Time Pressure System User Guide

Version 1.0
July 27, 2015
Part No. 22800100

for model:

22891007

for use with:

Time Pressure System software, v1.0.0

prepared by GPD Global® Documentation Dept.

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Safety Notices

Appropriate use, warranty

Any of the following that are done without the explicit and written approval of the manufacturer:

- conversions or additions,
- the use of non-original spare parts,
- repairs carried out by companies or persons that have not been authorized by the manufacturer

can lead to the warranty being rendered null and void. The manufacturer shall have no liability whatsoever for damage resulting from failure to follow the operation and maintenance instructions.

Qualifications of the operating and maintenance personnel

The owner bears the responsibility for ensuring that operating and maintenance personnel have the required qualifications. The operation and maintenance instructions must be read and understood. Comply with the relevant applicable technical and safety regulations.

Organizational measures

The owner is to provide any personal protective equipment that is required. All the safety devices are to be checked regularly. Wear protective glasses and a protective suit for operation and cleaning to protect against any chemicals that may be sprayed out.

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Warranty

General Warranty. Subject to the remedy limitation and procedures set forth in the Section "Warranty Procedures and Remedy Limitations," GPD Global warrants that the system will conform to the written description and specifications furnished to Buyer in GPD Global's proposal and specified in the Buyer's purchase order, and that it will be free from defects in materials and workmanship for a period of one (1) year. GPD Global will repair, or, at its option, replace any part which proves defective in the sole judgment of GPD Global within one (1) year of date of shipment/invoice. Separate manufacturers' warranties may apply to components or subassemblies purchased from others and incorporated into the system. THIS WARRANTY IS EXPRESSLY IN LIEU OF ANY AND ALL OTHER WARRANTIES,EXPRESS OR IMPLIED, INCLUDING WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

Limitations. GPD Global reserves the right to refuse warranty replacement, where, in the sole opinion of GPD Global the defect is due to the use of incompatible materials or other damages from the result of improper use or neglect.

This warranty does not apply if the GPD Global product has been damaged by accident, abuse, or has been modified without the written permission of GPD Global.

Items considered replaceable or rendered unusable under normal wear and tear are not covered under the terms of this warranty. Such items include fuses, lights, filters, belts, etc.

Warranty Procedures and Remedy Limitations. The sole and exclusive remedy of the buyer in the event that the system or any components of the system do not conform to the express warranties stated in the Section "Warranties" shall be the replacement of the component or part. If on-site labor of GPD Global personnel is required to replace the non-warranted defective component, GPD Global reserves the right to invoice the Buyer for component cost, personnel compensation, travel expenses and all subsistence costs. GPD Global's liability for a software error will be limited to the cost of correcting the software error and the replacement of any system components damaged as a result of the software error. In no event and under no circumstances shall GPD Global be liable for any incidental or consequential damages; its liability is limited to the cost of the defective part or parts, regardless of the legal theory of any such claim. As to any part claimed to be defective within one (1) year of date of shipment/invoice, Buyer will order a replacement part which will be invoiced in ordinary fashion. If the replaced part is returned to GPD Global by Buyer and found by GPD Global in its sole judgment to be defective, GPD Global will issue to Buyer a credit in the amount of the price of the replacement part. GPD Global's acceptance of any parts so shipped to it shall not be deemed an admission that such parts are defective.

Specifications, descriptions, and all information contained in this manual are subject to change and/or correction without notice.

Although reasonable care has been exercised in the preparation of this manual to make it complete and accurate, this manual does not purport to cover all conceivable problems or applications pertaining to this machine.

Overview

The off-line Time Pressure System controls a timed fluid pressure cycle by applying a specified amount of air pressure to a syringe for a specified period of time.

Features

The Time Pressure System may be connected to a GPD FPC Pump Interface to control FPC function. An operator starts/stops the time pressure cycle by pressing a button on the Time Pressure System touch screen or a foot switch. Alternatively, the Time Pressure System may be connected to a GPD Island Series robot or other control signal to automatically start/stop FPC function.

Run mode

Pump inlet pressure is controlled to match the pump inlet pressure set point.

Idle mode

Pump inlet pressure is controlled to match the idle set point.

Offline mode

Reservoir pressure is set to zero (0).

Manual mode

Pump inlet pressure control is disabled and a constant air pressure is exerted.

Set Point

Establishes desired air pressure. The set point can be specified through either the touch screen set point parameter or the external set point analog input channel. Only a single source is active at any given time.

Sensor Adjustment

Establishes a ‘zero offset’ for the pressure sensor.

At Pressure

The ready state for the Time Pressure System is based on actual pressure at the pump inlet. The ready state requires this pressure be within a specified range centered on the Run set point.

Maximum pressure

At no time will the Time Pressure System adjustment pressure exceed a configurable, maximum pressure value.

Scope of Supply

The Time Pressure System includes the Time Pressure controller with touch screen control software, a power cord, and a user guide.

Set Up

Set Up Hardware

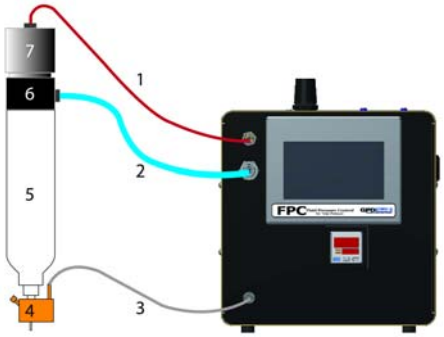
Rear Panel

1. Connect air to the air in port (A) on the rear panel. Refer to Specifications (pg 14).
2. Plug the power cord into an appropriate power outlet (B). Refer to Specifications (pg 14).
3. If applicable, plug a foot switch (C) into the external I/O port.

A	air source
B	power source
C	foot switch

Front Panel

1. Connect the syringe air hose (1) to the air out port on front panel.
2. Connect the syringe vacuum line (2) to the vacuum port.
3. Plug the sensor cable (3) from the FPC Pump Interface (mounted to pump) into the sensor port.



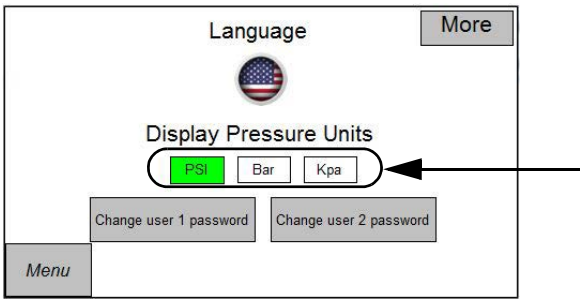
1	air pressure line
2	vacuum line
3	sensor wire
4	FPC Pump Interface
5	fluid syringe
6	vacuum adapter
7	cylinder

Set Options

Units of Measure

To change the unit of measure for all pressure displays:

1. From the Home window, press MENU > SETTINGS. The initial Settings window displays.
2. Press the desired choice of units: PSI, Bar, or Kpa. The selected units will display with a green background.



Localization

Currently, window text displays in English. Refer to Settings [1] (pg 23).

Set Parameters

NOTE: The controller retains some of the current set up parameters when power is cycled. Most settings remain unchanged until you enter new selections and values even if the Time Pressure System power is cycled; however, manual (air pressure) parameters will be set to a value of 0.0 when power is cycled.

