E400 Hot Melt Electric Gun

Customer Product Manual
Part 1048256B
Issued 12/05
For CE Declaration, refer to melter manual.

Nordson Corporation welcomes requests for information, comments, and inquiries about its products. General information about Nordson can be found on the Internet using the following address: http://www.nordson.com.

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E400 Hot Melt Electric Gun

Safety

Read this section before using the equipment. This section contains recommendations and practices applicable to the safe installation, operation, and maintenance (hereafter referred to as “use”) of the product described in this document (hereafter referred to as “equipment”). Additional safety information, in the form of task-specific safety alert messages, appears as appropriate throughout this document.

WARNING: Failure to follow the safety messages, recommendations, and hazard avoidance procedures provided in this document can result in personal injury, including death, or damage to equipment or property.

Safety Alert Symbols

The following safety alert symbol and signal words are used throughout this document to alert the reader to personal safety hazards or to identify conditions that may result in damage to equipment or property. Comply with all safety information that follows the signal word.

WARNING: Indicates a potentially hazardous situation that, if not avoided, can result in serious personal injury, including death.

CAUTION: Indicates a potentially hazardous situation that, if not avoided, can result in minor or moderate personal injury.

CAUTION: (Used without the safety alert symbol) Indicates a potentially hazardous situation that, if not avoided, can result in damage to equipment or property.
Responsibilities of the Equipment Owner

Equipment owners are responsible for managing safety information, ensuring that all instructions and regulatory requirements for use of the equipment are met, and for qualifying all potential users.

Safety Information

- Research and evaluate safety information from all applicable sources, including the owner-specific safety policy, best industry practices, governing regulations, material manufacturer’s product information, and this document.
- Make safety information available to equipment users in accordance with governing regulations. Contact the authority having jurisdiction for information.
- Maintain safety information, including the safety labels affixed to the equipment, in readable condition.

Instructions, Requirements, and Standards

- Ensure that the equipment is used in accordance with the information provided in this document, governing codes and regulations, and best industry practices.
- If applicable, receive approval from your facility’s engineering or safety department, or other similar function within your organization, before installing or operating the equipment for the first time.
- Provide appropriate emergency and first aid equipment.
- Conduct safety inspections to ensure required practices are being followed.
- Re-evaluate safety practices and procedures whenever changes are made to the process or equipment.
**User Qualifications**

Equipment owners are responsible for ensuring that users:

- receive safety training appropriate to their job function as directed by governing regulations and best industry practices
- are familiar with the equipment owner’s safety and accident prevention policies and procedures
- receive, equipment- and task-specific training from another qualified individual

**NOTE:** Nordson can provide equipment-specific installation, operation, and maintenance training. Contact your Nordson representative for information

- possess industry- and trade-specific skills and a level of experience appropriate to their job function
- are physically capable of performing their job function and are not under the influence of any substance that degrades their mental capacity or physical capabilities

**Applicable Industry Safety Practices**

The following safety practices apply to the use of the equipment in the manner described in this document. The information provided here is not meant to include all possible safety practices, but represents the best safety practices for equipment of similar hazard potential used in similar industries.

**Intended Use of the Equipment**

- Use the equipment only for the purposes described and within the limits specified in this document.
- Do not modify the equipment.
- Do not use incompatible materials or unapproved auxiliary devices. Contact your Nordson representative if you have any questions on material compatibility or the use of non-standard auxiliary devices.

**Instructions and Safety Messages**

- Read and follow the instructions provided in this document and other referenced documents.
- Familiarize yourself with the location and meaning of the safety warning labels and tags affixed to the equipment. Refer to Safety Labels and Tags at the end of this section.
- If you are unsure of how to use the equipment, contact your Nordson representative for assistance.
Installation Practices

- Install the equipment in accordance with the instructions provided in this document and in the documentation provided with auxiliary devices.
- Ensure that the equipment is rated for the environment in which it will be used and that the processing characteristics of the material will not create a hazardous environment. Refer to the Material Safety Data Sheet (MSDS) for the material.
- If the required installation configuration does not match the installation instructions, contact your Nordson representative for assistance.
- Position the equipment for safe operation. Observe the requirements for clearance between the equipment and other objects.
- Install lockable power disconnects to isolate the equipment and all independently powered auxiliary devices from their power sources.
- Properly ground all equipment. Contact your local building code enforcement agency for specific requirements.
- Ensure that fuses of the correct type and rating are installed in fused equipment.
- Contact the authority having jurisdiction to determine the requirement for installation permits or inspections.

