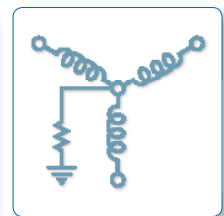
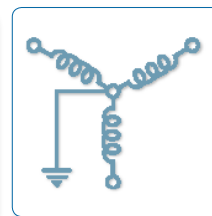
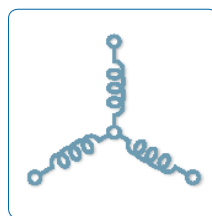
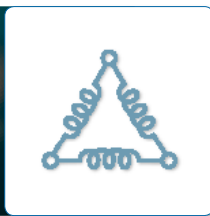
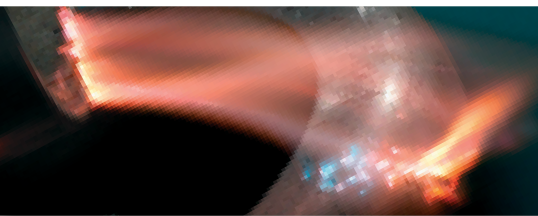




Unparalleled Protection

PROTECTION DIFFERENCES: OVER-CURRENT RELAY IN INSTANTANEOUS MODE V. AN ARC FLASH RELAY

Q&A



Webinar Q&A, June 2020

OVERCURRENT RELAY IN INSTANTANEOUS MODE V. AN ARC FLASH RELAY

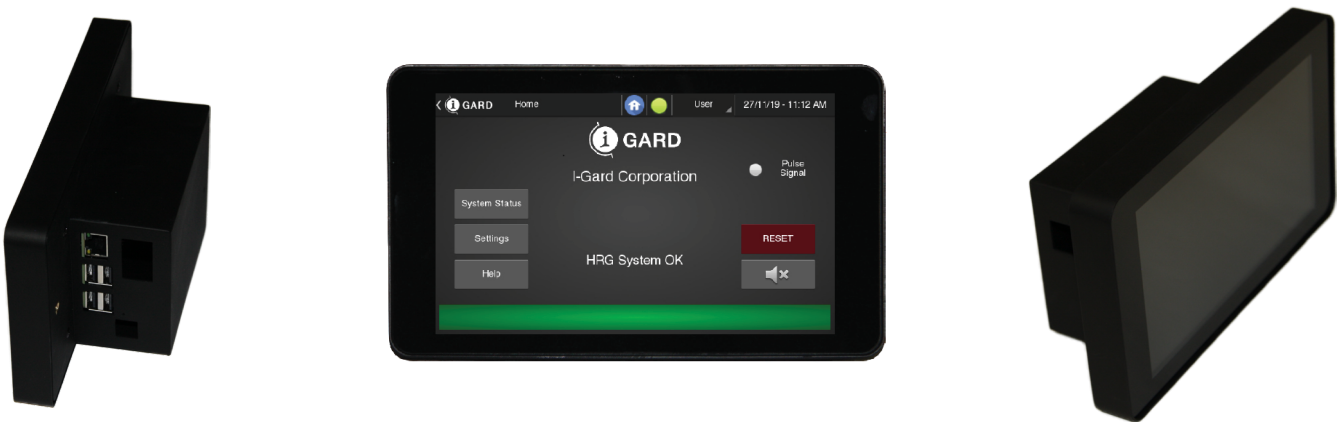
Thank you for attending our webinar focused on the key protection differences between an overcurrent relay in instantaneous mode v. an arc flash relay. For those of you who missed it, or would like to watch it again, the webinar recording is available on our website. Please find the link below or visit www.i-gard.com. As always, if you have any further questions, please email support@i-gard.com and one of our support team members will gladly assist.

[Click here](#)

QUESTIONS & ANSWERS

Q1. Are the Senti and MGFR the same cutout size? If not, is there a blanker plate to fit the Senti into the MGFR cutout?

A. The Senti is DIN RAIL mounted, however I-GARD has a new HMI digital display which can be easily flush mounted to fit the MGFR cutout, and connected to the senti via a communication module. The new HMI screen is pictured below.



