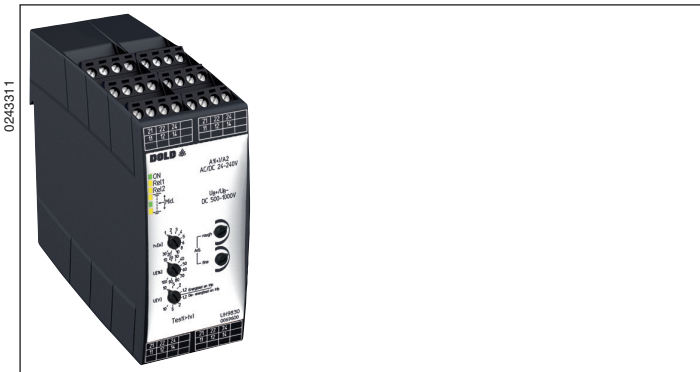


VARIMETER Battery Symmetry Monitor UH 9830

Translation
of the original instructions



Your advantages

- Preventive maintenance
- For better productivity
- High repeat accuracy
- Large battery voltage ranges up to DC 1000 V
- Easy setting

Features

- According to IEC/EN 60255-1
- To monitor for battery systems (emergency power supply)
- Measuring rang DC 0.12 ... 1.2 V, 0.2 ... 2 V, 0,5 ... 5 V and 1 ... 10 V
- With adjustable time delay
- LED indicators for operation and contact position
- 2 changeover contacts
- Goldplated contacts to switch low loads (on request)
- Width: 45 mm

Product Description

The battery symmetry monitor UH 9830 of the VARIMETER series monitors battery systems with centre tapping for faults. Early detection of impending failures and preventive maintenance prevent costly damage and as a user you benefit from the operational safety and high availability of your system.

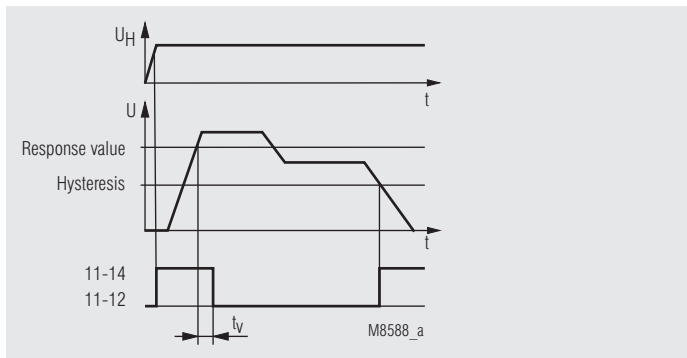
UH 9830/x0x

- For battery voltages up to 1000 V
- With separately auxiliary voltage

UH 9830/x1x

- For battery voltages up to 300 V
- Without separately auxiliary voltage

Function Diagram



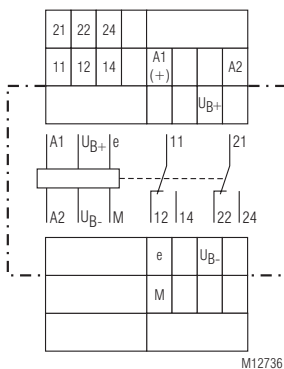
Approvals and Markings



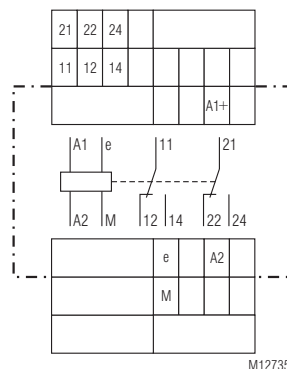
Applications

Monitoring of battery systems to find voltage inversions of single cells, internal short circuits and sulphating.

Circuit Diagrams



UH 9830/x0x

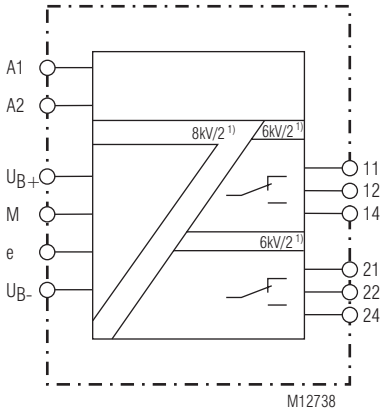


UH 9830/x1x

Connection Terminals

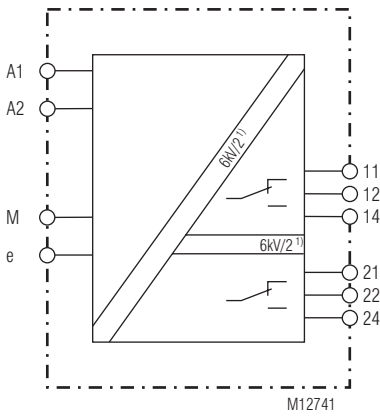
Terminal designation	Signal description
A1, A2	Auxiliary voltage
U_{B+} , U_{B-}	Batterie voltage
M	Middle tap of battery
e	Calibration reference
11, 12, 14	1 st Changeover contact
21, 22, 24	2 nd Changeover contact

