

Installation- / monitoring technique

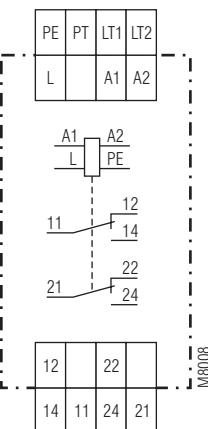
Insulation monitor IL 5880, IP 5880, SL 5880, SP 5880 varimeter



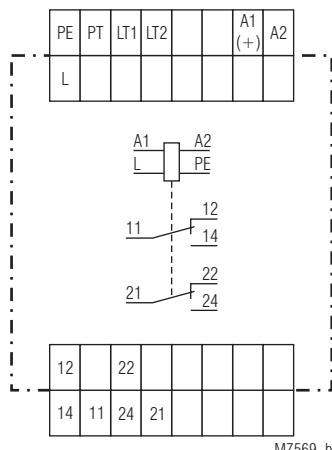
0238809



Circuit diagram



IL 5880, SL 5880



IP 5880, SP 5880

- According to IEC/EN 61 557
- For single and 3-phase AC-systems up to 0 ... 500 V and 10 ... 1000 Hz
- Adjustable tripping value R_{AL} of 5 ... 100 k Ω
- Monitors also disconnected voltage systems
- De-energised 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 k Ω ... 5 M Ω
 - 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 43 880

SL 5880, SP 5880: 98 mm deep with terminals near to the top to be mounted in cabinets with mounting plate and cable ducts

- 35 mm width

Approvals and marking



Applications

- Monitoring of insulation resistance of ungrounded voltage systems to earth.
- IL/SL 5880/200 can also be used to monitor standby devices for earth fault, e.g. motor windings of devices that have to function in the case of emergency.
- IL/SL 5880/300 according to DIN VDE 0100-551 to monitor mobile generator systems
- Other resistance monitoring applications.

Function

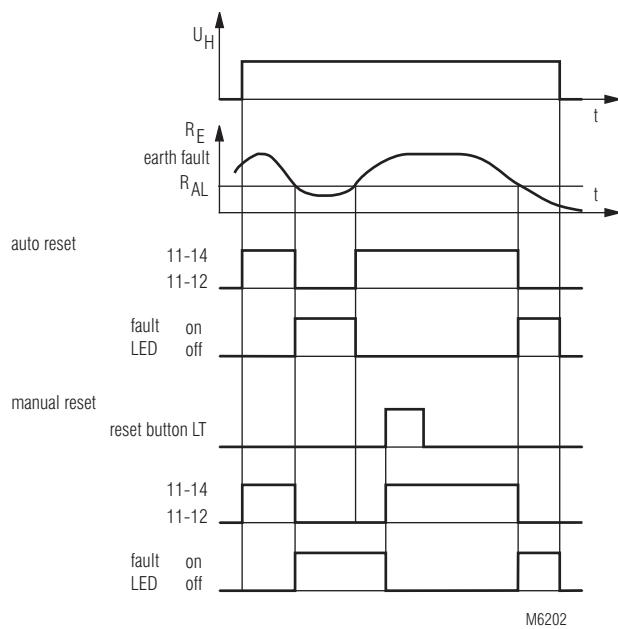
The device is connected to the supply via terminals A1-A2. The unit can either be supplied from the monitored voltage system or from an separate auxiliary supply. Terminal L is connected to the monitored voltage and PE to earth. If the insulation resistance R_E drops below the adjusted alarm value R_{AL} the red LED goes on and the output relay switches off (de-energised on trip). If the unit is on auto reset (bridge between LT1-LT2) and the insulation resistance gets better (R_E 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 M Ω (Potentiometer R_{vw}). 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 R_{vw} . 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.

