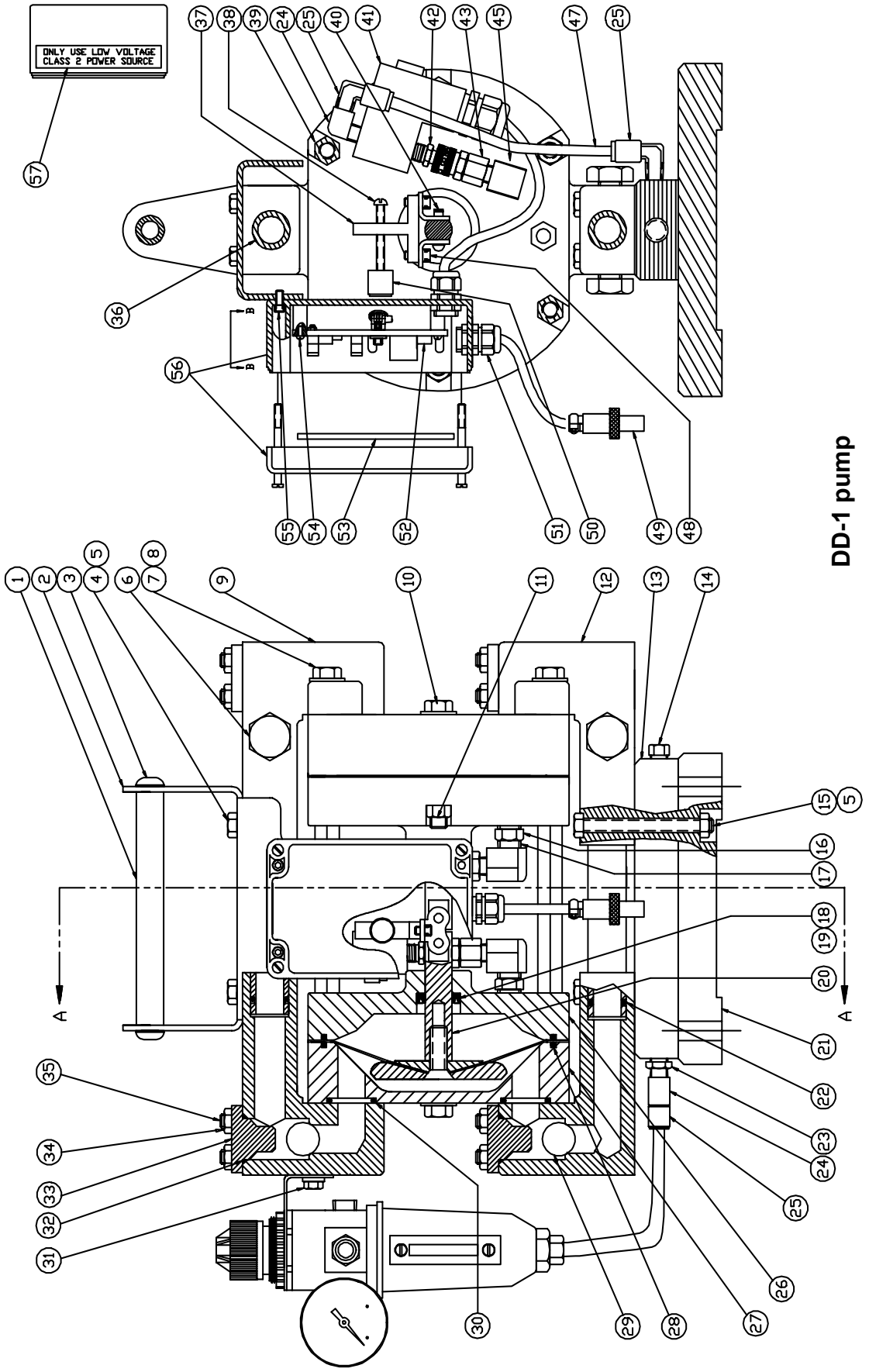


Air filter/regulator assembly, 594xx031

Illustration 594xx031-01

M Air filter/regulator assembly, 594xx031

Item	Description	Quantity	Part number
1	Air filter/regulator	1	594xx083
3	Gauge 960HP, 0-60 psi (1-5 bar), back mount	1	786xx002
4	Mounting stud	1	580xx014
5	Hex nut, 3/8-16	1	798xx962
6	Flange nut, 3/8-16	1	798xx693
7	Male connector fitting, 3/8 x 1/4	1	797xx329
8	Male elbow fitting, 3/8 x 1/4	1	797xx343
9	“T” fitting, F-F-F 1/4	1	797xx023
10	Bushing, M-F 1/4 x 1/8	1	797xx045
11	Nipple, M-M 1/4	1	797xx122