Operating Practices

- Familiarize yourself with the location and operation of all safety devices and indicators.
- Confirm that the equipment, including all safety devices (guards, interlocks, etc.), is in good working order and that the required environmental conditions exist.
- Use the personal protective equipment (PPE) specified for each task. Refer to Equipment Safety Information or the material manufacturer’s instructions and MSDS for PPE requirements.
- Do not use equipment that is malfunctioning or shows signs of a potential malfunction.
**Maintenance and Repair Practices**

- Perform scheduled maintenance activities at the intervals described in this document.
- Relieve system hydraulic and pneumatic pressure before servicing the equipment.
- De-energize the equipment and all auxiliary devices before servicing the equipment.
- Use only new factory-authorized refurbished or replacement parts.
- Read and comply with the manufacturer's instructions and the MSDS supplied with equipment cleaning compounds.

**NOTE:** MSDSs for cleaning compounds that are sold by Nordson are available at www.nordson.com or by calling your Nordson representative.

- Confirm the correct operation of all safety devices before placing the equipment back into operation.
- Dispose of waste cleaning compounds and residual process materials according to governing regulations. Refer to the applicable MSDS or contact the authority having jurisdiction for information.
- Keep equipment safety warning labels clean. Replace worn or damaged labels.

**Equipment Safety Information**

This equipment safety information is applicable to the following types of Nordson equipment:

- hot melt and cold adhesive application equipment and all related accessories
- pattern controllers, timers, detection and verification systems, and all other optional process control devices
**Equipment Shutdown**

To safely complete many of the procedures described in this document, the equipment must first be shut down. The level of shut down required varies by the type of equipment in use and the procedure being completed. If required, shut down instructions are specified at the start of the procedure. The levels of shut down are:

**Relieving System Hydraulic Pressure**

Completely relieve system hydraulic pressure before breaking any hydraulic connection or seal. Refer to the melter-specific product manual for instructions on relieving system hydraulic pressure.

**De-energizing the System**

Isolate the system (melter, hoses, guns, and optional devices) from all power sources before accessing any unprotected high-voltage wiring or connection point.

1. Turn off the equipment and all auxiliary devices connected to the equipment (system).
2. To prevent the equipment from being accidentally energized, lock and tag the disconnect switch(es) or circuit breaker(s) that provide input electrical power to the equipment and optional devices.

**NOTE:** Government regulations and industry standards dictate specific requirements for the isolation of hazardous energy sources. Refer to the appropriate regulation or standard.

**Disabling the Guns**

All electrical or mechanical devices that provide an activation signal to the guns, gun solenoid valve(s), or the melter pump must be disabled before work can be performed on or around a gun that is connected to a pressurized system.

1. Turn off or disconnect the gun triggering device (pattern controller, timer, PLC, etc.).
2. Disconnect the input signal wiring to the gun solenoid valve(s).
3. Reduce the air pressure to the gun solenoid valve(s) to zero; then relieve the residual air pressure between the regulator and the gun.
General Safety Warnings and Cautions

Table 1 contains the general safety warnings and cautions that apply to Nordson hot melt and cold adhesive equipment. Review the table and carefully read all of the warnings or cautions that apply to the type of equipment described in this manual.

Equipment types are designated in Table 1 as follows:

- **HM** = Hot melt (melters, hoses, guns, etc.)
- **PC** = Process control
- **CA** = Cold adhesive (dispensing pumps, pressurized container, and guns)

### Table 1 General Safety Warnings and Cautions

<table>
<thead>
<tr>
<th>Equipment Type</th>
<th>Warning or Caution</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>HM</strong></td>
<td><strong>WARNING:</strong> Hazardous vapors! Before processing any polyurethane reactive (PUR) hot melt or solvent-based material through a compatible Nordson melter, read and comply with the material's MSDS. Ensure that the material's processing temperature and flashpoints will not be exceeded and that all requirements for safe handling, ventilation, first aid, and personal protective equipment are met. Failure to comply with MSDS requirements can cause personal injury, including death.</td>
</tr>
<tr>
<td><strong>HM</strong></td>
<td><strong>WARNING:</strong> Reactive material! Never clean any aluminum component or flush Nordson equipment with halogenated hydrocarbon fluids. Nordson melters and guns contain aluminum components that may react violently with halogenated hydrocarbons. The use of halogenated hydrocarbon compounds in Nordson equipment can cause personal injury, including death.</td>
</tr>
<tr>
<td><strong>HM, CA</strong></td>
<td><strong>WARNING:</strong> System pressurized! Relieve system hydraulic pressure before breaking any hydraulic connection or seal. Failure to relieve the system hydraulic pressure can result in the uncontrolled release of hot melt or cold adhesive, causing personal injury.</td>
</tr>
<tr>
<td><strong>HM</strong></td>
<td><strong>WARNING:</strong> Molten material! Wear eye or face protection, clothing that protects exposed skin, and heat-protective gloves when servicing equipment that contains molten hot melt. Even when solidified, hot melt can still cause burns. Failure to wear appropriate personal protective equipment can result in personal injury.</td>
</tr>
</tbody>
</table>

