

PR-Xv

3A9328B

Variable Ratio Metering System

EN

For accurate metering, mixing, and dispensing of two-component materials. For professional use only.

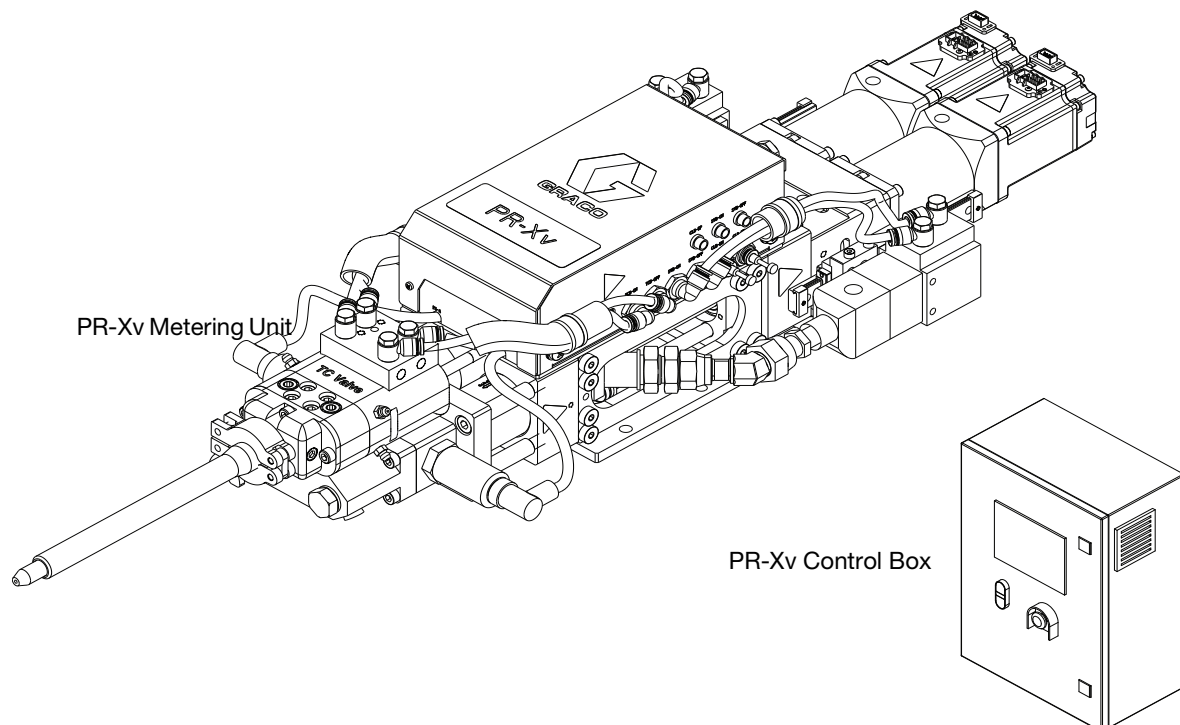
Not approved for use in explosive atmospheres or hazardous (classified) locations.

*1200 psi (8.3 MPa, 83 bar) Maximum Working Pressure
100 psi (0.7 MPa, 7 bar) Maximum Air Inlet Pressure.*



Important Safety Instructions

Read all warnings and instructions in this manual, your repair-parts manual, and your dispensing valve manuals before using the equipment. Save these instructions.



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Related Manuals

Manuals in English	Description
3A9349	PR-Xv Repair-Parts Manual
308876	1K Ultra-Lite™ Instructions and Parts List Manual
3A9283	TC Dispense Valve

Models

Part	Description	Includes:			
		PR-Xv Metering Unit	PR-Xv control box	Static Mixer Package	Direct Connection
25S181	PR-Xv System, Supply Pump Feed, DIRECT, SST ⁽¹⁾ , 100 CC, I/O	✓	✓	✓	✓
25S182	PR-Xv System, Supply Pump Feed, DIRECT, CER ⁽²⁾ , 100 CC, I/O	✓	✓	✓	✓
25S197	PR-Xv System, Supply Pump Feed, DIRECT, SST ⁽¹⁾ , 75 CC, I/O	✓	✓	✓	✓
25S198	PR-Xv System, Supply Pump Feed, DIRECT, CER ⁽²⁾ , 75 CC, I/O	✓	✓	✓	✓

⁽¹⁾ SST: Stainless steel material

⁽²⁾ CER: Ceramic material


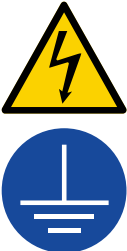


NOTE: The ratio range of PR-Xv 100cc metering system (1:1 volume ratio system) is from 1:1 to 5:1. The ratio range of PR-Xv 75cc metering system (2:1 volume ratio system) is from 2:1 to 10:1.

NOTE: Any PR-Xv system can be converted to Profinet communication mode by ordering SD card 2000359 and performing **Software update**, page 45.

NOTE: Any PR-Xv system can be converted to remote mode by using remote kits. See **Remote Kits** as outlined in your PR-Xv Parts Manual and order remote kits. See **Related Manuals**, page 2.

Warnings

The following warnings are for the setup, use, grounding, maintenance, and repair of this equipment. The exclamation point symbol alerts you to a general warning and the hazard symbols refer to procedure-specific risks. When these symbols appear in the body of this manual or on warning labels, refer back to these Warnings. Product-specific hazard symbols and warnings not covered in this section may appear throughout the body of this manual where applicable.

 <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 all power before disconnecting any cables and before servicing or installing equipment. • Connect only to grounded power source. • All electrical wiring must be done by a qualified electrician and comply with all local codes and regulations.
	<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.
	<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.

WARNING



PERSONAL PROTECTIVE EQUIPMENT

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:

- Protective eyewear, and hearing protection.
- Respirators, protective clothing, and gloves as recommended by the fluid and solvent manufacturer.







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.

! WARNING

 	<p>EQUIPMENT MISUSE HAZARD 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. • 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>MOVING PARTS HAZARD Moving parts can pinch, cut or amputate fingers and other body parts.</p> <ul style="list-style-type: none"> • 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.

Keep Components A and B Separate

			
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Cross-contamination can result in cured material in fluid lines which could cause serious injury or damage equipment. To prevent cross-contamination:

- 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.

Typical Installation

FIG. 1, FIG. 2 and FIG. 3 are only a guide for identifying system components and for assisting in installation. Contact your Graco distributor or Graco China Customer Service for assistance in designing a system to suit your specific needs.

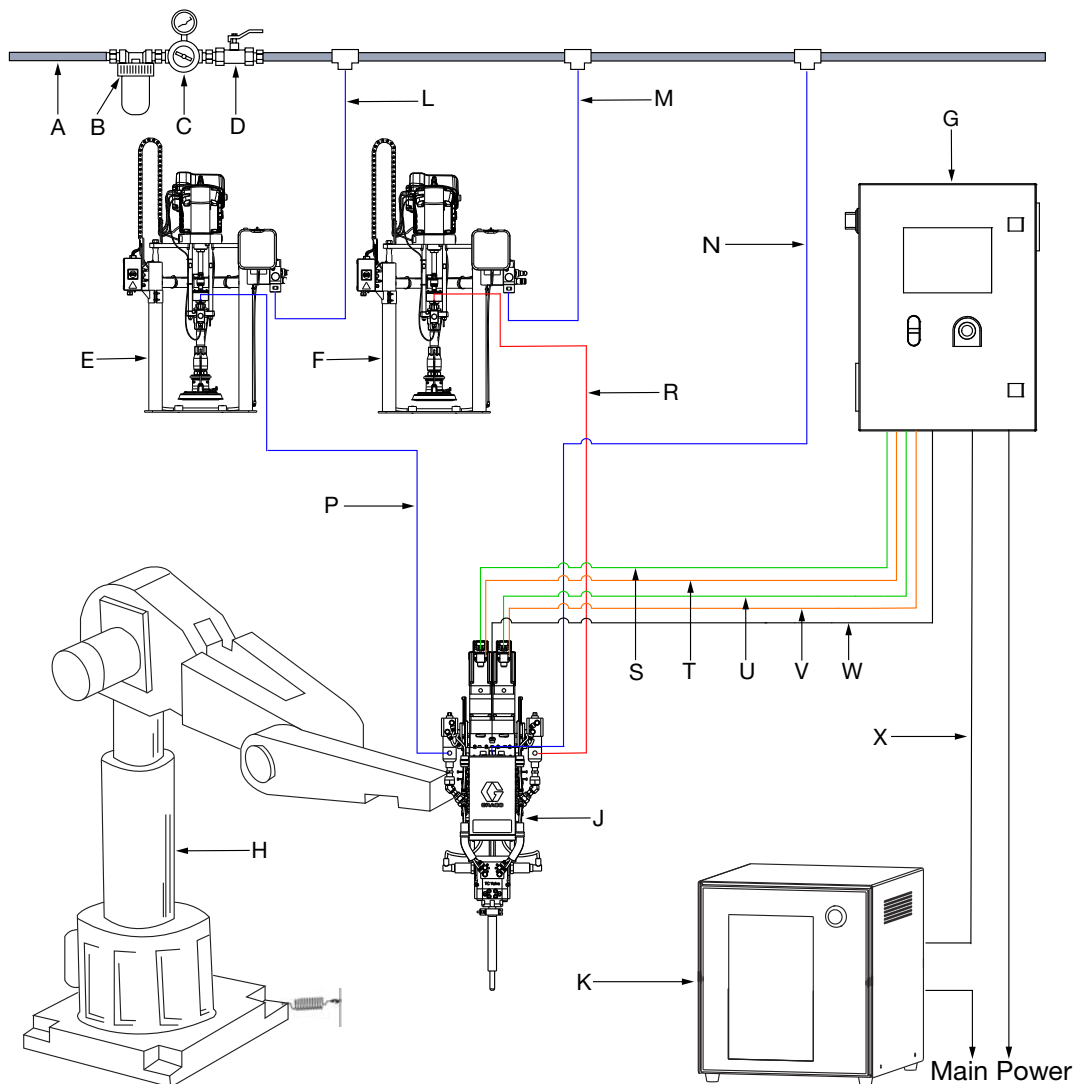


FIG. 1: Typical Installation

Key:

- | | |
|--|------------------------------------|
| A Main Air Line | M Supply Pump B Air Line |
| B Air Filter ⁽¹⁾ | N PR-Xv Air Line |
| C Pressure Regulator Valve ⁽¹⁾ | P Material Supply Line A |
| D Bleed-type Master Air Valve ⁽¹⁾ | R Material Supply Line B |
| E Supply Pump System A | S Servo Motor A Encoder Cable |
| F Supply Pump System B | T Servo Motor A Power Cable |
| G PR-Xv Control Box | U Servo Motor B Encoder Cable |
| H Customer Robot | V Servo Motor B Power Cable |
| J PR-Xv Metering Unit | W Junction Box Communication Cable |
| K Customer Robot Control Box | X I/O Communication Cable |
| L Supply Pump A Air Line | |

⁽¹⁾ Required, but not supplied.

Component Identification

PR-Xv Metering Unit, Supply Pump Feed

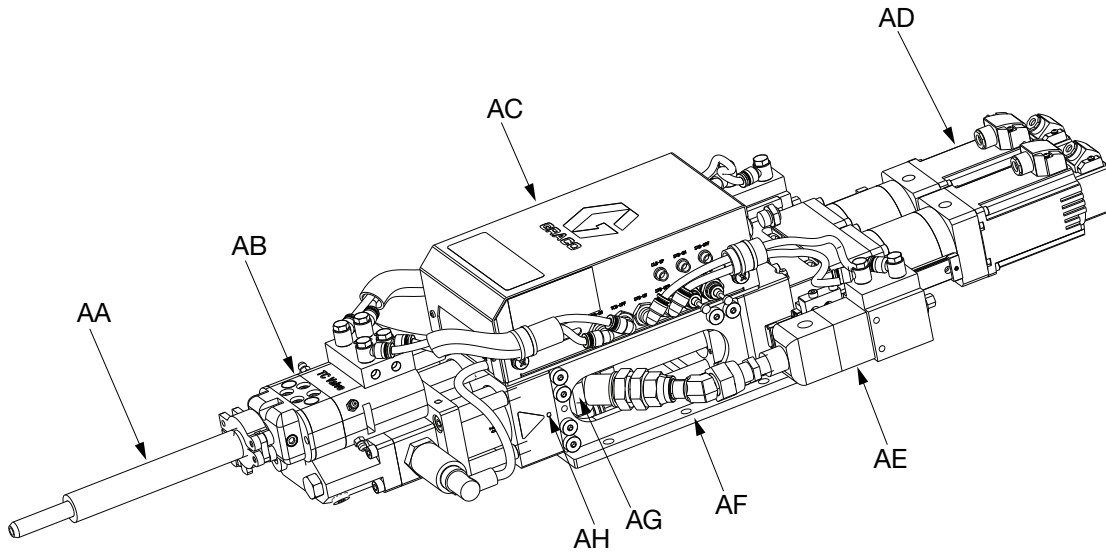


FIG. 2: PR-Xv System, Supply Pump Feed

Key:

- AA Static Mixer Package
- AB TC Dispense Valve
- AC Junction Box Assembly
- AD Drive Assembly
- AE Inlet Valve
- AF Installation Plate
- AG Base Unit
- AH Piston Observation Hole

Different types of Static Mixer Package (AA, page 8) and are available from Graco. Make certain the Static Mixer Package (AA, page 8) is adequately sized and pressure-rated to meet your system needs.

PR-Xv Control Box

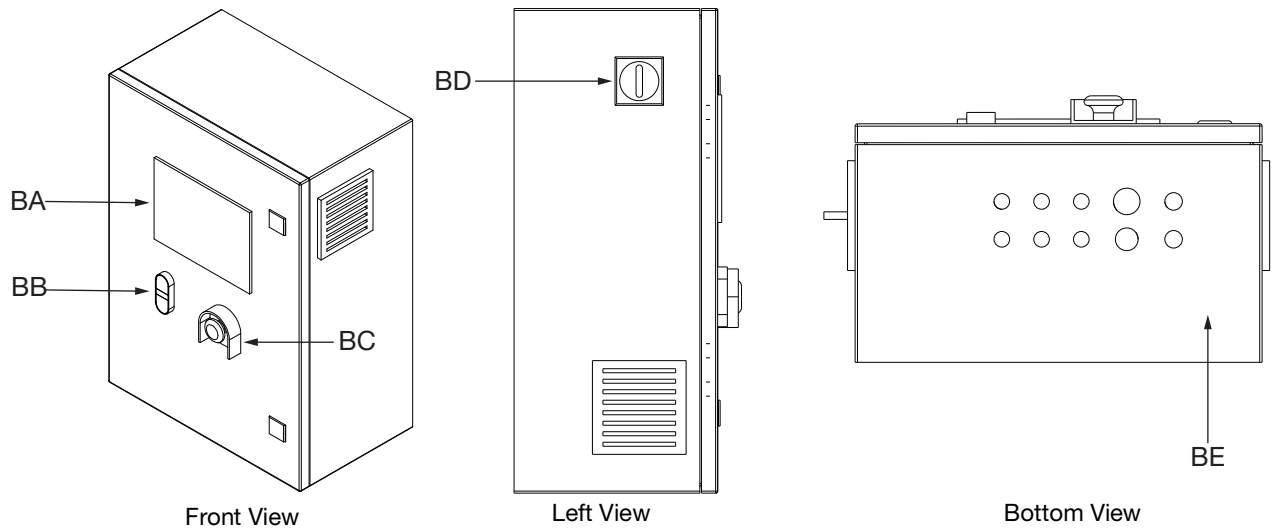




FIG. 3: PR-Xv Control Box

Key:

- BA Human Machine Interface (HMI) Display
- BB Control Power On/Off Buttons
- BC Emergency Stop (E-stop) Switch
- BD Main Power Switch
- BE Connection Plate

Installation

				
<p>All electrical wiring must be done by a qualified electrician and comply with all local codes and regulations.</p>				

Unpacking

1. Inspect the shipping container carefully for damage. Contact the carrier promptly if there is damage.
2. Open the box and inspect the contents carefully. There should not be any loose or damaged parts in the container.
3. Compare the packing slip against all the items in the box. Report any shortage or other inspection problems immediately.
4. Remove the system components from the container.

Mounting Location and Installation

1. The PR-Xv Metering Unit (J, page 7) can be directly mounted on a customer robot or remotely mounted on a motion table. Verify the location has access to compressed air and AC power.
2. Place the PR-Xv Metering Unit (J, page 7) onto the designated location.
3. Suggest to use M8 screw to attach the PR-Xv Installation Plate (AF, page 8) to the designated location through the four mounting holes. Use locating pins to precisely locate PR-Xv Metering Unit (J, page 7) through the two through holes ($\phi 8\text{mm}$).

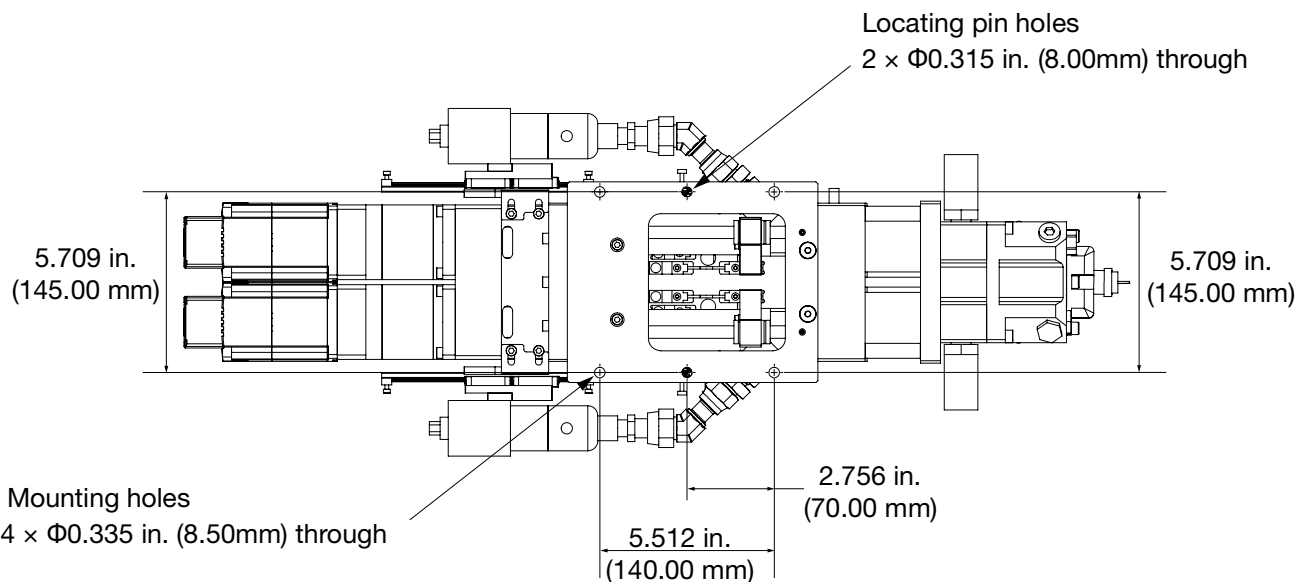






FIG. 4: Mounting Hole Dimensions for Installing the PR-Xv Metering Unit - Supply Pump Feed

Grounding

				
<p>The equipment must be grounded to reduce the risk of static sparking and electric shock. Electric or static sparking can cause fumes to ignite or explode. Improper grounding can cause electric shock. Grounding provides an escape wire for the electric current.</p>				

PR-Xv Metering Unit (J, page 7): Grounded through the PR-Xv Installation Plate. Use the supplied ground wire and clamp to ground the metal PR-Xv Installation Plate or Customer Robot to a true earth ground.

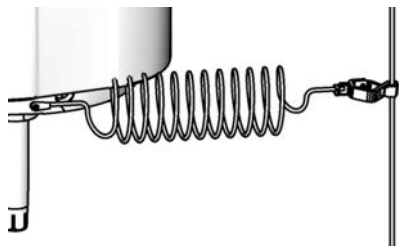


Fig. 5 Grounding

PR-Xv Control Box (G, page 7): grounded through the power cord.

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

Air compressor: follow manufacturer's recommendations.

TC Dispense Valve (AB, page 8): ground through connection to a properly grounded fluid line 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.

Power Requirements

The system requires a dedicated circuit protected with a circuit breaker.

Voltage	Phase	Hz	Current
200-240 VAC	1	50/60	10 A

Connecting Lines and Cables



1. Connect the PR-Xv Air Line (N, page 7) to the air inlet of the Junction Box Assembly (AC, page 8). The maximum air pressure is 100 psi (0.7 MPa, 7 bar). The air flow is over 1 CFM.
2. Connect the Material Supply Line A (P, page 7) and B (R, page 7) to the corresponding material inlets at the top of the Inlet Valve (AE, page 8).
3. Using the power cord provided, connect AC power (220 V, 50/60 Hz, single phase) to the power connection of the PR-Xv Control Box (G, page 7) by following the marks on the Connection Plate (BE, page 9) and cables.
4. Follow the marks on the PR-Xv Control Box (G, page 7) and the cables to connect the junction box, servo motor and pressure sensor from the PR-Xv Metering Unit (J, page 7) to the PR-Xv Control Box (G, page 7).

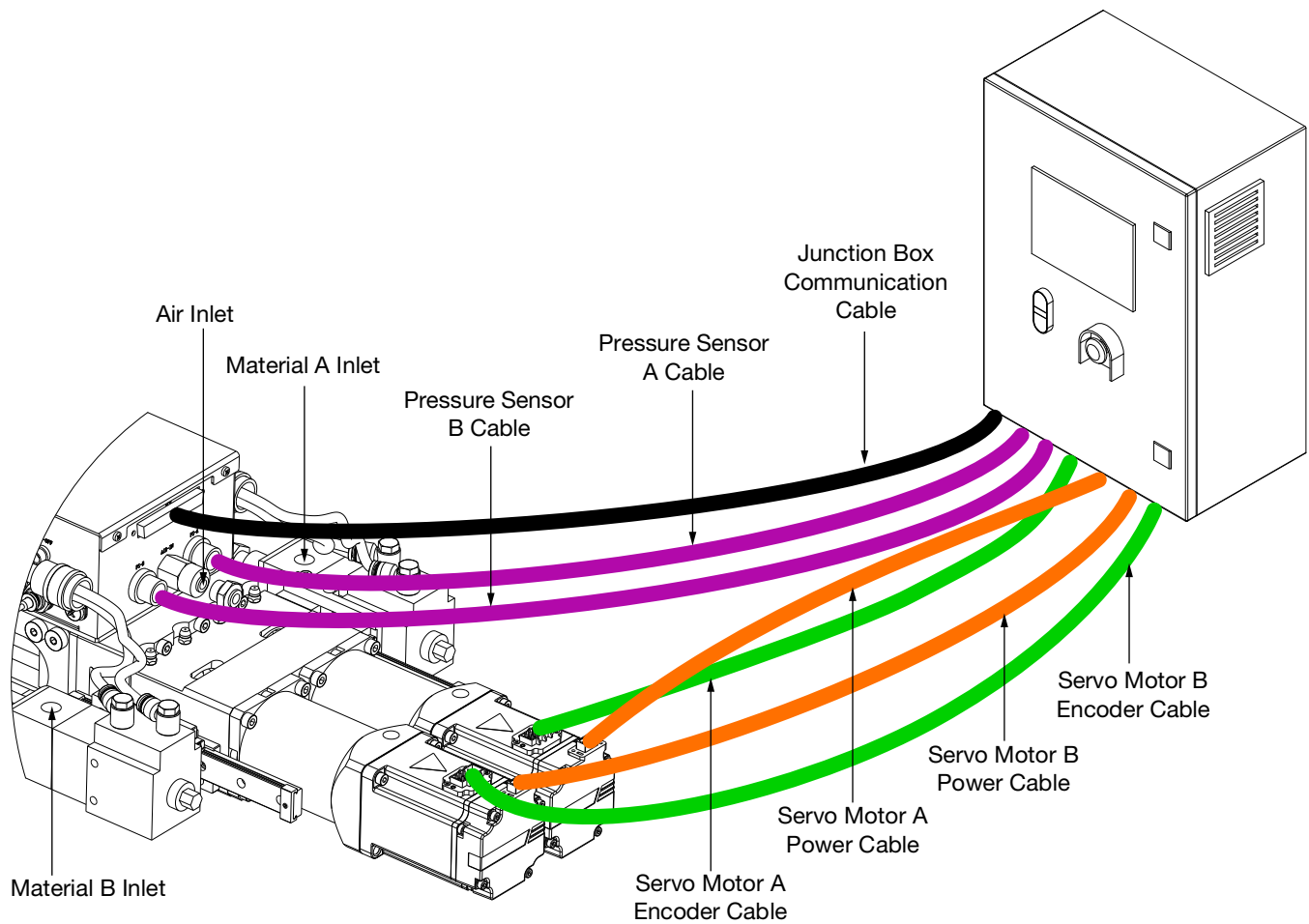



FIG. 6: System Connections

Flush Before Using Equipment

The equipment was tested with lightweight oil, which is left in the fluid passages to protect parts. To avoid contaminating your fluid with oil, flush the equipment

with a compatible solvent before using the equipment. Follow **Flush the equipment**, page 51.

