

PSM

3B0423C

1K Ambient and 1K Warm Melt Precision Metering System

EN

For accurate metering and dispensing of ambient and warm melt materials. For professional use only.

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

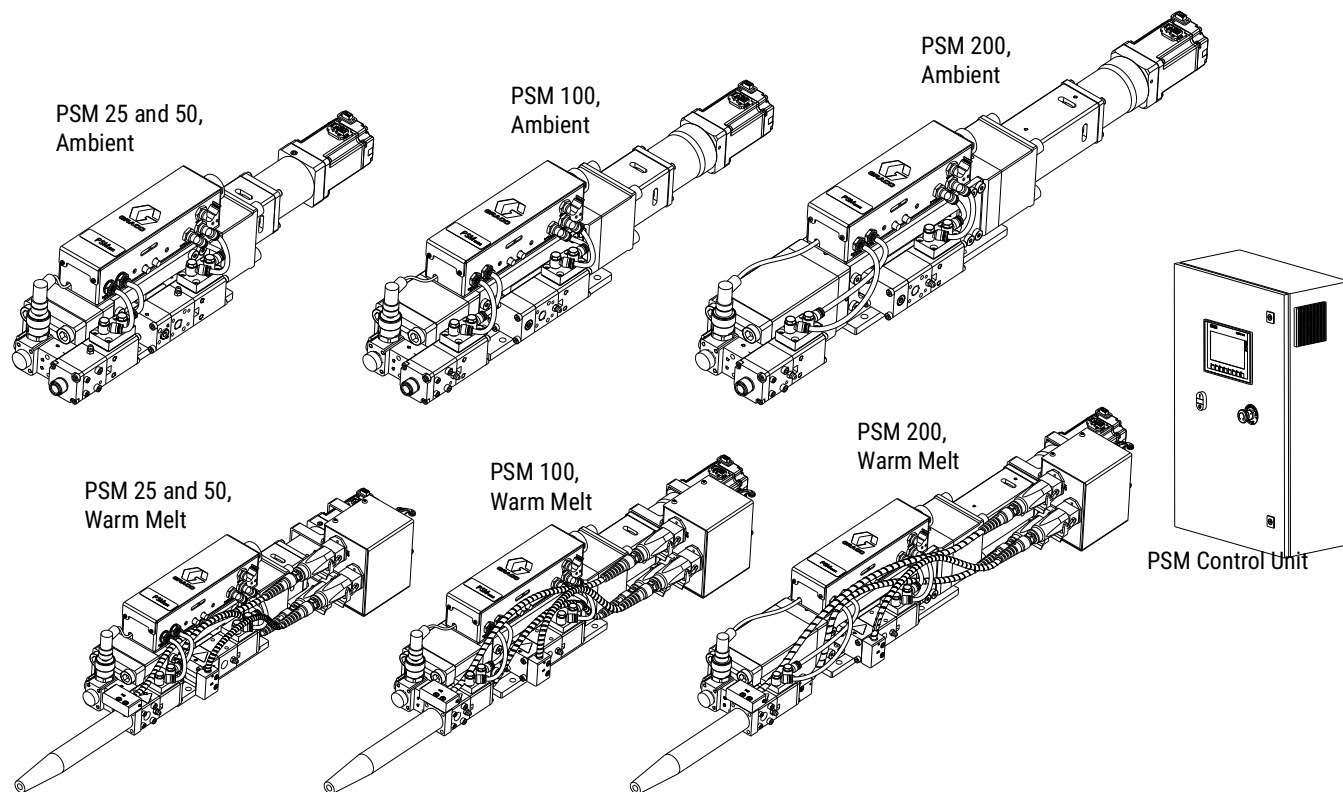
100 psi (0.7 MPa, 7 bar) Maximum Air Inlet Pressure.

See page 3 for model information, including maximum fluid working pressure.



Important Safety Instructions

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



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Related Manuals

Manuals in English	Description
3B0424	PSM Repair-Parts Manual
X032396	iQ Dispense Valves Instructions and Parts List Manual
3A8005	Therm-O-Flow® Warm Melt Instructions and Parts List Manual

Models

Models, PSM Ambient

Part	Capacity	Maximum Fluid Working Pressure psi (MPa, bar)	Description
2010342	25cc	3000 psi (20.7 MPa, 207 bar)	System, PSM25, SST ⁽¹⁾ , PLC, Ethernet IP
2010343	25cc	3000 psi (20.7 MPa, 207 bar)	System, PSM25, CER ⁽²⁾ , PLC, Ethernet IP
2010346	50cc	3000 psi (20.7 MPa, 207 bar)	System, PSM50, SST ⁽¹⁾ , PLC, Ethernet IP
2010347	50cc	3000 psi (20.7 MPa, 207 bar)	System, PSM50, CER ⁽²⁾ , PLC, Ethernet IP
2010350	100cc	3000 psi (20.7 MPa, 207 bar)	System, PSM100, SST ⁽¹⁾ , PLC, Ethernet IP
2010352	200cc	3000 psi (20.7 MPa, 207 bar)	System, PSM200, SST ⁽¹⁾ , PLC, Ethernet IP
2010372	25cc	3000 psi (20.7 MPa, 207 bar)	System, PSM25, SST ⁽¹⁾ , PLC, PN ⁽³⁾
2010373	25cc	3000 psi (20.7 MPa, 207 bar)	System, PSM25, CER ⁽²⁾ , PLC, PN ⁽³⁾
2010376	50cc	3000 psi (20.7 MPa, 207 bar)	System, PSM50, SST ⁽¹⁾ , PLC, PN ⁽³⁾
2010377	50cc	3000 psi (20.7 MPa, 207 bar)	System, PSM50, CER ⁽²⁾ , PLC, PN ⁽³⁾
2010380	100cc	3000 psi (20.7 MPa, 207 bar)	System, PSM100, SST ⁽¹⁾ , PLC, PN ⁽³⁾
2010382	200cc	3000 psi (20.7 MPa, 207 bar)	System, PSM200, SST ⁽¹⁾ , PLC, PN ⁽³⁾

Models, PSM Warm Melt

Part	Capacity	Maximum Fluid Working Pressure psi (MPa, bar)	Description
2010344	25cc	3000 psi (20.7 MPa, 207 bar)	System, PSM25, SST ⁽¹⁾ , Warm Melt, PLC, Ethernet IP
2010348	50cc	3000 psi (20.7 MPa, 207 bar)	System, PSM50, SST ⁽¹⁾ , Warm Melt, PLC, Ethernet IP
2010351	100cc	3000 psi (20.7 MPa, 207 bar)	System, PSM100, SST ⁽¹⁾ , Warm Melt, PLC, Ethernet IP
2010353	200cc	3000 psi (20.7 MPa, 207 bar)	System, PSM200, SST ⁽¹⁾ , Warm Melt, PLC, Ethernet IP
2010374	25cc	3000 psi (20.7 MPa, 207 bar)	System, PSM25, SST ⁽¹⁾ , Warm Melt, PLC, PN ⁽³⁾
2010378	50cc	3000 psi (20.7 MPa, 207 bar)	System, PSM50, SST ⁽¹⁾ , Warm Melt, PLC, PN ⁽³⁾
2010381	100cc	3000 psi (20.7 MPa, 207 bar)	System, PSM100, SST ⁽¹⁾ , Warm Melt, PLC, PN ⁽³⁾
2010383	200cc	3000 psi (20.7 MPa, 207 bar)	System, PSM200, SST ⁽¹⁾ , Warm Melt, PLC, PN ⁽³⁾

⁽¹⁾ SST: Stainless steel material

⁽²⁾ CER: Ceramic material

⁽³⁾ Any PSM system can be converted to Ethernet IP communication mode. Order kit 2010286 and follow **Ethernet IP Communication Protocol**, page 57.

Safety Symbols

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

Symbol	Meaning
	Burn Hazard
	Electric Shock Hazard
	Equipment Misuse Hazard
	Fire and Explosion Hazard
	Moving Parts Hazard
	Skin Injection Hazard
	Skin Injection Hazard
	Splash Hazard
	Toxic Fluid or Fumes Hazard

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

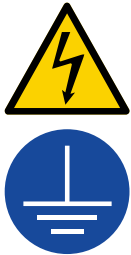


Safety Alert Symbol

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

General Warnings

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

 WARNING	
	ELECTRIC SHOCK HAZARD This equipment must be grounded. Improper grounding, setup, or usage of the system can cause electric shock. • 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.
	SKIN INJECTION HAZARD 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. • Do not point dispensing device at anyone or at any part of the body. • Do not put your hand over the fluid outlet. • Do not stop or deflect leaks with your hand, body, glove, or rag. • Follow the Pressure Relief Procedure when you stop dispensing and before cleaning, checking, or servicing equipment. • Tighten all fluid connections before operating the equipment. • Check hoses and couplings daily. Replace worn or damaged parts immediately.

WARNING



FIRE AND EXPLOSION HAZARD

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



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



EQUIPMENT MISUSE HAZARD

Misuse can cause death or serious injury.



- 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.



MOVING PARTS HAZARD

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



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



TOXIC FLUID OR FUMES HAZARD

Toxic fluids or fumes can cause serious injury or death if splashed in the eyes or on skin, inhaled, or swallowed.

- 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	
	BURN HAZARD Equipment surfaces and fluid that is heated can become very hot during operation. To avoid severe burns: • Do not touch hot fluid or equipment.
	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.

Changing Materials

NOTICE
Changing the material types used in your equipment requires special attention to avoid equipment damage and downtime. • 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, FIG. 3, FIG. 4 and FIG. 5 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.

PSM Ambient

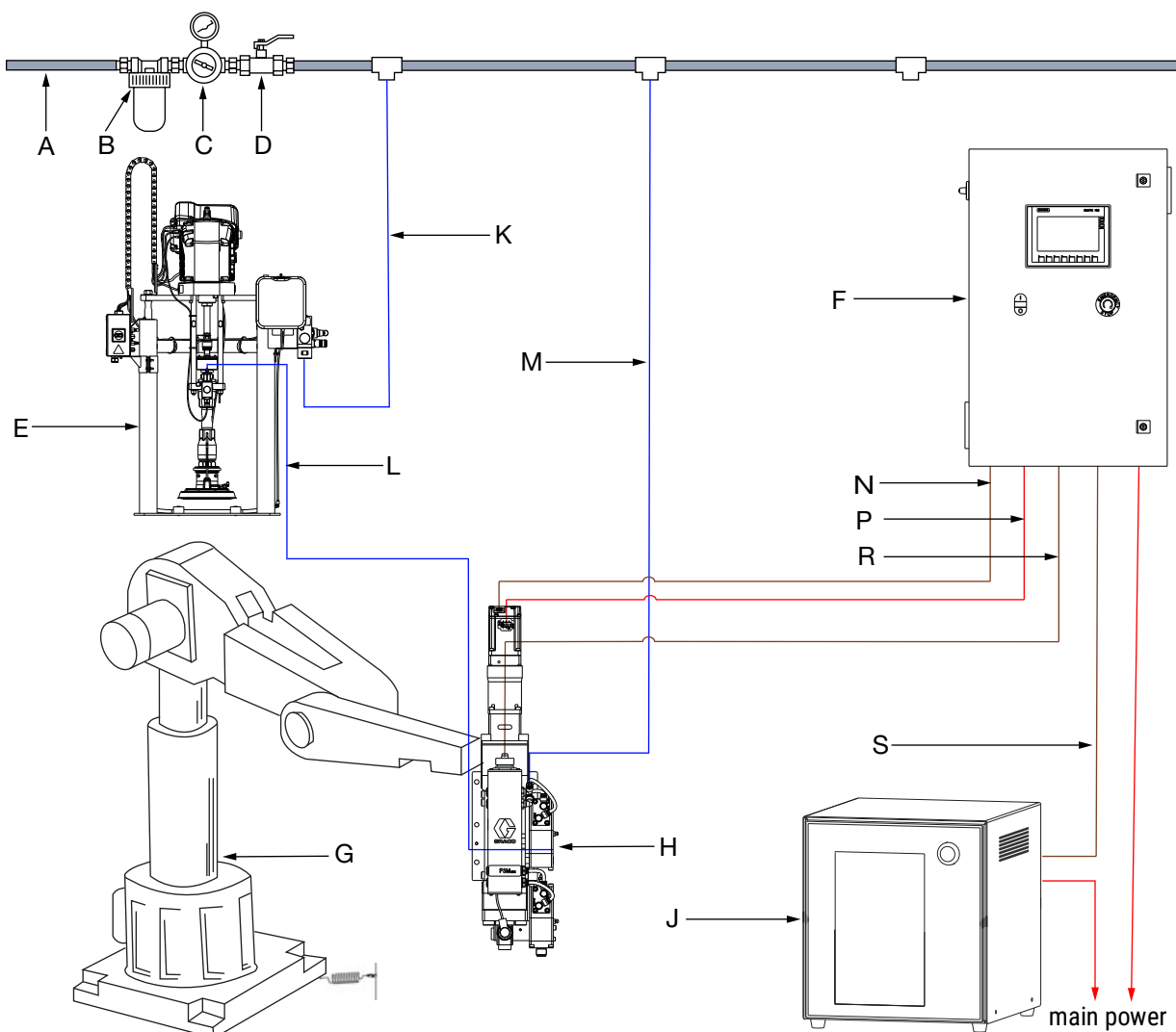


FIG. 1: PSM Ambient Typical Installation

Key:

- | | |
|--|---|
| A Main Air Line | L Material Supply Line |
| B Air Filter ⁽¹⁾ | M PSM Air Line |
| C Pressure Regulator Valve ⁽¹⁾ | N Servo Motor Encoder Cable |
| D Bleed-type Master Air Valve ⁽¹⁾ | P Servo Motor Power Cable |
| E Supply Pump System | R Junction Box Communication Cable |
| F PSM Control Unit | S I/O Communication Cable |
| G Customer Robot | ⁽¹⁾ Required, but not supplied |
| H PSM Metering Unit | |
| J Customer Robot Control Unit | |
| K Supply Pump Air Line | |

PSM Warm Melt

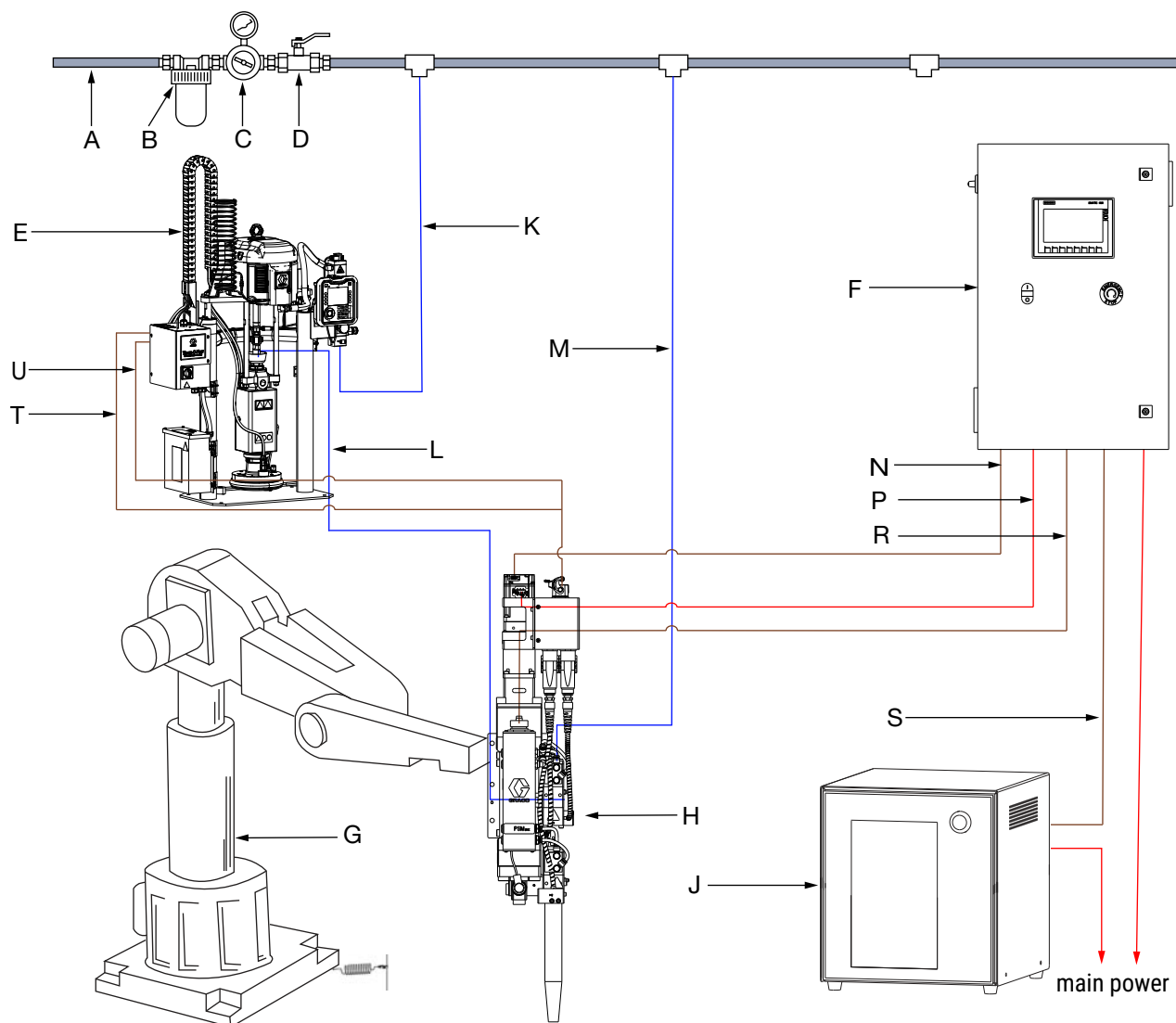


FIG. 2: PSM Warm Melt Typical Installation

Key:

- A Main Air Line
- B Air Filter ⁽¹⁾
- C Pressure Regulator Valve ⁽¹⁾
- D Bleed-type Master Air Valve ⁽¹⁾
- E Supply Pump System
- F PSM Control Unit
- G Customer Robot
- H PSM Metering Unit
- J Customer Robot Control Unit
- K Supply Pump Air Line
- L Material Supply Line
- M PSM Air Line
- N Servo Motor Encoder Cable
- P Servo Motor Power Cable
- R Junction Box Communication Cable

- S I/O Communication Cable
 - T Outlet Valve Heater and Sensor Cable (only for PSM Warm Melt) ⁽²⁾
 - U Inlet Valve and Cylinder Heater and Sensor Cable (only for PSM Warm Melt) ⁽²⁾
- ⁽¹⁾ Required, but not supplied
⁽²⁾ Purchase available, see Warm Melt Cables under Kits and Accessories chapter in your PSM Repair-Parts Manual. See **Related Manuals**, page 2.

Component Identification

PSM Metering Unit, Ambient

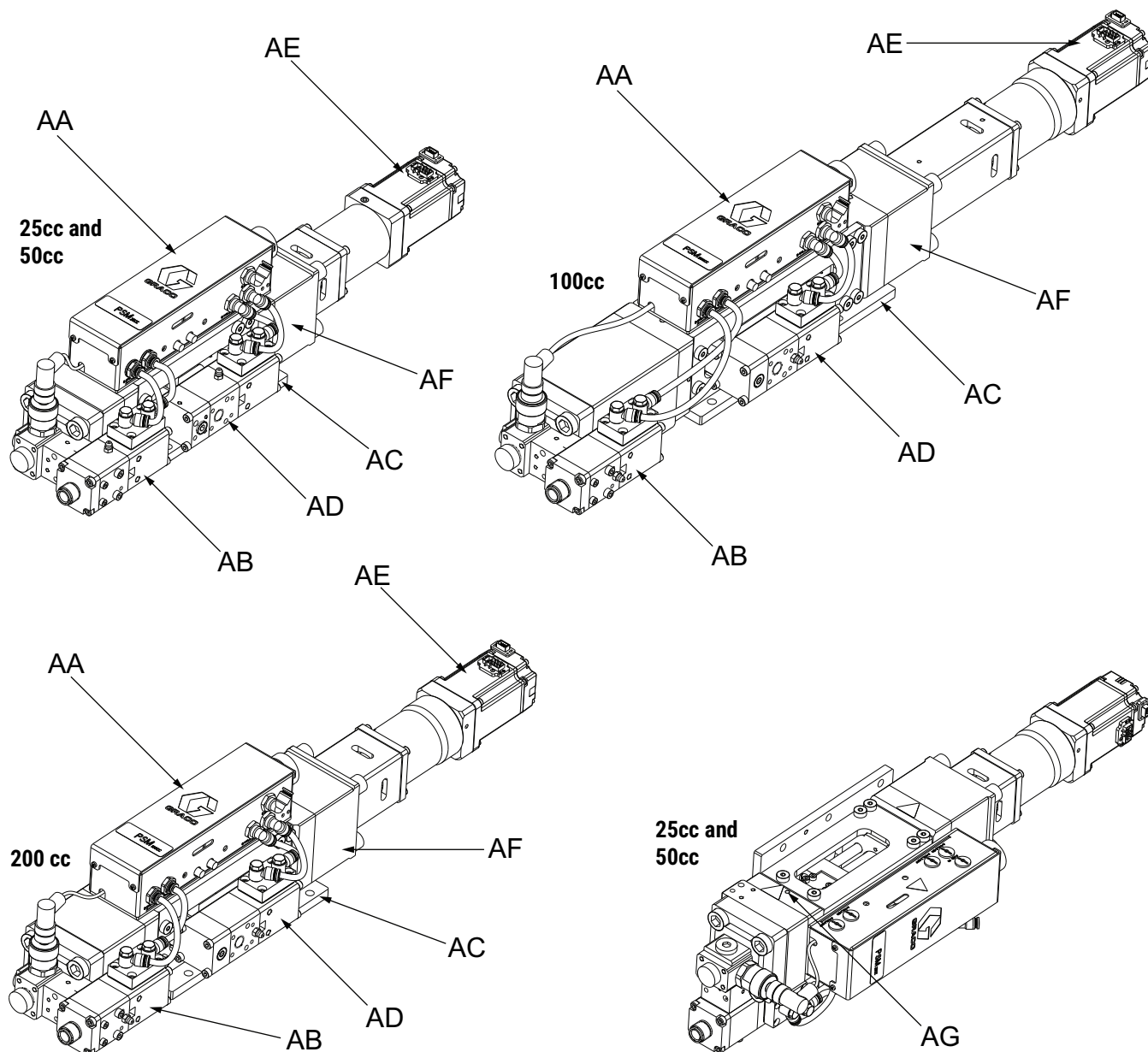


FIG. 3: PSM Metering Unit, Ambient

Key:

- AA Junction Box Assembly
- AB Dispense Valve
- AC Installation Plate
- AD Reload Valve
- AE Drive Assembly
- AF Base Unit
- AG Piston observation hole ⁽¹⁾

⁽¹⁾The sketch takes 25 cc and 50 cc as an example. The piston observation holes for 100 cc and 200 cc are at the same places.

PSM Metering Unit, Warm Melt

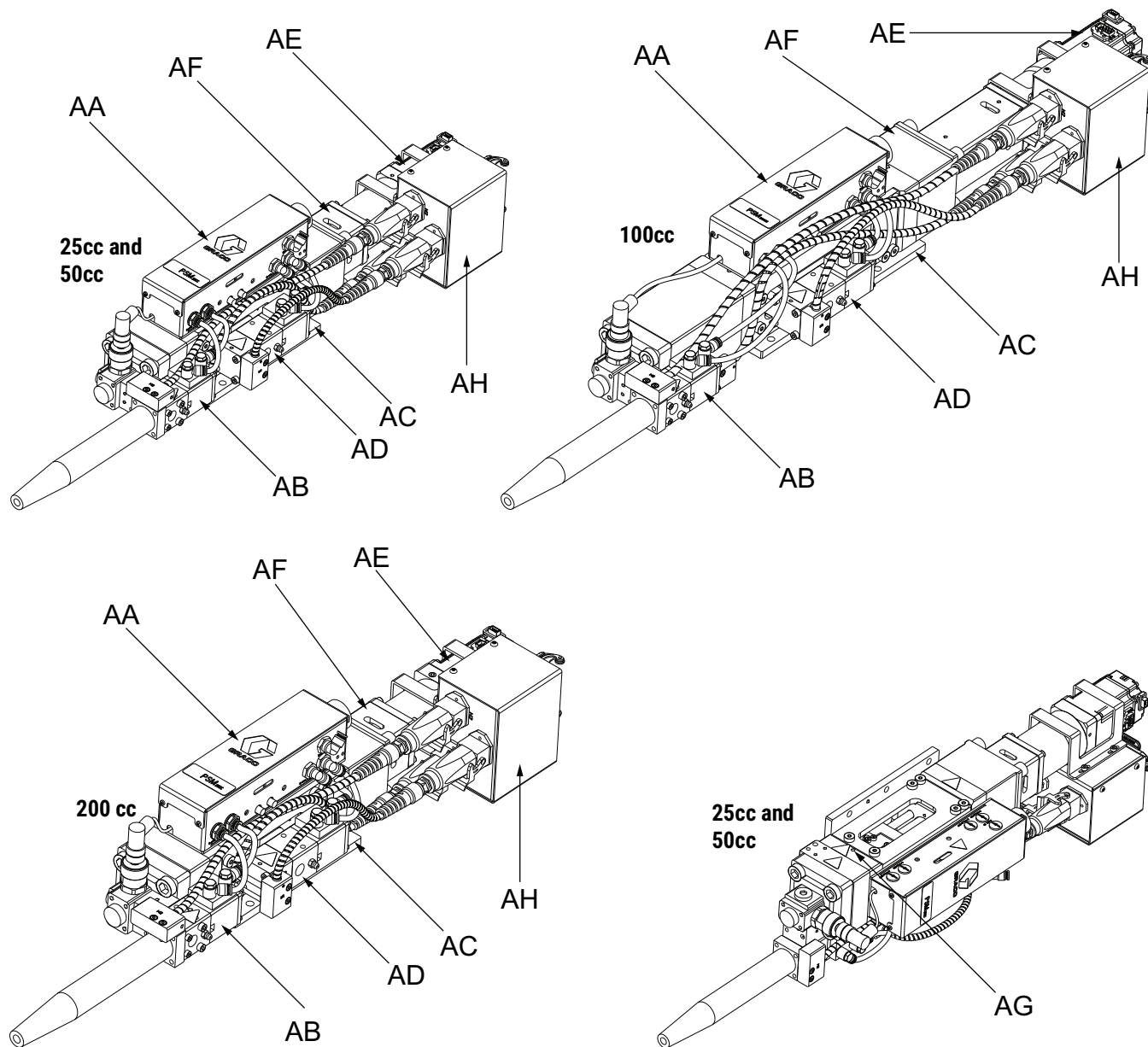


FIG. 4: PSM Metering Unit, Warm Melt

Key:

- AA Junction Box Assembly
- AB Dispense Valve
- AC Installation Plate
- AD Reload Valve
- AE Drive Assembly
- AF Base Unit
- AG Piston observation hole ⁽¹⁾
- AH Warm Melt Module

⁽¹⁾The sketch takes 25 cc as an example. The piston observation holes for 50 cc and 100 cc are at the same places.

