SureMix™ Dispensing System with PanelView 1000 Controller

Customer Product
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NORDSON CORPORATION • AMHERST, OHIO • USA

Contact Us

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Safety

Read and follow these safety instructions. Task- and equipment-specific warnings, cautions, and instructions are included in equipment documentation where appropriate.

Make sure all equipment documentation, including these instructions, is accessible to persons operating or servicing equipment.

Qualified Personnel

Equipment owners are responsible for making sure that Nordson equipment is installed, operated, and serviced by qualified personnel. Qualified personnel are those employees or contractors who are trained to safely perform their assigned tasks. They are familiar with all relevant safety rules and regulations and are physically capable of performing their assigned tasks.

Intended Use

Use of Nordson equipment in ways other than those described in the documentation supplied with the equipment may result in injury to persons or damage to property.

Some examples of unintended use of equipment include

- using incompatible materials
- making unauthorized modifications
- removing or bypassing safety guards or interlocks
- using incompatible or damaged parts
- using unapproved auxiliary equipment
- operating equipment in excess of maximum ratings

Regulations and Approvals

Make sure all equipment is rated and approved for the environment in which it is used. Any approvals obtained for Nordson equipment will be voided if instructions for installation, operation, and service are not followed.

Personal Safety

To prevent injury follow these instructions.

- Do not operate or service equipment unless you are qualified.
- Do not operate equipment unless safety guards, doors, or covers are intact and automatic interlocks are operating properly. Do not bypass or disarm any safety devices.
- Keep clear of moving equipment. Before adjusting or servicing moving equipment, shut off the power supply and wait until the equipment comes to a complete stop. Lock out power and secure the equipment to prevent unexpected movement.
- Relieve (bleed off) hydraulic and pneumatic pressure before adjusting or servicing pressurized systems or components. Disconnect, lock out, and tag switches before servicing electrical equipment.
- While operating manual spray guns, make sure you are grounded. Wear electrically conductive gloves or a grounding strap connected to the gun handle or other true earth ground. Do not wear or carry metallic objects such as jewelry or tools.
- If you receive even a slight electrical shock, shut down all electrical or electrostatic equipment immediately. Do not restart the equipment until the problem has been identified and corrected.
- Obtain and read Material Safety Data Sheets (MSDS) for all materials used. Follow the manufacturer's instructions for safe handling and use of materials, and use recommended personal protection devices.
- Make sure the spray area is adequately ventilated.
- To prevent injury, be aware of less-obvious dangers in the workplace that often cannot be completely eliminated, such as hot surfaces, sharp edges, energized electrical circuits, and moving parts that cannot be enclosed or otherwise guarded for practical reasons.

High-Pressure Fluids

High-pressure fluids, unless they are safely contained, are extremely hazardous. Always relieve fluid pressure before adjusting or servicing high pressure equipment. A jet of high-pressure fluid can cut like a knife and cause serious bodily injury, amputation, or death. Fluids penetrating the skin can also cause toxic poisoning.

If you suffer a fluid injection injury, seek medical care immediately. If possible, provide a copy of the MSDS for the injected fluid to the health care provider.

The National Spray Equipment Manufacturers Association has created a wallet card that you should carry when you are operating high-pressure spray equipment. These cards are supplied with your equipment. The following is the text of this card:

WARNING: Any injury caused by high pressure liquid can be serious. If you are injured or even suspect an injury:

- Go to an emergency room immediately.
- Tell the doctor that you suspect an injection injury.
- Show him this card
- Tell him what kind of material you were spraying

MEDICAL ALERT—AIRLESS SPRAY WOUNDS: NOTE TO PHYSICIAN

Injection in the skin is a serious traumatic injury. It is important to treat the injury surgically as soon as possible. Do not delay treatment to research toxicity. Toxicity is a concern with some exotic coatings injected directly into the bloodstream.

Consultation with a plastic surgeon or a reconstructive hand surgeon may be advisable.

The seriousness of the wound depends on where the injury is on the body, whether the substance hit something on its way in and deflected causing more damage, and many other variables including skin microflora residing in the paint or gun which are blasted into the wound. If the injected paint contains acrylic latex and titanium dioxide that damage the tissue's resistance to infection, bacterial growth will flourish. The treatment that doctors recommend for an injection injury to the hand includes immediate decompression of the closed vascular compartments of the hand to release the underlying tissue distended by the injected paint, judicious wound debridement, and immediate antibiotic treatment.

Fire Safety

To avoid a fire or explosion, follow these instructions.

- Ground all conductive equipment. Use only grounded air and fluid hoses. Check equipment and workpiece grounding devices regularly. Resistance to ground must not exceed one megohm.
- Shut down all equipment immediately if you notice static sparking or arcing. Do not restart the equipment until the cause has been identified and corrected.
- Do not smoke, weld, grind, or use open flames where flammable materials are being used or stored.
- Do not heat materials to temperatures above those recommended by the manufacturer. Make sure heat monitoring and limiting devices are working properly.
- Provide adequate ventilation to prevent dangerous concentrations of volatile particles or vapors. Refer to local codes or your material MSDS for guidance.
- Do not disconnect live electrical circuits when working with flammable materials. Shut off power at a disconnect switch first to prevent sparking.
- Know where emergency stop buttons, shutoff valves, and fire extinguishers are located. If a fire starts in a spray booth, immediately shut off the spray system and exhaust fans.
- Shut off electrostatic power and ground the charging system before adjusting, cleaning, or repairing electrostatic equipment.
- Clean, maintain, test, and repair equipment according to the instructions in your equipment documentation.
- Use only replacement parts that are designed for use with original equipment. Contact your Nordson representative for parts information and advice.

Halogenated Hydrocarbon Solvent Hazards

Do not use halogenated hydrocarbon solvents in a pressurized system that contains aluminum components. Under pressure, these solvents can react with aluminum and explode, causing injury, death, or property damage. Halogenated hydrocarbon solvents contain one or more of the following elements:

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.

Description

See Figure 1. The SureMix Dispensing System is designed for application of two-component materials.

The system consists of two 4.5 CC gear-metering pumps and a SureMix controller. Manual and automatic systems are available. The system can be configured either with or without temperature conditioning.

4.5 CC Gear-Metering Pumps

Each gear-metering pump is powered by a motor and is driven by an inline gear head. The inline gear head uses the motor input to increase torque and decrease speed. The motor speed determines the material flow rate. Flow rate adjustments are made at the SureMix controller.

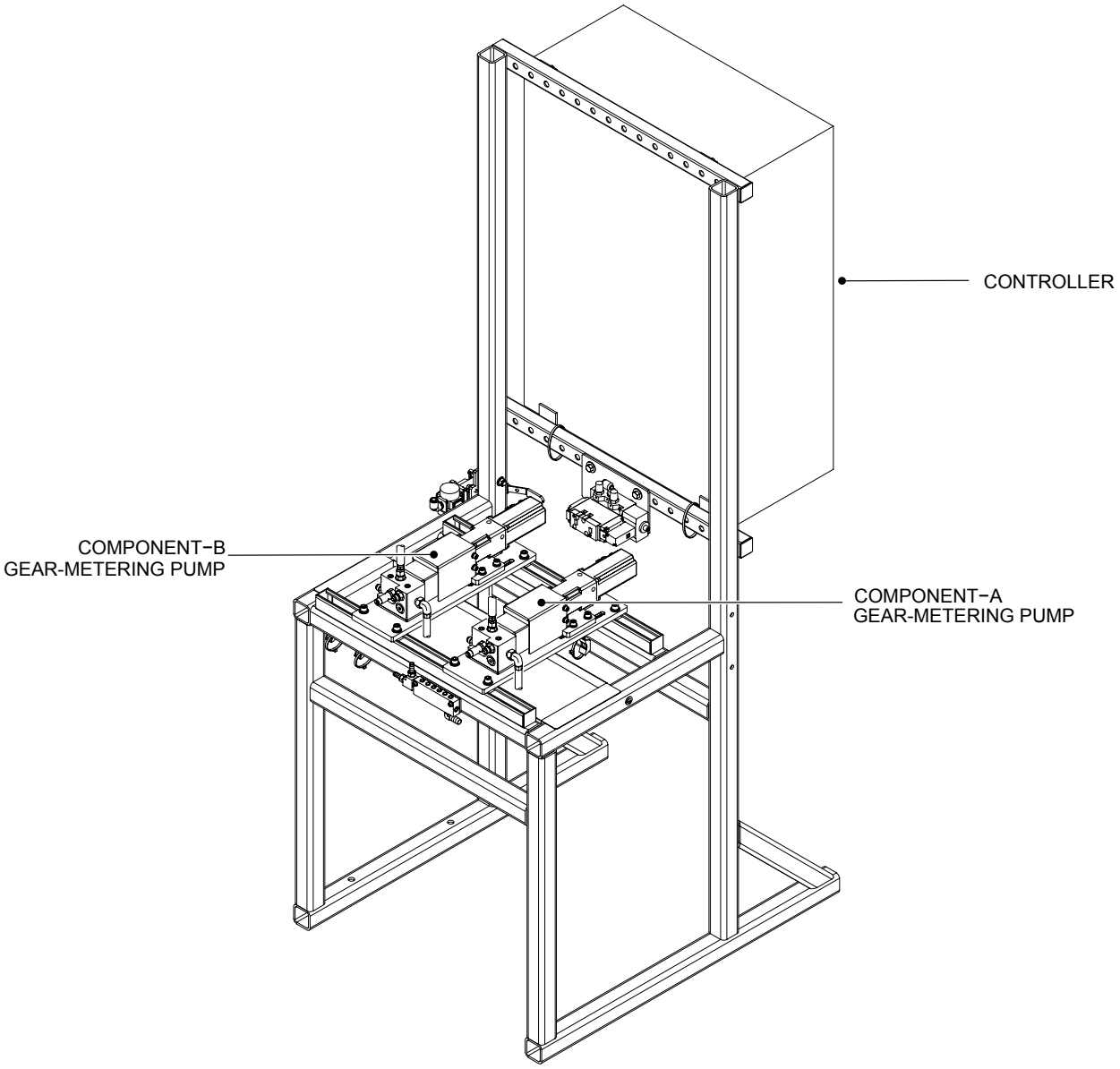


Figure 1 SureMix Dispensing System

SureMix Controller

See Figure 2 and refer to Table 1. The controller consists of a PanelView 1000 Plus terminal and operator controls. The controller

- maintains a consistent dispensed volume even as the viscosity of the material varies.
- monitors shear-thinning effects of the material and automatically adjusts the dispensing rate.
- displays recovery procedures if operation faults are generated by the controller or gun.

Diagnostic capabilities include self-testing and fault detection. The controller constantly monitors the dispense operation and relays fault conditions to the robot.

When a fault occurs, a fault message along with the appropriate corrective action appears on the touch screen. The operator can

- stop the system and correct the fault.
- run the system and correct the fault later.

Refer to the *SureMix Controller Screens* section for more information.

Table 1 Controller components

Item	Description
1	Main Power Switch—Enables and disables main power to the controller.
2	Touch screen—Operator interface for the system PLC. Refer to the *Operator Interface* section for more information.
3	FOR PROGRAMMERS ONLY—PLC programming port
4	Operator Controls: CONTROL POWER ON—Main power START—Enables power to the controller STOP—Disables power to the controller MIXER TUBE TIME EXCEEDED—Resets the Mixer Tube Time Out fault.
5	Connector Panel: GUN SOLENOID—Cable connection for the gun solenoid DEVICENET OUTPUT—Cable connection for the DeviceNet TEMPERATURE CONDITIONER—Cable connection for the temperature conditioning unit COMPONENT A PRESSURE—Cable connection for the Component A pressure transducer. COMPONENT B PRESSURE—Cable connection for the Component B pressure transducer.

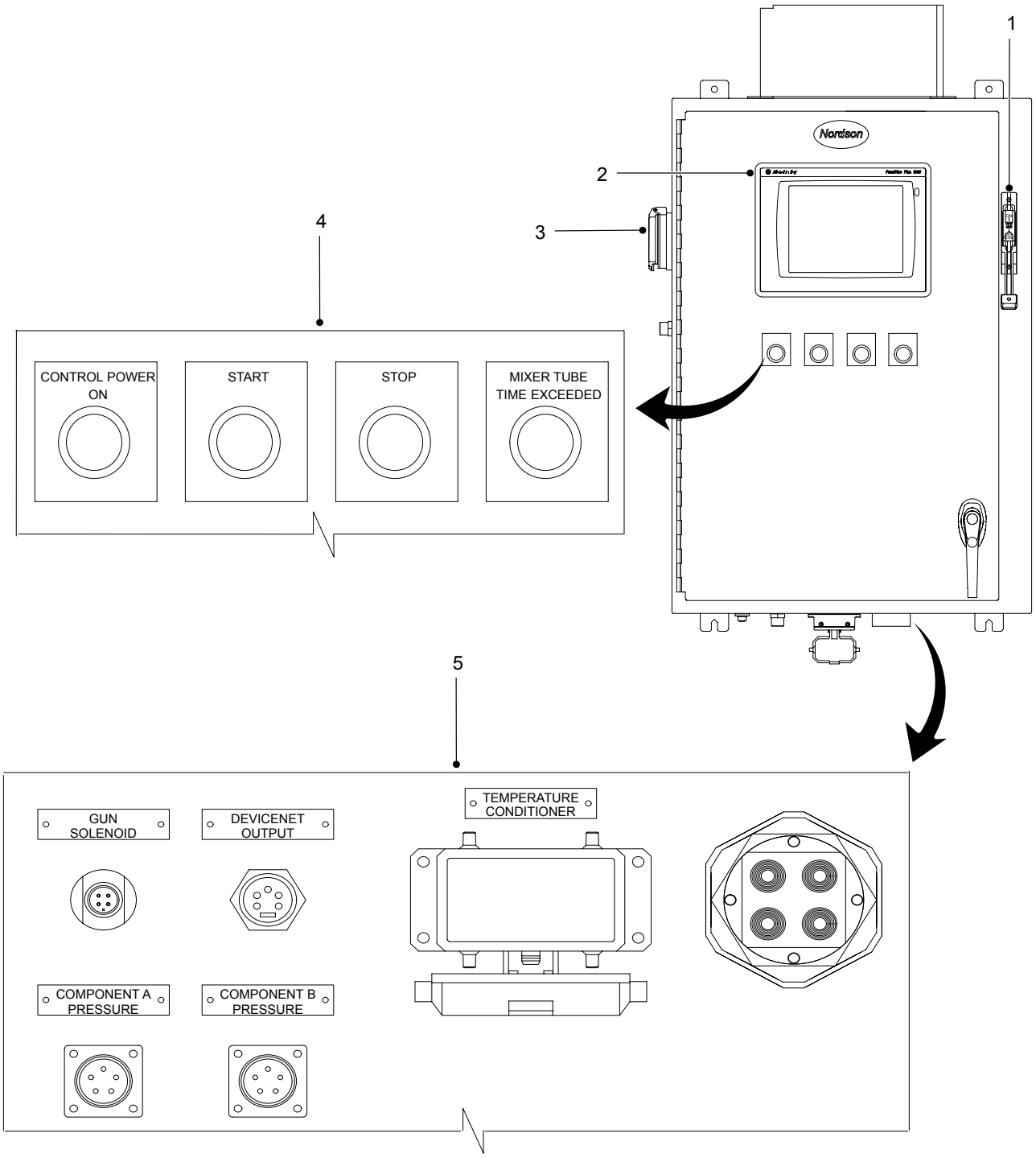


Figure 2 SureMix Controller

SureMix Controller Screens

NOTE: Read and understand this entire section before operating the controller.

See Screen 1.