Q2. Do the ADM Pressure sensors act to confirm the arc event? Light Detection followed by the pressure wave? Does the ADM operate if one or the other (Pressure/Light) is not present?

A. You can configure the DSP-ADM both ways i.e. to operate so that both light and pressure need to occur to confirm the arc event (this reduces the likelihood of nuisance trips), or only either one has to occur.

Q3. Are the Senti and ADM output Contacts fast switching? how fast do they operate, from moment of arc event to signal output?

A. Yes these contacts are fast switching, they typically operate in less than 1ms.

Q4. Why you did not show 1X Instantaneous?

A. 1X instantaneous is most likely rated current. You do not want the breaker to trip at rated current instantaneously.

Q5. Can we use arc flash relay to produce arc flash stickers as per CSA Z462-18?

A. Yes, Please use the software of your choice to produce incident energy and labels using protective devices.

Q6. Can we test the pressure relay -mechanically- during the commissioning?

A. Yes, a portable air compression chamber can be used. The pressure can also be regulated on these devices, so that the trigger point can be easily be observed.

Q7. Can you compare how the use of light & pressure sensor improved the related IEEE recommended FCT and IE?

A. IEEE has not recommended Fault Clearing Time (FCT) and Incident Energy (IE). IEEE has a guide, which allows you to calculate the IE from the FCT. However, using light, light and pressure will reduce the Fault Clearing time to calculate a lower Incident Energy.

Q8. Any experience with Translucent bodied 13 kv switchgear CB's? False tripping due to the fiber seeing light?

A. Erroneous trips can be avoided by using a combination of light and pressure or light and current. If you are placing the fiber sensors they should be shielded from sources of light that do not reflect a fault.

Q9. What is the response time of the ARC-i-TEC using both light & current?

A. Once a flash is detected, the ARC-i-TEC will trip the corresponding relay in under 1 ms provided the sensor is programmed to trip on light only. If the sensor is programmed to trip on light and over current then the ARC-i-TEC will search for an over current signal. If and only if this signal is found, the ARC-i-TEC will trip the corresponding relay, again in under 1 ms. The total response time using both light and current is about 4 to 7 ms.

Q10. Is a special light source required for testing these relays?

A. The relay can be tested by activating a high intensity flash light source within line of sight of the flash sensor and by direct injection of over current into one of the three phase current sensors. It can also be tested with light from the infrared spectrum.

Q11. In addition to 5-cycle circuit breaker, what is the maximum response time of arc flash relay?

A. The ARC-i-TEC utilizes solid-state relay technology that ensures the tripping sequence occurs in the shortest possible time, reaching the trip coil of the supply circuit breakers in less than 1 ms after the arc has been detected and the pre-set current value has been exceeded (if both light and current is used).

Q12. How do we actuate light sensor?

A. Each optical flash sensor/light sensor can detect a high intensity flash and is tuned to pick up in the infrared range on the electromagnetic spectrum.

Q13. What is the significant of light + pressure? In addition, is there light +current combination possible?

A. To avoid erroneous trips the combination of light and pressure or light and current is used which emphasizes the arc flash detection. The ARC-i-TEC is customizable to suit the specific arrangements of the switchgear and can be deployed using light and current or light only for detection purposes.

Q14. Is it true that arc flash relays will pick up on arcing current whereas instantaneous depending on the setting will pick up on three phase bolted fault?

A. Yes, this is true. When interlocking your arc flash relay with current, you want to ensure that you do have an arc flash so you must set up the pick up to be lower than the available arcing current. With instantaneous relays, you still need to coordinate your system so you can operate downstream devices.

Q15. Energy reducing maintenance switches are sometimes left on after the work is completed and cause serious interruptions of power as they will cause a trip. In a gas plant that is very costly, you should not suggest this option. What do you think?

