



COMPASSPRO

PRODUCT SPECIFICATIONS

How Safeguard Equipment®'s emergency response solution integrates a software application and service with a non-contact personal voltage and current detector.

COMPASS Pro™ Product Specifications

Introduction

The COMPASS Pro™ emergency response solution is the latest product in the COMPASS line of non-contact personal voltage and current (PVCD) detectors by Safeguard Equipment . It represents a revolutionary advancement in the utility and functionality of PVCD's by integrating a hardware detection device with Safeguard Equipment's cell-phone-based software interface (App) to provide emergency response in the event of an adverse electrical or fall event. The COMPASS Pro emergency response solution is unrivaled in providing both preventative assistance as well as reactive assistance to workers who face the risk of electrical injuries. The purpose of this paper is to outline the product specifications of the COMPASS Pro when used in conjunction with the Safeguard Equipment app.

Physical Features



- The COMPASS Pro device clips onto a standard hard-hat. This allows for hands-free operation, and ensures the user can see the unit's LEDs when warning of the presence of an electrical or magnetic field, as well as hear the audible warning.
- A hard-hat mount, as opposed to a chest or armband mount, is less susceptible to being obstructed by surrounding objects, such as the user's body, that can impede detection. The clips are removable and replaceable in the event a clip breaks or is lost.

- The device weighs less than one ounce and measures 3.0 W x 1.4 D x 0.9 H inches (including clips).
- The device has an SOS button (discussed below) to signal the need for emergency response, and a power button that both turns the device on and off as well as activates other operational features (discussed below).
- It operates off of a rechargeable 250mAh Lithium-Polymer (LiPo) battery. It has an integrated charging port, and fully recharges in approximately 1.5 hours on a USB 2.0 Micro B (5V) charger.
- Battery life is approximately 80 hours on a single charge, with battery life being less if alerts are repeatedly activated. Battery level is displayed whenever the device is turned on, and when the device comes out of “hibernation.” When battery life dips below 8 hours, the battery level will flash every 30 minutes. In addition, battery level is always visible in the Safeguard Equipment app.
- It is fully operational in virtually any weather conditions: IP-67 water-resistance rating and temperature rated for -20 degrees to 60 degrees C (-4 degrees to 140 degrees F).

Operational Features

The COMPASS Pro has many of the same features as the precursor line of Safeguard COMPASS PVCD's, with added functions provided through Safeguard Equipment's integrated cell-phone-based App. No other PVCD on the market has the breadth of utility as the COMPASS Pro emergency response solution in providing early and accurate detection of electrical dangers, as well as providing timely emergency response to an electrical or fall injury event.

The following Operational Features outline the primary warning alert capabilities of the COMPASS Pro emergency response solution.

- The Safeguard Equipment app can be installed on any iOS or Android device. Its utilities are discussed under each feature listed below.
- The hardware device has two buttons: a main power button, and an SOS button (discussed below). The main power button turns the device on and off, and performs several other functions, including setting the device sensitivity, activating the Smart Adaptive mode, and deactivating an emergency alert.
- The Safeguard Equipment app, also, can be used to set device sensitivity (including setting the voltage detection range), activate and deactivate the Smart Adaptive mode, and activate or deactivate an emergency call.
- The COMPASS Pro device has a 360 degree range of detection.
- The device can detect voltage by detecting the presence of electrical fields. Voltage detection is indicated by white LED's and an audible signal. For voltage threats, the line of LED indicators provide directional information by lighting up in sequence in the direction of the source of the electrical field, informing the user of where the energized source is located.
- Through the use of the Safeguard Equipment app, the user can set the range of voltage detection (Low, Medium, and High), as well as display voltage measurements in graph form.

- In addition to voltage, the device can detect current even in buried or insulated lines, if the current is strong enough and not obstructed by a ferrous metal barrier. Detection of current is indicated by blue LEDs; directional information cannot be determined with magnetic fields.
- Through the Safeguard Equipment app, current detection measurements can be displayed in graph form.
- The COMPASS Pro has seven different sensitivity settings, so that the device can be set to alert only when a worker is within a given range of an energized source, in some cases as far as 30 feet away, depending upon the voltage or current field strength. Sensitivity settings can be adjusted both by use of the main button and through the Safeguard Equipment app.
- The device has a Smart Adaptive Mode, which can be activated on the device itself, as well as through the Safeguard Equipment app. When in this mode, even if a user is within the set sensitivity range of an energized source, alerts are silenced while a user is stationary, and remains silenced unless and until the unit detects an increase in the electrical or magnetic field, such as in a voltage surge or if the user moves closer to the source. Once the unit detects that the field is stable, the adaptive feature resets, again only sending an alert if the electrical field becomes stronger. The device will similarly reset if the electrical field strength weakens. This feature allows the user to operate within range of a given electrical field without receiving constant alerts, yet receive a warning whenever the risk increases.
- Firmware for the hardware device can be updated through the App.

Emergency Response Features

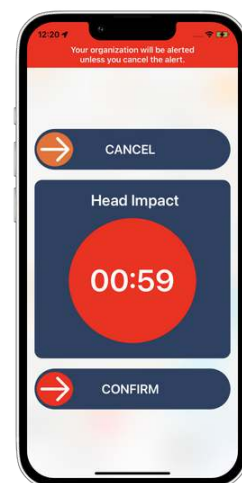
Being able to obtain prompt medical assistance is often the most critical factor determining the survivability of an adverse electrical event. For this reason, the COMPASS Pro device and integrated Safeguard Equipment app provide an automated emergency call protocol that is robust and methodical, designed specifically to summon prompt emergency response for a downed worker whenever needed. At the same time, it provides sufficient user involvement to prevent false alerts and keep internal company personnel informed of worker status, removing some of the anxiety and uncertainty that often accompanies sending crews out on difficult or dangerous jobs, or sending lone workers out.

The COMPASS Pro unit, in conjunction with the Safeguard Equipment app, combine to form an emergency response solution. The products, when used in conjunction with one another, feature the following emergency response utilities:

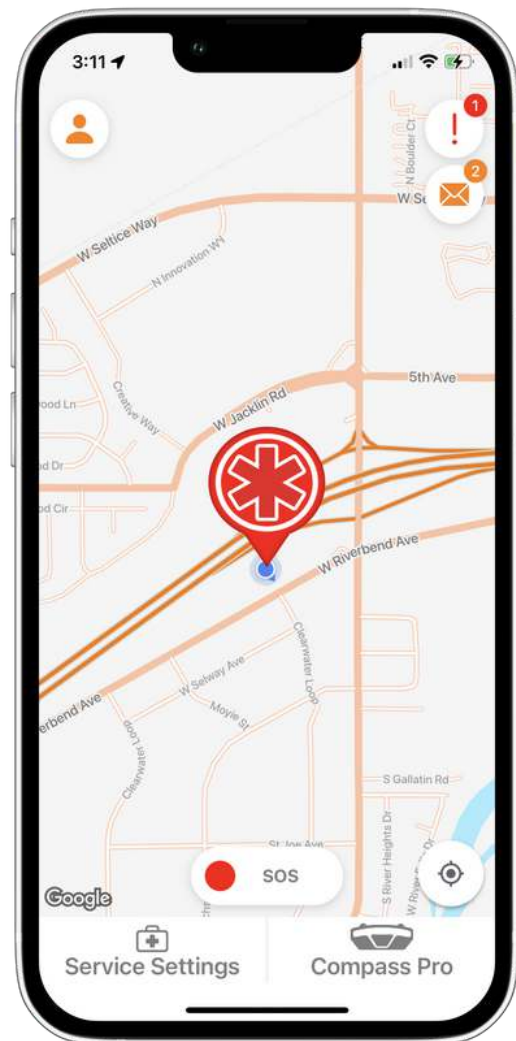
- During initial set-up, the App requires the user to input specific information, including the worker's identity information and the contact information for an internal (company) emergency response team. The user will also pair the hardware detection device with the App. This set-up procedure enables the user to utilize all of the App's utilities, so long as the user is within a cell-phone service area via Bluetooth® enabled connectivity.
- SOS button: this button, when held down for 5 seconds as indicated on an LED countdown timer, allows the user to immediately initiate an emergency response for any reason, even if the device has not detected an adverse electrical or fall event. In this way, the device provides greater utility for any type of serious injury for which emergency response is required, such as a vehicle accident, heart attack, or criminal

assault. The SOS alert is available both on the device itself, as well as from the App screen. Again, this utility only operates if the user is within a cell-phone service area; if there is no connectivity, the device will indicate this by flashing orange LED's and an error tone every 2 seconds while the button is being depressed.

- The Safeguard Equipment app allows the user to enable or disable specific emergency detection features on the COMPASS Pro device: arc-flash detection, fall detection, head impact detection, man-down detection, and location sharing. The location sharing feature is only activated when an emergency alert is triggered.
- eArc-flash detection: The unit has an arc-flash detector, which is specifically calibrated to detect only those wavelengths of light emitted by an arc-flash.
- Fall/impact detection: the unit has an accelerometer which will detect the change in acceleration when the device falls from a distance greater than 6 feet and when it stops falling (impact).
- Man-down detection: when the unit detects an arc-flash, fall, or impact, the device will further monitor movement. If no movement is detected, the App will also initiate a man-down alert.
- Once an arc-flash, fall, or impact is detected, the App will begin a 60-second countdown timer, during which the user can deactivate an alert. The countdown timer is to prevent false alarm emergencies: the user has the ability to disable the alert by holding the power button down for approximately two seconds. The App also gives the user the option to summon immediate assistance without waiting for the countdown timer to complete its countdown.



- Through the Safeguard Equipment app, the user can communicate with the response team by using the cell-phone touch screen's pre-set responses, such as "Call 911", "I need an ambulance," or "I'm okay."
- If the user does not deactivate an alert within the one minute window, the App will notify the designated response team, identifying the user, giving the exact time of the event, and indicating what event has been detected. The App will also activate geo-location information for the cell-phone. This will allow the response team to provide this information accurately to 911 services.



Conclusion

Despite extensive training, implementation of detailed safety procedures, and use and improvements in PPE, electrical injuries and deaths continue to occur in work environments. There is no way to completely avoid the inherent danger that lies in working with energized sources.

While detection of the presence of electrical dangers for linemen, electricians, construction personnel, and other workers creates a first line of defense to the risks of working in and around energized sources, Safeguard Equipment recognizes that the welfare of these workers cannot depend solely on preventative measures.

Safety of workers also depends on responding immediately and appropriately to an accident. Consequently, Safeguard Equipment's new generation of PVCD, the COMPASS Pro device, along with Safeguard Equipment's integrated app, provides an emergency response solution with capabilities that not only detect adverse events, but will appreciably shorten the reaction time for emergency personnel to respond to an adverse event.

Extensive research and thought on the practical realities of workers who operate in dangerous and at-times chaotic situations has informed the design of the COMPASS Pro. Safeguard has made every effort to make the COMPASS Pro and the Safeguard Equipment app convenient and simple to use so that it can be utilized everyday as standard safety equipment, providing enhanced peace of mind to companies, workers, and their families.