



## Frederick Energy Products FS-SILENCER Range adjust tool for MFG Generator User Manual

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**Frederick Energy Products FS-SILENCER Range adjust tool for MFG Generator**



## Overview

The Field Sense Cab Silencer, model # 1309890, is part of a complete iWAREHOUSE Field Sense System. This device, designed by Frederick Energy Products, installs on lift trucks and creates a pulsing 73 kHz magnetic field. The 73 kHz magnetic field has unique characteristics that a Personal Alarm Device (PAD) detects and recognizes as a signal to ignore standard 73 kHz magnetic fields emitted from iWAREHOUSE Magnetic Field Generators (MFGs). The Cab Silencer is typically installed within the crew cab of a fork truck to silence the truck operators PAD from sounding alarms to magnetic fields from other trucks with MFGs, while the operator is inside the cab. The size of the magnetic field is adjusted such that the field covers the cab volume but does not extend outside the cab. Thus, the operator's PAD is deactivated inside the cab but is reactivated when the operator leaves the cab.

Optional functional uses for Cab Silencer units allow the magnetic field pulses from the Cab Silencer to be slightly altered by switch settings on the Cab Silencer printed circuit board. The Cab Silencer can also be used as an "Aisle Identifier" or "Roadway Marker", where the unit is installed at select locations on facility storage racks. With a proper switch setting, the Cab Silencer unit will emit altered magnetic field pulses that Collision Avoidance Modules (CAMs) can interpret to identify specific types of locations. PADs are not affected by units used as Aisle Identifier or Roadway Marker.

## Theory of Operation

The function of the Cab Silencer is:

- To transmit a 73 kHz magnetic field around a fork truck operator's crew cab to act as a silent zone for PADS worn by the operator while operating the truck.
- In an alternate setting, to transmit variations in the magnetic field pulses that CAMs can detect as location markers.

The Cab Silencer has an internal 73 kHz transmitter and an inductor that creates a pulsed magnetic field around the Cab Silencer. When the unit is mounted on a lift truck, the magnetic field serves as a silent zone in the operator's cab of the truck. In some cases, an EMI background within the operator's crew cab is strong enough to interfere with the operator's PAD detecting/interpreting the Cab Silencer magnetic field. For this case, an internal switch on the printed circuit can be activated to cause the Cab Silencer to emit a more robust silencing field to counteract the EMI interference. Using this setting, however, can result in the performance of the Collision Avoidance Module (CAM) on the truck being affected by the Cab Silencer field if the Cab Silencer is too close to the CAM. To prevent interference with the CAM, the Cab Silencer needs to be located at least 5 feet away from

the MFG/CAM.

When mounted on a facility structure, with proper switch selection, the unit's magnetic field can be set to identify Aisle Identifier or Roadway Marker locations in the facility. When a CAM detects the magnetic field from the unit with switches set for an Aisle Identifier or Roadway Marker, the CAM is able to interpret the type of location where the unit is installed.

### **Operating Frequency**

The Cab Silencer will transmit on a frequency of 73 kHz.

### **FCC/IC Information**

The FCC ID for the FS Cab Silencer is QUI-FS-SILENCER and complies with Part 15 of the FCC Rules. Operation is subject to the following conditions:

1. This device may not cause harmful interference.
2. This device must accept any interference received including interference that may cause undesired operation.

Any intentional or unintentional changes or modifications to the configuration of the Cab Silencer not expressly approved by Frederick Energy Products LLC could void the user's authority to operate the equipment.

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is not guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/technician for help.

The required notices are specified in the RSS documents (including RSS-Gen) applicable to the equipment model. These notices are required to be shown in a conspicuous location in the user manual for the equipment or to be displayed on the equipment model. If more than one notice is required, the equipment model(s) to which each notice pertains should be identified. Suppliers of radio apparatus shall provide notices and user information in both English and French. This device complies with Industry Canada license-exempt RSS standards (s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device. Cet appareil est conforme avecx.

