

Ink-Dot Electric Spray Gun

Customer Product Manual

Part 1103065-02

Issued 10/11

**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	Operation	9
Qualified Personnel	1	Dot Size Adjustment	9
Intended Use	1	Unplugging the Gun Nozzle	11
Regulations and Approvals	1	Maintenance	11
Personal Safety	2	Troubleshooting	12
High-Pressure Fluids	2	Repair	12
Fire Safety	3	Replacing the Gun Module	12
Halogenated Hydrocarbon Solvent Hazards ..	4	Replacing the Ball and Seat	13
Action in the Event of a Malfunction	4	Parts	14
Disposal	4	Ink-Dot Gun Part Lists	14
Description	5	Options	15
Installation	5	Specifications	16
Gun Mounting	5	Standard Ink-Dot Spray Gun	16
Proximity Sensor Mounting	5		
Optional Adjustable Gun Bracket	6		
Adjustable Gun Bracket Mounting	7		
Electrical Connections	8		

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DECLARATION of CONFORMITY

Product: Ink-Dot System**Models:** Ink-Dot

Description: This system consists of a Controller, Ink Reservoir, and non-atomizing Applicator. This system is used in the Container industry for can identification. Different colors of ink are used on each line and a dot of ink is applied to the bottom of the can. This process allows the manufacturer to indentify which line a can was made on.

Applicable Directives:

2006/42/EEC (Machinery Directive)

2006/95/EC (Low Voltage Directive)

2004/108/EEC (Electromagnetic Compatibility Directive)

Standards Used for Compliance:

IEC60417 (2002)

EN55011 (2009)

EN12100-1 (2009)

EN61000-6-3 (2007)

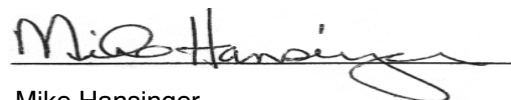
EN60204 (2006)

Principles:

This product has been manufactured according to good engineering practice.
The product specified conforms to the directive and standards described above.

Certificates:

DNV ISO9001: 2008 (Houston, Texas, USA)



Date: 15 July 2010

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Ink-Dot Electric Spray Gun

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

The Ink-Dot Series of Electric Spray Guns are high speed guns used in Ink-Dot Identification and Marking Systems.

- Ink-Dot Identification: These guns apply a small dot of ink on the can to identify the line and spray machine where it was coated. The identifying mark saves time in correcting problems and provides a means of producing a better quality product.
- Ink-Dot Marking: These guns are typically used to apply thermal-sensitive ink onto the can. Thermal-sensitive ink is used when the can goes through a retort process. This gun is similar to the identification version of the Ink-Dot electric spray gun except that the nozzle is not fixed and the ball and seat is threaded so it can use a variety of nozzles.

The Ink-Dot guns are available with 0.06 and 0.008 orifices. Contact your Nordson Corporation representative for help in selecting a gun for your application.

Installation



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



WARNING: Before installing the gun in a system relieve all pressure and disconnect and lock out electrical power.

The Ink-Dot application must take place at least five feet from the spinning mechanism on the spray machine, to ensure that the ink has enough time to dry on the can before spinning. Drying time for aluminum cans is two seconds; for steel cans three seconds.

Gun Mounting

See Figure 1. The gun has three $\frac{1}{4}$ -20 mounting holes on each side and two $\frac{1}{4}$ -20 mounting holes on the bottom.

Mount the gun on a 15–30° angle from the can, approximately 4–6 mm (0.16–0.24 in.) above the rim of the can and 5 mm (0.19 in.) away.

Proximity Sensor Mounting

See Figure 1. The distance between the gun and the proximity sensor must be adjustable due to variations in line speed. Position the sensor 3–5 mm (0.12–0.20 in.) from the can. The sensor can be up to 25 mm (1 in.) from the center of the gun nozzle.