Continued...
**General Safety Warnings and Cautions (contd)**

Table 1 General Safety Warnings and Cautions (contd)

<table>
<thead>
<tr>
<th>Equipment Type</th>
<th>Warning or Caution</th>
</tr>
</thead>
<tbody>
<tr>
<td>HM, PC</td>
<td><strong>WARNING:</strong> Equipment starts automatically! Remote triggering devices are used to control automatic hot melt guns. Before working on or near an operating gun, disable the gun's triggering device and remove the air supply to the gun's solenoid valve(s). Failure to disable the gun's triggering device and remove the supply of air to the solenoid valve(s) can result in personal injury.</td>
</tr>
<tr>
<td>HM, CA, PC</td>
<td><strong>WARNING:</strong> Risk of electrocution! Even when switched off and electrically isolated at the disconnect switch or circuit breaker, the equipment may still be connected to energized auxiliary devices. De-energize and electrically isolate all auxiliary devices before servicing the equipment. Failure to properly isolate electrical power to auxiliary equipment before servicing the equipment can result in personal injury, including death.</td>
</tr>
<tr>
<td>CA</td>
<td><strong>WARNING:</strong> Risk of fire or explosion! Nordson cold adhesive equipment is not rated for use in explosive environments and should not be used with solvent-based adhesives that can create an explosive atmosphere when processed. Refer to the MSDS for the adhesive to determine its processing characteristics and limitations. The use of incompatible solvent-based adhesives or the improper processing of solvent-based adhesives can result in personal injury, including death.</td>
</tr>
<tr>
<td>HM, CA, PC</td>
<td><strong>WARNING:</strong> Allow only personnel with appropriate training and experience to operate or service the equipment. The use of untrained or inexperienced personnel to operate or service the equipment can result in injury, including death, to themselves and others and can damage to the equipment.</td>
</tr>
</tbody>
</table>

Continued...
<table>
<thead>
<tr>
<th>Equipment Type</th>
<th>Warning or Caution</th>
</tr>
</thead>
<tbody>
<tr>
<td>HM</td>
<td><strong>CAUTION:</strong> Hot surfaces! Avoid contact with the hot metal surfaces of guns, hoses, and certain components of the melter. If contact can not be avoided, wear heat-protective gloves and clothing when working around heated equipment. Failure to avoid contact with hot metal surfaces can result in personal injury.</td>
</tr>
<tr>
<td>HM, CA</td>
<td><strong>CAUTION:</strong> Some Nordson melters are specifically designed to process polyurethane reactive (PUR) hot melt. Attempting to process PUR in equipment not specifically designed for this purpose can damage the equipment and cause premature reaction of the hot melt. If you are unsure of the equipment’s ability to process PUR, contact your Nordson representative for assistance.</td>
</tr>
<tr>
<td>HM</td>
<td><strong>CAUTION:</strong> Before using any cleaning or flushing compound on or in the equipment, read and comply with the manufacturer’s instructions and the MSDS supplied with the compound. Some cleaning compounds can react unpredictably with hot melt or cold adhesive, resulting in damage to the equipment.</td>
</tr>
<tr>
<td>HM</td>
<td><strong>CAUTION:</strong> Nordson hot melt equipment is factory tested with Nordson Type R fluid that contains polyester adipate plasticizer. Certain hot melt materials can react with Type R fluid and form a solid gum that can clog the equipment. Before using the equipment, confirm that the hot melt is compatible with Type R fluid.</td>
</tr>
</tbody>
</table>

**Other Safety Precautions**

- Do not use an open flame to heat hot melt system components.
- Check high pressure hoses daily for signs of excessive wear, damage, or leaks.
- Never point a dispensing handgun at yourself or others.
- Suspend dispensing handguns by their proper suspension point.
First Aid

If molten hot melt comes in contact with your skin:

1. Do NOT attempt to remove the molten hot melt from your skin.
2. Immediately soak the affected area in clean, cold water until the hot melt has cooled.
3. Do NOT attempt to remove the solidified hot melt from your skin.
4. In case of severe burns, treat for shock.
5. Seek expert medical attention immediately. Give the MSDS for the hot melt to the medical personnel providing treatment.

