# VARIMETER IMD
# Insulation monitor
# LK 5896/900

**Translation of the original instructions**

DOLD

0273755


## Product Description

The insulation monitor LK 5896/900 of the VARIMETER IMD family is a solution for optimal insulation monitoring of modern IT systems. The device can be used in the most flexible way for AC, DC and AC/DC systems even with large leakage capacity to earth (PE). By using a trigger input and a trigger output 2 separate IT systems can be coupled and monitored during operation without the problem that the 2 insulation monitors disturb each other. The adjustment of the setting values is simple and user friendly done on 2 rotary switches on the front of the device. Via LEDs the measured value, device parameters and device status are indicated easy to read. The unit has 3 relay contacts to signal Insulation and device failures. The analogue output provides a voltage and current signal proportional to the actual insulation resistance, which can be connected to a superior control (plc), another system or external display unit.

**Your Advantages**

- Preventive fire and system protection
- System for sequential monitoring of separated voltage systems, that can be coupled
- Quick fault localisation through selective earth fault detection to L+ and L-
- Universal application in non-earthed AC, DC, AC/DC networks with up to 1000 V nominal voltage
- Suitable for large leakage capacitances up to 3000 µF
- Simplest setting via engaging rotary switches
- Optimised measuring times - normally shorter than with known methods
- Monitoring also with voltage-free mains
- Measuring circuit with broken wire detection
- No additional coupling device required
- Analogue output for value of the insulation resistance: 0 ... 10 V / 0 ... 20 mA (2 ... 10 V / 4 ... 20 mA)

**Features**

- Insulation monitoring according to IEC/EN 61557-8
- Detection of symmetric and asymmetric insulation faults
- 1 changeover contact each for prewarning and alarm
- 3. output relay for signalling wire break and device faults
- Prewarning threshold setting range: 20 kΩ ... 2 MΩ
- Alarm threshold setting range: 1 kΩ ... 250 kΩ
- Energized or de-energized on trip can be selected for output relay
- Setting the maximum leakage capacitance to shorten the response time
- Simple, clearly arranged adjustment of the device with screwdriver
- LED chain to indicate the current insulation resistance
- Display " measuring circuits active"
- Display "Master" or "Slave"
- Automatic and manual device self-test
- Alarm storage selectable
- External test and reset pushbutton can be connected
- With watchdog timer to monitor the trigger signal
- Width: 90 mm

## Connection Terminals

| Terminal designation | Signal description |
|---|---|
| A1+, A2 | DC-Auxiliary voltage |
| L(+), L(-) | Connection for measuring circuit |
| KE, PE | Connection for protective conductor |
| G, R | Control input (manual/auto reset)<br>G/R not bridged: Manual reset<br>G/R bridged: Auto reset |
| G, T | Control input (External test input)<br>connection option for external device test pushbutton |
| G, HM | Trigger signal input<br>G/HM not bridged: Trigger new measuring cycle<br>G/HM bridged: Measuring circuit deactivated |
| G, M | Control input (Definition Master/Slave)<br>G/M not bridged: Device is Slave<br>G/M bridged: Device is Master |
| XA, GA, IA, UA | Analogue output<br>XA/GA not bridged:<br>UA-GA 0 ... 10 V; IA-GA 0 ... 20 mA<br>XA/GA bridged:<br>UA-GA 2 ... 10 V; IA-GA 4 ... 20 mA |
| Y1, Y2 | Trigger signal-output |
| 11, 12, 14 | Alarm signal relay (1 changeover contact) |
| 21, 22, 24 | Prewarning signal relay (1 changeover contact) |
| 31, 32, 34 | Device fault signal relay (1 changeover contact) |