The Cab Silencer also complies with Industry Canada (IC) under Category II radio apparatus with RSS-310:

iWAREHOUSE Field Sense Cab Silencer  
Model: # 1309890  
IC ID: 11625A-FSSILENCER  
Canada 310

### **Operation**

### **Installation Information**

When used to produce a PAD silencing field inside the cab of a lift truck, the Cab Silencer is mounted inside the cab. The exact location varies depending on lift truck model. The Cab Silencer must be at least 5 feet away from the MFG. Performance of the Collision Avoidance Module function of the MFG may be degraded (or silenced) by the Cab Silencer if they are less than 5 feet apart. Installation on the machine needs to be on a 12VDC source, downstream from the ignition. After installation on a lift truck, the magnetic field size of the Cab Silencer should be adjusted using a potentiometer on the printed circuit board such that the silencing field does not extend outside the operator's cab. (See Section 2.5 below) When used as an Aisle Identifier or Roadway Marker, the unit is installed on a fixed structure such as a rack using an interface mounting adapter. The location should be selected such that the truck passing by will pass through the magnetic field from the Cab Silencer. After installing the Cab Silencer, performance of the unit should be verified by operation and test.

#### **Inoperability Warning**

The Cab Silencer may degrade the performance or blind the CAM when installed too close to the CAM. A safe guideline is to keep the Cab Silencer at least 5ft away from the CAM. The purpose of the CAM is to sense the magnetic field from a MFG on another lift truck. If the Cab Silencer is closer than 5ft from the CAM, it may cause the sensing range of the CAM to be degraded or blinded. Then a collision between trucks would be possible.

#### **Charging**

The Cab Silencer is directly powered and requires no charging.

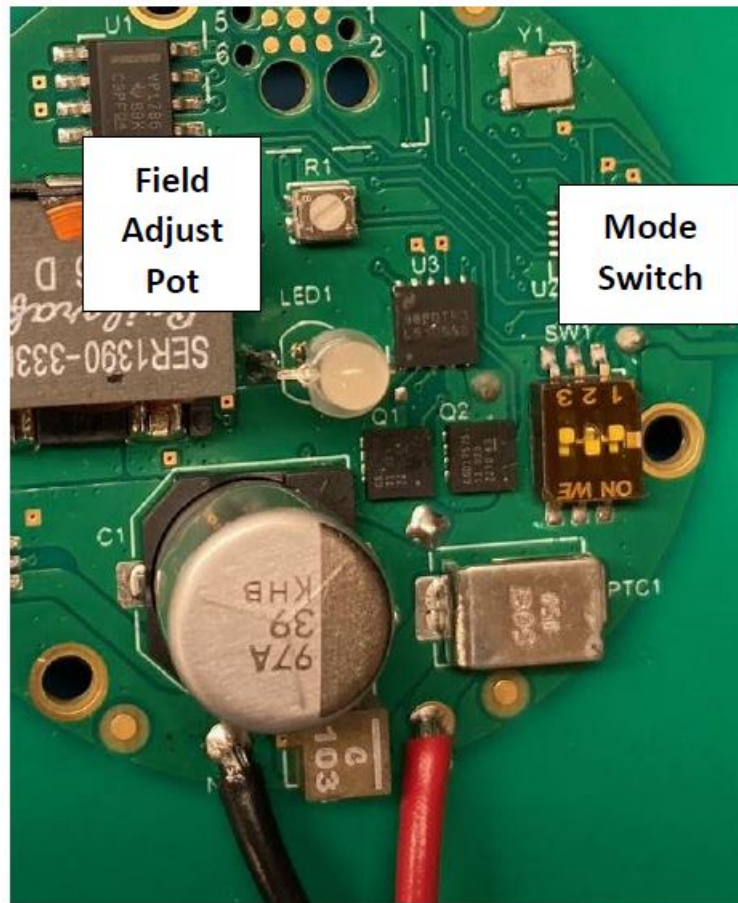
#### **Alerts**

If a pedestrian with a PAD approaches a truck with a MFG system, their PAD could be silenced if they stand too close to a truck with a Cab Silencer. The pedestrian is in danger of being hit by the truck or a foot getting run over if their PAD is too close the Cab Silencer. The operator needs turn OFF the truck while anyone is standing next to the truck.

