CP II Inline Regulator

Customer Product Manual
Part 1097151-02
Issued 6/13

For parts and technical support, call the Finishing Customer Support Center at (800) 433-9319.

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# Change Record

<table>
<thead>
<tr>
<th>Revision</th>
<th>Date</th>
<th>Change</th>
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<tr>
<td>A01</td>
<td>3/10</td>
<td>New</td>
</tr>
<tr>
<td>02</td>
<td>6/13</td>
<td>Added optional 1604129 Polymyte packing cartridge kit.</td>
</tr>
</tbody>
</table>
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.

- 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.
- **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:

<table>
<thead>
<tr>
<th>Element</th>
<th>Symbol</th>
<th>Prefix</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fluorine</td>
<td>F</td>
<td>“Fluoro-”</td>
</tr>
<tr>
<td>Chlorine</td>
<td>Cl</td>
<td>“Chloro-”</td>
</tr>
<tr>
<td>Bromine</td>
<td>Br</td>
<td>“Bromo-”</td>
</tr>
<tr>
<td>Iodine</td>
<td>I</td>
<td>“Iodo-”</td>
</tr>
</tbody>
</table>

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 CP II Inline Regulator consists of a precision mastic regulator that is typically mounted at the point of dispensing. The following versions are available:

- Air-Actuated (34:1 Ratio)
- 1500 psi (103.4 bar) Spring-Actuated
- 3500 psi (241.3 bar) Spring-Actuated

Theory of Operation

Pilot pressure on the top of the air cylinder controls the output pressure. Variations in supply pressure have little effect on the output pressure. The opposing forces from the output pressure and the air cylinder or spring actuator open and close the control orifice to create an equilibrium. If more pressure is needed, the pilot pressure is raised or spring force is increased. This causes the control orifice to open more, raising the output pressure until it is in equilibrium with the new higher force.

Specifications

The following table lists approximate specifications for the CP II Inline regulators.

<table>
<thead>
<tr>
<th>Item</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum air inlet pressure</td>
<td>87 psi (6 bar)</td>
</tr>
<tr>
<td>Maximum fluid inlet pressure</td>
<td>5000 psi (345 bar)</td>
</tr>
<tr>
<td>Maximum fluid outlet pressure</td>
<td>Air Actuated: 2960 psi (204 bar)</td>
</tr>
<tr>
<td></td>
<td>Spring Activated: 1500 psi (103.4 bar) 3500 psi (241.3 bar)</td>
</tr>
<tr>
<td>Minimum fluid output pressure for responsive control</td>
<td>15% of maximum fluid output pressure.</td>
</tr>
<tr>
<td>Maximum operating temperature</td>
<td>190 °F (88 °C)</td>
</tr>
</tbody>
</table>

Figure 1   CP II Inline Regulators
Installation

**WARNING:** Allow only qualified personnel to perform the following tasks. Follow the safety instructions in this document and all other related documentation. Read and understand the following procedures before installing this component into a system. System or material pressurized. Relieve pressure. Failure to observe this warning may result in serious injury or death.

- Installation procedures may vary due to application requirements. The following procedures are only for a typical installation. Contact a local Nordson representative for specific installation procedures if necessary.
- The CP II Inline Regulator is referred to as the regulator throughout the remainder of this manual.

**Secure the Regulator to a Fixture**

See Figure 2 for the mounting dimensions.

The regulator can be mounted to fixed, mobile, and robotic fixtures. Contact a Nordson representative for specific information on mounting configurations if necessary.

**Connect the Air Line and Material Hoses**

1. See Figure 2. If installing an air-actuated regulator, connect a supply air line to the fitting (1).
2. Connect hoses to the material INLET (2) and OUTLET (4) ports.
3. If desired, connect a pressure gauge to one of the gauge ports (3).

Operation

Operation is dependent upon the system application requirements and the material delivery system. Refer to the applicable *System Manuals* that shipped with the system for detailed operating procedures.

1. Make sure that the gun is properly installed. Refer to the *Installation* section.
2. Turn on the system controllers.
3. Set the material pressure to the recommended operating level.
4. Check for air and material leaks. Repair leaks before starting a dispense cycle.
5. Start the dispense cycle.

