Model A15A
Electric Gun and
Inside Stripe System

Part 107 956A

NORDSON CORPORATION • AMHERST, OHIO • USA

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Notice

Trademarks

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Safety
Liquid and Electrostatic Equipment

1. Introduction

This section contains general safety instructions for using your Nordson equipment. Task- and equipment-specific warnings are included in other sections of this manual where appropriate. Note all warnings and follow all instructions carefully. Failure to do so may result in personal injury, death, or property damage.

To use this equipment safely,

- read and become familiar with the general safety instructions provided in this section of the manual before installing, operating, maintaining, or repairing this equipment.
- read and carefully follow the instructions given throughout this manual for performing specific tasks and working with specific equipment.
- store this manual within easy reach of personnel installing, operating, maintaining, or repairing this equipment.
- follow all applicable safety procedures required by your company, industry standards, and government or other regulatory agencies. Refer to the National Fire Protection Association (NFPA) standard 33 and to federal, state, regulatory agency, and local codes for rules and regulations covering installation and operation of spray systems.
- obtain and read Material Safety Data Sheets (MSDS) for all materials used.

2. Safety Symbols

Become familiar with the safety symbols presented in this section. These symbols will alert you to safety hazards and conditions that may result in personal injury, death, or property and equipment damage.

WARNING: Failure to observe this warning may result in personal injury, death, or equipment damage.

2. Safety Symbols (contd.)

WARNING: Risk of electrical shock. Failure to observe this warning may result in personal injury, death, or equipment damage.

WARNING: Disconnect equipment from line voltage. Failure to observe this warning may result in personal injury, death, or equipment damage.

WARNING: Risk of explosion or fire. Fire, open flames, and smoking prohibited.

WARNING: Wear protective clothing, safety goggles, and approved respiratory protection. Failure to observe may result in serious injury.

WARNING: Hot! Risk of burns. Wear heat-protective clothing, safety goggles with side shields and/or heat-protective gloves depending on the symbol shown.

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

WARNING: Injection. Do not point this device at yourself or other personnel. Failure to observe this warning may result in serious injury or death.

2. Safety Symbols (contd.)

CAUTION: Failure to observe may result in equipment damage.

CAUTION: Hot surface. Failure to observe may result in burns.

3. Qualified Personnel

"Qualified personnel" is defined here as individuals who thoroughly understand the equipment and its safe operation, maintenance, and repair. Qualified personnel are physically capable of performing the required tasks, familiar with all relevant safety rules and regulations, and have been trained to safely install, operate, maintain, and repair the equipment. It is the responsibility of the company operating this equipment to see that its personnel meet these requirements.

4. Intended Use

WARNING: Use of this equipment in ways other than described in this manual may result in personal injury, death, or property and equipment damage. Use this equipment only as described in this manual.

Nordson Corporation cannot be responsible for injuries or damages resulting from nonstandard, unintended applications of its equipment. This equipment is designed and intended only for the purpose described in this manual. Uses not described in this manual are considered unintended uses and may result in serious personal injury, death, or property damage. Unintended uses may result from taking the following actions:

- making changes to equipment that have not been recommended or described in this manual or using parts that are not genuine Nordson replacement parts
- failing to make sure that auxiliary equipment complies with approval agency requirements, local codes, and all applicable safety standards
- using materials or auxiliary equipment that are inappropriate or incompatible with your Nordson equipment
- allowing unqualified personnel to perform any task

5. Installation

Read the installation section of all system component manuals before installing your Nordson equipment. A thorough understanding of system components and their requirements will help you to install this equipment safely and efficiently.

WARNING: Failure to follow these safety procedures can result in personal injury or death.

- Allow only qualified personnel to install Nordson equipment.
- Use only approved equipment. Using unapproved equipment in an approved system may void agency approvals.
- Make sure all equipment is rated and approved for the environment in which you are using it.
- Follow all instructions for installing components and accessories.
- Install all electrical, pneumatic, gas, and hydraulic connections to local code.
- Install locking, manual, shutoff valves in the air supply lines to the system. This allows you to relieve air pressure and lock out the pneumatic system before undertaking maintenance and repairs.
- Install a locking disconnect switch or breaker in the service line ahead of any electrical equipment.
- Use only electrical wire of sufficient gauge and insulation to handle the rated current demand. All wiring must meet local codes.
- Ground all electrically conductive equipment. Ungrounded conductive equipment can store a static charge which could ignite a fire or cause an explosion if a hot spark is discharged.
- Route electrical wiring, electrostatic cables, and air hoses and tubing along a protected path. Make sure they will not be damaged. Do not bend electrostatic cables around a radius of less than 6 in. (152 mm).
- Install safety interlocks and approved, fast-acting fire detection systems. These shut down the spray system and any flammable liquid supply if a ventilation or electrical problem occurs, a fire is detected, or other emergency situation develops.

5. Installation (contd.)

- Make sure the spray area floor is conductive to ground and that the operator's platform is grounded.
- Use only designated lifting points or lugs to lift and move heavy equipment. Always balance and block loads when lifting to prevent shifting. Lifting devices must be inspected, certified, and rated for a greater weight than the equipment being lifted.
- Do not use unapproved fluid hoses. Solvents may cause them to deteriorate rapidly which may allow flammable or pressurized material to escape.
- Protect components from damage, wear, and harsh environmental conditions.
- Allow ample room for maintenance, material supply container drop-off and loading, panel accessibility, and cover removal.
- Protect equipment with safety devices as specified by applicable safety regulations.
- If safety devices must be removed for installation, install them immediately after the work is completed and check them for proper functioning.

6. Operation

Only qualified personnel, physically capable of operating the equipment and with no impairments to their judgement or reaction times, should operate this equipment.

Read all component manuals before operating this equipment. A thorough understanding of system components and their operation will help you operate the system safely and efficiently.

- Use this equipment only in the environments for which it is rated. Do not operate this equipment in humid, flammable, or explosive environments unless it has been rated for safe operation in these environments.
- Before starting this equipment, check all safety interlocks, fire-detection systems, and protective devices such as panels and covers. Make sure all devices are fully functional. Do not operate the system if these devices are not working properly. Do not deactivate or bypass automatic safety interlocks, locked-out electrical disconnects, or pneumatic valves.

6. Operation (contd.)

- Know where *EMERGENCY STOP* buttons, shutoff valves, and fire extinguishers are located. Make sure they work. If a component malfunctions, shut down and lock out the equipment immediately.
- Before operating, make sure all conductive equipment, objects being sprayed, and fluid containers are connected to a true earth ground.
- Never operate equipment with a known malfunction or leak.
- Never point handguns or applicator nozzles at yourself or other persons.
- Never touch exposed electrical connections on equipment while the power is ON.
- Do not operate the equipment at pressures higher than the rated maximum working pressure of any component in the system.
- Shut off moving equipment before taking measurements or inspecting workpieces.
- Know the pinch points, temperatures, pressures, and material composition for all equipment that you are working with. Recognize potential hazards associated with these and exercise appropriate caution.
- Wear shoes with conductive soles, such as leather, or use grounding straps to maintain a connection to ground when working with or around electrostatic equipment.
- Do not wear or carry metallic objects (jewelry or tools) while working with or around electrostatic equipment. Ungrounded metal can store a static charge and cause harmful shocks.
- Maintain skin-to-metal contact between your hand and the gun handle to prevent shocks while operating manual electrostatic spray guns. If wearing gloves, cut away the palm or fingers.
- Shut off electrostatic power supplies and ground gun electrodes before making adjustments to powder spray guns.
- If you notice electrical arcing in a spray area, shut down the system immediately. An arc can cause a fire or explosion.
- Keep parts of the body or loose clothing away from rotating parts. Remove personal jewelry and cover or tie back long hair.

6. Operation (contd.)

- Wear National Institute of Occupational Safety and Health (NIOSH) approved respirators while operating spray equipment and when performing maintenance and cleaning tasks.
- Wear eye protection when operating spray equipment.
- Wear gloves and protective clothing to protect your skin from materials.
- Keep paint pumps, pressure pots, and containers of flammable coating materials or solvents far enough away from spray booths to prevent their inclusion in a booth fire.
- Do not smoke in the spray area. A lit cigarette could ignite a fire or cause an explosion.
- Treat all high-pressure fittings and hoses as if they could leak. High-pressure compressed air can be injected under the skin and cause serious injury or death.
- Do not use materials that will corrode the equipment.
- Do not attempt to operate electrical equipment if standing water is present.
- Wash exposed skin frequently with soap and water, especially before eating or drinking. Do not use solvents to remove coating materials from your skin.

7. Less-obvious Dangers

Operators should also be aware of less-obvious dangers in the workplace that often cannot be completely eliminated:

- exposed surfaces on the equipment which may be hot or have sharp edges and cannot be practically safeguarded
- electrical equipment which may remain energized after the equipment has been shut off
- vapors and materials which may cause allergic reactions or other health problems
- automatic hydraulic, pneumatic equipment, or mechanical parts that may move without warning
- unguarded, moving mechanical assemblies

8. Action in the Event of a System or Component Malfunction

Do not operate a system that contains malfunctioning components. If a component malfunctions, turn the system OFF immediately.

- Disconnect and lock out electrical power. Close and lock out hydraulic and pneumatic shutoff valves and relieve pressures.
- Allow only qualified personnel to make repairs. Repair or replace the malfunctioning component according to instructions provided in its manual.

9. Maintenance and Repair

Allow only qualified personnel to perform maintenance, troubleshooting, and repair tasks. Only persons who are properly trained and familiar with Nordson equipment are permitted to service this equipment.

- Always wear appropriate protective clothing and use safety devices when working on this equipment.
- Follow the recommended maintenance procedures in your equipment manuals.
- Do not service or adjust any equipment unless another person trained in first aid and CPR is present.
- Disconnect, lock out, and tag electrical power at a disconnect or breaker in the service line ahead of electrical equipment before servicing.
- Relieve air and fluid pressures before servicing equipment. Follow the specific instructions in this manual.
- Use only genuine Nordson replacement parts. Using unapproved parts or making unapproved modifications to equipment may void agency approvals and create safety hazards.

WARNING: Note the flash point of the cleaning solvent used. Only use controlled methods and equipment, such as temperature-controlled or explosion-protected heaters, to heat cleaning solvent. Observe explosion-prevention regulations and follow applicable safety instructions.

- Refer to the MSDS before using solvents to clean this equipment. The MSDS will provide use, storage, and disposal information about the solvent. Read this information carefully and follow instructions.

9. Maintenance and Repair (contd.)

- Never use an open flame to clean the unit or components of the unit.
- Do not store flammable materials in the spray area or room. Keep paint pumps, pressure pots, and containers of flammable coating materials or solvents far enough away from spray booths to prevent their inclusion in a booth fire. If a fire or explosion occurs, flammable materials in the area will increase the chances and the extent of personal injuries and property damage.
- Make sure that the room where you are working is sufficiently ventilated. Avoid breathing vapors over prolonged periods of time.
- Check interlock systems periodically to ensure their effectiveness.

WARNING: Operating faulty or electrostatic equipment is hazardous and can cause electrocution, fire, or explosion. Make resistance checks part of your periodic maintenance program.

- Check all ground connections periodically with a megohm meter. Resistance to ground must not exceed one megohm. If sparks or arcing occur, shut down the system immediately.
- Connect all disconnected equipment ground cables and wires after servicing the equipment. Ground all conductive equipment.

WARNING: Service lines connected to panel disconnect switches will still be energized unless power is shut off at another disconnect ahead of the panel. Make sure the power is off before servicing. Wait 5 minutes for capacitors to discharge after shutting off the electrical power.

- Turn off the electrostatic power supply and ground the gun electrode before adjusting or cleaning the nozzles, fluid tips, or air caps.
- If a “power on” test is required, perform the test carefully and then shut off and lock out power as soon as the test is over.
- Never troubleshoot the power supply without first disconnecting all external power supplies and discharging the high-voltage capacitors with an insulated screwdriver.
- Ground electrodes and electrostatic cable ends before touching them.

9. Maintenance and Repair (contd.)

- Do not attempt to service electrical equipment if there is standing water present. Do not service electrical equipment in a high-humidity environment.
- Use tools with insulated handles when working with electrical equipment.
- Keep high-voltage connection points clean and insulated with dielectric grease or oil.
- Do not attempt to service a moving piece of equipment. Shut off the equipment and lock out power. Secure equipment to prevent uncontrolled movement.

10. Material and Solvent Precautions

WARNING: Hot! Risk of burns. Wear heat-protective clothing, eye protection with side shields and/or heat-protective gloves.

