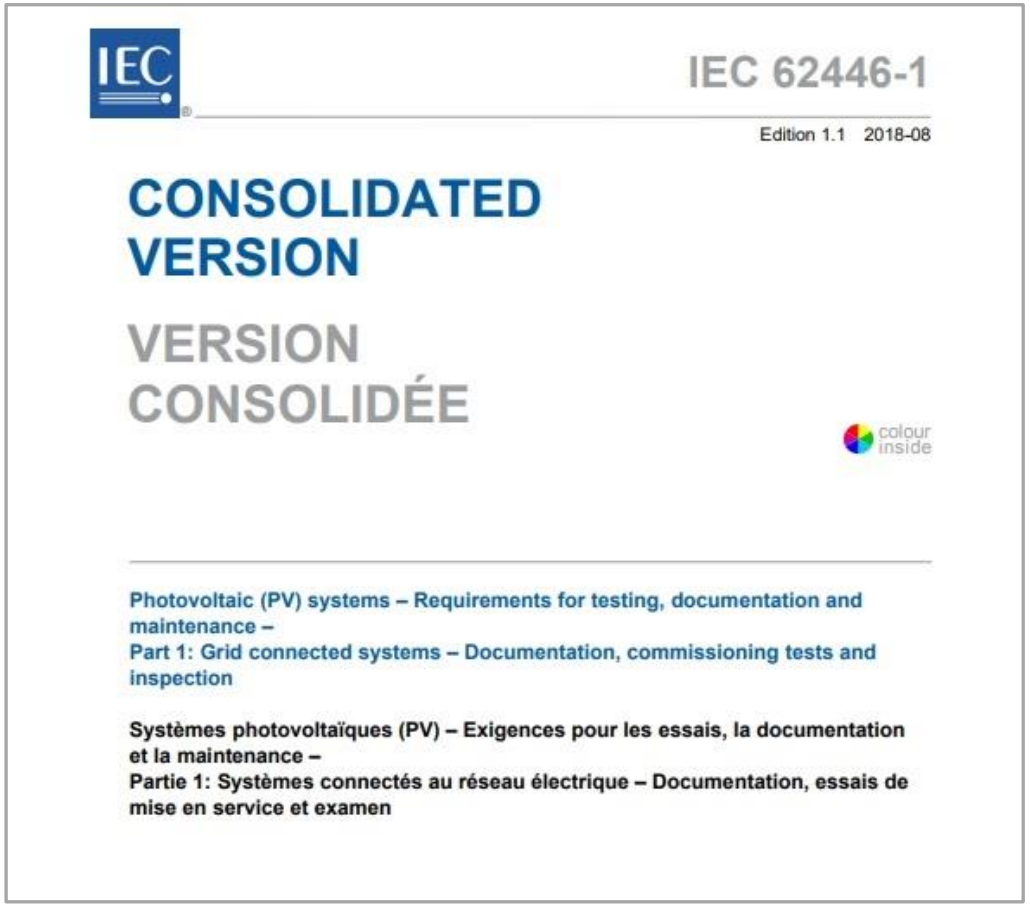
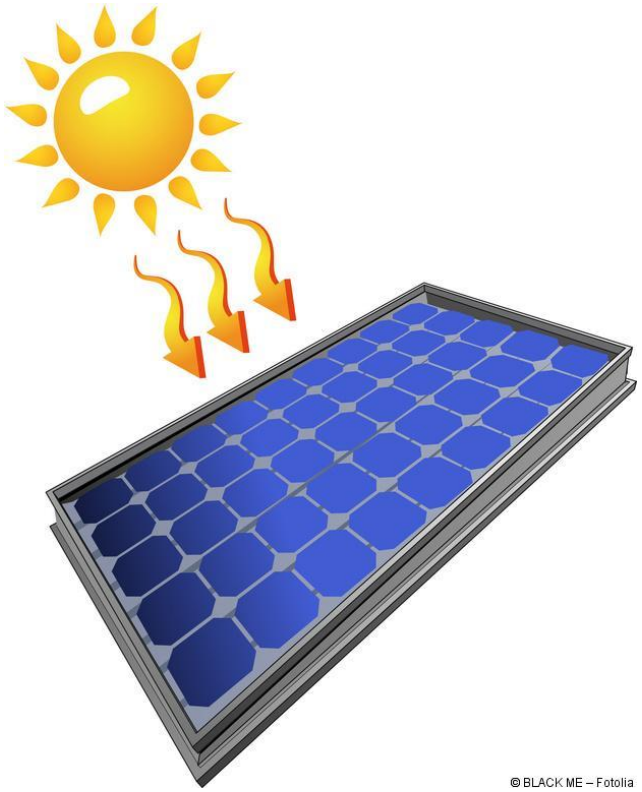
How-to test a Solar System (Appendix)