DD-1 pump

Illustration 562xx018-01

N Pump systems

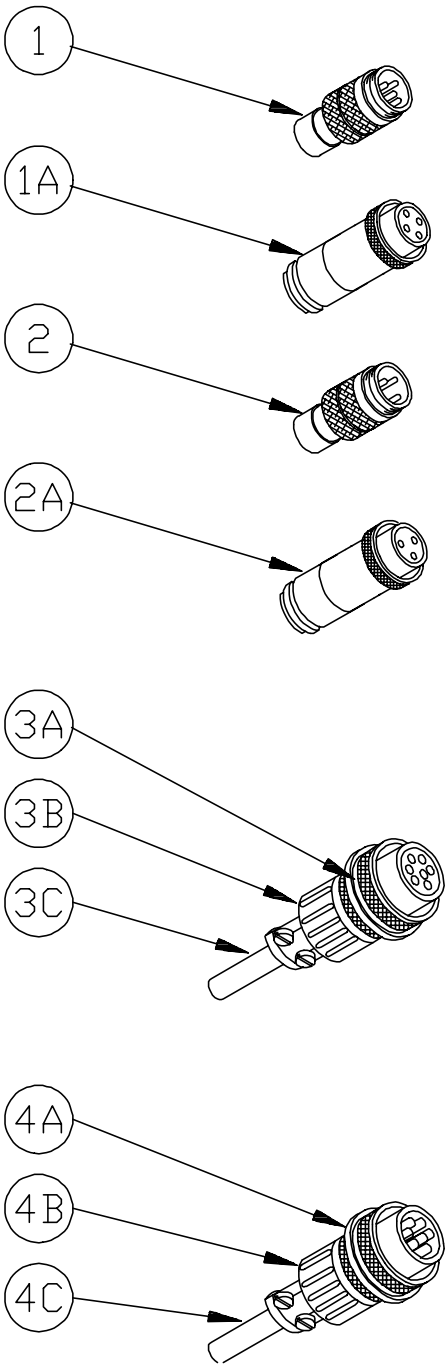
Description	Part number
DD-1 glue pump, Teflon diaphragms/check valves, single inlet/single outlet, no power supply, includes 33 ft. (10 m) cable for connection to 24VAC	562xx018
DD-1 ink pump, Teflon diaphragms/check valves, dual inlet/dual outlet, 120/240VAC	562xx031
DD-1 glue pump, Teflon diaphragms/check valves, single inlet/single outlet, 120/240VAC	562xx033
DD-1 pump, EPDM diaphragms/Viton check valves, dual inlet/dual outlet, 120/240VAC	562xx035
DD-1 pump, Teflon diaphragms/stainless-steel check valves, single inlet/single outlet, no power supply, includes 33 ft. (10 m) cable for connection to 24VAC	562xx036
DD-1 pump, Teflon diaphragms/stainless-steel check valves, single inlet/single outlet, 120/240VAC	562xx037
Transformer assembly, 120/240VAC field-selectable (do not use for old-style pumps)	036xx129
Cable assembly, 33 ft. (10 m) for connection to 24VAC	030xx004
Air filter for DD-1 pump, 0-160 psi , 1 outlet	594xx113
Repair kit, 5:1 piston pump (Graco)	560xx012
Repair kit, 5:1 air motor (Graco)	560xx013
Seal kit for DD-1 pump (Valco)	560xx602
Throat-seal lubricant, 8 oz. (.237 liters) (Graco)	560xx007
Throat-seal lubricant, 1 quart (.946 liters) (Graco)	560xx008
Throat-seal lubricant, 1 gallon (3.8 liters) (Graco)	560xx009

N DD-1 pump

Item	Description	Quantity	Part number
1	Handle	1	791xx046
2	Handle bracket	1	581xx106
3	Screw, 3/8-16 x 1/2	2	798xx923
4	Hex-head cap screw	4	798xx619
5	Hex nut	8	798xx932
6	Hex-head pipe plug	6	797xx040
7	Screw, 3/8-16 x 3-1/4	8	798xx926
8	Washer, 3/8	12	798xx755
9	Top manifold	2	560xx482
10	Screw, 3/8-16 x 2-1/2	4	798xx925
11	Hex nut, 3/8-16	8	798xx679
12	Bottom manifold	2	560xx481
13	Spacer	1	560xx565
14	Hex-head pipe plug, 1/4	1	797xx038
15	Screw, 5/16-18 x 3	4	798xx629
16	Hex pipe plug, 1/4	2	799xx041
17	Nipple, M-M 1/4	2	797xx122
18	Retaining ring	2	793xx058
19	Seal	2	745xx820
20	Teflon/Stainless-steel diaphragm shaft assembly	2	560xx554
	Diaphragm shaft assembly (only with pump 562xx035)	2	560xx633
21	Plastic foot	1	560xx566
22	O-ring (562xx018)	4	745xx035
23	Bushing, M-F 1/4 x 1/8	1	797xx045
24	Elbow fitting, F-M 1/8 x 1/8	3	797xx005
25	Male elbow fitting, 1/4 x 1/8 NPT	5	799xx156
26	Air chamber	2	560xx516
27	Liquid chamber	2	560xx515
28	O-ring	4	745xx099
29	Brown ball (562xx035)	4	560xx642
	Teflon ball (562xx018, 562xx031, 562xx033)	4	560xx410
	Ball, 3/4 stainless-steel (562xx037)	4	560xx603
30	O-ring	4	745xx082
31	Screw, #12	2	798xx791

