Tohm-e part number TE-DK500.

INSTRUCTIONS FOR USE.

Socket and earth loop tester. For 230 V AC single-phase 2-pole + earth "Danish" K-type power sockets.

- For 230 V AC “Danish” single-phase power sockets and TT earthing system.
- OK / not OK threshold : 500 Ω.
- Compatible with 30 mA~ RCD.
- Phase-neutral reversal detection.
- Rotating plug.
- Ergonomic.

ELMA TOHM-E

“Danish” power sockets and 500 ohms.

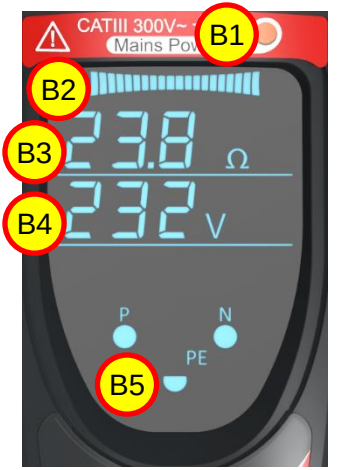
Made in France.

A - CONNECTING.

- Hold Tohm-e in one hand (±90 ° rotating plug).
- Tohm-e initializes for a short moment.
- Tohm-e displays the information below. If needed, turn Tohm-e to make reading easier (thanks to the ±90 ° rotating plug).

B - INDICATIONS OF TOHM-E.

- B1 - LED indicator showing voltage in the power socket. If on then caution, voltage is present in the power socket, even if the other indications are off.
- B2 - Measurement timer of earth electrode impedance.
- B3 - Earth electrode impedance.
- B4 - Phase - neutral voltage (true RMS value).
- B5 - Drawing of the power socket contacts.



If the indications are red, then there is a fault.

C – IMPEDANCE MEASUREMENT :

To measure the impedance of the earth electrode, Tohm-e allows a low current between the phase and the PE of the power socket. It controls the current. The current does not trip the 30 mA~ RCD (except if some significant leakage currents are already present between phase and PE).

The timer B2 is related to the B3 earth electrode impedance measurement.

A short moment after connecting, if the power socket is fault-free then Tohm-e indicates a first earth electrode impedance measurement and displays the complete timer.

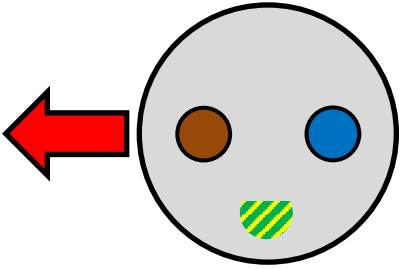
Then the timer counts down every second, over a cycle of approximately 20 seconds. During the cycle, Tohm-e saves several earth electrode impedance measurements. It regularly updates the indicated value. This indicated value is the mean of all the values saved since the start of the cycle. Once it reaches the end of the 20-second cycle, Tohm-e repeats a new cycle with new measurements and new mean values.

The cycle and the mean values allow Tohm-e to observe the electrical system over a certain time and indicate earth electrode impedance that is as accurate as possible in spite of the disturbances on the phase, neutral and PE conductors.

The measurements indicated may change due to the connection in parallel of additional circuits or transient currents.

D1 – POWER SOCKET AND EARTH OK.

Indications of Tohm-e.



Drawing of the tested power socket.

- Caution, voltage in the power socket.
- Earth electrode impedance OK, 23.8 Ω (< 500 Ω).
- Phase-neutral voltage OK, 232 V~ (> 195 V~ and < 253 V~).
- Power socket OK, correctly connected.

QUICK USE.

Grasp Tohm-e.

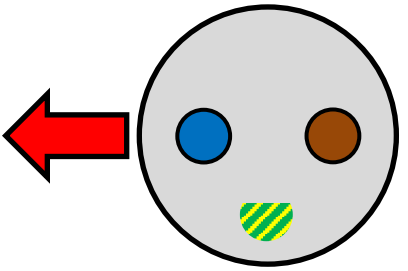
Connect it to the selected power socket.

Observe the indications displayed by Tohm-e to identify the wiring of the power socket, the phase-

neutral voltage and the impedance of the earth electrode of the installation.

D2 – PHASE AND NEUTRAL REVERSED.

Indications of Tohm-e.

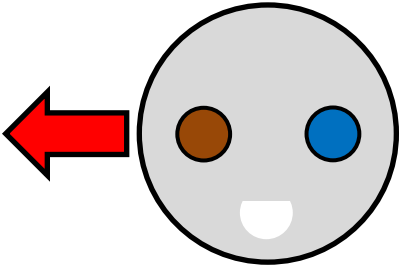


Drawing of the tested power socket.

- Caution, voltage in the power socket.
- Earth electrode impedance OK, 23.8 Ω (< 500 Ω).
- Phase-neutral voltage OK, 228 V~ (> 195 V~ and < 253 V~).
- Power socket fault, phase-neutral reversal.

D3 – NOT WIRED TO EARTH.