Function diagram

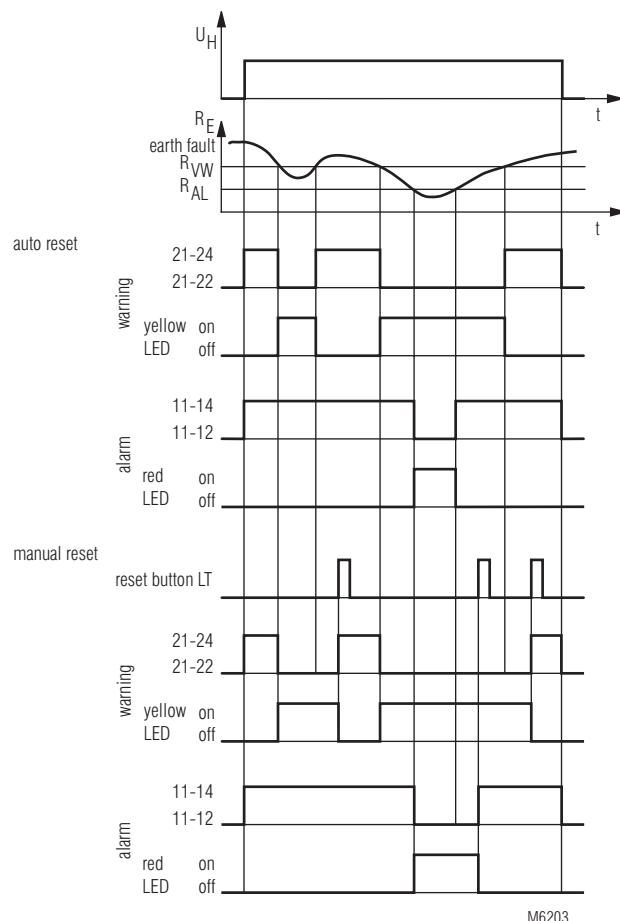


M6202

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, ($R_E < R_{AL}$)
 Yellow LED "VW": On, when insulation resistance is under prewarning value, $R_E < R_{VW}$ (only with variant IL/SL 5880.12/2_ _ and /300)



IL 5880/200, SL 5880/200, IP 5880/200, SP 5880/200

Notes

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.

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. In one voltage system only one Insulation monitor must be connected. This has to be observed when coupling voltage system.

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 $R_E * C_E$.

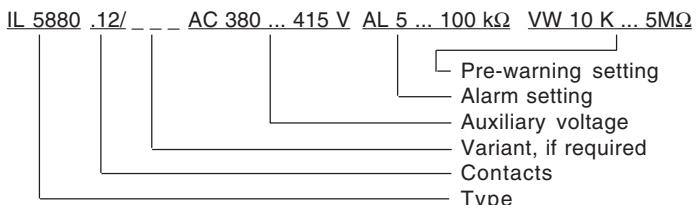
The model /200 can be used, because of its higher setting value, to monitor single or 3-phase loads for ground fault.

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).

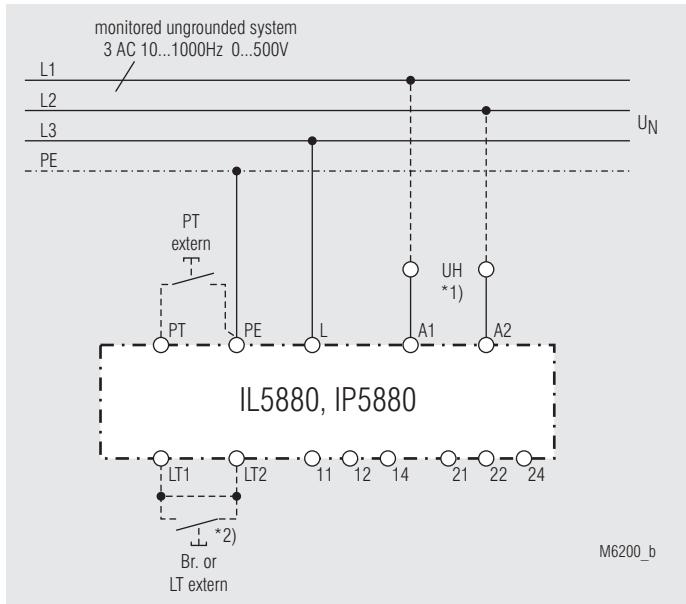
The auxiliary supply can be connected to a separate auxiliary supply or to the monitored voltage system. The range of the auxiliary supply input has to be observed.