PSM Control Unit

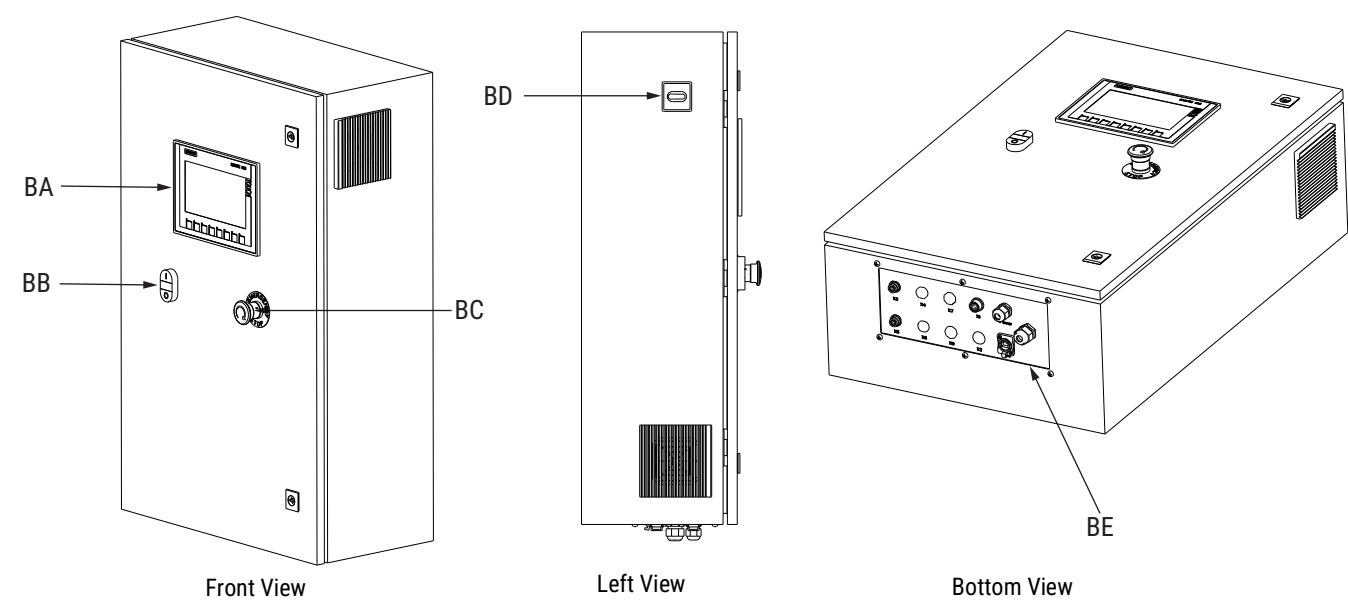


Fig. 5: PSM Control Unit

Key:

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

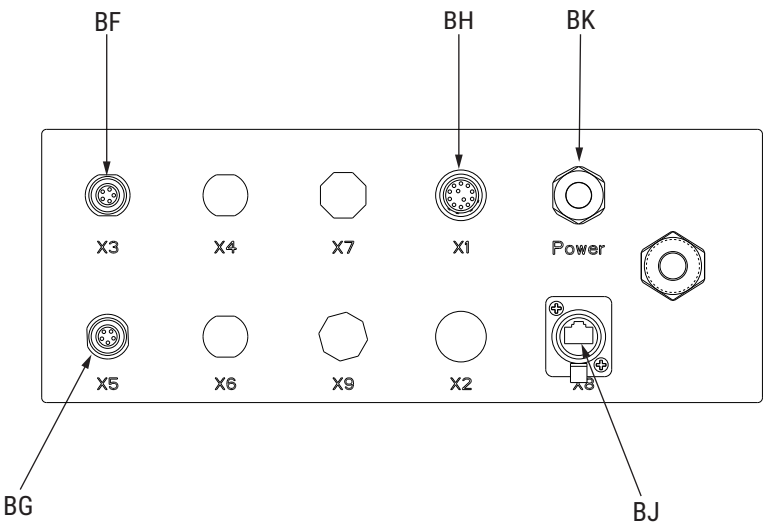


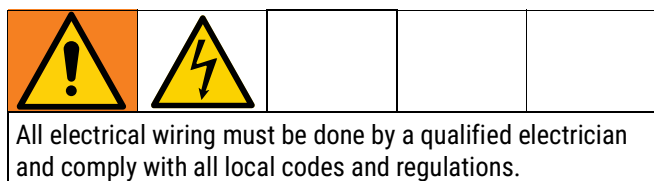
Fig. 6: Connection Plate (BE)

Key:

- BF Servo Motor Encoder Connection (X3)
- BG Servo Motor Power Connection (X5)
- BH Junction Box Connection (X1)
- BJ Ethernet Connection (X8)
- BK Power Connection

Notes: X2, X4, X6, X7, X9 are knock-out holes for functional use when needed.

Installation



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 PSM Metering Unit (H, page 8) can be directly mounted on a Customer Robot (G, page 8) or remotely mounted on a motion table. Verify the location has access to compressed air and AC power.
2. Place the PSM Metering Unit (H, page 8) onto the designated location.
3. Attach the PSM Installation Plate (AC, page 11) to the selected location by installing fasteners (not provided with the PSM metering unit) through the four mounting holes. There are also two position pin holes. Refer to the following figures for mounting hole dimensions.

Mounting Hole Dimensions for PSM Ambient Metering Unit

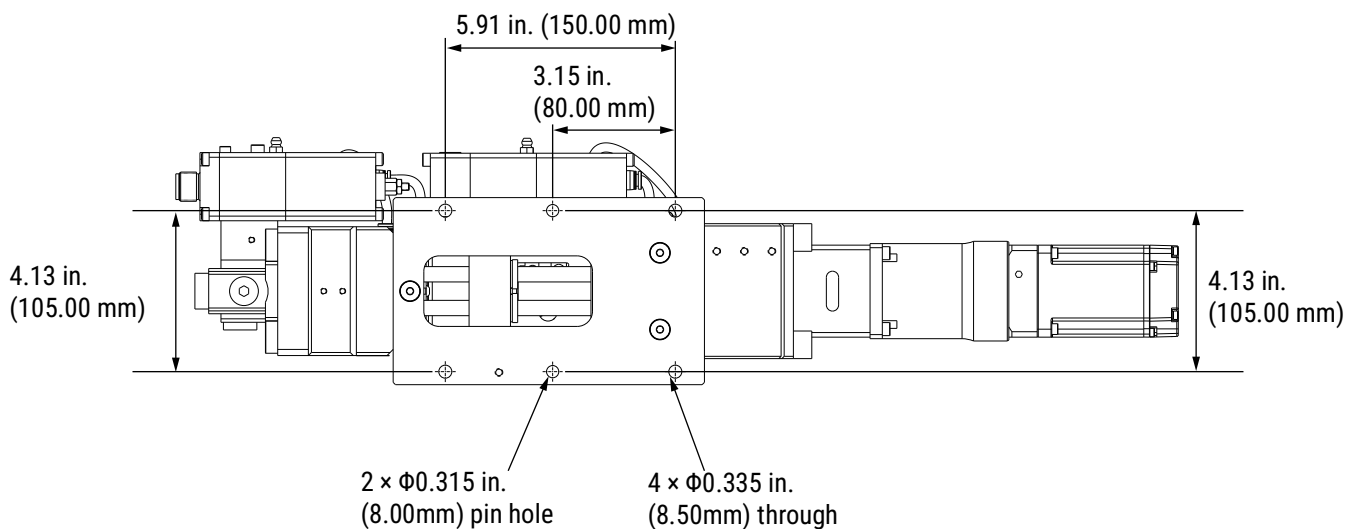


FIG. 7: Mounting Hole Dimensions for Installing the PSM Ambient Metering Unit - 25cc and 50cc

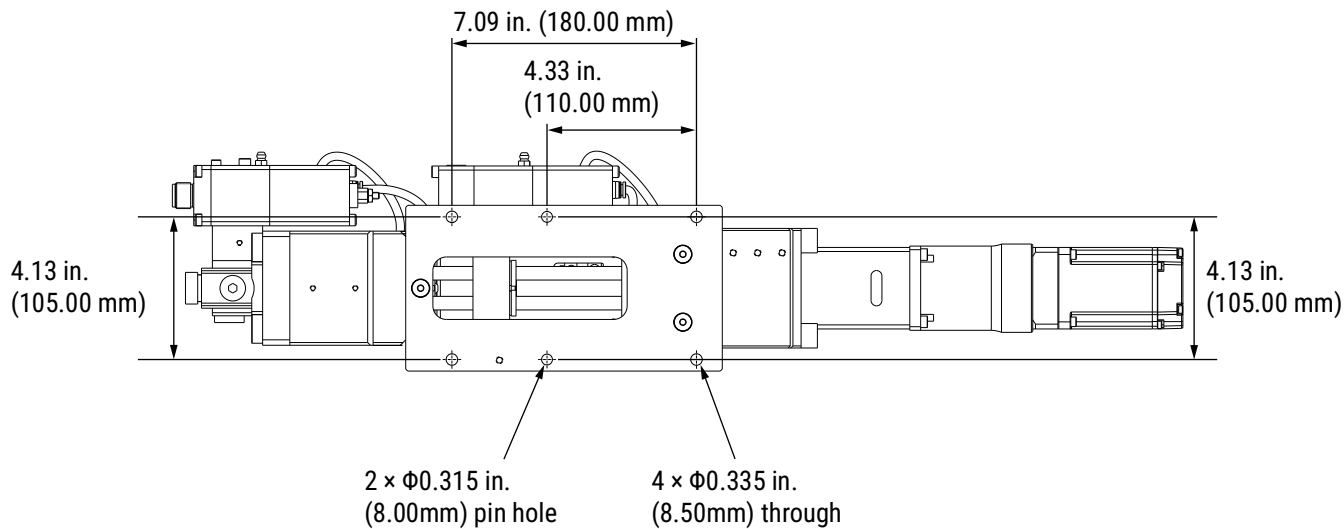


FIG. 8: Mounting Hole Dimensions for Installing the PSM Ambient Metering Unit - 100cc

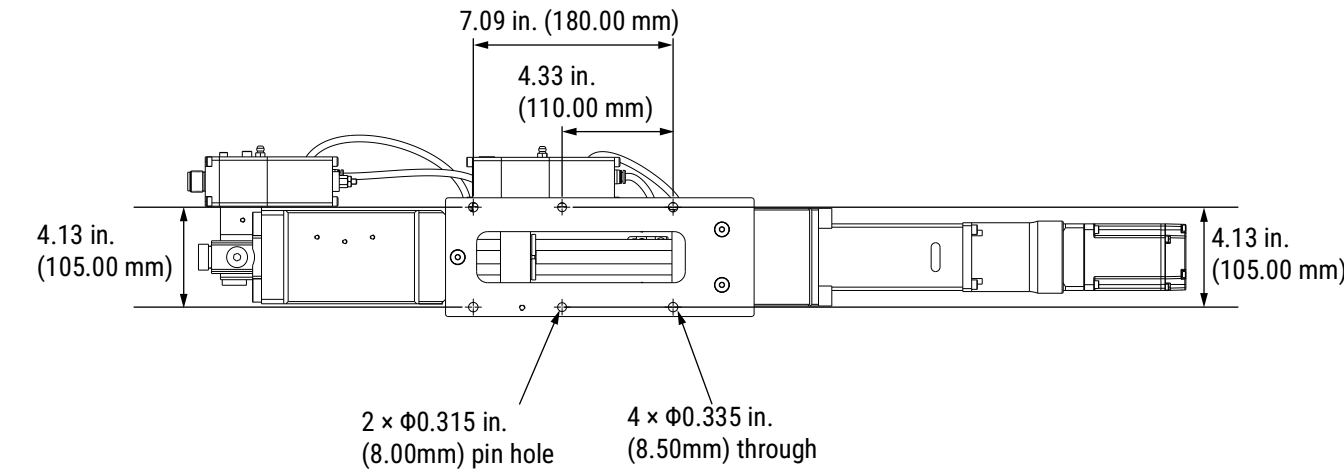


FIG. 9: Mounting Hole Dimensions for Installing the PSM Ambient Metering Unit - 200cc

Mounting Hole Dimensions for PSM Warm Melt Metering Unit

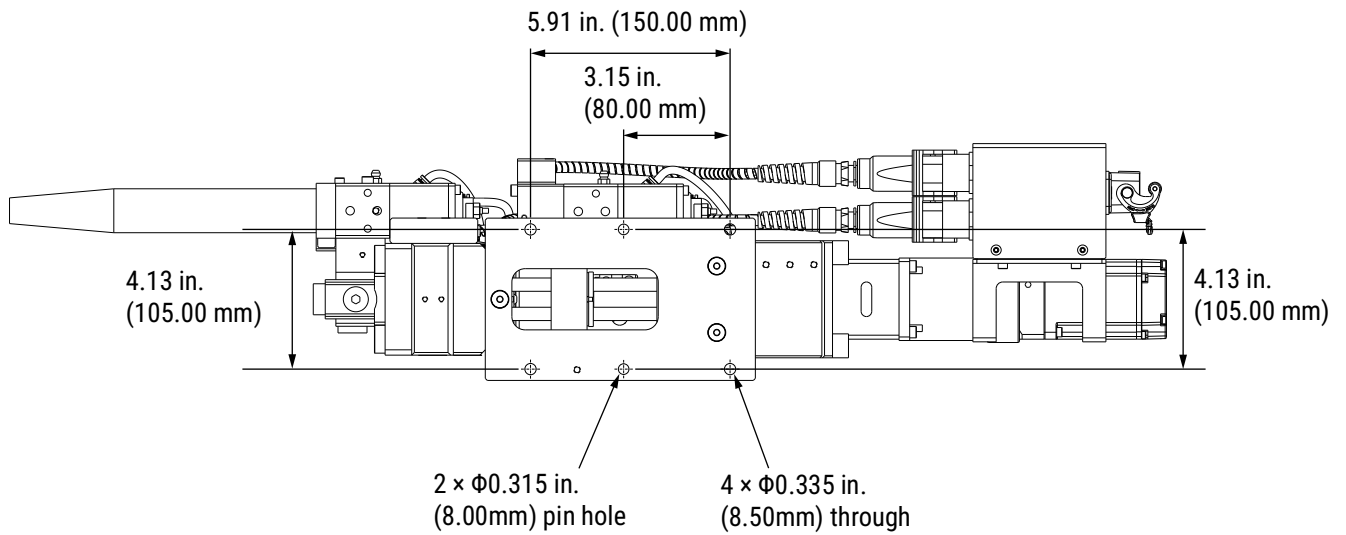


FIG. 10: Mounting Hole Dimensions for Installing the PSM Warm Melt Metering Unit - 25cc and 50cc

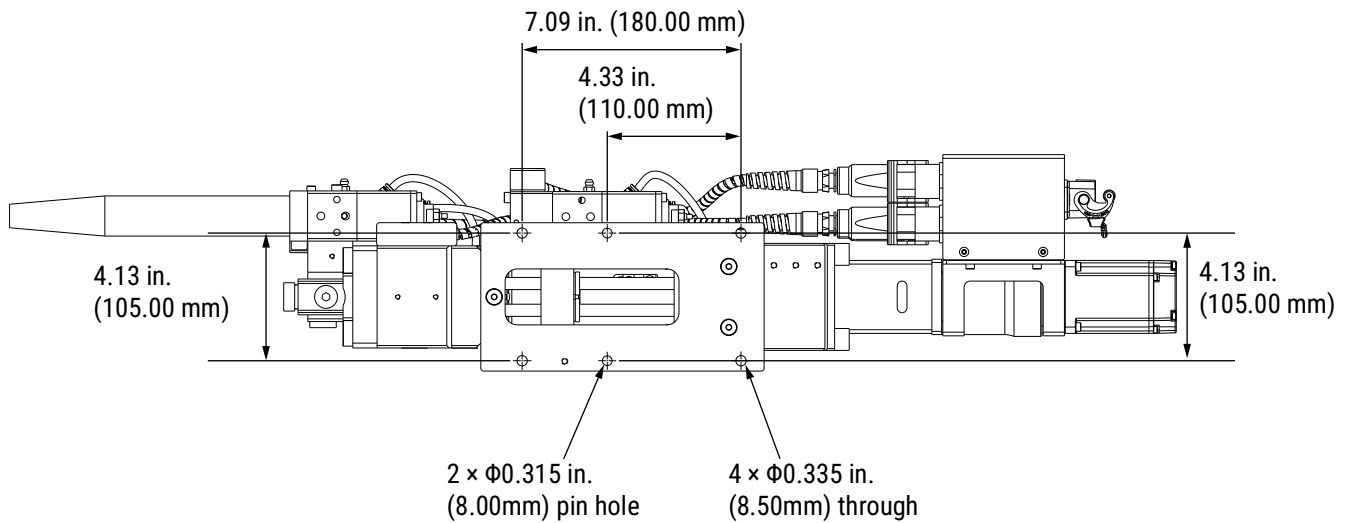


FIG. 11: Mounting Hole Dimensions for Installing the PSM Warm Melt Metering Unit - 100cc

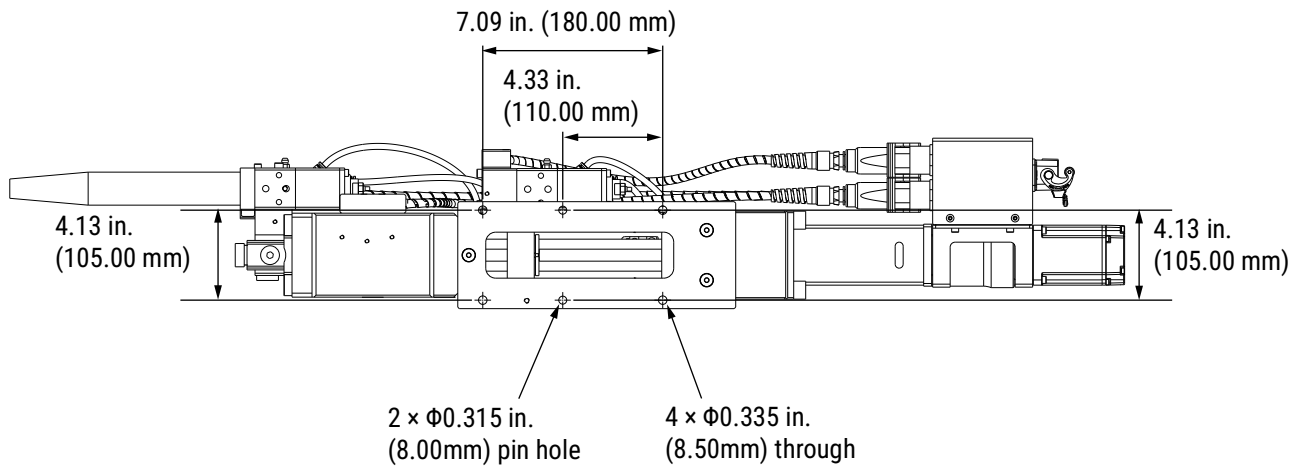


FIG. 12: Mounting Hole Dimensions for Installing the PSM Warm Melt Metering Unit - 200cc

Installation for Control Unit

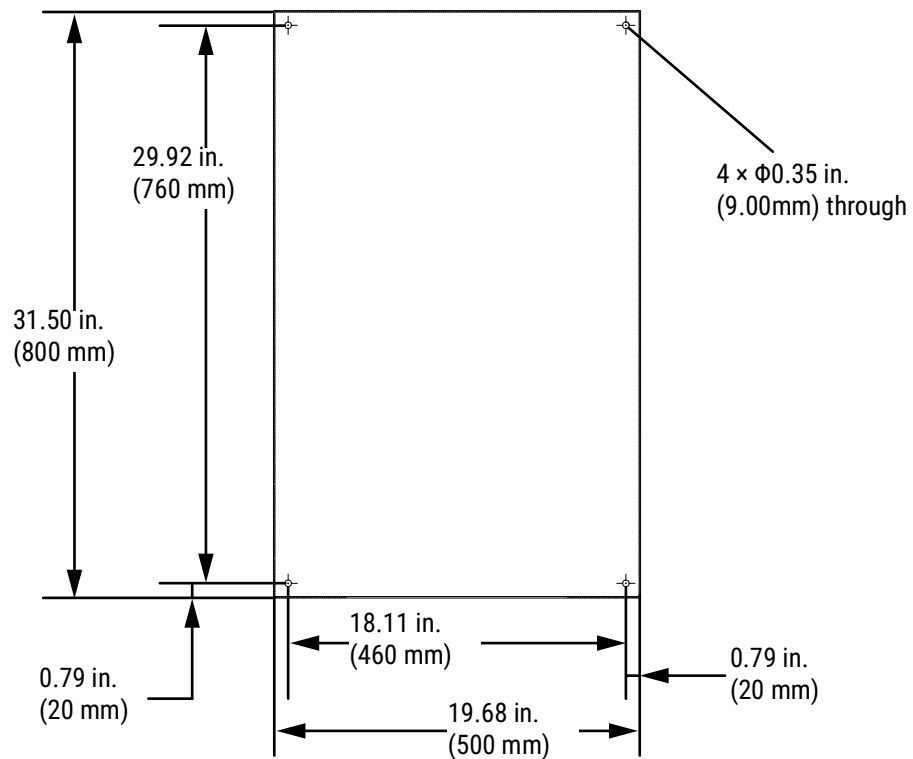


FIG. 13: Installation Dimensions for Control Unit

Grounding



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.

PSM Metering Unit (H, page 8): grounded through the Installation Plate (AC, page 11). Use the supplied ground wire and clamp to ground the metal Installation Plate (AC, page 11) or Customer Robot (G, page 8) to a true earth ground.

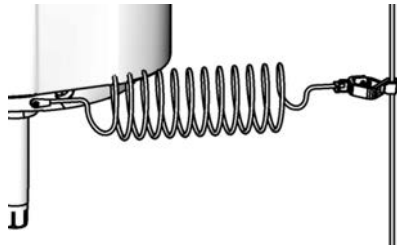
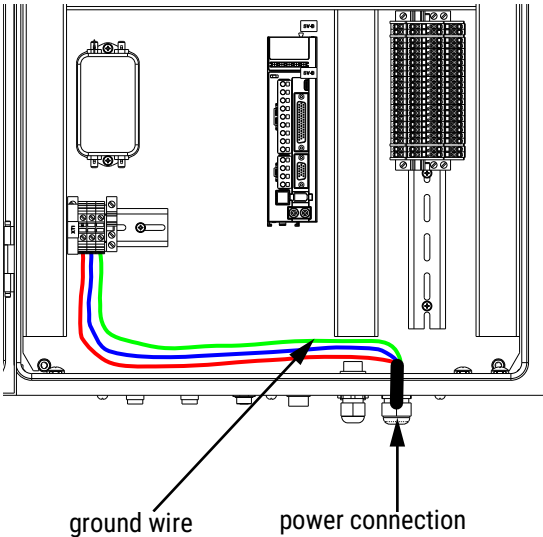


FIG. 14 Grounding

PSM Control Unit (F, page 8): 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.

Dispense Valve (AB, page 11): ground through connection to a properly grounded fluid line and pump.

Fluid supply container: follow local code and regulations.

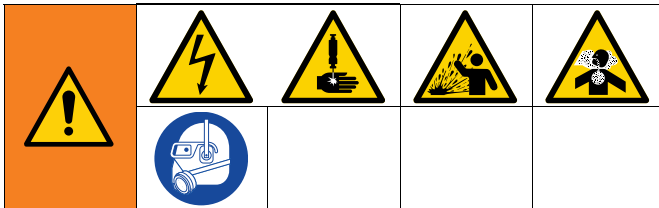
Solvent pails used when flushing: follow local code. Use only conductive metal pails placed on a grounded surface. Do not place the pail on a non-conductive surface, such as paper or cardboard, which interrupts grounding continuity.

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

Connect Lines and Cables



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

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

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

NOTE: Supply cable and overcurrent protection device are not provided in the control unit. Use a supply cable size with a minimum of 14AWG. Use an overcurrent protection device that is a branch type circuit breaker or fuse with voltage rating not less than 240V, a current rating not more than 10A, and a short-circuit current rating not less than 10kA.

1. Connect the PSM System Air Line (M, page 8) to the air inlet of the Junction Box Assembly (AA, page 11). The maximum air pressure is 100 psi (0.7 MPa, 7 bar). The air flow is over 1 CFM.
2. Connect the Material Supply Lines (L, page 8) to the corresponding material inlets at the top of the Reload Valve (AD, page 11).
3. Using the power cord (customer prepared), connect AC power (220 V, 50/60 Hz, single phase) to the Power Connection (BL, page 12) on the back of the PSM Control Unit (F, page 8).
4. Follow the marks on the PSM Control Unit (H, page 8) and cables to connect the junction box and the servo motor from the PSM Metering Unit (H, page 8) to the PSM Control Unit (F, page 8).

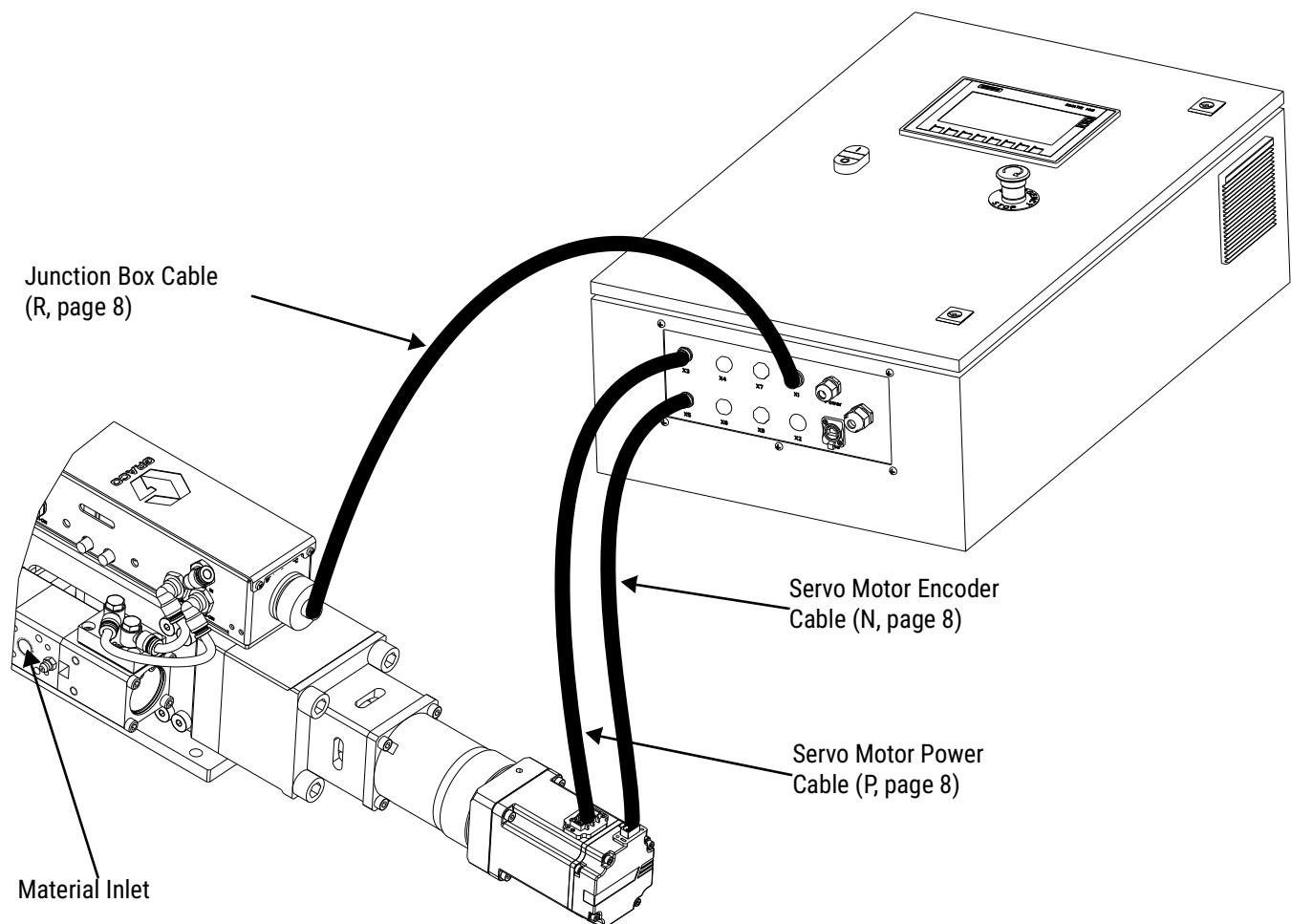


FIG. 15: PSM Ambient Cable Connections

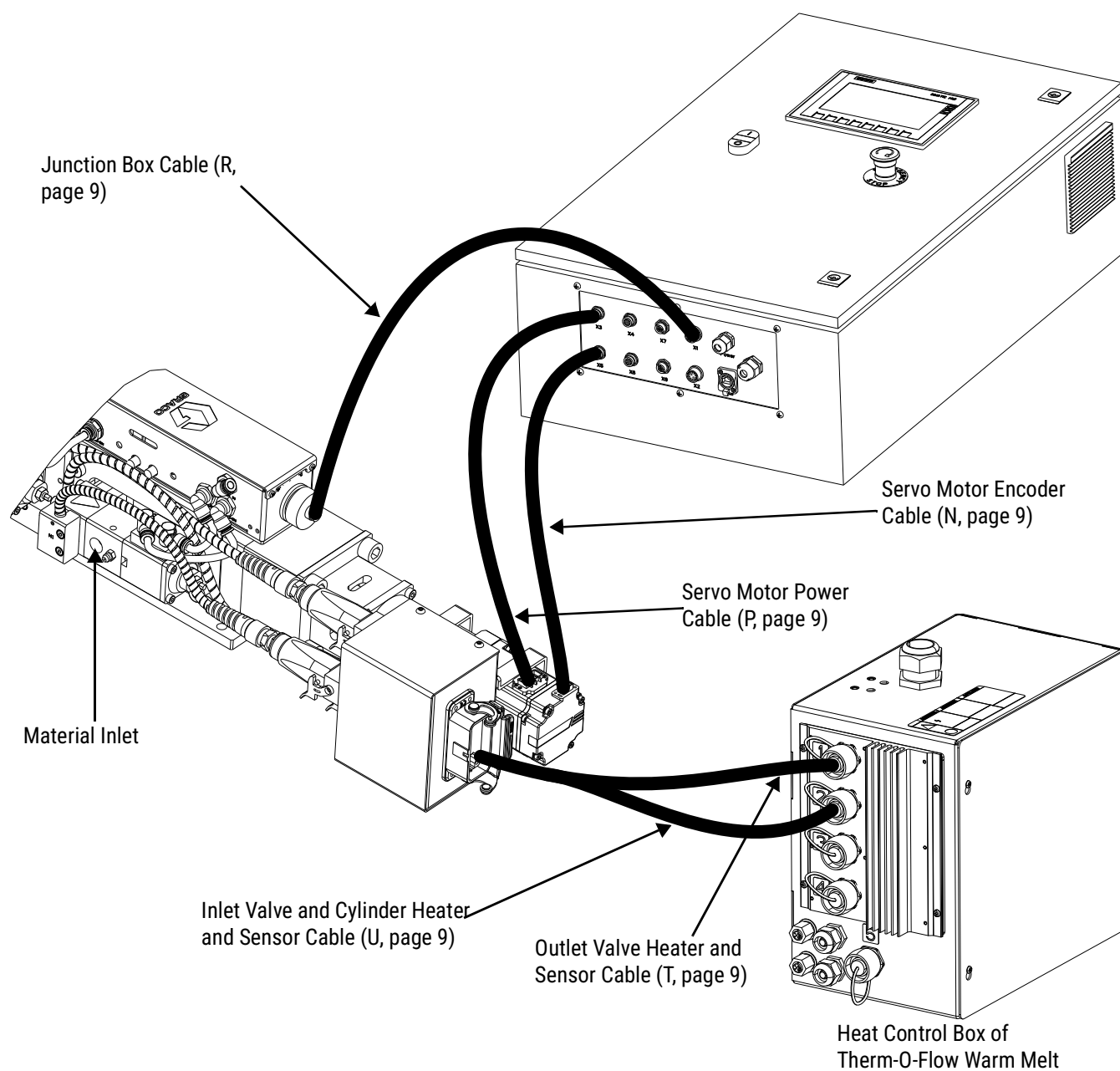


FIG. 16: PSM Warm Melt Cable Connections

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** on page 60.