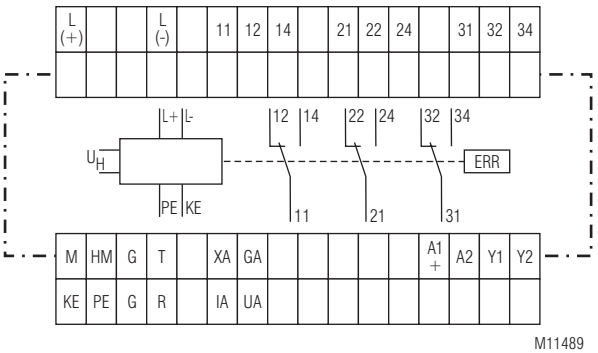
## Approvals and Markings

CE | c UL US LISTED Canada / USA | AC/DC | PV | UKCA

## Application

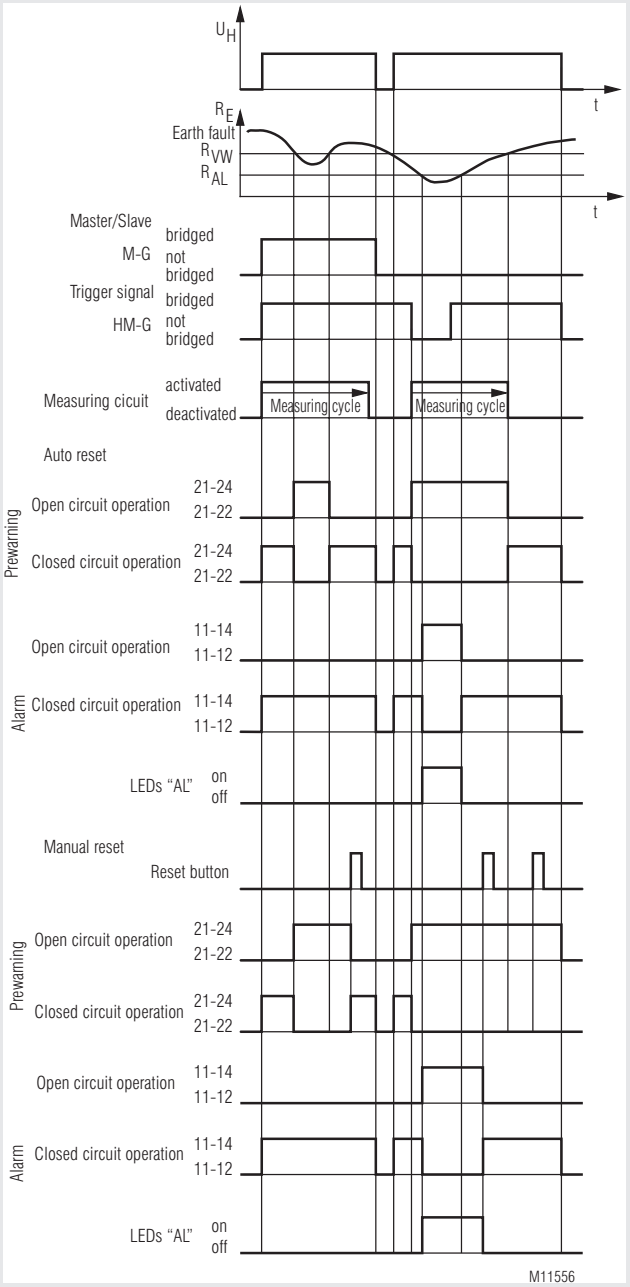
Insulation monitoring of Non-earthed AC, DC, AC/DC networks that can be couples.

## Circuit Diagram

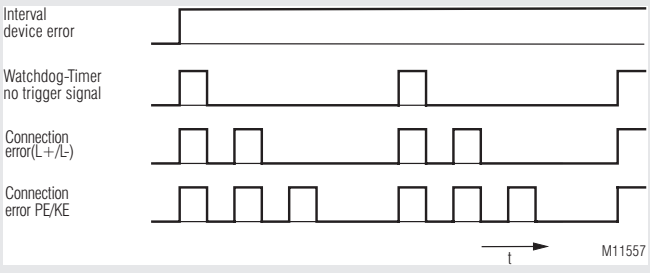



M11489

## Function Diagram




## Flashing Codes LED "ERR"




## Function

The device is supplied with DC auxiliary voltage via terminals A1+ / A2; a green "PWR" LED comes on. Switching on the auxiliary voltage is followed by an internal self-test for 10 sec, where the LEDs of the indicator string light up in sequence.

**Monitoring of several separated or coupled voltage systems**
Each voltage system is equipped with its own insulation monitor. When coupling several voltage systems not more then one insulation monitor must be active as several active insulation monitors in one system will influence each other in a negative way. The insulation monitors are connected in a loop and the different systems are then monitored sequentially.

To achieve this the trigger output Y1-Y2 of one unit is connected to the trigger input HM-G of the next insulation monitor. The last insulation monitor in a chain is then connected back to the first one. One insulation monitor in the chain is defined as master by linking the control terminals M-G. This unit will start the measuring cycle after power up and performs a defined number of measuring periods. When the cycle is finished, the measuring circuit is deactivated and a signal from Y1-Y2 goes to the next connected insulation monitor so that it can start its measuring cycle. The measured value will be stored in the unit and is displayed on the LED chain indicator and on the analogue output. The number of measuring period per measuring cycle can be set by the rotary switch "tv":

| "tv"- Setting | Number of measuring periods / measuring cycle |
|---|---|
| 0 | 8 |
| 1 | 10 |
| 2 | 12 |
| 3 | 16 |

The complete system is designed for maximum 20 devices connected in a loop. The trigger signal input is monitored with a watchdog timer. If the device does not get a new trigger pulse within 20 hours, (at max. 20 devices 1 h measuring time for each device) a fault indication is displayed, the LED "ERR" shows failure code 1 and the failure relay switches. If the device gets a new trigger pulse, the failure indication is reset automatically.

**Measuring circuit**
**(Insulation measurement between terminals L(+) / L(-) and PE / KE)**
Terminals L(+) and L(-) are connected to the mains to be monitored.
The broken wire detection is constantly effective during activated measuring cycle. It generates an error message if there is no low resistance connection from the 2 terminals to the mains.

