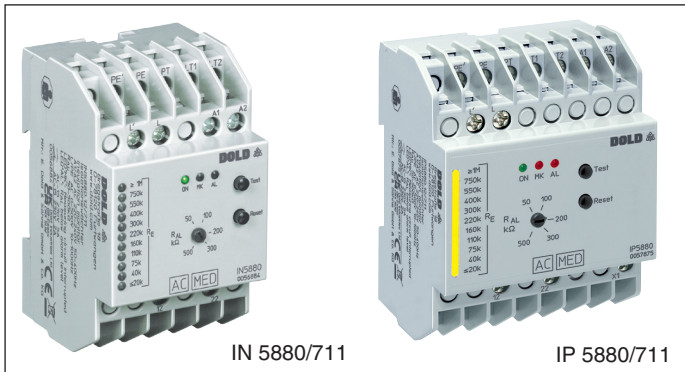


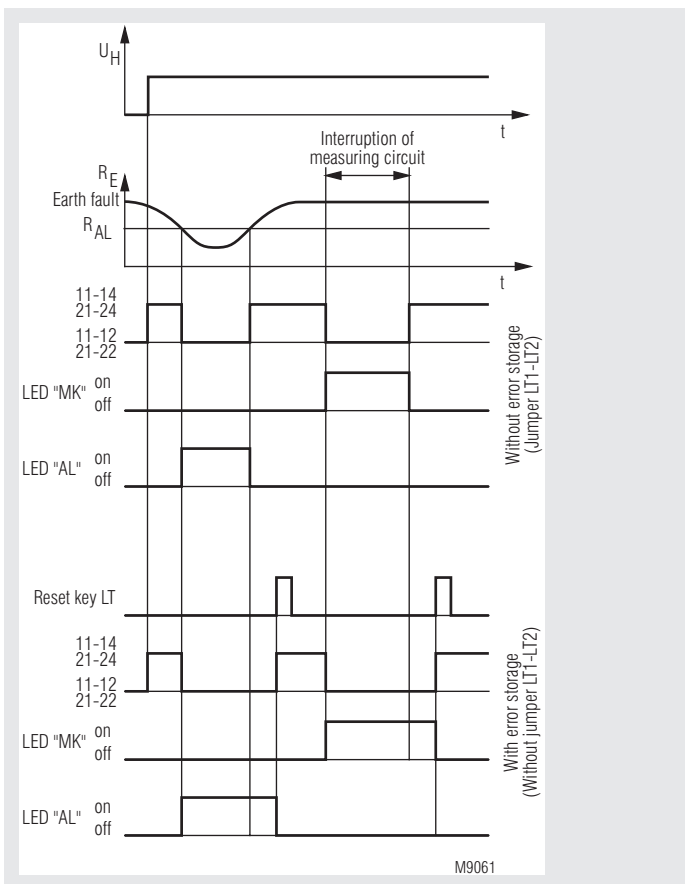
## VARIMETER IMD Insulation Monitor IN 5880/711, IP 5880/711

Translation  
of the original instructions



- According to IEC/EN 61557-8
- For rooms used for medical purposes according to IEC 60364-7-710, DIN VDE 0100-710
- For three-phase and A.C. power systems with 0 ... 500 V and 10 ... 1000 Hz (IT power systems)
- Adjustable alarm value for ground fault  $R_{AL}$  of 50 ... 500 k $\Omega$
- Measuring circuit with broken wire protection
- As option, programmable for storing or non-storing of errors
- With reset and test button
- Additional external reset and test buttons can be connected
- LED indicators for operation, insulation fault, and interruption of Measuring circuit
- 2 changeover contacts
- With LED chain for indication of the current insulation status
- IP 5880/711 for connection of the test and display panel UP 5862
- 52.5 mm width

### Function Diagram Insulation Monitoring System



### Approvals and Markings



### Applications

For insulation monitoring of the IT system of rooms used for medical purposes according to VDE 0100-710:

### Function

The terminals L/L' and PE/PE' are connected to the respective lines of the IT power system. If the IT transformer has a centre tapping or a star point, the terminals L' and PE' are preferably connected to this point. The terminals L and PE should be connected with separate lines and possibly not in the same place (at least not at the same terminal) of the IT power system to allow for safe recognition of an interruption in the measuring circle.