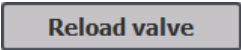
Startup

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

To avoid severe burns, do not touch hot fluid or equipment.

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

1. Make sure the air line and the cables are correctly connected to the system.
2. Locate the Power Switch (BD, page 12) at the left of the PSM Control Unit (F, page 8) and turn the power on.
3. Press the Control Power on Button (BB, page 12).
4. Go to the Advanced Screen of the PSM Control Unit (F, page 8), then select  to turn on Reload Valve (AD, page 11).

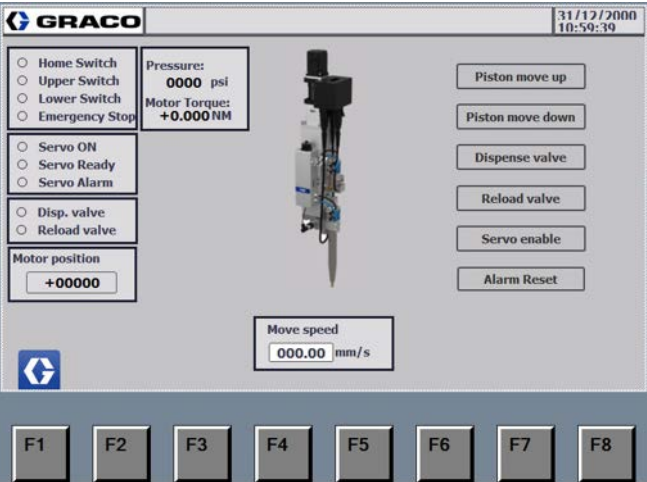


Fig. 17 Advanced Screen

5. Adjust the Pressure Regulating Valve (C, page 8) so the air pressure provided by the customer 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** on page 51.
7. Dispense several full stroke shots until the PSM Metering Unit (H, page 8) is free of air and there is no leakage at the Dispense Valve (AB, page 11) 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 metering unit should be filtered.

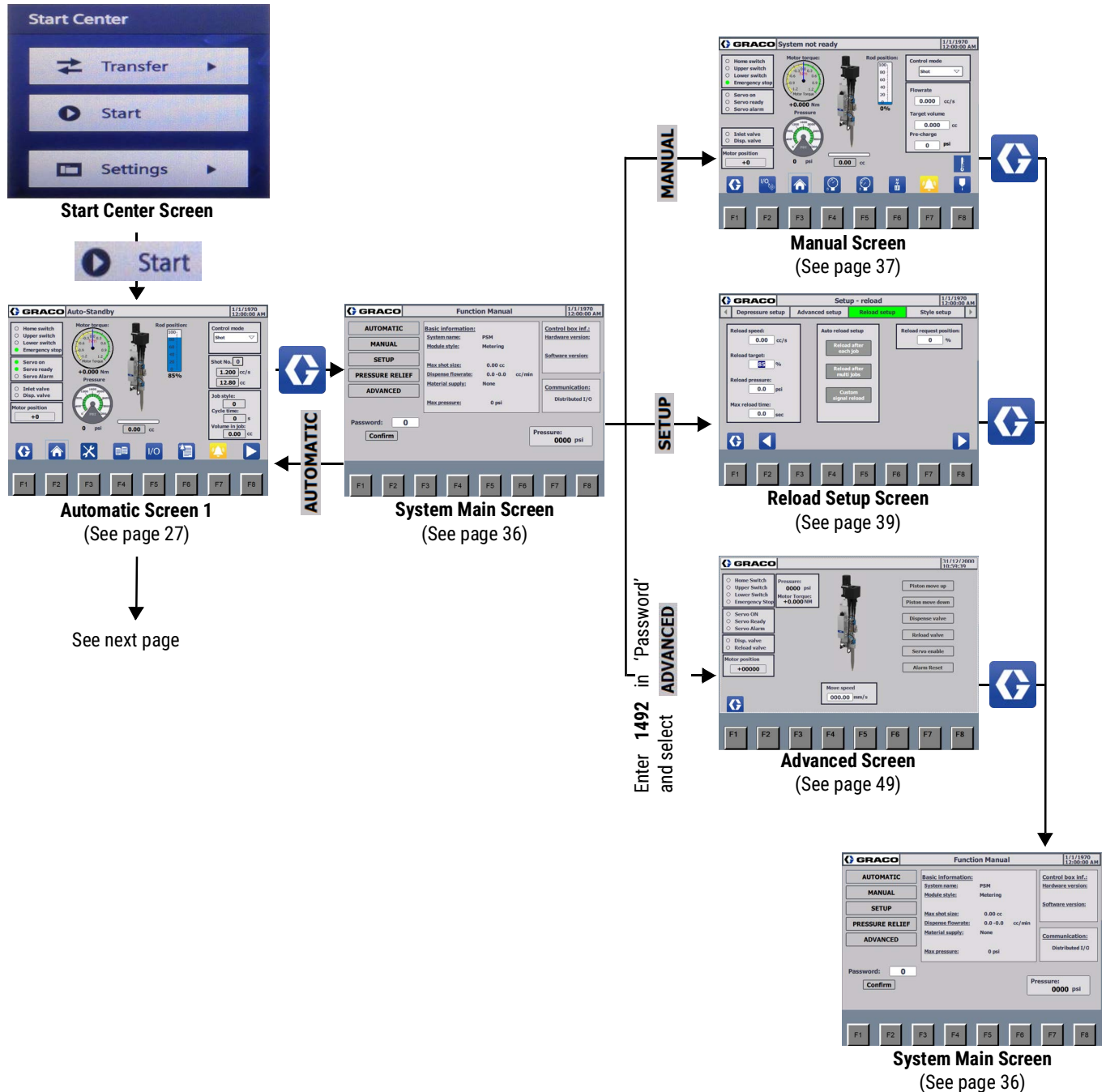
HMI Display Operation and Identification

Screen Navigation Diagrams

NOTE: Use the icons or corresponding “F” keys below the icons to navigate between screens. Navigation of icons is shown as the example.

Navigation on Main Screen

NOTE: Select  in any other screens can enter System Main Screen.

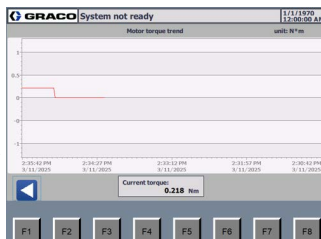
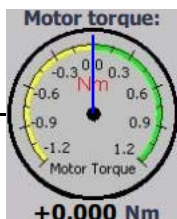


Navigation on Automatic Screens

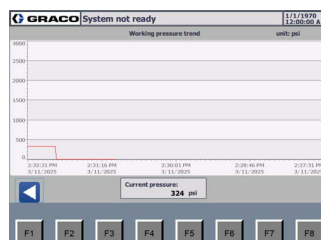
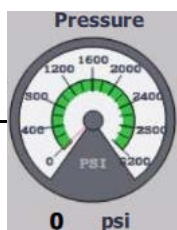


Automatic Screen 1
(See page 27)

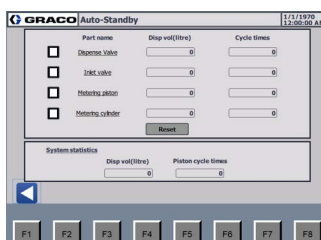
See next page



Motor Torque Trend Screen
(See page 34)



Working Pressure Trend Screen
(See page 35)



Maintenance Record Screen
(See page 31)



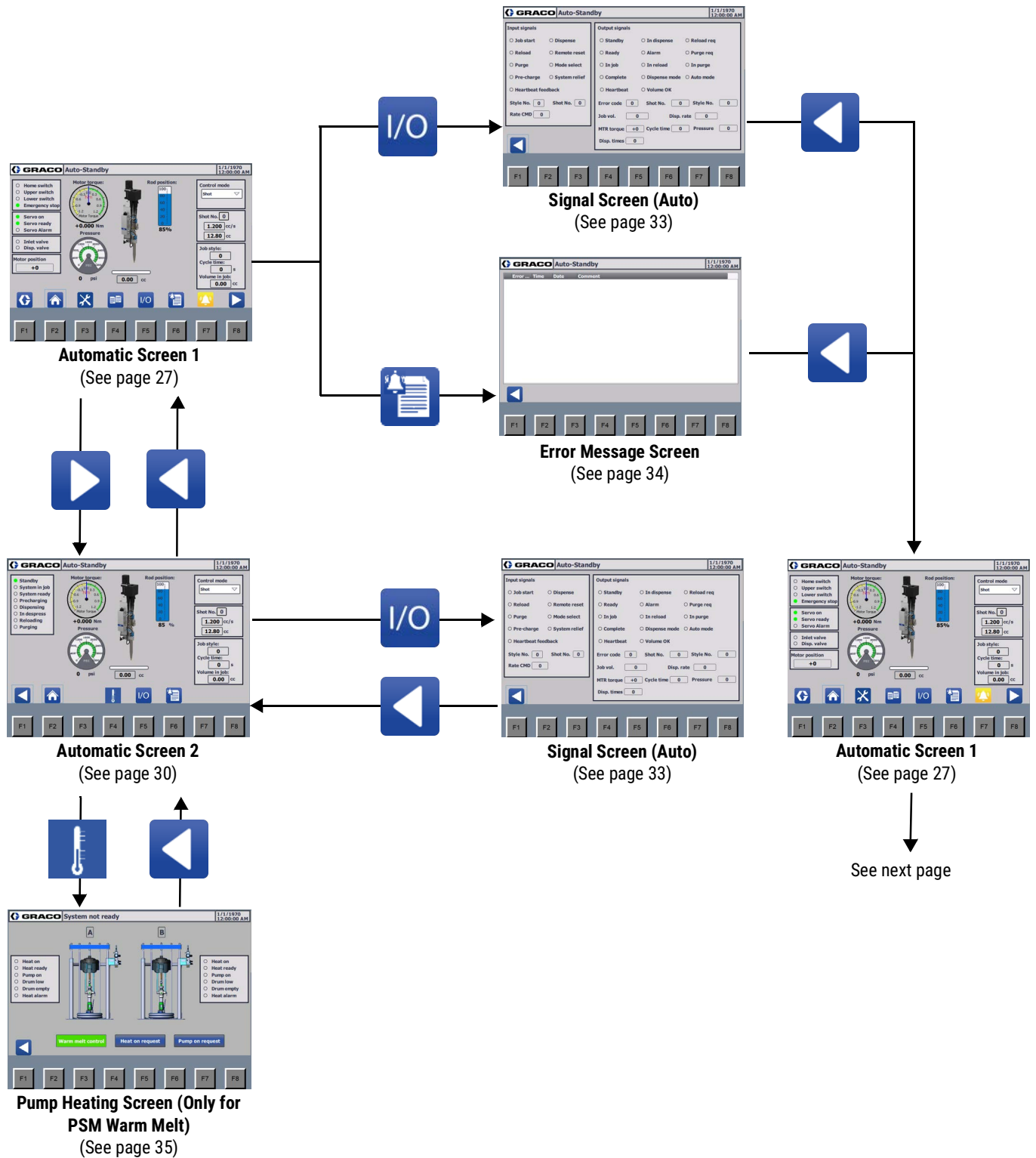
Job Record Screen displays a table of job records. The table has columns for No., Date/Time, Shot times, Displacement, and Cycle time. The screen includes a status bar at the top and eight function keys at the bottom.

No.	Date/Time	Shot times	Displacement	Cycle time
1	1/1/1970 12:00:00 AM	0	0.0 cc	0s
2	1/1/1970 12:00:00 AM	0	0.0 cc	0s
3	1/1/1970 12:00:00 AM	0	0.0 cc	0s
4	1/1/1970 12:00:00 AM	0	0.0 cc	0s
5	1/1/1970 12:00:00 AM	0	0.0 cc	0s
6	1/1/1970 12:00:00 AM	0	0.0 cc	0s
7	1/1/1970 12:00:00 AM	0	0.0 cc	0s
8	1/1/1970 12:00:00 AM	0	0.0 cc	0s
9	1/1/1970 12:00:00 AM	0	0.0 cc	0s
10	1/1/1970 12:00:00 AM	0	0.0 cc	0s

Job Record Screen
(See page 32)

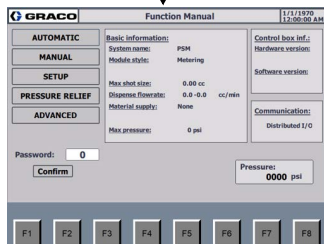


Automatic Screen 1
(See page 27)



See next page

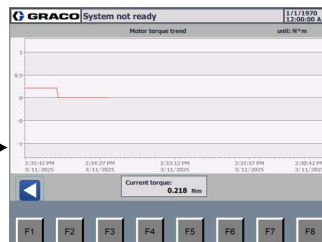
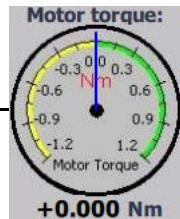
Navigations on Manual Screens



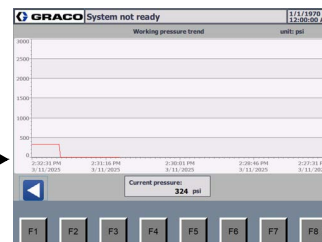
MANUAL



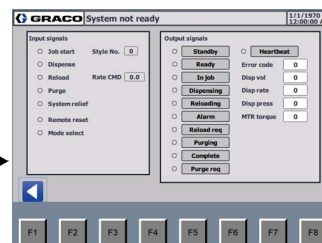
Manual Screen
(See page 37)



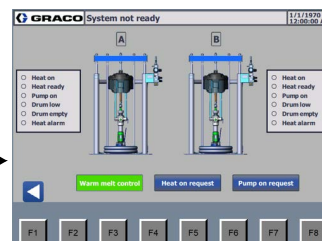
Motor Torque Trend Screen
(See page 34)



Working Pressure Trend Screen
(See page 35)



Signal Screen (Manual)
(See page 38)



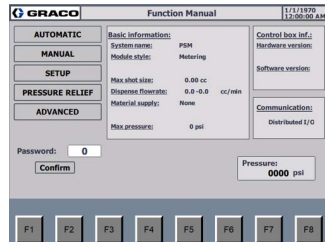
Pump Heating Screen (Only for PSM Warm Melt)
(See page 35)



Manual Screen
(See page 37)

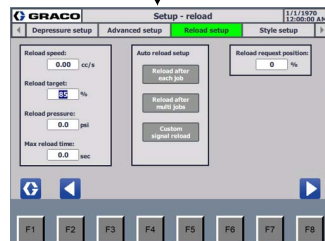
Navigations on Setup Screens

NOTE: Click the  button on any screen that has this button can display System Main Screen, which is not showed in the following diagrams.



System Main Screen
(See page 36)

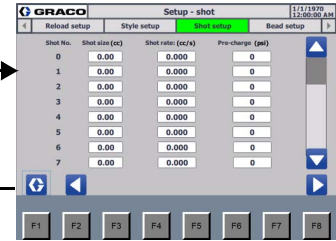
↓
SETUP



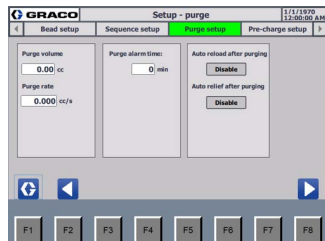
Reload Setup Screen
(See page 39)



Style Setup Screen
(See page 40)



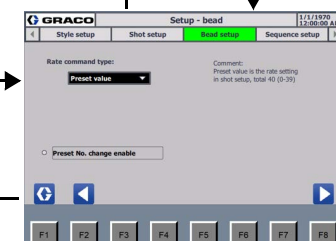
Shot Setup Screen
(See page 41)



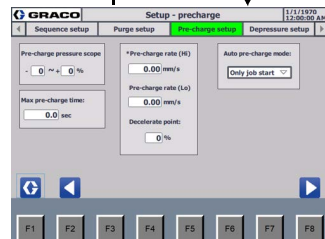
Purge Setup Screen
(See page 42)



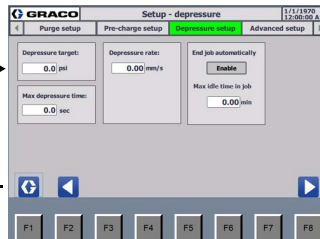
Sequence Setup Screen
(See page 42)



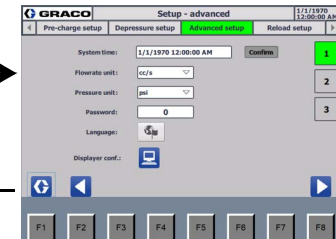
Bead Setup Screen
(See page 41)



Pre-charge Setup Screen
(See page 43)

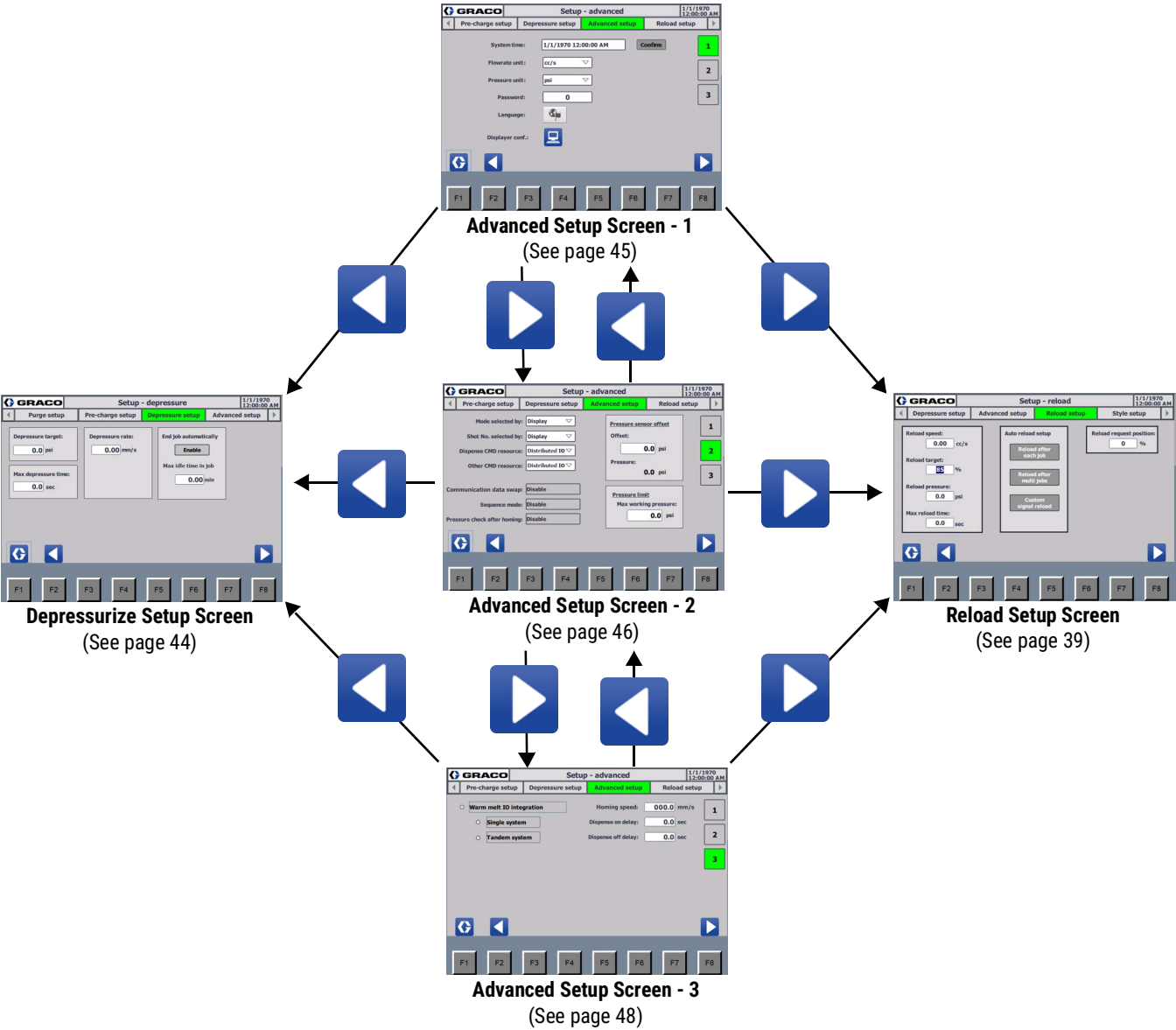


Depressurize Setup Screen
(See page 44)



Advanced Setup Screen - 1
(See page 45)

↓
See next page



Start Center

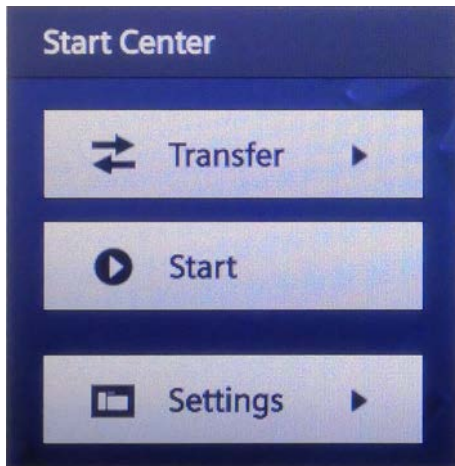


FIG. 18 Start Center Screen

When the PSM control unit is powered on, select 'Start' in the 'Start Center' screen and the system performs self check.



FIG. 19 Self Check Screen

If the displayer is connected, the system will perform successful self check and display Automatic Screen 1.

If the displayer is disconnected, the system fails to perform self check and stays 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 **Edit IP address**, page 55.

Automatic Screen 1



FIG. 20 Automatic Screen 1

The content and functions of this screen are as follows:

-  : Press F1 or select to display **System Main Screen**, page 36. This button is only available when the system is in standby or has an alarm. When on the System Main Screen, the system will not work in automation mode.
-  : Press F2 or select to execute the command of returning to home point. The system must be inactive when the HOME button is selected. Check in the information bar to see if the piston has returned to the home point.
-  : Press F3 or select to display **Maintenance Record Screen**, page 31.
-  : Press F4 or select to display **Job Record Screen**, page 32.
-  : Press F5 or select to display **Signal Screen (Auto)**, page 33.
-  : Press F6 or select to display **Error Message Screen**, page 34.

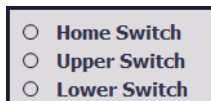
-  : Press F8 or select to display **Automatic Screen 2**, page 30.
-  : It appears when system sends the alarm. Press F7 or select to stop the alarm.

Information bar



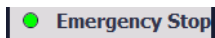
- To illustrate the current status of equipment, such as Auto-Standby or Auto-Shot dispense.
- To show error information when an alarm is active.

Sensors status



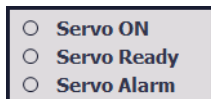
To show the 3 slider position sensors.

Emergency stop status



- Red circle: E-stop button is pushed in.
- Green circle: E-stop button is released.

Servo motor signals



- Servo ON: This signal will be shown as green after system start.
- Servo Ready: Motor can be used or is working without problem.
- Servo Alarm: Something is wrong with the motor. Operator should select reset icon or send a remote reset signal. If reset does not work, the PSM control unit needs to be restarted.

Reload or dispense valve status



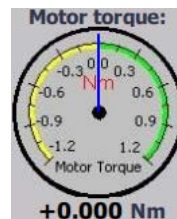
To show if the reloading valve or dispensing valve is open.

Motor position



To Show the number of motor steps.

Motor torque



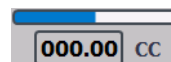
The torque of the drive motor is shown in N•m. Click to display **Motor Torque Trend Screen**, page 34.

Pressure



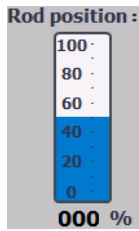
The current pressure is shown in psi. The operator can change the unit of pressure. See **Pressure unit**, page 45. Click to display **Working Pressure Trend Screen**, page 35.

Progress bar and dispense volume



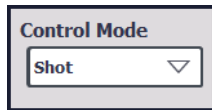
- Progress bar
 - Shot mode: The progress bar displays the completion of the current target.
 - Bead mode: The progress bar always displays 100%.
- Dispense volume: Display the volume for current one shot.

Rod position



This displays how much material is 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%.

Control mode



Automatic mode includes three control modes: shot mode, bead mode and sequence mode.

