



GASBOY

SERIES 9800A PUMPS AND DISPENSERS DIAGNOSTIC MANUAL

C35797

REV. 03/07/03

Copyright 2003 by Gasboy International LLC All rights reserved.
The information in this document is confidential and proprietary. No further disclosure shall be made without permission of Gasboy International LLC. Gasboy International LLC believes that the information in this document is accurate and reliable. However, we assume no responsibility for its use, nor for any infringements of patents or other rights of third parties resulting from its use. We reserve the right to make changes at any time without notice.

GASBOY INTERNATIONAL LLC LANSDALE, PA

IMPORTANT WARNINGS AND SAFEGUARDS

Gasoline and petroleum products are flammable. To avoid injury or death to persons or damage to equipment or property, follow these listed warnings and other warnings and precautions outlined in this manual when installing, using, or working around this equipment. Check with GASBOY Technical Services for compatibility of liquids with pump materials.

TURN OFF AND LOCK OUT ALL POWER TO PUMP BEFORE PERFORMING SERVICE, MAINTENANCE OR IN THE EVENT OF A FUEL SPILL.

All products must be installed by a qualified installer and used in conformance with all building, fire, and environmental codes and other safety requirements applicable to its installation and use, including, but not limited to, NFPA 30, NFPA 30A, NFPA 395 & NFPA 70. A qualified installer is familiar with fuel systems installations under the above stated building, fire, and environmental codes and other safety requirements for the particular type of installation.

This product is only part of a fuel dispensing system and additional equipment and accessories, such as, but not limited to, breakaway connectors, shear valves, pressure regulators, flow limiters, and other safety devices may be necessary to meet the applicable codes.

For maximum safety, we recommend that all employees be trained as to the location and procedure for turning off power to the entire system. Instructions regarding proper operation of the equipment along with the appropriate safety warnings should be posted in plain view at the fuel island.

Before performing service or maintenance (including changing of fuel filters or strainers) or in the event of a fuel spill, turn off and lock out all power to the system. In battery-powered pumps, disconnect power source. In submersible pump applications, turn off and lock out power at the master panel and close any impact valves to the submersible pump and any other dispensers which use that submersible pump. AC power can feed back into a shut-off dispenser when dispensers share a common submersible pump or starter relay. Also block islands so no vehicles can pull up to the dispenser when the dispenser is being worked on.

DO NOT use Teflon tape for any pipe threads in the product.

DO NOT use consumer pumps for pumping fuel or additives into aircraft.

DO NOT use commercial pumps for direct fueling of aircraft without filters and separators necessary to ensure product purity.

DO NOT use where sanitary design is required (for food products for human consumption) or with water-based liquids.

DO NOT smoke near the pump or when using the pump.

DO NOT use near open flame or electrical equipment which may ignite fumes.

DO NOT permit the dispensing of gasoline or other petroleum products into a vehicle with its motor running.

DO NOT permit the dispensing of gasoline or other petroleum products into unapproved containers or into approved containers in or on vehicles including trucks. All containers must be filled on the ground to prevent static discharge. Always use Approved and Listed hoses and nozzles with electric pumps and dispensers.

DO NOT block open the nozzle in any manner. Nozzles shall conform to UL and NFPA code requirements for attended or unattended service.

DO ensure that the pump is equipped with proper filters based on the product being dispensed and its intended use.

DO wear safety goggles and protective clothes when dispensing any liquid which may be potentially harmful or hazardous.

DO keep all parts of body and loose clothing clear of belts, pulleys, and other exposed moving parts at all times.

DO require washing and changing of clothes if fuel is spilled on a person or his/her clothing. Keep away from open flames, sparks, or people smoking.

DO provide a receptacle for catching product from pump/meter when servicing.

DO clean up product spills on the driveway. Turn off and lock out all power prior to cleanup.

DO insure pump is properly grounded.

DO insure hose is compatible with fluid being dispensed.

DO inspect hose, nozzle, and pump on a regular basis for wear, damage, or other conditions which may create a safety or environmental hazard.

DO make sure all pipe threads are properly cut and the inside reamed to remove burrs. Use UL classified gasoline-resisting compound on all joints of gasoline handling piping. Sealing compound must also be resistant to Gasohol (Ethanol and Methanol). Use gasoline-resistant pipe compound on male threads only; pipe compound used on female threads can be squeezed into the supply line where it can enter the product stream and become lodged in the pump or meter.

DO ensure that junction box covers are in place and properly tightened. Mating surfaces between the box and cover must be free of dirt, nicks, and scratches. All unused entries into the junction box must be properly plugged.

CONTENTS

Section 1:	INTRODUCTION	
	About this Book	1-1
	Using the Troubleshooting Section	1-1
Section 2:	CHASSIS WIRING	
	Junction Boxes	2-1
	AC Junction Box	2-1
	DC Junction Box	2-1
	115VAC/60 Cycle Pump Wiring	2-3
	115VAC/60 Cycle Dispenser Wiring	2-4
	230VAC/50 Cycle Pump Wiring	2-5
	230VAC/50 Cycle Dispenser Wiring	2-6
	115VAC/60 Cycle Front Load Option Pump Wiring	2-7
	115VAC/60 Cycle Front Load Option Dispenser Wiring	2-8
	230VAC/50 Cycle Front Load Option Pump Wiring	2-9
	230VAC/50 Cycle Front Load Option Dispenser Wiring	2-10
Section 3:	ELECTRONIC HEAD ASSEMBLY	
	Overall Layout	3-1
	CPU PCB	3-2
	Connectors	3-3
	Jumpers	3-5
	LED Indicators	3-6
	Test Points	3-6
	SW Switches	3-6
	Address Switches	3-8
	Pulser Output Rate Switches	3-8
	LCD Display PCB (C01373)	3-9
	Connector	3-9
	Jumpers	3-10
	Sale Backlight PCB (C06372)	3-11
	Connector	3-11
	RS-485 Interface PCB (C06389)	3-12
	Connectors	3-12
	LED Indicators	3-13
	Pump Interface PCB (06425)	3-14
	Connectors	3-15
	LED Indicators	3-15
	Power Supply PBC	3-16
	Connectors	3-17
	LED Indicators	3-17
	Test Points	3-17
	Pump Relays	3-18
	Connectors	3-19
	Ballast Assembly	3-20
	Connectors	3-20
	Fluorescent Lamp Assembly (C06398), Fluorescent Lamp (033412)	3-21
	Connector	3-21

	Heater/Thermostat Cable Assembly	3-22
	Connector	3-22
	Power Bracket Assembly (C06436)	3-23
	Connectors.....	3-23
Section 4:	TROUBLESHOOTING	
	Using This Section	4-1
Section 5:	REPLACEMENT INSTRUCTIONS	
	General Information	5-1
	Electronic Component Access	5-2
	Replacing the Platform Assembly	5-3
	Replacing the CPU PCB	5-5
	Replacing the LCD Display PCB.....	5-6
	Replacing the Sale Backlight PCB.....	5-7
	Replacing the Power Supply PCB	5-8
	Replacing the RS-485 or Pump I/F PCB	5-9
	Replacing the Ballast Cable Assembly	5-10
	Replacing the Heater Cable Assembly	5-13
Appendix:	PARTS LIST	
	Using This Parts List	1
	9800A Single Assembly – Front View.....	2
	9800A Single Assembly –Side View	4
	9800A Twin Assembly –Front View	6
	9800A Twin Assembly –Side View	8
	9840A Assembly – Front View.....	10
	9840A Assembly –Side View	12
	9840A Chassis	14
	9840AX Chassis.....	16
	9850AS Chassis.....	18
	9850AXS Chassis	20
	9850AXTW1 Chassis.....	22
	9850AXTW2 Chassis.....	24
	9852A, 9853A Chassis	26
	9853AHC Chassis.....	28
	9852AX, 9853AX Chassis.....	30
	9852ATW1 Chassis Assembly.....	32
	9853ATW1M Chassis Assembly.....	34
	9852AXTW1, 9853XTW1 Chassis Assembly	36
	9852ATW2, 9853ATW2 Chassis Assembly	38
	9852AXTW2, 9853AXTW2 Chassis Assembly.....	40
	Assembly Breakdowns	
	Air Separator Assembly	42
	Barrier, Intrinsically Safe (IS), Front Load Nozzle Option	43
	Check Valves	44
	9800A Single Dial Enclosure	45
	9800A Twin Dial Enclosure.....	46
	9840A, 9840AX Dial Enclosure.....	47
	Flange Assembly.....	48
	Motor Mount.....	48

Support Assembly	48
Float Assembly	49
Float Assembly Breakdown	50
High Hose Retriever Parts	51
Internal Retriever Breakdown	52
9840A Manifold Assembly	53
9840AX Manifold Assembly	53
9853AHC Pump Discharge	54
9853AHC Manifold	54
9853ATW1M Manifold Assembly	55
9800AXTW1 Manifold Assembly	55
Mechanical Totalizer	56
9850A, 9850AX, 9850AXTW Meter Assembly	57
Liquid Controls Meter Cover Assembly Breakdown (9850A)	58
Liquid Controls Meter Housing Assembly Breakdown (9850A)	60
9840A, 9852A, 9853A, 9853AHC, 9852ATW1, 9852ATW2, 9853ATW2, 9853ATW1M Meter Assembly	62
9852AXTW1, 9853AXTW1, 9840AX Meter Assembly	63
9852AXTW2, 9853AXTW2 Meter Assembly	64
9800A Meter Assembly Breakdown	66
9840A Motor	68
9850A Motor	69
9852A, 9853A Motor	70
9853AHC Motor	71
9852ATW1 Motor	72
9852TW2, 9853ATW2, 9853ATW1M Motor	73
9853ATW2, 9853ATW1M Motor, 380V	74
Nozzle Boot, Front Load Option	75
9840 Pumping Unit Assembly	76
9850A Pump and Platform Assembly	77
9852A, 9853A Pumping Unit Assembly	78
9853AHC Pumping Unit Assembly	79
9852ATW1 Pumping Unit Assembly	80
9853ATW1M Pumping Unit Assembly	81
9852ATW2, 9853ATW2 Pumping Unit Assembly	82
Pumping Unit Assembly Breakdown	84
Blackmer XU2A Pump and Platform Assembly Breakdown	86
Reset	88
Strainer Body/Check Valve Assembly	88

Discharge Assemblies

9840A Discharge – 097230	89
9840A Discharge, Canada-ATC 097264	89
9840A Valve Discharge - 097239 115V, 097240 230V	90
9840AX Discharge - 097241 115V, 097242 230V	91
9840AX Discharge – Canada-ATC 097415	92
9840AX Filter Discharge - 097243 115V, 097244 230V	93
9840AX Satellite Discharge - 097245 115V, 097246 230V, Canada-ATC 097416	94
9850A, 9850AX Discharge Valve Assembly 097305 115V, 097311 230V, Canada-ATC 097426	95
9850A Discharge Assembly - 097302, Canada-ATC 070087	95
9850AS Discharge, Satellite Pipe Assembly 097308 115V,	

097335 230V, Canada-ATC 097434	96
9850AXS Discharge, Valve Pipe Assembly, 097321 115V, 097323 230V, Canada-ATC 097435	97
9850AXTW Discharge 097326 115V, 097329 230V, Canada-ATC 097428	98
9850AXTW Discharge 097348 115V, 097349 230V, Canada-ATC 097436	99
9852A, 9852AX Discharge - 097300 115V, 097301 230V, Canada-ATC 097418.....	100
9852ATW1, 9852AXTW Discharge - 097324 115V, 097325 230V, Canada-ATC 097419	100
9852ATW2 Discharge - 097352 115V, 097353 230V, Canada-ATC 097420.....	100
9852A, 9852AX Filter Discharge - 097306 115V, 097307 230V, Canada-ATC 097424.....	101
9852ATW1, 9800AXTW Filter Discharge - 097333 115V, 097334 230V, Canada-ATC 097425.....	101
9852AX Satellite Discharge - 097303 115V, 097304 230V, Canada-ATC 097429.....	102
9800AXTW Satellite Discharge - 097327 115V, 097328 230V, Canada-ATC 097430.....	102
9852AX Filter, Satellite Discharge - 097309 115V, 097310 230V.....	103
9852AXTW Filter, Satellite Discharge - 097336 115V, 097337 230V	103
9852A Discharge – 097188; Canada-ATC 097273	104
9852A Filter Discharge – 097359, Canada-ATC 097338	104
9852ATW2 Discharge Assembly – 097209; Canada-ATC 097417.....	105
9852ATW2 Filter Discharge Assembly – 097208; Canada-ATC 097417.	105
9853A, 9853AX, 9853AHC Discharge - 097312 115V, 097313, 230V, Canada-ATC 097421.....	106
9853AXTW Discharge - 097339 115V, 097340 230V, Canada-ATC 097422.....	106
9853ATW2, 9853ATW1M Discharge - 097355 115V, 097356 230V; Canada-ATC 097423.....	106
9853A, 9853AX Filter Discharge - 097316 115V, 097317 230V	107
9853AXTW Filter Discharge - 097343 115V, 097344 230V	107
9853A, 9853AHC Discharge Assembly – 097171, Canada-ATC 097269	108
9853A Filter Discharge Assembly - 097361	108
9853ATW1M, 9853ATW2 Discharge Assembly – 097155, Canada-ATC 097266.....	109
9853AX Satellite Discharge - 097314 115V, 097315 230V, Canada-ATC 097431.....	110
9853AXTW Satellite Discharge - 097341 115V, 097342 230V, Canada-ATC 097432.....	110
9853AX Filter, Satellite Discharge - 097318 115V, 097319 230V.....	111
9853AXTW Filter, Satellite Discharge - 097345 115V, 097346 230V	111
9853ATW2F Discharge Assembly – 097205; Canada-ATC 097433.....	112
 Electronic Assembly	
Electronic Platform Assembly	114
Electronic Platform Options	116
 9800A Kits and Accessories	
	118

INTRODUCTION

ABOUT THIS BOOK

This book was written to assist the authorized service representative (ASR) or technician in troubleshooting the Series 9800A. This manual contains:

- a functional description of each part
- wiring connections
- illustrations of the circuit boards and their indicators, connectors, jumpers, and switches
- diagnostic test procedures
- a troubleshooting (Problems) section.

USING THE TROUBLESHOOTING SECTION

The Troubleshooting section lists common problems, probable causes, and corrective action to be taken. The probable causes and checks for each problem are presented in logical sequence, allowing you to rule out one set of symptoms before going on to the next. Thus, following the procedures as listed should help isolate your problem.

A double line at the end of a problem sequence indicates the last of the checks for that problem. If your 9800A still is not working, recheck your symptoms and follow another problem sequence if necessary. If you encounter problems you cannot solve by using this manual, call GASBOY customer service at 1-800-444-5529.

Checks and corrective actions requiring voltage measurements assume familiarity with and are done with a voltmeter unless noted that an oscilloscope or ohmmeter should be used.

CHASSIS WIRING

JUNCTION BOXES

All field wiring connections to the Series 9800A dispensing unit are made in the unit's junction boxes. The 9800A wiring is split into two classifications, AC and DC. A junction box is provided for AC; a DC junction box is optional. AC and DC wiring must never be mixed in any common junction box, conduit, or trough. See the *Series 9800A Installation/Operation Manual* for detailed instructions. The following lists the wires that can be found in the junction boxes along with a brief description of each. A more detailed description can be found in the *Series 9800A Installation/Operation Manual*.

AC Junction Box

AC Ground - Grounding for the Series 9800A

Micro Feed - Hot side of power for the microprocessor register electronics.

Micro Neutral - Neutral side of power for the micro feed.

Control Pump Motor Feed - Hot side of power used to authorize the control line to the dispensing unit. Two lines provided for twins. Also powers slow and fast flow valves, when valves are used.

Neutral Feed - Neutral side of the power supplied on the Control/Pump Motor or Control/Submersible Feed lines.

Control/Submersible Feed - Hot side of the power used to authorize the control line to the dispensing unit. Provides power to slow and fast flow valves along with the switch detect signal. Two lines provided for twins.

Submersible Starter Drive - Controls Submersible Starter Relay. Two lines provided for twins.

Submersible Drive - Active only when submersible drive relays are provided. Controls submersible starter relay or submersible pump. Two lines provided for twins.

Reset Complete (Switch Detect)/Slow Flow - For use with fuel management system, indicates reset process is complete and dispensing unit is ready to dispense product; if applicable, also controls remote slow flow valve (satellite). Two lines provided for twins.

Fast Flow - Controls remote fast flow valve (satellite). Used only with two-stage solenoid valves. May provide remote control or monitoring of fast flow. Two lines provided for twins.

Phase 2 Feed - Hot feed; opposite phase of pump motor feed.

Slow/Fast Satellite Returns - Used only with satellites in nonsimultaneous applications. Four lines are provided with twins.

Light Feed - Hot side of power for fluorescent lights.

Light Neutral - Neutral side of power for the light feed.

