The device is connected to the supply via terminals A1-A2. The unit can either be supplied from the monitored voltage system or from a separate auxiliary supply. Terminal L is connected to the monitored voltage and PE to earth. If the insulation resistance RE drops below the adjusted alarm value R_AL the red LED goes on and the output relay switches off (de-energized on trip). If the unit is on auto reset (bridge between LT1-LT2) and the insulation resistance gets better (RE rises), the insulation monitor switches on again with a certain hysteresis and the red LED goes off. Without the bridge between LT1-LT2 the Insulation monitor remains in faulty state even if the insulation resistance is back to normal. (In order to achieve failure storage, the voltage system showing a fault must not be switched off too fast after detection of the failure, see notes). The reset is done by pressing the internal or external reset button or by disconnecting the auxiliary supply. By activating the “Test” button an insulation failure can be simulated to test the function of the unit.

The variants IL/SL 5880.12/200 have a second setting range with a higher resistance up to 5 MΩ (Potentiometer RVW). This setting value can be used for pre-warning with relay output, by positioning the lower setting switch to “AL 11-12-14; VW 21-22-24”.

If the higher setting range should be used only, the setting switch is put in position “VW 2u” and both contacts react only to the higher setting. If the lower setting range should be used only, the setting switch is put in position “AL 2u” and both contacts react only to the lower setting. When set to manual reset the latching is active on both settings R_AL and RVW. Therefore it is possible in the case of a short insulation decrease (Switch position AL 11-12-14; VW 21-22-24), to pass the warning signal to a PLC while the main fault does not lead to a disconnection of the mains via the contacts 11-12-14.

According to IEC/EN 61557-8
- For single and 3-phase AC-systems up to 0 ... 500 V and 10 ... 10000 Hz
- Adjustable tripping value R_AL of 5 ... 100 kΩ or 10 ... 500 kΩ
- Monitors also disconnected voltage systems
- De-energized on trip
- Auxiliary voltage Measuring Circuit and output contacts are galvanically separated
- Manual and auto reset
- With test and reset button
- Connections of external test and reset buttons possible
- LED indicators for operation and alarm
- 2 changeover contacts
- IL/SL 5880/200 with additional prewarning
  - Adjustable prewarning value 10 kΩ ... 5 MΩ
  - Output function programmable
- Variant IL/SL 5880/300 according to DIN VDE 0100-551 for mobile generator sets available
- 4 models available:
  - IL 5880, IP 5880: 61 mm deep with terminals near to the bottom to be mounted in consumer units or industrial distribution systems according to DIN 43880
  - SL 5880, SP 5880: 98 mm deep with terminals near to the top to be mounted in cabinets with mounting plate and cable ducts
- DIN rail or screw mounting
- 35 mm width

All technical data in this list relate to the state at the moment of edition. We reserve the right for technical improvements and changes at any time.
IL 5880, SL 5880, IP 5880, SP 5880

Indicators

- **Green LED "ON":** On, when supply voltage connected
- **Red LED "AL":** On, when insulation fault detected, \( R_c < R_{AL} \)
- **Yellow LED "VW":** On, when insulation resistance is under prewarning value, \( R_c < R_{VW} \) (only with variant IL/SL 5880.12/2_/300)

Notes

**Risk of electrocution!**

- **Danger to life or risk of serious injuries.**
  - Disconnect the system and device from the power supply and ensure they remain disconnected during electrical installation.
  - The terminals of the control input PT, LT1 und LT2 have no galvanic separation to the measuring circuit L and are electrically connected together, therefore they have to be controlled by volt free contacts or bridge. These contacts or bridges must provide a sufficient separation depending on the mains voltage on L.
  - No external potentials may be connected to external control terminals PT, LT1 und LT2.

**Attention!**

- Before checking insulation and voltage, disconnect the insulation monitor IL/SL 5880 from the power source!
- In one voltage system only one insulation monitor can be used. This has to be observed when interconnecting two separate systems.
- The auxiliary supply can be connected to a separate auxiliary supply or to the monitored voltage system. The range of the auxiliary supply input has to be observed.

**Notes**

- The Insulation monitors IL/SL 5880 are designed to monitor AC-voltage systems. Overlayed DC voltage does not damage the instrument but may change the conditions in the measuring circuit.
- Line capacitance \( C_e \) to ground does not influence the insulation measurement, as the measurement is made with DC-voltage. It is possible that the reaction time in the case of insulation time gets longer corresponding to the time constant \( R_c * C_e \).
- The model /200 can be used, because of it’s higher setting value, to monitor single or 3-phase loads for ground fault. If the load is operated from a grounded system the insulation resistance of the load can only be monitored when disconnected from the mains. This is normally the fact with loads which are operated seldom or only in the case of emergency but then must be function (see connection example).
- When monitoring 3-phase IT systems it is sufficient to connect the insulation monitor only to one phase. The 3-phases have a low resistive connection (approx. 3 - 5 \( \Omega \)) via the feeding transformer. So failures that occur in the non-connected phases will also be detected.
- Storing of insulation failures:
  - The storing of an insulation failure is delayed slightly longer the reaction of the output relay because of interference immunity. In cases where the defective voltage system is switched off immediately by the output of the insulation monitor it can happen that the fault is not stored (e. g. mobile generator sets). For these applications we recommend the variant IL/SL 5880/300, where the output relay reacts only after the fault is stored. All other features of this variant are similar to IL/SL 5880/200.
Technical Data