In addition, the two terminals PE and KE must be connected to the protective conductor system via separate lines. An error message is given here as well if a line is interrupted (see section "Actions in case of connection faults"), while the measuring circuit is active.
If the main measuring circuit is activated, an active measuring voltage with alternating polarity is applied between L(+) / L(-) and PE / KE to measure the insulation resistance. During the measuring phase with positive polarity, the "Active" LED flashes with a long On-phase and with negative polarity with a short On-phase.
If the measuring circuit is inactive, the LED "Active" is off. the measurement is stopped and no measuring voltage is applied to the measuring circuit, causing no problem coupling a second voltage system with an additional insulation monitor.
The length of the positive and negative measuring phases depends on the settings on the rotary switch "CE/µF", the actual leakage capacitance of the monitored network and with DC networks, on the level and duration of possible mains voltage fluctuations. Correct and preferably quick measurement is thus given with different mains conditions. In the event of particularly adverse conditions and major interferences, the measuring analysis can be steadied and delayed in addition with rotary switch "tv" if necessary.
The current insulation resistance is determined and analysed at the end of each measuring phase. The LED chain and the analogue output shows the resistance determined, and the output relays for prewarning "VW" and alarm "AL" switch according to the respective response values set. If the response thresholds have been undercut, the LEDs "VW" or "AL" light according to the insulation fault location: "+", "-" or "+" and "-" simultaneously for AC faults or symmetric insulation faults.

## Function

**Storing insulation fault message**
If terminal R is open, the insulation fault messages are stored when the respective response value is undercut, but also when the insulation resistance returns to the OK-range. In addition, the temporary minimum values of the insulation resistance are indicated on the LED-chain through dimmed LEDs.
If the "Reset" button on the device front is pressed or terminal R is connected with G, the stored insulation fault messages are reset when the insulation resistance is again in the OK-range.

**Output relay for insulation fault messages**
The rotary switch "CE/µF Rel." allows selecting the operating current (A) or standby current (R) principle for the output relays "AL" (contacts 11-12-14) and "VW" (contacts 21-22-24).
With the operating current principle, the relays respond when the response values are undercut, with the standby current principle they release when the response values are undercut.
If 2 different response values are not needed, "VW" and "AL" can be set to the same value. The output relays switch together in this case.

**Analogue output**
The LK 5896 features a universal analogue output to display the current insulation resistance in the main measuring circuit: Terminal UA-GA: 0 ... 10 V and terminal IA-GA: 0 ... 20 mA. By bridging terminals XA-GA, the output can be switched to 2 ... 10 V and 4 ... 20 mA.

**Broken wire detection**
As mentioned above, the measuring circuit (if active), is constantly monitored for wire breaks – not only at Power-On or a manual or occasional automatic test. The response time of monitoring is only a few seconds.
Broken wire detection between L(+) and L(-) is performed via coupled alternating voltage. This alternating voltage is short-circuited if the terminals are connected to the connected mains at low-resistance. The device detects that the mains to be monitored is properly connected.
Since this broken wire detection is carried out with alternating voltage, large capacitances should be avoided between L(+) and L(-), since the capacitive reactance of these capacitances also short-circuits this alternating voltage. The device would no longer detect a connection fault on L(+)/L(-).
Especially parallel lines should be prevented over larger distances.
If larger capacitances between L(+)/L(-) cannot be avoided or if the coupled alternating voltage interferes with the system, version LK 5896.13/901 (without broken wire detection on L(+)/L(-) ) shall be used.

**Device test functions**
Principally, 2 different test functions are implemented: The "self-test" and the "expanded test":
The self-test of the device is performed automatically after Power-On and every 4 operating hours. It can also be triggered manually at any time by pressing the "Test" button at the device front or with an external pushbutton connected between terminals T and G.
With the self-test, contrary to the expanded test, the status of the output relays and the analogue output are not affected; the sequence is as follows:
Switching to the negative measuring phase is performed for 4 sec. The LEDs of the LED-chain are selected in sequence and the internal circuit is checked. After this, switching to the positive measuring phase is performed for 4 sec. The LED-chain cycles again and additional internal tests are performed. Insulation measurement continues normally after a pause of 2 sec if no faults have occurred.

The expanded test is started when the internal or external "Test" button is pressed (or is still held) at the end of the 8 sec self-test, described above. The sequence is the same as with the self-test (2 measuring phases at 4 sec + 2 sec pause); however, the output relays "AL" and "VW" as well as the associated LEDs switch to the alarm state and the analogue output proceeds to its lowest value.

After the extended test is passed successfully it is automatically finished and the device starts its normal measuring function.