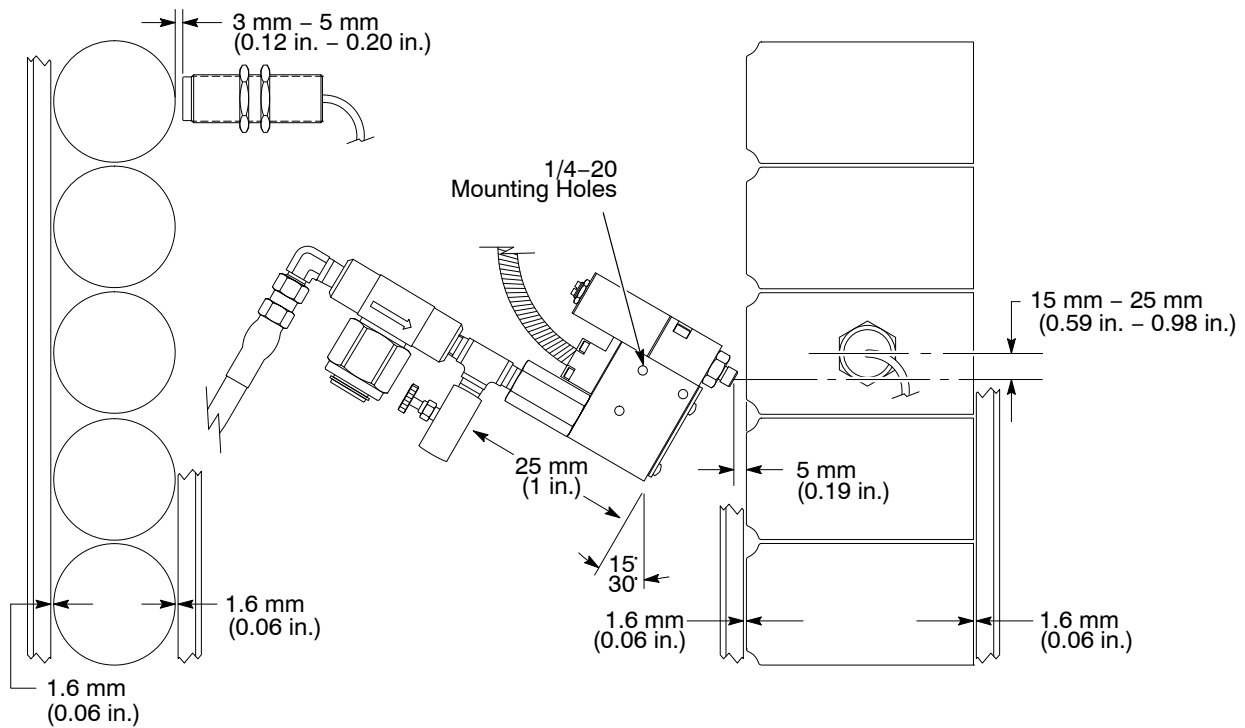


Figure 1 Mounting Dimensions

Optional Adjustable Gun Bracket

See Figure 2. The optional Ink-Dot adjustable gun bracket mounts directly on the can track rails and is adjustable for flexible gun positioning:

Item	Position Adjustment
A	moves the gun closer to the can
B	moves the gun vertically across the back of the can
C	rotates the gun on an axis to various angles

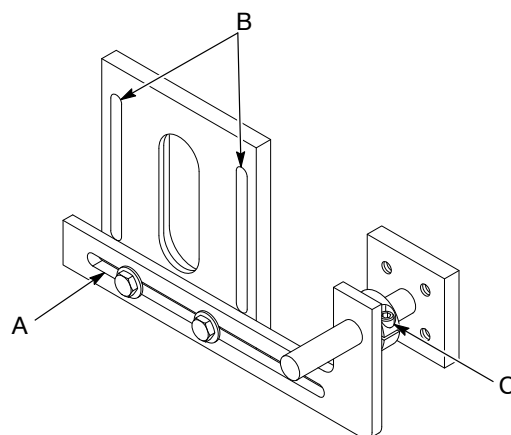


Figure 2 Optional Adjustable Gun Bracket

Adjustable Gun Bracket Mounting

1. See Figure 3. Unscrew one locking nut (2) from the end of the proximity sensor (1).
2. Insert the proximity sensor through the center slot of the mounting bracket (5). The center slot has a lip that holds the locking nut securely in place.
3. Install the locking nut on the opposite side of the mounting bracket as shown, position the sensor, then tighten the locking nut to hold the sensor in place.
4. Align the slots on the mounting bracket with the studs (6) on the rail and install the washers (4) and nuts (3). Tighten the nuts to hold the mounting bracket in place.
5. Secure the adjusting rod (7) to the mounting bracket (5) with the clamp screws (9) and washers (8).