- Shot mode: Per the style selected, the system will dispense at the preset volume and flow rate. For the preset style, see **Shot Setup Screen**, page 41.
- Bead mode: Per the style selected, the system will dispense at the preset flow rate. For the preset style, see **Bead Setup Screen**, page 41.
- Sequence mode: When the system works in automatic status, the Customer Robot Control Unit (J, page 8) can send 'dispense' signal to initiate the sequence. The working sequence can only be edited before dispense starts. The sequence includes 16 steps maximum, and the operator can edit step 1 to 14, as step 0 and 15 are reserved respectively for pre-charge and depressurization.
 - When 'Enable Sequence Mode' option is not selected and the system is not dispensing, the operator may choose between 'Bead' or 'Shot' mode by using the touch screen or customer signal.
 - When 'Enable Sequence Mode' option is selected, control mode will be fixed as 'Sequence' mode. 'Bead' or 'Shot' mode will be inaccessible.

NOTE: For enabling sequence mode, see 'Enabling sequence mode' in **Advanced Setup Screen - 2**, page 46. For preset sequence style, see **Sequence Setup Screen**, page 42.

System working information

This area shows information unique to each control mode.

- Shot mode

Control Mode
Shot

Shot No. 00
000.00 CC/s
00.00 CC

In Shot mode, the selected shot number, target flow rate and target volume will be shown. Shot style can be selected by touch screen or customer signals. Preset styles include 40 styles, 0-39. If Distributed IO is selected in Shot No. selected by column in **Advanced Setup Screen - 2**, page 46, only shot numbers from 0 to 15 are available.

- Bead mode with preset value

Control Mode
bead

Shot No. 00
000.00 CC/min

In Bead mode with preset value, the selected style number and target flow rate will be shown. The process for style number selection is the same as shot mode.

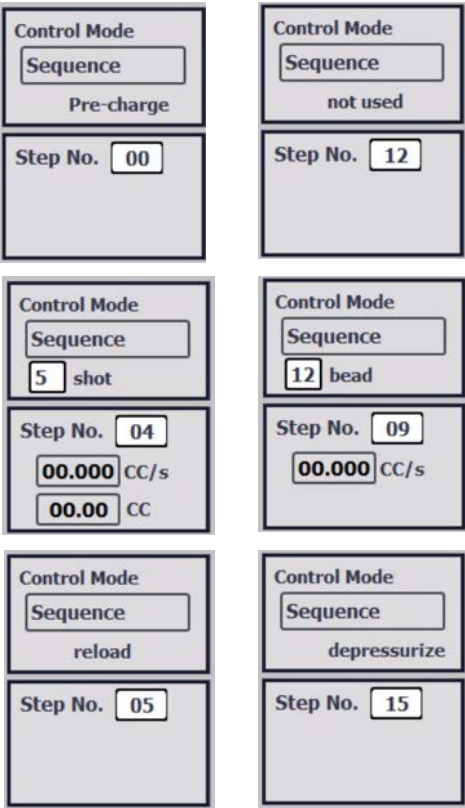
- Bead mode with custom setting

Control Mode
Bead

Rate CMD 00 V
000.00 CC/min

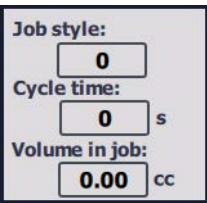
In Bead mode with custom setting, 'Rate CMD' will be shown as voltage value and target flow rate will be shown. The flow rate will change based on rate command.

- Sequence mode



In Sequence mode, the step number, remaining repeat times, target flow rate and volume will be shown in different screens based on different step types. The operator can edit the step by using the touch screen prior to or following the current job. Once dispensing has begun, the 'Control mode' display will show the current step, including pre-charge, not used, shot, bead, reload and depressurize.

Cycle time and volume in job



- Job style: To show the current style number defined on **Style Setup Screen**, page 40. If Distributed IO is selected in Shot No. selected by column in **Advanced Setup Screen - 2**, page 46, the default value of job style is set to '0'.
- Cycle time: To show the accumulative time of a job.
- Volume in job: To show the accumulative volume of a job.

Automatic Screen 2



FIG. 21 Automatic Screen 2

On the Automatic Screen 2, press F1 or select  to display the Automatic Screen 1.

The content and functions of this screen are as follows:



: Press F4 or select to display the Pump Heating Screen. This icon and related functions are enabled only when Warm melt IO integration is enabled in **Pump enabled**, page 48.

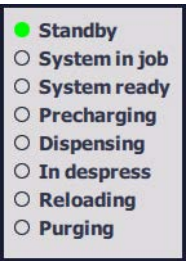


: Press F5 or select to display the Signal Screen (Auto).



: Press F6 or select to display the Error Message Screen.

System working status



- Standby: The system has checked the home position, but is not pre-charged.

- System in job: The job starts from pressure pre-charge and ends after depressurization. The system will record the dispense volume for each job. In shot or bead mode, 'job start' signal must be '1' during one job. In sequence mode, step 0 to step 15 will be considered one job.
- System ready: Pre-charge has been completed and the system is ready to dispense material.
- Precharging: The system is pre-charging pressure for current job.
- Dispensing: The system is dispensing material.
- In depress: The system is in the last step of the current job. In shot or bead mode, when 'job start' is from '1' to '0', system completes de-pressurization and finishes the current job.
- Reloading: The system is reloading material.
- Purging: The system is purging some material based on the preset flow rate and volume.

Other information

For other information on this screen, see **Automatic Screen 1**, page 27.

Maintenance Record Screen

FIG. 22 Maintenance Record Screen

On the Maintenance Record Screen, press F1 or select  to display the Automatic Screen 1. The content and functions of this screen are as follows:

Select box

After one or several selection boxes are selected, the

will appear. The operator can clear the selected record and restart data recording.

Workload record

Part name	Disp vol(litre)	Cycle times
Dispense Valve	0	0
Inlet valve	0	0
Metering piston	0	0
Metering cylinder	0	0

To record the workload of important parts.

System statistics

System statistics

Disp vol(litre)	Piston cycle times
0	0

This section displays system workload record. This data cannot be reset.

Job Record Screen

GRACO Auto-Standby 1/1/1970 12:00:00 AM

No.	Date/Time	Shot times	Disp. vol.	Cycle time
1	1/1/1970 12:00:00 AM	0	0.0 cc	0s
2	1/1/1970 12:00:00 AM	0	0.0 cc	0s
3	1/1/1970 12:00:00 AM	0	0.0 cc	0s
4	1/1/1970 12:00:00 AM	0	0.0 cc	0s
5	1/1/1970 12:00:00 AM	0	0.0 cc	0s
6	1/1/1970 12:00:00 AM	0	0.0 cc	0s
7	1/1/1970 12:00:00 AM	0	0.0 cc	0s
8	1/1/1970 12:00:00 AM	0	0.0 cc	0s
9	1/1/1970 12:00:00 AM	0	0.0 cc	0s
10	1/1/1970 12:00:00 AM	0	0.0 cc	0s

F1 F2 F3 F4 F5 F6 F7 F8

Fig. 23 Job Record Screen

On the Job Record Screen, press F1 or select  to display the Automatic Screen 1.

This screen shows the job records. It will record the shot times, dispense volume and cycle time for the last 50 job records.

Signal Screen (Auto)

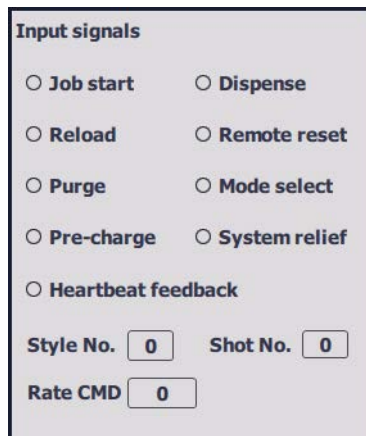


FIG. 24 Signal Screen (Auto)

On the Signal Screen (Auto), press F1 or select  to display the Automatic Screen 1.

The content and functions of this screen are as follows:

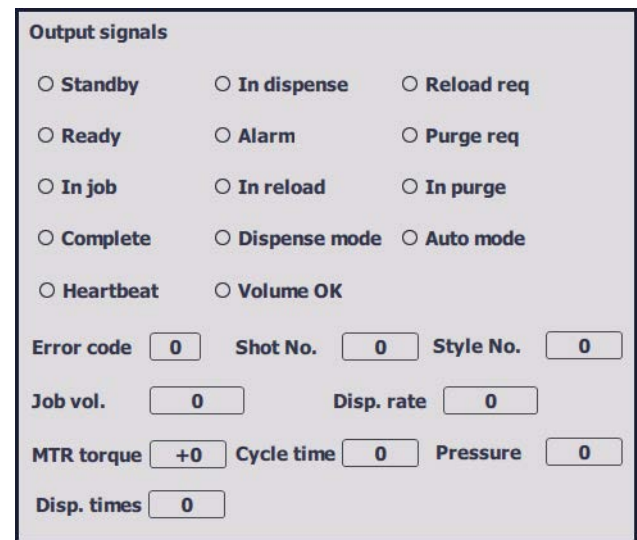
Input signals status



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

- Rate CMD
 - If 'distributed IO' is selected as 'Other CMD Resource' on **Advanced Setup Screen - 2**, see page 46, the input voltage signal will be shown as 0-10.0, where 0 means 0 voltage, 10.0 means 10 V.
 - If 'Gateway' is selected as 'Other CMD Resource' on **Advanced Setup Screen - 2**, see page 46, the input data sent by Profinet will be shown as a value from 0 to 1000.

Output signals status



The output signals display shows the current signal status from the PSM control unit.

- Shot No.: Displays what shot number it is for current job.
- Style No.: Displays what style number it is for current job.
- Job vol: Dispense volume during current shot. The value from the PSM control unit is an integer and must be multiplied by 0.1 to calculate the requested volume. The unit is cc.
- Disp rate: Dispense flow rate. The value from the PSM control unit is an integer and must be multiplied by 0.01 to calculate the requested volume. The unit is cc/s.
- MTR torque: Current driver motor working torque. The value is an integer and must be multiplied by 0.001 to calculate the requested volume. The unit is N•m.
- Cycle time: spending time for current job.
- Pressure: Current working pressure value. The value from the PSM control unit is an integer and the unit is psi.
- Disp. times: times of shots for current job.

Error Message Screen

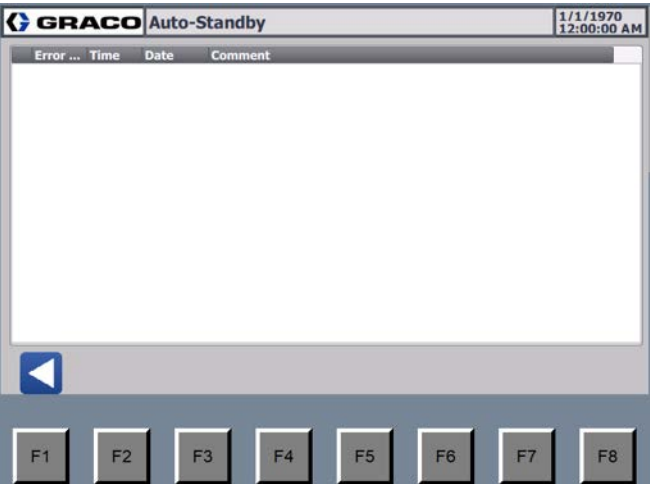


Fig. 25 Error Message Screen

On the Error Message Screen, press F1 or select  to display the Automatic Screen 1.

This screen shows the error history. It will record the error number, time, date, error code and comment for the last 50 system errors.

Motor Torque Trend Screen

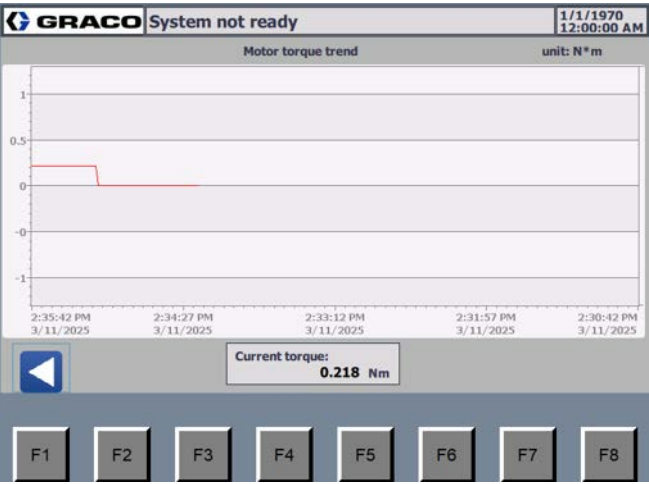


Fig. 26 Motor Torque Trend Screen

On the Motor Torque Trend Screen, press F1 or select  to display the Automatic Screen 1.

This screen shows motor torque changes with time in a job.

Working Pressure Trend Screen

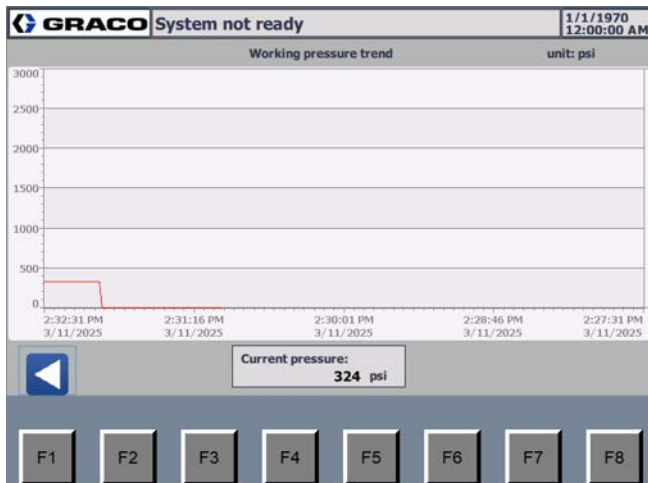


FIG. 27 Working Pressure Trend Screen

On the Working Pressure Trend Screen, press F1 or select  to display the Automatic Screen 1.

This screen shows the pressure changes with time in a job.

Pump Heating Screen (Only for PSM Warm Melt)



FIG. 28 Pump Heating Screen - One Pump

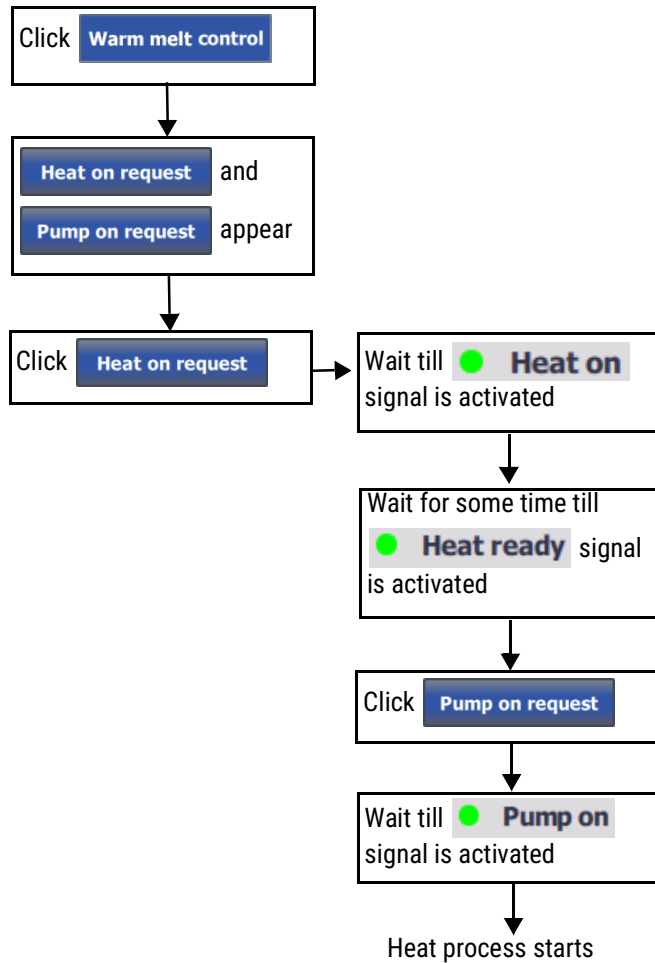


FIG. 29 Pump Heating Screen - Two Pumps

On the Pump Heating Screen, press F1 or select  to display the Automatic Screen 1.

This screen is designed to open the heating process and check the status of heating process for supply system.

The operations of heating process are as follows.



Signal alert

Any of the following signals light indicate the heating process is interrupted, and you need to trouble shoot before restarting the heating process.

- ☐ Drum low
- ☐ Drum empty
- ☐ Heat alarm

- **Drum low:** The materials in supply drum is lower than expected, and more materials are needed.
- **Drum empty:** The supply drum is empty, and more materials are needed.
- **Heat alarm:** Something wrong is with the supply system. Please trouble shoot the problems before restarting the supply system.

System Main Screen

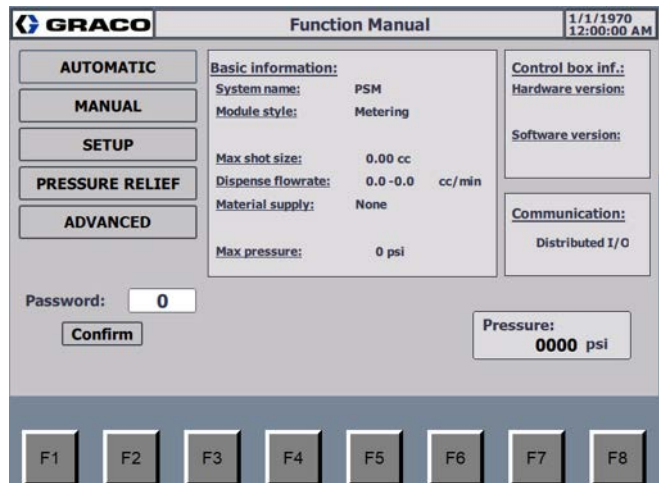


FIG. 30 System Main Screen

On the Automatic Screen 1, press F1 or select  to display the System Main Screen. This can only be selected when the system is in standby or alarm mode. On this screen, the operator can switch the system to Automatic mode, Manual mode, Setting mode, Pressure relief function or Advance mode.

Password



If the operator has already set up password protection on **Advanced Setup Screen - 1**, page 45, the password must be entered to visit the Setup Screens.

To open the Advance mode, the operator must enter the password **1492**. The Advanced option won't show until the password has been entered.

Pressure relief

Select **PRESSURE RELIEF** to execute pressure relief procedure. For more information, see **Pressure Relief Procedure**, page 59.

System information

Basic information:		Control box inf.:
System name:	PSM	Hardware version:
Module style:	Metering	Software version:
Max shot size:	0.00 cc	
Dispense flowrate:	0.0 -0.0 cc/min	
Material supply:	None	
Max pressure:	0 psi	Communication:
		Distributed I/O

System main screen displays system information.

Manual Screen



FIG. 31 Manual Screen

On the Manual Screen, Press F1 or select  to display System Main Screen. This can only be selected when the system is in standby or alarm mode. When the operator has entered the System Main Screen, the system will not work in Automation mode.

The content and functions of this screen are as follows:

-  : Press F2 or select to display the Signal Screen (Manual).
-  : Press F3 or select to execute the command of returning to home point. The system must be inactive when the HOME button is selected. Check in the information bar to see if the piston has returned to the home point.
-  : When the piston returns to home point, the system displays this icon. Select to reload material.
-  : Press F4 or select to execute pre-charge.
-  : Press F5 or select to execute pressure relief.
-  : Press F6 or select to execute purging.

-  : When the system sends out the alarm, select to stop the alarm.
-  : Press F8 or select to dispense material.
-  : Select to display Pump Heating Screen. This icon and related functions are enabled only when Warm melt IO integration is enabled in **Pump enabled**, page 48.

Other information

For other information, please see **Automatic Screen 1**, page 27.

Signal Screen (Manual)

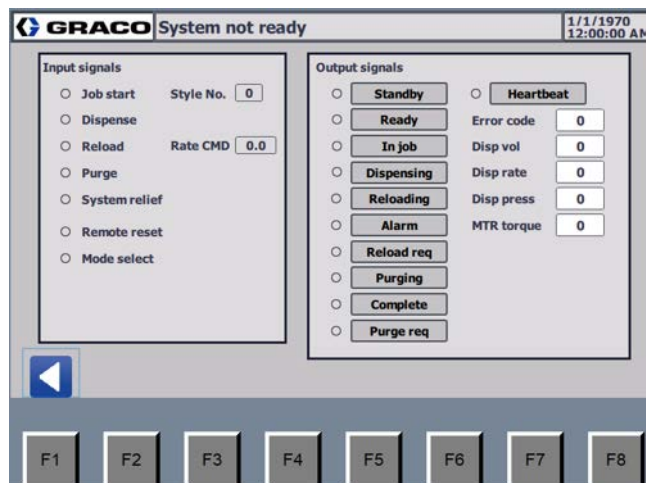


Fig. 32 Signal Screen (Manual)

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

The Signal Screen (Manual) is to check the signal exchange. For signal descriptions, see **Signal Screen (Auto)**, page 33. For error code information, see **Appendix A - Error Codes**, page 71.

Setup Screen

Reload Setup Screen

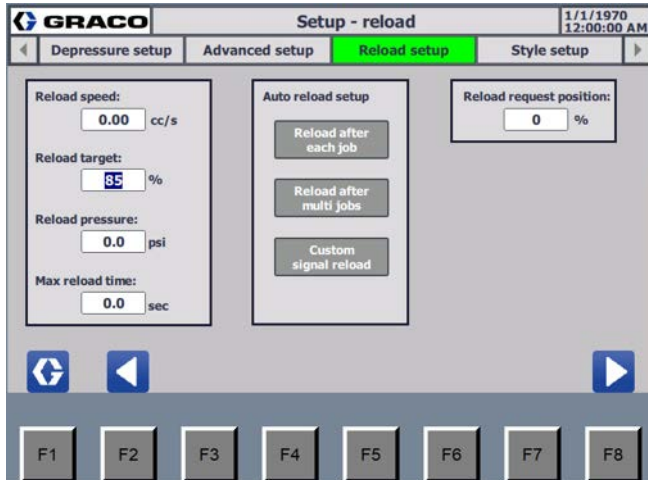
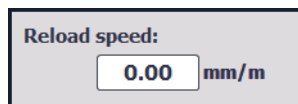


FIG. 33 Reload Setup Screen

On the Reload Setup Screen, press F1 or select  to display the System Main Screen. Press F2 or select  to return to previous screen. Press F8 or select  to continue to next screen.

The content and functions of this screen are as follows:

Reload speed setup



Set both the reloading speed and Home operations speed.

Reload target



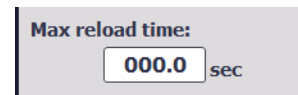
Set the target completed position of reload. For example, if 80% is set to be the reload target, the system finishes reloading when it is 80% full of the reload volume. The operator can set a range from 80% to 100% and should adjust the value per material viscosity and fluid pressure.

Reload pressure setup



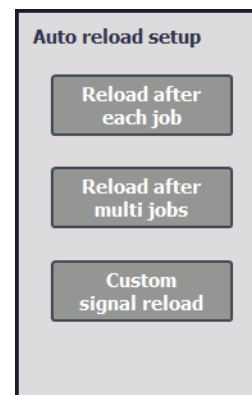
Set the reload pressure. During reloading, after piston returns to home position, the system will keep the Reload Valve (AD, page 11) open until the pressure has exceeded the preset reload pressure.

Maximum reload time



Set reload time limit. If the reload process exceeds the time limit, the system will send out an alarm as a reload time out.

Reload type setup



- **Reload after each job:** In this mode, the metering rod retracts after every job. This is the default setup.
- **Reload after multi jobs:** In this mode, the metering rod retracts only when the job is completed and the metering rod reaches the reload request position.
- **Custom signal reload:** In this mode, the metering rod retracts only when the operator sends 'Reload' signal. When in job status, the system automatically executes pre-charge after reloading.

Reload request position

Reload request position:

00

%

- When the material in the supply pump system is less than the percentage set here, the system will send out an alarm, but the system can still work.
- If Reload after each job or Reload after multi jobs is selected, and the material in the supply pump system or supply cartridge is less than the percentage set here, the system automatically reloads after each job or multiple jobs.

Style Setup Screen

GRACO

Setup - style

1/1/1970
12:00:00 AM

Advanced setup

Reload setup

Style setup

Shot setup

Style No.	Target vol.(cc)	Tolerances(%)		
0	0.00	- 0	~ +	0
1	0.00	- 0	~ +	0
2	0.00	- 0	~ +	0
3	0.00	- 0	~ +	0
4	0.00	- 0	~ +	0
5	0.00	- 0	~ +	0
6	0.00	- 0	~ +	0
7	0.00	- 0	~ +	0

◀

▶

F1

F2

F3

F4

F5

F6

F7

F8

Fig. 34 Style Setup Screen

On the Style Setup Screen, press F1 or select  to display the System Main Screen. Press F2 or select  to return to previous screen. Press F8 or select  to continue to next screen.

This screen includes 5 pages of 40 style numbers to set target volume and tolerance. After each job, the system compares the dispense volume and the target volume. If the deviation is out of the tolerance, the system will send out the signal.

Shot Setup Screen

Shot No.	Shot size (cc)	Shot rate (cc/s)	Pre-charge (psi)
0	0.00	0.000	0
1	0.00	0.000	0
2	0.00	0.000	0
3	0.00	0.000	0
4	0.00	0.000	0
5	0.00	0.000	0
6	0.00	0.000	0
7	0.00	0.000	0

FIG. 35 Shot Setup Screen

On the Shot Setup Screen, press F1 or select to display the System Main Screen. Press F2 or select to return to previous screen. Press F8 or select to continue to next screen.

This screen includes 40 shot numbers to set target volume, dispense rate and pre-charge pressure.

Bead Setup Screen

FIG. 36 Bead Setup Screen (Preset value)

FIG. 37 Bead Setup Screen (Custom setting)

On the Bead Setup Screen, press F1 or select to display the System Main Screen. Press F2 or select to return to previous screen. Press F8 or select to continue to next screen.

There are two Rate command types:

- **Preset value:** The flow rate is defined on **Shot Setup Screen**, see page 41. 'Shot bit 0-3' signals or style numbers are used to select flow rate.
- **Custom setting:** The operator should set 'Max Rate' first. The Operator can use 0-10 V signal to control flow rate.

Sequence Setup Screen

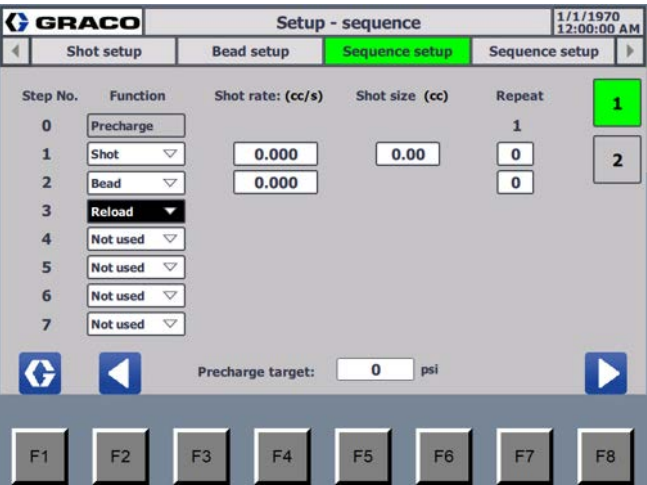


Fig. 38 Sequence Setup Screen

On the Sequence Setup Screen, press F1 or select  to display the System Main Screen. Press F2 or select  to return to previous screen. Press F8 or select  to continue to next screen.

Sequence includes 14 steps maximum. 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).

Purge Setup Screen

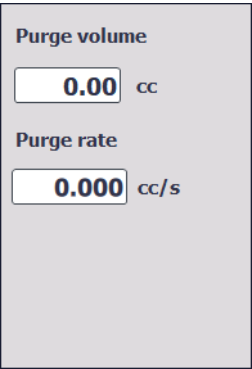


Fig. 39 Purge Setup Screen

On the Purge Setup Screen, press F1 or select  to display the System Main Screen. Press F2 or select  to return to previous screen. Press F8 or select  to continue to next screen.