SUGGESTION: Record your settings by material. Previous settings are not retrievable after new selections and values are entered.

Below are some of the various parameters available for user modification:

To edit:	Refer to:
Set point	Process (pg 18)
Idle set point	
Manual (air pressure)	
Idle time	Configuration [1] (pg 20)
Ramp up time	
Idle ramp up time	
Pressure settings *	Settings [3] (pg 25)
External set point settings *	Settings [4] (pg 26)
*for use when external hardware is interfaced with the Time Pressure System	

Configuring System

Various configuration settings for the Time Pressure System may be changed by the user:

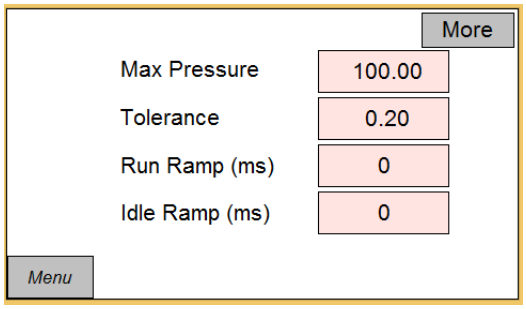
- maximum pressure
- pump inlet pressure range
- ramp values
- sensor offset value
- tuning parameters
- noise suppression values

NOTE: A top level password is required to configuration settings.

Configuration Parameters

To change various configuration parameters, go to the Home window and press MENU > CONFIGURATION to open the initial Configuration window.

For further details about each parameter, refer to Configuration [1] (pg 20).



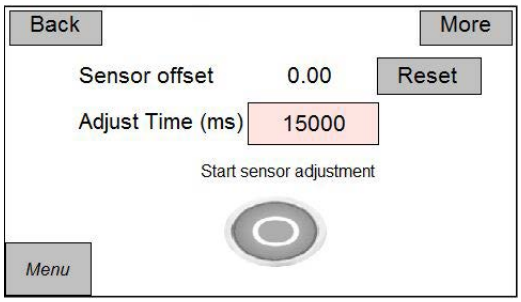
Sensor Adjustment

To perform the sensor adjustment procedure:

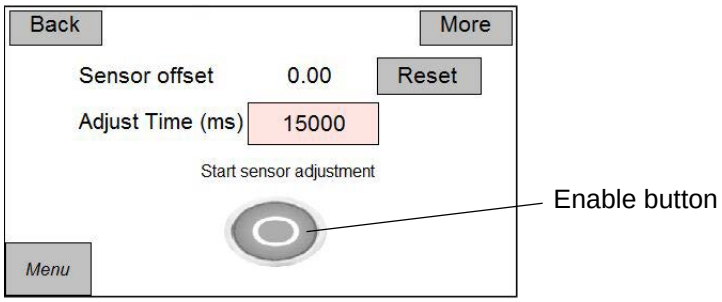
1. If external hardware interfacing with the Time Pressure System is present:
   a. Verify that the EStop digital input channel to the Time Pressure System is not being asserted (typically by releasing the Emergency Stop button on the interfacing hardware).
   b. Verify that the RunMode digital input channel to the Time Pressure System is not being asserted.
2. From the Home window, press the RUN button. The RUN button will turn yellow to indicate the controller is in Idle mode.

   IMPORTANT: Do not press the OFFLINE button during this procedure.

3. Press MENU > CONFIGURATION, and then press MORE to open the second Configuration window. For details about each parameter, refer to Configuration [2] (pg 21).



4. Enter a value in Adjust Time (ms).
5. To start the sensor adjustment procedure, press the grey ENABLE button. The button is green while the adjustment procedure is active and returns to grey when the procedure has been completed.

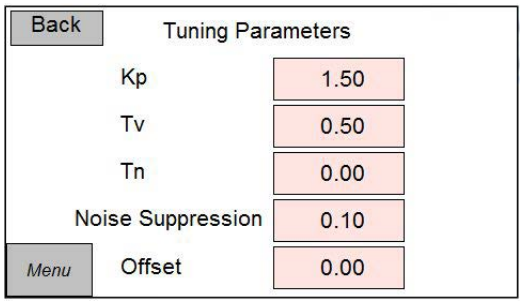


The Sensor offset value is updated upon procedure completion.

Tuning Parameters
Noise Suppression

To change tuning or noise suppression parameters, from the Home window press MENU > CONFIGURATION, and then press MORE > MORE to open the third Configuration window.

For further details about each parameter, refer to Configuration [3] (pg 22).

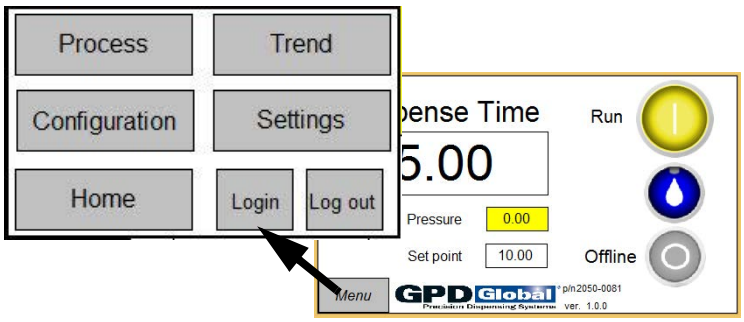


User Interface

Navigation

Use the Menu window to navigate to all windows: Process, Trend, Configuration, Settings, Home, Login, and Log out.

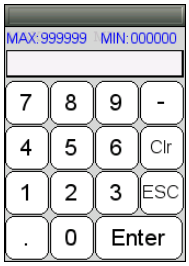
To close the Menu window, either press the MENU button again or select a menu item. Selecting a menu item automatically closes the Menu window while opening the window for the selected menu item.



Enter Value

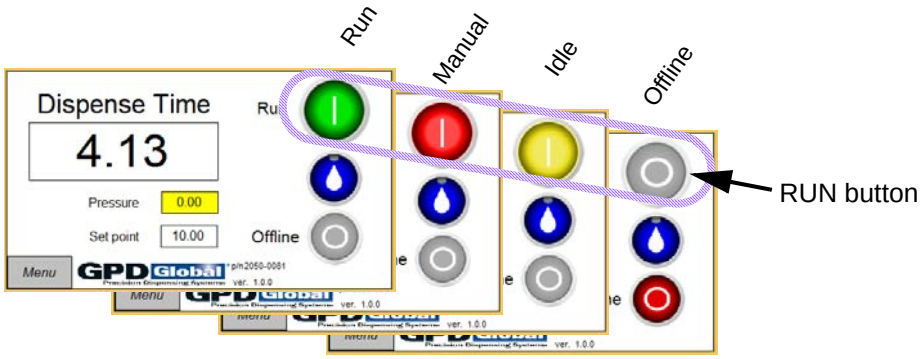
A numeric keypad will display whenever you press a value field. The keypad closes automatically when you press the keypad ENTER or ESC button.

NOTE: All input takes effect immediately.



Operation Modes

Figure 1: *Time Pressure System mode is indicated by color of RUN button.*



Run Mode

Press the RUN button on the Home window. The Time Pressure System is active when the RUN button is Yellow or Green.

> ***NOTE:*** For RUN mode to be active, it must be selected from the Home screen.