Use the following screens to configure and operate the controller:

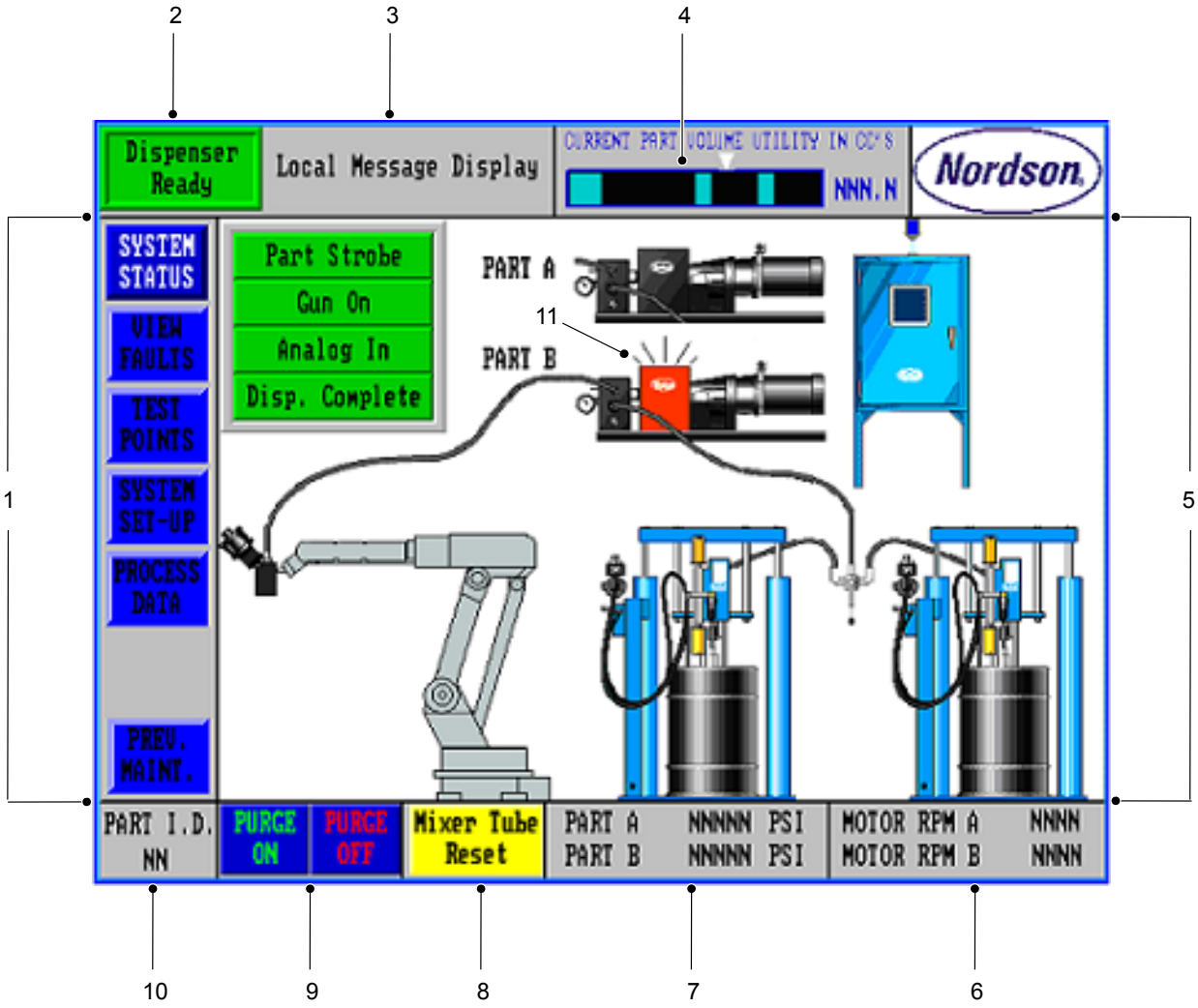
SYSTEM STATUS	**SYSTEM SET-UP**
VIEW FAULTS	**PROCESS DATA**
TEST POINTS	**PREV. MAINT.** (Preventive Maintenance

System Status

SYSTEM STATUS is the default screen. It monitors material dispensing characteristics during production. For each part run, the **SYSTEM STATUS** screen displays the following:

- System configuration
- Status of **Part Strobe**, **Gun On**, **Analog In**, and dispense complete (**Disp. Complete**) signals

Refer to Table 2 for a description of the operator interface functions.



Screen 1 SYSTEM STATUS Screen

Table 2 Operator Interface

Item	Description
1	Menu Buttons—Set and view screens of the application.
2	Dispenser field—Indicates the status of the dispenser—**Ready** or **Not Ready**.
3	Fault Indicator field—Displays fault messages.
4	**CURRENT PART VOLUME UTILITY**—Visually indicates the percent of the job which is completed and the actual dispensed volume at the end of the part cycle.
5	**SYSTEM STATUS**—Default screen.
6	**MOTOR RPM**—Indicates motor rpm for both pumps.
7	**SYSTEM PRESSURE**—Indicates pump pressure for both pumps.
8	**Mixer Tube Reset**—Resets a mixer tube time-out fault.
9	**PURGE ON/OFF** —Starts/stops the gun purge function.
10	**PART I.D.**—Displays the part ID.

View Faults

See Screen 2.

The **VIEW FAULTS** screen displays a description of a fault with the fault number.

The operator has two options:

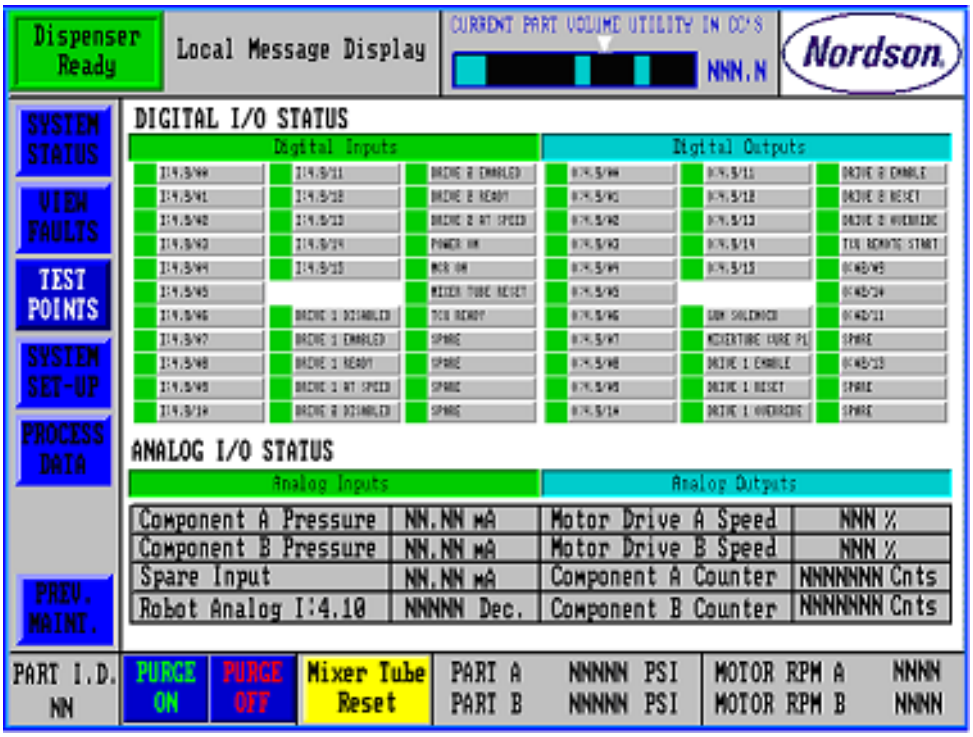
- Stop the system to correct the fault.
- Run the system and correct the fault later.

Screen 2 VIEW FAULTS Screen

Test Points

See Screen 3.

There are two **TEST POINTS** screens that display the status of each analog and digital I/O signals. Toggle between the screens to view either the signal name or the corresponding signal I/O number.

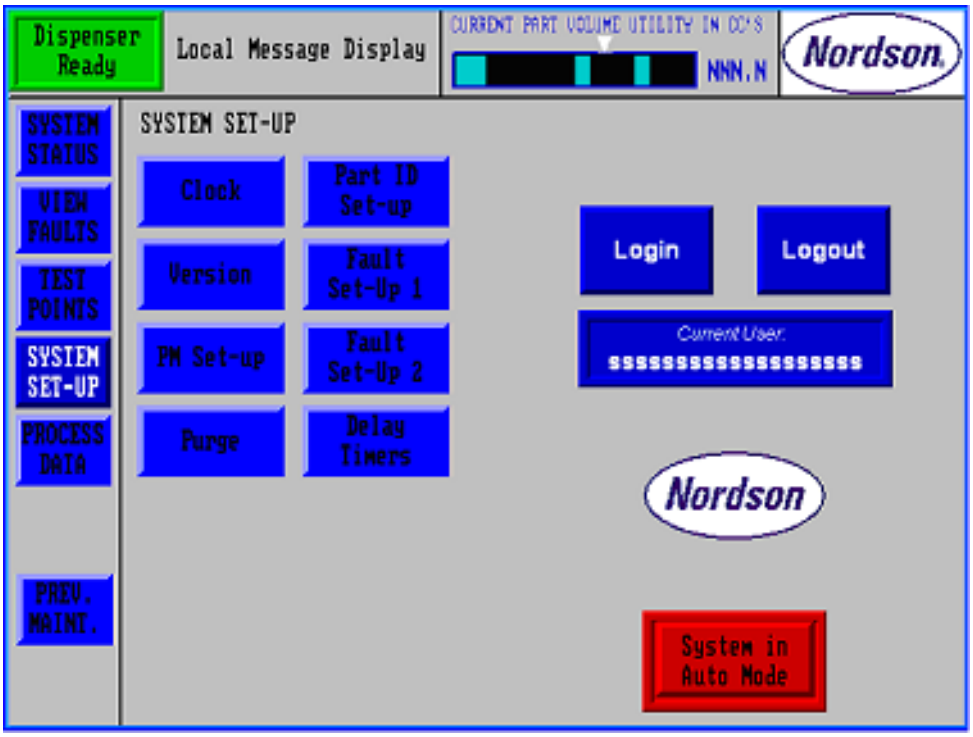


Screen 3 TEST POINTS Screen

System Set-Up

See Screen 4.

Use the **SYSTEM SET-UP** screen to configure the system parameters. The following paragraphs provide a description of each system parameter.



Screen 4 SYSTEM SET-UP Screen

Clock

See Screen 5.

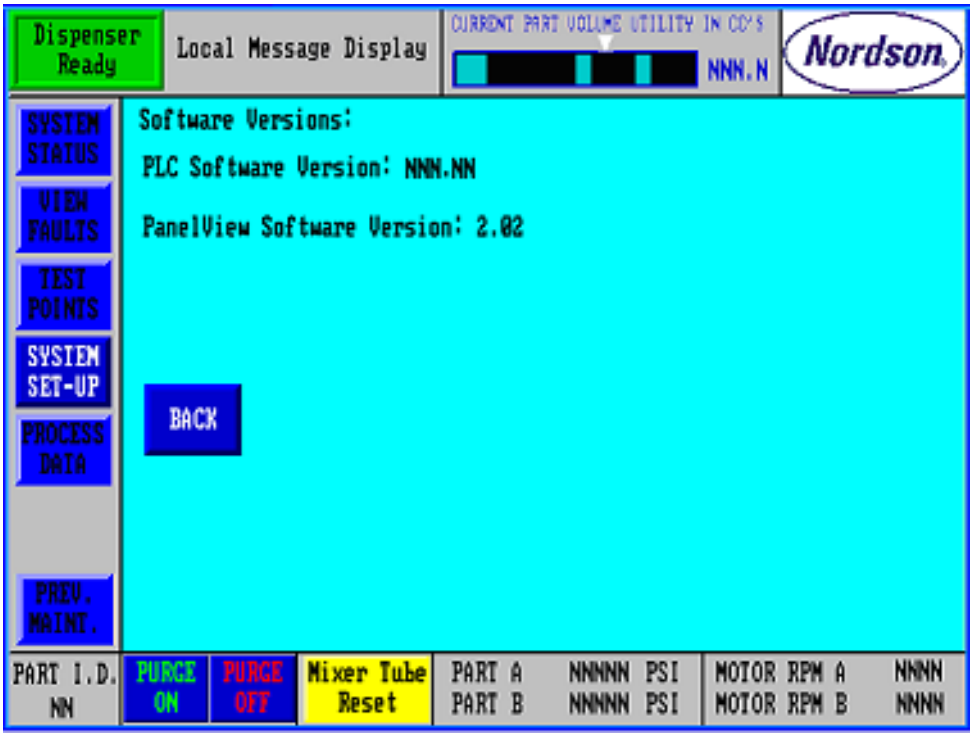
The time and date are set using this function during initial startup. The PanelView 1000 automatically synchronizes with the PLC every hour.

Screen 5 Clock Set-up Screen

Version

See Screen 6.

This screen displays the current version of the system software.



Screen 6 Software Version Screen

PM Set-up

See Screen 7.

Use this screen to set the preventive maintenance schedule for gun cycles and material volume dispensed.

Screen 7 PM Set-up Screen

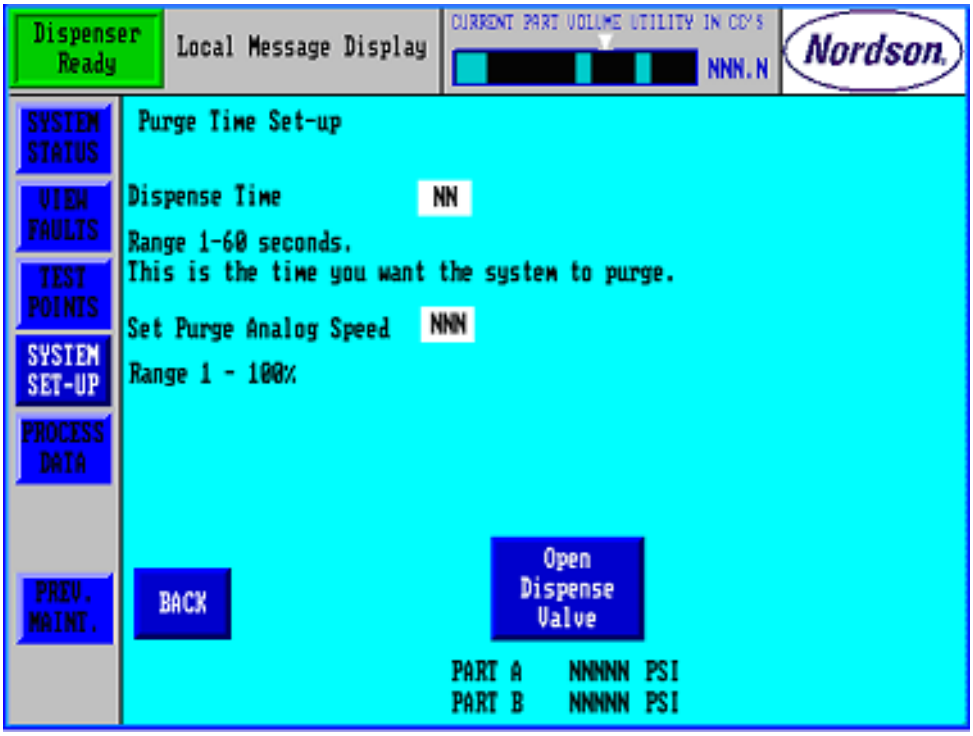
Purge

See Screen 8.

Use this screen to set how long the gun stays open each time the **PURGE ON** button is touched.

Dispense Time—Amount of time that the system will purge from the controller.

Set Purge Analog Speed—Speed of the motor when performing a purge from the controller or the robot controller.



