

GSD

3A9390C

Automated Dispense Platform

EN

For automated, programmable, precision micro-dispensing. For professional use only.

Not approved for use in explosive atmospheres or hazardous (classified) locations.

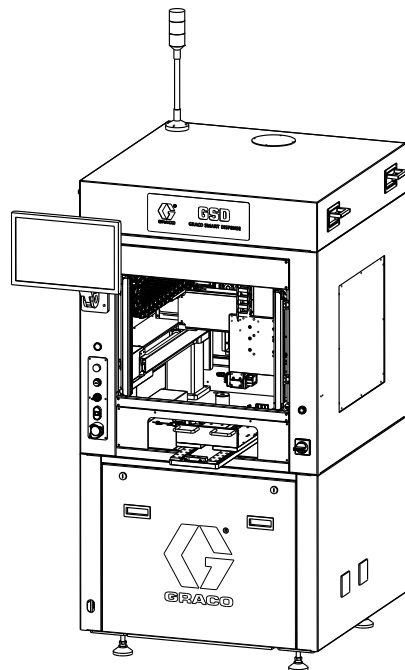
Model 2001644, 2001647, 2004679, 2001646

See page 3 for model information, including air pressure operating range and approvals.

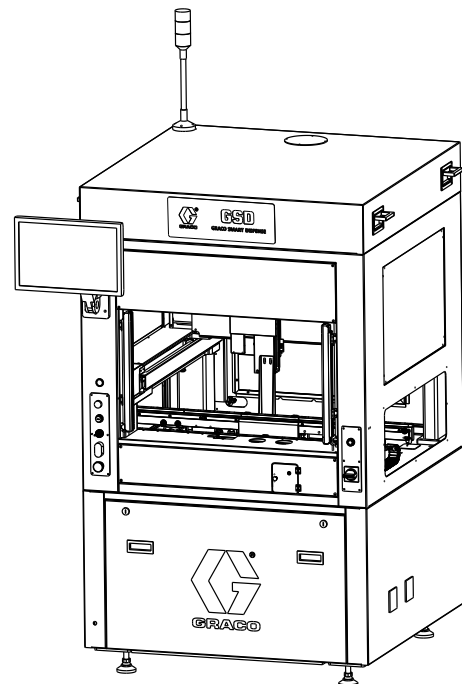


Important Safety Instructions

Read all warnings and instructions in this manual and all related manuals before using the equipment. Save all instructions.



GSD Off-line System



GSD In-line System

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Related Manuals

Find English manuals and any available translations at www.graco.com.

Manual in English	Description
3B0272	GSD Automated Dispense Platform Parts Manual
3B0107	PSM 15 Repair-Parts Manual
3A9277	PSM Repair-Parts Manual
3A9349	PR-Xv Repair-Parts Manual
3B0213	PR-Xv30 Repair-Parts Manual
3A8107	PCP Control Box Instruction Manual

Models

Part	Air Pressure Operating Range	Description	Approvals
2001644	80-100 psi (0.6-0.7 MPa, 5.5-7 bar)	GSD300 System, Off-line, I/O	
2001647		GSD500 System, Off-line, I/O	
2004679		GSD6050 System, Off-line, I/O	
2001646		GSD500 System, In-line, I/O	









NOTE: GSD I/O system can be converted to Profinet or Ethernet IP communication mode. Order kit 2005933 for Profinet communication mode or kit 2005934 for Ethernet IP communication mode. See **Accessories** in your GSD Parts Manual. See **Related Manuals**, page 3.

NOTE: If you want to order other customized GSD systems, please contact Graco sales representative for a custom solution. See **Accessories** in your GSD Parts Manual. See **Related Manuals**, page 3.

Safety Symbols

The following safety symbols appear throughout this manual and on warning labels. Read the table below to understand what each symbol means.

Symbol	Meaning
	Electric Shock Hazard
	Equipment Misuse Hazard
	Fire and Explosion Hazard
	Moving Parts Hazard
	Pressurized Equipment Hazard
	Skin Injection Hazard
	Skin Injection Hazard
	Splash Hazard
	Tipping Hazard
	Toxic Fluid or Fumes Hazard
	Laser Light Hazard: Avoid Direct Eye Contact

Symbol	Meaning
	Do Not Place Hands or Other Body Parts Near Fluid Outlet
	Do Not Stop Leaks with Hand, Body, Glove or Rag
	Eliminate Ignition Sources
	Follow Pressure Relief Procedure
	Ground Equipment
	Read Manual
	Ventilate Work Area
	Wear Personal Protective Equipment













Safety Alert Symbol

This symbol indicates: Attention! Become Alert! Look for this symbol throughout the manual to indicate important safety messages.

General Warnings

The following warnings apply throughout this manual. Read, understand, and follow the warnings before using this equipment. Failure to follow these warnings can result in serious injury.

 <h2 style="margin: 0;">WARNING</h2>	
 	<p>ELECTRIC SHOCK HAZARD</p> <p>This equipment must be grounded. Improper grounding, setup, or usage of the system can cause electric shock.</p> <ul style="list-style-type: none"> • Turn off and disconnect power cord before servicing equipment. • Connect only to grounded electrical outlets. • Use only 3-wire extension cords. • Ensure ground prongs are intact on power and extension cords. • Do not expose to rain. Store indoors.
	<p>TOXIC FLUID OR FUMES HAZARD</p> <p>Toxic fluids or fumes can cause serious injury or death if splashed in the eyes or on skin, inhaled, or swallowed.</p> <ul style="list-style-type: none"> • Read Safety Data Sheets (SDSs) to know the specific hazards of the fluids you are using. • Store hazardous fluid in approved containers, and dispose of it according to applicable guidelines.
     	<p>SKIN INJECTION HAZARD</p> <p>High-pressure fluid from dispensing device, hose leaks, or ruptured components will pierce skin. This may look like just a cut, but it is a serious injury that can result in amputation. Get immediate surgical treatment.</p> <ul style="list-style-type: none"> • Do not point dispensing device at anyone or at any part of the body. • Do not put your hand over the fluid outlet. • Do not stop or deflect leaks with your hand, body, glove, or rag. • Follow the Pressure Relief Procedure when you stop dispensing and before cleaning, checking, or servicing equipment. • Tighten all fluid connections before operating the equipment. • Check hoses and couplings daily. Replace worn or damaged parts immediately.

⚠️ WARNING



FIRE AND EXPLOSION HAZARD

Flammable fumes, such as solvent and paint fumes, in **work area** can ignite or explode. Paint or solvent flowing through the equipment can cause static sparking. To help prevent fire and explosion:



- Use equipment only in well-ventilated area.
- Eliminate all ignition sources; such as pilot lights, cigarettes, portable electric lamps, and plastic drop cloths (potential static sparking).
- Ground all equipment in the work area. See **Grounding** instructions.
- Never spray or flush solvent at high pressure.
- Keep work area free of debris, including solvent, rags and gasoline.
- Do not plug or unplug power cords, or turn power or light switches on or off when flammable fumes are present.
- Use only grounded hoses.
- Hold gun firmly to side of grounded pail when triggering into pail. Do not use pail liners unless they are anti-static or conductive.
- **Stop operation immediately** if static sparking occurs or you feel a shock. Do not use equipment until you identify and correct the problem.
- Keep a working fire extinguisher in the work area.



MOVING PARTS HAZARD

Moving parts can pinch, cut or amputate fingers and other body parts.



- Keep clear of moving parts.
- Do not operate equipment with protective guards or covers removed.
- Equipment can start without warning. Before checking, moving, or servicing equipment, follow the **Pressure Relief Procedure** and disconnect all power sources.






LASER LIGHT HAZARD: AVOID DIRECT EYE CONTACT

Eye exposure to Class II levels of laser light can cause injury, including eye (retinal) injury. To avoid direct eye exposure:



- Never look directly into a laser beam.
- Never shine the laser at mirror-like surfaces that can cause specular reflections of the beam.
- Do not disassemble the laser product.
- Laser must be turned off when cleaning the lens, so as not to create unwanted laser refraction.

WARNING

 	<p>EQUIPMENT MISUSE HAZARD</p> <p>Misuse can cause death or serious injury.</p> <ul style="list-style-type: none"> • Do not operate the unit when fatigued or under the influence of drugs or alcohol. • Do not exceed the maximum working pressure or temperature rating of the lowest rated system component. See Technical Specifications in all equipment manuals. • Use fluids and solvents that are compatible with equipment wetted parts. See Technical Specifications in all equipment manuals. Read fluid and solvent manufacturer’s warnings. For complete information about your material, request Safety Data Sheets (SDSs) from distributor or retailer. • Do not leave the work area while equipment is energized or under pressure. • Turn off all equipment and follow the Pressure Relief Procedure when equipment is not in use. • Check equipment daily. Repair or replace worn or damaged parts immediately with genuine manufacturer’s replacement parts only. • Do not alter or modify equipment. Alterations or modifications may void agency approvals and create safety hazards. • Make sure all equipment is rated and approved for the environment in which you are using it. • Use equipment only for its intended purpose. Call your distributor for information. • Route hoses and cables away from traffic areas, sharp edges, moving parts, and hot surfaces. • Do not kink or over bend hoses or use hoses to pull equipment. • Keep children and animals away from work area. • Comply with all applicable safety regulations.
	<p>PERSONAL PROTECTIVE EQUIPMENT</p> <p>Wear appropriate protective equipment when in the work area to help prevent serious injury, including eye injury, hearing loss, inhalation of toxic fumes, and burns. Protective equipment includes but is not limited to:</p> <ul style="list-style-type: none"> • Protective eyewear, and hearing protection. • Respirators, protective clothing, and gloves as recommended by the fluid and solvent manufacturer.

Two-Component Materials




Material Self-Ignition

				
Some materials may become self-igniting if applied too thick. Read material manufacturer's warnings and Safety Data Sheets (SDSs).				

Be aware that orientation of the Component A and Component B hoses varies depending on the type of dispense head being used.

For additional clarification of the A and B components, refer to the manual for the dispenser you are using. For example, if using the PR-Xv dispenser, refer to the PR-Xv Instructions Manual (3A9328), and Repair and Parts Manuals (3A9349).

Keep Components A and B Separate

				
Cross-contamination can result in cured material in fluid lines which could cause serious injury or damage equipment. To prevent cross-contamination:				
<ul style="list-style-type: none"> • Never interchange component A and component B wetted parts. • Never use solvent on one side if it has been contaminated from the other side. 				

Changing Materials

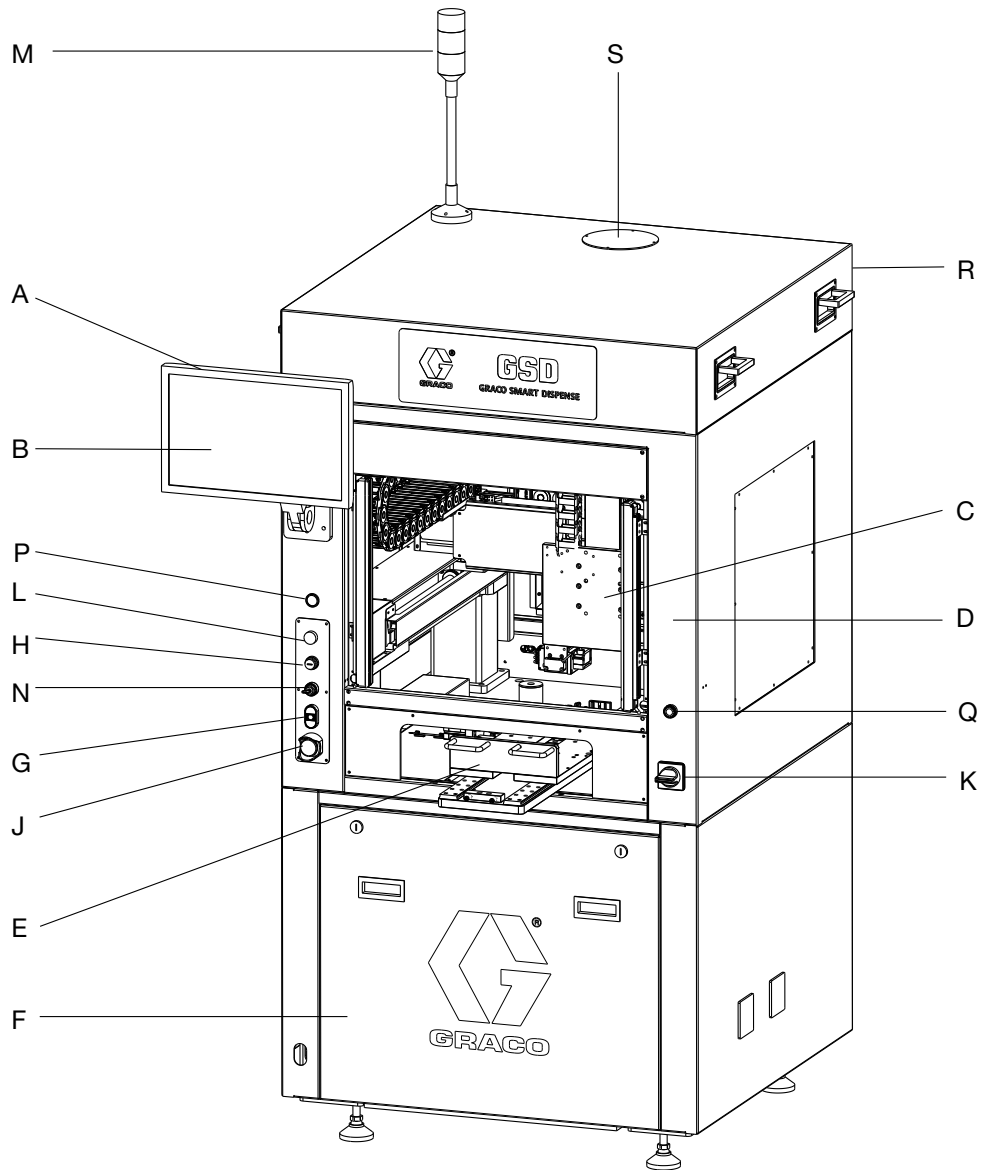
NOTICE
<p>Changing the material types used in your equipment requires special attention to avoid equipment damage and downtime.</p> <ul style="list-style-type: none"> • When changing materials, flush the equipment multiple times to ensure it is thoroughly clean. • Always clean the fluid inlet strainers after flushing. • Check with your material manufacturer for chemical compatibility. • When changing between epoxies and urethanes or polyureas, disassemble and clean all fluid components and change hoses. Epoxies often have amines on the B (hardener) side. Polyureas often have amines on the B (resin) side.

A and B Components

NOTE: Material suppliers can vary in how they refer to plural component materials.

Component Identification

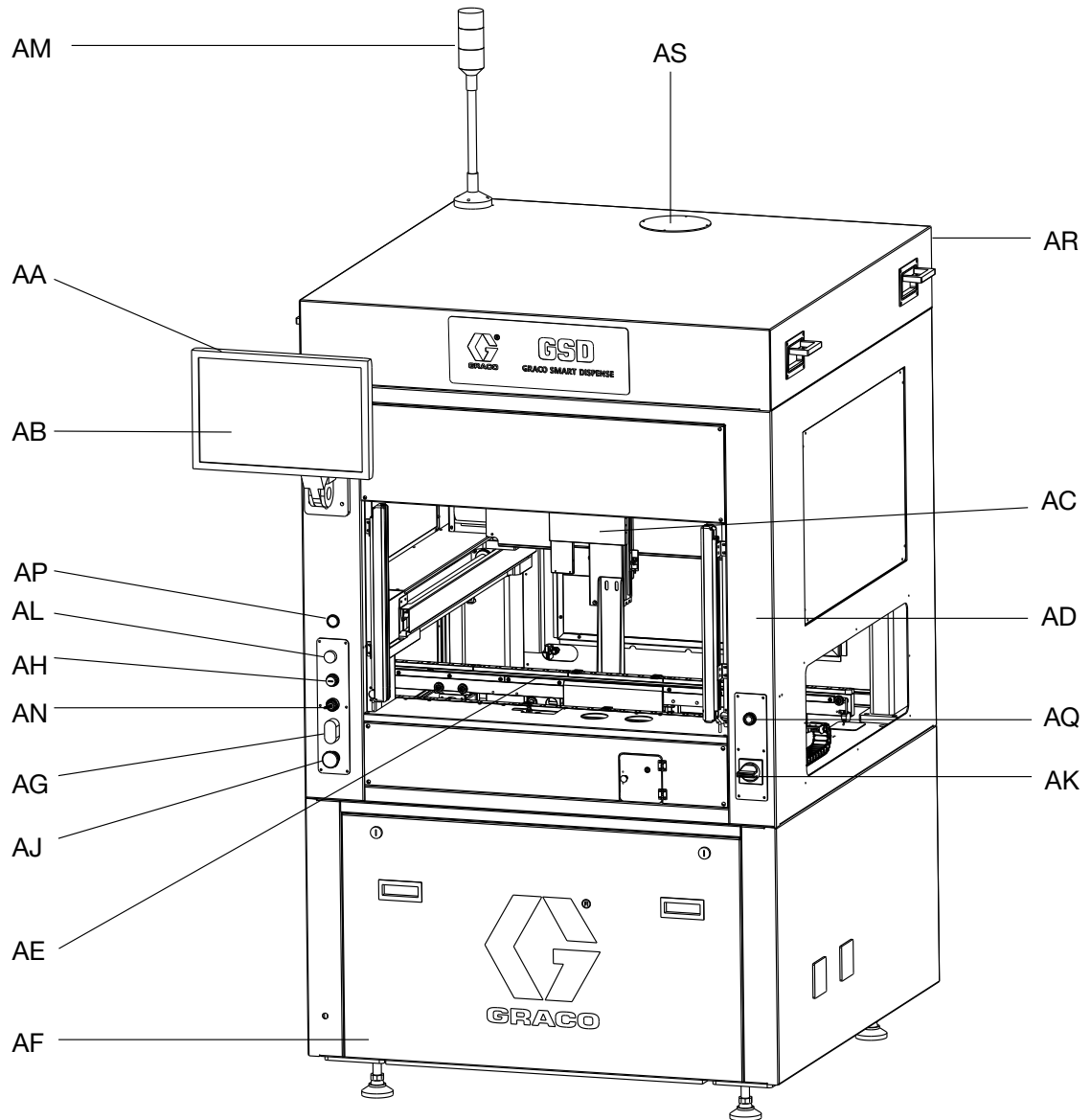
GSD Off-line System



Key:

- | | |
|---|-----------------------|
| A Computer Touch Screen Monitor | L Pump Air Regulator |
| B GSD System Software Application | M Light Tower |
| C Dispenser Holder | N Maintenance Switch |
| D Access Door | P Air Pressure Gauge |
| E Dual Y-slide | Q Manual Start Button |
| F Access Panel to Electrical Components (including Motion Controller) | R Top Cover |
| G Control Power | S Exhaust Hole |
| H USB Port | |
| J Emergency Stop | |
| K System Power Switch/Fused Power Inlet | |

GSD In-line System



Key:

- | | |
|--|------------------------|
| AA Computer Touch Screen Monitor | AQ Manual Start Button |
| AB GSD System Software Application | AR Top Cover |
| AC Dispenser Holder | AS Exhaust Hole |
| AD Access Door | |
| AE Conveyor | |
| AF Access Panel to Electrical Components (including Motion Controller) | |
| AG Control Power | |
| AH USB Port | |
| AJ Emergency Stop | |
| AK System Power Switch/Fused Power Inlet | |
| AL Pump Air Regulator | |
| AM Light Tower | |
| AN Maintenance Switch | |
| AP Air Pressure Gauge | |

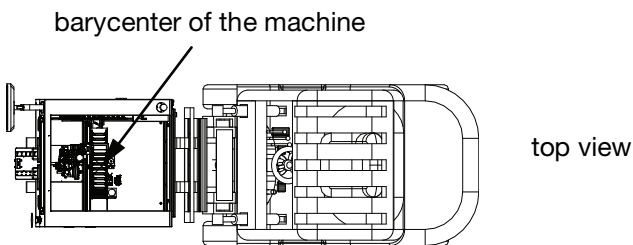
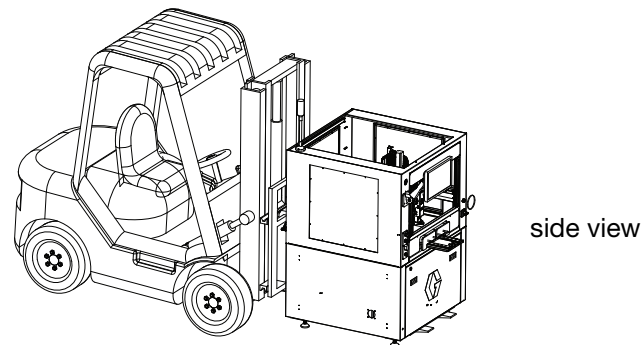
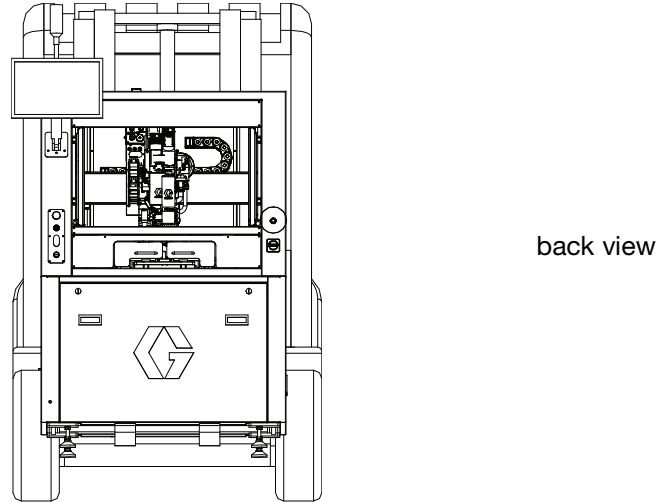
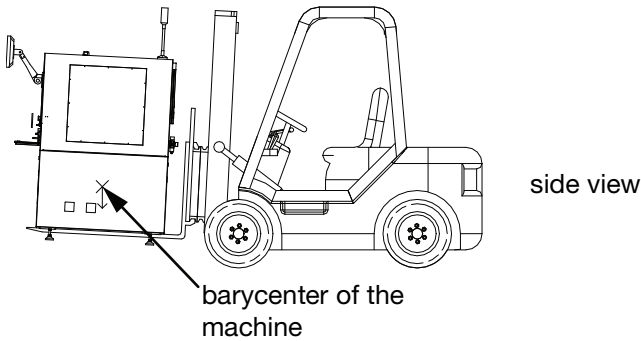
Installation

Transportation Requirements

Follow the instructions when transporting the machine.

NOTE: The load of for forklift must be at least 1000kg.

NOTE: The front fork of the forklift must be longer than 1400mm.



Unpacking

<p>The GSD machines are shipped in large wooden crates. To avoid personal injury or damage to the machine:</p> <ul style="list-style-type: none"> • It is recommended that at least two people are present to safely remove the panels. • Make sure the contents will not shift when removing any banding or blocking that was used to secure the components and keep them in place. 				

GSD automated dispensing machine configurations vary based on table size and the options selected. For this reason, the packaging used for each machine varies as well.

The following instructions apply when unpacking GSD systems.

1. Inspect the shipping container carefully for damage. Contact the carrier promptly if there is damage.

NOTE: All crates are equipped with drop sensors to indicate if the crate was improperly handled. Check these sensors prior to unpacking. If the sensor indicates rough handling, make note of that on the bill of lading and inspect the product for damage when unpacking.

2. Read all special instructions and warnings that are posted on the crate before attempting to open it.
3. Each machine is bolted to a pallet and then side panels are attached to each side. The lid is then fastened to the sides. Inspect the crate to see if screws or nails were used to attach the panels.
4. Disassemble the crate using a pry bar and/or electric screw driver, depending on how the crate was assembled. Remove the top first, then loosen and remove one side at a time.
5. During the unpacking process, inspect all components for damage. If you find damage, take pictures of the damaged components to show as much detail as possible and contact your Graco distributor.
6. Brace any contents that appear as if they could shift or move in an unsafe manner when packaging is removed.
7. Remove any plastic wrap and banding used to secure and protect the equipment.
8. Lift the machine from the pallet with hoisting machine or fork lift.

NOTICE

The forks on the tow motor must extend completely through the machine base to ensure the machine can be removed and transported without damage.

9. Prior to starting the machine, inspect the machine closely. Additional unpacking or setup instructions in the form of tags or stickers may be attached.

Locate and Prepare the Machine

Place the GSD machine on a flat, level surface close to necessary service requirements. The machine requires electric and air connections. (See the identification plate on the machine.) Allow sufficient clearance around the machine to gain access to the control components in the machine's base.

NOTE: Additional space may be needed for the material feed system depending on the application. Refer to the manual for the feed system you are using. See **Related Manuals**, page 3.

1. Adjust the leveler stems on the base so the table surface is level and all four levelers are contacting the floor.

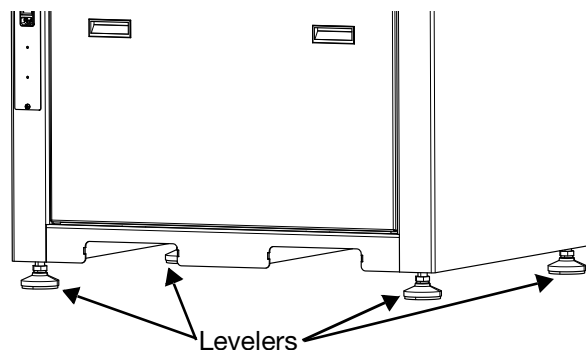


FIG. 1: Leveling the GSD Base

2. Tighten the lock nuts on the levelers.
3. Ensure that the axes moves freely left to right and front to back along the axes as shown in FIG. 2, and that there are no physical obstructions to movement.
 - There may be banding or zip ties used to prevent the front-to-back motion (Y axis) during shipment. Remove any banding and any other packaging materials from the machine before attempting operation.

NOTE: The up and down motion (Z axis) is prevented by an electric brake that requires power to disengage. The dispenser should not move up or down until power is applied to the system and it is moved using the machine controls.

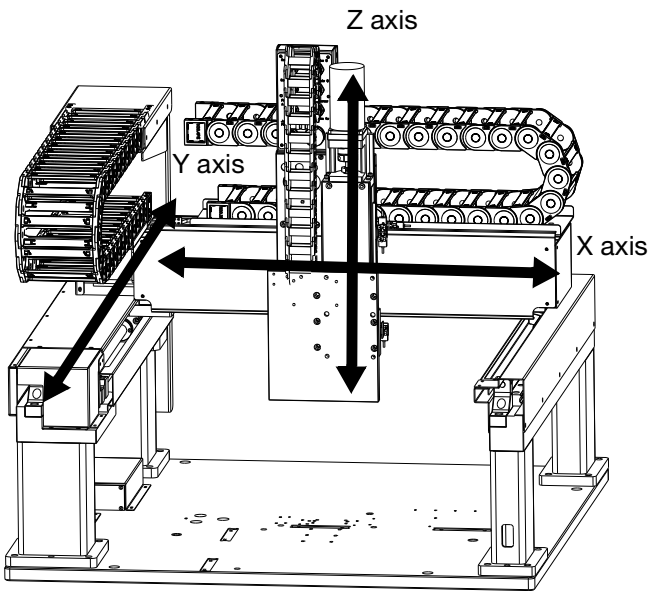


FIG. 2: Dispenser Axis Movement

4. The computer monitor is typically removed for shipment. The screws for mounting the monitor to the arm on the machine are screwed into the back of the monitor. Remove them and use them to attach the monitor to the arm. Connect the three cords hanging from the arm to the matching receptacles on the back of the monitor.

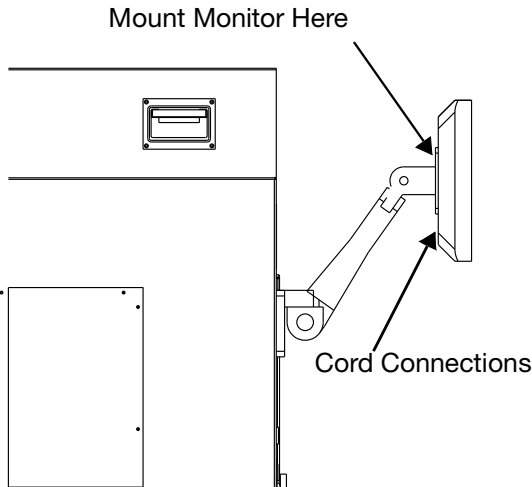


FIG. 3: Mounting the Monitor

5. Reassemble any other components that might have been removed for safe shipment. Special instructions for these components should be included.