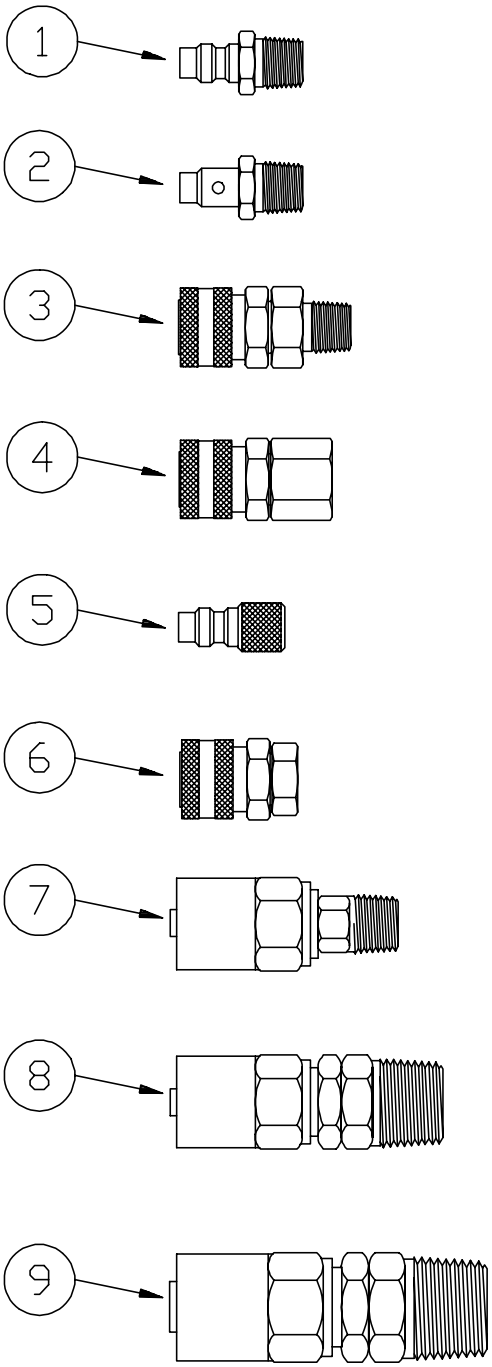
N DD-1 pump

Item	Description	Quantity	Part number
32	O-ring	4	745xx031
33	End cap	4	560xx483
34	Hex nut	16	798xx932
35	Screw, 5/16-18 x 1-1/4	16	798xx808
36	Manifold connector pipe:		
	(562xx018, 562xx033, 562xx037)	2	560xx562
	Manifold support bar (562xx031, 562xx035)	2	560xx563
37	Bracket	1	581xx107
38	Screw, 10-32 x 1-3/4	1	798xx429
39	Support bar	2	580xx633
40	Link	1	788xx499
41	Air valve assembly	2	411xx434
42	Male swivel fitting	2	750xx011
43	Female swivel fitting	2	750xx015
45	Elbow fitting, F-M 1/4 x 1/8	2	797xx006
47	Tube	14" (356 mm)	755xx007
48	Screw, 10-32 x 1/2	2	798xx085
49	Cable assembly, 24V	1	030xx199
50	Magnet and holder assembly	1	560xx761
51	Cable grip	3	066xx109
52	PCB assembly	1	151xx121
53	Label	1	560xx524
54	Screw, zinc 4-40 x 5/8	4	798xx444
55	Screw, stainless-steel 8-32 x 3/8	2	798xx029
56	Box	1	023xx067
57	Label	1	560xx578
60	Manual	1	MS005
65	Cable assembly for valves (562xx018)	33 feet (10 m)	030xx004


1
1A
2
2A
3A
3B
3C
4A
4B
4C

Electrical connectors

Item	Description	Quantity	Part number
1	Connector, CBC-4, male	1	060xx004
1A	Connector, CBC-4, female	1	060xx003
2	Connector, CBC-3, male	1	060xx005
2A	Connector, CBC-3, female	1	060xx001
3A	Connector, female, 7-pin	1	065xx001
3B	Clamp	1	066xx001
3C	Cable protector	1	066xx002
4A	Connector, male, 7-pin	1	065xx002
4B	Clamp	1	066xx001
4C	Cable protector	1	066xx002


1
2
3
4
5
6
7
8
9

Fittings

Item	Description	Quantity	Part number
1	Male swivel fitting	1	750xx009
	Male swivel fitting, package of 10	1	750xx022
2	Male swivel fitting - fixed	1	750xx011
	Male swivel fitting - fixed, package of 10	1	750xx023
3	Female swivel fitting	1	750xx001
	Female swivel fitting, package of 10	1	750xx019
4	Female swivel fitting	1	750xx015
	Female swivel fitting, package of 10	1	750xx025
5	Male stopper	1	750xx013
	Male stopper, package of 10	1	750xx024
6	Female stopper	1	750xx005
	Female stopper, package of 10	1	750xx020

Reusable fittings for 3/8" reinforced hoses

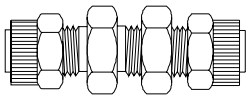
7	Reusable fitting, 1/4 NPT, male	799xx101
8	Reusable fitting, 3/8 NPT, male swivel	799xx102

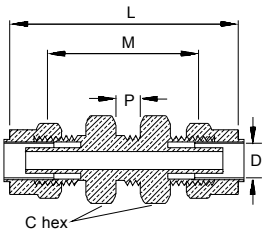
Reusable fittings for 1/2" reinforced hoses

9	Reusable fitting, 1/2 NPT, male swivel	799xx104

Fittings

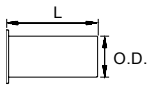
Bulkhead union





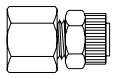
Tube O.D.	Straight thread	C hex	P max.		L		M		Flow dia. (D)		Part number
			in.	mm	in.	mm	in.	mm	in.	mm	
1/4"	3/8-24	3/8"	.38	9.7	1.67	42.4	1.25	31.8	.125	3.2	799xx053
3/8"	1/2-24	1/2"	.47	11.9	1.83	46.5	1.38	35.1	.203	5.2	799xx054

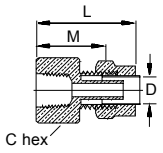
Brass insert



Tube O.D.	Tube wall		L		O.D.		Part number
	in.	mm	in.	mm	in.	mm	
1/2"	.018	.46	.720	18.3	.370	9.4	797xx903

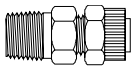
Female connector

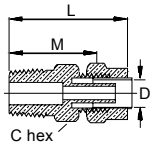




Tube O.D.	Pipe thread	Straight thread	C hex	L		M		Flow dia. (D)		Part number
				in.	mm	in.	mm	in.	mm	
1/4"	1/8"	3/8-24	1/2"	0.97	24.6	0.72	18.3	.125	3.2	797xx317
1/4"	1/4"	3/8-24	5/8"	1.19	30.2	0.94	23.9	.125	3.2	797xx318
3/8"	1/4"	1/2-24	5/8"	1.22	31.0	0.94	23.9	.203	5.2	797xx320
1/2"	3/8"	11/16-20	13/16"	1.32	33.5	1.00	25.4	.323	8.2	797xx321

