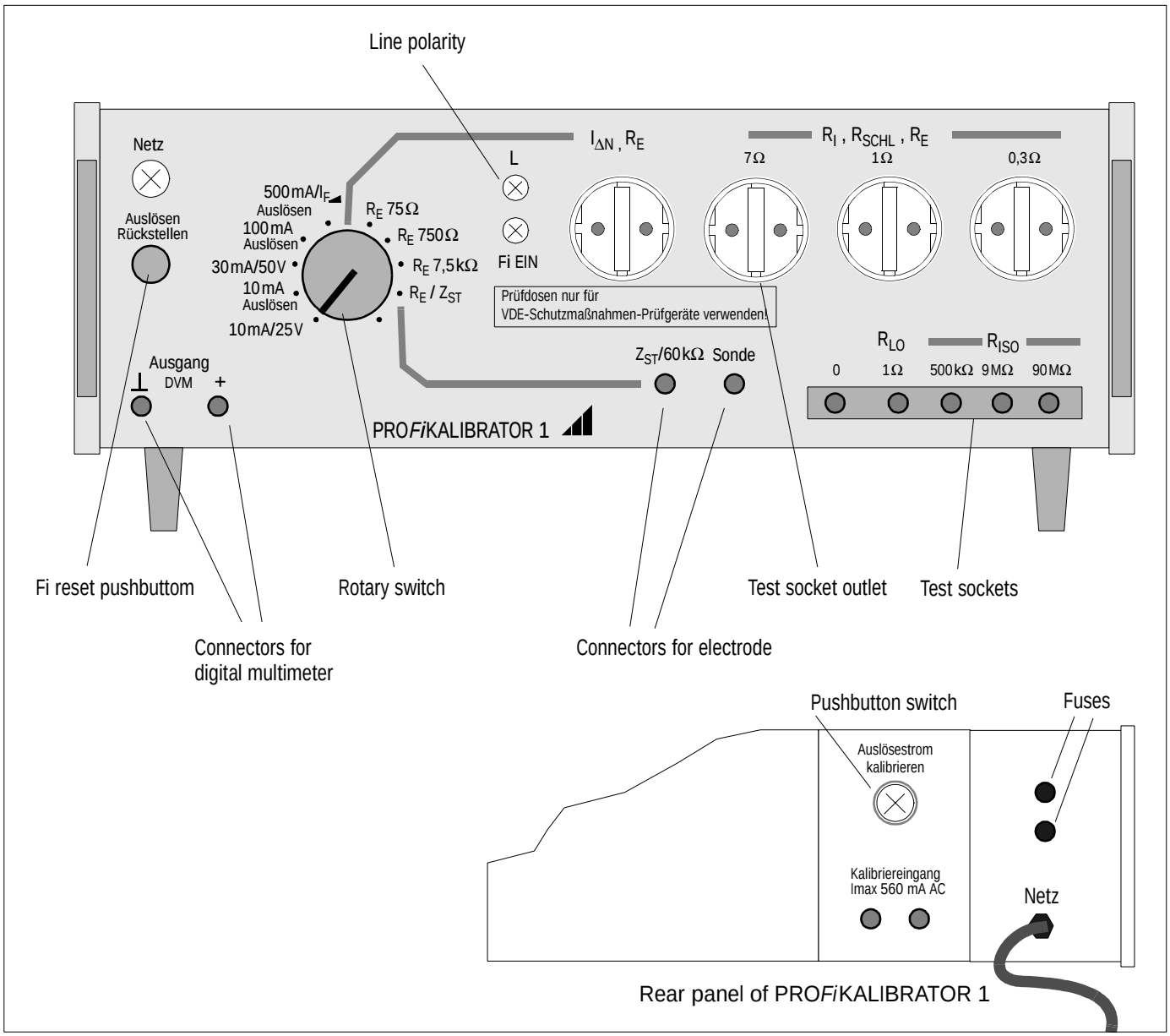
GOSSEN METRAWATT CAMILLE BAUER

PRO*Fi* KALIBRATOR 1
Calibration device for testers according to DIN VDE 0100

13883
4/7.96



1 General

Together with a test standard (PRO*Fi* TEST 0100S), the PRO*Fi* KALIBRATOR serves to test aspplianes for testing the protecting devices, e.g. the M5010, M5011, M5012 series and the PRO*Fi* TEST 0100S. The different function values to be determined according to DIN VDE 0100, part 610, are first compared with the test standard and then with the measured values of the device under test. For this purpose, test standard and device under test are connected to the PROFiKALIBRATOR at a time. The measured values of the device under test serve as reference values.

2 Getting started for the comparison measurement

2.1 Power supply PRO*Fi* KALIBRATOR

- Connect the power plug
  - *The lamp Netz (line) lights*
  - *The lamp L must light*,
    if not, reverse the polarity of the power plug!
  - *The lamp FI EIN (FI ON) must light*,
    if not, press the "Start/Reset" pushbutton

2.2 Connection of digital multimeter and test standard PRO*Fi* TEST 0100S

- Connect a digital multimeter (e.g. METRA*Hit* 18S) to the socket output and set the DC voltage measuring range.
- Depending upon the measurement, plug the test plug into the corresponding test socket outlet
- To measure ground resistance and site insulation impedance, establish additional electrode connections.
- For a measurement of R_{LO} and R_{ISO}, the two-pole measuring adapter must be plugged accordingly.

3 Comparison measurements with the test standard PRO*Fi* TEST 0100S

Comparison measurements are briefly described below. We recommend to have the test protocol of the test standard at hand for this purpose. Please see the operating instructions of the PRO*Fi* TEST 0100S, No. 3.348.703.03, for the operation of test standard and device under test. You will find brief operating instructions in section 4.

