



ISO 9001
OBAC/002/SZJ/20



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INDEX CARD

Universal Control and Measurement Instrument (UCMI) - universal control and protection device

Application:

The universal control and protection device UCMI (Universal Control and Measurement Instrument) protects against the effects of insulation deterioration in non-grounded alternating current power networks, with a rated voltage of up to 1140 V, 50 Hz, including mine networks supplying mining devices.

UCMI device is a static underload resistance protection built on semiconductor elements. The output elements of the protection are conventional electromechanical relays.

The UCMI device system consists of two cooperating measuring units:

- central module, adapted to measure the insulation resistance under voltage,
- a blocking member adapted to measure the insulation resistance of the network after switching off the voltage in the non-ignition circuit.

The task of the interlocking leakage protection is to measure the resistance of the network section disconnected from voltage and in the event of the resistance drop below the value given in the table, not allowing voltage to be applied to the controlled section of the network. The current of the measuring circuit of the blocking relay flowing through the resistance of the earth insulation causes a voltage drop on the measuring resistor, which signal through separation controls the operation of the electromechanical relay PB. The PB relay has contacts available on terminals [10], [11], [12].

Central leakage protection ensures continuous measurement of the insulation resistance R_{iz} in all phases of the live



electrical network. If the insulation resistance drops below the value specified in Table 5, the UCMI device disconnects the network from voltage.

It will be possible to re-energize the monitored section of the network when the insulation resistance of this section rises above the return of the interlocking protection. The central element of the protection is equipped with a PC executive relay, the contacts of which are available on terminals No. [9], [11], [12].

The UCMI device has two intrinsically safe isolated circuits used for remote switching off of the Q switch. **Connect a rectifying diode at each end of the intrinsically safe circuit.** The diode polarity does not matter. A break in the control circuit or its short circuit available on terminals No. [17] and [18] activates the Pc operational relay and changes the position of the contacts available on terminals No. [9], [11], [12], which results in switching off the Q switch and the message "Blocking REXI 1" appears on the display - displayed in the lower right corner. **A break in the control circuit or its short circuit available on terminals No. [19] and [20] causes the activation of the Pc operational relay and the change of the position of the contacts available on the terminals No. [6], [7], [8], which in turn results in switching off the Q switch and the message "Blocking REXI 2" appears on the display - displayed in the lower right corner.**

Technical parameters

Table 1. UCMI rating data

Supply voltage	230 V +15%-20%, 50 Hz
Type of work	continuous
Power consumption	≤18 VA
The degree of protection of the housing	IP40 / IP54
External dimensions	420 x 240 x 190 mm
Contact load	3 A / 230 V

Table 2. UCMI operating conditions

Rated voltage of the controlled network	127 V < UN ≤ 230 V 230 V < UN ≤ 500 V 500 V < UN ≤ 1140 V
Voltage fluctuations	0.8 · UN < UN ≤ 1,2 · UN
The content of higher harmonics	≤ 5%
Network frequency fluctuations	± 4%
Presence of DC voltages in the	lack



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network	
Allowable capacity of the controlled network	1 μ F per phase
Height above sea level	-2000 m ÷ 2000 m
Ambient temperature	-10 °C ÷ 70 °C
Relative humidity at 25 °C	< 98%
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
Permissible deviations from the vertical	15° from the vertical in any direction

Table 3. Setting resistances of the CC module of the UCMI device

UN of secured network	Setting resistance of the central element CC depending on the fault
230 V	7 k Ω +20% symmetrical
	7 k Ω +20% single-phase
400 V, 500 V	15 k Ω +20% symmetrical
	15 k Ω +20% single-phase
1000 V, 1140 V	30 k Ω +20% symmetrical
	30 k Ω +20% single-phase

Table 4. Parameters of the measurement circuit of the CC module of the UCMI device

Rated measuring voltage	115 V direct current
Short circuit current	1,9 mA \pm
Measuring circuit impedance at freq. 50 Hz	31 k Ω + 30%
Number and type of PC executive output contacts	2 changeover contacts

Table 5. Activation time of the CC module of the UCMI device

UN of secured network	The activation time of the CC module of the UCMI device
230 V	max 100 ms
400 V, 500 V	max 100 ms
1000 V, 1140 V	max 70 ms

Table 6. Setting resistances of the blocking element CB of the UCMI device

UN of secured network	Setting resistances of the blocking element CB
230 V	15 k Ω +20%
400 V, 500 V	25 k Ω +20%
1000 V, 1140 V	50 k Ω +20%

Table 7. Parameters of the measurement circuit of the blocking element CB of the UCMI device

Measuring voltage	16 V \pm 5% direct current
Short-circuit current of the measuring system	0,45 mA \pm 5%
Output voltage of the measuring system	U _o = 17 V

Table 8. Data on terminals [21] and [22]

Output voltage of the measuring circuit	U _o max = 18,9 V
Output current of the measuring circuit	I _o max = 0,60 mA
Output capacity of the measuring circuit	C _o max = 5 μ F
Output inductance of the measuring circuit	L _o max = 600 H
A feature of the intrinsic safety of the circuit	non-ignition circuit
Number and type of PB actuator output contacts	1 changeover contact

Table 9. Output parameters of intrinsically safe circuits of interlocks 1 and 2

Terminals [X17] and [X18] and [X19] and [X20] intrinsically safe level ib:	U ₀ = \pm 11,7 V	C _i = 0 F	C ₀ = 5 μ F
	I ₀ = \pm 16,6 mA	L _i = 0 H	L ₀ = 0,65 H
	P ₀ = 48 mW		

Certificate and opinions:

The UCMI universal control and protection device has the EU-type examination certificate: **FTZÚ 08ATEX0037X** of **August 20, 2018**, issued by Fyzikálně technický zkušební ústav FTZÚ Ostrava. The essential requirements of safety and health protection were fulfilled by meeting the requirements of the standards: EN 60079-0: 201 + A11: 2013 and EN 60079-11: 2012.