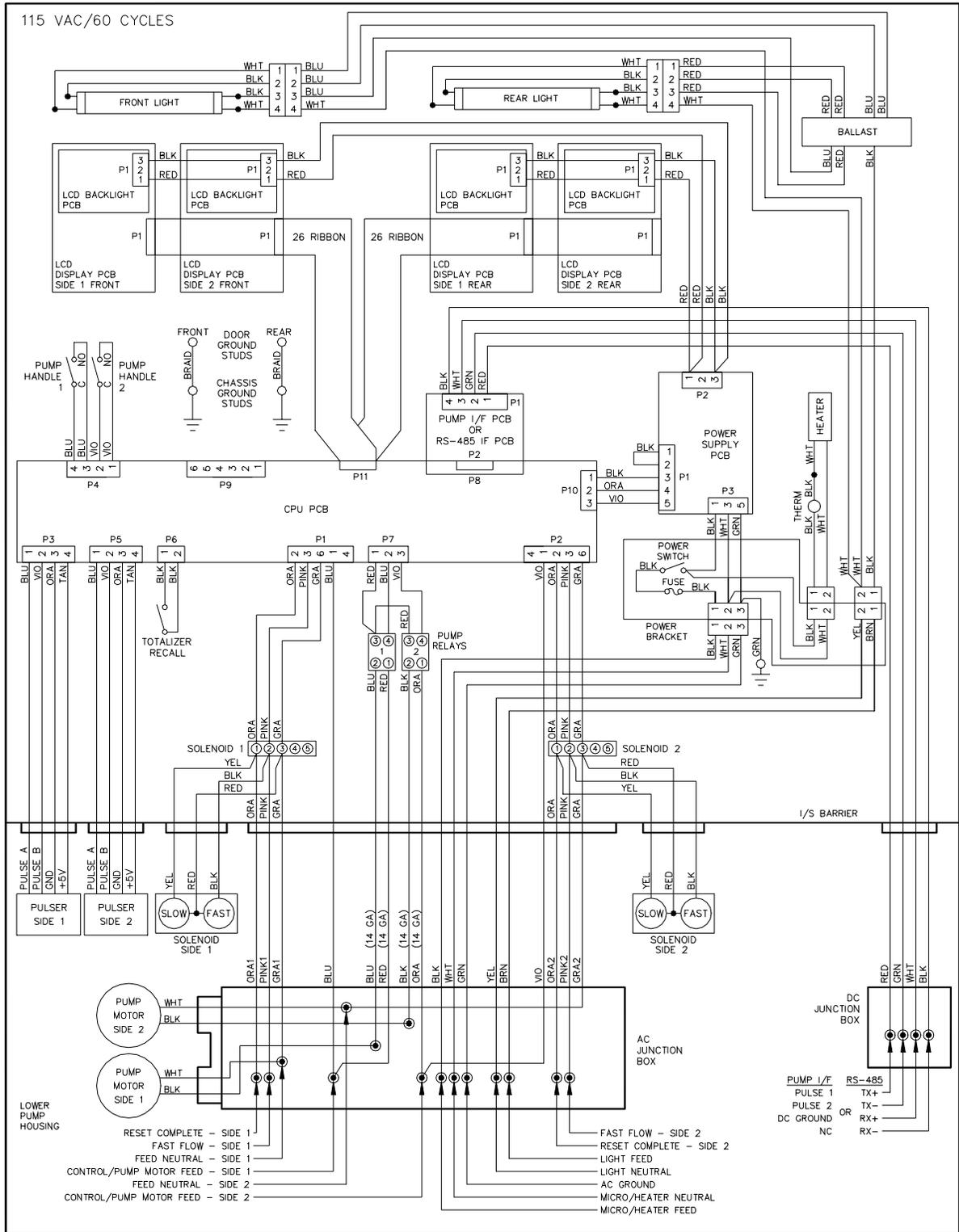
DC Junction Box

Pulsar - When the dispensing unit includes the optional pulser interface, a pulser output is provided. This pulser output provides a DC output to indicate the quantity dispensed. This is an open collector output. A DC ground line from the monitoring equipment should be connected to the DC ground line provided from the electronic register. This output can sink up to 100 milliamps DC at voltages up to 24 VDC. The pulse rate can be configured by a sealable DIP switch for rates of 1, 10, 100, 250, 500, or 1000 pulses per unit (gallons) or 1, 10, 100, or 250 pulses per unit (liters). This output should only be used when monitoring of the dispenser's operation is desired. An additional output is provided for a twin. ***These lines must be capped when not in use.***

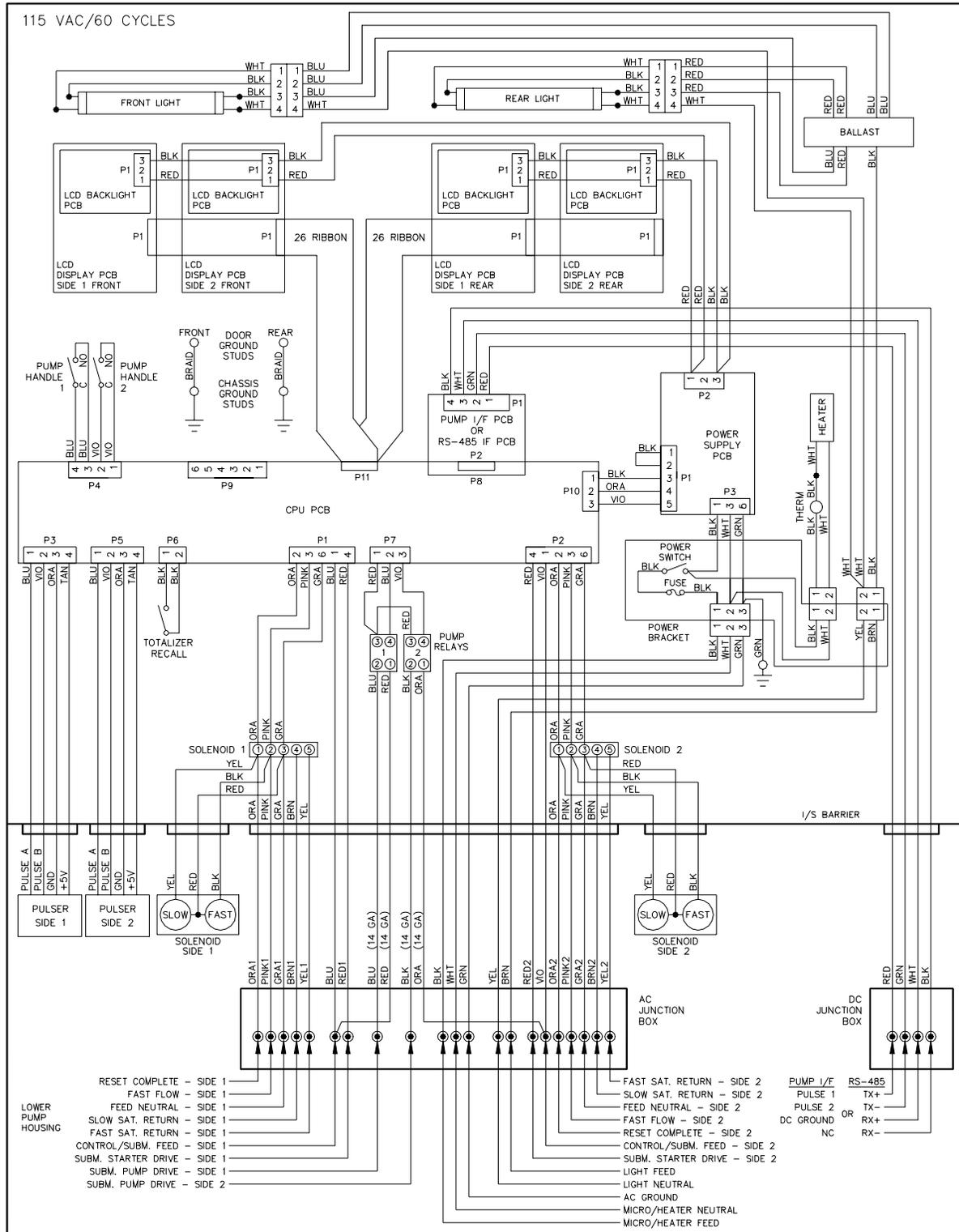
RS-485

When the dispensing unit includes the optional RS-485 interface, RS-485 lines are provided. This interface allows the user to connect a GASBOY CFN Series System directly to the Series 9800A dispensing unit. ***These lines must be capped when not in use.***

