



VEBKO ONLINE HELP

Introducing “AMT Diff. Harmonics” Room

Category	tester
Section	AMT Diff Harmonics Module
Language	English
Generated	2026-10-18

Contents

1. Relay settings in "AMT Diff. Harmonics" Room	3
2. "Protected Object" Tab	4
3. "Protection Device" Tab	4
4. "Characteristic Definition" Tab	5
5. "Harmonic" Tab	5

"Differential Harmonic" test or "Inrush Blocking" test is performed in "AMT Diff. Harmonics" room. This room opens by clicking on "AMT Diff. Harmonics" option. At the moment of initiation, power transformer draws a great deal of inrush current named "Inrush". If the transformer is not completely "Demagnetized", and has some residue, it makes it to draw a great deal of inrush current which can damage the transformer. One of the ways for detecting this inrush current at the moment of transformer initiation is to compare the secondary harmonic current with the main harmonic.

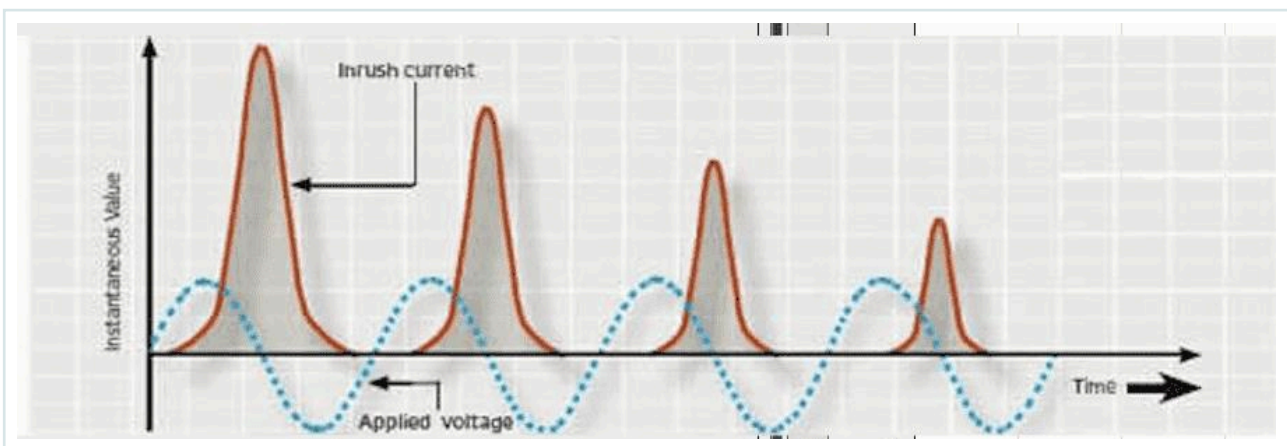


Figure 1

"AMT Diff. Harmonics" room consists of two main windows of "Test View" and "Harmonic Restraint View". "Shot", "Check" and "Search" test are performed in "Test View" window and in "Harmonic Restraint View" the harmonic differential characteristic curve is displayed. This diagram is based on a percentage of the harmonic current of the "n"th level and "Idiff". Note that in this window it is possible to manage the settings up to 20th harmonic and inject it into the relay. In this room, three current outputs of the device are used to perform the injection into the relay because the transformer turns via, three phases.