If external hardware interfacing with the Time Pressure System is present and an Emergency Stop condition (Emergency Stop digital input) is enabled, the Time Pressure System is forced offline (OFFLINE button on Home screen). The Time Pressure System cannot be active with the emergency condition active.

When the Time Pressure System is in Run mode, the reservoir pressure is being controlled to match the set point (pump inlet pressure). The set point can be specified through two sources, only one of which will be active at any given time:

- The set point parameter input via the touch screen. Refer to Process (pg 18).
- The external set point analog input channel (if external hardware interfacing with the Time Pressure System is present). Refer to Settings [4] (pg 26).

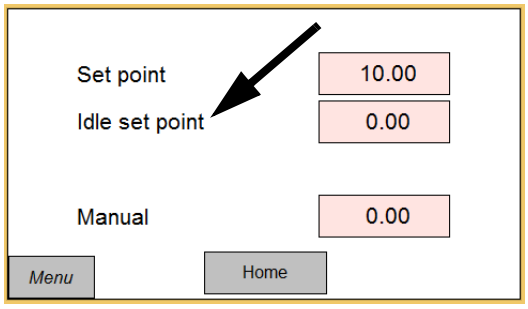
Idle Mode

Idle mode is indicated by a Yellow RUN button. The Time Pressure System changes to Idle mode when a timed dispense cycle completes.

These conditions will exist during Idle mode:

- Reservoir pressure is controlled to match the Idle set point.
- RunMode digital input is not asserted.
- Idle or RUN Mode cannot be active if an Emergency Stop condition is present on an externally connected machine.

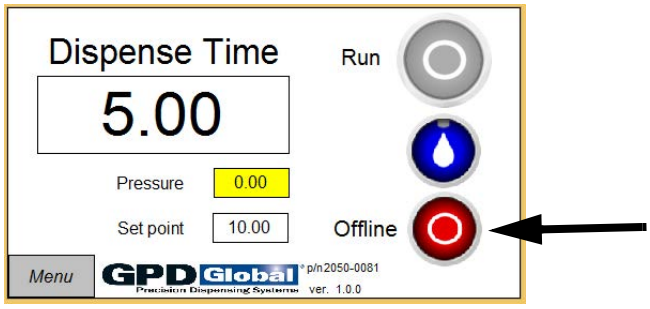
The Idle set point is located in the Process (pg 18) window.



Offline Mode

When the Time Pressure System is in the Offline mode, the OFFLINE button appears red and zero (0) reservoir pressure is forced.

The Time Pressure System is in Offline mode when the Time Pressure System is forced Offline through the touch screen or an externally connected machine (via the Emergency Stop digital input) is in an Emergency Stop condition.

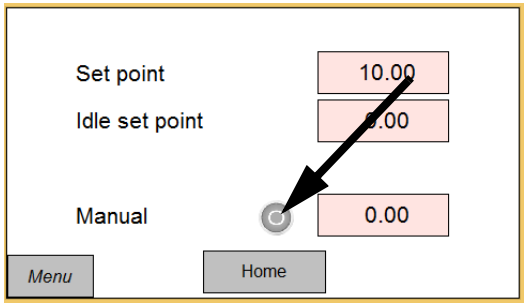


Manual Mode

The MANUAL button is available when the Time Pressure System is in Idle mode (RUN button is Yellow).

When the Time Pressure System is in Manual mode, inlet pressure control is disabled and a constant reservoir pressure is commanded.

To activate Manual mode, press the MANUAL button in the Process (pg 18) window.



Operations

Power On/Off

To power the Time Pressure System on/off, press the Power switch on the back of the unit.

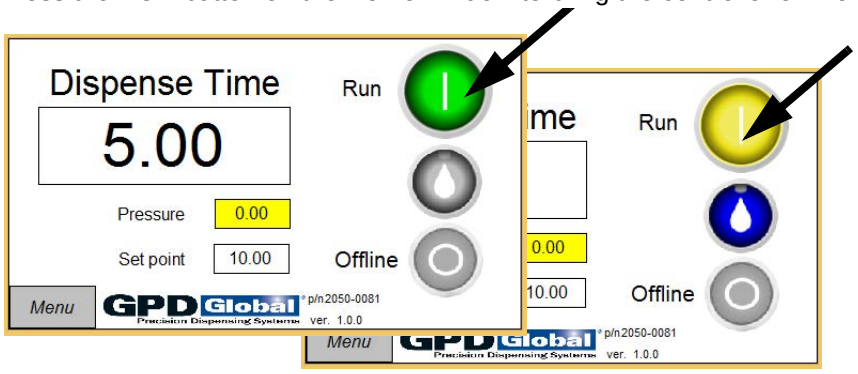
Online

When the RUN button is pressed:

- the controller will go online, and
- the RUN button will turn green if the RunMode digital input is asserted, or
- the RUN button will turn yellow if the RunMode digital input is not asserted.

Run Button Color	Run Button State
Yellow	Idle Mode: pressure comes from idle Pressure.
Green	Run Mode: pressure comes from Set Point.
For further details, refer to Operation Modes (pg 7).	

1. Before turning on the Time Pressure System, make sure the sensor for the FPC Pump Interface is connected to the controller. For details, refer to Set Up (pg 2).
2. Press the RUN button on the Home window to bring the controller online.



Run Time Pressure

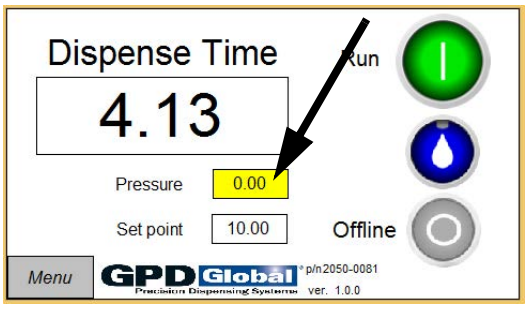
To run the FPC Pump Interface using the Time Pressure System:

1. Verify Set Up (pg 2) has been performed.
2. Press the RUN button. When the RUN button turns green, the system is in Run mode.

View Current Pressure

The current pump inlet pressure is always displayed in the Home window. The background color of reading indicates the state of the pump inlet pressure:

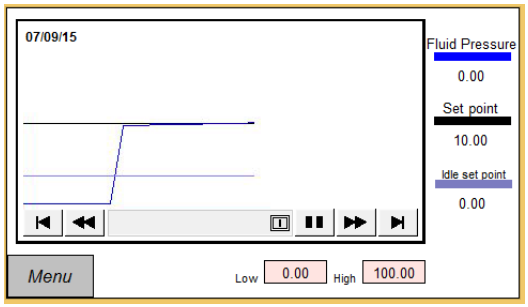
- White background - pump inlet pressure is within set point tolerance (requires Run mode to be active).
- Yellow background - pump inlet pressure is outside set point tolerance.



Reporting Data Results

To generate a data trend line graph for pump inlet pressure, set point, and Idle set point:

1. From the Home window, press MENU > TREND. The Trend window displays.



2. To zoom in/out on the vertical pressure line, enter a value in Low and High.
3. Navigate the horizontal time line using the controls at the bottom of the graph.

Troubleshooting

This section is intended for use by those with access to configuration settings.

Symptom

A Pressure value of “nan” displays in the Home window:

Possible Problem

The system is configured incorrectly. Each set of Low and High fields in all Settings windows must define a range; if they are equal to each other, an error occurs.