Safety Label and Tag

Figure 1 illustrates the location of the product safety label and tag affixed to the equipment. Table 2 provides an illustration of the hazard identification symbol that appears on each safety label and tag, the meaning of the symbol, or the exact wording of any safety message.

<table>
<thead>
<tr>
<th>Item</th>
<th>Part</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>178475</td>
<td><strong>WARNING</strong>: Hot surface! Before touching the gun body, allow the gun to cool, or wear heat-protective gloves. Failure to allow the gun body to cool or to wear heat-protective gloves may cause personal injury.</td>
</tr>
</tbody>
</table>
Description

This manual provides information about the installation and use of the E400 hot melt electric gun. The E400 gun dispenses hot melt adhesive only in the form of beads.

The E400 guns are available in two configurations:

- Rear feed
- Top feed

See Figure 2 for the E400 gun configurations and Figure 3 for the key parts of the E400 gun.

**NOTE:** Apart from the gun mounting procedure, the hose connector and filter plug location, the components and the method of installation and operation for both the configurations are similar.
Key Parts

Figure 3  Key parts of an E400 gun (rear feed configuration shown)

1. Mounting bracket
2. RTD (adapter) bayonet
3. RTD cordset
4. Cordset
5. Hose connector (inlet port)
6. Heater
7. Filter plug
8. Manifold
9. Gun module
Intended Uses

The E400 gun is designed for use

- in industrial applications that require the deposition of a precise bead of hot melt adhesive onto a moving substrate
- with small diameter hoses designed and manufactured by Nordson Corporation
- with electric gun drivers and pattern controllers designed and manufactured by Nordson Corporation

Functional Description

The E400 gun is driven by the E400 gun driver to provide an all-electric actuation and eliminating the need for compressed air. The adhesive enters the inlet port of the E400 gun and flows through the manifold into the module seat, which is sealed by the end of the armature. When the coil is energized by the gun driver, the armature lifts off the seat, allowing the adhesive to flow from the E400 gun. The armature is held off the seat by the magnetic attraction of the coil. When the gun driver de-energizes the coil, the coil loses its magnetic attraction and the armature is forced back into the seat by a return spring, stopping the adhesive flow.

See Figure 3 for the location of the manifold and inlet port.

Location of E400 gun’s key internal parts
1. Coil
2. Armature
3. Module seat
Installation

Guns are installed using the following six-step process:

- unpack and inspect
- mount
- connect the hose
- connect the gun driver
- flush
- install nozzles

Refer to Parts at the end of this manual for gun-specific parts. For nozzle, hose, and gun driver parts refer to the appropriate product manuals, Nordson Adhesive and Sealants Equipment Guide, or contact your Nordson representative.

Installation Guidelines

Mounting

- Mount the gun so that the nozzle is as close as possible to the substrate. The minimum distance is two times the diameter of the nozzle orifice.
- Ensure that the mounting location provides sufficient clearance around the rear and side of the gun to allow for removal of the gun body cover.
- Mount the gun on a rigid support to prevent external vibration and gun rotation.
- Ensure that the mounting hardware is insulated from the gun so that heat transfer is minimized.
Hydraulic and Electrical Connections

- If you are installing the hose vertically, replace the straight hose connector on the gun with a \(45^\circ\) or \(90^\circ\) connector. Tighten the connector from \(10-14\) N\(\cdot\)m (7-10 ft-lb). For the \(45^\circ\) and \(90^\circ\) hose connector part numbers, refer to Parts.
- Follow the hose routing and installation guidelines provided in the melter manual.
- Insulate the hose-to-gun joint. An insulation plate is provided with the gun.
- Install the E400 electric gun driver and connect the module control cordset to the driver. For the E400 driver and gun-to-driver cable part numbers, refer to Parts.
- Before using the the E400 driver, run the E400 Driver Application Guide software to determine whether the factory-default settings for the driver are appropriate for the application. Program the driver as needed. Refer to the setup instructions in the E400 driver manual.
- After installation and before first use, flush the gun as directed in the melter manual.

