Ejector Gun Controller

Customer Product Manual
Part 1006453A

NORDSON CORPORATION • AMHERST, OHIO • USA

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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Notice

Trademarks

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Ejector Gun Controller

1. 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 in the spray area. 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 while 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:

Element	Symbol	Prefix
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.

2. Description

See Figure 1.

Figure 1 shows an Ejector gun controller, its main components, and basic dimensions.

The Ejector gun controller is used to operate Ejector guns in a mastic material dispensing operation. The Ejector gun controller monitors and controls the dispense and refill operations of the Ejector guns. Magnetic proximity switches located on the Ejector guns send signals that communicate gun dispense and refill information to the controller.

When a fault occurs, the light (2) illuminates and the fault messages appear on the keypad display (7).

The ground fault lights (3) are typically lit at half brilliance if the control circuit is not grounded, which is the desired condition. If the control circuit is grounded, one of the ground fault lights will shine at full brilliance and the other ground fault light will go out.

Internal replaceable parts, such as fuses and the power supply, are accessible by opening the enclosure door handle (5). Power to the controller is shut off by opening the knife disconnect (4).

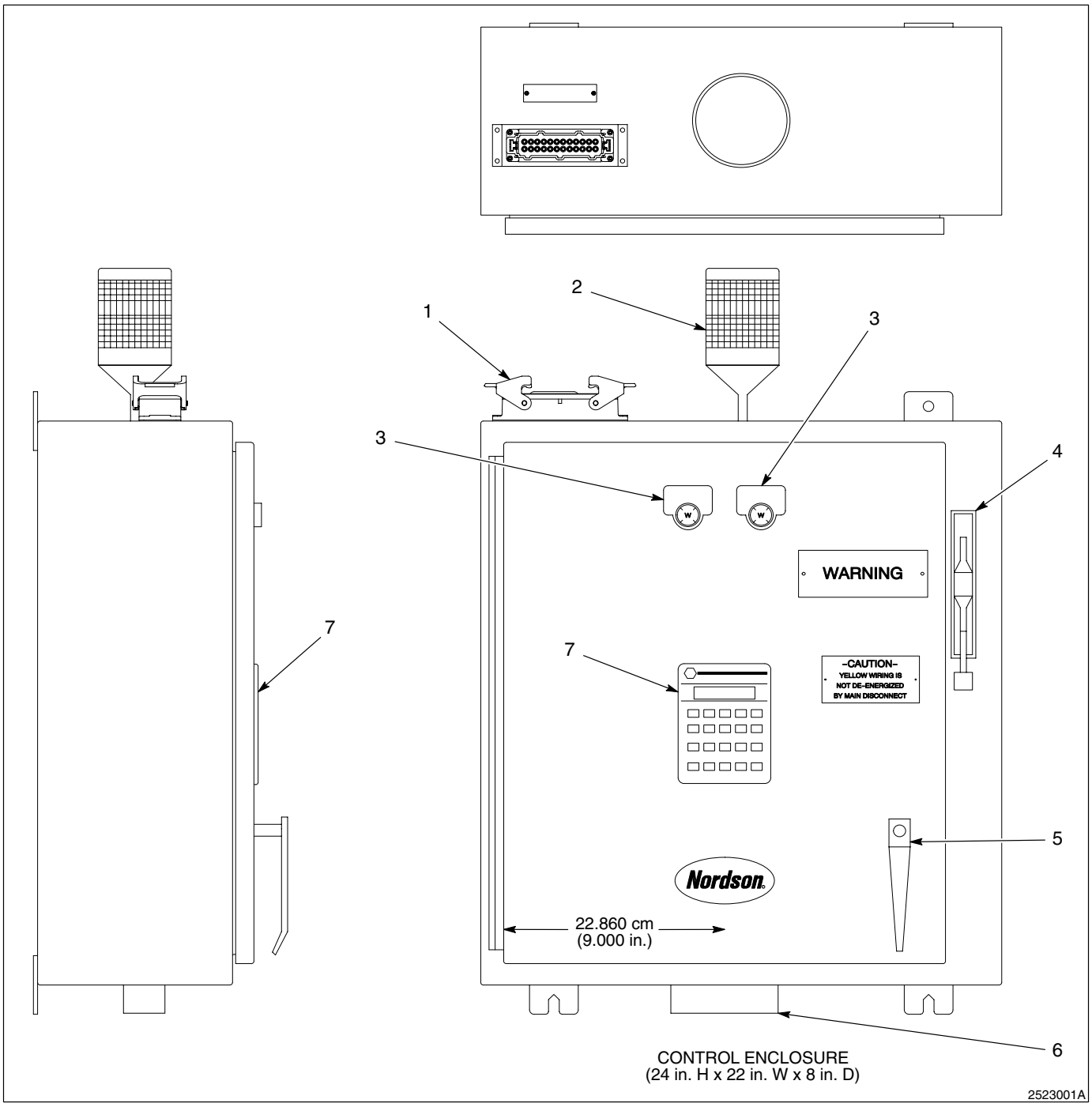

Fig. 1 Ejector Gun Controller Components and Dimensions

1. Main power connector (from robot)
2. Light
3. Ground fault lights
4. Knife disconnect
5. Door handle
6. Gun communication connector
7. Keypad

3. Installation

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

