

EGIL200 application example: Classic medium voltage circuit breaker – Timing measurement

Introduction

The requirements for testing a medium voltage circuit breaker vary by customer, meaning there are various test procedures in use by different companies. This application note outlines a common test for a medium voltage circuit breaker and can be used if no other test procedure is available.

Setup

Upon powering on the EGIL200, the user will discover that the instrument is already prepared to start a test. First select the type of breaker – In the example given – as indicated in the top row of Figure 1 – the breaker has three phases: a common mechanism, one break per phase and no pre-insertion resistors (no PIR).

Click those to view details on how to connect. It is recommended to have the circuit diagram for the breaker at hand to make sure you connect correct.

Step 2 requires selection of the measurement type to perform (row 2 in Figure 1). Start with timing and measurement mode “Single”, meaning you want to perform a standard timing test. Make sure the coil current measurement (row 3 in figure 1) is active. In this case the coil currents are measured with the internal channels. In the picture example auxiliary contacts are select, type a and b.

Typically, the breaker will be open when starting the test. So, start by selecting a close sequence, indicated by “C”.



Figure 1: EGIL200 TEST display that appears after powering on the instrument

Connections

To view how to connect the EGIL200 test instrument to the circuit breaker under test, go to CONNECTIONS in the leftmost column (Figure 1). In this tab, (Figure 2), you will see what channels are needed for the measurement. Active channels are marked with a dotted, red rectangle.



Click those to view details on how to connect. It is recommended to have the circuit diagram for the breaker at hand, to make sure you connect correct.

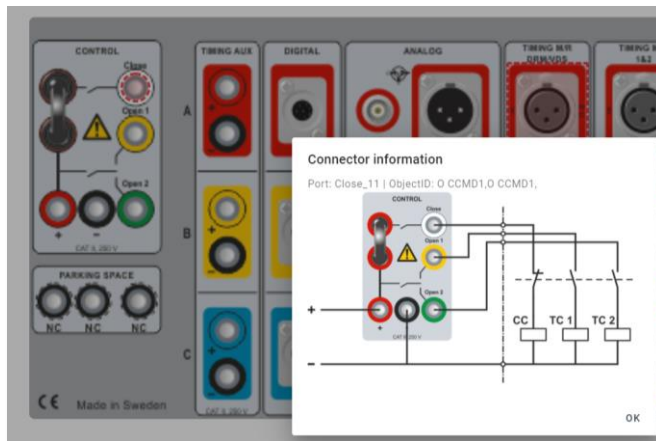


Figure 2: EGIL200 CONNECTIONS display

Turn the knob clockwise to perform the measurement. The Circuit breaker will operate.



Results



Figure 3: EGIL200 test RESULTS display

The results will be displayed after the test (Tmg= timing test.) A good practice is to review the graph and parameters to make sure the measurement was correctly executed. In this example, the next measurement after completing the close sequence is an open sequence. As the settings are the same, simply select a new open sequence in the RESULTS tab. Select the operation OPEN SEQUENCE under SEQUENCE (Figure 3). Open is indicated by the “O” symbol. Turn the knob clockwise once more to operate the breaker. To continue with more, close select “Tmg Cls” in the list and continue with selection “Tmg Opn”.

Administration and report

Click the METADATA tab and fill in the identification field of the circuit breaker. Then click TEST INFO to fill in information about the test session. Then press the REPORT tab.

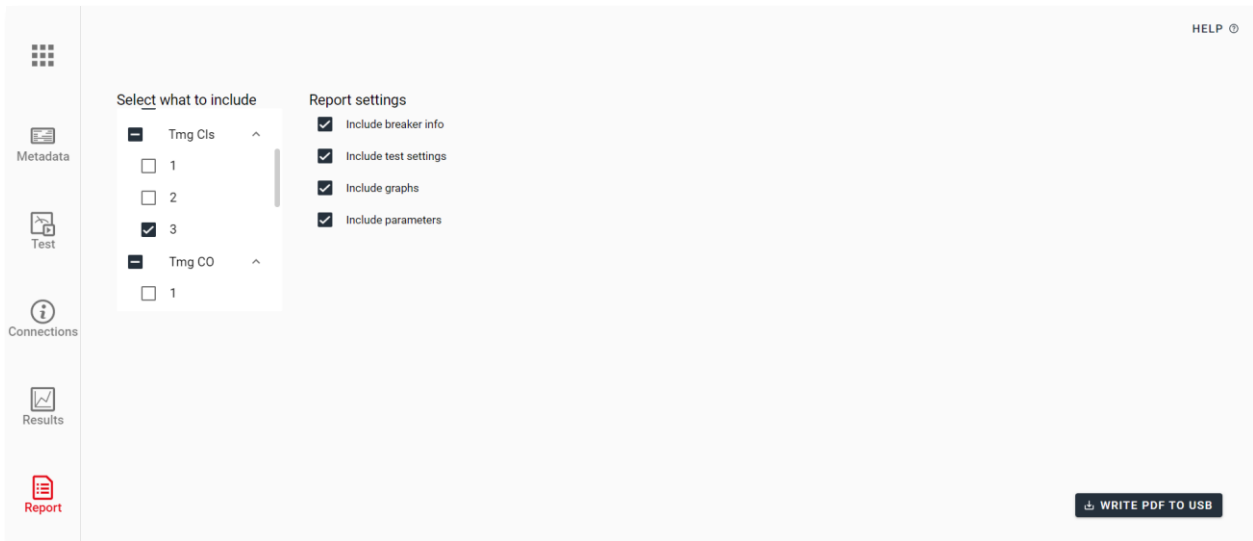
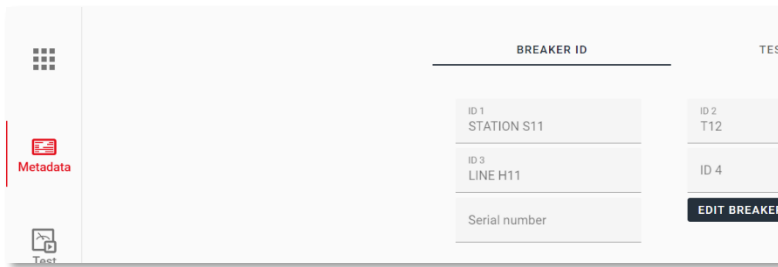