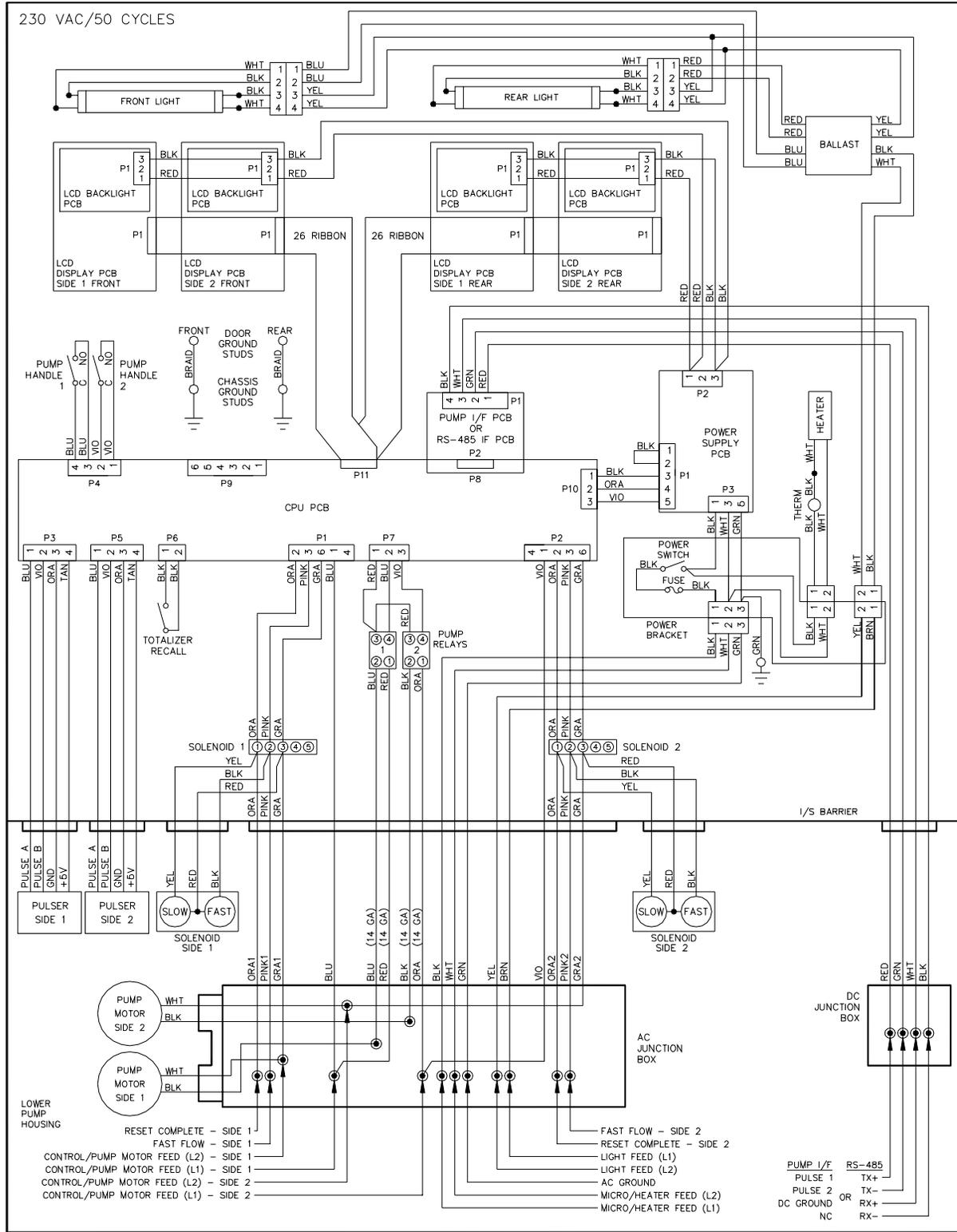
115VAC/60 CYCLE PUMP WIRING



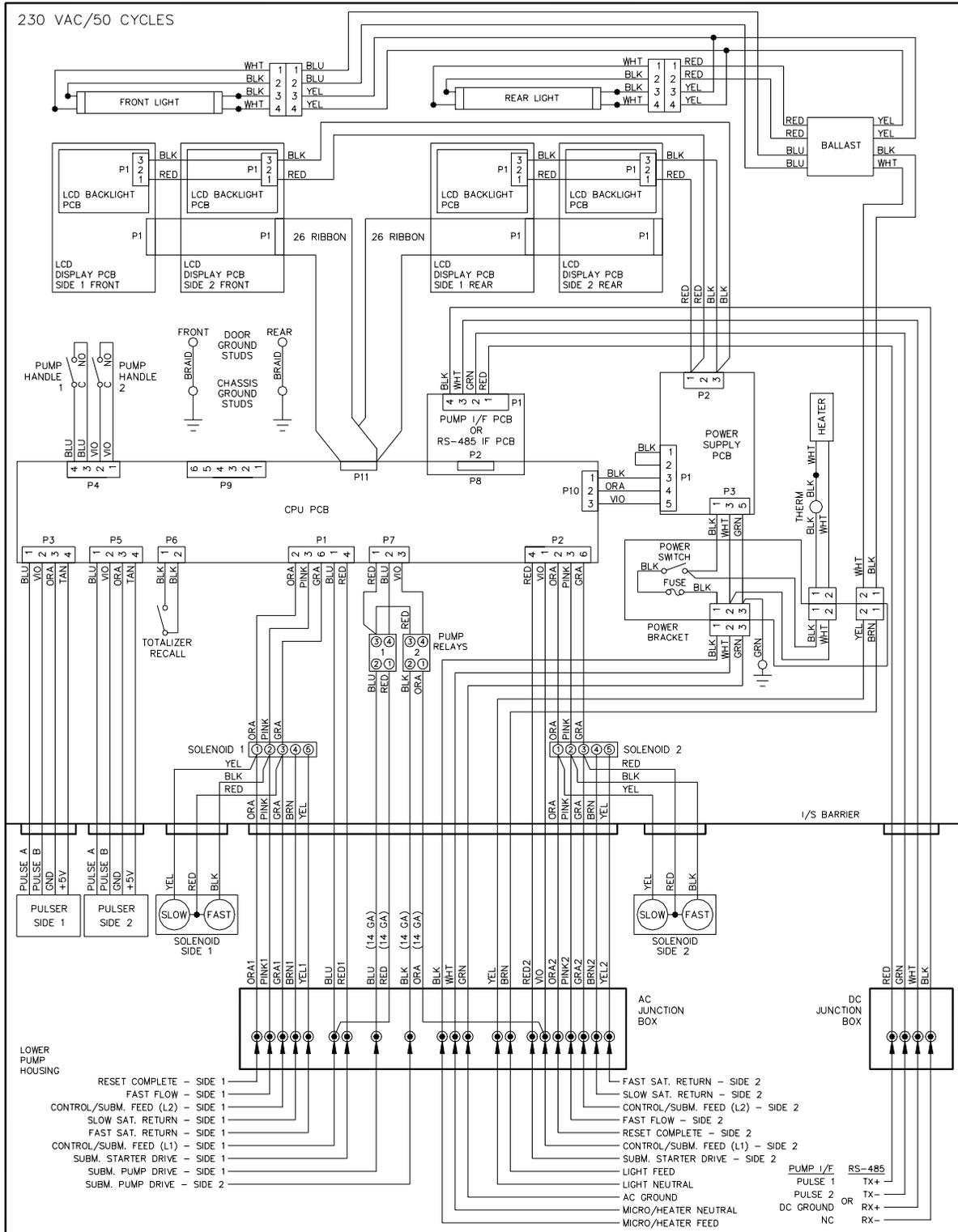
115VAC/60 CYCLE DISPENSER WIRING



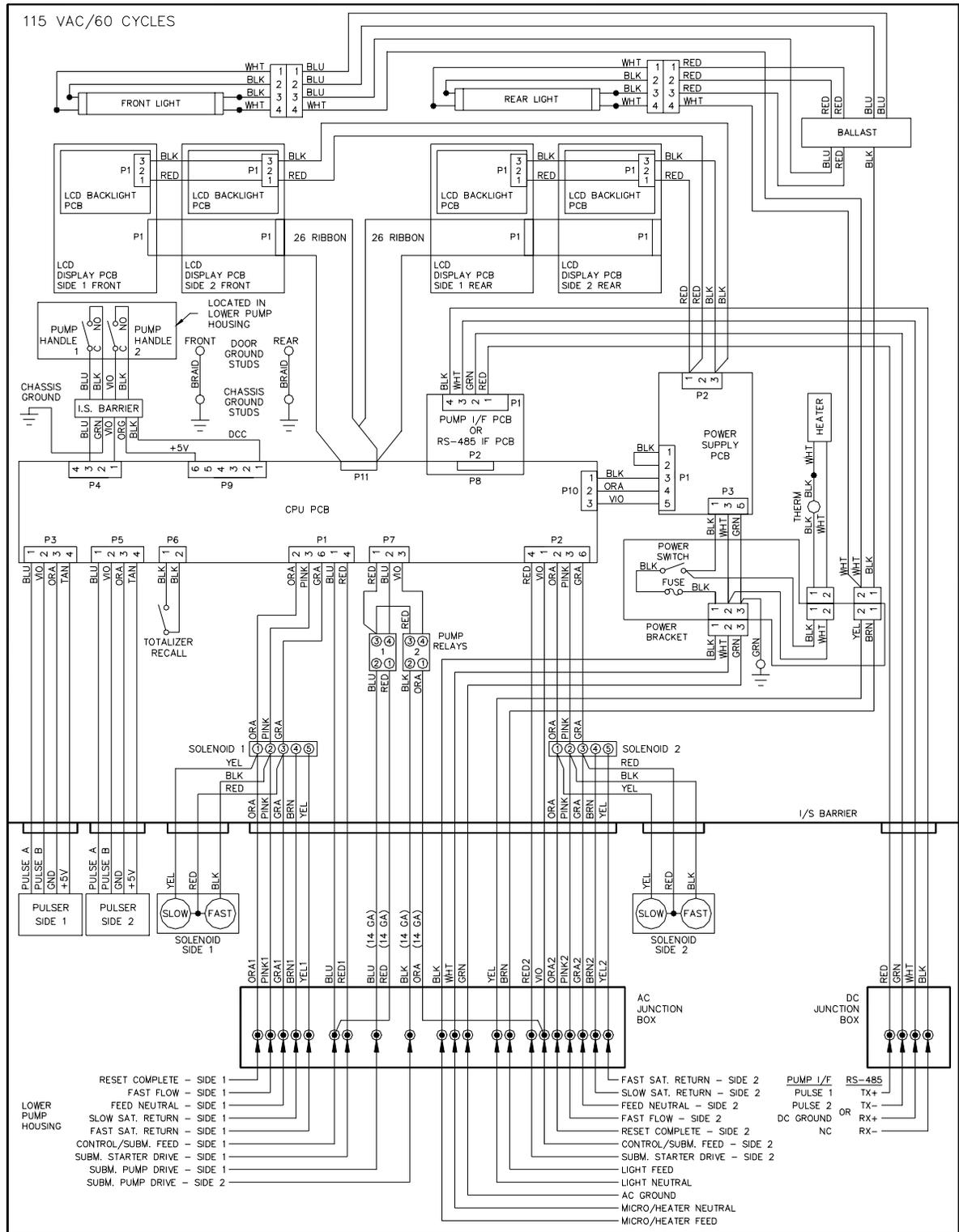
230VAC/50 CYCLE PUMP WIRING



230VAC/50 CYCLE DISPENSER WIRING

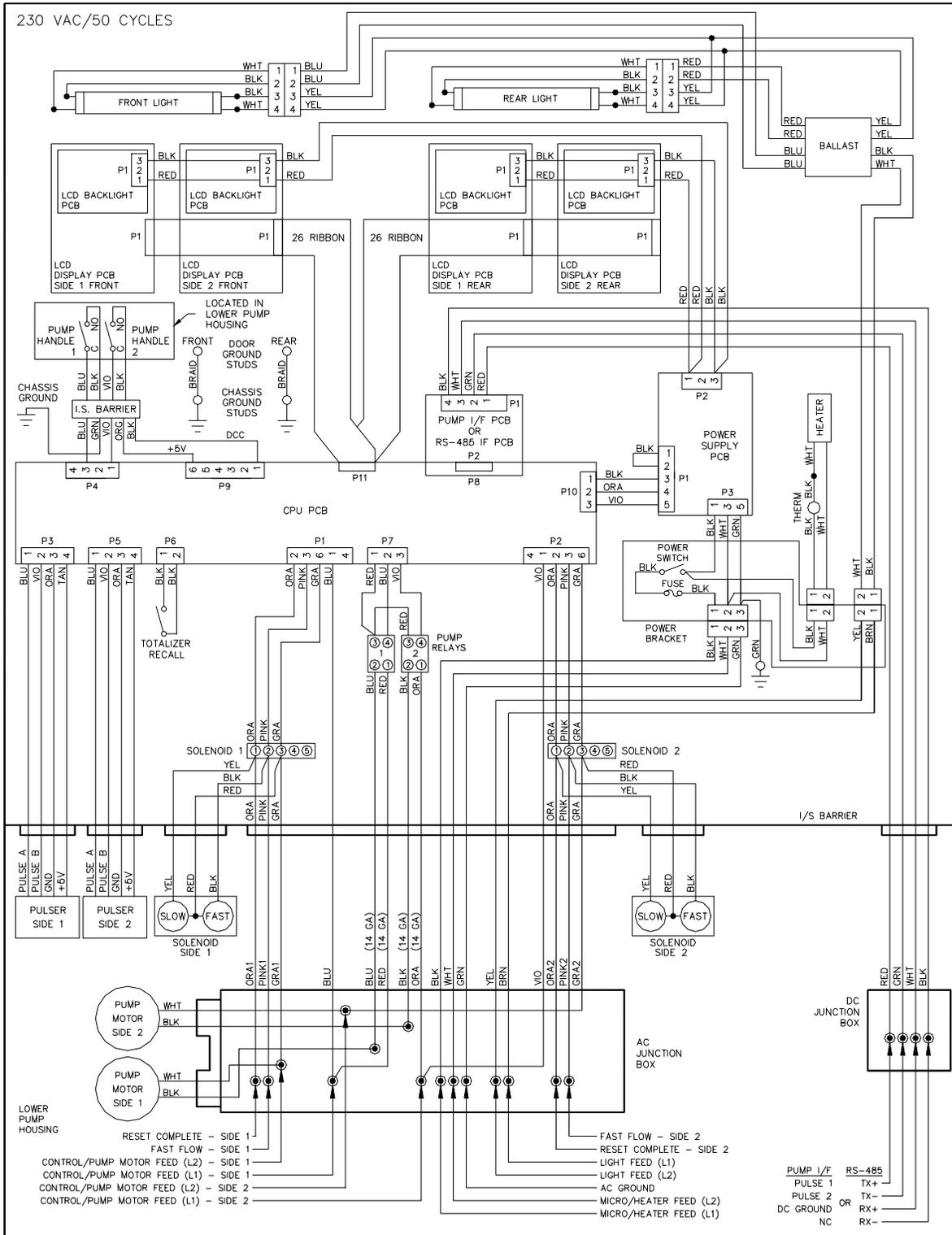


115VAC/60 CYCLE FRONT LOAD OPTION DISPENSER WIRING

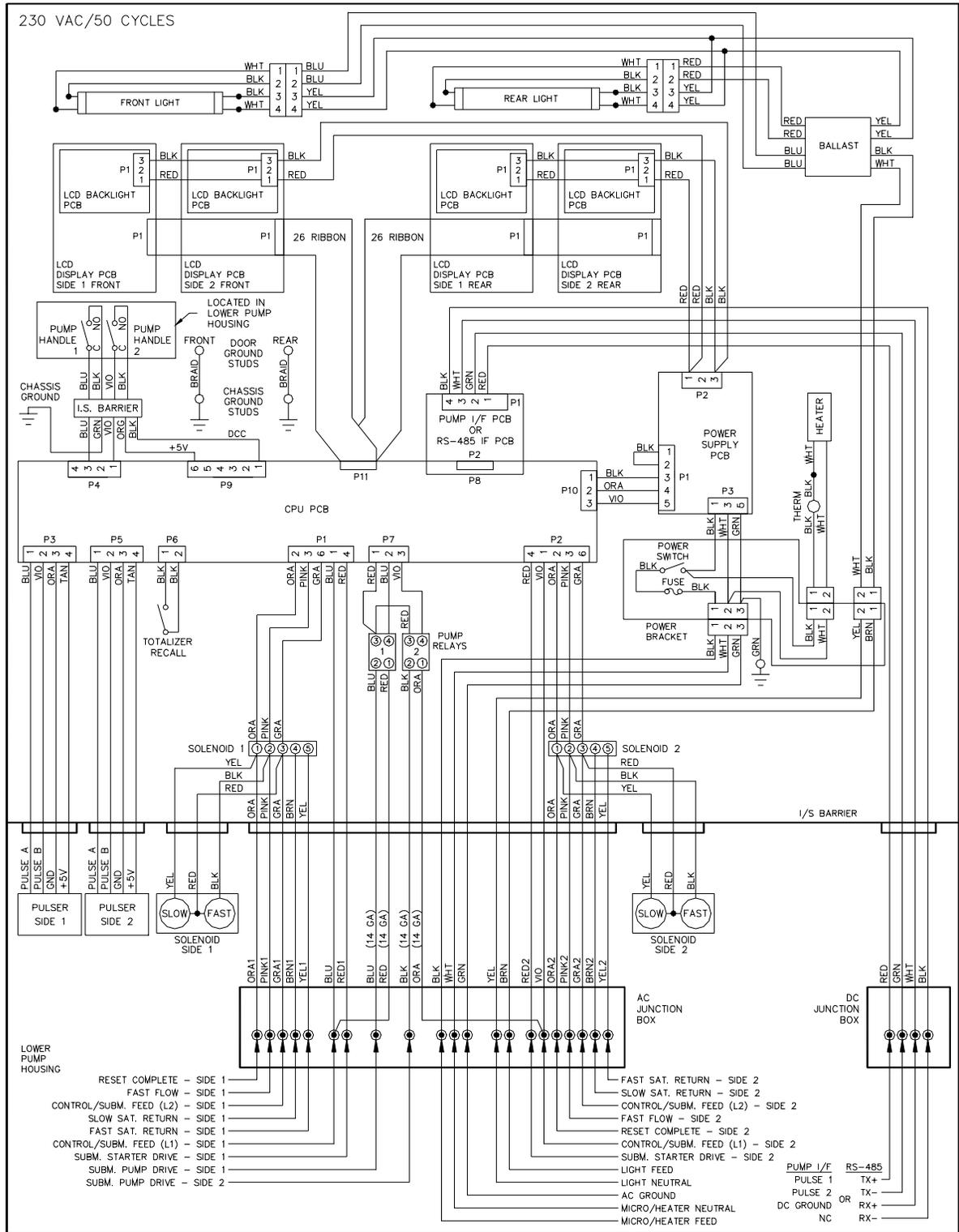


230VAC/50 CYCLE FRONT LOAD OPTION PUMP WIRING

FRONT LOAD OPTION



230VAC/50 CYCLE FRONT LOAD OPTION DISPENSER WIRING

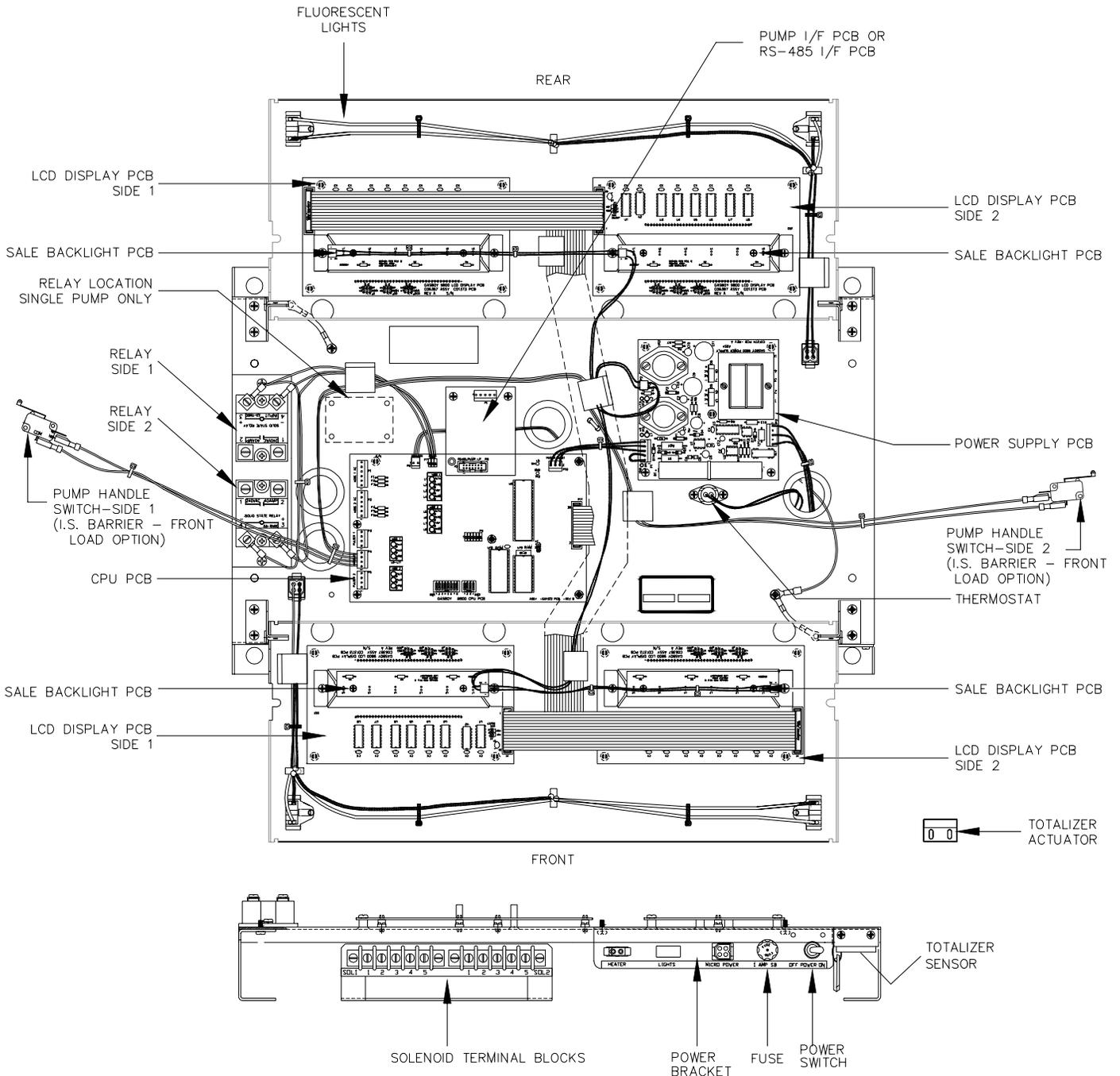


Section 3

ELECTRONIC HEAD ASSEMBLY

OVERALL LAYOUT

Use this drawing as a guide to identifying the components in a 9800A electronic head assembly.

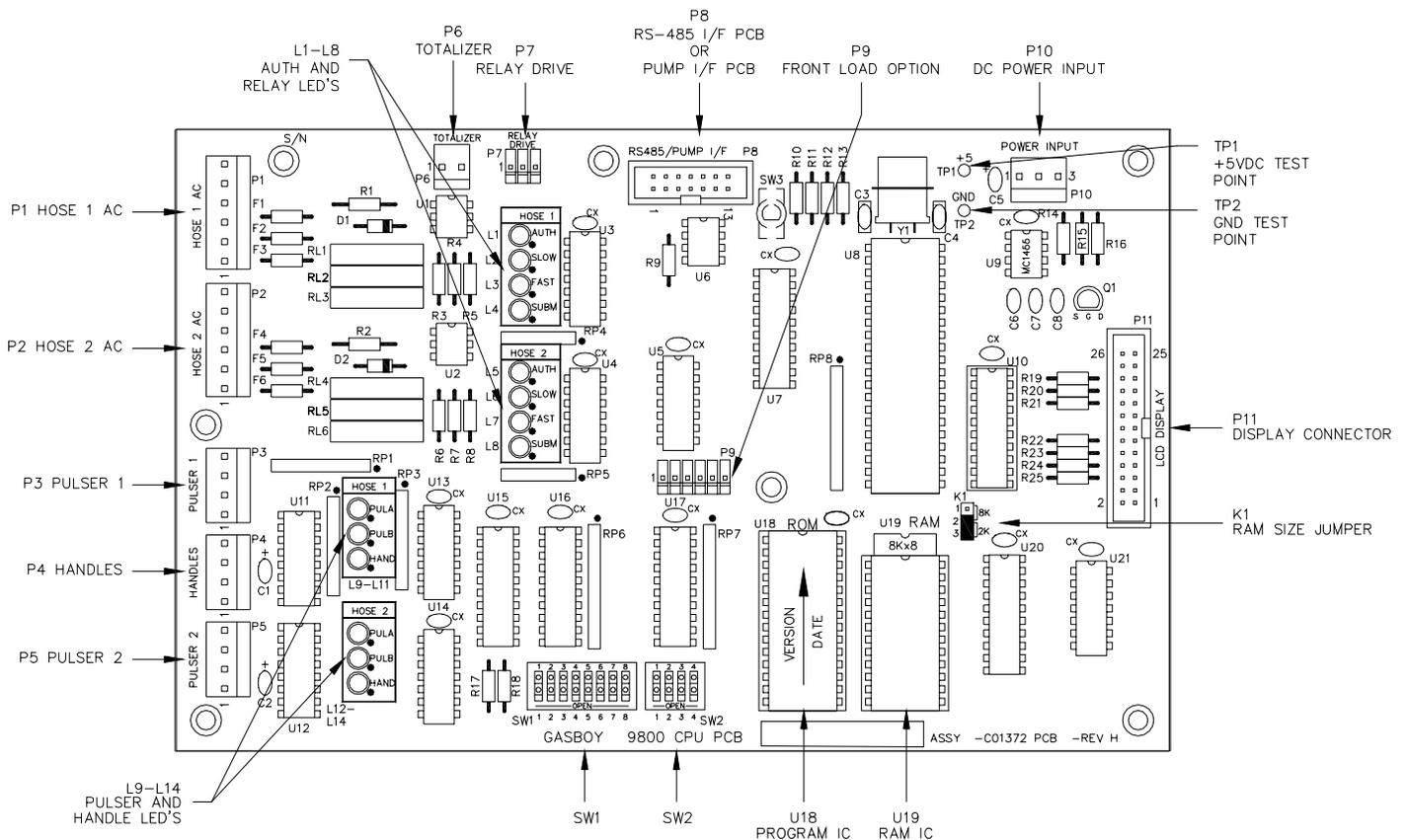


CPU PCB

Single Pump 115VAC (C06391), Twin Pump 115VAC (C06392)
Single Dispenser 115VAC (C06393), Twin Dispenser 115VAC (C06394)
Single Pump 230VAC (C06500), Twin Pump 230VAC (C06501)
Single Dispenser 230VAC (C06502), Twin Dispenser 230VAC (C06503)

The CPU PCB is the heart of the GASBOY Series 9800A. This CPU PCB:

- processes and stores all 9800A data
- contains a battery-backed RAM IC for transaction and totalizer data retention during power failures
- controls the data sent to the display PCB's
- controls the relays for each pump side
- monitors the dual-channel pulser inputs for each pump side
- monitors the handle switch for each pump side
- monitors the electronic totalizer switch
- sends pulser data to an external control system via an optional pump interface PCB
- communicates on the GASBOY RS-485 pump loop via an optional RS-485 pump interface PCB
- allows the user to configure the 9800 through dip switches
- provides diagnostic LED's to monitor operation of the unit

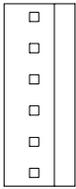


Version shown is C06394

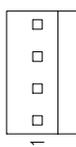
Connectors

Connector P1 controls side 1 and P2 controls side 2. The AC IN and NEUT pins are used as a pump authorization signal when SW1-6 is closed. The AC IN also feeds the SF, FF, and SUBM relays. The SF and FF outputs can directly power the solenoid valves. The SUBM output can power a customer-supplied submersible starter relay. The starter relay's coil current must not exceed 300 mA.