The insulation resistance of the IT power system against ground is measured between the terminals L / L' and PE / PE'. If the ground fault resistance  $R_E$  falls below the pickup value  $R_{AL}$  of the line isolation monitor, the red LED "AL" will be illuminated, and the two changeover contacts fall back into normal position. On interruption of the Measuring circuit, the two changeover contacts will likewise fall back into normal position, and the red LED "MK" will be illuminated.

After correction of the error ( $R_E > R_{AL}$ , Measuring circuit connected) and jumpered terminals LT1 – LT2 (= error not stored), the changeover contacts will change into work position (correct status), and the red error LEDs will stop lighting.

If you wish to store errors, remove the jumper LT1 – LT2. In this way, also short-lived errors as e.g. a temporary deterioration of insulation, for example by touching of a line or unreliable contact making in the Measuring circuit may trigger a stored alarm: The output contacts remain open also after the error has been corrected. The type of the error can be seen in retrospect from the illuminated error LED "AL" or "MK".

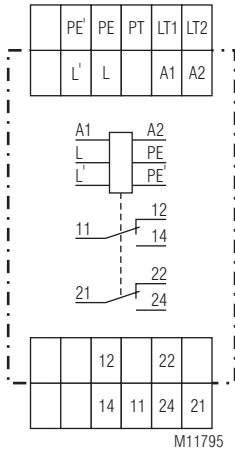
The error memory can be reset by pressing the internal or external reset key, or by switching off the auxiliary voltage.

By pressing the internal or external "Test" key, a deterioration of insulation is simulated in the Measuring circuit ( $= R_E$  approx. 40 k $\Omega$ ); thus, the correct response of the isolation monitor is checked.

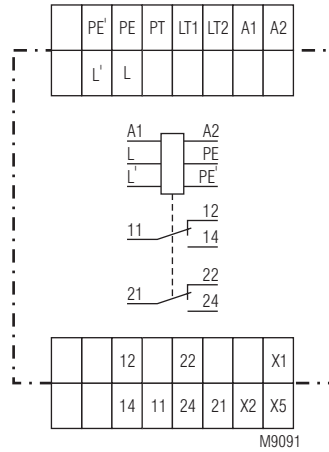
The IN 5880/711 comprises an 11-stage LED chain for indication of the current insulation resistance of the power system. By means of differently colored LEDs, the insulation status in the range of 20 k $\Omega$  ... 1 M $\Omega$  is indicated. In this way, deterioration of insulation can be detected even before an alarm is triggered.

The IP 5880/711 includes a 11 step LED indicator to monitor the actual state of the insulation, an additional power supply and relays to connect a test and indicator unit UP 5862. The width is 70 mm.

## Circuit Diagrams



IN 5880/711



IP 5880/711

## Connection Terminals

Terminal designation	Signal description
A1, A2	Auxiliary voltage
L / L'	Connection for monitored IT-systems
PE / PE'	Connection for protective conductor
PT	Connection for external test button
LT1, LT2	Connections for external reset or manual and auto reset: LT1/LT2 bridged: Hysteresis function LT1/LT2 not bridged: Manual reset
X1, X2, X5 *)	Connections for external Test and indication panel UP 5862 *)
11, 12, 14 21, 22, 24	Alarm signal relay (2 changeover contact)

\*) At IP 5880/711 only

## Indicators

Green LED "ON":	Is illuminated when auxiliary voltage has been applied (operability)
Red LED "AL":	Is illuminated when an insulation failure is present, $R_i < R_{al}$ (value has fallen below alarm level)
Red LED "MK":	Is illuminated when one of the lines of the Measuring circuit is interrupted (L, L', PE, PE')

11-stage LED chain:

Green LEDs:	At $\geq 1 \text{ M}\Omega$ , 750 k $\Omega$ , 550 k $\Omega$
Yellow LEDs:	At 400 k $\Omega$ , 300 k $\Omega$ , 220 k $\Omega$ , 160 k $\Omega$ , 110 k $\Omega$ , 75 k $\Omega$
Red LEDs:	At 40 k $\Omega$ , $\leq 20 \text{ k}\Omega$

## 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 ore 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 IN 5880, IP 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.