The content and functions of this screen are as follows:

Purge volume and rate setup



- **Purge volume:** Set the target purge volume.
- **Purge rate:** Set the purge flowrate.

Purge alarm time

Purge alarm time :

0 min

Set the purge request time. When the equipment does not dispense, the control unit will start the countdown for the time chosen by the operator. When time is up, the system will send out the purge alarm signal.

Purge type setup

Auto reload after purging

Disable

Auto relief after purging

Disable

- **Auto reload after purge button:** When enabled, the system automatically reloads after purge is completed.
- **Auto relief after purge button:** When enabled, the system automatically performs pressure relief after purge is completed.

Pre-charge Setup Screen

GRACO Setup - precharge 1/1/1970 12:00:00 AM

Sequence setup Purge setup **Pre-charge setup** Depressure setup

Pre-charge pressure scope: - 0 ~ + 0 %

Max pre-charge time: 0.0 sec

*Pre-charge rate (Hi): 0.00 mm/s

Pre-charge rate (Lo): 0.00 mm/s

Decelerate point: 0 %

Auto pre-charge mode: Only job start

F1 F2 F3 F4 F5 F6 F7 F8

FIG. 40 Pre-charge Setup Screen

On the Pre-charge Setup Screen, press F1 or select to display the System Main Screen. Press F2 or select to return to previous screen. Press F8 or select to continue to next screen.

The content and functions of this screen are as follows:

Pre-charge pressure scope

Pre-charge pressure scope

- 0 ~ + 0 %

The pre-charge pressure value is set in **Pre-charge Setup Screen**, page 43. The operator may set a scope of pre-charge pressure. The system starts to work when reaching the scope of pre-charge pressure.

Maximum pre-charge time limit

Max pre-charge time:

0.0 sec

The operator may set the time in seconds the system may spend 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 speed

*Pre-charge rate (Hi)

0.00 mm/s

Pre-charge rate (Lo)

0.00 mm/s

Decelerate point:

0 %

The operator may set two separate pre-charge rates. The system will pre-charge at the set 'Hi' speed until reaching the decelerate point. The decelerate point is the target pressure at which the system will switch from the "Hi" to the "Lo" pre-charge rate. Enter the decelerate point as a percentage of the Pre-charge pressure. For example, if the pre-charge pressure is 500 psi and the decelerate point is 75%, the system will switch to the 'Lo' speed once pressure has reached 375 psi. The system will then continue pre-charging at the set 'Lo' speed until system confirms the pressure has exceeded the set target pressure.

Pre-charge trigger

Auto pre-charge mode:

Only job start ▾

The operator may choose whether pre-charge is required during a job from the drop down list, including options of Only job start, Shot No. change, Distributed IO, or Gateway.

- Only job start: Except for the pre-charge conducted prior to the job's initiation, no pre-charge will be executed during the entire course of the job.
- Shot No. change: Pre-charge is executed every time the shot number is changed.
- Distributed IO: Pre-charge is executed by remote control in I/O communication protocol.
- Gateway: Pre-charge is executed by remote control in gateway (Profinet and Ethernet IP) communication protocol.

Depressurize Setup Screen

GRACO

Setup - depressure

1/1/1970
12:00:00 AM

Purge setup

Pre-charge setup

Depressure setup

Advanced setup

Depressure target:

0.0 psi

Depressure rate:

0.00 mm/s

End job automatically

Enable

Max depressure time:

0.0 sec

Max idle time in job

0.00 min

⏮

⏪

⏩

⏭

F1

F2

F3

F4

F5

F6

F7

F8

Fig. 41 De-pressurization Setup Screen

On the De-pressurization Setup Screen, press F1 or select  to display the System Main Screen. Press F2 or select  to return to previous screen. Press F8 or select  to continue to next screen.

The content and functions of this screen are as follows:

De-pressurization setup

Depressure target:

0.0 psi

Depressure rate:

0.00 mm/s

Max depressure time:

0.0 sec

- **Depressurization target:** The operator may set the depressurization target. The system will reduce the pressure to the target volume automatically when the job is finished.

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

- **Max depressurization time:** The operator may set a maximum time in seconds for the system to perform depressurization. If depressurization function exceeds the set time, the system alarm will be activated.
- **Depressurization rate:** The operator may input a value here to set the piston speed during depressurization.

End job automatically

After this option is enabled, the operator must set the maximum idle time for the system while performing a job. After the set period passes without any operation, the depressurization program will be automatically executed and the current job ended.

Advanced Setup Screen

Advanced Setup Screen - 1

FIG. 42 Advanced Setup Screen - 1

On the Advanced Setup Screen 1, press F1 or select to display the System Main Screen. Press F2 or select to return to previous screen. Press F8 or select to continue to next screen. Select to display Advanced Setup Screen 2. Select to display Advanced Setup Screen 3.

The content and functions of this screen are as follows:

System time

Click at the System time column, set system time by using the popup keyboard, and select to confirm the setting.

Flowrate unit

The operator may select either cc/minute, cc/second, g/second, or g/ minute from the drop-down list to customize the units used for flowrate setup. When selecting g/second or g/minute, customer can access Calibration Screen and perform weight calibration. See **Weight Calibration**, page 53.

Pressure unit

The operator may select psi, bar or MPa from the dropdown list to customize the units used for pressure setup.

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 navigating to any of the setup screens.

Language

The operator may 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.

Displayer conf.



Select this to open displayer configuration. For some instructions, see **Ethernet IP Communication Protocol**, page 57.

Advanced Setup Screen - 2

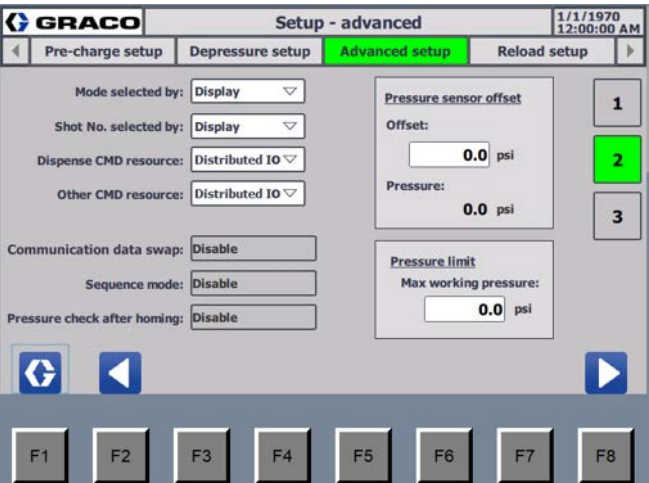


Fig. 43 Advanced Setup Screen - 2

On the Advanced Setup Screen 2, press F1 or select  to display the System Main Screen. Press F2 or select  to return to previous screen. Press F8 or select  to continue to next screen. Select  to display Advanced Setup Screen 1. Select  to display Advanced Setup Screen 3.

The content and functions of this screen are as follows:

Mode selected by

Options for mode selection input include Display, Distributed IO or Gateway.

- If Distributed IO or Gateway is selected, in Automatic mode, the shot or bead working mode (Sequence mode will be inaccessible) must be controlled by customer signals. The operator will not be able to change working mode using the touch screen.
- If Display is selected, working mode will include Shot, Bead and Sequence mode. The operator will be able to change working mode using the touch screen.

Shot No. selected by

The operator may choose whether the style number may be changed by Display, Distributed IO or Gateway.

Dispense CMD resource

The operator may choose whether the Dispense Command (CMD) resource comes from Distributed I/O communication or Gateway communication. Display option is unavailable.

Other CMD resource

The operator may choose whether the Other Command (CMD) Resource comes from Distributed I/O communication or Gateway communication. Display option is unavailable. Other command (CMD) includes job start, reload, purge start, remote reset.

Communication data swap

Select to enable or disable this function. The green color indicates the communication data swap is enabled.

If this function is enabled, the system performs high-low byte swapping.

Sequence mode

Select to enable or disable this function. The green color indicates the sequence mode is enabled.

If this function is enabled, the PSM system will run 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 de-pressurization). When the system works in automatic status, the Customer Control Box (J, page 8) can send dispense signal to start the sequence mode and then dispense step by step.

Pressure check after homing

Select to enable or disable this function. The green color indicates pressure check after homing is enabled.

If this function is enabled, the system pressure will be checked when the piston is at the home position.

Pressure sensor offset

The operator may input values to adjust the pressure offset on the sensors.

Pressure limit

Set the maximum pressure. If the pressure is higher than the preset maximum pressure, the system will activate the alarm and send the alarm signal to customer system.

Advanced Setup Screen - 3

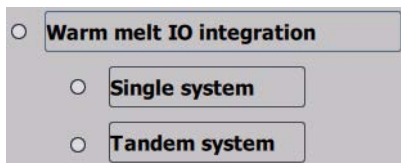


FIG. 44 Advanced Setup Screen - 3

On the Advanced Setup Screen 3, press F1 or select to display the System Main Screen. Press F2 or select to return to previous screen. Press F8 or select to continue to next screen. Select to display Advanced Setup Screen 1. Select to display Advanced Setup Screen 2.

The content and functions of this screen are as follows:

Pump enabled



- **Warm melt IO integration:** Select to enable pump connections and pump heating process. Only when Warm melt IO integration is enable can appear in Automatic Screen 2 and Manual Screen and the related functions enabled.
- **Single system:** When Warm melt IO integration is enabled, select Single system to confirm one-pump connection
- **Tandem system:** When Warm melt IO integration is enabled, select Tandem system to confirm two-pump connection.

Dispense on and off delay



- **Dispense on delay:** Set how many seconds the system will start dispensing after receiving customer signals.
- **Dispense off delay:** Set how many seconds the system will stop dispensing after receiving customer signals.

Advanced Screen

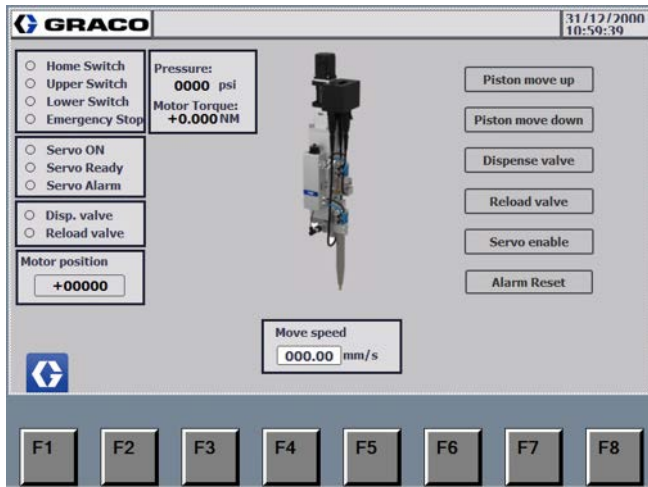
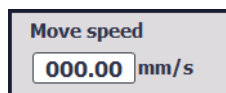


FIG. 45 Advanced Screen

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, inlet 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.

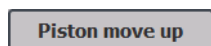
The content and functions of this screen are as follows:

Move speed



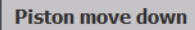
Click at the column to set the speed of the slide block.

Piston move up



This button is for motor, multi function part and piston tests. Jog control piston and multi function part move away from the outlet port.

Piston move down



Jog control piston and multi function part move toward the outlet port.

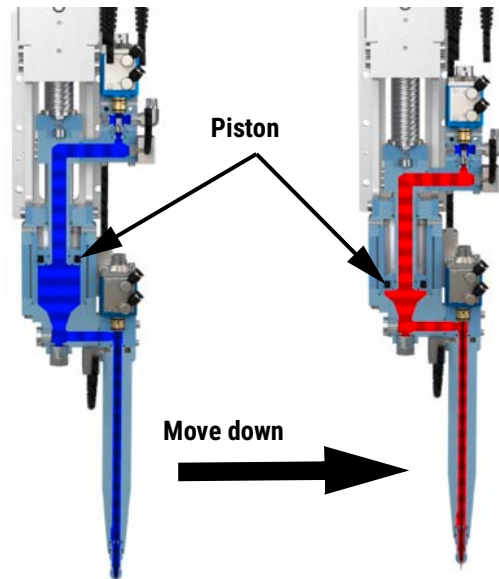
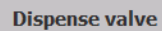


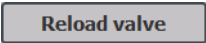
FIG. 46 Piston move down

Dispense valve



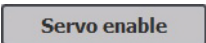
Selecting this button enables testing of the Dispense Valve (AB, page 11) by controlling the opening or closing of the valve. When the Dispense Valve (AB, page 11) is open, the button will be green. When the Dispense Valve (AB, page 11) is closed, the button will be gray.

Reload valve

A rectangular button with a gray background and the text "Reload valve" in black.

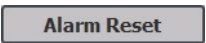
Selecting the button enables testing of Reload Valve (AD, page 11) by controlling the opening or closing of the valve. When the Reload Valve (AD, page 11) is open, the button will be green. When the Reload Valve (AD, page 11) is closed, the button will be gray.

Servo enable

A rectangular button with a gray background and the text "Servo enable" in black.

Select to enable or disable servo. Background of Green indicates servo is enabled.

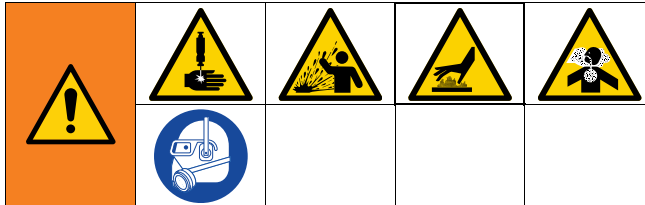
Alarm Reset

A rectangular button with a gray background and the text "Alarm Reset" in black.

Select to stop the alarm of the servo.

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 fluid, keep fingers and other body parts away from the spray tip.

To avoid severe burns, do not touch hot fluid or equipment.

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

1. Place a waste container below Dispense Valve (AB, page 11).
2. Pressurize the Supply Pump Feed (E, page 8), and set the lower pressure to 20 psi (0.14 MPa, 1.4 bar).
3. Go to the Advanced Screen of the PSM Control Unit (F, page 8). Select **Piston move down**, the piston moves down until the sensor sends out the stop signal, then set the move speed to 0.2 cc/s.

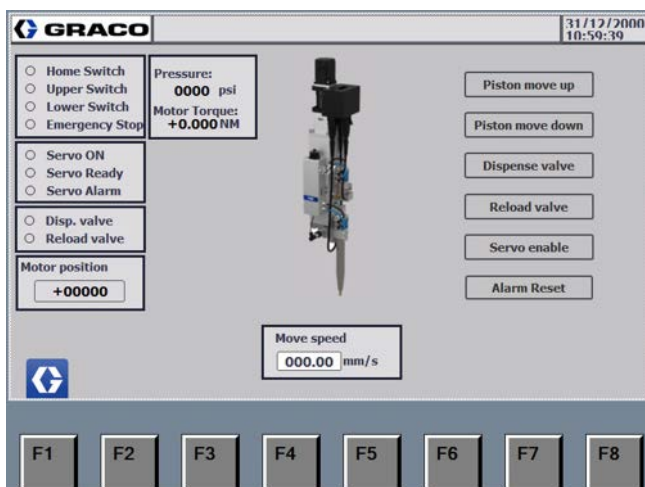


FIG. 47 Advanced Screen

4. Select **Dispense valve** and **Reload valve** to turn on the Dispense Valve (AB, page 11) and Reload Valve (AD, page 11).

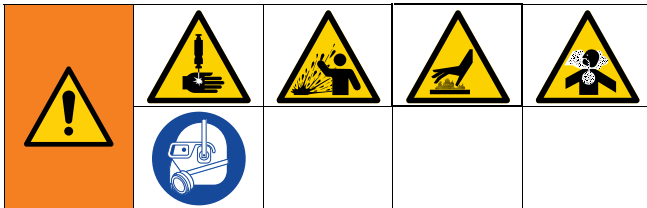
5. When the system have a continuous and stable flow, select 'Dispense valve' again to turn off the Dispense Valve (AB, page 11).
6. Return to the Manual Screen 1. Select  to execute manual dispense.



FIG. 48 Manual Screen

7. Dispense several full stroke shots until the PSM Metering Unit (H, page 8) is free of air.

Daily Start Up



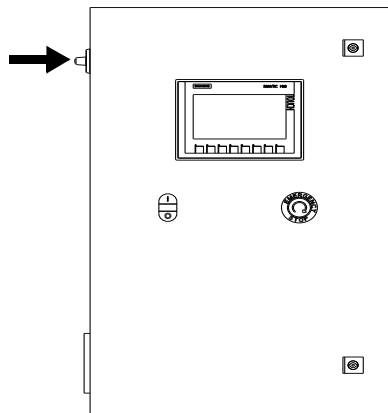
This equipment stays pressurized until pressure is manually relieved. To help prevent serious injury from pressurized fluid, such as skin injection and splashing fluid, keep fingers and other body parts away from the spray tip.

To avoid severe burns, do not touch hot fluid or equipment.

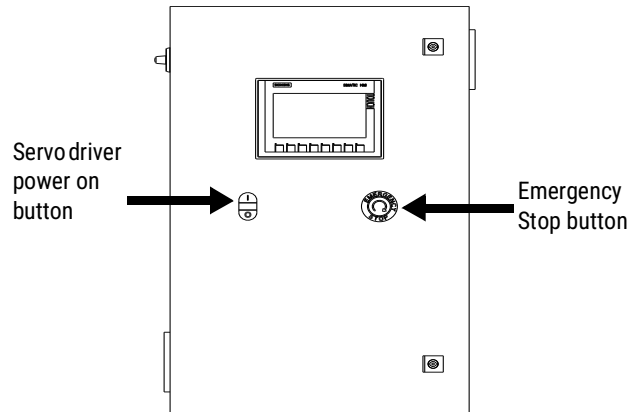
To avoid injury from toxic fluids or fumes, such as splashing in the eyes or on skin, wear appropriate personal protective equipment.

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

1. Turn on the air for the supply pump and PSM Metering Unit. Check the air pressure for the supply pump.
2. Turn on the Main Power Switch (BD, page 12) of PSM Control Unit (F, page 8).



3. Pull up the Emergency Stop Switch (BC, page 12). Then press the green button of Servo Driver Power On/Off Buttons (BB, page 12) to turn on the power for the PSM Drive Assembly (AE, page 10).



4. Place a waste container below the Dispense Valve (AB, page 10).
5. Go to the Automatic Main Screen 1 - Main. Then press  to execute Home order. Message of Auto-Back Home in the information bar indicates successful Home order.

If the PSM system is connected with robot or motion table, follow the steps 6 to 7. If the PSM system is used independently, follow the steps 8 to 11.

For connection of robot or motion table: Follow steps 6 to 7.

6. On the Automatic Main Screen, select Shot for control mode, and purge out materials about 1 to 2 cc.
7. On the Automatic Main Screen, select the correct control mode and get ready for running the system.

For independent use of PSM system: follow steps 8 to 11.

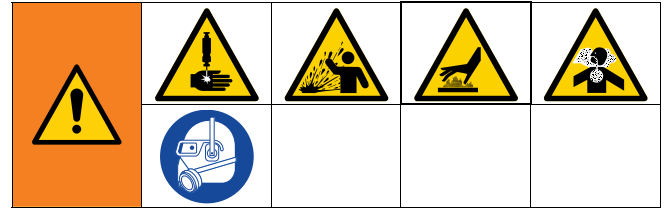
8. On the Advanced Setup Screen, press  to display System Main Screen. On the System Main Screen, press **MANUAL** to display Manual Screen.



FIG. 49 Manual Screen

9. On the Manual Screen 1, select the "Shot" control mode and then press  to execute manual dispense.
10. Press  to display System Main Screen. Then press **AUTOMATIC** to display Automatic Screen 1.
11. On the Automatic Screen 1, select the correct control mode and get ready for running the system.

Weight Calibration



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

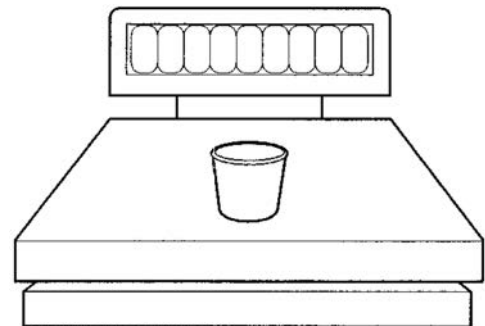
To avoid severe burns, do not touch hot fluid or equipment.

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

When selecting g/second or g/minute in Flowrate unit drop-down list on **Advanced Setup Screen - 1**, page 45, perform the weight calibration procedure at startup and after rebuild.

NOTE: After weight calibration, check if the specific gravity of the material stays within normal range. The normal range changes per operators needs.

1. Prepare several cups.
2. Weigh one cup and record the weight.



3. Dispense into a waste container to prime the PSM metering unit.
4. On Advanced Setup Screen - 1, select g/second or g/minute in Flowrate unit drop-down list, enter the specific gravity of the material in **Specific gravity:** , and select  to access Calibration Screen.

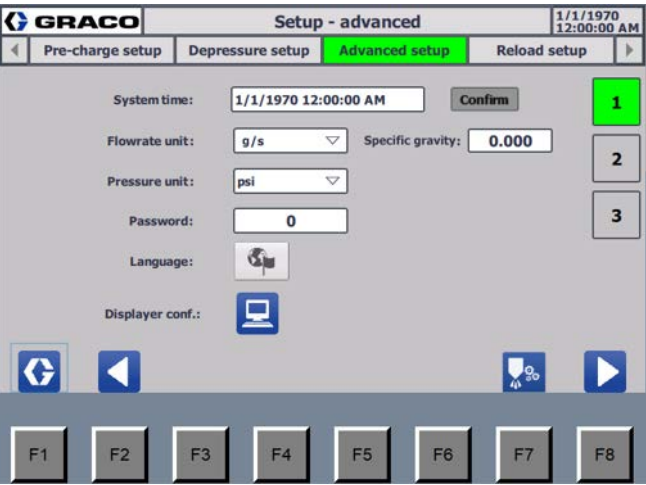


Fig. 50 Advanced Setup Screen - 1

5. On Calibration Screen, enter shot rate in
Shot rate: 0.000 g/s and shot size in
Shot size: 0.000 g .

- Specific gravity: 0.000 : Displays the specific gravity of the material, which is the value set in Specific gravity on Advanced Setup Screen - 1 by customers.

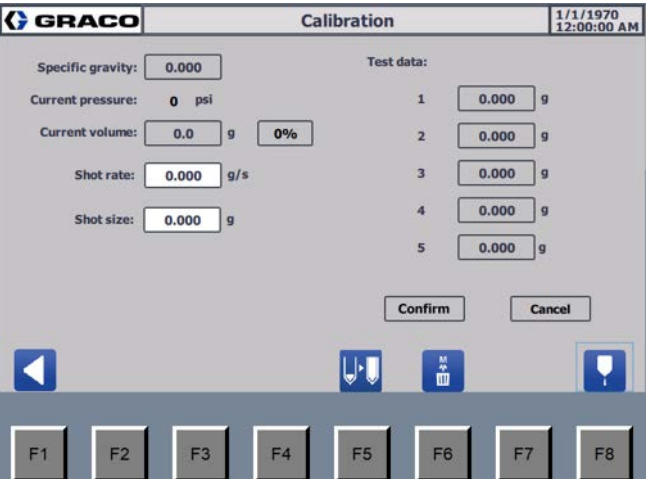


Fig. 51 Calibration Screen

6. Check Current pressure: 0 psi for current pressure. If necessary, point press  to perform purge and reduce the current pressure.

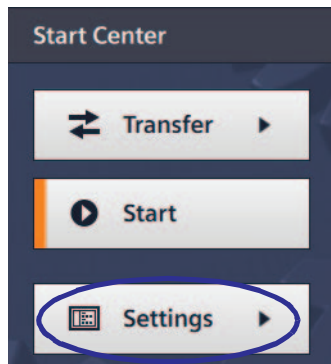
7. Check Current volume: 0.0 g 0% for how much material (in unit g or percentage) is left in the cylinders. If necessary, select  to perform reload.
8. Place the cup under Dispense Valve (AB, page 11) and select  to shot once.
9. Repeat by using a cup each time.
10. Re-weigh all cups and record weights.
11. Subtract weight of empty cups from weight of filled cups to get material weights.
12. Record weights in Test data list.
13. Select Confirm to complete the calibration. If necessary, select Cancel to remove all records in Test data and redo the calibration procedure.

Edit IP address

Configure the network interface to ensure its IP address is in the same subnet as destination IP address.

Edit communication connections

1. Start PSM control unit and select Settings on the Start Center screen.



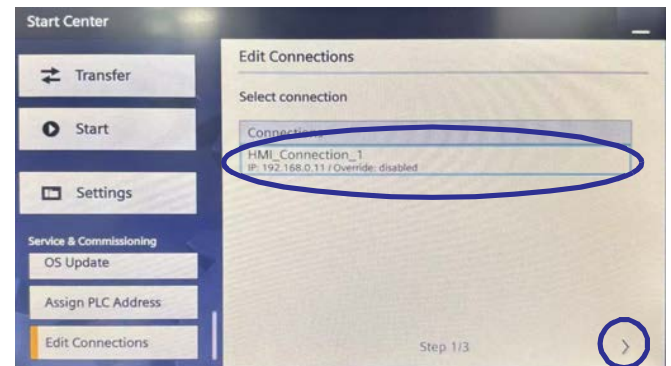
2. Select Service & Commissioning on the Settings screen.



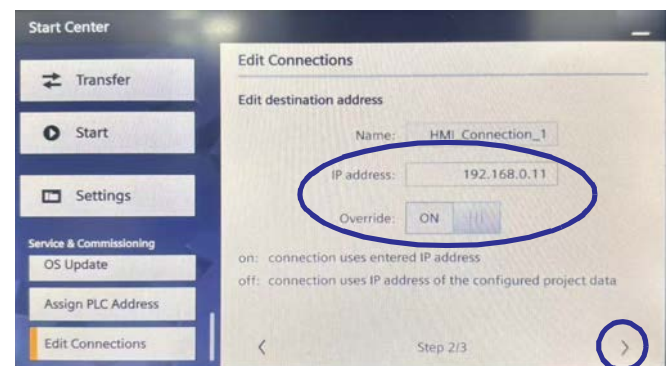
3. Scroll down within the Service & Commissioning area, find and select Edit Connections.



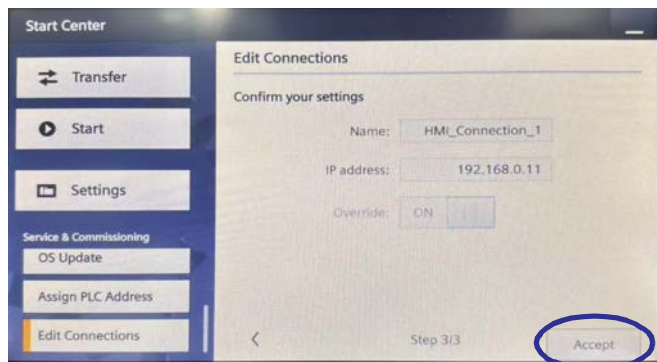
4. Select HMI_Connection_1 on Step 1/3 screen. Then select '>' to proceed to the next screen.



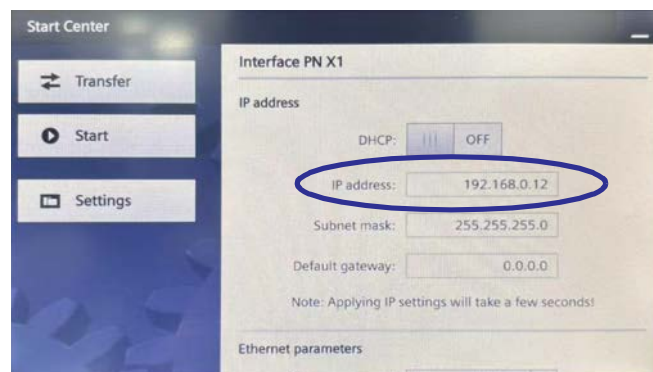
5. Switch to ON for the Override item on Step 2/3 screen. Record this IP address, which is the destination IP address. Then select '>' to proceed to the next screen.