Heated materials may cause severe burns on contact. Remember that some materials, even solid materials, may retain heat for some time. If you are burned by a heated material, immediately cool the affected skin with lots of cool, clean water. Do not try to remove hot, melted material from the skin. Seek immediate medical attention.

High-pressure fluids, unless they are safely contained, are extremely hazardous. A jet of high-pressure fluid can act like a knife or needle, penetrate skin and muscle, and inject itself into your body. Injected fluids can cause toxic poisoning.

Do not treat an injection injury as minor. Seek medical care immediately. Inform the medical staff at the hospital that you have an injection injury and identify the fluid that was injected. If possible, give the doctor copies of the MSDS for the injected fluid and for any additives, such as solvents, that are in the injected fluid.

Also, Nordson recommends that you carry a National Safety Equipment Manufacturers Association (NSEMA) wallet card to give to emergency medical staff in the event of an injection injury. These cards are supplied with the equipment. Additional cards are available free from Nordson Corporation.

10. Material and Solvent Precautions (contd.)

WARNING: Injection hazard. Do not go near a known leak in a hose or fitting, and stay clear of all spray nozzles or orifices. Do not point an applicator at yourself or other personnel. The high-pressure fluid into the body causing serious injury or death.

To prevent an injection injury, take some basic safety precautions when operating your equipment.

- Always handle spray applicators carefully. Do not point a pressurized gun at yourself or other personnel.
- Never place hands, fingers, or other parts of your body directly over a spray nozzle or in front of a leak in a high-pressure system.
- Never “back-flush” the nozzles. Blocking a nozzle causes the high-pressure fluid to reverse direction and can lead to an injection injury.
- Always relieve system pressure before servicing equipment. Trigger all applicators and bleed off system pressure.

Halogenated hydrocarbon solvents can cause an explosion when used with aluminum components in a pressurized fluid pumping system (pumps, heaters, filters, valves, spray guns, and tanks). The explosion could cause serious bodily injury, death, or substantial property damage. No available stabilizers will prevent this violent reaction from happening.

WARNING: Never use halogenated hydrocarbon solvents to clean aluminum parts or to flush any system. Cleaning agents, coatings and paints, or adhesives may contain halogenated hydrocarbon solvents. Obtain and read the MSDS for each material and solvent being used.

- Use nonhalogenated solvents.
- Contact your solvent supplier to determine whether your existing materials and solvents contain halogenated hydrocarbons or to obtain a suitable, nonhalogenated hydrocarbon solvent for cleaning and flushing your system.

10. Material and Solvent Precautions (contd.)

- See Table 1. Check the labels on your solvent containers. Halogenated hydrocarbon solvents can be recognized if any of the following elements are listed in the name of the product or as an ingredient:

Element	Symbol	Prefix
Flourine	F	“Flouro-”
Chlorine	Cl	“Chloro-”
Bromine	Br	“Bromo-”
Iodine	I	“Iodo-”

If you are now using halogenated hydrocarbon solvents in pressurized systems with aluminum components, perform the following steps:

- Pump the system empty, shut off the pumps, and relieve the system pressure.
- Disassemble and inspect the system components. Replace any damaged or corroded parts.
- Thoroughly clean all noncorroded parts with nonhalogenated hydrocarbon.
- Contact your coatings, solvent, or adhesive supplier for a nonhalogenated solvent to thoroughly flush the entire system before operating it.
- If you must continue to use halogenated hydrocarbon solvents, consult your Nordson representative about compatible Nordson components.

10. Material and Solvent Precautions (contd.)

Table 1 Solvents Containing Halogenated Fluids

Chlorinated Solvents	Iodinated Solvents	Brominated Solvents	Fluorocarbon Solvents
Carbon Tetrachloride	Ethyl Iodide	Ethylene Dibromide	Dichlorofluoromethane
Chloroform	Methyl Iodide	Methyl Bromide	Trichlorofluoromethane
Ethylene Dichloride	N-butyl Iodide	Methylene Chlorobromide	Freon
Methylene Chloride	Propyl Iodide		
1-1-1 Trichloroethane			
Monochlorobenzene			
Orthodichlorobenzene			
Perchloroethylene			
Trichloroethylene			

11. Disposal

Dispose of equipment and materials used in operation and cleaning according to your local regulations.

SECTION 2
EQUIPMENT FAMILIARIZATION

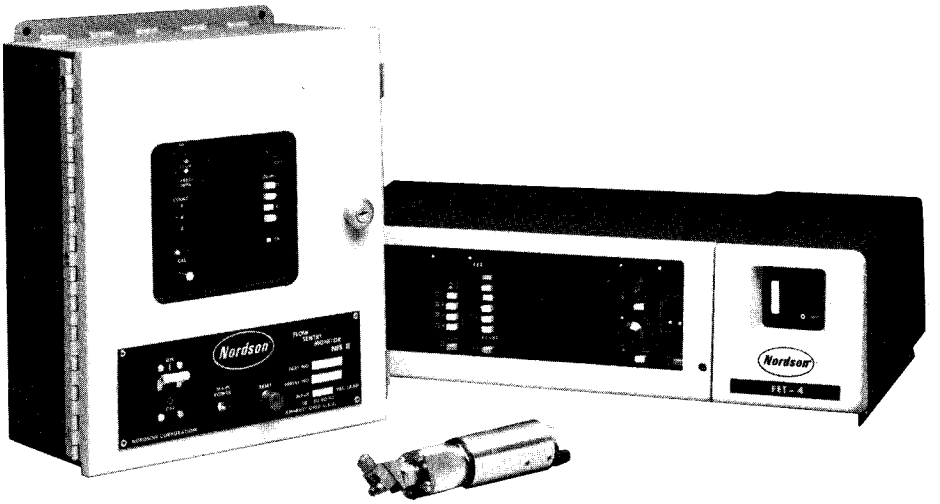

Figure 1 - Electric Inside Stripe System, Major Components.

SYSTEM DESCRIPTION

Refer to Figure 1. The Nordson High-Speed Electric Inside Stripe System for 3-piece welded cans is designed for increased line speeds of various can body maker machines. At operating speeds of up to 700 cans per minute, the Nordson system provides precision film deposition and automatic, on-line nozzle flow monitoring.

The system consists of the A15A Airless Electric Gun, NFS-II Flow Sentry, NFS-II Preamp, FET-4 Solid-State Timer and associated cables & hardware.

The A15A Gun and FET-4 Timer combine to provide high-speed operation while the NFS-II Flow Sentry monitors fluid pressure in the gun to indicate high or low flow, and rapid pressure drops. If system operation varies above or below the selected parameters, an alarm circuit is tripped after as few as two consecutive cans. The alarm circuit can be interfaced with an external alarm or with in-plant process control systems to minimize the manufacturing of defective cans.

NOTE: A complete list of component part numbers for the Electric Inside Stripe System WITH or WITHOUT Flow Sentry can be found in the System Options section of this manual.

NOTE: The A15A Electric Gun and Inside Stripe System is suitable for installation on body maker machines which have the Precision Tools Ltd. Quick Connect Spray Arm or a fixed spray arm. The weld arm outer diameter, availability of the flow sentry option and cables differ for fixed or quick connect spray arm installations. Refer to Table 1 in Section 3 for spray arm installation data. The flow sentry option for quick connect spray arm installations is not available at this time.

THEORY OF OPERATION - SYSTEM WITH FLOW SENTRY

Refer to Figure 2. The Electric Inside Stripe System with Flow Sentry is a high-cycle airless system that monitors fluid flow and pressure. It can detect abnormally high flow conditions (as in a worn or chipped nozzle) or low flow conditions (as in a blocked nozzle). It will also detect a rapid pressure drop in the fluid delivery system.

The Inductive Proximity Sensor (8a) detects a can as it passes by the Sensor, and sends a signal to the FET-4 Timer (8). The FET-4 (8) picks up the signal sent by the Sensor (8a), and delays the triggering of the A15A Electric Gun (1). When the can is just in front of the gun nozzle the FET-4 (8) triggers the A15A (1), and keeps the gun on as the can passes over the nozzle. The A15A Gun (1) then shuts off until the next can is sensed.

At the same time the A15A Gun is triggered, the FET-4 Timer (8) also sends a signal to the NFS-II Flow Sentry (9). This signal is used by the NFS-II (9) to initiate the monitoring of fluid flow in the A15A Gun (1).

The NFS-II (9) reads the signal from the pressure transducer which is mounted in the A15A Gun (1). The NFS-II (9) compares the fluid pressure when the gun is off, to the fluid pressure when the gun is triggering. If the difference in fluid pressure is greater or less than a pre-selected value, the NFS-II (9) registers this difference as an error. When the NFS-II (9) counts a pre-determined number of consecutive errors, an alarm will be activated.

The PreAmp (7) acts as an interface between; the FET-4 (8) and A15A Gun (1), and also between the A15A Gun (1) and the NFS-II (9).

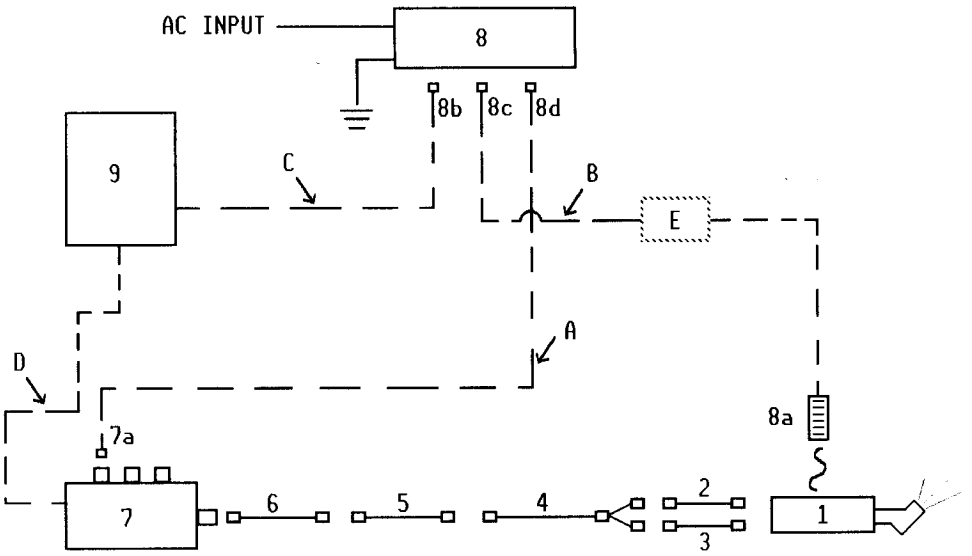

Figure 2 - Inside Stripe System Diagram WITH Flow Sentry®

Selected Nordson Components

1. A15A Gun
2. Trigger Cable
3. Transducer Cable
4. Splitter Cable
5. Weld Arm Cable
6. 6-Pin Preamp Cable
7. Pre-Amp
7a. Connector, Power Cable
8. FET-4 Timer
8a. Proximity Sensor
8b. Connector, Interface Cable
8c. Connector, Sensor Signal Cable
8d. Connector, Power Cable
9. NFS-II Flow Sentry Monitor

Customer Supplied Components

A. Power Cable
B. Sensor Signal Cable
C. Interface Cable
D. Flow Sentry Signal Cable
E. Intrinsic Safety Barriers

THEORY OF OPERATION - SYSTEM WITHOUT FLOW SENTRY

Refer to Figure 3. The Electric Inside Stripe System with Flow Sentry is a high-cycle airless system.

The Inductive Proximity Sensor (6a) detects a can as it passes by the Sensor, and sends a signal to the FET-4 Timer (6). The FET-4 (6) picks up the signal sent by the Sensor (6a), and delays the triggering of the A15A Electric Gun (1). When the can is just in front of the gun nozzle the FET-4 (6) triggers the A15A (1), and keeps the gun on as the can passes over the nozzle. The A15A Gun (1) then shuts off until the next can is sensed.