**Attention!**

- The Insulation monitors IN 5880, IP 5880 are designed to monitor AC-voltage systems. Overlaid 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  $R_E * C_E$ .
- 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.

## Technical Data

### Insulation Measuring Circuit

<b>Nominal voltage <math>U_N</math>:</b>	AC 0 ... 500 V
<b>Voltage range:</b>	0 ... 1.1 $U_N$
<b>Frequency range:</b>	10 ... 1000 Hz,
<b>Alarm value <math>R_{AL}</math>:</b>	Adjustable from 50 ... 500 k $\Omega$
<b>Internal testing resistor:</b>	Corresponds to an $R_E$ of approx. 40 k $\Omega$
<b>AC internal resistance:</b>	> 250 k $\Omega$
<b>DC internal resistance:</b>	> 250 k $\Omega$
<b>Measuring voltage:</b>	Approx. DC 15 V (generated internally)
<b>Max. measuring current (<math>R_E = 0</math>):</b>	< 50 $\mu$ A
<b>Response inaccuracy:</b>	$\pm 15\% + 1.5\text{ k}\Omega$ IEC 61557-8
<b>Max. permissible interfering direct voltage:</b>	DC 500 V
<b>Operate delay:</b>	With $R_{AL} = 50\text{ k}\Omega$ , $C_E = 1\ \mu$ F
$R_E$ of $\infty$ to 0.9 $R_{AL}$ :	< 1.3 s
$R_E$ of $\infty$ to 0 k $\Omega$ :	< 0.7 s
<b>Hysteresis:</b>	Approx. 15 %

### Auxiliary Circuit

<b>Auxiliary voltage <math>U_H</math>:</b>	AC 220 ... 240 V
<b>Voltage range:</b>	0.85 ... 1.1 $U_H$
<b>Nominal consumption</b>	
IN 5880/711:	Approx. 2,5 VA
IP 5880/711:	Approx. 4 VA
<b>Nominal frequency:</b>	45 ... 400 Hz

### Output

<b>Contacts:</b>	2 changeover contacts
<b>Thermal current <math>I_{th}</math>:</b>	4 A
<b>Switching capacity</b>	
Acc. to AC 15	
NO contact:	5 A / AC 230 V IEC/EN 60947-5-1
NC contact:	2 A / AC 230 V IEC/EN 60947-5-1
<b>Contact life</b>	
To AC 15 with 1 A, AC 230V:	5 x 10 <sup>6</sup> operating cycles IEC/EN 60947-5-1
<b>Short circuit strength</b>	
<b>max. fuse rating:</b>	4 A gG / gL IEC/EN 60947-5-1
<b>Mechanical life:</b>	> 30 x 10 <sup>6</sup> operating cycles

### General Data

<b>Nominal operation:</b>	Permanent operation
<b>Temperature range:</b>	
Operation:	- 20 ... + 60 °C
Storage:	- 25 ... + 70 °C
<b>Betriebshöhe:</b>	$\leq 2000\text{ m}$
<b>Clearance and creepage distances</b>	
Overvoltage category/ pollution degree:	4 kV / 2 IEC 60664-1
Insulation test voltage	
Routine test:	AC 2,5 kV; 1 s
<b>EMC</b>	
Static discharge (ESD):	8 kV (air discharge) IEC/EN 61000-4-2
HF irradiation	
80 MHz ... 1 GHz:	10 V / m IEC/EN 61000-4-3
1 GHz ... 2.5 GHz:	3 V / m IEC/EN 61000-4-3
2.5 GHz ... 2.7 GHz:	1 V / m IEC/EN 61000-4-3
Fast transients:	2 kV IEC/EN 61000-4-4
Surges	
Between supply lines:	1 kV IEC/EN 61000-4-5
Between wire and ground:	2 kV IEC/EN 61000-4-5
HF-wire guided:	10 V IEC/EN 61000-4-6
Interference suppression:	Limit value class B EN 55011
<b>Degree of protection</b>	
Housing:	IP 40 IEC/EN 60529
Terminals:	IP 20 IEC/EN 60529
<b>Housing:</b>	Thermoplast with V0 behavior according to UL Subject 94
<b>Vibration resistance:</b>	Amplitude 0.35 mm
	Frequency 10 ... 55 Hz IEC/EN 60068-2-6
<b>Climate resistance:</b>	20 / 060 / 04 IEC/EN 60068-1
<b>Terminal designation:</b>	EN 50005