Make Connections

Review all documentation for the feed system components before completing installation and operating the system with material.

1. Review the serial number tag on the machine to determine the system power requirements.
2. Inspect all air fittings to ensure there are no loose or disconnected air tubes.
3. Apply regulated air pressure to the system.

NOTE: Pressure in excess of maximum allowable system pressure will result in the relief valve on the air inlet assembly venting to atmosphere.

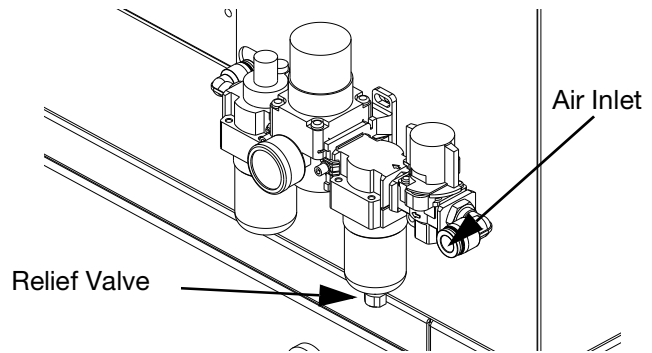


FIG. 4: Air pressure control location

4. Adjust the air pressure down to within system limits to prevent the relief valve from venting.
5. Connect electrical power to the machine. Most machines are equipped with a fused IEC connector that accepts a molded cord set that plugs into a conventional wall outlet.
6. Install a mixer, shut off valve, and needle tip as appropriate for your application. Refer to the manual for the type of valve you are using.

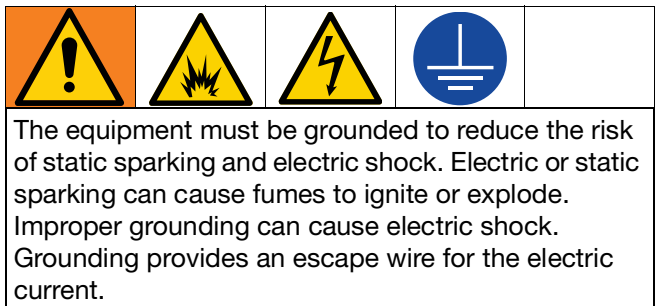
NOTE: There may be custom features on your system that require additional installation and setup procedures that are not defined in this manual.

Flush Before Using Equipment

The equipment is typically tested with lightweight oil, which is left in the fluid passages to protect parts. To avoid contaminating your material with oil, flush the equipment with a compatible solvent before using the equipment. The procedure for flushing equipment depends on the type of feed system. Refer to the manual for the feed system you are using.

NOTE: See the tags and markings on the equipment to confirm the contents of the wetted components.

Grounding



Air and fluid hoses: Use only electrically conductive hoses with a maximum of 500 ft. (150 m) combined hose length to ensure grounding continuity. Check electrical resistance of the hoses. If total resistance to the ground exceeds 29 megohms, replace the hose immediately.

Machine: Grounded through the supplied power cord.

Air compressor: Follow manufacturer's recommendations.

Dispense valve: Ground through connection to a properly grounded fluid hose and pump.

Fluid supply container: Follow local code.

Solvent pails used when flushing: Follow local code. Use only conductive metal pails, placed on a grounded surface. Do not place the pail on a non-conductive surface, such as paper or cardboard, which interrupts grounding continuity.

To maintain grounding continuity when flushing or relieving pressure: Hold the metal part of the dispense valve firmly to the side of a grounded metal pail, and then trigger the valve.

Startup

Start the System

1. Make sure the air line and the cables are correctly connected to the system.
2. Turn the air inlet to open the air supply of the system. It is the red switch at the rear of the machine. The direction instructions on the red switch should be visible.

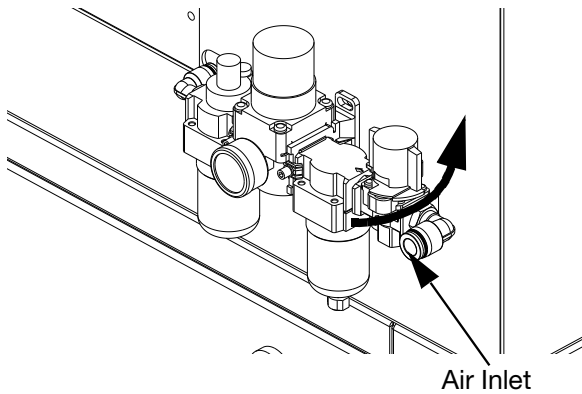
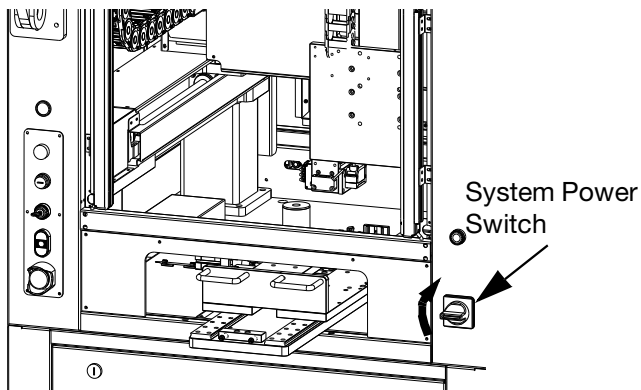
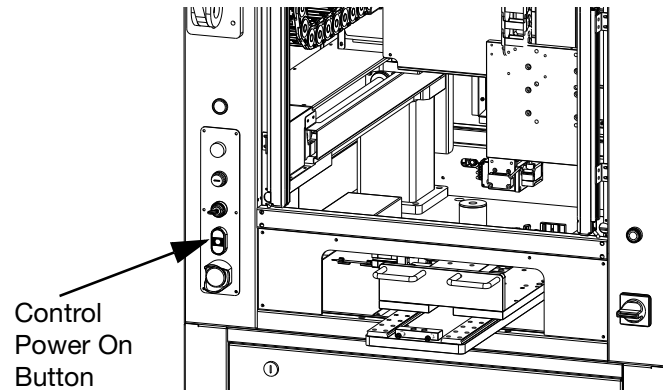



FIG. 5: Supply air to the system

3. Turn the system power switch to on. The switch is located on the front right of GSD.



4. Turn on the control power by pressing the green power on button on the front left of the machine.



5. Make sure the monitor display is on.
6. Make sure you reset the time and time zone if it is different from what was set when the software was installed at the factory. Restart the computer after time reset.
7. Open GSD software by Graco icon  on the desktop.

Log In

The Log In screen is the GSD system software’s main screen that provides access to the system and its functionality. There are three levels of access to the system: Operator, Technician, and Engineer.

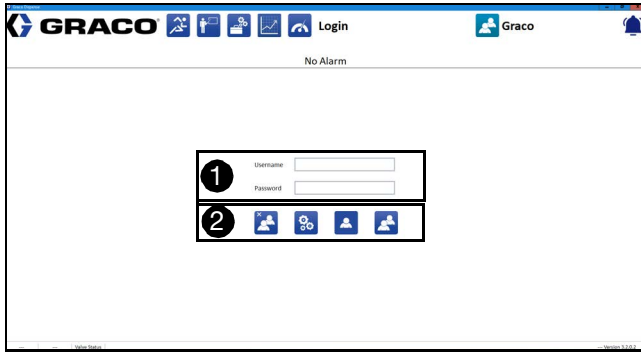


Fig. 6 Log In Screen

To log in, enter the user name and password in ①, and select the system access icons in ②.



Operator Log In: Select this icon to automatically log in without a user name or password if you have Operator level access only. Users with Engineer and Technician level access must use the user name and password fields and the standard Log In icon.



Log In: Select this icon to complete the log in after entering your user name and password.



Operator Log In: Select this icon to log out the current user and log in as the default user with Operator level access only.

The default user names and passwords are:

Username	Password
Operator	Operator
Technician	Technician
Engineer	Engineer

To log in a user:

1. To log in as a Technician or Engineer the first time, enter the default password.

2. Select  icon.

Once you are logged in, you are automatically connected to the system. This enables you to create and download new programs, change parameters, check the status, or run existing programs.

NOTE: Only one user can be logged in at a time. Logging in a new user logs out the previous one.

After you are logged in and connected to the system, you will see your user name displayed in the upper-right corner of the Log In screen ①, next to the Log In screen icon.

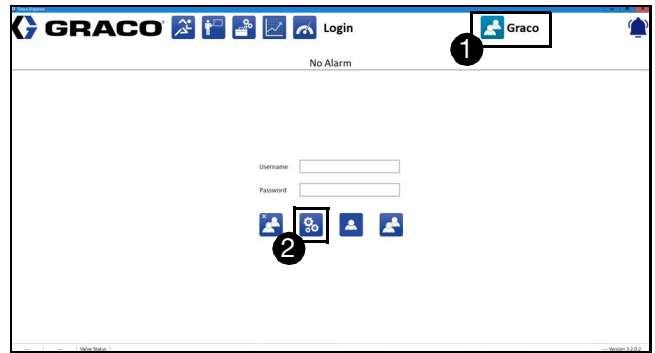



Fig. 7 Log In Screen

If you have Engineer level access, when you return to the Log In screen, you will see an extra icon to edit the Users list ②.

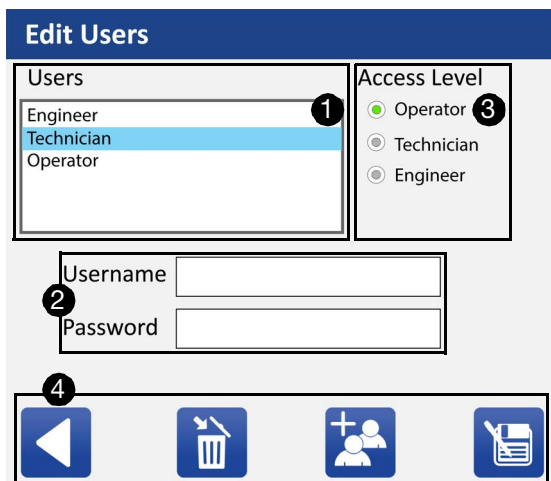


Edit Users: Edit the list of users, their passwords, and their access levels. This icon is only visible if an administrator (Engineer) is logged in.

Edit Users

To edit user information with Engineer level access, select the  icon on the Log In screen. This opens the Edit User window.

At the Edit User window, the defaults can be changed and new names and passwords can be added. If the password file is deleted or corrupted at any time, a new file is generated with the default passwords.



The screenshot shows the 'Edit Users' interface. It features a list of users: Engineer, Technician (highlighted), and Operator. To the right, the 'Access Level' section has radio buttons for Operator, Technician, and Engineer. Below the list are input fields for 'Username' and 'Password'. At the bottom, there is a toolbar with four icons: a back arrow, a trash can, a plus sign with two people, and a document with a pencil.

To edit users:

1. Select a name from the Users list **1**.
2. Change the name and password for the currently selected user as needed **2**.
3. If necessary, change the access level for the selected name **3**.

NOTE: User names must be unique. Passwords are not required to be unique.

4. Delete or edit all default users and passwords to prevent unauthorized access or tampering with software.

General controls for editing users are located at the bottom of the screen **4**.



Back: Return to the login screen. No changes that were made on the edit screen are saved.



Delete User: Remove a user name and password from the database.



New User: Create a new user with a default user name, password, and access level. The user name, password, and access level can be changed after the user has been created.



Save Changes: Save any changes made to the user database. If the Save icon is not selected, changes are not saved.

NOTE: While Operators can access the system without entering a user name and password, the option of assigning Operator passwords is offered for customer applications that require everyone who accesses the system to log in.

System Functions

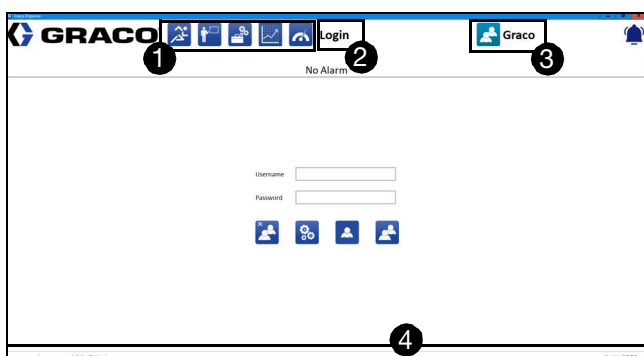


FIG. 8 Log In Screen

The icons at the top of the log In screen ① provide access to the GSD system functions.

NOTE: These icons remain displayed at the top of the screen for navigation purposes even when you access one of the system's functions. The icon for the function we are currently using is highlighted in Blue-green.

The following icons represent the functions currently available for standard or custom use as of the date of this manual's publication:



Operation: Selecting this icon opens the Operation Screen, which allows you to run programs.



Programming: Selecting this icon opens the Programming Screen, which allows you to create a new part program, modify an existing part program, and save a part program.



Setup: Selecting this icon opens the Setup Screen, which allows you to edit parameters, view the state of the inputs, toggle outputs, and go calibrations.



Data Check: Selecting this icon opens the Data Check Screen, which allows you to do repeatability and weight check tests.



SPC: Selecting this icon dynamically displays pressure data. The pressure sensors must be enabled in the parameters. This feature requires the optional pressure transducers.

NOTE: The icons are not visible on the screen until you log in. The icons appear gray if you do not have access to the functions and blue when accessible.

The name of the function you are currently using is displayed just to the right of the main program functions ②.

The Log In screen icon is located in the upper-right corner of the screen ③.



Log In: This icon provides a shortcut to the Log In screen when you are navigating between system functions.

General system information is displayed at the bottom of all screens ④. In the lower-left corner is the connection status of the system and other applicable functions.

The software automatically connects to the motion controller when log in. If the software disconnects to the motion controller, restart the system.

The lower-right corner in ④ is the system date and version number of the development software.

Setup

System Jogging

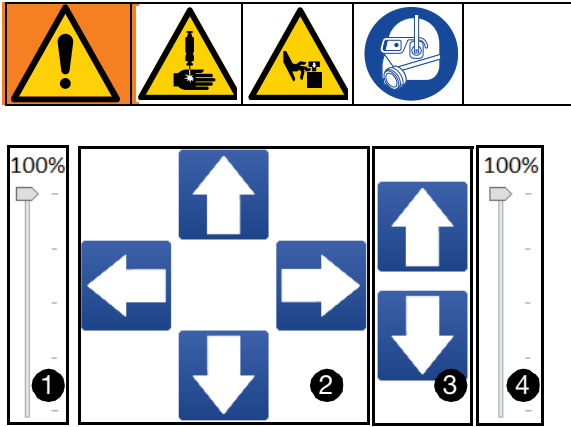


Fig. 9 System Jogging

The system jogging controls allow you to operate the dispense axes to test and purge the system and to select coordinates when setting parameters.

Jogging controls are also used when programming parts. See **Teaching Points**, page 46.

Adjust the slider bars to low down the maximum speeds of the axes. Adjust jogging speed of X and Y axes in **1**, and Z axis in **4**. Set the maximum speed of each axis independently. See **JOGGING**, page 23.

Use the central jog controls in **2** to jog the system in X and Y.

NOTE: Touching an arrow moves the dispenser incrementally. To jog continuously, long press the arrows.



Negative X Jog: Move the X axis in the negative direction, which is towards the left side of the machine. The axis continues to jog for as long as the icon is pressed. This icon is disabled if the system is not in a state to allow jogging.



Positive X Jog: Move the X axis in the positive direction, which is towards the right side of the machine. The axis continues to jog for as long as the icon is pressed. This icon is disabled if the system is not in a state to allow jogging.



Positive Y Jog: Move the Y axis in the positive direction, which is away from the front of the machine. The axis continues to jog for as long as the icon is pressed. This icon is disabled if the system is not in a state to allow jogging.



Negative Y Jog: Move the Y axis in the negative direction, which is towards the front of the machine. The axis continues to jog for as long as the icon is pressed. This icon is disabled if the system is not in a state to allow jogging.

Use the central jog controls in **3** to jog the system in Z.



Positive Z Jog: Move the Z axis in the positive direction, which is up away from the nest. The axis continues to jog for as long as the icon is pressed. This icon is disabled if the system is not in a state to allow jogging.



Negative Z Jog: Move the Z axis in the negative direction, which is towards the nest. The axis continues to jog for as long as the icon is pressed. This icon is disabled if the system is not in a state to allow jogging.

System Parameter Overview

The parameters of the system play an essential role in controlling the operation of the UniXact machines.

There are two categories of parameters:

- General System Parameters
- Valve Parameters

Within the general system parameters, there are location, application-specific, and machine configuration types of parameters.

See **Appendix: Parameters Worksheets**, page 93 for a worksheet to record and reference system parameters.

Location Parameters

Location parameters teach the system software where physical components are in the work area.

NOTICE

If the locations are not taught prior to running the machine, the system could be damaged by running into obstacles. These locations are typically taught at the factory, but should be verified and adjusted as necessary before running the machine the first time.

The settings can change depending on the physical location of the hardware in the work area. The locations can even be slightly different on identical machines running the same application.

Location parameters include the following:

- Needlefind
- Purge Location
- Machine Offset Parameters
 - Left Nest Pitch/Roll
 - Right Nest Pitch/Roll
 - Left Nest Zero
 - and Right Nest Zero
- Part Presence
- Maintenance

Application-specific Parameters

These parameters are unique to your application and may take some testing and experimenting to determine the parameter settings that work best.

These can be affected by material being dispensed, material gel time, material temperature, dispense rate, dispense pressure, production rate, and the production environment (temperature and humidity).

The following application-specific parameters may need to be adjusted from time-to-time if any of those factors change:

- Dispenser Reload Speed
- Purging - other than location parameters
- Alarm and limit Parameters

Machine Configuration Parameters


These parameters affect the speed of the machine. The factory defaults for these parameters can be used initially. You can make adjustments as the application is refined. Machine configuration parameters include the following:

- General Parameters
- Running Parameters
- Homing Parameters
- Jogging Parameters
- System Limits
- Dispense Valves

It is important to select the dispense valve being used in your system during this process. See **Valve Parameter Descriptions**, page 30 for more information.

Set and Verify Parameters

Because the GSD machines are wet tested at the factory, starting parameters should be set appropriately for your system. However, you should review and verify these parameters so you can understand what each parameter does and how it can be adjusted and used to improve your process.

Select the  icon to access the Setup Screen. Technician level access or higher is required.

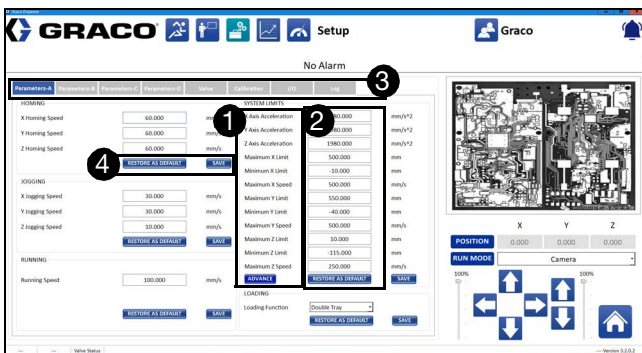







FIG. 10 Setup Screen

Changing parameters modifies the operation of the machine. Parameters that are changed are immediately updated in the system after you select .

Each parameter has a unique name listed in column .

Parameters can be adjusted by inputting a new value in column .

Use the tabs  at the top to toggle among system parameters, valve-specific parameters, calibration parameters, and I/O.

Two functional icons  are located in the bottom of each function area.



Restore as default: Select this to restore default parameters.



Save: Select this to save the parameters file. This is the only way to save changes made to the parameters.

The methods for setting or changing a parameter depend on the type of parameter. Some require you to select from drop down menus while others have you use the jogging controls or enter values. See **System Parameter Descriptions**, page 23 for more information.

System Parameter Descriptions

This section provides descriptions of the general system parameters.

NOTE: Due to the various options available for the UniXact systems and the diversity of applications, not all of these parameters may be appear in the list for your system.

Parameters-A

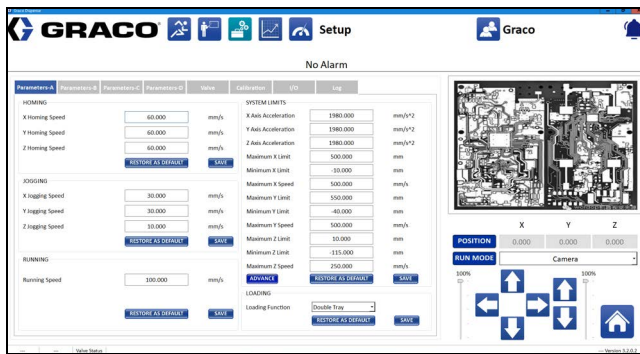


Fig. 11 Parameters-A Setup Screen

HOMING

X Homing Speed: The speed at which the system moves the X-axis during homing. X homing speed is less than 500 mm/s.

Y Homing Speed: The speed at which the system moves the Y-axis during homing. Y homing speed is less than 500 mm/s.

Z Homing Speed: The speed at which the system moves the Z-axis during homing. Z homing speed is less than 250 mm/s.

JOGGING

X Jogging Speed: The default speed at which the system moves the X-axis during jogging. The maximum X jogging speed is 100 mm/s.

Y Jogging Speed: The default speed at which the system moves the Y-axis during jogging. The maximum Y jogging speed is 100 mm/s.

Z Jogging Speed: The default speed at which the system moves the Z-axis during jogging. The maximum Z jogging speed is 100 mm/s.

RUNNING

Running Speed: The default speed at which the system moves the three axes during moving, such as Move command. This is also the default speed in editing part program. The maximum running speed is 500 mm/s.

SYSTEM LIMITS

X Axis Acceleration: The rate of acceleration used by the motion controller to bring the X axis up to the requested speed. The maximum rate of X axis acceleration is 19800 mm/s².

Y Axis Acceleration: The rate of acceleration used by the motion controller to bring the Y axis up to the requested speed. The maximum rate of X axis acceleration is 19800 mm/s².

Z Axis Acceleration: The rate of acceleration used by the motion controller to bring the Z axis up to the requested speed. The maximum rate of X axis acceleration is 19800 mm/s².

Maximum X Limit: The maximum X-value that the system can move to. Location X parameters cannot have a value greater than this value.

Minimum X Limit: The minimum X-value that the system can move to. Location X parameters cannot have a value less than this value.

Maximum X Speed: The maximum speed at which the system can move the X-axis. The maximum X speed is 500 mm/s.

Maximum Y Limit: The maximum Y-value that the system can move to. Location Y parameters cannot have a value greater than this value.

Minimum Y Limit: The minimum Y-value that the system can move to. Location Y parameters cannot have a value less than this value.

Maximum Y Speed: The maximum speed at which the system can move the Y-axis. The maximum X speed is 500 mm/s.

Maximum Z Limit: The maximum Z-value that the system can move to. Location Z parameters cannot have a value greater than this value.

Minimum Z Limit: The minimum Z-value that the system can move to. Location Z parameters cannot have a value less than this value.

Maximum Z Speed: The maximum speed at which the system can move the Z-axis. The maximum X speed is 250 mm/s.

NOTE: The servo is disabled when the hardware limit is triggered. In this situation, homing is required.

LOADING

Loading Function: To display the current loading function.

Parameters-B

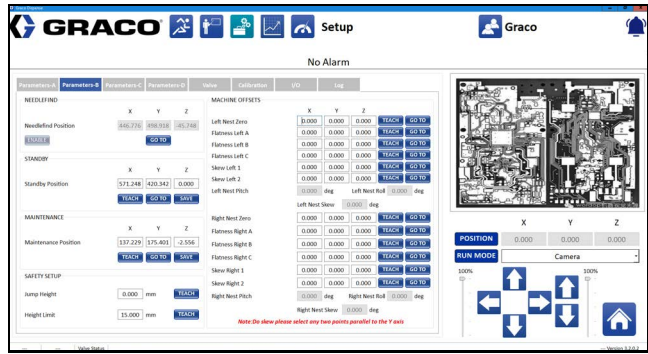


FIG. 12 Parameters-B Setup Screen

NEEDLEFIND

Needlefind Position: This shows the coordinates of needlefind position.



ENABLE: Select this button to enable the system to perform a needle finding routine before enter automatic running.



GO TO: Select this button to enable the needle to go to the needlefind position.

When the system runs needle find, the dispenser first goes to the needle find position to execute needle find, and then perform automatic running. The location of the needle is used for all future moves.

NOTE: The machine must be homed before needle find. This establishes the axis position with respect to the hard-wired over-travel position switches on each axis.

STANDBY

Standby Position: Set the standby position of the system. If no programs are running, the dispenser will go to this position.



TEACH: Select this button to record current X, Y and Z coordinates.



GO TO: Select this button to move the dispenser to the standby position.



SAVE: Select this button to save the current setup.

MAINTENANCE

Maintenance Position: The X, Y and Z coordinates of the maintenance position. The dispenser moves to this position when receiving the maintenance request

- TEACH:** Select this button to record the current X, Y and Z coordinates.
- GO TO:** Select this button to move the dispenser to the maintenance position.
- SAVE:** Select this button to save the current setup.

SAFETY SETUP

Jump Height: Before the machine moves to any position, the Z axis indexes to the specified Z height. The Z axis will move before moving the X or Y axis. Use this setting to ensure the dispense tip has adequate clearance above all obstacles in the dispense area. This is also the default Safe Z.

Height Limit: To set the system height limit.

MACHINE OFFSETS

Machine offset allows you to set the flatness and skew of a part by finding points on the part and having the system automatically calculate the approximate angles.

NOTE: Lock the nest before you teach each point.

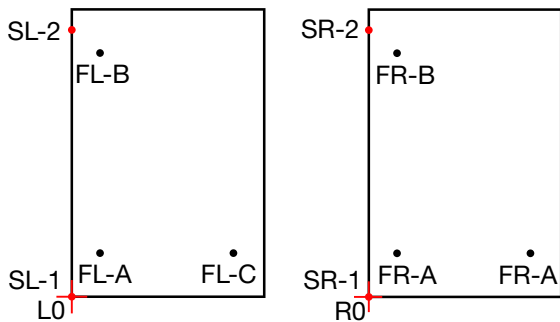


FIG. 13: Machine offset-Pitch and Role

Left Nest Zero (L0): The X, Y and Z coordinates for the origin of the left nest.

Flatness left A, B and C (FL-A, FL-B and FL-C): The X, Y and Z coordinates for the flatness points of the left nest.

Skew left 1 and 2 (SL-1 and SL-2): The X, Y and Z coordinates for the skew points of the left nest.

Left Nest Pitch: The angle the left nest is rotated about the X-axis.

Left Nest Roll: The angle the left nest is rotated about the Y-axis.

Left Nest Skew: The angle the left nest is rotated about the Z-axis.

Right Nest Zero (R0): The X, Y and Z coordinates for the origin of the right nest.

Flatness Right A, B and C (FR-A, FR-B and FR-C): The X, Y and Z coordinates for the flatness points of the right nest.

Skew Right 1 and 2 (SR-1 and SR-2): The X, Y and Z coordinates for the skew points of the right nest.

Right Nest Pitch: The angle the right nest is rotated about the X-axis.

Right Nest Roll: The angle the right nest is rotated about the Y-axis.

Right Nest Skew: The angle that the right nest is rotated about the Z-axis.

NOTE: Select two points parallel to the Y axis when you do skew.

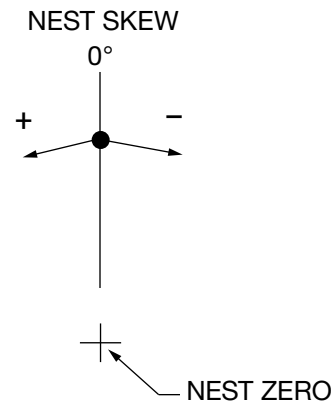


FIG. 14: Machine offset-Nest Skew

Following is the operation details for flatness and skew calibrations.