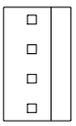
P1 and P2 - AC Input, Valve, and Submersible Relay Outputs

Pinout	Pin	P1 Wire	P2 Wire	Function	Voltage
	1	Blue	Violet	AC IN – AC hot input	115/230VAC
	2	Orange	Orange	SF OUT – Slow flow valve drive	115/230VAC – ON
	3	Pink	Pink	FF OUT – Fast flow valve drive	115/230VAC – ON
	4	Red	Red	SUBM OUT – Subm. starter relay drive	115/230VAC – ON
	5			N/C	
	6	Gray	Gray	NEUT – AC neutral input	AC neutral

P3 - Side 1 Pulser Input, P5 - Side 2 Pulser Input

Pinout	Pin	Wire	Function	Voltage
	1	Blue	Pulse A – Channel A pulser signal	⎓ +5VDC signal
	2	Red	Pulse B – Channel B pulse signal	⎓ +5VDC signal
	3	Orange	GND – pulser ground	DC ground
	4	Brown	+5V – pulser power	+5VDC

P4 - Handle Switch Inputs

Pinout	Pin	Wire	Function	Voltage
	1	Violet	HANDLE 2 – side 2 handle switch signal	0VDC=handle on, +5VDC=handle off
	2	Violet	GND – side 2 handle switch ground	DC ground
	3	Blue	HANDLE 1 – side 1 handle switch signal	0VDC=handle on, +5VDC=handle off
	4	Blue	GND – side 1 handle switch ground	DC ground

NOTE: Pin 2 and Pin 4 are not used on the Front Load option.

P6 - Electronic Totalizer Switch

The electronic totalizer switch connects to P6.

Pinout	Pin	Wire	Function	Voltage
	1	Black	GND – totalizer switch ground	DC ground
	2	Black	TOTAL – totalizer switch signal	0VDC=switch on, +5VDC=switch off

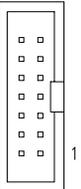
P7 - Suction Pump/Submersible Pump Relay Drives

The suction pump/submersible pump (optional) relays connect to P7.

Pinout	Pin	Wire	Function	Voltage
	1	Orange	+5V – relay power	+5VDC
	2	Blue	SUBM 1 – side 1 suction/subm relay drive	0VDC=relay on, +5VDC=relay off
	3	Violet	SUBM 2 – side 2 suction/subm relay drive	0VDC=relay on, +5VDC=relay off

P8 - RS-485/Pump Interface

The optional RS-485 and Pump Interface PCB's connect to P8.

Pinout	Pin	Function	Voltage
	1–3	VCC– I/F PCB power	+5VDC
	4	SELPUL – pulser rate select	0VDC–below 1000:1/250:1 rate +5VDC–1000:1/250:1 rate
	5	1000:1 side 1 1000:1 pulses per gallon output 250:1 side 1 250:1 pulses per liter output or pulses per gallon output, 2650 66–2/3:1 side 1 66–2/3:1 pulses per liter output, 2650	 +5VDC signal
	6	1000:1 side 2 1000:1 pulses per gallon output 250:1 side 2 250:1 pulses per liter output or pulses per gallon output, 2650 66–2/3:1 side 2 66–2/3:1 pulses per liter output, 2650	 +5VDC signal
	7	RX – receive from RS–485 comm. loop	 +5VDC signal
	8	ENA – RS–485 driver enable	 +5VDC signal
	9	TX – transmit to RS–485 comm. loop	 +5VDC signal
	10	PULSE1–side 1 pulser signal 500:1 or below (gals) PULSE1–side 1 pulser signal 100:1 or below (ltr or 2650 gallons) PULSE1–side 1 pulser signal 10:1 or below (2650 ltr)	 +5VDC signal
	11	PULSE2–side 2 pulser signal 500:1 or below (gals) PULSE2–side 2 pulser signal 100:1 or below (ltrs or 2650 gallons) PULSE2–side 2 pulser signal 10:1 or below (2650 ltr)	 +5VDC signal
	12–14	GND – I/F PCB ground	DC ground

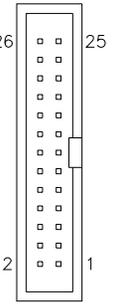
P9 – Front Load Option

Pinout	Pin	Wire	Function	Voltage
	1	Black	GND	DC ground
	2	–	X INPUT – no function	+5VDC
	3	–	X INPUT – no function	+5VDC
	4	–	X INPUT – no function	+5VDC
	5	–	X INPUT – no function	+5VDC
	6	Orange	+5	+5VDC

P10 - Power Supply Input

Pinout	Pin	Wire	Function	Voltage
	1	Black	GND	DC ground
	2	Orange	+5	+5VDC ± .10VDC
	3	Violet	AC PWR FAIL	0VDC=AC power fail, +5VDC=normal

P11 - LCD Display Interface

Pinout	Pin	Function	Voltage
	1–2	LCD STROBE – LCD back plane drive signal	⎓ +5VDC signal
	3–4	DP ON – Display decimal point	⎓ +5VDC signal
	6	D0 – Data 0	⎓ +5VDC signal
	8	D3 – Data 3	⎓ +5VDC signal
	10	D1 – Data 1	⎓ +5VDC signal
	12	D2 – Data 2	⎓ +5VDC signal
	14	H02– side 2 display select	⎓ +5VDC signal
	16	H01 – side 1 display select	⎓ +5VDC signal
	18	A0 – Address 0	⎓ +5VDC signal
	20	A1 – Address 1	⎓ +5VDC signal
	22	A2 – Address 2	⎓ +5VDC signal
	24–26	+5	+5VDC ± .10VDC
	Pins 5,7,9,11,13,15,17,19,21,23 are GND		

Jumpers

Jumper K1 is set according to the size of the RAM IC in socket U19.

The 9800A CPU PCB can accommodate two sizes of battery-backed RAM; 2K and 8K. At this time only the 2K size is being used.

RAM	Jumper Pins
2K	Across 2 and 3
8K	Across 1 and 2

LED Indicators

The LED indicators provided enable you to monitor 9800A operations.

LED	Function
L1	AUTH1 – side 1 AC authorization present
L2	SLOW1 – side 1 slow flow solenoid
L3	FAST1 – side 1 fast flow solenoid
L4	SUBM1 – side 1 submersible starter relay
L5	AUTH2 AC – side 2 AC authorization present
L6	SLOW2 – side 2 slow flow solenoid
L7	FAST2 – side 2 fast flow solenoid
L8	SUBM2 – side 2 submersible starter relay
L9	PUL1A – side 1 pulser, channel A
L10	PUL1B – side 1 pulser, channel B
L11	HAND1 – side 1 handle switch
L12	PUL2A – side 2 pulser, channel A
L13	PUL2B – side 2 pulser, channel B
L14	HAND2 – side 2 handle switch

Test Points

Test points are provided for voltage measurements.

Test Point	Function
TP1	+5VDC
TP2	DC ground

SW Switches

The 9800A can be configured for various operating conditions using the switches located on the CPU PCB. Check these switches and change their settings if necessary. Switch settings should be changed with the power switch OFF. The new settings are read by the CPU PCB when the power is turned ON again.

SW1

SW1-1 Baud Rate

This switch is set to reflect the communication rate of the GASBOY RS-485 pump loop; open for 9600 baud or closed for 1200 baud. The GASBOY CFN system communicates at 9600 baud.

Baud Rate	SW1-1
1200	Closed
9600	Open

SW1-2 Mode

This switch should be open for the 9800A to communicate on the GASBOY RS-485 pump loop (on-line) and closed for all other applications (standalone).

Mode	SW1-2
On-line	Open
Standalone	Closed

SW1-3, SW1-4 Delay Time

These two switches set the delay time used by leak detectors in submersible pump applications. The delay time is the period between activation of the submersible pump and activation of the slow flow valve. This time should be set according to the type of leak detector installed on the submersible pump to allow a normal leak test for each transaction. The delay time should be set to zero seconds for suction pumps.

Delay Time	SW1-3	SW1-4
0 seconds	Closed	Closed
4 seconds	Closed	Open
5 seconds	Open	Closed
6 seconds	Open	Open

SW1-5

Not used.

SW1-6 Authorization

This switch allows activation or non-activation of the unit through an external source (fuel management system). When closed, a 115/230 VAC signal must be present on the Control Feed (pump motor or subm) line for pump activation to occur (required setting for Series 1000). When open, the 9800A ignores the Control Feed line (required setting for CFN System or no fuel management system).

Authorization	SW1-6
Yes	Closed
No	Open

SW1-7 Totalizers

This switch should be set to open for normal operation. When closed, this switch enables the reset of the electronic totalizers.

Totalizers	SW1-7
Reset	Closed
Normal	Open

SW1-8

Not used.

SW2

This four-position switch pack serves a dual purpose: as an address setting when communicating on the GASBOY RS-485 loop or Series 900, or as a pulser output rate selector when pulser data is sent to a fuel management system other than a GASBOY CFN or Series 900.

Address Switches

A unique address identifier must be set when the 9800A is connected to the GASBOY RS-485 pump loop via the 9800A RS-485 I/F PCB. Because there are 16 possible address combinations, up to 16 units (single or twin) may be connected to the pump loop. Addressing should start at 1 and continue sequentially through 16. The physical wiring order does not have to correspond with the address order; that is the first unit on the RS-485 loop doesn't have to be address 1. The chart at right gives the switch settings and address selections. With the Series 900 option, the address must be set to 1.

Address	SW2-1	SW2-2	SW2-3	SW2-4
1	Closed	Closed	Closed	Closed
2	Open	Closed	Closed	Closed
3	Closed	Open	Closed	Closed
4	Open	Open	Closed	Closed
5	Closed	Closed	Open	Closed
6	Open	Closed	Open	Closed
7	Closed	Open	Open	Closed
8	Open	Open	Open	Closed
9	Closed	Closed	Closed	Open
10	Open	Closed	Closed	Open
11	Closed	Open	Closed	Open
12	Open	Open	Closed	Open
13	Closed	Closed	Open	Open
14	Open	Closed	Open	Open
15	Closed	Open	Open	Open
16	Open	Open	Open	Open

Pulser Output Rate Switches

When the 9800A is connected to external control equipment other than a GASBOY CFN system (standalone), the pulser signals are sent out via the 9800A Pump I/F PCB. The pulse rate required by the monitoring equipment can be configured by setting the switches as shown in the chart at right. The pulse rate represents pulses per gallon (PPG, domestic) or pulses per liter (PPL, international). For domestic units, the pulse rate can be up to 500 PPG for 9840A, 250 PPG for 9850A and up to 1000 PPG for all other models. For international units, the pulse rate can be up to 100 PPL for 9840A, 10 PPL for 9850A, and up to 250 PPL for all other models. This switch may need to be sealed by a Weights and Measures paper seal if the 9800A is used for the resale of product.

Pulse Rate	SW2-1	SW2-2	SW2-3
1	Closed	Closed	Closed
10	Open	Closed	Closed
100	Closed	Open	Closed
250	Open	Open	Closed
500	Closed	Closed	Open
1000	Open	Closed	Open
None	Closed	Open	Open
None	Open	Open	Open

Leading zeros are always suppressed in the hundreds and tens positions to the left of the decimal point. When in standalone mode, positions to the right of the decimal point are displayed based on the pulse rate selected as shown in the table at right.

Pulse Rate	Display
1:1	XXX.
10:1	XXX.X
100:1	XXX.XX
250:1	XXX.XXX
500:1	XXX.XXX
1000:1	XXX.XXX

Timeout Switch

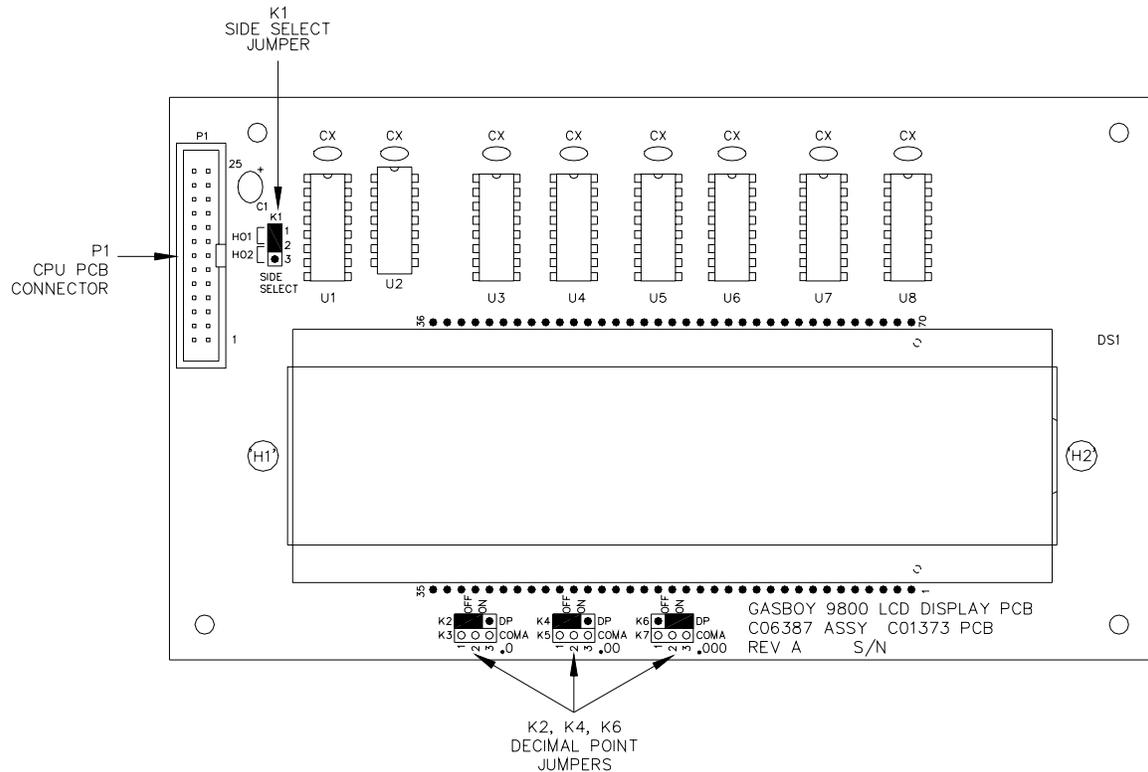
When the 9800A is in standalone mode, it will turn off an active hose if it doesn't detect pulses for 4 minutes, 15 seconds. This timeout feature can be disabled by setting switch SW2-4 to Open.

Timeout	SW2-4
Enabled	Closed
Disabled	Open

LCD DISPLAY PCB (C01373)

The LCD Display PCB contains the quantity display viewed by the user. This PCB:

- displays the quantity per sale, totalizer data, and diagnostic information



Connector

P1 - CPU PCB Interface

Pinout	Pin	Function	Voltage	
	1-2	LCD STROBE – LCD back plane drive signal	⎓ +5VDC signal	
	3-4	DP ON – Display decimal point	⎓ +5VDC signal	
	6	D0 – Data 0	⎓ +5VDC signal	
	8	D3 – Data 3	⎓ +5VDC signal	
	10	D1 – Data 1	⎓ +5VDC signal	
	12	D2 – Data 2	⎓ +5VDC signal	
	14	H02– side 2 display select	⎓ +5VDC signal	
	16	H01 – side 1 display select	⎓ +5VDC signal	
	18	A0 – Address 0	⎓ +5VDC signal	
	20	A1 – Address 1	⎓ +5VDC signal	
	22	A2 – Address 2	⎓ +5VDC signal	
	24-26	+5	+5VDC ± .10VDC	
	Pins 5,7,9,11,13,15,17,19,21,23 are GND			DC ground

Jumpers

The LCD Display PCB must be addressed to display the pump data for the hose (side) that is closest to it. This means that two of the PCB's are addressed as hose outlet #1 and two are addressed as hose outlet #2 (in a twin). Jumper K1 selects the display address.

Hose	Jumper Pins
1	Across 1 and 2
2	Across 2 and 3

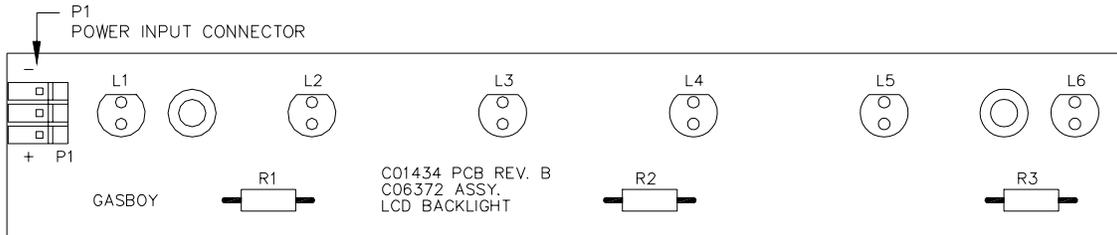
The LCD Display PCB can be configured to display whole units, tenths, hundredths, or thousandths. Presently all domestic 9800A's, except 9850A, are shipped displaying thousandths of a gallon; all international 9800A's are shipped displaying hundredths. 9850A units are shipped displaying hundredths. The 9850A liter software will blank the hundredths location and display tenths only. Jumper K2, K4, and K6 select the units and their pins should be jumpered as shown. Presently there is no software or firmware to support whole units or tenths.

Units	K2	K4	K6
Whole units	1-2	1-2	1-2
Tenths - .0	2-3	1-2	1-2
Hundredths - .00	1-2	2-3	1-2
Thousandths - .000	1-2	1-2	2-3

SALE BACKLIGHT PCB (C06372)

The backlight PCB illuminates the LCD display for night viewing. This PCB:

- attaches to the 9800A LCD display PCB
- combines long-life, super-bright LED's with a reflector for increased surface illumination



Connector

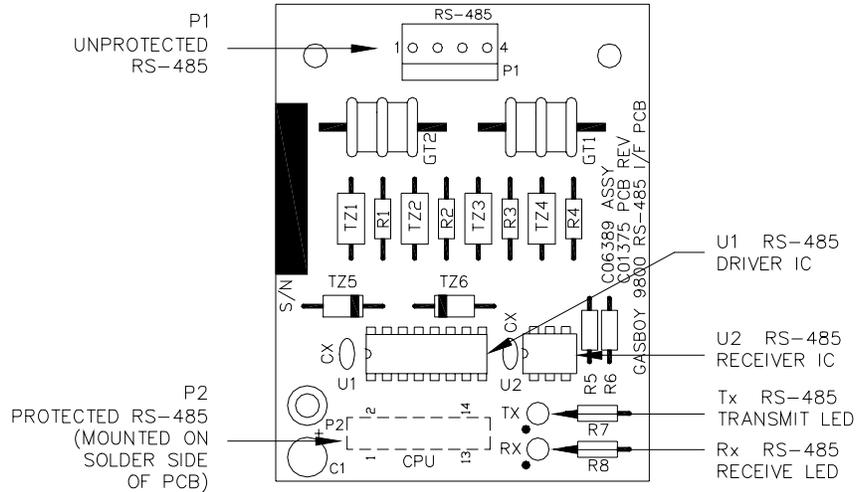
P1 - Power Input Connector

Pinout	Pin	Wire	Function	Voltage
	1	Red	+7.5VDC	+7.5VDC \pm .10VDC
	2		N/C	
	3	Black	DC ground	DC ground

RS-485 INTERFACE PCB (C06389)

The RS-485 Interface PCB allows the 9800A to communicate on the GASBOY RS-485 loop. This PCB:

- provides protection against noise and damaging voltage transients that may be induced onto the RS-485 lines
- contains diagnostic LED's to monitor operation of the RS-485 lines.