The UCMI universal control and protection device is marked with:



I (M2) [Ex ib Mb] I



1461

Based on the EMC test report **No.Z21 / 21400558/1166/08** of **October 22, 2008**. The National Institute of Telecommunications - National Research Institute in Wrocław, UCMI universal control and protection device received a positive opinion in the field of electromagnetic compatibility in accordance with the requirements of Directive 2004/108 / EC.

Based on the Technical Opinion **No.OBAC / 478 / TE / 09** of **March 18, 2010** of the OBAC Attestation and Certification Center (Annex No. 1 to the opinion OBAC / 174 / TE / 08 of June 2008) and the additional EMC test report **No. Z21 / 21400939/1325/10** of **19.01.2010**. Of the National Institute of Telecommunications - National Research Institute in Wrocław, the scope of application of the UCMI device has been extended. The universal control and protection device UCMI can be used in power supply stations for frequency converters. In addition, the UCMI device controls IT networks in the frequency range 0.2 - 60 Hz.



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An insulation monitoring device in networks with an insulated neutral, installed on the power supply of the frequency converter, controls the entire network of the frequency converter, including the outlet and the supply facility. The insulation condition control device must therefore detect a decrease in the insulation condition as well as earth faults in the entire outgoing network from a given transformer and switch them off in accordance with PN-HD 60364-4-41: 2009.

The UCMI universal control and protection device has received a positive opinion for use in transformer stations supplying frequency converters, therefore it can be used in renovated transformer stations of the following types: IT3Sb, IT3Sc, IT3Sd, IT3SF-2 ITe, ITp in exchange for the current leakage protection. The UCMI device, after installation in transformer stations in accordance with the Technical Data Sheet, built by an employee of the IZOL-PLAST company, does not reduce the explosion safety level of the station and the stations may retain the existing approval feature.

After installing the UCMI device, the transformer station is additionally marked with a repair plate with the date and number of the renovation, as well as the type and serial number of the transformer station. Additionally, after completing and checking the installation of the UCMI device it is recorded in the documents of the transformer station.

List of transformer stations in which UCMI protection may be used:

- IT3Sb 315/6, IT3Sb 315/6N, IT3Sb 315/6/Z,
- IT3Sb 400/6/1, IT3Sb 400/6/1N, IT3Sb 400/6/BM, IT3Sb 400/6/1/BM, IT3Sb 630/6/1,
- IT3Sd 315/6/Z, IT3Sd 400/6, IT3Sd 400/6N, IT3Sd 400/6/1, IT3Sd 400/6/1N, IT3Sd 400/6/Z, IT3Sd 400/6/1/Z, IT3Sd 630/6, IT3Sd 630/6/1,
- IT3Sc 400/6, IT3Sc 400/6/1, IT3Sc 500/6, IT3Sc 630/6/1, IT3Sc 400/6/MR, IT3Sc 400/6/1/MR, IT3Sc 630/6/1/MR,
- series of types ITe, series of types ITp.

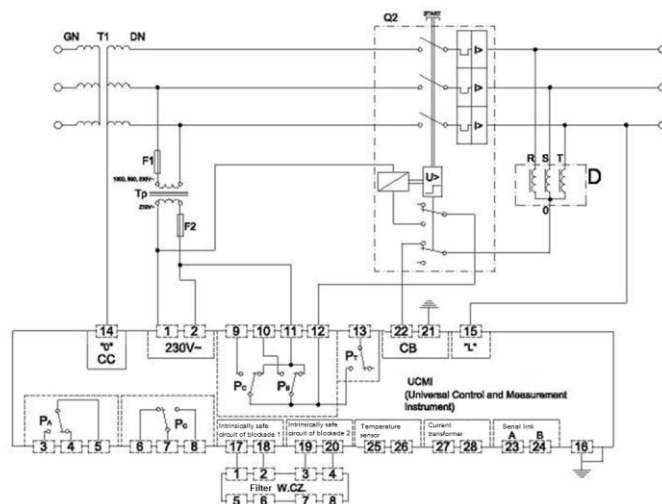


Figure 1 UCMI device cooperation diagram with a circuit breaker and a shunt release

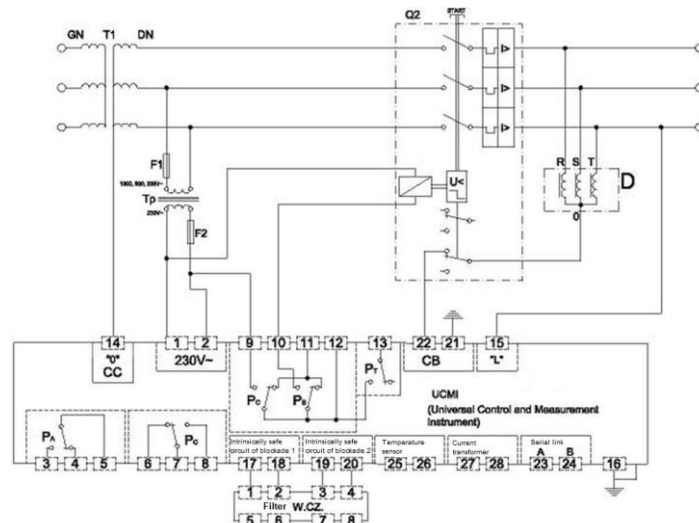


Figure 2 UCMI device cooperation diagram with a circuit breaker and an undervoltage release



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