Example - CORRECT

Each set of Low and High fields defines a range.

In this example, correct settings reflect the electrical signal of the sensor. The sensor has a VDC output range of 0-10 VDC for 0-72.0 PSI.

	LOW	HIGH	SAMPLE SETTING WINDOW
Units	0.00	72.00	
VDC	0.00	10.00	

Example - INCORRECT

One or more sets of Low and High fields do NOT define a range; they are equal to each other.

In this example, Low and High values for Units are both 0.00. For VDC, values are both 10.00.

	LOW	HIGH	SAMPLE SETTING WINDOW
Units	0.00	0.00	
VDC	10.00	10.00	

Action

Inspect and edit, as needed, the values for each set of Low and High fields located here:

- Sensor - refer to Settings [2] (pg 24).
- Regulator - refer to Settings [3] (pg 25).
- Pressure - refer to Settings [3] (pg 25).
- External Set Point - refer to Settings [4] (pg 26).

Security

Access Levels

The Time Pressure System has two passworded access levels. The first (user 1) – a limited access level – enables the user to access the Home, Login, and Process windows. The second level (user 2) – the unlimited access level – enables the user to access all aspects.

Login

NOTE: As a security measure, the user is logged off automatically after a period of inactivity; the login screen is reset.

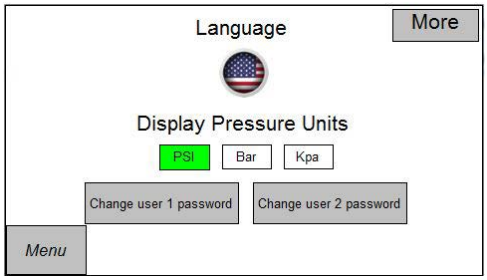
To log into the Time Pressure System:

1. From the Home window, press MENU > LOGIN. The Login window displays. Close the Menu window.
2. Press the USER field. Enter a user name (1 or 2) for the appropriate level of access, and then press ENTER.
3. Press the PASSWORD field. Enter the appropriate password and then press ENTER. If the password is input incorrectly, an Invalid Password prompt will display; otherwise, the login will have been successful.
4. Press MENU to exit this window and select a different window.

Change Password

To change a password:

1. From the Home window, press MENU > SETTINGS. The Settings window displays. Close the Menu window.



2. To change the password for user 1, press CHANGE USER 1 PASSWORD. To change the password for user 2, press CHANGE USER 2 PASSWORD instead. A prompt for the appropriate user displays.

3. Press the ****** button and input the desired password. Pressing the SAVE button confirms and changes the password for the applicable user.

   NOTE: Make note of the new password. Passwords cannot be recovered if lost.

4. Press the X icon to exit.

Specifications

Input air pressure, maximum (clean, dry air) . . . . 6.9 bar (100 psi)
Output pressure, maximum . . . . . 6.9 bar (100 psi)
Air input port tube diameter . . . . . 6 mm
Air output port tube diameter . . . . . 6 mm
Input power . . . . . 90-264 VAC, 47/63 Hz
Controller interface . . . . . touch screen w/Time Pressure System software
External input/out. . . . . 9 pin DB

Spare Parts

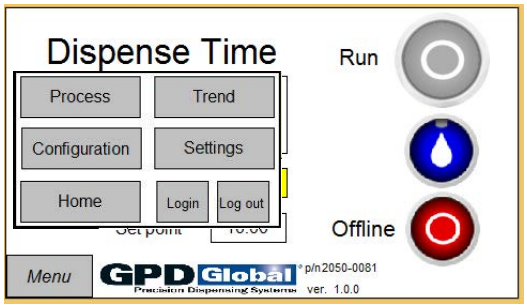
Description	Part No.	Qty
Potentiometer Trim Pot Adjustment Tool	4750-0052	1
Fuse F1 and F2, 2A	4300-0118	1

References

Windows

Menu

Use the Menu window to navigate to any of these windows: Process, Trend, Configuration, Settings, Home, Login, and Log out.



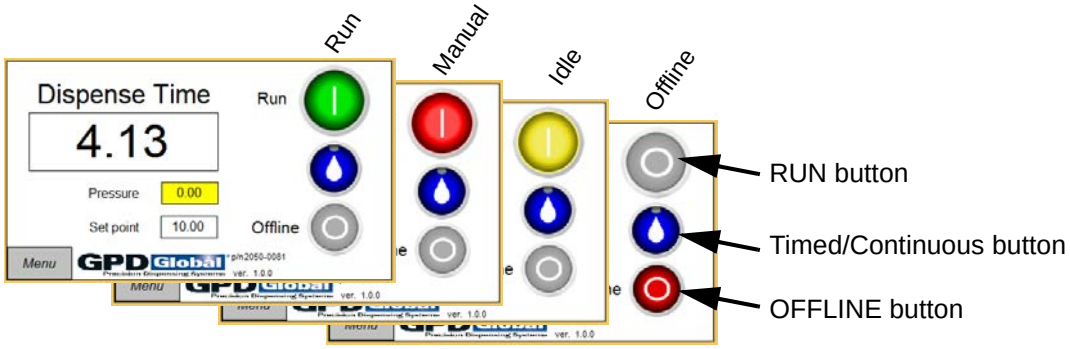
Component	Description
Menu button	Always present in lower left corner of Home window. Press the MENU button once to display the Menu window, and again to close the Menu window.
Process	Opens the process parameters window. Requires access level 1 or 2.
Trend	Opens the trend line graph display window.
Configuration	Opens the first configuration settings window. Requires access level 2.
Settings	Opens the first system settings window. Requires access level 2.
Home	Opens the Home window.
Login	Opens the Login window.
Log out	Logs out the current user. Additionally, an automatic log out of the current user occurs if there is no user interaction with the touch screen for more than 5 minutes.

Home

Use this window to:

- determine the current fluid pressure (pump inlet pressure),
- enter set point value for fluid pressure,
- determine if the fluid pressure is within set point tolerance,
- start/stop the Time Pressure cycle, and
- determine the current state of the Time Pressure System.

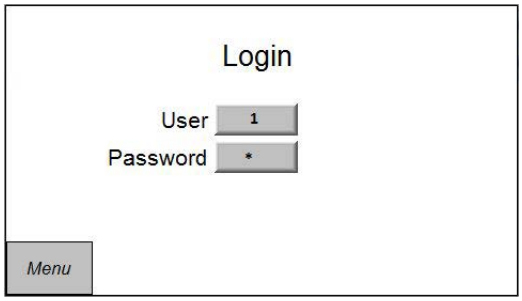
Figure 2: *Button color indicates RUN button mode & OFFLINE button state.*



Component	Description
Dispense Time	The amount of time remaining for a time pressure cycle. Pressing and changing this value changes the total time to be used during a time pressure cycle.
Pressure	The current fluid pressure (sensor reading).
Set point	The targeted amount of pump inlet pressure achieved when the Time Pressure System is in Run mode. Requires access level 1 or 2.
Run	The RUN button has four different visual states: • **Green** - Time Pressure System is currently in Run mode and is set to achieve pump inlet pressure at the targeted set point. • **Red** - The air regulator is commanding a user specified constant air pressure, and pump inlet pressure control is not in effect. • **Yellow** - Time Pressure System is in Idle mode and the pump inlet pressure will be achieved at the specified Idle set point. • **Grey** - Time Pressure System is currently in Offline mode; the air regulator will command zero (0) pressure in this state.
Timed/Continuous	Toggle button selects and initiates: • Time pressure cycle to execute during a run, or • Continuous pressure control while a run is being asserted.
Offline	The OFFLINE button has two different visual states: • **Red** - Time Pressure System is currently Offline. The air regulator will command zero (0) pressure in this state. • **Grey** - Time Pressure System is currently operational.