What tests need to be done at a photovoltaic (PV) system, acc. to the photovoltaic test standard IEC/EN 62446-1?





Why Customers need an Irradiance Meter?

Site Survey	System Design	Permitting	Installation	O&M	Customer Report
Sales Engineer Field Supervisor	Design Engineer CAD Designer Consulting Service Manager	Operations Manager PV Installers	Electrician PV Installers Construction Manager	Electrician PV Technician Maintenance Manager	Electrician PV Installers

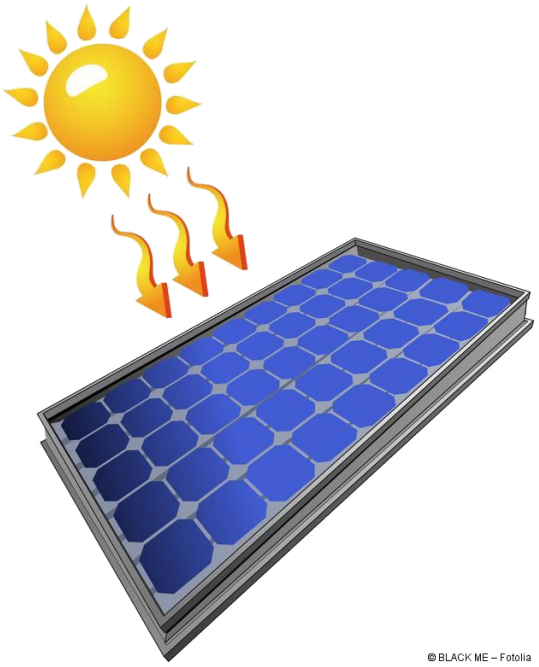
- Customers have the need of dedicated solar tools for specific phase of their workflow
- When installing, commissioning and executing maintenance on Solar modules, PV Installers and/or Utilities Technicians are mandated to **verify performance of a solar module** under IEC/EN 62446-1

Category 1 Test Regime

- Continuity of earthing or bonding
- Polarity test
- Voltage on open circuit (Voc)
- Operational or short circuit current (Isc)
  - **Irradiance meter needed to align and compare measured values with nominal values of solar module**
- Insulation resistance (Riso)

Category 2 Test Regime

- IV Curve tracing and associated software analysis
  - **Irradiance needed to calculate IV Curve**



How-to test a Solar System (Appendix)

