

Low-Pressure Color Change Manifold

Customer Product Manual

Part 331151C

Issued 10/03

**For parts and technical support, call the Industrial Coating
Systems Customer Support Center at (800) 433-9319 or
contact your local Nordson representative.**

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Table of Contents

Safety	1	Repair	12
Qualified Personnel	1	Color Change Manifold Disassembly	12
Intended Use	1	Color Change Manifold Assembly	13
Regulations and Approvals	1	Microvalve Repair	14
Personal Safety	2	Removal	14
High-Pressure Fluids	2	Disassembly	15
Fire Safety	3	Assembly	16
Halogenated Hydrocarbon Solvent Hazards	4	Installation	16
Action in the Event of a Malfunction	4	Troubleshooting	16
Disposal	4	Parts	18
Description	5	Using the Illustrated Parts List	18
Color Change Plates	6	Color Change Manifold	19
Color Change Manifold Components	6	Female Plate Assembly	20
Options	7	Male Plate Assembly	20
Theory of Operation	8	Circulating Plate Assembly	21
Installation	9	Non-Circulating Plate Assembly	22
Fluid Lines	9	Microvalve Assembly	22
Air Supply Lines	10	Kits	23
Adding Colors	10	Buna-N, Hot Paint Manifold Air Fitting Kit ...	23
Adding a Divider Plate	10	Mounting Bar Kits	24
Operation	11	Recommended Spare Parts	25
Startup	11	Optional Parts	26
Change Colors	11	Divider Plate Assembly	26
Shutdown	11	Zalak Microvalve O-ring Kit	27
Maintenance	11	Zalak Manifold Air Fitting Kit	27
		Specifications	28

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Low-Pressure Color Change Manifold

Safety

Read and follow these safety instructions. Task- and equipment-specific warnings, cautions, and instructions are included in equipment documentation where appropriate.

Make sure all equipment documentation, including these instructions, is accessible to persons operating or servicing equipment.

Qualified Personnel

Equipment owners are responsible for making sure that Nordson equipment is installed, operated, and serviced by qualified personnel. Qualified personnel are those employees or contractors who are trained to safely perform their assigned tasks. They are familiar with all relevant safety rules and regulations and are physically capable of performing their assigned tasks.

Intended Use

Use of Nordson equipment in ways other than those described in the documentation supplied with the equipment may result in injury to persons or damage to property.

Some examples of unintended use of equipment include

- using incompatible materials
- making unauthorized modifications
- removing or bypassing safety guards or interlocks
- using incompatible or damaged parts
- using unapproved auxiliary equipment
- operating equipment in excess of maximum ratings

Regulations and Approvals

Make sure all equipment is rated and approved for the environment in which it is used. Any approvals obtained for Nordson equipment will be voided if instructions for installation, operation, and service are not followed.

Personal Safety

To prevent injury follow these instructions.

- Do not operate or service equipment unless you are qualified.
- Do not operate equipment unless safety guards, doors, or covers are intact and automatic interlocks are operating properly. Do not bypass or disarm any safety devices.
- Keep clear of moving equipment. Before adjusting or servicing moving equipment, shut off the power supply and wait until the equipment comes to a complete stop. Lock out power and secure the equipment to prevent unexpected movement.
- Relieve (bleed off) hydraulic and pneumatic pressure before adjusting or servicing pressurized systems or components. Disconnect, lock out, and tag switches before servicing electrical equipment.
- While operating manual spray guns, make sure you are grounded. Wear electrically conductive gloves or a grounding strap connected to the gun handle or other true earth ground. Do not wear or carry metallic objects such as jewelry or tools.
- If you receive even a slight electrical shock, shut down all electrical or electrostatic equipment immediately. Do not restart the equipment until the problem has been identified and corrected.
- Obtain and read Material Safety Data Sheets (MSDS) for all materials used. Follow the manufacturer's instructions for safe handling and use of materials, and use recommended personal protection devices.
- Make sure the spray area is adequately ventilated.
- To prevent injury, be aware of less-obvious dangers in the workplace that often cannot be completely eliminated, such as hot surfaces, sharp edges, energized electrical circuits, and moving parts that cannot be enclosed or otherwise guarded for practical reasons.

High-Pressure Fluids

High-pressure fluids, unless they are safely contained, are extremely hazardous. Always relieve fluid pressure before adjusting or servicing high pressure equipment. A jet of high-pressure fluid can cut like a knife and cause serious bodily injury, amputation, or death. Fluids penetrating the skin can also cause toxic poisoning.

If you suffer a fluid injection injury, seek medical care immediately. If possible, provide a copy of the MSDS for the injected fluid to the health care provider.

The National Spray Equipment Manufacturers Association has created a wallet card that you should carry when you are operating high-pressure spray equipment. These cards are supplied with your equipment. The following is the text of this card:



WARNING: Any injury caused by high pressure liquid can be serious. If you are injured or even suspect an injury:

- Go to an emergency room immediately.
- Tell the doctor that you suspect an injection injury.
- Show him this card
- Tell him what kind of material you were spraying

MEDICAL ALERT—AIRLESS SPRAY WOUNDS: NOTE TO PHYSICIAN

Injection in the skin is a serious traumatic injury. It is important to treat the injury surgically as soon as possible. Do not delay treatment to research toxicity. Toxicity is a concern with some exotic coatings injected directly into the bloodstream.

Consultation with a plastic surgeon or a reconstructive hand surgeon may be advisable.

The seriousness of the wound depends on where the injury is on the body, whether the substance hit something on its way in and deflected causing more damage, and many other variables including skin microflora residing in the paint or gun which are blasted into the wound. If the injected paint contains acrylic latex and titanium dioxide that damage the tissue's resistance to infection, bacterial growth will flourish. The treatment that doctors recommend for an injection injury to the hand includes immediate decompression of the closed vascular compartments of the hand to release the underlying tissue distended by the injected paint, judicious wound debridement, and immediate antibiotic treatment.

Fire Safety

To avoid a fire or explosion, follow these instructions.

- Ground all conductive equipment. Use only grounded air and fluid hoses. Check equipment and workpiece grounding devices regularly. Resistance to ground must not exceed one megohm.
- Shut down all equipment immediately if you notice static sparking or arcing. Do not restart the equipment until the cause has been identified and corrected.
- Do not smoke, weld, grind, or use open flames where flammable materials are being used or stored.
- Do not heat materials to temperatures above those recommended by the manufacturer. Make sure heat monitoring and limiting devices are working properly.

Fire Safety (contd)

- Provide adequate ventilation to prevent dangerous concentrations of volatile particles or vapors. Refer to local codes or your material MSDS for guidance.
- Do not disconnect live electrical circuits when working with flammable materials. Shut off power at a disconnect switch first to prevent sparking.
- Know where emergency stop buttons, shutoff valves, and fire extinguishers are located. If a fire starts in a spray booth, immediately shut off the spray system and exhaust fans.
- Shut off electrostatic power and ground the charging system before adjusting, cleaning, or repairing electrostatic equipment.
- Clean, maintain, test, and repair equipment according to the instructions in your equipment documentation.
- Use only replacement parts that are designed for use with original equipment. Contact your Nordson representative for parts information and advice.

Halogenated Hydrocarbon Solvent Hazards

Do not use halogenated hydrocarbon solvents in a pressurized system that contains aluminum components. Under pressure, these solvents can react with aluminum and explode, causing injury, death, or property damage. Halogenated hydrocarbon solvents contain one or more of the following elements:

<u>Element</u>	<u>Symbol</u>	<u>Prefix</u>
Fluorine	F	"Fluoro-"
Chlorine	Cl	"Chloro-"
Bromine	Br	"Bromo-"
Iodine	I	"Iodo-"

Check your material MSDS or contact your material supplier for more information. If you must use halogenated hydrocarbon solvents, contact your Nordson representative for information about compatible Nordson components.

