



ISO 9001  
OBAC/002/SZJ/23

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## INDEX CARD

### UCMI 2 (Universal Control and Measurement Instrument)

#### Application:

The universal control and protection device UCMI 2 (Universal Control and Measurement Instrument) protects against the effects of insulation deterioration in AC power networks with rated voltage up to 1140 V, 50 Hz, including mine networks supplying mining equipment in flameproof enclosures.



UCMI 2 device can be used in:

- transformer units,
- compact stations,
- transformer stations,
- contactor switches.

The UCMI 2 device performs the following control and protection functions:

- Central-blocking leakage protection,
- over-current protection (overload, short-circuit and asmeter element),
- temperature protection,
- protection of earthing continuity control,
- intrinsically safe local and remote control control of warning signaling,
- visualization on the LCD display of the measurement results and device operation status,
- sending information about the operating status of the device.

The UCMI2 device measures the insulation condition of the tested network, disconnecting it from voltage in case of damage and preventing voltage supply to the damaged power network. It also protects the network from the effects of

overloads, short circuits, current asymmetry and exceeding the allowable temperature. The UCMI 2 protection displays the insulation status, phase currents, temperature and voltage of the tested network on the LCD display.

#### Rated data:

Table 1. UCMI 2 rating data

Supply voltage	24 V ±20%, 50 Hz
Type of work	continuous
Power consumption	≤24 VA
The degree of protection of the housing	IP 40
External dimensions	122 x 106 x 205 mm
Contact load	5 A / 230 V

Table 2. UCMI 2 operating conditions

Rated voltage of the controlled network	$U_N \leq 1140 \text{ V}$
Voltage fluctuations	$0.8 \cdot U_N < U_N \leq 1,2 \cdot U_N$
The content of higher harmonics	≤ 5%
Mains frequency fluctuation	± 4%
Presence of DC voltages in the network	lack
Allowable capacity of the controlled network	1 μF per phase
Height above sea level	-2000 m ÷ 2000 m
Ambient temperature	-10 °C ÷ 70 °C
Relative humidity at temperatures up to 40 °C	95%
Maximum relative humidity up to 25 °C or in lower temperature when the steam is condensed	100%
Air surrounding the protection	Free from water, dust and chemically active gases
Mechanical vibrations at the mounting point	Sinusoidal vibrations in the frequency range 5 ÷ 35 Hz
The location of the device	any

The UCMI 2 is equipped with two identical resistance measuring circuits. The measuring elements are adapted to measure the insulation resistance of the mains or installation under voltage and in the de-energized state. Each of the measuring elements acts on separate contacts of the relays.


 <p><b>OBAC</b> CERTIFIED QMS PN-EN ISO 9001</p> <p>ISO 9001 OBAC/002/SZJ/23</p>	<p><b>P.H.P.U.</b> <b>IZOL PLAST</b> Sp. z o.o.</p> <p>44-362 Rogów ul. Raciborska 79 tel./fax 32-4512444, 32-4512010 <a href="http://www.izol-plast.rogow.pl">www.izol-plast.rogow.pl</a></p>	<b>INDEX CARD</b>
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Table 3. Parameters of the measurement circuit for the insulation resistance of the network.

Output voltage of the measuring circuit	$U_{max} = 35 \text{ V}$ direct current
Output current of the measuring circuit	$I_{o,max} = 0,35 \text{ mA}$
Output capacity of the measuring circuit	$C_{o,max} = 5 \mu\text{F}$
Output inductance of the measuring circuit	$L_{o,max} = 600 \text{ H}$
A feature of the intrinsic safety of the circuit	non-ignition circuit
Resistance measuring range	$0 \div 200 \text{ k}\Omega$
Resistance setting range for the activation threshold	$1 \div 99 \text{ k}\Omega$
Resistance setting range for the return threshold	$1 \div 99 \text{ k}\Omega$
Low insulation alarm threshold	$1 \div 99 \text{ k}\Omega$
Insulation resistance measurement compensation	$0 \div 99 \text{ k}\Omega$
Setting range of the time delay of the resistance measuring element	$5 \div 1000 \text{ ms}$

The UCMI device has four intrinsically safe isolated circuits for remote control of the contactor. The circuit has a diode connected at the end of the circuit. A break in the control circuit or its short circuit in front of the diode turns off the contactor. The circuits perform the following functions:

- Earth continuity measurement circuit
- Two remote shutdown circuits
- Remote on and off circuit

Table 4. Output parameters of intrinsically safe circuits.

Output voltage of the measuring circuit	$U_0 = \pm 11,7 \text{ V}$
Output current of the measuring circuit	$I_0 = \pm 16,6 \text{ mA}$
Output power of the measuring circuit	$P_0 = 48 \text{ mW}$
Input inductance of the measuring circuit	$L_i = 0 \text{ H}$
Input capacity of the measuring circuit	$C_i = 0 \text{ F}$
Output inductance of the measuring circuit	$L_o = 0,65 \text{ H}$
Output capacity of the measuring circuit	$C_o = 5 \mu\text{F}$

The UCMI 2 is equipped with three identical current measuring circuits. Each of the circuits, via the current-voltage transformer, measures the value of the current flowing in the network. The UCMI 2 protection also has a short-circuit element, an asymmetric element and an overload element in addition to the measuring element.

Table 5. Parameters of the current measuring circuit.

Input measuring voltage	$0 \div 8 V_{RMS}$
Rated current setting range $I_N$	$30 \div 800 \text{ A}$
Range of transformer ratio settings N	$0,1 \div 25,5 \text{ mV/A}$
Setting range of the short-circuit module W	$2,5 \div 10$
The activation threshold of an asymmetric element	$0,5 I_N$
Setting range of the asymmetric element	$30 \div 100\%$
Setting range of the time delay of the short-circuit module	$5 \div 70 \text{ ms}$
Time delay setting range of an asymmetric element	$5 \div 200 \text{ ms}$
Current limitation	$30 \div 2000 \text{ A}$
Setting range of the time delay of the current limitation element	$5 \div 200 \text{ ms}$
Time delay setting range of the overload element	$0 \div 120 \text{ min}$

Table 6 Additional UCMI2 protection parameters

Temperature element activation threshold	$50..150^\circ\text{C}$
Temperature element return threshold	$50..150^\circ\text{C}$
Adjustable switch-on time of the UCMI2	$0 \div 60 \text{ s}$
Initial delay of measurements	$0 \div 200 \text{ ms}$
Voltage gear	$0 \div 50 \text{ V/V}$

#### Certificate and opinions:

The UCMI 2 universal control and protection device has the EU-type examination certificate: **FTZÚ 11ATEX0145X** of **08/09/2014**. with attachments, issued by Fyzikálně technický zkušební ústav FTZÚ Ostrava. The basic requirements of safety and health protection were implemented by meeting the requirements of the following standards: **PN-EN 60079-0: 2013** and **PN-EN 60079-11: 2012**.

Based on the Technical Opinion No. **OBAC / 591 / TE / 12** of **18.01.2013** of the OBAC Attestation and Certification Center, it is stated that the UCMI 2 universal control and protection device complies with the design solutions in terms of general technical requirements. Detailed information can be found in the above-mentioned technical opinion.

The UCMI universal control and protection device is marked with:

