



VEBKO ONLINE HELP

Introducing “Distance” Room, Part 3

Category	tester
Section	AMT Distance Module
Language	English
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To simplify drawing the zones you can use "Predefined Shapes". In this section, some patterns are predefined for three types of characteristics. Circle is used to draw "MHO" characteristic curves. In "Forward Reach" field, the maximum forward protective area is specified which is in "R" positive direction. If the characteristic is in a way that covers a part of the back of the relay, by using the "Offset" field, you can apply this item as well. About the mentioned subject, note that applying offset does not cause "Forward Reach" to change. Moreover, it is also possible to apply negative offset, which causes the characteristic to distance from the origin of the coordinates. By entering the angle in the "Angle" field, the center of the circle moves in counter clockwise direction as much as the value mentioned in this field. For example, if "5" and "1" are entered as "Forward Reach" and "Offset" respectively, in "0" degree you can see that "R=-1 to R=5" is the area that is covered. Now, if "45" is entered as the angle, you see that the center of the circle rotates as much as "45" degrees. In this case, the radius and center of the circle can be obtained using $r = (\text{forward Reach} + \text{Offset})/2$ And $M = (\text{forward Reach} - \text{Offset})/2$ formula respectively. "Polygon" characteristic are made of four line Cartesians. To change any of the sides, first you need to select the intended line and enter the characteristics. Explanations for this matter are the same as the explanations provided for line Cartesian.

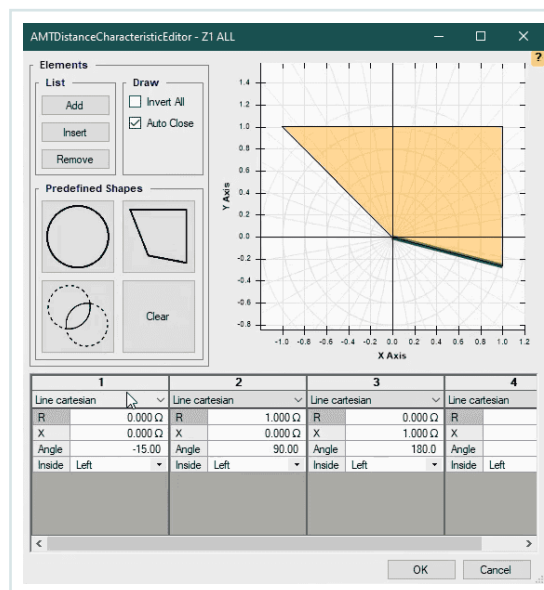


Figure 1

The last characteristic is "Lens/Tomato". The use of "Forward Reach", "Offset" and "Angle" fields is the same as "MHO" characteristic. Parameters "A" and "B" stand for "Width" and "Forward Reach" respectively and in "A/B" field the proportion of these two is entered. If "A/B" is bigger than "1", smaller than "1" or equals "1", the characteristic will be in tomato form, lens form and MHO form respectively. If "A/B" is selected in the "Type" field, by changing the "Forward Reach", the proportion of "A/B" remains the same and the "Width" changes. For example you can see that if "A/B" equals "0.5", by changing "Forward Reach" the value of "Width" changes. However, if "Width" is selected as "Type", by changing "Forward Reach", you see that the "Width" remains the same and "A/B" changes.

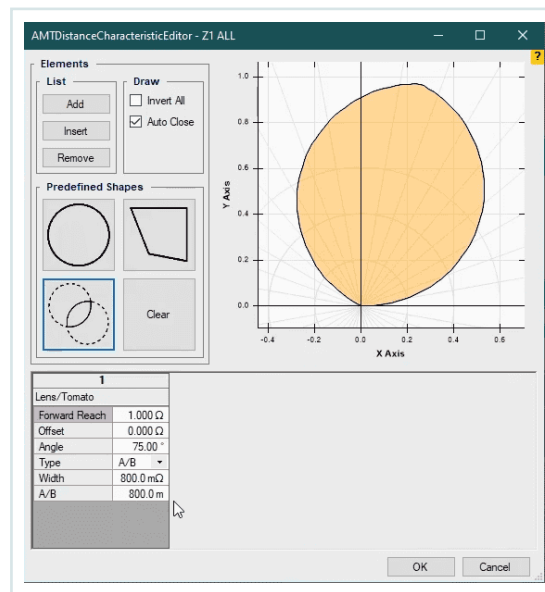


Figure 2

Practically this characteristic curve is made of "2" circles and the radius of these circles is shown as the "R" formula, the center of the first circle is shown as "M1", and the center of the second circle is in the form of "M2" where " α ", " β " and " ϕ " are as illustrated.

$$R = \frac{B^2}{4A} + \frac{A}{4}$$

$$M1 = \sqrt{2 - \left(\frac{B}{2}\right)^2 + \left(\frac{B}{2} - \text{offset}\right)^2} < \phi + \beta, M2 = |M1| < \phi - \beta$$

$$\alpha = \cos^{-1} \frac{\beta}{2r}, \beta = \tan^{-1} \frac{r \sin \alpha}{\frac{B}{2} - \text{offset}}, \phi = \text{Angle}$$

Figure 3

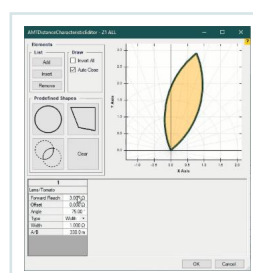


Figure 4

In the end, some points about this section is mentioned:

By selecting any element, any information entered earlier will be deleted.

By checking "Invert all" option, the selected area inverses. This means that if this option is checked and "1" second is entered as the trip time, on the test page you can see that inside the curve is "NO TRIP" while outside the curve is "Tripping" area.

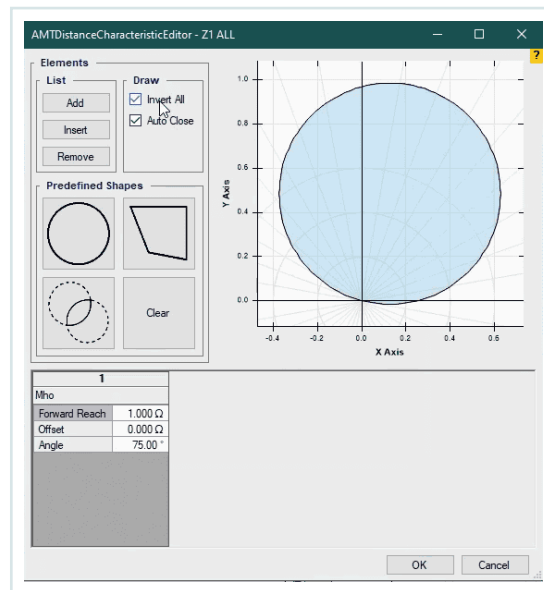


Figure 5

By clicking on "Clear" on this page, all information will be deleted.

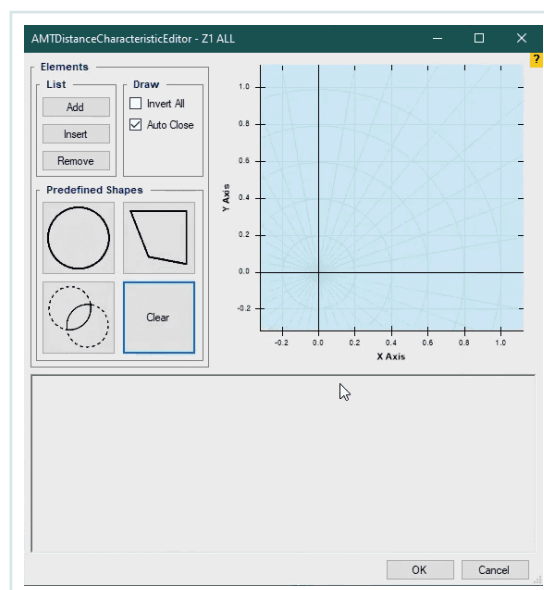


Figure 6

After specifying the zone, the type of the zone should be specified in "Type" field. If "Tripping" is selected, its trip time and time and impedance tolerances should be entered in "Zone Details" and for changing any tolerance, its checkbox should be checked and then the changes can be made. Generally, starting zones are very big, which contain tripping zones, and the condition which the relay performs a trip is that the fault impedance is located not only in the tripping area but also inside the starting area. "Extended" zones are those that are activated by receiving a specific signal from the network and usually cause the zone cover a bigger part of the line.

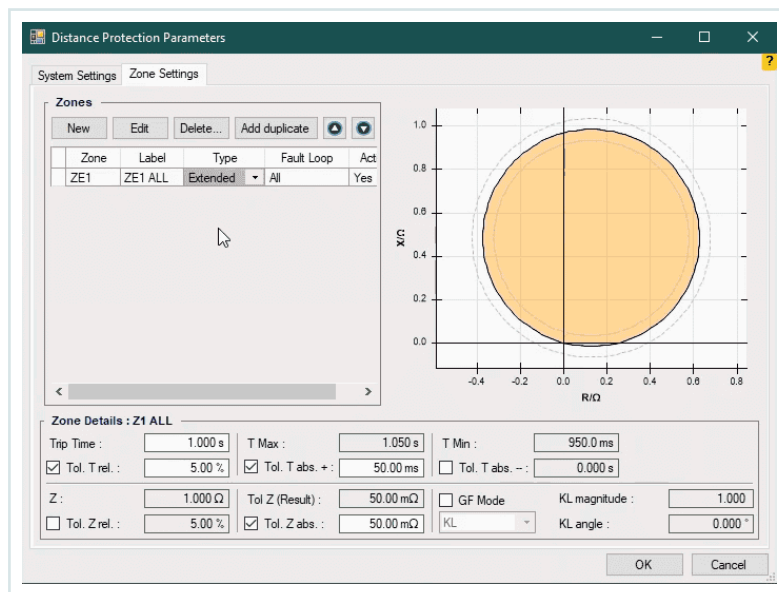


Figure 7

In "Fault Loop" field you can specify the type of faults that the defined zone can be used for. To specify that a zone is to be used only for two-phase faults you need to select "LL" in "Fault Loop" field and check "LL Fault Group Exclude L1L2L3 fault Type" in "System Setting". You can use "Active" column to activate or deactivate a zone.

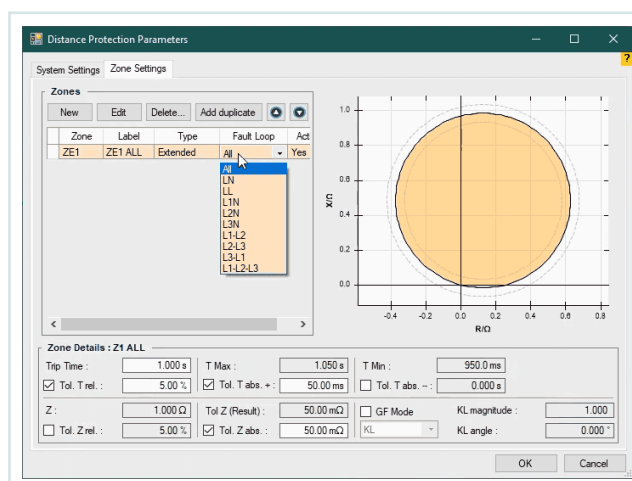


Figure 8

"Up" and "Down" options at the top of the table are used to move the defined zones. At the bottom of the page there is a box including grounding factor by which makes it possible to specify a different single-phase grounding factor for each zone. However, this section is in progress and is not ready for use yet.

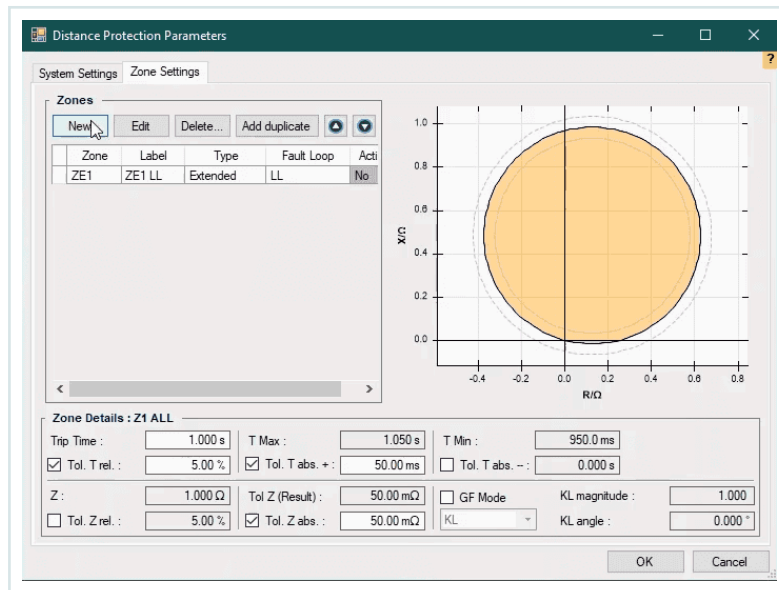


Figure 9

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