Action in the Event of a Malfunction

If a system or any equipment in a system malfunctions, shut off the system immediately and perform the following steps:

- Disconnect and lock out system electrical power. Close hydraulic and pneumatic shutoff valves and relieve pressures.
- Identify the reason for the malfunction and correct it before restarting the system.

Disposal

Dispose of equipment and materials used in operation and servicing according to local codes.

Description

See Figure 1. The low-pressure color change manifold allows you to make quick color changes with minimum material coating loss.

The modular construction of the color change manifold allows you to increase or decrease the number of colors simply by adding or removing plates.

Manifolds can be configured for the application by assembling four or more of the following plates:

- Male end plate
- Female end plate
- Circulating valve plate
- Non-circulating valve plate
- Divider plate

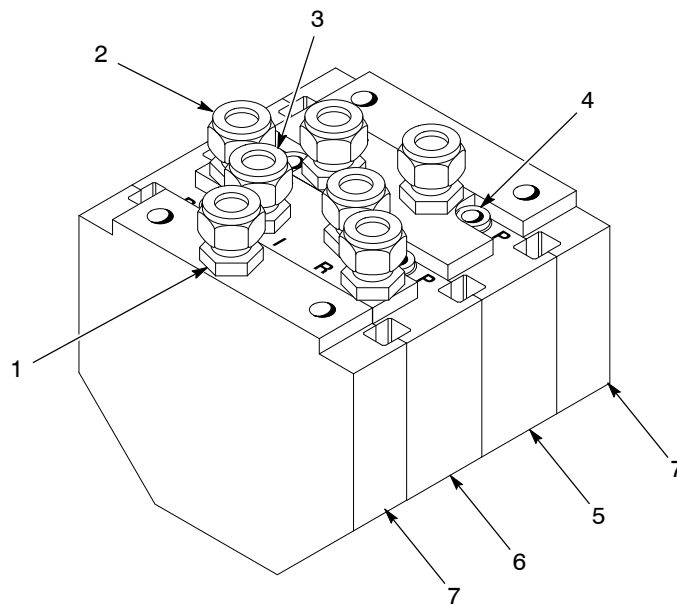


Figure 1 Color Change Manifold

- | | |
|--------------------------|--------------------------------|
| 1. Fluid outlet fitting | 5. Non-circulating valve plate |
| 2. Fluid return fittings | 6. Circulating valve plate |
| 3. Fluid inlet fittings | 7. End plates |
| 4. Air fittings | |

Color Change Plates

Figure 2 identifies the two types of valve plates. The paint type you use determines which color change plate is used.

- Use a circulating valve plate for paints that need to be agitated or heated. When the microvalve is closed, the paint continues to circulate.
- Use a non-circulating valve plate for paint that does not need to be heated or agitated. When the microvalve is closed, the paint is stopped at the valve.

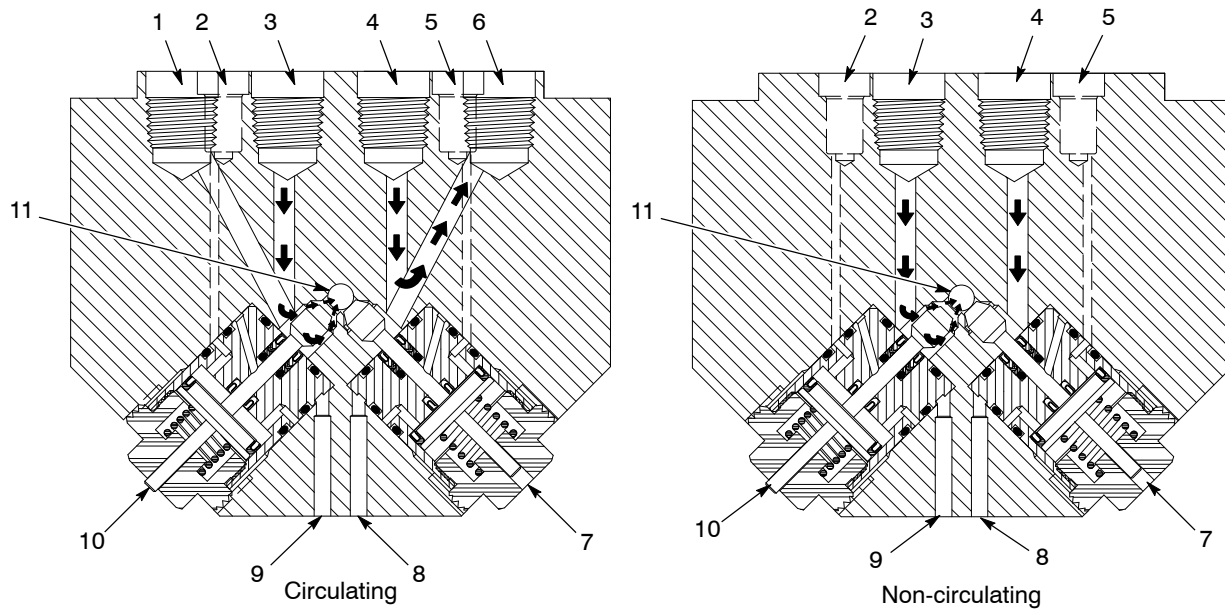


Figure 2 Circulating and Non-Circulating Valve Plates

- | | | |
|---------------------------|---------------------------|--------------------------|
| 1. Return outlet | 5. Air supply for valve 2 | 9. Weep hole for valve 1 |
| 2. Air supply for valve 1 | 6. Circulation-to-pump | 10. Microvalve 1 |
| 3. Paint inlet to valve 1 | 7. Microvalve 2 | 11. Fluid outlet |
| 4. Paint inlet to valve 2 | 8. Weep hole for valve 2 | |

Color Change Manifold Components

See Figure 3 for the components in a typical color change manifold.

Each color change manifold consists of a male (6) and female end plate (1), and combinations of circulating (3) and non-circulating (7) valve plates. The circulating plate has two valves and can be used for two colors. The non-circulating plate also has two valves, which can be used for color, air, or solvent.

