earth safe
Fuel Systems for Critical Power

Model C820
OmniPlex Control Module
Duplex Pump Operation

INSTRUCTION MANUAL
EMERGENCY POWER FUEL SYSTEMS

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Notice

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Damage Claims

Thoroughly examine all components and units as soon as they are received. If damaged, write a complete and detailed description of the damage on the face of the freight bill. The carriers agent must verify the inspection and sign the description. Immediately notify the delivering carrier of damage or loss. This notification may be given either in person or by telephone. Written confirmation must be mailed within 48 hours. Risk of loss, or damage to merchandise belongs with the buyer. It is the buyers responsibility to file a claim with the carrier involved. Immediately advise Earthsafe of the problem so that we may assist you.

Safety Information

UL Listed. The Earthsafe OmniPlex Control Module is UL listed.

Intended Use. The Earthsafe OmniPlex Control Module is intended for use with diesel fuel systems for emergency power generators. The control module and any connected sensors or devices are intended for operation only within ordinary electrical areas. Use of the module and connected sensors or devices within hazardous electrical areas is prohibited.

Intellectual Property

The equipment and software described herein are the property of Earthsafe Systems, Inc. and are protected by various trademarks and patents.

Table of Contents

General Description

The C800 OmniPlex Multi-Function Control Module is designed to monitor and control diesel fuel transfer for emergency power applications. The OmniPlex Module is customized with operating software to provide required operating functions for over 6 common applications:

- Generator Tank Level Control
- Duplex Pump Control
- Fuel Filtration / Polishing
- Multi-Tank Selection Control
- Remote Tank Fill Systems
- Dual Tank Full Systems

The OmniPlex Module receives inputs from operating systems including: (a) tank level sensors, (b) leak detection sensors, (c) flow sensors, (d) pressure sensors, (e) pump current sensors, (f) filter water sensors, (g) filter differential pressure sensors, (h) valve position sensors.

The OmniPlex Module operates output devices for the fuel system including: (a) solenoid valves, (b) fuel supply pumps, (c) fuel return pumps, (d) actuated ball valves, (e) actuated butterfly valves.

The control module includes MAN.-OFF-AUTO selector switches for the fuel transfer pump / valves. The manual mode allows the pump / valve to be activated for manual operation or testing. In the auto mode the pump / valve are activated by the conditions of the input sensors.

The OmniPlex Module includes the following elements:

1. Programmable Controller
   The programmable controller provides the control logic for the system and operates system elements with limited current capabilities.
2. Output Control Relays
   The unit includes relays to operate valves, pumps, remote alarms, and to isolate the Controller from these devices.
3. Mode Selector Switches
   The module includes dual MAN.-OFF-AUTO mode selector.
4. Display Screen
   The module includes a display to communicate the operating status of the unit. Different screens are presented based on the specific operating function of the unit. See the operating section of the manual for additional information.
5. Alarm Horn
   The module includes an audible alarm which operates on a auto-shutoff adjustable timer.
6. Emergency Stop
   The module includes an emergency stop button which interrupts the function of the output relays to stop pumps and close valves. The emergency stop button is mechanically maintained with a twist to release function.
7. Communications Link
   The module includes a communication link to allow operating status data to be transferred to other control and monitoring systems.

The pump set control module is operationally tested at the factory. However additional inspection and testing is required at installation to ensure that the unit has not been adversely affected by shipment.

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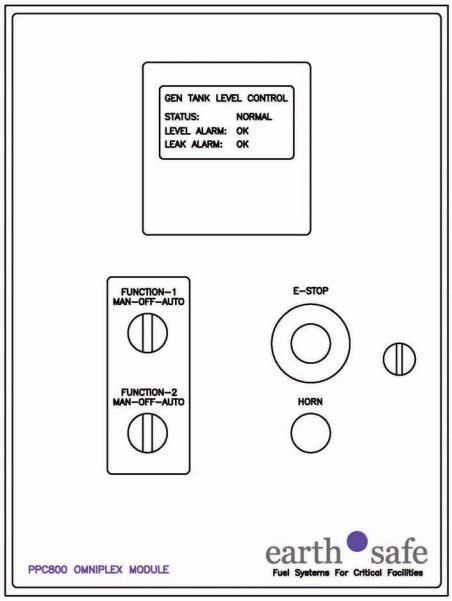

OmniPlex Module	
Dimensions	12" H x 10" W x 8" D
Approval	UL
Power	120 VAC / 5 A / 60 Hz Single or Dual Source 24 VDC Control Circuits
Enclosure	NEMA 4 Color RAL 7035 (Light Gray)
Environmental	32 to 131 F (0-55 C) -20 to 130 F with heater
Communication	AB DeviceNet
Communication	AB PICO GFX-70
Other	Isolated Inductive Loads 5 Amp Output Relays (Typ)
Options	50 Hz Power CE Approval Intrinsic Safety Barriers Enclosure Heater

ORDERING INFORMATION	
PART	DESCRIPTION
C820	Control Module: Duplex Pump

Software Versions

The OmniPlex Multifunction Controller is programmed to operate in a wide variety of fuel system control configurations. The software is selected at the time of purchase and is factory configured. The software can be changed after installation by installing a new memory module into the controller and re-starting the device.

Standard Software Versions

VERSION	TYPE	GENERAL DESCRIPTION
OS200.01	Duplex Pump	Start Pump From Day Tank Signal ubmersible or Standard Pumps Alternate Pump Starts Monitor Pump Current / Flow and Switch on Fail

Enhanced Software Versions

Enhanced Software Versions are available for the OmniPlex Controller. Detailed information on the Versions is available at www.earthsafe.com including the specialized operating sequence, wiring diagrams, and operating instructions associated with each version.

Standard Software Versions

VERSION	TYPE	MODIFICATIONS FROM STANDARD
OS200.10	Duplex Pump Dual Tank	Operate Duplex Pumps Select Tank for Supply – Return Operate Supply Valves Operate 3 Way Return Valve or Dual FOR Valves

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Installation Instructions

A. General
1. The system including the control panel, sensors, and devices is designed for ordinary electrical areas, and shall not be installed in hazardous electrical areas.
2. The control panel, external devices, and wiring should be installed by a competent electrician in accordance with National Electric Code requirements and all applicable local regulations.

B. Control Panel:
1. Select an appropriate location for the control panel installation. The location should be indoors in a dry and temperature controlled environment. The operating temperature for the control panel is 32 to 104 degrees F (0 to 40 degrees C). The control panel must be protected from severe vibration, extremes in temperature and humidity, rain, and other conditions that could harm computerized electronic equipment.

2. Remove all packaging material. Inspect the control module for damage. Install the panel on a wall or bracket and secure with (4) bolts at the corners. Provide 120 VAC power supply to the control module from a dedicated circuit breaker. Provide conduit openings in the panel suitable for the input and output wiring to external devices.

3. Always disconnect power at the external circuit breaker, using approved lock out / tag out procedures prior to terminating wiring inside the control panel.

C. External Devices
1. The control panel is designed to receive inputs from external sensors, operate external valves and pumps, and supply on/off signals to remote systems. Install external sensors, valves, and pumps per their manufacturers recommendations. Install wiring junction boxes where required to make wiring connections to the devices. Junction boxes should be rain tight where exposed to weather.

D. Conduit Systems
1. The system can be installed using a variety of conduit systems as applicable for the environment and code requirements, including PVC, EMT, IMC, and RGS.
2. Wiring should be separated in conduit systems in conformance with code requirements, and in conformance with the following:
   (a) separate fuel system wiring from wiring for other building systems.
   (b) separate DC wiring from AC wiring in conduits.
   (c) separate AC signal wires from AC power for motor loads.
   (d) separate data wiring for networks from other wiring
   (e) separate Intrinsically Safe wiring for tank gauge sensors.

E. Wiring
1. Use only stranded THHN wiring. Use #14 AWG wiring for signal wining unless noted otherwise. Use sequential numbering to identify wiring in each conduit to assist in connection and troubleshooting.
2. Network data wiring shall be 8 conductor, minimum 24 gauge wiring with RJ45 connectors.

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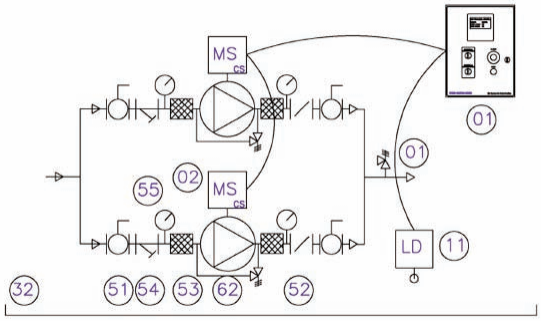
Functional Description:
Duplex Pump



Duplex Pump:
The control panel monitors day tanks, gensets, or other systems for a pump on / fuel request signal. The primary / lead pump is started and is monitored for a current sense signal from the motor starter indicating operation. When the pump on / fuel request signal ceases, then the pump shuts down after a 20 second delay that prevents short cycling.

The first pump selected from OFF to AUTO mode is the lead pump and the other pump is the lag pump. Pumps automatically alternate on consecutive starts. The lag pump will start, after a 20 second delay, if the lead pump has on overload alarm or a current sense failure. The 20 second standard delay can be increased to accommodate the operation of line leak detection systems. The audible alarm operates for 60 seconds, or until reset. Alarms are reset by placing the pump selector in the OFF position and returning to AUTO.

The display indicates for each pump: (a) lead / lag status, (b) normal / alarm status, (c) overload alarm condition, (d) current sense fail condition, (e) not-in-auto status, (f) pump run time meter. A common alarm output relay and a serial data interface are provided for BMS integration.

Duplex Pump Set		
Item	Qty	Description
1	1	OmniPlex Control Panel
2	2	Pump Control Panel
11	1	Leak Sensor
33	1	Pump / Filter Containment
51	4	Ball Valve
52	2	Check Valve
53	4	Flex Connector
54	2	Strainer
55	4	Pressure / Vacuum Gauge
62	2	Pump – Main Transfer
72		Pressure Relief Valve

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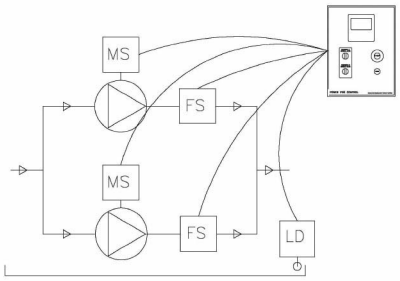
Operation Instructions

Duplex Pump Control



Duplex Pump Control

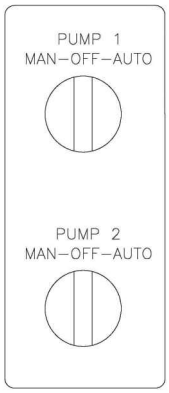
Refer to Standard Operating Procedures for detailed description of inputs, outputs, and operating logic.

Manual Mode (Pump 1 or 2)

Place the switch in the manual mode to (a) energize pump motor starter and start pump.

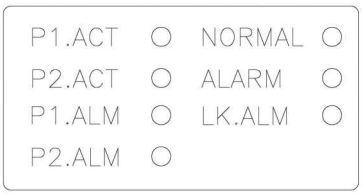
Auto Mode (Pump 1 or 2)

Place the switch in the auto mode to operate pumps based on remote inputs. (a) Start pump when input active from day tank requesting refill, and stop pump when signal ceases. (b) Alternate pumps on successive starts. (c) Monitor input from pump flow or pump current sensor to prove pump, and auto switch to second pump if no signal after 30 second time delay. (d) Monitor pump motor starter for not-in-auto state and indicate alarm.



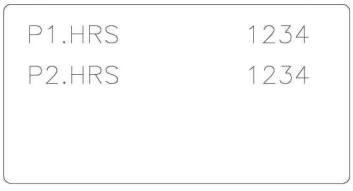
Display 1

Indicates operating status and alarm conditions.



Display 2 (Press ALT Button to Access and Return)

Indicates operating hours for pumps.



Troubleshooting

Maintenance Instructions

MODE	ITEM	DESCRIPTION	RESPONSE
General	1.01	Display not Active	Check circuit breaker status Check panel internal breaker Check display latch to processor
	1.02	No outputs active	Check Emergency Stop position
	1.03	Select outputs not active	Check wire terminations at panel Check wire terminations at device Check output relay continuity
Duplex Pump	3.01	Pump did not start	Check auto mode selected Check emergency stop position Check motor starter power on. Check motor starter auto position Check motor starter overload Check on request input
	3.02	Pump start but no flow	Check for closed manual valves Check pump prime

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Maintenance Instructions / Spare Parts

Maintenance Instructions

ITEM	MAINTENANCE	SCHEDULE
1	Operate selector switches to manual or test position	30 day intervals
2	Open panel and check for water seepage or excessive condensation	30 day intervals
3	Remove sensors and activate to confirm system function	Annually

Spare Parts

Spare parts are available worldwide from local Allen Bradley parts distributors. Locate local distributor information at www.ab.com

Technical Support / Warranty Service

Technical Support

Contact Earthsafe at

(630) 794-5100
(630) 794-5106 Fax

www.earthsafe.com

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Warranty Statement

Earthsafe Systems, Inc. warrants the tank level controls to be the kind and quality described in specification provided herein and to be free from defects in material or workmanship under normal service for a period of 1 year after shipment. Earthsafe obligations under this warranty shall be limited to repair or replacement, at the option of Earthsafe, of parts deemed to be defective upon inspection by Earthsafe. User is responsible for transportation of parts or assemblies to Earthsafe or its authorized repair location where the repairs are to be performed.

The provisions of the warranty shall not apply to any equipment, part, or accessory which (a) has been improperly specified by buyer, (b) has been improperly stored or handled prior to placing in service, (c) has been damaged or loosened during shipment, (d) has been improperly mounted or connected, (e) has not been operated within the equipment specifications, or (f) has been improperly maintained.

Earthsafe reserves the right to reject warranty claims of any kind for equipment for which it has not received full payment.

This warranty is in lieu of all other warranties, express or implied, and all other obligations or liabilities on the part of Earthsafe. Earthsafe assumes no responsibility or liability for any special, incidental, or consequential damage.