On principle, reference measurements can be made in any order. Here, the order of the test protocol record has been chosen.

The function values on the following headlines correspond to the position of the function switch on the test standard PRO*Fi* TEST 0100S with the exception of the measurement for Z_{ST} and $UI_{\Delta N}$. In that case, reference is made to the appropriate position of the function switch and to the required menu selection.

3.1 Loop resistance R_{Schl}

- ⇨ Test socket outlet: 0,3 Ω, 1 Ω or 7 Ω
- ⇨ Pushbutton: START
- ⇨ Reference value: read R_{Schl}

3.2 Internal line resistance R_l

- ⇨ Test socket outlet: 0,3 Ω or 7 Ω
- ⇨ Pushbutton: START
- ⇨ Reference value: read R_l

3.3 Ground resistance R_E

- ⇨ Test socket outlet: 0,3 Ω, 1 Ω, 7 Ω or $R_E/I_{\Delta N}$
- ⇨ Electrode in: socket "Electrode"
- ⇨ Rotary switch: R_E = 75 Ω, 750 Ω and 7,5 kΩ
- ⇨ Pushbutton: START
- ⇨ Reference value: read R_E
- ⇨ Remove the electrode after the measurement

3.4 Site insulation impedance Z_{ST}

- ⇨ Test socket outlet: $R_E/I_{\Delta N}$
- ⇨ Electrode in: socket Z_{ST} 60 kΩ
- ⇨ Rotary switch: $R_E = R_E/Z_{ST}$
- ⇨ Function switch: R_E
- ⇨ Pushbutton: MENU ⇒ Z_{ST}
- ⇨ Pushbutton: START
- ⇨ Reference value: read Z_{ST}
- ⇨ Remove the electrode after the measurement

3.5 Contact potential $UI_{\Delta N}$ for $I_{\Delta N}$ = 10 and 30 mA

- ⇨ Test socket outlet: $R_E/I_{\Delta N}$
- ⇨ Rotary switch: $I_{\Delta N}$ = 10 mA/25 V or 30 mA/50 V
- ⇨ Function switch: $I_{\Delta N\ 10\ mA}$ or $I_{\Delta N\ 30\ mA}$
- ⇨ Pushbutton: START
- ⇨ Reference value: read $UI_{\Delta N}$

3.6 $I_{\Delta N}$ for 10 and 100 mA starting current

- ⇨ Test socket outlet: $R_E/I_{\Delta N}$
- ⇨ Rotary switch: $I_{\Delta N}$ = 10 mA/Ausl. oder 100 mA/Ausl.
- ⇨ Pushbutton: START, wait for measurement
- ⇨ Pushbutton: $I_{\Delta N}/i$, read start time
- ⇨ Display value: Read voltage value on multimeter and divide it by 10, this yields the starting current $I_{\Delta N}$

Please note: When repeatedly measuring the starting current, it is required to press the reset pusbutton at a time.

3.7 $I_{\Delta N}$ with rising starting current from 500 mA

- ⇨ Test socket outlet: $R_E/I_{\Delta N}$
- ⇨ Rotary switch: 500 mA/$I_{\Delta N}$◢
- ⇨ Pushbutton: START, wait for measurement
- ⇨ Display value: Read voltage value on multimeter and divide it by 10, this yields the starting current $I_{\Delta N}$. Compare the computed value with the displayed value.

3.8 AC voltage U_{L-N} and frequency f

- ⇨ Test socket outlet: $R_E/I_{\Delta N}$
- ⇨ Rotary switch: R_E/Z_{ST}
- ⇨ Pushbutton: START
- ⇨ Reference value: read U_{L-N} and f

Note: You may eventually plug the device under test in parallel to the test standard into the test socket outlet 1 Ω and perform a direct comparison measurement.

3.9 AC voltage U_{L-PE} and frequency f

- ⇨ Test socket outlet: $R_E/I_{\Delta N}$
- ⇨ Rotary switch: R_E/Z_{ST}
- ⇨ Pushbutton: START
- ⇨ Reference value: read U_{L-PE} and f

Note: You may eventually plug the device under test in parallel to the test standard into the test socket outlet 1 Ω and perform a direct comparison measurement.

3.10 Low-ohmic resistances R_{LO}

- ⇨ Test socket outlet: R_{LO} and R_{ISO}
  – Probe to 0
  – Measuring adapter to 1 Ω
- ⇨ Pushbutton: START
- ⇨ Reference value: read R_{LO}

3.11 Insulation resistance R_{ISO}

- ⇨ Test socket outlet: R_{LO} and R_{ISO}
  – Probe to 0
  – Meas. adapt. to 500 kΩ, 9 MΩ or 90 MΩ
- ⇨ Pushbutton: START
- ⇨ Reference value: read R_{ISO}

Note: It is possible to select different nominal voltages by means of the MENU key.

4 Calibrating the starting currents on the PRO*Fi* KALIBRATOR 1 with the aid of a reference current source

➩ Connection: Connect a digital multimeter to the output DMV on the front.

Connect a reference current source to the calibrator input at the rear.
I_{max} = 560 mA AC

➩ Pushbutton switch: Press the pushbutton switch at the rear, calibration is activated, the pushbutton switch must light.

➩ Rotary switch: Set the desired starting current.

➩ Display value: Read the voltage value on the multimeter:

Starting current $I_{\Delta N}$	Value DVM
10 mA	100 mV
100 mA	1 V
550 mA	5.5 V
Limit	Limit
560 mA	5.6 V

Continue to change the reference current until the desired voltage value is shown on the multimeter.

Note

After calibration of the starting current, the calibration mode must be deactivated. For this purpose, press the pushbutton switch again, the lamp of the switch must no longer light.

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