

INSTALLATION, OPERATION, AND MAINTENANCE MANUAL

Model C230  
**Pump Controller**

Earthsafe Systems, Inc.  
7553 S. Madison  
Willowbrook, IL 60527

T: (630) 794-5100  
F: (630) 794-5106

[info@earthsafe.com](mailto:info@earthsafe.com)  
[www.earthsafe.com](http://www.earthsafe.com)

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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 carrier's 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 buyer's 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 CentraPlex Control Module is UL listed.

Intended Use. The Earthsafe CentraPlex 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.

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## Safety notices – General Safety Rules – Symbols (danger-warning-caution)

### **SAFETY INFORMATION AND INSTRUCTIONS**

**Danger** — Failure to follow the indicated instruction may result in serious injury or death.

**Warning** — In addition to possible serious injury or death, failure to follow the indicated instruction may cause damage to pump and/or other equipment.

IMPROPER INSTALLATION, OPERATION OR MAINTENANCE OF PUMP CONTROLLER MAY CAUSE SERIOUS INJURY OR DEATH AND/OR RESULT IN DAMAGE TO PUMP CONTROLLER AND/OR OTHER EQUIPMENT. EARTHSAFE'S WARRANTY DOES NOT COVER FAILURE DUE TO IMPROPER INSTALLATION, OPERATION OR MAINTENANCE.

THIS INFORMATION MUST BE FULLY READ BEFORE BEGINNING INSTALLATION, OPERATION OR MAINTENANCE OF PUMP CONTROLLER AND MUST BE KEPT WITH THE PUMP CONTROLLER. PUMP CONTROLLER MUST BE INSTALLED, OPERATED AND MAINTAINED ONLY BY SUITABLY TRAINED AND QUALIFIED PERSONS.

THE FOLLOWING SAFETY INSTRUCTIONS MUST BE FOLLOWED AND ADHERED TO AT ALL TIMES.

### **Symbol Legend:**

**Danger** — Failure to follow the indicated instruction may result in serious injury or death

**Warning** — In addition to possible serious injury or death, failure to follow the indicated instruction may cause damage to pump and/or other equipment.

**DANGER:** The pump controller may include power sources from more than one source. Be sure to disable power from all sources prior to opening the enclosure to access the interior items.

**BEFORE** opening the pump can be sure that power from all sources have been de-energized and locked out.

## General Description

Pump Control Motor Starters and Drives are an important aspect of critical facility fuel systems. Primarily it is to have a simple manual operation to start the pump independent of control power. Here is a good way to classify pump control motor starter configurations:

Class A: Motor starter has (a) code compliant motor protection, (b) a local power disconnect, (c) current sensor or other means of functional feedback, (d) manual start from line power – independent of control power. Earthsafe standard pump motor starters are Class A.

Class B: Motor starter has (a) code compliant motor protection, and (b) a local power disconnect. Many standard industrial motor starters are Class B. Earthsafe economy pump motor starters are Class B.

Class C: Motor starter has (a) code compliant motor protection. Most submersible pump, service station type, motor starters are Class C.

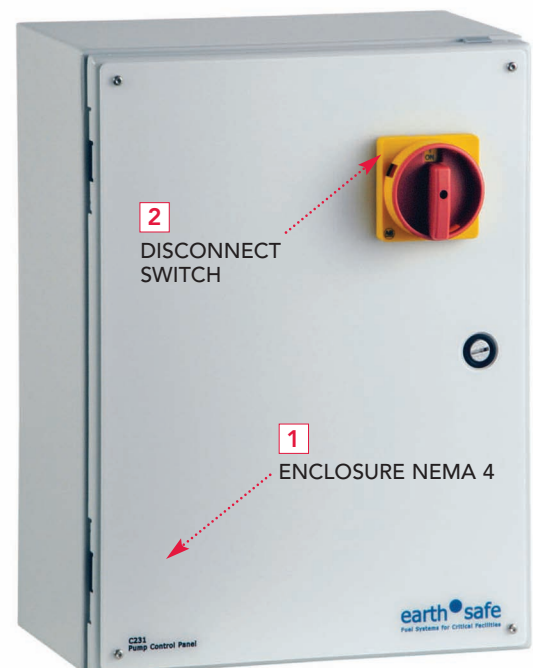
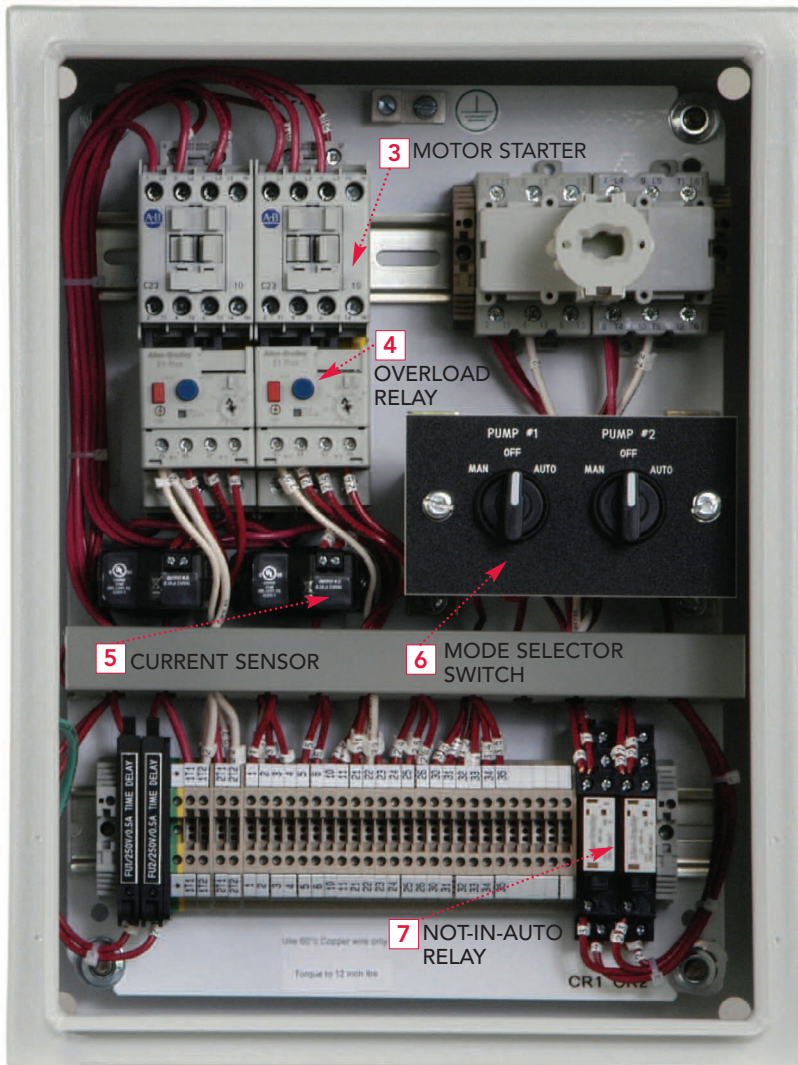
### **Earthsafe VFD Drives**

Earthsafe VFD Drives are designed to soft start - stop and maintain a constant line pressure for feeding multiple day tanks or boilers. The important advantages are:

- (a) Constant pressure is maintained at day tank or boiler inlets, whether a single or multiple units are active at the same time.
- (b) Fluid hammer problems are avoided in longer piping runs by the soft start – stop working in coordination with end of line valve control.

## Physical Description

1. Enclosure: NEMA 4 rated steel enclosure.
2. Disconnect Switch: 3-pole or 6-pole disconnect switch.
3. Motor Starter / Contactor: 3-pole contactor with 120 VAC coil standard.
4. Overload Relay: Overload relay for design motor operating amps with overload trip and relay.
5. Current Sensor: Current sensor for controller proof of pump operation.
6. MODE Selector Switch: Manual-Off-Auto selection switch
7. Not-in-Auto Relay: Provide dry contact for controller feedback.



## Installation

1. Remove packaging and inspect for shipping damage. Note any shipping damage on the shipping ticket and notify Earthsafe within 24 hours of receipt.
2. Install the panel rigidly to a wall surface, or equipment mounting support.
3. Connect power to the pump controller. Reference specific wiring diagrams for the controller.
4. Install wires from the controller to the pump motor. Reference specific wiring diagrams for the controller and the motor.
5. Connect pump start wiring from remote fuel system controller. Connect signal wires in the pump controller to provide feedback to the fuel system controller.

## Startup

1. Check all wiring terminations at the pump controller, pumps, other system controllers, and the power distribution system.
2. Place the controller HOA switch in the OFF position, and the pump controller disconnect switch in the OFF position. Energize the power circuits for the pump controller.
3. Check pump rotation. Correct wiring at the pump motor connection if required for proper rotation. For 3 phase power reverse any 2 wire leads.
4. Check motor overload setting versus the pump nameplate full load amps (FLA) Adjust the overload setting as required. Operate pump at maximum design pressure to confirm no-trip of overload relay.
5. Confirm operation of the pump in Manual and Auto modes.

**Testing**

Perform testing in accordance with the procedure described in the checklist.

Duplex Pump Startup and Test Checklist				
Item	Description	Check	Date	Comments
1	Power to control panel			
2	Power to Pump 1			
3	Power to Pump 2			
4	Pump 1 Manual mode start			
5	Pump 2 Manual mode start			
6	Pump 1 current sensor signal to system control			
7	Pump 2 current sensor to system control			
8	Pump 1 Auto mode start from system control			
9	Pump 2 Auto mode start from system control			
10	Pump 1 Not-in-Auto signal to system control			
11	Pump 2 Not-in-Auto signal to system control			
12	Test overload trip for Pump 1			
13	Test overload trip for Pump 2			

## Operation

1. Pump controller operation.  
Refer to Controller manual for details of duplex pump set operations.

## Maintenance

1. Check tightness of internal wiring on annual basis.

## Troubleshooting — General

1. **Pump does not start:**  
Check power to motor starters and controllers,  
check emergency stop,  
check motor overloads.  
Check pump start signal at controller.
2. **Overload trips:**  
Check relief valve settings on pumps.  
Check for debris in pump head.

## Spare Parts:

1. **Allen Bradley Components**  
Pump controller parts are available from local Allen Bradley distributors worldwide.  
Locate distributors at [www.ab.com](http://www.ab.com)

## Technical Support / Warranty Service

### Technical Support

Contact Earthsafe at

(630) 794-5100

(630) 794-5106 Fax

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### Warranty Statement

Earthsafe Systems, Inc. warrants the pump 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.