Auxiliary Circuit

Nominal voltage $U_N$:
- IL 5880, SL 5880: AC 220 ... 240 V, AC 380 ... 415 V
- IP 5880, SP 5880: AC 12 V, DC 24 V
- IP 5880, SP 5880: AC / DC 110 ... 240 V
- IP 5880, SP 5880: AC 500 V
- IP 5880, SP 5880: DC 500 V

Frequency range (AC):
- IL 5880: 45 ... 400 Hz
- SL 5880: 45 ... 400 Hz

DC voltage: Max. permissible noise $V_{max}$:
- $0.8 ... 1.1 U_N$
- $10 ... 100 \text{k}\Omega$
- $10 ... 500 \text{k}\Omega$

Prewarning value $R_{RW}$:
- (only at IL/SL 5880/2): $10 \text{k}\Omega \cdots 5 \text{M}\Omega$
- Infinite variable

Internal test resistor:
- Equivalent to earth resistance of $< 5 \text{k}\Omega$

Response inaccuracy:
- $< 0.1 \text{mA}$

Max. permissible noise:
- DC voltage: $< 0.1 \text{mA}$

Operate delay:
- $10 \text{k}\Omega \cdots 5 \text{M}\Omega$
- Infinite variable

Internal AC resistance:
- $> 250 \text{k}\Omega$

Internal DC resistance:
- $> 250 \text{k}\Omega$

Measuring voltage:
- Approx. DC 15 V, (internally generated)

Max. measuring current $I_{max}$:
- $5 \text{A}$
- $2 \text{A}$

Measuring Circuit

Nominal voltage $U_N$:
- AC 0 ... 500 V

Voltage range:
- $0 ... 1.1 U_N$

Frequency range:
- $10 ... 10000 \text{Hz}$

Alarm value $R_{AL}$:
- $5 \times 10^6 \text{switching cycles}$
- $5 \times 10^5 \text{switching cycles}$

Prewarning value $R_{RW}$:
- (only at IL/SL 5880/2): $< 1.3 \text{s}$
- $< 0.7 \text{s}$

Response inaccuracy:
- $\pm 15 \% \pm 3 \text{k}\Omega$

Hysteresis:
- $\pm 3 \text{k}\Omega$

Technical Data

EMC

Electrostatic discharge:
- $8 \text{kV}$ (air)

HF irradiation:
- $10 \text{V} \text{m}$
- $3 \text{V} \text{m}$
- $1 \text{V} \text{m}$

Fast transients:
- $2 \text{kV}$

Surge voltages:
- Between A1 - A2: $1 \text{kV}$
- Between L - PE: $2 \text{kV}$
- HF-wire guided: $10 \text{V}$

Interference suppression:
- IL / SL 5880: $10 \text{V} / \text{SP}$
- IP / SP 5880: $10 \text{V} / \text{SP}$

Degree of protection:
- Housing: EN 50050
- Terminals: IEC/EN 60529

Housing:
- Thermostatic with V0 behaviour

Vibration resistance:
- According to UL Subject 94

Climate resistance:
- Frequency $10 \text{...} 55 \text{Hz}$
- $> 2000 \text{m}$

Terminial designation:
- DIN 46228-1/-2/-3/-4
- Cross section: $2 \times 2.5 \text{mm}^2$ solid or $2 \times 1.5 \text{mm}^2$ stranded wire
- Stripping length: $10 \text{mm}$
- $0.8 \text{Nm}$

Fixing torque:
- Flat terminals with self-lifting clamping piece
- Screw mounting M4, 90 mm hole pattern

Mounting:
- DIN rail mounting (IEC/EN 60715)
- Screw mounting M4, 90 mm hole pattern, with additional clip available as accessory

Weight:
- IL 5880: 160 g
- SP 5880: 250 g
- SL 5880: 189 g
- IL 5880: 160 g
- IP 5880: 250 g
- SL 5880: 189 g
- IP 5880: 250 g
- SP 5880: 300 g

Dimensions:
- Width x height x depth:
  - IL 5880: $35 \times 90 \times 61 \text{mm}$
  - SP 5880: $70 \times 90 \times 61 \text{mm}$
  - SL 5880: $35 \times 90 \times 98 \text{mm}$
  - IP 5880: $70 \times 90 \times 98 \text{mm}$

Classification to DIN EN 50155 for IL 5880

Vibration and shock resistance:
- Category 1, Class B
- IEC/EN 61373

Ambient temperature:
- T1 compliant
- T2, T3 and TX with operational limitations

Protective coating of the PCB:
- No

Standard Types

IL 5880.12 AC 220 ... 240 V
- Article number: 0053378
- Auxiliary voltage $U_N$: AC 220 ... 240 V
- Adjustable alarm value $R_{AL}$: $5 \cdots 100 \text{k}\Omega$
- Width: $35 \text{mm}$

SL 5880.12 AC 220 ... 240 V
- Article number: 0053996
- Auxiliary voltage $U_N$: AC 220 ... 240 V
- Adjustable alarm value $R_{AL}$: $5 \cdots 100 \text{k}\Omega$
- Width: $35 \text{mm}$
Monitoring of motor windings against ground.
The insulation of the motor to ground is monitored as long as contactor K does not activate the load.

*2) With bridge LT1 - LT2: Automatic reset
Without bridge LT1 - LT2: Manual reset, reset with button LT

Grounded system

L1
L2
L3
PE

PT

IL5880, IP5880

(Monitoring of insulation to 5M-Ohm)

Monitored ungrounded system
AC 10...1000Hz 0...500V

Connecting Example