Connectors

P1 - RS-485 Unprotected from DC Junction Box

Pinout	Pin	Wire	Function	Voltage	
	1	Red	RS-485 TX+	To comm. loop	+5VDC signal between 1 & 2
	2	Green	RS-485 TX-		
	3	White	RS-485 Rx+	From comm. loop	+5VDC signal between 3 & 4
	4	Black	RS-485 Rx-		

P2 - RS-485 Protected to CPU PCB

Pinout	Pin	Function	Voltage
	1-3	+5VDC	+5VDC ± .10VDC
	4-6	N/C	
	7	RS-485 Rx from RS-485 comm. loop	+5VDC signal
	8	ENA - RS-485 driver enable	+5VDC signal
	9	RS-485 Tx to RS-485 comm. loop	+5VDC signal
	10-11	N/C	
	12-14	DC ground	DC ground

LED Indicators

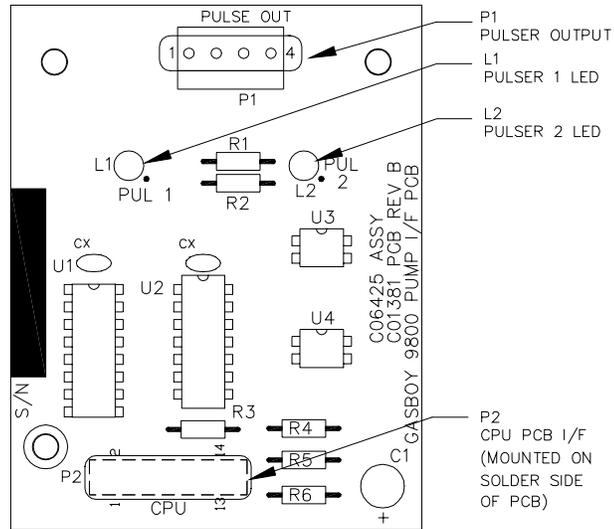
LED indicators are provided to allow you to monitor the RS-485 communication lines.

LED	Function
Tx	RS-485 transmit to fuel management system
Rx	RS-485 receive from fuel management system

PUMP INTERFACE PCB (C06425)

The Pump Interface PCB sends the pulser signal to external monitoring equipment that does not support the GASBOY RS-485 electronic pump loop. This PCB:

- provides a pulser signal for each pump side, up to 100 mA at 24 VDC. The current and voltage are determined by the external equipment.
- contains diagnostic LEDs to monitor the pulser output lines



Connectors

P1 - Pulser Output

Pinout	Pin	Wire	Function	Voltage
	1	Red	Side 1 pulser signal	determined by system
	2	Green	Side 2 pulser signal	
	3	White	DC ground	DC ground
	4	Black	No function	0 VDC

P2 - CPU PCB Interface

Pinout	Pin	Function	Voltage
Connector view from component side of PCB 	1-3	+5 VDC	+5 VDC \pm .10VDC
	4	SELPUL – pulser rate select	+5VDC
	5	1000:1 side 1 1000:1 pulses per gallon output 250:1 side 1 250:1 pulses per liter output or pulses per gallon, 9850) 66-2/3 side 1 66-2/3:1 pulses per liter, 9850	 +5VDC signal
	6	Side 2 1000:1 (gals), 250:1 (ltrs or 9850 gals) 66-2/3 (9850 ltrs)	 +5VDC signal
	7-9	N/C	
	10	Side 1 pulser signal 500:1 or below (gals) Side 1 pulser signal 100:1 or below (ltrs or 9850 gallons) Side 1 pulser signal 10:1 or below (9850 ltrs)	 +5VDC signal
	11	Side 2 pulser signal 500:1 or below (gals) Side 2 pulser signal 100:1 or below (ltrs or 9850 gallons) Side 2 pulser signal 10:1 or below (9850 ltrs)	 +5VDC signal
	12-14	DC ground	DC ground

LED Indicators

LED indicators are provided to allow you to monitor the pulser output lines.

LED	Function
L1	Pulser output – side 1
L2	Pulser output – side 2

POWER SUPPLY PCB

115 VAC (C06396)

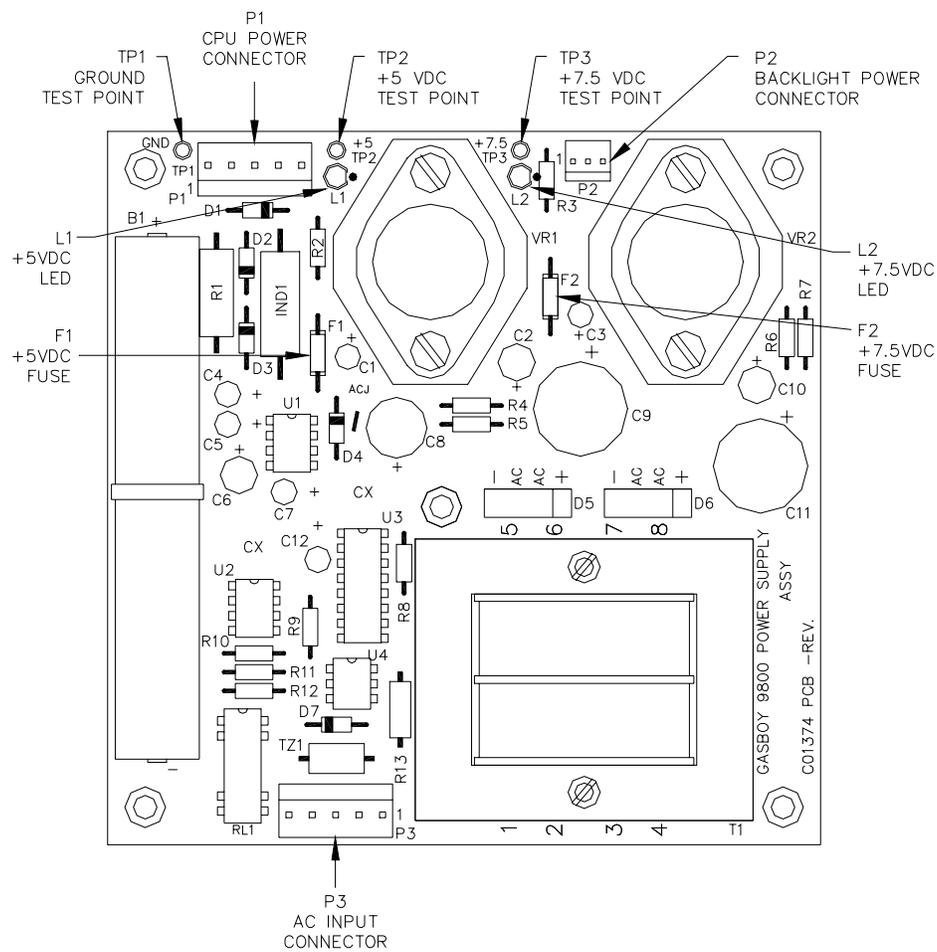
Battery-Backed 115 VAC (C06397)

230 VAC (C06488)

Battery-Backed 230 VAC (C06489)

The power supply PCB provides:

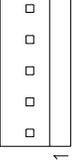
- +5VDC logic power and +7.5VDC LED backlight power
- diagnostic LED's to monitor DC voltages
- a signal to warn the microprocessor of an impending power failure
- rechargeable battery-backup to display last transaction for a minimum of 15 minutes (C06397 and C06489 versions).



Version shown is C06397.

Connectors

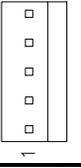
P1 - CPU Power Output

Pinout	Pin	Wire	Function	Voltage
	1	Black	Battery enable	+3.0 to +4.5VDC for C06397 & C06489
	2	Black		0VDC for C06396 & C06488
	3	Black	Ground	DC ground
	4	Orange	+5VDC	+5VDC, \pm .10VDC
	5	Yellow	AC power fail	0VDC–AC power fail +5VDC–normal

P2 - Backlight Power Output

Pinout	Pin	Wire	Function	Voltage
	1	Red	+7.5VDC	+7.5VDC, \pm .10VDC
	2		N/C	
	3	Black	DC ground	DC ground

P3 - AC Input

Pinout	Pin	Wire	Function	Voltage
	1	Black	AC hot	120/240VAC
	2		N/C	
	3	White	AC neutral	AC neutral
	4		N/C	
	5	Green	AC ground	AC ground

LED Indicators

LED indicators are provided to allow you to monitor the DC voltages.

LED	Function
L1	+5VDC
L2	+7.5VDC

Test Points

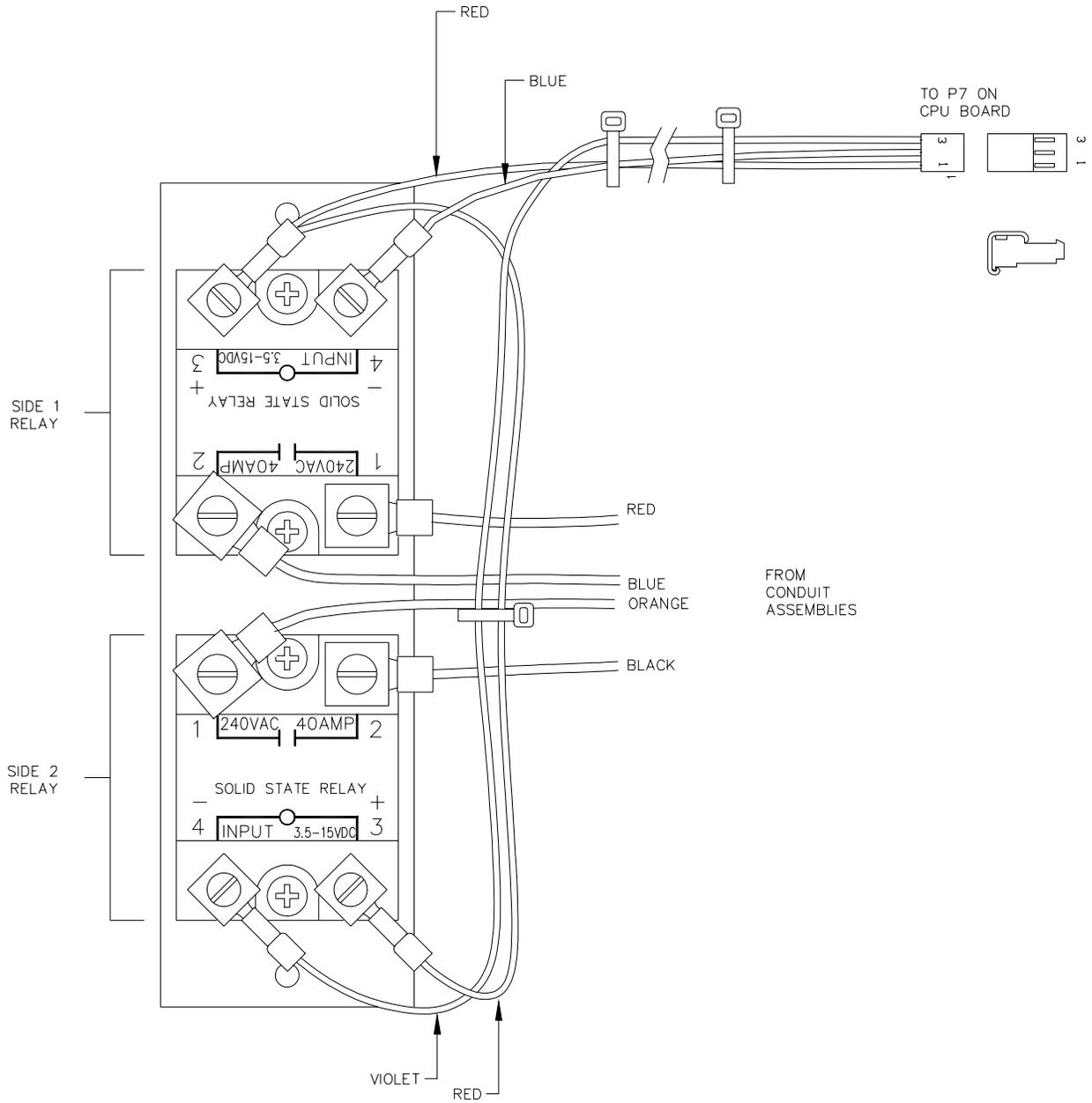
Test points are provided for voltage measurement.

Test Point	Function
TP1	DC ground
TP2	+5VDC
TP3	+7.5VDC

PUMP RELAYS

The pump relays are always used for suction pumps and may be used for submersible pumps up to and including 1-1/2 HP at 230 VAC. These relays:

- control the motor that drives the suction or submersible pump (one each side)
- are controlled by the CPU PCB

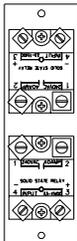


Connectors

Relay Drive

Pinout	Relay	Screw Terminal	Wire	Function	Voltage
	1	3	Red-22	+5 – relay power	+5VDC
	1	4	Blue-22	SUBM1 – side 1 relay drive	0VDC–relay on +5VDC–relay off
	2	3	Red-22	+5 – relay power	+5VDC
	2	4	Violet-22	SUBM2 – side 2 relay drive	0VDC–relay on +5VDC–relay off

Pump Motor Power

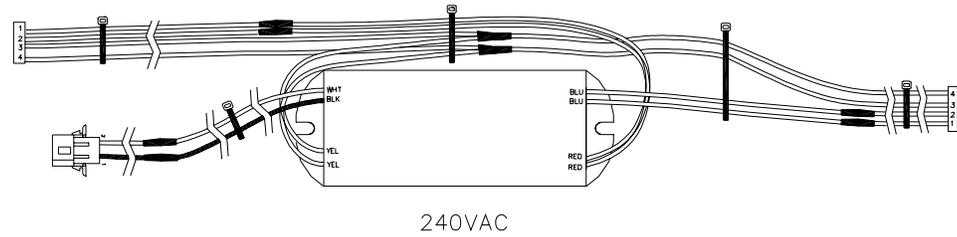
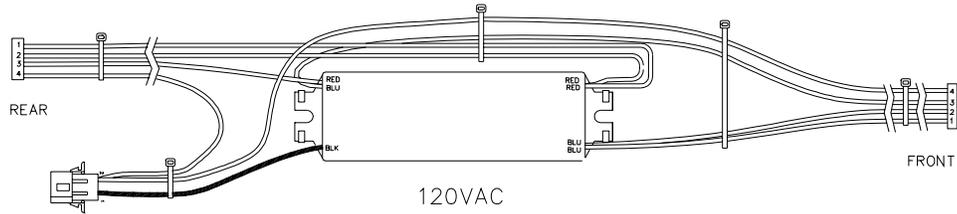
Pinout	Relay	Screw Terminal	Wire	Function	Voltage
	1	1	Red-14	Pump motor feed – side 1	115/230VAC
	1	2	Blue-14	Pump motor drive – side 1	115/230VAC when relay on
	2	1	Orange-14	Pump motor feed – side 2	115/230VAC
	2	2	Black-14	Pump motor drive – side 2	115/230/VAC when relay on

BALLAST ASSEMBLY

115 VAC (C06473)

230 VAC (C06476)

The ballast assembly provides power for the fluorescent lights.



Connectors

Front and Rear Lamps

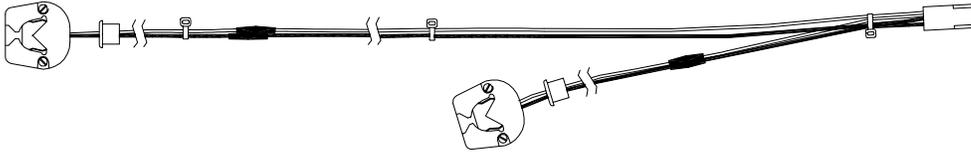
Pinout	Pin	Wire				Function	Voltage
		115VAC		230VAC			
		Front	Rear	Front	Rear		
	1	Blue	Red	Blue	Red	Light power	N/A
	2	Blue	Red	Blue	Red	Light power	N/A
	3	Blue	Red	Yellow	Yellow	Light power	N/A
	4	White	White	Yellow	Yellow	Light power	N/A

Input Power

Pinout	Pin	Wire	Function	Voltage
	1	Black	AC hot	115/230VAC
	2	White	AC neutral	AC neutral

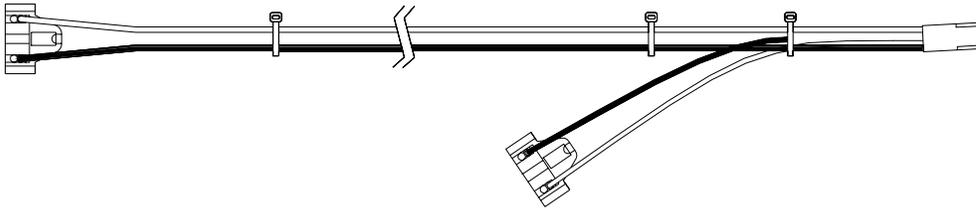
FLUORESCENT LAMP ASSEMBLY (C06398)
FLUORESCENT LAMP (033412)

The fluorescent lamp assemblies illuminate the brand panels.