Block Diagrams



¹⁾ Rated impulse voltage / Pollution degree

UH 9830/x0x



¹⁾ Rated impulse voltage / Pollution degree

UH 9830/x1x

Function

The centre tap of a battery system is supplied with the device "Terminal M". If the symmetry deviation of the two partial voltages is exceeded by more than an adjustable amount, the signalling relay drops out with the response delay t_v . The signal relay also de-energises in the event of a line break at terminal M. The functionality can be checked with the test button on the front of the unit. The test button must be pressed at least with the set response delay t_v .

Indicators

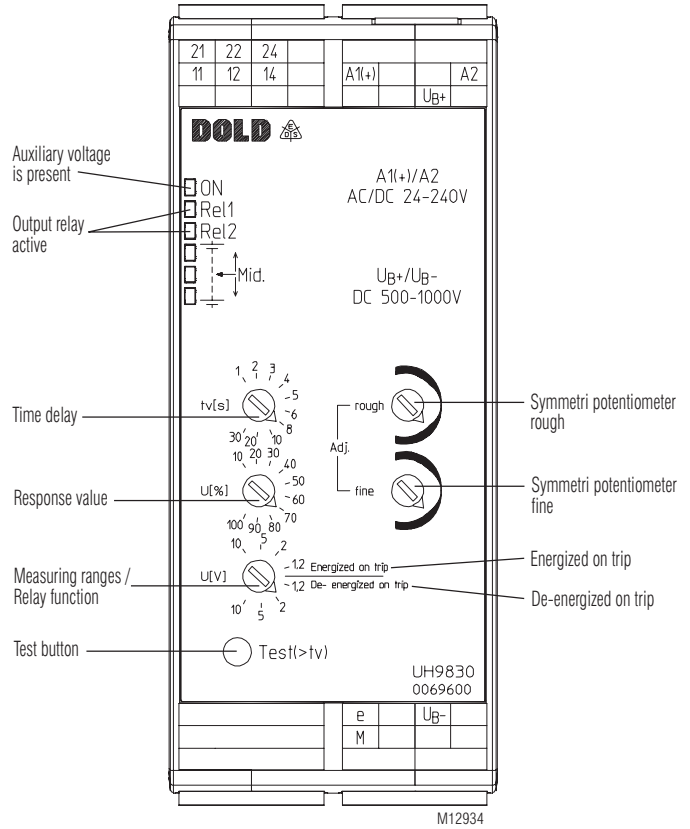
Green LED "ON" (perm. on): Supply connected
 Yellow LED "REL1" (perm. on): On, when output relay 1 activated
 (flashing): On delay t_v on process
 Yellow LED "REL2" (perm. on): On, when output relay 2 activated
 (flashing): On delay t_v on process

LED chain "Mid"

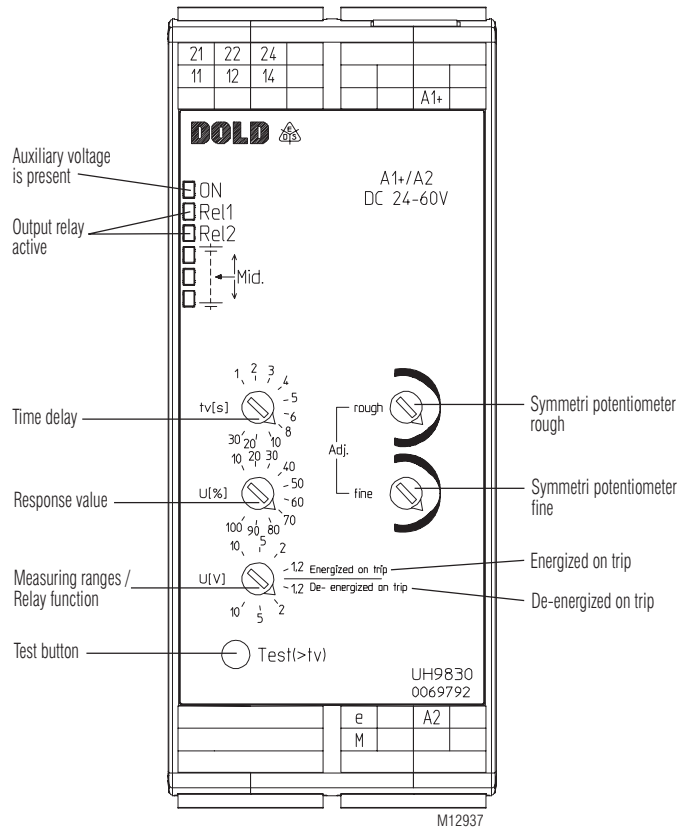
Upper yellow LED (perm. on): Lights up in case of asymmetry $> 0V$
 (Subvoltage $U_{B1} < U_{B2}$)
 (flashing)¹⁾: Test button pressed
 Middle green LED (perm. on): Lights up with symmetry voltage = 0 V
 (Subvoltage $U_{B1} = U_{B2}$)
 Lower yellow LED (perm. on): Lights up in case of asymmetry $< 0V$
 (Subvoltage $U_{B1} > U_{B2}$)
 (flashing)¹⁾: Test button pressed