6. Select Accept on Step 3/3 screen to complete editing of communication connections.

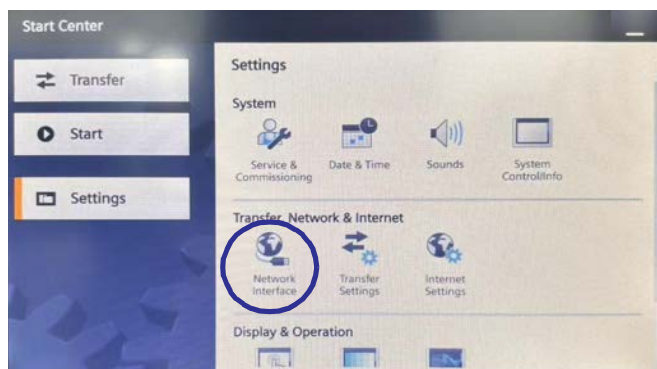


2. Click on the IP address display area, edit the IP address, and ensure it is in the same subnet as the destination IP address.

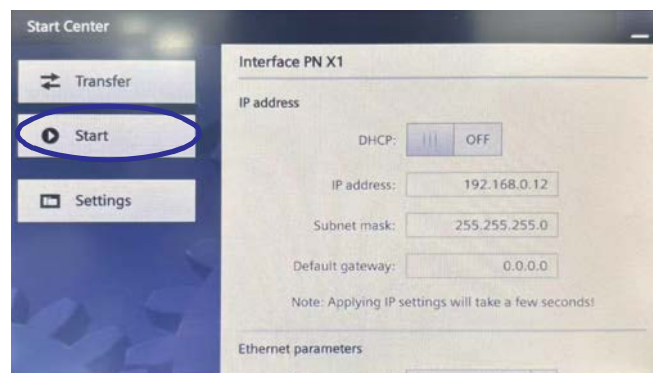


Edit network settings

1. Go to Settings screen and select Network Interface.



3. Click Start to complete the network interface setting and access HMI operation screens.



Ethernet IP Communication Protocol

Installation

Ethernet IP communication gateway module and SD card are applied for Ethernet IP communication protocol.

1. Make sure the power of the control unit is off.
2. Unplug the power cord on top of the Ethernet switch module and disconnect the cables connected to the module.



FIG. 52 Ethernet Switch Module

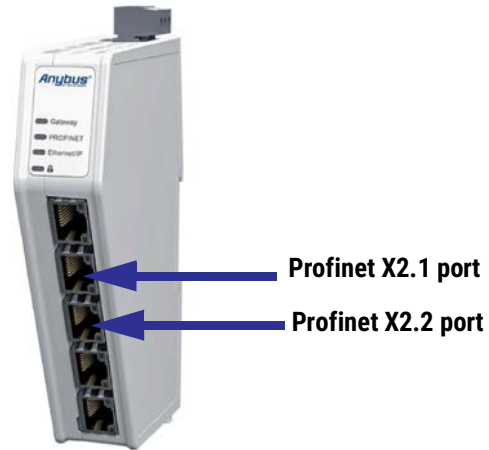
3. Remove the Ethernet switch module from the control cabinet and replace with Ethernet IP communication gateway module.



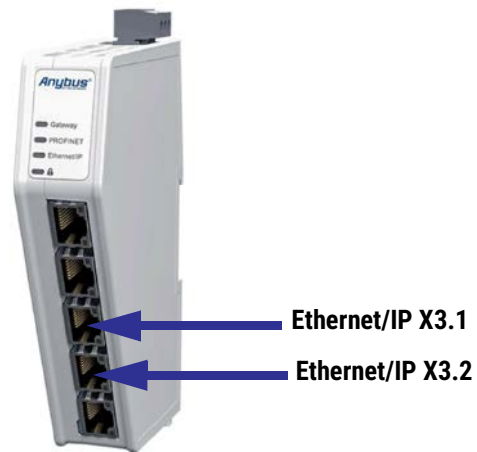
FIG. 53 Ethernet IP Communication Gateway

4. Connect the power cord to the power interface on the top of the Ethernet IP communication gateway module.

5. Insert the Ethernet cables labeled PLC-# (where # represents a number) and HMI into the Profinet X2.1 and X2.2 ports.



6. Plug the Ethernet cable connected to the Ethernet interface of the cabinet housing into the Ethernet/IP X3.1 or X3.2 interface.



7. Remove the old SD card, and insert the new SD card into the SD card slot of the CPU module.

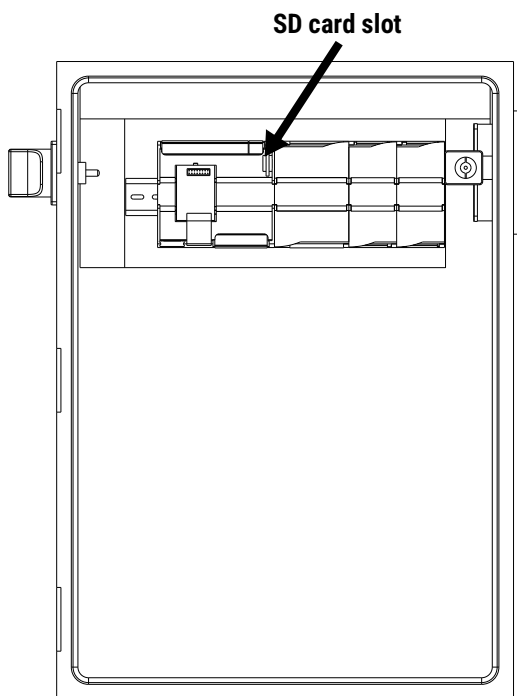


Fig. 54 Insert SD Card

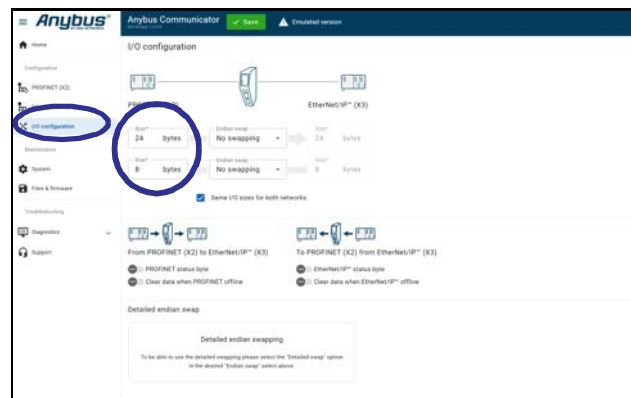
8. Turn on the control unit and wait for 30 seconds for startup.
9. Connect the laptop and the Ethernet IP communication gateway module Config X1 using an Ethernet cable.



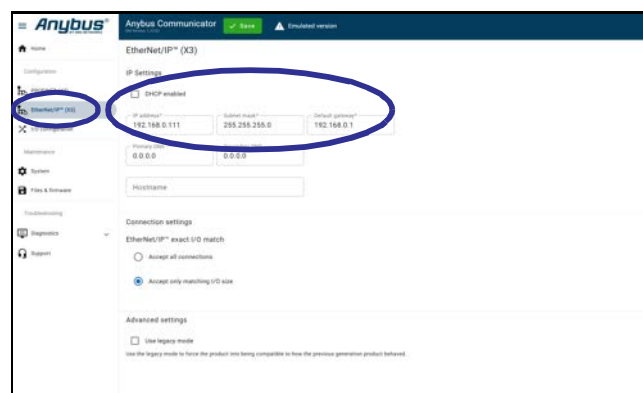
10. Open IE and access the gateway module at 192.168.0.10.



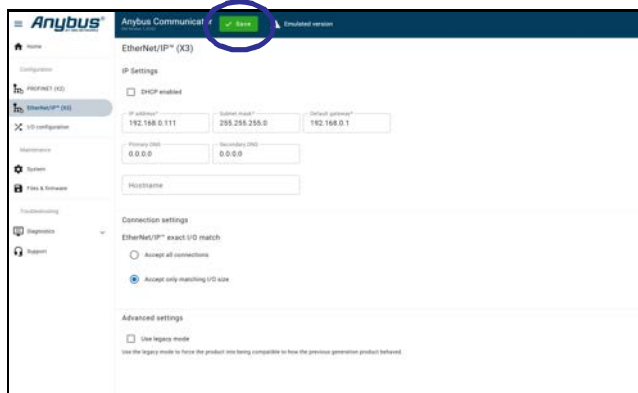
11. Select IO configuration tab and set size as "24" bytes and "8" bytes..



12. Select Ethernet/IP™ (X3) tab and set IP according to the on-site environment.



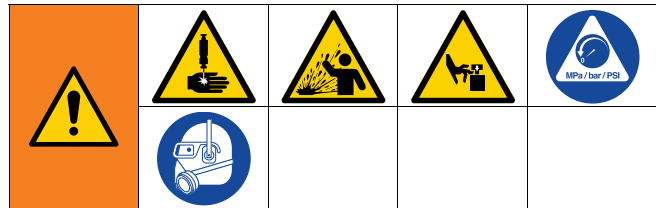
13. Click Save to complete the settings.



Pressure Relief Procedure



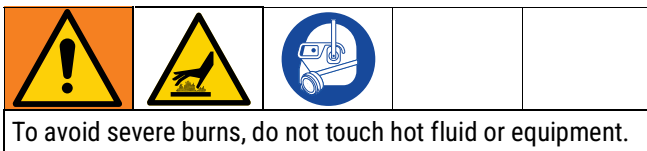
Follow the Pressure Reduction Procedure whenever you see this symbol.



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 Reduction Procedure when you stop dispensing and before cleaning, checking, or servicing the equipment.

To avoid severe burns, do not touch hot fluid or equipment.

1. Close the Bleed-type Master Air Valve (D, page 8) (required in the system).
2. Place a waste container below the Dispense Valve (AB, page 10).



3. Go to System main screen of the PSM Control Unit (F, page 8), then select 'Depressurization'.
 - The system will identify whether the Reload Valve (AD, page 10) is closed. If the Reload Valve (AD, page 10) is opened, it will be closed. Then the Dispense Valve (AB, page 10) will be opened. The whole system pressure is relieved.

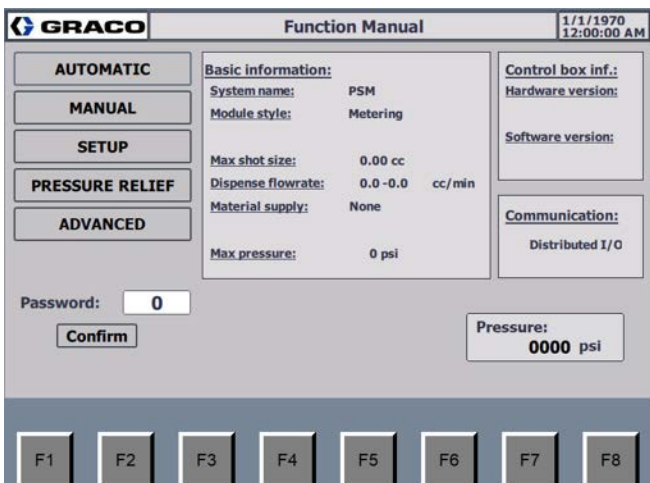
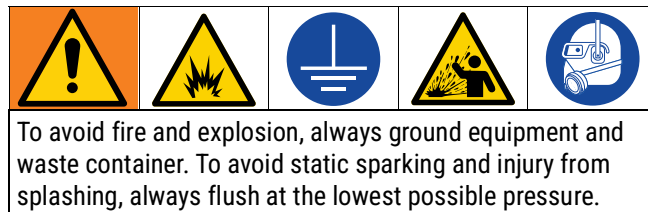


Fig. 55 System Main Screen

4. Turn off the system power and the air supply when the fluid pressure drops to ZERO.

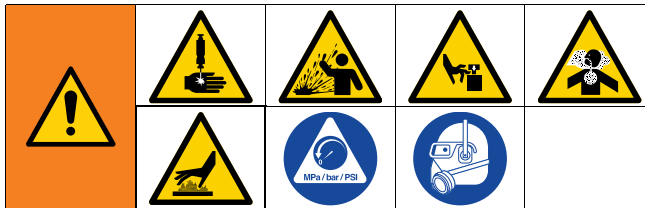


Flush the Equipment



- 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 Dispense Valve (AB, page 10), and circulate a compatible solvent through the system for several times until the Dispense Valve dispenses the compatible solvent. Then drain the compatible solvent.

Shutdown



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.

To avoid severe burns, do not touch hot fluid or equipment.

1. Place a waste container below the Dispense Valve (AB, page 11).
2. Perform the **Pressure Relief Procedure** on page 59.
3. Turn off the system power.
4. Wipe the dispense outlet with a clean rag. Be careful to avoid contact between dispense materials.
5. If necessary, isolate the output needle from the air by using sealing medium, such as alcohol, kerosene or oil paper. Chose proper sealing medium according to different types of materials.

Maintenance



Preventive Maintenance

Before maintenance, wear heat resistant gloves to cut off power. Please make sure the temperature is reduced to normal degree.

There is a grease filled secondary seal/bearing area on each valve shaft (Dispense Valve (AB, page 11)) and Reload Valve (AD, page 11). 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 the front or back of the valve. For the detailed information, please check iQ Dispense Valves Instructions and Parts Manual 333585, 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 using situations.

Maintenance Schedule

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

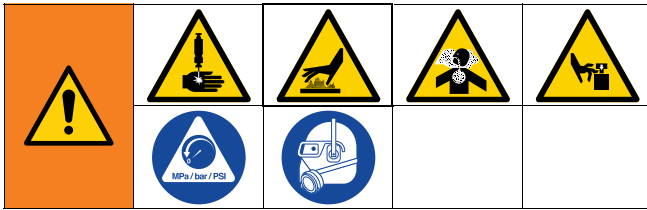
Recycling and Disposal

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**, page 59.
- 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 59, before checking or repairing the system.
2. Disconnect AC power from the system.

Problem	Cause	Solution
Display module completely dark	No power	Verify Main Power Switch (BD, page 12) and Control Power Buttons (BB, page 12) are ON
	Thrown breaker	Check metering unit breakers and reset
	Loose connection	Tighten screen data cable
	Bad display module	Replace display module
No material or incorrect amount of material dispensed	Dispense Valve (AB, page 11) closed	Verify dispense valve works normally and supply air pressure is within range
	Needle clogged	Replace needle
	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 PSM 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
Material weight incorrectly dispensed	Needle clogged	Replace needle.
	Dispense Valve (AB, page 11) or fluid lines clogged	Clean Dispense Valve (AB, page 11) or fluid lines
	Dispense Valve (AB, page 11) opened or closed incorrectly	1. Verify Dispense Valve's (AB, page 11) inlet air pressure. 2. Inspect Dispense Valve (AB, page 11) air cylinder and adapters for leaks.
	Input air reduced or removed	Reconnect input air line to system. Increase air pressure regulator adjustment
	Reload Valve (AD, page 11) not closed (if installed)	1. Inspect the Reload Valve (AD, page 11) for wear and tear. 2. Verify rotary cylinder inlet pressure.
	Reload Valve (AD, page 11) leaking	Inspect needle and seal components
	Piston worn out or broken	Replace piston

Problem	Cause	Solution
Leakage from needle	Air in Dispense valve (AB, page 11)	Slow speed purging
	Dispense Valve (AB, page 11) not closed	1. Verify Dispense Valve's (AB, page 11) inlet air pressure. 2. Clean blockage between needle and seat. 3. Verify solenoid valve status.
	Dispense Valve (AB, page 11) needle and/or seat worn out (pressure reduces after closing the valve)	Replace Dispense Valve (AB, page 11) 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
High pressure	Dispense Valve (AB, page 11) clogged	Clean Dispense Valve (AB, page 11)
	Material in needle cured	Replace needle
	Dispense speed unsuitable for needle	1. Replace the current 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
"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 unit, select 'Dispense valve' to open Dispense Valve (AB, page 11) to reduce pressure
	"Home" icon flashing and waiting	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	1. Inspect ball screw and slides are functional. 2. Verify motor and encoder cable are connected.
System does not dispense or dispenses in the incorrect amount/mode	Signal error between platform and PSM control unit	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