Screen 8 Purge Time Set-up Screen

Part ID Set-up

See Screen 9.
Use this screen to enter up to 16 Part IDs and the following for each Part ID:

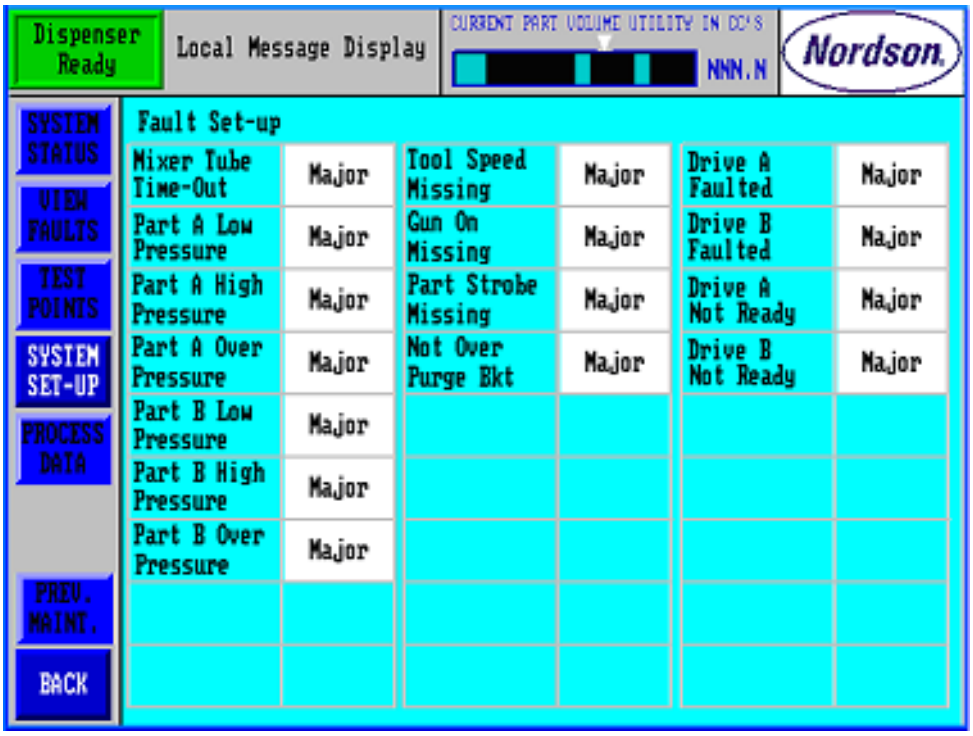
- Volume setpoint of material to dispense
- Bead size
- Low/high Component A and Component B pressures
- High/low volume alarm limits for major and minor faults

Screen 9 Part ID Set-up Screen

Fault Set-Up 1

See Screen 10.
Use this screen to set the system fault conditions. Depending upon how the fault conditions are set, when a fault occurs:

- **Disabled** disables the fault; the fault does not trigger
- **Major** triggers a major fault
- **Minor** triggers a minor fault



Screen 10 Fault Set-up 1 Screen

Fault Set-Up 2

See Screen 11.

Use this screen to set the fault conditions for the volume alarms. **Volume Alarms** Indicate that the dispensed volume is outside the programmed limits for a particular part ID. Volume Alarms can be set to major/minor high and major/minor low fault levels.

Screen 11 Fault Set-up 2 Screen

Delay Timers

See Screen 12.

Delay times determine how fast the system reacts to signals received from the robot controller and this controller. Delay times are used to pre-pressurize the system and prevent the controller from reacting more quickly than the robot. When determining delay times use the following operation sequence as a guide:

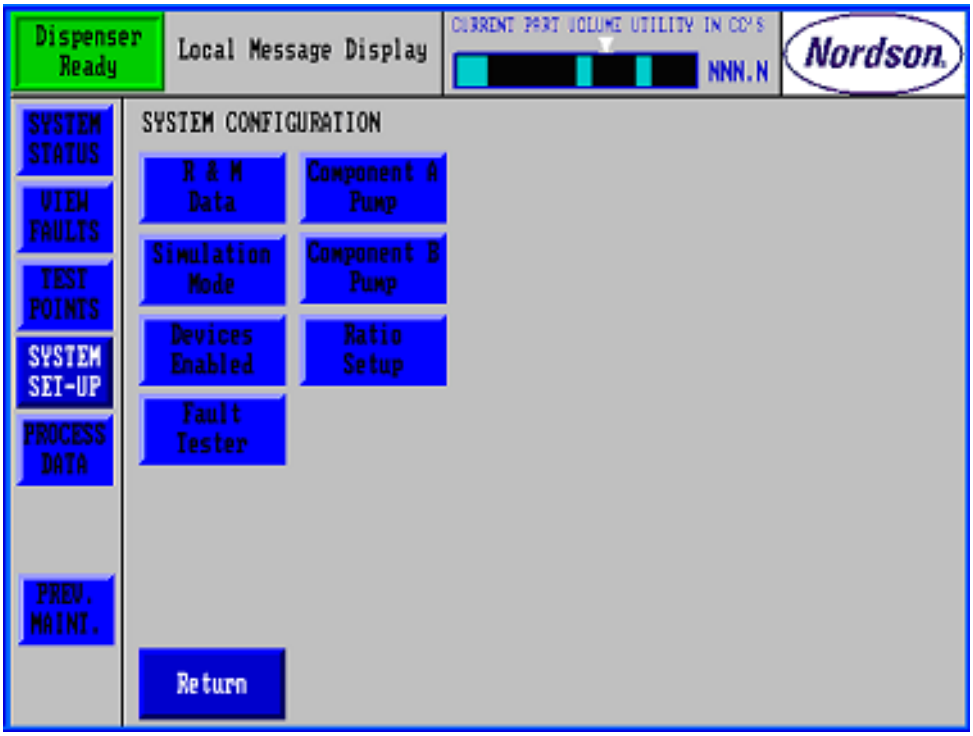
Start Dispense Signal → Gear Metering Pump Starts → Gun On

Screen 12 Delay Time Set-up 2 Screen

System Configuration

See Screen 13.

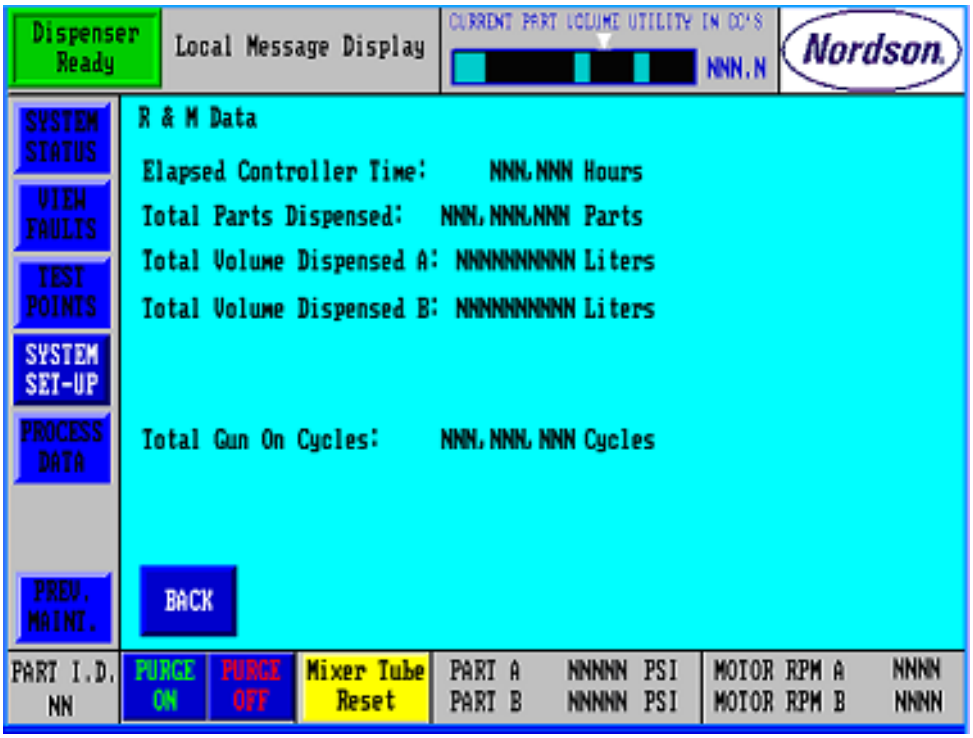
The **SYSTEM CONFIGURATION** screen is accessed from the **SYSTEM SET−UP** screen. See Screen 4. To access this screen, login and touch the Nordson oval below the *Current User* field. The following paragraphs provide a description of each parameter.



Screen 13 SYSTEM CONFIGURATION Screen

R & M Data

See Screen 14.
This screen displays reliability and maintainability data.



Screen 14 R & M Data Screen

Simulation Mode

See Screen 15.
Simulated production runs can be done from this screen to test the I/O signals without operating the robot.
Simulation Type Set−up consists of the following:

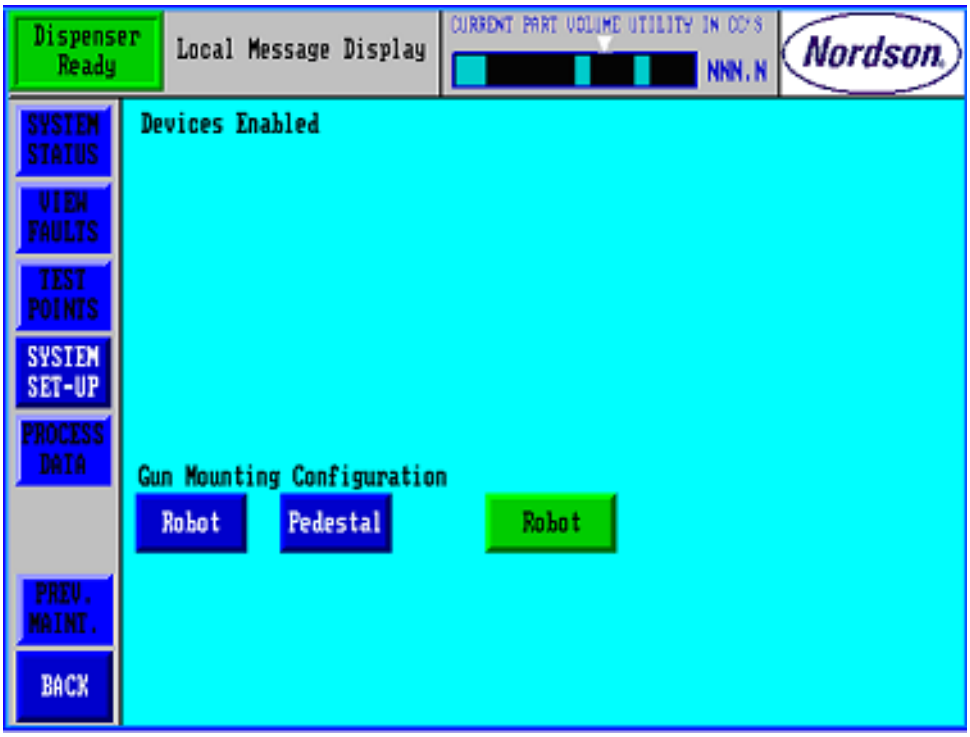
- **Constant Cycle** sets time interval and constant analog signal.
- **Up/down Cycle** presets the time at 2 seconds for 2, 4, 6, 8, 10 volts.
- **Multiple On/Off** sets the time interval for each of the analog 1, 2, and 3 signals.

Screen 15 Simulation Type Set-up Screen

Devices Enabled

See Screen 16.

Use this screen to select and display either the Robot or Pedestal gun mounting configuration on the **SYSTEM STATUS** screen.



Screen 16 Devices Enabled Screen

Fault Tester

See Screen 17.
Use this screen to test faults. When a fault number is entered, touching

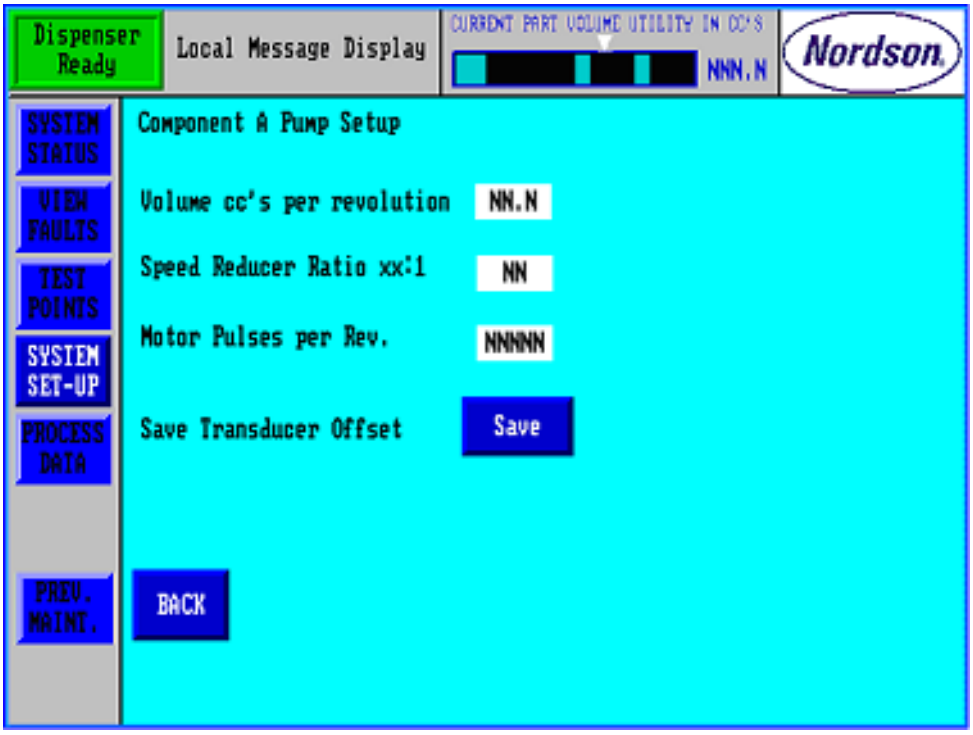
- Enable causes the fault message to appear.
- Disable disables or clears the fault.

Screen 17 Fault Tester Screen

Component A Pump

See Screen 18.

Use this screen to setup the parameters for the Component A pump. Touch **Save** to calibrate the transducer when pressure is not in the system.

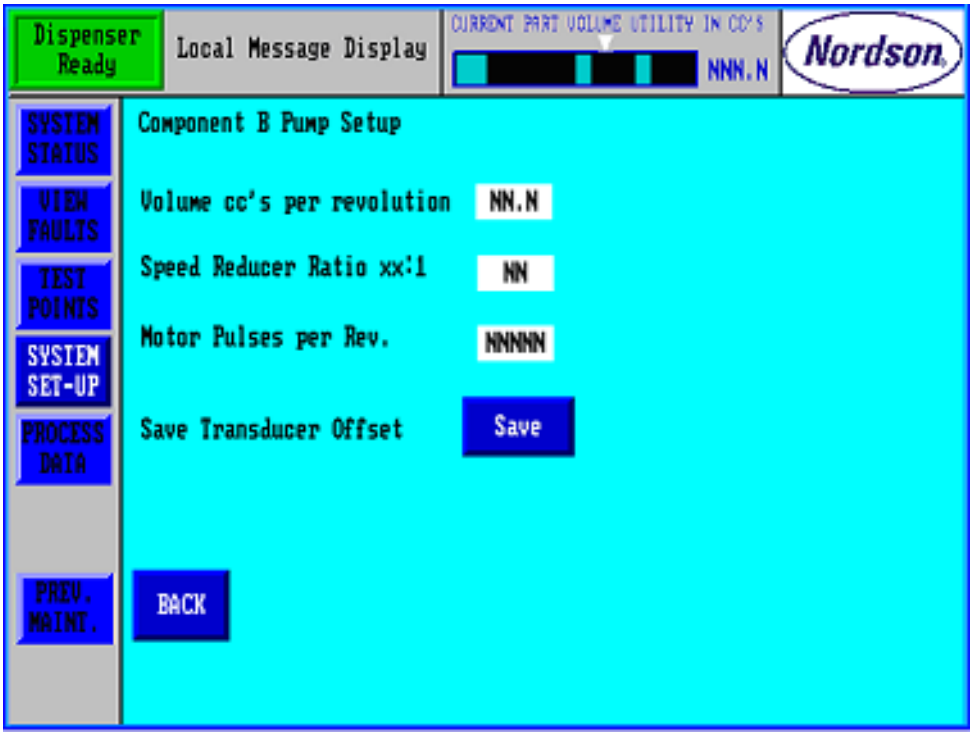


Screen 18 Component A Pump Setup Screen

Component B Pump

See Screen 19.

