

Dispense System UPS Control

for MAX Series Dispensers

UPS models: 100-120V & 200-240V

Introduction to UPS Control on Dispense System

If a power outage occurs, the UPS (uninterrupted power supply) battery backup option provides approximately 10 to 15 minutes (depending on gantry activity) of total battery backup power to provide full load power to the dispense system. This allows the GPD Global® MAX Series dispense system to finish the part currently in process. The UPS unit recharges any time the UPS is plugged into mains power.

Scope of Contents

Figure 1: Identifying contents of 220 V Power Supply (PN 22291129)



NOTES: Items not shown to scale. Items may vary in appearance for 110 V (PN 22291148).


Item	Description	Part Numbers	
		220 V (PN 22291129)	110 V (PN 22291148)
1	UPS Power Supply	4000-0108	4000-0107
2	UPS Output Cable	22298358	22198226
3	UPS Input AC Power Cable	22298359	Included inside Item 1
4	IO Cage UPS Active Cable	22298356	22298356
5	Cinching Strap with Buckle	10/3917	10/3917
6	Fasteners	--	--
7	Washers	--	--
8	Service Panel-to-UPS Power Out Cable	22298357	22298357
9	UPS User Guide	22100145M	22100145M
10	UPS Side Mount Base Plate	22201460	22201460
11	UPS Label	--	--


Theory of Operation


1. When the UPS detects a loss of utility power, it outputs a signal to the dispense system and then powers the dispense system from its internal batteries.
2. Upon receipt of signal, the dispense system begins counting down UPSDelay timer value.
3. If power is restored before the UPSDelay timer expires, the dispense system resumes normal operation.


If power remains off and the UPSDelay timer expires, the dispense system begins waiting for the UPSMax delay timer to expire. While the UPSMax timer counts down, the dispense system either waits for the currently running process to finish or, if the machine is not running a process, does not allow a new process to begin and conducts a normal shutdown. If the machine is running process on a part, it finishes only that part and does not process any further parts. If the process does not finish before the UPSMax delay expires, the machine stops the process and then conducts a normal shutdown.


Safety Notices


 **DANGER:** The UPS has its own power source (battery). Consequently, the power outlets may be energized even if the UPS is disconnected from the power source.


 **DANGER:** Dangerous voltage levels are present within the UPS. Only qualified service personnel should perform installation or maintenance procedures requiring access to the UPS interior. Opening the UPS will void your warranty.

 **CAUTION:** For pluggable equipment, the socket-outlet shall be installed near the equipment and shall be easily accessible.

 **CAUTION:** Never install the system near liquid or in an excessively damp environment.

 **CAUTION:** Never block the ventilation grates of the system.


 **CAUTION:** Never expose the system to direct sunlight or source of heat.

 **CAUTION:** The acceptable storage temperature range is -15° C to +50° C.

NOTE: The system is not for use in a computer room as defined in the standard for the Protection of Information Technology Equipment, ANSI/NFPA 75 (US installations only).

Install UPS on Dispense System

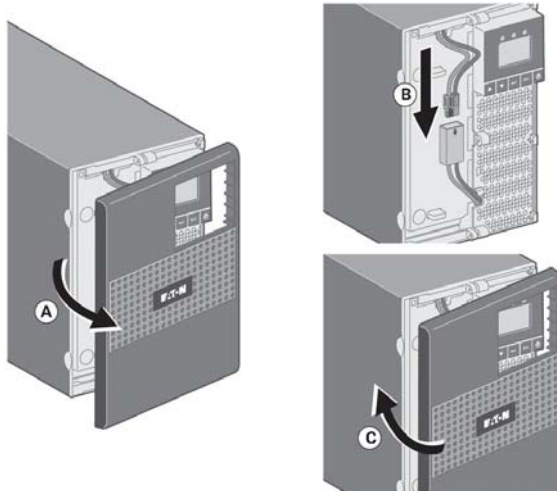
The UPS is typically installed on the dispense system at the factory. If, however, you want to install the UPS on a dispense system already in the field, follow this procedure.

 **IMPORTANT:** Before and after installation, if the UPS remains de-energized for a long period, the UPS must be energized for a period of 24 hours, at least once every 6 months (for a normal storage temperature less than 25° C). This charges the battery, thus avoiding possible irreversible damage.