Unpacking and Inspection

1. Carefully unpack the gun.
2. Inspect the gun and check for any damage that may have been caused during shipping. The guns are shipped fully assembled.
   Guns ordered with optional features may be shipped with additional components.

Mounting the Gun

The E400 guns are equipped with a mounting assembly. Use the mounting assembly on the gun to install it onto the parent machine. Variations in mounting may be required depending on the configuration of the parent machine or production line. Regardless of the mounting method used, follow the guidelines provided in Installation Guidelines.
Mounting an E400 Gun with Rear Feed Configuration

See figure on the left.

1. Slide the mounting bracket onto a mounting bar, or disassemble the mounting bracket and reassemble them (with the gun and insulation plate) onto the mounting bar.
   Ensure that the insulation plate is placed between the gun body and the mounting bracket.
2. Securely attach the gun assembly to the parent machine using the mounting bracket.
3. Connect to the hose and the E400 gun driver, follow the guidelines provided in Hydraulic and Electrical Connections under Installation Guidelines. For additional setup instructions refer to the hose and the E400 driver manuals.
4. Go to Installing the Nozzle.

Mounting an E400 Gun with Top Feed Configuration

See figure on the left.

1. Thread the M6x1.0 screws (2) through the holes on the manifold.
2. Securely attach the gun assembly to the wall near the parent machine.
3. Connect to the hose and the E400 gun driver, follow the guidelines provided in Hydraulic and Electrical Connections under Installation Guidelines. For additional setup instructions refer to the hose and the E400 driver manuals.
4. Go to Installing the Nozzle.
Installing the Nozzle

A bead nozzle used with the E400 gun is a one-piece unit. Follow this procedure to remove or install a bead nozzle.

1. Heat the system to a temperature that is slightly higher than the application temperature.
2. Relieve system pressure. Refer to Safety.
3. Trigger the gun momentarily.
4. Disconnect and lock out electrical power to the driver to prevent accidental triggering of the gun.

See Figure 4.

5. To remove the bead nozzle, loosen it with a wrench and then remove it by hand.
6. To install the bead nozzle, hand-thread the nozzle onto the module and then use a torque wrench to tighten the nozzle to 4.5 N•m (40 in.-lb).

Figure 4 Installing/removing a bead nozzle

7. Restore the system to normal operation and check for leaks at the nozzle. Tighten the nozzle again if necessary.
**Operation**

Use these procedures to operate the gun. Before operating the gun for the first time, make sure you have completed the installation process, flushed the gun, and installed the nozzles.

**Starting the Gun**

Starting the gun involves starting the melter and enabling the driver. Refer to the melter and driver manuals as needed.

1. Start the melter and heat the system to application temperature.
2. Enable the driver.
   
   **NOTE:** Before placing the driver into routine operation, run the E400 Driver Application Guide software to ensure that the driver’s default settings are appropriate for the application. Refer to the setup instructions in the E400 driver manual.
3. Start the melter pump(s).
4. Start the production line.

**Shutting Down the Gun**

Shutting down the gun involves stopping the melter and disabling the driver. Refer to the melter and driver manuals as needed.

1. Stop the production line.
2. Stop the melter pump(s).
3. Relieve system pressure. Refer to Safety.
4. Disable the driver.
5. Shut down the melter.

**Adjusting the Adhesive Pattern**

Use the following techniques to modify the adhesive pattern:

- adjust the adhesive add-on weight (melter pump speed)
- adjust the electronic control device (timer or pattern controller)
- adjust the driver settings (refer to the driver manual)
- adjust the adhesive application temperature
- change the type of adhesive used
- change the nozzle
- adjust the gun height
Maintenance

Use these procedures to properly maintain the gun. Attempting any other maintenance procedures can result in improper system operation, and equipment damage.

Recommended Maintenance Schedule

Table 3 provides a recommended maintenance schedule. Base how often you perform these maintenance activities on your operating environment.

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Maintenance Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weekly</td>
<td>Clean nozzles. Refer to Cleaning Nozzles in this section.</td>
</tr>
<tr>
<td>As needed</td>
<td>Replace the filter screen. Refer to Replacing the Filter Screen in this section.</td>
</tr>
</tbody>
</table>

Cleaning Nozzles

Nozzles should be cleaned weekly (or as needed) to prevent them from getting clogged. Follow this procedure to clean a nozzle.