Startup



This equipment stays pressurized until pressure is manually relieved. To help prevent serious injury from pressurized fluid, such as skin injection and splashing, keep fingers and other body parts away from the spray tip.

To avoid injury from toxic fluids or fumes, such as splashing in the eyes or on skin, wear appropriate personal protective equipment.

To start the system for the first time, follow the steps below.

1. Make sure the air line and the cables are correctly connected to the system.
2. Locate the Power Switch (BD, page 9) at the left of the PR-Xv Control Box (G, page 7) and turn the power on.
3. Press the Control Power on Button (BB, page 9) to open HMI displays.
4. Go to the Advanced Screen, then select 'A Inlet Off' and 'B Inlet Off' to turn on Inlet Valves (AE, page 8).

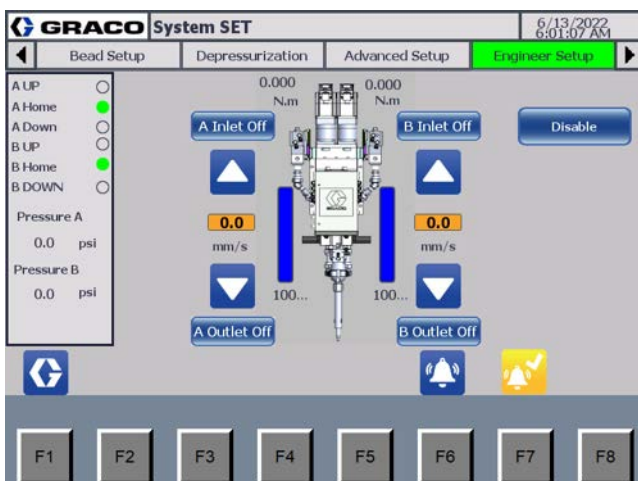


FIG. 7 Advanced Screen

5. Adjust the Pressure Regulating Valve (C, page 7) so the air pressure provided by is at least 80 psi (0.6 MPa, 6 bar), and no higher than 100 psi (0.7 MPa, 7 bar).

NOTE: If needed, add the pressure relief valve to reduce pressure to 100 psi (0.7 MPa, 7 bar).

6. Perform **Prime the system**, page 38.
7. Dispense several full stroke shots until the PR-Xv Metering Unit (J, page 7) is free of air and there is no leakage at the Dispense Valve (AB, page 8) after shutoff.

NOTE: Very viscous, compressible materials may continue to leak after system is primed. Reduce flow rate as required to produce air-free dispensation. Very thin materials may require tilting the valve greater than 45 degrees and dispensing shots until material is air-free.


NOTE: Air entering the system should be filtered.

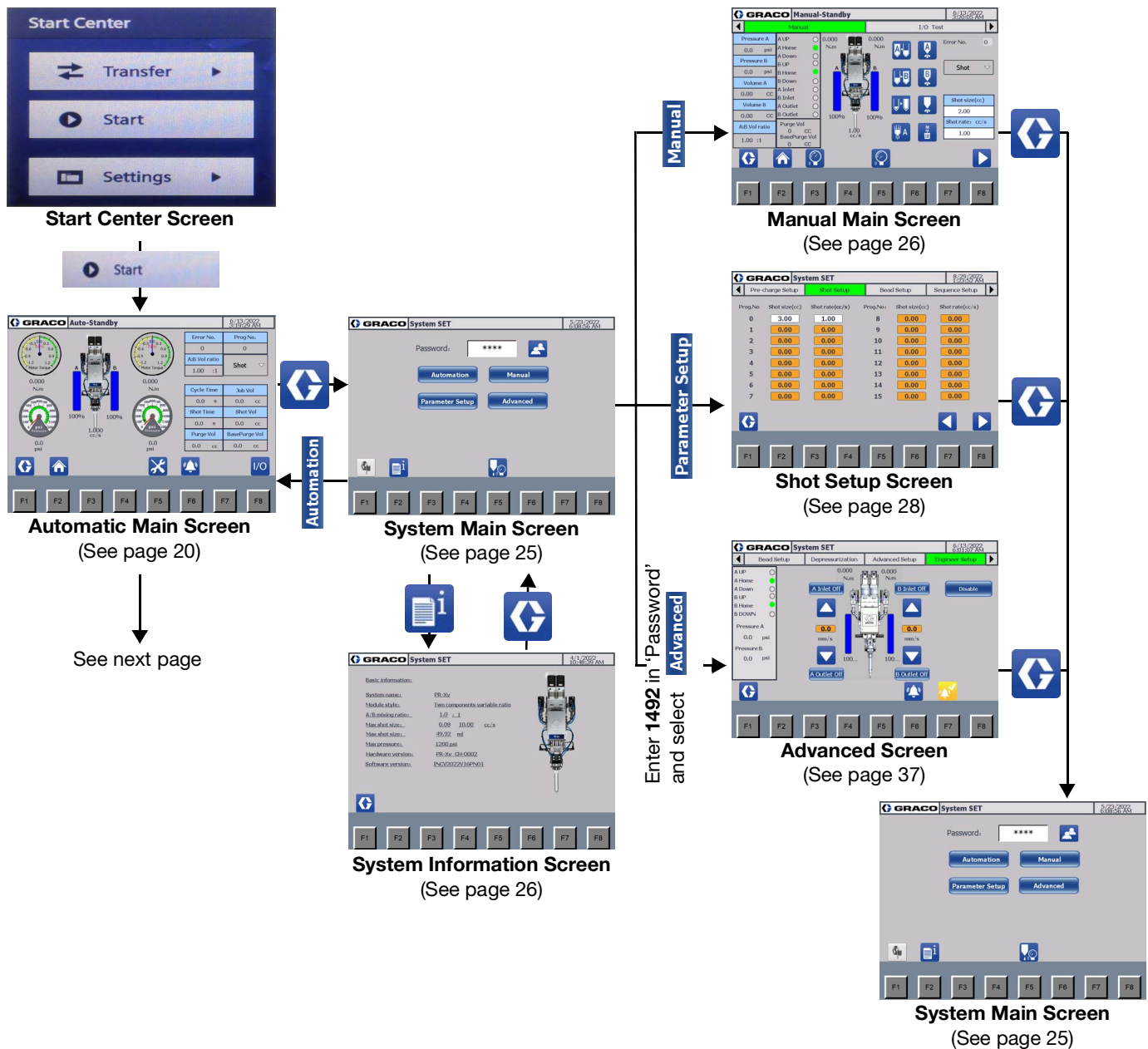
HMI Display Operation and Identification

Screen Navigation Diagrams

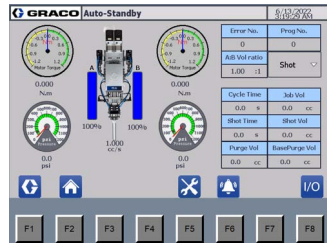
NOTE: Use the icons or corresponding “F” keys to navigate between screens. For example, navigation using icons is shown in the following diagrams. The “F” keys are shown along the bottom of each screen.

Navigation on Main Screen

NOTE: The following only displays the navigation on the System Main Screen. Select  in any other screens where it appears can enter System Main Screen.



Navigation on Automatic Screens

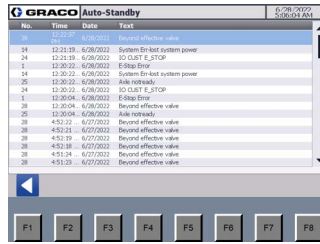


Automatic Main Screen
(See page 20)

See next page



Maintenance Screen
(See page 22)



Error Message Screen
(See page 23)



Signal Check Screen (Auto)
(See page 23)

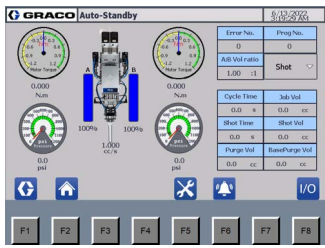
Cycle Time	Job Vol
0.0 s	0.0 cc
Shot Time	Shot Vol
0.0 s	0.0 cc
Purge Vol	BasePurge Vol
0.0 cc	0.0 cc



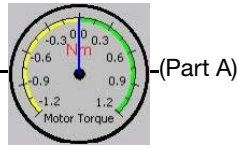
Job Record Screen
(See page 25)



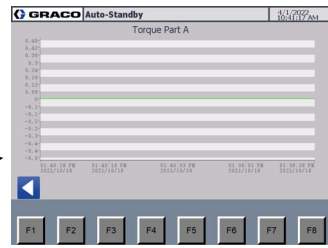
Automatic Main Screen
(See page 20)



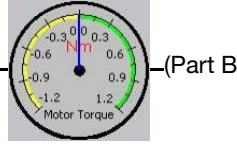
Automatic Main Screen
(See page 20)



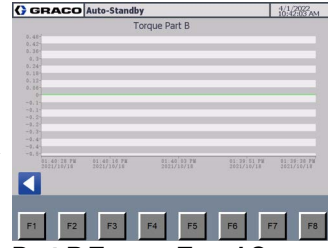
(Part A)



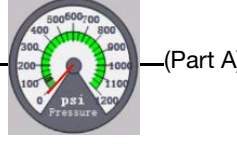
Part A Torque Trend Screen
(See page 24)



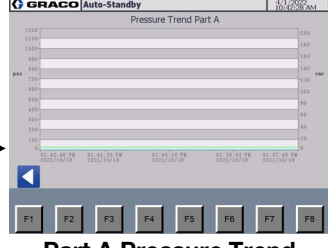
(Part B)



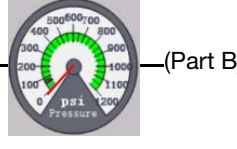
Part B Torque Trend Screen
(See page 24)



(Part A)



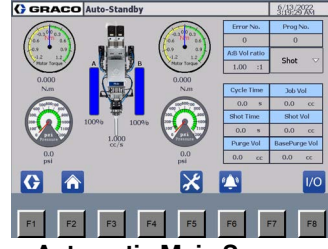
Part A Pressure Trend Screen
(See page 24)



(Part B)



Part B Pressure Trend Screen
(See page 24)



Automatic Main Screen
(See page 20)

See next page

Navigation on Manual Screens

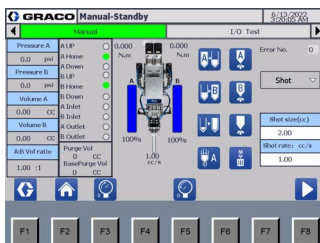


Automatic Main Screen
(See page 20)

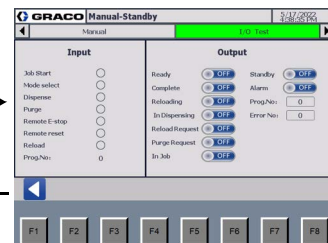


System Main Screen
(See page 25)

Manual



Manual Main Screen
(See page 26)



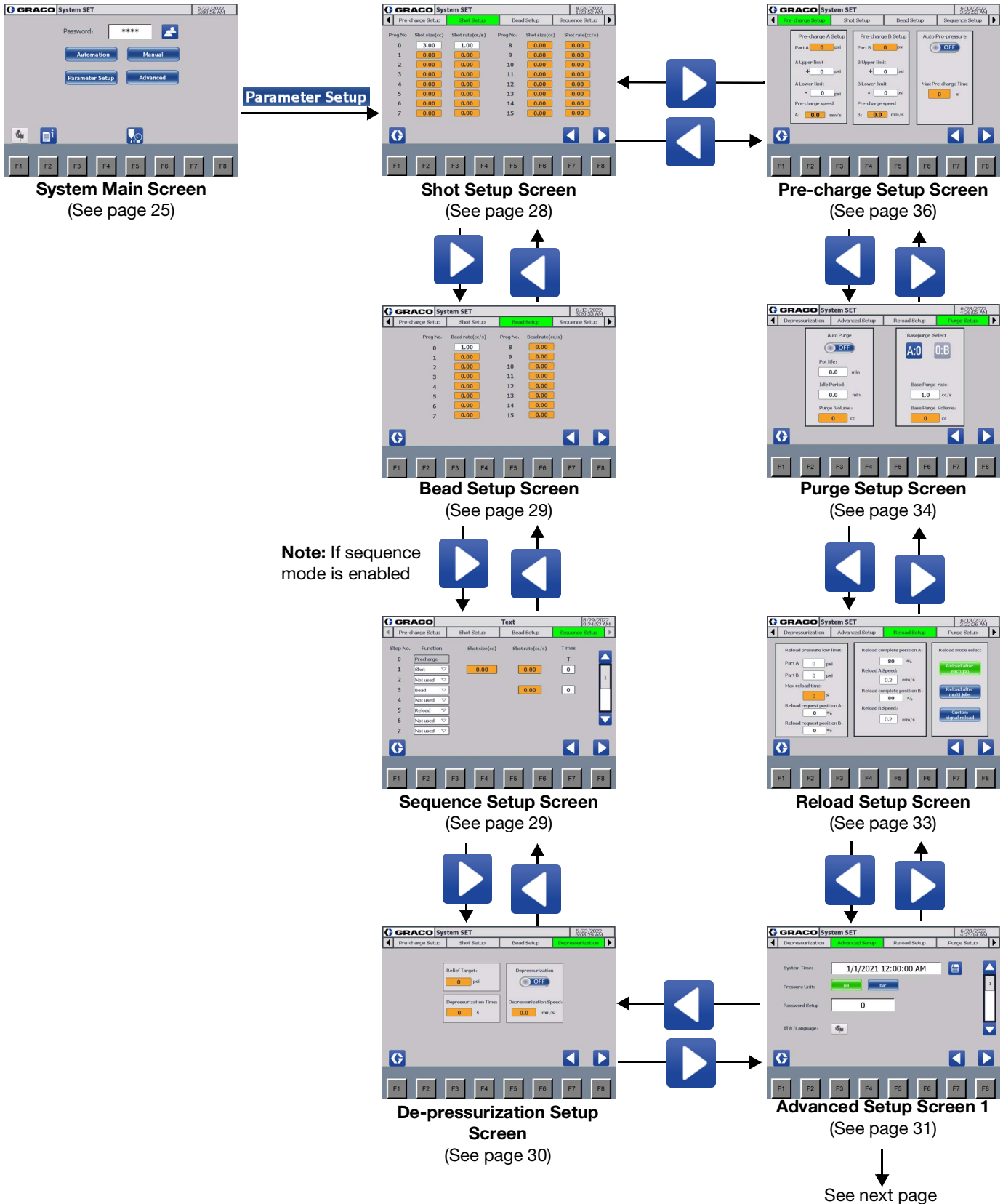
Signal Check Screen (Manual)
(See page 26)

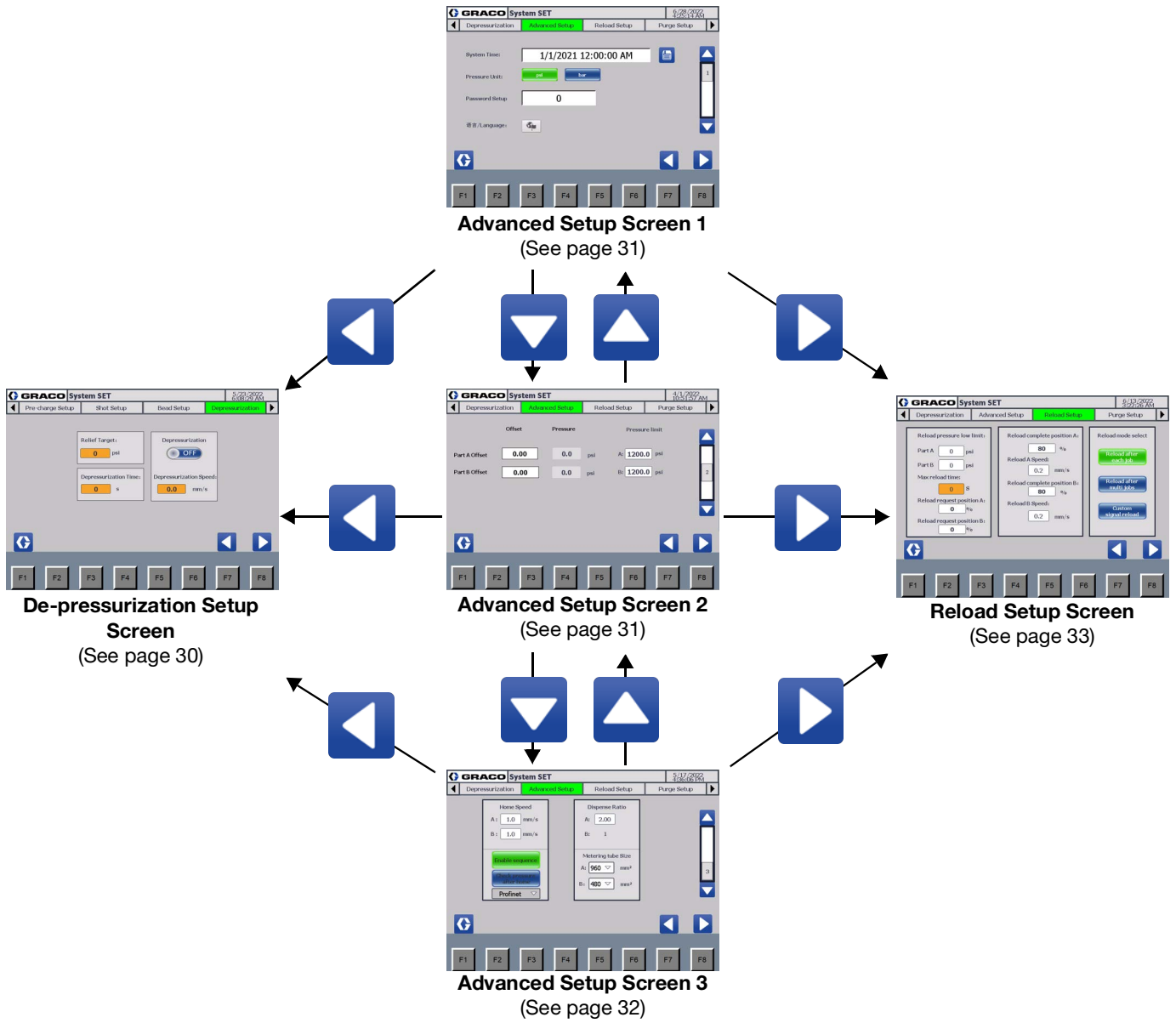


System Main Screen
(See page 25)

See next page

Navigation on Setup Screens





Start Center

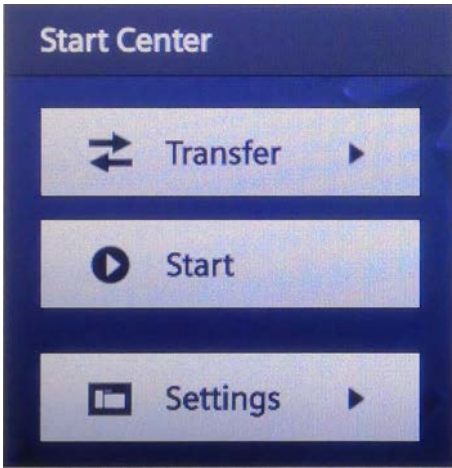


FIG. 8 Start Center Screen

When the PR-Xv control box is powered on, select 'Start' in the 'Start Center' screen and the system performs the self check.

If the displayer is connected, the system will perform successful self check and display 'Automatic Main Screen'.

If the displayer is disconnected, the system fails to perform self check and stay on the self-check screen.


Press 'F8' or select  to display displayer setting screens. Enter correct IP address to make the displayer connected. For more information, see **Software update**, page 45.



FIG. 9 Self Check Screen

Automatic Main Screen

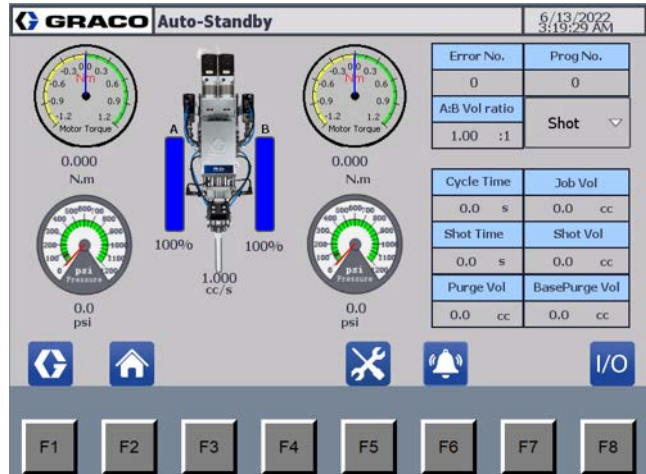


FIG. 10 Automatic Main Screen

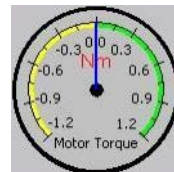
The content and functions of this screen are as follows:

Information bar



- To illustrate the current status of equipment, such as Auto-Standby or Auto-Shot dispense.
- To show error information when an alarm is active.

Motor torque



To show the current motor torque. The torque of the drive motor is shown in N•m. Select this to display motor torque trend screen.

- The A side: To show the current motor torque of part A. Select to display **Part A Torque Trend Screen**, page 24.
- The B side: To show the current motor torque of part B. Select to display **Part B Torque Trend Screen**, page 24.

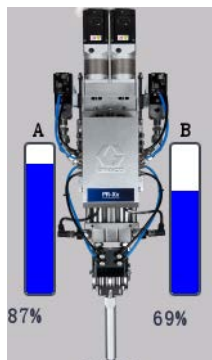
Pressure



To show the current pressure. The current pressure is shown in psi. The operator can change the unit of pressure. See **Pressure unit**, page 31. Select to display pressure trend screen.

- The A side: To show the current pressure of part A. Select to display **Part A Pressure Trend Screen**, page 24.
- The B side: To show the current pressure of part B. Select to display **Part B Pressure Trend Screen**, page 24.

Rod position



Display the remained materials in the cylinders (0-100%). When the rod slider is at the home position, 'Rod position' will show 100%. When the slider moves to the 'empty' position, 'Rod position' will show 0%.

- A: to show the amount of material for part A.
- B: to show the amount of material for part B.

Flow rate

1.000
cc/s

To show the dispense rate of a mixture of Part A and B.

Working information

Error No
1
A:B Vol ratio
1.00 :1

- Error No: to show the current error number.
- A:B Vol ratio: to show the dispense volume ratio of part A: part B.