## Function

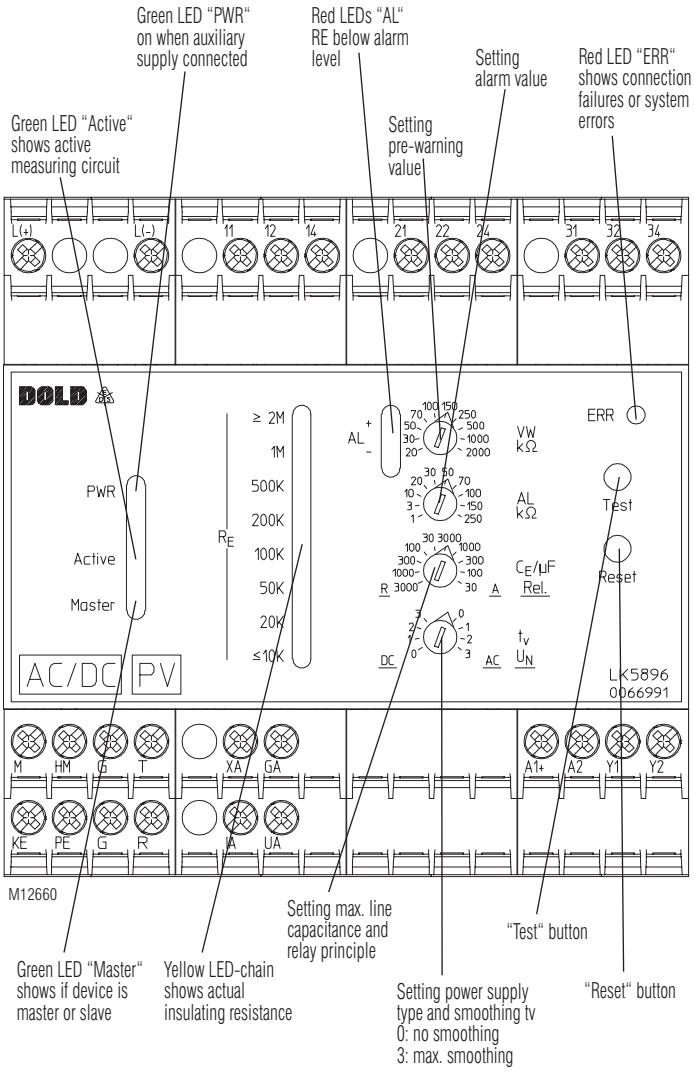
**Behaviour with internal device faults**
If internal device faults were detected during the test function, the "ERR" LED is lit continuously and the fault signalling relay (31-32-34) responds. The measuring circuit is deactivated internally ("Active" LED goes off). The output relays "AL" and "VW" as well as the associated LEDs switch to the alarm state. The analogue output proceeds to its lowest value and all LEDs of the LED-chain extinguish.

**Behaviour with connection faults**
Measurement is suspended if a line interruption is detected at terminals L(+) / L(-); the "Active" LED goes off. The state of the output relays "AL" / "VW" and associated LEDs, the display of the LED-chain and the analogue output are "frozen". This Broken wire detection is signalled by the "ERR" LED flashing with "Error code 2" and the fault signalling relay responds. Measurement of the connection insulation resistance restarts after the connection interruption has been corrected. However, stored alarm messages are preserved. If the connections PE / KE to the protective-conductor system are interrupted, the same responses take place as with an interruption at terminals L(+) / L(-), only that the "ERR" LED indicates "Error code 3".

## Indicators

| | | |
|---|---|---|
| Green LED „PWR“: | On when auxiliary supply connected | |
| Red LED „ERR“: | Flashing: | At connection and Watchdog-failure |
| | Permanent on: | At system error |
| Green LED „Active“: | Flashing: | At active measuring ciruit, ON-OFF-ratio per measurement phase: Long ON period during measurement phase with positiv polarity short ON period during measurement phase with negative polarity |
| Green LED „Master“: | Permanent on: | Device is Master |
| | Off: | Device is Slave |
| Yellow LED-chain: | 8 LEDs indicate the actual insulating resistance (≤ 10 kΩ ... ≥ 2 MΩ) | |
| Red LED „AL +“: | Permanent on: | $R_E$ lower then tripping value to + potential |
| Red LED „AL -“: | Permanent on: | $R_E$ lower then tripping value to - potential |
| Red LEDs „AL +“ And „AL -“ simultaneity: | Permanent on: | AC-fault / symmetric fault |

## Setting




## 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 voltage of the monitored voltage system is connected to terminals L(+) / L(-). Please observe sufficient distance to terminals of neighbour devices and to the grounded metal cabinet or box (min 0.5 cm).
- The terminals of the control inputs M, HM, T, R and G have no galvanic separation to the measuring circuit L(+) and 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(+)-L(-).
- No external potentials may be connected to control terminals M, HM, T and R. The associated reference potential is G (identical with PE), and the connection of the terminals is made via bridges to G.

**Attention!**

- Before checking insulation and voltage, disconnect the monitoring device LK 5896/900 from the power source!
- Only one insulation monitor may be active in a network to be monitored, since the devices would otherwise influence each other. When coupling several networks or incoming feed sections, where each of them is equipped with its own insulation monitor, all of them must be deactivated except for one insulation monitor.
- Device terminals PE and KE must always be connected via separate lines to different terminal points of the protective-conductor system.
- The device must not be operated without KE/PE connection!
- The measuring circuit should not be connected via longer parallel guided wires, as this may interfere with the broken wire detection. Also large capacities between L(+) und L(-) have to be avoided.
- To ensure correct measurement of the insulation resistance, there must be a low-impedance connection (≤ 10 kΩ) or a low-impedance internal system resistance across the source or across the load between the measuring circuit connections L(+) and L(-).