Calibrate Flatness

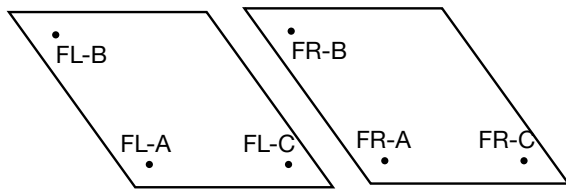


FIG. 15: Machine offset- Flatness

Flatness calibration enables the system to compensate for parts that are angled up or down on the Y axis (pitch) and/or left or right on the X axis (roll). This process aligns the actual X-Y dispense plane of the part with the X-Y motion of the table.

When flatness is calibrated, the software corrects the Z axis so the dispensing tip tracks parallel to the surface of the part, adjusting as if the part is perfectly flat in the nest. This minimizes the need to shim or adjust the part.

NOTE: Flatness calibration does not correct for parts that are cupped or twisted or have any raised areas. The part surface itself must be flat.

To calibrate flatness:

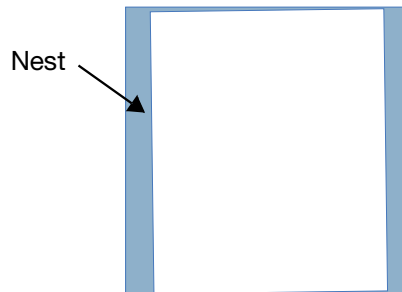
1. Locked the left nest.
2. Use jogging controls to move the dispenser to approximately 5 mm above a point on the part or fixture.
3. Slow down and move the tip to just touch the part or fixture. Then press **TEACH** to record current position (FL-A).
4. Repeat step 2 and 3 for the other two points (FL-B and FL-C).
5. When all three points have been recorded, the nest flatness is displayed in Left Nest Pitch and Left Nest Roll.

NOTE: These three points must be taught for the system to compute the flatness. All three points must form a triangle in the X-Y plane to be valid. The three points cannot be in a straight line.

6. Repeat steps 1 to 5 for the right nest.

Calibrate Skew

Calibrating the skew of a part compensates for parts that are turned (skewed) in a nest. The part might only be very slightly skewed as in the example below, but any variation from perfectly parallel with the sides of the nest affects the material dispensing if you do not properly calibrate the skew.



This feature minimizes the need to manually adjust the position of the part in the nest.

The screen for calibrating skew is similar to the screen for calibrating flatness, although only two points are needed. The Z axis field will have a value, but that value is not required for calibrating skew.

NOTE: The two points must form a line parallel to the Y axis of the part for the skew to be correctly computed. When calibrated, the software translates both axes to maintain a path that is parallel to all four sides of the part.

To calibrate skew:

1. Locked the left nest.
2. Use jogging controls to move the dispenser to approximately 5mm above a point on the part or fixture.
3. Slow down and move the dispense tip to just touch the part or fixture. Then press **TEACH** to record current position (SL-A).
4. Repeat step 2 and 3 for the other point (SL-B).
5. When two points have been recorded, the nest skew is displayed in Left Nest Skew.
6. Repeat steps 1 to 5 for the right nest.

Parameter-C

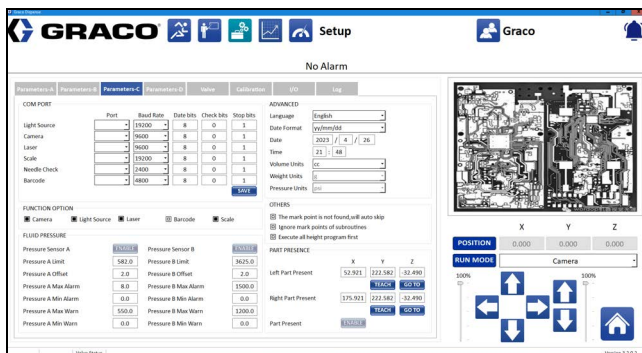



Fig. 16 Parameters-C Setup Screen

COM PORT

Displays the parameters of light source, camera, laser, weight scale, needle check and barcode ports.

FUNCTION OPTION

Displays if the system installs light source, camera, laser and barcode functions. Corresponding hardwares are required for these function properties. 

indicates the functions are available.

FLUID PRESSURE

Pressure A and B are two fluid pressure inputs. The inputs get data from pressure transducers in the material stream. The locations of the sensors vary depending on the application.

NOTE: It is generally best to place zeros in these parameters to start. This essentially turns off any pressure warnings and alarms. When the pattern is ready for production, the max and min pressures can be monitored on the Run screen to establish the appropriate warning and alarm levels.

ENABLE

ENABLE: Enabling the pressure inputs activates the dispense pressure warning and alarm features described below.

NOTE: If the valves are different, the default values of the sensor parameters will also be different.

Pressure A Limit: The rated pressure of the fluid pressure sensor A.

Pressure B Limit: The rated pressure of the fluid pressure sensor B.

Pressure A Offset: Enter a value to offset the pressure A to 0 psi when nothing touches the pressure sensor A. The absolute value of Pressure A Offset is less than 2% of Pressure A Limit.

Pressure B Offset: Enter a value to offset the pressure B to 0 psi when nothing touches the pressure sensor B. The absolute value of Pressure B Offset is less than 2% of Pressure B Limit.

Pressure A Max Alarm: If the pressure sensor A input goes higher than this value, the system raises an alarm and stops running.

Pressure B Max Alarm: If the pressure sensor B input goes higher than this value, the system raises an alarm and stops running.

Pressure A Min Alarm: If the pressure sensor A input goes lower than this value, the system raises an alarm and stops running.

Pressure B Min Alarm: If the pressure sensor B input goes lower than this value, the system raises an alarm and stops running.

Pressure A Max Warn: If the pressure sensor A input goes higher than this value, the system issues a warning to remind you.

Pressure B Max Warn: If the pressure sensor B input goes higher than this value, the system issues a warning to remind you.

Pressure A Min Warn: If the pressure sensor A input goes lower than this value, the system issues a warning to remind you.

Pressure B Min Warn: If the pressure sensor B input goes lower than this value, the system issues a warning to remind you.

ADVANCED

Language: English is available currently.

Date format: Select a date format from the drop-down list.

- mm/ dd/ yy
- yy/ mm/ dd

Date & Time: Use date and time from the windows system.

Volume Units: Select a volume unit from the drop-down list.

- cc
- L

Weight Units: [g] is available currently.

Pressure Units: [psi] is available currently.

OTHERS


The mark point is not found, will auto skip: This function is available when camera is applied. When part programs have commands of finding fiducial points, unselecting this function enables the system to find fiducial points and recalculate the program position before running the programs. When no fiducial points are found, the system raises alarm and stops running. On the contrary, selecting this function causes the system to keep running no matter fiducial points are found or not.

Ignore mark points of subroutines: This function is available when camera is applied. Selecting this function enables the system to ignore fiducial points of subroutines, and only run fiducial points of main part program.

Execute all height program first: Selecting this function enables the system to run all the Laser Check commands first, and then run other programming commands.

PART PRESENCE

Calibrate the part present sensor prior to dispensing. See **Calibrate the Part Present Sensor Option**, page 65 for operation details.

Part Present : Selecting this button determines whether or not the system moves to the part present location and checks the part present sensor before running a part program.

Left Part Present: The coordinates of the position the system moves to when determining if there is a part present in the left nest.

Right Part Present: The coordinates of the position the system moves to when determining if there is a part present in the right nest.

 **TEACH:** Select this button to record the current X, Y and Z coordinates.

 **GO TO:** Selecting this button enables the part sensor to move to the part present position.

Parameters-D

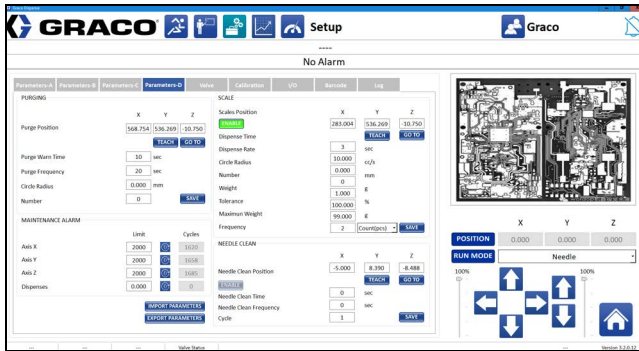


FIG. 17 Parameters-D Setup Screen

PURGING

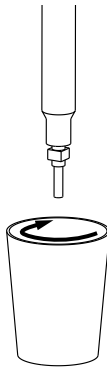


FIG. 18 Purge

NOTE: To start a process, select a purge amount that dispenses the full volume of mixed material in the mixer in 1/2 to 3/4 of the gel time of the material. These are highly material-dependent.

The dispenser draws circles in completing purge. Define circle parameters of purge position, circle radius and numbers, and other parameters of purge warn time and purge frequency before starting purge.

Purge Position: The coordinates of center of the circle in purge. The dispenser moves around the center position before starting a purge.

Purge Warn Time: The time in seconds that you are warned before the purge occurs. The warning is indicated on the run screen by highlighting the count down time value in yellow to alert of the imminent purge.


Purge Frequency: The time in seconds between standard purges and dispensing. The standard purge timer is reset any time the system undergoes any type of purge. The time also is reset any time the system

dispenses, causing the system not to undergo standard purges during continuous running.

Circle Radius: The radius of the circles drawn in purge.

Number: Set number of dispensing dots in a circle.

MAINTENANCE ALARM

Set limit cycles in Limit column and check the number of times the axis returns to homing and dispenses in Cycles column. When the running cycles reach the limits, the system raises warnings and reminds you to do maintenance. Select  to reset the values to 0.

SCALE

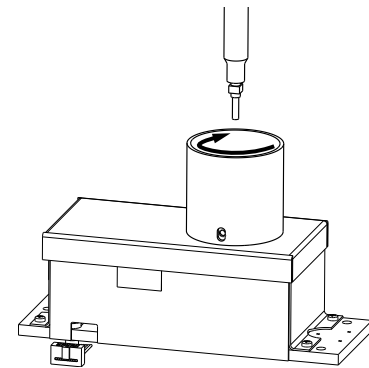


FIG. 19 Scale

Scale Position: The coordinates of the scale cup position. The dispenser moves there to wait for shot dispensing.

ENABLE

ENABLE: Selecting this button enables the weight check function.

TEACH

TEACH: Select this button to record the current X, Y and Z coordinates.

GO TO

GO TO: Select this button to move the dispenser to the scale cup position.

Dispense Time: Set the duration of dispensing in running scale.

Dispense Rate: Set the dispensing rate in running scale.

Circle Radius: The system dispenses in circles when running scale. This sets the radius of the circles.

Number: Set number of dispensing dots in one circle.

Weight: Set the target weight of the material.

Tolerance: The allowable deviation between the actual and the target weight.

Maximum Weight: Set the maximum weight the cup can hold. If the weight in the cup exceeds the maximum, the system raises an alarm and stop running. The system will not restart until a new cup is replaced.

Frequency: Select Time(min) in frequency, the system performs weight check every the specified amount of time. Select Count(pcs) in frequency, the system performs weight check every the specified pieces of parts.

SAVE **SAVE:** Select this button to save all the settings.

IMPORT PARAMETERS

Import all the parameters of setups from the specified folder.

EXPORT PARAMETERS

Export all the parameters of setups to the specified folder.

NEEDLE CLEAN

Needle Clean Position: This displays the X, Y and Z coordinates of the needle clean position. The dispenser moves to this position when needle cleans are needed.

Needle Clean Time: Set the amount of time in seconds for one needle clean.

Needle Clean Frequency: Set the time in seconds between two adjacent needle cleans.

Cycle: Set the total times that the system executes from the start to the end of the needle cleans.

ENABLE **ENABLE:** Select this button to enable needle clean function.

TEACH **TEACH:** Select this button to record the current X, Y and Z coordinates.

GO TO **GO TO:** Select this button to move the dispenser to needle clean position.

SAVE **SAVE:** Select this button to save the current setup.

Valve Parameter Descriptions

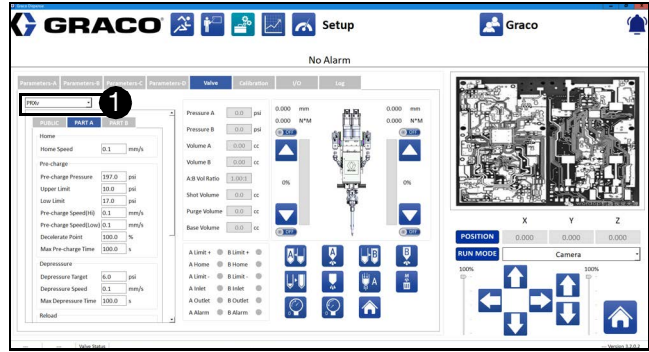


Fig. 20 Valve Setup Screen

Select the Valve tab to access the valve parameters.

Use the drop-down menu ① to select the type of valve in use for your system.

PCP

Select PCP in valve list and adjust parameters of PCP dispense valve.

Gear Box Ratio: The speed ratio of the gear box.

Max Rate: The maximum dispensing rate.

Volume/rev: The amount of volume that the screw valve takes a turn.

With Snuff Back: Set **ENABLE** to enable snuff back function.

Snuff Back Volume: Set volume of snuff back.

Snuff Back Rate: Set rate of snuff back.

Shot Size: Set the dispensing volume of one shot.

Shot Rate: Set the dispensing rate of one shot.

Purge Rate: Set purge rate.

Purge Amount: Set amount of volume in purge.

On/Off Valve

Select On/Off Valve in valve list and adjust parameters of On/Off dispense valve.

Purge Time: Set amount of time in seconds in purge.

Test Shot Time: Set amount of time in seconds for one shot.

PR-Xv and PR-Xv30

Select PR-Xv or PR-Xv30 in valve list and adjust parameters of PR-Xv or PR-Xv30 dispense valve.

Parameters in PUBLIC

Shot

Shot Volume: Set the dispensing volume of one shot.

Shot Rate: Set the dispensing rate of one shot.

Purge

Purge Volume: Set amount of volume in purge.

Purge Rate: Set purge rate.

Max Purge Time: Set the maximum time in seconds that the system may spend in purge. If purge exceeds the specified time, the system will raise the alarm to alert the operator.

Base Purge Type: Select which part is used as base purge.

Base Purge Volume: Set amount of material in base purge.

Base Purge Rate: Set base purge rate.

Reload After Purge: Set **ENABLE** to automatically perform reload after purge.

Depressure After Purge: Set **ENABLE** to automatically perform de-pressure after purge.

Ratio

Dispense Ratio A:B: Set the material dispensing ratio of side A and B.

Pressure

Pressure Unbalance: Set the maximum pressure difference between side A and B. If the pressure difference exceeds the specified, the system raises an alarm.

Depressure

Automatic Depressure: Set **ENABLE** to automatically perform de-pressurization after the system finishes auto-running.

Reload

Reload After Each Job: Set to make the metering rods retract after finishing dispensing every part.

Reload After Multi Jobs: Set to make the metering rods retract only when the metering rods reach the reload request position and finish dispensing the current part.

Home

Press Check After Home: Set **ENABLE** to automatically check pressure each time the system performs homing.

Pre-charge

Automatic Pre-charge: Set **ENABLE** to automatically perform pre-charge progress when auto-running mode starts.

SIDE A and B

Home

Home Speed: Set the homing speed of side A and B.

Pre-charge

Pre-charge Pressure: Set the target of pre-charge pressure for side A and B.

Upper Limit: Set the upper limit range of pre-charge pressure for side A and B.

Low Limit: Set the lower limit range of pre-charge pressure for side A and B.

Pre-charge Speed (Hi): Set the high speed of pre-charge rate for side A and B.

Setup

Pre-charge Speed (Low): Set the low speed of pre-charge rate for side A and B.

Decelerate Point: Set the point in percentage that the system starts to decelerate in pre-charge for side A and B.

Max Pre-charge Time: Set the maximum time in seconds that the system may spend in pre-charging. If pre-charging exceeds the specified time, the system will raise the alarm to alert the operator.

Depressure

Depressure Target: The system completes depressurization when it reaches the target pressure.

Depressure Speed: Set the speed during de-pressurization for side A and B.

Max Depressure Time: Set the maximum time in seconds for the system to perform de-pressurization. If de-pressurization exceeds the specified time, de-pressurization fails and the system raises the alarm.

Reload

Reload Target: Set the target completed position of reload. For example, if 80% is set to be the reload target, the system finishes reloading when it is 80% full of the maximum reload volume. Value of 95% is recommended. The operator needs to adjust the value per material viscosity and fluid pressure.

Reload Request Position: When Reload After Multi Jobs is selected, and the piston is lower than the specified reload request position, the system executes reloading.

Reload Speed: Set the reload rate.

Reload Pressure: Set the pressure during reloading.

Max Reload Time: Set the maximum time in seconds that the system may spend in reloading. If reloading exceeds the specified time, the system will raise the alarm to alert the operator.

Valve Data Display

Pressure A: Displays the dispensing pressure of side A in real time.

Pressure B: Displays the dispensing pressure of side B in real time.

Volume A: Displays the dispensing volume of side A in real time.

Volume B: Displays the dispensing volume of side B in real time.

A:B Vol Ratio: Displays the material dispensing ratio of A and B.

Shot Volume: Displays the current dispensing volume for one shot.

Purge Volume: Displays the current purge volume.

Base Volume: Displays the current base purge volume.

A Limit +: Piston of side A is at the highest limit.

B Limit +: Piston of side B is at the highest limit.

A Home: Piston of side A is at home point.

B Home: Piston of side B is at home point.

A Limit -: Piston of side A is at the lowest limit.

B Limit -: Piston of side B is at the lowest limit.

A Inlet: Inlet valve of side A is open.

B Inlet: Inlet valve of side B is open.

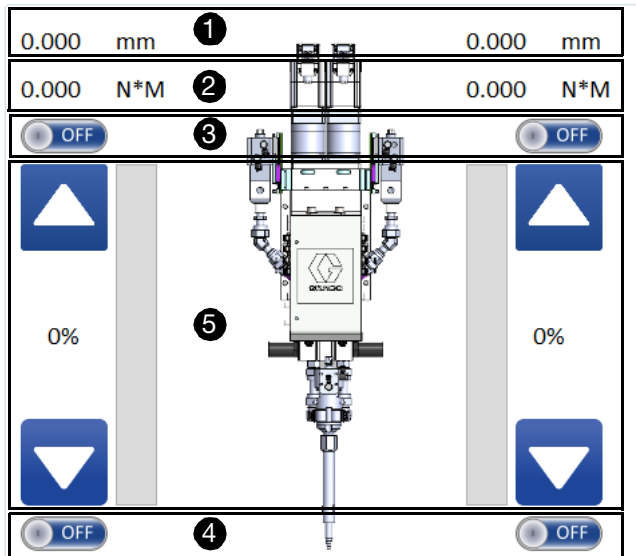
A Output: Dispense valve of side A is open.

B Output: Dispense valve of side B is open.

A Alarm: Alarms for servo A.

B Alarm: Alarms for servo B.

Functional Operations



The piston positions in mm for side A and B are displayed in ①. The motor torques in N•M for side A and B are displayed in ②. Open or close the inlet valves of side A and B in ③ by selecting ON or OFF. Open or close the outlet valves of side A and B in ④. The left materials in percent are displayed in ⑤. Open Inlet valves and select to reload materials. Open outlet valves and select to flow out materials.

Icon	Function	Icon	Function
	Part A reloads		Part A shots
	Part B reloads		Part B shots
	Part A and B reload		Part A and Part B shot
	Base purge part A or part B.		Purge
	Manual pre-charge		Manual de-pressurization
	Rod homing		

PSM 15, PSM 25, PSM 50 and PSM 100

Select PSM 15, PSM 25, PSM 50 or PSM 100 in valve list and adjust parameters of PSM 15, PSM 25, PSM 50 or PSM 100 dispense valve.

Parameters in PUBLIC

Shot

Shot Volume: Set the dispensing volume of one shot.

Shot Rate: Set the dispensing rate of one shot.

Purge

Purge Volume: Set amount of volume in purge.

Purge Rate: Set purge rate.

Max Purge Time: Set the maximum time in seconds that the system may spend in purge. If purge exceeds the specified time, the system will raise the alarm to alert the operator.

Reload After Purge: Set **ENABLE** to automatically perform reload after purge.

Depressure After Purge: Set **ENABLE** to automatically perform de-pressure after purge.

Pre-charge

Automatic Pre-charge: Set **ENABLE** to automatically perform pre-charge progress when auto-running mode starts.

Reload

Reload After Each Job: Set to make the metering rods retract after finishing dispensing every part.

Reload After Multi Jobs: Set to make the metering rods retract only when the metering rods reach the reload request position and finish dispensing the current part.

Depressure

Automatic Depressure: Set **ENABLE** to automatically perform de-pressurization after the system finishes auto-running.

Home

Press Check After Home: Set **ENABLE** to automatically check pressure each time the system performs homing.

SIDE A

Home

Home Speed: Set the homing speed of PSM dispense valve.

Pre-charge

Pre-charge Pressure: Set the target of pre-charge pressure for PSM dispense valve.

Upper Limit: Set the upper limit range of pre-charge pressure for PSM dispense valve.

Low Limit: Set the lower limit range of pre-charge pressure for PSM dispense valve.

Pre-charge Speed(Hi): Set the high speed of pre-charge rate for PSM dispense valve.

Pre-charge Speed(Low): Set the low speed of pre-charge rate for PSM dispense valve.

Decelerate Point: Set the point in percentage that the system starts to decelerate in pre-charge for PSM dispense valve.

Max Pre-charge Time: Set the maximum time in seconds that the system may spend in pre-charging. If pre-charging exceeds the specified time, the system will raise the alarm to alert the operator.

Depressure

Depressure Target: The system completes depressurization when it reaches the target pressure.

Depressure Speed: Set the speed during de-pressurization for PSM dispense valve.

Max Depressure Time: Set the maximum time in seconds for the system to perform de-pressurization. If de-pressurization exceeds the specified time, de-pressurization fails and the system raises the alarm.

Reload

Reload Target: Set the target completed position of reload. For example, if 80% is set to be the reload target, the system finishes reloading when it is 80% full of the maximum reload volume. Value of 95% is recommended. The operator needs to adjust the value per material viscosity and fluid pressure.

Reload Request Position: When Reload After Multi Jobs is selected, and the piston is lower than the specified reload request position, the system executes reloading.

Reload Speed: Set the reload rate.

Reload A Pressure: Set the pressure during reloading.

Max Reload Time: Set the maximum time in seconds that the system may spend in reloading. If reloading exceeds the specified time, the system will raise the alarm to alert the operator.

Valve Data Display

Pressure A: Displays the dispensing pressure in real time.

Volume A: Displays the remaining dispensing volume.

Shot Volume: Displays the current dispensing volume for one shot.

Purge Volume: Displays the current purge volume.

A Limit +: Piston is at the highest limit.

A Home: Piston is at home point.

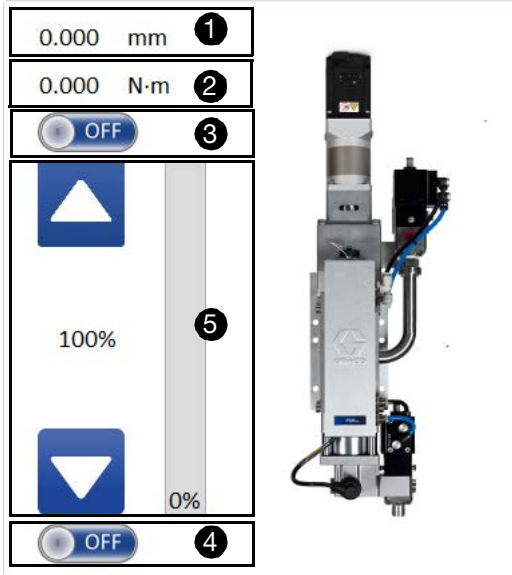
A Limit -: Piston is at the lowest limit.

A Inlet: Inlet valve is open.

A Output: Dispense valve is open.

A Alarm: Alarms for the servo.

Functional Operations



The piston position in mm is displayed in ①. The motor torque in N•m is displayed in ②. Open or close the inlet valve in ③ by selecting ON or OFF. Open or close the outlet valve in ④. The left materials in percent are displayed in ⑤. Open Inlet valve and select to reload materials. Open outlet valve and select to flow out materials.

Icon	Function	Icon	Function
	Material reload		Material shot
	Purge		Rod homing
	Manual pre-charge		Manual de-pressurization

Calibration

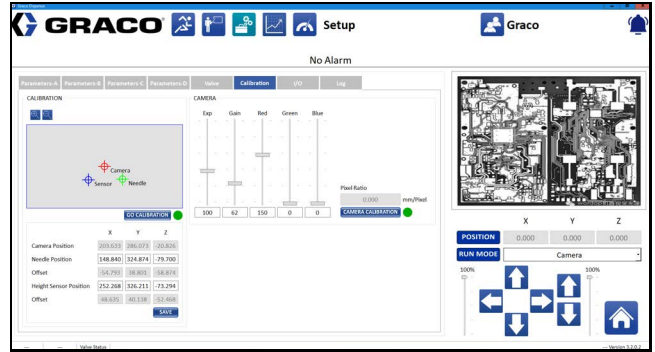


FIG. 21 Calibration Screen

This calibrates the relative position of camera, needle and height sensor.

NOTE: The machine must be homed before doing the calibration. Make sure the cross mark is clean (The cross mark is on top of the needle find box).

Camera Position: The coordinates of the position when cross marks are in center of camera window.

Needle Position: The coordinates of the position when the dispense tip touch the center of cross marks.

Offset: The first offset is the distance deviation between needle and camera.






Height Sensor Position: The coordinates of the position when the laser light is in center of cross marks.

Offset: The second offset is distance deviation between camera and laser.

Calibrate Needle, Camera and Laser

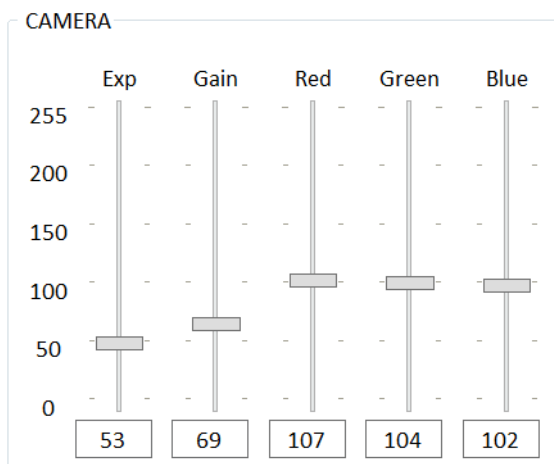
1. Select to make system homed.
2. Select **GO CALIBRATION** to open calibration windows.
3. For camera calibration, jog the camera to find the cross mark of needlefind position. Let the cross mark of the camera coincides with the cross mark of needlefind position.
4. Select **TEACH** to record the current position into Camera Position.

Setup

5. Select  to needle calibration.
6. For needle calibration, jog the dispense tip to touch the center cross mark of needlefind position.
7. Select **TEACH** to record the current position into Needle Position.
8. Select  to continue.
9. Select  to execute calibration. The needle calibration result is recorded in Needle Position.
10. Select  to height calibration.
11. For height calibration, jog the laser and let the laser light to find the cross mark of needlefind position.
12. Select **TEACH** to record the current position into Height Sensor Position.
 - **Height Sensor value:** Displays the detected height in real time.
13. Select  to finish calibration.



CAMERA

Slide to adjust the brightness of the camera vision by defining integer values in exposure, gain, red, green and blue.



The system forms a square with nine points to finish camera calibration. Define the coordinates of the center point and spacing between the center point and its adjacent points.

NOTE: Make sure all the nine points are within the camera vision.

1. Select **CAMERA CALIBRATION** to open camera calibration screen.
2. Select **SETTING** to set camera parameters. See **Set Fiducials**, page 53 for more information.
3. Define the center point by jogging the camera to move to the specified point or entering the values in Center Point.
4. Set space between two adjacent points by entering in the Spacing.
5. Set the moving speed of the camera in Speed.
6. Define the time that the camera stays at one point before moving to the next in DWait.
7. Select  to start the calibration.
8. After calibration, select  to return to the Calibration Screen. See the calibration result in Pixel Ratio.