A. Energy reducing maintenance switches are used on switchgear to prioritize safety by operating faster should an arc flash occur. As per NFPA70E AND CSA Z462, Arc flash mitigation systems that use a maintenance system have a local indication for maintenance workers. This usually comes in the form of a blue light, which, under appropriate training, allows personnel to properly identify and turn off the switch once maintenance is complete.

Q16. Don't you see the highest kA value during the first half cycle of the fault, and start to dissipate into a symmetrical fault with a lower fault value as time goes on?

A. Yes - During the onset of a fault, the kA will be high because of the transient reactance of the equipment. The fault current may then decrease from an asymmetrical fault current to symmetrical fault current, but these parameters must still be used to calculate the arcing current. The arcing current, which is used to calculate incident energy, increases with respect to time.

Q17. You can reduce the 50 pickup settings but you also need to coordinate with downstream which may not be possible sometimes?

A. Reducing the 50 pickup settings does not require coordination with downstream devices if it is a temporary measure for arc flash mitigation.

Q18. What happens if the local circuit breaker is not shielded and we need to trip the arc using an upstream breaker?

A. I-Gard's arc flash relays such as the Arc-i-Tec and the Senti have back up relays that trip the upstream device using the same contact.

Q19. What is the voltage input for the Senti relay?

A. Standard control power for the Senti relay ranges from 60-240V AC/DC. I-Gard provides a wide range of viable inputs with a majority of our relays. Please visit our website at www.i-gard.com for more information.

Q20. If you experience the highest fault during the first half cycle (10 milliseconds), why are your fault values going up if the fault is transitioning into a symmetrical fault after this point?

A. Yes, the sub-transient and transient reactance will decay after several cycles. However, the time referred to in this webinar refers to the Fault Clearing Time (FCT). The Fault Clearing Time (FCT) is directly proportional to the Incident Energy (IE). Therefore, the longer time to clear the fault the higher Incident Energy (IE). See attached slide, formula for calculating incident energy for details. Using Arc Flash Relay will greatly reduce the FCT and IE.

Q21. These inputs or outputs signals used in what voltage of control circuits?

A. The I/Os for sensors are dry contacts. Optical and Pressure sensors for Arc-i-Tec and Senti are not dependent on system voltage. It draws its power from the relay, so you can use them to detect arc-flash on the LV and MV side of the switchgear. For Current Sensor, insulation consideration needed especially for MV application. See attached manual for Arc-i-Tec and Senti for more details.

Q22. What does AFD stands for?

A. AFD, means "Arch Flash Device", however if you mean AFB as shown on the sample SLD then AFB stands for "Arc Flash Boundary". An arc-flash boundary (AFB) Is the approach limit from an arc source at which the Incident energy equals 1.2 cal/cm² (5J/cm²) The reason this limit is used per NFPA 70E and CSA Z462 is because according to the Stoll skin burn injury model, the onset of a second degree burn on the unprotected skin is likely to occur an exposures of 1.2 cal/cm² (5J /cm²) for one second

Q23. Do all the Form A and Form C contacts have the same electrical ratings and suitable for tripping breakers? 30 A @ 125 Vdc etc

A. Yes, for standard contact ratings shown on the manual for Arc-i-Tec and Senti. However, we can customize the contact rating based on your breaker shunt trip coil voltage (i.e. 125VDC, 30A). You have to let us know when you placed an order so we can customize the contact rating according to your requirements.

Q24. Does the pressure sensor still work properly when the enclosure is opened?

A. The pressure sensor is mechanical. It measures the differential pressure inside and outside of an enclosure. Therefore, it might not work properly when the enclosure is open. See attached cut sheet for the pressure sensor for more details.

Q25. What type of cable that is wired to Arc-i-Tec relay?

A. If you are referring to the optical point sensor. There are two types:

1. Optical Sensor with shielded cable, standard from factory and length can be customized and
2. Optical Sensor with Fiber Optic Cable, length can be customized as well. Wiring for Pressure and Current Sensors can be twisted pair or shielded #14AWG cable.

Phone: 905-673-1553
Toll Free: 1-888-737-4787

Fax: 905-673-8472
support@i-gard.com



www.i-gard.com