Connect the internal UPS battery

1. Open and remove the front panel (Figure 2, Item A) from the UPS power supply.
2. Connect the internal battery (Figure 2, Item B).
3. Close the front panel (Figure 2, Item C).

Figure 2: Access and connect internal battery for UPS power supply



Install UPS Base Plate on Dispense System

1. The shelf (base plate) for the UPS power supply is typically installed on the side of the dispense system nearest the dispense system service panel. Remove the two (2) casters and the caster bolts from that underside of the dispense system.



2. Set aside the casters. The bolts will NOT be reused.
3. Align the UPS Side Mount Base Plate (Figure 1, Item 10) with the caster holes in the dispense system.



4. Place the casters under the Base Plate.

- Secure the UPS Side Mount Base Plate to the dispense system using the casters, Fasteners (Figure 1, Item 6), and Washers (Figure 1, Item 7).



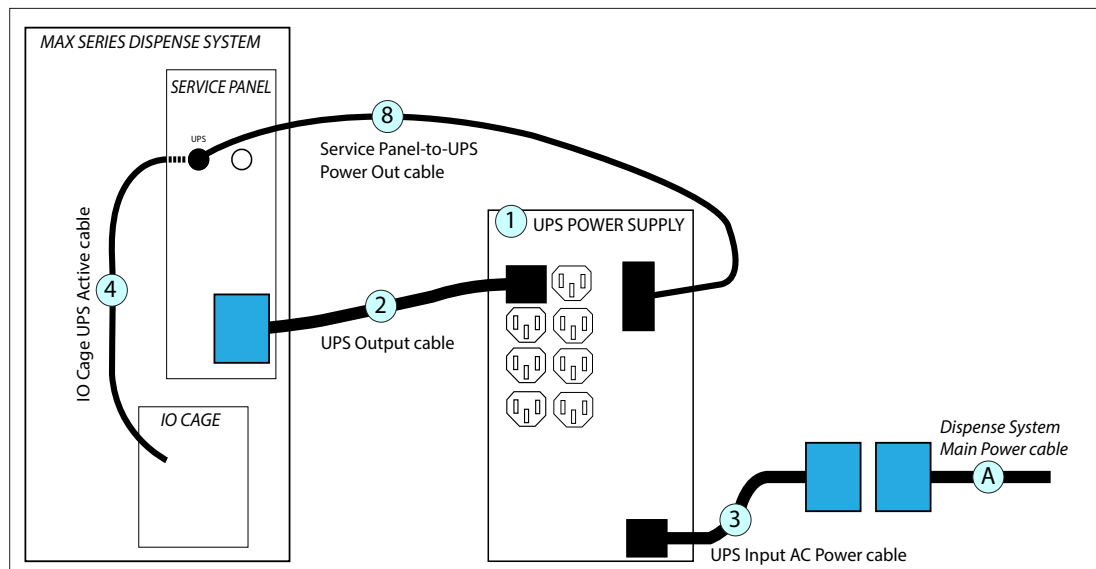
- Secure the UPS power supply to the Base Plate with the Cinching Strap (Figure 1, Item 5).

Connect Cables

To connect the UPS power supply to the dispense system:

- Perform the standard dispense system power off procedure.
- Unplug the Dispense System Main Power cable (Figure 3, Item A) from facility power source.