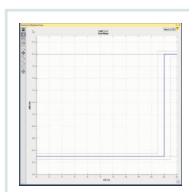


Figure 2

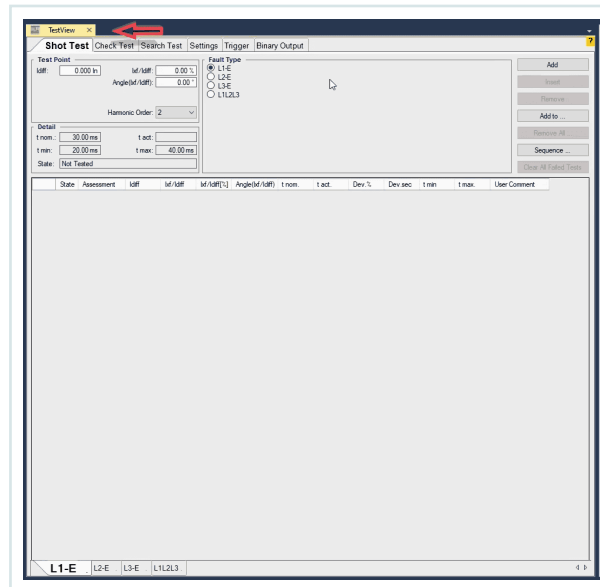


Figure 3

1 Relay settings in "AMT Diff. Harmonics" Room

As mentioned before, before testing the relay, its information must be entered in "Test Object" window. In "Device" block, information such as nominal characteristics of the relay, serial number, location of the relay and "CT" and "PT" characteristics of the relay are entered. This section has been thoroughly explained in previous videos. But the main block of this room is "Differential" by double-clicking on which "Differential Protection Parameters" window opens. This window consists of four tabs of "Protected Object", "Protection Device", "Characteristic Definition" and "Harmonic" where the differential relay settings is entered.

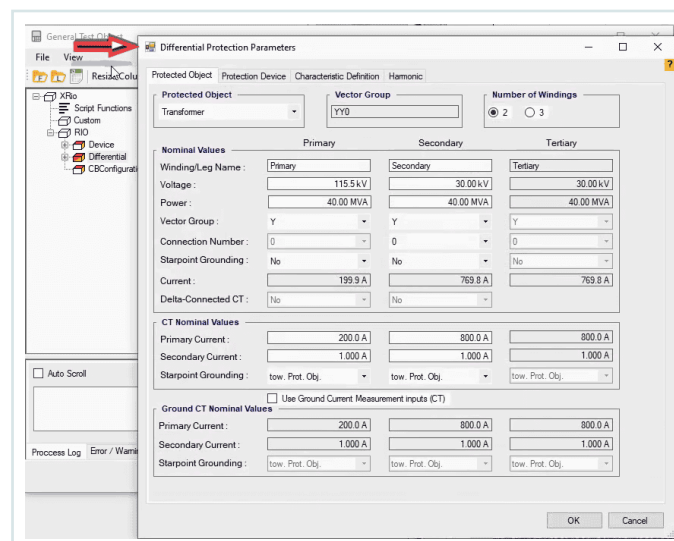


Figure 4

2 "Protected Object" Tab

In this tab the information of the transformer on which the "Inrush Blocking" protection is done is entered. First, from "Protected Object" section, the "Transformer" option is selected. Other information of this tab such as the number of coils of the transformer, nominal voltage, nominal power, vector group characteristics and "CTs" characteristic should be entered at the two sides of the relay. This information is the same as that of the "AMT Differential" room and has been explained in previous videos.

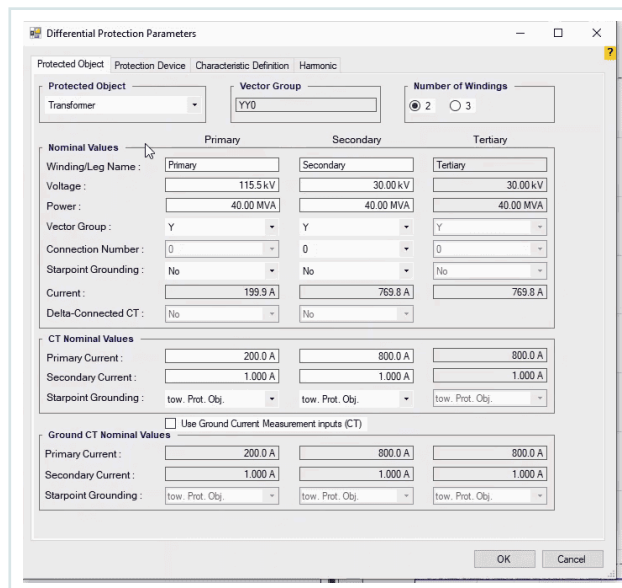


Figure 5

3 "Protection Device" Tab

After entering the transformer information, the information and differential relay characteristics are entered in "Protection Device" tab. This information includes determining the calculation formula of "I bias" or "I Restraint" current by the relay, determining the reference winding, specifying the maximum fault injection time and delay time after the "Trip", entering the minimum and maximum differential current in the relay characteristic curve, entering the nominal relay operation time and specifying the current and time tolerances of the relay which are the same as "AMT Differential" room and have been thoroughly explained in previous videos.