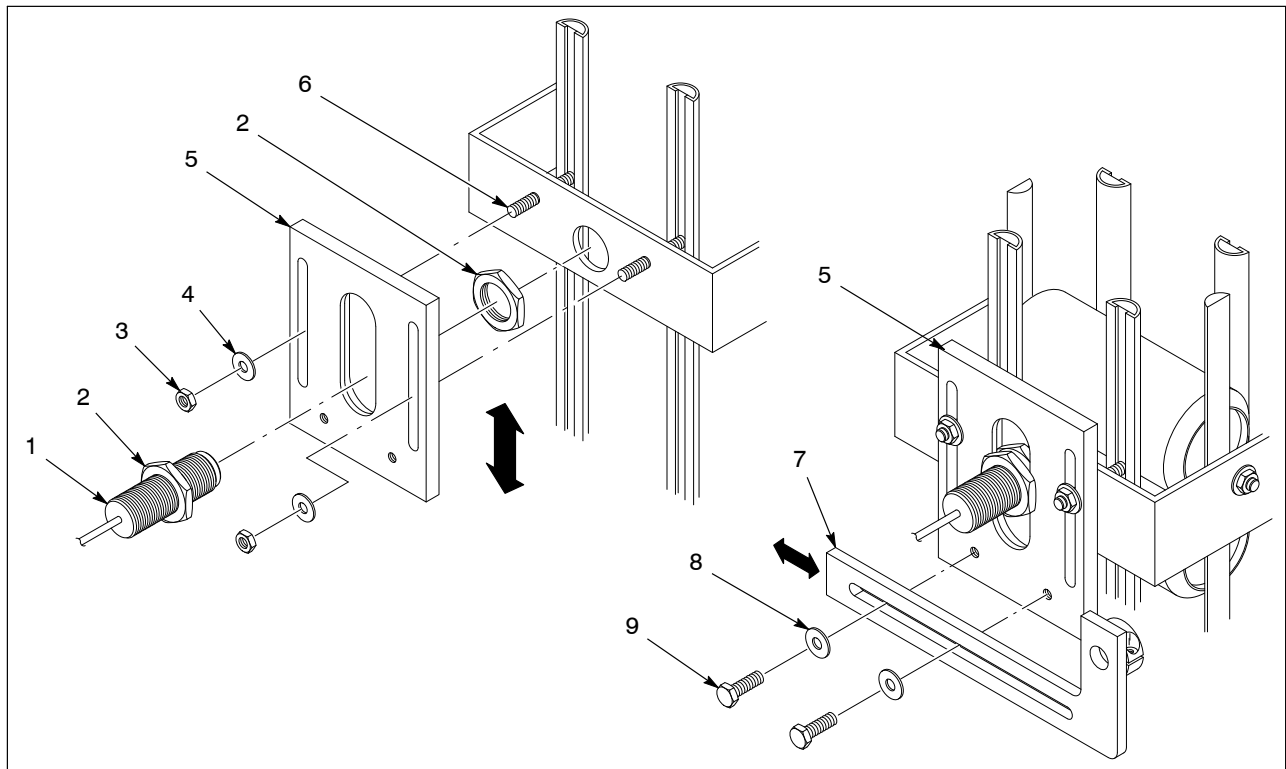


Figure 3 Adjustable Gun Bracket Mounting

- | | | |
|-----------------------|---------------------|------------------|
| 1. Proximity sensor | 4. Washers | 7. Adjusting rod |
| 2. Sensor locking nut | 5. Mounting bracket | 8. Washers |
| 3. Nuts | 6. Studs | 9. Clamp screws |

6. See Figure 4. Secure the gun (14) to the gun mount (13) with three screws (11) and washers (12).
7. Loosen the set screw (10), and rotate the gun mount until the gun is in the desired position in relation to the can. Tighten the set screw.
8. See Figure 3. Slide the adjusting rod (7) forward or back to adjust the distance from the gun nozzle to the can, then tighten the clamp screws (9).

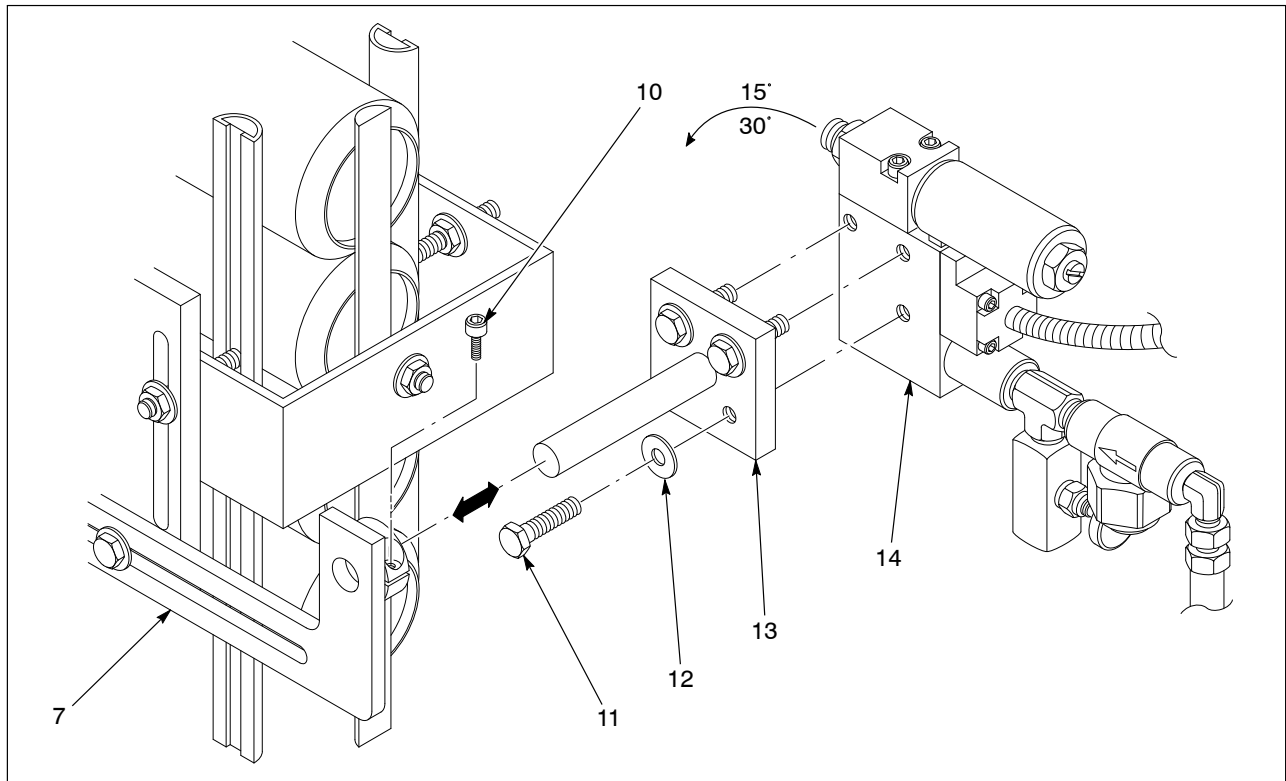
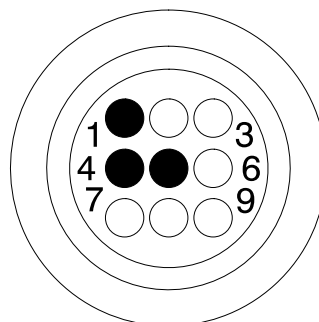


Figure 4 Installing the Gun on the Optional Adjustable Gun Bracket

- | | | |
|------------------|-------------|---------------|
| 7. Adjusting rod | 11. Screws | 13. Gun mount |
| 10. Set screw | 12. Washers | 14. Gun |

Electrical Connections

Figure 5 shows the electrical connector pin-outs for the gun. Use a 3 conductor (20 AWG) shielded cable, such as Belden P/N 8772, or equivalent, to attach the terminal connector to the Ink-Dot Controller. Refer to the *Ink-Dot Controller* manual.



Electrical Connections
 Power = Pins #4 and #5
 Ground = Pin #1

Figure 5 Gun Connector Pin-outs

Operation

Dot Size Adjustment

See Figure 6. Follow these steps to adjust the dot size.

1. Set the RUN/OFF/TEST switch (2) on the Ink-Dot control unit to OFF.
2. Set the air pressure regulator (4) to 0.5 bar (7 psi) at the ink reservoir.
3. Loosen the lock nut (13).
4. Carefully screw in the armature guide tube (12) until it stops or bottoms out.
5. Unscrew the armature guide tube approximately $\frac{1}{12}$ of a turn or 30° .
6. Hold a piece of paper by the bottom of the can and in line with the nozzle (11).
7. Set the RUN/OFF/TEST switch in the Ink-Dot control unit to TEST. Adjust the armature guide tube until the dot is the desired size, typically 2–3 mm (0.07–0.11 in.).