Dimensions

25cc

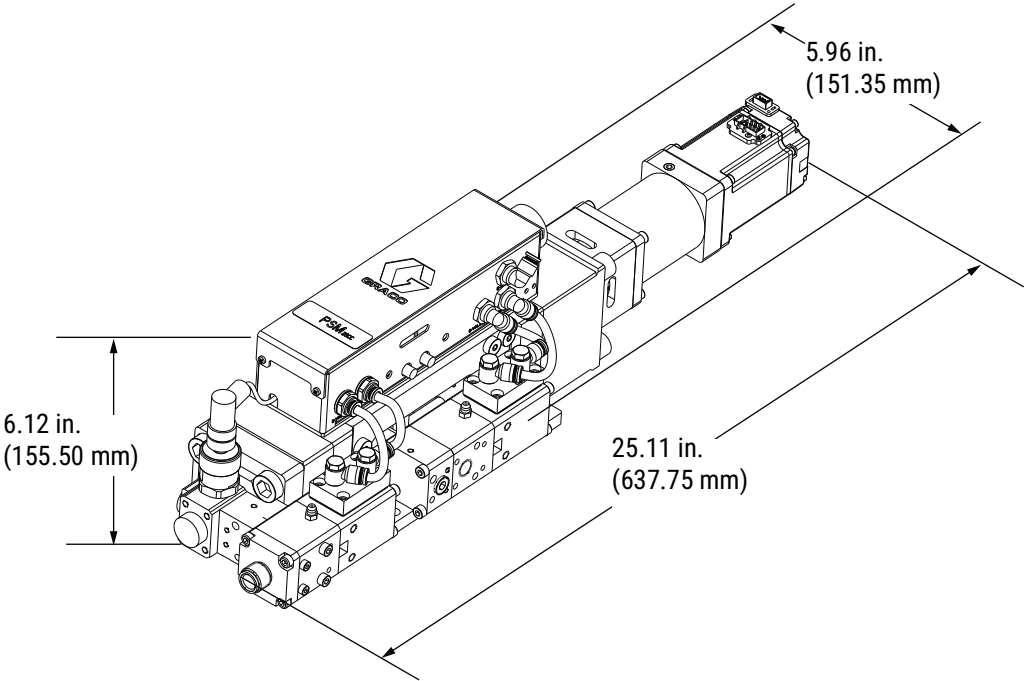


FIG. 56: PSM Ambient Metering Unit Dimensions, 25cc

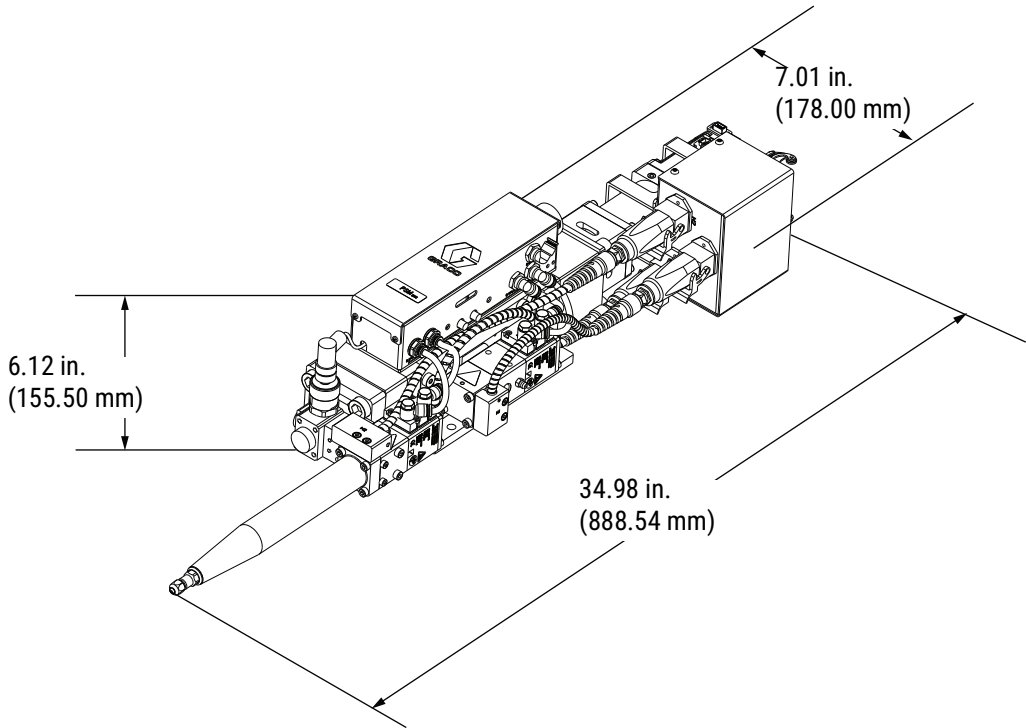


FIG. 57: PSM Warm Melt Metering Unit Dimensions, 25cc

50cc

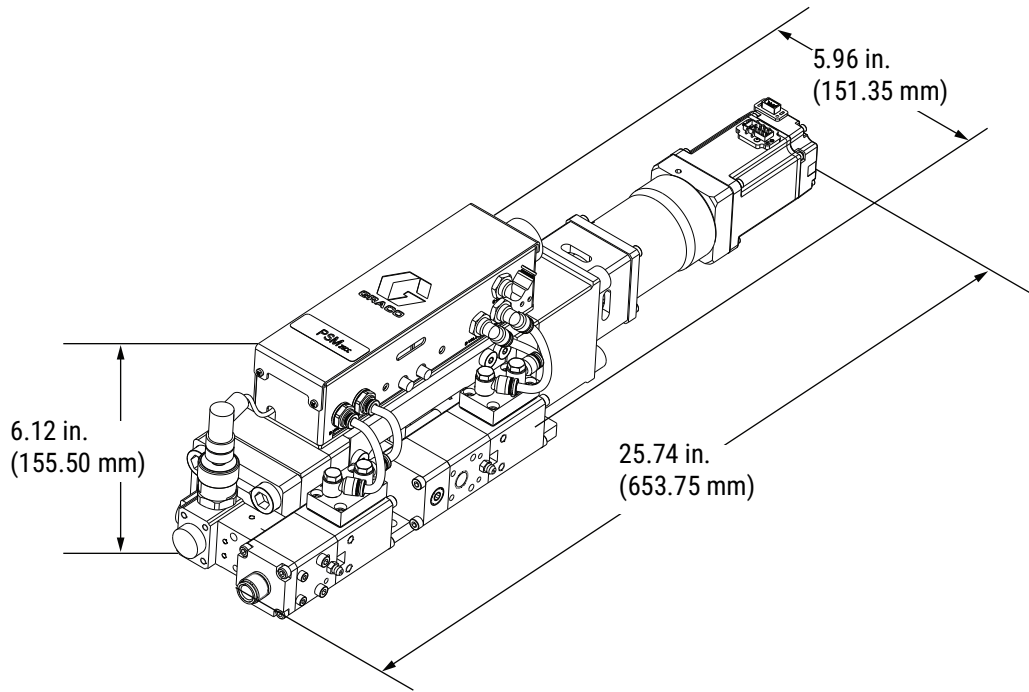


FIG. 58: PSM Ambient Metering Unit Dimensions, 50cc

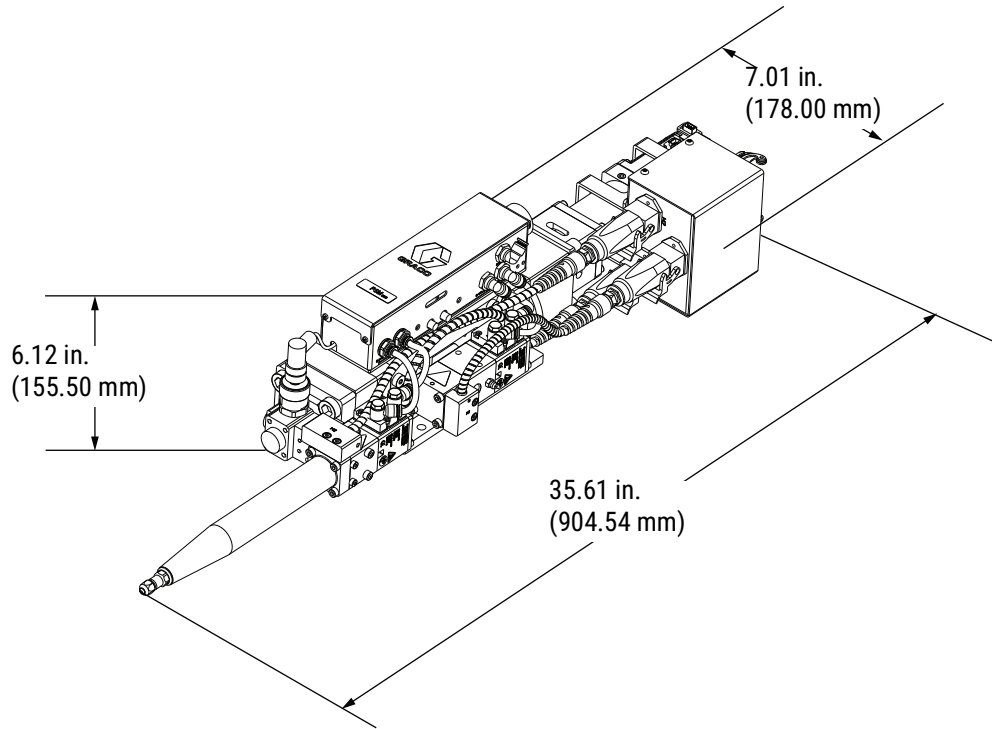


FIG. 59: PSM Warm Melt Metering Unit Dimensions, 50cc

100 cc

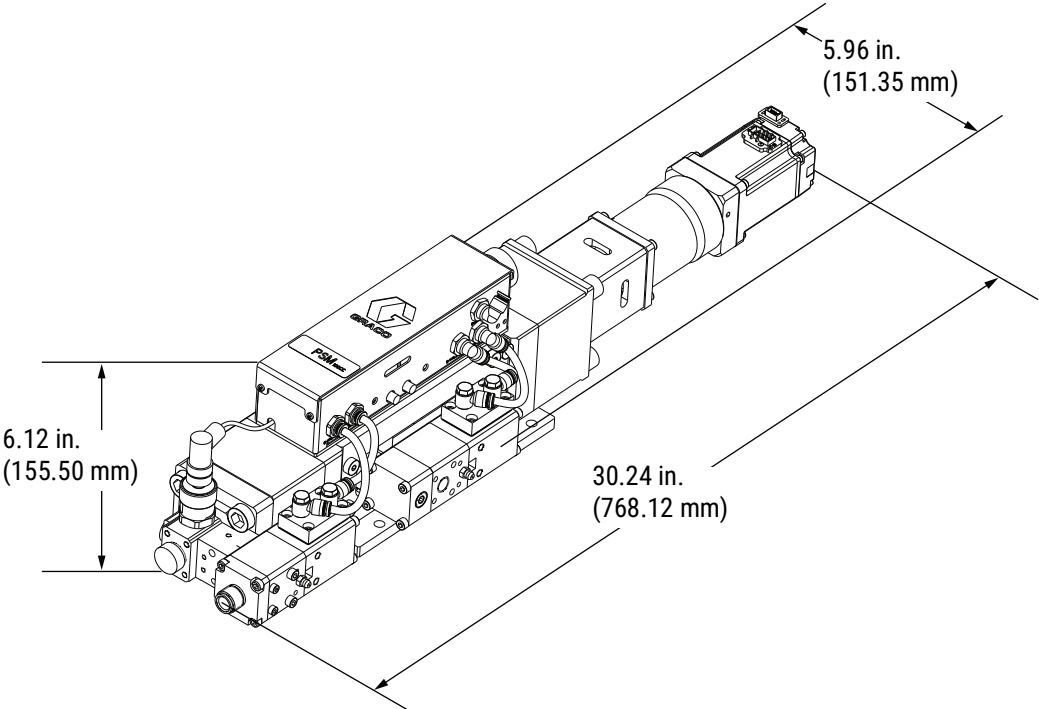


FIG. 60: PSM Ambient Metering Unit Dimensions, 100 cc

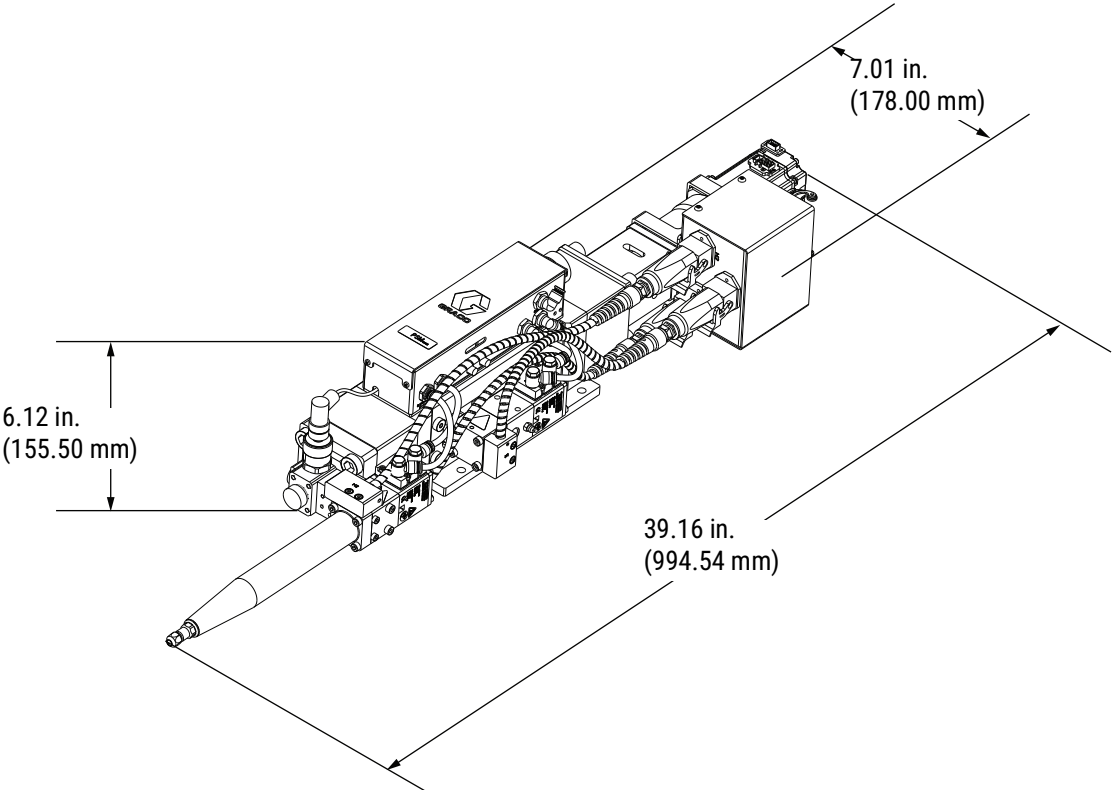


FIG. 61: PSM Warm Melt Metering Unit Dimensions, 100 cc

200 cc

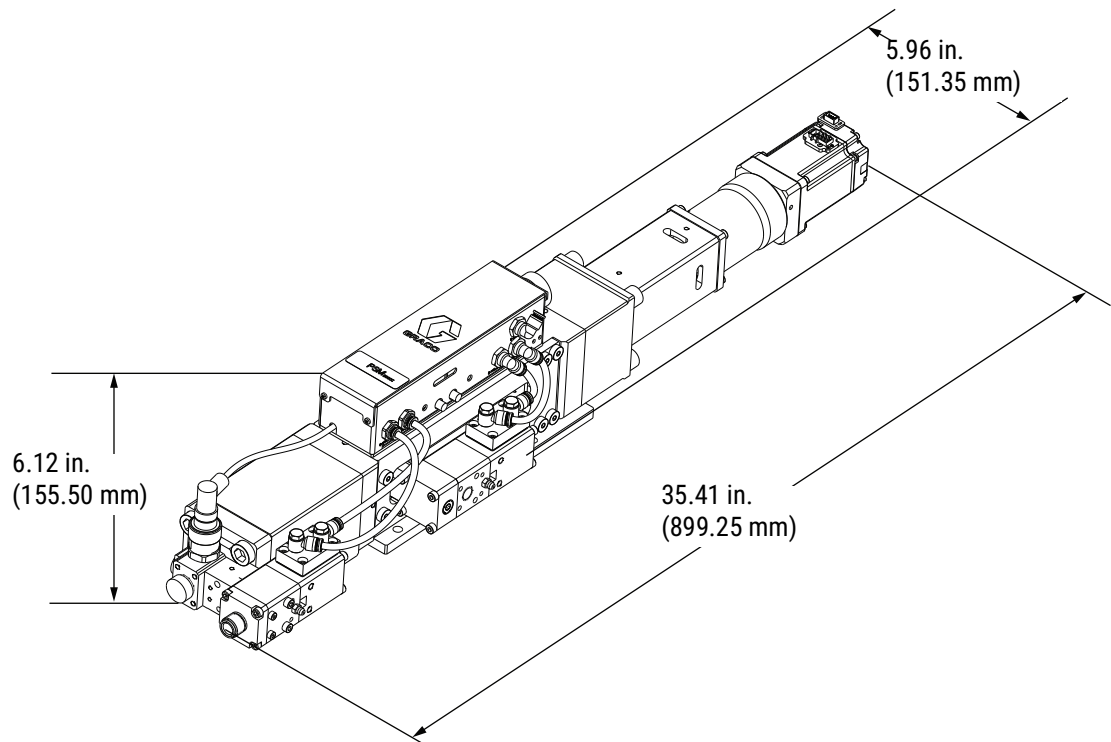


FIG. 62: PSM Ambient Metering Unit Dimensions, 200 cc

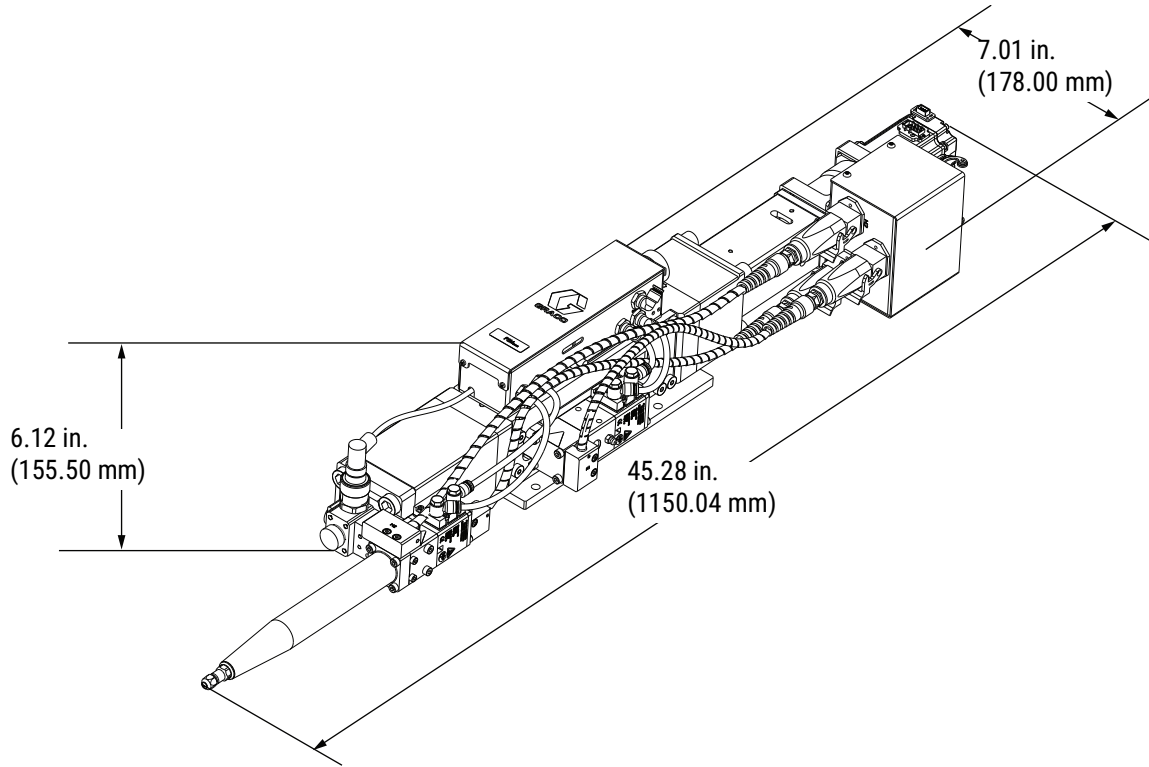


FIG. 63: PSM Warm Melt Metering Unit Dimensions, 200 cc

PSM Control Unit

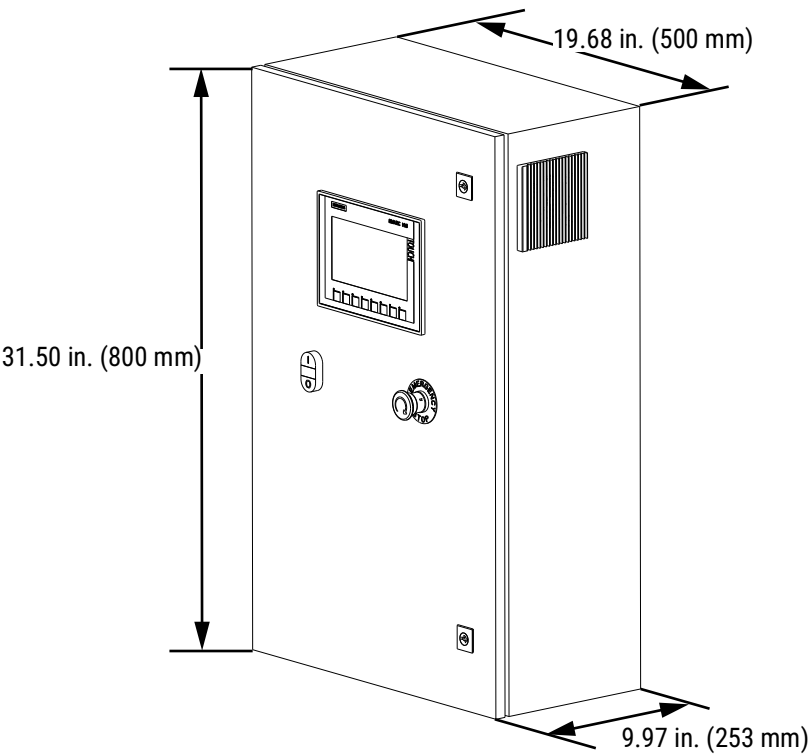


Fig. 64: PSM Control Unit Dimensions

Appendix A - Error Codes

Error Code	Error Type	Error Name	Description	Cause	Solution
0	----	No error	----	----	----
1	Error	E-Stop	System emergency stops	System Emergency Stop Switch (BC) is pressed	Make sure the system is in safety status. Plug the Emergency Stop Switch (BC), and press the reset button to close the alarm. Note: Execute Home after system emergency stop.
2	Error	Touch low limit	Moving of metering cylinder touches the lower limit sensor	Improper position of the lower limit sensor	Re-install lower limit sensor
				Damage of lower limit sensor	Replace lower limit sensor
				Drive mechanism error	Repair drive mechanism
3	Error	Touch upper limit	Moving of metering cylinder touches the upper limit sensor	Improper position of the upper limit sensor	Re-install upper limit sensor
				Damage of upper limit sensor	Replace upper limit sensor
				Drive mechanism error	Repair drive mechanism
4	Error	Precharge time out	Pre-charge time exceeds the set maximum time	Target pre-charge pressure is set too high	Set proper target pre-charge pressure
				Pre-charge speed is set too low	Set proper pre-charge speed
				Maximum pre-charge time is too short	Set proper maximum Pre-charge time
				Piston seal leaks	Replace piston
				Inlet valve leaks	Replace inlet valve seal assembly
				Dispense valve leaks	Replace dispense valve seal assembly
				Pressure sensor error	Replace pressure sensor
5	Error	Pressure depressure time out	Depressurization time exceeds the set maximum time	Drive mechanism error	Repair drive mechanism
				De-pressurization target pressure is set too low	Set proper target de-pressurization pressure
				De-pressurization speed is set too low	Set proper de-pressurization speed
				Maximum de-pressurization time is set too short	Set proper maximum de-pressurization time
				Inlet valve leaks	Replace inlet valve seal assembly
				Pressure sensor error	Replace pressure sensor
				Drive mechanism error	Repair drive mechanism
6	Error	Reload time out	Reload time exceeds the set maximum reload time	Reload pressure is set too high	Set proper target reload pressure
				Maximum reload time is set too short	Set proper maximum reload time
				Supply Pump System (E) error	Check Supply Pump System
				Inlet valve is not open normally	Check inlet valve
				Pressure sensor error	Replace pressure sensor
				Block of Material Supply Line (L)	Clean or replace the line
7	Error	Servo fault	Servo fault	Servo system error	Check servo drive alarm code, or restart the control unit
8	Error	Servo unit lost power	Servo system power supply error	Power supply breaker of servo breaks	Test supply circuit, check servo, and close breaker
				Servo is not open	Check status of Control Power On/Off buttons (BB), Emergency Stop Switch (BC) and outside emergency stop contact
9	Error	Supplier low level	Insufficient material for the supply system	Insufficient material in the supply system	Replace supply feeding tank
				Error of material lower level sensor	Check position of the sensor or replace the sensor

Error Code	Error Type	Error Name	Description	Cause	Solution
10	Error	Metering cylinder empty	Material in metering cylinder is empty	Reload target is set too low	Set proper reload position
				Improper reload request mode. For example, setting 'reload after multiple jobs' as reload request mode	Set proper reload request mode.
				Improper dispense program	Change dispense program by adding reload order in proper program workflow
11	Error	Pressure is too high	Pressure exceeds system upper limit	Dispense outlet line clogged	Clean or replace dispense valve and other outlet parts
				Dispense rate is too fast	Set proper dispense rate, or replace with bigger dispense nozzle
				Dispense Valve (AB) is not open	Check dispense valve and dispense solenoid valve
				Pressure sensor error	Replace pressure sensor
				Maximum working pressure is set too low	Set proper maximum working pressure
13	Error	Precharge fault	Pre-charge fails	When pre-charging, material level in metering cylinder is too low	Change dispense program by adding reload order in proper program workflow.
				Piston seal leaks	Replace piston
				Inlet Valve (AD) leaks	Replace inlet valve seal assembly
				Dispense Valve (AB) leaks	Replace dispense valve seal assembly
				Pressure sensor error	Replace pressure sensor
14	Error	Pressure depressure fault	Depressurize fails	When depressurizing, material level in metering cylinder is too high	Execute system de-pressurization, or depressurize by dispensing
				Inlet Valve (AD) leaks	Replace inlet valve seal assembly
				Pressure sensor error	Replace pressure sensor
16	Error	Supply valve does not turn on in time	Inlet valve does not turn on normally	Inlet Valve (AD) error	Check and replace inlet valve
				Insufficient air supply pressure	Check air supply pressure
				Reload solenoid valve error	Check or replace reload solenoid valve
				Inlet valve close sensor error	Check or replace close sensor of inlet valve
				System pressure exceeds the limit pressure of inlet valve.	Execute system relief and adjust system pressure in proper range.
17	Error	Supply valve does not turn off in time	Inlet valve does not turn off normally	Inlet Valve (AD) error	Check and replace inlet valve
				Insufficient air supply pressure	Check system air supply pressure
				Reload solenoid valve error	Check or replace reload solenoid valve
				Inlet valve close sensor error	Check or replace close sensor of inlet valve
				System pressure exceeds the limit pressure of inlet valve.	Execute system relief and adjust system pressure in proper range.
18	Error	Dispense valve does not turn on in time	Dispense valve does not turn on normally	Dispense Valve (AB) error	Check and replace dispense valve
				Insufficient air supply pressure	Check system air supply pressure
				Dispense solenoid valve error	Check or replace dispense solenoid valve
				Dispense Valve (AB) close sensor error	Check or replace close sensor of dispense valve
				System pressure exceeds the limit pressure of dispense valve	Execute system relief and adjust system pressure in proper range

Error Code	Error Type	Error Name	Description	Cause	Solution
19	Error	Dispense valve does not turn off in time	Dispense valve does not turn off normally	Dispense Valve (AB) error	Check and replace dispense valve
				Insufficient air supply pressure	Check system air supply pressure
				Dispense solenoid valve error	Check or replace dispense solenoid valve
				Dispense Valve (AB) close sensor error	Check or replace close sensor of dispense valve
				System pressure exceeds the limit pressure of dispense valve	Execute system relief and adjust system pressure in proper range
20	Error	Homing fault	Homing fault	Home position sensor disabled	Check and replace home position sensor
				Wrong installation position of home position sensor	Check and re-installation Home position sensor
				Drive mechanism error	Repair drive mechanism
21	Error	Motor torque is over limit	Motor torque is over limit	Dispense outlet line clogged	Clean or replace dispense valve and other outlet parts
				Dispense rate is fast	Set proper dispense rate
				Dispense valve is not open	Check Dispense valve and dispense solenoid valve
				Drive mechanism error	Repair drive mechanism
				Motor error	Check error code, and repair or replace motor
22	Error	Motor peak torque is over limit	Motor peak torque is over limit	Dispense outlet line clogged	Clean or replace dispense valve and other outlet parts
				Dispense rate is too fast	Set proper dispense speed
				Dispense valve is not open	Check Dispense valve and dispense solenoid valve
23	Error	Supply tank is empty (only for PSM warm melt)	Supplier material tank empty	For single pump supply system, the material tank is empty. For the dual pump supply system, both pump tanks are empty	Replace with a new tank
24	Deviation	Heater or pump not ready (only for PSM warm melt)	For single pump supply system, heater or pump is not ready for running	1. Heating system not start 2. Heating system is running, but not get target temperature 3. Heating system is OK, but pump not work	Check the Therm-O-Flow Warm Melt system
25	Deviation	Illegal setting	Invalid preset dispensing program	Invalid preset dispensing program	Confirm and reset the program
26	Deviation	Illegal command	The current dispense program order is invalid and not able to be executed	The current dispense program order is invalid and not able to be executed	check dispense program

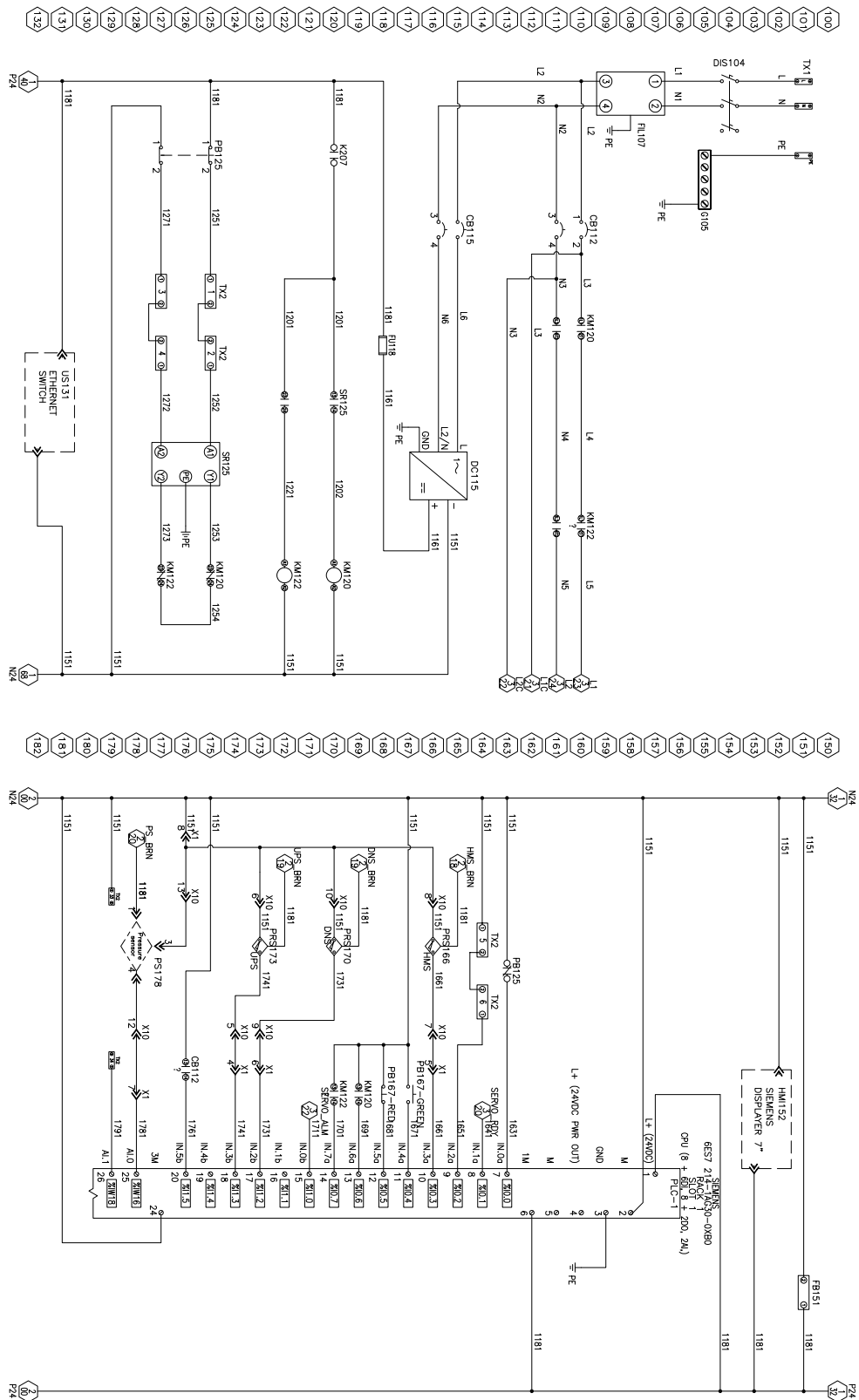
Error Code	Error Type	Error Name	Description	Cause	Solution
27	Deviation	Home is lost	System home position lost	Emergency stop, upper switch sensor, or lower switch sensor is activated	Execute Home
				Home is not executed after system start	
28	Deviation	Reload is request	Material in the metering cylinder is lower than the set 'reload request position'.	Material in the metering cylinder is lower than the set 'reload request position'	Execute reload
29	Deviation	Purge is request	The system have not dispensed for over the set 'purge alarm time'.	The system have not dispensed over the set 'purge alarm time'.	Execute dispense or purge immediately. If necessary, clean dispense valve and other outlet parts.
30	Deviation	Idle timeout	The system idles for longer time than the set 'Max idle time in job'.	The system idles for longer time than the set 'Max idle time in job'	The system automatically ends job per the set depressurize parameters
31	Deviation	system pressure relieve	The system is in pressure relief status.	The system is in pressure relief status	Complete system relief before getting the system back to normal