**Attention!**

- The measuring circuit can be connected with its terminals L(+) and L(-) both to the DC and also AC side of a mixed network; it is done most practically where the primary incoming power supply takes place. Selector switch "tv / UN" should be set accordingly.
- To monitor a 3NAC system, the unit can be connected to the neutral conductor of the three-phase mains with one pole (L(+) and L(-) are bridged). Due to the low-resistance (approx. 3 - 5 Ω) mains coupling of the 3 phases in the feeding transformer, insulation faults on the phases not directly connected can also be detected.
- If a monitored AC system includes galvanically connected DC circuits (e.g. via a rectifier), an insulation failure on the DC side can only be detected correctly, when a current of min 10 mA can flow via the semiconductor connections.
- If a monitored DC system includes galvanically connected AC circuits (e.g. via an inverter), an insulation failure on the AC side can only be detected correctly, when a current of min 10 mA can flow via the semiconductor connections.
- The measuring circuit is designed for large leakage capacitances up to 3000 µF. The selection switch "CE/µF" must be set accordingly. Measurement of the insulation resistances is not falsified by this; however, longer periods are required for the measuring phases than with small capacitances. If the maximum approximate leakage capacitance is known, the selector switch "CE/µF" can possibly be set to smaller values, which reduces the response time further.
- The analogue output and trigger output Y1-Y2 are electrically separated from the rest of the circuitry. No external voltages may be applied.
- The LK 5896/900 can also be used as a stand alone device The terminals HM-G must not be bridged. After every finshed measuring cycle the device is triggered by itself. If the measuring circuit should be deactivated (bridge on HM-G) the device finishes the current measuring cycle and after that deactivates the measurement.
- For the measuring circuit, the nominal voltage range for DC is specified with 1000 V; however, absolute values up to max. DC 1500 V are permissible.
- To provide a synchronous starting we recommend to supply the auxiliary voltage (UH) of the insulation monitors in a system from the same power supply. If the insulation monitors are supplied from different sources it may be possible that that due to not synchronised start of the different power supplies, the enabling of the measurement signals has an offset, which could lead to the situation that more then one insulation monitor is active in the system.

## Technical Data

**Measuring ciruit L(+) / L(-) to PE / KE**

| | | |
|---|---|---|
| **Nominal voltage $U_N$:** | DC 0 ... 1000 V; | AC 0 ... 1000 V |
| **Voltage range:** | DC max. 1500 V; | AC max. 1100 V |
| **Frequency range:** | DC or 16 ... 1000 Hz | |
| **Max. line capacitance:** | 3000 µF | |
| **Internal resistance (AC / DC):** | > 280 kΩ | |
| **Measuring voltage:** | Approx. ± 95 V | |
| **Max. mesured current ($R_E$ = 0):** | < 0.35 mA | |

**Response values $R_E$**

Pre-warning („VW“):

| kΩ: | 20 | 30 | 50 | 70 | 100 | 150 | 250 | 500 | 1000 | 2000 |
|---|---|---|---|---|---|---|---|---|---|---|

Alarm („AL“):

| kΩ: | 1 | 2 | 10 | 20 | 30 | 50 | 70 | 100 | 150 | 250 |
|---|---|---|---|---|---|---|---|---|---|---|

Each adjustable via rotational switches

| | | |
|---|---|---|
| **Response inaccuracy:** | ± 15 % + 1.5 kΩ | IEC 61557-8 |
| **Response value hysteresis** | | |
| at range 10 kΩ ... 700 kΩ: | Approx. 25 % | |
| Out of range: | Approx. 40 % + 0.5 kΩ | |
| **On delay** | | |
| at $C_E$ = 1 µF, | | |
| $R_E$ of ∞ to 0,5 * response value: | < 10 s | |

**Input auxiliary voltage**

**DC-Input (A1+ /A2)**

| | |
|---|---|
| **Nominal voltage $U_H$:** | DC 24 V |
| **Voltage range:** | 0.8 ... 1.25 $U_H$ |
| **Nominal consumption:** | Max. 5 W |

**Control input (between M, HM, T, R and G)**

| | |
|---|---|
| **Current flow:** | Approx. 3 mA |
| **No-load voltage to G:** | Approx. 12 V |
| **Permissible wire length:** | < 50 m |
| **Min. activation time:** | 0.5 s |

**Output**

| | | |
|---|---|---|
| **Contacts:** | 3 x 1 changeover contacts for VW, AL and ERR | |
| **Thermal current $I_{th}$:** | 4 A | |
| **Switching capacity** | | |
| to AC 15: | | |
| NO contact: | 3 A / AC 230 V | IEC/EN 60947-5-1 |
| NC contact: | 1 A / AC 230 V | IEC/EN 60947-5-1 |
| **Electrical life** | | |
| at 8 A, AC 250 V: | 1 x $10^4$ switching cycles | |
| **Short circuit strength** | | |
| **max. fuse rating:** | 4 A gG / gL | IEC/EN 60947-5-1 |
| **Mechanical life:** | 10 x $10^6$ switching cycles | |

**Analogue output**

**For actual insulating value, galvanic separation**

| | |
|---|---|
| **Terminals IA(+) / GA:** | 0 ... 20 mA (bridge XA-GA: 4 ... 20 mA); max. burden 500 Ω |
| **Terminals UA(+) / GA:** | 0 ... 10 V (bridge XA–GA: 2 ... 10 V); max. current 10 mA |
| **Scaling** | |
| lower analogue value: | $R_E$ = 0 |
| Upper analogue value: | $R_E$ = ∞ |
| **Middle of range:** | $R_E$ = 289 kΩ |
| **Formula example** | |
| for 0-10V: | $R_E$ = 289 kΩ / (10V / UA – 1) |
| For 2-10V: | $R_E$ = 289 kΩ / (8V / (UA-2V) – 1) |