Figure 3: Installation connections for 220 V model

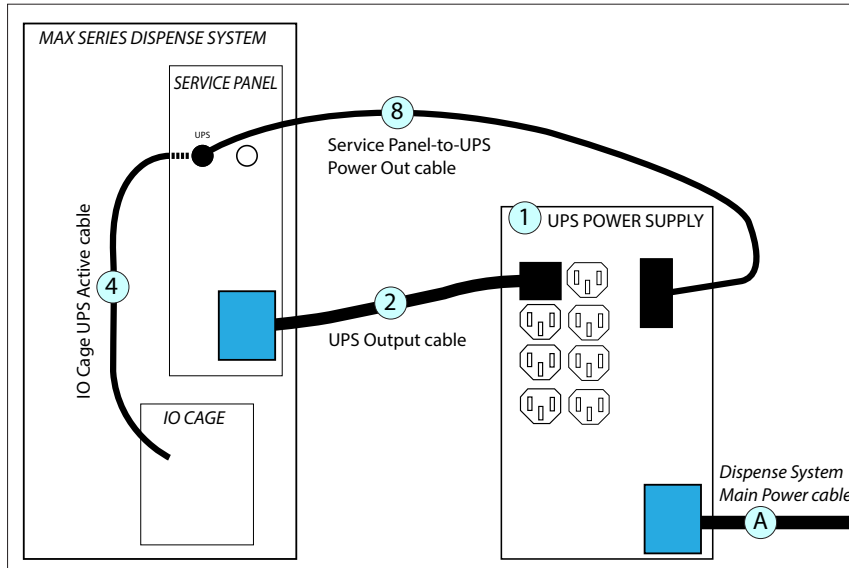


- Install the IO Cage UPS Active cable (Item 4):
 - Remove the “UPS” knock out from the dispense system service panel.
 - Adhere the “UPS” label on the service panel above the hole created by removing the knock out.
 - Install the IO Cage UPS Active cable (Item 4) between the UPS IO card in the dispense system IO cage and the back of the dispense system service panel.

NOTE: Refer to [Configure ds.options.cfg](#) (pg 5) to install IO side of cable.
- Connect the Service Panel-to-UPS Power Out cable (Item 8) between the new UPS connector on the dispense system service panel and the RS232 outlet on the UPS power supply (Item 1).
- Connect the UPS Output Cable (Item 2) between the dispense system main power outlet and the indicated outlet on the UPS power supply (Item 1).

6. **For 220 V models only:** Connect the UPS Input AC Power cable (Item 3) to the Dispense System Main Power cable (Item A) and the indicated power input socket on the UPS Power Supply (Item 1).
7. **For 110 V models only:** Connect the Dispense System Main Power cable (Figure 4, Item A) to the power input socket on the UPS Power Supply (Figure 4, Item 1).

Figure 4: Installation connections for 110 V model



Configure Dispense System for UPS

In order for the UPS to function as desired with the GPD Global® dispense system, both of the following dispense system files must be configured.

Configure ds.options.cfg

For the UPS to function as desired with the dispense system, the following items in the FLOWare® software **ds.options.cfg** file must be set properly.

EXAMPLE

```
HasUPS = True
# True to use UPS control on installed UPS
UPS Delay = 300
# Delay (seconds) after power fail before actual
UPSMax = 600
# Max time (seconds) to wait for run engine termination
```

HasUPS = True|False

When set to True, both UPS software functionality and the ability to turn off the machine, once a UPS has been installed, are enabled.

When set to False, the only way to remove power from the machine is to manually switch off the UPS.

UPSDelay = XXX

This is the number of seconds of delay between detection of power loss and the beginning of normal shutdown procedure. This delay allows power recovery after a short power outage (as documented in the options.txt file on each machine).

This item can be configured to allow time to finish the current process before shutting down the machine. Set a time span long enough to finish executing a run/process for a single board and park the gantry, plus add some extra time as a buffer.

UPSMAX = XXX

This value must be greater than UPSDelay.

This is the maximum number of seconds to wait for run engine termination after a power loss; this forces shutdown if the system is waiting for an operator response (as documented in the options.txt file on each machine).

This is the maximum amount of time the system will wait for various sections of the software to stop before giving up and forcing a shutdown. This allows time for the operator to acknowledge the power failure and respond by stopping the program and parking the machine. If this time elapses, the machine forcibly stops all sections of the software and begins normal shutdown procedure.

Configure ds.io.cfg

For the UPS to function as desired with the dispense system, the following item in the FLOWare® software **ds.io.cfg** file must be set properly.

IO/Safety/PowerLost

Identify an available IO channel for the dispense system and configure it accordingly. IO#42 is used in the following example.

EXAMPLE

```
IO/Safety/PowerLost : Input42NormalFalsePhysIODriver
```

Set Up Dispense System with UPS

To set up a dispense system with UPS:

1. If not already powered on, turn on UPS:
 - a. Verify the UPS power cord is plugged in. The UPS front panel display illuminates.
 - b. Verify the UPS status screen displays the Standby symbol.
 - c. Press the On/Off button on the UPS front panel for at least 2 seconds. The UPS front panel display changes status to "UPS starting..."
 - d. Inspect the UPS front panel display for active alarms or notices. Resolve any active alarms before continuing. Refer to [Troubleshooting](#) (pg 10).