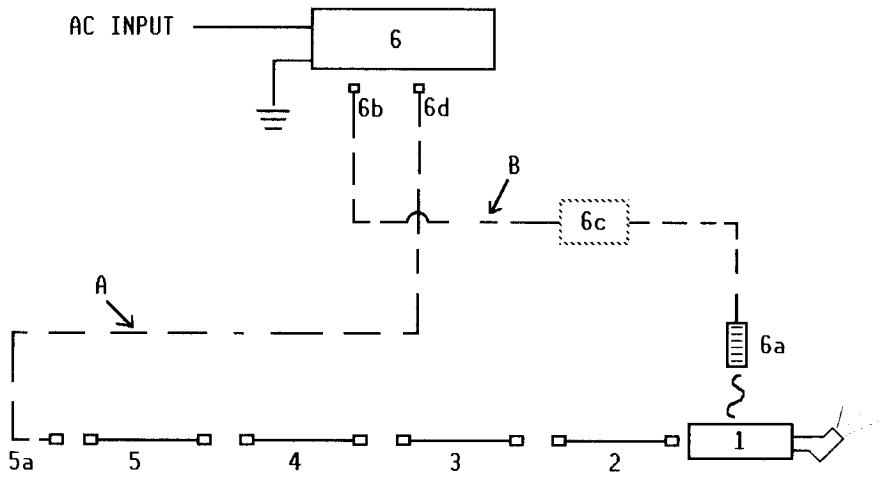

Figure 3 - Inside Stripe System Diagram WITHOUT Flow Sentry

Selected Nordson Components

1. A15A Gun
2. Trigger Cable
3. Spray Arm Cable
4. Weld Arm Cable
5. 2-Pin Power Cable
5a. Connector, Power Cable
6. FET-4 Timer
6a. Proximity Sensor
6b. Connector, Sensor Signal Cable
6c. Intrinsic Safety Barriers
6d. Connector, Power Cable

Customer Supplied Components

A. Power Cable
B. Sensor Cable

EQUIPMENT FAMILIARIZATION - GUN

Refer to Figure 4. The A15A gun can be used with or without the NFS-II Flow Sentry. However, the A15A **MUST** be used with the FET-4 Timer (with Electric Gun "E.G." Driver modules) for assured high cycle performance.

This gun is FM approved (Class I, Division 1 & 2, Group D) and is designed for use with Non-Pigmented Solvent or Waterborne Materials, including High-Solids.

The A15A Gun features an integral electric solenoid, tapered needle & seat and has no moving seals or packing cartridge to wear out.

The nozzle tip is adjustable and can be located in close proximity to the inside welded seam to apply the coating material by the "flow-coating" method, or further away for an atomized stripe.

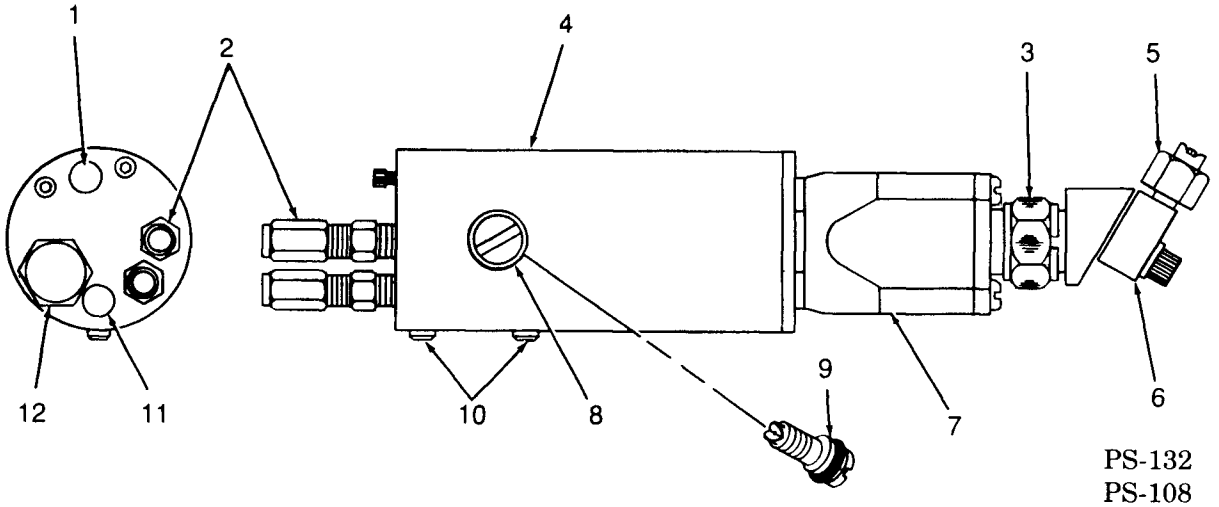

Figure 4 - A15A Electric Stripe Gun, Description

1. Trigger Cable Receptacle
2. Hydraulic Tube Fitting For Fluid Delivery & Circulation
3. Swivel Adjustment For Nozzle Holder
4. Circulation Body
5. Nozzle
6. Slide Adjustment For Nozzle Holder
7. Engraved Body
8. CO-Plate Plug
9. CO-Plate
10. Mounting Set Screws
11. Mounting Hole
12. Transducer Cable Port

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SECTION 3
INSTALLATION

INSTALLATION: SYSTEM WITH FLOW SENTRY

GENERAL INFORMATION

Refer to System Diagram WITH Flow Sentry, Figure 2 for location of all system components.

Before installing Nordson or customer supplied cables, locate, mount and wire the main components of the system (FET-4 Timer with Proximity Sensor, and NFS-II with Preamp). See individual component manuals for instructions (Manuals 17-7 & 17-8).

Part numbers for standard components are listed in the Component Selection & System Options section of this manual.

NOTE: The length of customer supplied cables is based on individual installation parameters.

POWER CABLE

(Item A, Figure 2 - Customer Supplied).

Refer to Figure 5. The power cable connects the FET-4 to the Pre-Amp. The cable is a 2 conductor cable and does not need to be shielded. Conductor size should be 18-22 AWG.

NOTE: Connector 8d is 2-Pole and is supplied with the FET-4 Timer. Connector 7a is 2-Pole and is supplied with the Preamp.

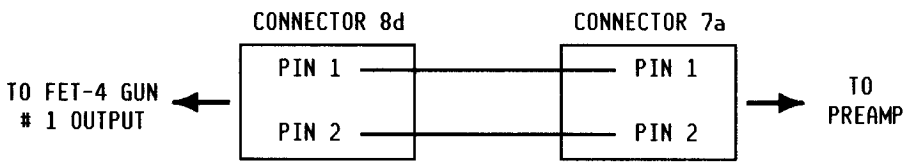


Figure 5 — Power Cable Wiring Diagram

SENSOR SIGNAL CABLE WITHOUT INTRINSIC SAFETY BARRIERS

(Item B, Figure 2 - Customer Supplied)

NOTE: This cable (WITHOUT Intrinsic Safety Barriers) should only be used for systems that DO NOT use solvent based materials.

Refer to Figure 6. The Sensor Cable without Intrinsic Safety Barriers connects the FET-4 to the Proximity Sensor. The cable is a 3-conductor and does not need to be shielded. Conductor size should be 18-22 AWG.

NOTE: Connector 8c is 3-Pole and is supplied with the FET-4 Timer. Proximity Sensor 8a is supplied with the FET-4 Timer.

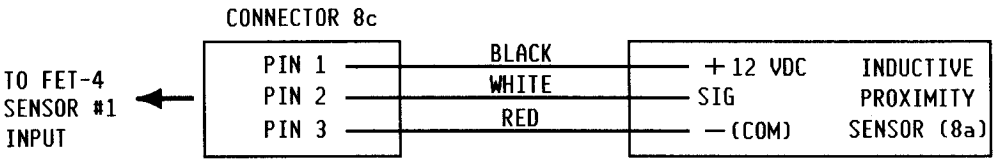


Figure 6 — Power Cable Without I/S Wiring Diagram

SENSOR SIGNAL CABLE WITH INTRINSIC SAFETY BARRIERS

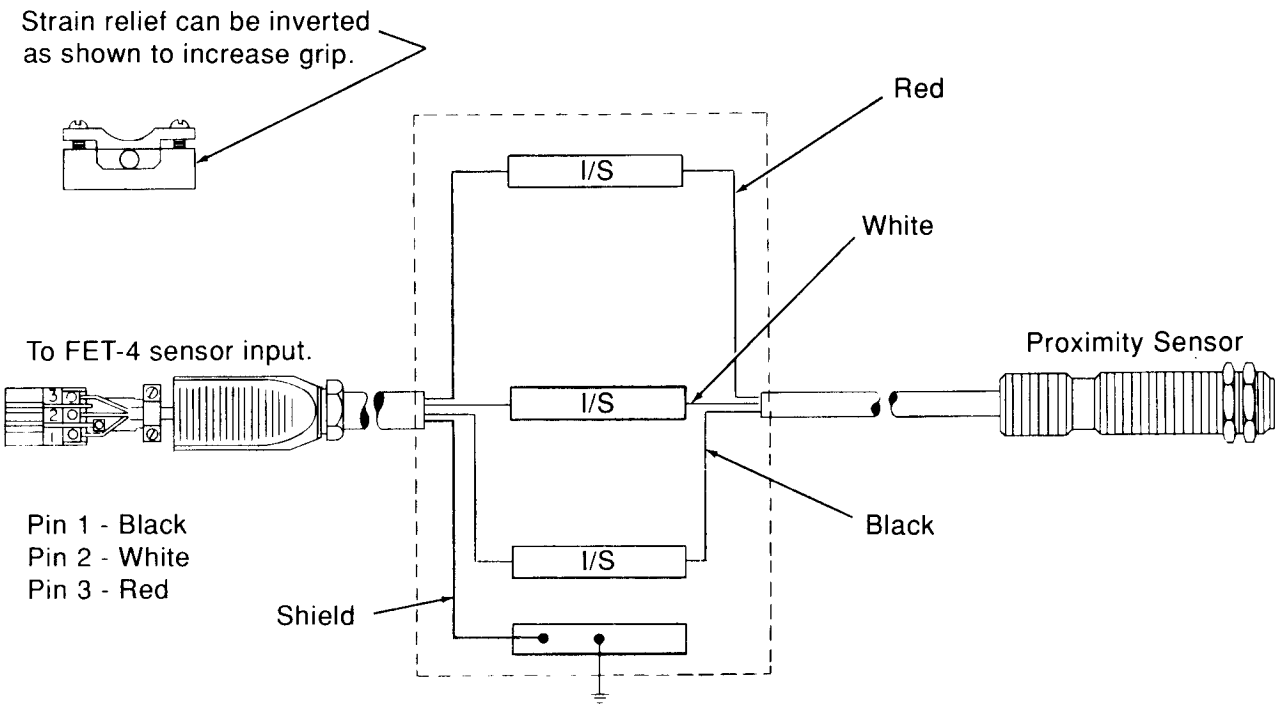
(Items B & E, Figure 2 - Customer Supplied)

NOTE: This cable WITH Intrinsic Safety Barriers should be used for systems that use solvent based materials.

Refer to Figure 7. The Sensor Signal Cable with Intrinsic Safety barriers connects the FET-4 to the Proximity Sensor through Intrinsically Safe Barriers.

The cable is a 3-conductor cable and **needs to be shielded** however, the shield should NOT be connected at the plug end. Conductor size should be 18-22 AWG.

NOTE: Connector 8c is 3-Pole and is supplied with the FET-4 Timer. Proximity Sensor 8a is supplied with the FET-4 Timer.



I/S Barrier Specifications (3 Required)
+ 12 VDC/100 ma DC/160 Ohms.

PS-126

Figure 7 — Sensor Signal Cable With Intrinsic Safety Barrier

INTERFACE CABLE

(Item C, Figure 2 - Customer Supplied)

Refer to Figure 8. The Interface Cable connects the FET-4 to the NFS-II. The cable is 2-conductor, twisted pair cable and **must be shielded**. The shield of the cable should be connected to the ground screw of the plug, 8b. Conductor size should be 18-22 AWG.