## Technical Data

<b>Wire connection:</b>	DIN 46228-1/-2/-3
<b>Cross section:</b>	2 x 2.5 mm <sup>2</sup> solid, or 2 x 1.5 mm <sup>2</sup> stranded wire with sleeve
<b>Stripping length:</b>	10 mm
<b>Wire fixing:</b>	Screw terminals with self-lifting clamping piece IEC/EN 60999-1
<b>Fixing torque:</b>	0.8 Nm
<b>Mounting:</b>	DIN rail IEC/EN 60715
<b>Net weight</b>	
IN 5880/710:	Approx. 190 g
IN 5880/711:	Approx. 250 g
IP 5880/711:	Approx. 350 g

### Dimensions

<b>Width x height x depth</b>	
IN 5880/711:	52.5 x 90 x 59 mm
IP 5880/711:	70 x 90 x 59 mm

### Standard typs

#### IN 5880.12/711 AC 220 ... 240 V

Artikelnummer:	0056884
• Output:	2 changeover contacts
• Auxiliary voltage $U_H$ :	AC 220 ... 240 V
• Width:	52.5 mm
• Adjustable alarm value RAL:	50 ... 500 k $\Omega$
• With 11-stage LED chain for indication of the current insulation value	

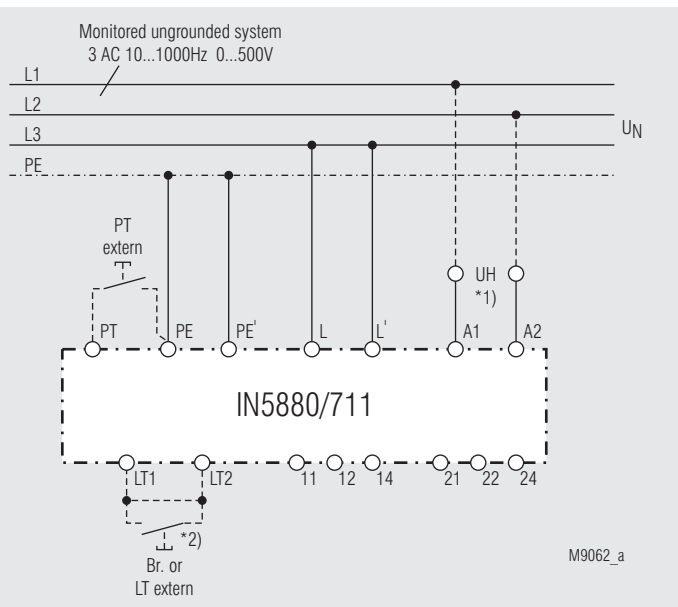
#### IP 5880.12/711 AC 220 ... 240 V

Artikelnummer:	0057875
• Output:	2 changeover contacts
• Auxiliary voltage $U_H$ :	AC 220 ... 240 V
• Width:	70 mm
• Adjustable alarm value RAL:	50 ... 500 k $\Omega$
• With 11-stage LED chain for indication of the current insulation value	
• In addition with connection for test and indicator panel UP 5862	