IMPORTANT: If the Alarm indicator is on, do not proceed until all alarms are clear. Check the UPS status from the front panel to view the active alarms. Correct the alarms and restart if necessary.

- e. Verify the Normal mode indicator illuminates solid, indicating the UPS is operating normally and any loads are powered and protected. The UPS should be in Normal mode.
2. Verify all dispense system safety switches are in the operate position; the Emergency Stop button should be pulled out and all safety shield doors should be closed.
3. Press the dispense system power button (square green).

User Interface

Control Panel

The UPS has a five-button graphical LCD that provides useful information about the UPS itself, load status, events, measurements, and settings.

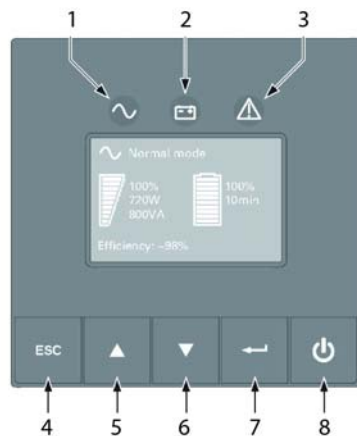





Table 1: Status Indicator Information

Item	Description	Status
1	Power On indicator	 On = green The UPS is operating normally.
2	On Battery indicator	 On = yellow The UPS is on battery mode.
3	Alarm indicator	 On = red The UPS has an active alarm or fault. Refer to Trouble-shooting (pg 10).
4	Escape button	---
5	Up button	---
6	Down button	---
7	Enter button	---
8	On/Off button	---

LCD Description

As default, or after 5 minutes of inactivity, the LCD displays the screen saver.

The LCD automatically dims after 10 minutes of inactivity. Press any button to restore the screen.

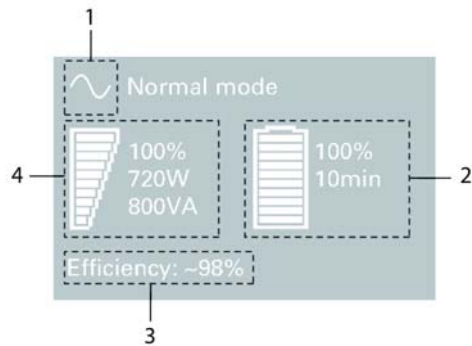





Table 2: Status Information Provided by UPS

Item	Description	Status
1	Operation status	 Standby mode. Example: The UPS is OFF, waiting for start up command from user. Equipment is not powered until Standby mode button is pressed.
		 Normal mode. Example: The UPS is operating normally. The UPS is powering and protecting the equipment.
		 On Battery mode. Battery LED is on; 1 beep every 10 seconds. Example: A utility failure has occurred and the UPS is in Battery mode. The UPS is powering the equipment with the battery power. Prepare the dispense system for shutdown.
2	Battery status	---
3	Efficiency and load group information	---
4	Load / Equipment status	---

On / Off Control

Power On

No special steps are required to power on a dispense system with UPS. Use the standard *Power On* procedure in the *Basic Operations* section of the *Dispense System User Guide* (PN 22100079K).

Shutdown

Shutdown UPS

To shut down the UPS, press the On/Off button on the front panel for three seconds. The UPS starts to beep and shows a status of “UPS shutting OFF...”. The UPS then transfers to Standby mode, and the Normal indicator turns off.

Shutdown Dispense System & UPS

No special steps are required to shutdown or power off a dispense system with UPS. Use the standard *Power Off* in the *Basic Operations* section of the *Dispense System User Guide* (PN 22100079K).

Operation on Battery Power

Transfer to battery power

The dispense system is supplied by the battery.

- The dispense system continues to be supplied by the UPS when AC input power is no longer available. The necessary energy is provided by the battery.
- The Normal and On Battery indicators illuminate solid.
- The audio alarm beeps every ten seconds.

Low battery warning

The remaining battery power is low. Shut down all applications on the connected equipment because automatic UPS shutdown is imminent.

- The Normal and On Battery indicators illuminate solid.
- The audio alarm beeps every three seconds.

End of battery backup time

- LCD displays “End of backup time”.
- All the LEDs go OFF.
- The audio alarm stops.

Recovery

Return of AC Input Power

Following an outage, the UPS restarts automatically when AC input power returns (unless the restart function has been disabled) and the load is supplied again.