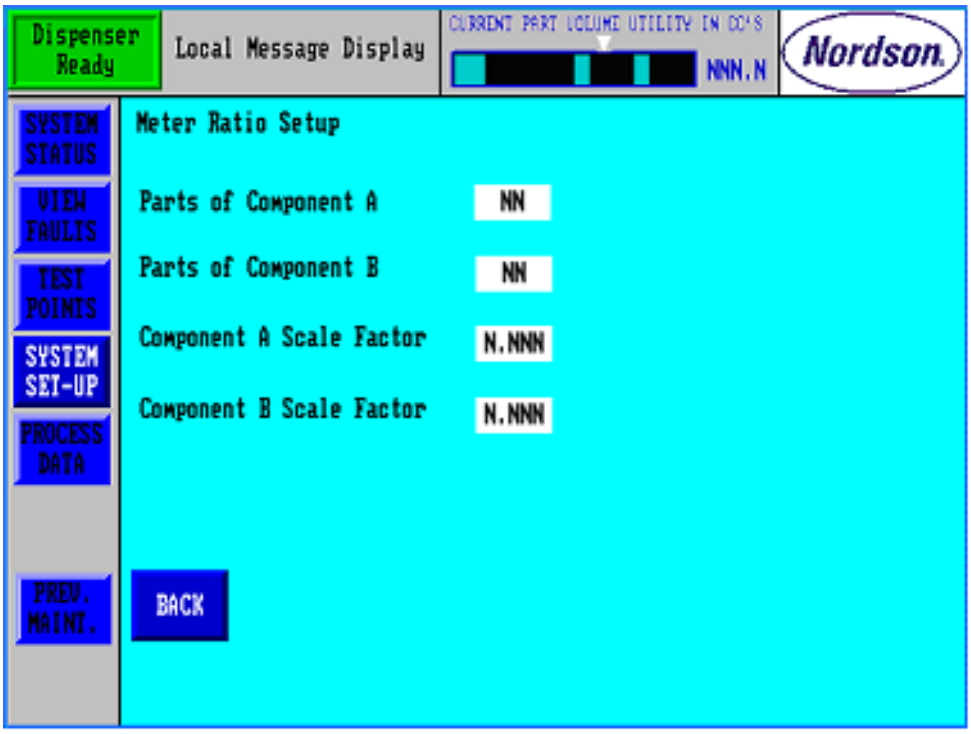
Use this screen to setup the parameters for the Component B pump. Touch **Save** to calibrate the transducer when pressure is not in the system.



Screen 19 Component B Pump Setup Screen

Ratio Setup

See Screen 20.
Use this screen to setup the system mix ratio and calibrate the pumps.

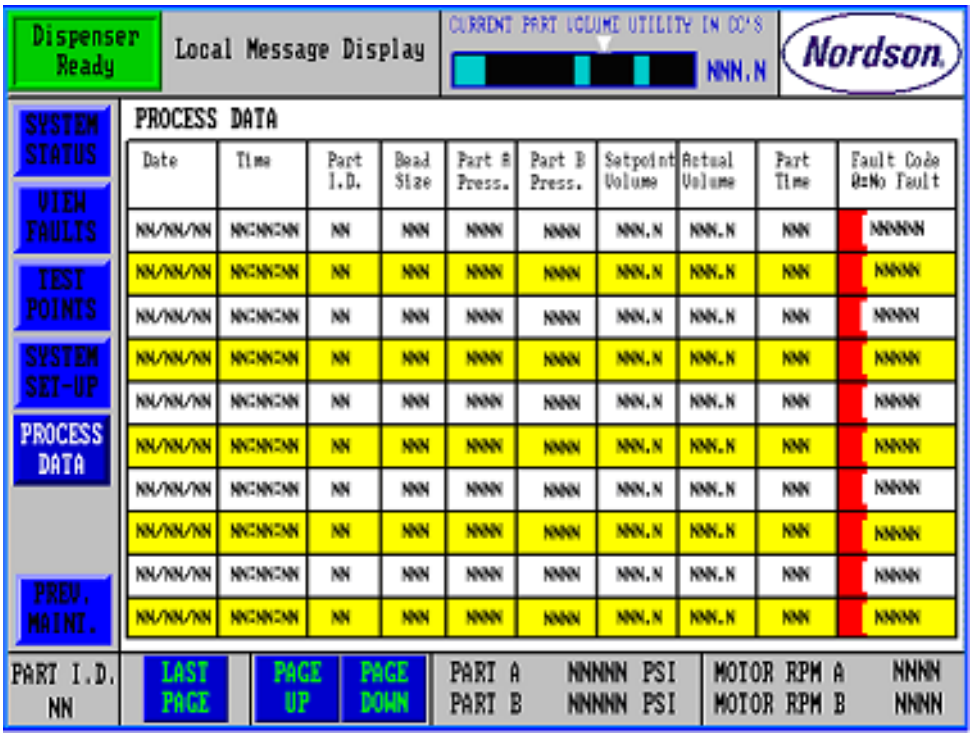


Screen 20 Ratio Setup Screen

Process Data

See Screen 21.

Access this screen to view production data. The Fault Code column displays error codes. Touch the desired error code in the Fault Code column to display the **Error Code** screen.

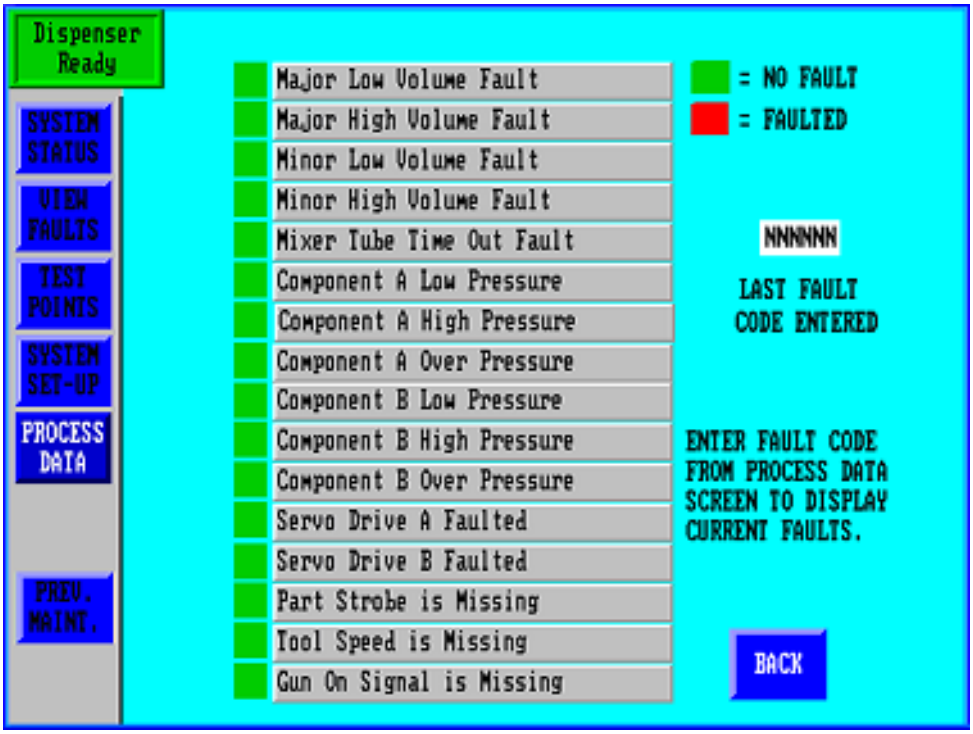


Screen 21 PROCESS DATA Screen

Error Code Screen

See Screen 22.

Entering a Fault code in the number field causes the corresponding error lights to illuminate.



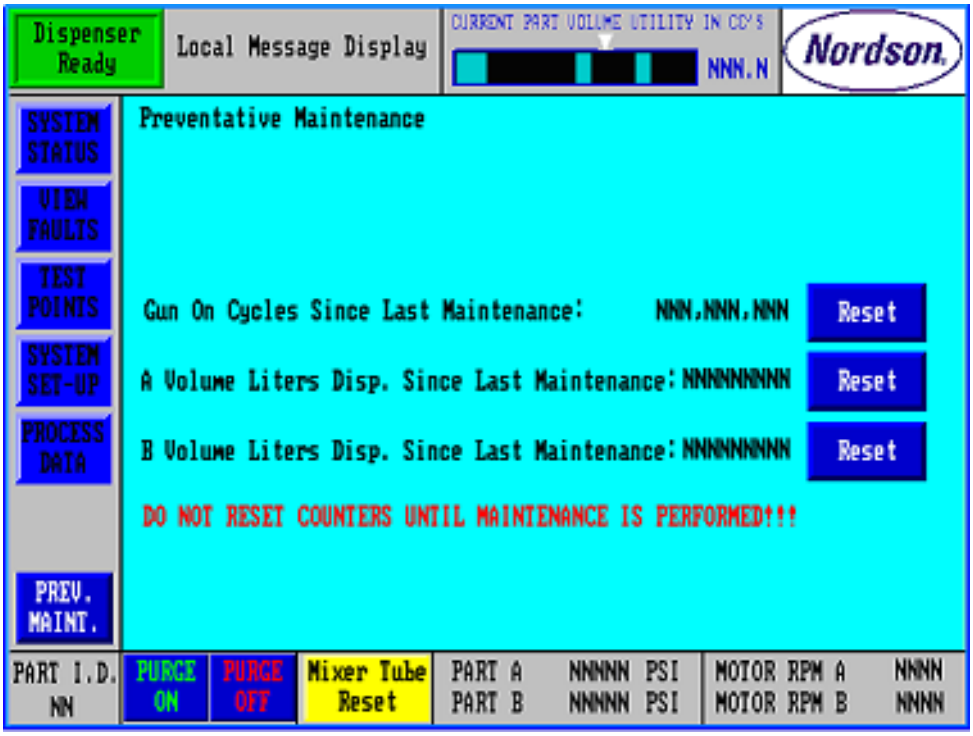
Screen 22 Error Code Screen

Prev. Maint.

See Screen 23.

Access this screen to view preventative maintenance data. Once preventative maintenance is done, a value can be reset by touching Reset.

Refer to the *Maintenance* section for more information.



Screen 23 PREV.MAINT Screen

Installation

WARNING

- Allow only qualified personnel to perform the following tasks. Follow the safety instructions in this document and all other related documentation.
- Read and understand the entire Installation section before performing any procedures. Contact a Nordson representative with questions regarding these procedures if necessary.

Unpack the system and inspect it for dents, scratches, corrosion, or other physical damage. If there is any visible damage, call your Nordson Corporation representative immediately.

Table 3 lists the installation specifications.

Table 3 Installation Specifications

Item	Specification
Main Air Supply	60 psi minimum at 1 scfm
Main Air Supply Ball Valve	$^{1}/_{2}$ NPT
Pump Manifold Fluid Ports	$^{9}/_{16}$-18 UNF-B
Material Supply	Filtered to 200 microns
Main Electrical Supply	480 VAC, 1 phase, 25 amp, 60 Hz, 10 FLA

Guidelines

Review the following guidelines:

- Make sure that the desired installation location has the required clearances, environmental conditions, and utilities to safely operate the system.
- Hard-wire the controller to a dedicated power supply to provide safe operation and reduce interference from electrical noise.
- Install all electrical connections to local code.
- Install a locking disconnect switch or breaker in the service line ahead of any electrical equipment.
- Make sure that there is enough slack in all hose and cable routings to allow for proper system operation.

Electrical Connections

Electrical connections are dependent upon application requirements. Use the Electrical Interconnect drawings provided with the system documentation for connections.

Fluid and Air Connections

Fluid and air connections are dependent upon application requirements. See Figures 3 and 4 for typical installations. Use the System Layout drawings provided with the system documentation for connections.

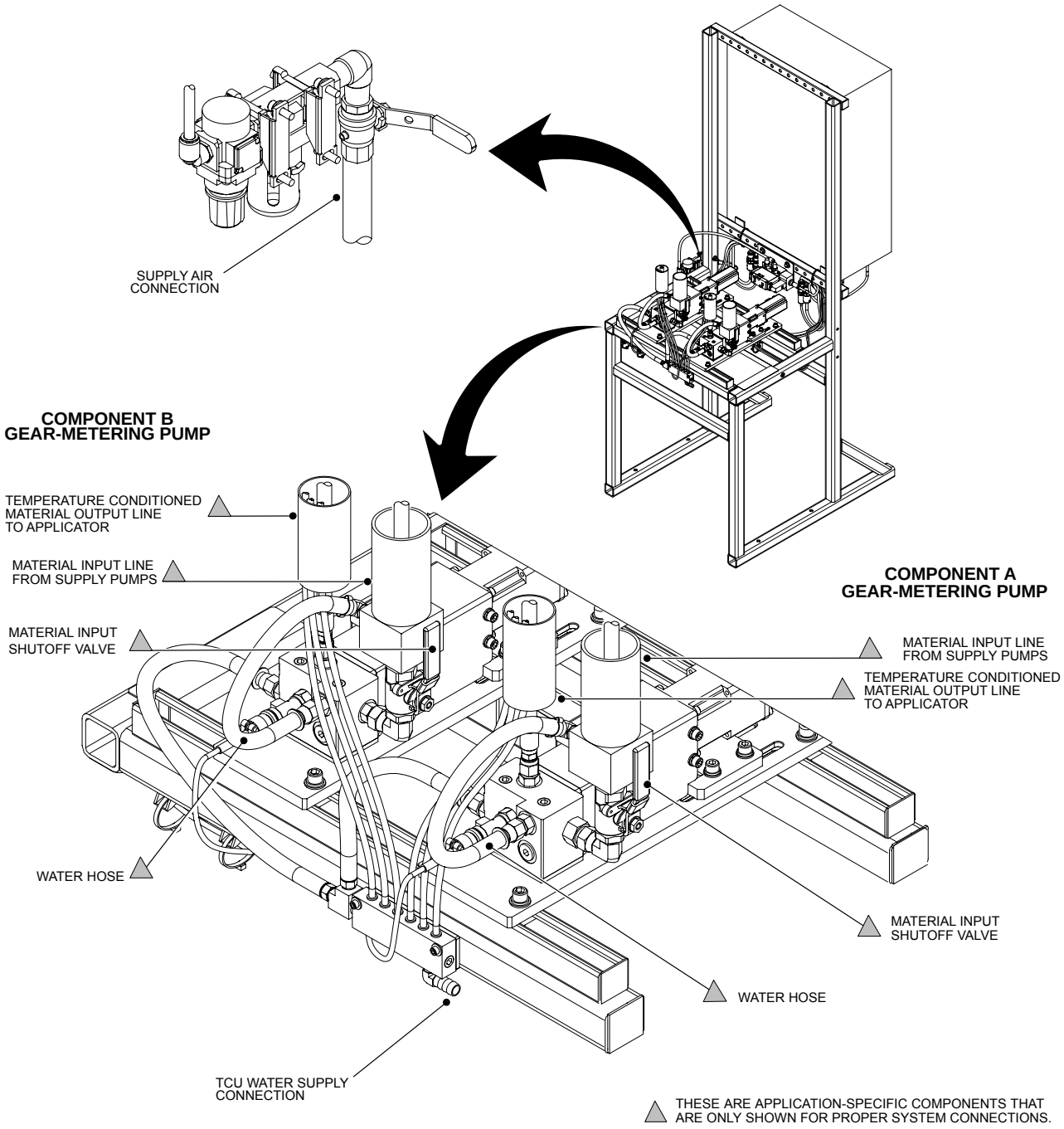


Figure 3 Typical Connections for Temperature Conditioned Metering Pumps

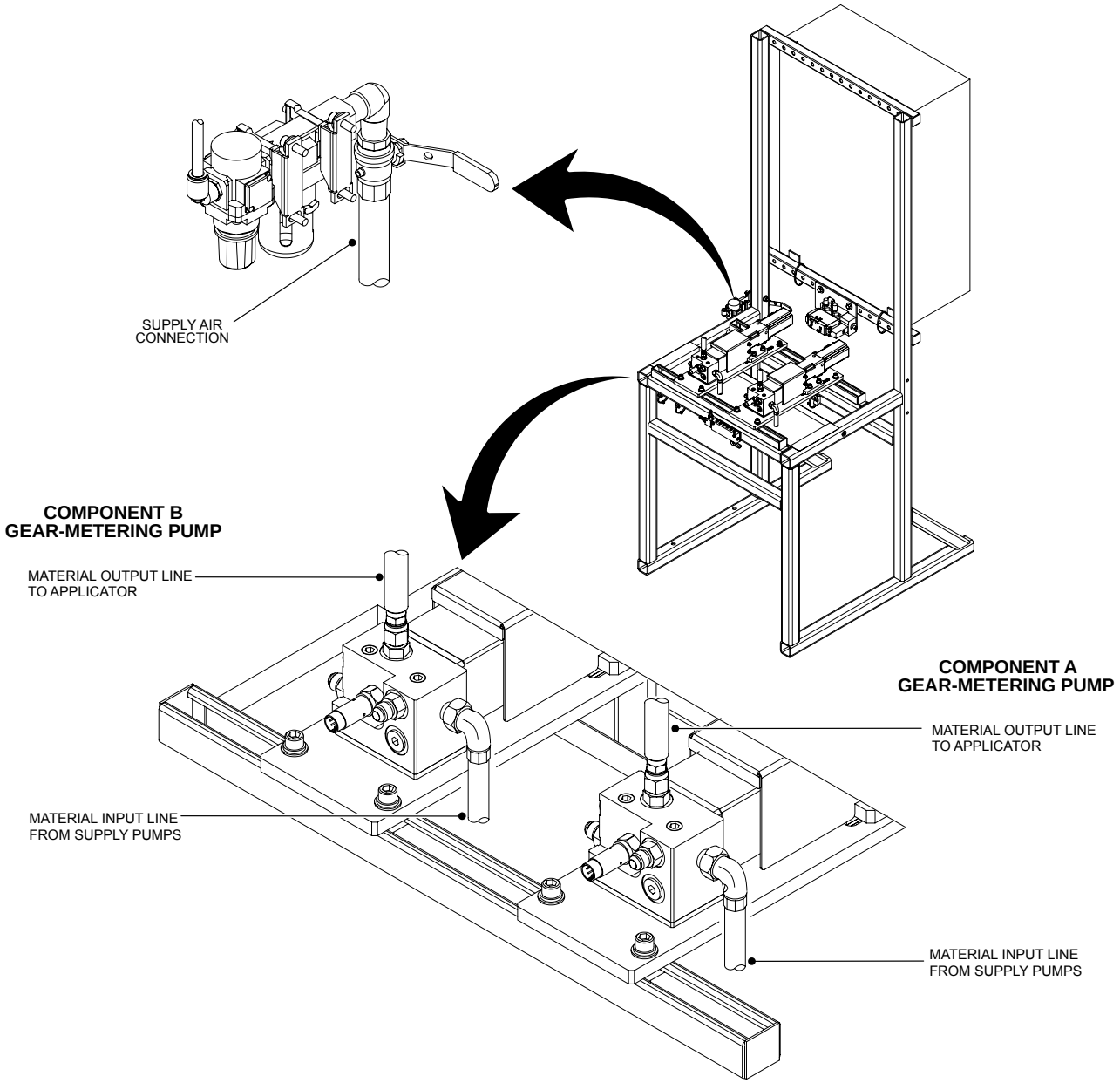


Figure 4 Typical Connections for Non-Temperature Conditioned Metering Pumps

Controller

Perform the following procedures to adjust the timing sequences, configure the Analog signal #1, and set the bead size.