NOTE: Do not hold the armature guide tube with the screwdriver while you are tightening the lock nut.

8. Use a $\frac{1}{2}$ -in. wrench to tighten the lock nut. The dot size will become slightly larger as you tighten the lock nut.
9. If desired, change the fluid pressure to make fine adjustments to the dot size:
 - Increase the pressure for a larger dot.
 - Decrease the pressure for a smaller dot.

NOTE: Refer to the *Ink-Dot Series II Driver* manual to make additional adjustments to the dot size using the dip switches.

NOTE: The New-Style Reservoir Manifold delivers ink to the gun from the bottles that the ink is supplied in. Refer to the *Ink-Dot Half-Liter Reservoir Kit* instruction sheet P/N 1099270 and the *Ink-Dot Hydraulic System with Reservoir Manifold* manual P/N 1103067 for information on installing, filling, and repairing the reservoir manifold.

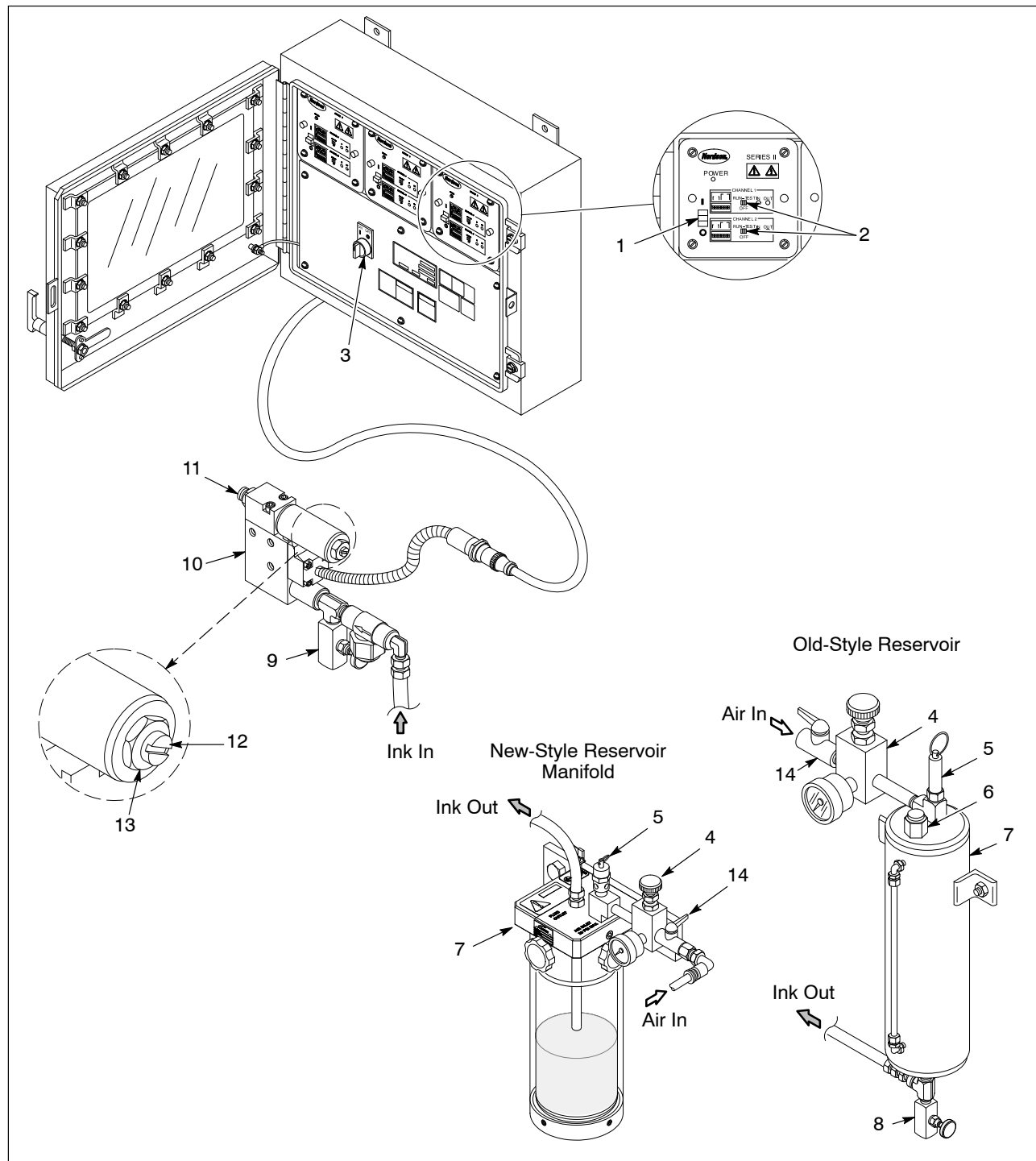


Figure 6 Typical Ink-Dot System with Old-and New-Style Reservoirs

- | | | |
|----------------------------|------------------------------------|-------------------------|
| 1. Driver power switch | 6. Cap | 11. Nozzle |
| 2. RUN/OFF/TEST switch | 7. Reservoir or reservoir manifold | 12. Armature guide tube |
| 3. Controller power switch | 8. Drain valve | 13. Lock nut |
| 4. Air pressure regulator | 9. Bleeder valve | 14. Air shut-off valve |
| 5. Relief valve lanyard | 10. Ink-Dot gun | |

Unplugging the Gun Nozzle

See Figure 6. Follow these steps to unplug the gun nozzle.

1. Close the air shut-off valve (14).
2. Set the air pressure regulator (4) to 0. Pull on the relief valve lanyard (5) to relieve system air pressure.
3. Set the RUN/TEST/OFF switch (2) to OFF.
4. Remove the nozzle (11) and clean with flushing thinner and a nozzle brush.
5. Loosen the lock nut (13). Back out the armature guide tube (12) one turn.
6. Install the nozzle.
7. Make sure the relief valve is closed.
8. Open the air shut-off valve. Set the air pressure regulator to 0.2 bar (3 psi).
9. Open the bleeder valve (9) to bleed air out of the hose. Close the bleeder valve.
10. Set the air pressure regulator (4) to 0.4–0.7 bar (5–10 psi).
11. Set the RUN/OFF/TEST switch (2) to RUN.
12. Adjust the dot size. Refer to *Dot Size Adjustment*.

Maintenance



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