Recover from Emergency Shutdown

To recover from an Emergency Stop shutdown or other non-conventional occurrence:

1. Verify the UPS has mains power. Refer to [Set Up Dispense System with UPS](#) (pg 6).
2. Release the dispense system Emergency Stop button.
3. Press the dispense system power (square green) button.
4. Verify the Normal mode indicator is displayed on the UPS front panel.

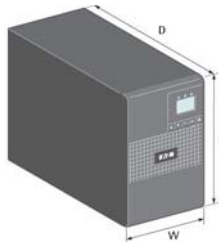
Troubleshooting

Table 3:

Operation Status	Possible Cause	Action
End of battery life	The end of the battery life is reached.	Contact GPD Global® for battery replacement.
UPS fault	The UPS has an internal fault.	The UPS does not protect the dispense system any longer. Note the alarm message and UPS serial number, and then contact GPD Global®.

Specifications

Specification	Models	
	100-125V	200-240V
Output power	@ 120V: 1440 VA, 1100 W @ 125V: 1440 VA, 1100 W @ 100V: 1080 VA, 825 W	@ 230 V: 1550 VA, 1100 W @ 208 V: 1395 VA, 990 W @ 200 V: 1395 VA, 990 W
AC input power	Single phase 100-125 V	Single phase 200-245 V
Rated input voltage	80-162 V*	160-294 V*
Input voltage range	47-70 Hz (50 Hz system), 56.5-70 Hz (60 Hz system)**	
Input frequency range		
Output on battery power	100/120 V (-10/+6%***)	200/208/220/230/240 V (-10/+6%)‡
Voltage	50/60 Hz ±0.1 Hz	50/60 Hz ±0.1 Hz
Frequency	Sealed lead acid, maintenance free Standard 3 x 12 V, 9 Ah	
Battery		
Environment:	0-90%	20-90%
Relative humidity (without condensation)	0-40° C (32 to 104° F)	
Operating temp. range	-15 to +50° C (5 to 122° F)	
Storage temp. range	< 40 dBA	
Noise level	16.01 kg (35.3 lb)	15.9 kg (35.2 lb)
Weight	445 x 150 x 233 mm (17.5" x 5.9" x 9.1")	
Dimensions (D x W x H)		



*The high and low thresholds can be adjusted using UPS settings.

**Up to 40 Hz in low-sensitivity mode (programmable using UPS settings).

***Adjustable to 100/120/125 V, must be set to the identical AC power source value.

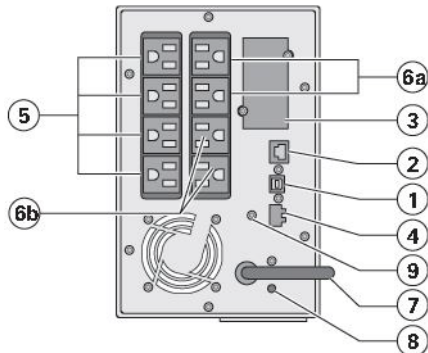
‡Adjustable to 200/208/220/230/240 V, must be set to the identical AC power source value.

References

- [Connections - Rear Panel](#) (pg 12)
- [Schematic for MAX Series 220V Model - 22291129](#) (pg 13)
- [Schematic for MAX Series 110V Model - 22291148](#) (pg 14)

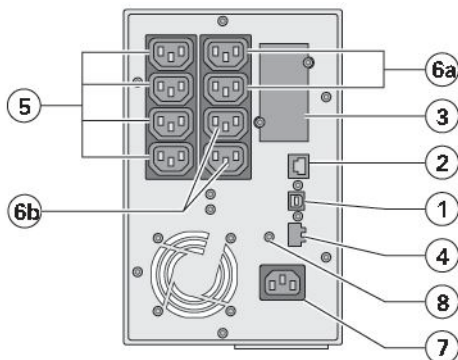
Connections - Rear Panel

120V (PN 22100145)



1	USB communication port
2	RS232 communication port
3	Slot for optional communication card
4	Connector for ROO (remote ON/OFF) or ROP (remote power OFF) control
5	Outlets for connection of critical equipment (Primary group)
6a	Group 1: programmable outlets for connection of equipment
6b	Group 2: programmable outlets for connection of equipment
7	Attached input power cord for AC power source
8	LED indicating site wiring fault (SWF) alarm
9	Ground screw

220V, 230V (PN 22291129)