Login

Use this window to log in and gain access to additional secure areas.

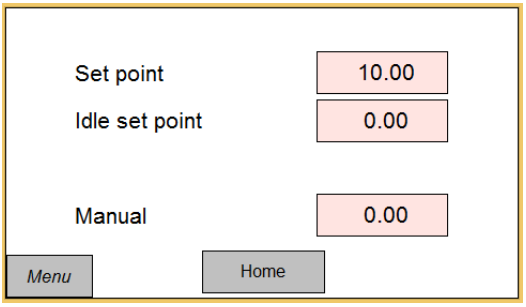


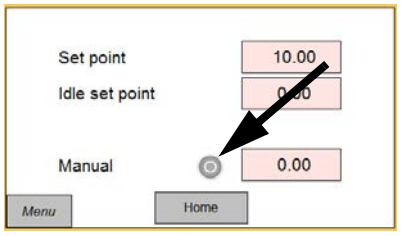
Component	Description
User	Used to select the user login access level: Access levels: • user 1 = access limited to Home, Login, and Process windows. • user 2 = unlimited access
Password	Used to enter the security access code for the currently selected user. An invalid password message will display if an incorrect password is entered. Passwords can be changed in Settings (pg 23). **NOTE**: Changed passwords cannot be recovered. Default passwords: • user 1 = 111111 • user 2 = 222222

Process

Use this window to set the set point and Idle set point, and to enable/disable the Idle and Manual modes.

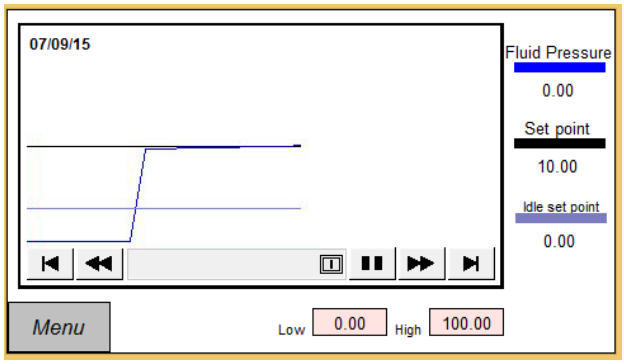
To open the Process window from Home, press MENU > PROCESS.



Component	Description
Set Point	The value of the current set point is entered/changed here. Indicates the desired amount of pump inlet pressure to be exerted when the Time Pressure System is in Run mode.
Idle set point	The current Idle set point value. Indicates the desired amount of pump inlet pressure to be exerted when the Time Pressure System is in Idle mode.
Manual	The amount of constant air pressure the air regulator will supply when Manual mode is enabled.
Manual button	When this button is visible, the Time Pressure System can be put in Manual mode. Manual mode forces the air regulator to maintain a constant air pressure. **NOTE:** Pump inlet pressure control is not active in Manual mode. 

Trend

This window displays a real time, trend line graph of the following data: pump inlet pressure, set point, and Idle set point.

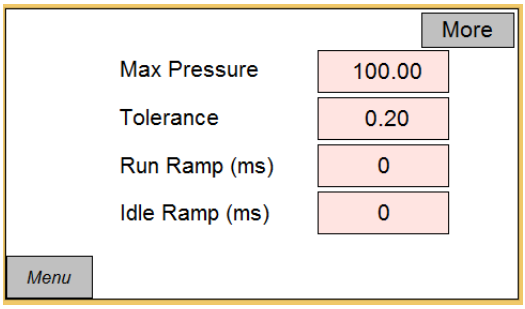


Component	Description
Time line	The horizontal axis represents time. The time line can be navigated using the controls at the bottom of the graph.
Pressure line	The vertical axis represents pressure (in units set in Settings (pg 23)). The vertical view can be scaled (zoomed in/out) using the Low and High boxes.
Low	The lower range of the vertical axis on the displayed line graph.
High	The upper range of the vertical axis on the displayed line graph.

Configuration

Configuration [1]

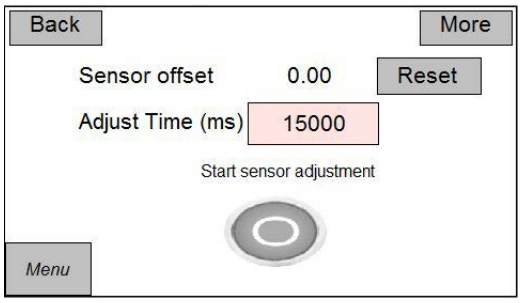
Use this window to set maximum pressure, pump inlet pressure range, and ramp values.



Component	Description
Max Pressure	The maximum amount of air pressure allowed through the air regulator.
Tolerance	The range of tolerated pump inlet pressure; the range centered on the current set point in which the controller will consider the current pump inlet pressure within acceptable range. This is calculated as follows: Tolerance range = [SP - T/2, SP + T/2] **Example**: Tolerance = 0.20 Set point = 5.0 Tolerance range = [4.9,5.1]
Run Ramp (ms)	Amount of time (in milliseconds) that the Time Pressure System will ramp up to the current set point when the controller enters run mode. **Example**: Run ramp (ms) = 2000 Set point = 10.0 If the controller goes from an Offline state (with a current pump inlet pressure of 0.0) into the Run mode state, the controller will take at least 2000 milliseconds to achieve the set point of 10.0
Idle Ramp (ms)	Amount of time (in milliseconds) that the Time Pressure System will ramp up to the Idle set point when the Time Pressure System enters Idle mode.
MORE	Opens the next window - Configuration [2] (pg 21).

Configuration [2]

Use this window to adjust the sensor offset value.



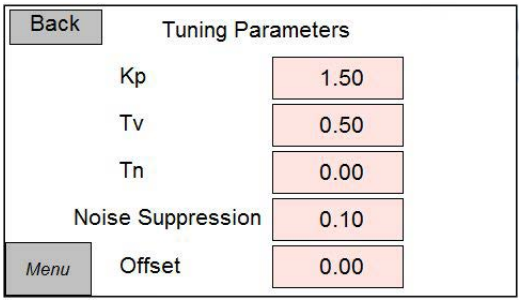
Component	Description
Sensor offset	The currently adjusted sensor offset. The Time Pressure System internally adds this value to the current set point and subtracts this value from the actual pressure sensor value for display purposes. NOTE: The value remains unchanged if the sensor pressure reading is beyond its limit of 10% of the sensor range.
RESET	When the RESET button is clicked, the sensor offset will be reset to a value of 0.0.
Adjust Time (ms)	Amount of time the sensor adjustment process takes when enabled.
Enable button	Starts the sensor adjustment process. When the adjustment has been completed, the ENABLE button is automatically disabled and the sensor offset value is updated. To perform the adjustment, the Time Pressure System must be in Idle mode (refer to Idle Mode (pg 7)). If the ENABLE button remains green (fails to disable after N milliseconds, where N = Adjust Time parameter), step through the Sensor Adjustment (pg 4) procedure.
MORE	Opens the next window - Configuration [3] (pg 22).
BACK	Opens the previous window - Configuration [1] (pg 20).