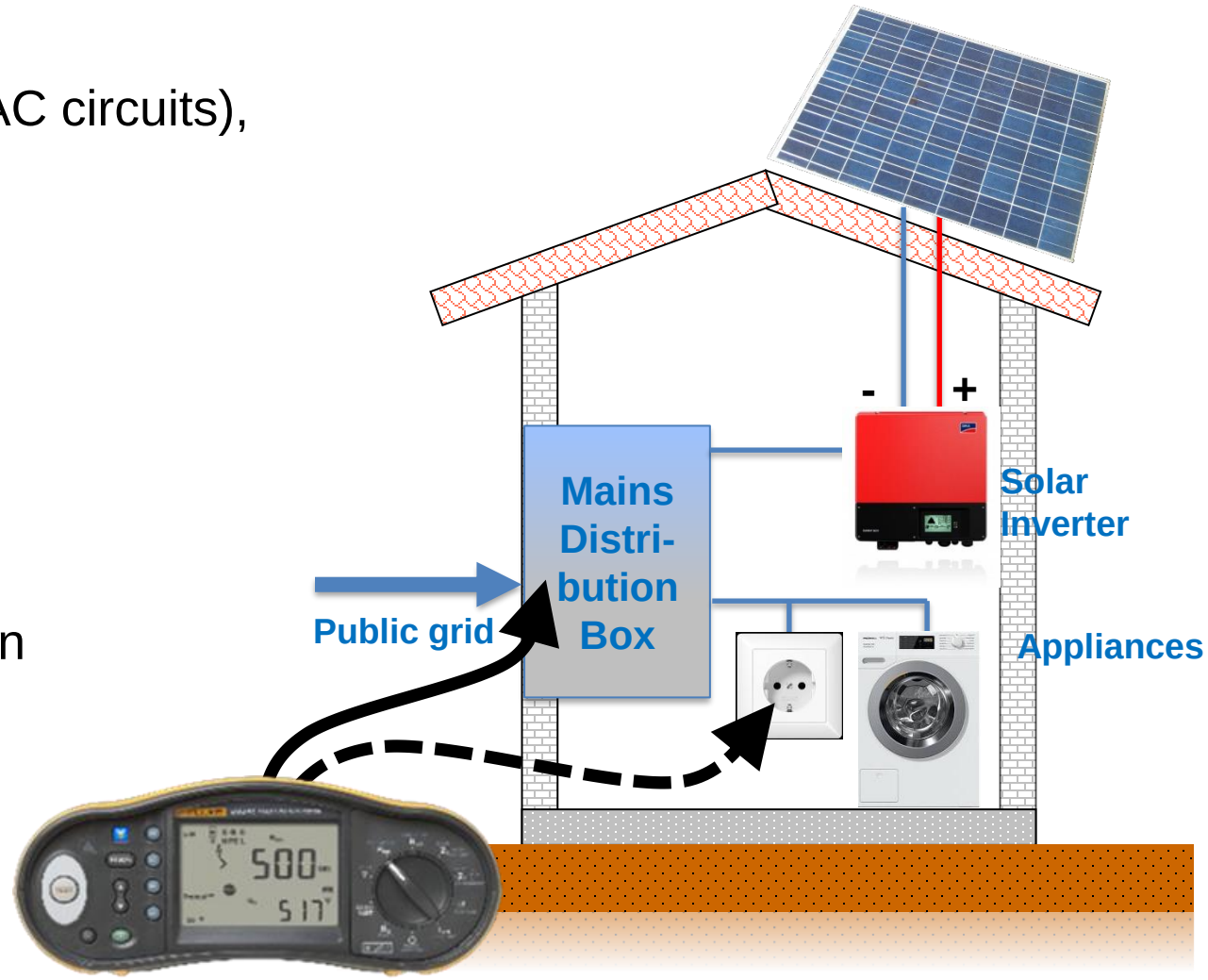
Testing on photovoltaic system could be divided in three topics:

1. **Safety testing** at the mains installation (AC circuits), acc. to the European installation test standard IEC/HD 60364-6.

This includes:

- Continuity of the protective conductors
- Insulation resistance test
- RCD and loop test

→ This is already covered via the Multifunction Installation Tester (MFT) **Fluke 1664 FC**



How-to test a Solar System (Appendix)

Testing on photovoltaic system could be divided in three topics:

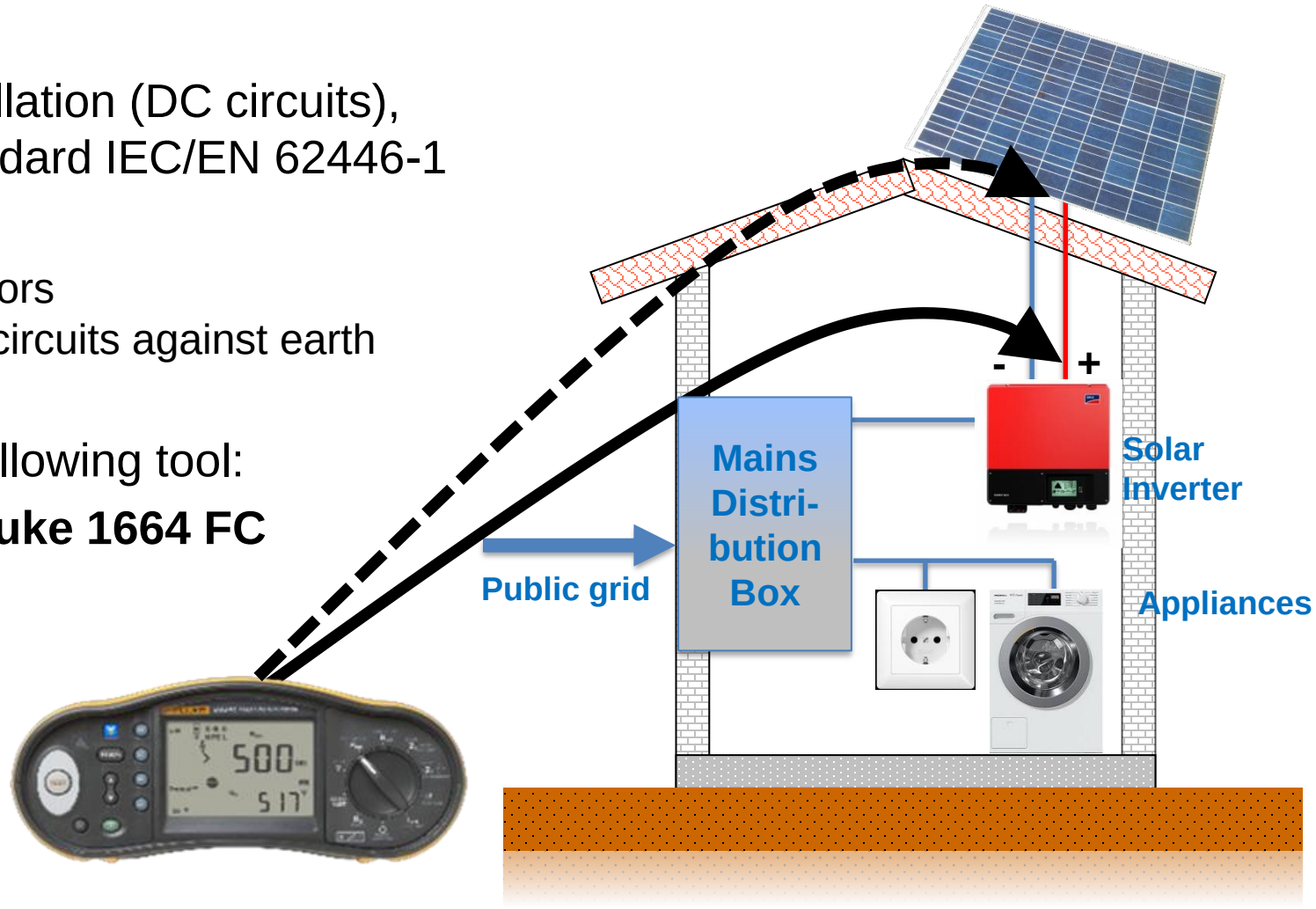
2. **Safety testing** at the solar installation (DC circuits), acc. to the photovoltaic test standard IEC/EN 62446-1

This includes:

- Continuity of the (protective) conductors
- Insulation resistance test (of the DC circuits against earth

→ This could be done with via the following tool:

- Multifunction Installation Tester **Fluke 1664 FC**



How-to test a Solar System (Appendix)

Testing on photovoltaic system could be divided in three topics:

3. **Functional testing** at the solar installation (DC circuits), acc. to the photovoltaic test standard IEC/EN 62446-1

This includes:

- Polarity test of the solar modules and strings
- String open circuit voltage of the generated solar voltage
- String current, short circuit or operational of the generated solar current
- Solar irradiance (W/m²) and solar module temperature (°C)

→ This could be done with the NEW irradiance meter **IRR1-SOL,** in combination with the NEW solar clamp meter **Fluke 393 FC**