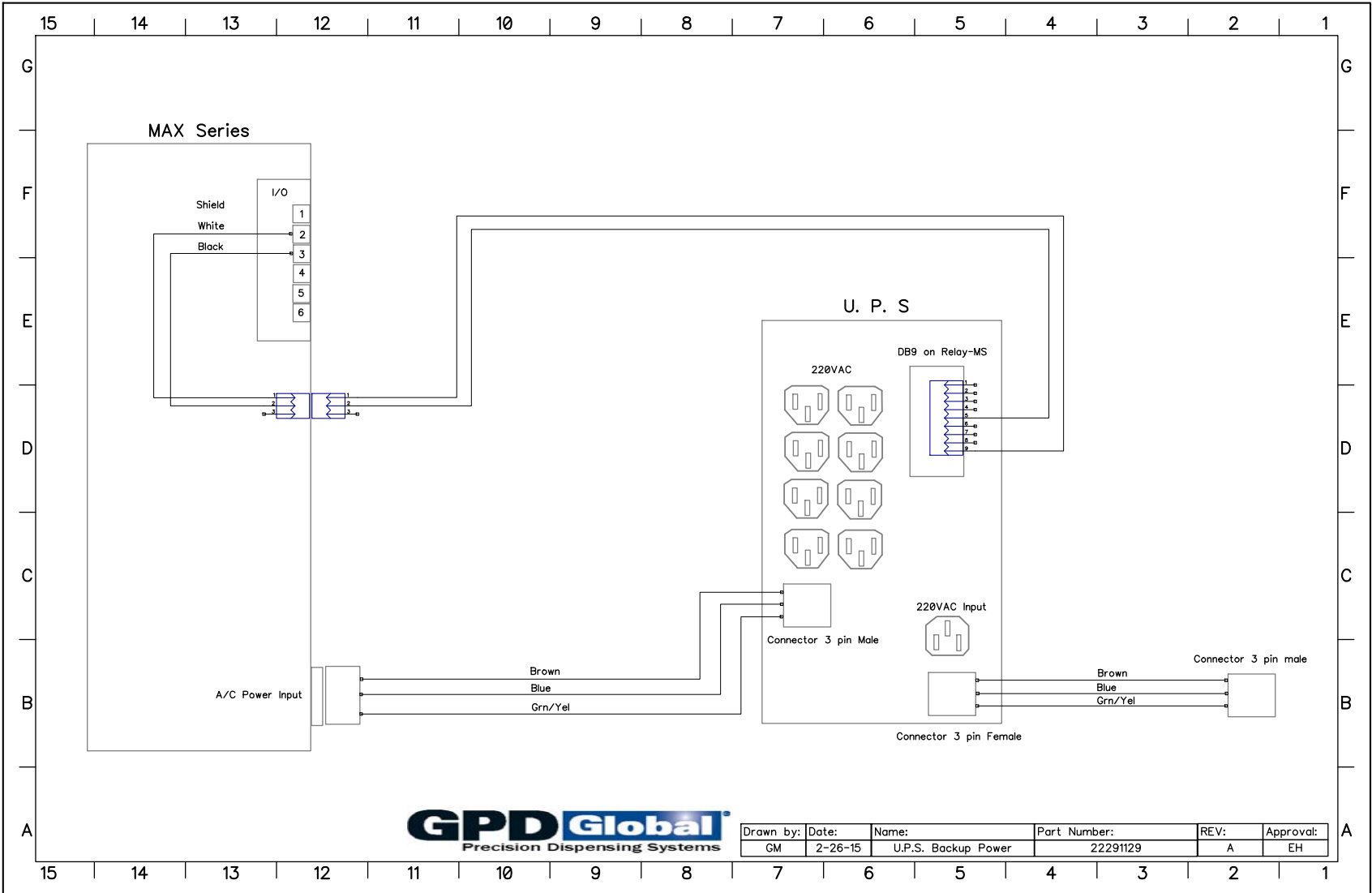
1	USB communication port
2	RS232 communication port
3	Slot for optional communication card
4	Connector for ROO (remote ON/OFF) or ROP (remote power OFF) control
5	Outlets for connection of critical equipment (Primary group)
6a	Group 1: programmable outlets for connection of equipment
6b	Group 2: programmable outlets for connection of equipment
7	Socket for connection to AC power source
8	Ground screw