## Technical Data

**General Data**

| | | |
|---|---|---|
| **Operating mode:** | Continuous operation | |
| **Temperature range** | | |
| Operation: | - 25 ... + 60 °C (Device mounted away from heat generation components) - 25 ... + 45 °C (Device mounted without distance heated by devices with same load) | |
| Storage: | - 40 ... + 70 °C | |
| **Relative air humidity:** | 93 % at 40 °C | |
| **Atmospheric pressure:** | 860 ... 1600 mbar (86 ... 106 kPa) | |
| **Altitude:** | ≤ 4000 m | IEC 60664-1 |
| **Clearance and creepage distances** | | |
| Rated impulse voltage / pollution degree | | IEC 60664-1 |
| Measuring ciruit L(+) / L(-) to auxiliary voltage DC and relay contacts VW, AL, ERR and analogue output IA, UA, GA and trigger output Y1-Y2: | 8 kV / 2 | |
| Auxiliary voltage DC and trigger output Y1-Y2 to relay contacts VW, AL, ERR and analogue output IA, UA, GA: | 8 kV / 2 | |
| Relay contact VW to relay contact AL to relay contact ERR: | 4 kV / 2 | |
| Analogue output IA, UA, GA to relay contacts VW, AL, ERR and trigger output Y1-Y2: | 4 kV / 2 | |
| Trigger output Y1-Y2 to relay contacts VW, AL, ERR: | 4 kV / 2 | |
| Insulation test voltage, routine test: | AC 5 kV; 1 s AC 2.5 kV; 1 s | |

**EMC**

| | | |
|---|---|---|
| Electrostatic discharge (ESD): | 8 kV (air) | IEC/EN 61000-4-2 |
| HF irradiation | | |
| 80 MHz ... 2.7 GHz: | 10 V / m | IEC/EN 61000-4-3 |
| Fast transients: | 4 kV | IEC/EN 61000-4-4 |
| Surge voltages | | |
| between A1 - A2: | 1 kV | IEC/EN 61000-4-5 |
| Between L(+) - L(-): | 2 kV | IEC/EN 61000-4-5 |
| Between A1, A2 - PE and L(+), L(-) - PE: | 4 kV | IEC/EN 61000-4-5 |
| Between control line: | 0.5 kV | IEC/EN 61000-4-5 |
| Between control line and earth: | 1 kV | IEC/EN 61000-4-5 |
| HF-wire guided: | 10 V | IEC/EN 61000-4-6 |
| Interference suppression: | Limit value class A*) | |

*) The device is designed for the usage under industrial conditions (Class A, EN 55011).
When connected to a low voltage public system (Class B, EN 55011) radio interference can be generated. To avoid this, appropriate measures have to be taken.

| | | |
|---|---|---|
| **Degree of protection** | | |
| Housing: | IP 40 | IEC/EN 60529 |
| Terminals: | IP 20 | IEC/EN 60529 |
| **Housing:** | Thermpolastic with V0 behaviour according to UL subject 94 | |
| **Vibration resistance:** | IEC/EN 60068-2-6 Amplitude 0.35 mm frequency 10 ... 55 Hz Amplitude ± 1mm, frequency 2 ... 13.2 Hz 13.2 ... 100 Hz, acceleration ± 0.7 $g_n$ | |
| **Shock resistance:** | 10 $g_n$ / 11 ms, 3 pulses | IEC/EN 60068-2-27 |
| **Climate resistance:** | 25 / 060 / 04 | IEC/EN 60068-1 |
| **Terminal designation:** | EN 50005 | |

## Technical Data

| | | |
|---|---|---|
| **Wire connection** | | DIN 46228-1/-2/-3/-4 |
| **Screw terminals** | | |
| **(fixed)**: | 1 x 4 mm² solid or<br>1 x 2.5 mm² stranded ferruled (isolated) or<br>2 x 1.5 mm² stranded ferruled (isolated) DIN 46228-1/-2/-3-4 or<br>2 x 2.5 mm² stranded ferruled (isolated) DIN 46228-1/-2/-3 | |
| Insulation of wires or sleeve length: | 8 mm | |
| **Wire fixing:** | Plus-minus terminal screws M3,5 terminal with wire protection | |
| **Fixing torque:** | 0.8 Nm | |
| **Mounting:** | DIN rail | IEC/EN 60715 |
| **Weight:** | Approx. 584 g | |

### Dimensions

| | |
|---|---|
| **Width x height x depth:** | 90 x 90 x 121 mm |

## UL-Data

**Measuring ciruit L(+) / L(-) to PE / KE**

| | |
|---|---|
| **Voltage range:** | AC/DC max. 600 V |
| **Switching capacity:** | Pilot duty B300, C300, R300<br>4 A 250 Vac, Resistive<br>4 A 30 Vdc, Resistive |
| **Wire connection:** | Min. 60 °C copper conductors only<br>Torque 0.8 Nm |
| **Test specification:** | ANSI/UL 60947-1, 5th Edition<br>ANSI/UL 60947-5-1, 3rd Edition<br>CAN/CSA-C22.2 No. 6047-1-13, 2nd Edition<br>CAN/CSA-C22.2 No. 60947-5-1-14, 1st Edition |