Working mode

Prog.select	
0	
Shot	▼

shot and bead mode

Sequence	
Step 0 - 0	
0.0	cc
0.00	cc/s

sequence mode

The system provides shot and bead mode when sequence mode is not enabled. In shot or bead mode, click on the drop-down column to select the shot or bead mode, and then select a preset program number in 'Prog.select'. The default number in 'Prog.select' is '0'. Click on the column and select a number from '0' to '15' to call the preset program.

- For preset program of shot mode, see **Shot Setup Screen**, page 28.
- For preset program of bead mode, see **Bead Setup Screen**, page 29.

The system switches to sequence mode when sequence mode is enabled. Numbers in 'Step' columns show information of 'which step is in progress' – 'how many dispense times are left'. Below is the current function and its parameters.

- For enabling sequence mode, see **Enable sequence mode**, page 32.
- For preset program of sequence mode, see **Sequence Setup Screen**, page 29.

Job records

Cycle Time	0.0 s	Job Vol	0.0 cc
Shot Time	0.0 s	Shot Vol	0.0 cc
Purge Vol	0.0 cc	BasePurge Vol	0.0 cc

To show the job information. Select to display **Job Record Screen**, page 25.

- Cycle Time: To show the accumulative dispense time for one job.
- Job Vol: To show the accumulative dispense volume for one job.

- Shot Time: To show the dispense time for current one shot.
- Shot Vol: To show the dispense volume for current one shot.
- Purge Vol: To show the current one shot volume of purging.
- BasePurge Vol: To show the current one shot volume of base purge.

Function icons



Press 'F1' or select the icon to display **System Main Screen**, page 25.



Home: Press 'F2' or select the icon to execute the command of returning to home point.



Press 'F5' or select the icon to display **Maintenance Screen**, page 22.



Press 'F6' or select the icon to display **Error Message Screen**, page 23.



Reset: This icon appears when alarms are activated. Press 'F7' or select to display current alarm message. On the current alarm message screen, select this icon to clear the alarms. Only reset alarms can be cleared.




Press 'F8' or select the icon to display **Signal Check Screen (Auto)**, page 23.

Maintenance Screen



FIG. 11 Maintenance Screen

On the Maintenance Screen, press 'F1' or select  to display the Automatic Main Screen.


Maintenance Screen records the workload data of important parts. Some data can be reset. Click at the part clear buttons and confirm the execution to reset workload data.

- Output count clear: Clear the workload of dispense valve.
- Input count clear-A: Clear the workload of inlet valve A.
- Input count clear-B: Clear the workload of inlet valve B.
- Output count clear-A: Clear the workload of outlet valve A.
- Output count clear-B: Clear the workload of outlet valve B.
- Volume count clear: Select to clear value in 'Shot volume cc'. Value in 'System Shot volumes cc' cannot be cleared.
 - Shot volume cc: Display the accumulative dispense volumes from the last zeroed.
 - System Shot volume cc: Display the total dispense volumes from the first time the system starts to work. This cannot be cleared.

Error Message Screen



Fig. 12 Error Message Screen

On the Error message screen, press 'F1' or select  to display the Automatic Main Screen. This screen shows the error history. It records the error number, time, date and explanation text for the last 100 system errors.

Signal Check Screen (Auto)

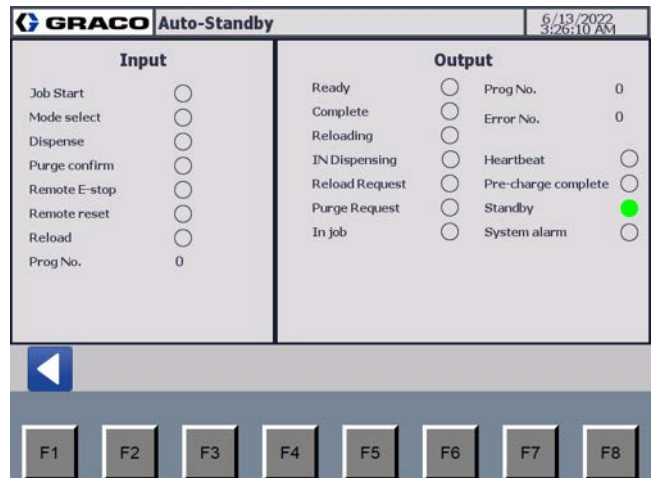

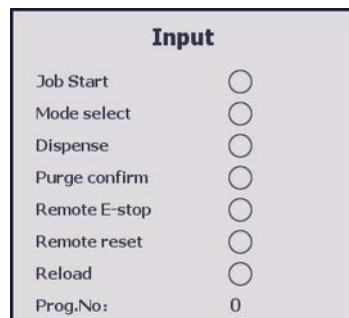


Fig. 13 Signal Check Screen (Auto)

On the Signal Check Screen, press 'F1' or select  to display the Automatic Main Screen.

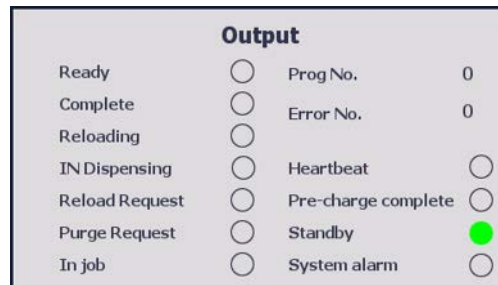
The content and functions of this screen are as follows:

Input signals status



The input signals shows the current signal status from customer inputs.

Output signals status



The output signals shows the current signal status from the control box.

Part A Torque Trend Screen

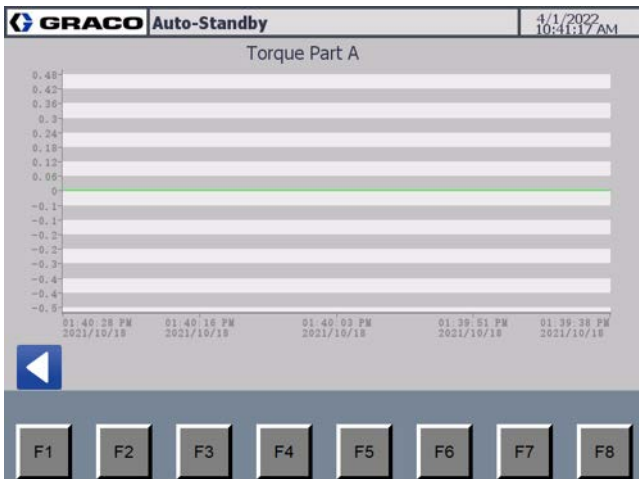



FIG. 14 Part A Torque Trend Screen

On the part A Torque Trend Screen, press 'F1' or select  to display the Automatic Main Screen.

This screen displays the motor torque trend of part A.

Part A Pressure Trend Screen

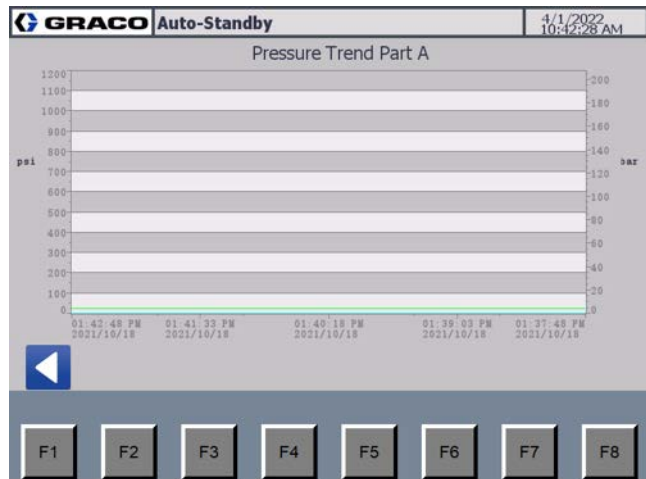



FIG. 16 Part A Pressure Trend Screen

On the Part A Pressure Trend Screen, press 'F1' or select  to display Automatic Main Screen.

This screen displays the pressure trend of part A.

Part B Torque Trend Screen

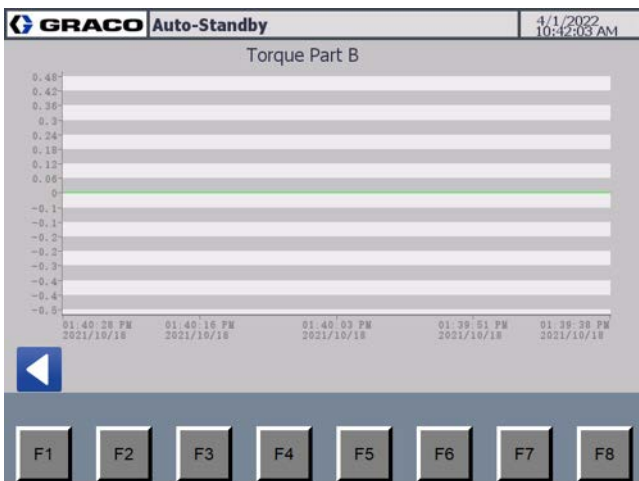



FIG. 15 Part B Torque Trend Screen

On the Part B Torque Trend Screen, press 'F1' or select  to display the Automatic Main Screen.

This screen displays the motor torque trend of part B.

Part B Pressure Trend Screen

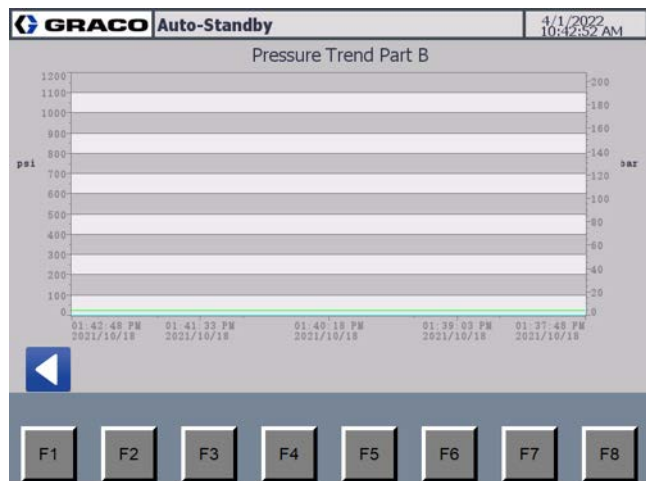



FIG. 17 Part B Pressure Trend Screen


On the Part B Pressure Trend Screen, press 'F1' or select  to display Automatic Main Screen.

This screen displays the pressure trend of part B.

Job Record Screen

PN	Work Time	Disp.Vol	Cycle time	ShotTimes
1	1/1/1970 12:00:00 AM	0.00cc	0.0s	0
2	1/1/1970 12:00:00 AM	0.00cc	0.0s	0
3	1/1/1970 12:00:00 AM	0.00cc	0.0s	0
4	1/1/1970 12:00:00 AM	0.00cc	0.0s	0
5	1/1/1970 12:00:00 AM	0.00cc	0.0s	0
6	1/1/1970 12:00:00 AM	0.00cc	0.0s	0
7	1/1/1970 12:00:00 AM	0.00cc	0.0s	0
8	1/1/1970 12:00:00 AM	0.00cc	0.0s	0
9	1/1/1970 12:00:00 AM	0.00cc	0.0s	0
10	1/1/1970 12:00:00 AM	0.00cc	0.0s	0

FIG. 18 Job Record Screen

On the Job Record Screen, press 'F1' or select  to display the Automatic Main Screen.


This screen displays the job records. It records the basic information of the latest 50 jobs. The data is displayed in reverse order. The most recent data is displayed at first. After more than 50 groups of data, the new group of data overwrites the earliest.

System Main Screen




FIG. 19 System Main Screen

On System Main Screen, the operator can switch the system to Automatic mode, Manual mode, Setup mode, Depressurization function or Advanced mode.

Click  to display System Information Screen.

Password



- If the password protection is set on **Advanced Setup Screen 1**, page 31, only 'Automation' is accessible. After entering the correct password and selecting , the operator can enter manual and setup screens.
- To open the Advanced mode, the operator should enter the password **1492**. The 'Advanced' appears after the password is entered.

System relief




This is for system relief. For details, see **Pressure Relief Procedure**, page 50.

System Information Screen





Fig. 20 System Information Screen

On the System Information Screen, press 'F1' or select  to display System Main Screen.
The system Information Screen shows the basic information of the system.

Manual Main Screen







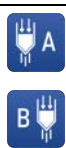





Fig. 21 Manual Main Screen

On the Manual Main Screen, press 'F1' or select  to display the System Main Screen. Press 'F8' or select  to display the Signal Check Screen (Manual).

The content and functions of this screen are as follows:

Manual Control icons

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. See Purge Setup Screen , page 34 for base purge settings.		Purge
	Manual pre-charge		Manual de-pressurization

'HOME'



Press 'F2' or select this to execute the command of returning to home point.

Current pressure

Pressure A
23.0 psi
Pressure B
23.0 psi

To show the current pressure of part A and B.

Dispense volume

Volume A
0.00 CC
Volume B
0.00 CC

To show current one shot volume for part A and B.

Part A:B volume ratio

A:B Vol ratio
1.00 :1

To show the dispense volume ratio of part A and B.

System working status

A UP	<input type="radio"/>
A Home	<input checked="" type="radio"/>
A Down	<input type="radio"/>
B UP	<input type="radio"/>
B Home	<input checked="" type="radio"/>
B Down	<input type="radio"/>
A Inlet	<input type="radio"/>
B Inlet	<input type="radio"/>
A Outlet	<input type="radio"/>
B Outlet	<input type="radio"/>

The green signal indicates the working status.

- A UP: piston of part A is at the highest limit.
- A Home: piston of part A is at home point.
- A Down: piston of part A is at the lowest limit.
- B UP: piston of part B is at the highest limit.
- B Home: piston of part B is at home point.
- B Down: piston of part B is at the lowest limit.

- A Inlet: Inlet valve of part A is open.
- B Inlet: Inlet valve of part B is open.
- A Outlet: Dispense valve of part A is open.
- B Outlet: Dispense valve of part B is open.

Purge and base purge volume

Purge Vol
0 CC
BasePurge Vol
0 CC

To display purge and base purge volume.

Motor torque

0.000		0.000
N.m		N.m

To show the motor torque of part A and B.

Error number

Error No.	1
-----------	---

To show the current error number. See **Appendix A - Error number message**, page 58 for details of error number.

Mode selection

Shot	▼
------	---

Click at the column to select shot mode or bead mode.

Shot size and rate

Shot size(cc)
0.0
Shot rate: cc/s
0.0

For shot mode, the operator can set shot size and rate. For bead mode, the operator can set shot rate. The settings in manual operation are not connected with automatic operation.

Other information

For other information, please see **Automatic Main Screen**, page 20.

Signal Check Screen (Manual)

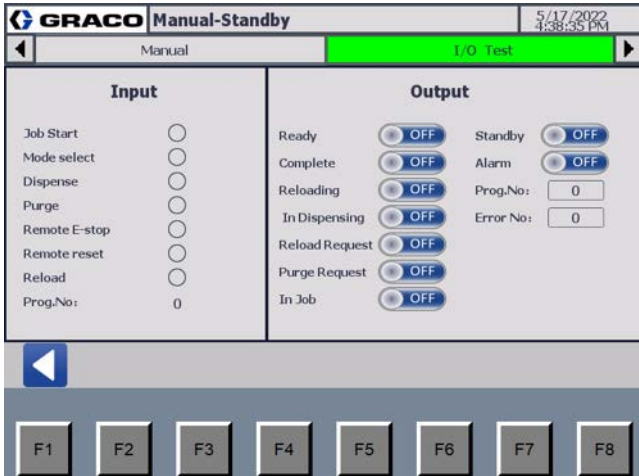



Fig. 22 Signal Check Screen (Manual)

On the Signal Check Screen (Manual), press 'F1' or select  to display the Manual Main Screen.




The Signal Check Screen (Manual) is to check if the system communication is correctly connected with the outside.

Setup Screen

Shot Setup Screen



Fig. 23 Shot Setup Screen

On the Shot Setup Screen, press 'F1' or select  to display the System Main Screen. Press 'F7' or select  to return to the previous screen. Press 'F8' or select  to continue to the next screen.

The content and functions of this screen are as follows:

- Select to set shot rate and shot size. If '0' is set, the system skips the program number and execute the following.
- The 'Prog.No' is the preset program number of 'Prog.select' for shot mode in automatic operation. See **Working mode**, page 21 for more details.
- The system supports 16 groups of settings.

Bead Setup Screen



FIG. 24 Bead Setup Screen

On the Bead Setup Screen, press 'F1' or select to display the System Main Screen. Press 'F7' or select to return to the previous screen. Press 'F8' or select to continue to the next screen.

The content and functions of this screen are as follows:

- Select to set dispense rate. If '0' is set, the system skips the program number and execute the following.
- The 'Prog.No' is the preset program number of 'Prog.select' for bead mode in automatic operation. See **Working mode**, page 21 for more details.
- The system supports 16 groups of setting.

Sequence Setup Screen



FIG. 25 Depressurization Setup Screen

On the Depressurization Setup Screen, press 'F1' or select to display the System Main Screen. Press 'F7' or select to return to the previous screen. Press 'F8' or select to continue to the next screen.

The system displays sequence setup screen when sequence mode is enabled. To enable sequence mode, see **Enable sequence mode**, page 32.

Sequence includes 16 steps maximum. Step 0 and step 15 are used to start job (Pre-charge) and end job (Depressurization). Operator can select functions including shot, bead, reload and not used. If the shot or bead function is selected, repeat time can be set (1-99).

De-pressurization Setup Screen

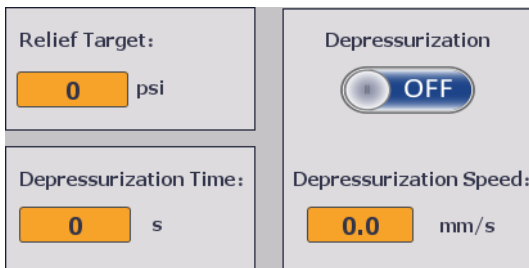


FIG. 26 De-pressurization Setup Screen

On the De-pressurization Setup Screen, press 'F1' or select to display the System Main Screen. Press 'F7' or select to return to the previous screen. Press 'F8' or select to continue to the next screen.

The content and functions of this screen are as follows:

De-pressurization setup



After the motor moves at the set 'Depressurization Speed' and reach the set 'Depressurization Target', the system completes de-pressurization. If the pressure does not reach the set 'Relief Target' in the set 'Depressurization Time', the de-pressurization fails.

- : This shows auto de-pressurization is on. That is, the system automatically execute de-pressurization after job. Click at this to close auto de-pressurization.
- : This shows auto de-pressurization is off. The operator needs to execute manual de-pressurization. Click at this to open auto de-pressurization.

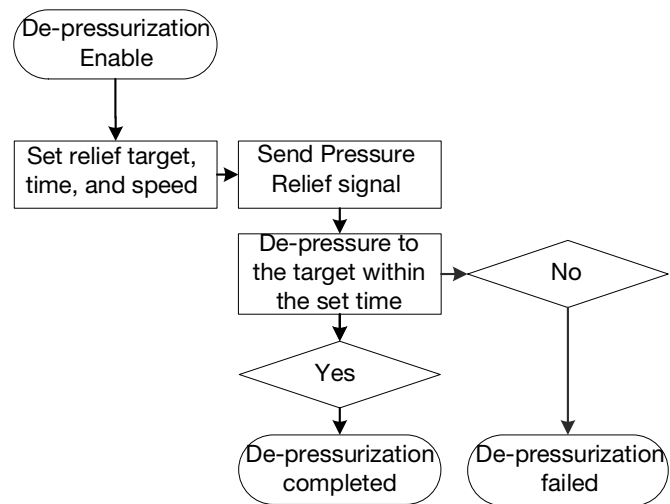
- Depressurization Target:** The system completes depressurization when it reaches the target pressure.

NOTE: Set different de-pressurization targets according to different materials. For detailed information, please contact your Graco distributor.

- Depressurization Time:** Set the maximum time in seconds for the system to perform de-pressurization. If de-pressurization exceeds the set time, de-pressurization fails and the system activates the alarm.
- Depressurization Speed:** Set the piston speed during de-pressurization.

De-pressurization in automatic operation mode

The following shows how to execute de-pressurization in automatic operation mode.



Advanced Setup Screen

Advanced Setup Screen 1

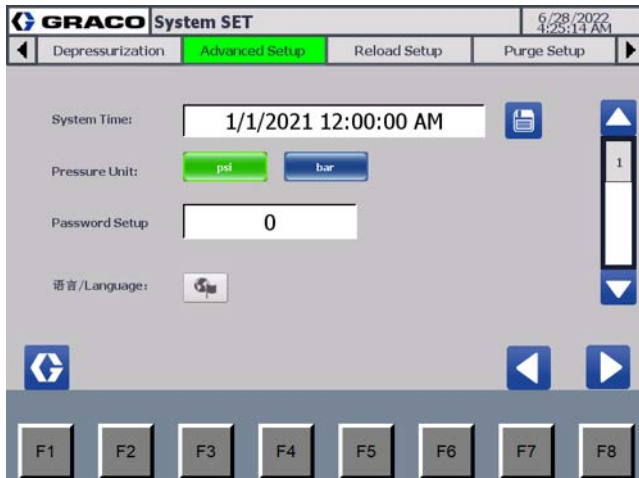


FIG. 27 Advanced Setup Screen - 1

On Advanced Setup Screen 1, select to display Advanced Setup Screen 2. Press 'F1' or select to display System Main Screen. Press 'F7' or select to return to the previous screen. Press 'F8' or select to continue to the next screen.

The content and functions of this screen are as follows:

System time

Click at the "System Time" column, set system time, and select to confirm the setting.

Pressure unit

Select 'psi' or 'bar' to customize the units used for pressure. The green color indicates the selected.

Password

If this function is selected, a 4-digit number should be set. After the 4-digit number is set, the operator must be prompted to input the password before visiting manual screens or setup screens.

Language

Select either Chinese (by selecting the Chinese flag) or English (by selecting British flag) to change the language used on the system's user interface.

Advanced Setup Screen 2

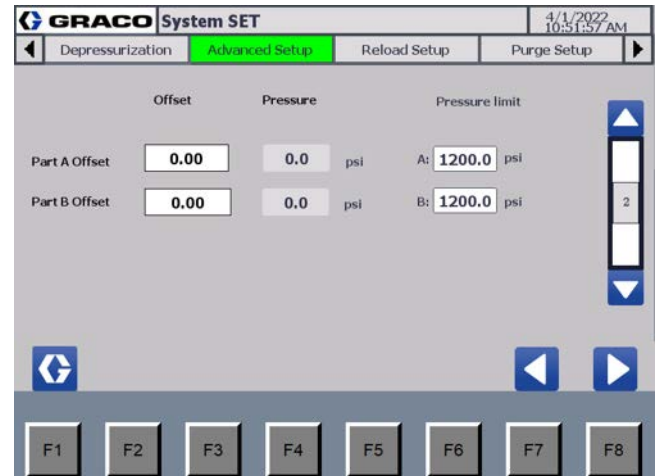


FIG. 28 Advanced Setup Screen - 2

On the Advanced Setup Screen 2, select to display the Advanced Setup Screen 1. Select to display the Advanced Setup Screen 3. Press 'F1' or select to display the System Main Screen. Press 'F7' or select to return to the previous screen. Press 'F8' or select to continue to the next screen.





The content and functions of this screen are as follows:

- Offset: The operator may input values to offset the pressure on the sensors.
- Pressure: To show the current pressure.
- Pressure limit: Set the maximum pressure for system operation. If the pressure exceeds the set value, the system will activate alarm.