Follow these procedures when installing your Ejector gun controller and preparing it for operation:

NOTE: When mounting the controller cabinet, be sure to allow clearance for the door to open and for all cable connections supplied to the cabinet.

See Figure 1.

1. To connect main power to the Ejector gun controller, connect the cable from the robot to the controller main power connector (1).

2. Connect the cable from the gun communication connector (6) to the junction box near the guns.

3. Make all system electrical connections according to the system schematics provided in your system documentation. If you have any questions, contact your Nordson representative.

4. Operation

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

The following paragraphs detail the operation of the Ejector gun controller. Read this entire section before performing any procedures.

Keypad

The following provides information on how to use the controller keypad.

See Figure 2, which shows what each button on the keypad represents.

Refer to Table 1 for an explanation of the keypad functions.

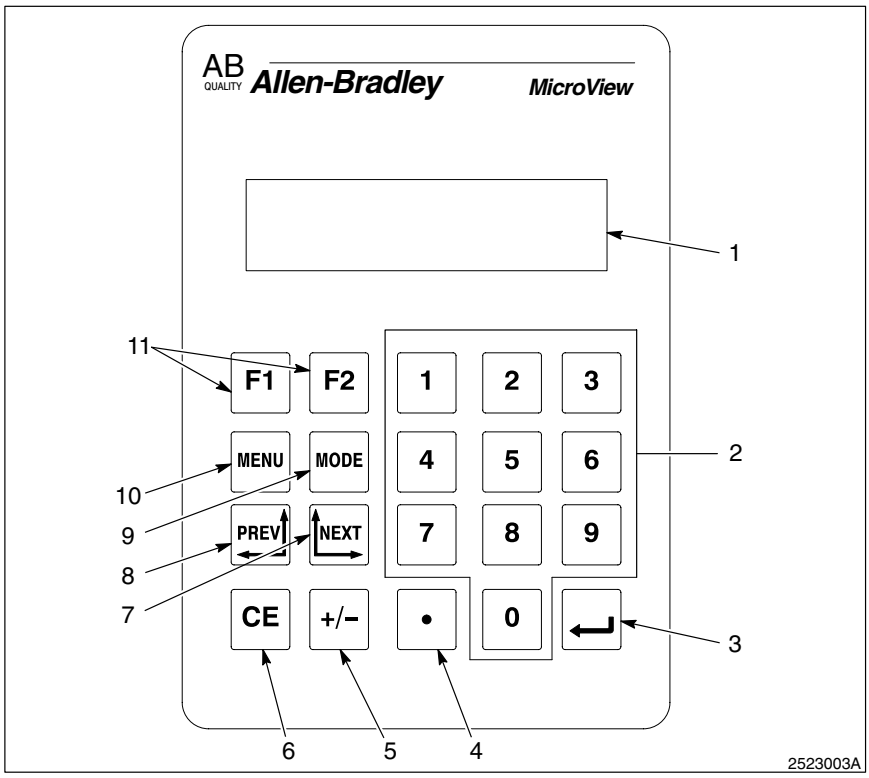

Fig. 2 Controller Keypad

Table 1 Keypad Functions

Item	Key	Function
1	Display panel	Displays menu options, pump information readouts, and fault messages
2	[**0–9**]	Enters numbers 0–9 during data entry or selects a numbered item shown on the display
3	[↵]	The [**ENTER**] key, sends data to the controller. Data can be either default values or data entered at the keypad
4	[**.**]	Enters a decimal point
5	[**+/–**]	Toggles a data entry value between positive or negative
6	[**CE**]	Clears an entire value during data entry
7	[**NEXT**]	Steps forward through a series of linked screens
8	[**PREV**]	Steps back through a sequence of linked screens
9	[**MODE**]	Accesses special features and configuration of operating parameters
10	[**MENU**]	Returns to the main menu of an application
11	[**F1**] – [**F2**]	Displays any application screen assigned to the key

Controller Menu Options

See Figure 3.