Indications of Tohm-e.

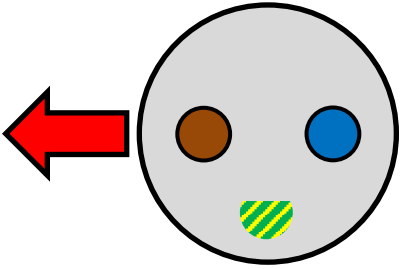


Drawing of the tested power socket.

- Caution, voltage in the power socket.
- Earth electrode fault, PE broken (or earth electrode impedance very high).
- Phase-neutral voltage OK, 231 V~ (> 195 V~ and < 253 V~).
- Power socket fault, no PE.

D4 – EARTH NOT CORRECT.

Indications of Tohm-e.

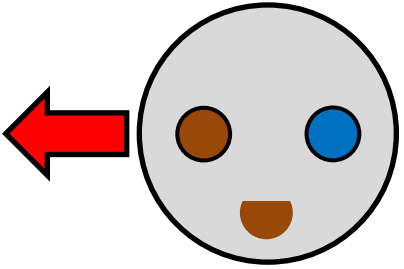


Drawing of the tested power socket.

- Caution, voltage in the power socket.
- Earth electrode impedance fault, 564 Ω (> 500 Ω).
- Phase-neutral voltage OK, 228 V~ (> 195 V~ and < 253 V~).
- Power socket OK, correctly connected.

D5 – DANGER. PHASE ON PE TOO.

Indications of Tohm-e.



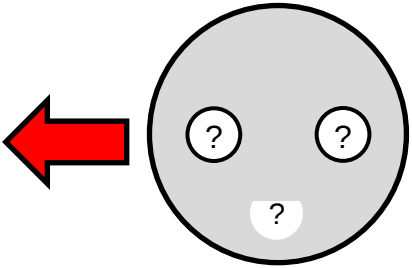
Drawing of the tested power socket.

- Caution, voltage in the power socket.
- Earth electrode impedance indicated as zero, 0 Ω .
- Indication of phase-neutral reversal.
- This is a particular case. Even if Tohm-e does not directly indicate a fault, EXERCISE CAUTION. THERE IS A HAZARD BECAUSE THE PHASE CAN BE TOUCHED on the PE contacts of the power socket. The phase is connected to its contact and the

PE contacts too.

D6 – NOT CORRECTLY WIRED.

Indications of Tohm-e.



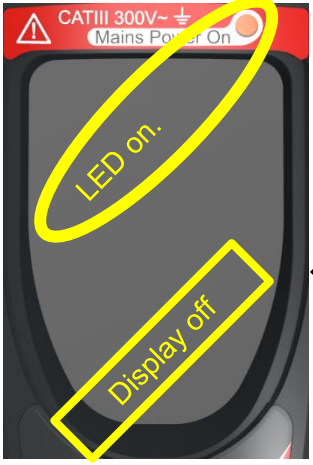
Drawing of the tested power socket.

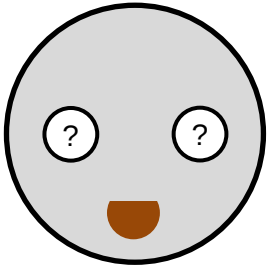
- The power socket is not correctly wired. In principle, there is no voltage on the power socket contacts. Tohm-e may have deliberately tripped a 30 mA~ RCD.

Check that Tohm-e is not malfunctioning. Connect Tohm-e to a power socket known to be OK. If it stays off then Tohm-e is malfunctioning. Otherwise, take all usual precautions, even though Tohm-e is off, before working on the installation or the power socket (because, for example, it may happen that a contact of the power socket is connected to the phase and the others are not

connected).

D7 – DANGER. NOT CORRECTLY WIRED.





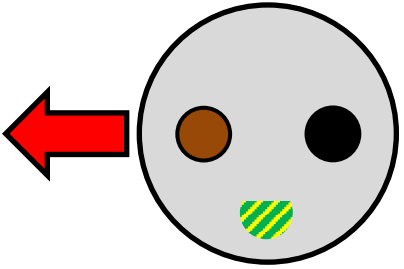
Drawing of the tested power socket.

Indications of Tohm-e.

- Caution, voltage in the power socket.
- The power socket is not correctly wired. In principle phase and PE reversed. EXERCISE CAUTION. THERE IS A HAZARD BECAUSE THE PHASE CAN BE TOUCHED on the PE contacts of the power socket.
- Take all the usual precautions before working on the installation or the power socket.

D8 – TWO PHASES ON THE POWER SOCKET.

Indications of Tohm-e.



Drawing of the tested power socket.

- Caution, voltage in the power socket.
- Voltage fault, 409 V~ (> 253 V~), probably a second phase instead of neutral.
- Take all the usual precautions before working on the installation or the power socket.

SAFETY AND SPECIFICATIONS.

The protection is compromised if the instructions are not followed.