¹⁾ Upper and lower "Mid" LED flash together

Setting



UH 9830/x0x



UH 9830/x1x

Notes

The voltage difference between UB1 and UB2 can be adjusted using the "Adj. rough" and "Adj. fine" symmetry potentiometers. The maximum regulation voltages can be taken from the following table.

Measuring ranges	Adjustment voltage	
	DC 10 ... 60 V, DC 24 ... 60 V	Max. 2.5 V at UB = DC 24 V
DC 110 ... 220 V	Max. 12 V at UB = DC 110 V	Max. 24 V at UB = DC 220 V
DC 200 ... 500 V	Max. 12 V at UB = DC 200 V	Max. 24 V at UB = DC 500 V
DC 350 ... 700 V	Max. 12 V at UB = DC 350 V	Max. 24 V at UB = DC 700 V
DC 500 ... 1000 V	Max. 12 V at UB = DC 500 V	Max. 24 V at UB = DC 1000 V

For the measuring ranges DC 10 ... 60 V and DC 24 ... 60 V, the line break detection at terminal M only functions with a response sensitivity of up to 2 V.

Technical Data**Input****Sensitivity of tripping:
(Measuring range):**

DC 0.12 ... 1.2 V, DC 0.2 ... 2 V,
DC 0.5 ... 5 V, DC 1 ... 10 V
selectable by rotary switch
Infinite variable 10 % ... 100 % U_N
relative scale

Response value:

Measuring accuracy
(in % of the end scale value):

$\pm 2\%$

Temperature influence:

$< 1\%$

Hysteresis:

5 %

Repeat accuracy:

$\leq \pm 0.5\%$

Adjustable on delay t_v :

10 response delays, selectable by
rotary switch
1, 2, 3, 4, 5, 6, 8, 10, 20, 30 s

Current middle connection

(terminal M):

Max. 12 μ A (at 60 V or 220 V or 500 V)

Principle de mesure:

Arithmetic mean value

Temperature influence:

$< 0.05\%$ / K

Auxiliary Circuit**UH 9830/x1x****Battery voltage =****auxiliary voltage:**

DC 24 ... 60 V / DC 110 ... 220 V

Voltage range:

DC 19 ... 80 V / DC 60 ... 300 V

UH 9830/x0x**Battery voltage (U_B):**

DC 10 ... 60 V, DC 200 ... 500 V,
DC 350 ... 700 V, DC 500 ... 1000 V

Auxiliary voltage (A1/A2):

AC/DC 24 ... 240 V

Voltage range:

0.8 ... 1.1 U_H

Nominal consumption:

Approx. 2.5 VA

Nominal frequency:

50 / 60 Hz

Frequency range:

$\pm 5\%$

Technical Data**Output****Rated output voltage:**

AC 230 V

Contacts:

2 changeover contacts

Thermal current I_{th} :

2 x 5 A

Switching capacity

to AC 15:

NO contact: 2 A / AC 230 V IEC/EN 60947-5-1

NC contact: 1 A / AC 230 V IEC/EN 60947-5-1

To DC 13: 1 A / DC 24 V IEC/EN 60947-5-1

Electrical life

to 4 A, AC 230 V $\cos \varphi = 1$: 2 x 10⁵ switching cycles

Short-circuit strength**max. fuse rating:**

4 A gG / gL IEC/EN 60947-5-1

Mechanical life:

50 x 10⁶ switching cycles

$\geq 10^8$ switching cycles

General Data**Operating mode:**

Continuous operation

Temperature range:

Operation: - 40 ... + 60 °C

Storage: - 40 ... + 70 °C

Altitude:

≤ 2000 m

Clearance and creepage distances

Contacts / Contacts: 6 kV / 2 IEC 60664-1

Within contact path: 1.5 kV / 2 IEC/EN 60664-1

UH 9830/x0x

Auxiliary voltage / Contacts: 6 kV / 2 IEC 60664-1

Auxiliary voltage / Meas. input: 8 kV / 2 IEC 60664-1

Meas. input / Contacts: 8 kV / 2 IEC 60664-1

UH 9830/x1x

Auxiliary voltage / Contacts: 6 kV / 2 IEC 60664-1

Meas. input / Contacts: 6 kV / 2 IEC 60664-1

Overvoltage category:

III

EMC

Zone B

Electrostatic discharge: 8 kV (air) IEC/EN 61000-4-2

HF irradiation:

80 MHz ... 6.0 GHz: 10 V / m IEC/EN 61000-4-3

Fast transients: 4 kV IEC/EN 61000-4-4

Surge voltages

between wires for power supply: 2 kV IEC/EN 61000-4-5

Between wire and ground: 4 kV IEC/EN 61000-4-5

HF wire guided: 10 V IEC/EN 61000-4-6

Damped oscillatory

wave immunity test

Differential mode voltage: 1 kV IEC/EN 61000-4-18

Common mode voltage: 2.5 kV IEC/EN 61000-4-18

Interference suppression: Limit value class B EN 55011

Degree of protection

Housing: IP 40 IEC/EN 60529

Terminals: IP 20 IEC/EN 60529

Housing: Thermoplastic with V0 behaviour according to UL subject 94

Vibration resistance: Amplitude 0.35 mm

frequency 10 ... 55 Hz IEC/EN 60068-2-6

40 / 060 / 04 IEC/EN 60068-1

Wire connections: DIN 46228-1/-2/-3/-4

Aux. voltage
pluggable screw terminal (PS): 0.25 x 2.5 mm² solid or
0.25 x 2.5 mm² stranded ferruled

Insulation of wires or

sleeve length: 7 mm

Fixing torque: 0.5 Nm

Mounting: DIN rail IEC/EN 60715

Weight: 237 g

Dimensions

Width x height x depth: 45 x 107 x 121 mm

Standard Types

UH 9830.12 DC 500 ... 1000 V AC/DC 24 ... 240 V

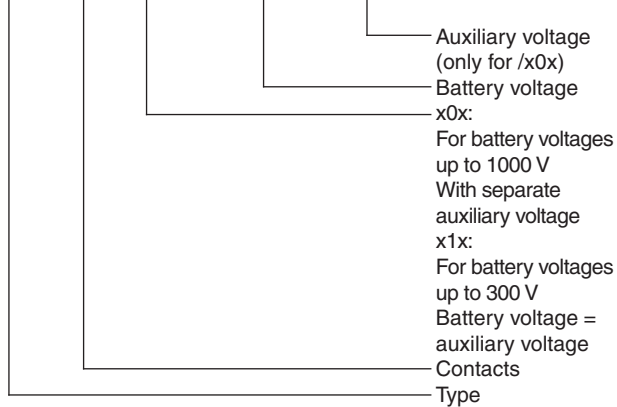
- Article number: 0069600
 • Auxiliary voltage: AC/DC 24 ... 240 V
 • Battery voltage: DC 500 ... 1000 V
 • Width: 45 mm

UH 9830.12/010 DC 24 ... 60 V

- Article number: 0069792
 • Auxiliary- / battery voltage: DC 24 ... 60 V
 • Width: 45 mm

Ordering example

UH 9830 .12 / _ _ _ DC 10 ... 60 V AC/DC 24 ... 240 V



Set-up Procedure

- Set the desired time delay "tv[s]", response value "U[%]", measuring range and operating principle "U[V]".
- Set the symmetry potentiometers "Adj. rough" and "Adj. fine" to the centre position.
- Connect the device as shown in the corresponding application example. The batteries must be in an intact condition.
- Set the centre of the operating voltage using the "Adj. rough" and "Adj. fine" symmetry potentiometers. If the setting is correct, the voltmeter U2 must display 0 V or the centre green LED chain "Mid." should light up.
- The appliance is now ready for operation.

Example 1 Symmetric battery

$$U1 = \frac{1}{2} U_B \rightarrow$$

Adjust U2 with tuning and fine tuning potentiometer to 0 V.

Example 2 60 V battery set, combination of 12 V Block batteries

$$U1 = 36 V$$

Adjust U2 with tuning and fine tuning potentiometer to 0 V.

Example 1 Asymmetrical battery (equalisation of battery tolerances)

$$U1 = \frac{1}{2} U_B + \text{e.g. } 200 \text{ mV} \rightarrow$$

Adjust U2 with tuning and fine tuning potentiometer to 0 V.

Troubleshooting

The following error codes are indicated by all LEDs in the "Mid." chain flashing in quick succession.

Failure code	Error	Failure recovery
10	Checksum failure EEPROM	- Device error (if still present after restart, replace device)
11	Internal communication failure	
12	Checksum failure EEPROM 2	
13	Internal communication failure 2	

Application Examples