This section describes the various menu options and shows you how to navigate within the **MAIN MENU**. When you turn on the Ejector gun controller, the **MAIN MENU** appears.

The four **MAIN MENU** selections are:

1. **AUTO** (press 1)
2. **MANUAL** (press 2)
3. **SETUP** (press 3)
4. **DIAG** (press 4)

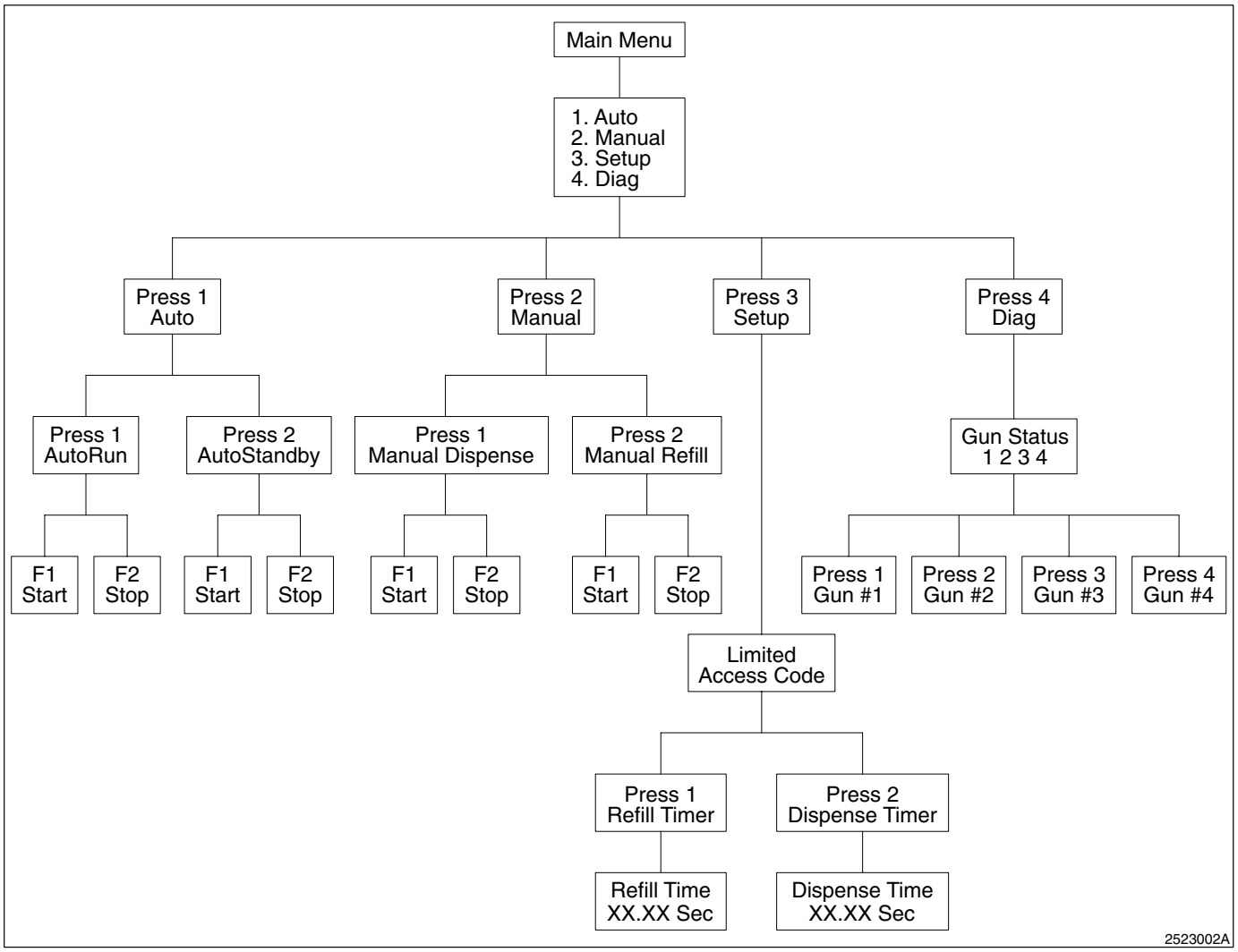

Fig. 3 Ejector Gun Controller Menu Tree

AUTO Screen

Refer to Table 2 for information to help you navigate in the **AUTO** screen.