Schematic for MAX Series 220V Model - 22291129

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GPD Global
Precision Dispensing Systems

Drawn by:	Date:	Name:	Part Number:	REV:	Approval:
GM	2-26-15	U.P.S. Backup Power	22291129	A	EH

GPD Global®

References

Schematic for MAX Series 110V Model - 22291148

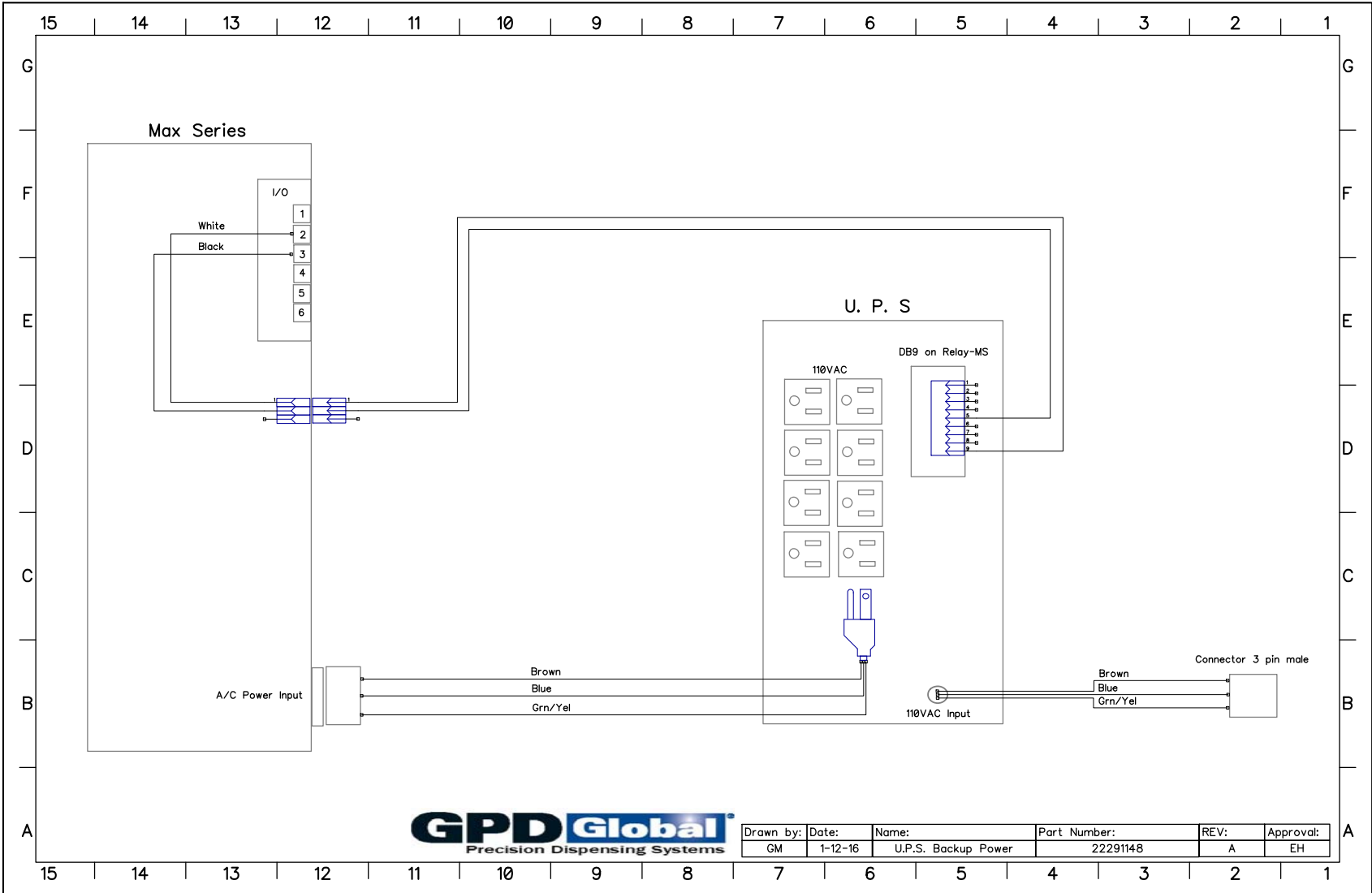
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GPD Global®

References



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 sub-assemblies 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.