Configuration [3]

CAUTION: The content in this section is NOT recommended for use by anyone besides GPD Global personnel or those working under the direct guidance of GPD Global personnel.

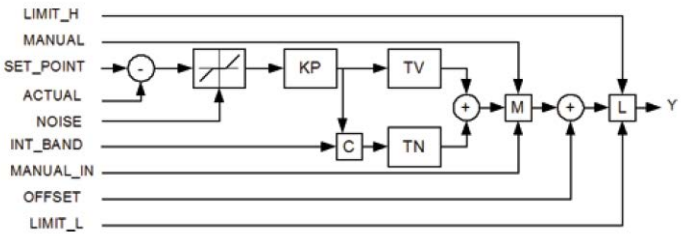
IMPORTANT: Before changing parameter values, write down the original parameters because they will not be retained.

Use this window to tune parameters (PID controller settings) and set noise suppression set point and offset values.



Component	Description
Tuning Parameters	PID controller settings. The PID controller calculates output with the following equation: Y = KP * (DIFF + 1/Tn * INTEG (DIFF) + TV *DERIV (DIFF)) + OFFSET
Noise Suppression	The PID controller will only be active when the deviation between the set point and the actual sensor value is greater than this value (PSI).
BACK	Opens the previous window - Configuration [2] (pg 21).

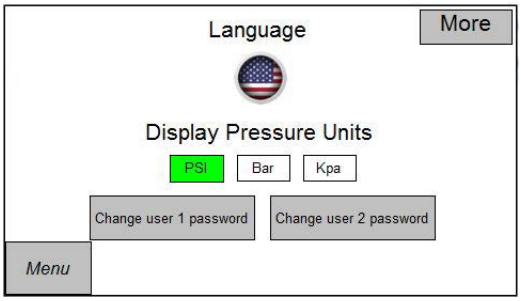
Figure 3: *PID Schematic*



Settings

Settings [1]

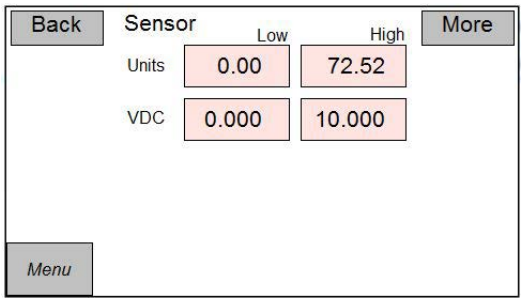
Use this window to select a language, select the desired units of pressure, and change passwords.



Component	Description
Language	This button will cycle through the available languages the system supports. Selecting a language will change the displayed system text to the selected language.
Display Pressure Units	Use this button series to select the units of pressure on the controller. The available units of pressure are PSI (pounds per square inch), Bar, and kPa (kilopascal).
Change user n password	Pressing a “Change user n password” button will open a popup window allowing you to change the login password for that user.

Settings [2]

Use this window to set linear scaling settings for the analog input of the sensor to the PLC.



Example settings:

Units Low = 0.0
Units High = 72.52
VDC Low = 0.0
VDC High = 10.0

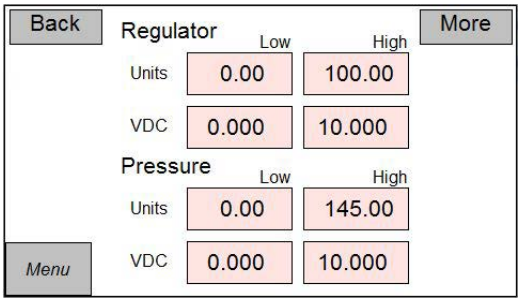
Interpreting Example Settings:

- When measured voltage of sensor is 0.0, this amount of pressure is equal to 0.0 PSI.
- When measured voltage of sensor is 10.0, this amount of pressure is equal to 72.52 PSI.
- When measured voltage of sensor is 5.0, this amount of pressure is equal to 36.26.

Component	Description
Units	• Units Low - minimum value in PSI for which the sensor is capable of producing output. • Units High - maximum value in PSI for which the sensor is capable of producing output.
VDC	• VDC Low - voltage output when sensor is reading zero (0) pressure. • VDC High - maximum voltage of which the sensor is capable.

Settings [3]

Use this window to set linear scaling settings for the analog output for controlling the air regulator and the analog output for reading the current pump inlet pressure.

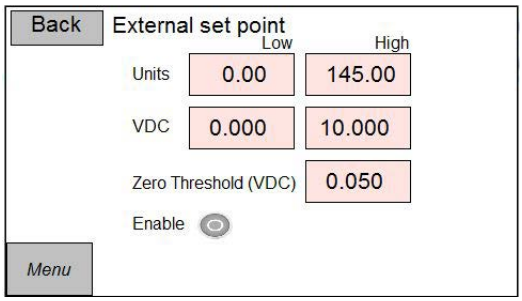


NOTE: All unit parameters (low and high) are in PSI.

Component	Description
Regulator	The linear scaling settings for the analog output for controlling the air regulator.
Pressure	The linear scaling settings for the analog output to indicate the current pump inlet pressure.

Settings [4]

Use this window to set the linear scaling settings for the analog input for controlling the set point, specify the voltage range in which the external set point should be considered zero, and set the external set point to be used.



NOTE: All unit parameters (low and high) are in PSI.

Component	Description
External set point	The linear scaling settings for the analog input for controlling the set point.
Zero Threshold (VDC)	Specifies the voltage range in which the external set point should be considered at 0. The set point will be considered at 0.0 when the measured voltage of the external set point is within the following range: [VDCLow,VDCLow+ZT)
Enable	Button enables the external set point to be used. When enabled, the set point is completely controlled by this analog input channel; the set point settings available through the touch screen will no longer be in effect.

Interface IO

Analog IO

Analog Inputs to Time Pressure System

External set point - Time Pressure channel is used to control the pump inlet pressure set point when the Time Pressure System is in Run mode.

To enable this feature, the scaling settings must be configured properly and use of the external set point must be enabled via Settings [4] (pg 26).

Analog Outputs from Time Pressure System

Current Pressure - this channel can be used to monitor the current pump inlet pressure.

The scaling settings, which specify the voltage range and its representation in units of pressure, are configurable in Settings [4] (pg 26).

Digital IO

Digital Inputs to Time Pressure System

RunMode - while this channel is asserted, the Time Pressure System will be forced into Run mode unless the Time Pressure System is in an emergency stop condition or the Time Pressure System is being forced offline.

EStop - while this channel is asserted, the Time Pressure System disables air pressure on the system.

Digital Outputs from Time Pressure System

Ready - this channel is asserted under the following conditions:

- the controller is in Run mode.
- the pump inlet pressure is within tolerance of the specified set point.
- the Enabled channel is asserted when the controller is not in Offline mode.

