



VR-3S FAQs

Single Phase Tripping Option

Can I program single phase tripping, three phase lockout?

Yes. For every step in the reclose cycle, and for each protective element, the utility can program single-phase trip, single-phase lockout, three-phase trip or three phase lockout. This flexibility will meet the needs of any utility.

What does it require to change an installed VR to single phase tripping? Does single phase tripping require modifications to the high voltage cabinet?

No, all VR-3S high voltage cabinets have the ability to trip on a single phase. In order to upgrade the recloser to single phase tripping, the CPU cards is removed, sent to ABB, and upgraded. The upgraded CPU card is then installed into the PCD control and single phase tripping is available. The current settings on the control are still in place, and three-phase tripping can be applied at any time. This is the beauty of the VR-3S. Any VR-3S can be upgraded to a single phase tripping unit by merely changing the CPU board. The entire upgrade process takes approximately 15 minutes. The cost of this depends on what type of CPU you currently have installed in the unit. Please contact the factory for pricing.

What if I do not want single-phase trip all the time?

The PCD can be set up to trip single phase for the primary settings group, three phase tripping for the Alternate protection groups, or vice versa.

Can I change the unit from single phase to three phase remotely from SCADA?

Yes, the utility can remotely activate the Primary, Alternate1 or Alternate 2 settings groups through hardwired SCADA, or SCADA using DNP3.0 or Modbus protocols.

Can the utility control (open/close) the recloser on a per phase basis?

Yes. Through the Operations menu, SCADA, or through WinPCD.

If the user programs the unit for single-phase trip, what happens when the lineman pushes reclose block, and there is a trip?

The unit will trip and lockout on that phase. However, if desired, the unit can easily be programmed to lockout three phase under this condition by using programming logic to put the recloser into Alternate 1 settings when reclose blocked is pressed. Alternate 1 settings could be programmed with only a fast curve, set for only one - three phase operation (one shot).

What will the lineman see after a single-phase lockout?

Fault data will alternate between the following screens (for example, an A phase fault of 300 A):

Max Fault Current: 300 A

Type: 51P (A – N)

**A: LOCK C: Load Current
B: Load Current N: Neutral Current**

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The target lights will also be lit.

What happens if there is a fault above the ground setting, but below the phase setting?

The unit will trip three phase because the fault current would need to exceed one of the phase pickup values to know what phase to trip. If the fault current is above both the phase and ground minimum pickup, the unit will trip single phase, even if the neutral pickup value is lower.

After a single-phase lockout, what happens to ground tripping?

Because of the ground current imbalance that arises after a single phase lockout, the ground tripping elements are suppressed, so subsequent tripping current must be above the phase pickup values to trip the unit on another phase fault.

Can the utility program the recloser to automatically change from single to three phase tripping based on loading conditions?

This is one of the most powerful parts of the PCD. The user can program the unit to change from single phase to three phase tripping upon a condition such as the load exceeding a demand current threshold.

Can I program a different curve for each phase?

No. The same protective element is used for all three phases. The fast curve you use for one phase will be used for all phases. However, you can have completely different protection settings for the Alternate settings groups.

How will I know through SCADA which phase tripped?

This is available through DNP3.0 and Modbus protocols, as well as current magnitudes and time stamping.

What if the utility expects there are some three-phase motor loads on the feeder, but wants the reliability improvements of single phase tripping?

There are several things that the single phase tripping PCD allows you to do for this application. Most motors can ride through a single-phase condition for fast trips. Therefore single phase tripping can be programmed for the first two operations (which are normally the fast curves) and use relatively short open times can be programmed. The time-delayed operations could then be programmed with three-phase trip only. This will improve reliability significantly, since over 75% of faults are temporary in nature. Also, there are two modes of operation for single phase tripping in the PCD, OPUP (Only Picked Up Phases) and One Or All Phases (OOAP mode). Most motors do not have a problem with one open phase for a short period, but two open phases may be less desirable. Using the OPUP mode, the unit will trip on the faulted phases only. Using OOAP mode, if there is a phase to ground fault, the unit will trip on that phase only. If the fault is on two phases, i.e. line-line, then the unit will trip all three phases, which may be more appropriate in situations such as this.

What happens when there is a line-to-line fault?

See the two modes of operation explained in the above question.

How do I program the PCD for single phase tripping?

The PCD can be programmed through the MMI of the device itself or with WinPCD. WinPCD version 2.0 or later is required for programming single phase tripping.

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The VR-3S recloser is a first of its kind in the industry. It includes fast acting maintenance free magnetic actuation instead of a high maintenance mechanism, solid dielectric instead of oil or SF6 gas, and is substantially lighter weight than oil filled reclosers. It is available in 15, 27 and 38 kV ratings, 560 or 800 A continuous current. In response to what you have asked for, the VR-3S and its PCD control now have the capability to operate on individual phases!

Call 1-800-929-7947 +1-407-732-2000 for any other questions you may have.

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FQ-FAVR-04.02-01-B
Rev. C
November 2002