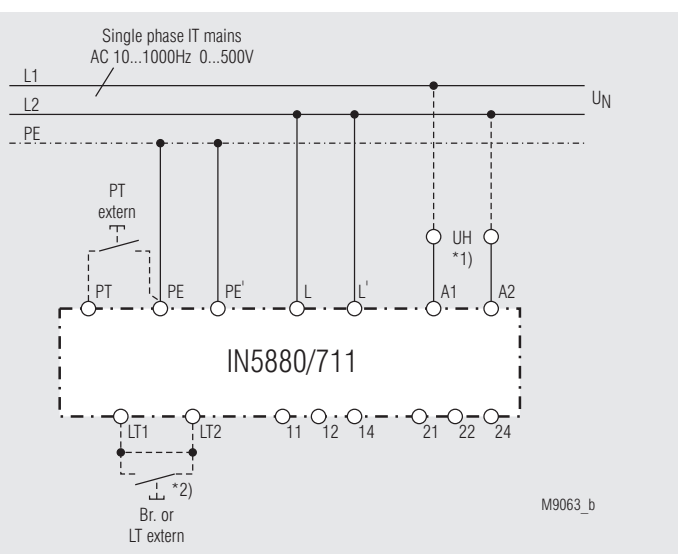
### Ordering Example

IN 5880.12/711	AC 220 ... 240 V	50 ... 500 k $\Omega$	
			Alarm value
			Auxiliary voltage
			Type

## Connection Examples



Monitoring of a 3-phase IT power system

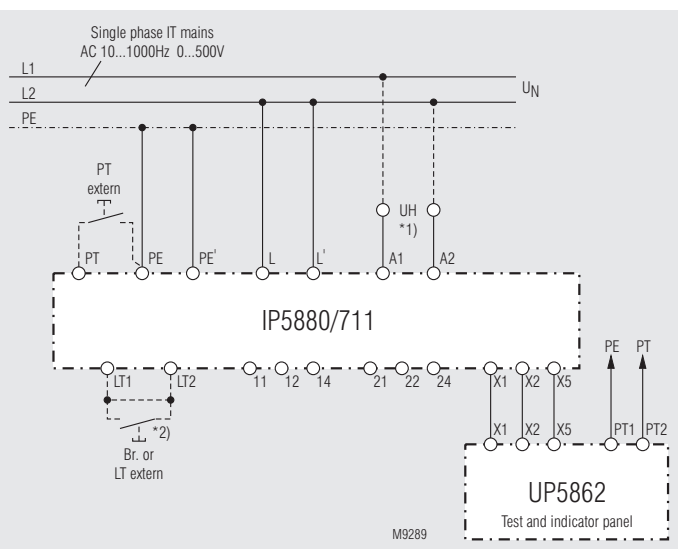


Monitoring of a single phase IT power system

\*1) The auxiliary voltage  $U_{H_i}$  (A1 – A2) can also be drawn from the power system to be monitored. However, the voltage range of the auxiliary voltage must be taken into consideration.

\*2) With jumper LT1 – LT2: No storing of error message (hysteresis behavior)

With jumper LT1 – LT2: Storing of error message; can be deleted by pressing the Delete (Reset) key LT



**E. Dold & Söhne GmbH & Co. KG • D-78120 Furtwangen • Bregstraße 18 • Phone +49 7723 654-0 • Fax +49 7723 654356**

dold-relays@dold.com • www.dold.com

## Accessories

### Test and indicator panel UP 5862

For insulation monitors in medically used rooms according to IEC 60364-7-710, DIN VDE 0100-710



- To mount in flush device boxes  $\varnothing$  60 mm, 35 mm deep;
- Test button to check the function of the device
- With green LED to indicate operation
- Reset button for audible alarm
- With yellow LED to monitor insulation failure

Max. wire length to IN / IP 5880

At wire cross section  $A = 0.5 \text{ mm}^2$ : 500 m

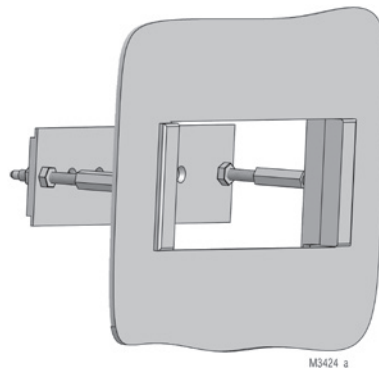
At wire cross section  $A = 1.5 \text{ mm}^2$ : 1000 m

Dimensions (width x height): 80 x 80 mm

Article number: 0041706

### Flush mounting kit

Order reference: KU 4087-150/005659



For universal use with:

- I-series devices of 17,5 to 105 mm width
- Easy mounting