Table 2 **AUTO** Screen Functions

Press	To
[**1**]	Access the **AUTO RUN** screen
[**2**]	Access the **AUTO STANDBY** screen
[**F1**]	Start
[**F2**]	Stop

MANUAL Screen

Refer to Table 3 for information to help you navigate in the **MANUAL** screen.

Table 3 **MANUAL** Screen Functions

Press	To
[**1**]	Access the **MANUAL DISPENSE** screen
[**2**]	Access the **MANUAL REFILL** screen
[**F1**]	Start
[**F2**]	Stop

SETUP Menu

Refer to Table 4 to navigate the **SETUP** menu. Access the **SETUP** menu when you need to enter data to adjust the length of time allotted for Ejector gun refill and dispense.

NOTE: To perform functions in the **SETUP** menu, you must enter an access code. Contact your Nordson Corporation representative if you do not have the proper access code.

Table 4 **SETUP** Menu Navigation

When:	You Will See This Message:	Then:
You enter the **SETUP** menu	`LIMITED ACCESS CODE`	Enter your **`access code`** to continue.

Your access code is accepted	`Valid Code Access Permitted`
	Then, you will see this menu:
	`1. REFILL TIMER`
	`2. DISPENSE TIMER`
		Access the menu you need to make adjustments.

You enter the **REFILL TIMER** menu	`Refill Time` `XX.XX Sec`	Using the numeric keys on the keypad, make the necessary adjustments to the refill time settings.
You enter the **DISPENSE TIMER** menu	`Dispense Time` `XX.XX Sec`	Using the numeric keys on the keypad, make the necessary adjustments to the dispense time settings.

DIAG (Gun Status) Screen

Refer to Table 5 for information to help you navigate in the **DIAG (Gun Status)** screen.

Table 5 **DIAG (Gun Status)** Screen Functions

Press	To
1	Access the **Gun #1** screen and view gun load and dispense fault status
2	Access the **Gun #2** screen and view gun load and dispense fault status
3	Access the **Gun #3** screen and view gun load and dispense fault status
4	Access the **Gun #4** screen and view gun load and dispense fault status

5. Maintenance

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

Follow these guidelines to keep the Ejector gun controller maintained:

- Follow all plant safety lockout procedures.
- Keep the controller door closed except when performing maintenance and repair inside the enclosure.

CAUTION: Do not use solvents to clean any part of the controller. Using solvents to clean the controller can damage its components.

- Periodically clean the keypad with a soft, damp cloth.
- Periodically check the tightness of all wire termination screws.

6. 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.

Ejector Gun Controller Troubleshooting

Refer to these procedures when troubleshooting the Ejector gun controller. Enter the **DIAG (Gun Status)** screen to view fault status at the Ejector guns.

Problem	Possible Cause	Corrective Action
1. Receiving dispense fault (Gun #X: DISP-FLT) at controller	Proximity switch not adjusted properly	Adjust the proximity switch locations. Refer to the *Ejector Gun* manual for more information.
	Timer not set properly	Change the dispense timer value from the **SETUP** menu. Refer to the *Operation* section for instructions. You may have to adjust the dispense timer when you change materials.
2. Receiving load fault (Gun #X: LOAD-FLT) at controller	Proximity switch not adjusted properly	Adjust the proximity switches on the gun. Refer to the *Ejector Gun* manual for more information.
	Timer not set properly	Change the refill timer value from the **SETUP** menu. Refer to the *Operation* section for instructions. You may have to adjust the refill timer when you change materials.
	Material not being supplied to Ejector guns, hoses partially or completely blocked	Check the material supply and the unloader material supply hoses. Load new material or troubleshoot for material blockages, as indicated. Refer to your unloader manual for more information.

Ejector Gun Troubleshooting

Follow these procedures when troubleshooting the Ejector gun.

NOTE: The procedures referenced in the following table are located in the *Ejector Gun* manual.

Problem	Possible Cause	Corrective Action
1. Leaking of air or fluid observed around coupling slot	Failed seals	Replace the fluid section or the seals in the Ejector gun. Refer to *Replacing the Fluid Section* in the *Repair* section of the *Ejector Gun* manual to replace the fluid section as a pre-assembled kit. Refer to the *Replacing the Seals* in the *Repair* section of the *Ejector Gun* manual to replace the seals in the liquid and air sides of the gun.
2. No signals being received at the controller from the proximity switches	Proximity switches not adjusted properly	Verify that the cables from the proximity switches are attached to the controller and that the cables are intact. Re-adjust the proximity switch locations. Refer to *Setting the Proximity Switches* in the *Installation* section of the *Ejector Gun* manual. If the switches have failed, replace the switches. If the gun is not operating properly and is preventing the switches from signalling the controller, identify and correct the operation problems: If the needle is sticking or if the shuttle is stopped due to leaking, replace the seals. Refer to the *Repair* section of the *Ejector Gun* manual.
3. Gun cycling too fast or too slow	Speed control valves not adjusted properly	The needle should take 1.0–1.5 seconds to fully stroke. Refer to *Adjusting the Speed Control Valves* in the *Installation* section of the *Ejector Gun* manual to modify the speed control valve adjustments.

7. Repair

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

WARNING: Risk of electrical shock. Disconnect and lock out input power to equipment before servicing. Failure to observe this warning may result in personal injury or death.

WARNING: The yellow wiring in the controller enclosure is not de-energized by the knife disconnect.

Prior to performing any service on the controller, make sure that the knife disconnect (Figure 1, (4)) has been opened to cut power to the controller.

This section provides information about replacing fuses, the keypad, the power supply, the power cable, and the PLC in the Ejector gun controller.

Replacing Fuses

Follow these procedures to replace the fuses.

See Figure 4.

1. Disconnect power at the knife disconnect and open the controller door.
2. Open the fuse holder(s) containing the blown fuse(s) (2, 4, or 5).
3. Remove the blown fuse(s). Install a new fuse. Make sure you use the correct type of fuse in each location.
4. Close the fuse holder(s).
5. Correct the problem that caused the fuse to blow.
6. Close the controller door and restore the power connection at the knife disconnect.

Replacing the Keypad

Follow these procedures to replace the keypad on the front of the Ejector gun controller enclosure.

See Figure 4.

1. Disconnect power at the knife disconnect and open the controller door.
2. Unplug the communication cable (6) from the keypad (1).
3. Remove the nuts that secure the keypad to the enclosure door. Remove the keypad from the door.
4. Install a new keypad and tighten the nuts.
5. Download the most current Ejector gun program according to your programming software literature, using the cables supplied for downloading.
6. Reconnect the power cable.
7. Close the controller door and restore the power connection at the knife disconnect.

Replacing the Power Supply

Follow these procedures to replace the power supply.

See Figure 4.

1. Disconnect power at the knife disconnect and open the controller door.
2. Disconnect the wires going to the power supply (3).
3. Remove the power supply from the DIN rail.
4. Install the new power supply onto the DIN rail.
5. Connect the wires per the electrical schematics provided with your system documentation.
6. Close the controller door and restore the power connection at the knife disconnect.

Replacing the Communication Cable

Follow these procedures to replace the power cable that connects the keypad to the PLC.

See Figure 4.

1. Disconnect power at the knife disconnect and open the controller door.
2. Unplug the communication cable (6) from the keypad (1).
3. Unplug the communication cable from the PLC (7).
4. Plug a new cable into the PLC and the keypad.
5. Close the controller door and restore the power connection at the knife disconnect.

Replacing the PLC

Follow these procedures to replace the PLC in the Ejector gun controller enclosure.

See Figure 4.

1. Disconnect power at the knife disconnect and open the controller door.
2. Disconnect the wires and communication cable (6) from the PLC (7).
3. Disconnect the PLC from the DIN rail and remove the PLC from the controller enclosure.
4. Install the new PLC onto the DIN rail.
5. Connect the wires.
6. Download the most current Ejector gun program according to your programming software literature, using the cables supplied for downloading.
7. Put the PLC in the software RUN mode.
8. Plug in the communication cable.
9. Close the controller door and restore the power connection at the knife disconnect.

8. Parts

To order parts, call the Nordson Customer Service Center or your local Nordson representative. Use the parts list, and the accompanying illustration, to describe and locate 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.

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

- 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.

Ejector Gun Controller Parts

See Figure 4.

The following parts list provides part numbers for the replaceable parts in the Ejector gun controller. If you need further parts information, contact your Nordson representative.

Item	Part	Description	Quantity	Note
—	1013145	Controller, Ejector gun	1	
1	235956	• Display, operator panel	1	
2	939983	• Fuse, dual element, time delay, 3 amp	2	
3	1005874	• Power supply, 2.1 amp @ 24 Vdc	1	
4	939094	• Fuse, $^1/_2$ amp	1	
5	1002383	• Fuse, 2 amp	2	
6	235935	• Cable, communication	1	
7	341358	• Programmable logic controller	1	

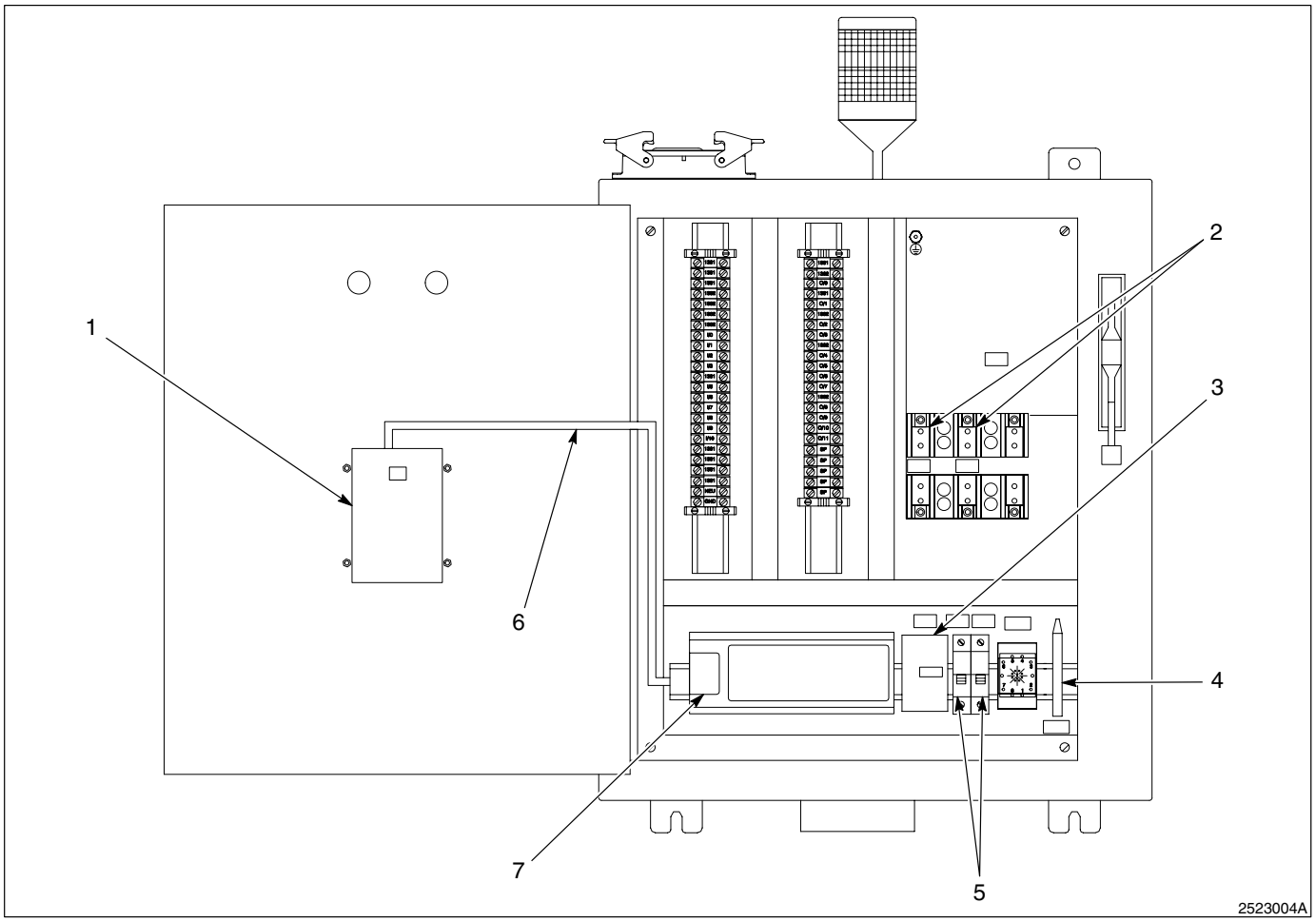

Fig. 4 Ejector Gun Controller Replacement Parts