1. Relieve system pressure. Refer to Safety.
2. Trigger the gun momentarily.
3. Disconnect and lock out electrical power to the gun driver.
4. Remove the nozzle. Refer to Installing the Nozzle earlier in this manual.
5. Place the nozzle in a container of Type-R cleaning fluid and heat the fluid above the adhesive’s melting temperature. See figure on the left.
6. Remove the nozzle from the cleaning fluid and clean it with a pin-type probe.
7. Reinstall the nozzle. Refer to Installing the Nozzle earlier in this manual.
8. Restore the system to normal operation.
Replacing the Filter Screen

The gun filter screen should be replaced whenever it becomes clogged (usually indicated by diminished adhesive output). Follow this procedure to replace the filter screen.

1. Relieve system pressure. Refer to Safety.
2. Trigger the gun momentarily.
3. Disconnect and lock out electrical power to the gun driver.

See Figure 5.

4. Unscrew the filter plug from the manifold and remove the filter screen.
5. Insert a new screen and reinstall the plug.
6. Restore the system to normal operation.

Figure 5 Replacing a filter screen
1. Filter plug
2. Filter screen
# Troubleshooting

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 Nordson representative for help.

**NOTE:** Refer to the driver manual for troubleshooting information related to the driver settings.

<table>
<thead>
<tr>
<th>Problem</th>
<th>Possible Cause</th>
<th>Corrective Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. <strong>No adhesive output</strong></td>
<td>No input power</td>
<td>Make sure power is supplied to the gun driver and that the driver is energized.</td>
</tr>
<tr>
<td></td>
<td>Filter screen clogged</td>
<td>Replace the filter screen. Refer to <a href="#">Replacing the Filter Screen</a> under Maintenance.</td>
</tr>
<tr>
<td></td>
<td>Manifold, module, or nozzle clogged</td>
<td>Clean the nozzle. Refer to <a href="#">Cleaning Nozzles</a> under Maintenance. If cleaning the nozzle does not solve the problem, check for a clogged module, filter, or manifold and replace components as necessary.</td>
</tr>
<tr>
<td></td>
<td>Faulty triggering device or gun driver</td>
<td>Refer to the driver manual to troubleshoot the driver.</td>
</tr>
<tr>
<td></td>
<td>Incorrect wiring</td>
<td>Make sure the gun-to-driver wiring is correct. Refer to the driver manual.</td>
</tr>
<tr>
<td></td>
<td>Jammed armature</td>
<td>Replace the module. Refer to <a href="#">Replacing a Module</a> under Repair.</td>
</tr>
<tr>
<td></td>
<td>Failed coil</td>
<td>Check the coil continuity and resistance. The resistance should be 10–11 ohms at room temperature. Replace the module if the coil is defective. Refer to <a href="#">Replacing a Module</a> under Repair.</td>
</tr>
<tr>
<td></td>
<td>Incorrect driver settings</td>
<td>Make sure the driver will work for the application. Use the E400 Driver Application Guide software to ensure that the application requirements can be met by the driver settings.</td>
</tr>
</tbody>
</table>

*Continued...*
## Troubleshooting (contd)

<table>
<thead>
<tr>
<th>Problem</th>
<th>Possible Cause</th>
<th>Corrective Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Adhesive output will not stop</td>
<td>Jammed armature</td>
<td>Replace the module. Refer to <em>Replacing a Module under Repair</em>.</td>
</tr>
<tr>
<td></td>
<td>Contamination in module seat</td>
<td>Cycle the module several times to dislodge the obstruction. If there is no improvement, replace the module. Refer to <em>Replacing a Module under Repair</em>.</td>
</tr>
<tr>
<td></td>
<td>Incorrect wiring</td>
<td>Make sure the gun-to-driver wiring is correct. Refer to the driver manual.</td>
</tr>
<tr>
<td></td>
<td>Faulty (continuous) triggering</td>
<td>Verify that the pattern controller is operating correctly. Refer to the pattern controller manual.</td>
</tr>
<tr>
<td>3. Hydraulic leaks between module and adhesive or air manifolds</td>
<td>Failed O-rings</td>
<td>Replace the O-rings between the module and the manifold. Refer to <em>Replacing a Module under Repair</em>.</td>
</tr>
<tr>
<td>4. Gun does not heat, overheats, or underheats</td>
<td>Open or shorted heater (see Note)</td>
<td>Check the heater continuity and resistance. The resistance should be approximately 192 ohms at room temperature. Replace the cordset if the heater is defective. Refer to <em>Replacing a Heater or an RTD under Repair</em>.</td>
</tr>
<tr>
<td></td>
<td>Open or shorted RTD (see Note)</td>
<td>Check the RTD continuity and resistance. At room temperature, the resistance should be 105–110 ohms. Replace the cordset if the RTD is defective. Refer to <em>Replacing a Heater or an RTD under Repair</em>.</td>
</tr>
</tbody>
</table>

**NOTE:** Refer to the illustrations under *Cordset Parts Lists*, in the *Parts* section, for cordset wiring and pin position diagrams.
**Repair**

Refer to these repair procedures as needed. For repair procedures not included in this section, refer to the instructions supplied with the replacement part.