Male connector

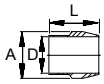




Tube O.D.	Pipe thread	Straight thread	C hex	L		M		Flow dia. (D)		Part number
				in.	mm	in.	mm	in.	mm	
1/4"	1/8"	3/8-24	7/16"	1.06	26.9	0.81	20.6	.125	3.2	797xx323
1/4"	1/4"	3/8-24	9/16"	1.25	31.8	1.00	25.4	.125	3.2	797xx324
1/4"	3/8"	3/8-24	11/16"	1.28	32.5	1.03	26.2	.125	3.2	797xx325
3/8"	1/8"	1/2-24	1/2"	1.13	28.7	0.84	21.3	.203	5.2	797xx328
3/8"	1/4"	1/2-24	9/16"	1.31	33.3	1.03	26.2	.203	5.2	797xx329
3/8"	3/8"	1/2-24	11/16"	1.31	33.3	1.03	26.2	.203	5.2	797xx330
1/2"	1/4"	11/16-20	3/4"	1.41	35.8	1.09	27.7	.323	8.2	797xx332
1/2"	3/8"	11/16-20	3/4"	1.45	36.8			.323	8.2	797xx333
1/2"	1/2"	11/16-20		1.60	40.6			.407	10.3	797xx913

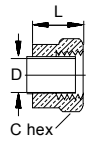
Fittings

Acetal plastic sleeve



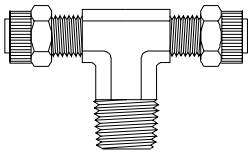
Tube O.D.	A		D		L		Part number
	in.	mm	in.	mm	in.	mm	
1/4"	.334	8.5	.258	6.6	.35	8.9	797xx300
3/8"	.460	11.7	.383	9.7	.37	9.4	797xx302
1/2"	.597	15.2	.508	12.9	.40	10.2	797xx303

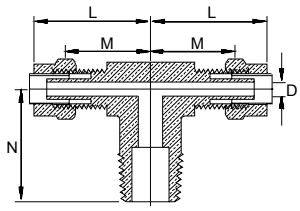
Nut and sleeve assembly



Tube O.D.	Straight thread	C hex	D		L		Part number
			in.	mm	in.	mm	
1/4"	3/8-24	7/16"	.255	6.5	.34	8.6	797xx306
3/8"	1/2-24	9/16"	.382	9.7	.38	9.7	797xx308
1/2"	11/16-20	13/16"	.507	12.9	.44	11.2	797xx309

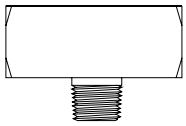
Male branch tee (tube)

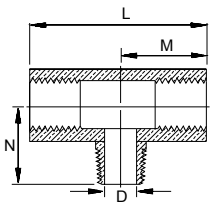




Tube O.D.	Pipe thread	Straight thread	L		M		N		Flow dia. (D)		Part number
			in.	mm	in.	mm	in.	mm	in.	mm	
1/4"	1/4"	3/8-24	0.91	23.1	0.66	16.8	0.92	23.4	.125	3.2	797xx359
3/8"	1/4"	1/2-24	1.00	25.4	0.72	18.3	1.03	26.2	.203	5.2	797xx362

Male branch tee

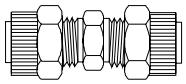


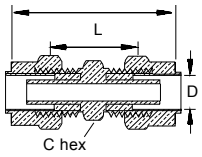


Pipe thread	L		M		N		Flow dia. (D)		Part number
	in.	mm	in.	mm	in.	mm	in.	mm	
1/4"	1.52	38.6	0.76	19.3	0.91	23.1	.305	7.7	797xx027

Fittings

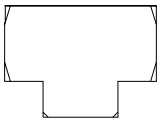
Union

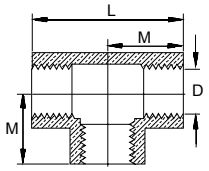




Tube O.D.	Straight thread	C hex	L		M		Flow dia. (D)		Part number
			in.	mm	in.	mm	in.	mm	
1/4"	3/8-24	3/8"	1.25	31.8	.66	16.8	.125	3.2	
3/8"	1/2-24	1/2"	1.15	29.2	.69	17.5	.209	5.3	797xx315
1/2"	11/16-20	11/16"	1.38	35.0	.82	20.8	.323	8.2	

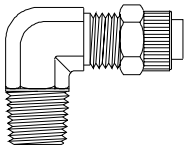
Union tee

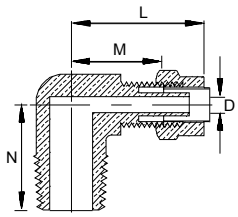




Pipe thread	L		M		Flow dia. (D)		Part number
	in.	mm	in.	mm	in.	mm	
1/8"	1.08	27.4	0.54	13.7	.328	8.3	797xx022
1/4"	1.58	40.1	0.78	19.8	.421	10.7	797xx023
3/8"	1.68	42.7	0.84	21.3	.562	14.3	797xx024
1/2"	2.14	54.4	1.07	27.2	.687	17.4	797xx025

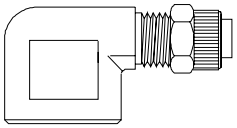
Male elbow - 90°

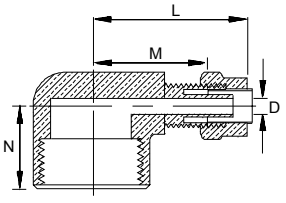




Tube O.D.	Pipe thread	Straight thread	L		M		N		Flow dia. (D)		Part number
			in.	mm	in.	mm	in.	mm	in.	mm	
1/4"	1/8"	3/8-24	0.84	21.3	0.59	15.0	0.75	19.1	.125	3.2	797xx338
1/4"	1/4"	3/8-24	0.91	23.1	0.66	16.8	0.92	23.4	.125	3.2	797xx339
1/4"	3/8"	3/8-24	0.94	23.9	0.69	17.5	1.08	27.4	.125	3.2	797xx340
3/8"	1/8"	1/2-24	1.00	25.4	0.66	16.8	0.73	18.5	.203	5.2	797xx342
3/8"	1/4"	1/2-24	1.00	25.4	0.72	18.3	1.05	26.7	.203	5.2	797xx343
3/8"	3/8"	1/2-24	1.00	25.4	0.72	18.3	1.08	27.4	.203	5.2	797xx344
1/2"	3/8"	11/16-20	1.16	29.5	0.84	21.3	1.13	28.7	.323	8.2	797xx347
1/2"	1/2"	11/16-20	1.59	40.4	0.91	23.1	1.13	28.7	.410	10.4	797xx348