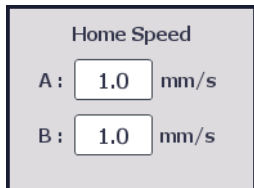
Advanced Setup Screen 3



Fig. 29 Advanced Setup Screen - 3

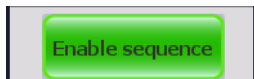
On the Advanced Setup Screen 3, select  to display the Advanced Setup Screen 2. Press 'F1' or select  to display the System Main Screen. Press 'F7' or select  to return to the previous screen. Press 'F8' or select  to continue to the next screen.

Home rate



Click to set the speed of homing for part A and part B.

Enable sequence mode



Green background color indicates sequence mode is selected. The system runs in sequence mode. In this mode, the operator can edit the working sequence (The sequence includes 16 steps maximum. The operator can edit step 1 to 14, as step 0 and 15 are tied to pre-charge and depressurization). When the system works in automatic status, the Customer Controller can send 'dispense' signal to start the sequence mode.

Check pressure after home



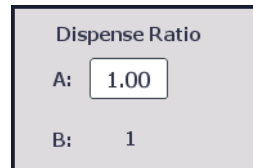
If this function is selected, the system displays green background color. System pressure will be checked when the piston is in the home position.

Select work mode



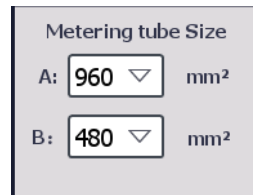
Click to select communication mode, including IO communication mode and Profinet communication mode.

Dispense ratio



Click to set the dispense ratio of part A and part B.

Pressure limit



Set the size of metering tube per real situation.

Reload Setup Screen

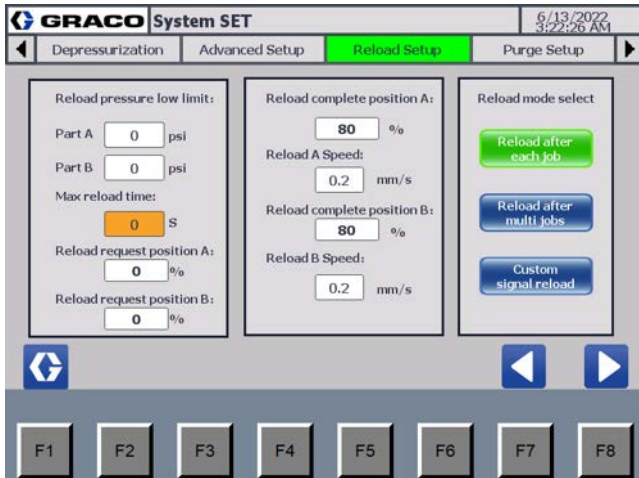



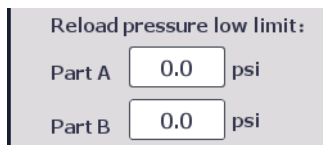


FIG. 30 Reload Setup Screen

On the Reload Setup Screen, press 'F1' or select  to display the System Main Screen. Press 'F7' or select  to return to the previous screen. Press 'F8' or select  to continue to the next screen.

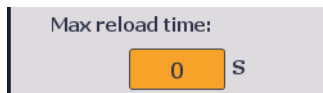
The content and functions of this screen are as follows:

Reload pressure setup



Set the minimum pressure when reloading. If the pressure does not reach the set 'Reload pressure low limit' in the set 'Max reload time', the reload fails. The system activates the alarm. If '0' is set, the reload pressure monitoring function is disabled.

Maximum reload time setup



It is enabled when '0' is not set in 'Reload pressure low limit'. If the pressure does not reach the set 'Reload pressure low limit' in the set 'Max reload time', the reload fails. The system activates the alarm.

Reload request setup



When the piston reaches the set 'Reload request position', the system sends out signal for reloading and executes reloading command per the setup reload type. Meanwhile, the system will not stop dispensing.

Reload completion setup



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 rate setup



Set the reload rate of part A and B separately.

Reload type setup



The selected reload type is shown as green color.

- Reload after each job: In this mode, the metering rods retract after every shot. This is the default setup.
- Reload after multi jobs: In this mode, the metering rods retract only when the metering rods reach the reload request position and the operator closes the 'Job Start' signal.
- Custom signal reload: In this mode, the metering rods retract only when the metering rods reach the reload request position and the operator sends 'Reload' signal.

Purge Setup Screen

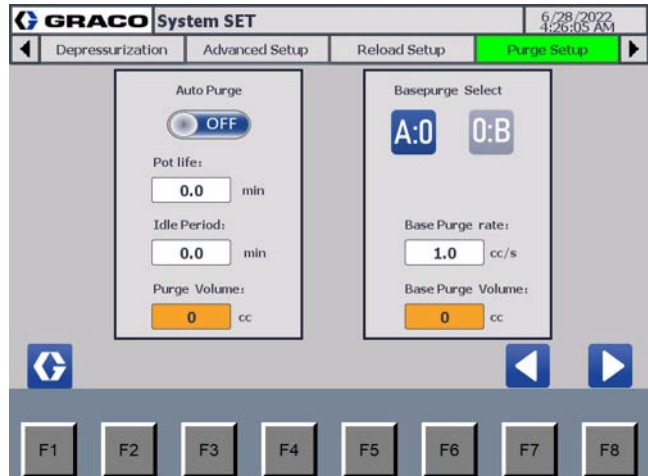
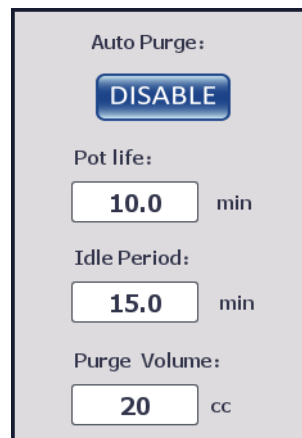


FIG. 31 Purge Setup Screen

On the Purge Setup Screen, press 'F1' or select to display the System Main Screen. Press 'F7' or select to return to the previous screen. Press 'F8' or select to continue to the next screen.

The content and functions of this screen are as follows:

Auto purge setup

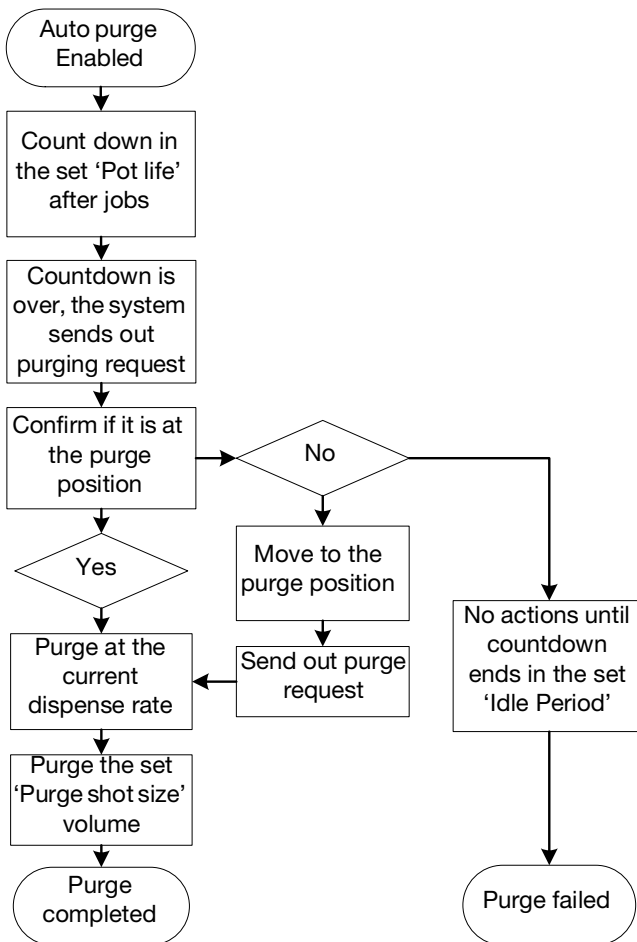


- : This shows that auto purge is open. That is, the system automatically starts to execute purge after jobs. Click at this to disable auto purge.
- : This shows that auto purge is closed. The operator needs to execute manual purge. Click at this to enable auto purge.

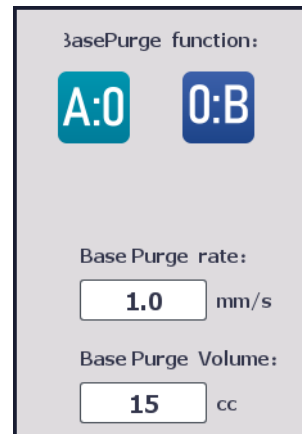
- Pot life: When the system completes jobs, the control box counts down from the set 'Pot life'. When it counts down to '0', the system activates the alarm of purging.
- Idle period: When the system completes jobs, the control box counts down from the set 'Idle Period'. When the time counts down to '0', purge fails.
- Purge shot size: set the total volume of purge.

Note: 'Idle period' restores to the set value after purge. If purge fails, the operator need to replace the mixing tube (if the materials are solidified), reset the alarm, and perform manual purge.

The automatic purge flow is as follows:



Base purge setup

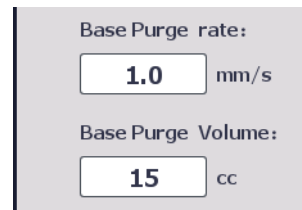



1. When executing base purge, select the base purge object of part A or part B.



- Green color indicates the selected. Meanwhile, the selected part is showed on the Manual Main Screen.

2. Set rate in 'Base Purge rate' and volume in 'Base Purge Volume'.



3. In Manual Main Screen, select the  to execute base purge.
 - Dispense is disabled after base purge, but the reload is available.
 - The operator needs to conduct manual purging after flushing, and confirm whether the base purge medium has been drained from the mixing tube.

Pre-charge Setup Screen

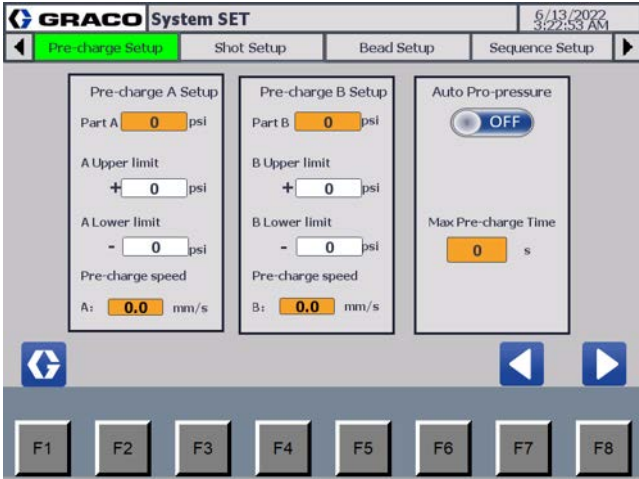


FIG. 32 Pre-charge Setup Screen

On the Pre-charge Setup Screen, press ‘F1’ or select to display the System Main Screen. Press ‘F7’ or select to return to the previous screen. Press ‘F8’ or select to continue to the next screen.

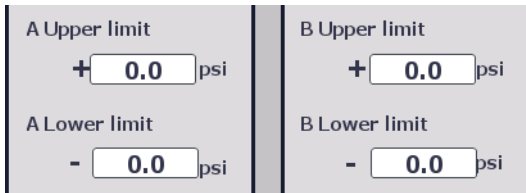
The content and functions of this screen are as follows:

Pre-charge target



Set the target value of pre-charge for Part A and B.

Pre-charge pressure scope



The operator may set the scope of pre-charge pressure. The system starts jobs when reaching the scope of pre-charge pressure.

- For upper limit: maximum pre-charge value = pre-charge target value + upper limit value.
- For lower limit: minimum pre-charge value = pre-charge target value - lower limit value.

Pre-charge speed

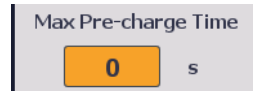


The operator may set pre-charge speed in mm/s. The system executes pre-charge at the set ‘Pre-charge speed’.

Open or close pre-charge

- : This shows auto pre-charge is on. That is, the system executes pre-charge progress after receiving ‘Job Start’ signal. Click at this to close auto pre-charge.
- : This shows auto pre-charge is off. The operator needs to conduct manual pre-charge. Click at this to open auto pre-charge.

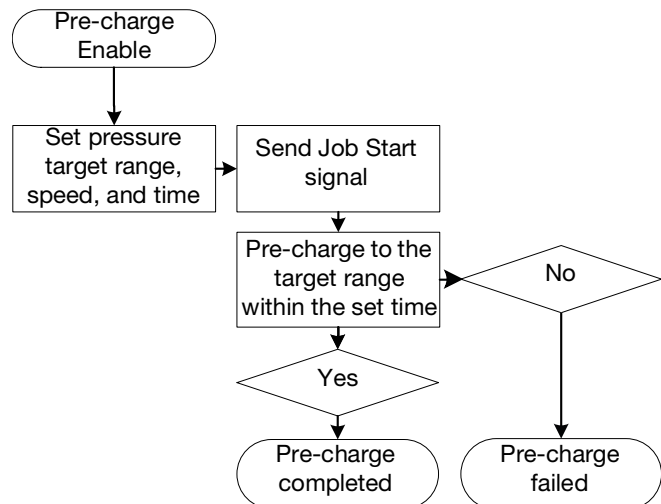
Maximum pre-charge time



The operator may set the maximum time in seconds that the system may spend in pre-charging. If pre-charging exceeds the set time, the system will activate the alarm to alert the operator the limit has been reached.

Pre-charge in automatic operation mode

Follow the steps to execute pre-charge in automatic operation mode.



Advanced Screen

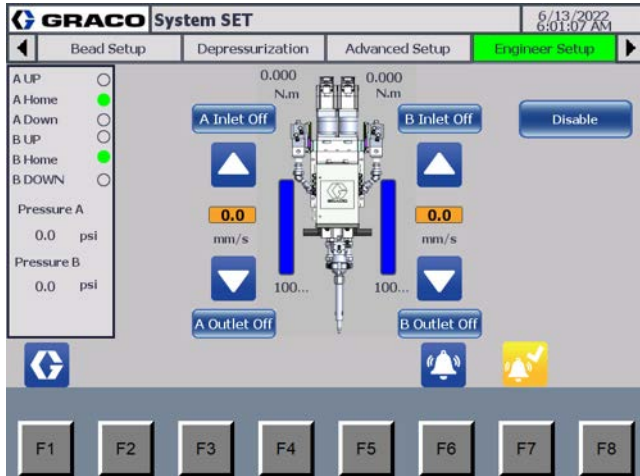



Fig. 33 Advanced Screen

On the Advanced Screen, press 'F1' or select  to display the System Main Screen. Advanced screen is dedicated to repairing and testing the system. After navigating to this screen, the logic relationship between the drive motor, reloading valves and dispense valves will be overrode and the operator may control each part individually. For this reason, only qualified personnel who have received equipment maintenance training should be authorized to navigate to this screen and perform system check.

The content and functions of this screen are as follows:

Open inlet valves



This shows that the inlet valves are closed. Select to open inlet valve A or inlet valve B.

Close inlet valves



This shows that the inlet valves are open. Select to close inlet valve A or inlet valve B.

Open outlet valves



This shows that the outlet valves are closed. Select to open outlet valve A or outlet valve B.




Close outlet valves



This shows that the outlet valves are open. Select to close outlet valve A or outlet valve B.

Piston movement speed



- Select  to set movement speed of piston.
- Select  to control the piston to move up. Select  to control the piston to move down.

Servo disabled



Select this to close servo. Parameters of servo can be modified when servo is closed.

Operation

Prime the system



This equipment stays pressurized until pressure is manually relieved. To help prevent serious injury from pressurized fluid, such as skin injection and splashing, keep fingers and other body parts away from the spray tip.

To avoid injury from toxic fluids or fumes, such as splashing in the eyes or on skin, wear appropriate personal protective equipment.

NOTE: If the material is with low viscosity. You may flip the system outlet valve to the top, and then prime the system.

1. Load material A and B to the supply pump.
2. Check and open main air slider valves on both sides of supply pump A and B.

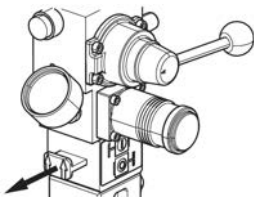


FIG. 34 Open Air Slider Valves

3. Pressurize the A and B Material Feed System (E and F, page 7). Set the air motor regulator to 20 psi.
4. Open the air motor slider valve.

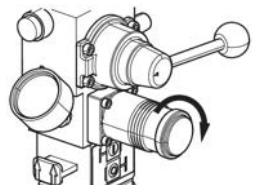


FIG. 35 Set Air Regulator

5. Turn on the Main Power Switch (BD, page 9) of the PR-Xv Control Box (G, page 7).

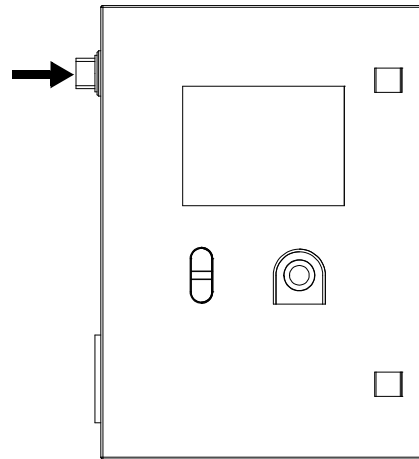


FIG. 36 Main Power Switch of Control Box

6. Press “Start” on the Start Center Screen and wait to go to the Automatic Main Screen.

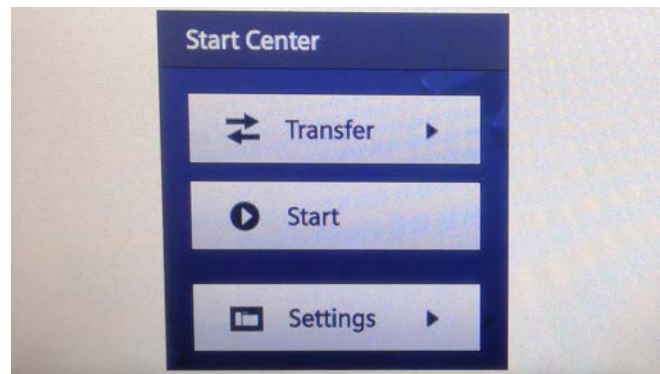


FIG. 37 Start Center Screen

- Pull up the E-stop Button (BC, page 9). Then press the green button of Control Power On/Off Buttons (BB, page 9) to turn on the power for the PR-Xv Drive Assembly (AD, page 8).

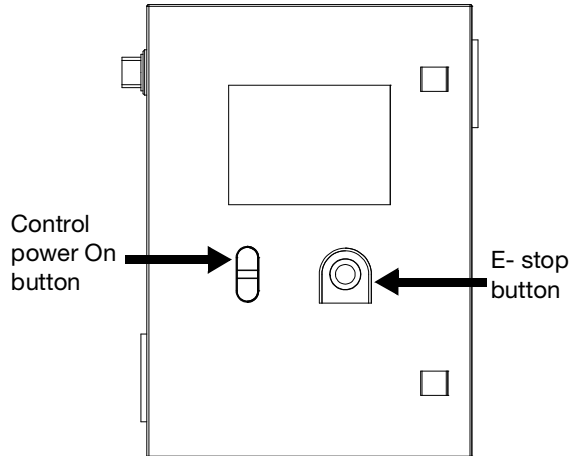


FIG. 38 Control Power On and E- Stop Buttons

- Press on the Automatic Main Screen for about 3 seconds.

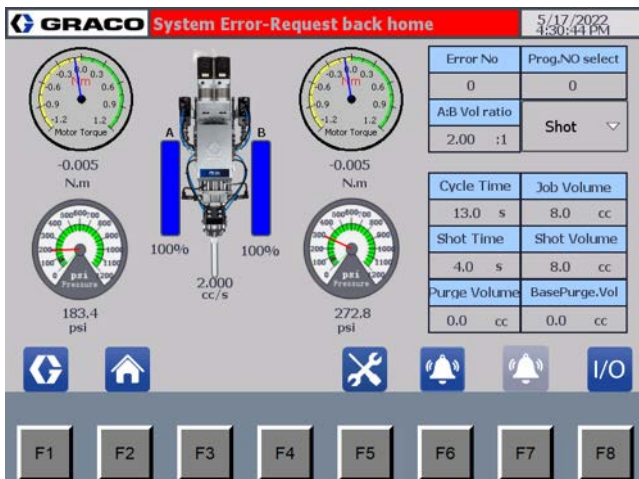


FIG. 39 Automatic Main Screen

- Press on the Automatic Main Screen to execute "Home". Message of "Auto-Back Home" in the information bar indicates successful "Home".
- When information bar displays "Standby", press to display System Main Screen.



FIG. 40 System Main Screen

- On the System Main Screen, enter "1492" at the "Password" column and press to display **Advanced** selection.
- Press **Advanced** to display Advanced Screen.

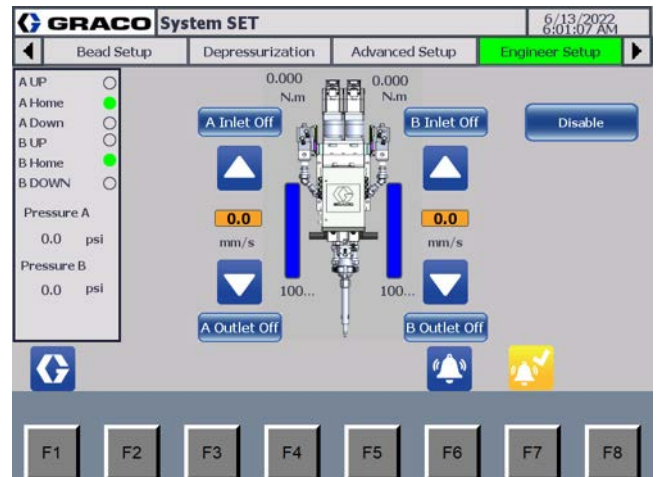


FIG. 41 Advanced Screen

- Remove the night cap from the TC Dispense Valve (AB, page 8).

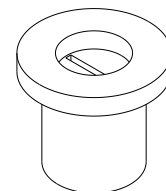
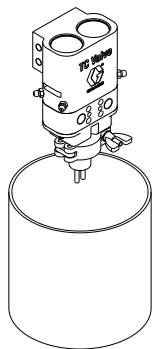
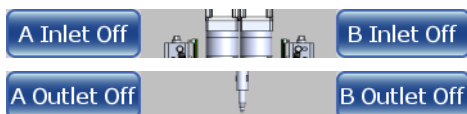


FIG. 42 Night Cap

- Put a waste container under the dispense valve.






15. On the Advanced Screen, select “A Inlet Off”, “B Inlet ON”, “B Outlet Off”, “B Outlet Off” to open input and dispense valves of part A and B.



16. Wait for part A and B to dispense in continuous and stable flow. Then select "A Outlet ON" and "B Outlet ON" to close the Dispense Valves of part A and B.



17. Press  on the Advanced Screen to display System Main Screen.

18. On the System Main Screen, press **Parameter Setup** to display setup screens. Press  to go to “Advanced Setup Screen 1” and press  to go to “Advanced Setup Screen 3”. Check Home Speed, Metering tube Size and Dispense Ratio.