NOTE: Connector 8b is 3-Pole (with one pin removed) and is supplied with the FET-4 Timer

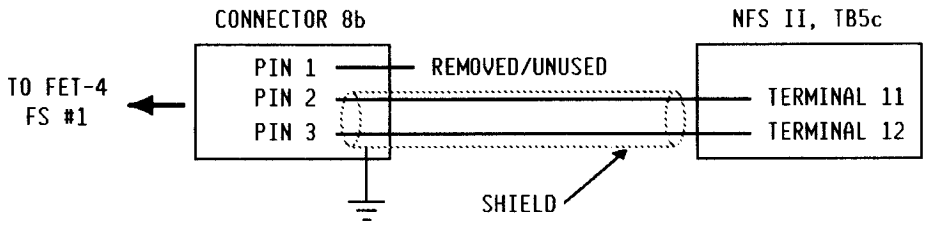
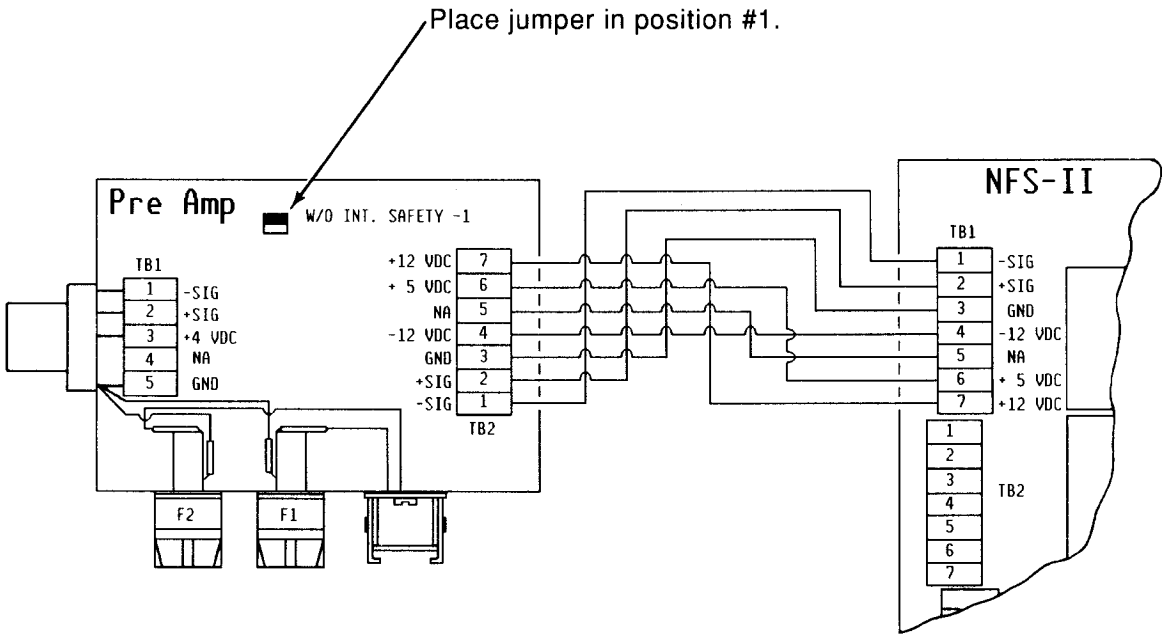


Figure 8 — Interface Cable Wiring Diagram

FLOW SENTRY SIGNAL CABLE

(Item D, Figure 2 - Customer Supplied)

Refer to Figure 9. The Flow Sentry Signal Cable connects the Pre-Amp to the NFS-II. The cable is a 6-Conductor, 3 twisted pair cable and **must be shielded**. Connect the shield of the cable to Pin 3 of TB1, TB2, TB3 or TB4 in the NFS-II monitor. Conductor size should be 18-22 AWG. This cable **should not** be in any conduit containing power conductors or adjacent to power conductors.



WIRE CONNECTIONS		
PRE AMP TB2	NFS-II TB1 OR 2-4	PIN FUNCTIONS
1	1	- SIGNAL
2	2	+ SIGNAL
3	3	GROUND
4	4	- 12 VDC
5	5	NOT USED
6	6	+ 5 VDC
7	7	+ 12 VDC

TWISTED PAIR GROUPS

1&2
3&6
4&7

Figure 9 — Flow Sentry Signal Cable

GUN MOUNTING

Refer to Figure 10 for gun mounting dimensions.

1. Using a ⅛ inch hex key, loosen set screws in the side of the gun body.

2. Install the A15A Gun to a ⅜ inch diameter rod on the can making machine Spray Arm. Mounting hole is 1-½ inches deep.

3. Securely tighten set screws on side of gun body to secure gun to mounting rod.

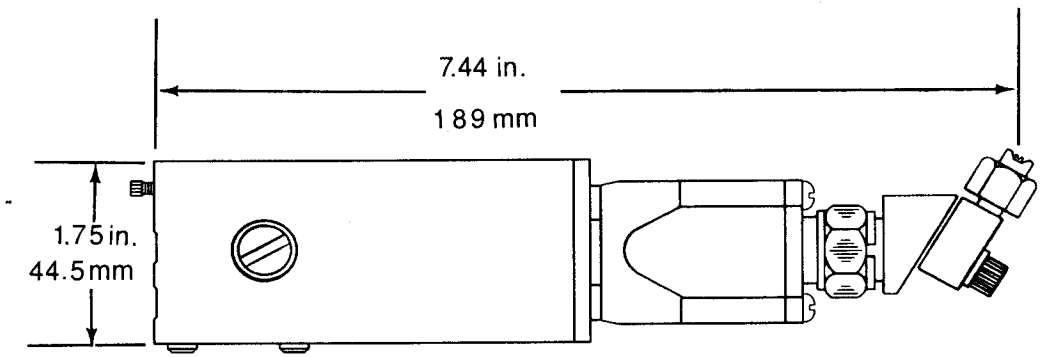


Figure 10 — Gun Mounting Dimensions

FLUID LINES

Refer to Figure 11.

1. Using a 7/16 inch open-end wrench, remove tube nuts from hydraulic tube connectors on gun.

2. Place nut on tubing (.190 inch OD x .120 inch ID) with open threaded end. Place ferrule on tubing with smaller end of ferrule toward tubing end.

3. Place tube end into connector. Slide tube nut forward to connector while capturing ferrule, and hand-tighten to hold in place. Tubing is properly aligned when tube nuts engage freely.

4. Using a wrench, securely tighten tube nuts to engage ferrule and prevent leakage.

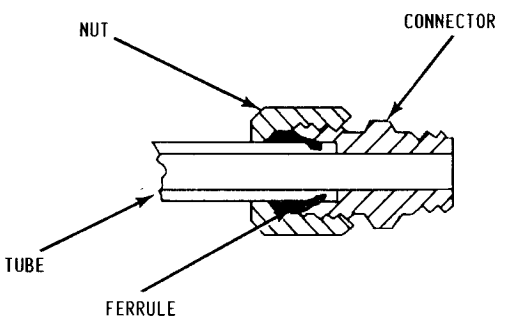


Figure 11 — Hydraulic Tube Connector Part Orientation

PROXIMITY SENSOR LOCATION

Refer to Figure 12.

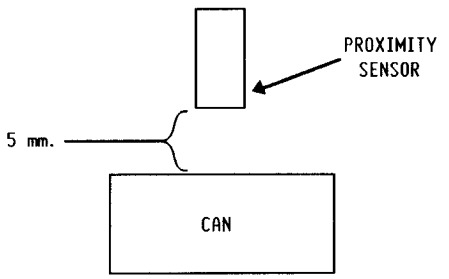


Figure 12 — Locating Proximity Sensor

1. Locate Proximity Sensor no more than one can length before the nozzle.

2. The Sensor face should be mounted within 5 mm of the can wall.

TRIGGER CABLE

(Item 2, Figure 2 - Rigid Nordson Cable)

1. Select length of Trigger Cable which best fits the installation from chart in System Options section of this manual.

2. Before inserting the cable into the gun body, make sure the O-Ring (supplied with cable) is in place in the connector cap.

3. Carefully insert the cable into the gun body. The Trigger Cable has a 2-Pin connector which is keyed. Twist the cable while gently pushing on connector until connection is made. Make certain the connection is solid.

4. Slide the protective cap forward and twist to secure tabs under screw heads. Using a 7/64 inch hex key, tighten screws to secure cable to gun.

TRANSDUCER CABLE

(Item 3, Figure 2 - Rigid Nordson Cable)

1. Select length of Transducer Cable which best fits the installation from chart in System Option section of this manual.

2. Using combination wrench supplied with gun, remove 5/8 inch plug from transducer cable port.

3. Before inserting transducer into gun body, make sure the O-Ring (supplied with the cable) is in place on the transducer face or in the transducer cable port in the body.

4. Carefully insert the transducer into the gun body. Thread cable connector into port. Using wrench supplied with the gun, securely tighten connector.

SPLITTER CABLE

(Item 4, Figure 2 - Flexible Nordson Cable)

1. Fixed spray arm installations:

   a. Determine required length of Splitter Cable, using information in Figure 13. Select appropriate Splitter Cable from chart in System Options section of this manual.

   b. Attach cable to Trigger Cable leading from the gun. Connectors push together.

   c. Attach cable to Transducer Cable leading from the gun. Connectors push together.

DETERMINING SPLITTER CABLE LENGTH FOR FIXED SPRAY ARM

(Refer to Figure 13)

A - Distance from end of Welding Arm to end of Spray Arm.
B - Distance from end of Spray Arm to back of A15A Gun.
C - Distance over all. (A + B)
D - Distance from beginning of the Spray Arm to point where Splitter Cable will enter the Spray Arm.
E - Splitter Cable length (mm).
F - Distance between the Welding Arm and the Spray Arm.

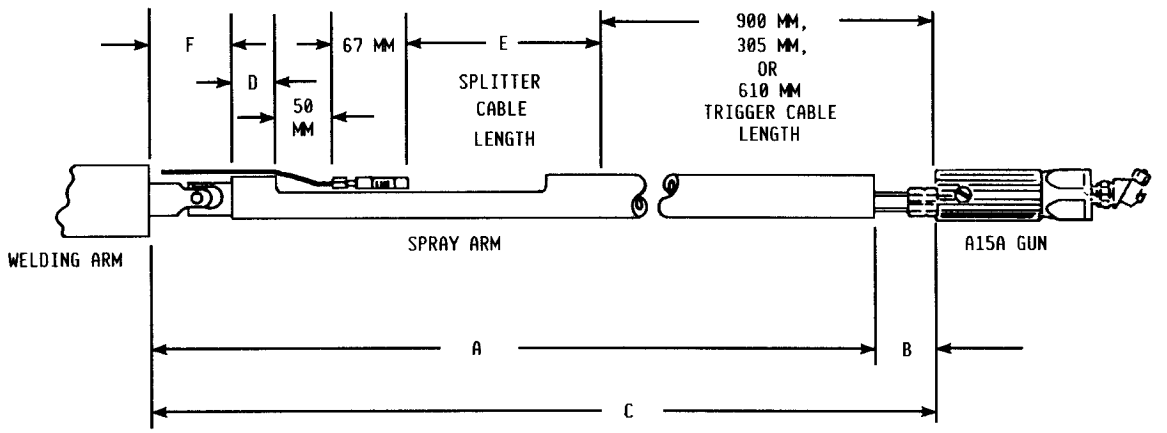


Figure 13 — Determining Splitter Cable Length

DISCONNECTING PUSH TOGETHER CONNECTORS

1. Refer to Figure 14. Hold only at points indicated to disconnect cables having connector style as shown.

2. Pull straight out to disconnect.

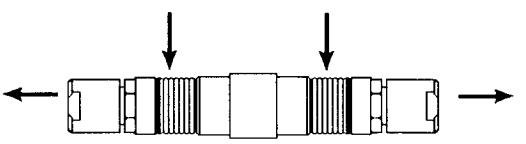


Figure 14 — Disconnecting Cables

WELD ARM CABLE

(Item 5, Figure 2 - Rigid Nordson Cable.)

1. Fixed Spray Arms:

   a. Determine if weld arm of Container Body Machine is grounded or isolated. Use insulated Weld Arm Cable on machines which have isolated Weld Arm.

NOTE: A ⅛ inch tube bender is helpful for bending Weld Arm Cable during installation.

NOTE: Insulated Weld Arm Cable has an O.D. of .157 inches (4 mm). Non-Insulated Weld Arm Cable has an O.D. of 0.125 inch (3.2 mm).

   b. Install weld arm cable in weld arm. Make sure cable is not bowed in such a way as to cause the cans to rub the cable casing, causing premature failure. If the insulated weld arm has been installed, there should be no continuity between the cable tube and the weld arm. Poor welds can result if an isolated weld arm is grounded via the weld arm cable.

   c. Connect the splitter cable to the weld arm cable after mounting the spray arm on the can body maker.

6-PIN PREAMP CABLE

(Item 6, Figure 2 - Flexible Nordson Cable)

1. Attach cable to Weld Arm Cable already installed. Connectors push together.

2. Attach other end of cable to 6-Pin Connector on PreAmp. Connectors push together.

WARNING - Relieve all pressure to the system BEFORE removing CO-Plate Plug, Nozzle, or Nozzle Holder and before making any adjustments to the Nozzle Holder slide assembly. Serious personal injury can result if pressure is not relieved prior to disassembly.

NOZZLES & CO-PLATES

Select appropriate Nozzle and CO-Plate from Tables in the System Options section of this manual.

CO-PLATE INSTALLATION

1. Using a standard screw driver, remove CO-Plate Plug from gun body.
2. Make sure O-Ring is in place on CO-Plate.
3. Loosely thread CO-Plate onto CO-Plate Puller.
4. Insert the puller into the gun body and push to seat the O-Ring.
5. Partially unscrew the puller and push again to ensure that CO-Plate is seated.
6. Unscrew puller to disengage CO-Plate and remove puller from gun body.
7. Make sure O-Ring is in place on CO-Plate Plug, then install plug and tighten securely.