Controls and Connections

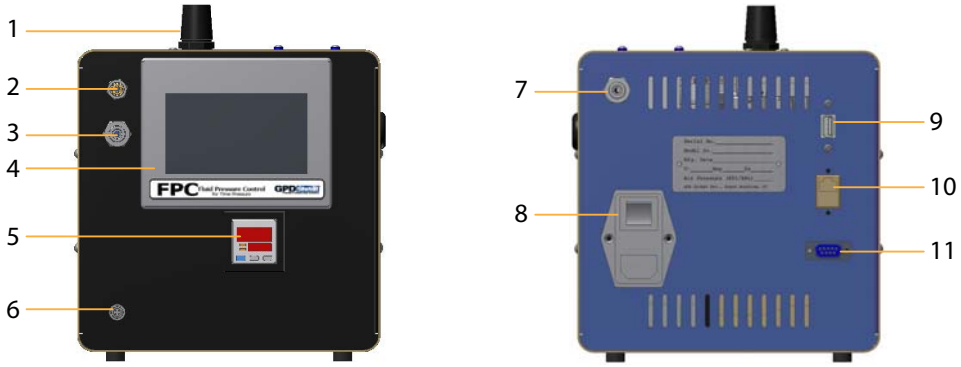


Table 1: *Control & Connection Identification*

Item		Description
1	Regulator	Controls vacuum at vacuum port.
2	Air out	Air to syringe.
3	Vacuum port	Vacuum to syringe.
4	Touch screen	User interface.
5	Vacuum gauge	Displays amount of vacuum at vacuum port.
6	Sensor port	Connector for reservoir sensor cable.
7	Air In	Connector for external air source.
8	Power switch	Powers the controller box.
9	USB	Connector for upgrading touch screen control software.
10	Ethernet	Network connector for external data acquisition/streaming.
11	External I/O	Connector for external inputs / outputs. Example: foot switch connects here.

Table 2: *External I/O Connector Pin Descriptions*

Pin	I/O Description	I/O Function	I/O State
1	Digital Input	Enable run mode	• Timed/Continuous ON = Transition from low-to-high will start the timer for the dispense. • Timed/Continuous OFF = Transition from low-to-high will immediately start the dispense. Transition from high-to-low will stop the dispense. For example: While the foot switch is pressed, fluid pressure is controlled with the given set point, so the dispense time coincides with the foot pedal being pressed.
2	Digital Input	Emergency stop	• Closed = E-Stop asserted • Open = Run
3	Digital Output	Ready	• 24VDC = FPC ready • 0V = FPC busy
4	Digital Output	Error	• 24VDC = FPC in error state • 0V = FPC normal state
5	Ground, Digital		
6	Analog Input	Set point for FPC pressure.	0-10VDC
7	Analog Output	Current pressure out	0-10VDC
8	Ground, Analog		
9	+24VDC		

Fuses

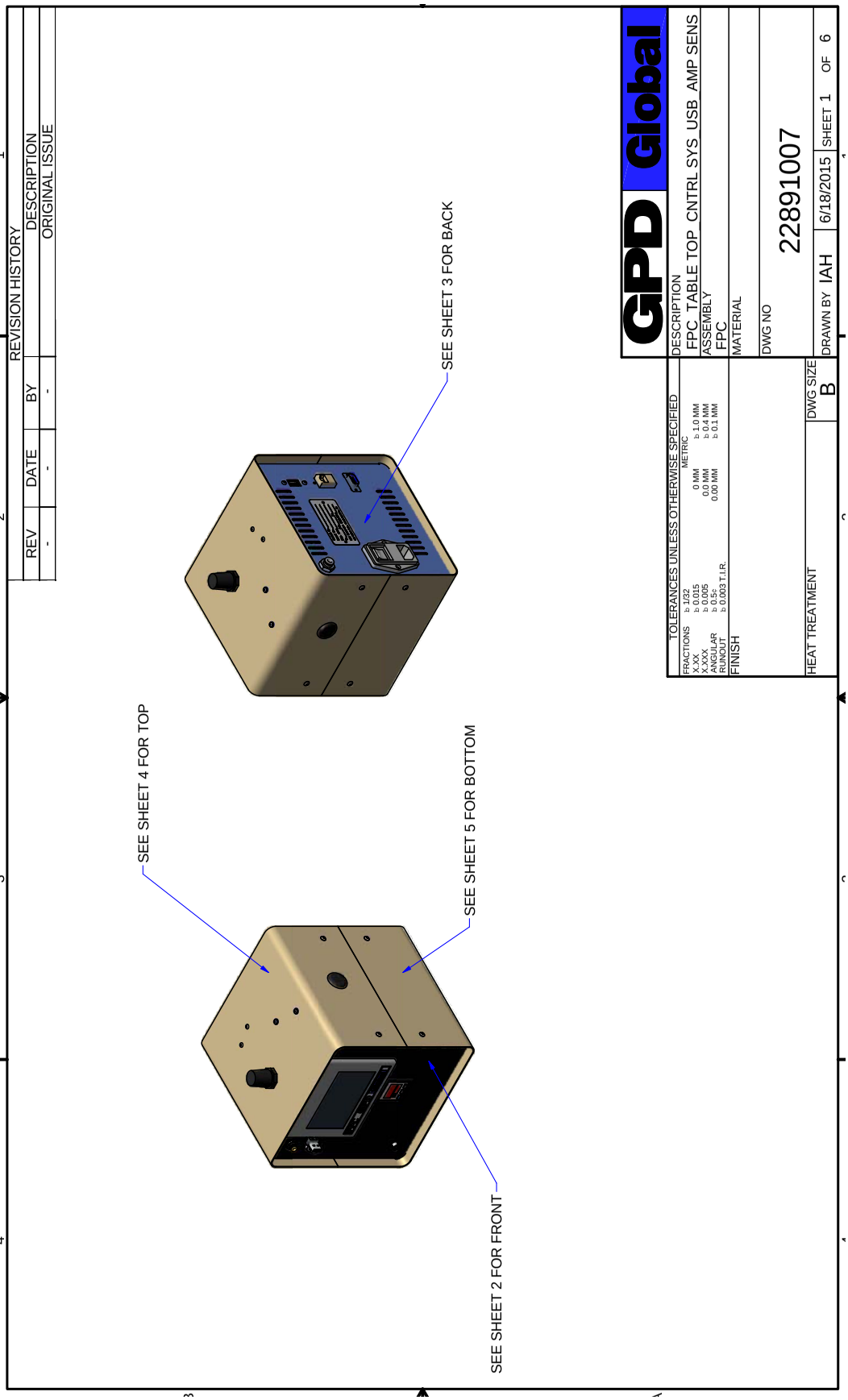
Refer to Spare Parts (pg 14)for replacement part numbers.

