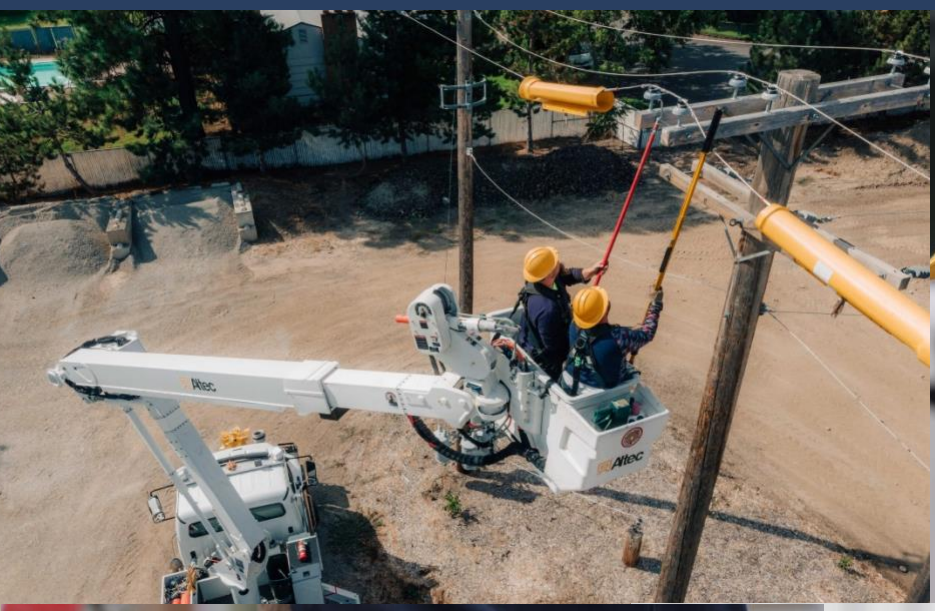
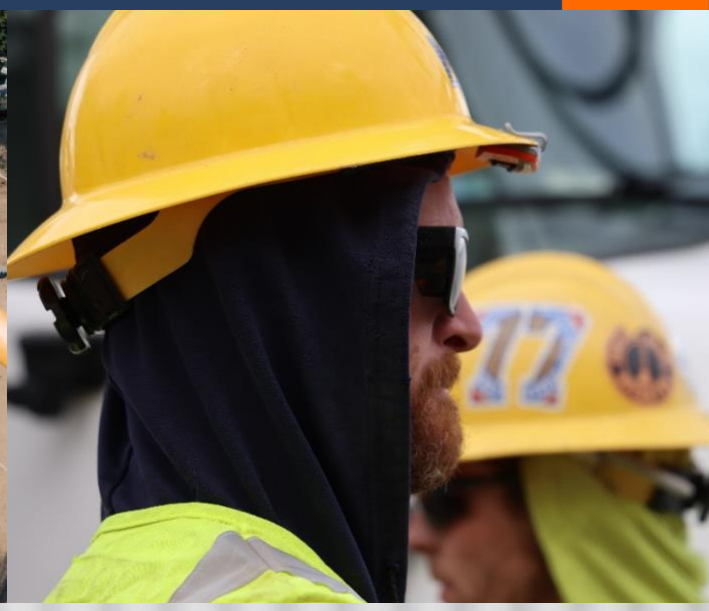
# COMPASS® SERIES

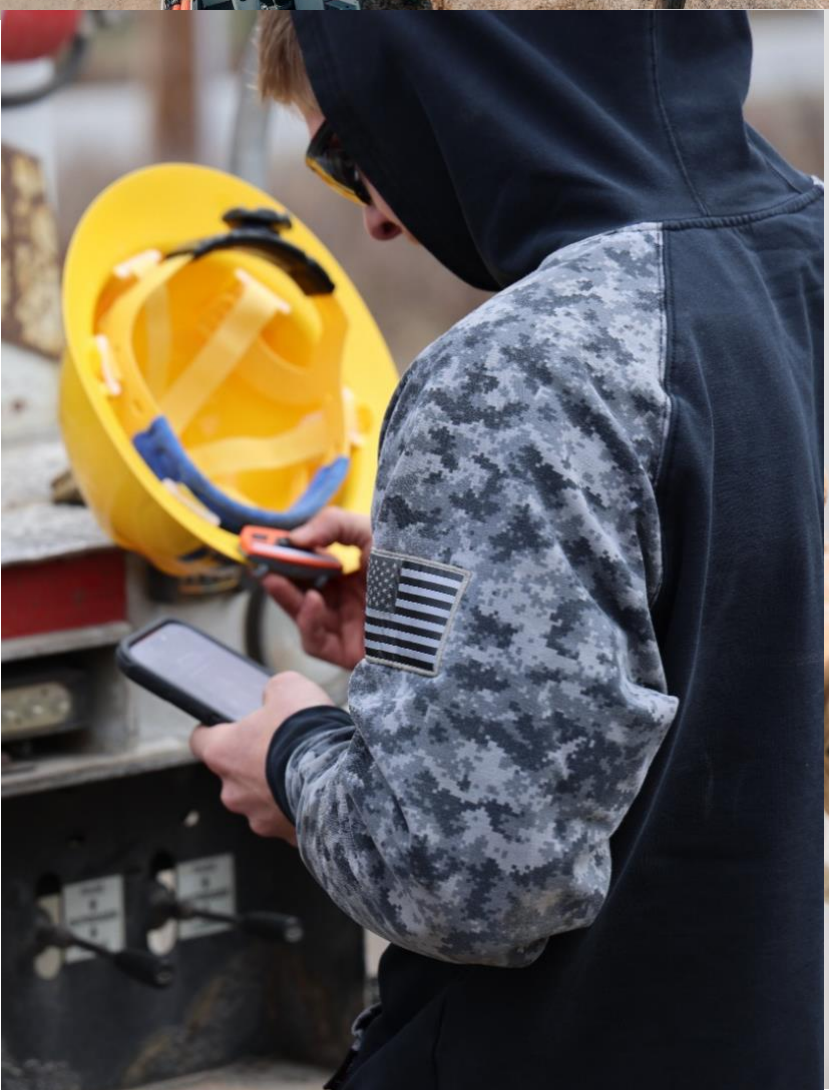
## USER GUIDE

www.safeguardequipment.com

SAFEGUARD









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# Introduction

The Compass Series device is an advanced voltage and current detector with built-in emergency response features. Compass Series has a proven track record of helping prevent serious injury for anyone working in or around live alternating current (AC). Alerts are generated based on configurable settings that warn users of nearby energized electrical sources and their location.

Two adaptive modes are available that can be used to automatically pick a setting for your local working environment. Use the device in Smart Adaptive mode for the simplest overall operation and use the Work Zone Adaptive mode for ultimate control over when the device adapts to the local environment.

The device can be used standalone, but when paired with Safeguard Navigator Mobile App and optionally the Safeguard Navigator Console, additional features and controls are available. The internal sensors in Compass Series can automatically detect and share emergency events such as falls, impacts, and arc flashes with your team. Compass Series also has SOS capability that can be triggered with the press of a button, and no movement/man down information is automatically added to emergency events when detected.

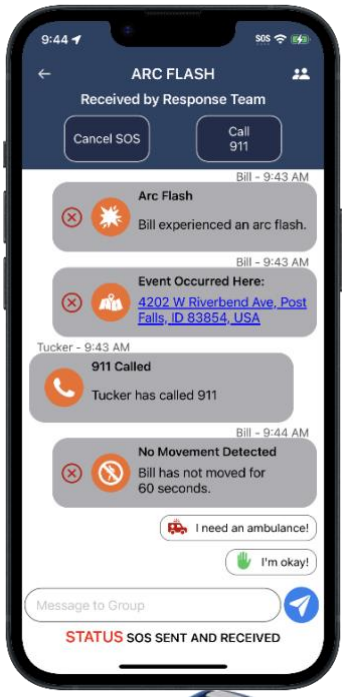
## Primary Functions

- Identify live conductors
  - Voltage detection with directional alerts
  - Current detection
  - Adaptive features
  - Configurable visual & audible alerts
- Identify emergencies (With Safeguard Navigator Apps)
  - Arc flash detection
  - Impact detection
  - Fall detection
  - No movement detection/man down
  - SOS button
- Facilitate fast emergency response (With Safeguard Navigator Apps)
  - Emergency type information sharing
  - Team emergency communication via SMS and in-app messaging
  - Event logs






*COMPASS Pro IS (for use in hazardous locations)




# Specifications







| Features | Compass Core<br>M01030 (50hz)<br>M01029 (60hz) | Compass Pro<br>M01009 (50Hz)<br>M01012 (60Hz) | Compass Pro IS<br>M01024 (50Hz)<br>M01023 (60Hz) |
|---|---|---|---|
| Size | 3.0” (77mm) X 1.4” (35mm) x .9” (23mm) | | |
| Weight | 0.95 oz (27g) | | 1.02 oz (29g) |
| Ingress | IP-67 | | |
| Enclosure | Flame Retardant: UL recognition 94 V-0 at 1.5 mm, Electric Strength (IEC 60243-1): 34kV/mm, Electric Volume Resistivity (IEC 60093): 1.0E+14 ohms-m | | |
| Battery | Rechargeable Li-Po Battery (3.7V, 250mAh). Typical life 6 days (48+ hours), varies with usage. | | Rechargeable Li-ion Battery (3.7V, 85mAh). Typical life 2 days (16+ hours), varies with usage. |
| Operating Temp | -20°C to 60°C (-4°F to 140°F) | | -20°C to 50°C (-4°F to 122°F) |
| Charging | 0% to 100% in 1.5 hrs. USB minimum 5V, 0.5A<br>Only charge in ambient temps 0°C to 45°C (32°F to 113°F) | | |
| Detection Frequency | 50 Hz and 60 Hz options available | | |
| Detection Voltage | 2.4kVAC - 34.5kVAC | 120VAC - 500kVAC | |
| Voltage Settings | 2 settings*<br>**Setting 12 and 16 selectable via Safeguard Navigator Mobile App* | 22 settings + 2 Adaptive modes + Alert Disable | 21 settings* + 2 Adaptive modes + Alert Disable<br>**Setting 22 is not available* |
| Directional Accuracy | Point source accuracy: Approximately ±20° | | |
| Current Settings | 1 setting (locked to setting 11) | 11 settings + 2 Adaptive modes + Alert Disable | |
| Emergency Detection | Impacts: Above 190g<br>Falls: Greater than 6ft (1.8m)<br>Arc Flash: Minimum of 4 Cal/cm2 with +/- 45 degrees viewing angle. | | |
| EMC | FCC Part 15B Class B: ICES-003 Issue 7 FCC Part 15C: IC RSS-GEN<br>Directive 2014/53/EU (Radio Equipment Directive (RED)), EN 300 328 V2.2.2, EN 301 489-1 V2.2.3, EN 301 489-17 V3.2.6 | | |
| Safety | ANSI/ISEA Z89.1-2014 - Class E Helmet, Tested Accessory | | ANSI/ISEA Z89.1-2014 - Class E Helmet, Tested Accessory<br>UL 60079-0, 60079-11 & 61010-1<br>CSA C22.2#60079-0, 60079-11 & 61010-1-12<br>IEC 60079-0, 60079-11<br>*See “*Compass Pro IS Annex*” for additional safety information.* |
| Environmental | Directive 2011/65/EU (RoHS 2), Directive 2015/863/EU (RoHS 2 amendment), EN IEC 63000:2018, Directive 2006/66/EC (Battery RoHS)<br>REACH (EC) No 1907/2006: No SVHC above 0.1% by weight evaluated to SVHC candidate list January 23, 2024 (240 substances).<br>California Proposition 65: ⚠ This product can expose you to chemicals such as Ethylbenzene, which is known to the state of California to cause cancer. For more information go to www.P65Warnings.ca.gov | | |
| Conformances (To Other Standards) | ASTM F3283/F3283M - 18: Standard Specification for the Manufacturing of High Voltage Proximity Alarm to be used for the Detection of Overhead High Voltage Alternating Current (AC) | | |

# Getting Started

Before using your Compass Series device ensure it is fully charged. Open the USB cover and connect the cable provided. The device will show a charging status indicator. If it does not, please wait for it to charge.




Solid Red LED: Charging




Green LED: Fully Charged

For the best usability we recommend using your Compass Series device with the Safeguard Navigator Mobile App. See our “Navigator Mobile User Guide” for details. The Safeguard Navigator Mobile Apps are free for download from the Apple App Store (iOS) and Google Play Store (Android).
Your Compass Series device can be used without the Safeguard Navigator Mobile App, but with some features limited.

Turn on the Compass Series device with a quick press of the MAIN button. On power up, the battery status is displayed by a sweeping green LED display. Examples are shown below.




Battery 50% Charged




Battery 90% Charged

# Voltage & Current Alerts

When a nearby voltage or current source is detected by your Compass Series device, it will issue audible and visual LED alerts (RED for voltage, BLUE for current). As the source is approached, the urgency and frequency of the alerts will increase. See the Settings section for information about adjusting the sensitivity setting for each type of alert.



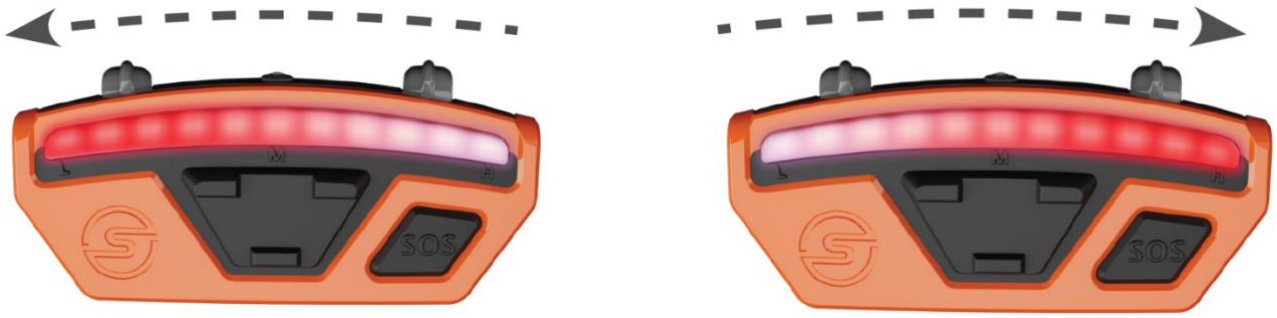

Red = Voltage Alerts




Blue = Current Alerts

## Directional Voltage Alerts

If your Compass Series device is alerting and detects a voltage source originating off to the left or right side of the device, it will generate a directional alert to indicate the direction to the voltage source. This is shown with sweeping RED LEDs.



The directional alerts will stop when the user is facing the source. This is indicated by RED LED flashes at each end of the light bar.

# Settings Navigation

## Long MAIN Button Press

1. Press and hold the MAIN button until the corner lights turn RED to change voltage settings or BLUE to change current settings. Release the button at the desired color to enter the menu.



Voltage Settings Menu



Current Settings Menu

2. The setting is indicated by how many BLUE/RED lights fill the light bar. Click the MAIN button quickly to cycle through the settings.
3. 0 LEDs means the alert will be disabled, 1 LED is the lowest setting (least sensitive), and 11 LEDs is the highest setting (most sensitive). See the Detection Distances section for more information about standoff distances for each setting.



Voltage Setting: 16*

*The voltage menu has 22 settings and uses half lit LEDs to indicate odd numbers



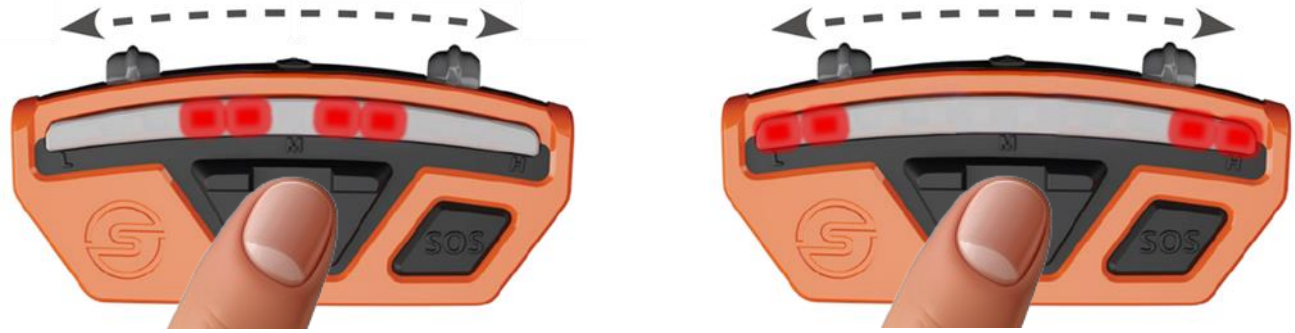
Current Setting: 3

4. Smart Adaptive setting is designated by the lights filling from the center out and fading back to the center. See the Trigger Adapt section and the Adaptive section for more details on adaptive operation.




Voltage Smart Adaptive Setting Shown (Current Smart Adaptive same but with Blue LEDs)

5. Work Zone Adaptive setting is designated by two lights moving from the center out. See the Trigger Adapt section and the Adaptive section for more details on adaptive operation.




6. When finished press and hold the MAIN button for 1 second to save the setting.

# Transit/Mute Mode

## Single MAIN Button Press

Use a single MAIN button press to enter and exit Transit/Mute Mode. Transit/Mute Mode uses your devices currently used setting, mutes audible alerts, and changes the visual alerts to a less obtrusive fade in/fade out effect. Use Transit/Mute mode when transitioning between work areas to silence alarming but maintain awareness of surrounding electrical sources.




Enter Transit/Mute Mode

2x Slow Corner LED Flash/Beep
(Enter Transit/Mute Mode)



Exit Transit/Mute Mode

3x Fast Growing LED Flash/Beep
(Exit Transit/Mute Mode)

# Trigger Adapt

## Double Main Button Press

Use a double MAIN button press to trigger the Adapt function when using either voltage or current in Adaptive mode. This will automatically pick the best setting for your local environment and silence alerts. See the Adaptive section for more details about the Adaptive Modes.

After triggering, the Compass Series device displays a single red LED for 1.5 seconds. Remove your hands from the device during this time to maximize the accuracy of the adapt feature. After the 1.5 seconds is up the Adapt is performed and an animation will show what the device has done.

Adapting to a higher field level than the previous setting is indicated by a growing LED pattern and rising sound.
Adapting to a lower field level than the previous setting is indicated by a shrinking LED pattern and a lowering sound.
The final setting the device has picked is displayed at the end of the animation.




Adapt Triggered 1.5 seconds Adapting to Higher Field Level
(Growing LED Pattern and Rising Sound)
(Device set to Setting 18)

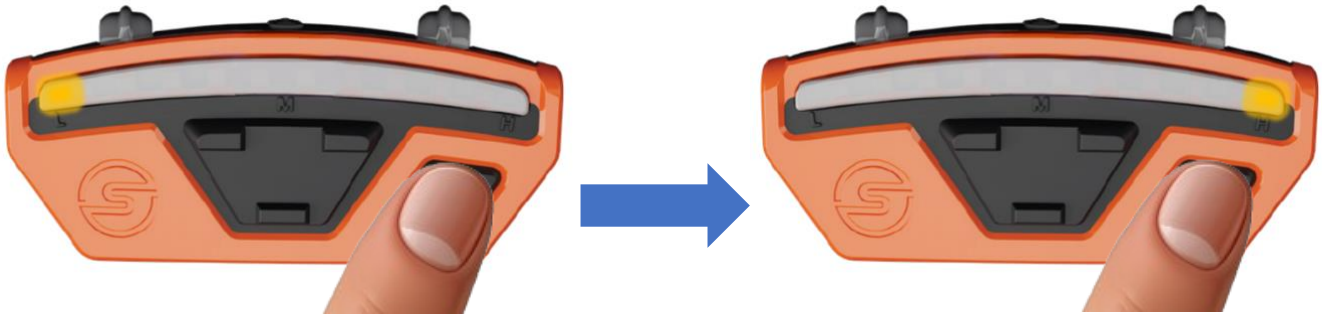



Adapt Triggered 1.5 seconds Adapting to Lower Field Level
(Shrinking LED Pattern and Lowering Sound)
(Device set to Setting 21)

# Trigger SOS

## Long SOS Button Press

Use a long SOS button press (3 seconds) to trigger an SOS signal. This feature is available when your Compass Series device is connected with the Safeguard Navigator Mobile App and the emergency service enabled. An orange LED will travel across the display over the course of the 3 seconds the button is held to show when the SOS will be sent.



## Device Heartbeat

The Compass Series device flashes a heartbeat every 2 seconds.
A green heartbeat indicates that the device is connected to the Safeguard Navigator Mobile App and the user's phone is connected to a network (Wi-Fi or cellular data).
A WHITE heartbeat indicates that one of these network/connectivity conditions is not met.



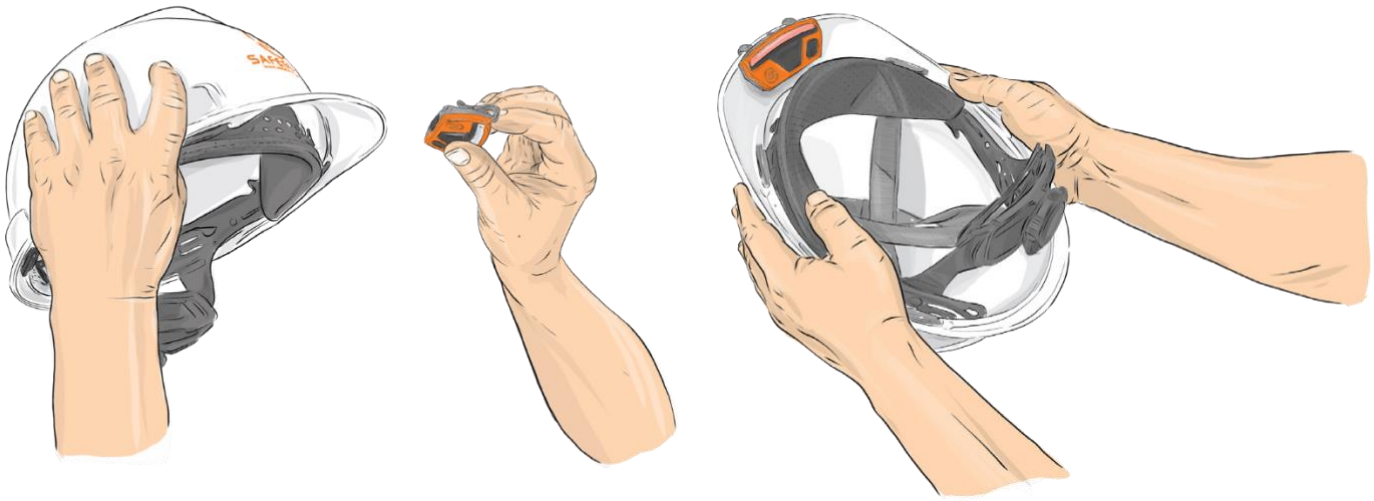

Green = full connectivity




White = no or partial connectivity

# Device Mounting

## Helmet



Compass Series devices are designed to be worn on the brim of a helmet. Ensure the unit is within the user's peripheral vision to maximize effectiveness.

The Compass Series can mount to helmet brims that are 0.04" (1mm)" to 0.24" (6mm) thick and at least 1.25" (32mm) wide. For helmets with brims that do not conform to these dimensions we offer a variety of adapters. Please see "Compass Series Accessories Guide" for available options. New adapters can be developed on request.

## Alternative Mounting

The Compass Series can alternately be mounted to the end of a lineman hot stick, worn via wrist strap, and used in handheld mode with the corresponding accessory. See "Compass Series Accessories Guide" for further details.

## Clip Replacement

The Compass Series mounting clips are replaceable should they become broken or ineffective.



**Step 1**
Broken Clip

**Step 2**
Remove Broken Clip

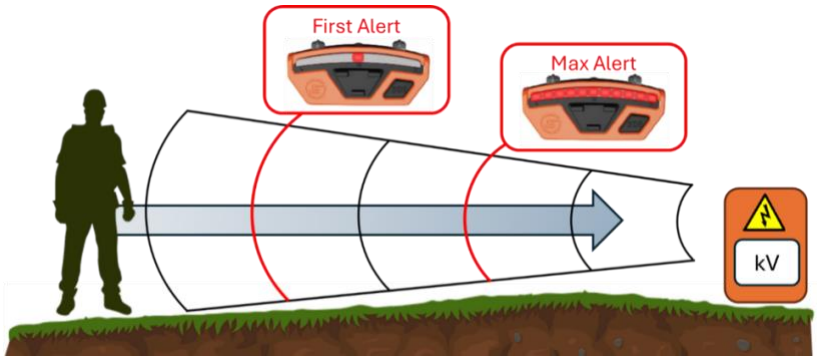
**Step 3**
Install New Clip

# Voltage Detection Distances

## Helmet

Distances are measured using a 10ft (3.0m) wire elevated 6 feet (1.8m) above the ground, in an outdoor setting (26°C and 35% RH) by a tester walking with a Compass Series device mounted on a helmet as shown below.

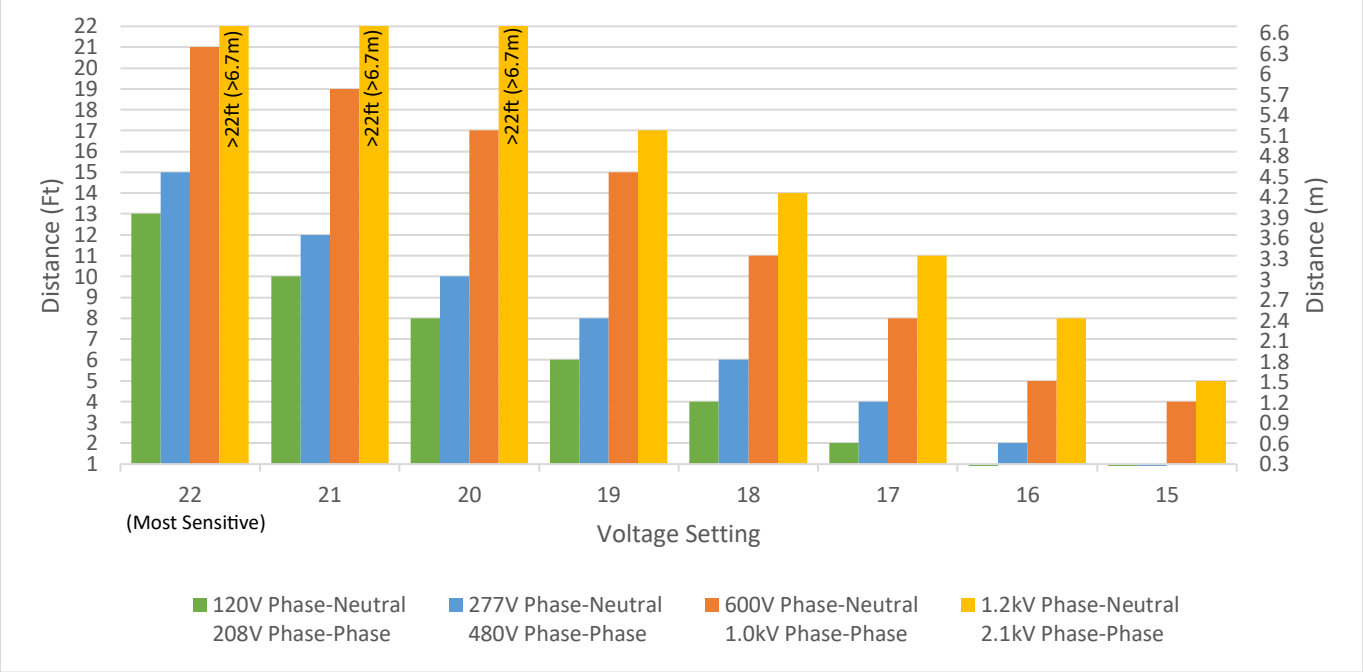




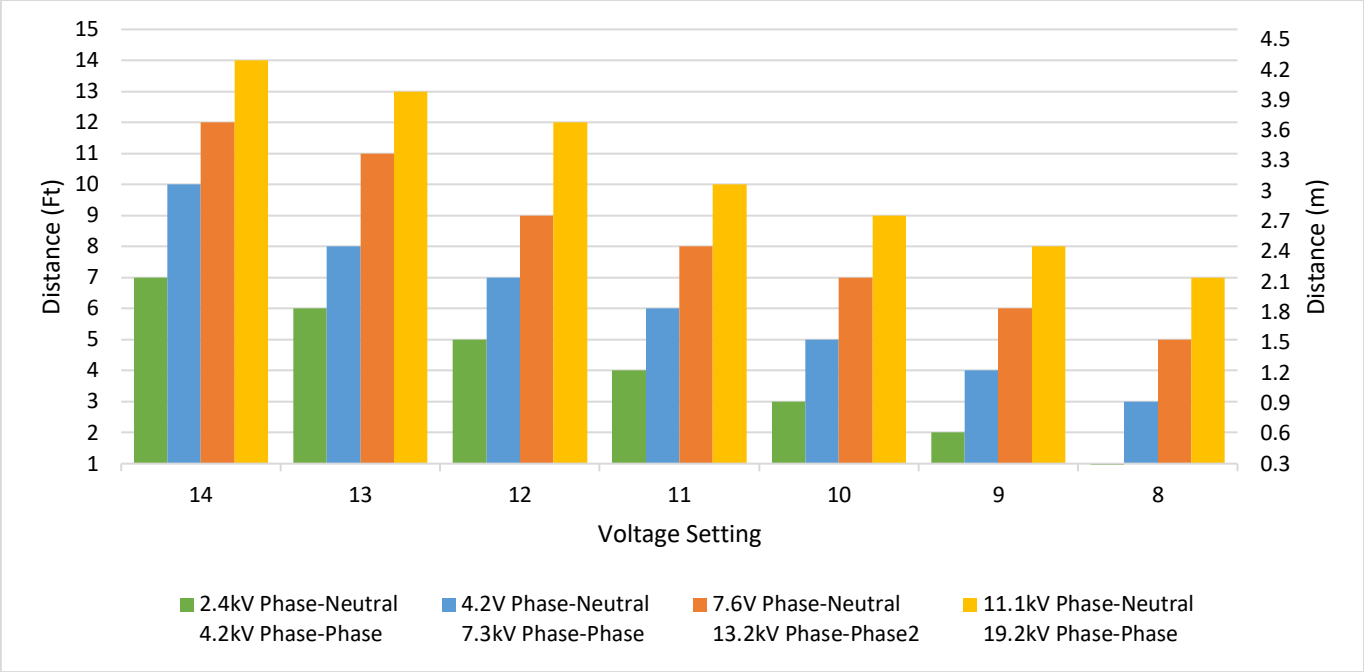

A Max Alert can be expected at roughly 60% of the distance where the First Alert occurred. Example: A First Alert at 10ft (3.0m) will result in a Max Alert at 6ft (1.8m).

In the plots below if a setting does not have an entry for a given voltage, no alert was experienced during testing and that setting is not recommended for use around that voltage.

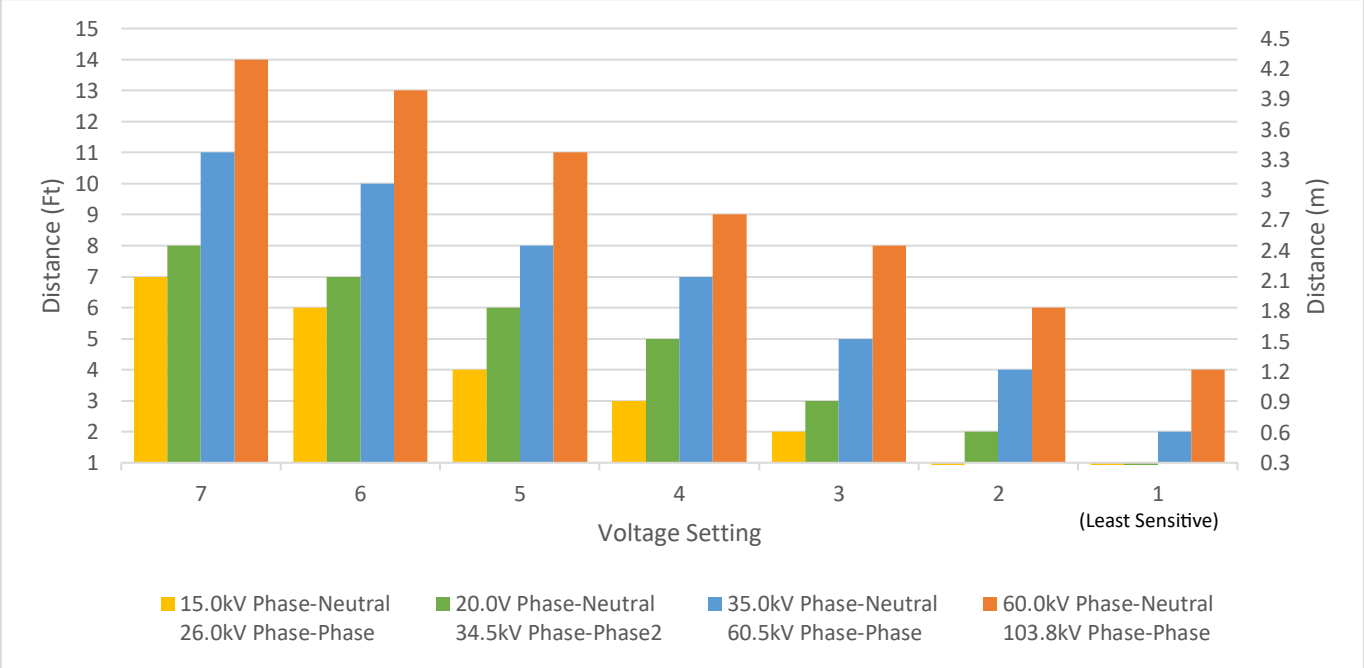
## Low Voltage Examples, First Alert Distances




## Medium Voltage Examples, First Alert Distances




## High Voltage Examples, First Alert Distances

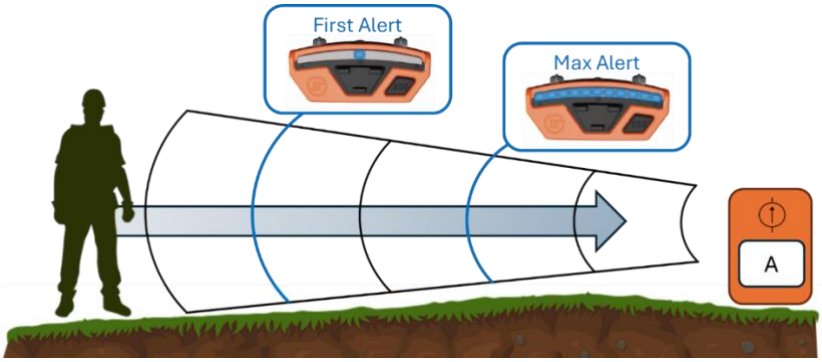


# Current Detection Distances

## Helmet

Distances are measured using a cable carrying current elevated 6 feet (1.8m) above the ground, in an outdoor setting (26°C and 35% RH) by a tester walking with a Compass Series device mounted on a helmet as shown below.

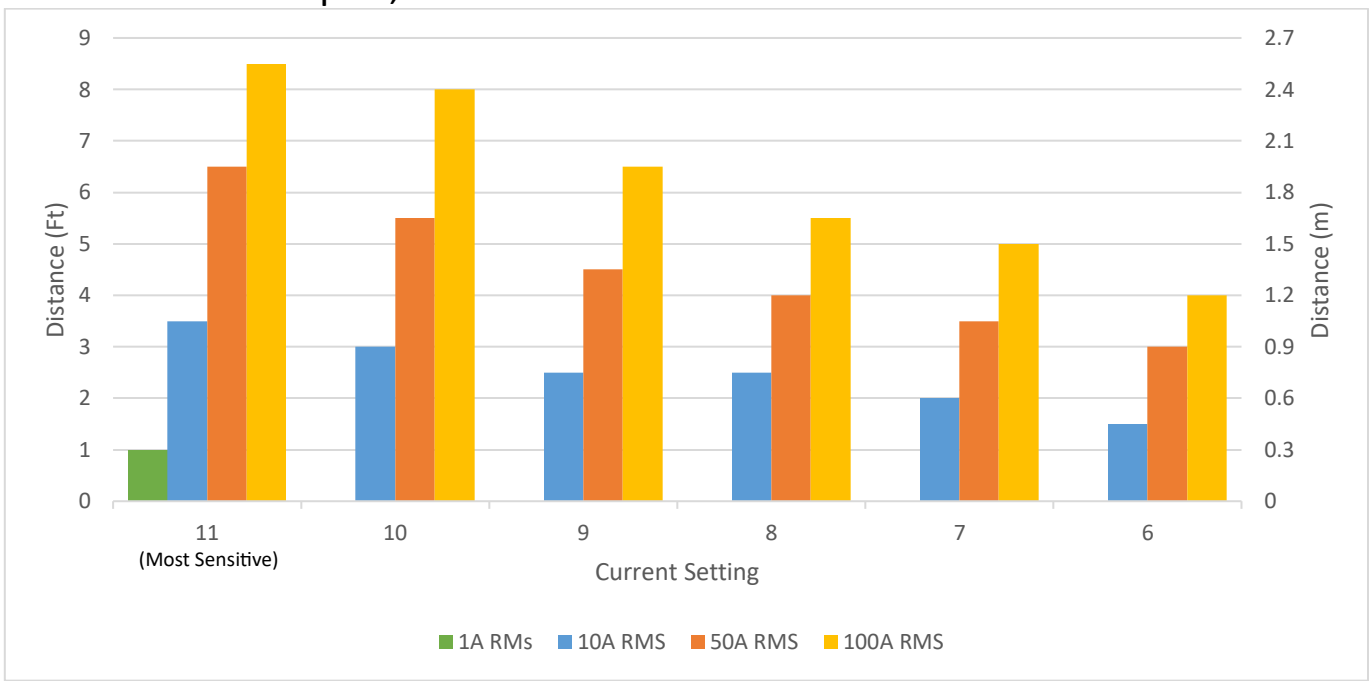




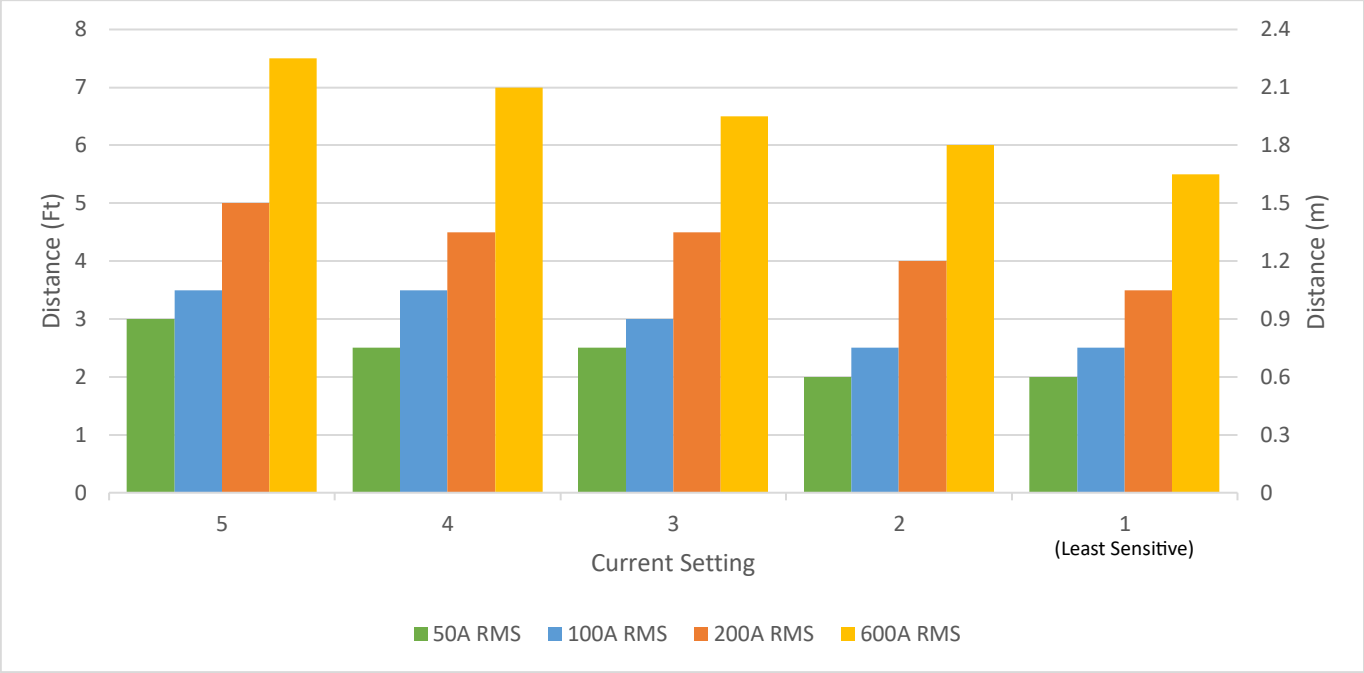

A Max Alert can be expected at roughly 60% of the distance where the First Alert occurred. Example: A First Alert at 10ft (3.0m) will result in a Max Alert at 6ft (1.8m).

In the plots below if a setting does not have an entry for a given current, no alert was experienced during testing and that setting is not recommended for use around that current.

## Low Current Examples, First Alert Distances



## High Current Examples, First Alert Distances

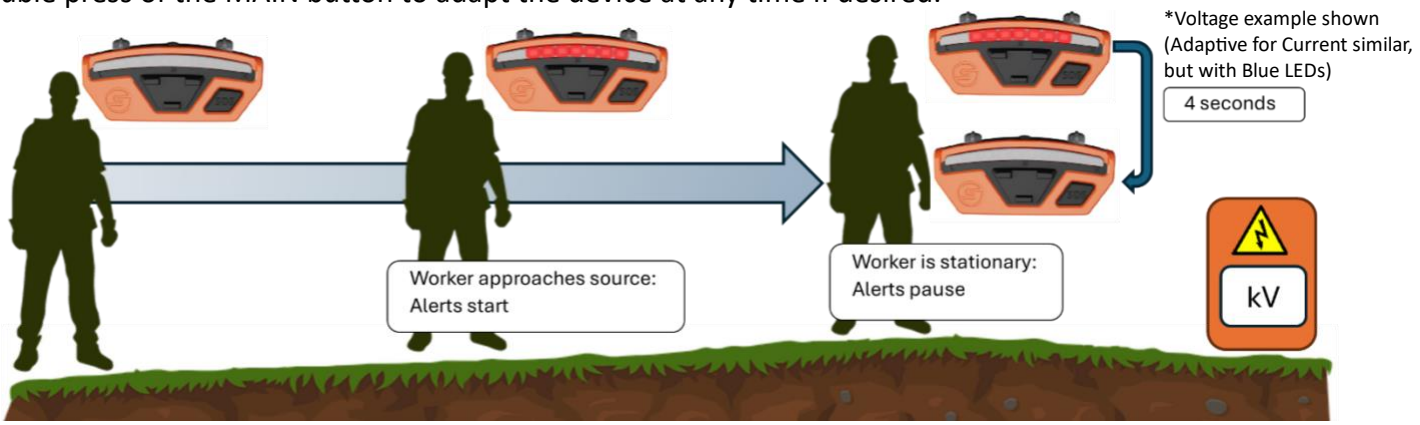


# Adaptive Modes

The Compass Series has two Adaptive modes that simplify operation for users working in environments where electric and magnetic fields are known to be present. In its Adaptive modes Compass Series can adapt to the local ambient fields and pause alerts while the user is working within a specified area.

## Smart Adaptive Mode

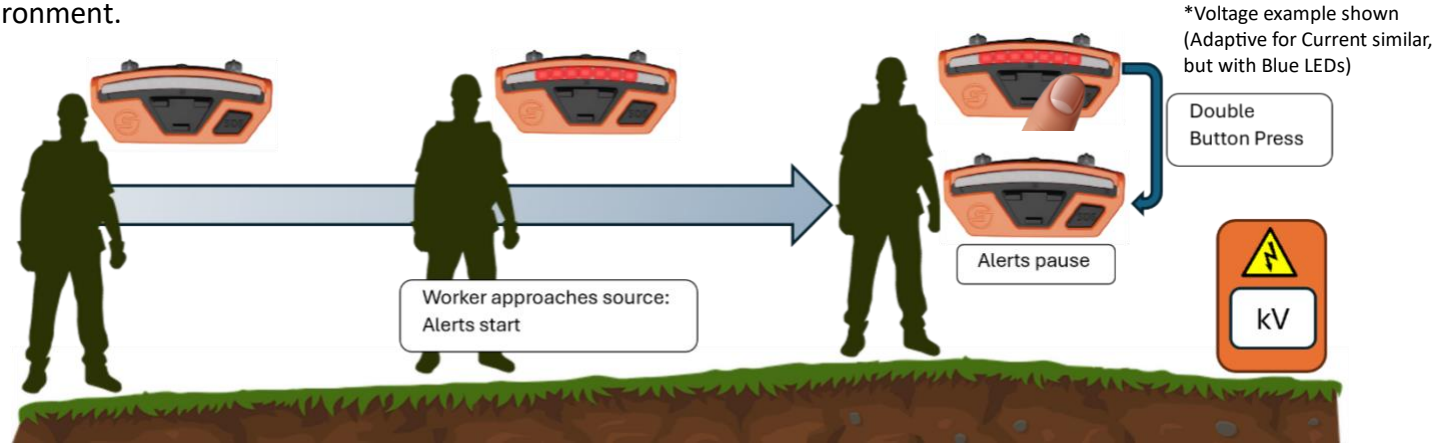
As the user moves towards a source, alerts will be generated. If the user remains stationary in this new location for approximately 4 seconds, the device will automatically adapt to the ambient field level and alerts will pause. If the user begins moving toward the source, alerts will begin again. The user can also use a double press of the MAIN button to adapt the device at any time if desired.




As the user moves further away from the source, alerts will not be generated. If the user remains stationary in this new location for approximately 4 seconds, the device will adapt to the new ambient field level.

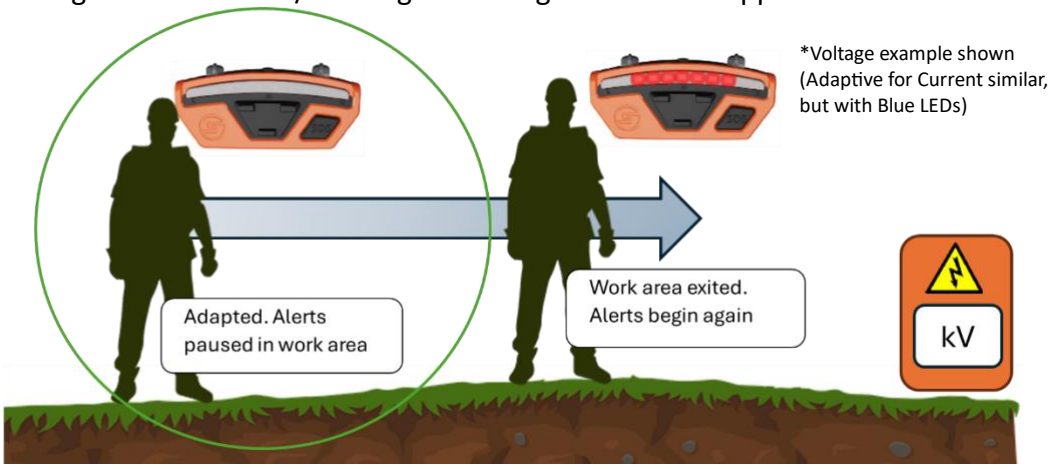
## Work Zone Adaptive Mode

As the user moves towards a source, alerts will be generated. The device will adapt and pause alerts when commanded with a double press of the MAIN button. If the user begins moving toward the source, alerts will begin again. Use this for ultimate control of when you would like your device to adapt to the local working environment.



## Work Area Size

Once the device is adapted to the local environment a protective area that the user can work within is established. The size of the protective area can be adjusted between small and large independently for the voltage and current detection functions of the Compass Series device. These settings can be selected through the Safeguard Navigator Mobile and/or Safeguard Navigator Console Apps.




*Voltage example shown (Adaptive for Current similar, but with Blue LEDs)

*Approximate available work area size when working around voltage

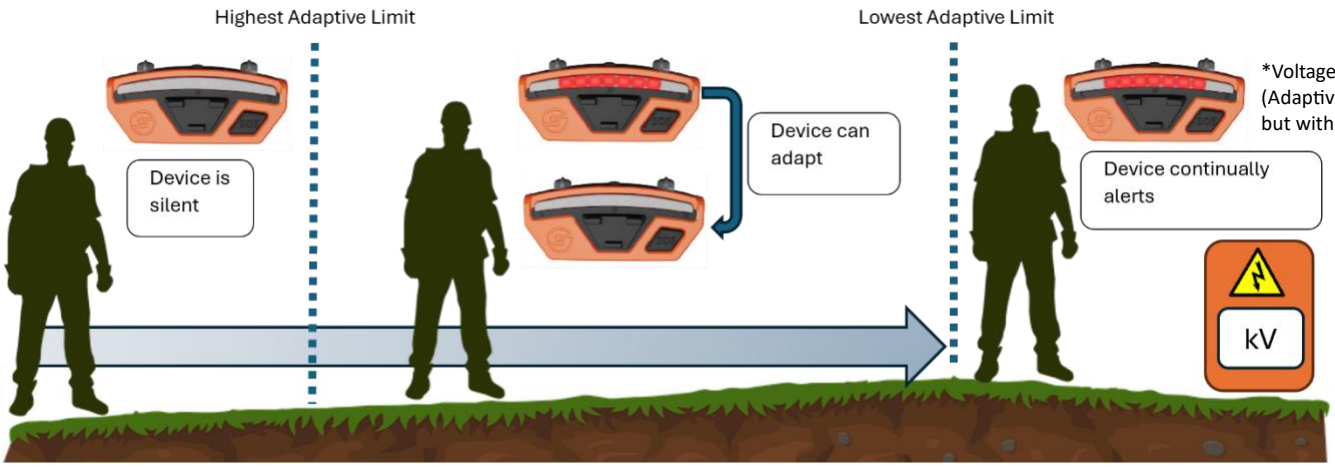
| Voltages | 1.2kV Phase-Neutral 2.1kV Phase-Phase | 6.6kV Phase-Neutral 11.4kV Phase-Phase | 50.0kV Phase-Neutral 86.6kV Phase-Phase |
|---|---|---|---|
| **Small Size (default)** | 3.0ft (0.9m) | 5.0ft (1.5m) | 7.5ft (2.3m) |
| **Large Size** | 6.0ft (1.8m) | 9.0ft (2.7m) | 12.0ft (3.7m) |

*Approximate available work area size when working around current

| Current | 10A | 200A | 600A |
|---|---|---|---|
| **Small Size (default)** | 1.0ft (0.3m) | 2.5ft (0.8m) | 4.0ft (1.2m) |
| **Large Size** | 1.5ft (0.5m) | 4.0ft (1.2m) | 7.5ft (2.3m) |

## Adaptive Limits

Adaptive limits can be set through the Safeguard Navigator Console App. These controls can be used to set points at which the Adaptive function is overridden, and the device is kept silent or is continually alerting the user.




*Voltage example shown (Adaptive for Current similar, but with Blue LEDs)

Highest Adaptive Limit prevents the device from alerting when the signal is below this setting threshold. Lowest Adaptive Limit makes the device constantly alert when the signal is above this setting threshold.

# Emergency Events

While using Compass Series devices with the Safeguard Navigator Apps, a Compass Series device can communicate emergency events to and from other users. The device shows this by flashing the corner LED's ORANGE and WHITE three times with an accompanying sound. After this, the device heartbeat will be replaced with a silent WHITE/ORANGE emergency pulse animation until you check the Safeguard Navigator Mobile App emergency chat.




## Automatically Detected Emergency Events

The below events can be automatically detected and sent by a Compass Series device. These events can be disabled/enabled through the Safeguard Navigator Mobile and Safeguard Navigator Console Apps.

Impacts

 An impact event is generated when:
The Compass Series device is appropriately mounted on a helmet (see mounting instructions).
The impact is in a downward direction.
The force of the impact experienced is enough that it could cause a concussion.

Falls

 A fall event is generated when the Compass Series device experiences a 6ft (1.8m) fall.

Arc Flash

 An arc flash event is generated when the Compass Series device detects light characteristics of an arc flash severe enough to cause injury.

No Motion Detected / Man Down

 When no motion is detected by the Compass Series device for 60 seconds following the initiation of an emergency event this is added to elevate the urgency of the emergency event. An additional notification will be sent to the user's response team. No movement does not trigger an event by itself.

## Manually Created Emergency Events

SOS



An SOS event is triggered when the user presses and holds the SOS button on the Compass Series device or the in-App SOS button for 3 seconds.

# Self Test

Compass Series performs a periodic self-test routine during operation to verify the operation of its internal sensors. If any faults are detected, Compass Series will show this by flashing the corner LED's RED and YELLOW. The device is not able to be used when in this state.




If your Compass Series remains in this state, please fill out an RMA form at: SafeguardEquipment.com/return or call 208-773-9263 for assistance.

# Compass Pro IS Annex

For further safety information about the Compass Pro IS device that is designed for use in Hazardous locations please see the below linked annex.

Compass Pro User Guide IS Annex.pdf




# Safety Disclosures

- Verify your Compass Series device firmware is updated to ensure its behavior matches what is described in this guide. Connect your device to the Safeguard Navigator Mobile App to receive the latest update.
- Before field use, always verify correct device operation by testing with a known source of voltage/current.
- Always adhere to proper high voltage electrical safety practices.
- Extreme humidity may decrease the voltage/current detection capabilities.
- Some materials may shield electromagnetic fields from the detection circuits of Compass Series devices.
- Compass Series is intended to be used as a secondary voltage detection method only.
- Warning distances can vary due to a live conductor's exposed surface area, elevation above ground, and proximity to other grounded conductive objects.
- If the user is walking briskly, this may reduce initial warning distances.
- 3-phase systems can hinder detection accuracy by creating electric fields that cancel out in certain areas.
- The Adaptive modes should be used only by experienced electrical professionals.

# Ordering Information

| Part# | Description |
|---|---|
| M01009 | KIT, Compass PRO, 50Hz |
| M01012 | KIT, Compass PRO, 60Hz |
| M01023 | KIT, Compass PRO IS, 60Hz |
| M01024 | KIT, Compass PRO IS, 50Hz |
| M01029 | KIT, Compass CORE, 60Hz |
| M01030 | KIT, Compass CORE, 50Hz |
| M01037 | KIT, Compass PRO, 60Hz, International |
| M01038 | KIT, Compass CORE, 60Hz, International |
| M01006 | KIT, Accessory, PRO Clips, 25 Qty |

For all device and software sales please contact us at sales@safeguardequipment.com

# End User License Agreement

Please see the Safeguard Equipment End User License Agreement for terms and conditions.
https://www.safeguardequipment.com/end-user-license-agreement/