Frequency	Task
Daily	Wipe or brush the nozzle once per shift with a solvent compatible with the ink. A nozzle brush is included with the gun.
Weekly	1. Check the gun mounting angle. 2. Check the distance between the • proximity sensor and can conveyor • gun and can conveyor • gun nozzle and proximity sensor 3. Make sure that the proximity sensor is perpendicular to the side of the can.
Periodically	Check the ink level in the reservoir.
3–6 months	Flush the system with a compatible solvent and replace the inline filter element.
9–12 months	Replace the gun ball and seat, seals, O-rings, and the in-line filter element.

Troubleshooting



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

These troubleshooting procedures cover only the most common problems. If you cannot solve a problem with the information given here, contact your local Nordson representative for help.

Problem	Possible Cause	Corrective Action
1. Dot size decreasing	In-line filter is clogged	Open the bleeder valve between the filter and the gun. If no ink flows, replace the filter element. Check the air pressure. Check the nozzle.
2. Gun is on, but no ink comes out	Incorrect air pressure	Check the air pressure level.
	Clogged nozzle	Clean the nozzle. If the nozzle is clean, adjust the stroke length.
3. Gun remains open	Broken spring or dirt lodged between ball and seat	Replace the gun module.
	Mis-wired gun	Check the wiring.

Repair

Replacing the Gun Module

NOTE: Relieve the system pressure and trigger the gun before replacing the gun module.

1. See Figure 7. Remove the gun from the manifold by unscrewing the two socket-head cap screws (5) from the valve body (6) and unplugging the coil (2) contact pins (1) from the manifold.
2. Remove the lock nut (4) from the guide tube (3), then slide the coil assembly (1) off the guide tube.
3. Remove the lock nut from the new module and install it through the coil. Install the lock nut (3) finger tight.
4. Lubricate the O-ring (7) shipped with the module with O-ring lubricant and install it into the groove around the fluid inlet port in the bottom of the gun body.
5. Install the gun on the manifold and secure it with the two socket-head screws (5) included in the module kit. Tighten the lock nut (3) securely.

Refer to page 9 for dot size adjustments.