Safety : 300 V~ CAT III, reinforced insulation, class 2, pollution degree 2, according to EN / CEI 61010-1. IP2X according to EN / CEI 60529.

"~" means, alternating current (AC).
"P", "N", and "PE" mean Phase, Neutral and Protective Earth respectively.

 means caution, please refer to these instructions.

Pollution degree 2. Only non-conductive pollution occurs except that occasionally a temporary conductivity caused by condensation is expected. The normal environment is in pollution degree 2**.**
Operator : person operating equipment for its intended purpose.
Responsible body : individual or group responsible for the safe use and maintenance of equipment.
CAT III (overvoltage category III). This is the environment of building wiring installations including socket outlets, fuse panels, … Tohm-e can support the mains supply overvoltages.
Environmental conditions : pollution degree 2 (normal environment) ; storage and operating temperature range, from -20 °C to +40 °C ; maximum relative humidity 80 % for temperatures up to 31 °C decreasing linearly to 50 % relative humidity at 40 °C ; altitude up to 2000 m ; don't submerge the device ; indoor use only ; do not use it in wet or explosive atmospheres.
Power supply : power supply from tested power socket (no cell, accumulator or battery).
Mains supply voltage fluctuation : -15 % / + 10 % (230 V~ - 240 V~).

Power socket test. The “Mains Power On” indicator LED shows that there is hazardous voltage in reference to the earth, even if there is no impedance, voltage and power socket indications. In some cases where power sockets are not correctly wired, Tohm-e does not directly indicate the anomaly :

- Tohm-e deliberately trips a 30 mA~ RCD. These are cases where there is no other way to indicate the fault, e.g. a power outlet with reversed neutral and PE.
- Tohm-e displays earth connection impedance equal to 0 Ω. These are cases, like case D5 opposite, where the phase is on two contacts at the same time or the neutral is on two contacts at the same time.
- Tohm-e remains fully turned off if the phase is present but if the other contacts of the power outlet are not wired. Tohm-e is not a voltage detector; do not use it for that purpose.

Compliance with standards EN / IEC 61010-1:2010, EN / IEC 61010-2-030:2010, EN / IEC 61557-1:2007, EN / IEC 61557-3:2007, EN / IEC 62262, EN / IEC 60529, EN 61326-1:2013, EN 61326-2-2:2013, EN 61000-3-2:2006+A1/2009+A2/2009, EN 61000-3-3:2008.

Compliance with European Directives 2011/65/EU “RoHS”, 2015/863/EU “RoHS”, 2014/35/UE “LVD”, 2006/96/EC “WEEE”, 2004/108/EC “ECM”.

Earth electrode impedance measuring method : method compatible with standards EN / IEC 61557-1:2007, EN / IEC 61557-3:2007.

Accuracy of earth electrode impedance : ±0,7 Ω from 0,0 Ω to 19,9 Ω ; ±6,1 Ω from 20,0 Ω to 99,9 Ω ; ±7,0 Ω from 100 Ω to 999 Ω ; ±16,0 Ω from 1,00 kΩ to 2,00 kΩ. Operating uncertainties according to EN / IEC61557-3 : ≤ 30 %.
Earth electrode impedance measuring range : from 0,0 Ω to 2000 Ω.
Earth electrode impedance display resolution : from 0,0 Ω to 2,00 kΩ.
Current : 18 mA~, compatible with 30 mA~ RCD.
Phase-neutral voltage measurement tolerances : ±4 V~.

If Tohm-e indicates that the power socket is faulty or if the indications of Tohm-e are inconsistent, take all the usual precautions before starting to work on the electrical system or power socket.

Compatible power sockets : single-phase 2-pole + earth “Danish” K-type power sockets (typically installed in Denmark), 230 V~ - 240 V~, 50 Hz, wired to a TT earth system.

Maximum phase angle : 18 °.
The measurement results may be distorted by the impedance values of additional circuits connected in parallel or transient currents.

USE.

Tohm-e is a socket and earth loop tester. It is a portable device that is connected directly. It is designed for use by an operator. A responsible authority must take responsibility for its maintenance and use. See the previous pages on instructions for use.

The operator uses it to test power sockets, measure the impedance of earth electrodes and measure the phase - neutral voltage. The operator holds it in the hand and connects it to a power socket.
The electrical installations are live when the operator carries out tests and measurements with Tohm-e.

Hold it in the hands by keeping them away from the power socket no to be shocked if there are abnormal and hazardous electric potentials in the power socket.

Tohm-e is to be used by a qualified operator who can recognize hazardous situations, and who is trained in the necessary safety conditions for avoiding injury during use.

Before each use, check the integrity of Tohm-e. If any insulator is damaged (even in part), Tohm-e must be locked out and scrapped. Regularly clean the different parts with a soft cotton cloth that is moistened with water and detergent solution after fully disconnecting Tohm-e. Dry the parts fully before energizing.

Tohm-e is not a voltage detector, do not use it for that purpose. Checking electrical continuity before testing power sockets and measuring earth connection impedance is highly recommended.