

## Relay protection setting of line impedance



### Overview

The feature is useful where line impedance characteristics change between sections or where hybrid circuits are used. Direction: Forward Typically the zone 1 reach is required to be 80% - 90% of the line. When a system has too many radial lines protection using time delay overcurrent relay becomes impractical. Time delay for relay closest to the source becomes excessive. This problem can be solved to an extent by using distance relays. They provide primary line protection as well as backup for a range of failure conditions, including momentary. Distance relays measure impedance ( $Z = V/I$ ) to detect faults.

## Relay protection setting of line impedance



The SEL-751 Feeder Protection Relay is ideal for directional overcurrent, fault location, arc-flash detection, and high-impedance fault detection applications.



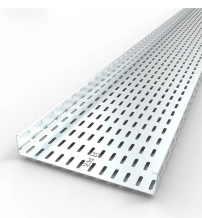
The line impedance angle is a characteristic of the line, which depends on many factors such as tower geometry and conductor material. For a short-circuit with no arc-resistance, the fault ...



Modern digital relays can be programmed with line parameters such as positive and zero sequence line impedance (in secondary ohms) and the corresponding phase ...



Distance relays measure impedance ( $Z = V/I$ ) to detect faults. The settings are based on: Line impedance (primary & secondary values).



Distance protection relays measure impedance to detect faults by comparing the measured impedance to a set value. They are used to protect transmission lines ...



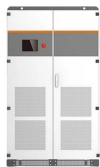
We can calculate the impedance of a line with reasonable accuracy, using its physical properties. Line distance relays constantly measure the line voltage and current, constantly performing Ohm's Law ...



RAT-STATS - Statistical Software RAT-STATS is a free statistical software package that providers can download to assist in a claims review. The package, created by OIG in the late 1970s, is also the ...



Zone 2 Protection Set to cover (120% of the protected line) Or (Protected line impedance + 50% of adjacent shortest line impedance) or (Protected line + 50% transformer impedance). 150% of the ...



A distance relay may fix the MTA by design by using the positive-sequence line impedance ( $Z_1$ ) angle, or it may allow setting the MTA independently from the line impedance angle.



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To avoid relay mal-operation, set Slope 2 as high as possible. Normally, a high Slope 2 setting causes slow tripping for evolving faults (external-to-internal faults).



For two-terminal lines where the remote station is a ring bus or breaker-and-one-half scheme including breaker failure protection, set the relay to reach 110% of the sum of the protected line impedance and ...



Zone 1 elements should provide instantaneous protection for three-phase and line-to-line faults inside the zone 1 reach, which is usually set at 80-90% of the line ...



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Let's say you set your overcurrent relay to trip at  $12\times$  full-load current. If your transformer has an impedance of 10%, will that setting work as intended? Let's do the math.



A Zone-2 trip on a distance relay indicates a fault, usually in the last 20% of the protected line or just beyond the remote bus. It operates with a slight time delay (typically 0.3-0.4s) to allow ...



The proposal itself and define the different protection zones should be based on impedance lines to be determined by the calculation referred to in the previous section of this article.



C2000 RT overload relays provide motor overload protection through fixed bimetal heaters. These relays are ambient compensated and utilize a differential mechanism for single-phase sensitivity. The trip ...



Browser-based relay protection tools, learning modules, and technical references for protection engineers. Analyze COMTRADE, coordinate relays, test directional trip logic, and visualize phasors.

## Contact Us

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