Set the Analog Signal #1 Configuration

See Figure 5. Perform the following to configure the robot controller analog signals.

1. Determine the highest and lowest robot speeds to be used in production.
2. Configure the robot controller to send an analog signal #1 of +10 Vdc when the robot is moving at or slightly above maximum speed.
3. Configure the robot controller to send an analog signal #1 of 0 Vdc when the robot is stationary.

A robot speed of 80% should now correspond to 8 Vdc, a robot speed of 40% should now correspond to 4 Vdc.

Adjust the Timing Sequences

See Figure 6 and refer to Table 4. Adjust the timing sequence of output signals from the robot controller. Refer to your robot controller manual to set the signal timing sequences.

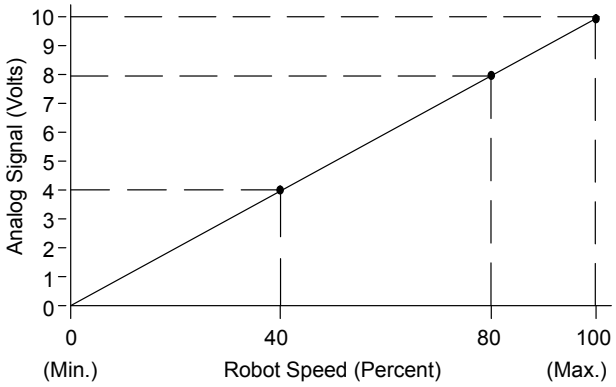


Figure 5 Relationship Between Analog Signal #1 and Robot Speed

Table 4 Operation Sequence

Sequence	Description
Part ID On	The robot controller sends a part ID signal to the controller. The signal is 4 bits long and corresponds to a specific part.
Run Mode (Part Strobe ON)	The robot controller sends the Run Mode signal to the controller as long as the part is being processed. This allows the controller to accumulate volume and pressure readings for the part. When the controller receives this signal, it • reads the part ID bits. • resets the internal flow meter counter and begins counting flow meter pulses to measure the volume dispensed. • resets the fault beacon and Part OK outputs to the controller.
Analog Input Signal	The robot controller sends the analog tool speed signal to the controller. The controller uses the tool speed signal and bead size setting to control the bead size dispensed by the gun.
Start Dispense (Gun ON)	The robot controller sends the Start Dispense signal to the controller when the robot is in position to start dispensing material. To start dispensing material, the controller • activates the motor drives and the gun solenoid. • outputs an analog signal to the servo drive to control bead size. • monitors the material pressure.
Stop Dispense (Gun OFF)	The robot controller sends the Stop Dispense signal to the controller when the robot has completed its programmed tool path. To stop dispensing material, the controller deactivates the motor drives and the gun solenoid.
Run Mode (Part Strobe Off)	The robot controller turns off the Run Mode signal. The controller then • stops counting the flow meter pulses and reads the total flow meter pulses accumulated for the part. • compares flow meter pulses from the motor to the gear metering pump sensor pulse. • computes the total volume of material dispensed, based on the flow meter rating. • reports the material volume to the **PROCESS DATA** screen. A fault is generated when the total volume dispensed exceeds the high or low limits set for the part, or when the material pressure or temperature exceeds the high or limits. The system fault output and alarm beacon are turned on. The fault appears on the **VIEW FAULTS** screen.
Dispense Complete	After the run mode signal turns off, there is a 200 ms delay, then the dispense complete signal turns on.

Set the Bead Size

The bead size scales analog signal #1. For example, if the bead size is set to 50, the analog signal to the motor drives would be 50 percent of the robot analog signal #1.

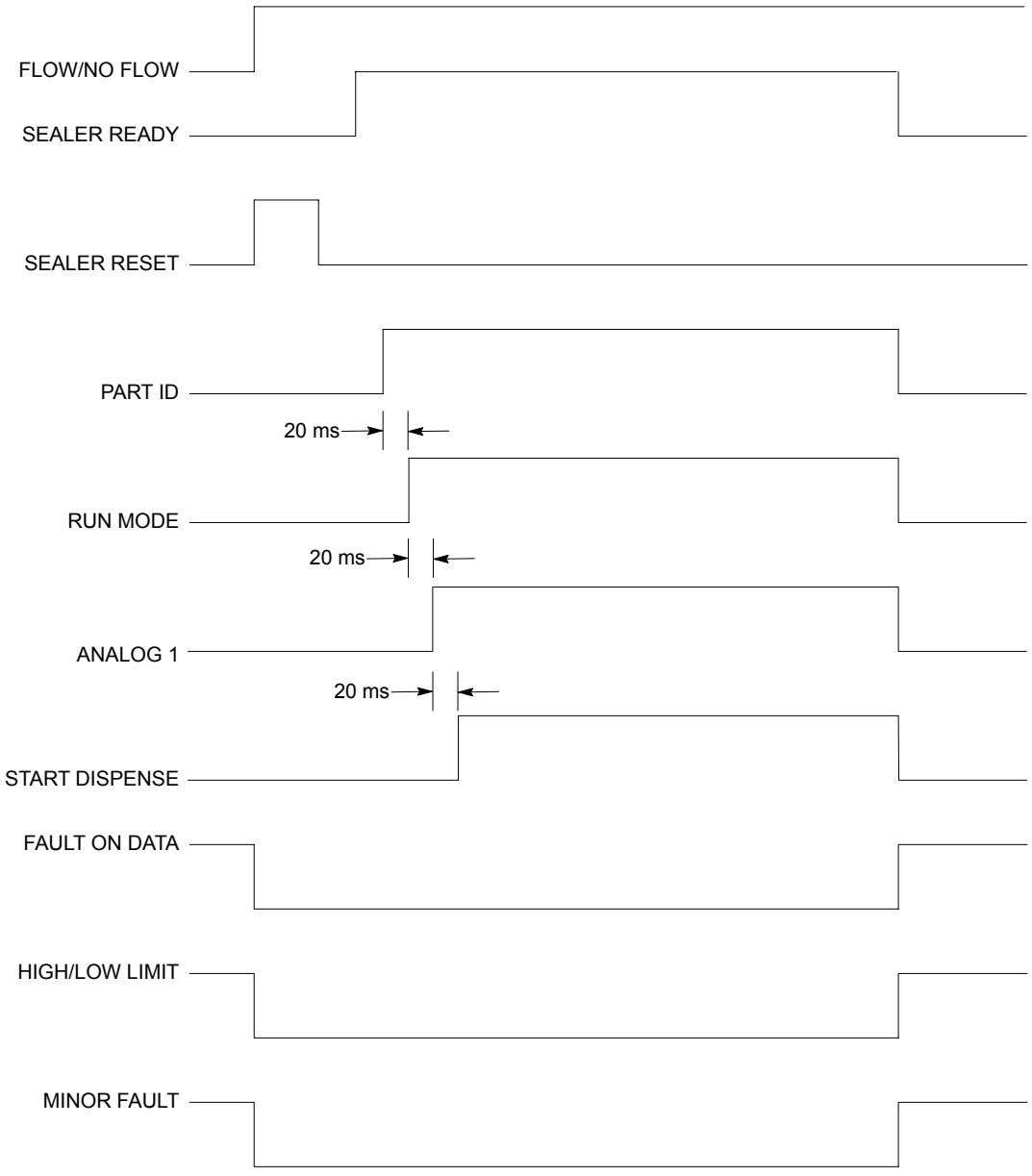


Figure 6 Timing Sequences

Operation

Operation is dependent upon application and fluid delivery requirements. Refer to the System Parameter Sheet provided with the system documentation.

WARNING

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

! CAUTION !

To prevent damage to equipment, make sure that you teach the robot controller the proper tool path before operating this controller.

NOTE:

Nordson Corporation recommends that a Nordson representative be present during the initial setup.

Make sure all other system components are operational. Refer to the individual component manuals for startup and operating procedures.

The controller is configured by Nordson. Contact your Nordson representative if the configuration needs to be changed.

Menu Tree

The menu tree for this controller configuration is shown in Figure 7.

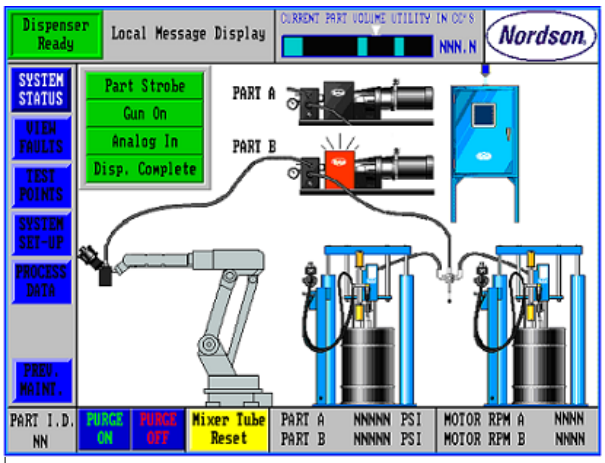
Initial Set-up

Initial set-up consists of setting system parameters and configurations.

Turn on the following components:

- controller
- unloaders
- temperature conditioning system
- gear metering pump

The controller performs a self-test to verify system status and proper operation. The **SYSTEM STATUS** screen appears on the touch screen.



SYSTEM STATUS

VIEW FAULTS
Fault Log
Fault Status

TEST POINTS

SYSTEM SET-UP
(Password Protected)

- **Clock**
- **Version**
- **PM Set-Up**
  Gun Cycles
  Volume Dispensed Liters
- **Purge**
  Dispense Time
  Set Purge Analog Speed
- **Part ID Set-Up**
  Part ID
  Volume in CC's
  Pressure Componet A Low/High
  Pressure Componet B Low/High
  Alarm Volumes in CC's Major Low/High
  Alarm Volumes in CC's Minor Low/High
  Bead Size
- **Fault Set-Up 2**
  Volume Alarms:
  Major High 1−99% Over
  Minor High 1−99% Over
  Major Low 1−99% Over
  Minor Low 1−99% Over
- **Delay Timers**
  Pump A On Delay
  Pump A Off Delay
  Pump B On Delay
  Pump B Off Delay
  Gun On Delay
  Gun Off Delay
  Mixer Tube Time-Out
  Low Pressure Fault
  High Pressure Fault

Fault Set-Up 1
Mixer Tube Time-Out
Part A Low Pressure
Part A High Pressure
Part A Over Pressure
Part B Low Pressure
Part B High Pressure
Part B Over Pressure
Tool Speed Missing
Gun On Missing
Part Strobe Missing
Not Over Purge Bucket (Bkt)
Drive A Faulted
Drive B Faulted
Drive A Not Ready
Drive B Not Ready

SYSTEM CONFIGURATION
(Password Protected)
R & M Data
Simulation Mode
Devices Enabled
Fault Tester
Component A Pump
Component B Pump
Ratio Setup

PROCESS DATA
Fault Decoder

PREV. MAINT.

Figure 7 Menu Tree

Access the System Set-Up Screen

Touch **SYSTEM SET-UP**. The **SYSTEM SET-UP** screen appears. Perform the procedures listed in Table 5.

Table 5 System Set-Up Procedures

Touch...	Then...
Clock	1. Enter the date and time. 2. Touch **BACK** to return to the **SYSTEM SET-UP** screen.
PM Set-UP	1. Enter values for the Gun Cycles and Volume Dispensed Liters. 2. Touch **BACK** to return to the **SYSTEM SET-UP** screen.
Purge	1. Enter a dispense time from 1 to 60 seconds. 2. Enter a set purge analog speed from 1 to 100 percent. 3. Touch **BACK** to return to the **SYSTEM SET-UP** screen.
Part ID Set-Up	1. Enter a Part ID. 2. Enter a value for the material volume. 3. Enter Low Pressure values between 0−2000 psi for the Component A and Component B pumps. 4. Enter High Pressure values between 0−2000 psi for the Component A and Component B pumps. 5. Enter values for the Major High/Low and the Minor High/Low Volume Alarms. 6. Enter a Bead Size number. Bead Size is an arbitrary number between 1 and 100. 7. Touch **SAVE** to save changes. 8. Touch **BACK** to return to the **SYSTEM SET-UP** screen.
Fault Set-Up 1	1. Touch the button next the fault description to toggle between **Disabled**, **Minor**, and **Major** fault conditions. 2. Touch **BACK** to return to the **SYSTEM SET-UP** screen.
Fault Set-Up 2	1. Enter values for the Volume Alarms. 2. Touch **BACK** to return to the **SYSTEM SET-UP** screen.
Delay Timers	1. Enter delay times that are based upon the following operation sequence: • Gun On Signal • Gear Metering Pump Starts • Fault Timers 2. Touch **BACK** to return to the **SYSTEM SET-UP** screen.

Access the System Configuration Screen

The **SYSTEM CONFIGURATION** and **Bead Size** screens are password protected.

See Screen 4. From the **SYSTEM SET-UP** screen, login and touch the Nordson oval below the *Current User* field to access the **SYSTEM CONFIGURATION** screen. Perform the applicable procedures listed in Table 6.

Table 6 System Configuration Procedures

Touch...	Then...
Simulation Mode	1. Enter the applicable data to simulate a production run. 2. Select the simulation type. 3. Make sure that the time and analog voltages are set. 4. Touch **Run Simul.** 5. Touch **BACK** to return to the **SYSTEM CONFIGURATION** screen.
Devices Enabled	1. Select a gun mounting configuration: • Touch **Robot** to display a robot-mounted gun. • Touch **Pedestal** to display a pedestal-mounted gun. 2. Touch **BACK** to return to the **SYSTEM CONFIGURATION** screen.
Fault Tester	1. Follow the directions on the screen. 2. Touch **BACK** to return to the **SYSTEM CONFIGURATION** screen.
Component A Pump	1. Enter a value for the Volume cc's per revolution parameter. 2. Enter a value for the Speed Reducer Ratio. 3. Enter a value for the Motor Pulses per revolution parameter. 4. Touch **SAVE**. 5. Touch **BACK** to return to the **SYSTEM CONFIGURATION** screen.
Component B Pump	1. Enter a value for the Volume cc's per revolution parameter. 2. Enter a value for the Speed Reducer Ratio. 3. Enter a value for the Motor Pulses per revolution parameter. 4. Touch **SAVE**. 5. Touch **BACK** to return to the **SYSTEM CONFIGURATION** screen.
Ratio Setup	1. Enter a value for the Parts of Component A parameter. 2. Enter a value for the Parts of Component B parameter. 3. Enter a value for the Component A Scale Factor. 4. Enter a value for the Component B Scale Factor. 5. Touch **BACK** to return to the **SYSTEM CONFIGURATION** screen.
NOTE: From the **SYSTEM CONFIGURATION** screen, touch **RETURN** to return to the **SYSTEM SET-UP** screen.	