Inputs and Outputs

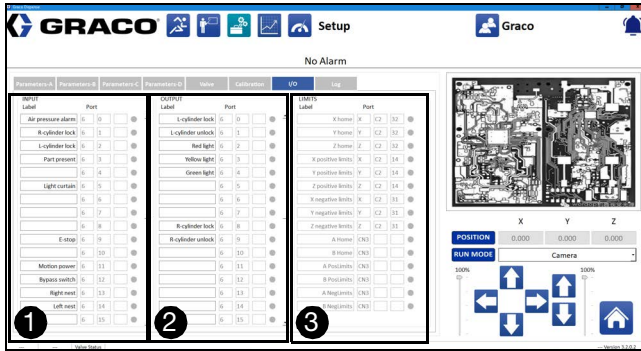


FIG. 22 I/O Screen

Although the GSD machines are fully inspected and tested at the factory, verifying the inputs and outputs provides a good understanding of the equipment and how to make adjustments to minimize the possibility of issues during startup.

Selecting the **I/O** in setup shows the inputs, outputs, and over-travel limits if they are not currently displayed on the screen when you access it.

The inputs are displayed in the left column **1** of the input data.

The central column **2** shows the outputs. The state of each output can be toggled by clicking at (gray), which can assist with troubleshooting. The (green) indicates the outputs are selected.

The over-travel limits are in the right column **3**. Each of the three axes has a positive limit, a negative limit, a home input, and a user input.

Click the labels for the inputs and outputs limits. They are editable directly.

Verify that the inputs and outputs are functioning properly by activating the input and output switches as described in **Input/Output Test Procedure** on page **72**.

Here is a listing of the inputs, outputs, and limits at they are typically assigned. They may vary from one machine to another.

Off-line System

Module	Input	Description	Output	Description
Controller (CU0580)	DI0	Spare	DO0	SupplyA valve
	DI1	Spare	DO1	SupplyB valve
	DI2	Spare	DO2	DispenseA valve
	DI3	Spare	DO3	DispenseB valve
	DI4	Spare	DO4	Spare
	DI5	Spare	DO5	Spare
	DI6	Spare	DO6	Spare
	DI7	Spare	DO7	Spare
IO Module 1 (CU0578)	DI0	Air pressure alarm	DO0	L-cylinder lock
	DI1	R-cylinder lock	DO1	Spare
	DI2	L-cylinder lock	DO2	Red light
	DI3	Part present	DO3	Yellow light
	DI4	Spare	DO4	Green light
	DI5	Light curtain	DO5	Buzzer
	DI6	Start auto-work	DO6	Spare
	DI7	Spare	DO7	Spare
	DI8	Spare	DO8	R-cylinder lock
	DI9	E-stop	DO9	Spare
	DI10	Spare	DO10	Curtain bypass
	DI11	Motion power contactor	DO11	Spare
	DI12	N24V	DO12	Spare
	DI13	Right nest	DO13	Spare
	DI14	Left nest	DO14	Spare
DI15	Spare	DO15	Spare	

Setup

IO Module 2 (CU0578)	DI0	SupplyPump A empty	DO0	Spare
	DI1	SupplyPump B empty	DO1	Spare
	DI2	Spare	DO2	Spare
	DI3	Spare	DO3	Spare
	DI4	Spare	DO4	Spare
	DI5	Spare	DO5	Spare
	DI6	Spare	DO6	Spare
	DI7	Spare	DO7	Spare
	DI8	Spare	DO8	Spare
	DI9	Spare	DO9	Spare
	DI10	Spare	DO10	Spare
	DI11	Spare	DO11	Spare
	DI12	Spare	DO12	Spare
	DI13	Spare	DO13	Spare
	DI14	Spare	DO14	Spare
DI15	Spare	DO15	Spare	
AI Module (CU0952)	AI0	Pressure A		
	AI1	Pressure B		
X axis motor drive (CU0579)	IN1	Spare	OUT1	Spare
	IN2	Spare	OUT2	Spare
	IN3	X negative limits	OUT3	Spare
	IN4	X positive limits	OUT4	Spare
	IN5	X home	OUT5	Spare
	IN6	X-axis needle calibration	OUT6	Spare
	IN7	Spare		
	IN8	Spare		
	IN9	Spare		
	IN10	Spare		
	IN11	Spare		
Y axis motor drive (CU0579)	IN1	Spare	OUT1	Spare
	IN2	Spare	OUT2	Spare
	IN3	Y negative limits	OUT3	Spare
	IN4	Y positive limits	OUT4	Spare
	IN5	Y home	OUT5	Spare
	IN6	Y-axis needle calibration	OUT6	Spare
	IN7	Spare		
	IN8	Spare		
	IN9	Spare		
	IN10	Spare		
	IN11	Spare		

Z axis motor drive (CU0579)	IN1	Z T+	OUT1	Spare
	IN2	Spare	OUT2	Z-axis brake relay
	IN3	Z negative limits	OUT3	Spare
	IN4	Z positive limits	OUT4	Spare
	IN5	Z home	OUT5	Spare
	IN6	Tool setting gauge	OUT6	Spare
	IN7	Spare		
	IN8	Spare		
	IN9	Spare		
	IN10	Spare		
	IN11	Spare		
Valve A axis motor drive (CU0579)	IN1	Spare	OUT1	Spare
	IN2	Spare	OUT2	Spare
	IN3	A negative limits	OUT3	Spare
	IN4	A positive limits	OUT4	Spare
	IN5	A home	OUT5	Spare
	IN6	Spare	OUT6	Spare
	IN7	Spare		
	IN8	Spare		
	IN9	Spare		
	IN10	Spare		
	IN11	Spare		
Valve B axis motor drive (CU0579)	IN1	Spare	OUT1	Spare
	IN2	Spare	OUT2	Spare
	IN3	B negative limits	OUT3	Spare
	IN4	B positive limits	OUT4	Spare
	IN5	B home	OUT5	Spare
	IN6	Spare	OUT6	Spare
	IN7	Spare		
	IN8	Spare		
	IN9	Spare		
	IN10	Spare		
	IN11	Spare		

In-line System

Module	Input	Description	Output	Description
Controller (CU0580)	DI0	Spare	DO0	Supply A valve
	DI1	Spare	DO1	Supply B valve
	DI2	Spare	DO2	Dispense A valve
	DI3	Spare	DO3	Dispense B valve
	DI4	Spare	DO4	Spare
	DI5	Spare	DO5	Spare
	DI6	Spare	DO6	Spare
	DI7	Spare	DO7	Spare
IO Module 1 (CU0578)	DI0	Air pressure alarm	DO0	Spare
	DI1	Spare	DO1	Spare
	DI2	Spare	DO2	Red light
	DI3	Part present	DO3	Yellow light
	DI4	Spare	DO4	Green light
	DI5	Light curtain	DO5	Buzzer
	DI6	Start auto-work	DO6	Spare
	DI7	Spare	DO7	Spare
	DI8	Spare	DO8	Spare
	DI9	E-stop	DO9	Spare
	DI10	Spare	DO10	Curtain bypass
	DI11	Motion power contactor	DO11	Spare
	DI12	N24V	DO12	Spare
	DI13	Spare	DO13	Spare
	DI14	Spare	DO14	Spare
DI15	Spare	DO15	Spare	

IO Module 2 (CU0578)	DI0	SupplyPump A empty	DO0	Wait cyl rise
	DI1	SupplyPump B empty	DO1	Process cyl rise
	DI2	Wait entrance	DO2	Lift cyl A rise
	DI3	Wait position	DO3	Lift cyl B rise
	DI4	Process position	DO4	Spare
	DI5	Exit position	DO5	Spare
	DI6	Spare	DO6	Spare
	DI7	Spare	DO7	Spare
	DI8	Wait cyl rise	DO8	Spare
	DI9	Process cyl rise	DO9	Spare
	DI10	Lift cyl A rise	DO10	Spare
	DI11	Lift cyl B rise	DO11	Spare
	DI12	Wait cyl drop	DO12	Spare
	DI13	Process cyl drop	DO13	Spare
	DI14	Lift cyl A drop	DO14	Spare
DI15	Lift cyl B drop	DO15	Spare	
AI Module (CU0952)	AI0	Pressure A		
	AI1	Pressure B		
X axis motor drive (CU0579)	IN1	Spare	OUT1	Spare
	IN2	Spare	OUT2	Spare
	IN3	X negative limits	OUT3	Spare
	IN4	X positive limits	OUT4	Spare
	IN5	X home	OUT5	Spare
	IN6	X-axis needle calibration	OUT6	Spare
	IN7	Spare		
	IN8	Spare		
	IN9	Spare		
	IN10	Spare		
	IN11	Spare		

Setup

Y axis motor drive (CU0579)	IN1	Spare	OUT1	Spare
	IN2	Spare	OUT2	Spare
	IN3	Y negative limits	OUT3	Spare
	IN4	Y positive limits	OUT4	Spare
	IN5	Y home	OUT5	Spare
	IN6	Y-axis needle calibration	OUT6	Spare
	IN7	Spare		
	IN8	Spare		
	IN9	Spare		
	IN10	Spare		
	IN11	Spare		
Z axis motor drive (CU0579)	IN1	Spare	OUT1	Spare
	IN2	Spare	OUT2	Z-axis brake relay
	IN3	Z negative limits	OUT3	Spare
	IN4	Z positive limits	OUT4	Spare
	IN5	Z home	OUT5	Spare
	IN6	Tool setting gauge	OUT6	Spare
	IN7	Spare		
	IN8	Spare		
	IN9	Spare		
	IN10	Spare		
	IN11	Spare		
Valve A axis motor drive (CU0579)	IN1	Spare	OUT1	Spare
	IN2	Spare	OUT2	Spare
	IN3	A negative limits	OUT3	Spare
	IN4	A positive limits	OUT4	Spare
	IN5	A home	OUT5	Spare
	IN6	Spare	OUT6	Spare
	IN7	Spare		
	IN8	Spare		
	IN9	Spare		
	IN10	Spare		
	IN11	Spare		

Valve B axis motor drive (CU0579)	IN1	Spare	OUT1	Spare
	IN2	Spare	OUT2	Spare
	IN3	B negative limits	OUT3	Spare
	IN4	B positive limits	OUT4	Spare
	IN5	B home	OUT5	Spare
	IN6	Spare	OUT6	Spare
	IN7	Spare		
	IN8	Spare		
	IN9	Spare		
	IN10	Spare		
	IN11	Spare		

Barcode Reader

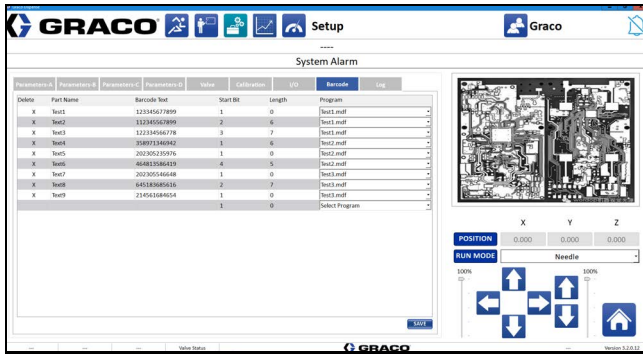


FIG. 23 Barcode Screen

The Barcode function must be enabled on the Setup screen for this function to be available. See **FUNCTION OPTION**, page 27.

Delete: Delete the selected barcode text. Changes are made after deletion.

Part Name: To add comments for a barcode text.

Barcode Text: Displays the text string scanned by the barcode, which is editable. Click at the Barcode Text column to activate the scan. Then use the barcode reader to scan a new barcode. The system reads the text string on the new barcode into the Barcode Text. If the read text string differs from the original, select the text string and edit it by using the pop-up keyboard.

Start Bit: Define from which number of the barcode that the barcode reader regards as the start of an effective text string. This function works together with Length function. An effective text string starts from a specified start bit and ends with a total number of specified length. For example, if the start bit is set “3” and the length is set “6”, then the effective text string of “2068790523” is “687905”.

Length: Define the total numbers that the barcode reader counts into an effective barcode text. If “0” is set, the whole text string of the barcode is read as an effective text string regardless of the start bit.


Program: Select the available barcode program from the drop-down list.

SAVE: Select to save the changes. A blank line appears at the end when the barcode texts are successfully saved.

When the system starts auto-running, it reminds the operator to scan the barcode. After the barcode is scanned, the system translates it to a text string, and compares the translated text string to the barcode text strings that had been previously entered into the Barcode Text.

- If the text string from the scanned barcode has the same effective text string contained in the Barcode Text, the system starts running.
- If there is no matching of effective text string, the alarm bar at the top of the screen reminds the operator that the barcode was not found and please scan the barcode. No programming is executed until a correct barcode is detected.

Programming

Select the  icon to open the programming Screen.

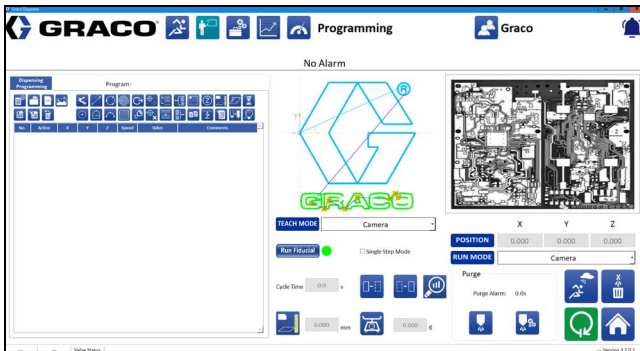


FIG. 24 Programming Screen

The Programming screen allows you to create new programs for dispensing parts. Part programs can be saved to and loaded from a local or network drive. By default, the folder used for saving and loading programs is named Parts and it is in the same location as the executable file.

Tool Path



The tool path provides operations on creating, importing, saving and deleting part programs, as well as adding pictures to the screen.



New Part: Select this to start programming a new part. A confirmation appears when you select this option. You need to name the program the first time you save it.



Open Part: This opens a previously saved part program. When you select this icon, choose a part from the pop up window.



DXF Import: You can select a DXF file from any location, select the appropriate layer of the DXF file, and have that layer converted into a part that follows the lines in that layer.



Add Picture: This links a picture of the part for viewing on the Operation screen. The picture displays to the right of the Active Program. Pictures can be in either JPG or PDF format and are linked to the part by the file path. Moving a picture or changing the name breaks the link, which would cause the picture not to display. A missing picture does not affect the functionality of the program.



Save Part: Select to save the current part program under its current name. If the current program does not have a name, enter a part name for it when prompted.



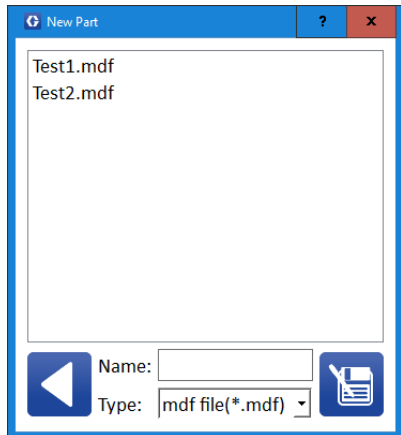
Save Part As: Select to save the current part program under a different name. Any additional changes to the program are then made under the new name. The program for the original part name is not affected.



Delete: Delete the selected part program. The deleted part programs are left in the trash bin of computer.

Create a New Part Program

Select  to start creating a new part program.



Two types of main program (*.mdf) and sub program (*.cdf) are available for the new program.

NOTE: Only main program can be selected in Dispensing Program on Operation screen. Sub program is showed when opening a part program on Programming screen.



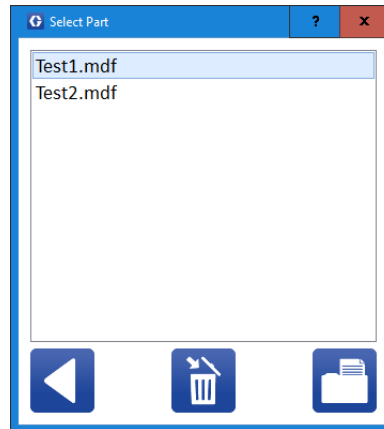
Back: Close the window without creating a part program.



Save Part: Save the current part program under a different name, or overwrite an existed part program. Keep it mind that the previous program being overwritten is then lost.

Open a Part Program

Select  to open a previously saved part program.



Open Part: Select a previously saved part program from the list, and select this icon to open the program.




Delete Part: Select a previously saved part program, and select this icon to delete the program.

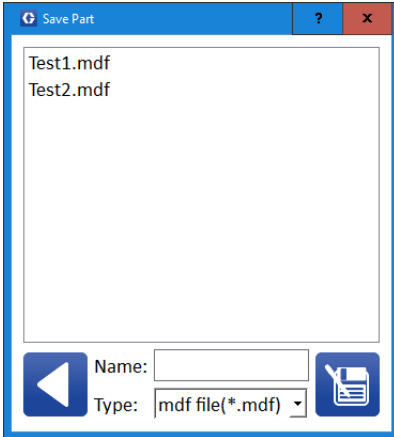



Back: Close the window without opening a part program. Deletion of programs are retained.


Save a Part Program

The first time to save a part program:



1. Select the  icon to open the Save Part window.



2. Enter the name of the part program.
3. Select the  icon to save the part program.

NOTE: Once a part program has been saved the first time, it automatically saves when you press the save icon .

Save the part program under another file name:

1. Select the  icon to open the Save Part As window.
2. Enter the name of the part program.
3. Select the  icon to save as the part program.



Back: Close the window without saving the program.



Save Part: Save the current part program under a different name, or overwrite an existed part program. Keep it mind that the previous program being overwritten is then lost.

Using DXF Files

This feature is intended for importing two-dimensional flat patterns.

DXF File Preparation

Cleaning up a source file before saving it in DXF format can minimize or eliminate the need to further manipulate the pattern in the software.

1. Change properties of all pattern lines to be on the same layer.
2. Make sure there are no other lines on the layer with your pattern. If so, they will be imported and need to be deleted.
3. If the file contains features in the source file such as polylines that treat multiple lines as one entity, they should be exploded so the entity is broken into individual segments.


NOTE: Some software creates a 3D DXF file that has non-zero Z coordinates. Be aware that some program commands do not interpolate in the Z axis and will not run as intended.

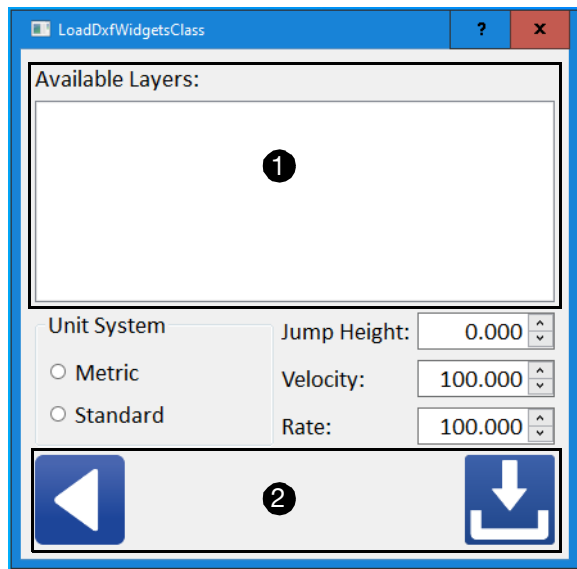
NOTE: Some segments of multi-line entities may not import.

NOTE: Importing ellipses is not supported. An ellipse can be closely approximated using 4 arc segments.

4. Locate the pattern appropriately with respect to the origin (0,0,0) to match the fixture/part origin.
5. Creating a custom layer for the pattern to be imported from a DXF file may be beneficial and help avoid importing unwanted features that may not be viewable. Naming the layer "DXF" helps with selecting the correct layer for import.
6. Purging the drawing prior to saving can be beneficial by helping to avoid importing unwanted features that may not be viewable.

Importing a Part from a DXF File

Select the  icon from the tool path to import a DXF file. Choose the file you want to import from the dialog box.



A list of the layers in the DXF file is located at the top of the import DXF window **1**. You can select one of the layers of the DXF to import at a time or you can select All Layers to import all of the layers in the DXF file.

NOTE: You cannot select multiple layers other than using the All Layers option. If you want to select another layer in the DXF file, you need to import the file again and choose the new layer. However, it will replace the current file, not append it.

At the bottom of the window **2**, you can select to either return to the main programming screen without loading the file or to convert the selected layer of the file into program commands.

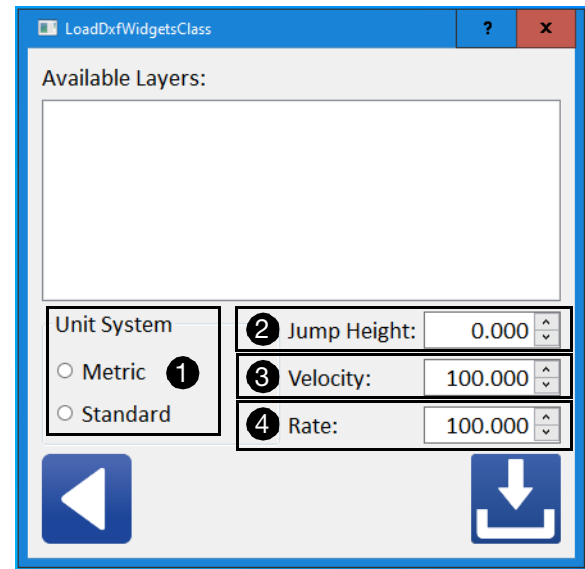


Back: Return to the main programming screen without importing the file.



Download: Download the selected layer of the DXF file into program commands. The selected options are used during this conversion.

Converting the Selected Layer(s)



Unit System **1** refers to the metric or standard units in which the DXF file was created. The units in the program created from importing the DXF must match the Unit System defined in the parameters.

For example, a DXF that is one inch square in inch units must be imported by selecting the standard unit system. If the unit system is set to inches in the parameters, the imported program is 1 in. x 1 in. square.

If the Unit System is set to metric in the parameters, the imported program is 25.4 mm x 25.4 mm square.

Selecting the wrong unit system results in the scale of the geometry being increased by a factor of 25.4 or reduced by a factor of 1/25.4.

If the imported pattern has multiple dispense segments separated by spaces, a jump command is inserted to transition between each segment **2**. The Jump Height you enter is used for all jump commands in the imported program.

By default, no imported command has an associated velocity. Each command can be assigned the velocity you enter in the Velocity parameter **3**.

If you check the Apply Velocity box, the velocity is assigned to each command in the imported program. If it is not checked, no program is assigned a velocity.

As set in the parameters, the Rapid Velocity ④ is the maximum speed at which the system can move during rapid movements, such as Move command.

NOTE: Large files may require velocities to be assigned on some layers. On these layers, it is not possible to un-check the Apply Velocity box.

Creating a Functional Program for a DXF File

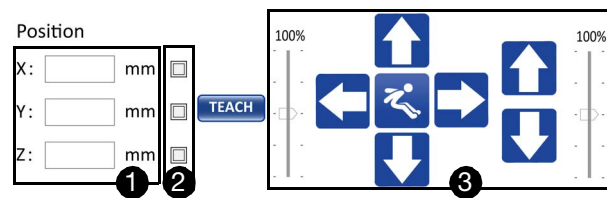
A command list for the pattern is generated when the DXF file is downloaded. Commands appearing in red italics require information to be entered before the table can run the program pattern. The following table shows the command parameters that must be entered to complete the commands.

Command Parameters	Details
<p>Move</p> <p>Every command must be edited individually.</p>	<p>Enter the Rapid Speed and the ZUp Speed if it is different from the Rapid Speed.</p> <p>Adjust the Jump Height if necessary.</p> <p>Enter the offset between the needle and the part in Z axis. (This value will be applied to the rest of the program through inheritance.)</p>
<p>Line, Arc</p> <p>Once a value for each of these command parameters is entered, it is inherited each place the parameter is used in following commands.</p>	<p>Enter the offset between the needle and the part in Z axis.</p> <p>Enter the Velocity value.</p>
<p>Circle</p> <p>Every command must be edited individually.</p>	<p>Enter the Rapid Speed.</p> <p>Adjust the Jump Height if necessary.</p> <p>Enter the offset between the needle and the part in Z axis.</p>

Programming Command Properties

Teaching Points


Commands that have the coordinate properties can have properties taught using the teach function. You can move the machine to a specified point and then set that point to be the coordinates for a selected command. You can also select to use only one or two of the X, Y, and Z coordinates when teaching points this way.



Use system jogging controls ③ to move the dispenser to the specified position. See **System Jogging**, page 20 for more information. The current coordinates of the dispenser are displayed in ①.

Select the check boxes in ② to decide whether to teach the coordinates into the specified position. indicates the coordinates are selected.

Select **TEACH** to record the X, Y and Z coordinates in ① into corresponding X, Y and Z in Data. This teaches the current position as the specified position in Data.

Use the central Move  to jump the dispenser to the X, Y and Z coordinates of specified position displayed in Data.

Valve On and Valve Off



For Valve On	
Distance (mm)	Select 'Distance(mm)' in ① and enter the value in ②. This allows the dispenser to move the specified distance before dispensing.
Time (s)	Select 'Time(s)' in ① and enter the value of time ②. This allows to dispense for the specified period of time before the dispenser starts to move.
For Valve Off	
Distance (mm)	Select 'Distance(mm)' in ③ and enter the value in ④. This allows to stop dispensing at the specified distance before the dispenser reaches the endpoint.
Time (s)	Select 'Time(s)' in ③ and enter the value in ④. This allows to dispense for the specified period of time after the dispenser reaches the endpoint.

Data

Data									
No	Action	X	Y	Z	Speed	Rate	Mode	Surface	
1	Move Point	0.000	0.000	0.000	100.000				

Common Programming Commands Properties

Action: Displays the name of the programming command. This cannot be modified.

X, Y, Z: To define the coordinates of the specified position. This can be modified by **TEACH** or double clicking and entering the values.

Speed: To define how fast the dispenser moves in X, Y and Z axes. Double click and enter values by using the popup keyboard to modify the speed. The default speed is set in **RUNNING**, page 23.

Rate: To define the dispensing rate. Double click and enter values by using the popup keyboard to modify rate.

Mode: Two types of mode can be selected.

- **ABS (absolute):** the system moves to the specified point.
- **INC (incremental):** the system offsets its current location to the previous point.

Surface: Select one surface from the drop-down list. The surface are based on Laser Check. See **Height Check**, page 50.

Specific Programming Commands Properties

Time: This parameter is for Dot command. This sets the amount of time for Dotting.

Jump Function: This parameter is for Move command. It defines the moving tracks from the start point to the end point.

- **Z, X&Y:** Moves in the Z axis first, and then moves in the X and Y direction.
- **X&Y, Z:** Moves in the X and Y direction first, and then moves in the Z axis.
- **X&Y&Z:** Moves in the X, Y and Z direction.
- **X&Y:** Only moves in the X and Y direction.
- **X:** Only moves in the X axis.
- **Y:** Only moves in the Y axis.
- **Z:** Only moves in the Z axis.

Pitch: This parameter is for Spiral Fill and Rectangular Fill commands.

- **For Spiral Fill:** The pitch is the spacing between lines of spiral.
- **For Rectangular Fill:** The pitch is the spacing between lines and also the turning diameter of rectangular spiral.

Direct: This parameter is for Circle, Spiral Fill, and Rectangular Fill commands. Four types of directions are:

- **FWD:** Draws a circle in a three-point order.
- **REV:** Draws a circle in the opposite direction of the three points.
- **CW:** Moves in a clockwise direction.
- **CCW:** Moves in a counter-clockwise direction.

Spiral Direct: This parameter is for Spiral Fill and Rectangular Fill commands.

- **Inwards:** Moves in an decreasing inward spiral.
- **Outwards:** Moves in an increasing outward spiral.

Programming Commands



The group of icons in the Programming screen are the commands that you can use in editing a part program.

Select the icon and set parameters in the pop-up program command window.

NOTE: Commands that are invalid are displayed in red on the programming screen.



Move: Moves the dispenser from the current point to the specified endpoint.



Dot: Turns on the dispenser at the specified rate for the specified amount of time.



Line: Moves in a straight line from designated start point to the designated endpoint.