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 Ω) via the feeding transformer. So failures that occur in the non-connected phases will also be detected.

Technical data		Technical data	
Auxiliary circuit		EMC	
Nominal voltage U_N IL 5880, SL 5880:	AC 220 ... 240 V, AC 380 ... 415 V 0,8 ... 1,1 U_N DC 12 V, DC 24 V	Electrostatic discharge: 8 kV (air) HF irradiation: 10 V / m Fast transients: 2 kV Surge voltages	IEC/EN 61 000-4-2 IEC/EN 61 000-4-3 IEC/EN 61 000-4-4
IP 5880:	0,9 ... 1,25 U_N AC / DC 110 ... 240 V 0,7 ... 1,25 U_N	between A1 - A2: 1 kV between L - PE: 1 kV Interference suppression: Limit value class B	IEC/EN 61 000-4-5 IEC/EN 61 000-4-5 EN 55 011
Frequency range (AC): Nominal consumption:	45 ... 400 Hz	Degree of protection:	
AC: DC:	ca. 2 VA ca. 1 W	Housing: IP 40 Terminals: IP 20	IEC/EN 60 529 IEC/EN 60 529
Measuring circuit		Housing:	
Nominal voltage U_N:	AC 0 ... 500 V	Vibration resistance:	
Voltage range:	0 ... 1,1 U_N	Climate resistance:	
Frequency range:	10 ... 1000 Hz	Terminal designation:	
Alarm value R_{AL}:	5 ... 100 k Ω	Wire connection:	
Prewarning value R_{vw} (only at IL/SL 5880/2_ _ and IL/SL 5880/300):	10 k Ω ... 5 M Ω	Wire fixing:	
Setting R_{AL}, R_{vw}:	infinite variable	Wire fixing:	
Internal test resistor:	equivalent to earth resistance of < 5 k Ω	Mounting:	
Internal AC resistance:	> 250 k Ω	IL 5880: 160 g	
Internal DC resistance:	> 250 k Ω	SL 5880: 189 g	
Measuring voltage:	approx. DC 15 V, (internally generated)	IP 5880: 250 g	
Max. measuring current ($R_E = 0$):	< 0,1 mA	SP 5880: 300 g	
Max. permissible noise DC voltage:	DC 500 V	Dimensions	
Operate delay at $R_{AL} = 50$ k Ω , CE = 1 μ F		Width x height x depth:	
R_E from ∞ to 0,9 R_{AL} :	< 1,3 s	IL 5880: 35 x 90 x 61 mm	
R_E from ∞ to 0 k Ω :	< 0,7 s	SL 5880: 35 x 90 x 98 mm	
Hysteresis at $R_{AL} = 50$ k Ω :	approx. 15 %	IP 5880: 70 x 90 x 61 mm	
Output		SP 5880: 70 x 90 x 98 mm	
Contacts:		Standard types	
IL / SL 5880.12, IP / SP 5880.12: IL / SL 5880.12/2_ _ , IL / SL 5880.12/300, IP / SP 5880.12/2_ _ :	2 changeover contacts	IL 5880.12 AC 220 ... 240 V Article number: 0053378	stock item
Thermal current I_{th}: Switching capacity to AC 15	2 x 1 changeover contact, programmable 4 A	• Auxiliary voltage U_H : AC 220 ... 240 V • adjustable alarm value R_{AL} : 5 ... 100 k Ω • Width: 35 mm	
Electrical life to AC 15 at 1 A, AC 230 V: Short circuit strength max. fuse rating: Mechanical life:	$\geq 5 \times 10^5$ switching cycles 4 A gL $\geq 30 \times 10^6$ switching cycles	IL 5880.12 AC 220 ... 240 V Article number: 0055396 • Auxiliary voltage U_H : AC 220 ... 240 V • adjustable alarm value R_{AL} : 5 ... 100 k Ω • Width: 35 mm	
General data		Variants	
Operating mode:	Continuous operation	IL / SL 5880.12/200:	with pre-warning and programmable outputs
Temperature range:	- 20 ... + 60°C	IL / SL 5880.12/201:	as version IL / SL 5880.12/200, but both output relays with energized on trip principle
Clearance and creepage distances		IL / SL 5880.12/300:	according to DIN VDE 0100-551 as version IL / SL 5880.12/200, but for use with mobile generator sets
overvoltage category / contamination level		Ordering example for variants	
between auxiliary supply connections (A1- A2):	IEC 60 664-1	IL 5880 .12/ _ _ AC 380 ... 415 V AL 5 ... 100 k Ω VW 10 K ... 5M Ω	
between measuring input connections (L - PE):	4 kV / 2 at AC-auxiliary voltage IEC 60 664-1		Pre-warning setting
between auxiliary supply and measuring input connections:	4 kV / 2 IEC 60 664-1		Alarm setting
	4 kV / 2 (3 kV at DC-auxiliary voltage)		Auxiliary voltage
			Variant, if required
			Contacts
			Type