Startup

1. Purge the gun to remove air from the material supply hose and nozzle by touching **PURGE ON**.
2. Purging will stop after the purge time has elapsed. Otherwise, touch **PURGE OFF** to stop purging immediately.
3. Check the bead size for the part being being run. If necessary. access the **Part ID Set-up** screen from the **SYSTEM SETUP** screen to adjust the bead size.
4. Touch **PROCESS DATA** to monitor material dispensing characteristics.
5. Position the part and begin dispensing from the robot controller.

Fault Messages

A fault message appears on the operator interface if a fault is detected during operation.

Touch **VIEW FAULTS**. A description of the fault appears along with the fault number.

Fault Code Descriptions

The fault codes listed in Table 7 are applicable to this controller configuration.

Shutdown

Turn the system components off and relieve all pressures.

Table 7 Fault Code Descriptions

Fault	Description	Fault	Description
1	No DC Power Fault	16	In Manual Mode
2	Major Low Volume Fault	17	Remote I/O Error
3	Not Used	18	DeviceNet Error
4	Major Low Volume Fault	19	Battery is Low
5	Major High Volume Fault	20	Servo Drive A Faulted
6	Minor Low Volume Fault	21	Servo Drive B Faulted
7	Minor High Volume Fault	22	Servo Drive A Not Ready
8	Mixer Tube Time Out Fault	23	Servo Drive B Not Ready
9	Component A Low Pressure	24−27	Not Used
10	Component A High Pressure	28	Part Strobe is Missing
11	Component A Over Pressure	29	Tool Speed is Missing
12	Component B Low Pressure	30	Gun On Signal is Missing
13	Component B High Pressure	31−35	Not Used
14	Component B Over Pressure	36	TCU Not Ready Fault
15	Not Over Purge Bucket		

Maintenance

Table 8 lists general maintenance procedures for the SureMix system. The frequency of maintenance is dependent upon operating conditions.

Table 8 Maintenance Schedule

Frequency	Item	Task
Monthly	Pump seals	Check pump seals and replace if necessary. Refer to the *Pump Seals* procedure in the *Repair* section.
Semi-Annually		Grease pump seals. Refer to the *Pump Seals* procedure in the *Repair* section.

Notes:

Troubleshooting

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

WARNING

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

Problem	Possible Cause	Corrective Action
1. Motors do not spin when gun trigger is pulled; no fault from controller	Faulty gun trigger or gun cable	Check gun trigger, cables, and connectors. Repair or replace parts if necessary.
2. Motors begin to spin when gun trigger is pulled but controller displays High Pressure fault	No air or low air pressure to system	Check air supply.
	Pneumatic gun solenoid did not open	Check pneumatic control valve and cable. Repair or replace parts if necessary.
	Gun did not open when pneumatic signal was present	Rebuild gun.
	Gun opened but little or no material was dispensed	Check the following and repair if necessary: • supply hoses to gun for clogs or restrictions • restricted or clogged gun passages
	Clogged mixer tube	Replace mixer tube.
3. Mix ratio not within specifications	Controller parameters not properly set	Check system parameters and reset if necessary.
	Pumps have excessive wear	Replace pumps.
	Slippage between motor and gear head connection	Check and adjust coupling torque if necessary.
4. Gun does not dispense material	Material supply pressure low	Increase material supply pressure. Refer to drum unloader documentation.
	Nozzle blocked	Remove and clean nozzle. Refer to dispensing gun documentation.
	Material supply hose blocked	Unblock material supply hose.
	Signals not received from robot in proper timing sequence	Set proper timing sequence. Refer to *Timing Sequences* in *Installation* section.
	Signals not received from robot controller or sent to gun	Check cable continuity and replace cable if necessary. Refer to dispensing gun documentation.
	Dispensing gun malfunction	Refer to dispensing gun documentation.

Continued...

Problem	Possible Cause	Corrective Action
5. Gun does not dispense material, does not open	Absent or low control air pressure	Check supply air pressure and increase it if necessary.
	Dispensing gun malfunction	Refer to dispensing gun documentation.
6. Gun dispenses early, before robot moves	Signals from robot controller timed improperly	Set the proper timing sequence. Refer to *Timing Sequences* in *Installation* section.
	Gun ON or Tool Speed delay too short	Increase parameter settings. Refer to *Operation* section.
7. Gun dispenses after cycle, gun closed	Control air pressure low	Check supply air pressure and increase it if necessary.
	Needle not seating	Purge gun. Refer to dispensing gun documentation.
	Cured material or contaminants preventing gun from closing	Purge gun. Refer to dispensing gun documentation.
	Dispensing gun or robot malfunction	Refer to dispensing gun and robot documentation.
8. Dispensing delayed	Gun ON signal from robot controller timed improperly	Set proper timing sequence. Refer to *Timing Sequences* in *Installation* section.
	Gun ON delay too long	Decrease parameter setting. Refer to *Operation* section.
	Gun or robot malfunction	Refer to dispensing gun and robot documentation.
9. Bead deposition wiggles	Nozzle too high above work piece	Re-teach robot tool path; keep nozzle closer to workpiece. Refer to robot documentation.
	Material speed through nozzle too high	Decrease material pressure, nozzle size, or bead size. Refer to *Initial Setup* in *Operation* section.
	Nozzle too small	Install a larger nozzle. Contact your Nordson Corporation representative for part numbers.
10. Unexpected bead-size change	Nozzle partially blocked	Clean nozzle. Refer to dispensing gun documentation.
	Material exceeded shelf life	Use fresh material.
11. Material leaks from dispensing gun cartridges	Cartridge seals worn	Replace cartridge seals. Refer to dispensing gun documentation.

Repair

WARNING

- Allow only qualified personnel to perform the following tasks. Follow the safety instructions in this document and all other related documentation.
- To prevent serious injury, relieve system and material pressure before performing these procedures.

Drive Motor

Use the following procedure to replace a drive motor.

Remove the Drive Motor

1. Make sure that all air and material pressures are relieved from the SureMix Dispense stand.
2. See Figure 8. Disconnect the applicable cables (1) from the controller cable set (2).

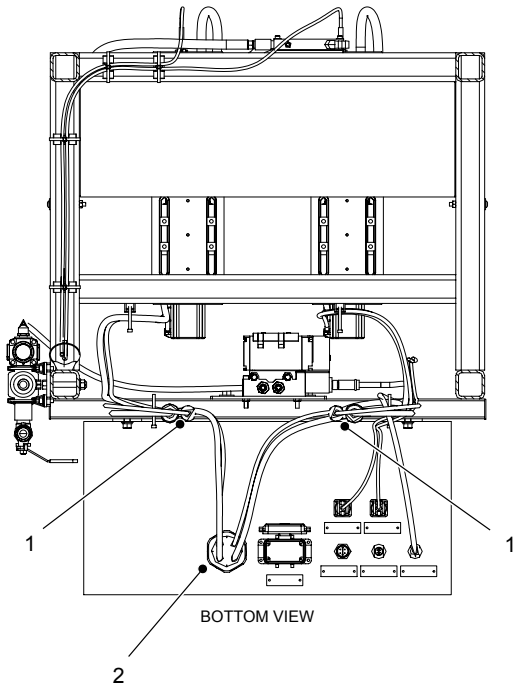
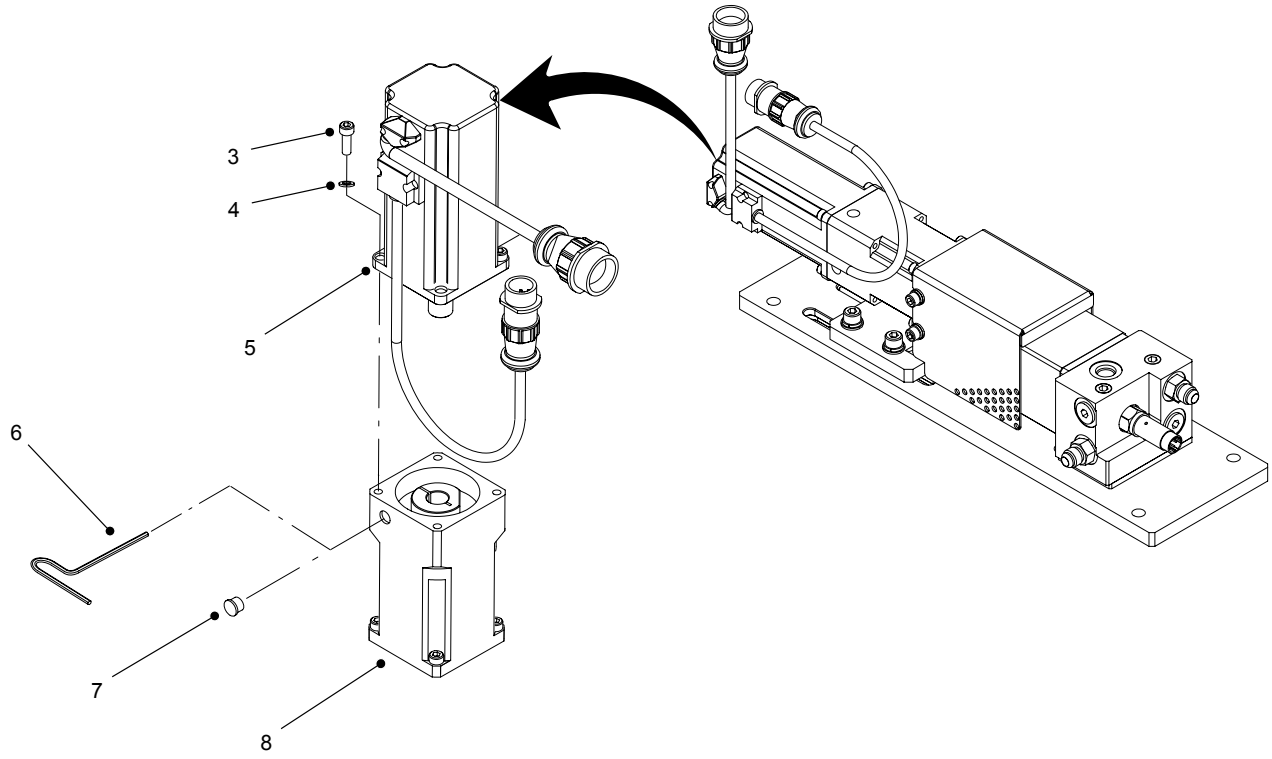


Figure 8 Cable Set Location

3. See Figure 9. Disconnect the coupling between the drive motor (5) and inline gear head (8):
   a. Remove the plugs (7) from the inline gear head (5) to access the coupling.
   b. Manually turn the drive shaft to expose the hub screws. Use a hex wrench (6) to loosen the hub screws.
4. Remove the screws (3) and lock washers (4) securing the drive motor (5) to the inline gear head (8). Remove the drive motor from the inline gear head.

Install the Drive Motor

1. De-grease the drive motor shaft and inline gear head bore using an approved solvent.
2. Rotate the inline gear head hub to align the hub screws to the access holes.
3. Perform the following:
   a. Install the new drive motor (5) onto the inline gear head (8).
   b. Make sure that the inline gear head hub screws are aligned to the access holes. Pre-tighten the hub screws to 2-in.-lb. (0.2 N•m).
   c. Secure the drive motor to the inline gear head using the screws (3) and lock washers (4). Tighten the screws securely.
   d. Tighten the hub screws to 39-in.-lb. (4.4 N•m) Install the plugs (7) into the inline gear head.
4. See Figure 8. Connect the drive motor cables (1) to the controller cable set (2).



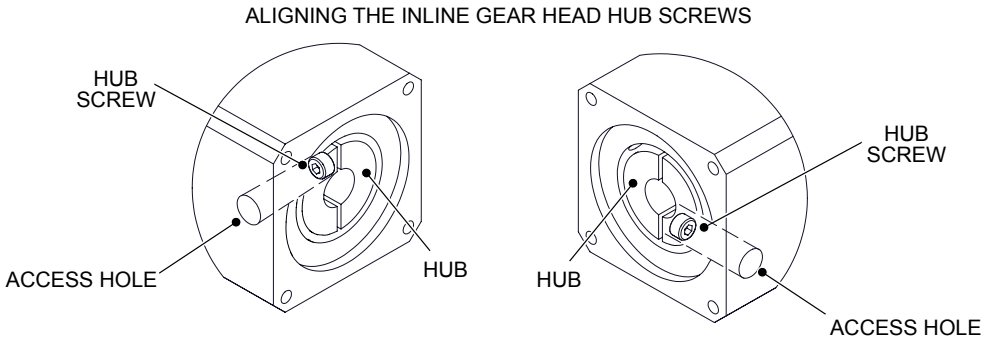


Figure 9 Drive Motor Replacement

Inline Gear Head

See Figure 10

Remove the Inline Gear Head

1. Make sure that all air and material pressures are relieved from the SureMix Dispense stand.
2. Remove the drive motor (15) from the inline gear head (14). Refer to the *Drive Motor* procedures in this section.
3. Loosen the screws (10) securing the shroud (1) to the mounting bracket (11). Remove the shroud.
4. Loosen the mounting bracket screws (12). Slide the mounting bracket (11) back and remove the center coupling (5).
5. Remove the screws (13), lock washers (9), and nuts (8) securing the inline gear head (14) to the mounting bracket (11).
6. Loosen the screw (3) securing the upper coupling (2) to the inline gear head (14). Remove the upper coupling and key (4).

Install the Inline Gear Head

1. Install the upper coupling (2) and key (4) onto the new inline gear head (14). Tighten the screw (3) to 45-in.-lb (5 N•m).
2. Install the inline gear head (14) onto the mounting bracket (11) using the lock washers (9), nuts (8), and screws (13). Tighten the screws securely.
3. Install the center coupling (5) onto the lower coupling (6). It may be necessary to rotate the lower coupling to keep the center coupling on the lower coupling.

NOTE

The following step requires the use of a 0.020-0.030-in. shim.

4. Make sure that there is a 0.020-0.030-in gap between the upper coupling (2) and the center coupling (5). Perform the following if the gap needs to be reset:
   a. Place the 0.020-0.030-in. shim between the upper coupling (2) and center coupling (5).
   b. Slide the mounting bracket (11) toward the upper coupling (2) until it makes contact with the shim.
   c. Tighten the Mounting bracket screws (12) to 25-30 ft-lb (34-40 N•m). Remove the shim.
5. Install the shroud (1) onto the mounting bracket (11) and tighten the screws securely.