**Technical data that is not stated in the UL-Data, can be found in the technical data section.**

## Standard Type

LK 5896.13/900/61 DC 24 V

| | |
|---|---|
| Article number: | 0066991 |
| • Outputs: | 1 changeover contact for pre-warning<br>1 changeover contact for alarm<br>1 changeover contact for connection- / system error |
| • Auxiliary voltage: | DC 24 V |
| • Setting range pre-warning: | 20 kΩ ... 2 MΩ |
| • Setting range alarm: | 1 kΩ ... 250 kΩ |
| • Adjustable line capacitance | |
| • Energized or de-energized on trip | |
| • Adjustable time delay / selection of AC or DC connection | |
| • Analogue output: | 0 ... 20 mA / 4 ... 20 mA; 0 ... 10 V / 2 ... 10 V |
| • Trigger output | |
| • Width: | 90 mm |

## Variant

| | |
|---|---|
| LK 5896.13/901/61: | Without wire-break detection at L(+)/L(-) |

## Accessories

EH 5861/005:

Indicating instrument,
degree of protection: IP 52
Article number: 0067516

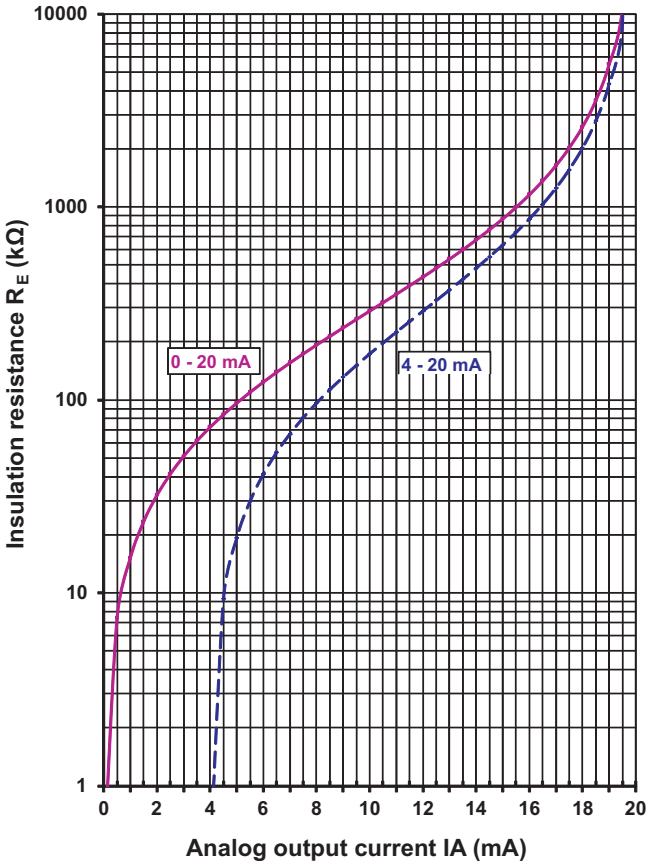

The indicating device EH 5861 is externally connected to the insulation monitor on terminals UA / GA (0 - 10 V) and shows the actual insulation resistance of the voltage system to ground.
Dimensions:
Width x heigth x depth
96 x 96 x 52 mm

HK 3087N.16/004 DC 24 V:

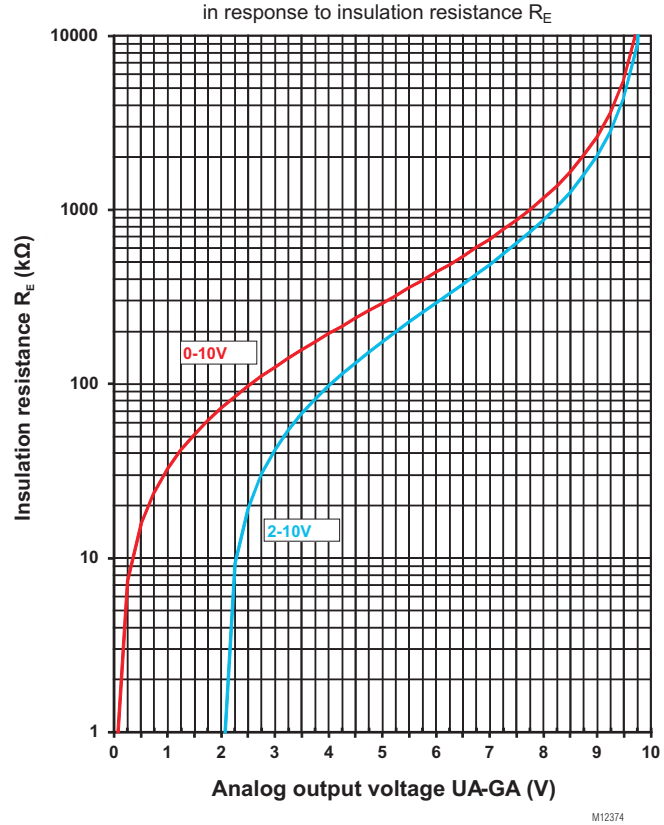
Interface module with gold contacts and 8 kV isolation between contacts and relay coil.
Suitable for potential-free control of the control inputs.
Article number: 0069865