**Replacing a Heater or an RTD**

To replace a heater or RTD, the entire cordset must be replaced. Follow this procedure to replace the heater or RTD in either the manifold or the heated air manifold.

1. Disconnect and lock out electrical power to the gun driver and to the melter or temperature controller.
2. Disconnect the gun cordset(s).

See Figure 6.

3. Loosen the heater retainer screw and remove the heater.

![Figure 6 Replacing a heater or an RTD](image)

<table>
<thead>
<tr>
<th>1. Manifold</th>
<th>3. Heater retainer</th>
<th>5. RTD bayonet ring</th>
</tr>
</thead>
</table>
Replacing a Heater or an RTD (contd)

4. Press and rotate the RTD bayonet ring about one quarter-turn clockwise, and then remove the RTD.
5. Coat the new heater with heater lubricant, and then install it into the manifold.
6. Install the new RTD into the manifold.
7. Reconnect the cordset(s) and restore the system to normal operation.

Replacing a Module

Follow this procedure to replace a module. You can also use this procedure to remove a module to replace the O-rings between the module and the adhesive or air manifolds.

1. Relieve system pressure. Refer to Safety.
2. Disconnect and lock out electrical power to the gun driver.
3. Remove the nozzle as appropriate. Refer to Installing the Nozzle given earlier in this manual.

See Figure 7.

4. Disconnect the module control cordset from the gun-to-driver cable, and then remove the module and the cordset assembly from the manifold. For additional information on the E400 driver and gun-to-driver cable, refer to the E400 driver manual.
5. Apply anti-seize compound to the module socket-head screws and install the new module on the manifold. Tighten the socket screws to 3.4 N•m (30 in.-lb).

6. Reinstall the nozzle as appropriate Refer to *Installing the Nozzle* given earlier in this manual.

7. Connect the new module control cordset to the gun-to-driver cable and restore the system to normal operation.
Parts

To order parts, call the Nordson Customer Service Center or your local Nordson representative. Use these five-column parts lists, and the accompanying illustrations, to locate parts.

Gun Parts

Figure 8  E400 rear feed gun parts
See Figure 8.

<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>1031013</td>
<td>ES401-RC-TC rear feed gun</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-</td>
<td>1031635</td>
<td>ES401-RC-TC top feed gun</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>1063458</td>
<td>• Module, E400 B, bead</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>1033597</td>
<td>• Manifold, ES401, rear feed</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>NS</td>
<td>1033598</td>
<td>• Manifold, ES401, top feed</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>985206</td>
<td>• Pin roll, 0.94x500</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>309931</td>
<td>• Mounting bracket</td>
<td>1</td>
<td>A</td>
</tr>
<tr>
<td>5</td>
<td>142278</td>
<td>• Adapter, bayonet, (\frac{3}{4}) NPT</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>900298</td>
<td>• Compound heat sink</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>1007017</td>
<td>• Disposable filter, 0.10 mesh</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>900223</td>
<td>• O-ring lubricant</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>900344</td>
<td>• Lubricant, Never Seez</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>1035554</td>
<td>• Armored, cordset</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>157945</td>
<td>• Retainer, heater</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>983111</td>
<td>• Washer lock</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>981515</td>
<td>• Socket screw</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>972657</td>
<td>• Hose connector with O-ring, (\frac{9}{16}-18)</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>940111</td>
<td>• O-ring, Viton, 0.301 ID x 0.070 W</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>981516</td>
<td>• Screw socket, 8.32x1.125</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>NS</td>
<td>981905</td>
<td>• Screw drive, RD, 2x 0.187, ZN</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>NS</td>
<td>900620</td>
<td>• Tubing, poly spiral</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

**NOTE A:** ES401-RC-TC top feed gun does not use a mounting bracket.

**NS:** Not Shown

**Nozzles**

Nordson offers many types and sizes of nozzles. Contact your Nordson representative for assistance in ordering nozzles.