OR

FLUORESCENT LAMP ASSEMBLY (C07117)
FLUORESCENT LAMP (033412)



Connector
 Input Power - from ballast assembly

Pinout	Pin	Wire	Wire	Wire
	1	White	Light power	N/A
	2	Black	Light power	N/A
	3	Black	Light power	N/A
	4	White	Light power	N/A

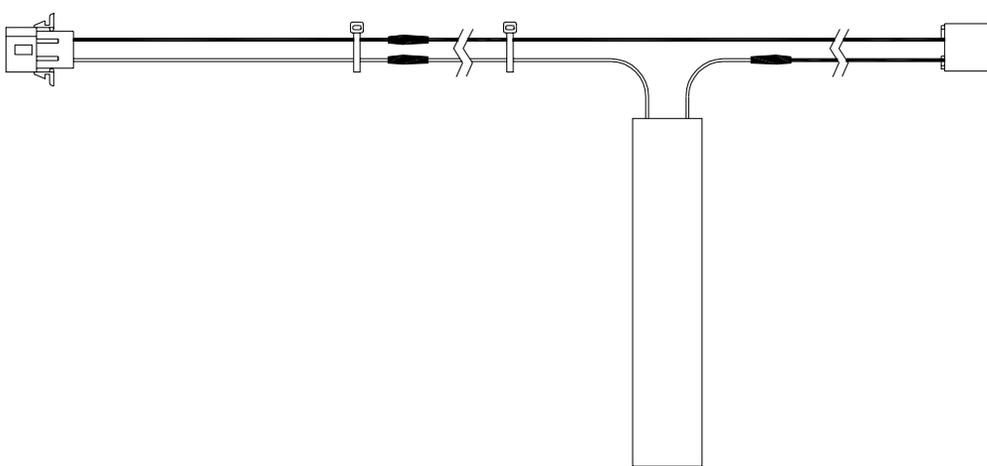
HEATER/THERMOSTAT CABLE ASSEMBLY

115 VAC (C06450)

230 VAC (C06490)

The heater assembly is used to warm the power supply battery in extreme temperatures and conditions. It:

- contains a 25W heater strip
- contains a thermostat to regulate temperature

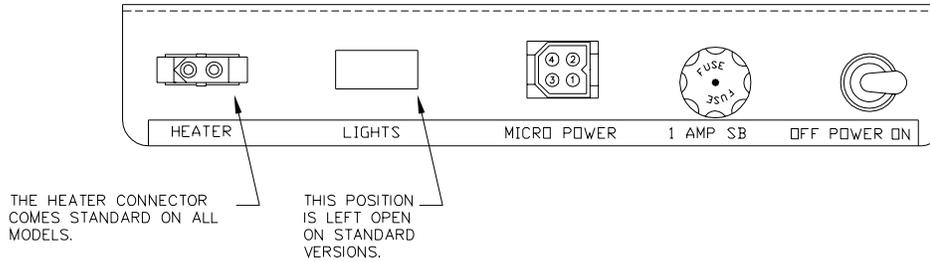


Connector Input Power

Pinout	Pin	Wire	Function	Voltage
 1	1	Black	AC hot	115/230VAC
	2	White	AC neutral	AC neutral

POWER BRACKET ASSEMBLY (C06436)

The Power Bracket Assembly contains the switch, fuse, and AC connectors.



Connectors

Micro Power Input - Connects to AC power from conduit assembly.

Pinout	Pin	Wire	Function	Voltage
	1	Black	AC hot for micro/heaters	115/230VAC
	2	White	AC neutral for micro/heaters	AC neutral
	3	Green	AC ground input	AC ground
	4		N/C	

Heater Power - Supplies AC power to optional heater. Connector is standard on all models.

Pinout	Pin	Wire	Function	Voltage
	1	Black	AC hot heater feed	115/230VAC
	2	White	AC neutral heater feed	AC neutral

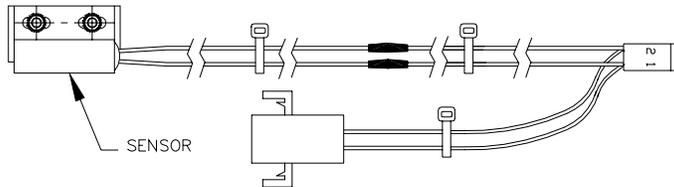
ELECTRONIC TOTALIZER CABLE ASSEMBLY

Front (Standard) C06434

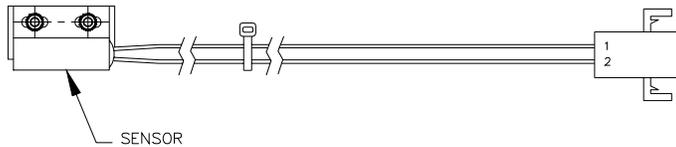
Rear (Optional) C06819

The electronic totalizer assembly contains a sensor that, when activated, shows the pump's totalizer data on the sale displays. A rear extension cable allows the totalizer to be activated from both sides of the unit.

Front Cable

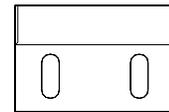


Rear Cable



ELECTRONIC TOTALIZER ACTUATOR C01342

The electronic totalizer actuator is a permanent magnet that causes the 9800A displays to show totalizer data when placed in close proximity to the totalizer sensor.



TROUBLESHOOTING

USING THIS SECTION

The Troubleshooting section lists common problems, probable causes, and corrective action to be taken. The probable causes and checks for each problem are presented in logical sequence, allowing you to rule out one set of symptoms before going on to the next. Thus, following the procedures as listed should help isolate your problem.

A double line at the end of a problem sequence indicates the last of the checks for that problem. If your unit still is not working, recheck your symptoms and follow another problem sequence if necessary. If you encounter problems you cannot solve by using this manual, call GASBOY Technical Service at 1-800-444-5529.

Checks and corrective actions requiring voltage measurements assume familiarity with and are done with a voltmeter unless noted that an oscilloscope or ohmmeter should be used.

9800A is dead. Displays are blank, including decimal points. Unable to activate side 1 or side 2.

Possible Cause	Checks	Corrective Action
No 115/230AC feed to 9800A for micro power.	<p>Check if circuit breaker is off or tripped.</p> <p>Check if 115/230VAC is being switched through circuit breaker.</p> <p>Check if 115/230VAC is measured at the micro connector on the power bracket.</p>	<p>Turn breaker on, if off.</p> <p>Replace circuit breaker if 115/230VAC is not measured.</p> <p>Correct wiring problems if 115/230VAC is not measured.</p>
Power switch is off.	Check the power switch.	Turn on, if off.
AC power fuse is blown.	Check the fuse in power bracket.	Replace fuse, if blown.
Blown power supply (PICO) fuse(s) or defective power supply.	Using a voltmeter, measure between the GND test point and each side of F1 and F2 on the power supply.	<p>Replace F1 if 5VDC is measured on one side but not the other.</p> <p>Replace F2 if 7.5VDC is measured on one side but not the other.</p> <p>Replace the power supply if 0VDC is measured on both sides of F1 or F2.</p>
Defective CPU PCB.	None	<p>Replace the PCU PCB if +5VDC is measured between the GND and +5VDC test points on the CPU PCB but the 9800A is still dead.</p> <p><i>NOTE: Changing the pulser rate switches may require replacement of your Weights and Measures seal.</i></p>

9800A won't activate in standalone mode. When the pump handle is thrown, the displays do not go through reset sequence.

Possible Cause	Checks	Corrective Action
System controlling 9800A not functioning properly.	If the 9800A is controlled by a fuel management system other than CFN, verify proper operation of system.	Repair fuel management system if necessary. Refer to fuel management system manuals for further assistance.
AUTH signal not getting to CPU PCB.	If the 9800A is controlled by a fuel management system other than CFN, an AC authorization (AUTH) signal is required for pump activation. On the 9800A CPU PCB, check if L1 (side 1) or L5 (side 2) light when the fuel system tries to activate the pump.	If L1 and/or L5 don't light, use an AC voltmeter to measure between pins 1 and 6 of connectors P1 (side 1) and P2 (side 2) of the CPU PCB. If 115/230 VAC is measured but L1 and/or L5 don't light, replace the CPU PCB. If 115/230VAC is not measured, trace the wiring back to the fuel management system and correct the problem.
Mode switch on CPU PCB set incorrectly.	Check switch SW1-2 on CPU PCB.	Close switch, if open. Turn power switch off, then on after changing switch settings.
9800A is running on battery power (<i>Skip this section if your 9800A is not equipped with a battery back-up power supply</i>).	<p>Check if micro circuit breaker is off or tripped.</p> <p>Check if 115/230VAC is being switched through circuit breaker.</p> <p>Check if 115/230VAC is measured in 9800A AC junction box.</p> <p>Check the MICRO power switch.</p> <p>Check the fuse in the power bracket.</p>	<p>Turn breaker on, if off.</p> <p>Replace circuit breaker if 115/230VAC is not being switched.</p> <p>Correct wiring problems if 115/230VAC is not measured.</p> <p>Turn on, if off.</p> <p>Replace fuse if blown.</p>
Defective handle switch.	Using a DC voltmeter, measure between the common (COM) and normally open (N.O.) terminals on the handle switch. +5VDC should be measured. Turn the handle on. 0VDC should be measured.	Replace the handle switch if proper voltages are not measured.
Defective AC power fail circuitry.	Using a DC voltmeter, measure between ground (TP2) and pin 3 of connector P10 (violet wire) on the CPU PCB.	Replace the power supply PCB if +5VDC is not measured between GND and the violet wire.

continued

Possible Cause	Checks	Corrective Action
Defective CPU PCB.	None.	Replace the CPU PCB if the 9800A still will not activate. <i>NOTE: Changing the pulser rate switches may require replacement of your Weights and Measures seal.</i>

9800A won't activate in on-line mode. When the pump handle is thrown, the displays do not go through reset sequence.

Possible Cause	Checks	Corrective Action
9800A is not communicating to the GASBOY CFN system.	Verify that the 9800A is communicating.	Perform actions listed under 9800A is not communicating to the GASBOY CFN System.
9800A won't activate in standalone mode.	Verify that the 9800A works in standalone mode..	Close SW1-2 on the CPU PCB, turn the power switch off and on, then perform the actions listed under 9800A won't activate in standalone mode. Open SW1-2, then turn the power switch off and on before returning to this page.
CFN system data loaded incorrectly.	Verify that all CFN system data is loaded correctly (authorization codes, product codes, pump table, etc.)	Reload system data, if incorrect.

9800A is not communicating to the GASBOY CFN system.

Possible Cause	Checks	Corrective Action
CFN system is not functioning properly.	Verify proper operation of the CFN system.	Repair CFN system, if necessary. Refer to CFN manuals for further assistance.
CFN system not configured properly.	Verify that the device types and pump addresses are configured correctly.	Make sure the pump type is 2 with no options for the Site Controller II or type 64 for the Site Controller I.
Incorrect switch settings on 9800A CPU PCB.	Verify that the SW1 switches are set as follows: 1=OPEN, 2=OPEN, 6=OPEN. Verify that the SW2 switches match the CFN system.	Change switch settings if necessary. Turn the power switch off, then on after changing switch settings.
Defective RS-485 PCB.	None.	Replace RS-485 PCB.
Defective CPU PCB.	None.	Replace CPU PCB. <i>NOTE: Changing the pulser rate switches may require replacement of your Weights and Measures seal.</i>

9800A resets but does not dispense fuel – Pump.

Possible Cause	Checks	Corrective Action
No 115/230VAC feed to pump.	<p>Check if circuit breaker is off or tripped.</p> <p>Check if 115/230VAC is being switched through circuit breaker.</p> <p>Check if 115/230VAC is measured in the junction box.</p>	<p>Turn breaker on, if off.</p> <p>Replace circuit breaker if 115/230VAC is not being switched.</p> <p>Correct wiring problems if 115/230VAC is not being measured.</p>
Defective CPU PCB.	<p>Using a DC voltmeter, measure between ground (CPU PCB test point TP2) and screw terminal #4 (blue wire for side 1, violet wire for side 2) of the pump relay. The voltage should be 0VDC.</p> <p>If equipped with an optional solenoid valve, measure between screw terminals 1 and 3 of terminal block SOL1 and SOL2, using an AC voltmeter.</p>	<p>Replace the CPU PCB if +5VDC is measured between ground and the blue or violet wires. <i>NOTE: Changing the pulser rate switches may require replacement of your Weights and Measures seal.</i></p> <p>Replace the CPU PCB if 115/230VAC is not measured between screw terminal 1 and 3. <i>NOTE: Changing the pulser rate switches may require replacement of your Weights and Measures seal.</i></p>
Defective pump relay.	Using an AC voltmeter, measure between AC neutral and screw terminals #1 and #2 of the pump relay.	Replace the relay if 115/230VAC is measured at screw terminal #1 but not at #2.
Defective optional solenoid valve.	Solenoid valve should click after reset.	Replace valve if click is not heard after reset.
Defective pump motor.	Motor should turn when 115/230VAC is measured in AC junction box.	Replace pump motor if 115/230VAC is not measured.
Out of fuel.	Check fuel level in tank.	Order fuel if tank empty.
Pump will not prime or loses prime.	<p>Dirty strainer.</p> <p>Loose V-belt.</p> <p>Air leak in suction line, excessive lift, bypass valve stuck on open, air separator float stuck open, float chamber valve open.</p>	<p>Remove strainer cap and clean strainer.</p> <p>If belt is loose, tighten according to <i>Installation/Operation Manual</i> instructions.</p> <p>Call qualified service personnel if any of these conditions exist..</p>

9800A resets but does not dispense fuel – Dispenser.

Possible Cause	Checks	Corrective Action
No 115/230VAC feed to dispenser.	<p>Check if circuit breaker is off or tripped.</p> <p>Check if 115/230VAC is being switched through circuit breaker.</p> <p>Check if 115/230VAC is measured in junction box.</p>	<p>Turn breaker on, if off.</p> <p>Replace circuit breaker if 115/230VAC is not being switched.</p> <p>Correct wiring problems if 115/230VAC is not measured.</p>
Defective CPU PCB.	<p>If the submersible pump is powered by the optional solid state relay mounted in the pump head, follow this check, otherwise skip to next check. Using a DC voltmeter, measure between ground (CPU PCB test point TP2) and screw terminal #4 (blue wire for side 1, violet wire for side 2). The voltage should be 0VDC.</p> <p>Using a DC voltmeter, measure between neutral and both sides of fuse F1 (side 1) or F2 (side 2).</p> <p>Using an AC voltmeter, measure between screw terminals 1 and 3 of terminal SOL1 or SOL2.</p>	<p>Replace the CPU PCB if +5VDC is measured between ground and the blue or violet wires. <i>NOTE: Changing the pulser rate switches may require replacement of your Weights and Measures seal.</i></p> <p>If 115/230VAC is not measured on either side of the fuses, replace the CPU PCB. If 115/230VAC is measured on one side of the fuse but not on the other, replace the fuse. <i>NOTE: Changing the pulser rate switches may require replacement of your Weights and Measures seal.</i></p> <p>Replace the CPU PCB if 115/230VAC is not measured between screw terminal 1 and 3. <i>NOTE: Changing the pulser rate switches may require replacement of your Weights and Measures seal.</i></p>
Defective pump relay.	Using an AC voltmeter, measure between AC neutral and screw terminals #1 and #2 of the pump relay.	Replace the relay if 115/230VAC is measured at screw terminal #1 but not at #2.
Defective submersible starter relay.	Measure across coil of starter relay.	Replace starter relay if 115/230VAC is measured across coil, but relay does not close.
Out of fuel	Check fuel level in tank.	Order fuel if tank empty.

Possible Cause	Checks	Corrective Action
Leak detector did not open.	<p>Check the settings of switches SW1-3 and SW1-4 to determine the selected delay time.</p> <p>Leak in supply line or piping.</p>	<p>Select a longer delay time if needed.</p> <p>Replace defective leak detector if it does not open.</p> <p>Repair leak.</p>
Shear valve tripped.	Try to determine cause (loose mounting to island, cabinet had been hit, etc.)	Reset, or if necessary, replace shear valve if it is tripped. Correct cause of valve tripping.
Defective submersible motor.		Repair or replace motor.

Product is dispensed, but no quantity shows on the 9800A display.

Possible Cause	Checks	Corrective Action
Broken or damaged coupling.	Broken or damaged coupling.	Repair or replace coupling if damaged.
Defective pulser or defective CPU PCB.	While dispensing fuel slowly, measure between GND (TP2) and pins 1 and 2 of connector P3 (side 1) or P5 (side 2) on the CPU PCB using an oscilloscope.	Replace the pulser if a +5VDC square wave is not measured between GND and pin 1 and between GND and pin 2 of the appropriate connector. Replace the CPU PCB if a +5VDC square wave is measured but the displays still show no quantity. <i>NOTE: Changing the pulser rate switches may require replacement of your Weights and Measures seal.</i>

Quantity shows on 9800A displays but fuel management system records incorrect or zero quantity. This problem pertains only to 9800A's connected to non-CFN fuel management systems.

Possible Cause	Checks	Corrective Action
Pulser output rate switches don't match system pulser rate.	Check the settings of SW2-1 through SW1-4 on the CPU PCB.	Change the CPU PCB switch settings or change the fuel management system pulser rate accordingly. <i>NOTE: Changing the pulser rate switches may require replacement of your Weights and Measures seal.</i>
Fuel management system pulser input circuitry not compatible.	The 9800A requires the fuel management system to "pull up" the pulser signal to a DC voltage between 5VDC and 24VDC.	Call GASBOY Technical Service for assistance.
Defective CPU PCB.	Using an oscilloscope, check the signal between GND (TP2) and the following pins of P2 on the pump I/F PCB.: Pin 5-Side 1 1000:1; 250:1, international Pin 6-Side 2 1000:1; 250:1, international Pin 10-Side 1 below 1000:1; below 250:1 international Pin 11-Side 2 below 1000:1; below 250:1 international	Replace the CPU PCB if a +5VDC square wave signal is not measured on the appropriate pins. <i>NOTE: Replacing the CPU PCB may require replacement of your Weights and Measures seal.</i>
Defective Pump I/F PCB.	Using an oscilloscope, check the signal between GND (TP2) and P1 pin 1 (side 1) or P1 pin 2 (side 2) on the pump I/F PCB.	Replace the Pump I/F PCB if the pulser signal is not measured on the appropriate pins. Replace the power supply if 0VDC is measured on both sides of F1 or F2.