## Characteristics

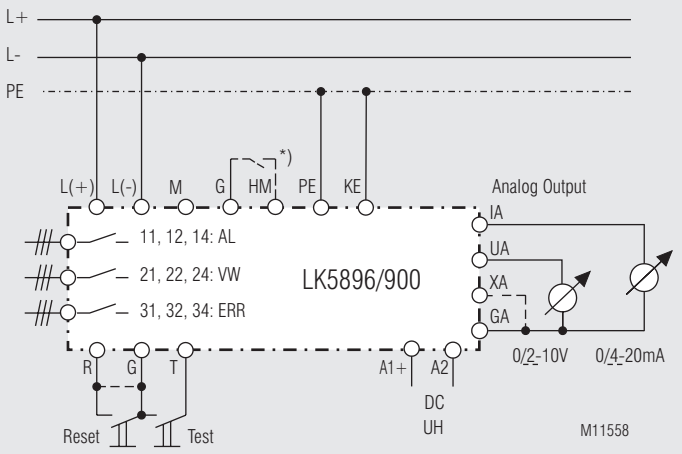
Analog output current IA
in response to insulation resistance $R_E$




Analog output voltage UA-GA
in response to insulation resistance $R_E$

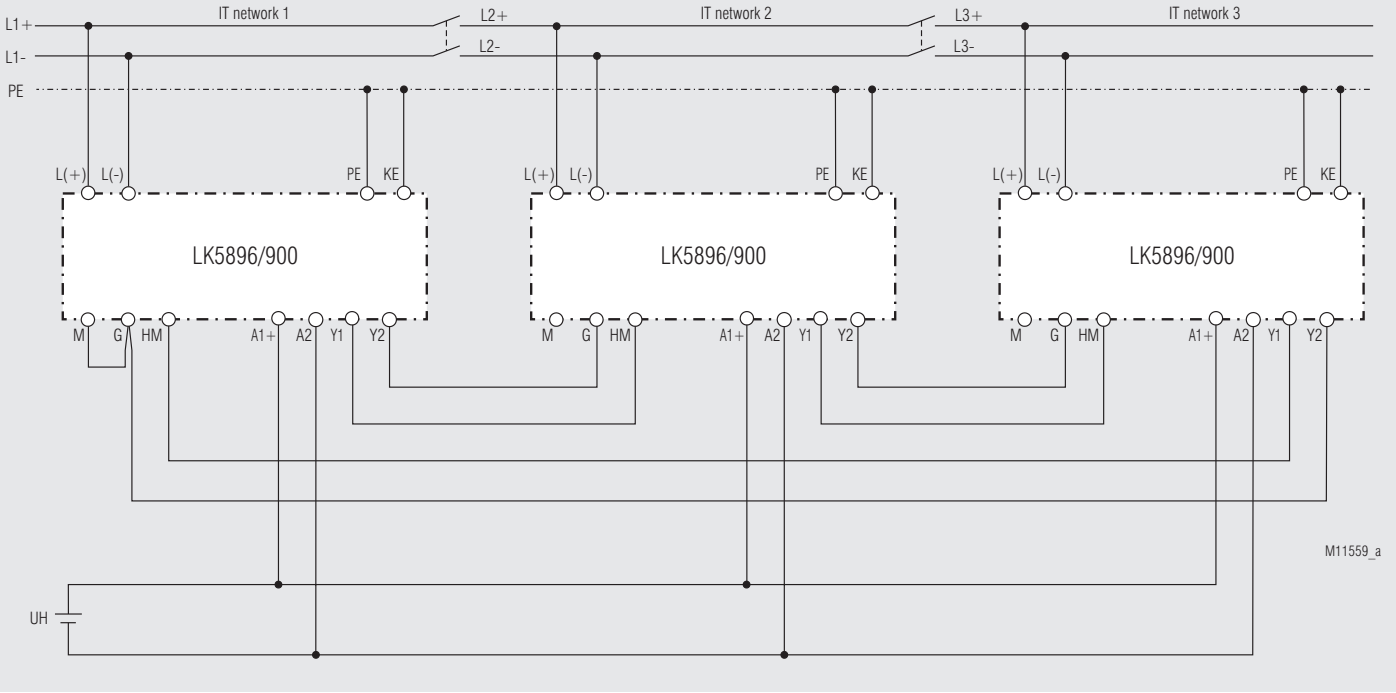


## Connection Examples




*) G-HM connected: Measuring circuit is off

Connection to a simple DC system. When terminals HM-G are open the device triggers itself automatically.




Monitoring of 3 separate DC voltage systems, that can be coupled by coupling switches. By sequential triggering of the insulation monitors it is made sure that only one of the insulation monitor is active at the same time. the first insulation monitor in IT network 1 is configured as master and starts the measuring cycle after power up. To provide synchronous starting of all insulation monitors in a system we recommend to use the same same source for the power supply UH.