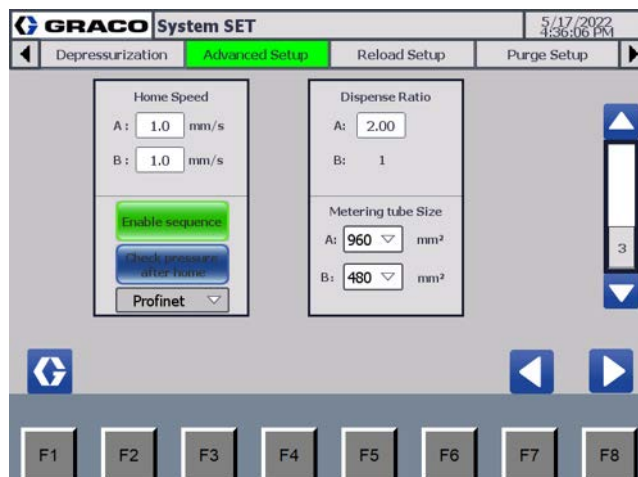



FIG. 43 Advanced Setup Screen 3

19. Press  to display the Reload Setup Screen. Set and check reload rate of part A and B.

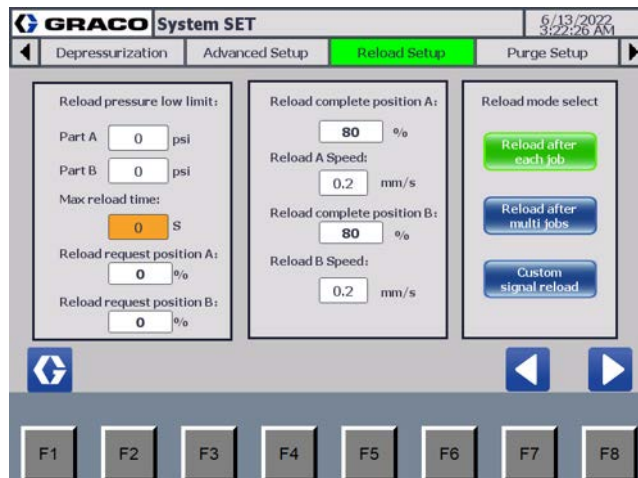



FIG. 44 Reload Setup Screen

20. Press  on the Advanced Setup Screen to display System Main Screen. Then press **Manual** on the System Main Screen to display Manual Main Screen.

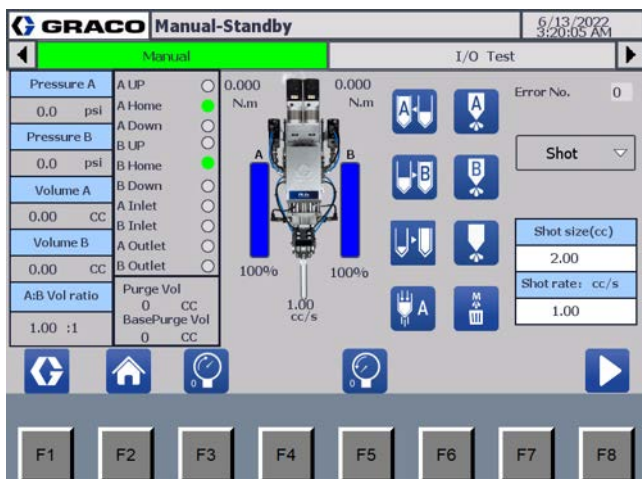





Fig. 45 Manual Main Screen

21. On the Manual Main Screen, set the shot size to 100 cc (1:1 version system) or 75 cc (2:1 version system), and shot rate about 1cc/s. Adjust the settings based on the material viscosity.
22. Press  to execute home and reloading. Then press  to purge out materials, and repeat for three or four times to ensure there is no air in the system.
23. Press  to display System Main Screen. On the System Main Screen, press **Automation** to display Automatic Main Screen. The system is ready for jobs.

Daily start up



This equipment stays pressurized until pressure is manually relieved. To help prevent serious injury from pressurized fluid, such as skin injection and splashing, keep fingers and other body parts away from the spray tip.

To avoid injury from toxic fluids or fumes, such as splashing in the eyes or on skin, wear appropriate personal protective equipment.

For daily start of the system, follow the below steps.

1. Turn on the air for the supply pump and PR-Xv Metering Unit. Check the air pressure for the supply pump.
2. Remove the night cap from the TC Dispense Valve (AB, page 8).

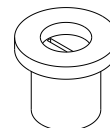


Fig. 46 Night Cap

3. Turn on the Main Power Switch (BD, page 9) of PR-Xv Control Box (G, page 7).

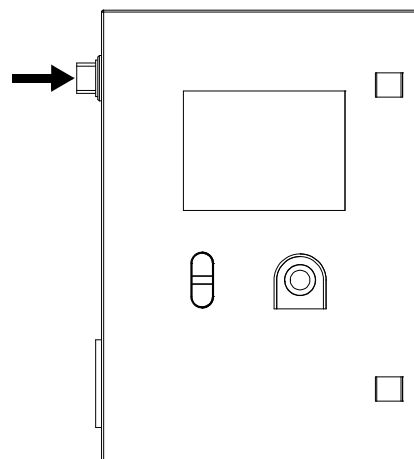


Fig. 47 Main Power Switch of Control Box

4. Press “Start” on the Start Center Screen and wait to go to the Automatic Main Screen.

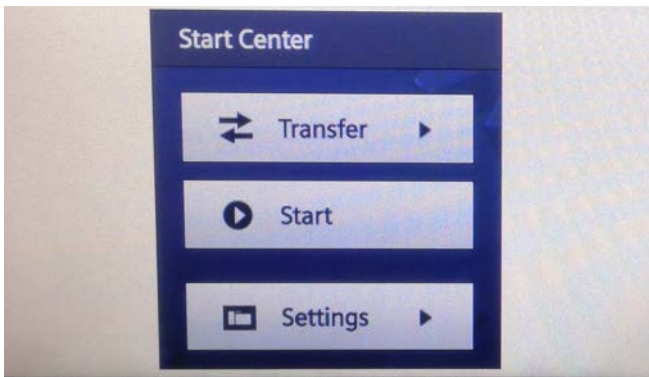


FIG. 48 Start Center Screen

5. Pull up the E-stop Button (BC, page 9). Then press the green button of Control Power On/Off Buttons (BB, page 9) to turn on the power for the PR-Xv Drive Assembly (AD, page 8).

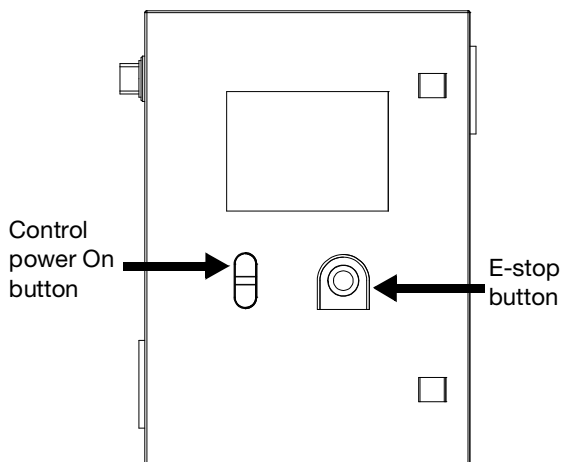




FIG. 49 Control Power ON and E-stop Buttons

6. Place a waste container below the TC Dispense Valve (AB, page 8).
7. Press  on the Automatic Main Screen for about 3 seconds. Then press  to execute "Home" order. Message of "Auto-Back Home" in the information bar indicates successful "Home" order.

If the PR-Xv system is connected with robot or motion table, follow the steps 8 to 14. **If the PR-Xv system is used independently**, follow the steps 15 to 24.

For connection of robot or motion table: Follow steps 8 to 14.

8. on the Automatic Main Screen, select "Shot" for control mode, and purge out materials about 1 to 2 cc.
9. Install the ratio check nozzle onto the TC Dispense Valve (AB, page 8).

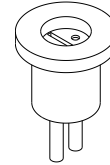


FIG. 50 Ratio Check Nozzle

10. Dispense into a waste container to prime the ratio check nozzle.
11. Perform **Ratio Check Procedure**, page 44.
12. Remove the check nozzle and install Static Mixer Package (AA, page 8) to TC Dispense Valve (AB, page 8).

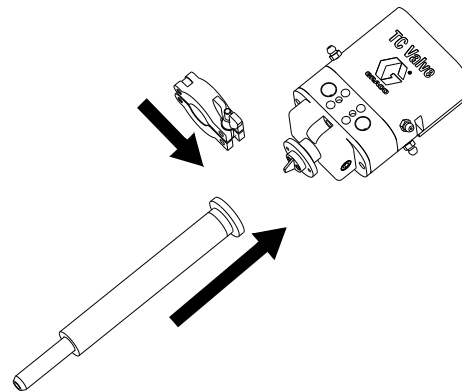



FIG. 51 Install Static Mixer Package

13. Dispense into a waste container to prime the static mixer package.
14. On the Automatic Main Screen, select the correct control mode and get ready for running the system.

For independent use of PR-Xv system: follow steps 15 to 24.

15. On the Advanced Setup Screen, press  to display System Main Screen. On the System Main Screen, press **Manual** to display Manual Main Screen.

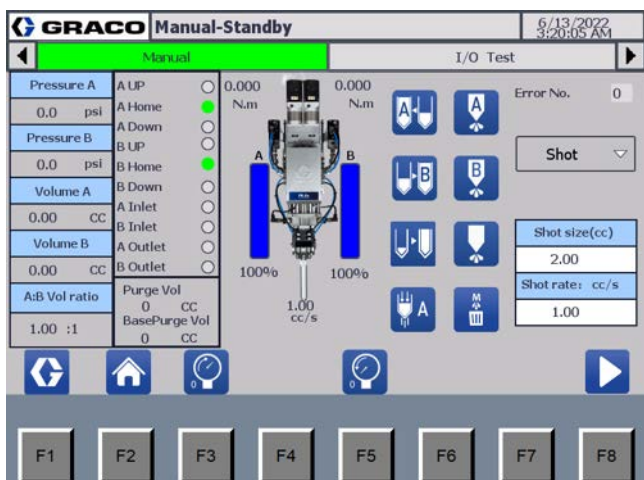



FIG. 52 Manual Main Screen

16. On the Manual Main Screen, select the “Shot” control mode and then press  to purge out materials.
17. Install the ratio check nozzle onto the TC Dispense Valve (AB, page 8).

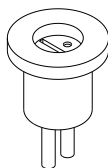




FIG. 53 Ratio Check Nozzle

18. Dispense into a waste container to prime the ratio check nozzle.
19. Execute procedure of reload > Pre-charge > shot dispense by pressing  >  for several times until there is no air in the system.
20. Perform **Ratio Check Procedure**, page 44.
21. Remove the ratio check nozzle and install Static Mixer Package (AA, page 8) to TC Dispense valve (AB, page 8).

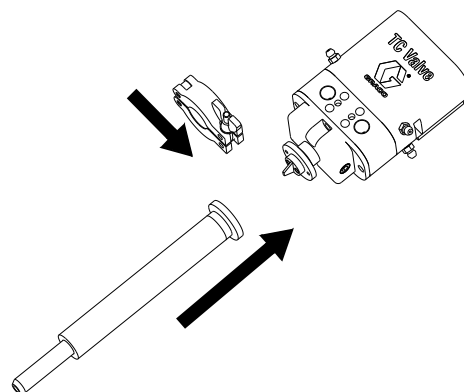



FIG. 54 Install Static Mixer Package

22. Dispense into a waste container to prime the Static Mixer Package (AA, page 8).
23. Press  to display System Main Screen. Then press **Automation** to display Automatic Main Screen.
24. On the Automatic Main Screen, select the correct control mode and get ready for running the system.

Ratio Check Procedure

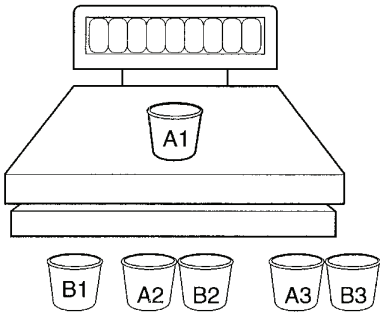


This equipment stays pressurized until pressure is manually relieved. To help prevent serious injury from pressurized fluid, such as skin injection and splashing, keep fingers and other body parts away from the spray tip.

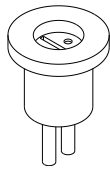
To avoid injury from toxic fluids or fumes, such as splashing in the eyes or on skin, wear appropriate personal protective equipment.

Perform the Ratio Check Procedure at startup and after rebuild.

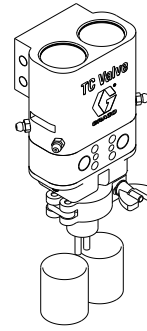
1. Weigh several small cups and label as indicated. Record weights.



2. Remove Static Mixer Package (AA, page 8) or night cap from TC Dispense Valve (AB, page 8).
3. Install the ratio check nozzle onto the TC Dispense Valve (AB, page 8).



4. Dispense into a waste container to prime the ratio check nozzle.
5. Place cups as indicated under ratio check nozzle and cycle the metering unit one time.



6. Repeat until all three sets of cups have been used.
7. Re-weigh all cups and record weights.
8. Subtract weight of empty cups from weight of filled cups to get material weights.
9. Complete ratio calculations.

The following formula can be used when the density or specific gravity of both the “A” and “B” components are known and only one of the ratios:

$$\frac{\text{Weight Ratio}}{\text{Volume Ratio}} = \frac{\text{Specific Gravity}}{\text{Specific Gravity}}$$

Example:

A material has a weight ratio of 10:1, the “A” material has a specific gravity of 1.20 and the “B” material has a specific gravity of 1.00. To calculate volume ratio:

$$\frac{10:1}{\text{Volume Ratio}} = \frac{1.20}{1.00}$$

$$\text{Volume Ratio} = \frac{10}{1.20}$$

$$\text{Volume Ratio} = 8.33:1$$

NOTE:

If ratio calculations result in NG. Please confirm:

- Make sure the material pressure of part A and part B is balanced.
- There are no air bubbles in the material.

Repeat steps 1 to 8 till the ratio calculations succeed.

Software update

SD card (2000359) is applied to update the software, or change the system from I/O communication mode to Profinet communication mode.

Insert the SD card in the indicated slot to complete software update. If necessary, set the IP address after software update.

NOTE: Do not remove the SD card once it is inserted into the control box, because the control box can not work without the SD card.

Insert the SD card

1. Turn off the control box power.
2. Open the cover of the SD card inserting position.
3. Insert the SD card.

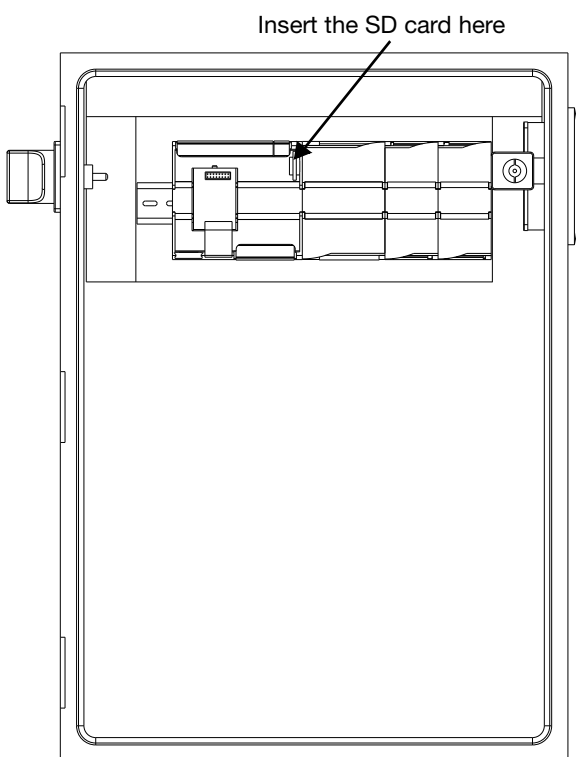


FIG. 55 Insert the SD Card

Change the IP address

After inserting the SD card or establishing Profinet communication mode, the data on the screen may be displayed as #####.

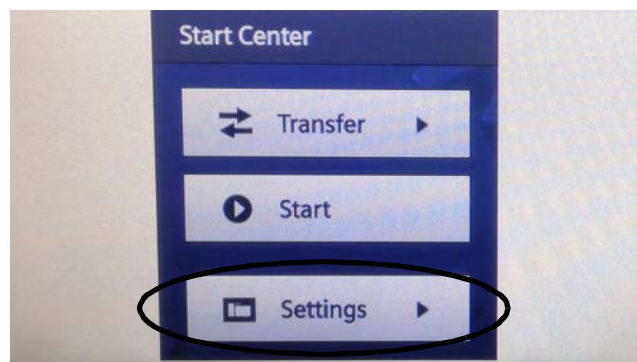
In this case, it is necessary to edit communication connections and make sure the network settings for

Profinet mode are in the subnet with HMI and PLC IP address.

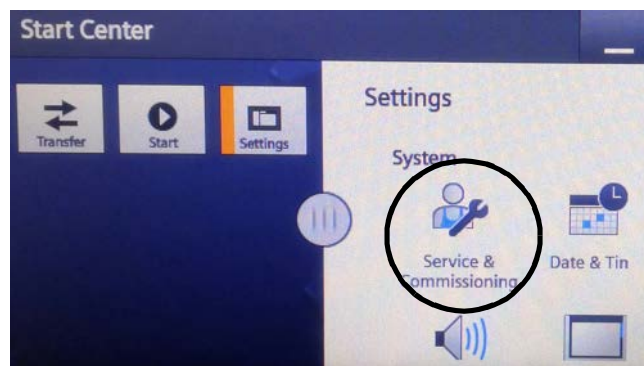
For operation instructions, see **Edit communication connections**, page 45, and **Edit network settings**, page 47.

Edit communication connections

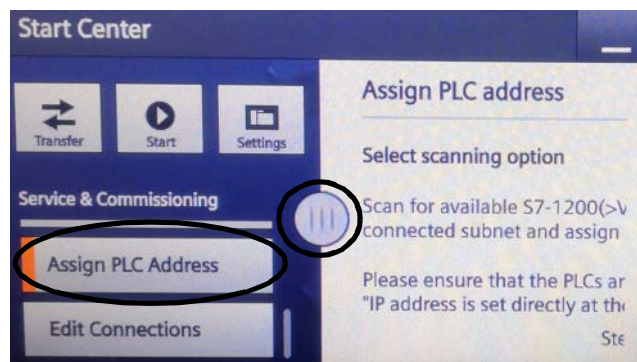
1. Start PR-Xv control box and push 'Settings' on the 'Start Center' screen.



2. Select 'Service & Commissioning' on the 'Settings' screen.

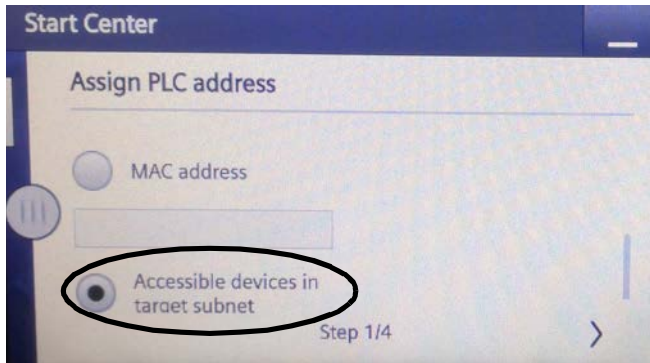


3. Select 'Assign PLC Address' from the 'Service & Commissioning' list, then touch the cycle in the middle of screen to see complete information.

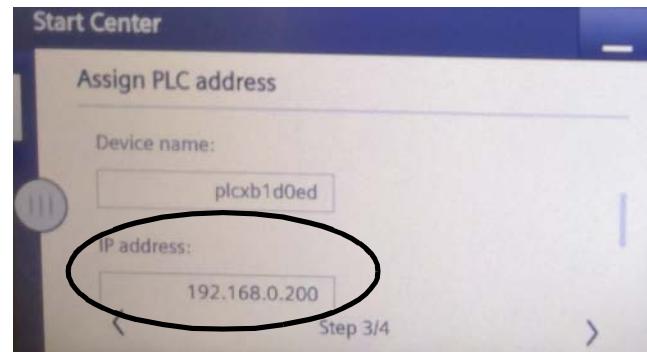


Operation

4. Select 'Accessible devices in target subnet' on the 'Step 1/4' screen. Then select '>' to proceed to the next screen.

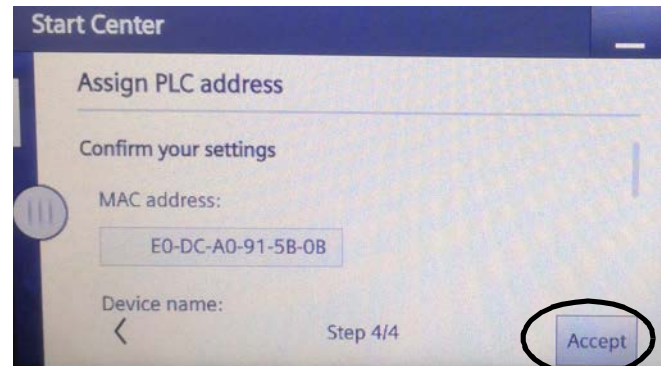
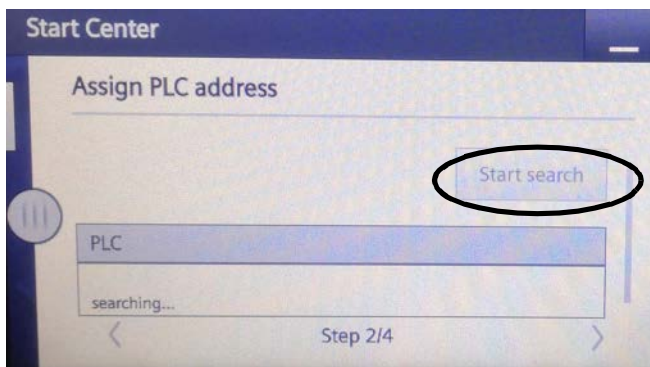


6. Edit IP address directly on the 'Step 3/4' screen. Then select '>' to proceed to the next screen.

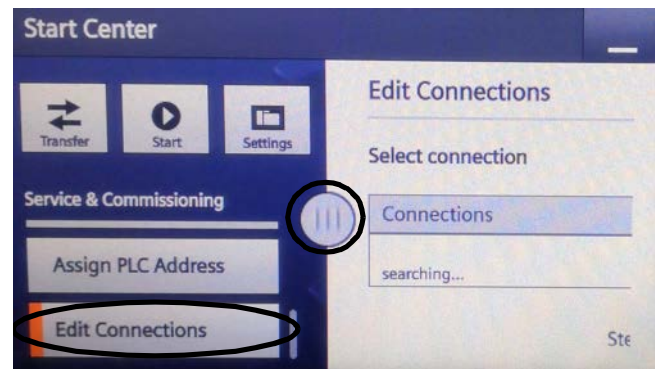
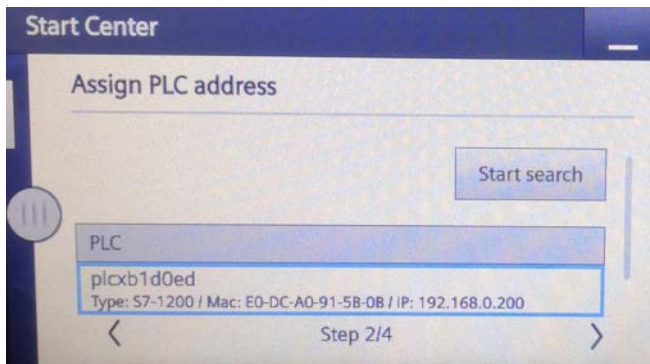


5. Select 'Start search' on the 'Step 2/4' screen, HMI will then find PLC in the Net. Select the device with the IP address you want to change. Then select '>' to proceed the next screen.