The 9800A does not display the last transaction during an AC power failure. This problem pertains only to 9800A's equipped with a battery back-up power supply.

Possible Cause	Checks	Corrective Action
Battery not fully charged or defective power supply PCB.	If the 9800A had been off for a very long time, the battery probably isn't fully charged. After AC power is restored, allow the 9800A to run for 24 to 36 hours, then turn AC power off and make sure the last transaction is displayed for 15 minutes minimum.	Replace the power supply if charging did not fix the problem.

9800A does not display electronic totalizer data.

Possible Cause	Checks	Corrective Action
Pump Handles are on.	Check if pump handles are on.	Turn pump handles off, if on.
Possible misalignment of totalizer switch and magnet.	Check alignment.	Realign if needed.
Defective actuator.	None.	Replace actuator.
Defective totalizer sensor or defective CPU PCB.	Remove the totalizer cable assembly from P6 of the CPU PCB. Short the two pins together on P6 of the CPU PCB.	Replace the totalizer cable assembly if shorting P6 causes totalizer data to display. Replace the CPU PCB if shorting P6 does not cause totalizer data to display. <i>NOTE: Changing the pulser rate switches may require replacement of your Weights and Measures seal.</i>

Electronic totalizer data looks scrambled after a power failure.

Possible Cause	Checks	Corrective Action
RAM memory IC not retaining data.	None.	Replace RAM memory IC.

The fluorescent lights don't turn on.

Possible Cause	Checks	Corrective Action
No 115/230VAC feed to 9800A for light power.	<p>Check if circuit breaker is off or tripped.</p> <p>Check if 115/230VAC is being switched through circuit breaker.</p> <p>Check if 115/230VAC is measured at the LIGHTS connector on the power bracket.</p>	<p>Turn breaker on, if off.</p> <p>Replace circuit breaker if 115/230VAC is not being switched.</p> <p>Correct wiring problems if 115/230VAC is not measured.</p>
Loose, burnt out, or damaged bulb.	Check bulb for damage or burn marks.	Tighten, if loose. Replace if burnt out or damaged.
Defective ballast	None.	Replace ballast.

All displays on 9800A show 01 at the far left of the display.

Possible Cause	Checks	Corrective Action
RAM failure.	None.	Replace RAM IC U19 on CPU PCB. Replace CPU PCB if replacing U19 did not fix problem.

All displays on 9800A show 02 at the far left of the display.

Possible Cause	Checks	Corrective Action
ROM failure.	None.	Replace ROM IC U18 on CPU PCB. Replace CPU PCB if replacing U18 did not fix problem.

STANDALONE MODE ERROR HANDLING

When operating the pump/dispenser in standalone mode (not connected to a fuel management system), the 9800A displays two-digit error transaction codes on the LCD displays when transactions are terminated abnormally (by a means other than turning off the pump handle).

There are four possible error conditions that may be displayed:

Code	Condition
55	Power failure
56	Pulser error
57	Timed out
58	Limit cutoff

The error codes are displayed for two seconds at the left of the LCD window, alternating with a five second display of the last sale amount. The display alternates between the two until a new transaction begins. When an error occurs, the user should note the error code and relay the information to the system administrator.

Transaction error codes are displayed only when the pump/dispenser is operating in standalone mode. When connected to a fuel management system, (on-line mode), transaction error codes are transmitted back to the fuel management system with the completed transaction data.

With the 9800A in standalone mode, one or more displays flash 55 at the far left of the display.

Possible Cause	Checks	Corrective Action
9800A is running on battery power (Skip this Possible Cause if your 9800A is not equipped with a battery back-up power supply).	<p>Check if the breaker supplying power to the MICRO circuit is off or tripped.</p> <p>Check if 115/230 VAC is being switched through circuit breaker.</p> <p>Check if 115/230 VAC is measured in 9800A AC junction box.</p> <p>Check the MICRO power switch.</p> <p>Check the fuse in the power bracket.</p>	<p>Turn breaker on, if off.</p> <p>Replace circuit breaker if 115/230 VAC is not being switched.</p> <p>Correct wiring problems if 115/230 VAC is not measured.</p> <p>Turn on, if off.</p> <p>Replace fuse if blown.</p>
Defective AC power fail circuit.	Using a DC voltmeter, measure between ground (TP2) and pin 3 of connector P10 (violet wire) on the CPU PCB.	Replace the power supply PCB if +5VDC is not measured between ground and the violet wire.

With the 9800A in standalone mode, one or more displays flash 56 at the far left of the display.

Possible Cause	Checks	Corrective Action
Bad pulser or CPU PCB.	With the pump handle in the off position (nozzle hung up), observe the pulser lamp indicators on the CPU PCB, while <i>slowly</i> turning the pulser shaft. Both lamps (PULA and PULB) should flash on and off.	If both lamps do not flash, replace the pulser. If both lamps flash, replace the CPU PCB.

With the 9800A in standalone mode, one or more displays flash 57 at the far left of the display.

Possible Cause	Checks	Corrective Action
No fuel is dispensed.	None.	Go to the problem 9800A resets but does not dispense fuel.
Pulser doesn't turn.	Check if the pulser coupling is broken or damaged.	Repair or replace coupling if damaged.
The operator filled the vehicle, but never turned off the pump handle.	Check if the handle is still on.	None.
9800 timeout feature is enabled.	Check the position of switch SW2-4 on the 9800 CPU PCB.	If the switch is closed, the 9800 will timeout if it doesn't detect pulses for 4 minutes, 15 seconds. To set the 9800 to never timeout, open SW2-4.

With the 9800A in standalone mode, one or more displays flash 58 at the far left of the display.

Possible Cause	Checks	Corrective Action
The maximum quantity limit for a single transaction was pumped. The limits are: 9800 gallons = 990.000 9840 gallons = 990.000 9850 gallons = 9990.00 9800 liters = 9990.00 9840 liters = 9990.00 9850 liters = 9990.0	Verify that the display's last sale shows the limit from the Possible Cause column for the applicable 9800 model.	The 9800 cannot dispense more than the maximum quantity shown in the Possible Cause column in a single transaction. Run additional transactions until fueling is completed.

REPLACEMENT INSTRUCTIONS

GENERAL INFORMATION

WARNING:

This unit should be serviced only by qualified service personnel.

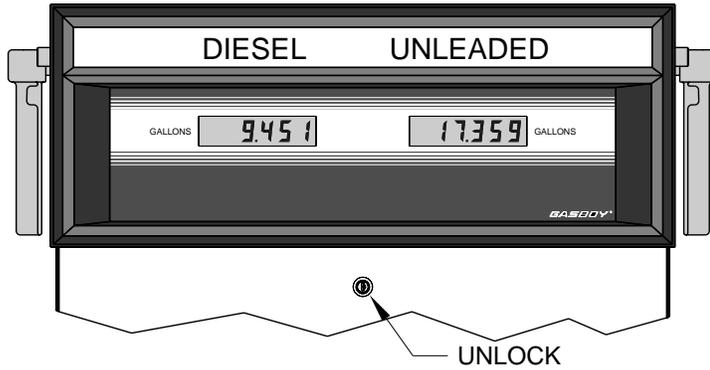
To reduce the risk of electrical shock when servicing, turn off all power to the pump/dispenser. Simply turning off the power switch in the electronic head will not remove all power from the unit! All breakers that feed the unit should be turned off. In submersible pump applications, turn off power to the submersible pump and any other dispensers which use that submersible pump. AC power can feed back into a shut-off dispenser when other dispensers share a common submersible pump or starter relay.

All replacement procedures are written with the understanding that the Series 9800A has been opened for servicing. Electronic component access is detailed on the next page.

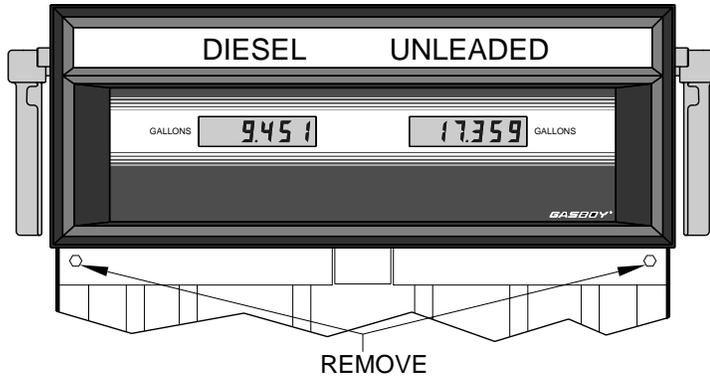
The numbers found in brackets [1] in the text can be used to find the associated balloon number in the reference drawings.

ELECTRONIC COMPONENT ACCESS

Before attempting to start-up the 9800A, it is important to become familiar with the location of some key components as well as the various switch-selectable operating modes.

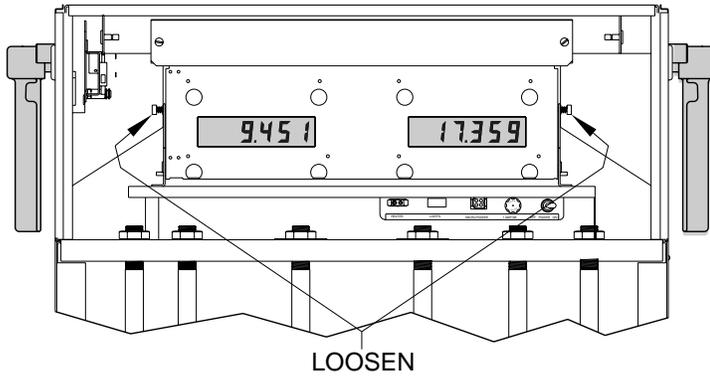


1. Unlock and remove the front panel.
2. Remove the two bolts located over the tabs of the bezel assembly. Lift the bezel assembly upwards and out to remove. If the model includes the front load nozzle, remove the nozzle



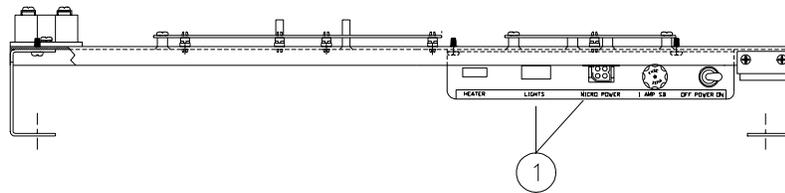
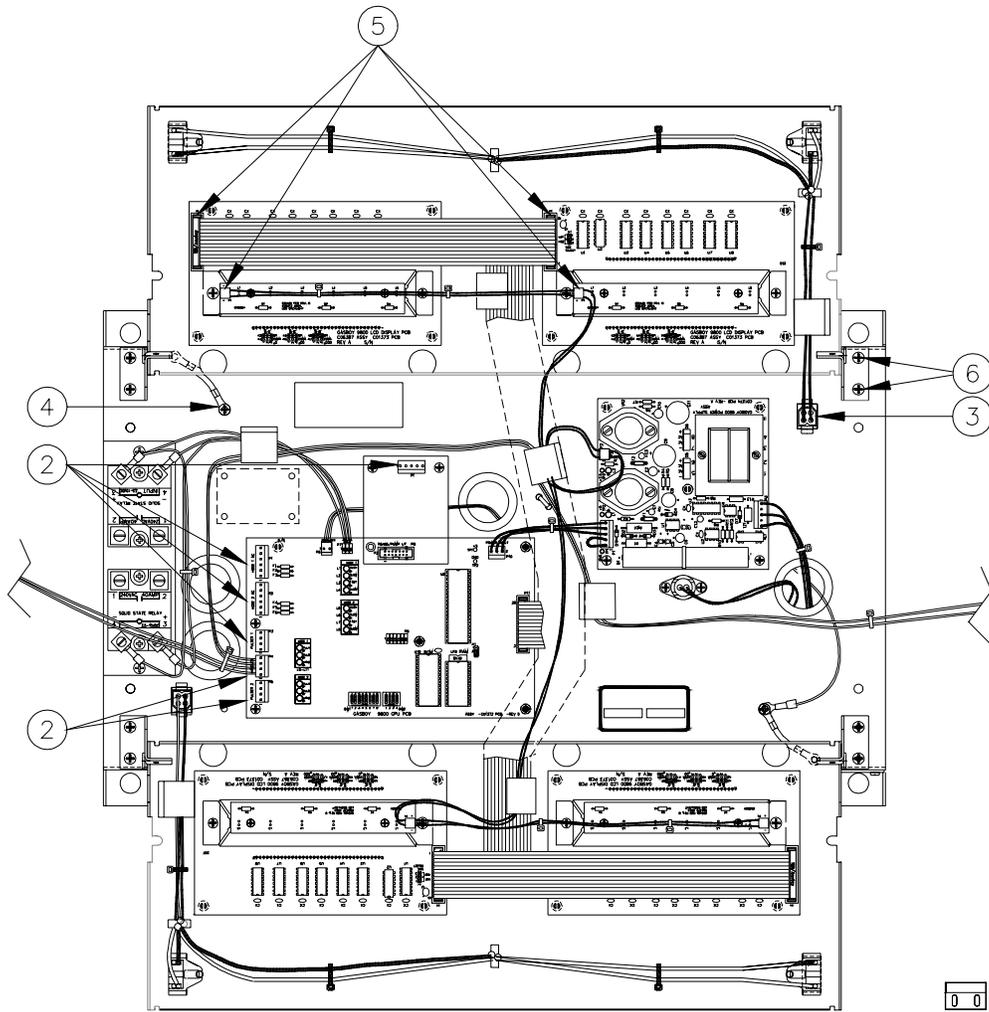
boot plastic shroud (two screws) before removing the bezel assembly.

3. Loosen, and remove if necessary, the two screws located on the left and right door support brackets and pivot display panel down.



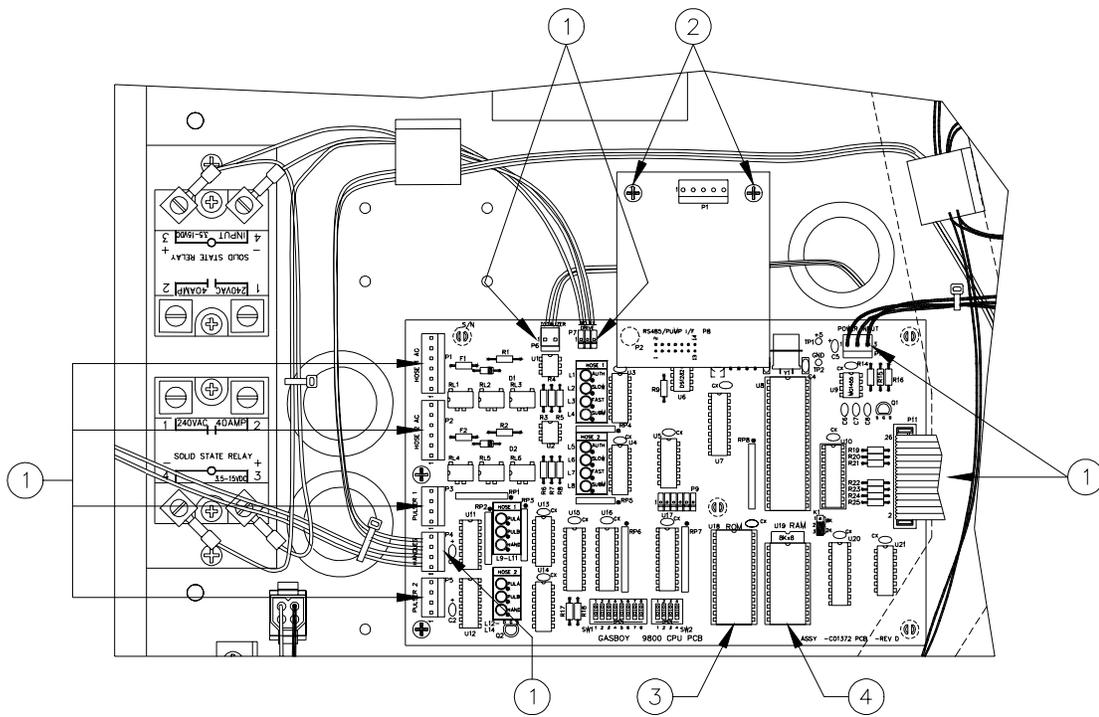
REPLACING THE PLATFORM ASSEMBLY

1. Disconnect the LIGHTS and MICRO connectors [1] from the power bracket.
2. Disconnect the AC, pulser, handle, and DC [2] cables from the CPU PCB and RS-485 or Pump I/F PCB. Push the cables down through the holes in the platform.
3. Disconnect the rear lamp cable from the ballast cable [3].
4. Remove the rear ground braid and its retaining hardware [4] from the platform.
5. Disconnect the cables [5] from the rear door PCB's.
6. Remove the hardware [6] securing one of the support brackets. Be careful not to let the door fall off while removing the screws. Slide the door away from the remaining support bracket and pull the door out of the cabinet.
7. Remove the four nuts, washers, and lock washers securing the platform assembly to the chassis.
8. Go to the front of the chassis (the side with the door still installed) and lift the platform up and out toward you.
9. Reverse Steps 1 through 9 to replace the platform assembly.