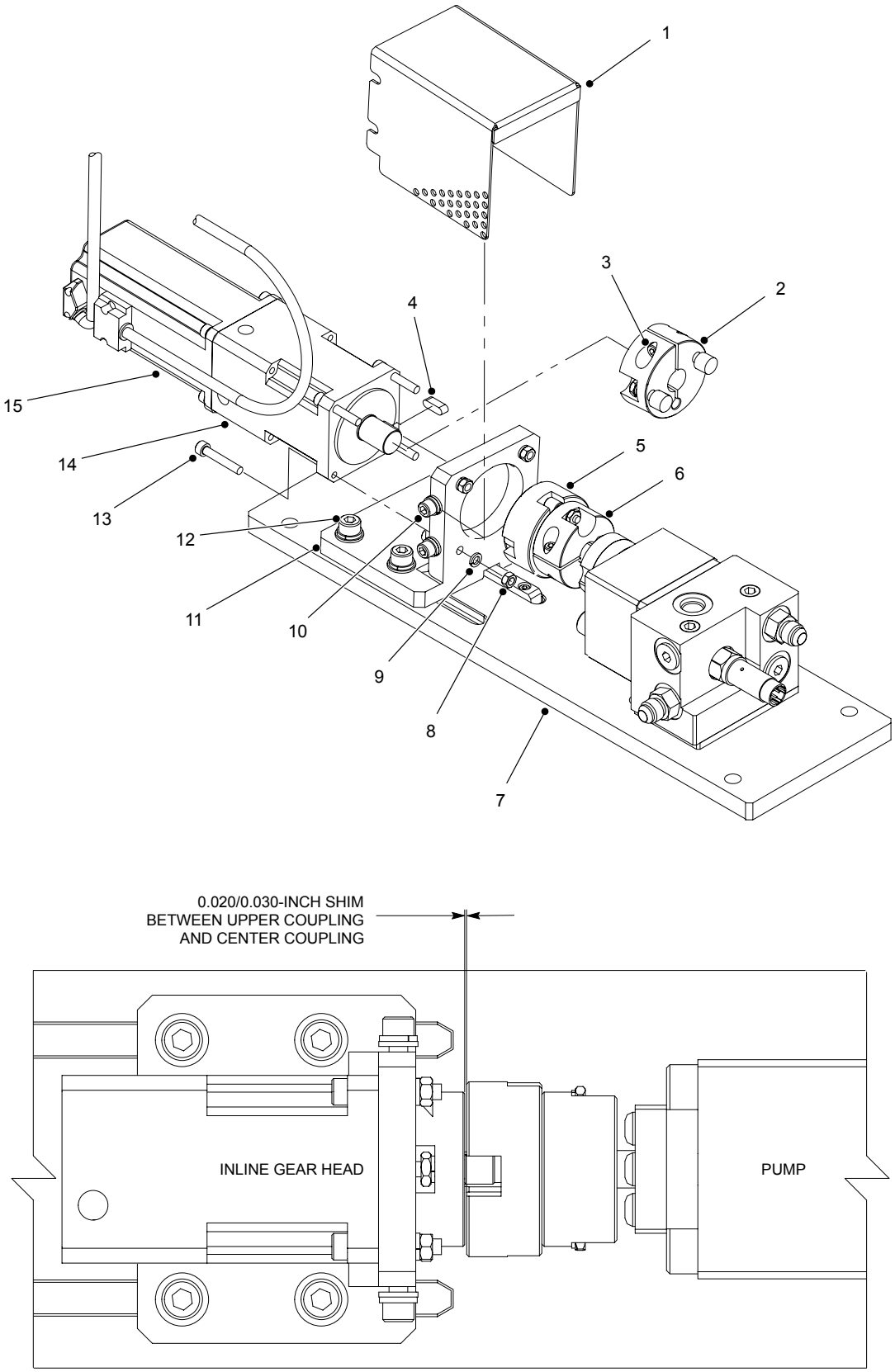


Figure 10 Inline Gear Head Replacement

Pump

See Figure 11.

Remove the Pump

1. Make sure that all air and material pressures are relieved from the SureMix Dispense stand.
2. Loosen the screws (14) securing the shroud (1) to the mounting bracket (16). Remove the shroud.
3. Loosen the mounting bracket screws (15). Slide the mounting bracket (16) back and remove the center coupling (2).
4. Remove the screws (9) securing the pump (7) and spacer plate (6) to the manifold (12).
5. Remove the O-rings (5, 10) from the spacer plate (6) and manifold (12). Discard the O-rings.
6. Loosen the screw (4) securing the lower coupling (3) to the pump (7). Remove the lower coupling and key (8).

Install the Pump

NOTE

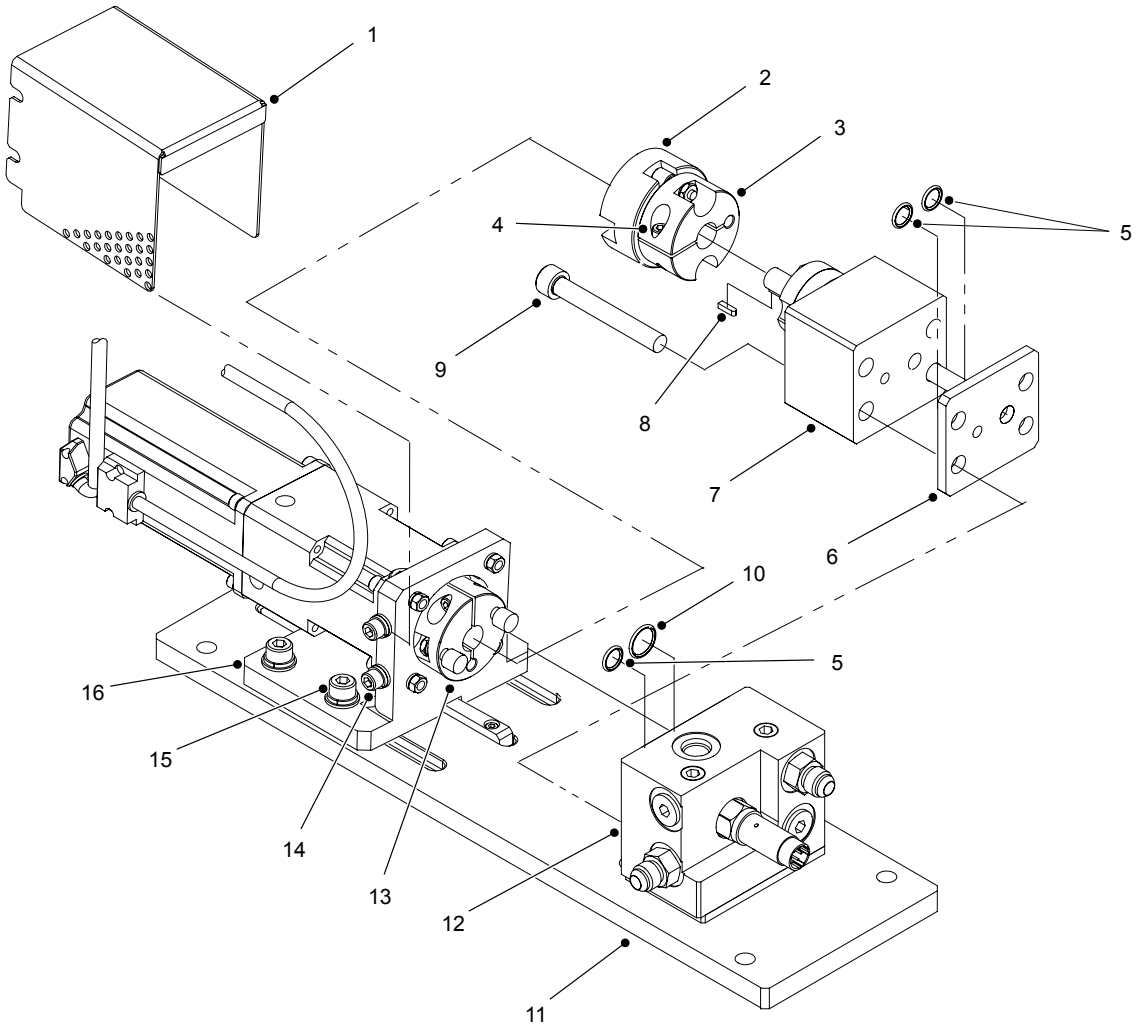
The following step requires the use of a 0.050-0.100-in. shim.

1. Install the lower coupling (3) and key (8) onto the pump (7). Do not tighten the screw (4) at this time.
2. Make sure that there is a 0.050-0.100-in gap between the lower coupling (3) and the pump (7) screw head. Tighten the lower coupling screw (4) screw to 45-in.-lb (5 N•m).
3. Install new O-rings (5, 10) onto the spacer plate (6) and the manifold (12).
4. Apply Never-Seez to the threads of the screws (9). Install the spacer plate (6) and pump (7) onto the manifold (12) using the screws. Tighten the screws to 35-40 ft-lb (48-54 N•m).
5. Install the center coupling (2) onto the lower coupling (3). It may be necessary to rotate the lower coupling to keep the center coupling on the lower coupling.

NOTE

The following step requires the use of a 0.020-0.030-in. shim.

6. Perform the following:
   a. Make sure the upper coupling (13) is properly aligned to the center coupling (2).
   b. Place the 0.020-0.030-in. shim between the upper coupling (13) and center coupling (2).
   c. Slide the mounting bracket (16) toward the upper coupling (13) until it makes contact with the shim.
   d. Tighten the Mounting bracket screws (15) to 25-30 ft-lb (34-40 N•m). Remove the shim.
7. Instal the shroud (1) onto the mounting bracket (16) and tighten the screws (14) securely.



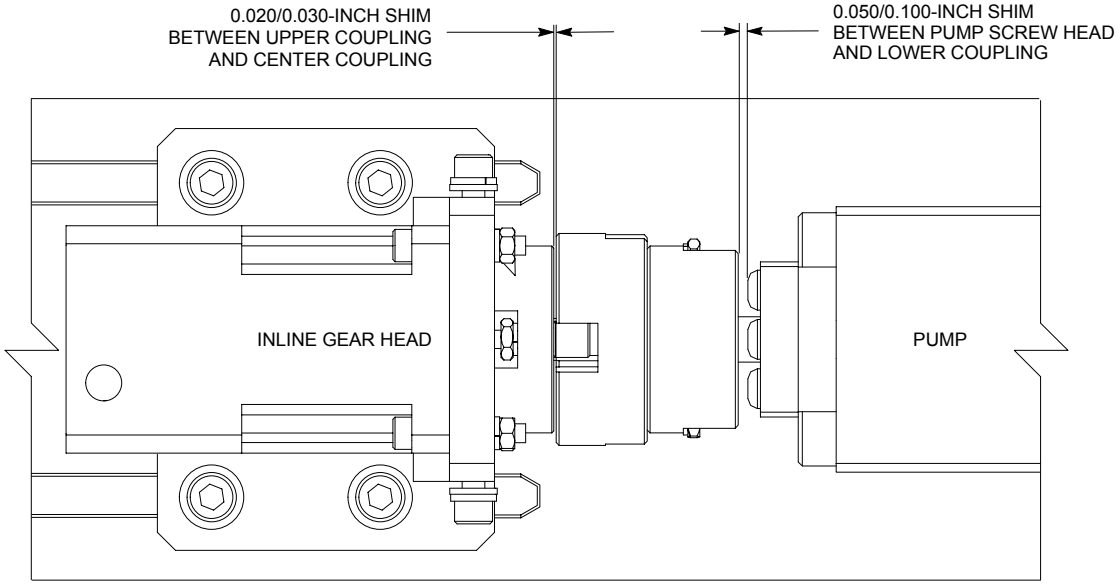


Figure 11 Pump Replacement

Pump Seals

See Figure 12.

NOTE

This procedure requires 2 pump seals. The part number for the seals is 333127.

Remove the Pump Seals

1. Make sure that all air and material pressures are relieved from the SureMix Dispense stand.
2. See Figure 11. Loosen the screws (14) securing the shroud (1) to the mounting bracket (16). Remove the shroud.
3. Loosen the mounting bracket screws (15). Slide the mounting bracket (16) back and remove the center coupling (2).
4. Loosen the screw (4) securing the lower coupling (3) to the pump (7). Remove the lower coupling and key (8).
5. See Figure 12. Remove the screws (1) securing the seal housings (3) to the pump (2).
6. Note the orientation of the seals (4). Use an O-ring pick to remove the seals from the housings (3).

Install the Pump Seals

NOTE

This procedure requires the use of petroleum jelly.

1. Make sure that the seal housings (3) are free of debris.
2. Apply a small amount of petroleum jelly to the seals (4) and the inside diameter of the seal housings (3).
3. Install the seals (4), smaller diameter side first, into the seal housings (3).
4. Pack the seals (4) with petroleum jelly as shown.
5. Install the seal housings (3) onto the pump (2) shaft using the screws. Tighten the screws to 75−85 in.-lb (8.5−9.6 N•m).

NOTE

The following step requires the use of a 0.050-0.100-in. shim.

6. See Figure 11. Install the lower coupling (3) and key (8) onto the pump (7). Do not tighten the screw (4) at this time.
7. Make sure that there is a 0.050-0.100-in gap between the lower coupling (3) and the pump (7) screw head. Tighten the lower coupling screw (4) screw to 45-in.-lb (5 N•m).
8. Install the center coupling (2) onto the lower coupling (3). It may be necessary to rotate the lower coupling to keep the center coupling on the lower coupling.

NOTE

The following step requires the use of a 0.020-0.030-in. shim.

9. Perform the following:
   a. Make sure the upper coupling (13) is properly aligned to the center coupling (2).
   b. Place the 0.020-0.030-in. shim between the upper coupling (13) and center coupling (2).
   c. Slide the mounting bracket (16) toward the upper coupling (13) until it makes contact with the shim.
   d. Tighten the Mounting bracket screws (15) to 25-30 ft-lb (34-40 N•m). Remove the shim.
10. Instal the shroud (1) onto the mounting bracket (16) and tighten the screws (14) securely.

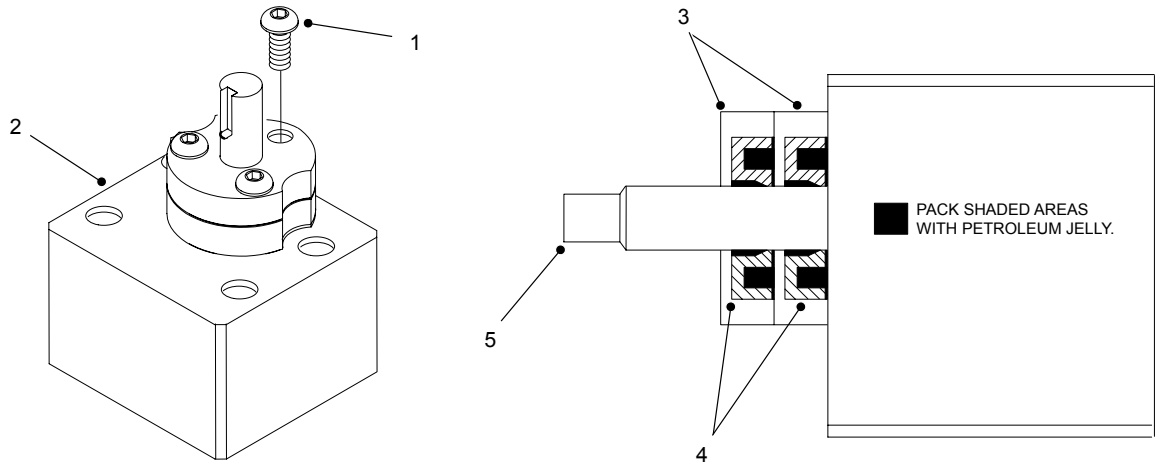


Figure 12 Pump Seals

Parts

To order parts, call the Nordson Customer Service Center or your local Nordson representative.

Pumps and Frame

See Figures 13 and 14 and refer to the following parts lists.