**Hose Connectors**

<table>
<thead>
<tr>
<th>Part</th>
<th>Description</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>134957</td>
<td>Elbow, straight-thread, 90-degree, (\frac{9}{16}-\frac{3}{4})</td>
<td>A</td>
</tr>
<tr>
<td>134956</td>
<td>Elbow, straight-thread, 45-degree, (\frac{9}{16}-\frac{3}{4})</td>
<td>A</td>
</tr>
</tbody>
</table>

**NOTE A:** This connector is supplied with the gun.
E400 Drivers

<table>
<thead>
<tr>
<th>Part</th>
<th>Description</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>1045869</td>
<td>Driver, E400, non-programmable, high-viscosity</td>
<td></td>
</tr>
<tr>
<td>1039761</td>
<td>Cable, gun-to-driver, E400, 12 m</td>
<td>A</td>
</tr>
</tbody>
</table>

NOTE A: The non-programmable E400 driver will work for most applications. Use the E400 Driver Application Guide software to determine if the non-programmable driver will work for your application.

Recommended Spare Parts and Supplies

Tables 4 and 5 provide part numbers for the replacement parts and miscellaneous supplies that are most commonly needed to service an gun. Your decision about stocking spare parts and supplies depends on your approach to maintenance and the type of gun you are using. The quantity of each item you stock will vary depending on the number of hours you operate per day and the number of guns you have. Base your spare parts stocking decisions on the specific needs of your operating environment.

Table 4 Recommended Spare Parts

<table>
<thead>
<tr>
<th>Component</th>
<th>Part</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gun</td>
<td>465703</td>
<td>Filter assembly, 0.1 mm mesh, with bung</td>
</tr>
<tr>
<td></td>
<td>206461</td>
<td>• Screen, filter, 0.1 mm mesh, with spring</td>
</tr>
<tr>
<td></td>
<td>945032</td>
<td>• O-ring, Viton, 3/8 in. tube (hose connector O-ring)</td>
</tr>
</tbody>
</table>

Table 5 Recommended Supplies and Tools

<table>
<thead>
<tr>
<th>Part</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>900344</td>
<td>Lubricant, anti-seize, 8 oz can (for lubricating threads)</td>
</tr>
<tr>
<td>900223</td>
<td>Lubricant, O-ring, 4 oz (for lubricating O-rings)</td>
</tr>
<tr>
<td>165415</td>
<td>Lubricant, heater (for lubricating heaters)</td>
</tr>
<tr>
<td>901915</td>
<td>Nozzle cleaning kit</td>
</tr>
</tbody>
</table>
Technical Data

Gun Specifications

Due to technological or quality improvements, specifications are subject to change without notice. Please note that specifications are generally expressed in maximum values and that all specification values may not necessarily be achieved simultaneously.

<table>
<thead>
<tr>
<th>Item</th>
<th>Specification</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adhesive viscosity</td>
<td>up to 7,500 cps</td>
<td>A</td>
</tr>
<tr>
<td>Operating hydraulic pressure</td>
<td>82 bar (1,200 psi) recommended</td>
<td></td>
</tr>
<tr>
<td></td>
<td>103.4 bar (1,500 psi) maximum</td>
<td></td>
</tr>
<tr>
<td>Operating temperature</td>
<td>175 °C (350 °F) nominal</td>
<td>A</td>
</tr>
<tr>
<td></td>
<td>190 °C (375 °F) maximum</td>
<td></td>
</tr>
<tr>
<td>Operating speed</td>
<td>up to 6,000 cycles per minute</td>
<td>A</td>
</tr>
<tr>
<td>Nozzle selection (bead)</td>
<td>Any standard nozzle or Saturn precision nozzle</td>
<td></td>
</tr>
<tr>
<td>Electrical service</td>
<td>220–240 VAC, 50/60 Hz</td>
<td></td>
</tr>
</tbody>
</table>

NOTE A: Actual cycle rates and maximum operating temperatures depend on the application. Use the ES400 Application Guide software to determine the operating speeds for a specific application.

Torque Specifications

<table>
<thead>
<tr>
<th>Item</th>
<th>Torque Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hose connector</td>
<td>10–14 N•m (7–10 ft-lb)</td>
</tr>
<tr>
<td>Bead nozzle</td>
<td>4.5 N•m (40 in.-lb)</td>
</tr>
<tr>
<td>E400 module bracket (clamp)</td>
<td>1.7 N•m (15 in.-lb)</td>
</tr>
<tr>
<td>screw</td>
<td></td>
</tr>
</tbody>
</table>
Gun Dimensions

Figure 9   E400 gun dimensions