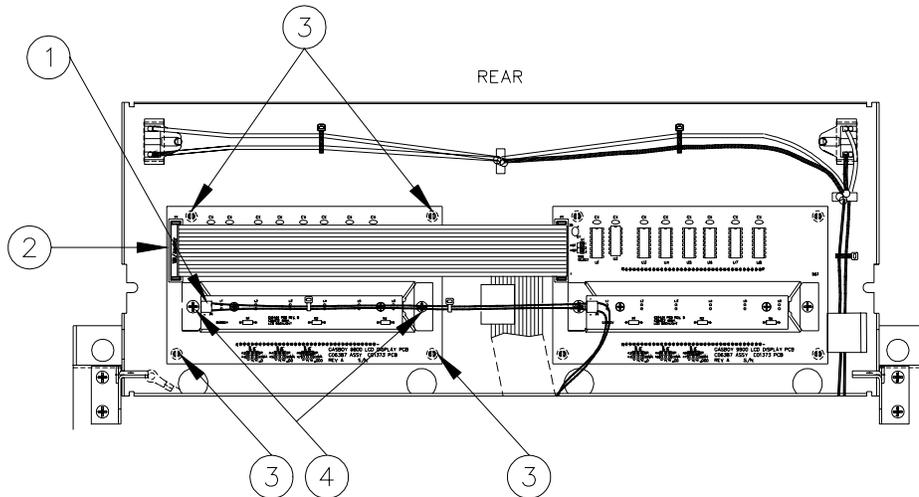
REPLACING THE CPU PCB

1. Disconnect all cables [1] from the CPU PCB.
2. If an optional RS-485 or Pump I/F PCB is installed, remove the two Phillips screws [2]. Pull the optional PCB off of the CPU PCB.
3. Remove the screws from the CPU PCB and unsnap PCB from standoffs.
4. Remove the program IC from socket U18 [3] and the memory IC from socket U19 [4] of the defective CPU PCB by gently prying with a slotted screwdriver.
5. Install the old program IC and memory IC into sockets U18 and U19 on the new CPU PCB. Be careful to observe proper pin orientation.
6. Reverse Steps 1 through 3 to install the new CPU PCB.
7. Verify that the switch settings on the new CPU PCB are correct. See the switch settings in Section 3, **Electronic Head Assembly** for verification.



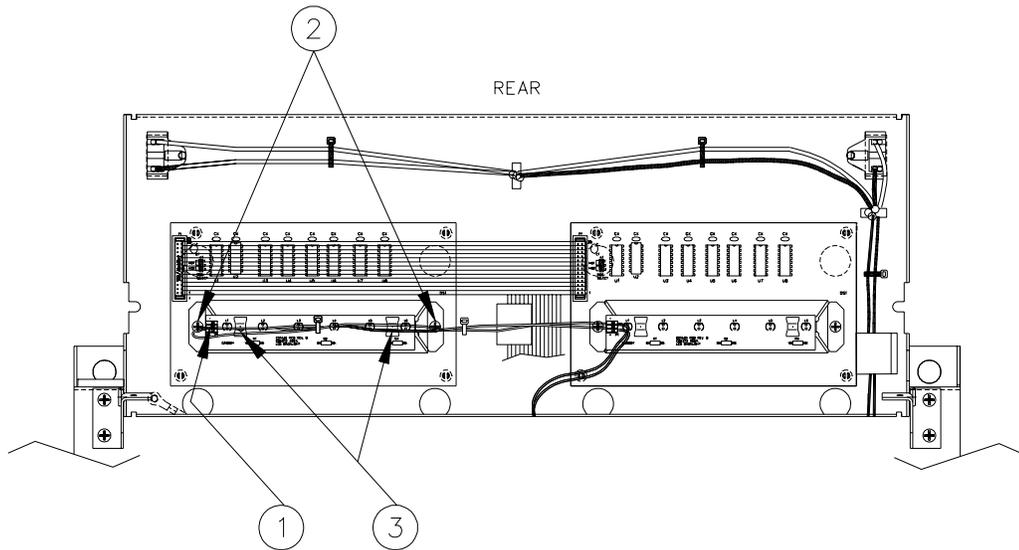
REPLACING THE LCD DISPLAY PCB

1. Disconnect the cable [1] from the Sale Backlight PCB.
2. Disconnect the ribbon cable [2] from the LCD Display PCB.
3. Unsnap the LCD display PCB from standoffs [3].
4. Remove the two Phillips screws [4] and washers securing the Sale Backlight PCB to the LCD Display PCB.
5. Reverse Steps 1 through 4 to install the new LCD Display PCB.
6. Verify that the jumper settings on the new LCD Display PCB match the jumper settings from the defective LCD Display PCB. See the jumper settings in Section 3, **Electronic Head Assembly** for verification.



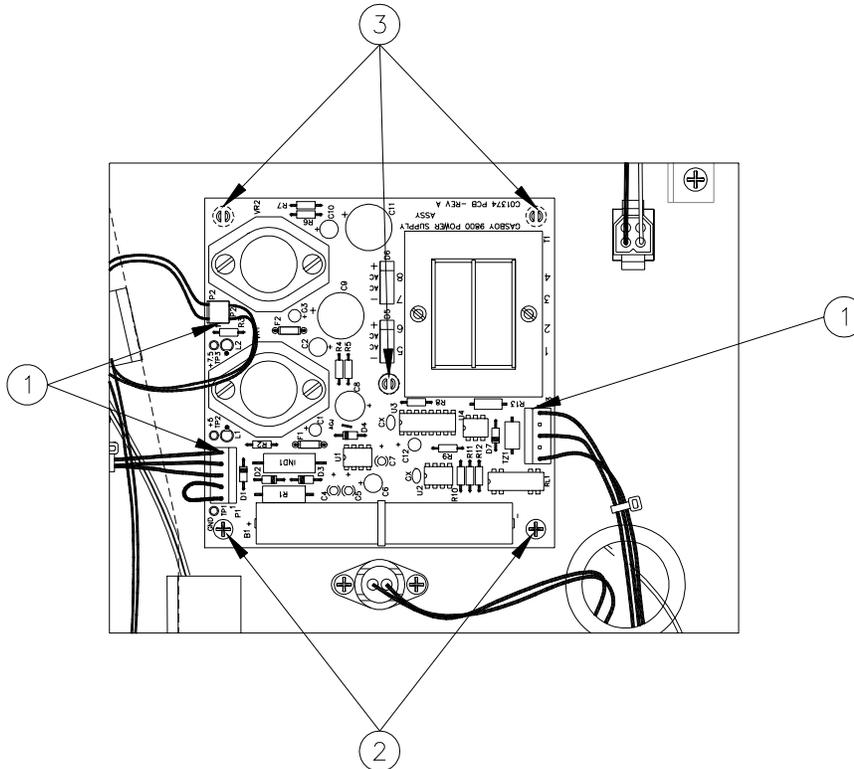
REPLACING THE SALE BACKLIGHT PCB

1. Disconnect the cable [1] from the Sale Backlight PCB.
2. Remove the two Phillips screws [2] and washers securing the Sale Backlight PCB to the LCD Display PCB.
3. Unsnap and remove the two plastic buttons [3] securing the Sale Backlight PCB to the reflector.
4. Reverse Steps 1 through 3 to install the new Sale Backlight PCB.



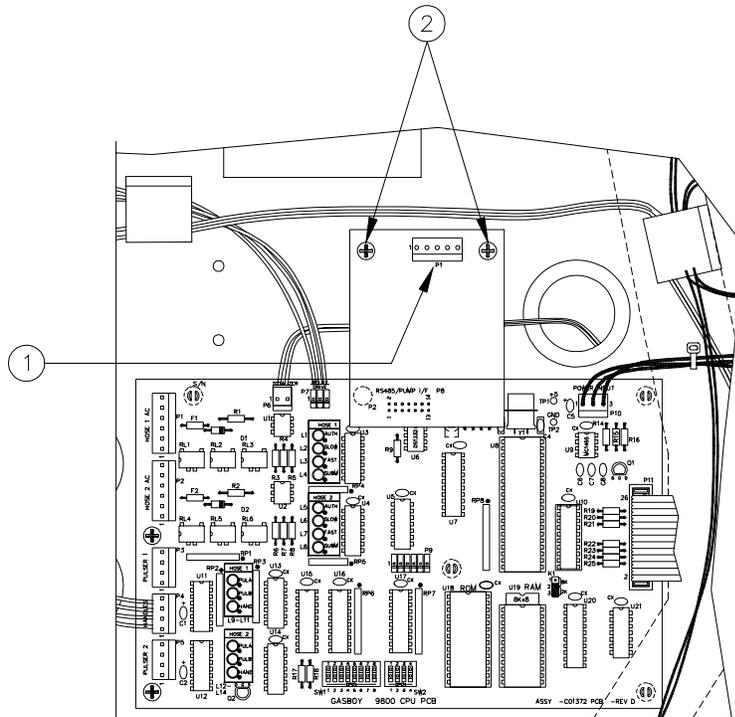
REPLACING THE POWER SUPPLY PCB

1. Disconnect the cables [1] from the Power Supply PCB.
2. Remove the two screws [2] from the Power Supply PCB and then unsnap PCB from standoffs [3].
3. Reverse Steps 1 and 2 to install the new Power Supply PCB.



REPLACING THE RS-485 OR PUMP I/F PCB

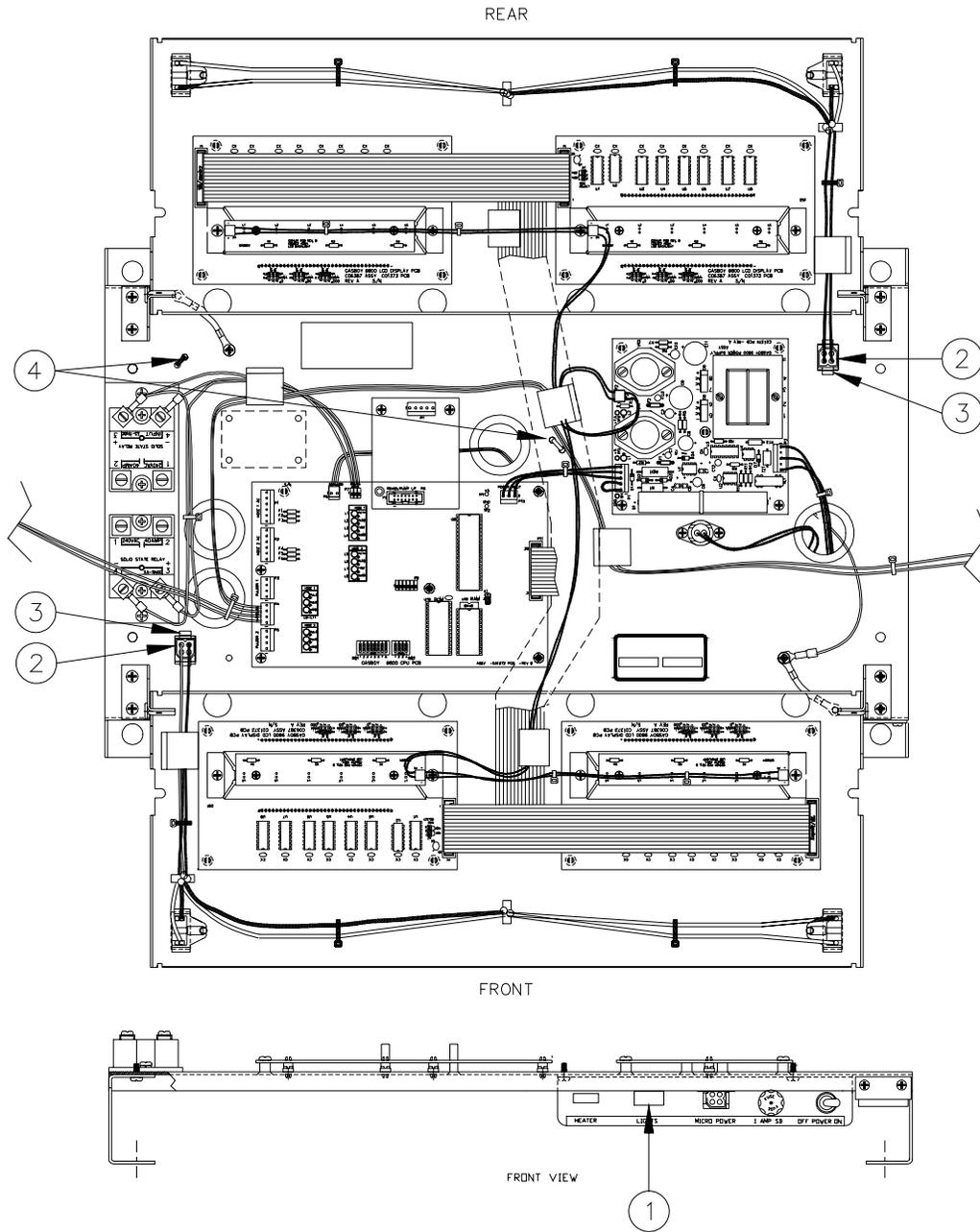
1. Disconnect the connector [1] from the RS-485 or Pump I/F PCB.
2. Remove the two Phillips screws [2] from the RS-485 or Pump I/F PCB.
3. Pull the RS-485 or Pump I/F PCB from the CPU PCB.
4. Reverse Steps 1 through 3 to install the new RS-485 or Pump I/F PCB.



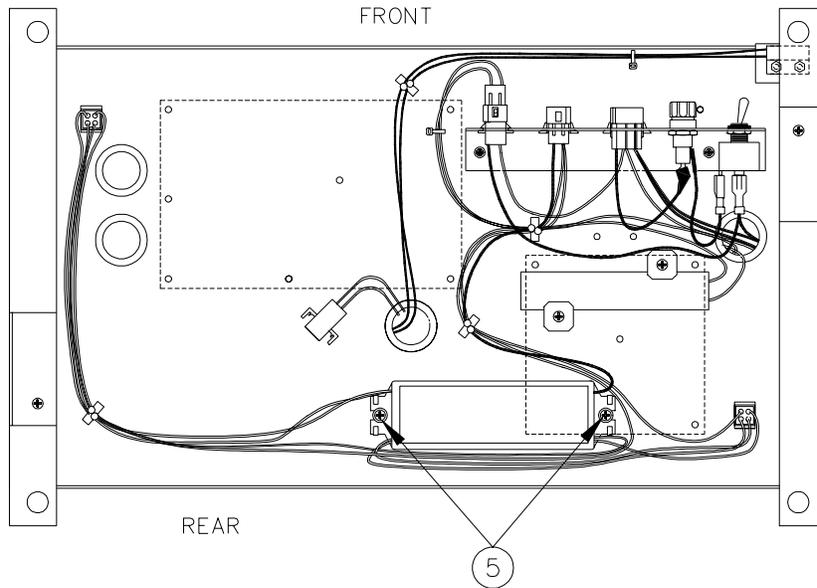
NOTE: Older units may have a 5-position cable from DC conduit. New pump and RS-485 PCBs have a 4-position connector. When installing the new PCB, make sure that pin 1 of the cable (red wire) matches up with pin 1 of the PCB connector.

REPLACING THE BALLAST CABLE ASSEMBLY

1. The platform assembly must be removed in order to replace the ballast cable assembly. See **Replacing the Platform Assembly** earlier in this section. Proceed to Step 2 once platform assembly is removed.
2. Using a slotted screwdriver, apply pressure to the retaining tab on one side of the LIGHTS connector [1] on the power bracket, then push the connector in through bracket.
3. Disconnect the lamp cable assemblies [2] from the ballast cable assembly on the front and rear of the platform.
4. Using a slotted screwdriver, apply pressure to the retaining tab on one side of each ballast connector [3], then push the connectors down through the platform.
4. With older units, on the base of the platform assembly (top side) cut the tie strap [4] using wire cutters.

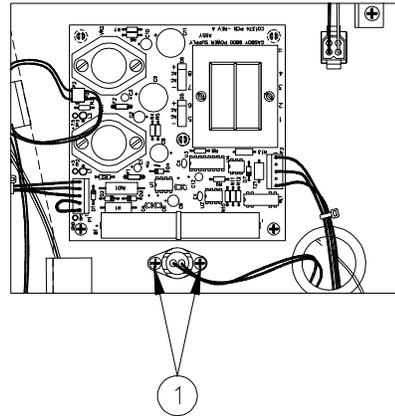


6. On the underside of the platform assembly, remove the two screws and washers [5] holding the ballast to the platform; on older units two nuts must be removed.
7. Reverse Steps 2 through 6 to install the new ballast cable assembly. Be sure to install a new tie strap or push-in wire twist standoff to keep the cable wiring away from the optional heater strip. See **Replacing the Platform Assembly** earlier in this section to complete the procedure.

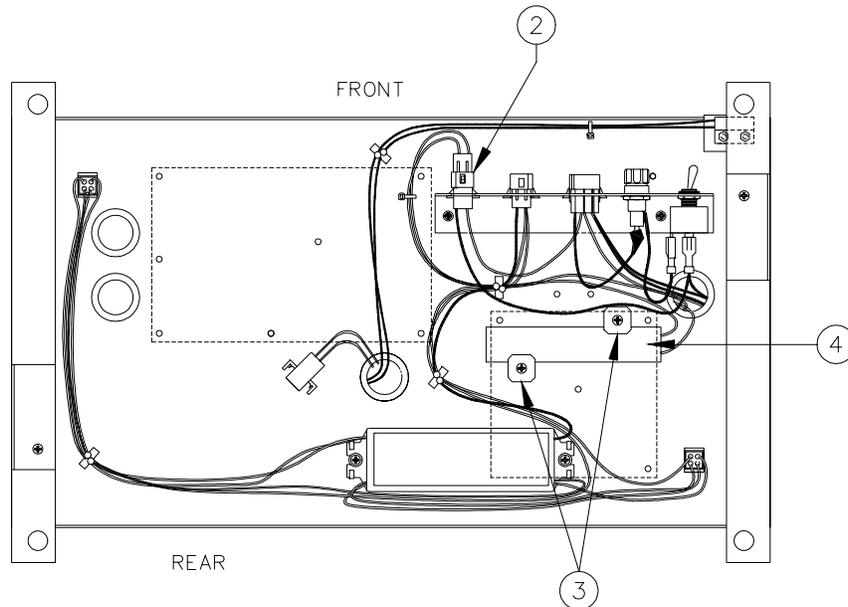


REPLACING THE HEATER CABLE ASSEMBLY

1. The platform assembly must be removed in order to replace the heater cable assembly. See **Replacing the Platform Assembly** earlier in this section. Proceed to Step 2 once platform assembly is removed.
2. Remove the two Phillips screws [1] securing the thermostat to the platform. Push the thermostat through the bushing.



3. Disconnect the HEATER connector [2] from the power bracket.
4. Remove the two Phillips screws [3] and fiber washers retaining the heater strip.
5. Peel the heater strip [4] from the platform.
6. Remove backing from the new heater strip and secure it to the platform in the same position as the old heater.
7. Reverse Steps 2 through 4 to install the new heater cable assembly. See **Replacing the Platform Assembly** earlier in this section to complete the procedure.



APPENDIX

PARTS LIST