#### **Maintenance**

The Cab Silencer should be regularly cleaned to reduce buildup of dust and dirt.

#### **Selection of Operational Options**



The Cab Silencer unit has three aforementioned operational modes (Cab Silencing, Aisle Identifier, or Roadway Marker) that can be selected using combination settings of the three-switch unit “SW1” on the printed circuit board. Combinations of the three switch settings allow eight different operational modes. A multi-colored LED emits flashes every 15 seconds to denote which mode is operating. The table below delineates switch combinations for the eight modes and the corresponding LED flashes.

### **Cab Silencer Operational Modes**

Mode	Switch Position	LED Indication *
Silencer (standard)	1 "Off", 2 "On", 3 "Off"	1 Red Flash
Silencer (robust)	1 "Off", 2 "On", 3 "On"	2 Red Flashes
Roadway Marker 1	1 "Off", 2 "Off", 3 "Off"	1 Green Flash
Roadway Marker 2	1 "Off", 2 "Off", 3 "On"	2 Green Flashes
Aisle Indicator A	1 "On", 2 "Off", 3 "Off"	1 Yellow Flash
Aisle Indicator B	1 "On", 2 "Off", 3 "On"	2 Yellow Flashes
Aisle Indicator C	1 "On", 2 "On", 3 "Off"	3 Yellow Flashes
Aisle Indicator D	1 "On", 2 "On", 3 "On"	4 Yellow Flashes

Flash repeats every 15 seconds.

### Adjustments

The Cab Silencer field size is adjustable. To make the adjustment, remove the cover using the three screws securing the cover. To adjust the field size, turn the potentiometer on the printed circuit using a small slotted screwdriver. Turning in a clockwise direction will increase the field size while turning counterclockwise will decrease the field. Adjustments must be made by an approved personnel.

### Interferences

The Cab Silencer may interfere with a MFG/CAM. If the MFG and the Cab Silencer are less than 5 ft apart, the CAM's detection of magnetic fields from MFGs on other trucks may be degraded.

### Cab Silencer Specifications

- Model Number: 1309890,
- Size: 5" x 4.75" x 1.5" (127 mm x 121 mm x 38 mm)
- Weight: 0.56 lbs. (0.26 kg)
- Input Voltage: 12 VDC
- Magnetic Field Frequency: 73 kHz
- Magnetic Field Strength: negligible
- Maximum Current Draw: Less than 5A.
- Transmitter Frequency: NA
- Operating Temperature Range: -30°C to + 55°C; -22°F to 131°F
- Shipping Considerations: None

**Safety Consideration**

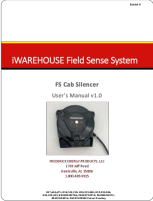
A pedestrian should not be in close proximity to a truck while the truck is in gear. The driver must turn OFF the truck while a pedestrian is standing next to the truck.

**Revision History**

Version 1.0 – April 29, 2021  
Original Release. No revision history.

US7,420,471; US8,169,335; US8,232,888; US5,939,986; US6,810,353; AU2005289704; ZA2007/02919; ZA2008/02673; ZA2010/06816, ZA2010/09068 Patent Pending

**Documents / Resources**

	<p><a href="#">Frederick Energy Products FS-SILENCER Range adjust tool for MFG Generator</a> [pdf] User Manual</p> <p>FS-SILENCER, FSSILENCER, QUI-FS-SILENCER, QUIFSSILENCER, FS-SILENCER Range adjust tool for MFG Generator, Range adjust tool for MFG Generator, MFG Generator</p>
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