POSITION ADJUSTABLE NOZZLE

1. Using combination wrench supplied with gun, install nozzle on holder.
2. Using same wrench, loosen retaining nut and swivel nozzle holder into position. Tighten retaining nut securely.
3. Using 5/32 inch hex key, carefully loosen slide adjust screws. **(NOTE: These screws WILL fall out if care is not taken).** Slide nozzle into required position. Tighten screws EVENLY and securely. (If screws are not tightened evenly, leaking will occur).

For additional information on Installation, see individual component manuals for the FET-4 Timer (Manual 17-7) and NFS-II Flow Sentry (Manual 17-8).

INSTALLATION: SYSTEM WITHOUT FLOW SENTRY

GENERAL INFORMATION

Refer to System Diagram WITHOUT Flow Sentry, Figure 3 for location of all system components.

Before installing Nordson or customer supplied cables, locate, mount and wire the main components of the system (FET-4 Timer and Proximity Sensor). See Manual 17-7 for instructions.

Part numbers for standard components are listed in the Component Selection & System Options section of this manual.

NOTE: The length of customer supplied cables is based on individual installation parameters.

POWER CABLE

(Item A, Figure 3 - Customer Supplied)

Refer to Figure 15. The Power Cable connects the FET-4 to the 2-Pin Power Cable. The cable is a 2-conductor cable and **does not need to be shielded**. Conductor size should be 18-22 AWG.

NOTE: Connector 6c is 2-Pole and is supplied with the FET-4 Timer. Connector 5a is 2-Pole and is supplied with the 2-Pin Power Cable.

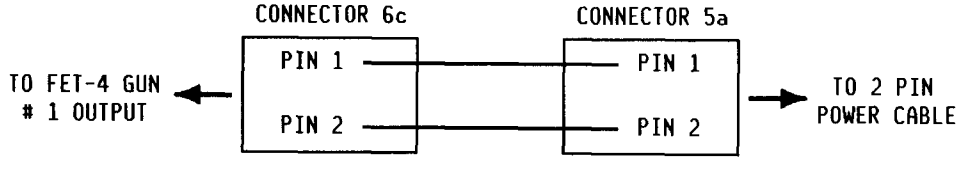


Figure 15 — Power Cable Wiring Diagram

SENSOR SIGNAL CABLE WITHOUT INTRINSIC SAFETY BARRIERS

(Item B, Figure 3 - Customer Supplied)

NOTE: This cable (WITHOUT Intrinsic Safety Barriers) should only be used for systems that DO NOT use solvent based materials.

Refer to Figure 16. The sensor Cable without Intrinsic Safety Barriers connects the FET-4 to the Proximity Sensor. The cable is a 3-conductor cable and **does not need to be shielded**. Conductor size should be 18-22 AWG.

NOTE: Connector 6b is 3-Pole and is supplied with the FET-4 Timer. Proximity Sensor 6a is supplied with the FET-4 Timer.

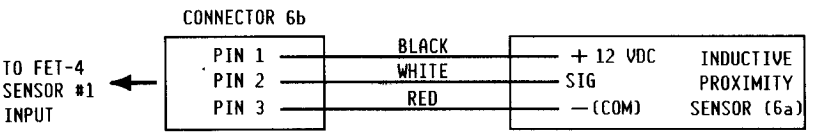


Figure 16 — Sensor Cable Without I/S Wiring Diagram

SENSOR SIGNAL CABLE WITH INTRINSIC SAFETY BARRIERS

(Items B & C, Figure 3 - Customer Supplied)

NOTE: This cable WITH Intrinsic Safety Barriers should be used for systems that use solvent based materials.

Refer to Figure 17. The Sensor Signal Cable with Intrinsic Safety barriers connects the FET-4 to the Proximity Sensor.

The cable is a 3-conductor cable and **must be shielded** however, the shield should NOT be connected at the plug end. Conductor size should be 18-22 AWG.

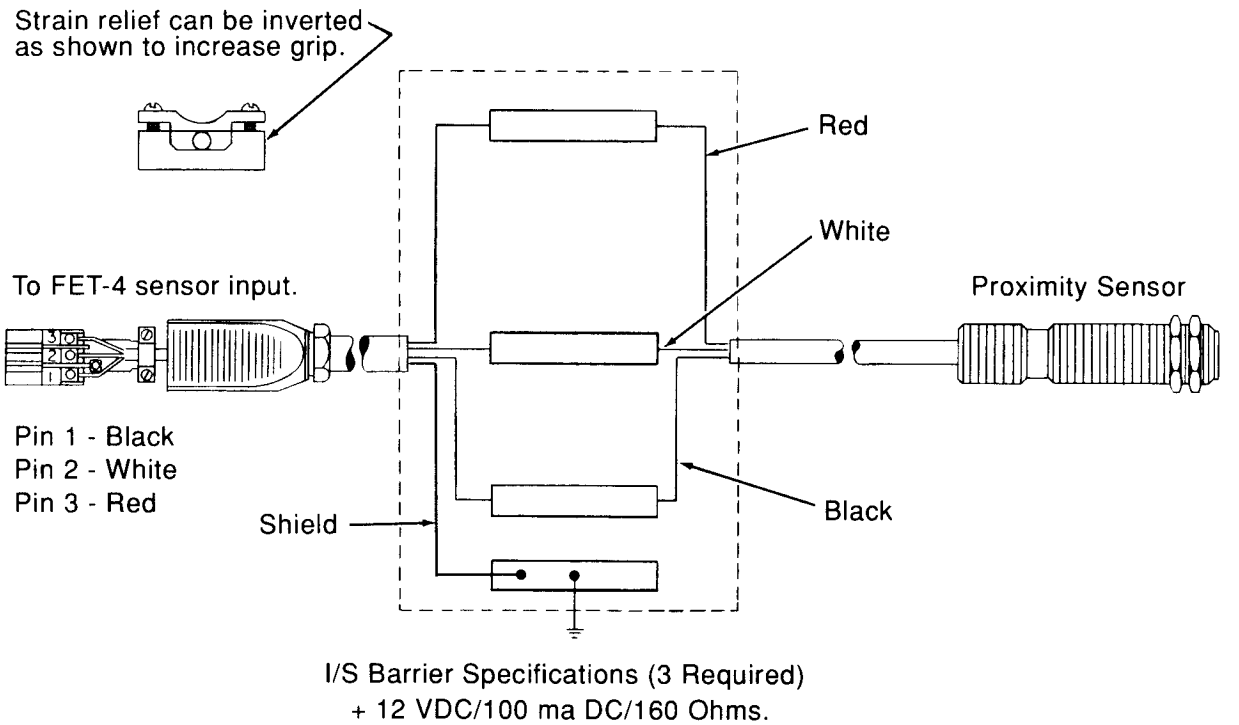


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Figure 17 — Sensor Signal Cable With Intrinsic Safety Barriers

NOTE: Connector 6b is 3-Pole and is supplied with the FET-4 Timer. Proximity Sensor 6a is also supplied with the FET-4 Timer.

NOTE: An additional connector (3-Pole with one pin removed) is supplied with the FET-4 Timer but is NOT used for systems without flow monitoring capabilities.

GUN MOUNTING

1. Using a 1/8 inch hex key, loosen set screws in the side of the gun body.

2. Install the A15A Gun on the end of the can making machine Spray Arm (3/8 inch diameter rod). Mounting hole is 1-1/2 inches deep.

3. Securely tighten set screws on side of gun body to secure gun to mounting rod.

FLUID LINES

Refer to Figure 18.

1. Using a 7/16 inch open-end wrench, remove tube nuts from hydraulic tube connectors on gun.

2. Using same wrench, make sure connectors are securely tightened in gun body.

3. Place nut on tubing (.190 inches OD x .120 inches ID) with open threaded end toward tubing end. Place ferrule on tubing with smaller end of ferrule toward tubing end.

4. Place tube end into connector. Slide tube nut forward to connector while capturing ferrule, and hand-tighten to hold in place. **(NOTE: Tubing is properly aligned when tube nuts engage freely.)** Using a wrench, securely tighten tube nuts to engage ferrule and prevent leakage.

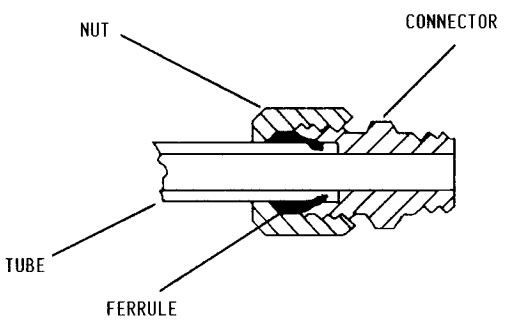

Figure 18 — Hydraulic Tube Connector Component Orientation

PROXIMITY SENSOR LOCATION

Refer to Figure 19.

1. Locate Proximity Sensor no more than one length before the nozzle.

2. The Sensor face should be mounted within 5 mm of the can wall.

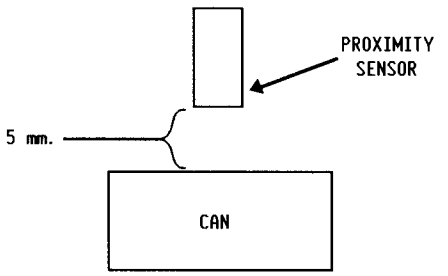

Figure 19 — Locating Proximity Sensor

TRIGGER CABLE

(Item 2, Figure 3 - Rigid Nordson Cable)

1. Select length of Trigger Cable which best fits the installation from chart in System Options section of this manual.

2. Before inserting the cable into the gun body, make sure the O-Ring (supplied with cable) is in place in the connector cap.

3. Carefully insert the cable into the gun body. The Trigger Cable has a 2-Pin connector which is keyed. Gently twist the cable while pushing on connector until connection is made. Make certain the connection is solid.

4. Slide the protective cap forward and twist to secure tabs under screw heads. Using a 7/64 inch hex key, tighten screws to secure cable to gun.

SPRAY ARM CABLE

(Item 3, Figure 3 - Flexible Nordson Cable or Precision Tools Quick Connect Cable)

Note: There are two types of spray arm cables. Cable selection depends on the type of spray arm (Quick Connect or Fixed) being used. Refer to the parts list for the spray arm cable part number.

1. For fixed spray arm installations:

   a. Refer to Figure 20 to determine required length of spray arm cable. Select appropriate spray arm cable from chart in System Options section of this manual.

   b. Attach cable to trigger cable leading from the gun. Connectors push together.

2. For quick connect spray arm installations:

   a. Refer to Precision Tools manual for attaching spray arm cable to trigger cable.

DETERMINING SPRAY ARM CABLE LENGTH

Refer to Figure 20.

A - Distance from end of Welding Arm to end of Spray Arm.
B - Distance from end of Spray Arm to back of A15A Gun.
C - Distance over all. (A + B)
D - Distance from beginning of the Spray Arm to point where spray arm cable will enter the spray arm.
E - Spray Arm cable Length
F - Distance between the Welding Arm and the Spray Arm.

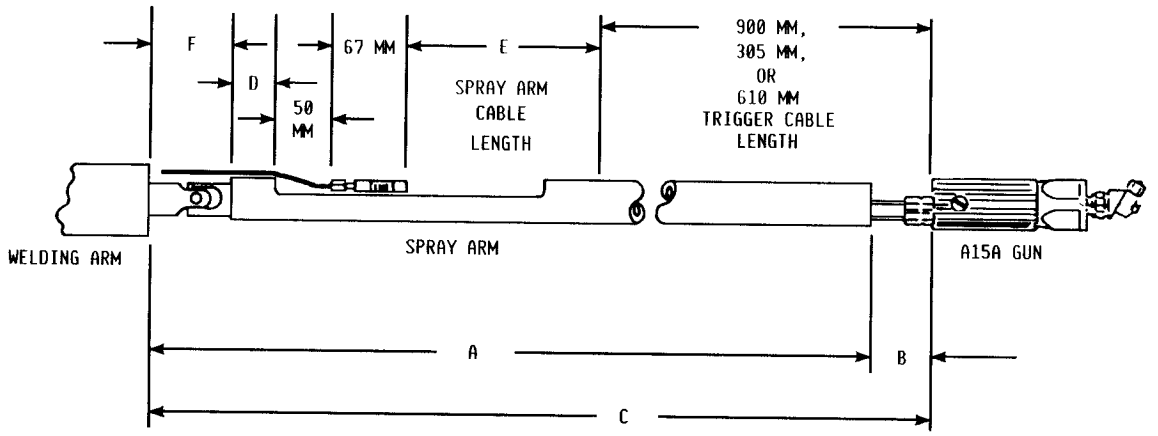

Figure 20 — Determinimg Spray Arm Cable Length

DISCONNECTING PUSH TOGETHER CONNECTORS

Refer to Figure 21.

1. To disconnect cables with connector style as shown, hold ONLY at points indicated.

2. Pull straight out to disconnect.

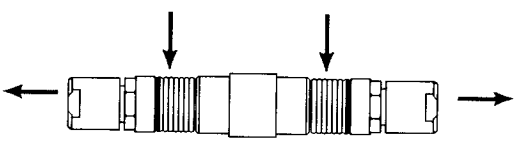

Figure 21 — Disconnecting Cables

WELD ARM CABLE

(Item 4, Figure 3 - Rigid Nordson Cable or Precision Tools Quick Connect Cable)

Note: There are two types of spray arm cables. Cable selection depends on the type of sray arm (Quick Connect or Fixed) being used. Refer to the parts list for the spray arm cable part number.

1. For fixed spray arm installations:

   a. Determine if weld arm of Container Body Machine is grounded or isolated. Use insulated Weld Arm Cable on machines which have isolated Weld Arm.

NOTE: A ⅛ inch tube bender is helpful for bending Weld Arm Cable during installation.

NOTE: Insulated Weld Arm Cable has an O.D. of .157 inches (4 mm). Non-Insulated Weld Arm Cable has an O.D. of 0.125 inch (3.2 mm).

   b. Install weld arm cable in weld arm. Make sure cable is not bowed in such a way as to cause the cans to rub the cable casing, causing premature failure. If the insulated weld arm has been installed, there should be no continuity between the cable tube and the weld arm. Poor welds can result if an isolated weld arm is grounded via the weld arm cable.

   c. Connect the spray arm cable to the weld arm cable after mounting the spray arm on the can body maker.

2. For quick connect spray arm installations:

   a. Refer to Precision Tools manual for procedures.

2-PIN POWER CABLE

(Item 5, Figure 3 - Flexible Nordson Cable or Percision Tools Cable)

NOTE: There are two types of 2-Pin Power Cables. Cable selection depends on the type of spray arm (quick connect or fixed) being used. Refer to the parts lists for 2-Pin Power Cable part numbers.

1. Attach cable to Weld Arm Cable already installed. Connectors push together.

2. Other end of cable will attach to Power Cable A when constructed. Connectors will push together.

WARNING - Relieve all pressure to the system BEFORE removing Nozzle or Nozzle Holder and before making any adjustments to the Nozzle Holder slide assembly. Serious personal injury can result if pressure is not relieved prior to disassembly.

NOZZLES

Select appropriate Nozzle from Tables in System Options section of this manual.

POSITION ADJUSTABLE NOZZLE

1. Using combination wrench supplied with gun, install nozzle on holder.

2. Using same wrench, loosen retaining nut and swivel nozzle holder into position. Tighten retaining nut securely.

3. Using 5/32 inch hex key, carefully loosen slide adjust screws. **(NOTE: These screws WILL fall out if care is not taken).**

4. Slide nozzle into required position. Tighten screws EVENLY and securely. If screws are not tightened evenly, leaking will occur.

A15A CABLE SELECTION GUIDELINES

Note: The Flow Sentry Option is not available for machines using the Precision Tools Ltd. Quick Connect Spray Arm at this time.

The A15A Electric Gun and Inside Stripe System is suitable for installation on body maker machines which have the Precision Tools Ltd. Quick Connect fixed spray arm. The weld arm outer diameter, availability of the flow sentry option, and cables, differ for fixed or quick connect spray arm installations. Refer to Table 1 for cable guideline data.

Table 1 — A15A Cable Selection Guidelines

FIXED SPRAY ARM

1. The minimum outer diameter of the weld arm the system can be installed on is 65mm.
2. The Flow Sentry option is available, provided the weld current frequency is greater than 250 Hz.
3. The weld arm cables (Figure 2, Item 5 and Figure 3, Item 4) are available from Nordson. The **INSULATED** weld arm cable must be used on machines having un-grounded weld arms. The **NON-INSULATED** weld arm cable is used on machines having grounded weld arms.
4. All other cables in the Selected Nordson Components list in Figures 2 and 3 are available from Nordson.

QUICK CONNECT SPRAY ARM

1. The minimum outer diameter of the weld arm the system can be installed on is 52mm.
2. The weld arm cable is available from Precision Tools Ltd. Each weld arm cable is designed for a specific weld arm.
3. The spray arm cable (Figure 3, Item 3) is available from Precision Tools Ltd. It is designed for a specific quick connect spray arm.
4. The 2-Pin Power cable (Figure 3, Item 5) is available from Precision Tools Ltd. It is only designed to mate with the Quick Connect weld arm cable.
5. All other cables in the Selected Nordson Components list in Figure 3 are available from Nordson.

SECTION 4
OPERATION

OPERATION
DETERMINING "DELAY" & "DURATION" TIME SETTINGS

"Delay" = (D x C) - Ro "Duration" = (L x C) - Rc

Ro = Open response Time, 12 milliseconds
Rc = Close Response Time, 10 milliseconds
D = Distance from Sensor Centerline to Nozzle Centerline (Inches)
L = Length of Can (Inches)
C = Can Speed (Milliseconds per Inch)

To Convert Feet per Minute to Milliseconds per Inch:

$$\frac{\text{Milliseconds}}{\text{Inch}} = \frac{5000}{\text{Can Ft/Min}}$$

To Convert Meters per Minute to Milliseconds per Inch:

$$\frac{\text{Milliseconds}}{\text{Inch}} = \frac{1523}{\text{Can M/Min}}$$

NOTE: Enter the times established for "Delay" and "Duration" on the Timer Module of the FET-4.

START-UP TEST

BEFORE pressurizing fluid system, manually trigger the gun using the FET-4 Test button to ensure proper electrical connection. A click should be heard from the A15A Gun.

START-UP, GUN & TIMER

After pressurizing fluid system run the Gun & Timer (without using the Flow Sentry) to ensure proper "delay" and "duration" settings.

START-UP WITH FLOW SENTRY

1. Turn on power to the Flow Sentry and allow approximately one minute warm-up.

2. If guns are not already firing, turn on power to the Timer.

3. Adjust Flow Sentry calibration knobs (on each Channel Board) until calibration lights are of equal intensity. While firing the A15A Gun via the test button on the Timer, adjust the Flow Sentry with the body maker weld current turned off. After proper calibration, recheck calibration lights with weld current turned on. Calibration lights should not change.

For additional information on Operation, see individual component manuals for the FET-4 Timer (Manual 17-7) and NFS-II Flow Sentry (Manual 17-8).

SECTION 5
TROUBLESHOOTING

PROBLEM
Gun Fails To Trigger.

Possible Cause:	**Suggested Correction:**
1. Poor electrical signal and/or connection.	1. Check signal source from FET-4 by depressing "Test" on the FET-4 E.G. Driver Module. Check wiring continuity.
2. Gun/Cable electrical component failure.	2. Turn off and lock out power to the gun at FET-4 Timer. Check Gun/Cable resistance using chart at end of this section.

PROBLEM
Gun Triggers, No Flow From Nozzle.

Possible Cause:	**Suggested Correction:**
1. Nozzle, CO-Plate, and/or filter screen dirty or blocked.	1. Relieve pressure to the system. Clean or replace nozzle, CO-Plate or Filter screen as necessary.

PROBLEM
Gun Fails To Turn Off

Possible Cause:	**Suggested Correction:**
1. Fluid pressure above maximum rating of 600 PSI (4200 kPa).	1. Reduce fluid pressure at pump.

PROBLEM
Gun Spitting

Possible Cause:

1. Air trapped in fluid system.

2. Dirty or worn Needle & Seat, and/or compression springs entwined or worn.

Suggested Correction:

1. Circulate fluid for several minutes to purge air from system.

2. Flush fluid system while triggering gun on and off. If spitting continues, disassemble gun and inspect for damage. Clean or replace parts as necessary.

Approximate Free-Length of Compression Springs
- Large Diameter (270 863) = .415 inches
- Small Diameter (248 519) = 1.215 inches

PROBLEM
Gun Leaking At Nozzle Retaining Nut

Possible Cause:

1. Loose connections.

Suggested Correction:

1. Check the following connection points; nozzle retaining nut, nozzle and hex socket head screws used to secure nozzle slide adjustment.

NOTE: The slide adjustment hex socket screws must be tightened EVENLY to prevent leakage.

PROBLEM
Gun Leaking Between Body And Seat

Possible Cause:

1. Damaged sealing O-Ring.

Suggested Correction:

1. Replace O-Ring.

PROBLEM
Gun Leaking Between Body And Circulation Body

Possible Cause:	**Suggested Correction:**
1. Damaged sealing O-Ring.	1. Replace O-Ring.

PROBLEM
Gun Leaking At Transducer Cable Port

Possible Cause:	**Suggested Correction:**
1. Damaged sealing O-Ring.	1. Replace O-Ring inside transducer cable port.

PROBLEM
Gun Leaking At Co-plate Port

Possible Cause:	**Suggested Correction:**
1. Damaged sealing O-Ring.	1. Replace O-Ring on CO-Plate Plug.

PROBLEM
"Low Flow" Alarm

Possible Cause:	**Suggested Correction:**
1. Nozzle plugging.	1. Clean or replace nozzle.
2. CO-Plate clogged.	2. Clean or replace CO-Plate.
3. CO-Plate too small.	3. Install CO-Plate with larger orifice.
4. Fluid pressure at pump is decreasing.	4. Check pump for correct operation.
5. Gun needle not completely raising off seat.	5. Disassemble gun and inspect needle & seat for wear or damage; inspect compression springs for fatigue. Approximate Free-Length of Compression Springs - Large Diameter (270 863) = .415 inches - Small Diameter (248 519) = 1.215 inches

PROBLEM
"High Flow" Alarm

Possible Cause:	**Suggested Correction:**
1. Nozzle worn or broken.	1.Replace nozzle.
2. CO-Plate too large.	2. Install CO-Plate with smaller orifice.
3. Pump pressure has increased.	3. Check pump for correct operation.
4. Nozzle retaining nut or slide adjustment leaking.	4. Check nozzle nut and hex socket head screws that secure slide adjustment. Replace adjustable nozzle assembly if necessary. **NOTE: The slide adjust hex socket screws must be tightened EVENLY to prevent leakage.**
5. Transducer wire shorted to ground.	5. Check continuity of cables chart at end of this section. Replace defective cable.

PROBLEM
"Pressure" Alarm

Possible Cause:	**Suggested Correction:**
1. Gun needle is not seating properly.	1. Disassemble gun and inspect for damage. Repalce parts as necessary.
2. Pump is cavitating.	2. Check fluid supply level. Check pump for correct operation.
3. Broken hydraulic lines.	3. Check hydraulic lines and replace if necessary.
4. Ball valve in return line open.	4. If open, close ball valve.
5. Filter clogging.	5. Clean or replace filter screen.
6. Worn or dirty ball check in pump.	6. Check pump for correct operation.
7. Pump packing leaking.	7. Check pump for correct operation.
8. Faulty air valve in pump.	8. Check pump for correct operation.

PROBLEM
"Pressure" Alarm (Cont.).

Possible Cause:	**Suggested Correction:**
9. Transducer wire shorted to ground.	9. Check continuity of cables using chart at end of this section. Replace defective cable.

PROBLEM
Calibration Lights Do Not Calibrate

Possible Cause:	**Suggested Correction:**
1. CO-Plate missing or wrong size for nozzle and pump pressure.	1. Select appropriate CO-Plate from Tables in System Options section of this manual.
2. Transducer wires in cable are damaged.	2. Measure resistance of cables, gun and transducer using chart at end of this section. Replace defective cable.

Resistance Chart

Wire Color		Green	White	Red	Brown	Blue	Black
	Pin	1	2	3	4	5	6
Green	1	N/A					
White	2	350Ω	N/A				
Red	3	265Ω	265Ω	N/A			
Brown	4	∞	∞	∞	N/A		
Blue	5	∞	∞	∞	18Ω	N/A	
Black	6	265Ω	265Ω	350Ω	∞	∞	N/A
	Case	∞	∞	∞	∞	∞	∞

Key: N/A = Not Applicable
∞ = Infinite resistance
Tolerance is: 3Ω

TESTING PROCEDURES

1. Disconnect & lock out power to the FET-4 & NFS-II.

2. Connect cables and "Troubleshooting Connector" as shown below.

3. Take resistance reading using Volt/Ohm Meter.

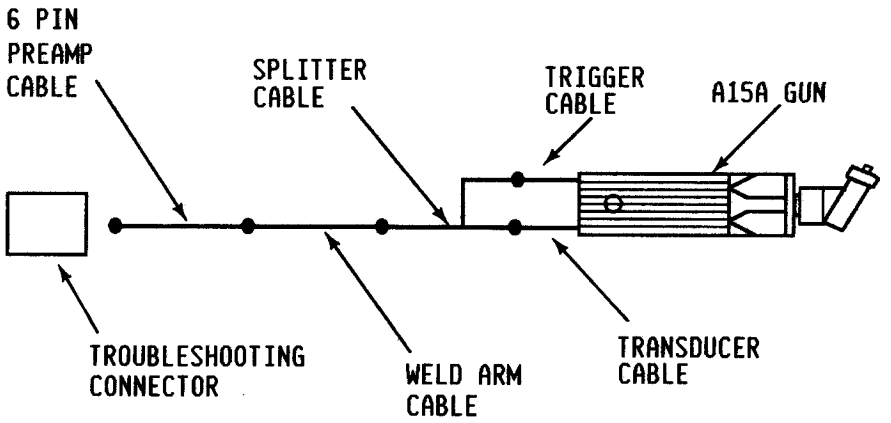

Figure 22 - Cable Troubleshooting Connections.

NOTE: To measure Gun Solenoid resistance, disassemble gun to remove Solenoid. Take resistance reading using Volt/Ohm Meter.

Gun Solenoid Resistance = 16 Ohms (+/- 8%) @ 25° C (77° F)

For additional information on Troubleshooting, see individual component manuals for the FET-4 Timer (Manual 17-7) and NFS-II Flow Sentry (Manual 17-8).

SECTION 6
DISASSEMBLY & REPAIR

NOTE: Refer to Parts List and Exploded View during disassembly.

DISASSEMBLY

1. Relieve all pressure to the system.

   WARNING - Serious personal injury can result if pressure is not relieved prior to disassembly.

2. Turn off and lockout electrical power to the FET-4 Timer and if used, the NFS-II Flow Sentry.

3. Using 1/8 inch hex key, loosen mounting Set Screws (17) and remove gun from mounting rod.

4. Using wrench supplied with gun, remove Nozzle Holder (11).

5. Using standard screwdriver, remove slotted Screws (24) which secure the Needle & Seat assembly to the Engraved Body.

   NOTE: Work across corners to reduce stress. It is easier to remove screws if seat is held against body while screws are loosened and removed. Otherwise, compression springs within the gun will push the seat against the screw heads making them difficult to remove.

6. Remove Seat & Needle (25) and Armature (23) from Engraved Body (26)

7. Remove two compression Springs (20 & 21) and O-Ring (8) from Engraved Body (26).

8. Unscrew Engraved Body (26) from Circulating Body (5) and remove O-Ring (8).

9. Using large channel-locks, unscrew Sleeve (7) from Circulating Body (5).

10. Remove Coil Cover (6), Curved Washer (22) and Solenoid (19) from Circulating Body (5).

NOTE: It may be easier to remove the Solenoid using a wooden dowel, or other similar non-metallic object, to push against the connector end of the coil through the Trigger Cable Port in the end of the Circulating Body.

11. Inspect and replace parts as necessary, using A15A Needle & Seat Repair Kit, A15A Seal Kit and/or components selected from the Parts List.

REASSEMBLY

1. Place Solenoid (19) into Circulating Body (5) with connector end of Solenoid extending into the Trigger Cable Port.

2. Place Coil Cover (6) onto Sleeve (7) with open end of cover toward smaller, threaded end of Sleeve.

3. Place Curved Washer (22) onto Sleeve (7) with curve toward smaller, threaded end of sleeve.

NOTE: The curved inside diameter of the Washer will press against the Solenoid when assembled.

4. Slide Sleeve (with Coil Cover & Washer) through center of Solenoid and thread into Circulation Body. Using same wrench as used during disassembly, tighten sleeve securely.

5. Hold Armature (23) with larger opening facing up. Place Needle (point side first) into armature.

6. Place smaller diameter Compression Spring (20) into Armature to fit over blunt end of Needle.

7. Place larger diameter Compression Spring (21) over first spring to seat against shoulder inside the Armature cavity.

8. Place Armature (with Needle and Springs) into seat. Gently depress Needle to ensure the Needle is seating properly.

9. While holding Seat with Armature, place assembly portion of gun over Armature assembly.

10. Push Seat and Gun assembly together until face of Seat is flush with gun body face.

11. While holding Seat against Gun body, insert Screws (24) and tighten securely. Tighten across corners to reduce stress.

12. Replace Nozzle Holder (11).

13. Mount Gun on mounting rod and tighten Set Screws (17) securely.

14. Check position of Nozzle and realign if necessary.

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SECTION 7
ILLUSTRATED PARTS LIST

Introduction

This illustrated parts list lists, illustrates, and describes all saleable assemblies, subassemblies, and detail parts for the A15A Electric Stripe Gun (Figure 16). These parts lists provide information for identifying and ordering parts. It also illustrates the assembly and disassembly relationship of those parts.

Parts Listed

In general, the assemblies and parts installed at the time manufacture are listed and identified in the following list(s). Repair kits (when available) are listed at the end of this section. Parts which lose their identities by being welded or riveted, or joined in such a manner as to prohibit disassembly are not listed. Items made from raw stock or bulk items, such as wire, are not normally listed. When maintenance requires the listing of bulk items, they are listed within the parts lists using the bulk stock part number followed by the notation "ASR." This notation indicates that a bulk quantity part number appears within the parts list and the part should be ordered "as required" by the application in the quantity desired.

Parts Lists

The parts lists consist of five columns of information as explained below:

The **REF**. column provides the index numbers used to key a part to its location on the illustration associated with the parts list. The illustration associated with the parts list is referenced immediately above the top the of the list. An "NS" in this column indicates that the part listed in is not shown in the associated figure.

The letter in the **NOTE** column is a reference to an unusual circumstance for this particular part, and it is explained further at the end of the list. Special attention should be paid to the noted part.

The number in the **PART NO**. column indicates the Nordson part number for the part. A dash signifies that the item is a nonsaleable part or a nonsaleable subassembly of a saleable assembly.

The **DESCRIPTION** column gives the name of the part together with its dimensions and other physical properties, where appropriate. Indented parts are subgroups of a major assembly or sub-assembly and are indented to show higher assembly/installation relationship.

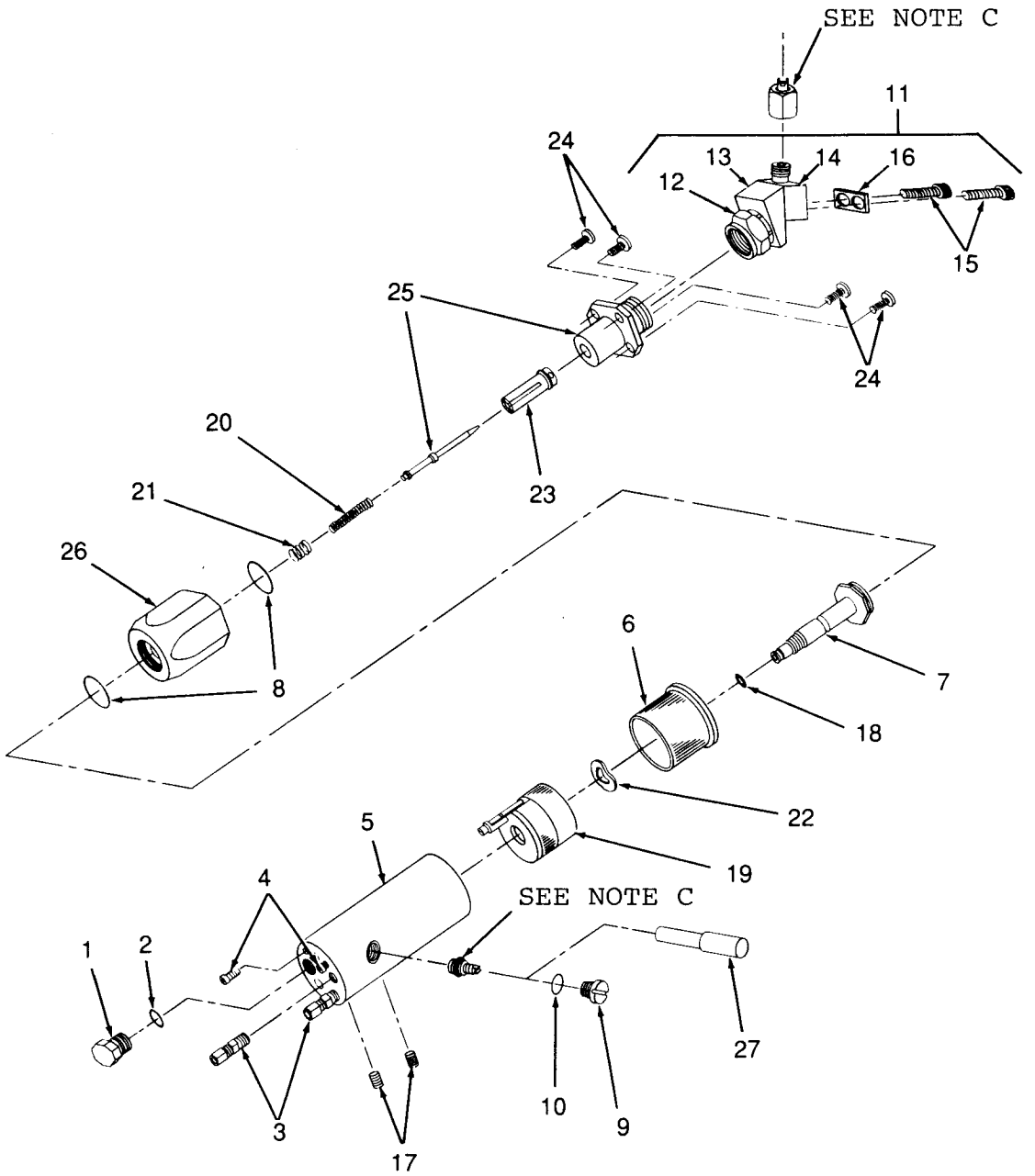
For example:

DESCRIPTION

Top Assembly or Installation.
. Assembly.
. . Detail Parts for above Assembly.
. . . Subassembly of above Detail Parts.
. . . . Detail parts of above subassembly.

The number in the **QTY** column indicates the quantity required per unit or assembly. When the quantity is not applicable, a dash appears in the column.

For additional information on Parts Listing, see individual component manuals for the FET-4 Timer (Manual 17-7) and NFS-II Flow Sentry (Manual 17-8).



PS-124

Figure 23 - A15A Electric Stripe Gun, Exploded View

Figure 23 - A15A Electric Stripe Gun, Exploded View

NOTE: Names of Parts Included in an assembly are Indented after Each Assembly or Sub-Assembly.

REF	NOTE	PART NO	DESCRIPTION	QTY
--	C	248 518	Gun, Electric Stripe, A15A	--
1		972 012	. Plug, O-Ring Boss, 1/2-20 Str Thd	1
2	D	945 042	. O-Ring, Thiokol, .312 Tube	1
3		971 769	. Connector, Tube, .190 OD x .120 ID	2
4		981 505	. Screw, Skt Hd, 6-32 x .375	2
5		248 517	. Body, A15A, Circulation	1
6		248 510	. Cover, Coil	1
7		248 508	. Sleeve	1
8		940 193	. O-Ring, Thiokol, .813 x .938 x .063	2
9		248 502	. Plug, CO-Plate	1
10	D	945 043	. O-Ring, Thiokol, .190 Tube	1
11		248 504	. Holder, Nozzle, Adjustable	1
12		152 496	. . Nut, Retaining	1
13		248 515	. . Guide, Nozzle Holder	1
14		248 516	. . Holder, Nozzle	1
15		981 164	. . Screw, Skt Hd, 10-32 x .75	2
16		248 503	. . Washer	1
17		981 213	. Screw, Set 1/4-20 x 1/4 Lg	2
18	D	940 106	. O-Ring, Thiokol, .250 x .375 x .063	1
19		248 509	. Cap, Solenoid Coil	1
20		248 519	. Spring, Comp. .188 OD x 1.215 Lg	1
21		270 863	. Spring, Comp. .247 OD x .415 Lg	1
22		983 604	. Spring, Curved Washer	1
23		246 072	. Armature, A10A	1
24		981 160	. Screw, Pan Hd, 10-32 x 1/2, Sl Zn	4
25		248 514	. Needle and Seat	1
26		--- ---	. Body, Engraved	1
27	A	247 638	. CO-Plate Puller	1
NS	A,B	152 999	. Combination Wrench	1
NS	A,B	901 905	. Nozzle Brush	1

NOTES

NOTE (A) - Shipped loose with the A15A Gun.

NOTE (B) - Not Shown.

NOTE (C) - Cables, Nozzles and CO-Plates must be ordered separately.

NOTE (D) - When installing, use O-Ring lube (P/N 900 223).

REPAIR KITS

NOTE: Names of Parts Included in an Assembly are Indented after Each Assembly or Sub-Assembly.

Ref.	Note	Part No.	Description	Qty.
--		106 411	Kit, A15A Needle and Seat	--
8		940 193	• O-Ring, Thiokol, .813 x .938 x .063	2
18		940 106	• O-Ring, Thiokol, .250 x .375 x .063	1
20		248 519	• Spring, Comp. .188 OD x 1.215 Lg	1
21		270 863	• Spring, Comp. .247 OD x .415 Lg	1
24		981 160	• Screw, Pan Hd, 10-32 x 1/2, Sl Zn	4
25		248 514	• Needle and Seat	1

Ref.	Note	Part No.	Description	Qty.
--		106 170	Kit, A15A Seal	-
2		945 042	• O-Ring, Thiokol, .312 Tube	1
8		940 193	• O-Ring, Thiokol, .813 x .938 x .063	2
10		945 043	• O-Ring, Thiokol, .190 Tube	1
18		940 106	• O-Ring, Thiokol, .250 x .375 x .063	1
NS		940 083	• O-Ring, Thiokol, .188 x .313 x ..063 (Used on Transducer Cable)	1
NS		940 121	• O-Ring, Viton®, .375 x .500 x .063 (Used on Trigger Cable)	1
NS		940 061	• O-Ring, Hot Paint, .125 x .250 x .063 (Used on CO-Plate)	1

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PUBLICATION P/N 107 956

SECTION 8
OPTIONS AND ACCESSORIES

NOZZLE SELECTION

PART NO.	G.P.M.	PATTERN WIDTH
221 140	.035	3.5
221 141	.025	3.0
221 142	.020	2.5
221 143	.015	2.5
221 144	.010	2.0
221 145	.015	0.8

Flow Rate is measured using water at 500 PSI.
Fan Pattern is shown in inches, and is measured with gun one inch from product.

CO-PLATE SELECTION

NOTE: CO-Plate designation number is on front of CO-Plate.

Proper CO-Plate selection is important to the operation of the Electric Inside Stripe System.

Refer to chart. To select a CO-Plate, cross-reference the selected Nozzle size with the system Fluid Pressure.

This is only a starting point. Selection may vary with individual installation characteristics.

	FLUID PRESSURE (PSI)					
NOZZLE	250	300	350	400	450	500
.010				247 707 (015)	247 708 (02)	—
.015		247 707 (015)	247 708 (02)	247 708 (02)	247 709 (025)	—
.020	247 707 (015)	247 708 (02)	247 709 (025)	247 709 (025)	247 709 (025)	—
.025	247 708 (02)	247 709 (025)	247 710 (03)	247 710 (03)	247 711 (04)	—
.035	247 709 (025)	247 710 (03)	247 710 (03)	247 711 (04)	247 712 (05)	—
CO-Plate Part Number: XXX XXX CO-Plate Designation: (XX)						

SYSTEM OPTIONS - WITH FLOW SENTRY

NOTE: Refer to Figure 2 for System Diagram.

COMPONENT SELECTION

NOTE: Names of Parts Included in an Assembly are Indented after Each Assembly or Sub-Assembly.

DESCRIPTION	REF.	PART NUMBER	QTY
A15A Electric Stripe Gun	1	248 518	1
Trigger Cable (Rigid)	2	(Notes A & B) 248 863 (305 mm) 249 349 (610 mm) 111 985 (900 mm)	1
• O-Ring, Thiokol	NS	940 121	1
Transducer Cable (Rigid)	3	(Notes A & B) 248 872 (222 mm) 249 350 (527 mm) 113 819 (817 mm)	1
• O-Ring, Thiokol	3a	940 083	1
Splitter Cable (Flexible) Fixed Spray Arm	4	(Note A & D) 249 052 (400 mm) 249 053 (600 mm) 249 054 (800 mm) 249 055 (1000 mm) 249 056 (1200 mm)	1
Weld Arm Cable (Rigid) Fixed Spray Arm • Non-Insulated Cable • Insulated Cable	5	(Note A & D) 248 851 (1625 mm) 104 921 (1625 mm)	1
6-Pin Preamp Cable (Flexible) Fixed Spray Arm	6	(Note D) 248 888 (1800 mm)	1
NFS-II PreAmp • 2-Pole Female Connector	7 7a	121 063 248 882	1 per gun
FET-4 Timer • FET-4 Proximity Sensor • 3-Pole Male Connector	8 8a 8b	248 356 248 351 248 350 (Note C)	1 1 1

COMPONENT SELECTION (Cont.)

NOTE: Names of Parts Included in an Assembly are Indented after Each Assembly or Sub-Assembly.

DESCRIPTION	REF.	PART NUMBER	QTY
• 3-Pole Male Connector	8c	296 095	1
• 2-Pole Male Connector	8d	296 094	1
NFS-II Flow Sentry	9	248 553 (100/120 VAC) - or - 248 554 (200/240 VAC)	1

NOTES:
A - Select one. See installation to determine correct length.
B - The 305 mm Trigger Cable and the 222 mm Transducer Cable form a matched set.
- The 610 mm Trigger Cable and the 527 mm Transducer Cable form a matched set.
- The 817 mm Transducer Cable and the 900 mm Trigger Cable form a matched set.
C - Pin # 1 is removed from this connector.
D - For fixed spray arms only.

CUSTOMER SUPPLIED COMPONENTS

NOTE: Refer to Installation Section for wiring instructions.

DESCRIPTION	REF.	PART NUMBER	QTY
Power Cable	A	2-Conductor	1
Sensor Signal Cable	B	3-Conductor	1
Interface Cable	C	2-Conductor	1
Flow Sentry Signal Cable	D	6-Conductor	1
Optional Safety Barrier (FET-4/Proximity Sensor)	E	+12VDC/100mA DC/160Ω	3

ACCESSORIES & OPTIONS

DESCRIPTION	PART NUMBER
Troubleshooting Connector	248 524
FET-4 Wall Mounting Bracket	248 339
Kit, Proximity Sensor	248 368 (See Note A)
• Proximity Sensor	248 351
• 3-Pole Male Connector	296 095
Kit, Expansion, FET-4 w/Timer	106 410 (See Note B)
• E.G. Driver Module	248 355
• Transistor Heat Sink Ass'y	296 047
• Timer Module (PC-10)	296 051

ACCESSORIES & OPTIONS (Cont.)

DESCRIPTION	PART NUMBER
Kit, Expansion, FET-4	106 409 (See Note C)
• E.G. Driver Module	248 355
• Transistor Heat Sink Ass'y	296 047
Connector, 3-Pole Male	248 350 (See Note D)
Connector, 2-Pole Male	296 094 (See Note E)
Kit, Relay & Board NFS-II	106 412 (See Note F)
• Channel Circuit Board	248 556
• 12V Subminiature Relay	247 741
Nozzles	See Separate Listing
CO-Plates	See Separate Listing

NOTES:

A - An additional Inductive Proximity Sensor is required for installations that are using one FET-4 to control two guns on two separate lines.

B - An Expansion Kit with Timer is required for installations that are using one FET-4 to control two guns on two separate lines.

C - An Expansion Kit without Timer is required for installations that are using one FET-4 to control two guns on one line firing with same delay and duration times.

D - Pin #1 is removed from this connector. This connector must be ordered separately for each additional Gun that will be flow monitored.

E - This connector must be ordered separately when ordering any Expansion Kit that contains an E.G. Driver Module.

F - An NFS-II Relay & Channel Board Kit is required for installation with two guns.

SYSTEM COMPONENTS - WITHOUT FLOW SENTRY

NOTE: Refer to Figure 3 for System Diagram.

COMPONENT SELECTION

NOTE: Names of Parts Included in an Assembly are Indented after Each Assembly or Sub-Assembly.

DESCRIPTION	REF.	PART NUMBER	QTY
A15A Electric Stripe Gun	1	248 518	1
Trigger Cable (Rigid)	2	(Note A)	1
		248 863 (305 mm)	
		249 349 (610 mm)	
		111 985 (900 mm)	
•O-Ring, Thiokol	NS	940 121 (900 mm)	1

COMPONENT SELECTION (Cont.)

NOTE: Names of Parts Included in an Assembly are Indented after Each Assembly or Sub-Assembly.

DESCRIPTION	REF.	PART NUMBER	QTY
Spray Arm Cable (Flexible)	3	(Note A & C)	1
Fixed Spray Arms		249 069 (400 mm)	
		249 070 (600 mm)	
		249 071 (800 mm)	
		249 072 (1000 mm)	
		249 073 (1200 mm)	
Quick Connect Spray Arm		(Note D)	
Weld Arm Cable (Rigid)	4	(Note A & C)	1
Fixed Spray Arms			
• Non-Insulated Cable		248 851 (1625 mm)	
• Insulated Cable		104 921(1625 mm)	
Quick Connect Spray Arm		(Note D)	
2-Pin Power Cable (Flexible)	5	(Note C)	1
Fixed Spray Arms		121 066	1
• 2-Pole Female Connector	5a	248 882	1
Quick Connect Spray Arm		(Note D)	1
FET-4 Timer	6	248 356	1
• FET-4 Proximity Sensor	6a	248 351	1
• 3-Pole Male Connector	6b	296 095	1
• 2-Pole Male Connector	6c	296 094	1
• 3-Pole Male Connector	6d	248 350 (Note B)	1

NOTES:

A - Select one. See installation to determine correct length.

B - This connector is supplied with the FET-4 but is NOT used for systems without flow monitoring capabilities.

C - Determine if spray arm is fixed or quick connect.

D - Part number selection is based upon welder and weld arm serial number.

CUSTOMER SUPPLIED COMPONENTS

NOTE: Refer to Installation Section for wiring instructions.

DESCRIPTION	REF.	PART NUMBER	QTY
Power Cable A, 2-Conductors	1		
Sensor Signal Cable	B	3-Conductors	1
Optional Safety Barriers (FET-4/Proximity Sensor)	C	12VDC, 100mA, 160Ω	3

ACCESSORIES & OPTIONS

SYSTEM OPTIONS	PART NUMBER
Troubleshooting Connector	248 524
FET-4 Wall Mounting Bracket	248 339
Kit, Proximity Sensor	248 368 (See Note A)
• Proximity Sensor	248 351
• 3-Pole Male Connector	296 095
Kit, Expansion, FET-4 w/Timer	106 410 (See Note B)
• E.G.Driver Module	248 355
• Transistor Heat Sink Ass'y	296 047
• Timer Module (PC-10)	296 051
Kit, Expansion, FET-4	106 409 (See Note C)
• E.G.Driver Module	248 355
• Transistor Heat Sink Ass'y	296 047
Connector, 2-Pole Male	296 094 (See Note D)
Nozzles	See Separate Listing
CO-Plates	See Separate Listing

NOTES:

A - An additional Inductive Proximity Sensor is required for installations that are using one FET-4 to control two guns on two separate lines.

B - An Expansion Kit with Timer is required for installations that are using one FET-4 to control two guns on two separate lines.

C - An Expansion Kit without Timer is required for installations that are using one FET-4 to control two guns on one line.

D - This connector must be ordered separately when ordering any Expansion Kit that contains an E.G. Driver Module.

SECTION 9
TECHNICAL DATA

SPECIFICATIONS, A15A Gun

The A15A gun may be used with non-pigmented, solvent or water-borne materials, including high-solids.

FM Approved - Class I, Division 1 and 2, Group D.

Maximum Fluid Pressure:	600 PSI (4200 kPa)
Minimum Can Size:	2:02
Cycle Rate:	700 Cans per Minute (For 4" Stripe with 1/2" Gap)
Opening Response Time:	12 milli-seconds
Closing Response Time:	10 milli-seconds
Electrical Characteristics:	16 VDC, .9 amps Continuous
Gun Length:	188 mm.
Gun Width:	41.4 mm.
Gun Mounting Hole:	9.8 mm. Dia. X 15.7 mm. deep.
Weight:	1 Pound, 14 Ounces (0.85 kilograms)