

# Gen DEF UM5 Day Tanks

## Installation, Operation, and Maintenance Guide

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### General Information

#### 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

Intended Use. Controls and instrumentation are intended for use with diesel exhaust fluid (DEF) 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.

## **Safety Information**

### **Safety Notice:**

Improper installation, operation, or maintenance may cause serious injury or death and/or result in damage to the unit 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 equipment and must be kept with equipment. Equipment must be installed, operated, and maintained only by suitably trained and qualified persons.

### **General Safety Instructions**

The following safety instructions must be followed and adhered to at all times.

Before opening any tank fitting, pipe system, pump, or valve be sure that:

- Any pressure in the chamber has been completely vented through the appropriate openings or connections.
- The electrical system means has been "locked out" or otherwise been made non-operational so that it cannot be started while work is being done on the equipment.
- You have obtained appropriate material safety data sheet (MSDS) and understand and follow all precautions appropriate for the safe handling of the material.

Install pressure gauges/sensors at piping and pump connections to the equipment to monitor pressures.

Use extreme caution when lifting the tank and associated equipment. Suitable lifting devices should be used when appropriate.

Avoid contact with hot areas of the tank, pump or equipment. Certain operating conditions, temperature control devices, improper installation, improper operation, and improper maintenance can all cause high temperatures on the pump or equipment.

Protect tanks, pumps and piping systems with pressure relief devices.

The equipment must be installed in a manner that allows safe access for routine maintenance and for inspection during operation to check for leakage and monitor operation.

## General Description

The UM5 Tank for DEF storage is used to supply generator SCR emissions control systems. UM5 Tanks are available as stainless steel or High Density Polyethylene (HDPE). Tanks may be single wall, double wall, or double wall with insulation.

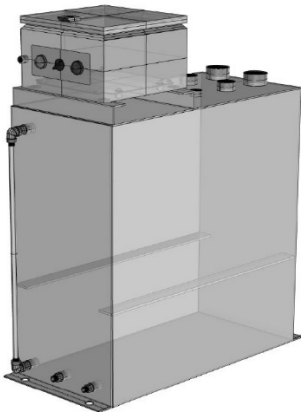
**Stand Alone Tank:** The UM5 tank can be used as a stand alone tank. The generator SCR control panel may have an internal suction pump to draw DEF from the tank and deliver to the SCR equipment.

**Buffer Tank Supply:** The UM5 can be equipped with a simplex or duplex transfer pump to circulate DEF in a pressure controlled loop to supply a single or multiple DEF reservoirs or buffer tanks.

**Head Tank for Reservoir Refill:** Standard generator engines may be equipped with onboard DEF reservoirs. The reservoirs are often equipped with special instrumentation and highly integrated to the engine emissions compliance. The UM5 DEF tank can be setup as a head tank to gravity feed and refill the standard DEF reservoir for the engine.

**Application Guide:** See the Earthsafe Generator DEF Application Guide for additional information.

## Physical Description



1. Primary Tank: Stainless Steel 304 or High Density Polyethylene 9HDPE
2. Containment: Optional Double Wall Construction
3. Insulation: Optional Insulation protected between Double walls
4. Control Panel Support: Support for Control / Instrument Panel
5. Floor Anchor: 4 Point anchor locations
6. Tank Fittings: NPT Tank Fittings Bonded to Tank
7. DEF Suction: Suction Tube Connection with Foot Valve
8. Sight Glass: Side Connections for Sight level Tubing
9. Side Wall Port: Tank Drain or Flooded Suction Port
10. Tank Fill: Adapter and Cap for Manual Fill
11. Vent: 2" Tank Opening with Vent Cap

## Planning the Installation

### Location

1. Location: Locate the tank as close as practical to the engine generator.
2. Accessibility: The tank should be located where it is accessible for inspection, maintenance, and repair.

### Piping

1. Size the DEF supply piping to minimize frictional head loss based on the design flow.
2. Be sure the inside of the pipe is clean before connecting to the day tank.
3. Be sure allowance is made for expansion and contraction of the piping so the tank connections are not stressed by the piping.

## 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. Set unit at installation location. Use proper handling procedures to avoid damage to the unit.
3. Install anchor bolts at 4 corners. Use 3/8 IN minimum diameter bolts or as required for local code compliance.
4. Connect power to tank control panel. Reference specific installation instructions and wiring diagrams for the control panel.
5. Pressure test hydrostatically by filling with clean water and observing water level over 24 hour period. Air testing of tanks is not permitted and will void warranty.
6. Clean field installed piping. Clean all dirt and debris from field installed piping prior to connecting to the tank.
7. Connect piping to inlet and outlet. Confirm that field piping is independently supported to avoid stress on the pump set piping.
8. If required, install vent piping to terminate to the building or enclosure exterior.

## Startup

1. Visually inspect tank installation and associated equipment and piping for proper installation and absence of physical damage.
2. Confirm that all connection below liquid level are liquid tight and closed.
3. Confirm that a vent is installed on the tank to prevent pressure buildup during filling.
4. Confirm that top of tank is clear of dirt and debris.
5. Remove fill cap and visually inspect inside of tank for cleanliness.
6. Fill Tank to 50 % level by transferring from drum, totes, containers, or bulk truck.
7. Inspect the exterior of the tank for leaks or excessive deformation.
8. Continue to fill the tank to maximum 95% tank level. Inspect exterior of tank. Replace tank fill cap.
9. If a pump is to draw DEF from the tank, operate the pump to confirm prime of the suction pipe. Continue the pump startup procedure in accordance with its written instructions.

10. Startup accessory equipment in accordance with its written instructions.

### Testing

The tank may be tested hydrostatically by filling with water to 100% level. Record or mark the fluid height at the start of the test period. After a 24 hour period confirm that fluid level is unchanged. Drain water from the tank.

Air testing of HDPE tanks is not permitted and will void warranty.

### Startup Checklist

Item	Description	Confirm
1	Visual inspection of tank and associated equipment for no damage	
2	Tank and associated equipment is clean and clear of debris	
3	Tank is securely anchored at 4 points	
4	Associated piping is supported and does not cause stress on tank or tank fittings.	
5	Tank fittings below liquid level are liquid tight and closed	
6	Manual isolation valves are installed and closed in piping system where connections are below liquid level or subject to siphon of fluid from tank	
7	Tank vent is installed and assures that tank filling or emptying will not deform tank.	
8	All associated piping and devices are confirmed to be compatible with DEF.	
9	Associated equipment with electrical connections is properly installed. All electrical devices are in a safe de-energized condition until startup of this equipment is performed in accordance with written instructions.	
10	The tank filling method (manual or by transfer pump) is designed to prevent spills or overfills and has been inspected and approved by a competent person.	
11	All required safety items are complete and available in the tank area including personal protective equipment (PPE), MSDS sheets, spill cleanup material. All required safety training has been performed.	

### Operation and Maintenance

1. Visually inspect tank exterior periodically for signs of leakage or damage.
2. Visually inspect tank exterior for dirt or engine fluids. Wipe clean as necessary.
3. Monitor fluid levels and refill tank as required.
4. Tank Pumps, Heaters, Controller operation. Refer to individual manuals for details of day tank operations.

### Troubleshooting

Observation	Troubleshooting
Tank Wall Deformation	<ul style="list-style-type: none"> <li>• Check that tank is properly vented</li> </ul>

	<ul style="list-style-type: none"> <li>• Check for physical damage to tank support elements</li> <li>• Check for excessive heat environment for plastic tanks</li> </ul>
Tank Fitting Damage or Leakage	<ul style="list-style-type: none"> <li>• Check piping connection for stress applied to tank</li> <li>• Check for excessive vibration from piping or motors</li> <li>• Tighten threaded fitting if loose</li> <li>• Remove threaded fitting and apply proper joint sealing then re-install</li> </ul>

### Spare Parts

There are no recommended spare parts for the basic storage tank. See manuals for pumps, heaters, and controls for spare part information.

### Technical Support

Contact Earthsafe at  
 tech@earthsafe.com  
 (312) 226-7600  
 www.earthsafe.com

1000 W. Crossroads Pkwy.  
 Bolingbrook, IL 60490

### 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.