Polyline: Includes actions of Line or Three Point Arc.



Circle: The system moves in a circle composed of up to 3 points.



Three Point Arc: Moves in an arc through the start point, middle point to the designated endpoint. Arcs cannot encompass a full circle or greater.



Spiral Fill: The system moves in an increasing outward spiral from the Spiral(Center) to Spiral(Start) or decreasing inward spiral from Spiral(Start) to Spiral(Center). The spacing (pitch) between lines of the spiral can be set to approximately match the bead width and achieve complete fill. The software automatically adjusts the pitch so there is the same number of beads to the left and to the right of the center of the spiral.

NOTE: A spiral fill does not follow an inclined plane based on the defined start and center points of the spiral. The Z height for both the start and end points must be equal for a flat fill pattern to be dispensed.



Rectangular Fill: The system moves in an increasing outward rectangular spiral or decreasing inward spiral up to three points. To dispense in clockwise or counterclockwise is decided by the direction from the specified first point to the second point. The spacing (pitch) between lines of the rectangular spiral can be set to approximately match the bead width and achieve complete fill. The software automatically adjusts the pitch so there is the same number of beads to the left and to the right of the center of the spiral.

Select  or  fill type. Spiral

Direction is not applicable for  fill type.



Turn On Output: Set the specified output state to either on or off.



Wait For Input: Wait until a specified input has been received. The desired state of the input can be selected to be either on or off. A timeout value is included, but can be set to zero to disable the timeout.



Fiducial Point: Define fiducials on parts. Three types of finding fiducial points are single, double and edge find. See **Find Fiducial Points**, page 51 for operation details.



Bad Mark: Find the bad marks on the parts. When the system runs the main program, it checks the bad marks on the parts. If bad marks are found, the parts are recognized unqualified and skipped with no dispensing.



Insert Line: Inserts a blank line in front of the selected command. Add action of the blank line by selecting and editing the programming commands.



Delete Line: Select a command and press this icon to delete the command.



Palletize: Load an existing program and place it in a pallet (rectangular array) so that the same pattern can be repeated multiple times. You can specify the spacing and the number of rows and columns in the command properties.



Subroutine: Load an existing program as a subroutine of the current one. The subroutine is not offset unless it is comprised of incremental movements. Changes made to the source program are carried over. A subroutine is skipped if it references its own program or if the required state of the selected input address is not met.



Z Up: Select a Z up Type to move the dispense tip up in Z axis after finishing dispensing a part. Modify the values of points except Point a. Either positive or negative values can be set as offsets to the previous points.



Safe Z: Moves up in a straight line to a specified height on the Z axis. It affects all the Safe Z after this command. If no Safe Z is set, the system uses the default jump height as the safe Z. The default safe Z is set in Jump Height. See **SAFETY SETUP**, page 25.



Laser Check High: Use laser check to offset in the Z axis. See **Height Check**, page 50 for operation information.



Comment: Add comments to the program. Comment command is not executed when running the programming commands.



Offset: Set coordinate offset for specified programming commands.



Reload Valve: The system pauses to reload and restarts running after reloading.




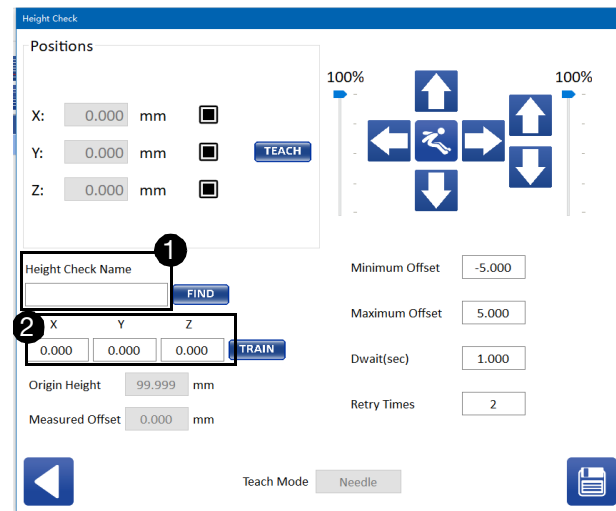
Delay: Pause the system for a specified amount of time. The system continues to run after timing out.



Pre-charge: The system pauses to activate pre-charge and restart running after pre-charge.

Height Check

1. Select  to check the height.



2. Name the height check in **1**. The name will be a selection in the Surface drop-down list in editing part program.
3. Move the height laser to the specified position.
4. Select **TEACH** to record the coordinates into **2**.
5. Select **TRAIN** to move the laser to the specified position.
 - **Dwait:** How much time the laser waits for before checking the height.
 - **Origin Height:** Displays the results of laser check.
6. Select **FIND** and get the offset written in Measured Offset.



Minimum Offset/ Maximum Offset: Set the limit of the measured offset. When the Measured Offset is out of the limit, the system retries height check within the specified Retry Times.

Retry Times: The maximum times for checking the height. The system raises an alarm if it fails to obtain an effective Measured Offset within the retry times.

Find Fiducial Points

Camera is used to find fiducial points. Fiducials are special features to recognize the parts.

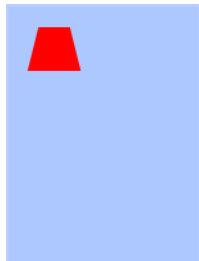
NOTE: It is imperative that the same part orientation that is used to teach the fiducials is also used to teach the part pattern. Do not remove or reposition the part in the nest between these steps. This establishes the relationship between the dispense pattern and the fiducial.

1. Select  to open Fiducial Type window.
2. Select fiducial type of single, double or edge find from the Fiducial Type drop-down list.
3. Select  to open Fiducial Point window.

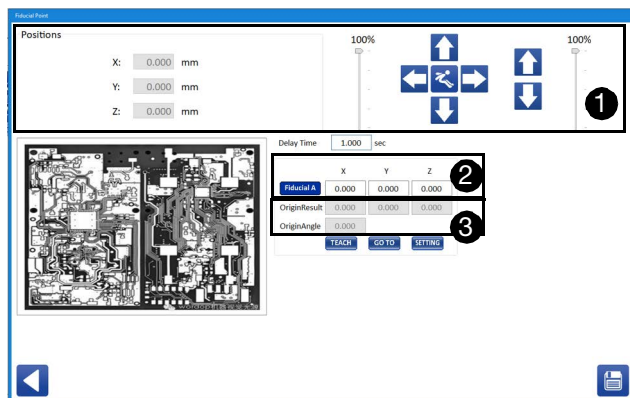
Single Fiducial

NOTE: The single fiducial should not be a circle.

Single fiducial recognizes the part by finding the special one feature (not a circle) on the part. For example:



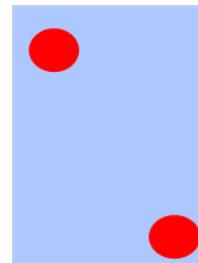
Follow the steps to find single fiducial.



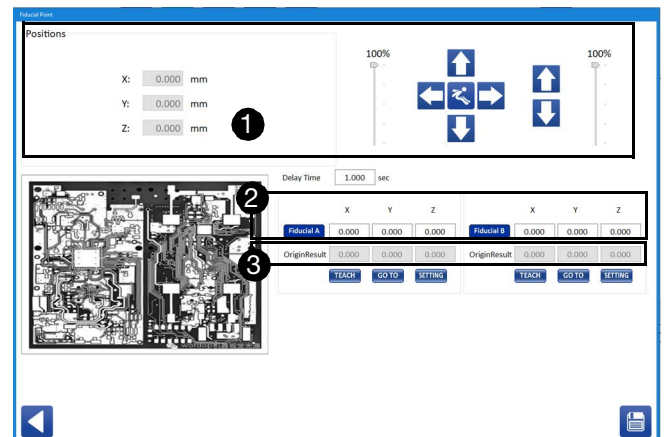
1. On the screen, select **SETTING** to set parameters of fiducial. See **Set Fiducials**, page 53 for more information.
2. Use jogging **1** to move the camera to the fiducial, or enter the coordinates of the fiducial point in Fiducial A directly and select **GO TO** to move the camera to the fiducial point.
3. Select **TEACH** to record the position into coordinates of Fiducial A **2**, and recognize the fiducial. The fiducial features are displayed in OriginResult and OriginAngle **3**.
 - The OriginResult records the actual position of the fiducial.
 - The OriginAngle records the angle in the fiducial.
 - The offset parameters are displayed on the upper left corner of the camera vision and will be applied to the programming.

Double Fiducials

Double fiducials recognize the part by finding the special two features on the part. For example:



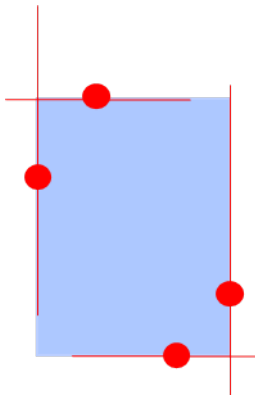
Follow the steps to find double fiducials.



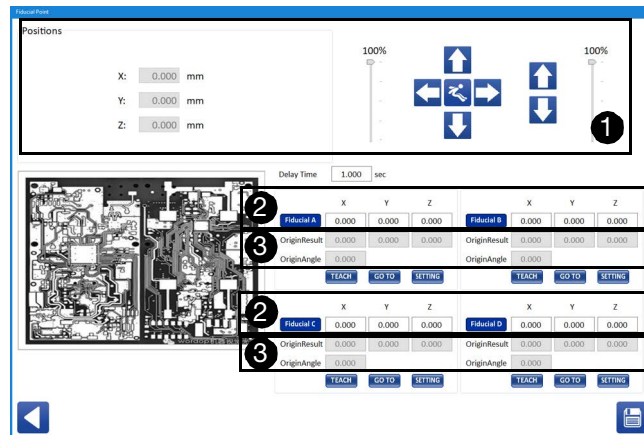
1. On the screen, select **SETTING** to set parameters of fiducial. See **Set Fiducials**, page 53 for more information.
2. Use jogging **1** to move the camera to the fiducials, or enter the coordinates of the fiducials directly in Fiducial A and Fiducial B, and select **GO TO** to move the camera to the fiducials.
3. Select **TEACH** to record the position into coordinates of Fiducial A and Fiducial B **2**, and recognized the fiducials. The fiducial features are displayed in OriginResult **3**.
 - The OriginResult records the actual position of the fiducials.
 - The offset parameters are displayed on the upper left corner of the camera vision and will be applied to the programming.

Edge Find Fiducials

Edge find fiducials recognize the part by finding edges of the part.




Follow the steps to find edge finding fiducials.









1. On the screen, select **SETTING** to set parameters of fiducial. See **Set Fiducials**, page 53 for more information.
2. Use jogging **1** to move the camera to the fiducials, or enter the coordinates of the fiducials directly, and select **GO TO** to move the camera to the fiducials.
3. Select **TEACH** to record the position of the fiducials into coordinates of Fiducial A, Fiducial B, Fiducial C and Fiducial D **2**, and recognize the fiducials. The fiducial features are displayed in OriginResult and OriginAngle **3**.
 - The OriginResult records the actual position of the fiducials.
 - The OriginAngle records the angle of edge.
 - The offset parameters are displayed on the upper left corner of the camera vision and will be applied to the programming.

Set Fiducials


When finding fiducials, set the fiducials, train the fiducials to be remembered, set its parameters, and then test if fiducials are correctly found.

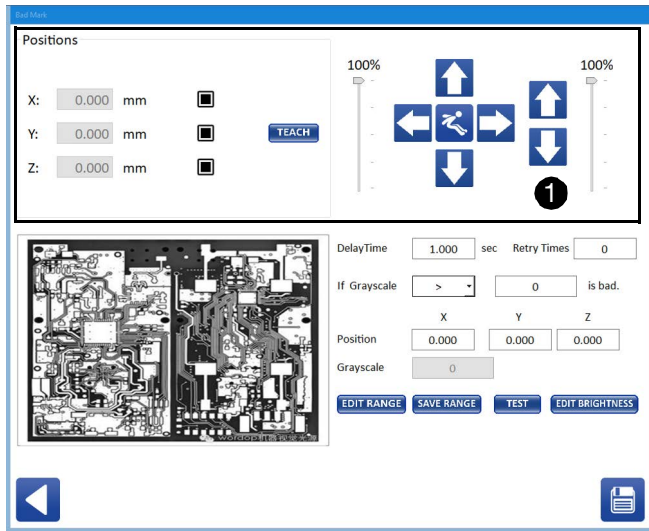
Model	Defines the profile of the fiducials.
Mode	Select colors of the fiducials and background. Black means the fiducials are black and its background is white. White means the fiducials are white and its background is black.
Accuracy	Select degree of accuracy during the process of finding fiducials. Degrees of accuracy are low, middle, high and highest. Higher level of accuracy requires more time.
Polarity	Select polarity of colors. Same means the color rules are the same with what is selected in Mode. Reverse means the color rules are reverse with what is selected in Mode. Same/reverse means color rules are the same or reverse with what is selected in Mode. Mixed means color rules are the same, reverse, or mixed with what is selected in Mode.
Threshold	Set the smoothness of the edge of the fiducials found. Higher value indicates smoother edge of fiducials. Set the value from 0 to 100.
Score	Set the required minimum score of the similarity between the trained fiducials and the target fiducials. Set the value from 0 to 100.
Angle Range	Set the allowable range for rotated fiducials that you expect to search for. Set the range from -180° to 180°.
Scale Range	Set the allowable range of fiducial size that you expect to search for. Set the range from 0.5 to 2.
	Train the system to remember the fiducials.




	Test if the system can find correct fiducials.
	Select to further modify the fiducials.
	Select to adjust parameters of camera vision.
	Select to edit search scope of fiducials.
	Select to save the specified search scope.
	Save all the parameter settings.



Set Bad Mark



Bad marks are used to recognize if the part is a qualified part. If a bad mark is set for the parts, these parts are skipped with no dispensing.


1. Select  to open Bad Mark window.



2. Use jogging  to move the camera to the bad mark, and select  to record the position of the bad mark into coordinates of Position. Or enter the coordinates of the bad mark directly in Position, and select  to move the camera to the bad mark.
 - Position: Displays the current coordinates of the camera.
 - Grayscale: Displays the grayscale of the current camera vision.

3. Set the parameters of bad mark.
 - DelayTime: Set the amount of time in seconds that the system waits before finding the bad mark.
 - Retry Times: The number of times the bad mark is confirmed after being detected.
 - Grayscale threshold: Set if grayscale is higher (>) or lower (<) than a specified value, the point detected is regarded as bad mark, and this part is an unqualified part.
 -  : Select to edit search scope of the bad mark.
 -  : Select to save the specified search scope.

-  : Test if the system can find the correct bad mark.
-  : Select to adjust parameters of camera vision.

4. Select  to add Bad Mark command.

Teaching Controls

TEACH MODE


Select the mode to teach part program.

- **Needle:** To teach part program with dispense tip.
- **Camera:** To teach part program with camera vision.

Run Fiducial

Fiducials are unique features of a part that are used as points of reference by the machine to positively identify the part orientation to ensure accurate dispensing. Use




command of Fiducial Point  to define fiducials.

Select  to run fiducials if the part programs contain fiducial command. The system pops up a dialog to remind the operator to run fiducial in the following situation:

- The program contains Fiducial Point command but the operator have not run fiducial.
- The parts are removed and put back.

The results of fiducial running are offset to the program.



The light on the right of Run Fiducial button indicates the status of running fiducials.

Light Color	Description
 (gray)	Indicates the operator needs to run fiducials.
 (green)	<ul style="list-style-type: none"> • The system succeeds in running fiducials, calculating the offset, and applying the offset to the program. • The part programs do not have fiducial commands.
 (red)	The system fails to run fiducials.

Single Step Mode

When Single Step Mode is selected, all motion commands constitute a single step.

Each command may contain multiple individual steps, which can be tracked by using single step mode. In Single Step Mode, the first move of the program is not

made until the  button is pressed. Each step is run by pressing the .

Lock the Nest

Lock the nest when conducting part program teaching.



Lock the Left Nest: Select to manually lock the left nest.



Lock the Right Nest: Select to manually lock the right nest.

Laser Height



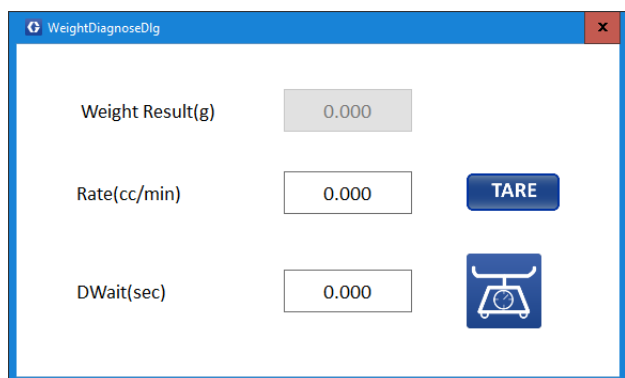
Laser Check: Shows the height in real time or the latest checked height. When the background color is white, it displays height in real time. When the background color is green, it displays the latest laser check height. Select the column to switch between the two display types.






Weight




Displays the latest weight result.

1. Select  to open WeightDiagnoseDlg window.



2. Select  to reset the value in Weight Result(g).
3. Set the rate in Rate(cc/min) and time in DWait(sec) for dispensing.
4. Select  to conduct weight check.
 - During the weight check process, the button  turns . Select  to stop weight.
5. The result is displayed in the Weight Result(g). The Weight Result(g) displays two types of weight data. When the background color is white, it displays the weight in real time. When the background color is green, it displays the latest weight result. Select the column to switch between the two displays.

Operation

Select the  icon from the top of the screen to access the Operation Screen. The dispenser software must be connected to the machine's controller to use the functions available on this screen.

The Operation Screen

The Operation screen is to run selected programs from the dispenser software. Also, you can perform basic tasks, such as homing the system, viewing and clearing alarms, initiating a manual purge, performing a dry run, moving to the maintenance position, and dispensing a test shot.

Programs can be tested at various speeds. The current and historical analog input values are displayed in the center of the screen.

NOTE: You cannot switch out of the Operation screen while the system is actively running.

Select Part Programs

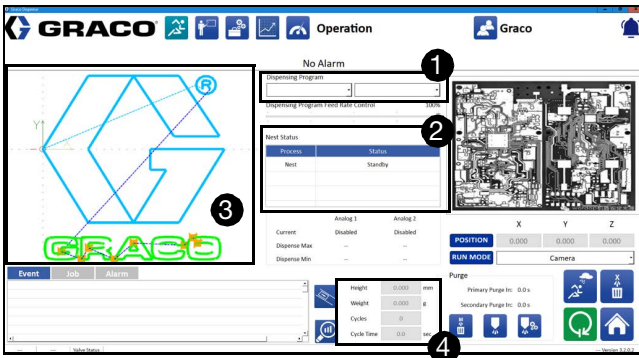


Fig. 25 Part Programs Information

Select the programs to run from the Dispensing Program in **1**. The left is for left-nest program, and the right is for right-nest program. You can select the programs for the left and right nest independently by using the drop-down list for each. The list includes all programs that have been saved. The selected programs can be the same or different.

If the system is off-line system, area **2** displays the status of the nest. If the system is in-line system, area **2** displays the status of the conveyor.

The dispensing tracks are displayed in **3**. When the system is running, area **3** fits to display the tracks of the current command. When the system is in standby, area **3** displays the tracks of the currently selected part program. When both nests have part programs, it displays the part program of the left nest.

Height, weight and cycle information is shown in **4**.

- **Height:** Displays the latest height check.
- **Weight:** Displays the latest weight.
- **Cycles:** Displays the total number of parts the system has dispensed.
- **Cycle Time:** Displays the total running time of the last part program.

Run Controls

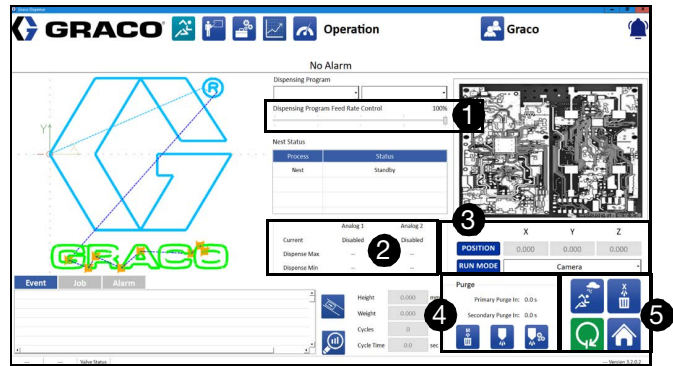


Fig. 26 Run Controls Information

The Dispensing Program Feed Rate Control **1** allows you to slow down the axes moving speed to a percentage of the default values.

NOTE: The Dispensing Program Feed Rate Control does not affect the rate of dispense.




NOTICE

Machine Offset parameters are not part of a program. Make sure you are running programs that were created using the currently set Machine Offset parameters or change the parameters to match the program. Failure to match the Machine Offset parameters to the program could result in damage to equipment. See **MACHINE OFFSETS**, page 25 and **Calibrate Needle, Camera and Laser**, page 35.



Analog input information of dispense pressure is displayed in ②. The labels for the analog inputs are the same as those in the parameters. The current value for each input is displayed, as are the minimum and maximum values for the last dispense. If the system has been reset since the last dispense, both the minimum and maximum values are zero.







Select running mode of needle or camera from the drop-down list of RUN MODE ③. The coordinates of POSITION display the absolute coordinates of the dispenser with reference to the origin of the system.

Purge information is displayed in ④.

Primary Purge In	Countdown of the purge alarm. Any dispense or purge will reset the timer.
Secondary Purge In	Countdown of purge. Any dispense or purge will reset the timer.
	Moves to the purge position and initiates a purge. This functions apply regardless of whether or not the system is in Autopurge mode. Manual purges also reset both purge timers.
	Shot Dispense: Dispenses a test shot. The rate and amount of the test shot are set in the valve parameters. The test shot can be dispensed while the system is in any position.
	Maintenance Position: Moves the dispenser to the maintenance position. The X, Y, and Z coordinates for the maintenance position can be set in the parameters. See MAINTENANCE , page 25. Homing is required before running this function. This function is disabled if the system is running a part program, a purge, or the needle find routine.

The main controls for running the system are displayed in ⑤. These icons are contextual based on the state of the system.

	Wet Run/Dry Run: Toggles whether or not the dispenser is active during running. The icon that is showing indicates the current state of the system.
	

	Auto Purge On/Off: Toggles whether or not the system automatically purges. The purge timer only counts down in Auto Purge mode. Manual purges can be toggled regardless of the state. The icon that is showing indicates the current state of the system.
	
	Start (green color) /Stop (red color): To start or stop the system. The system does not stop until it has completed any part that is currently running. This icon is disabled if the system is not in a suitable state to run.
	
	Home: To perform a homing routine. Homing is required after any loss of motion power. This icon is disabled if the system is e-stopped. During running, the Home icon becomes the Abort icon.
	Abort: To stop the system, even in the running procedure. There is no way to resume a program after an abort. While not running, the Abort button becomes the Home button.

Valve Status



Click to view the status of dispensing valves and perform other functions.

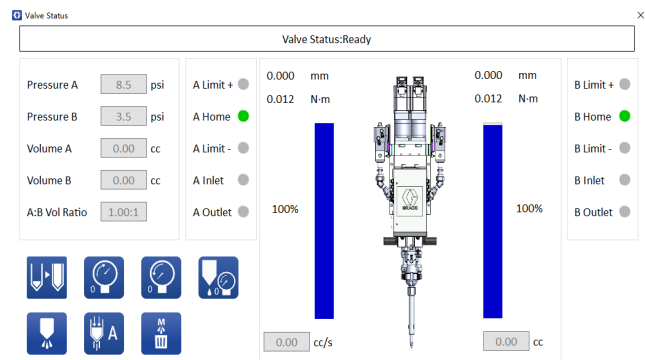


FIG. 27 Valve Status Screen

For more details, See **Valve Parameter Descriptions**, page 30.

Conveyor (For In-line System Only)



This function is enabled when selecting Conveyor in Loading Function. See **LOADING**, page 24 for more details.

Click to display Conveyor Hand Window.

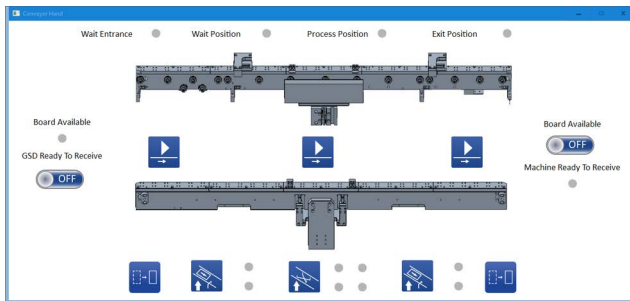


FIG. 28 Conveyor Hand

In automatic conveyor running procedure, the system removes the parts from the conveyor first, and then detect if there are parts on the conveyor. Only when parts are detected in a specific period of time, the system starts automatic conveyor running. **In manual conveyor running procedure**, click the manual functional buttons to run the parts.

If buffer function is enabled, the system allows a maximum of two parts on the conveyor. One part is allowed on wait position, and the other part is allowed at process position and exit position. **If buffer function is disabled**, a maximum of only one part is allowed on the conveyor.

Error messages are displayed at the top of the screen. For more details, see **Error/Event Alarms**, page 76.









Signals

Wait Entrance ●	A part is detected on the wait entrance.
Wait Position ● (When buffer function is enabled)	A part is detected on the wait position.
Process Position ●	A part is detected on the process position.
Exit Position ●	A part is detected on the exit position.

Board Available ●	A part is ready to be sent to the conveyor.
Machine Ready to Receive ●	A part is ready to be sent to the customer machine.
● (on the left)	The waiting block cylinder raises.
● (on the left)	The waiting block cylinder drops.
● ●	The lifting cylinders raise.
● ●	The lifting cylinders drop.
● (on the right)	The processing block cylinder raises.
● (on the right)	The processing block cylinder drops.

Manual Functional Buttons

GSD Ready to Receive <input checked="" type="checkbox"/>	Manually send the part to the conveyor.
Board Available <input checked="" type="checkbox"/>	Manually send the part to the customer machine.
	Click to convey the part to the next position. This icon turns after being clicked. Click to stop conveying the part.

	<p>Click  to convey the part from wait entrance to wait position, or convey the part from wait position to process position.</p>
<p>(on the left)</p>	<p>This icon turns  after being clicked, and other icons are disabled. Click  to stop conveying the part.</p>
	<p>Click  to convey the part to exit position.</p>
<p>(on the right)</p>	<p>This icon turns  after being clicked, and other icons are disabled. Click  to stop conveying the part.</p>

Camera



FIG. 29 Camera

This **1** displays a camera vision for the parts. If camera is not applicable, a picture can be loaded in place of camera vision.

Records



FIG. 30 Records

Records **1** display event, job and alarm information.

- **Event:** To record system operation steps, such as setting parameters and switching programs.
- **Job:** To record the basic job information, such as program time and cycle time.
- **Alarm:** To record the warnings and faults of the system.

System and Alarm Status

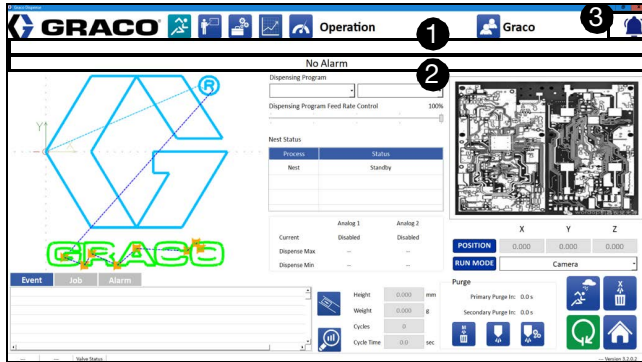





FIG. 31 Records

The bar ① displays the current status of the system.

If any alarms are active, the alarm bar ② below the status bar displays the alarm and has a red background. If warnings are active, the bar displays the warning and has a yellow background. When the system raises alarms, check the issues and do troubleshooting. Then click the alarm bar to clean the alarms.

The System Silencer button is located in ③. The  indicates active alarms. Click  to stop beeping and  turns .