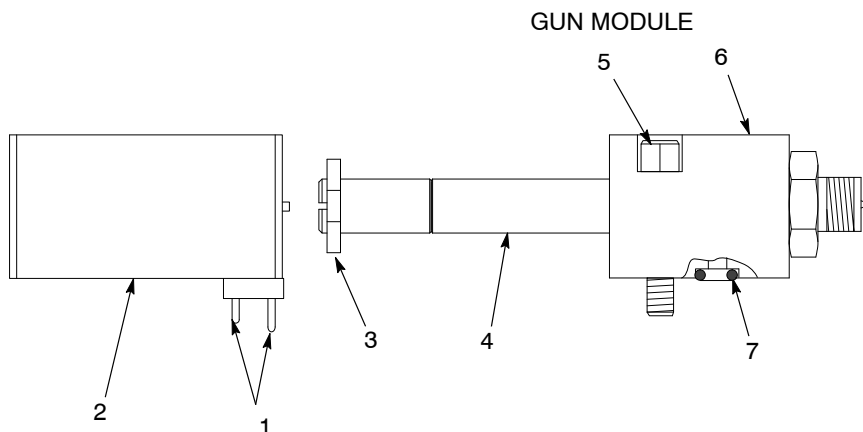


Figure 7 Replacing the Gun Module

- | | |
|------------------------|-----------------------|
| 1. Copper contact pins | 5. Socket-head screws |
| 2. Coil assembly | 6. Valve body |
| 3. Lock nut | 7. O-ring |
| 4. Guide tube | |

Replacing the Ball and Seat

Use the item 9 kits in the parts list to replace the ball (armature) and seat (nozzle assembly). Always replace both the ball and seat at the same time.

1. Shut off the ink supply and relieve the fluid pressure.
2. Loosen the lock nut (5), then use a screw driver to back out the guide tube (8) one complete turn, then unscrew the nozzle (13) from the valve body (7).
3. Remove the armature and spring (10, 11) from the guide tube and replace them with new parts from the kit.
4. Install the new O-ring (12) on the nozzle (13).
5. Screw the nozzle into the valve body and tighten it securely.
6. Screw the guide tube into the valve body until it bottoms out, then back it out $\frac{1}{12}$ turn (30°). Tighten the lock nut (5) to lock the adjustment and coil in place.

Refer to page 9 for dot size adjustments.

Parts

To order parts, call the Nordson Finishing Customer Support Center at (800) 433-9319 or contact your local Nordson representative.

Ink-Dot Gun Part Lists

See Figure 8.

Item	Part	Part	Description	Quantity	Note
—	1102825	—	GUN, Ink-Dot, 0.008	1	A
—	—	-----	GUN, Ink-Dot, 0.06 orifice	1	A, D
1	159906	159906	• COIL, 120V, 3 pin	1	
2	1102826	—	• KIT, module, Ink-Dot, 0.008 in.	1	B
2	—	-----	• KIT, module, Ink-Dot, 0.06 in.	1	B
3	981975	981975	• • SCREW, socket, cap, 10–32 x 1.125 in.	2	
4	940077	940077	• • O-RING, EPR, 0.156 x 0.281 x 0.063	1	
5	1029275	1029275	• • NUT, lock, $\frac{3}{8}$ –32 x 3/32 in.	1	
6	945067	945067	• • O-RING, EPR, 0.375 x 0.50 x 0.063 in.	1	
7	1033514	1033514	• • VALVE, body, Ink-Dot	1	
8	1033524	1033524	• • TUBE ASSEMBLY, guide, Ink-Dot	1	
9	1102827	—	• • KIT, nozzle assembly, Ink-Dot, 0.008 in., w/armature	1	C
9	—	159931	• • SEAT, with ball, 0.06 orifice	1	C
10	987073	987073	• • • SPRING, compression, 0.75 x 0.13 x 0.02 in.	1	
11	—	—	• • • ARMATURE, Ink-Dot, stainless steel	1	
12	945125	945125	• • • O-RING, EPR 80, 0.437 x 0.562 x 0.062 in.	1	
13	—	—	• • • NOZZLE, seat, Ink-Dot	1	
NOTE A: Cable and manifold assemblies are not saleable separately. B: These kits contain items 5–13 only. Use these kits to replace the wetted parts of the gun. C: These kits contain items 10–13 only. Use these kits to replace the ball and seat. D: Gun with 0.06 orifice is obsolete. Service parts are available.					