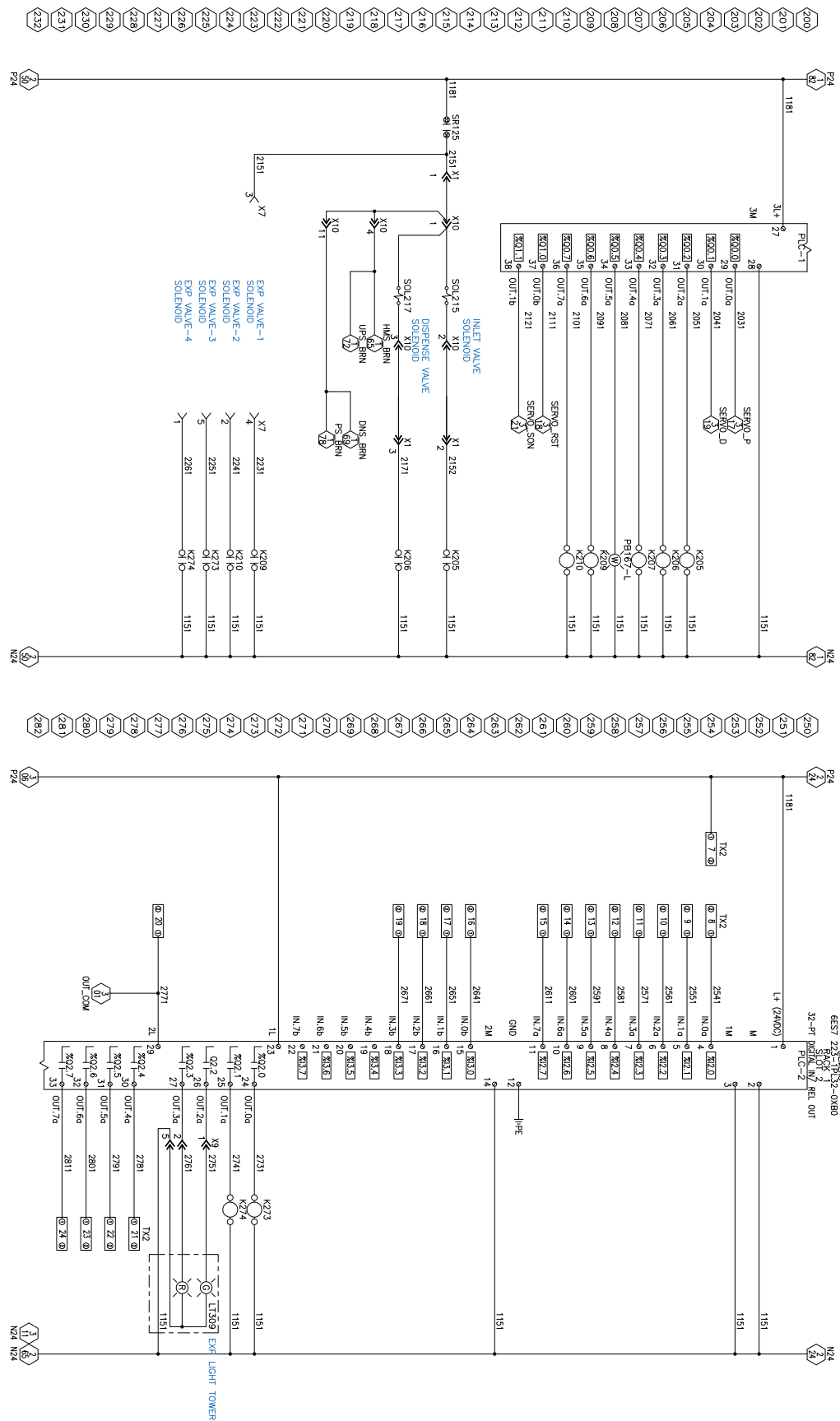
Appendix B - HMI Parameter Limits

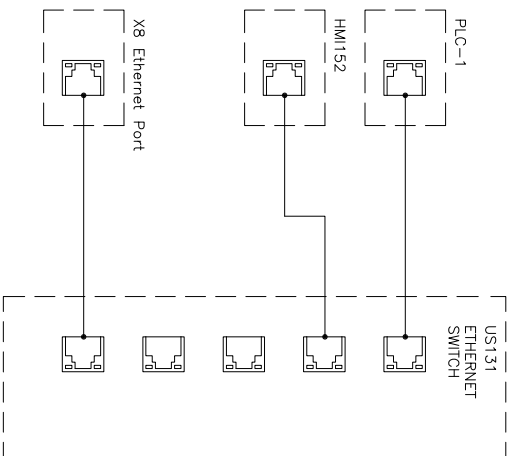
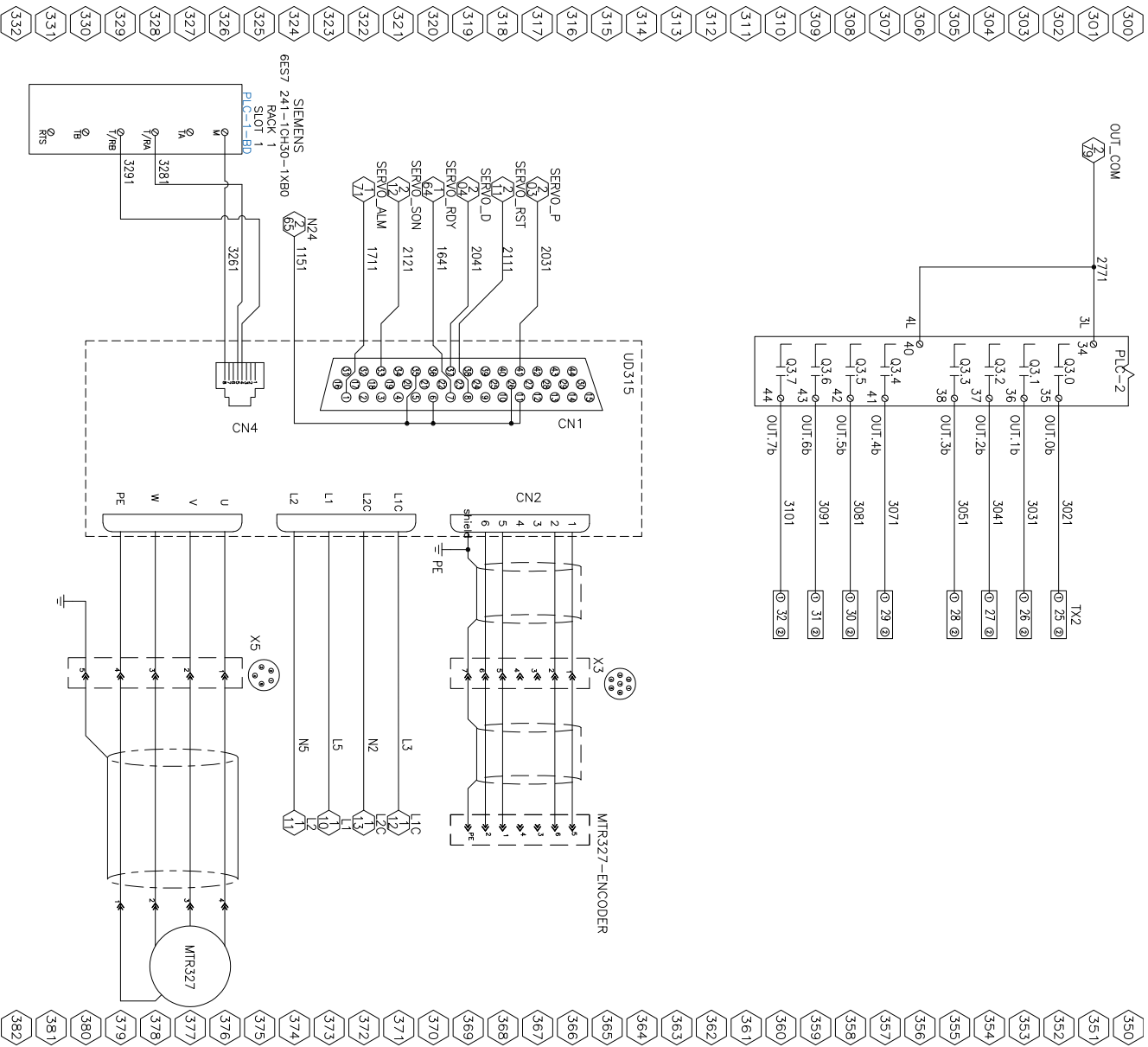
Screen	Parameter	PSM	Limit
Manual Screen	Flowrate	25cc	0.060 – 12.00cc/s
		50cc/100cc/200cc	0.075 – 15.00cc/s
	Target volume	25cc/50cc/100cc/200cc	≥0
	Pre-charge	25cc/50cc/100cc/200cc	0.0 – Value set in Max working pressure on Advanced Setup Screen - 2 , page 46
Reload Setup Screen	Reload speed	25cc	0.060 – 12.00cc/s
		50cc/100cc/200cc	0.075 – 15.00cc/s
	Reload target	25cc/50cc/100cc/200cc	80% – 100%
	Reload pressure	25cc/50cc/100cc/200cc	0.0 – Value set in Max working pressure on Advanced Setup Screen - 2 , page 46
	Max reload time	25cc/50cc/100cc/200cc	0 – 999s
	Reload request position	25cc/50cc/100cc/200cc	0 – 99%
Style Setup Screen	Target vol.	25cc/50cc/100cc/200cc	≥0
	Tolerance -	25cc/50cc/100cc/200cc	0 – 100%
	Tolerance +	25cc/50cc/100cc/200cc	0 – 100%
Shot Setup Screen	Shot size	25cc	0 – 25cc
		50cc	0 – 50cc
		100cc	0 – 100cc
		200cc	0 – 200cc
	Shot rate	25cc	0.060 – 12.00cc/s
		50cc/100cc/200cc	0.075 – 15.00cc/s
	Pre-charge	25cc/50cc/100cc/200cc	0.0 – Value set in Max working pressure on Advanced Setup Screen - 2 , page 46
Bead Setup Screen	Max rate	25cc	0.060 – 12.00cc/s
		50cc/100cc/200cc	0.075 – 15.00cc/s
Sequence Setup Screen	Shot rate	25cc	0.060 – 12.00cc/s
		50cc/100cc/200cc	0.075 – 15.00cc/s
	Shot size	25cc	0 – 25cc
		50cc	0 – 50cc
		100cc	0 – 100cc
		200cc	0 – 200cc
	Repeat	25cc/50cc/100cc/200cc	0 – 99
Purge Setup Screen	Purge volume	25cc/50cc/100cc/200cc	0 – 999cc
	Purge rate	25cc	0.060 – 12.00cc/s
		50cc/100cc/200cc	0.075 – 15.00cc/s
	Purge alarm time	25cc/50cc/100cc/200cc	0 – 999min
Pre-charge Setup Screen	Precharge scope -	25cc/50cc/100cc/200cc	0 – 50%
	Precharge scope +	25cc/50cc/100cc/200cc	0 – 50%
	Max pre-charge time	25cc/50cc/100cc/200cc	0 – 999s
	Pre-charge rate (Hi)	25cc	0.1 – 12.50mm/s
		50cc/100cc/200cc	0.1 – 8.3mm/s
	Pre-charge rate (Lo)	25cc/50cc/100cc/200cc	0.1 – Value set in Pre-charge rate (Hi)
	Decelerate point	25cc/50cc/100cc/200cc	0 – 99%
Depressure Setup Screen	Depressure target	25cc/50cc/100cc/200cc	0.0 – Value set in Max working pressure on Advanced Setup Screen - 2 , page 46
	Max depressure time	25cc/50cc/100cc/200cc	0 – 999s
	Depressure rate	25cc	0.1 – 12.50mm/s
		50cc/100cc/200cc	0.1 – 8.3mm/s

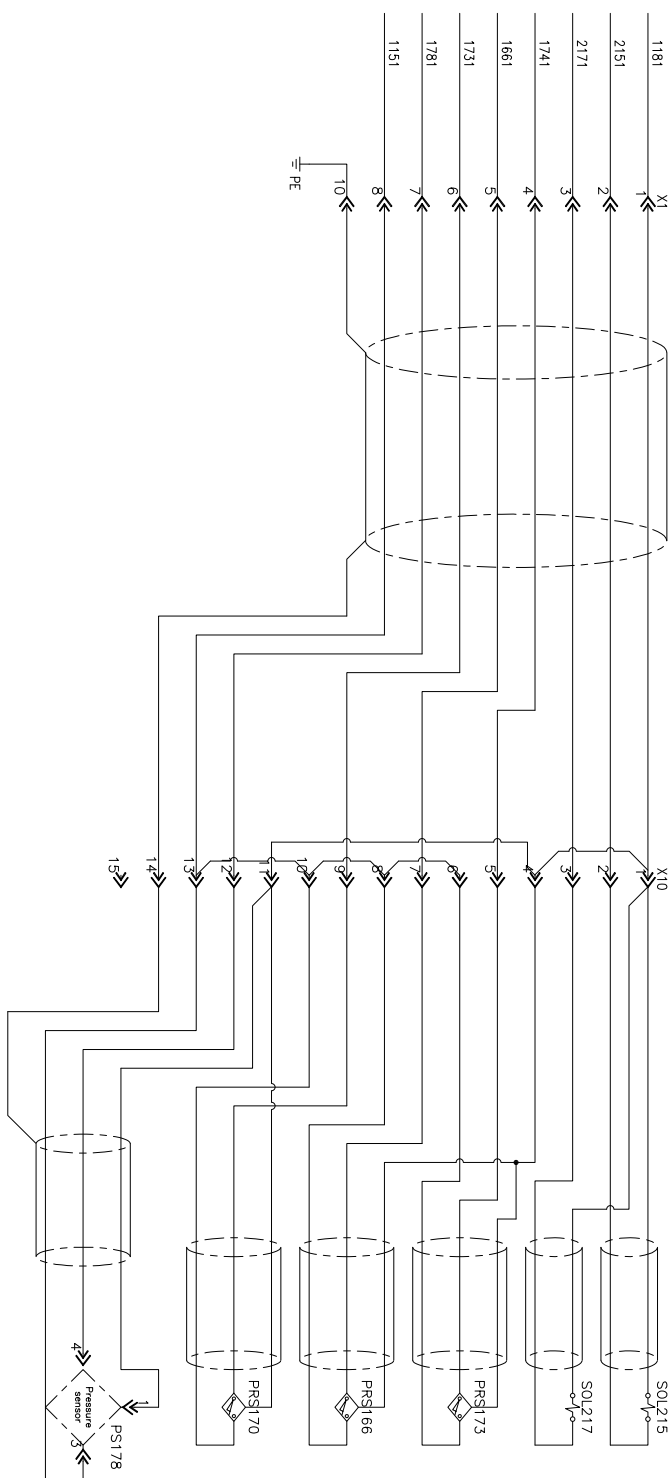
Screen	Parameter	PSM	Limit
Advanced Setup Screen - 2	Pressure offset	25cc/50cc/100cc/200cc	-100 – 100psi (-6.89 – 6.89bar, -0.689 – 0.689Mpa)
	Max working pressure	25cc/50cc/100cc/200cc	0 – 3000psi (0.0 – 206.8bar, 0.0 – 20.68Mpa)
Advanced Setup Screen - 3	Homing speed	25cc	0.1 – 12.50mm/s
		50cc/100cc/200cc	0.1 – 8.3mm/s
	Dispense on delay	25cc/50cc/100cc/200cc	0.0 – 99.9s
	Dispense off delay	25cc/50cc/100cc/200cc	0.0 – 99.9s

Schematics









I/O Signals

Signal Type	Terminal Number	Cable Number	Signal Name	Warm Melt Connect Signals
Input	1	1251	Emergency Stop 1 +	--
	2	1252	Emergency Stop 1 -	--
	3	1271	Emergency Stop 2 +	--
	4	1272	Emergency Stop 2 -	--
	5	1151	Emergency Stop 3 +	--
	6	1651	Emergency Stop 3 -	--
	7	1181	Input Common (24V+)	--
	8	2541	Dispense	--
	9	2551	Purge	--
	10	2561	Reload	--
	11	2571	Mode Select	--
	12	2581	Shot Bit0	--
	13	2591	Shot Bit1	--
	14	2601	Shot Bit2	WM_PUMPB_IN_1
	15	2611	Shot Bit3	WM_PUMPB_IN_2
	16	2641	Precharge Start	WM_PUMPA_IN_1
	17	2651	Alarm Reset	--
	18	2661	Job Start	--
	19	2671	Pressure Relief	WM_PUMPA_IN_2
	33	1151	Flow Rate Command -	--
	34	1791	Flow Rate Command +	--
Output	20	2771	Output Common	--
	21	2781	Ready	--
	22	2791	Standby	--
	23	2801	In Reload	--
	24	2811	Alarm	--
	25	3021	Error Code bit0	WM_OUT_PLC_EN
	26	3031	Error Code bit1	WM_OUT_HEAT_ON_CMD
	27	3041	Error Code bit2	WM_OUT_PUMP_ON_CMD
	28	3051	Error Code bit3	WM_OUT_MAP_SELECT
	29	3071	Error Code bit4	--
	30	3081	In Dispense	--
	31	3091	In Job	--
	32	3101	Reload Req.	--

Gateway Map

Controller Input from PLC Output

Name	Units	Byte	Description
GATE_IN_CMD_BIT0-15	0 Job Start	1-2	used to start job, normal
	1 Dispense		used to start dispensing in bead mode or shot mode
	2 Reload		used to start reloading material
	3 Purge		used to start purge
	4 Alarm Reset		used to reset error
	5 Mode Select		used to set working mode in automatic 0 means shot mode 1 means bead mode
	6 Pressure Relief		used to open dispense valve and relief pressure in metering system
	7 Precharge Start		--
	15 Heartbeat Feedback		--
GATE_IN_SHOT_NO	--	3-4	0-39, for select shot
GATE_IN_JOB_STYLE_NO	--	5-6	0-39, for select job style
GATE_IN_RATE_CMD	--	7-8	the dispense flow rate, unit is cc/s or g/s, by 0.01

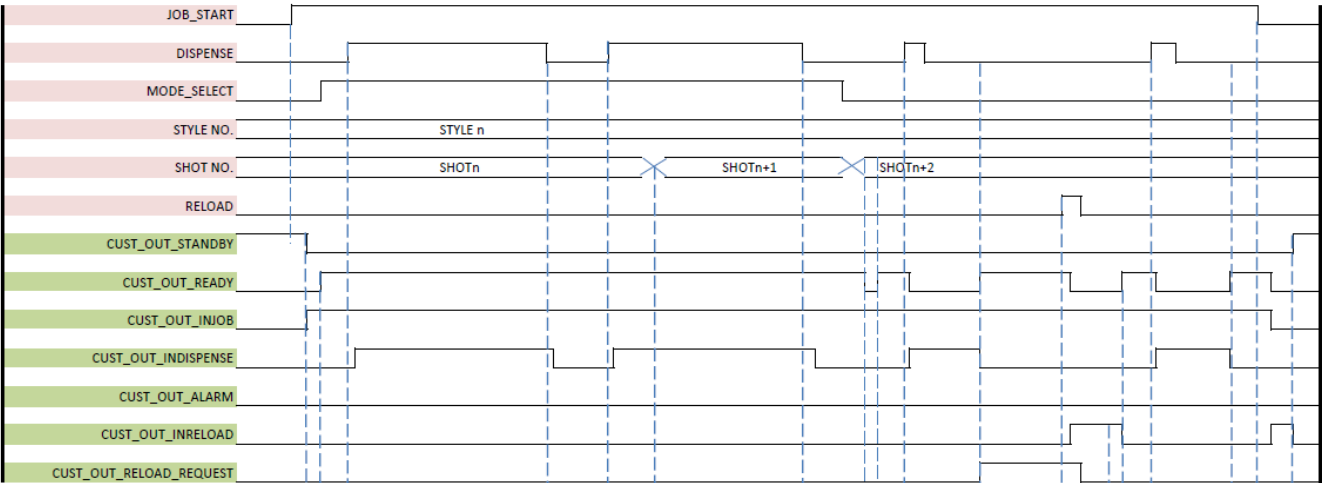
Controller Output to PLC Input

Name	Units	Byte	Description
GATE_OUT_STATUS	0 Ready	1-2	--
	1 In Dispense		--
	2 Completed		--
	3 In Reload		--
	4 Purge Request		--
	5 Reload Request		--
	6 Alarm		--
	7 Standby		--
	8 In Job		--
	9 In Purge		--
	10 Dispense Mode		--
	11 In Auto Mode		--
	12 Volume OK		--
	15 Heart Beat		--
GATE_OUT_ERR_CODE		3-4	--
GATE_OUT_SHOT_NO		5-6	--
GATE_OUT_JOB_STYLE_NO		7-8	--
GATE_OUT_DISP_VOL		--	--
GATE_OUT_JOB_VOL		9-10	Integer, should multiply by 0.1, unit is cc
GATE_OUT_DISP_RATE		11-12	Integer, should multiply by 0.01, unit is cc/s
GATE_OUT_PRESS		13-14	Integer, unit is PSI
GATE_OUT_MTR_TRQ		15-16	Integer, should multiply by 0.001, unit is N·M
GATE_OUT_JOB_DURATION		17-18	Integer, unit is s
GATE_OUT_DISP_TIMES		19-20	Integer

Timing Chart

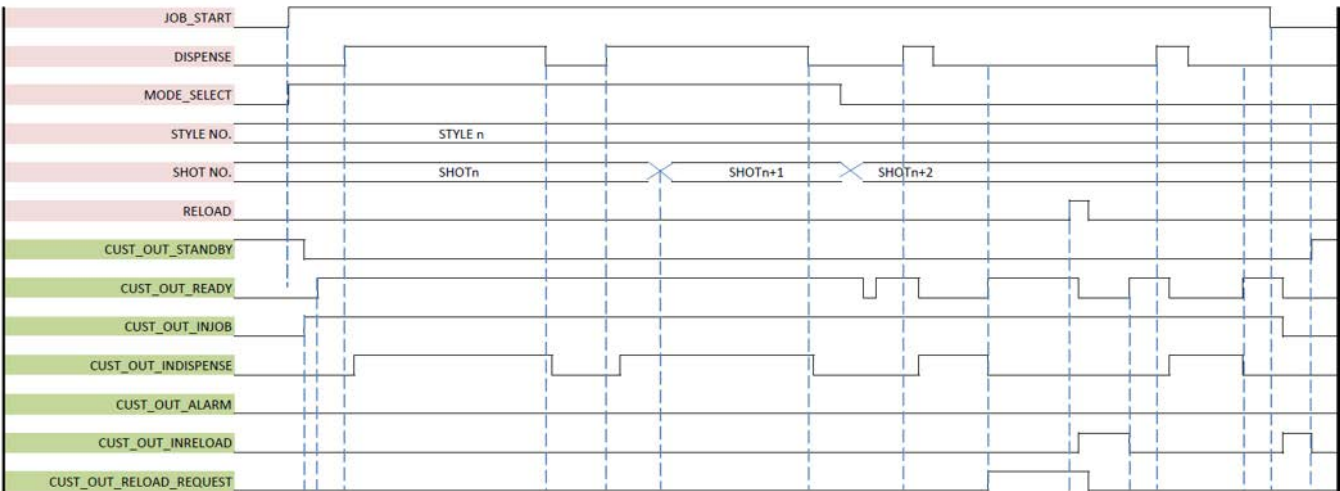
Set Precharge when Shot No. Change and Reload After Each Job

The timing charts describe standard shot application sequence when Auto pre-charge mode is set as Shot No. change, and Auto reload setup is set as Reload after each job.



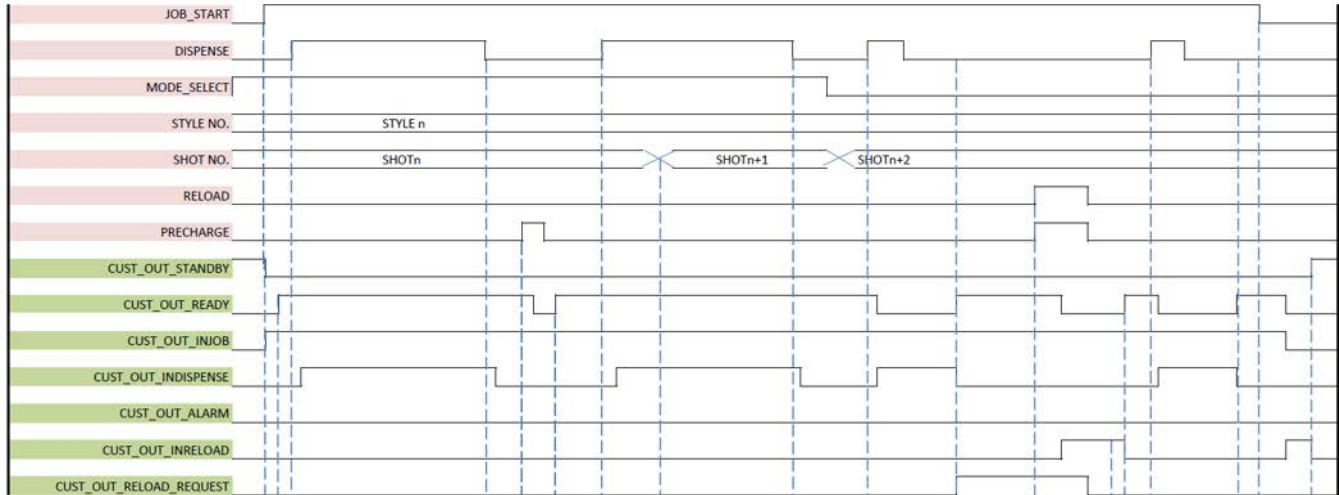
Set Precharge Only when Job Start and Reload After Each Job

The timing charts describe standard shot application sequence when Auto pre-charge mode is set as Only job start, and Auto reload setup is set as Reload after each job.



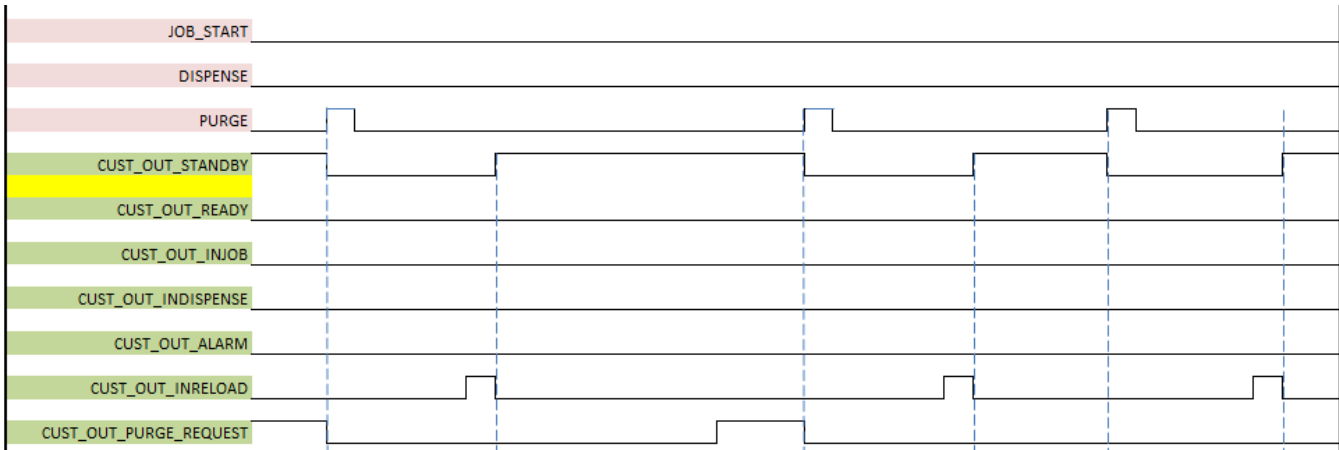
Set Distributed IO or Gateway Precharge and Reload After Each Job

The timing charts describe standard shot application sequence when Auto pre-charge mode is set as Distributed IO or Gateway, and Auto reload setup is set as Reload after each job.



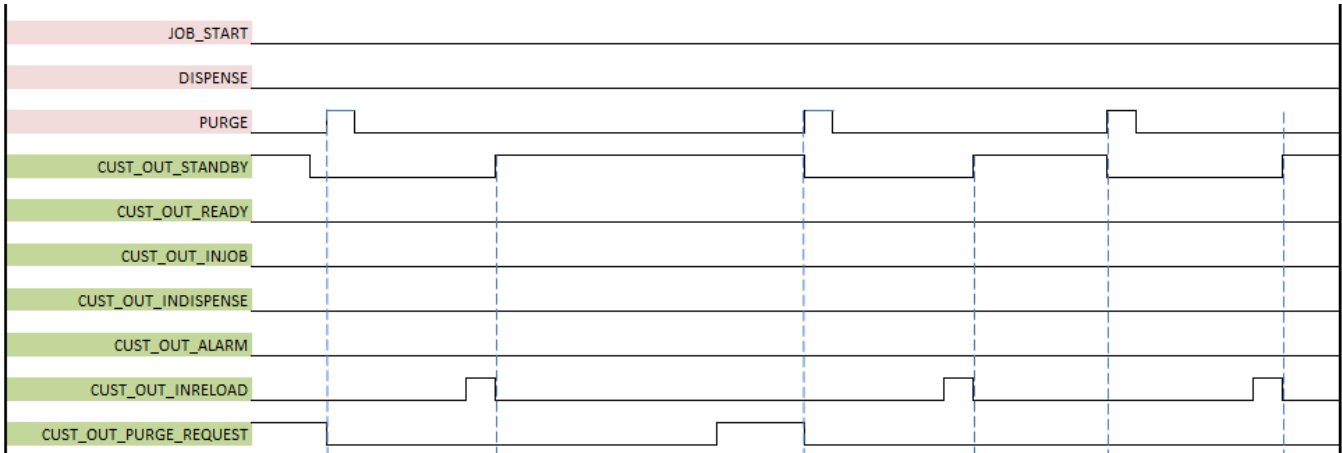
Enable Auto Reload After Purging

The timing charts describe standard shot application sequence when Auto reload after purging is enabled.



Enable Auto Relief After Purging

The timing charts describe standard shot application sequence when Auto relief after purging is enabled.



Technical Specifications

PSM System		
	US	Metric
Maximum Inlet Fluid Pressure	3000 psi	20.7 MPa, 207 bar
Maximum Working Fluid Pressure	3000 psi	20.7 MPa, 207 bar
Maximum Air Pressure	100 psi	0.7 MPa, 7 bar
Electrical Power	200–240 VAC, 50/60 Hz, 10 A	
Viscosity Range	20–1,000,000 cps	
Wetted Parts	304 Stainless Steel, 7075-T651, Ceramic, FKM, FFKM, Hard Chrome, PEEK, PH17-4, Ethylene Propylene, Parker PolyMyte™, Tungsten Carbide, UHMWPE	
Shot Size Range ⁽¹⁾	25 cc: 0.1–25cc 50 cc: 0.2–50 cc 100 cc: 0.5–100 cc 200 cc: 0.5–200cc	
Shot Size Repeatability	1%	
Maximum Flowrate ⁽²⁾	25 cc: 12 cc/s 50 cc: 15 cc/s 100 cc: 15 cc/s 200 cc: 15 cc/s	
Maximum Working Temperature	158°F	70°C
Inlet / Outlet Sizes		
Air Inlet Size	1/4 in.	6 mm
Fluid Inlet Size	1/4 in. npt (f)	
Fluid Outlet	iQ valve: 1.7mm tip size 1K valve: 1/4 in. npt(f)	
Weight		
PSM Metering Unit	25 cc: 40.8 lb 50 cc: 40.8 lb 100 cc: 43.0 lb 200 cc: 48.5 lb	25 cc: 18.5 kg 50 cc: 18.5 kg 100 cc: 19.5 kg 200 cc: 22 kg
PSM Warm Melt Metering Unit (with warm melt module)	25 cc: 45.2 lb 50 cc: 45.2 lb 100 cc: 49.6 lb 200 cc: 52.9 lb	25 cc: 20.5 kg 50 cc: 20.5 kg 100 cc: 22.5 kg 200 cc: 24 kg
Warm Melt Module	6.06 lb	2.75 kg
PSM Control Unit	88.2 lb	40.0 kg
Notes		
All trademarks or registered trademarks are the property of their respective owners.		
⁽¹⁾ Minimum shot size varies based on the material type and the customer tolerance requirements.		
⁽²⁾ Maximum flowrate varies based on the material viscosity.		

California Proposition 65

CALIFORNIA RESIDENTS

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

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Original instructions. This manual contains English. MM 3B0423

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