Location	Fuse I.D.	Items Affected
AC Inlet Module	F1, F2	Main system power
Power Supply	FS1	24V system supply voltage

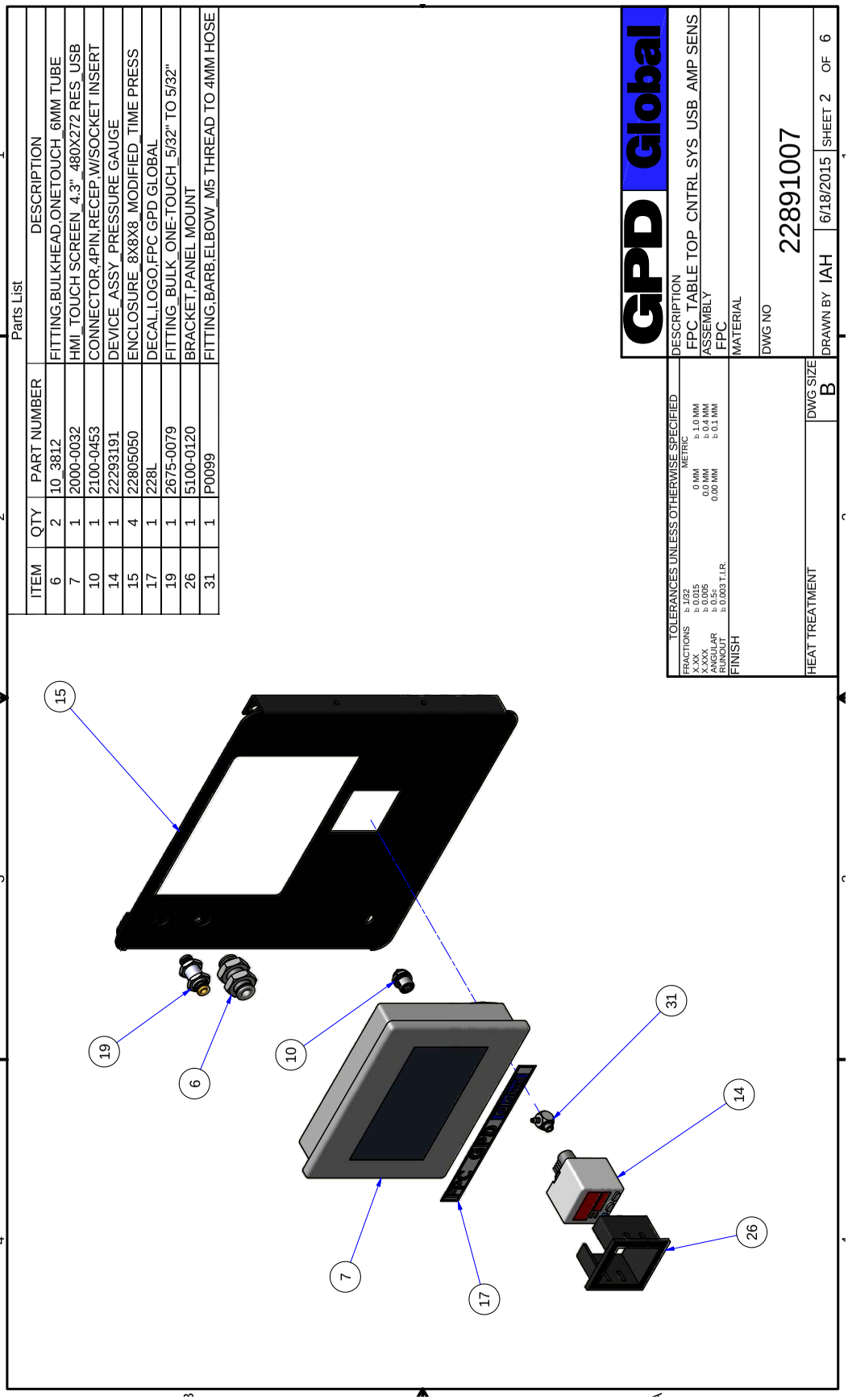
Drawings

- Time Pressure System - 22891007 (pg 30)
- Time Pressure System - Front (pg 31)
- Time Pressure System - Rear (pg 32)
- Plumbing Schematic (pg 33)

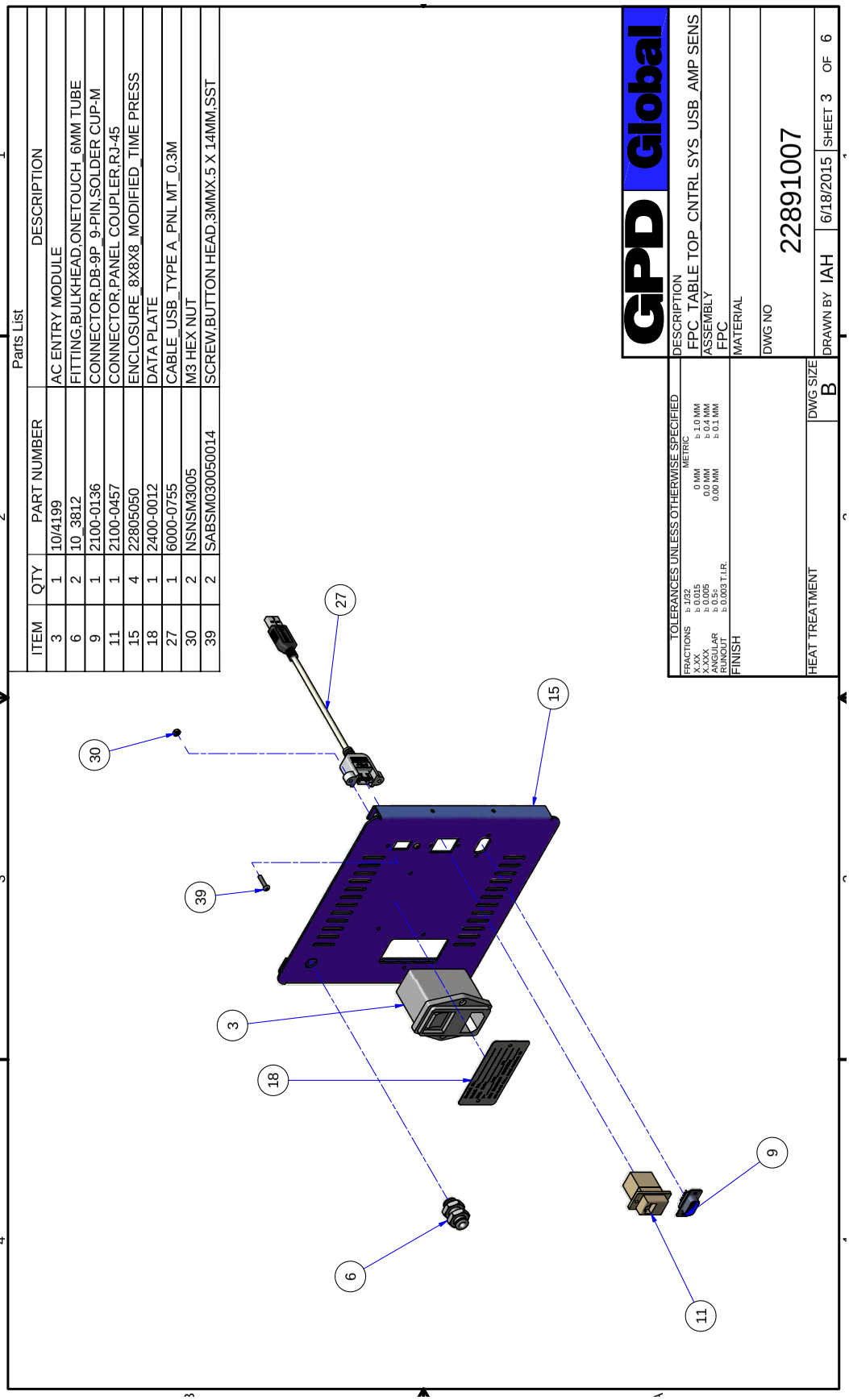
Time Pressure System - 22891007



Time Pressure System - Front



Time Pressure System - Rear



Plumbing Schematic