Female elbow - 90°

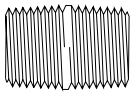


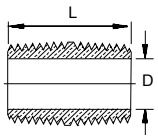


Tube O.D.	Pipe thread	Straight thread	L		M		N		Flow dia. (D)		Part number
			in.	mm	in.	mm	in.	mm	in.	mm	
1/4"	1/8"	3/8-24	0.91	23.1	0.66	16.8	0.56	14.2	.125	3.2	797xx349
1/4"	1/4"	3/8-24	1.00	25.4	0.75	19.1	0.69	17.5	.125	3.2	797xx350
3/8"	1/4"	1/2-24	1.03	26.2	0.75	19.1	0.69	17.5	.203	5.2	797xx352
1/2"	3/8"	11/16-20	1.22	31.0	0.91	23.1	1.13	28.7	.323	8.2	797xx356

Fittings

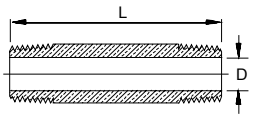
Close nipple





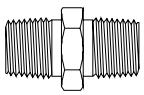
Pipe thread	L		Flow dia. (D)		Part number
	in.	mm	in.	mm	
1/4"	0.88	22.4	.375	9.5	797xx122
1/2"	1.12	28.4	.625	15.9	797xx124

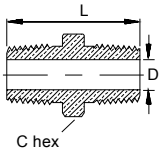
Long nipple



Pipe thread	L		Flow dia. (D)		Part number
	in.	mm	in.	mm	
1/8"	1.5	38.1	.250	6.4	797xx084
1/4"	1.5	38.1	.375	9.5	797xx085
3/8"	1.5	38.1	.500	12.7	797xx086
1/8"	2	51	.250	6.4	797xx088
1/4"	2	51	.375	9.5	797xx089
3/8"	2	51	.500	12.7	797xx090
1/2"	2	51	.625	15.9	797xx091
1/8"	2.5	63.5	.250	6.4	797xx092
1/4"	2.5	63.5	.375	9.5	797xx093
3/8"	2.5	63.5	.500	12.7	797xx094
1/8"	3	76.2	.281	7.1	797xx096
1/8"	3.5	89	.281	7.1	797xx100
1/4"	3.5	89	.375	9.5	797xx101
1/8"	4	102	.281	7.1	797xx104
3/8"	4	102	.500	12.7	797xx106
1/4"	4.5	114	.375	9.5	797xx109
1/8"	6	152	.281	7.1	797xx120

Hex nipple



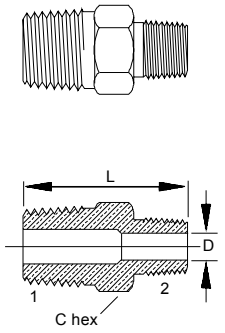


Pipe thread	C hex	L		Flow dia. (D)		Part number
		in.	mm	in.	mm	
1/8"	7/16"	0.97	24.6	.220	5.6	797xx079
1/4"	9/16"	1.38	35.1	.314	8.0	797xx080
3/8"	11/16"	1.41	35.8	.440	11.2	797xx081
1/2"	7/8"	1.81	46.0	.664	16.9	797xx082
3/4"	1-1/16"	1.58	40.1	.750	19.1	797xx083

Fittings

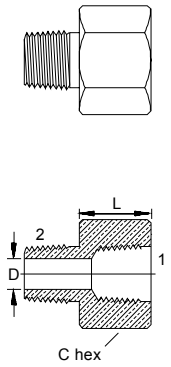
Hex nipple reducer

Pipe thread 1	Pipe thread 2	C hex	L		Flow dia. (D)		Part number
			in.	mm	in.	mm	
1/4"	1/8"	9/16"	1.19	30.2	.220	5.6	797xx069
3/8"	1/8"	11/16"	1.20	30.5	.220	5.6	797xx070
3/8"	1/4"	11/16"	1.41	35.8	.314	8.0	797xx071
1/2"	1/8"	7/8"	1.62	41.1	.440	11.2	797xx072
1/2"	1/4"	7/8"	1.34	34.0	.341	8.7	797xx073
1/2"	3/8"	7/8"	1.61	40.9	.430	10.9	797xx074
3/4"	1/2"	1-1/16"	1.60	40.6	.575	14.6	797xx078



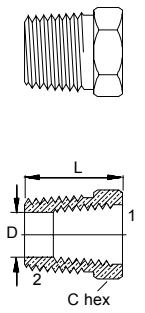
Adapter

Pipe thread 1	Pipe thread 2	C hex	L		Flow dia. (D)		Part number
			in.	mm	in.	mm	
1/8"	1/8"	9/16"	0.88	22.4	.220	5.6	797xx029
1/4"	1/8"	3/4"	1.06	26.9	.220	5.6	797xx030
1/4"	1/4"	3/4"	1.25	31.8	.314	8.0	797xx031
3/8"	1/8"	7/8"	1.25	31.8	.314	8.0	797xx032
3/8"	1/4"	7/8"	1.25	31.8	.440	11.2	797xx033
3/8"	3/8"	7/8"	1.47	37.3	.440	11.2	797xx034
1/2"	3/8"	1-1/16"	1.47	37.3	.440	11.2	797xx035
1/2"	1/4"	1-1/16"	1.47	37.3	.314	8.0	797xx961



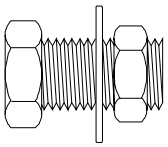
Bushing

Pipe thread 1	Pipe thread 2	C hex	L		Flow dia. (D)		Part number
			in.	mm	in.	mm	
1/8"	1/4"	9/16"	0.75	19.1	.328	8.3	797xx045
1/8"	3/8"	11/16"	0.75	19.1	.328	8.3	797xx046
1/4"	3/8"	11/16"	0.75	19.1	.422	10.7	797xx047
1/8"	1/2"	7/8"	1.00	25.4	.328	8.3	797xx048
1/4"	1/2"	7/8"	1.00	25.4	.422	10.7	797xx049
3/8"	1/2"	7/8"	1.00	25.4	.562	14.3	797xx050
1/8"	3/4"	1-1/8"	1.00	25.4	.328	8.3	797xx051
1/4"	3/4"	1-1/8"	1.00	25.4	.422	10.7	797xx052
3/8"	3/4"	1-1/8"	1.00	25.4	.562	14.3	797xx053
1/2"	3/4"	1-1/8"	1.00	25.4	.688	17.5	797xx054

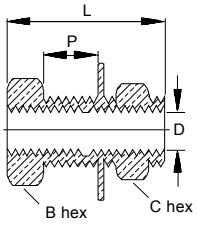


Fittings

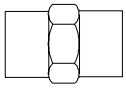
Anchor connector



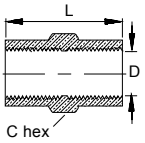
Pipe thread	Straight thread	B hex	C hex	P max.		L		Flow dia. (D)		Part number
				in.	mm	in.	mm	in.	mm	
1/4"	3/4-16"	1.00"	1.12"	.32	8.1	0.94	23.9	.421	10.7	793xx001



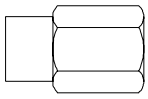
Coupling



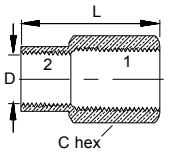
Pipe thread	C hex	L		Flow dia. (D)		Part number
		in.	mm	in.	mm	
1/8"	1/2"	0.75	19.1	.328	8.3	797xx055
1/4"	3/4"	1.12	28.4	.422	10.7	797xx056
3/8"	7/8"	1.12	28.4	.562	14.3	797xx057
1/2"	1-1/16"	1.50	38.1	.687	17.4	797xx058



Reducer coupling



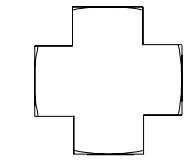
Pipe thread 1	Pipe thread 2	C hex	L		Flow dia. (D)		Part number
			in.	mm	in.	mm	
1/4"	1/8"	3/4"	0.97	24.6	.328	8.3	797xx059
3/8"	1/8"	7/8"	1.16	29.5	.422	10.7	797xx060
3/8"	1/4"	7/8"	1.28	32.5	.422	10.7	797xx061
1/2"	1/8"	1-1/16"	1.38	35.1	.562	14.3	797xx062
1/2"	1/4"	1-1/16"	1.28	32.5	.422	10.7	797xx063
1/2"	3/8"	1-1/16"	1.38	35.1	.562	14.3	797xx064
3/4"	1/2"	1-1/8"	1.38	35.1	.562	14.3	797xx068

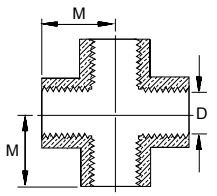


Fittings

Cross

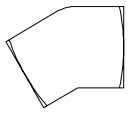
Pipe thread	M		Flow dia. (D)		Part number
	in.	mm	in.	mm	
1/8"	0.53	13.5	.328	8.3	797xx015
1/4"	0.75	19.1	.421	10.7	797xx016
3/8"	0.82	20.8	.562	14.3	797xx017

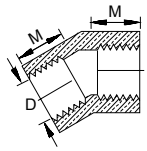




Female elbow - 45°

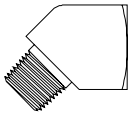
Pipe thread	M		Flow dia. (D)		Part number
	in.	mm	in.	mm	
1/8"	.450	11.4	.328	8.3	797xx010

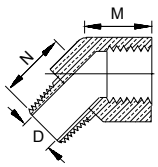




Street elbow - 45°

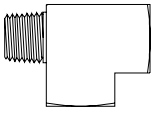
Pipe thread	M		N		Flow dia. (D)		Part number
	in.	mm	in.	mm	in.	mm	
1/8"	.38	9.7	0.50	12.7	.220	5.6	797xx011
1/4"	.56	14.2	0.70	17.8	.302	7.7	797xx012
3/8"	.56	14.2	0.78	19.8	.428	10.9	797xx013
1/2"	.75	19.1	1.00	25.4	.552	14.0	797xx014

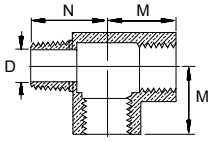




Street tee

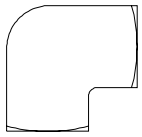
Pipe thread	M		N		Flow dia. (D)		Part number
	in.	mm	in.	mm	in.	mm	
1/8"	0.55	14.0	0.66	16.8	.220	5.6	797xx018
1/4"	0.78	19.8	0.91	23.1	.302	7.7	797xx019
3/8"	0.84	21.3	1.03	26.2	.440	11.2	797xx020
1/2"	1.07	27.2	1.31	33.3	.564	14.3	797xx021



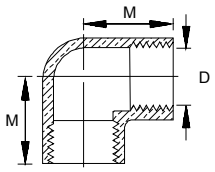


Fittings

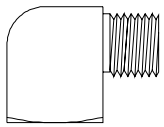
Union elbow - 90°



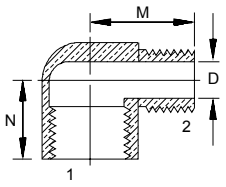
Pipe thread	M		Flow dia. (D)		Part number
	in.	mm	in.	mm	
1/8"	0.55	14.0	.328	8.3	797xx001
1/4"	0.78	19.8	.422	10.7	797xx002
3/8"	0.84	21.3	.563	14.3	797xx003
1/2"	1.09	27.7	.687	17.4	797xx004



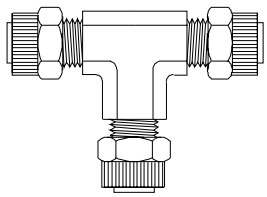
Street elbow - 90°



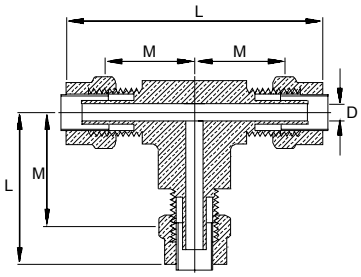
Pipe thread 1	Pipe thread 2	M		N		Flow dia. (D)		Part number
		in.	mm	in.	mm	in.	mm	
1/8"	1/8"	0.62	15.7	0.48	12.2	.209	5.3	797xx005
1/4"	1/8"	0.72	18.3	0.53	13.5	.209	5.3	797xx006
1/4"	1/4"	0.91	23.1	0.45	11.4	.302	7.7	797xx007
3/8"	3/8"	0.98	24.9	0.54	13.7	.428	10.9	797xx008
1/2"	1/2"	1.25	31.8	1.03	26.2	.552	14.0	797xx009



Union tee



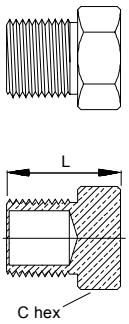
Tube O.D.	Straight thread	L		M		Flow dia. (D)		Part number
		in.	mm	in.	mm	in.	mm	
1/4"	3/8-24	0.84	21.3	.59	15.0	.125	3.2	797xx334
3/8"	1/2-24	1.00	25.4	.72	18.3	.203	5.2	797xx336
1/2"	11/16-20	1.16	29.5	.84	21.3	.323	8.2	797xx337



Fittings

Hex-head plug

Pipe thread	C hex	L		Part number
		in.	mm	
1/8"	7/16"	0.56	14.2	797xx037
1/4"	9/16"	0.75	19.1	797xx038
3/8"	11/16"	0.78	19.8	797xx039
1/2"	7/8"	0.97	24.6	797xx040
3/4"	1-1/16"	1.17	29.7	797xx914



Cables

Description	Part number
Encoder	
Encoder cable, 33' (10 m)	030xx003
Encoder cable, 66' (20 m)	030xx008
Encoder cable, retractable interconnect cable, 6' (1.8 m), 7-pin male/7-pin female	030xx318
Scanner	
Scanner cable, 15' (4.6 m)	030xx020
Scanner cable, 33' (10 m)	030xx021
Scanner cable, 66' (20 m)	030xx022
Scanner cable, retractable interconnect cable, 10' (3 m), 4-pin male/4-pin female	030xx153
Glue valve	
Cable, 15' (4.6 m) with 3-pin male connector	030xx012
Cable, 33' (10 m) with 3-pin male connector	030xx005
Cable, 66' (20 m) with 3-pin male connector	030xx010
EPC	
Cable, 6' (1.8 m)	030xx002
Cable, 13' (4 m)	030xx221
Cable, 33' (10 m)	030xx007
Cable, 66' (20 m)	030xx226

Miscellaneous parts

Description	Part number
Head-angle gauge, plastic key ring	667xx031
Head angle gauge tightenting tool	578xx505
Thumbwheel switch with cable (imperial)	481xx003
Thumbwheel switch with cable (metric)	481xx004
Ribbon cables for thumbwheel switch	
VC350/352	
Channel A ribbon cable	033xx001
Channel B ribbon cable	033xx002
VC370/374	
Channel A ribbon cable	033xx005
Channel B ribbon cable	033xx004
Channel C ribbon cable	033xx007
Channel D ribbon cable	033xx006
Encoder, VCE-250	155xx027
Encoder, VCE-500	155xx029
Encoder, VCE-1000	155xx031
Encoder timing belt	788xx300
Measuring wheel (10"/254 mm circumference)	788xx553
3-way air valve, 24VDC	411xx062
Pressure transducer (EPC)	521xx004
Coil for 2-way air valve (EPC)	411xx613
2-way air valve (EPC)	411xx400
Grease gun	795xx020
Grease cartridge	795xx022
Flushing adapter with swivel fitting (Flexoseal)	667xx001
Flushing adapter with swivel fitting and 90° street elbow fitting (labeler applicator heads)	667xx002
Flushing adapter with rotary fitting (taper machines)	667xx032

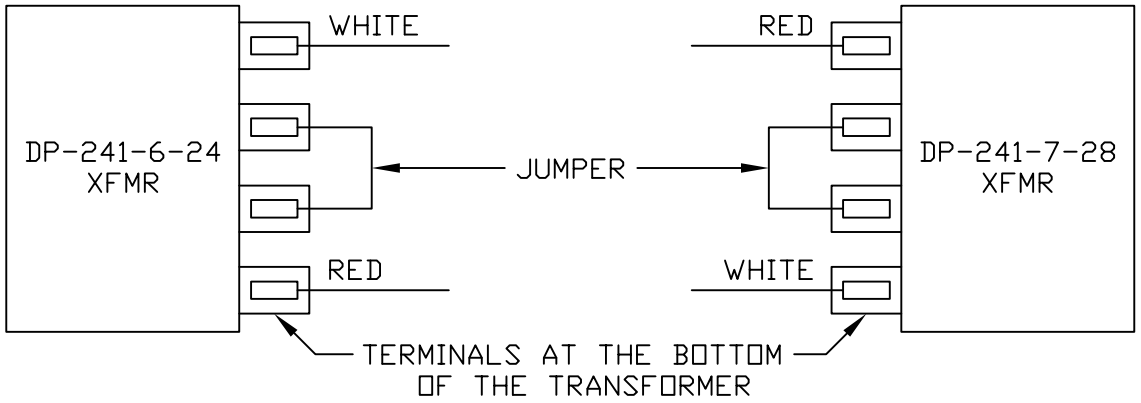
Miscellaneous parts

Description	Part number
O-ring, package of 10 (for quick-disconnect fittings)	745xx073
Seal, package of 10 (for quick-disconnect fittings)	745xx901
3-way repair kit	411xx604
Fuse, 2 amp	085xx001
Fuse, 1A slow-blow, package of 5	085xx005
Gauge, 0-60 psi (1-5 bar), back mount	786xx001
Gauge, 0-60 psi (1-5 bar), bottom mount	786xx004
Gauge, 0-160 psi (1-12 bar), back mount	786xx002
Gauge, 0-160 psi (1-12 bar), bottom mount	786xx005
Reinforced vinyl tubing **(Do not use with systems using more than 200 psi / 15 bar adhesive pressure.)**	
1/4" ID hose, 1' (305 mm) **Note**: This hose can be used with: 1/4" x 1/4" NPT male swivel fitting, straight (799xx108) 1/4" x 1/4" NPT male straight fitting (779xx109) 1/4" x 1/8" NPT male straight fitting (799xx107)	755xx236
3/8" ID hose, 1' (305 mm) **Note**: This hose can be used with: 3/8" x 3/8" NPT male swivel fitting, straight (799xx102) 3/8" x 1/4" NPT male straight fitting (799xx101)	755xx235
1/2" ID hose, 1' (305 mm) **Note**: This hose can be used with: 1/2" x 1/2" NPT male swivel fitting, straight (799xx104)	755xx234

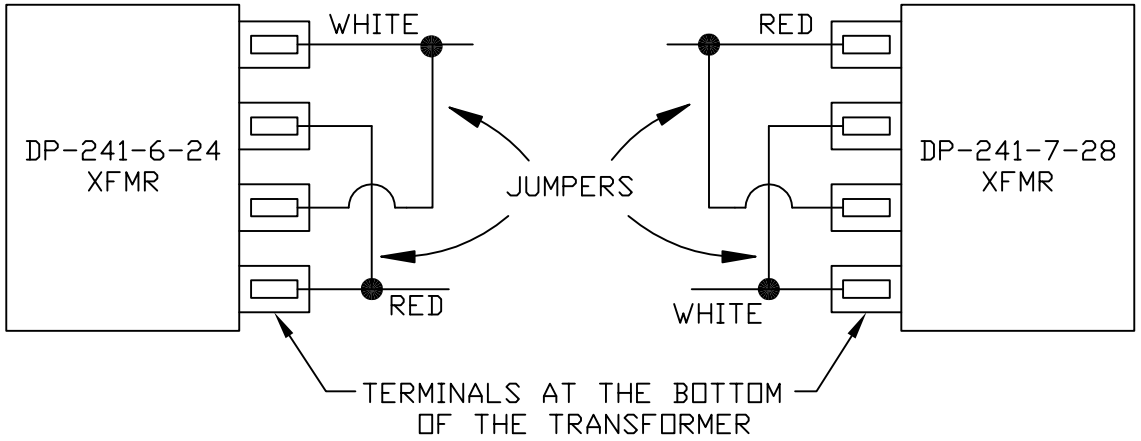
Miscellaneous parts

Description	Part number
Product counter	080xx047
Battery, 1.5VDC	795xx537
V224 card (for optional valve driver board)	151xx057
Glue flow knob	104xx001
Glue flow potentiometer	140xx001
Neon lamp, red	107xx002
Lamp socket	106xx001
Lamp cap	106xx002
On/off switch	480xx002
Gun selector switch	480xx001
Thumbwheel switch (imperial) with ribbon cable	481xx003
Thumbwheel switch (metric) with ribbon cable	481xx004
Ribbon cable (channel A)	033xx001
Ribbon cable (channel B)	033xx002
Fuse holder assembly	086xx002

TRANSFORMER WIRING FOR 220-VOLT LINE



TRANSFORMER WIRING FOR 120-VOLT LINE



USED ON: -

MTL: -

FINISH - OTHER: -

REV.: (PUT INTO CAD 6-12-87) R.D.

☐ CHECK IF REQ'D.
DRY GLASS BEAD BLAST
(AVOID THREADED AREAS)
PLATE ELECTROLESS NICKEL
.0003 THICK

☐ CHECK IF REQ'D.
SATIN SHEEN CLEAR
ANODIZE

BREAK ALL SHARP EDGES
& CORNERS (DEBURR)
UNLESS OTHERWISE
SPECIFIED (.015 MAX)

VALCO CINCINNATI

TOLERANCES - EXCEPT AS NOTED

FRACTIONAL +/- 1/64

ANGULAR +/- 1 DEG.

DECIMAL +/- .005

MACHINED SURFACES 125

THREAD LENGTH DIMENSIONS ARE FULL THREAD HOLES TO BE CHAMFERED ONE THREAD DEPTH MAX UNLESS OTHERWISE SPECIFIED

DRAWN BY R.D

CHECKED R.D.

APPROVED _

TITLE TRANSFORMER WIRING
120 & 220-VOLT LINES
-

DATE 6-12-87

SCALE N.T.S

SHEET 1 OF 1

DRAWING NUMBER 999XA551-01

SUPERSEDES NEW

SUPERSEDED BY