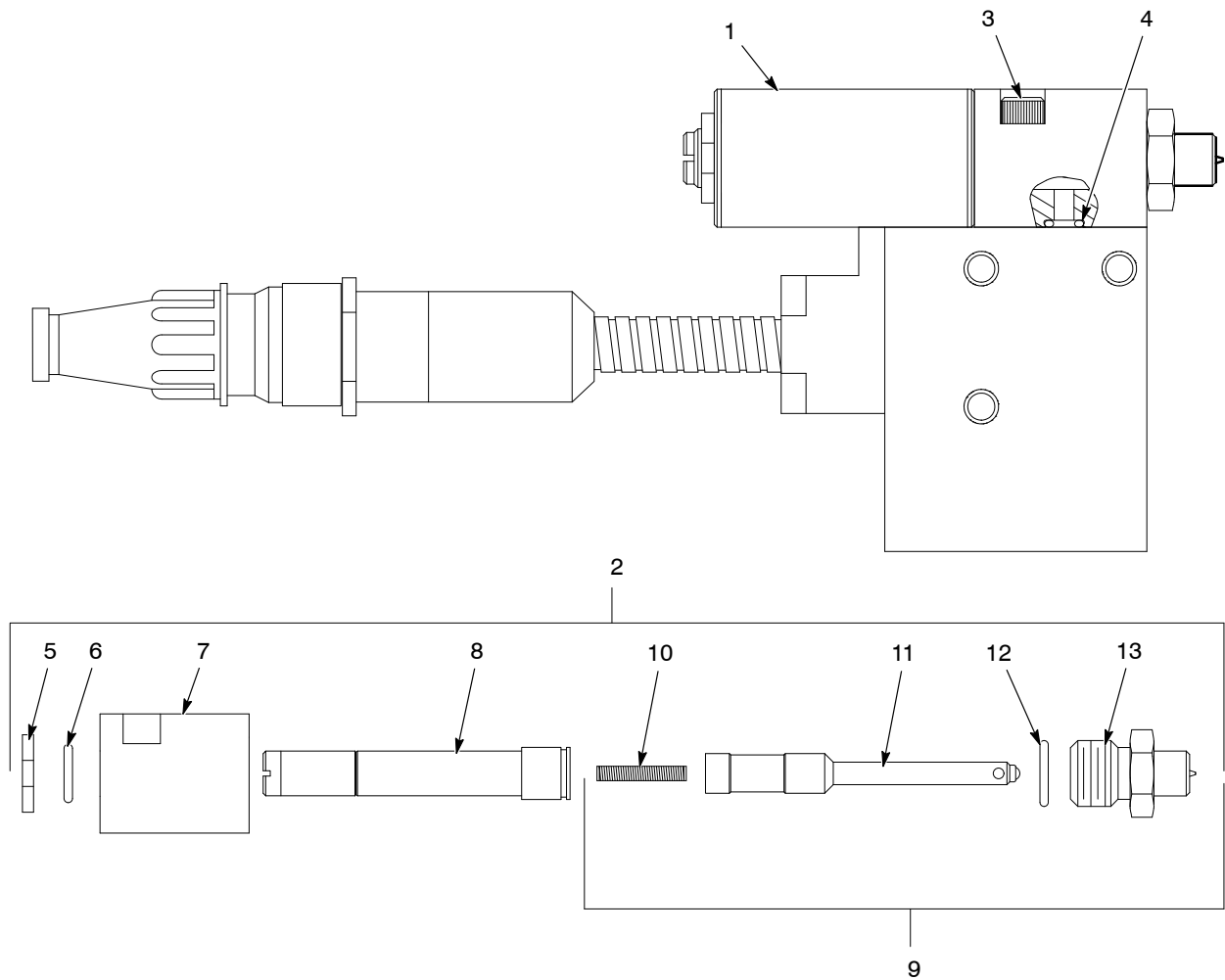


Figure 8 Ink-Dot Gun Parts

Options

Part	Description	Note
1600620	Bracket, adjustable, Ink-Dot, FC	
159908	Filter element, 15 micron	
901905	Brush	

Specifications

Standard Ink-Dot Spray Gun

Fluid Pressure:	8.6 bar (125 psi)
Electrical:	pulsed Vdc – 140/340 current – 0.2 amp
Ambient Temperature:	60 °C (140 °F) maximum