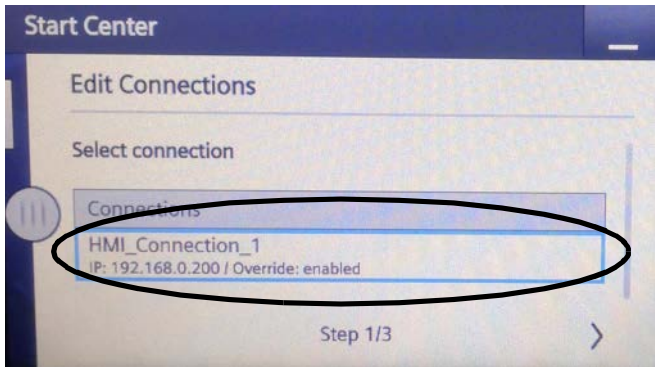
7. Choose 'Accept' on the 'Step 4/4' screen.



8. Select 'Edit Connections' from the 'Service & Commissioning' list. Next, touch the middle cycle to open the whole screen.



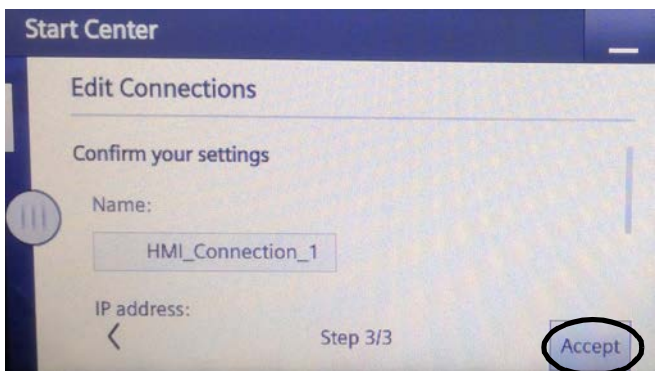
9. Select 'HMI_Connection_1' on the 'Step 1/3' screen. Then select '>' to proceed to the next screen.



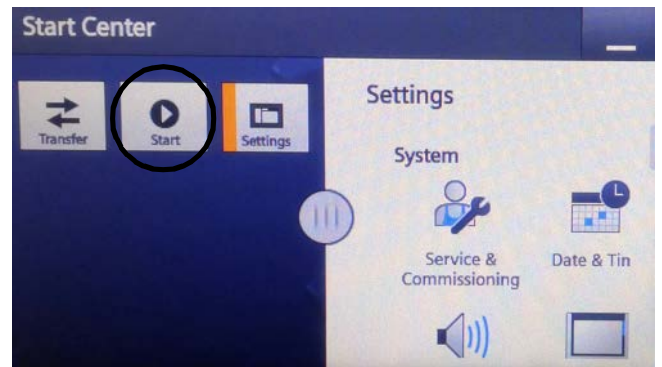
10. Select 'ON' for the 'Override' item on the 'Step 2/3' screen. Then select '>' to proceed to the next screen.



11. Select 'Accept' on the 'Step 3/3' screen.

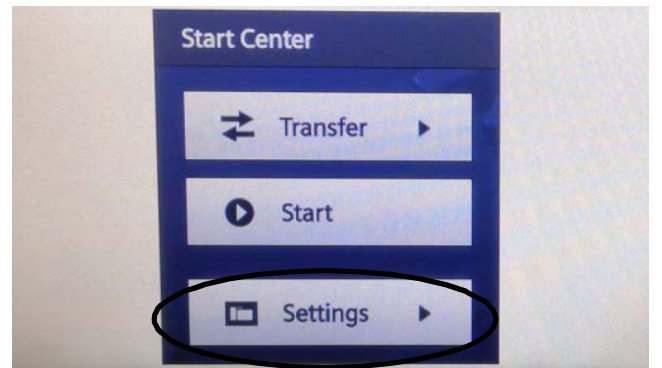


12. Return to the 'Start Center' screen and restart HMI before HMI IP address setup.

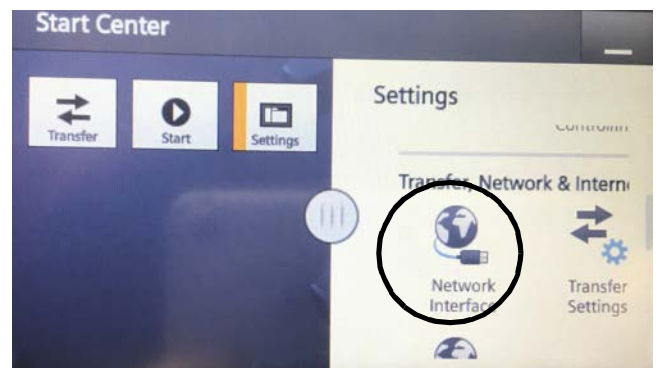


Edit network settings

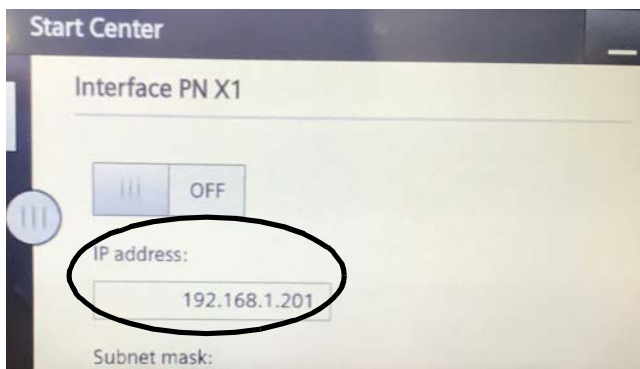
1. Start PR-Xv control box and select 'Settings' on the 'Start Center' screen.



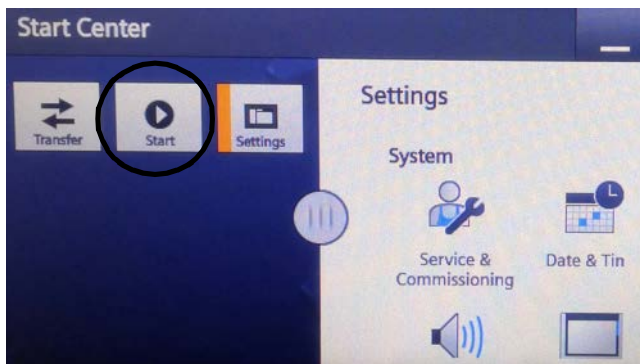
2. Select 'Network Interface' on the 'Settings' screen.



3. Edit IP address directly from the 'Network Interface' screen.



4. Return to the 'Start Center' main screen and restart HMI.



Shut down



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 **Pressure Relief Procedure**.

To avoid injury from toxic fluids or fumes, such as splashing in the eyes or on skin, wear appropriate personal protective equipment.

Standard shutdown

1. Make sure the system finishes the current job. The dispense valve closes after a job.
2. Remove Static Mixer Package (AA, page 8) from TC Dispense Valve (AB, page 8).

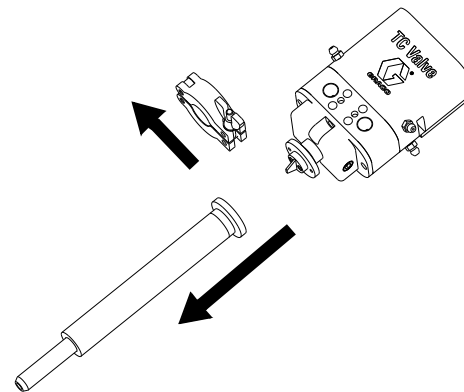
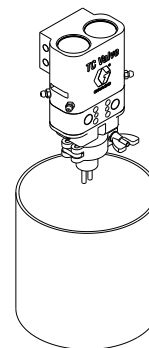


Fig. 56 Remove Static Mixer Package

3. Place a waste container below the TC Dispense Valve (AB, page 8) and activate a small shot to flush the mixed material out of the valve.



4. Perform the **Pressure Relief Procedure**, page 50.

5. Press E-stop Button (BC, page 9).
6. Turn off the Main Power Switch (BD, page 9) of the PR-Xv Control Box (G, page 7).

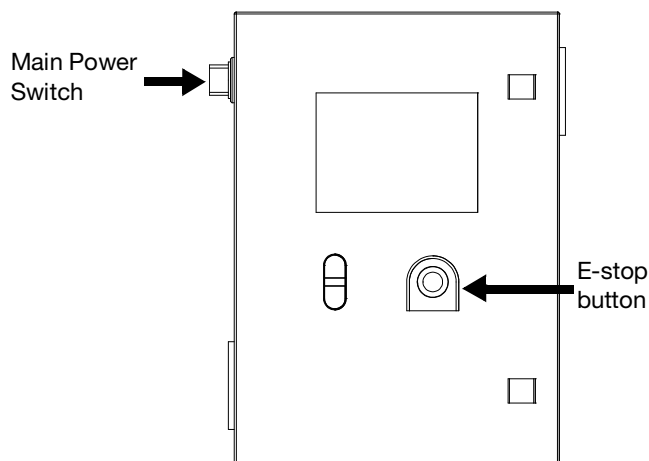


FIG. 57 Power Switch and E-stop Button

7. Wipe the nose piece with a clean rag. Be careful to avoid contact between dispense materials.
8. Install the PTFE night cap and retaining nut on the TC Dispense Valve (AB, page 8).

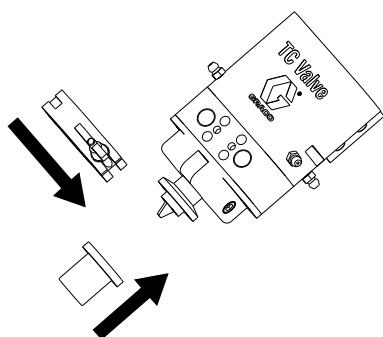



FIG. 58 Install Night Cap

9. Turn off the air supply.

Short-time shutdown

Base purge is used for short-time shutdown when the material have long pot life.

1. Make sure the system finishes the current job. The dispense valve closes after a job.
2. Go to the System Main Screen. Press **Parameter Setup** to display setup screens.
3. Press  to go to the Purge Setup Screen. Check “Base Purge function”, “Base Purge rate”, and “Base Purge Volume”.

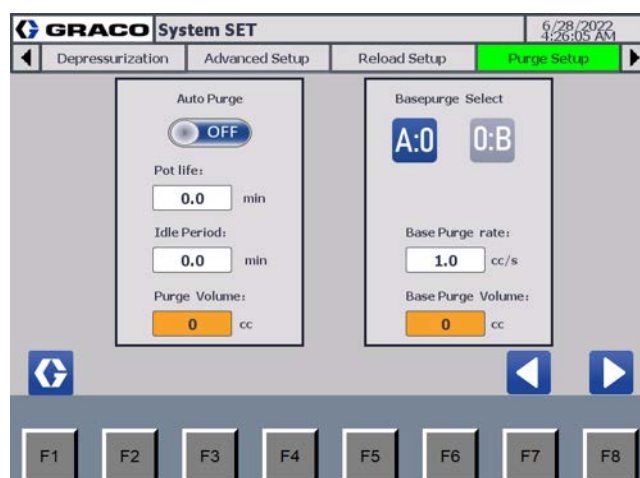






FIG. 59 Purge Setup Screen

4. Press  to display System Main Screen. Then press **Manual** to display Manual Main Screen.
5. Place a waste container below the TC Dispense Valve (AB, page 8).
6. On Manual Main Screen, press  or  (see **Base purge setup**, page 35 to know whether part A or B is selected). The system starts to flush the mixer with one component material. The system finishes base purge till it displays completion on the information bar.
7. Clean the needle and remove the waste container.

Run the system after short-time shutdown

1. Place a waste container below the TC Dispense Valve (AB, page 8).
2. On the Manual Main Screen, press  to prime the static mixer.
3. When the materials are stable out of the Static Mixer Package (AA, page 8), go to the Automatic Main Screen.
4. Select correct control mode to run the 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 Procedure** when you stop dispensing and before cleaning, checking, or servicing the equipment.


1. Make sure the system finishes the current job. The dispense valve closes after a job.
2. Remove Static Mixer Package (AA, page 8) from TC Dispense Valve (AB, page 8).
3. Close the Bleed-type Master Air Valve (D, page 7).
4. Place a waste container below the TC Dispense Valve (AB, page 8).
5. Go to the System Main Screen.




FIG. 60 System Main Screen

6. Press . The pressure in real time will be displayed. The system will identify whether the inlet valve is closed. If the inlet valve is opened, it will be

closed. Then the dispense valve will be opened. The whole system pressure is relieved.

	Pressure A
	0.0 psi
	Pressure B
	0.0 psi

7. Wait for the system to relief until pressure of A and B drops in a safety range. Select  again to finish system relief.
8. Turn off the system power and the air supply after system relief finishes.

Flush the equipment



To avoid fire and explosion, always ground equipment and waste container. To avoid static sparking and injury from splashing, always flush at the lowest possible pressure.

- Flush out old fluid with compatible solvent before introducing a new fluid.
- Use the lowest possible pressure when flushing.
- All fluid components are compatible with common solvents.
- To flush the system, put a waste container below the TC Dispense Valve (AB, page 8), and circulate a compatible solvent through the system for several times until the TC Dispense Valve dispenses the compatible solvent. Then drain the compatible solvent.

Maintenance

Preventive Maintenance

There is a grease filled secondary seal/bearing area on each valve shaft (TC Dispense Valve (AB, page 8) and Inlet Valve (AE, page 8). Every 10,000 cycles or twice each month, new grease should be flushed across this area.

To grease the valve:

1. Remove the fitting from each side of the front or back of the valve. For the detailed information, please check TC Dispense Valve Instruction and

Parts Manual 3A9283 and 1K Ultra-Lite Instructions and Part List Manual 308876.

2. Pump grease (115982) with grease gun (117792) across the valve until clean grease comes out the other side.
3. Reinstall the fitting.

NOTE: The maintenance schedule changes with different material types and actual machine using situations.


Maintenance Schedule

Item	Task	Daily	Monthly	Quarterly	Semiannually	Yearly
1	Check the power and air pressure for the system.	✓				
2	Clean and replace the static mixer.	✓				
3	Inject grease to the lubricated kits of the PR-Xv Metering Unit (J, page 7).		✓			
4	Clean and inject grease to the Inlet Valve (AE, page 8) and the TC Dispense Valve (AB, page 8).		✓			
5	Check the Piston Observation Hole (AH, page 8) of the PR-Xv Metering Unit (J, page 7).		✓			
6	Check and tighten the screws and nuts of the moving parts.			✓		
7	Replace the seal kits of the Inlet Valve (AE, page 8) and the TC Dispense Valve (AB, page 8).			✓		
8	Replace the rods and needles of the Inlet Valve (AE, page 8) and the TC Dispense Valve (AB, page 8).				✓	
9	Replace pistons and O-rings of the PR-Xv Metering Unit (J, page 7).				✓	
10	Calibrate the pressure sensor.				✓	
11	Replace the metering tube.					✓

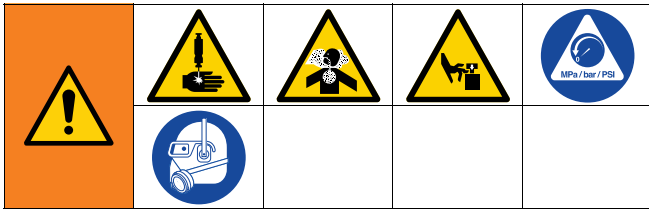
Recycling and Disposal

End of Product Life

At the end of the product's useful life, dismantle and recycle it in a responsible manner.

- Perform the **Pressure Relief Procedure** on page 50.
- Drain and dispose of fluids according to applicable regulations. Refer to the material manufacturer's Safety Data Sheet.
- Remove motors, circuit boards, LCDs (liquid crystal displays), and other electronic components. Recycle according to applicable regulations.
- Do not dispose of electronic components with household or commercial waste. 
- Deliver remaining product to a recycling facility.

Troubleshooting



1. Follow **Pressure Relief Procedure**, page 50, before checking or repairing the system.
2. Check all possible remedies before disassembling the equipment.
3. Turn off and disconnect all power.

Problem	Cause	Solution
Display (BA, page 9) module completely dark	No power	Verify Main Power Switch (BD, page 9) and Control Power Buttons (BB, page 9) are ON
	Thrown breaker	Check machine breakers and reset
	Loose connection	Tighten screen data cable
	Bad display module	Replace display module
No or incorrect amount of material dispensed from either side	TC Dispense Valve (AB, page 8) closed	Verify if dispense valve works normally and supply air pressure is within range
	Needle or Static Mixer Package (AA, page 8) clogged	Replace needle or Static Mixer Package (AA, page 8)
	Supply pump ball valve closed (if installed)	Open ball valve
	Cartridge or pail empty	Exchange cartridge or pail
	Supply pump clogged	Clean supply pump
	Air in PR-Xv Metering Unit	Purge and prime the system
Significant material leaking from pump seal	Pump shaft and/or shaft seal worn	Remove pump shaft assembly and reinstall pump rebuild kit

Problem	Cause	Solution
Material weight incorrectly dispensed	Needle or Static Mixer Package (AA, page 8) clogged	Replace needle or Static Mixer Package (AA, page 8). Incorporate purge timer or decrease purge timer delay to prevent Static Mixer Package (AA, page 8) blockage
	TC Dispense Valve (AB, page 8) or fluid lines clogged	Clean TC Dispense Valve (AB, page 8) or fluid lines
	TC Dispense Valve (AB, page 8) opened or closed incorrectly	<ol style="list-style-type: none"> 1. Verify TC Dispense Valve's (AB, page 8) inlet air pressure. 2. Inspect TC Dispense Valve (AB, page 8) air cylinder and adapters for leaks.
	Input air reduced or removed	Reconnect input air line to system. Increase air pressure regulator adjustment.
	Supply pump ball valve not closed (if installed)	<ol style="list-style-type: none"> 1. Inspect supply pump ball valve for wear and tear. 2. Verify rotary cylinder inlet pressure.
	Inlet valve (AE, page 8) leaking (if installed)	Inspect needle and seal components
	Piston worn out or broken	Replace piston
Leakage from Static Mixer Package (AA, page 8) tip	Air in Static Mixer Package (AA, page 8)	Slow speed purging
	TC Dispense Valve (AB, page 8) not closed	<ol style="list-style-type: none"> 1. Verify TC Dispense Valve's (AB, page 8) inlet air pressure. 2. Clean blockage between needle and seat. 3. Verify solenoid valve status.
	TC Dispense Valve (AB, page 8) needle and/or seat worn out (pressure reduces after closing the valve)	Replace TC Dispense Valve (AB, page 8) needle and/or seat
	Damaged or missing gasket (O-ring) between seat and housing (hard seat only)	Replace gasket (O-ring)
	High pressure	See solutions for problem of high pressure

Problem	Cause	Solution
High pressure	TC Dispense Valve (AB, page 8) clogged	Clean TC Dispense Valve (AB, page 8)
	Material in Static Mixer Package (AA, page 8) and/or needle cured	Replace Static Mixer Package (AA, page 8) and/or needle
	Dispense speed unsuitable for Static Mixer Package (AA, page 8) and needle	<ol style="list-style-type: none"> 1. Replace the current Static Mixer Package (AA, page 8) and/or needle with a bigger gauge. 2. Slow down dispensing speed to decrease working pressure (continuous and stable dispensing pressure should be within a range of 150-400 psi).
	Pressure sensor error	Replace pressure sensor
Pressure imbalance	One side of TC Dispense Valve (AB, page 8) or fluid lines clogged	Clean the high pressure side of TC Dispense Valve (AB, page 8) or fluid lines
	Air or hole in material	Prime the system
	Low pressure side piston worn out	Replace the piston
"Home" error	Error not reset	Pull up E-stop button and press "reset"
	Pressure higher than set point	Go to the Advanced Screen of control box, select 'Dispense valve' to open TC Dispense Valve (AB, page 8) to reduce pressure
	"Home" icon flashing and waiting	<ol style="list-style-type: none"> 1. Verify reload pressure value is correctly set. 2. Verify air supply. 3. Inspect low level sensor status. 4. Confirmed inlet ball valve is opened (if installed). 5. Verify cartridge or pail is not empty. 6. Verify supply pump is working.
	Servo motor alarm	<ol style="list-style-type: none"> 1. Inspect ball screw and slides are functional. 2. Verify motor and encoder cable are connected.

Problem	Cause	Solution
System does not dispense or dispenses in the incorrect amount/mode	Signal error between platform and PR-Xv control box	<ol style="list-style-type: none"> 1. Verify signal was correctly sent and received. 2. Verify signal cable is correctly connected.
	Wrong "Dispense mode"	Choose correct mode
	Wrong "Dispense type"	Choose correct type
	Wrong mode and/or type trigger method	Choose correct trigger method in "Setup" menu (job can be triggered by outside signal or manually)
Incorrect pressure value	Loose pressure sensor cable or adapters	Exchange cable, tighten adapters
	Pressure sensor error	Replace pressure sensor
	Pressure sensor signal incorrect	Calibrate pressure sensor

Appendix A - Error number message

Error No.	Error Type	Error Name	Description	Cause	Solution
0	----	No Error			
1	Error	E-stop	System emergency stops	System Emergency Stop Switch (BC, page 9) is pressed	Make sure the system is in safety status. Plug Emergency Stop Switch (BC, page 9), press Control Power On button (BB, page 9), and press reset icon to close the alarm. Note: Execute Home after system emergency stop.
2	Error	Part A reaches the lower limit	Moving of metering cylinder A touches the lower limit sensor	1. Improper position of limit sensor	1. Re-install lower limit sensor
3	Error	Part A reaches the higher limit	Moving of metering cylinder A touches the higher limit sensor	2. Damage of limit sensor 3. Drive mechanism error 4. Interference around limit sensor	2. Replace lower limit sensor 3. Repair drive mechanism 4. Check limit sensor
4	Error	Part B reaches the lower limit	Moving of metering cylinder B touches the lower limit sensor		
5	Error	Part B reaches the higher limit	Moving of metering cylinder B touches the higher limit sensor		
6	Error	Part A servo alarm	Servo fault	Servo system error	1. Check servo drive alarm code and trouble shoot per the alarm code 2. Restart the control box
7	Error	Part B servo alarm			
8	Error	Part A pre-charge time out	Pre-charge time exceeds the set maximum time	1. Target pre-charge pressure is set too high or pe-charge speed is set too low 2. Insufficient material in metering cylinder	1. Set proper pre-charge parameters 2. Check the material supply line and execute reload
9	Error	Part B pre-charge time out			
10	Error	Part A high pressure alarm	Pressure exceeds the system limit	1. Pressure sensor error 2. Maximum working pressure is set too low 3. Dispense outlet line clogged 4. Dispense rate is too fast 5. Dispense Valve (AB, page 8) is not open 6. Material inlet line error	1. Replace pressure sensor 2. Set proper maximum working pressure 3. Clean dispense outlet line 4. Set proper dispense rate 5. Check dispense solenoid valve 6. Check inlet line and replace damaged parts
11	Error	Part B high pressure alarm			
12	Error	Purge alarm			
13	Error	System power off	System power off	Power supply is disconnected	Check power connection lines and power-on buttons
14	Error	Home request	The operator needs to execute home	Home is not executed after system power on	Press Home icon to execute home