Maintenance

**WARNING:** Allow only qualified personnel to perform the following tasks. Follow the safety instructions in this document and all other related documentation. System or material pressurized. Relieve pressure. Failure to observe this warning may result in serious injury or death.

Perform the following maintenance tasks periodically:

- Check the air lines and the material supply hose for leaks, kinks, or damage. Replace lines and hoses when necessary.
- Make sure the regulator is mounted securely.
- Make sure the air supply filters are clean and dry.
- Check for leaks at the connection of the cylinder assembly to the regulator body.
Figure 2  Typical Installation
Troubleshooting

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

This section contains troubleshooting procedures. These procedures 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.

<table>
<thead>
<tr>
<th>Problem</th>
<th>Possible Cause</th>
<th>Corrective Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Material leaking from the cylinder assembly or the spring actuator connection at the regulator body or packing cartridge</td>
<td>Worn packing cartridge</td>
<td>Replace the packing cartridge.</td>
</tr>
<tr>
<td>2. Regulator responds slowly</td>
<td>Material outlet pressure insufficient</td>
<td>Verify material outlet pressure meets the minimum requirements.</td>
</tr>
<tr>
<td></td>
<td>Material supply pressure insufficient</td>
<td>Verify that material supply pressure exceeds desired outlet pressure by at least 25%.</td>
</tr>
<tr>
<td>3. Material leaking at fittings</td>
<td>Dirty or damaged connections</td>
<td>Check for leaks at the material connection points.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Replace tubing if damaged.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Clean connection if dirty.</td>
</tr>
<tr>
<td>4. Air leaking from cylinder</td>
<td>Worn cylinder seals</td>
<td>Replace the seals in the cylinder using the rebuild installation kit. If problem persists, replace the cylinder.</td>
</tr>
</tbody>
</table>

Repair

Repairs consist of replacing the packing cartridge, air cylinder assembly, air cylinder seals, and spring actuator assembly.

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

If repairs are made without removing the regulator from the dispense system, relieve all air and material pressures.

Read and understand the following procedures before installing this component into a system. Contact a local Nordson representative if you have questions regarding the installation of this component.

**NOTE:** Depending upon the mounting configuration, it may be possible to make some repairs without removing the regulator from the dispense system.
Replace the Regulator Packing Cartridge

Depending upon the mounting configuration, it may be possible to replace this part without removing the regulator from the dispense system.

**WARNING:** If repairs are made without removing the regulator from the dispense system, relieve all air and material pressures.

1. See Figure 3. Remove the screws (1) securing the packing cartridge (3) to the body (5).
2. Install two screws (1) into the jacking holes (2). Tighten the screws to remove the regulator packing cartridge from the body (5).
3. Clean the inside of the body (5) with a compatible solvent or wipe it clean with a rag.
4. Lubricate the O-rings (4) on the new packing cartridge (3) with O-ring lubricant.
5. Make sure that the groove in the base of the regulator packing gland cartridge (3) is aligned to the dowel pin (6) in the body (5). Secure the regulator packing cartridge (3) into the body using the screws (1). Tighten the screws to 90 in.-lb (10 N•m).

Replace the Air Cylinder Assembly

Depending upon the mounting configuration, it may be possible to replace these parts without removing the regulator from the dispense system.

**WARNING:** If repairs are made without removing the regulator from the dispense system, relieve all air and material pressures.

1. See Figure 4. Remove the fitting (1) from the air cylinder assembly (2).
2. Unscrew the air cylinder assembly (2) from the gun body (4).
3. Screw the new air cylinder assembly (2) into the gun body (4) until it bottoms out.
4. Apply pipe joint compound to the threads on the fitting (1). Install the fitting into the air cylinder assembly (2) and tighten securely.

Replace the Air Cylinder Seals

Replace the seals, Glyd-rings, and O-rings in the air cylinder assembly when there is an audible leak, excessive drag, or a degradation of control. Refer to the drawing that is included with Air Cylinder Rebuild Kit 1074554 for repair procedures.