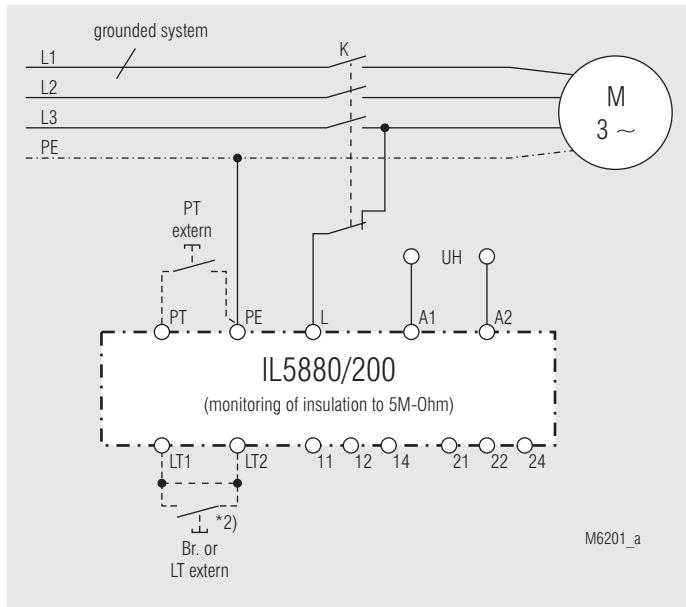


Connection diagram



Monitoring of an ungrounded voltage system.

- *1) Auxiliary supply U_H (A1 - A2) can be taken from the monitored voltage system. The range of the auxiliary supply input must be observed.
- *2) with bridge LT1 - LT2: automatic reset
without bridge LT1 - LT2: manual reset, reset with button LT

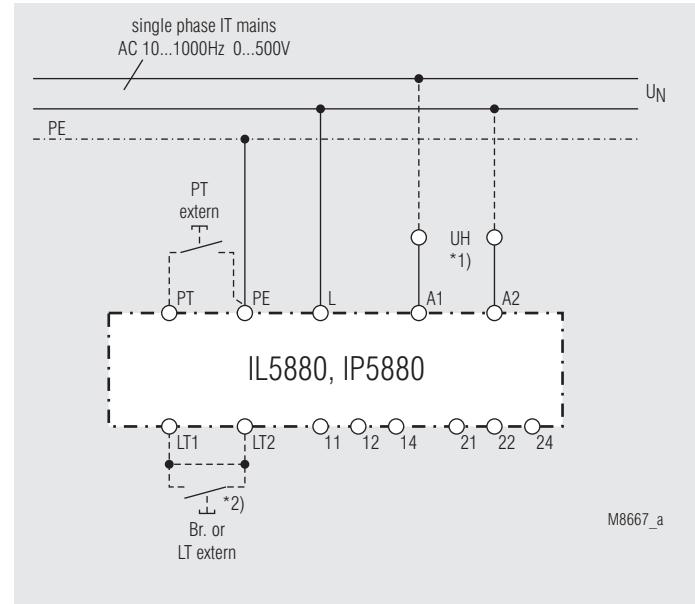


Monitoring of motorwindings against ground.

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

Connection diagram



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