Error No.	Error Type	Error Name	Description	Cause	Solution
15	Error	Motor torque is over limit	Motor torque is over limit	<ol style="list-style-type: none"> 1. Dispense outlet line clogged 2. Dispense rate is too fast 3. Motor error 4. Drive mechanism error 5. System high pressure 	<ol style="list-style-type: none"> 1. Clean the dispense outlet 2. Set proper dispense rate 3. Check Dispense valve and dispense solenoid valve 4. Repair drive mechanism 5. Execute system pressure relief
16	Deviation	Part A inlet pressure is low	Pressure is too low	<ol style="list-style-type: none"> 1. Dispense rate is too low 2. Inlet Valve (AE, page 8) leaks 3. Pressure sensor error 4. Drive mechanism error 5. Piston seal leaks 	<ol style="list-style-type: none"> 1. Set proper dispense speed 2. Check Inlet valve and replace damaged parts if necessary 3. Replace pressure sensor 4. Replace drive mechanism 5. Replace piston
17	Deviation	Part B inlet pressure is low			
18	Error	Purge time out	Purge is not executed within Idle Period	Auto purge is open and Idle Period time is over	Go to Manual Main Screen, and execute manual purge
19	Error	Pre-charge fault	Pre-charge fails to reach the target	<ol style="list-style-type: none"> 1. Insufficient material 2. Piston is at home position 3. Piston seal leaks 4. Pressure sensor error 5. Dispense Valve (AB, page 8) leaks 	<ol style="list-style-type: none"> 1. Check reload system and execute reload 2. Make piston away from home position 3. Replace piston 4. Replace pressure sensor 5. Replace dispense valve
20	Error	Reload fault	Reload fails	<ol style="list-style-type: none"> 1. Reload pressure is set too high 2. Maximum reload time is set too short 3. Inlet Valve (AE, page 8) does not work normally 4. Pressure sensor error 5. Material supply system error 	<ol style="list-style-type: none"> 1. Set proper target reload pressure 2. Set proper maximum reload time 3. Check inlet valve and corresponding solenoids 4. Replace pressure sensor 5. Check material supply system
21	Error	Pressure relief fault	System does not achieve relief target	<ol style="list-style-type: none"> 1. Improper pressure relief parameters 2. Pressure sensor error 3. Inlet Valve (AE, page 8) leaks 	<ol style="list-style-type: none"> 1. Set proper pressure relief time, speed and target 2. Check and replace pressure sensor 3. Check inlet valve
22	Deviation	No purge before gel or time out	No purge before gel or within the set Idle Period	No purge before gel	Replace with new static mixer package and execute purge
23	Deviation	Measure is out of range	Piston position is out of software settings	<ol style="list-style-type: none"> 1. Drive mechanism error 2. Improper system parameter settings 	<ol style="list-style-type: none"> 1. Check drive mechanism 2. Check system parameter settings
24	Deviation	Dispense valve is not ready	Dispense valve is not ready	<ol style="list-style-type: none"> 1. No purge after flushing 2. Send external dispense signal in non-auto working status 3. In auto working status, send dispense signal when system is not ready 	Check work flow

Dimensions

PR-Xv Metering Unit, Supply Pump Feed

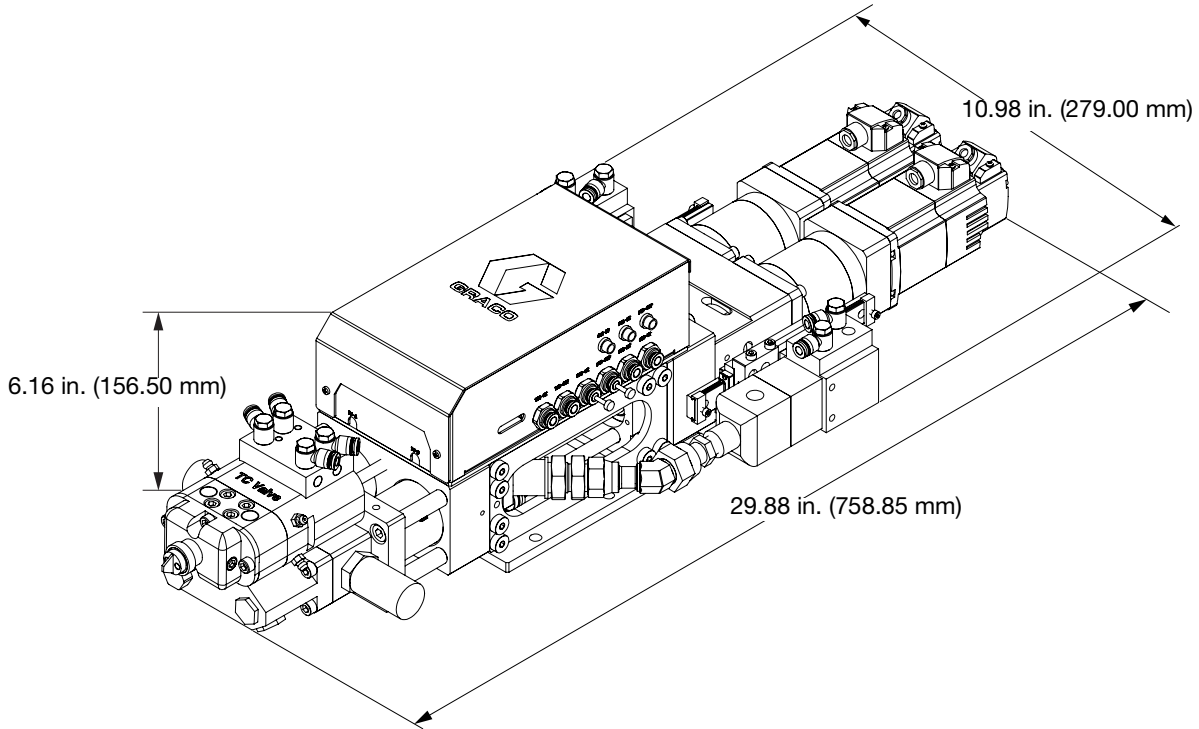


FIG. 61: PR-Xv Metering Unit Dimensions, Supply Pump Feed

PR-Xv Control Box

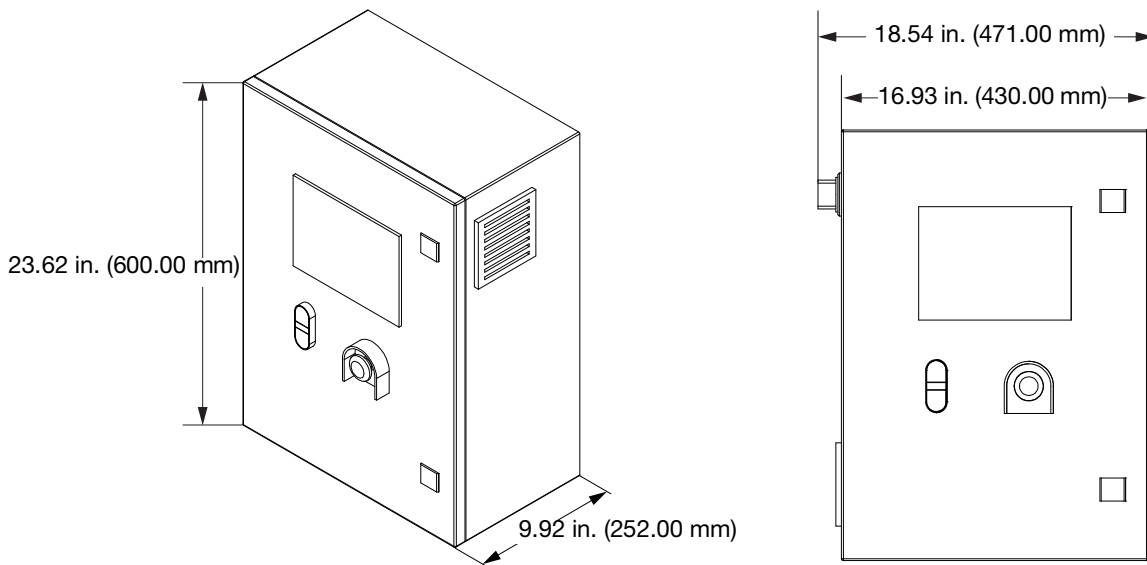
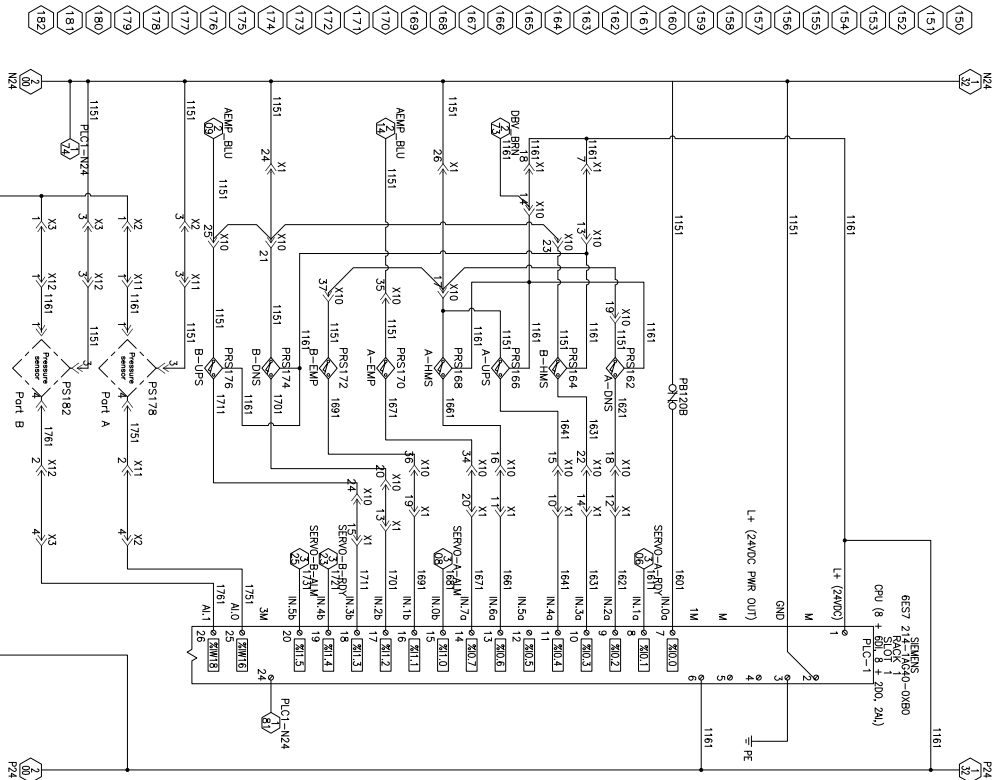
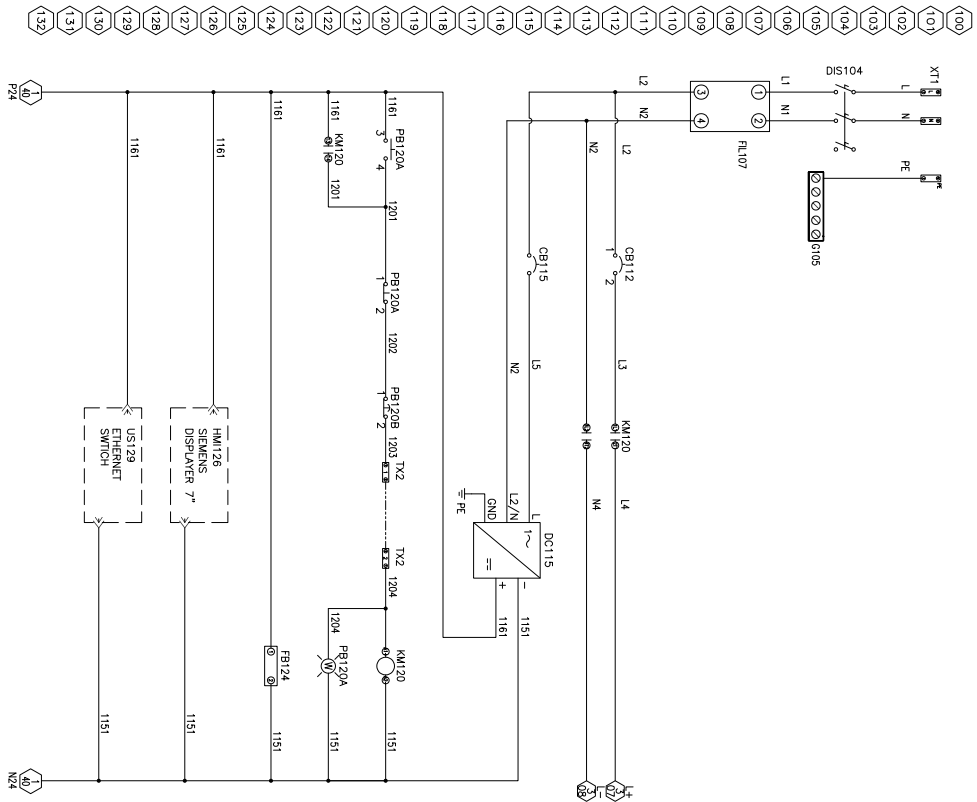
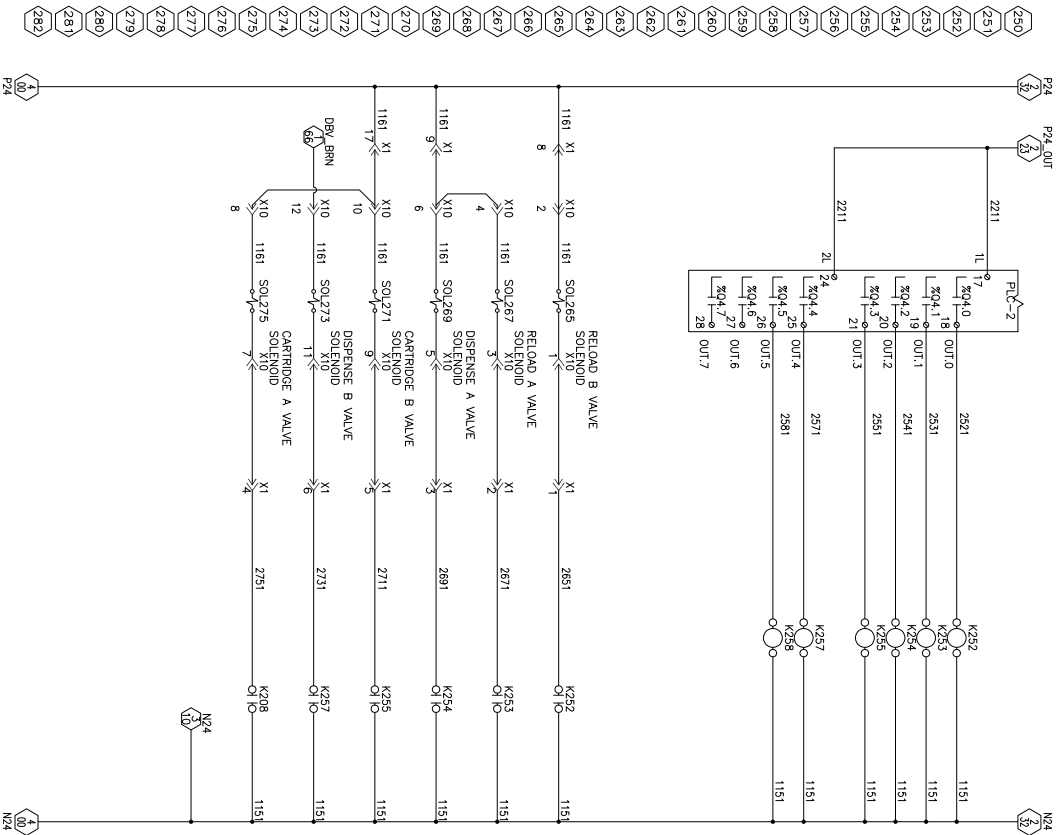
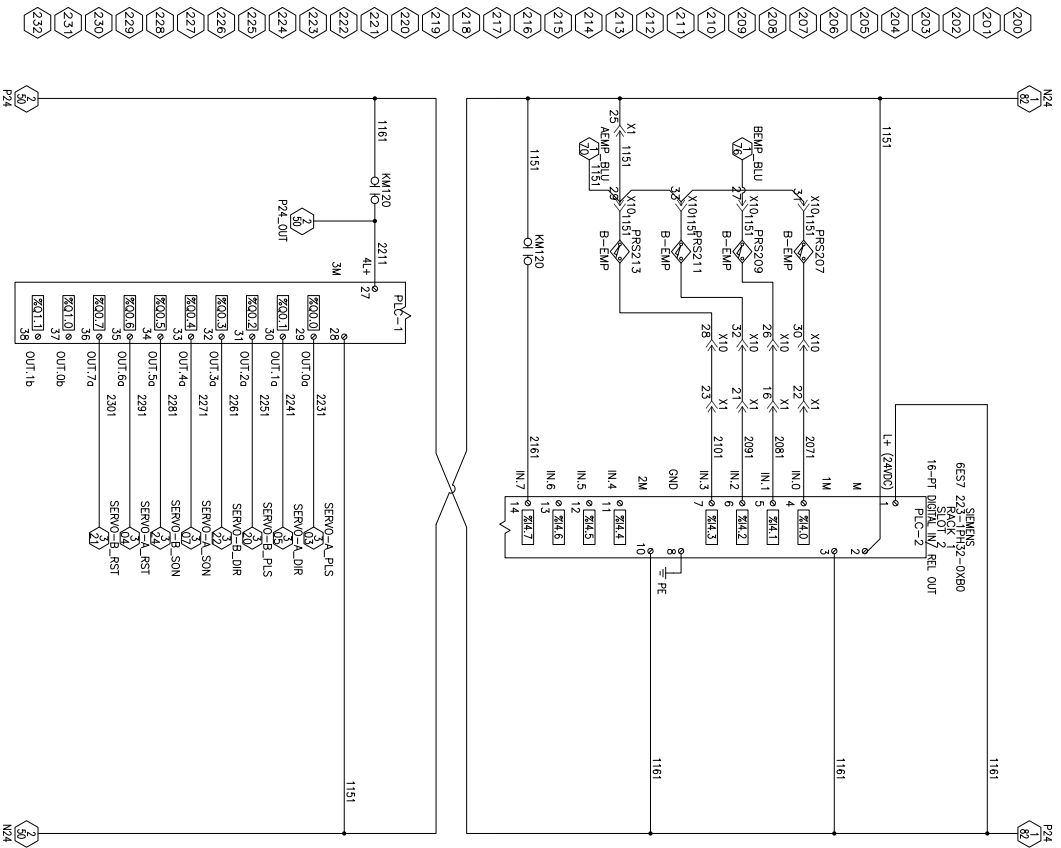
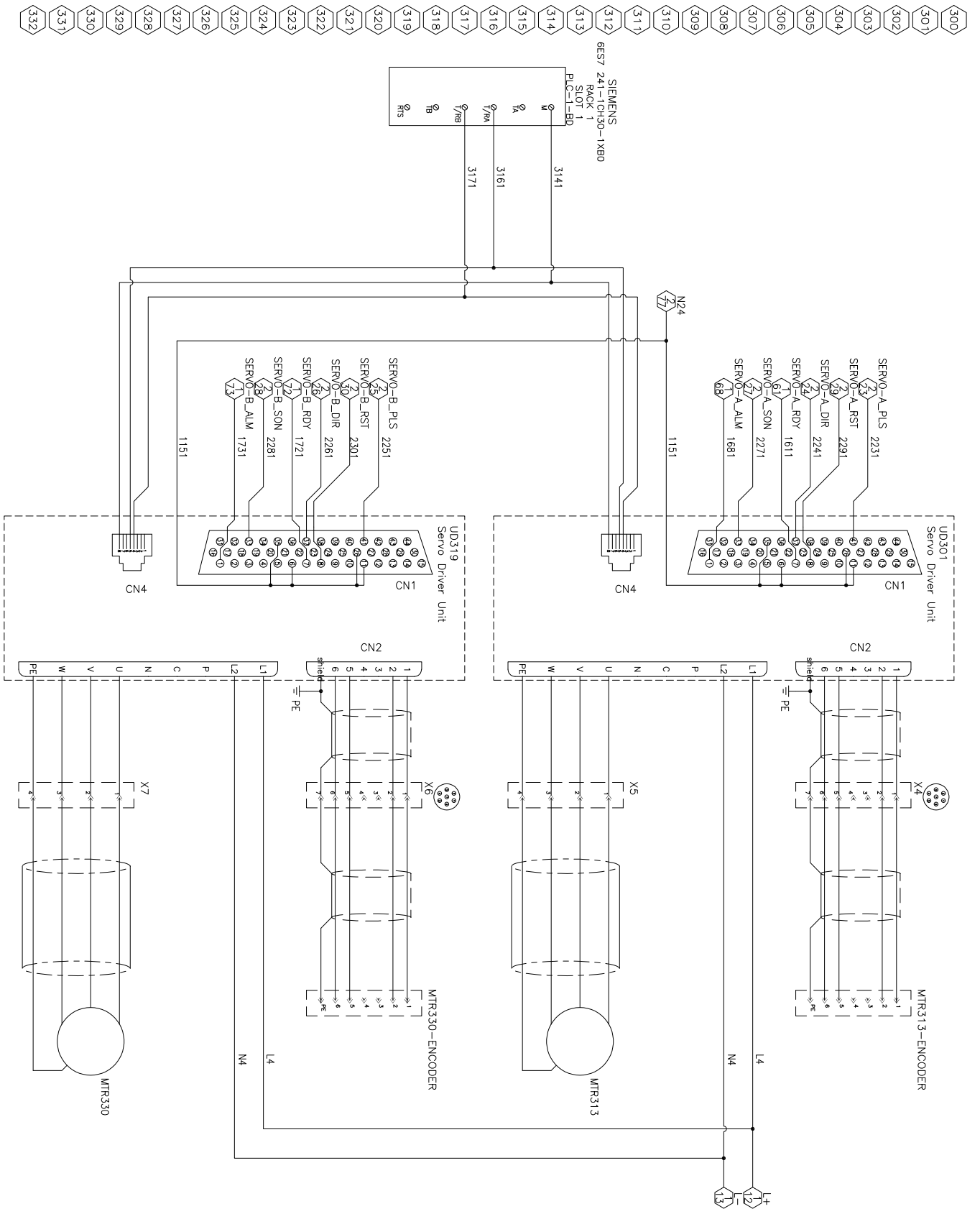