Figure 4: Generating a report

The REPORT tab automatically selects the last recording of each measurement type made. If you are pleased with this selection, insert a USB memory to the EGIL200 and press the button to write the pdf-report to the USB memory.

To continue testing another breaker, open the menu by clicking the top-most left icon and then NEW TEST.

If exactly the same type of breaker is tested, you can instead go to BREAKER and select "Clone CB".

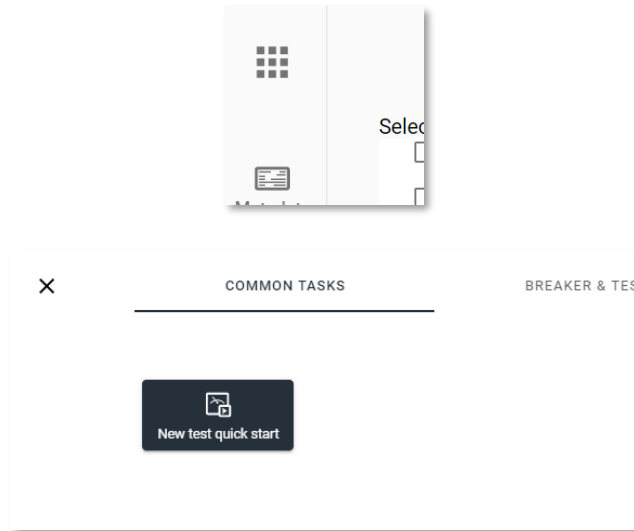


Figure 5: Continuing testing on a new breaker

Recommendations

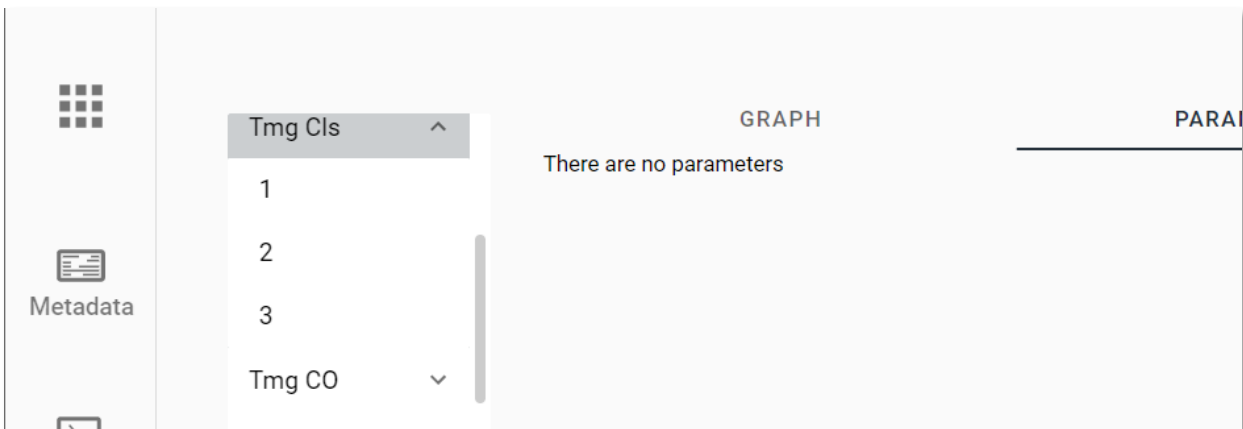


Figure 6: EGIL200 results display for multiple sequences

To verify the consistent operation of the breaker, the tests can be repeated. In general, it is good practice to perform three measurements for each sequence (open, close). In the RESULTS tab, the test list will build up as shown in Figure 6. By clicking any of those numbered recordings, the respective graph and parameters for that recording will be displayed.