Figure 6

4 "Characteristic Definition" Tab

In this tab the information related to the differential characteristic curve is entered. This section is similar to "AMT Differential" room which has been thoroughly explained in previous videos. However, in this room, it is not necessary to enter the differential characteristic curve because in this room only the harmonic characteristic is displayed and "Inrush Blocking" test is performed. This information is mentioned here so that the "Xrio" file is correctly "Loaded".

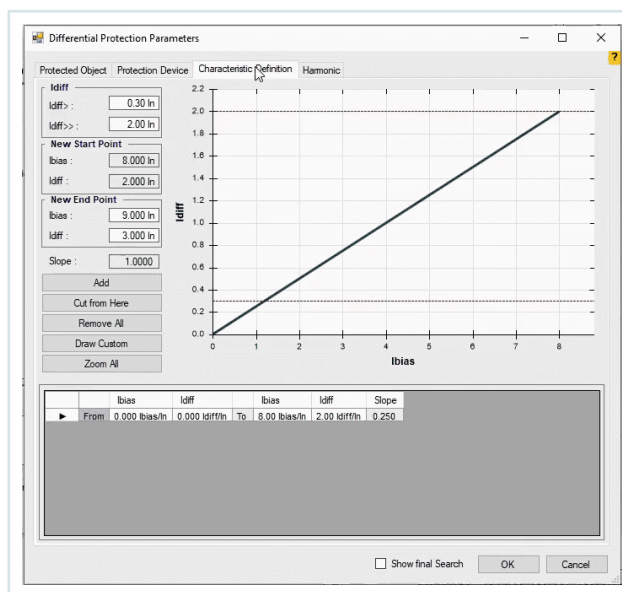


Figure 7

5 "Harmonic" Tab

The information related to the harmonic differential characteristic curve of the relay is of entered in this tab. In "Harmonic" field, the harmonic level is specified and it is possible to specify the information second to 20th harmonic and inject it by the device. Note that, "n/a" in front of any harmonic level means that the settings related to that harmonic is not specified. In "Ixf/Idiff" field, which is disabled, the proportion of the "nth" harmonic to the differential current is displayed. In "Tol. Relative" and "Tol. Absolute" fields, the relay tolerances are entered in terms of a percentage of the nominal value or as "Abs" respectively and the software picks the highest tolerance amount as the reference. Next, the differential characteristic curve is entered based on the relay parameters. 20 percent and 45 percent are set on the level 2 and level 5 harmonic current relays. First click on "Remove All" to remove all previous lines. Then, after entering the start point coordination in "New Start Point" section and then end point coordination in "New End Point" section in terms of "Idiff" and

" I_{xf}/I_{diff} " click on "Add" to display the information of this line in the table at the bottom of the page and display the characteristic curve in the diagram at the right side. Note that it is also possible to edit the start and end points from the box at the bottom of the page. To enter the fifth harmonic information, select 5 in "Harmonic" field and enter the start point and end point coordinates in the table at the bottom of the page. Then click on "Ok" and close "Test Object". You can see that the second harmonic differential characteristic curve is displayed by default.

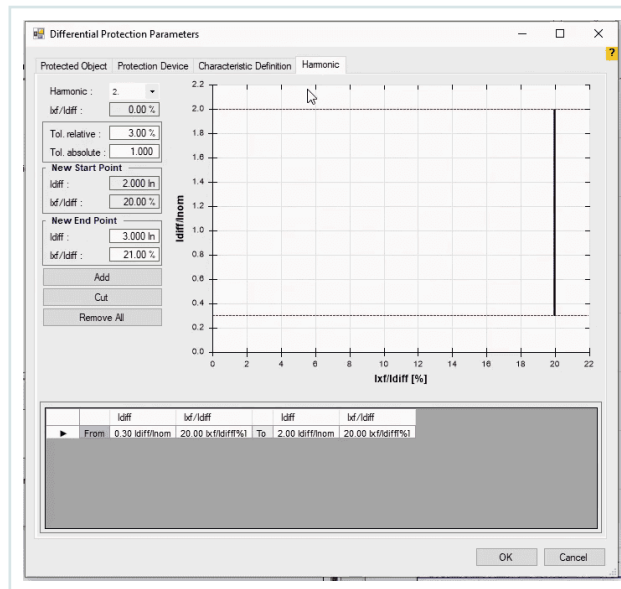


Figure 8

[jg1]Introducing_AMT_Diff_Harmonics_room