FIG. 62: PR-Xv Control Box Dimensions

Schematics







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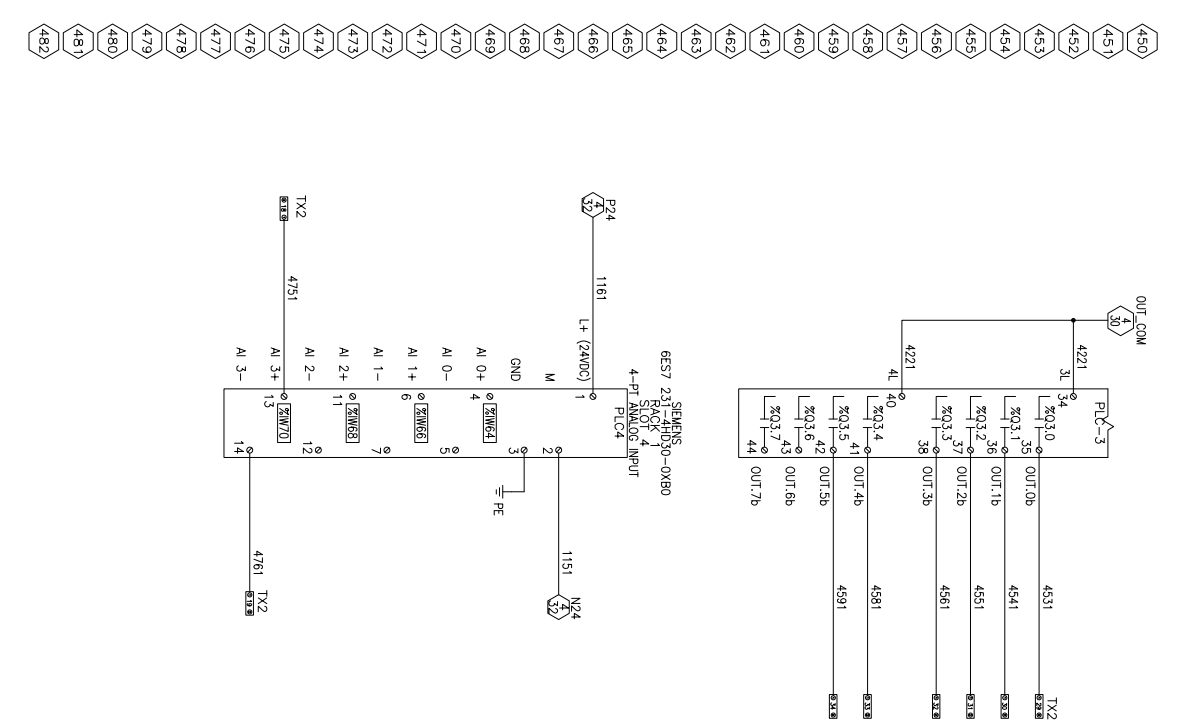
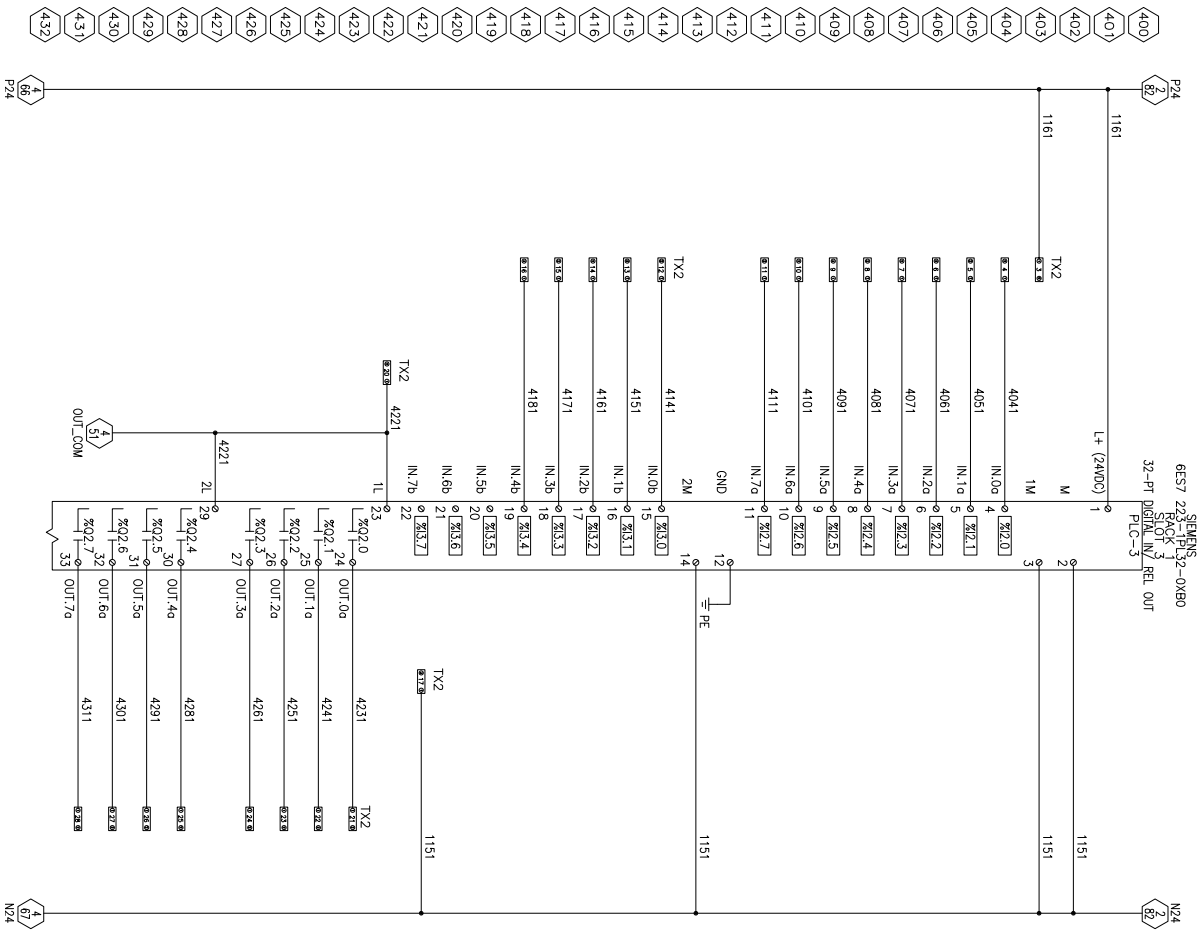
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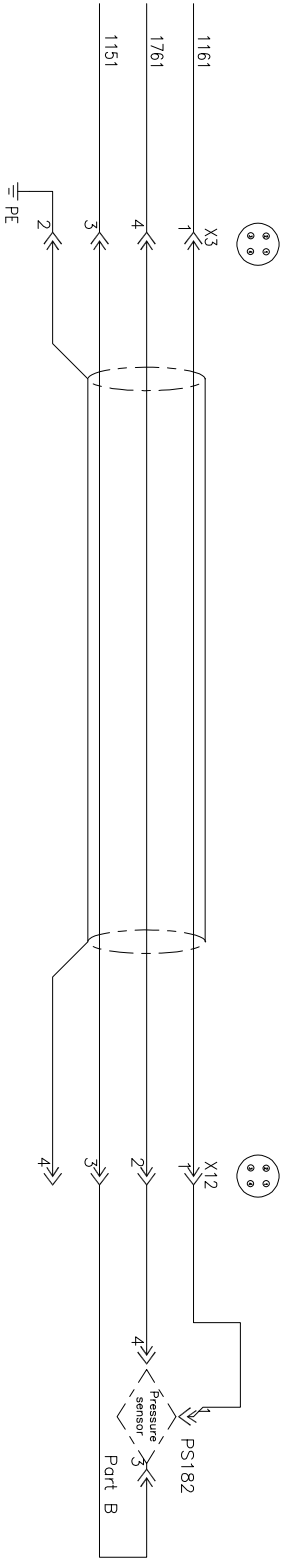
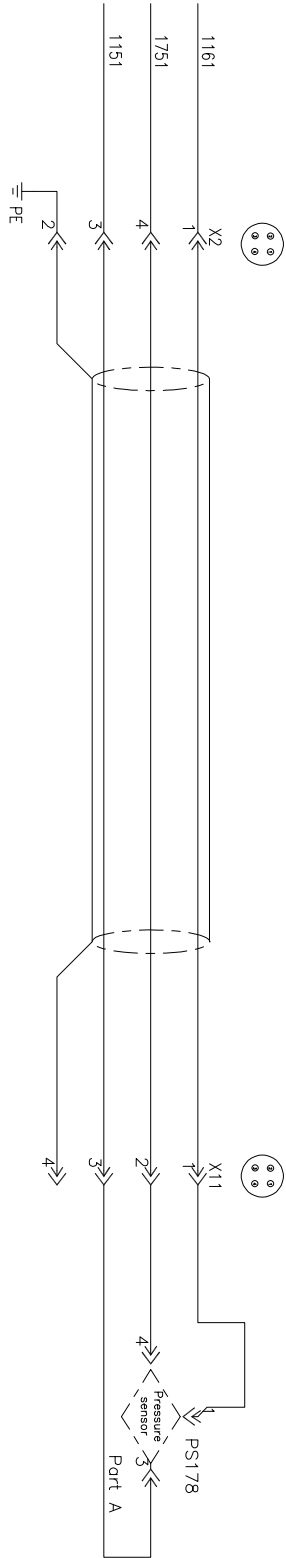
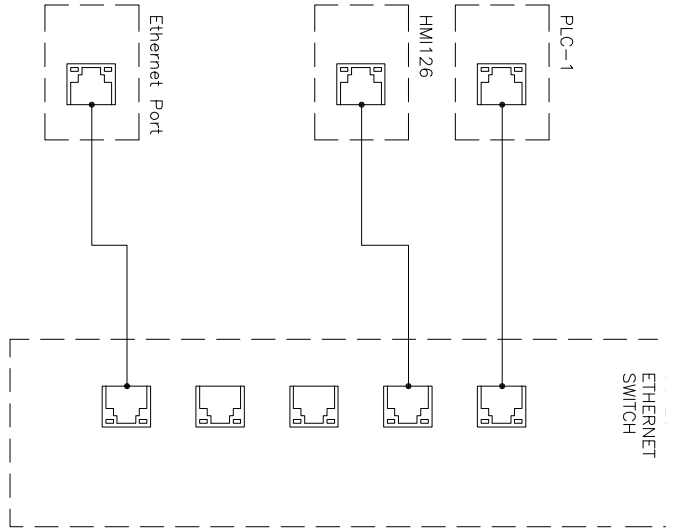
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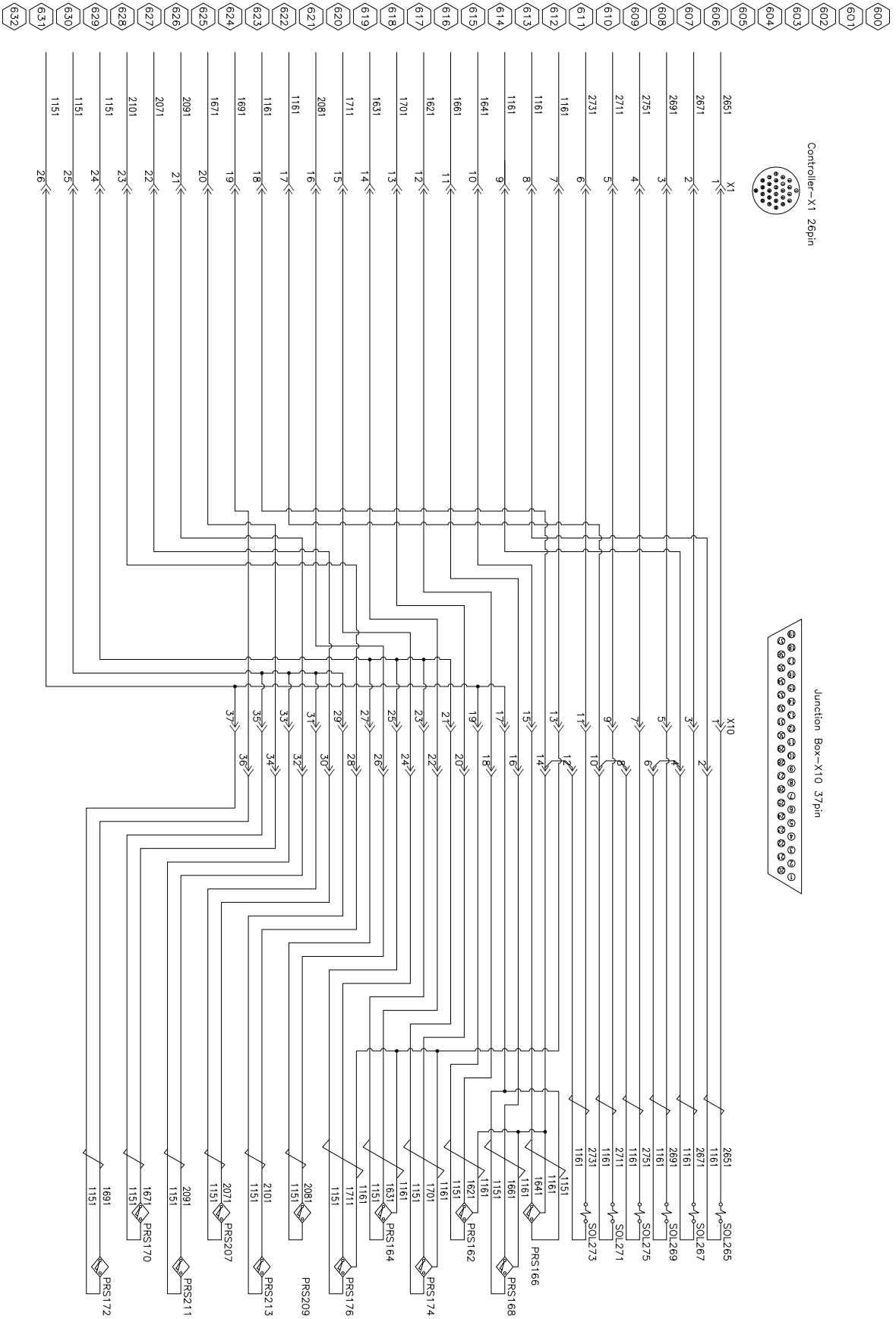
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Schematics



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IO signals

NO.	Signal Style	Signal Name	Pin number	PLC address	Description
1	INPUT	CUST_IN_DISPENSE	I2.0	X20	used to start dispensing in bead mode or shot mode
2		CUST_IN_PURGE	I2.1	X21	used to start purge.
3		CUST_IN_RELOAD	I2.2	X22	used to start reloading material.
4		CUST_IN_STYLEBIT_0	I2.3	X23	BIT0-3: 0-15, for select style
5		CUST_IN_STYLEBIT_2	I2.4	X24	
6		CUST_IN_ESTOP	I3.0	X30	used to connect customer emergency stop button
7		CUST_IN_REMOTE_RST	I3.1	X31	used to reset error
8		CUST_IN_MODE_SELECT	I2.5	X25	used to set working mode in automatic 0 means shot mode 1 means bead mode
9		CUST_IN_STYLEBIT_1	I3.3	X33	
10		CUST_IN_JOB_START	I3.2	X32	used to start job, normal
11		CUST_IN_STYLEBIT_3	I3.4	X34	
12		CUST_IN_COMMON		P24	
13	OUTPUT	CUST_OUT_READY	Q2.0	31	
14		CUST_OUT_COMPLETE	Q2.1	32	
15		CUST_OUT_INRELOAD	Q2.2	33	
16		CUST_OUT_ALARM	Q2.3	34	
17		CUST_OUT_ERR_BIT0	Q2.4	35	please check error code
18		CUST_OUT_ERR_BIT1	Q2.5	36	
19		CUST_OUT_ERR_BIT2	Q2.6	37	
20		CUST_OUT_ERR_BIT3	Q2.7	38	
21		CUST_OUT_ERR_BIT4	Q3.0	39	
22		CUST_OUT_INCYCLE	Q3.1	40	
23		CUST_OUT_PURGE_REQUEST	Q3.2	41	
24		CUST_OUT_RELOAD_REQUEST	Q3.3	42	
25		CUST_OUT_INJOB	Q3.4	43	
26		CUST_OUT_STANDBY	Q3.5	44	
27		CUST_OUT_COMMON		30	

Profinet map

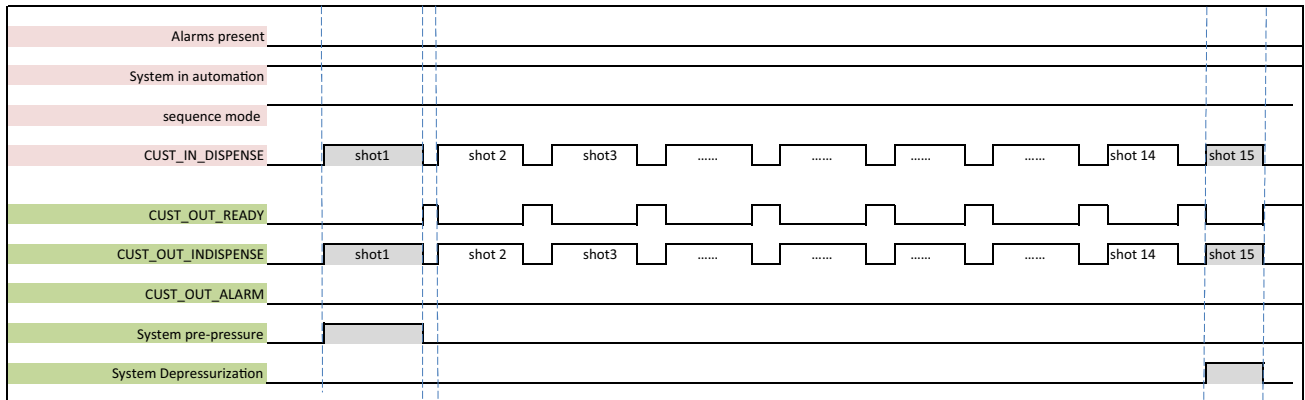
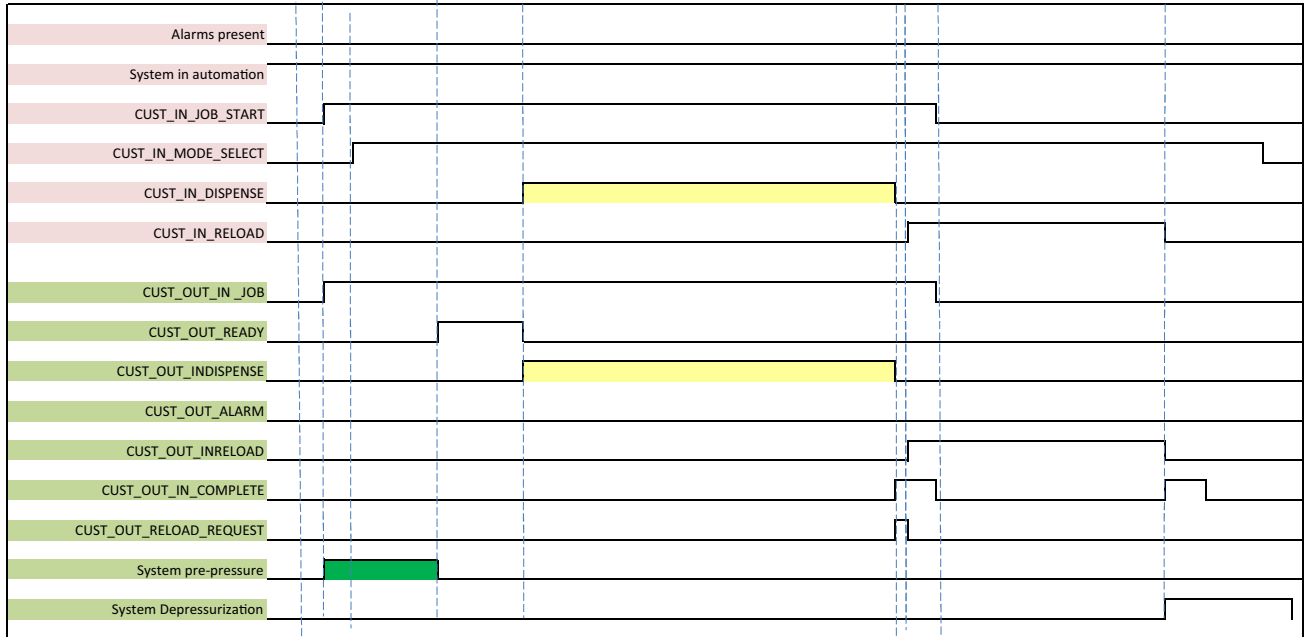
Control box input from PLC output

Name	Units	In Byte	Description
GATE_IN_CMD_BITS	0	JOB_START	1 used to start job, normal used to start dispensing in bead mode or shot mode used to start reloading material used to purge response used to reset error used to set working mode in automatic 0 means shot mode 1 means bead mode used to open dispense valve and relief pressure in metering system used to stop cartridge material supply
	1	DISPENSE	
	2	RELOAD	
	3	PURGE	
	4	REMOTE_RESET	
	5	MODE_SELECT	
	6	SYS_RELIEF	
	7	SUPPLY_STOP	
GATE_IN_NOTUSED		2	not used
GATE_IN_STYLE_NO		3-4	0-15, for select style

Control box output to PLC input

Name	Units	In Byte	Description
GATE_OUT_STATUS_0	0	READY	1
	1	INDISPENSE	
	2	COMPLETED	
	3	INRELOAD	
	4	PURGE_REQUEST	
	5	RELOAD_REQUEST	
	6	ALARM	
	7	STANDBY	
GATE_OUT_STATUS_1	0	INJOB	2
	1	INPURGE	
	2		
	3		
	4		
	5		
	6	INPURGE	
GATE_OUT_ERR_CODE		3-4	
GATE_OUT_DISP_VOL		5-6	Integer, should multiply by 0.1, unit is CC
GATE_OUT_JOB_VOL		7-8	Integer, should multiply by 0.1, unit is CC
GATE_OUT_DISP_RATE		9-10	Integer, should multiply by 0.1, unit is CC
GATE_OUT_PRESS_A		11-12	Integer, unit is PSI
GATE_OUT_PRESS_B		13-14	Integer, unit is PSI
GATE_OUT_MTR_TRQ-A		15-16	Integer, should multiply by 0.001, unit is N•m
GATE_OUT_MTR_TRQ-B		17-18	Integer, should multiply by 0.001, unit is N•m
GATE_OUT_DISP_RATIO		19-20	Integer, should multiply by 0.1

Timing chart



Technical Specifications

PR-Xv System		
	US	Metric
Maximum Inlet Fluid Pressure	1200 psi	8.3 MPa, 83 bar
Maximum Working Fluid Pressure	1200 psi	8.3 MPa, 83 bar
Maximum Air Pressure	100 psi	0.7 MPa, 7 bar
Minimum Air Flow	1 CFM	
Electrical Power	200–240 VAC, 50/60 Hz, 10 A	
Viscosity Range	20–1,000,000 cps	
Wetted Parts	303/304 Stainless Steel, Hard Chrome, Ceramic, UHMWPE, NBR, Carbon Steel, PTFE	
Shot Size Range	PR-Xv 100 cc: 0.1–100 cc PR-Xv 75 cc: 0.1–75 cc	
Shot Size Repeatability	1%	
Flowrate	0.01–10 cc/s (Depends on material viscosity)	
Material Ratio	PR-Xv 100 cc: 1:1 to 5:1 PR-Xv 75 cc: 2:1 to 10:1	
Inlet / Outlet Sizes		
Air Inlet size	1/4 in.	6 mm
Fluid Inlet size	1/4 in. npt (f)	
Fluid Outlet size	7/8-9 bell outlet	
Weight		
PR-Xv Metering Unit	56.8 lb	26 kg
Control Box	71 lb	32 kg
Maximum Piston Operating Temperature		
UHMWPE Pistons	300°F	150°C
PEEK Bearings	300°F	150°C
Notes		
All trademarks or registered trademarks are the property of their respective owners.		

California Proposition 65

CALIFORNIA RESIDENTS

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

Graco Standard Warranty

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.

This warranty does not cover, and Graco shall not be liable for general wear and tear, or any malfunction, damage or wear caused by faulty installation, misapplication, abrasion, corrosion, inadequate or improper maintenance, negligence, accident, tampering, or substitution of non-Graco component parts. Nor shall Graco be liable for malfunction, damage or wear caused by the incompatibility of Graco equipment with structures, accessories, equipment or materials not supplied by Graco, or the improper design, manufacture, installation, operation or maintenance of structures, accessories, equipment or materials not supplied by Graco.

This warranty is conditioned upon the prepaid return of the equipment claimed to be defective to an authorized Graco distributor for verification of the claimed defect. If the claimed defect is verified, Graco will repair or replace free of charge any defective parts. The equipment will be returned to the original purchaser transportation prepaid. If inspection of the equipment does not disclose any defect in material or workmanship, repairs will be made at a reasonable charge, which charges may include the costs of parts, labor, and transportation.

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Graco's sole obligation and buyer's sole remedy for any breach of warranty shall be as set forth above. The buyer agrees that no other remedy (including, but not limited to, incidental or consequential damages for lost profits, lost sales, injury to person or property, or any other incidental or consequential loss) shall be available. Any action for breach of warranty must be brought within two (2) years of the date of sale.

GRACO MAKES NO WARRANTY, AND DISCLAIMS ALL IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, IN CONNECTION WITH ACCESSORIES, EQUIPMENT, MATERIALS OR COMPONENTS SOLD BUT NOT MANUFACTURED BY GRACO. These items sold, but not manufactured by Graco (such as electric motors, switches, hose, etc.), are subject to the warranty, if any, of their manufacturer. Graco will provide purchaser with reasonable assistance in making any claim for breach of these warranties.

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For patent information, see www.graco.com/patents.

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If calling from Asia Pacific: 00-86-512-6260-5711 or 00-86-21-2310-6198

If calling from Europe: 00-32-89-770-862

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Original instructions. This manual contains English. MM 3A9328B

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International Offices: Belgium, China, Japan, Korea

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