Data Check

In Data Check Screen, set parameters of Repeatability and Weight Check tests.

Repeatability

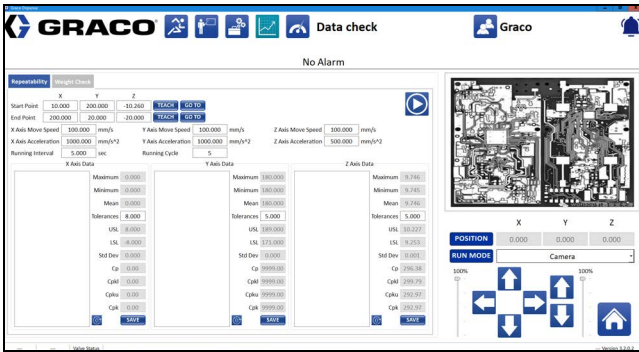


FIG. 32 Repeatability Screen

When doing repeatability test, the system repeatedly draws a line from the start point to the end point.

Start Point: The coordinates of the start point that the repeatability test line begins.

End Point: The coordinates of the end point that the repeatability test line ends.

TEACH: Select this button to record the current X, Y and Z coordinates.

GO TO: Select this button to move the dispenser to the current position.

X Axis Move Speed: Moving speed in X axis for repeatability test.

Y Axis Move Speed: Moving speed in Y axis for repeatability test.

Z Axis Move Speed: Moving speed in Z axis for repeatability test.

X Axis Acceleration: The rate of acceleration to bring the X axis up to the requested velocity.

Y Axis Acceleration: The rate of acceleration to bring the Y axis up to the requested velocity.

Z Axis Acceleration: The rate of acceleration to bring the Z axis up to the requested velocity.

Running Interval: After drawing a line, the system waits for this time before drawing the next line.

Running Cycle: The number of lines the system intends to draw in the process of repeatability test.

Weight Check

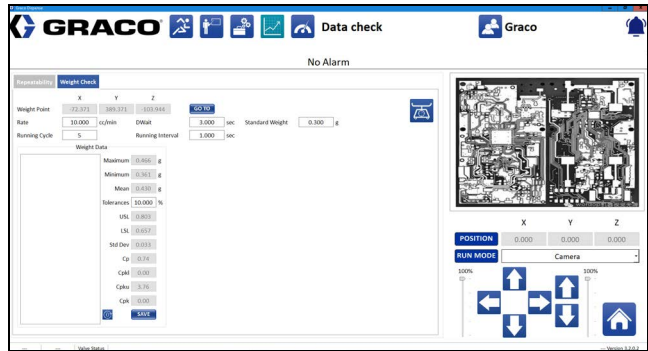



FIG. 33 Weight Check Screen

During weight check, if the weight exceeds the maximum limit, the system stops and reminds you to change the cup or manually stop the process. If

continuing the process, select  to restart it. Then the system pops up a window and ask you whether to continue or not. Confirm it and finish the weight check.

Weight Point: The coordinates of weight check position.

GO TO: Select this button to move the dispenser to the weight check position.

Rate: The dispensing rate in weight check.




Dwait: The time for dispensing in weight check.

Standard Weight: The target weight of the material.

Running Cycle: How many times the system execute weight check.

Running Interval: After completing one weight check, the system waits for this time before the next weight check.

Start Test

	Select this to start repeatability or weight test. The icon turns  when the tests start.
	Select this to stop repeatability or weight test.

Reference parameters

The parameters are references to the repeated stabilization of the axes, and the precision of dispensing.

Maximum: The maximum value of the data collected.

Minimum: The minimum value of the data collected.

Mean: The average value of the data collected.

Tolerances: The allowable variation between the actual value and the target value.

USL: Upper specification limit.

LSL: Lower specification limit.

Std Dev: Standard deviation. It is a quantity calculated to indicate the extent of deviation.

Cp: Process capability. It is an approach for determining the quantifiable attribute of a process in relation to a specification.

CpkI: Lower Process Capability Index.

CpkU: Upper Process capability Index.

Cpk: Process Capability Index. It is a statistical measure of process capability to determine how accurately a target is met. Different ranges of values reflect different levels of process capability.

Cpk value	Description
≥ 1.67	The system is running in great condition.
$1.33 \leq Cpk < 1.67$	The system is running well.
$1.0 \leq Cpk < 1.33$	Improvement is needed.
$0.67 \leq Cpk < 1.0$	The system is not running in good condition.
$Cpk < 0.67$	The system is running badly.

SPC Data Screen

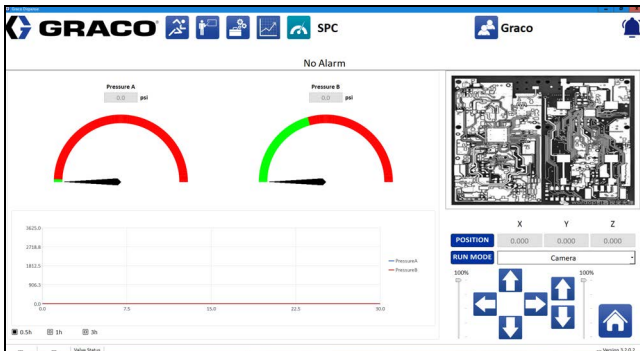


Fig. 34 SPC Screen

The SPC Data Screen dynamically displays pressure data for Pressure A and Pressure B.

NOTE: Pressure sensors must be enabled in the parameters. See **FLUID PRESSURE**, page 27.

High and Low warnings and alarm setpoints (defined in **FLUID PRESSURE**, page 27) are displayed on the graph. A chart history of 30 minutes, 1 hour, or 3 hours can be shown.

Pressure data is condensed to display and record only while the machine is in Run mode. The chart display does not reflect real time data unless the machine was in Run mode for the entire chart duration.

Calibration Features

Calibrate the Part Present Sensor Option

The part present sensor is optional. If one is installed, you need to calibrate it prior to dispensing. The sensor is located on the dispenser and emits a red light onto the slide where the part is located.

NOTE: Make sure all parameters are saved before performing this calibration procedure.

1. Locate a part in the nest.
2. Push in the slide with the part. Lock the nest.
3. Using the jogging controls to move the dispenser so that the part present sensor finds the part. The position selected should be close to the starting dispense point on the part to minimize cycle times.



NOTE: The sensing range for the sensor is between 10 cm and 40 cm.

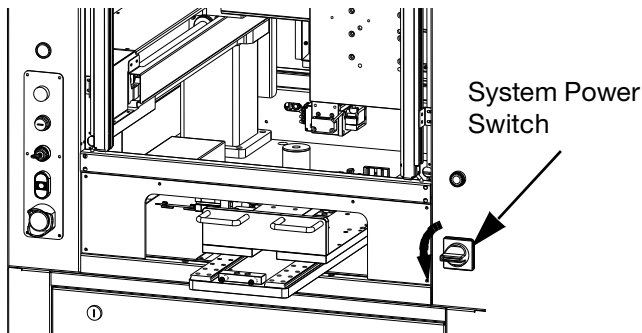
NOTE: When this feature is active, the machine automatically moves to this position to look for a part each time the slide is locked in (or the start device is activated).

Shutdown




Before shutting down, make sure parts are removed from the work area.







1. On the Operation screen, select  to stop GSD system.
 2. On the Operation screen, select  to bring the dispenser to the maintenance position.
 3. Remove the mixer, shut off valve, and needle as applicable.
 4. Put a waste container under the dispenser.
 5. Perform the step 2 to 6 of GSD system pressure relief procedure. See **Pressure Relief Procedure**, page 66.
 6. Clean and apply the night cap to the dispense nozzle.
- NOTE:** For more specific shutdown recommendations, refer to the manual for the dispenser and feed system you are using. See **Related Manuals**.
7. Log out of the dispenser software.
 8. Close out of any other open programs.
 9. Shut down the computer using the Windows Start Menu.
 10. Turn the system power switch to off. The switch is on the front left of the machine.



11. Shut down the air supply of GSD system.




Pressure Relief Procedure

 Follow the Pressure Relief Procedure whenever you see this symbol.



				
				

This equipment stays pressurized until pressure is manually relieved. To help prevent serious injury from pressurized fluid, such as skin injection, splashing fluid, and moving parts, follow the **Pressure Relief Procedures** when you stop dispensing and before cleaning, checking, or servicing the equipment.

Valve Pressure Relief Procedure

1. On the Operation screen, select  to stop GSD system.
2. Move the dispense valve to Purge position.
3. On the Operation screen, select  to go to the Valve Status screen.
4. On the Valve Status screen, select  to depressurise the pressure manually.

GSD System Pressure Relief Procedure

1. On the Operation screen, select  to stop GSD system.
2. Move the dispense valve to Purge position.
3. Shut down the air or power supply of feed system.
4. On the Log In screen, select  to go to the Setup screen.
5. Choose the Valve tab at the top of Setup screen to go to the Valve Setup screen.
6. Open the inlet and dispense valve until the fluid pressure drop to the set value.
7. Shut down the air supply of GSD system.

Maintenance



Follow the **Shutdown** procedure as described on page 66 before performing any maintenance on the GSD machine.

NOTICE

Do not use silicone as a lubricant. Doing so may cause damage to the machine.

NOTE: The drive components on all machines are shipped from the factory with greased ball screws and protective oil coating on the rails. The grease is compatible with DIN 51517T3.

Lubrication Schedule for the Double Rails

The steel shafts in the double rails and linear bearings should be lubricated and protected as follows:

- The rails should be cleaned and lubricated every 100-200 hours if the machine is being used in a dusty environment.
- The rails should be cleaned and lubricated every 300-500 hours if the machine is being run in a relatively clean and dust-free environment.

If the rails appear dirty, wipe them clean before lubricating.

Lubricate the rails with oil that contains both a lubricant and a rust inhibitor. See **Recommended Lubricants** on this page.

Recommended Lubricants

Double rails - Renolin CLP.

Ball screws and carriages - Alvania-1, Alvania-2, Alvania-3 (or equivalent) grease for light, medium, and heavy-duty applications, respectively.

Double Rails Lubrication Steps

1. Apply oil to an acid brush.
2. Use the hex wrench to remove the M4 screw of the guards.
3. After remove the guards apart at each of the four locations, brush oil onto the rails. See FIG. 35.

NOTE: It may be necessary to bend the brush to properly apply the oil.

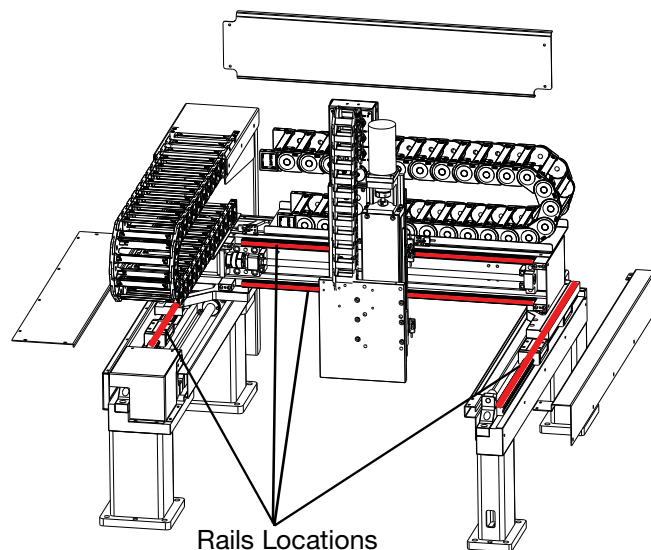


FIG. 35: Guards Remove and Rails Locations

Lubrication Schedule for the Ball Screw

Lubricate the ball screw after its first 50 hours of service.

Subsequently, lubricate the ball screw:

- Every 100-200 hours of service in a dusty environment.
- Every 300-700 hours in a relatively clean environment.

Ball Screw Lubrication Steps

NOTE: Access to the ball screw is through the rear, lower panel of the machine. See FIG. 36.

1. Apply grease to a different acid brush than the one used for the double rails.
2. Apply grease to the ball screw using the acid brush

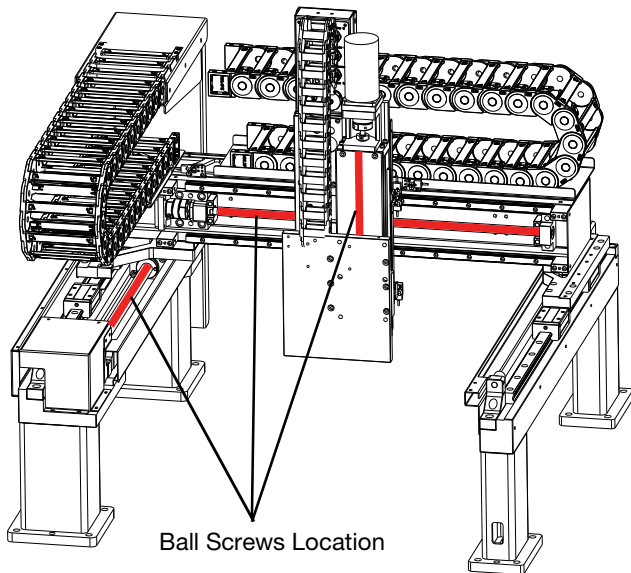
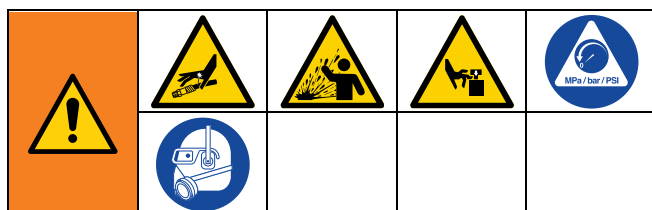


FIG. 36: Ball Screws Location

Troubleshooting



Before starting any troubleshooting procedures, perform the following procedures. Also refer to the **Related Manuals** on page 3.

1. Verify the system is powered on.
2. Verify there is control power on the machine (the on/off button light is illuminated).
3. Check the machine status messages for alarms. Press the clear alarms icon to clear all alarms that are not active. The remaining alarms will help to identify the issue.

Problem	Cause	Solution
The shape of the pattern dispensed does not match the programmed pattern.	One axis may not be moving at the requested velocity because the program is calling for a velocity higher than the limit established in the parameters.	Parameter settings for running rate should be equal to or greater than the velocity called for in the program. Adjust the program or parameter settings so the above statement is true.
A slide is locked in but the machine will not run a part.	The sensor on the locking cylinder that holds the slide in is faulty or out of calibration.	Adjust the sensor so it changes the state when the slide is locked in.
The machine can be jogged but it will not come to the maintenance position when the maintenance icon is selected.	The system needs to be homed.	Home the system.
The dispense tip is scraping on the part.	The needle find was not performed or the needle is dirty. The fixture moved or is out of calibration. The part is not seated properly or is out of spec.	Verify the needle find is enabled. Inspect the needle for dirt. Install a new needle and home the system. Verify the part is seated correctly. Inspect the fixture and make sure the part is secure and in spec.
The system does not home.	No control power. Z axis on an over-travel limit. Wrong dispense valve is selected or valve is installed incorrectly.	Turn on the control power. Attempt to re-home and home the system. Verify that the selected dispense valve in the software matches the installed hardware. Verify that the valve switches are positioned and functioning properly.
Low pressure alarm or slow pressure rise on one or both sides.	Valve not reloading properly. Air trapped in valve. Feed system issue.	Inspect feed system. Check for piston failure if cartridge feed. Check for inadequate material flow at valve. Purge air from the metering system. See the metering system manuals.

Problem	Cause	Solution
Dispense axis is stopped on positive limit.	<p>Attempted to dispense a shot or series of shots in excess of the valve output capacity.</p> <p>Limit sensor improperly calibrated.</p>	<p>Adjust the program to dispense an amount within the valve shot limit.</p> <p>Check positioning of valve over-travel switches.</p>
Dispense motor faults or valve does not dispense.	<p>Over pressure under pressure faults.</p> <p>Valve outlet is obstructed.</p> <p>Excessive flow rate.</p>	<p>Replace the mixer.</p> <p>Check that the valve outlet flows freely.</p> <p>Check the analog settings and calibration for pressure switches.</p> <p>Check for binding condition in the dispenser.</p>
Dispense Motor Axis Fault	<p>Incorrect dispense valve parameters.</p> <p>Faulty motor.</p>	<p>Verify correct valve is selected and valve parameters are correct.</p> <p>Verify dispense rate is appropriate for valve and material.</p> <p>Verify motor is operating within range; consider valve output per revolution, dispense rate, and gear reduction.</p>
Part program runs in a continuous loop without stopping	<p>Part in Fixture sensor is disabled.</p>	<p>Enable the Part in Fixture sensor in the parameters OR add a Wait for Input as the first command of the program with an input address for a start device.</p>
Part program runs in wet mode but does not dispense	<p>Material supply issue.</p> <p>Valve malfunction.</p> <p>Run in camera mode.</p>	<p>Verify the feed system is functioning and has sufficient material.</p> <p>Verify the dispense valve operation.</p> <p>Verify the system runs in needle mode.</p>
Program is not compiled with current dispense valve (error message)	<p>Selected programs for all nests must match with the correct dispense valve selected.</p>	<p>Verify the correct dispense valve is selected in the parameters.</p>
PC screen is blank but there is power on the machine and the monitor	<p>No power to PC.</p> <p>PC was shut down or put to sleep.</p> <p>Faulty PC.</p>	<p>If the PC is shut down or put to sleep, it is necessary to cycle power to the system to restart the PC.</p> <p>If the PC is sleeping, it may be possible to wake it up with a keyboard or mouse, depending on the PC settings.</p>
Machine starts to run a part but stops at the point the dispense should begin	<p>Dispense valve malfunction.</p> <p>Valve waiting for input to sequence properly.</p>	<p>Check valve input/output.</p> <p>Verify air pressure is on the valve.</p> <p>Verify all sensors are activating.</p> <p>Verify sensors are positioned properly.</p>

Problem	Cause	Solution
Machine does not function when power is on	Emergency stop button is engaged. No control power.	Verify the e-stop button is disengaged. Verify the light curtain is not interrupted (if equipped). Verify the safety switch on the door is engaged (if equipped). Press the green power button (the control power light in the button cluster should be illuminated).
Unexpected error messages or erratic behavior of dispenser software	Corrupt parameter files. Corrupt database files. Incorrect parameters.	Power down the system from the main system power switch, then restart. Rename the database file "SYS" to preserve data. Please contact the vendor for recovery. NOTE: The old parameters file can be opened in WordPad to view previous settings.
When jogging an axis, it only moves in one direction	The axis is located at the end of the travel position (over travel switch is activated). Failed over-travel switch. Mechanical obstruction.	Verify the axis is positioned between the limits. If the limit is active with the axis in this position, replace or service the limit sensor. Verify switch operation on the Maintenance Input/Output screen. The over-travel switch indicates red until the switch is activated at the end of travel. Then it should turn green.
Z-axis limit exceeded on program that previously ran without issue	Z-axis height limit is changed.	Increase the Z-axis height limit. Reduce jump height. Adjust the Z height in the program so the offset on the Run screen can be reduced.
Slide will not lock in and part will not run in Run mode Locking pin fires and immediately retracts	The locking pin sensor is out of calibration or has failed. The part program is corrupt.	Manually toggle the slide lock and verify that the locking pin sensor LED is illuminated and that the locking pin input changes its state. Re-select the program and attempt running again.

Input/Output Test Procedure

Verifying inputs and outputs is done at the Setup screen. See **Inputs and Outputs** on page 37. These procedures can also be performed when troubleshooting the system.

INPUTS	Procedure to Test
Left nest	<p>Push in the left slide until it stops and then slightly back and forth against the stop. The slide left indicator should toggle green/gray.</p> <p>When the left slide is pushed fully in, the Slide Left input should indicate green. NOTE: This input device is normally closed (N/C), the status bit is inverted.</p>
Right nest	<p>Push in the right slide until it stops and then slightly back and forth against the stop. The Slide Right indicator should toggle green/gray.</p> <p>When the right slide is pushed fully in, the slide right input should indicate green. NOTE: This input device is N/C, the status bit is inverted.</p>
Part present	<p>NOTE: The dispenser must be located in the taught position. See: Calibrate the Part Present Sensor Option on page 65.</p> <p>This device (if equipped) is always active but requires calibration. If properly calibrated, sliding a part in and out of the dispense position will toggle this input on and off. When a part is on the slide in the lock position this input will be green.</p>
Motion power contactor	<p>If the PC is on, but there is no control power (the red control power button has been pressed), status is red.</p> <p>If the PC is on, and there is control power (the green control power button has been pressed), status is green.</p>
L-cylinder lock	<p>Toggling output L-cylinder lock on and off should cause the L-cylinder lock input status indicator to toggle green/gray.</p> <p>When the output for L-cylinder lock indicator is green, L-cylinder lock input should indicate green.</p>
R-cylinder lock	<p>Toggling output R-cylinder lock on and off should cause the R-cylinder lock input status indicator to toggle green/gray.</p> <p>When the output for R-cylinder lock indicator is green, R-cylinder Lock input should indicate green.</p>

Start auto-work	<p>Press the start button and the status bit should turn green. NOTE: This input is available when the system is on manual mode.</p>
OUTPUTS	Procedure to Test
<p>NOTE: Outputs can be turned on and off manually by clicking on the green/gray status indicator to the right of each output name. If the indicator is green and does not toggle off when it is selected, it is being held on by the software and cannot be turned off in this manner.</p>	
L-cylinder lock	<p>Select the indicator to the right of the L-cylinder lock label. The locking air cylinder for the left slide should activate.</p>
R-cylinder lock	<p>Select the indicator to the right of the R-cylinder lock label. The locking air cylinder for the right slide should activate.</p>
Valve	<p>Select the indicator to the right of the valve label (the resulting action varies depending on the dispense valve).</p> <p>NOTICE: Toggling this output may result in material being dispensed, which could cause damage to the equipment. This output should be tested without material in the dispenser</p>
LIMITS	Procedure to Test
<p>NOTE: The maximum jog rate is controlled by the Jogging parameters on the Setup screen. It is recommended that all of the jog rates be set to a value of 5 (especially on the Z axis) until the operator is comfortable with jogging the system.</p>	
X positive limit	<p>Jog the X axis to the right until it stops. Jogging back and forth, on and off of this stopped position causes the X positive limit indicator to toggle on and off. When the X axis is in the rightmost position, the X positive indicator should be green.</p>
X negative limit	<p>Jog the X axis to the left until it stops. Jogging back and forth, on and off of this stopped position causes the X negative limit indicator to toggle on and off. When the X axis is in the leftmost position, the X negative indicator should be green.</p>
X home limit	<p>From the leftmost position, jog the X axis to the right about 5 mm, the negative limits indicator should turn gray first, followed by the home when indexing right.</p> <p>Jogging back and forth, on and off of this stopped position causes the X home limit indicator to toggle on and off. When the X axis is in the leftmost position, the X home indicator should be green.</p>
X-axis needle calibration	<p>Activate the X-axis needle calibration sensor by blocking the sensor beam. When the beam is blocked, the X-axis needle calibration status should be green.</p>

Y positive limit	Jog the Y axis forward (away from the operator) until it stops. Jogging back and forth, on and off of this stopped position causes the Y positive limit indicator to toggle on and off. When the Y axis is in the forward most position, the Y positive indicator should be green.
Y negative limit	Jog the Y axis backward (towards the operator) until it stops. Jogging back and forth, on and off of this stopped position causes the Y negative limit indicator to toggle on and off. When the Y axis is in the backward most position, the Y negative indicator should be green.
Y home limit	From the backward most position (towards the operator), jog the Y axis to the forward about 5 mm, the negative limits indicator should turn gray first, followed by the home when indexing forward. Jogging back and forth, on and off of this stopped position causes the Y home limit indicator to toggle on and off. When the Y axis is in the backward most position, the Y home indicator should be green.
Y-axis needle calibration	Activate the Y-axis needle calibration sensor by blocking the sensor beam. When the beam is blocked, the Y-axis needle calibration status should be green.
Z positive limit	Jog the Z axis up until it stops. Jogging up and down, on and off of this stopped position, causes the Z positive limit indicator to toggle on and off. When the Z axis is in the upper most position, the Z positive indicator should be green.
Z negative limit	NOTICE: Jogging this axis to the limit may cause the dispenser to crash into a part or fixture. You should test this limit in the home position, with the mixer and needle removed. Jog the Z axis down until it stops. Jogging up and down, on and off of this stopped position, causes the Z negative limit indicator to toggle on and off. When the Z axis is in the lower most position, the Z negative indicator should be green.
Z home limit	From the uppermost position, jog the Z axis to the down about 5 mm, the positive limits indicator should turn gray first, followed by the home when indexing down. Jogging back and forth, on and off of this stopped position causes the Z home limit indicator to toggle on and off. When the Z axis is in the uppermost position, the X home indicator should be green.

Tool setting gauge	Pressing the Z calibration sensor (touch sensor) on and off with your finger will cause the tool setting gauge sensor status indicator to toggle green/gray. When the tool setting gauge sensor is pressed the tool setting gauge status indicator should be green. NOTE: This input device is N/C, the status bit is inverted.
A/B positive limit	NOTICE: Jogging the dispenser forward when loaded with material may cause equipment damage if the dispenser is wetted with material. These limits should be tested without material in the dispenser. NOTICE: Jogging the dispenser to the limits can cause damage to some valves if the limit sensors are not positioned properly. Verify switch positioning prior to testing. NOTE: The speed override slider does not affect the jog speed of the dispenser. The dispenser can be jogged up or down from the valve tab in the setup window. Path: Setup Screen – Valve tab. Jog the dispenser using the up arrow on the display until it stops. Jogging up and down, on and off of this stopped position, causes the A/B positive limit indicator to toggle on and off. When the dispenser is in the uppermost position, the A/B positive limit indicator should be green.

A/B negative limit	<p>NOTICE: Jogging the dispenser forward when loaded with material may cause equipment damage if the dispenser is wetted with material. These limits should be tested without material in the dispenser.</p> <p>NOTICE: Jogging the dispenser to the limits can cause damage to some valves if the limit sensors are not positioned properly. Verify switch positioning prior to testing.</p> <p>NOTE: The speed override slider does not affect the jog speed of the dispenser.</p> <p>The dispenser can be jogged up or down from the valve tab in the setup window. Path: Setup Screen – Valve tab.</p> <p>Jog the dispenser using the down arrow on the display until it stops. Jogging up and down, on and off of this stopped position, causes the A/B negative limit indicator to toggle on and off.</p> <p>When the dispenser is in the lower most position, the A/B negative limit indicator should be green.</p>
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A/B home limit	<p>NOTICE: Jogging the dispenser forward when loaded with material may cause equipment damage if the dispenser is wetted with material. These limits should be tested without material in the dispenser.</p> <p>NOTICE: Jogging the dispenser to the limits can cause damage to some valves if the limit sensors are not positioned properly. Verify switch positioning prior to testing.</p> <p>NOTE: The speed override slider does not affect the jog speed of the dispenser.</p> <p>The dispenser can be jogged up or down from the valve tab in the setup window. Path: Setup Screen – Valve tab.</p> <p>From the uppermost position, jog the dispenser down about 5 mm using the down arrow on the valve tab. The positive limits indicator should turn gray first, followed by the home when indexing down.</p> <p>Jog the dispenser up using the up arrow on the valve tab. The indicator on the home limit should go out first, followed by the positive limit when indexing up.</p> <p>Jog down until the home sensor LED turns off – The dispenser home limit indicator should be gray.</p> <p>Jog back up until the home sensor LED goes on – The dispenser home limit indicator should be green.</p>
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Safety Circuit Design



Part Access Door

Systems equipped with an access door are designed to prevent access into the work area while the machine could be running. Opening the door disables the axis motors. However, if the maintenance switch is ON, you can enter the work area and the dispense axis remains enabled.

Light Curtain

Systems equipped with a light curtain are designed to disable the machine if you attempt to enter the work area while the machine is running. Interrupting the light curtain disables the axis motors. However, if the maintenance switch is ON, you can enter the work area and the dispense axis remains enabled.

Safety Circuit Activation Recovery

If the door is opened or the light curtain is interrupted while the system is running, the safety circuit is activated and the machine acts the same as if the emergency stop was pressed. Dispensing stops, motion stops, and the control power to the motors is cut. To recover from this:

1. Remove the aborted part.
2. Clean the dispense tip of any material or replace it.
3. Close the door or clear the light curtain.
4. Press the control power on button.
5. Home the system.
6. Purge the mixer if necessary.
7. Resume production.

Maintenance Position

This is a dispenser position defined by X, Y, and Z coordinates saved in the parameters. The coordinates of the maintenance position are chosen so that sensors verify the X, Y, and Z position. When the machine is indexed to this position and the maintenance switch is ON, the safety circuit is disabled to allow you to enter the work area to operate and maintain the dispense valve. Any X, Y, or Z motion would not be allowed, only the dispense axis remains enabled, when you are operating in the work area. The machine can be sent to this position automatically by pressing the maintenance position button.

Safe Part Removal

Dual-Y Slide with Access Door: The slide assembly facilitates loading and unloading the parts outside of the work area. There is no need to open the access door during production.

Light Curtain: The light curtain is muted to load or unload parts without the safety circuit being activated when the system is on manual mode.

Error/Event Alarms

The table below details the alarm text, the cause of the alarm, and the name of the alarm bit.

NOTE: When you have resolved the cause of an alarm, you still need to clear the alarm message on the Alarm window to remove it. See **System and Alarm Status** on page 61.

Alarms that occur during purging or dispensing require the alarm to be acknowledged before the system can continue to purge or dispense. Motion alarms require the system to be homed before running can proceed. If an alarm occurs while a part is being run, the part is canceled and the system moves out of run mode.

Generic Alarm

Serial Number	Error Message	Cause	Solution	Error Type
1	System error.	System file is lost or hardware is faulty.	Please view the log file and send the specific log information to the vendor.	Alarm
2	X Axis motor fault.	X axis servo drive has a fault alarm.	According to the current alarm code, check the corresponding drive fault solution in the driver troubleshooting manual.	Alarm
3	X Axis servo isn't enabled.	Motion power is off.	Power on the system motion power.	Alarm
4	X Axis servo enable failed.	Failed to enable X axis servo driver.	According to the current alarm code, check the corresponding drive fault solution in the driver troubleshooting manual.	Alarm
5	X Axis stopped on negative limit switch.	<ul style="list-style-type: none"> • X axis negative limit switch is touched. • X axis negative limit switch is damaged. • X axis negative limit switch connection cable is faulty. 	<ul style="list-style-type: none"> • Trigger system home. • Replace the X axis negative limit switch. • Correct the X axis negative limit switch connection cable. 	Alarm
6	X Axis stopped on positive limit switch.	<ul style="list-style-type: none"> • X axis positive limit switch is touched. • X axis positive limit switch is damaged. • X axis positive limit switch connection cable is faulty. 	<ul style="list-style-type: none"> • Trigger system home. • Replace the X axis positive limit switch. • Correct the X axis positive limit switch connection cable. 	Alarm

7	X Axis fatal following error or position error.	<ul style="list-style-type: none"> • X axis motor is overloaded or blocked. • X axis motor connection cable is faulty. 	<ul style="list-style-type: none"> • Clear overload or block. • Correct the X axis motor connection cable. <p>According to the current alarm code, check the corresponding drive fault solution in the driver troubleshooting manual.</p>	Alarm
8	Y Axis motor fault.	Y axis servo driver has a fault alarm.	According to the current alarm code, check the corresponding drive fault solution in the driver troubleshooting manual.	Alarm
9	Y Axis servo isn't enabled.	Motion power is off.	Power on the system motion power.	Alarm
10	Power on the system motion power.	Power on the system motion power.	According to the current alarm code, check the corresponding drive fault solution in the driver troubleshooting manual.	Alarm
11	Y Axis stopped on negative limit switch.	<ul style="list-style-type: none"> • Y axis negative limit switch is touched. • Y axis negative limit switch is damaged. • Y axis negative limit switch connection cable is faulty. 	<ul style="list-style-type: none"> • Trigger system home. • Replace the Y axis negative limit switch. • Correct the Y axis negative limit switch connection cable. 	Alarm
12	Y Axis stopped on positive limit switch.	<ul style="list-style-type: none"> • Y axis positive limit switch is touched. • Y axis positive limit switch is damaged. • Y axis positive limit switch connection cable is faulty. 	<ul style="list-style-type: none"> • Trigger system home. • Replace the Y axis positive limit switch. • Correct the Y axis positive limit switch connection cable. 	Alarm
13	Y Axis fatal following error or position error.	<ul style="list-style-type: none"> • Y axis motor is overloaded or blocked. • Y axis motor connection cable is faulty. 	<ul style="list-style-type: none"> • Clear overload or block. • Correct the Y axis motor connection cable. <p>According to the current alarm code, check the corresponding drive fault solution in the driver troubleshooting manual.</p>	Alarm
14	Z Axis motor fault.	Z axis servo driver has a fault alarm.	According to the current alarm code, check the corresponding drive fault solution in the driver troubleshooting manual.	Alarm
15	Z Axis servo isn't enabled.	Motion power is off.	Power on the system motion power.	Alarm
16	Z Axis servo enable failed.	Failed to enable Z axis servo driver.	According to the current alarm code, check the corresponding drive fault solution in the driver troubleshooting manual.	Alarm

17	Z Axis stopped on negative limit switch.	<ul style="list-style-type: none"> • Z axis negative limit switch is touched. • Z axis negative limit switch is damaged. • Z axis negative limit switch connection cable is faulty. 	<ul style="list-style-type: none"> • Trigger system home. • Replace the Z axis negative limit switch. • Correct the Z axis negative limit switch connection cable. 	Alarm
18	Z Axis stopped on positive limit switch.	<ul style="list-style-type: none"> • Z axis positive limit switch is touched. • Z axis positive limit switch is damaged. • Z axis positive limit switch connection cable is faulty. 	<ul style="list-style-type: none"> • Trigger system home. • Replace the Z axis positive limit switch. • Correct the Z axis positive limit switch connection cable. 	Alarm
19	Z Axis fatal following error or position error.	<ul style="list-style-type: none"> • Z axis motor is overloaded or blocked. • Z axis motor connection cable is faulty. 	<ul style="list-style-type: none"> • Clear overload or block. • Correct the Z axis motor connection cable. <p>According to the current alarm code, check the corresponding drive fault solution in the driver troubleshooting manual.</p>	Alarm
20	Axis X negative soft limit.	X axis negative soft limit is triggered.	Jog X axis towards positive (X+) direction.	Alarm
21	Axis X positive soft limit.	X axis positive soft limit is triggered.	Jog X axis towards negative (X-) direction.	Alarm
22	Axis Y negative soft limit.	Y axis negative soft limit is triggered.	Jog Y axis towards positive (Y+) direction.	Alarm
23	Axis Y positive soft limit.	Y axis positive soft limit is triggered.	Jog Y axis towards negative (Y-) direction.	Alarm
24	Axis Z negative soft limit.	Z axis negative soft limit is triggered.	Jog Z axis towards positive (Z+) direction.	Alarm
25	Axis Z positive soft limit.	Z axis positive soft limit is triggered.	Jog Z axis towards negative (Z-) direction.	Alarm
26	X Axis home not complete.	<ul style="list-style-type: none"> • X Axis home is not complete. • X axis home limit switch is damaged. • X axis home limit switch connection cable is faulty. 	<ul style="list-style-type: none"> • Trigger system home. • Replace X axis home limit switch. • Correct X axis home limit switch connection cable. 	Alarm
27	Y Axis home not complete.	<ul style="list-style-type: none"> • Y Axis home is not complete. • Y axis home limit switch is damaged. • Y axis home limit switch connection cable is faulty. 	<ul style="list-style-type: none"> • Trigger system home. • Replace Y axis home limit switch. • Correct Y axis home limit switch connection cable. 	Alarm

28	Z Axis home not complete.	<ul style="list-style-type: none"> • Z Axis home is not complete. • Z axis home limit switch is damaged. • Z axis home limit switch connection cable is faulty. 	<ul style="list-style-type: none"> • Trigger system home. • Replace Z axis home limit switch. • Correct Z axis home limit switch connection cable. 	Alarm
29	Device security check failed.	<ul style="list-style-type: none"> • Failed to complete device security check procedure. • Security device is damaged. • Security device connection cable is faulty. 	<ul style="list-style-type: none"> • Follow the instruction to complete device security check procedure. • Replace security device. • Correct security device connection cable. 	Alarm
30	Light curtain was touched.	<ul style="list-style-type: none"> • Light curtain was touched. • Light curtain is damaged. • Light curtain connection cable is faulty. 	<ul style="list-style-type: none"> • Do not touch the light curtain. • Replace light curtain. • Correct light curtain connection cable. 	Alarm
31	Low air pressure.	<ul style="list-style-type: none"> • The external air source is abnormal. • The air pressure sensor is abnormal. • The air pressure sensor connection cable is faulty. 	<ul style="list-style-type: none"> • Correct the external air source. • Replace the air pressure sensor. • Correct the air pressure sensor connection cable. 	Alarm
32	Maintenance cycle Count Reached.	The system needs maintenance.	Please maintenance the system, then clear the maintenance counter on the setup page.	Warning
33	Alarm-Wait for Input Timeout.	Input is not triggered within the specified time.	Manually select whether to continue work.	Alarm
34	System emergency stop.	<ul style="list-style-type: none"> • The emergency stop switch is pressed down. • The emergency stop switch is damaged. • The emergency stop switch connection cable is faulty. 	<ul style="list-style-type: none"> • Lift the emergency stop switch. • Replace the emergency stop switch. • Correct the emergency stop switch connection cable. 	Alarm
35	No part on left nest.	<ul style="list-style-type: none"> • No part on left nest during automatic work. • The part present sensor is damaged. • The part present sensor connection cable is faulty. 	<ul style="list-style-type: none"> • Place the part in the left nest. • Replace the part present sensor. • Correct the part present sensor connection cable. 	Alarm

36	No part on right nest.	<ul style="list-style-type: none"> No part on right nest during automatic work. The part present sensor is damaged. The part present sensor connection cable is faulty. 	<ul style="list-style-type: none"> Place the part in the right nest. Replace the part present sensor. Correct the part present sensor connection cable. 	Alarm
37	No Motion Power.	<ul style="list-style-type: none"> The motion power on button was not clicked. The power supply loop is faulty. 	<ul style="list-style-type: none"> Power on the system motion power. Correct the power supply loop. 	Alarm
38	Height out of detection range.	<ul style="list-style-type: none"> The height sensor is too high or too low from the bottom surface. The height sensor connection cable is faulty. 	<ul style="list-style-type: none"> Make sure that the height between height sensor and bottom surface is within normal range, the height measurement has value. Correct the height sensor connection cable. 	Alarm
39	The cup is over max weight, please change it.	The weight cup has reached the set maximum weight.	Please change the weight cup.	Alarm
40	Failed to read weight data.	<ul style="list-style-type: none"> The weight sensor is damaged. The weight sensor connection cable is faulty. 	<ul style="list-style-type: none"> Replace the weight sensor. Correct the weight sensor connection cable. 	Alarm
41	The scale failed to zero.	Current weight exceeds limit value.	Clean the weight cup.	Alarm
42	The weight is out of tolerance.	<ul style="list-style-type: none"> The amount of material is abnormal when weighing. The material is faulty. 	<ul style="list-style-type: none"> Set reasonable weight parameters. Replace the material. 	Alarm
43	Point 1...9 calibration failed.	<ul style="list-style-type: none"> The camera calibration point is not clear or not the same with set model. The camera is damaged. The camera connection cable is faulty. 	<ul style="list-style-type: none"> Make sure the camera calibration point is clear or reset the model. Replace the camera. Correct the camera connection cable. 	Alarm
44	Run fiducial failed.	<ul style="list-style-type: none"> The fiducial point is not clear or not the same with set model. The camera is damaged. The camera connection cable is faulty. 	<ul style="list-style-type: none"> Make sure the fiducial is clear or reset the model. Replace the camera. Correct the camera connection cable. 	Alarm
45	X Axis capture failed during needle find process.	<ul style="list-style-type: none"> The X axis needle find sensor is faulty. The X axis needle find sensor connection cable is faulty. 	<ul style="list-style-type: none"> Replace the X axis needle find sensor. Or set reasonable parameters of needle find sensor. Correct the X axis needle find sensor connection cable. 	Alarm

46	Y Axis capture failed during needle find process.	<ul style="list-style-type: none"> The Y axis needle find sensor is faulty. The Y axis needle find sensor connection cable is faulty. 	<ul style="list-style-type: none"> Replace the Y axis needle find sensor. Or set reasonable parameters of needle find sensor. Correct the Y axis needle find sensor connection cable. 	Alarm
47	Z Axis capture failed during needle find process.	<ul style="list-style-type: none"> The Z axis needle find sensor is faulty. The Z axis needle find sensor connection cable is faulty. 	<ul style="list-style-type: none"> Replace the Z axis needle find sensor. Or set reasonable parameters of needle find sensor. Correct the Z axis needle find sensor connection cable. 	Alarm
48	Left nest unlocked.	<ul style="list-style-type: none"> The external air source is abnormal. The left cylinder lock valve is damaged. The left cylinder lock valve connection cable is faulty. 	<ul style="list-style-type: none"> Correct the external air source. Replace the left cylinder lock valve. Correct the left cylinder lock valve connection cable. 	Alarm
49	Right nest unlocked.	<ul style="list-style-type: none"> The external air source is abnormal. The right cylinder lock valve is damaged. The right cylinder lock valve connection cable is faulty. 	<ul style="list-style-type: none"> Correct the external air source. Replace the right cylinder lock valve. Correct the right cylinder lock valve connection cable. 	Alarm
50	Waiting block cylinder drops abnormal.	<ul style="list-style-type: none"> The external air source is abnormal. The waiting block cylinder drop valve is damaged. The waiting block cylinder drop valve connection cable is faulty. 	<ul style="list-style-type: none"> Correct the external air source. Replace the waiting block cylinder drop valve. Correct the waiting block cylinder drop valve connection cable. 	Alarm
51	Processing block cylinder drops abnormal.	<ul style="list-style-type: none"> The external air source is abnormal. The processing block cylinder drop valve is damaged. The processing block cylinder drop valve connection cable is faulty. 	<ul style="list-style-type: none"> Correct the external air source. Replace the processing block cylinder drop valve. Correct the processing block cylinder drop valve connection cable. 	Alarm
52	Lifting cylinder A drops abnormally.	<ul style="list-style-type: none"> The external air source is abnormal. The lifting cylinder A drop valve is damaged. The lifting cylinder A drop valve connection cable is faulty. 	<ul style="list-style-type: none"> Correct the external air source. Replace the lifting cylinder A drop valve. Correct the lifting cylinder A drop valve connection cable. 	Alarm

53	Lifting cylinder B drops abnormally.	<ul style="list-style-type: none"> The external air source is abnormal. The lifting cylinder B drop valve is damaged. The lifting cylinder B drop valve connection cable is faulty. 	<ul style="list-style-type: none"> Correct the external air source. Replace the lifting cylinder B drop valve. Correct the lifting cylinder B drop valve connection cable. 	Alarm
54	Waiting block cylinder rises abnormal.	<ul style="list-style-type: none"> The external air source is abnormal. The waiting block cylinder rise valve is damaged. The waiting block cylinder rise valve connection cable is faulty. 	<ul style="list-style-type: none"> Correct the external air source. Replace the waiting block cylinder rise valve. Correct the waiting block cylinder rise valve connection cable. 	Alarm
55	Processing block cylinder rises abnormal.	<ul style="list-style-type: none"> The external air source is abnormal. The processing block cylinder rise valve is damaged. The processing block cylinder rise valve connection cable is faulty. 	<ul style="list-style-type: none"> Correct the external air source. Replace the processing block cylinder rise valve. Correct the processing block cylinder rise valve connection cable. 	Alarm
56	Lifting cylinder A rises abnormally.	<ul style="list-style-type: none"> The external air source is abnormal. The lifting cylinder A rise valve is damaged. The lifting cylinder A rise valve connection cable is faulty. 	<ul style="list-style-type: none"> Correct the external air source. Replace the lifting cylinder A rise valve. Correct the lifting cylinder A rise valve connection cable. 	Alarm
57	Lifting cylinder B rises abnormally.	<ul style="list-style-type: none"> The external air source is abnormal. The lifting cylinder B rise valve is damaged. The lifting cylinder B rise valve connection cable is faulty. 	<ul style="list-style-type: none"> Correct the external air source. Replace the lifting cylinder B rise valve. Correct the lifting cylinder B rise valve connection cable. 	Alarm
58	The part is detected in conveyor self check state.	There are parts on the conveyor.	Remove the parts.	Alarm
59	Parts are detected at both entry and waiting positions.	There are parts at the entry position and the waiting position.	Remove the parts.	Alarm
60	The waiting section motor or processing section motor of the conveyor fault.	The waiting section servo driver or processing section servo driver has a fault alarm.	Check whether the conveyor motor control module has a fault alarm. Check whether the conveyor is blocked.	Alarm
61	The waiting section motor of the conveyor fault.	The waiting section servo driver has a fault alarm.	Check whether the conveyor motor control module has a fault alarm. Check whether the conveyor is blocked.	Alarm

62	The processing section motor or exit section motor of the conveyor fault.	The processing section servo driver or exit section servo driver has a fault alarm.	Check whether the conveyor motor control module has a fault alarm. Check whether the conveyor is blocked.	Alarm
63	External emergency stop.	<ul style="list-style-type: none"> The external emergency stop switch is pressed down. The external emergency stop switch is damaged. The external emergency stop switch connection cable is faulty. 	<ul style="list-style-type: none"> Lift the external emergency stop switch. Replace the external emergency stop switch. Correct the external emergency stop switch connection cable. 	Alarm
64	GSD stop working.	<ul style="list-style-type: none"> Received the stop work signal from the robot. The connection cable between GSD and robot is faulty. 	<ul style="list-style-type: none"> Check why the robot send the stop work signal, then remove this signal. Correct the connection cable between GSD and robot. 	Alarm
65	Safety door open.	<ul style="list-style-type: none"> The safety door was opened. The safety door connection cable is faulty. 	<ul style="list-style-type: none"> Close the safety door. Correct the safety door connection cable. 	Alarm
66	Part exist before start.	There is a part in GSD when the automatic work is started.	Remove the part.	Alarm
67	Robot in area before start.	<ul style="list-style-type: none"> Robot is in GSD work area when the automatic work is started. The connection cable between GSD and robot is faulty. 	<ul style="list-style-type: none"> Move the robot out of GSD work area. Correct the connection cable between GSD and robot. 	Alarm
68	Lost part exist signal during GSD automatic work.	<ul style="list-style-type: none"> The signal from robot has a fault. The connection cable between GSD and robot is faulty. 	<ul style="list-style-type: none"> Correct the robot signal. Correct the connection cable between GSD and robot. 	Alarm
69	The falling edge of part exist signal was detected when GSD ready signal is off and GSD complete signal is on.	<ul style="list-style-type: none"> The signal from robot has a fault. The connection cable between GSD and robot is faulty. 	<ul style="list-style-type: none"> Correct the robot signal. Correct the connection cable between GSD and robot. 	Alarm
70	There is no robot in area signal when part exist signal is rising.	<ul style="list-style-type: none"> The signal from robot has a fault. The connection cable between GSD and robot is faulty. 	<ul style="list-style-type: none"> Correct the robot signal. Correct the connection cable between GSD and robot. 	Alarm
71	There is no robot in area signal when part exist signal is falling.	<ul style="list-style-type: none"> The signal from robot has a fault. The connection cable between GSD and robot is faulty. 	<ul style="list-style-type: none"> Correct the robot signal. Correct the connection cable between GSD and robot. 	Alarm
72	The barcode was not found.	The barcode text is not an effective text string.	Scan an effective barcode.	Warning

73	Part detection timeout.	Part is not detected for a long time.	Please put in a part within a specified time after you scan the barcode in the automatic working mode.	Alarm
74	Failed to send Profinet data.	The map address is out of range.	Make sure the map address is between 0 and 65535.	Alarm
75	Failed to load Profinet file.	The ProfinetSetting.ini file in the SYS folder is lost or faulty.	Please contact the vendor for recovery.	Alarm
76	Failed to initialize Profinet.	<ul style="list-style-type: none"> • The IP address doesn't match with physical network port. • The Profinet connection cable is faulty. • Valve is not powered on. • The right valve is not installed. <p>(3 and 4 are only effective when used as master to control the valve).</p>	<ul style="list-style-type: none"> • Set IP address match with physical network port. • Correct the Profinet connection cable. • Power on the valve. • Please install the right valve according to the valve selection. 	Alarm

PR-Xv Alarm

Serial Number	Error Message	Cause	Solution	Error Type
1	Valve home not complete.	<ul style="list-style-type: none"> • Valve home is not complete. • Valve home limit switch is damaged. • Valve home limit switch connection cable is faulty. 	<ul style="list-style-type: none"> • Trigger system/valve home. • Replace valve home limit switch. • Correct valve home limit switch connection cable. 	Alarm
2	Valve home time out.	<ul style="list-style-type: none"> • Supply pump pressure is lower than the set reload pressure. • Valve home limit switch is damaged. • Valve home limit switch connection cable is faulty. • The maximum time out time is set improperly. 	<ul style="list-style-type: none"> • Rise the supply pump pressure or reset the reload pressure. • Replace valve home limit switch. • Correct valve home limit switch connection cable. • Correct the maximum time out time. 	Alarm
3	Purge time out alarm.	<ul style="list-style-type: none"> • There is a problem with dispense valve or dispense valve relay. • The dispense valve connection cable is faulty. • Material in needle has cured. • The maximum time out time is set improperly. 	<ul style="list-style-type: none"> • Replace dispense valve or dispense valve relay. • Correct dispense valve connection cable. • Replace the needle. • Correct the maximum time out time. 	Alarm

4	Pressure relief fault.	<ul style="list-style-type: none"> • There is a problem with dispense valve or dispense valve relay. • The dispense valve connection cable is faulty. • Material in needle has cured. 	<ul style="list-style-type: none"> • Replace dispense valve or dispense valve relay. • Correct dispense valve connection cable. • Replace the needle. 	Alarm
5	Shot amount is more than remain amount.	The remain material is not enough for this shot.	Trigger valve home or trigger valve reload.	Alarm
6	Part A reload time out.	<ul style="list-style-type: none"> • Supply pump pressure is lower than the set reload pressure. • The maximum time out time is set improperly. 	<ul style="list-style-type: none"> • Rise the supply pump pressure or reset the reload pressure. • Correct the maximum time out time. 	Alarm
7	Part A servo alarm.	The A-side servo driver of the valve has a fault alarm.	According to the current alarm code, check the corresponding drive fault solution in the driver troubleshooting manual.	Alarm
8	Pressure A High Alarm.	<ul style="list-style-type: none"> • There is a problem with A-side dispense valve or A-side dispense valve relay or A-side pressure sensor. • Material in needle has cured. • The A-side dispense rate is too high. 	<ul style="list-style-type: none"> • Replace A-side dispense valve or A-side dispense valve relay or A-side pressure sensor. • Replace the needle. • Slow down the A-side dispense rate. 	Alarm
9	Pressure A Low Alarm.	There is a problem with A-side dispense valve or A-side dispense valve relay or A-side pressure sensor.	Replace A-side dispense valve or A-side dispense valve relay or A-side pressure sensor.	Alarm
10	Pressure A High Warning.	<ul style="list-style-type: none"> • There is a problem with A-side dispense valve or A-side dispense valve relay or A-side pressure sensor. • Material in needle has cured. • The A-side dispense rate is too high. 	<ul style="list-style-type: none"> • Replace A-side dispense valve or A-side dispense valve relay or A-side pressure sensor. • Replace the needle. • Slow down the A-side dispense rate. 	Warning
11	Pressure A Low Warning.	There is a problem with A-side dispense valve or A-side dispense valve relay or A-side pressure sensor.	Replace A-side dispense valve or A-side dispense valve relay or A-side pressure sensor.	Warning
12	Part A reaches the lowest limit.	<ul style="list-style-type: none"> • The A-side lowest limit switch of valve is touched. • The A-side lowest limit switch of valve is damaged. • The A-side lowest limit switch of valve connection cable is faulty. 	<ul style="list-style-type: none"> • Trigger valve upward action. Like reload, home. • Replace A-side lowest limit switch of valve. • Correct A-side lowest limit switch of valve connection cable. 	Alarm

13	Part A reaches the highest limit.	<ul style="list-style-type: none"> • The A-side highest limit switch of valve is touched. • The A-side highest limit switch of valve is damaged. • The A-side highest limit switch of valve connection cable is faulty. 	<ul style="list-style-type: none"> • Trigger valve downward action. Like shot, purge. • Replace A-side highest limit switch of valve. • Correct A-side highest limit switch of valve connection cable. 	Alarm
14	Part A pre-charge time out.	<ul style="list-style-type: none"> • There is a problem with A-side dispense valve or A-side supply valve or A-side dispense valve relay or A-side supply valve relay or A-side pressure sensor. • The A-side dispense valve connection cable or A-side supply valve connection cable is faulty. 	<ul style="list-style-type: none"> • Replace A-side dispense valve or A-side supply valve or A-side dispense valve relay or A-side supply valve relay or A-side pressure sensor. • Correct A-side dispense valve connection cable or A-side supply valve connection cable. 	Alarm
15	Part A pre-charge fault.	<ul style="list-style-type: none"> • There is a problem with A-side dispense valve or A-side supply valve or A-side dispense valve relay or A-side supply valve relay or A-side pressure sensor. • The A-side dispense valve connection cable or A-side supply valve connection cable is faulty. 	<ul style="list-style-type: none"> • Replace A-side dispense valve or A-side supply valve or A-side dispense valve relay or A-side supply valve relay or A-side pressure sensor. • Correct A-side dispense valve connection cable or A-side supply valve connection cable. 	Alarm
16	Part A motor torque is over limit.	<ul style="list-style-type: none"> • There is a problem with A-side dispense valve or A-side dispense valve relay. • Material in needle has cured. • The A-side dispense rate is too high. 	<ul style="list-style-type: none"> • Replace A-side dispense valve or A-side dispense valve relay. • Replace the needle. • Slow down the A-side dispense rate. 	Alarm
17	Part A reload fault.	<ul style="list-style-type: none"> • There is a problem with A-side supply valve or A-side supply valve relay. • The A-side supply valve connection cable is faulty. 	<ul style="list-style-type: none"> • Replace A-side supply valve or A-side supply valve relay. • Correct A-side supply valve connection cable. 	Alarm
18	Part A material empty.	The material on the A-side of the valve is empty.	Add a reload command to the part program. Set reasonable reload parameters.	Alarm

19	Supply pump A empty.	<ul style="list-style-type: none"> The empty sensor of supply pump A is triggered. The empty sensor of supply pump A is damaged. The empty sensor of supply pump A connection cable is faulty. 	<ul style="list-style-type: none"> Add material to the supply pump A. Replace the empty sensor of supply pump A. Correct the empty sensor of supply pump A connection cable. 	Alarm
20	Valve module initialization failed .	The valve servo driver connection cable is faulty.	Correct the valve servo driver connection cable.	Alarm
21	Part B reload time out.	<ul style="list-style-type: none"> Supply pump pressure is lower than the set reload pressure. The maximum time out time is set improperly. 	<ul style="list-style-type: none"> Rise the supply pump pressure or reset the reload pressure. Correct the maximum time out time. 	Alarm
22	Part B servo alarm.	The B-side servo driver of the valve has a fault alarm.	According to the current alarm code, check the corresponding drive fault solution in the driver troubleshooting manual.	Alarm
23	Pressure B High Alarm.	<ul style="list-style-type: none"> There is a problem with B-side dispense valve or B-side dispense valve relay or B-side pressure sensor. Material in needle has cured. The B-side dispense rate is too high. 	<ul style="list-style-type: none"> Replace B-side dispense valve or B-side dispense valve relay or B-side pressure sensor. Replace the needle. Slow down the B-side dispense rate. 	Alarm
24	Pressure B Low Alarm.	There is a problem with B-side dispense valve or B-side dispense valve relay or B-side pressure sensor.	Replace B-side dispense valve or B-side dispense valve relay or B-side pressure sensor.	Alarm
25	Pressure B High Warning.	<ul style="list-style-type: none"> There is a problem with B-side dispense valve or B-side dispense valve relay or B-side pressure sensor. Material in needle has cured. The B-side dispense rate is too high. 	<ul style="list-style-type: none"> Replace B-side dispense valve or B-side dispense valve relay or B-side pressure sensor. Replace the needle. Slow down the B-side dispense rate. 	Warning
26	Pressure B Low Warning.	There is a problem with B-side dispense valve or B-side dispense valve relay or B-side pressure sensor.	Replace B-side dispense valve or B-side dispense valve relay or B-side pressure sensor.	Warning
27	Part B reaches the lowest limit.	<ul style="list-style-type: none"> The B-side lowest limit switch of valve is touched. The B-side lowest limit switch of valve is damaged. The B-side lowest limit switch of valve connection cable is faulty. 	<ul style="list-style-type: none"> Trigger valve upward action. Like reload, home. Replace B-side lowest limit switch of valve. Correct B-side lowest limit switch of valve connection cable. 	Alarm

28	Part B reaches the highest limit.	<ul style="list-style-type: none"> • The B-side highest limit switch of valve is touched. • The B-side highest limit switch of valve is damaged. • The B-side highest limit switch of valve connection cable is faulty. 	<ul style="list-style-type: none"> • Trigger valve downward action. Like shot, purge. • Replace B-side highest limit switch of valve. • Correct B-side highest limit switch of valve connection cable. 	Alarm
29	Part B pre-charge time out.	<ul style="list-style-type: none"> • There is a problem with B-side dispense valve or B-side supply valve or B-side dispense valve relay or B-side supply valve relay or B-side pressure sensor. • The B-side dispense valve connection cable or B-side supply valve connection cable is faulty. 	<ul style="list-style-type: none"> • Replace B-side dispense valve or B-side supply valve or B-side dispense valve relay or B-side supply valve relay or B-side pressure sensor. • Correct B-side dispense valve connection cable or B-side supply valve connection cable. 	Alarm
30	Part B pre-charge fault.	<ul style="list-style-type: none"> • There is a problem with B-side dispense valve or B-side supply valve or B-side dispense valve relay or B-side supply valve relay or B-side pressure sensor. • The B-side dispense valve connection cable or B-side supply valve connection cable is faulty. 	<ul style="list-style-type: none"> • Replace B-side dispense valve or B-side supply valve or B-side dispense valve relay or B-side supply valve relay or B-side pressure sensor. • Correct B-side dispense valve connection cable or B-side supply valve connection cable. 	Alarm
31	Part B motor torque is over limit.	<ul style="list-style-type: none"> • There is a problem with B-side dispense valve or B-side dispense valve relay. • Material in needle has cured. • The B-side dispense rate is too high. 	<ul style="list-style-type: none"> • Replace B-side dispense valve or B-side dispense valve relay. • Replace the needle. • Slow down the B-side dispense rate. 	Alarm
32	Part B reload fault.	<ul style="list-style-type: none"> • There is a problem with B-side supply valve or B-side supply valve relay. • The B-side supply valve connection cable is faulty. 	<ul style="list-style-type: none"> • Replace B-side supply valve or B-side supply valve relay. • Correct B-side supply valve connection cable. 	Alarm
33	Part B material empty.	<ul style="list-style-type: none"> • The material on the B-side of the valve is empty. 	<ul style="list-style-type: none"> • Add a reload command to the part program. Set reasonable reload parameters. 	Alarm

34	Supply pump B empty.	<ul style="list-style-type: none"> The empty sensor of supply pump B is triggered. The empty sensor of supply pump B is damaged. The empty sensor of supply pump B connection cable is faulty. 	<ul style="list-style-type: none"> Add material to the supply pump B. Replace the empty sensor of supply pump B. Correct the empty sensor of supply pump B connection cable. 	Alarm
35	The current pressure is unbalance.	<ul style="list-style-type: none"> There is a problem with dispense valve or dispense valve relay or pressure sensor. Material in needle has cured. The difference rate between A-side dispense and B-side dispense is too high. 	<ul style="list-style-type: none"> Replace dispense valve or dispense valve relay or pressure sensor. Replace the needle. Reduce difference rate between A-side dispense and B-side dispense. 	Alarm

PSM Alarm

Serial Number	Error Message	Cause	Solution	Error Type
1	Valve home not complete.	<ul style="list-style-type: none"> Valve home is not complete. Valve home limit switch is damaged. Valve home limit switch connection cable is faulty. 	<ul style="list-style-type: none"> Trigger system/valve home. Replace valve home limit switch. Correct valve home limit switch connection cable. 	Alarm
2	Valve home time out.	<ul style="list-style-type: none"> Supply pump pressure is lower than the set reload pressure. Valve home limit switch is damaged. Valve home limit switch connection cable is faulty. The maximum time out time is set improperly. 	<ul style="list-style-type: none"> Rise the supply pump pressure or reset the reload pressure. Replace valve home limit switch. Correct valve home limit switch connection cable. Correct the maximum time out time. 	Alarm
3	Purge time out alarm.	<ul style="list-style-type: none"> There is a problem with dispense valve or dispense valve relay. The dispense valve connection cable is faulty. Material in needle has cured. The maximum time out time is set improperly. 	<ul style="list-style-type: none"> Replace dispense valve or dispense valve relay. Correct dispense valve connection cable. Replace the needle. Correct the maximum time out time. 	Alarm

4	Pressure relief fault.	<ul style="list-style-type: none"> • There is a problem with dispense valve or dispense valve relay. • The dispense valve connection cable is faulty. • Material in needle has cured. 	<ul style="list-style-type: none"> • Replace dispense valve or dispense valve relay. • Correct dispense valve connection cable. • Replace the needle. 	Alarm
5	Shot amount is more than remain amount.	The remain material is not enough for this shot.	Trigger valve home or trigger valve reload.	Alarm
6	Part A reload time out.	<ul style="list-style-type: none"> • Supply pump pressure is lower than the set reload pressure. • The maximum time out time is set improperly. 	<ul style="list-style-type: none"> • Rise the supply pump pressure or reset the reload pressure. • Correct the maximum time out time. 	Alarm
7	Part A servo alarm.	The A-side servo driver of the valve has a fault alarm.	According to the current alarm code, check the corresponding drive fault solution in the driver troubleshooting manual.	Alarm
8	Pressure A High Alarm.	<ul style="list-style-type: none"> • There is a problem with A-side dispense valve or A-side dispense valve relay or A-side pressure sensor. • Material in needle has cured. • The A-side dispense rate is too high. 	<ul style="list-style-type: none"> • Replace A-side dispense valve or A-side dispense valve relay or A-side pressure sensor. • Replace the needle. • Slow down the A-side dispense rate. 	Alarm
9	Pressure A Low Alarm.	There is a problem with A-side dispense valve or A-side dispense valve relay or A-side pressure sensor.	Replace A-side dispense valve or A-side dispense valve relay or A-side pressure sensor.	Alarm
10	Pressure A High Warning.	<ul style="list-style-type: none"> • There is a problem with A-side dispense valve or A-side dispense valve relay or A-side pressure sensor. • Material in needle has cured. • The A-side dispense rate is too high. 	<ul style="list-style-type: none"> • Replace A-side dispense valve or A-side dispense valve relay or A-side pressure sensor. • Replace the needle. • Slow down the A-side dispense rate. 	Warning
11	Pressure A Low Warning.	There is a problem with A-side dispense valve or A-side dispense valve relay or A-side pressure sensor.	Replace A-side dispense valve or A-side dispense valve relay or A-side pressure sensor.	Warning
12	Part A reaches the lowest limit.	<ul style="list-style-type: none"> • The A-side lowest limit switch of valve is touched. • The A-side lowest limit switch of valve is damaged. • The A-side lowest limit switch of valve connection cable is faulty. 	<ul style="list-style-type: none"> • Trigger valve upward action. Like reload, home. • Replace A-side lowest limit switch of valve. • Correct A-side lowest limit switch of valve connection cable. 	Alarm

13	Part A reaches the highest limit.	<ul style="list-style-type: none"> The A-side highest limit switch of valve is touched. The A-side highest limit switch of valve is damaged. The A-side highest limit switch of valve connection cable is faulty. 	<ul style="list-style-type: none"> Trigger valve downward action. Like shot, purge. Replace A-side highest limit switch of valve. Correct A-side highest limit switch of valve connection cable. 	Alarm
14	Part A pre-charge time out.	<ul style="list-style-type: none"> There is a problem with A-side dispense valve or A-side supply valve or A-side dispense valve relay or A-side supply valve relay or A-side pressure sensor. The A-side dispense valve connection cable or A-side supply valve connection cable is faulty. 	<ul style="list-style-type: none"> Replace A-side dispense valve or A-side supply valve or A-side dispense valve relay or A-side supply valve relay or A-side pressure sensor. Correct A-side dispense valve connection cable or A-side supply valve connection cable. 	Alarm
15	Part A pre-charge fault.	<ul style="list-style-type: none"> There is a problem with A-side dispense valve or A-side supply valve or A-side dispense valve relay or A-side supply valve relay or A-side pressure sensor. The A-side dispense valve connection cable or A-side supply valve connection cable is faulty. 	<ul style="list-style-type: none"> Replace A-side dispense valve or A-side supply valve or A-side dispense valve relay or A-side supply valve relay or A-side pressure sensor. Correct A-side dispense valve connection cable or A-side supply valve connection cable. 	Alarm
16	Part A motor torque is over limit.	<ul style="list-style-type: none"> There is a problem with A-side dispense valve or A-side dispense valve relay. Material in needle has cured. The A-side dispense rate is too high. 	<ul style="list-style-type: none"> Replace A-side dispense valve or A-side dispense valve relay. Replace the needle. Slow down the A-side dispense rate. 	Alarm
17	Part A reload fault.	<ul style="list-style-type: none"> There is a problem with A-side supply valve or A-side supply valve relay. The A-side supply valve connection cable is faulty. 	<ul style="list-style-type: none"> Replace A-side supply valve or A-side supply valve relay. Correct A-side supply valve connection cable. 	Alarm
18	Part A material empty.	The material on the A-side of the valve is empty.	Add a reload command to the part program. Set reasonable reload parameters.	Alarm

19	Supply pump A empty.	<ul style="list-style-type: none"> • The empty sensor of supply pump A is triggered. • The empty sensor of supply pump A is damaged. • The empty sensor of supply pump A connection cable is faulty. 	<ul style="list-style-type: none"> • Add material to the supply pump A. • Replace the empty sensor of supply pump A. • Correct the empty sensor of supply pump A connection cable. 	Alarm
20	Valve module initialization failed.	The valve servo driver connection cable is faulty.	Correct the valve servo driver connection cable.	Alarm

PCP Alarm

Serial Number	Error Message	Cause	Solution	Error Type
1	Valve motor alarm.	Valve servo driver has a fault alarm.	According to the current alarm code, check the corresponding drive fault solution in the driver troubleshooting manual.	Alarm
2	Supply pump A empty.	<ul style="list-style-type: none"> • The empty sensor of supply pump A is triggered. • The empty sensor of supply pump A is damaged. • The empty sensor of supply pump A connection cable is faulty. 	<ul style="list-style-type: none"> • Add material to the supply pump A. • Replace the empty sensor of supply pump A. • Correct the empty sensor of supply pump A connection cable. 	Alarm
3	Valve module initialization failed .	The valve servo driver connection cable is faulty.	Correct the valve servo driver connection cable.	Alarm

Appendix: Parameters Worksheets

System Parameters

Use this worksheet to record parameter settings.

HOMMING

X Homing Speed	
Y Homing Speed	
Z Homing Speed	

JOGGING

X Jogging Speed	
Y Jogging Speed	
Z Jogging Speed	

RUNNING

Running Speed	
---------------	--

SYSTEM LIMITS

X Axis Acceleration	
Y Axis Acceleration	
Z Axis Acceleration	
Maximum X Limit	
Minimum X Limit	
Maximum X Speed	
Maximum Y Limit	
Minimum Y Limit	
Maximum Y Speed	
Maximum Z Limit	
Minimum Z Limit	
Maximum Z Speed	

LOADING

Loading Function	
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NEEDLEFIND

Needlefind Position	ENABLE/DISABLE, GO TO
---------------------	-----------------------

STANDBY

Standby Position	TEACH, GO TO
------------------	--------------

NEEDLE CLEAN

Needle Clean Position	ENABLE/DISABLE, TEACH, GO TO
Needle Clean Time	
Needle Clean Frequency	
Cycle	

MAINTENANCE

Maintenance Position	TEACH, GO TO
----------------------	--------------

SAFETY SETUP

Jump Height	
Height Limit	

MACHINE OFFSETS

Left Nest Zero	TEACH, GO TO
Flatness left A	TEACH, GO TO
Flatness left B	TEACH, GO TO
Flatness left C	TEACH, GO TO
Skew left 1	TEACH, GO TO
Skew left 2	TEACH, GO TO
Left Nest Pitch	
Left Nest Roll	
Left Nest Skew	
Right Nest Zero	TEACH, GO TO
Flatness Right A	TEACH, GO TO
Flatness Right B	TEACH, GO TO
Flatness Right C	TEACH, GO TO
Skew Right 1	TEACH, GO TO
Skew Right 2	TEACH, GO TO
Right Nest Pitch	
Right Nest Roll	
Right Nest Skew	

COM PORT

Light Source	
Camera	
Laser	
Weight Scale	
Needle Check	
Barcode	

FUNCTION OPTION

Camera	ENABLE/DISABLE
Light Source	ENABLE/DISABLE
Laser	ENABLE/DISABLE
Barcode	ENABLE/DISABLE
Scale	ENABLE/DISABLE

FLUID PRESSURE

Pressure Sensor A	ENABLE/DISABLE
Pressure A Limit	
Pressure A Offset	
Pressure A Max Alarm	
Pressure A Min Alarm	
Pressure A Max Warn	
Pressure A Min Warn	
Pressure Sensor B	ENABLE/DISABLE
Pressure B Limit	
Pressure B Offset	
Pressure B Max Alarm	
Pressure B Min Alarm	
Pressure B Max Warn	
Pressure B Min Warn	

ADVANCED

Language	
Date format	
Date & Time	
Volume Units	
Weight Units	
Pressure Units	

OTHERS

The mark point is not found, will auto skip	
Ignore mark points of subroutines	
Execute all height program first	

PART PRESENCE

Part Present	TEACH, GO TO
Left Part Present	TEACH, GO TO
Right Part Present	ENABLE/DISABLE

PURGING

Purge Position	
Purge Warn Time	
Purge Frequency	
Circle Radius	
Number	

MAINTENANCE ALARM

Axis X	
Axis Y	
Axis Z	
Dispenses	

SCALE

Scale Position	ENABLE/DISABLE, TEACH, GO TO
Dispense Time	
Dispense Rate	
Circle Radius	
Number	
Weight	
Tolerance	
Maximum Weight	
Frequency	

CALIBRATION

Camera Position	
Needle Position	
Height Sensor Position	
Offset	

CAMERA BRIGHTNESS

Exp	
Gain	
Red	
Green	
Blue	

FIDUCIAL SETTING

Model	
Mode	
Accuracy	
Polarity	
Threshold	
Score	
Angle Range	
Scale Range	

Repeatability

Start Point	TEACH, GO TO
End Point	TEACH, GO TO
X Axis Move Speed	
Y Axis Move Speed	
Z Axis Move Speed	
X Axis Acceleration	
Y Axis Acceleration	
Z Axis Acceleration	
Running Interval	
Running Cycle	

Weight Check

Weight Point	GO TO
Rate	
Dwait	
Standard Weight	
Running Cycle	
Running Interval	

Repeatability and Weight Check Parameters

Maximum	
Minimum	
Mean	
Tolerances	
USL	
LSL	
Std Dev	
Cp	
Cpkl	
Cpku	
Cpk	

Valve Parameters

PCP

Gear Box Ratio	
Max Rate	
Volume/rev	
With Snuff Back	
Snuff Back Volume	
Snuff Back Rate	
Shot Size	
Shot Rate	
Purge Rate	
Purge Amount	

On/Off Valve

Purge Time	
Test Shot Time	

PR-Xv and PR-Xv30

Public

Shot Volume	
Shot Rate	
Purge Volume	
Purge Rate	
Max Purge Time	
Base Purge Type	
Base Purge Volume	
Base Purge Rate	
Reload After Purge	
Depressure After Purge	
Dispense Ratio A:B	
Pressure Unbalance	
Automatic Depressure	
Reload After Each Job	
Reload After Multi Jobs	
Press Check After Home	
Automatic Pre-charge	

Side A and B

Home Speed	
Pre-charge Pressure	
Upper Limit	
Low Limit	
Pre-charge Speed(Hi)	
Pre-charge Speed(Low)	
Decelerate Point	
Max Pre-charge Time	
Depressure Target	
Depressure Speed	
Max Depressure Time	
Reload Target	
Reload Request Position	
Reload Speed	
Reload Pressure	
Max Reload Time	

Valve Data Display

Pressure A	
Pressure B	
Volume A	
Volume B	
A:B Vol Ratio	
Shot Volume	
Purge Volume	
Base Volume	
A Limit +	
B Limit +	
A Home	
B Home	
A Limit -	
B Limit -	
A Inlet	
B Inlet	
A Output	
B Output	
A Alarm	
B Alarm	

Functional Buttons

Part A reloads	
Part B reloads	
Part A and B reload	
Base purge part A or part B	
Manual pre-charge	
Rod homing	
Part A shots	
Part B shots	
Part A and Part B shot	
Purge	
Manual de-pressurization	

PSM 15, PSM 25, PSM 50 and PSM 100

Public

Shot Volume	
Shot Rate	
Purge Volume	
Purge Rate	
Max Purge Time	
Reload After Purge	
Depressure After Purge	
Automatic Pre-charge	
Reload After Each Job	
Reload After Multi Jobs	
Automatic Depressure	
Press Check After Home	

Side A and B

Home Speed	
Pre-charge Pressure	
Upper Limit	
Low Limit	
Pre-charge Speed(Hi)	
Pre-charge Speed(Low)	
Decelerate Point	
Max Pre-charge Time	
Depressure Target	
Depressure Speed	
Max Depressure Time	
Reload Target	
Reload Request Position	
Reload Speed	
Reload A Pressure	
Max Reload Time	

Valve Data Display

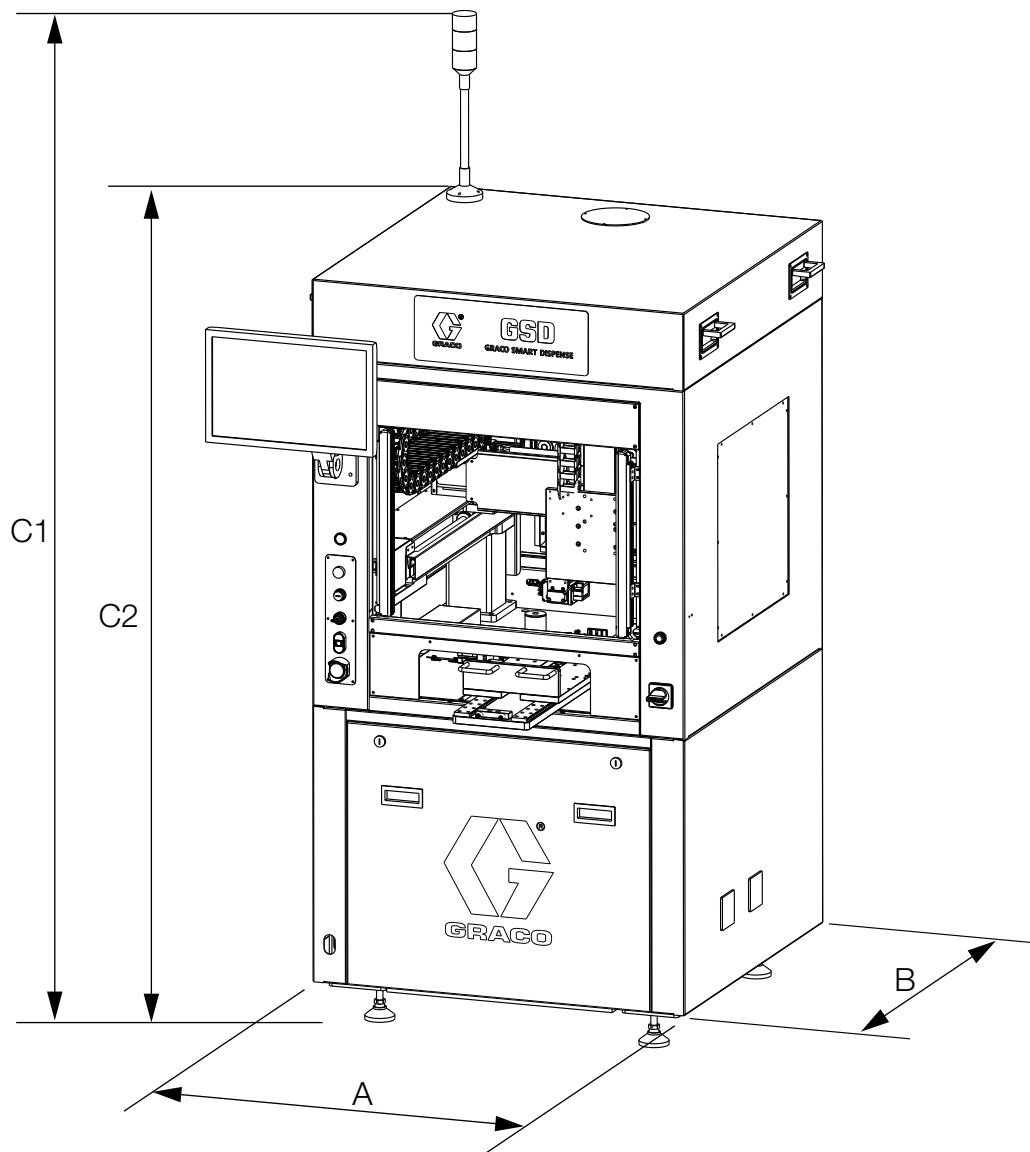
Pressure A	
Volume A	
Shot Volume	
Purge Volume	
Base Volume	
A Limit +	
A Home	
A Limit -	
A Inlet	
A Output	
A Alarm	

Functional Buttons

Material reload	
Material Shot	
Purge	
Rod homing	
Manual pre-charge	
Manual de-pressurization	

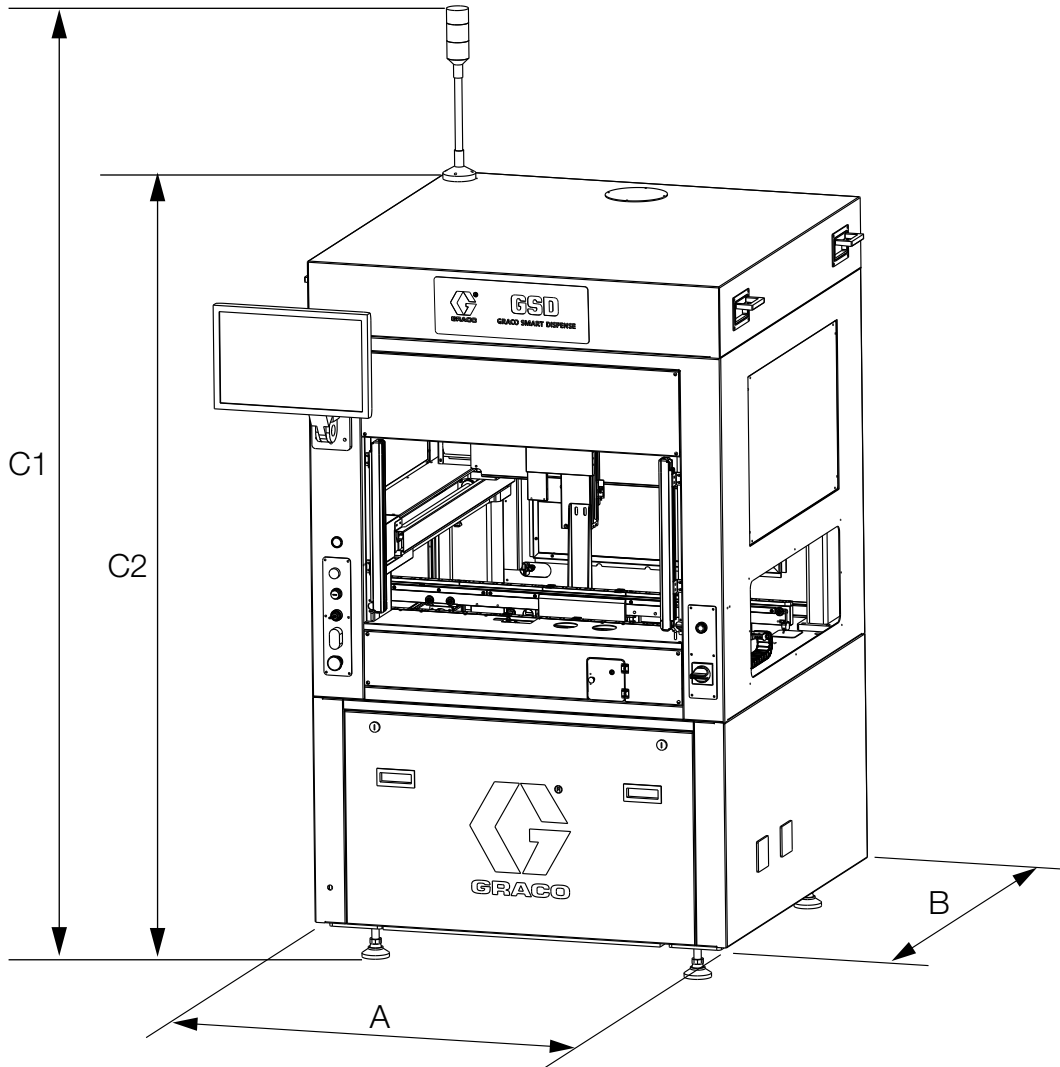
Dimensions

GSD Off-line System



GSD	A (Length) in. (mm)	B (Width) in. (mm)	C1 (Height with Lamp) in. (mm)	C2 (Height without Lamp) in. (mm)
2001644	38.98 (990)	38.98 (990)	94.49 (2400)	76.77 (1950)
2001647	46.85 (1190)	46.85 (1190)	94.49 (2400)	76.77 (1950)
2004679	50.79 (1290)	46.85 (1190)	94.49 (2400)	76.77 (1950)

GSD In-line System



GSD	A (Length) in. (mm)	B (Width) in. (mm)	C1 (Height with Lamp) in. (mm)	C2 (Height without Lamp) in. (mm)
2001646	46.85 (1190)	46.85 (1190)	94.49 (2400)	76.77 (1950)

Technical Specifications

GSD		
	US	Metric
Power	AC 220V 1ph 50/60 Hz 10A	
Ambient air temperature	32°-104°F	0°-40°C
Humidity	< 90%	
Noise level	< 70 dBA	
Pneumatic pressure	80-100 psi	0.55-0.69 MPa
Maximum Working Pressure of Dispensers		
PCP	400 psi	2.75 MPa
PR-Xv	1200 psi	8.3 MPa
PR-Xv30	1200 psi	8.3 MPa
PSM15	1200 psi	8.3 MPa
PSM25	1200 psi	8.3 MPa
PSM50	3000 psi	20.7 MPa
PSM100	3000 psi	20.7 MPa
Main motor	0.4 kW	
Gross motor	0.4 kW	
Gross Weight		
2001644	1388.9 lb	630 kg
2001647	1743.9 lb	791 kg
2004679	1818.8 lb	825 kg
2001646	1796.8 lb	815 kg

California Proposition 65

CALIFORNIA RESIDENTS

 **WARNING:** Cancer and reproductive harm – www.P65warnings.ca.gov.

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Graco warrants all equipment referenced in this document which is manufactured by Graco and bearing its name to be free from defects in material and workmanship on the date of sale to the original purchaser for use. With the exception of any special, extended, or limited warranty published by Graco, Graco will, for a period of twelve months from the date of sale, repair or replace any part of the equipment determined by Graco to be defective. This warranty applies only when the equipment is installed, operated and maintained in accordance with Graco's written recommendations.

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Original instructions. This manual contains English. MM 3A9390C

Graco Headquarters: Minneapolis

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