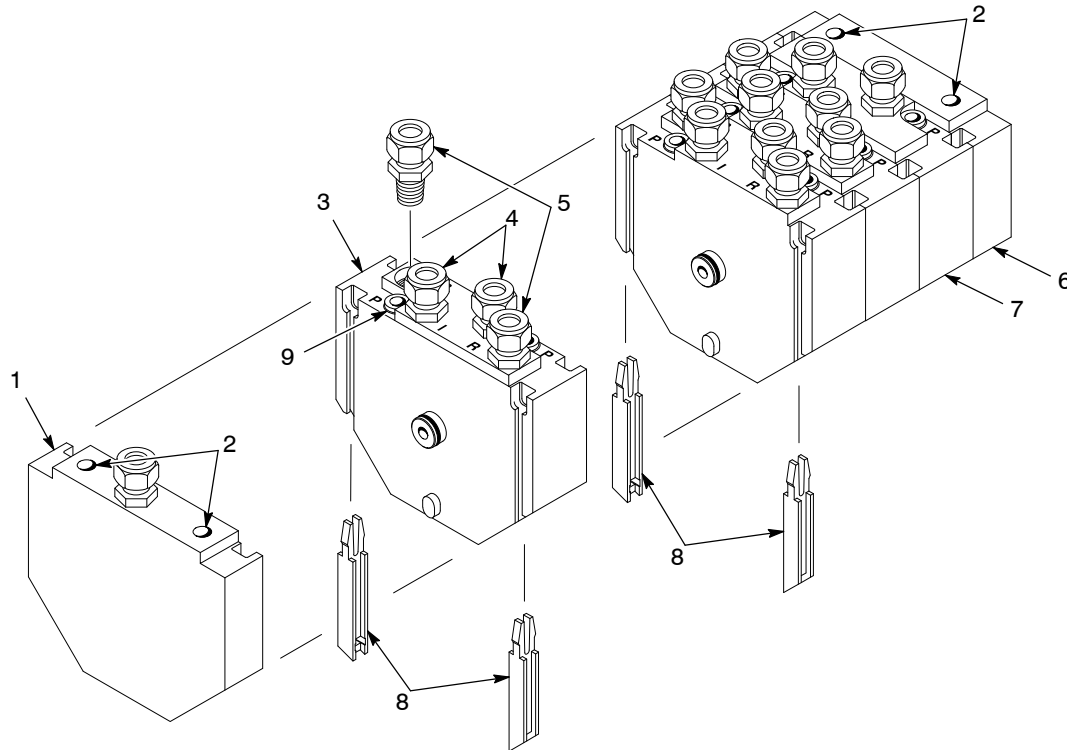


Figure 3 Typical Color Change Manifold

- | | | |
|----------------------------|---------------------------|--------------------------------|
| 1. Female end plate | 4. Fluid inlets to valves | 7. Non-circulating valve plate |
| 2. Mounting holes | 5. Return outlet | 8. Body clips |
| 3. Circulating valve plate | 6. Male end plate | 9. Air pilot fittings |

Options

Flowmeter	<p>The flowmeter is an option that allows you to measure the fluid flow out of the color changer.</p> <p>NOTE: If you require a flowmeter, contact your Nordson representative.</p>
Zalak O-rings	<p>Your paint or solvent may be incompatible with the standard O-rings provided with your color change manifold. You may need to replace them with Zalak O-rings. Contact your Nordson Corporation representative to determine if you need Zalak O-rings.</p>
Divider Plate	<p>See Figure 4. The divider plate assembly may be placed between any combination of circulating and non-circulating valve plates. It is used to divide the color change manifold into two separate color change manifolds. It is typically used for two component material, with resin on one side and the catalyst on the other side.</p>

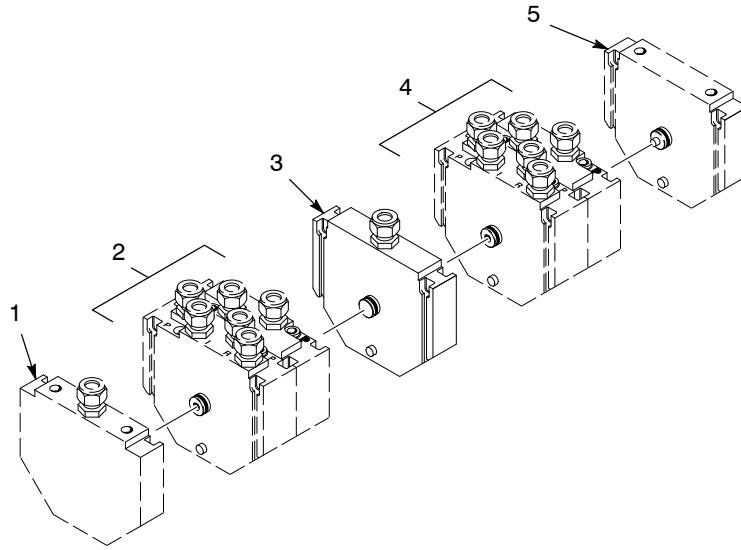


Figure 4 Divider Plate Assembly

- | | | |
|---|---|-------------------|
| 1. Female end plate | 3. Divider plate | 5. Male end plate |
| 2. Circulating and non-circulating valve plates | 4. Circulating and non-circulating valve plates | |

Theory of Operation

See Figure 5. A different color paint is supplied to valves 1 and 2. A remote pneumatic solenoid valve opens and closes the microvalves with air pressure. Only one microvalve is open at a time. The paint flows through the open microvalve to the applicator.

- The microvalves are normally closed (air open, spring return). The paint arriving at closed microvalve 2 cannot flow past the valve seat to the fluid outlet so it circulates through the plate out the return and back to the pump.
- When air is applied to microvalve 1, the piston compresses the spring and pulls the poppet with it. This allows the material to flow past the seat to the fluid outlet and to the applicator.
- If the valve seals fail, paint leaks out of the weep holes, alerting the operator that the microvalve plate requires service.

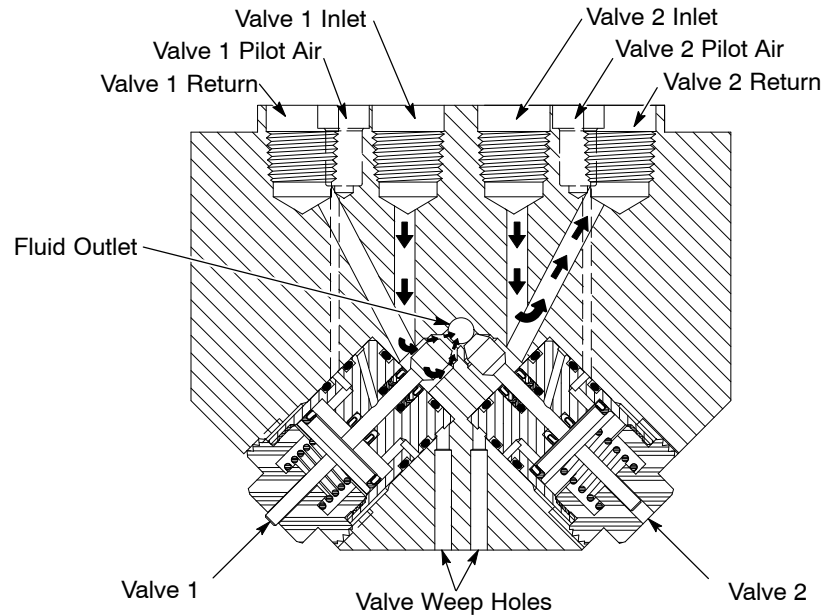


Figure 5 Circulating Valve Plate Operation

Installation



WARNING: Allow only qualified personnel to perform the following tasks. Follow the safety instructions in this document and all other related documentation.

The color change manifold should be as close to the applicator as possible. This minimizes paint loss and lessens the time required to change colors.

Fluid Lines

See Figure 1.

1. Use the grooving tool supplied with the male end plate assembly kit to groove the fluid tubing. Refer to the instruction sheet supplied with the kit to perform this procedure.

NOTE: Do not follow the tightening procedure in the grooving tool instruction sheet.

2. Insert the fluid tubing into a fluid fitting.
3. Make sure that the tubing rests firmly on the shoulder of the fitting and that the nut is finger tight.
4. Before tightening the nut, scribe the nut at the 6 o'clock position to make sure that there will be no uncertainty about the location of the starting position.
5. Turn the nut one complete revolution, and continue to the 9 o'clock position ($1\frac{1}{4}$ turns from finger tight).

Air Supply Lines

See Figure 1. Connect the 4-mm ($5/32$ -in.) air tubing by inserting the air line snugly into the air fitting (4).

Adding Colors

Depending on your application requirements and the number of colors/paints that are needed, you may need to add additional plates to your color change manifold.

- One valve plate must always be available for solvent or water.
- You need one circulating valve plate for two colors, and one non-circulating valve plate for air and solvent.
- Refer to *Parts* for information on how to order extra plates.
- See Figure 16. Allow adequate space for the color change manifold and any additional color change plates that are added.

Female End Plate		Non-Circulating Plate		Divider Plate		Circulating Plate		Male End Plate
2.0 cm (0.79 in)	+	2.82 cm (1.11 in.) x # of non-circ. plates	+	2.0 cm (0.79 in)	+	2.82 cm (1.11 in.) x # of circulating plates	+	2.0 cm (0.79 in.)

Use the following examples to help determine your number of color change plates.

# of colors/ paints you are using	# of color change plates you have	Are you using air?	You will need to order...	Manifold Breakdown
5	3	Yes	1 color change plate	Three plates: five valves for paint and one valve for solvent One plate: one valve for air
5	3	No	Nothing	Three plates: five valves for paint and one valve for solvent

Adding a Divider Plate



WARNING: System or material pressurized. Relieve all pressure. Failure to observe may result in serious injury.

See Figure 4.

1. Remove the body clips from the desired plates.
2. Pull the plate assemblies (2 and 4) apart.
3. Place the divider plate (3) between the plates.
4. Install the body clips.
5. Connect fluid tubing from the divider plate to the applicator.

Operation



WARNING: Allow only qualified personnel to perform the following tasks. Follow the safety instructions in this document and all other related documentation.

Startup

1. Set the fluid and air pressure to the desired setpoint for all valves.
2. Begin operation.

Change Colors

1. Shut off the air to the valve (color) you are currently using.
2. Apply air pressure to the solvent and air (if used) valve to flush the color change manifold. Open one valve at a time and flush the tubing going to the spray applicator.
3. Apply air pressure to the valve (color) you want to use next.

Shutdown

NOTE: Before shutdown, flush the color change manifold and the tubing to the applicator.

NOTE: Follow the procedure for your specific pump to reduce all fluid pressure to 0 bar/psi.

1. Reduce the fluid pressure for each fluid connection to 0 bar/psi.
2. Reduce the air pressure for each air connection to 0 bar/psi.

Maintenance



WARNING: Allow only qualified personnel to perform the following tasks. Follow the safety instructions in this document and all other related documentation.

Note the following precautions when performing routine maintenance:

- In the event of a leak, repair immediately.
- Do not soak plastic components in aggressive or incompatible solvents.
- Do not use acids.
- Do not soak O-rings in solvent.
- Replace deformed or cut O-rings immediately.
- Do not use sharp-edged tools for cleaning.

Perform periodic checks to identify any leaks that may exist:

- between each plate in the manifold plate,
- at the weep holes,
- at the valve and valve stem
- at the fluid and air fittings

Repair



WARNING: Allow only qualified personnel to perform the following tasks. Follow the safety instructions in this document and all other related documentation.

NOTE: When disassembling the color change manifold for routine maintenance, look for any sign of leakage, damaged O-rings, or abnormal wear which may affect operation.

The following tools will be needed to disassemble and assemble the color change manifold and valve plates:

- valve tool kit
- flathead screwdriver
- small adjustable wrench

Color Change Manifold Disassembly



WARNING: System or material pressurized. Relieve all pressure. Failure to observe may result in serious injury.

NOTE: It is only necessary to flush both valves in the plate you are taking apart.

NOTE: It is not necessary to disassemble the manifold to remove a valve.

See Figure 6.

1. Flush the color change manifold with air and solvent as needed.
2. Flush the tubing going to the spray applicator.
3. Depressurize all fluid and air lines.
4. Remove the color change manifold from its mounting.
5. Disconnect the fluid tubing from the fluid fittings. Disconnect the air lines from the air fittings.
6. Place the end of the flathead screwdriver on the body clip notch and pull the clip out. Remove all body clips that hold the plate in place.
7. Pull the color change manifold apart to separate the plates.

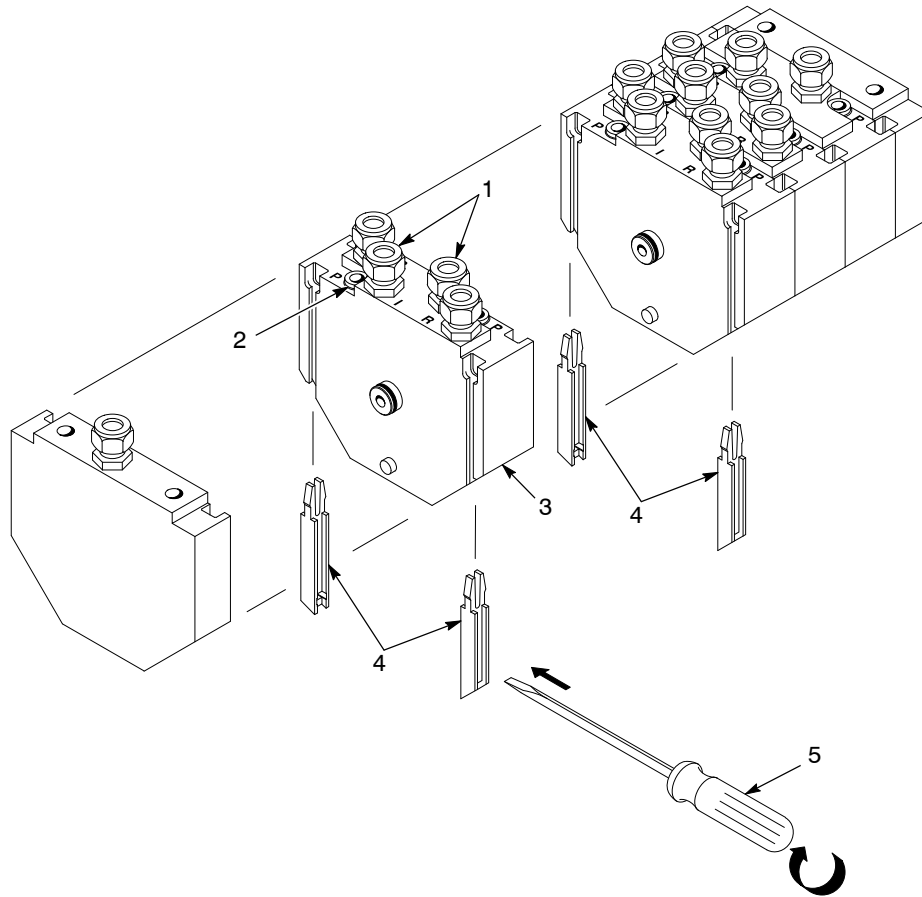


Figure 6 Color Change Manifold Disassembly and Assembly

- | | | |
|-------------------|----------------------------|-------------------------|
| 1. Fluid fittings | 3. Circulating valve plate | 5. Flathead screwdriver |
| 2. Air fittings | 4. Body clip | |

Color Change Manifold Assembly

See Figure 6.

1. Connect the air lines to the air fittings (2).
2. Connect the fluid tubing to the fluid fittings:
 - a. Insert the tubing with preswaged ferrules into the fitting body until the front ferrule seats.
 - b. Tighten the nut by hand. Rotate the nut to the original position with a wrench.
- NOTE:** An increase in resistance will be encountered at the original position.
- c. Tighten slightly with a wrench.
3. Put the plates back together.
4. Insert the body clips.

Microvalve Repair



WARNING: System or material pressurized. Relieve all pressure. Failure to observe may result in serious injury.

NOTE: It is only necessary to flush the valves in the plate you are taking apart.

NOTE: It is not necessary to disassemble the manifold to remove a valve.

Removal

See Figure 7.

1. Flush the tubing to the spray applicator.
2. Depressurize all fluid and air lines.
3. See View A. Using the microvalve tool (2), unscrew the microvalve (1) four turns to disengage the threads.

If the microvalve sticks in the manifold and the cap comes off of the valve, perform the following steps:

- a. See View C. Screw the microvalve tool four turns into the microvalve body.
 - b. Remove the microvalve by turning and then pulling the microvalve tool.
4. See View B. If the cap does not come off the microvalve, complete the microvalve removal by performing the following steps:
 - a. Turn the microvalve tool around.
 - b. Screw the microvalve tool onto the cap.
 - c. Completely pull out the microvalve.

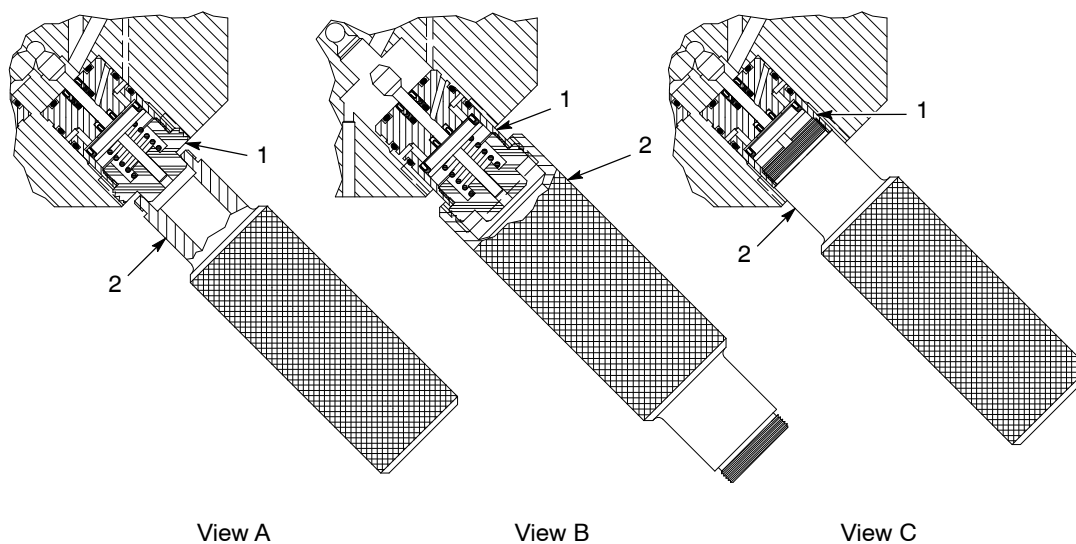


Figure 7 Microvalve Removal

1. Microvalve

2. Microvalve tool

Disassembly

1. See Figure 8. Remove the end cap (2) with the microvalve tool by rotating counterclockwise.
2. Remove the compression spring (3) from the microvalve.
3. Remove the poppet (7) by turning it counterclockwise while holding on to the flats of the piston stem (1) with a wrench.

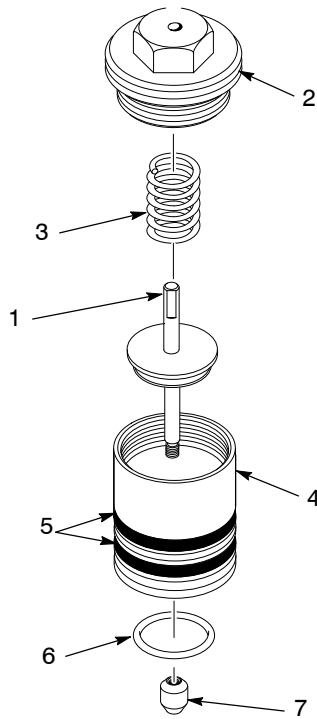


Figure 8 Microvalve Disassembly

- | | | |
|-----------------------|---------------------|---------------------|
| 1. Piston stem | 4. Valve body | 6. Face seal O-ring |
| 2. Valve end cap | 5. External O-rings | 7. Poppet |
| 3. Compression spring | | |

Assembly

1. Place a drop of removable threadlocking adhesive, such as Loctite 242 Blue, on the threads at the bottom of the piston stem.
2. See Figure 8. Using a wrench to hold the flats at the top of the piston stem, screw the poppet (7) clockwise onto the stem until the poppet bottoms out on the flat edge just past the threads.
3. Place the compression spring in the cap, then use the microvalve tool to screw the cap clockwise into the valve body until it stops.

Installation

See Figure 7.



CAUTION: Do not use metal tools. Metal tools will damage the seat of the microvalve.

1. Using plant air, dry the valve seat inside the plate.
2. Purge the air line to remove any impurities or debris.
3. Coat the body of the new valve (1) with O-ring lubricant.
4. Apply a thin coat of O-ring lubricant in the valve cavity.
5. Using the microvalve tool (2), apply pressure on the microvalve while threading it clockwise into the plate.
6. Rotate the valve tool clockwise until the microvalve is snug in the plate.

Troubleshooting



WARNING: Allow only qualified personnel to perform the following tasks. Follow the safety instructions in this document and all other related documentation.

These procedures in the following table cover only the most common problems that you may encounter. If you cannot solve the problem with the information given here, contact your local Nordson representative for help.

Problem	Possible Cause	Corrective Action
1. Plate is leaking fluid at the base through the weep hole	<p>Microvalve is loose</p> <p>O-ring on the microvalve face is cut</p> <p>Foreign matter where the O-ring seals in the plate</p> <p>Fluid seals are worn out</p>	<p>Tighten the microvalve in the plate.</p> <p>Replace the O-ring.</p> <p>Take the microvalve out of the plate, clean it out and reassemble.</p> <p>Replace the microvalve.</p>
2. Fluid is leaking past the external threads of the valve cap, out the hole in the cap, or out the weep hole	<p>External O-rings on the microvalve are damaged</p>	<p>Remove the microvalve and examine the O-rings. Replace the faulty ones.</p>
3. valve fails to open (indicator does not remain out at the cap)	<p>Pilot air pressure is not reaching the valve</p> <p>Pilot air pressure is less than 4.5 bar (65 psi)</p> <p>Piston stem is jammed. After a prolonged shut down, a leak at the seals may have caused the paint to dry out and stick on the piston stem</p> <p>Air piston seal is damaged. A leak at this point prevents the pressure from moving the piston</p>	<p>Make sure the pilot air line is not kinked or disconnected.</p> <p>Increase the air supply pilot pressure to the valve.</p> <p>Check for the presence of paint that may have run out of the weep hole. If this is the case, replace the microvalve.</p> <p>With the microvalve in the plate, apply air pressure and check for air leaking out the hole in the cap. If there is an air leak, replace the microvalve.</p>
4. Microvalve fails to close	<p>Air pressure applied to microvalve</p> <p>Return spring is broken</p> <p>Spring may be weak</p> <p>Poppet is defective</p> <p>Foreign matter preventing the poppet from sealing</p>	<p>Pneumatic solenoid valve is failing to vent the air pressure. Replace the solenoid valve.</p> <p>Remove the microvalve from the plate and apply pressure to the end of the poppet. If there is no resistance, the spring is broken. Replace the spring.</p> <p>Replace the spring.</p> <p>Remove the microvalve from the plate and check for scratches or faults in the poppet. If any are found, replace the poppet.</p> <p>Remove the microvalve from the plate and check for foreign matter on the poppet and seat.</p>

Parts

To order parts, call the Nordson Industrial Coating Systems Customer Support Center at (800) 433-9319 or contact your local Nordson representative. Use the parts illustrations and parts lists to locate and describe parts correctly.

Using the Illustrated Parts List

Numbers in the Item column correspond to numbers that identify parts in illustrations following each parts list. The code NS (not shown) indicates that a listed part is not illustrated. A dash (—) is used when the part number applies to all parts in the illustration.

The number in the Part column is the Nordson Corporation part number. A series of dashes in this column (- - - - -) means the part cannot be ordered separately.

The Description column gives the part name, as well as its dimensions and other characteristics when appropriate. Indentions show the relationships between assemblies, subassemblies, and parts.

- If you order the assembly, items 1 and 2 will be included.
- If you order item 1, item 2 will be included.
- If you order item 2, you will receive item 2 only.

The number in the Quantity column is the quantity required per unit, assembly, or subassembly. The code AR (As Required) is used if the part number is a bulk item ordered in quantities or if the quantity per assembly depends on the product version or model.

Letters in the Note column refer to notes at the end of each parts list. Notes contain important information about usage and ordering. Special attention should be given to notes.

Item	Part	Description	Quantity	Note
—	0000000	Assembly	1	
1	000000	• Subassembly	2	A
2	000000	• • Part	1	

Color Change Manifold

See Figure 9. The minimum number of plates you must order to build the color change manifold is four: One female plate, one male plate, and two color change plates (circulating, non-circulating, or both). Refer to the appropriate parts lists for the plate assembly parts breakdown.

Item	Part	Description	Quantity	Note
1	333920	PLATE ASSEMBLY, end, female	1	
2	338286	PLATE ASSEMBLY KIT, circulating	1	
3	338287	PLATE ASSEMBLY KIT, non-circulating	1	
4	338288	PLATE ASSEMBLY, end, male	1	

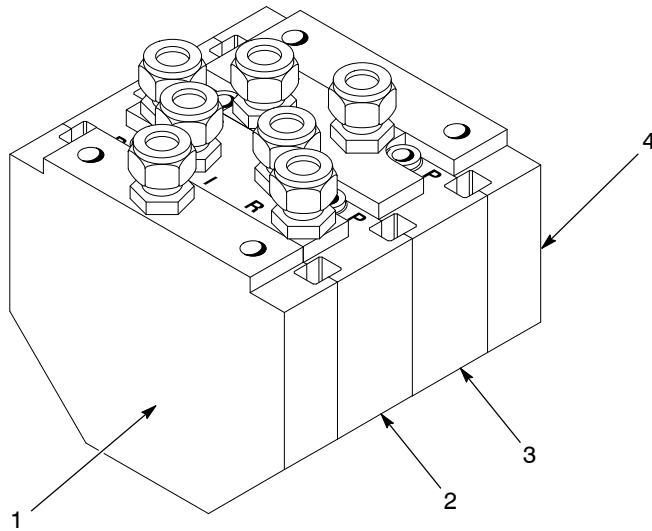


Figure 9 Color Change Manifold

Female Plate Assembly

See Figure 10.

Item	Part	Description	Quantity	Note
—	333920	PLATE ASSEMBLY, end, female	1	
1	-----	• PLATE, end, female	1	
2	333909	• FITTING, $\frac{3}{8}$ -tube x $\frac{1}{4}$ -in. NPT	1	
NS	331151	• MANUAL, LP color change manifold	1	
NS: Not Shown				

Male Plate Assembly

See Figure 10.

Item	Part	Description	Quantity	Note
—	338288	PLATE ASSEMBLY, end, male	1	
3	333919	• PLATE ASSEMBLY, end male	1	
4	940100	• O-RING, hotpaint, 0.250 x 0.375 x 0.063 in.	1	
5	333881	• CLIP, body	2	
NS	248649	• GROOVE TOOL, $\frac{3}{8}$ -in. OD tube	1	
4	333906	O-RING, Zalak, 0.239 x 0.070 in.	1	A
NOTE A: Use Zalak O-ring, part 333906, if the hotpaint O-ring, part 940100, is incompatible with your paint or solvent.				
NS: Not Shown				

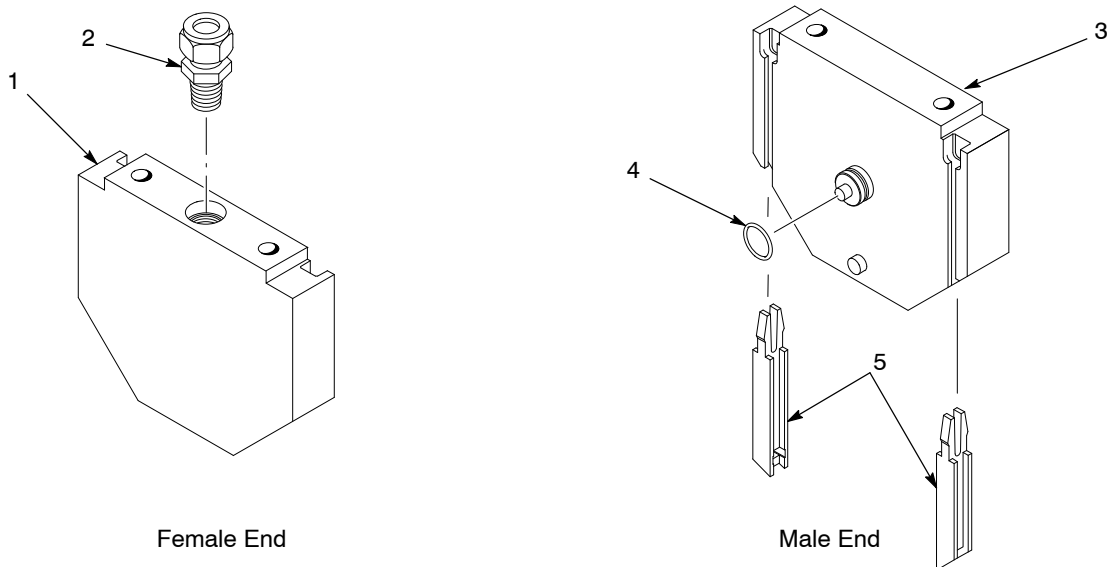


Figure 10 Female and Male End Plates

Circulating Plate Assembly

See Figure 11.

Item	Part	Description	Quantity	Note
—	338286	PLATE ASSEMBLY KIT, circulating	1	
1	-----	• PLATE ASSEMBLY, circulating	1	
2	333894	• • VALVE, assembly, microvalve	2	
3	333909	• • FITTING, $\frac{3}{8}$ -tube x $\frac{1}{4}$ -in. NPT	4	
4	333908	• • FITTING, cartridge, half	2	
5	-----	• • O-RING, hotpaint, 0.156 x 1.344 x 0.094 in.	2	
6	940100	• • O-RING, hotpaint, 0.250 x 0.375 x 0.063 in.	1	
7	333881	• CLIP, body	2	
6	333906	O-RING, Zalak, 0.239 x 0.070 in.	1	A

NOTE A: Use Zalak O-ring, part 333906, if the hotpaint O-ring, part 940100, is incompatible with your paint or solvent.

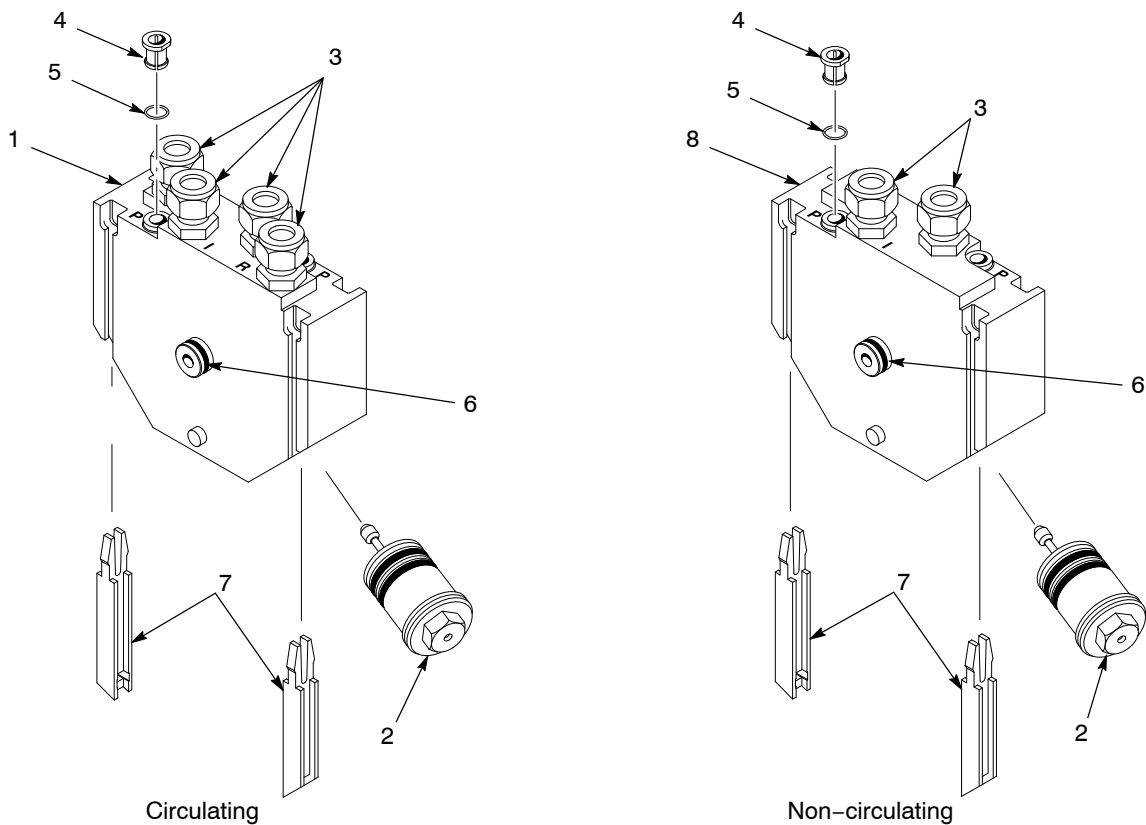


Figure 11 Circulating and Non-Circulating Valve Plates

Non-Circulating Plate Assembly

See Figure 11.

Item	Part	Description	Quantity	Note
—	338287	PLATE ASSEMBLY KIT, non-circulating	1	
8	-----	• PLATE ASSEMBLY, non-circulating	1	
2	333894	• • VALVE, assembly, microvalve	2	
3	333909	• • FITTING, $\frac{3}{8}$ -tube x $\frac{1}{4}$ -in. NPT	2	
4	333908	• • FITTING, cartridge, half	2	
5	-----	• • O-RING, hotpaint, 0.156 x 1.344 x 0.094 in.	2	
6	940100	• • O-RING, hotpaint, 0.250 x 0.375 x 0.063 in.	1	
7	333881	• CLIP, body	2	
6	333906	O-RING, Zalak, 0.239 x 0.070 in.	1	A

NOTE A: Use Zalak O-ring, part 333906, if the hotpaint O-ring, part 940110, is incompatible with your paint or solvent.

Microvalve Assembly

See Figure 12.

Item	Part	Description	Quantity	Note
—	333894	VALVE ASSEMBLY, microvalve	1	
1	333880	• SPRING, compression	1	
2	940180	• O-RING, hotpaint, 0.750 x 0.875 x 0.063 in.	2	
3	940140	• O-RING, hotpaint, 0.500 x 0.625 x 0.063 in.	1	
4	333892	• POPPET, microvalve	1	

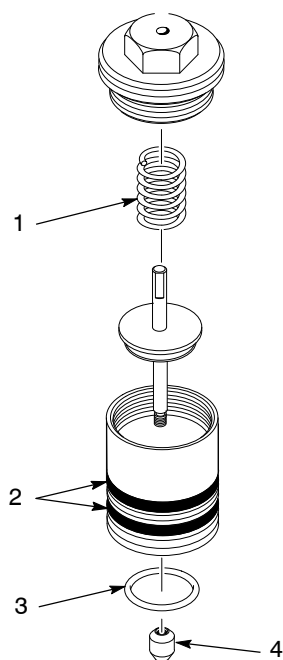


Figure 12 Microvalve Assembly

Kits**Buna-N, Hot Paint Manifold Air Fitting Kit**

See Figure 11.

Item	Part	Description	Quantity	Note
—	338281	AIR FITTING KIT, hot paint	1	
4	333908	• FITTING, cartridge, half	1	
5	-----	• O-RING, hot paint, 0.156 x 0.344 x 0.094	1	

Mounting Bar Kits

See Figure 13.

Item	Part	Part	Description	Quantity	Note
—	1030159		MOUNTING BAR KIT, color changer, 2.00 in.	1	
—		1030193	MOUNTING BAR KIT, color changer, 1.00 in.	1	
1	1030103		• BRACKET, color changer, threaded, 2-in. bar	2	
1		1030172	• BRACKET, color changer, threaded, 1-in. bar	2	
2	1030102		• BRACKET, color changer, 2-in. bar	2	
2		1030171	• BRACKET, color changer, 1-in. bar	2	
3	1030160	1030160	• CAP SCREW, socket head, 1/4-20, 5.50, alloy steel	4	
4	-----	-----	• LOCK WASHER, English, split, 1/4 in. steel, nickel	4	
5	-----	-----	• WASHER, flat, regular, 1/4 in., zinc	4	

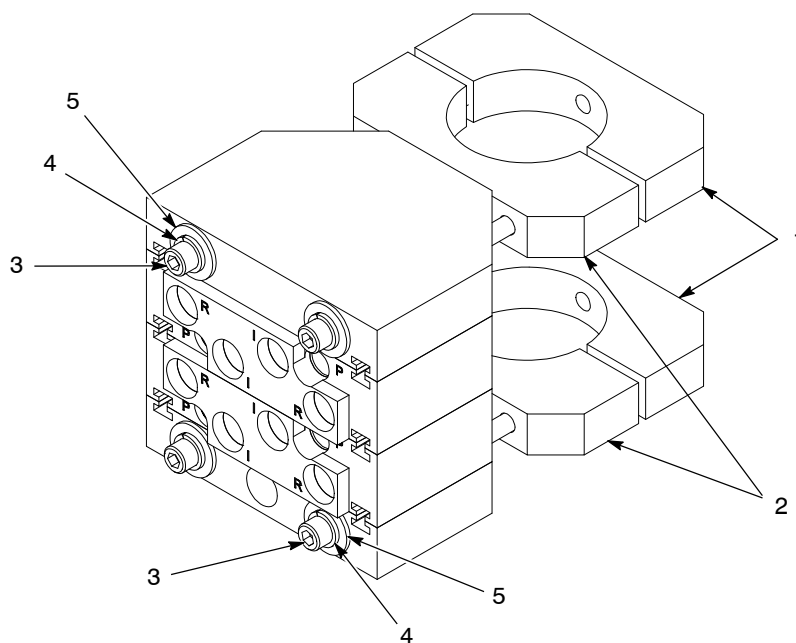


Figure 13 Mounting Bar Kits

Recommended Spare Parts

Keep these spare parts on hand to reduce downtime. The quantity you keep on hand depends on how many plates make up your color change manifold.

Part	Description	Quantity	Note
940100	O-RING, hotpaint, 0.250 X 0.375 X 0.063 IN.	1	A
333906	O-RING, Zalak, 0.239 x 0.070 in.	1	A
333909	FITTING, $\frac{3}{8}$ -tube x $\frac{1}{4}$ -in. NPT	1	
333894	VALVE ASSEMBLY, microvalve	1	
333893	TOOLKIT, microvalve	1	B
NOTE A: Use Zalak O-ring, part 333906, if the hotpaint O-ring 940100 is incompatible with your paint or solvent.			
B: See Figure 14.			

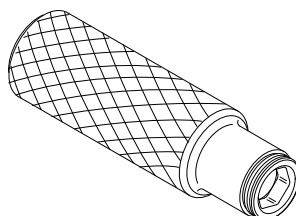


Figure 14 Microvalve Tool

Optional Parts

Divider Plate Assembly

See Figure 15.

Item	Part	Description	Quantity	Note
—	338289	DIVIDER PLATE ASSEMBLY KIT	1	
1	333918	• PLATE ASSEMBLY, divider	1	
2	333909	• • FITTING, $\frac{3}{8}$ -tube x $\frac{1}{4}$ -in. NPT	1	
3	940100	• • O-RING, hotpaint, 0.250 x 0.375 x 0.063 in.	1	
4	333881	• CLIP, body	2	
3	333906	O-RING, Zalak, 0.239 x 0.070 in.	1	A
NOTE A: Use Zalak O-ring, part 333906, if the hotpaint O-ring, part 940110, is incompatible with your paint or solvent.				

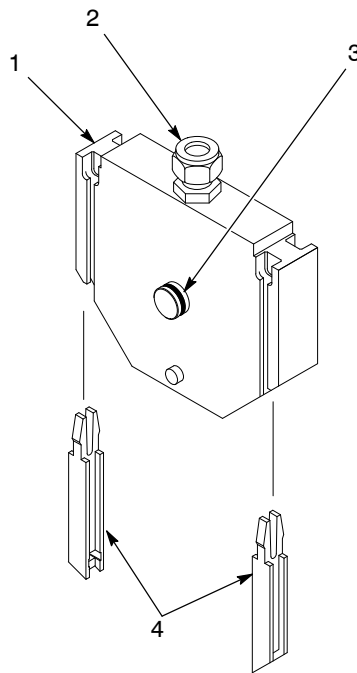


Figure 15 Divider Plate Assembly

Zalak Microvalve O-ring Kit

See Figure 12. Order this kit if your paint or solvent is incompatible with the standard O-rings.

Item	Part	Description	Quantity	Note
—	333929	ZALAK O-RING KIT, microvalve	1	
2	333907	• O-RING, Zalak, 0.750 x 0.875 x 0.063 in.	2	
3	941142	• O-RING, Zalak, 0.500 x 0.625 x 0.063 in.	1	

Zalak Manifold Air Fitting Kit

See Figure 11. Order this kit if your paint or solvent is incompatible with the standard O-rings.

Item	Part	Description	Quantity	Note
—	338280	AIR FITTING KIT, Zalak	1	
4	333908	• FITTING, cartridge, half	1	
5	-----	• O-RING, Zalak, 0.156 x 0.344 x 0.094 in.	1	

Specifications

Supply Air	Clean, dry, compressed air
Pilot Air Pressure	4.4–6.9 bar (65–100 psi)
Fluid Pressure	20.6 bar (300 psi) maximum
Dimensions (See Figure 16)	
End plates	2.0 cm (0.79 in.)
Plate assembly (circulating and non-circulating)	2.82 cm (1.11 in.)

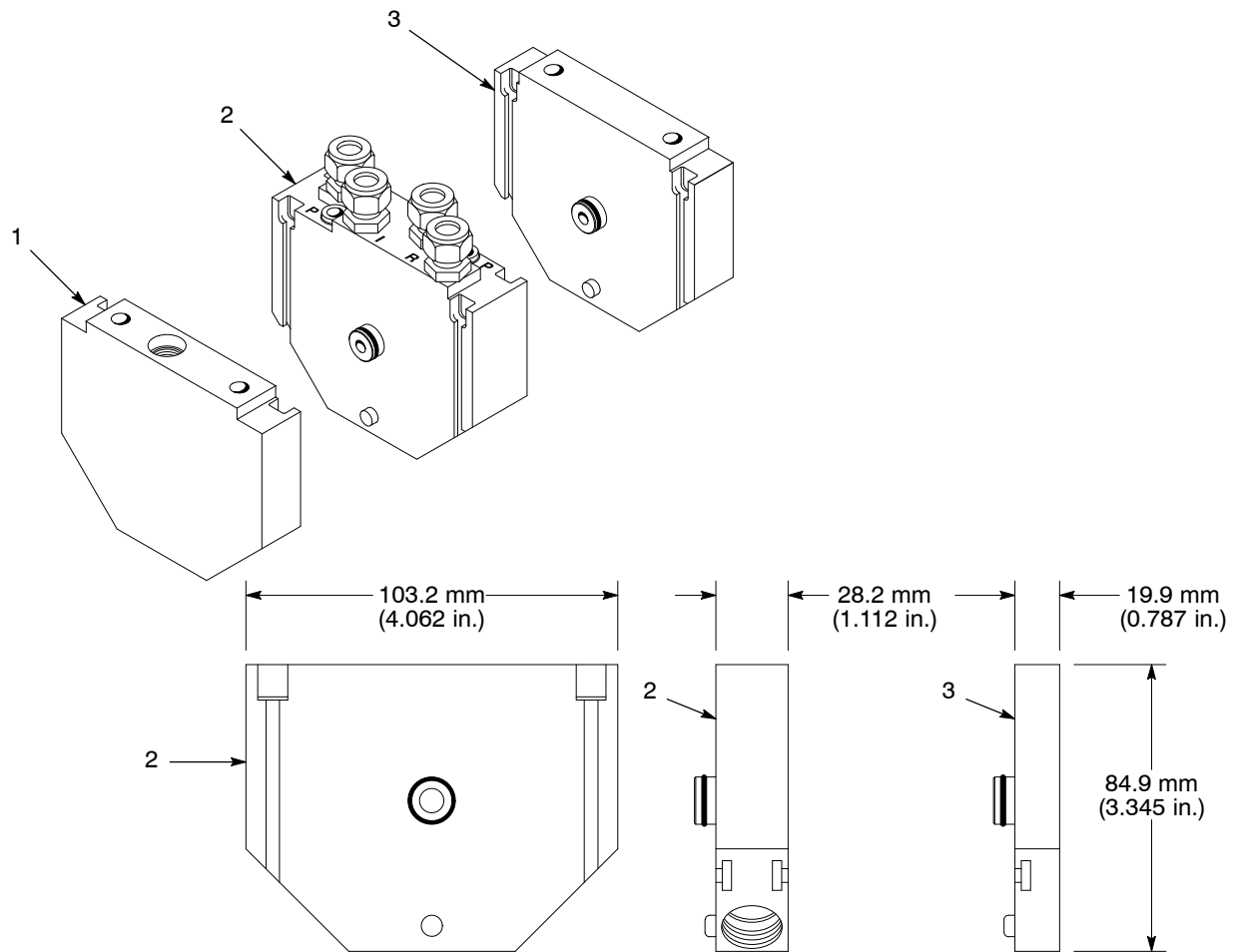


Figure 16 Plate Dimensions

1. Female end plate assembly

2. Circulating plate assembly

3. Male end plate assembly