Replace the Spring Actuator Assembly

1. See Figure 4. Unscrew the spring actuator assembly (3) from the body (4).
2. Screw the new spring actuator assembly (3) into the body (4) until it bottoms out.
Parts
See Figure 5 and the applicable parts list. For parts and technical support, call the Nordson Industrial Coating Systems Customer Support Center at (800) 433-9319 or contact your local Nordson representative.
Air-Actuated Regulator

<table>
<thead>
<tr>
<th>Item</th>
<th>Part</th>
<th>Description</th>
<th>Quantity</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1096873</td>
<td>Regulator, CP II inline, air-actuated</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>971265</td>
<td>Connector, male, 1/4 tube x 1/4 NPT</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>1096876</td>
<td>Cylinder assembly, dual-piston CP regulator</td>
<td>1</td>
<td>A, B</td>
</tr>
<tr>
<td>3</td>
<td>973411</td>
<td>Plug, pipe, socket, flush, 1/4, zinc</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>985246</td>
<td>Pin, roll</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td>Packing cartridge, CP regulator, UHMPE</td>
<td>1</td>
<td>C, D</td>
</tr>
<tr>
<td>6</td>
<td></td>
<td>Cylinder assembly, dual-piston CP regulator</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>1074816</td>
<td>O-ring, –127, Viton, 1.424 x 0.103</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>941261</td>
<td>O-ring, Viton, 1.375 x 0.563 x 0.094</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>941251</td>
<td>O-ring, Viton, 1.313 x 0.500 x 0.103</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>982264</td>
<td>Screw, socket, cap, M6 x 1 x 18 mm</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>900349</td>
<td>Grease, TFE, 0.75 oz tube</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

NOTE A: Order Kit 1074555 to replace this part.
B: Order Kit 1074554 to replace the cylinder assembly seals.
C: Order Kit 1099204 to replace this part.
D: To replace the standard cartridge with one with POLYMYTE seals, order 1604129 Kit, packing cartridge, CP regulator, polymyte.

Spring-Actuated Regulators

<table>
<thead>
<tr>
<th>Item</th>
<th>Part</th>
<th>Part</th>
<th>Description</th>
<th>Quantity</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1096874</td>
<td>1099180</td>
<td>Regulator, CP II inline, spring-actuated, 3500 psi</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Regulator, CP II inline, spring-actuated, 1500 psi</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td></td>
<td></td>
<td>NOT USED ON THIS CONFIGURATION</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>1096893</td>
<td>1099181</td>
<td>Actuator, spring, CP regulator, 3500 psi</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>1096876</td>
<td>1096876</td>
<td>Body, regulator, CP inline</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>973411</td>
<td>973411</td>
<td>Plug, pipe, socket, flush, 1/4, zinc</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>985246</td>
<td>985246</td>
<td>Pin, roll</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td></td>
<td></td>
<td>Packing cartridge, CP regulator, UHMWPE</td>
<td>1</td>
<td>A, B</td>
</tr>
<tr>
<td>7</td>
<td>1074816</td>
<td>1074816</td>
<td>O-ring, –127, Viton, 1.424 x 0.103</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>941261</td>
<td>941261</td>
<td>O-ring, Viton, 1.375 x 0.563 x 0.094</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>941251</td>
<td>941251</td>
<td>O-ring, Viton, 1.313 x 0.500 x 0.103</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>982264</td>
<td>982264</td>
<td>Screw, socket, cap, M6 x 1 x 18 mm</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>900349</td>
<td>900349</td>
<td>Grease, TFE, 0.75 oz tube</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

NOTE A: Order Kit 1099204 to replace this part.
B: To replace the standard cartridge with one with POLYMYTE seals, order 1604129 Kit, packing cartridge, CP regulator, polymyte.

AR: As Required

Kits

<table>
<thead>
<tr>
<th>Part</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1074554</td>
<td>Kit, rebuild, seal, cylinder,</td>
</tr>
<tr>
<td>1074555</td>
<td>Kit, cylinder assembly</td>
</tr>
<tr>
<td>1099204</td>
<td>Kit, packing cartridge, CP regulator, UHMWPE</td>
</tr>
<tr>
<td>1604129</td>
<td>Kit, packing cartridge, CP regulator, polymyte</td>
</tr>
</tbody>
</table>