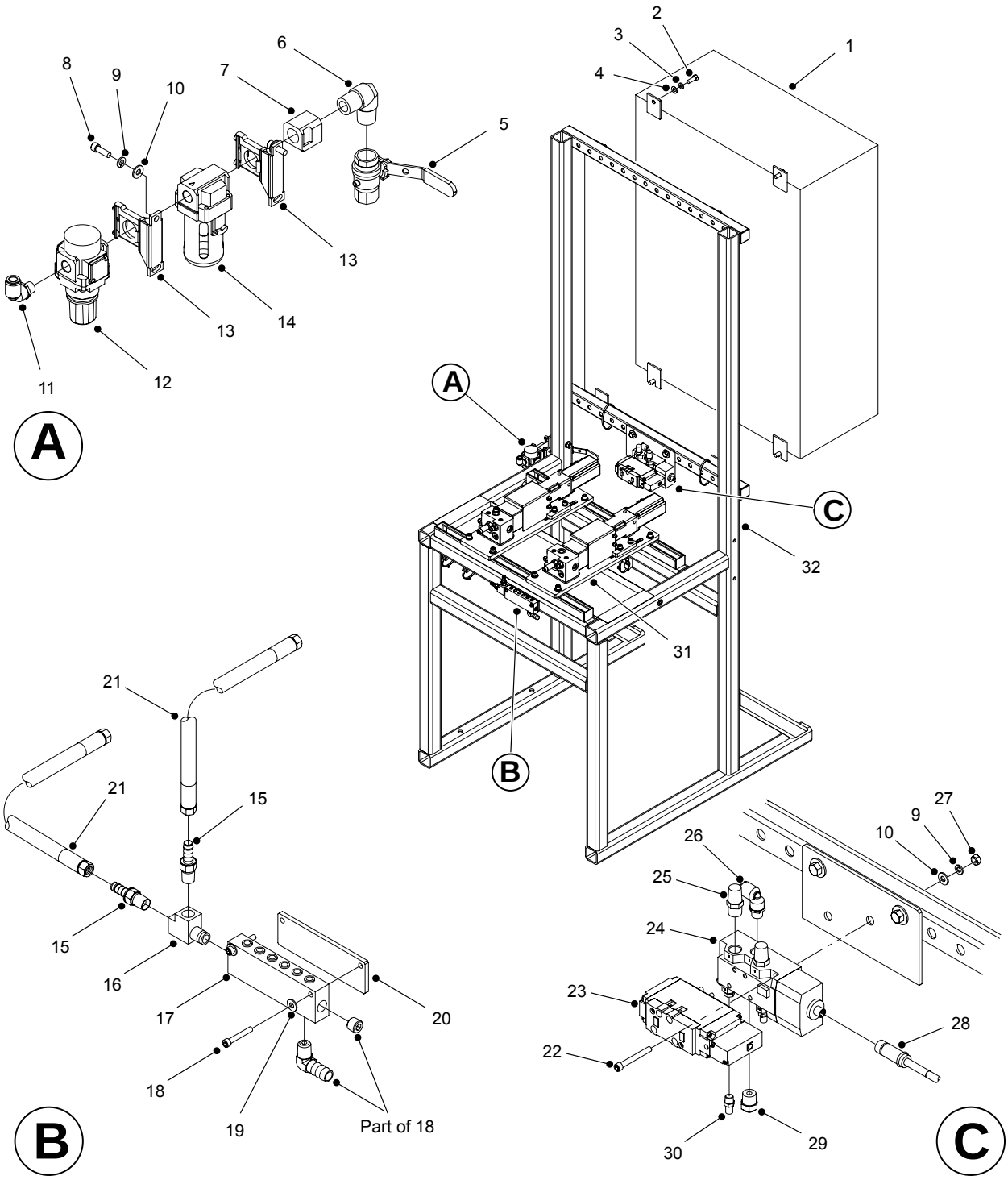


Figure 13 SureMix Dispensing System Parts

Item	Part	Description	Qty	Note
	1051712	SureMix 2K Dispensing System	1	
1	- - - - - -	• Controller	1	A
2	981402	• Screw, hex, $^{3}/_{8}$-16 x 1.000 in., cap, zn	4	
3	983530	• Lock washer, split $^{3}/_{8}$, zinc,14451−KA	4	
4	345929	• Washer, flat regular, $^{3}/_{8}$, zinc	4	
5	1052163	• Valve, ball,$^{1}/_{2}$ NPT, vent, lock, blue handle	1	
6	973212	• Elbow male, pipe, HYD, $^{1}/_{2}$, stl, zn	1	
7	1057517	• Tee, interface, branch, $^{1}/_{2}$ NPT	1	
8	345750	• Screw, socket, $^{1}/_{4}$-20 x 0.750	4	
9	983085	• Washer, lock, E, external,$^{1}/_{4}$, zn	4	
10	345913	• Washer, flat, regular,$^{1}/_{4}$, zn	4	
11	972183	• Elbow, male, $^{3}/_{8}$ tube x 1/4 NPT	1	
12	1057516	• Regulator, air,$^{1}/_{4}$ NPT, 150 psi, relieving	1	
13	1057518	• Spacer, with bracket, Y300T	2	
14	1057514	• Filter, air, $^{1}/_{4}$ NPT, 150 psi, 5-micron filter	1	
15	972893	• Connector, barbed, $^{3}/_{8}$T, $^{9}/_{16}$-18, brass	2	
16	973275	• Tee, pipe, $^{1}/_{4}$, brass	1	
17	1056155	• Manifold assembly, 6-passages, $^{5}/_{32}$ orifice	1	
18	981171	• Screw, socket, 10-32 x 1.250, zn	2	
19	345864	• Washer, flat, #10, regular, stl, zn	2	
20	1056300	• Insulator, manifold	1	
21	1045605	• Hose, air, $^{3}/_{8}$ ID x $^{5}/_{8}$ OD, 300 psi	3	
22	981441	• Screw, socket,$^{1}/_{4}$-20 x 2.000	2	
23	1044954	• Valve, ISO size 1, 2-position, 4-way, 24 VDC	1	
24	1043426	• Base, manifold, $^{3}/_{8}$ NPT, 5-port, ISO size 1	1	
25	177452	• Muffler, exhaust, $^{3}/_{8}$ inch NPTF	1	
26	972216	• Elbow, male,1/4 tube x $^{3}/_{8}$ NPT	1	
27	345836	• Nut, hex, regular,$^{1}/_{4}$−20, stl, zn, 14441−GA	2	
28	1042063	• Cable assembly, 4 conductor, 1 m, 18 AWG, 250 V	1	
29	971672	• Connector, male,$^{1}/_{4}$ tube x $^{3}/_{8}$ NPT	2	
30	170269	• Muffler, exhaust, $^{1}/_{8}$-inch NPT	2	
31	1051753	• Gear-meter, Servo, 4.5 CC, temperature conditioned	2	B
32	1051770	• Stand, servo gear meter assembly	1	

NOTE A: The controller is designed to system specifications. See Figure 15 and refer to the Controller section for available parts.

B: See Figure 14 for detailed parts breakdown.

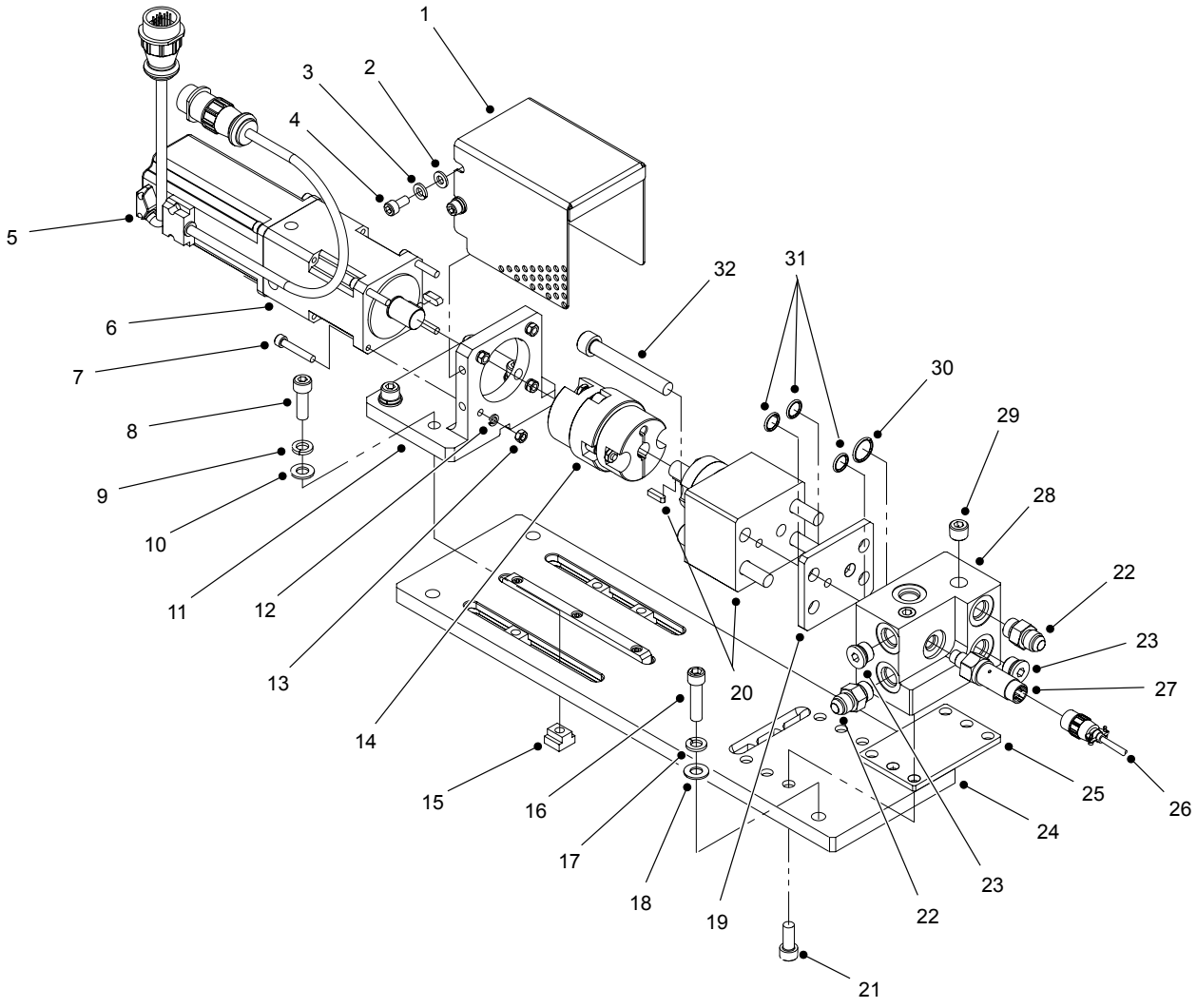


Figure 14 SureMix Dispensing System Parts *(continued)*

Item	Part	Description	Qty	Note
	1051753	Gear-meter, Servo, 4.5 CC, temperature conditioned	1	A
1	1051773	• Shroud, coupler, gear-meter, servo	1	
2	983410	• Washer, flat, M, narrow, M6, stl, zn	4	
3	983409	• Washer, lock, M, SPT, M6, stl, zn	4	
4	982176	• Screw, socket, M6 x 16	4	
5	320991	• Motor, servo, 4000 RPM	1	
6	320990	• Gear head, inline	1	
7	982029	• Screw, socket, M5 x 30	4	
8	982160	• Screw, socket, M8 x 25, zn	4	
9	983404	• Washer, lock, M, SPT, M8, stl, zn	4	
10	983013	• Washer, flat, M, regular, 8, stl, zn	4	
11	1051952	• Bracket, mounting, support, gear-meter, servo	1	
12	983035	• Washer, flat, M, regular, 5, stl, zn	4	
13	276141	• Nut, lock, M5	4	
14	322637	• Coupling assembly,12 x 16	1	
15	1054348	• Nut, T-slot, M8 x 1.25	4	
16	815208	• Screw, $^{3}/_{8}$-16 x 1.5	4	
17	983530	• Lock washer, split $^{3}/_{8}$, zinc, 14451-KA	4	
18	345929	• Washer, flat, regular, $^{3}/_{8}$, zinc	4	
19	1051763	• Plate, spacer, gear-meter, servo	1	
20	1054566	• Pump assembly, 4.5 CC, double seal	1	
NS	333127	• • Seal, KH1 PTFE	2	B
21	982006	• Screw, socket, M8 x 20, zn	4	
22	972121	• Connector, 37 HYD, $^{9}/_{16}$-18	2	
23	973574	• Plug, O-ring, $^{9}/_{16}$-18	2	
24	1051768	• Base, plate, gear-meter, servo	1	
25	1051765	• Insulator plate, gear-meter, servo	1	
26	1054304	• Cable assembly, transducer, AMP, 8 ft	1	
27	1063881	• Transducer, pressure, 0−2000 PSI, 4-20mA	1	
29	973411	• Plug, pipe, socket, flush,$^{1}/_{4}$, zn	2	
28	1051760	• Manifold, gear-meter, servo, temperature conditioned	1	
30	940166	• O-ring, Viton, 0.625 x 0.750, 10416	1	
31	940138	• O-ring, Viton, 0.438 x 0.563	3	
32	1054581	• Screw, socket, M10 x 75 MM	4	

NOTE A: The SureMix Dispensing System is configured with two gear meters. The quantities listed in the Qty column are for one gear meter.

B: This part is included with item 20 but can be ordered separately.

NS: Not Shown

Controller

See Figure 15 and the following parts list.

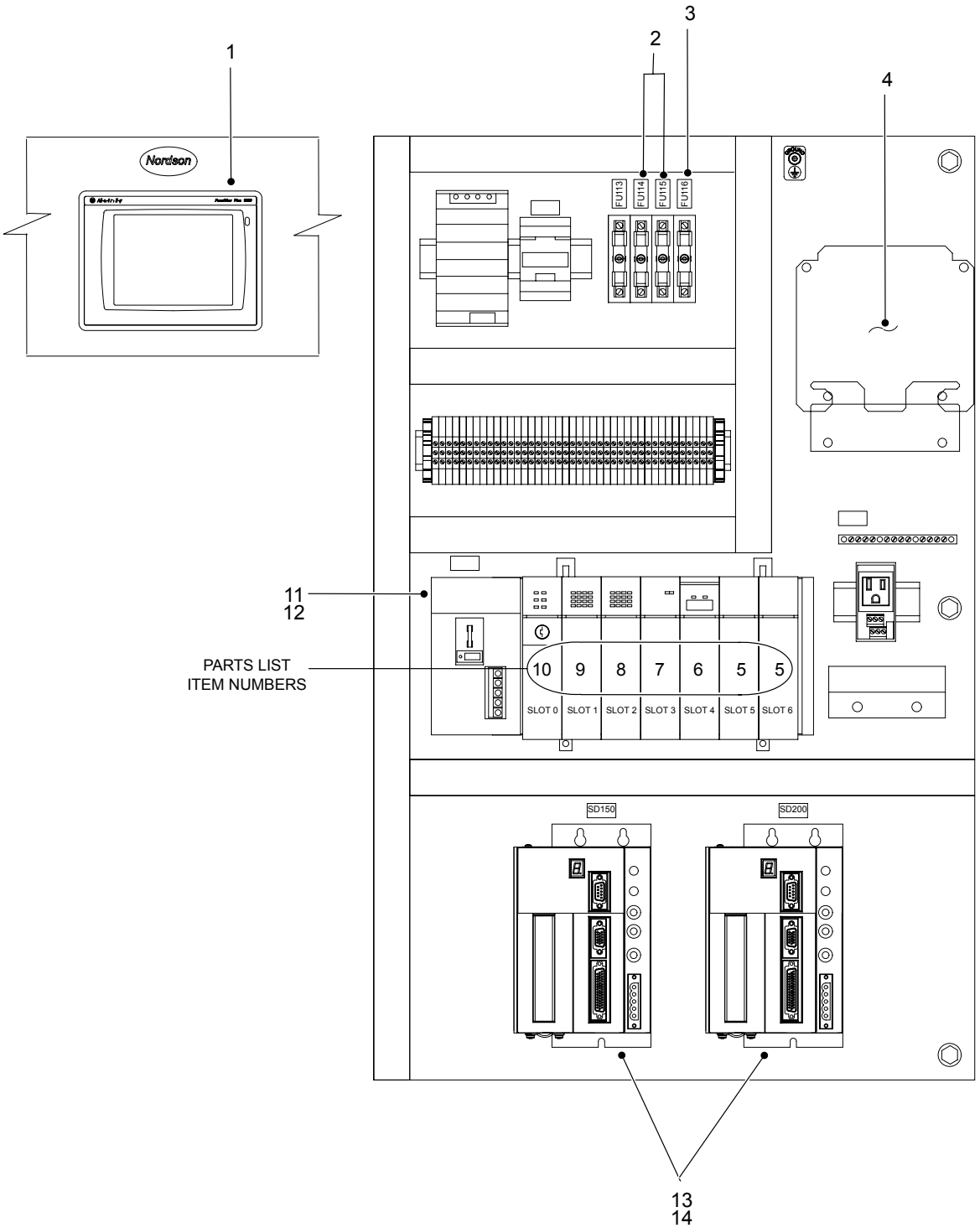


Figure 15 SureMix Controller Recommended Spare Parts

Item	Part	Description	Qty	Note
—	- - - - - -	Controller	1	
1	1060821	• PanelView 1000	1	
2	305985	• Fuse, 20 amp, 600v	2	
3	1002762	• Fuse, 10 amp, 600v	1	
4	939829	• Fuse, 25 amp, 600v	1	
5	176270	• PLC slot filler, SLC 500	2	
6	1007758	• I/O comm module, DeviceNet scanner	1	
7	184112	• I/O input module, analog, 4 inputs	1	
8	1007906	• I/O output module, 16 PT, 10/50 Vdc	1	
9	1007904	• I/O input module, digital, 16 PT, sink, 24 Vdc	1	
10	1077879	• I/O processor, SLC, 5/05, Ethernet and RS−232	1	
11	184109	• PLC, chassis assembly, 7 slots, SLC 500	1	
12	184108	• PLC, power supply, SLC5, 5 amp	1	
13	1080422	• Ultra 3000 drive with DeviceNet	2	
14	1080424	• Breakout board, Ultra 3000, drive, mounted	2	

Notes: