Insulation monitoring relays for unearthed supply systems
Product group picture

Insulation monitoring relays for unearthed supply systems
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Insulation monitoring relays for unearthed supply systems
Benefits and advantages, Applications

Overview
The CM-IWx product family offers a convincing solution for monitoring ungrounded AC, AC/DC and DC networks according to EN/IEC 61557-8. An IT network is supplied either by an isolaten transformer or a voltage source such as a battery or generator. In these systems no active conductor is directly connected to earth potential.

The high reliability of an IT system is guaranteed thanks to continuous insulation monitoring. The insulation monitoring device recognizes insulation faults (at least one conductor has a galvanic connection to earth potential) as they develop and immediately reports if the insulation resistance has fallen below a given threshold. Therefore, maintenance activities can be scheduled and executed while the plant keeps running.

Benefits:
- Increase plant availability and avoid costly unplanned stops of a plant / machine by quickly detecting first faults
- Prevents fires due to detection of a creeping deterioration of the insulation resistance
- The adjustment of the setting values is simple and user friendly done with rotary switches on the front of the device
- Device status is dispalyed with LEDs that are easy to read and understand

Application
CM-IWS.x and CM-IWN.x series provide excellent insulation monitoring for general purpose supply networks such as
- Non-earthed AC, DC, AC/DC networks
- UPS systems
- Battery networks
- Hybrid and battery-powered vehicles
- Railway applications
- Many more

CM-IWM.x can be additionally used in special applications such as
- Industrial networks with frequency inverters or direct current drives
- Photovoltaic systems with high system leakage capacitance
- Networks with system voltages up to 1500 V DC or 1100 V AC without requiring a coupling unit
- Installation on the AC or DC side of an inverter
- Networks which require measuring circuit deactivation in case two or more unearthed networks are coupled

Note:
Only one insulation monitor must be connected and active in a network at the same time.




Insulation monitoring relays for unearthed supply systems
Selection table - Insulation monitoring relays

	Order number	1SVR730670R0200	1SVR740670R0200	1SVR730660R0100	1SVR740660R0100	1SVR750660R0200	1SVR760660R0200	1SVR470670R1000	1SVR470670R1100
	Type	CM-IWS.2S	CM-IWS.2P	CM-IWS.1S	CM-IWS.1P	CM-IWN.1S	CM-IWN.1P	CM-IWM.10	CM-IWM.11
Rated control supply voltage U_s									
24 - 240 V AC/DC		■	■	■	■	■	■		
24 V DC								■	■
Measuring voltages									
250 V AC (L-PE)				■	■				
400 V AC (L-PE)		■	■			■	■		
690 V AC (L-PE)						■ 1)	■ 1)	■ 2)	
1000 V AC (L-PE)									■ 3)
300 V DC (L-PE)				■	■				
600 V DC (L-PE)						■	■		
690 V DC (L-PE)								■ 2)	
1000 V DC (L-PE)						■ 1)	■ 1)		■ 3)
Measuring range									
1 - 100 kΩ		■	■	■	■	■	■		
2 - 200 kΩ						■	■		
1 - 250 kΩ								■	■
System leakage capacitance, max.									
10 µF		■	■	■	■				
20 µF						■	■		
1000 µF								■	
3000 µF									■
Output									
1 c/o		■	■	■	■				
1 x 2 c/o or 2 x 1 c/o						■	■		
2 c/o								■	■
Operating principle									
Open-circuit principle		■	■	■	■			■	■
Open- or closed-circuit principle adjustable						■	■		
Test									
Front-face button or control input		■	■	■	■	■	■	■	■
Reset and further functions									
Front-face button or control input		■	■	■	■	■	■	■	■
Fault storage / latching configurable		■	■	■	■	■	■		
Non volatile storage configurable		■	■	■	■	■	■		
Interrupted wire detection						■	■	■	■
Threshold values configurable		1	1	1	1	2	2	2	2
Control input (measuring input deactivation)									■
Connection type									
Push-in terminals			■		■		■		
Double-chamber cage connection terminals		■		■		■			
Screw terminals								■	■

1) With coupling unit CM-IVN
- screw version: CM-IVN.S: 1SVR750669R9400
- push-in version: CM-IVN.P: 1SVR760669R9400

2) Allowed voltage range of the supervised network: 0-760 V AC / 0-1000 V DC

3) Allowed voltage range of the supervised network: 0-1100 V AC / 0-1500 V DC

Insulation monitoring relays for unearthed supply systems
Ordering details

CM-IWS.1

CM-IWS.2

Description

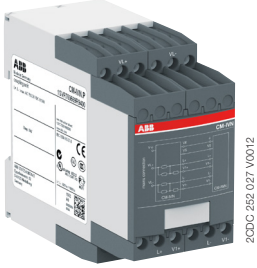
The CM-IWx serves to monitor insulation resistance in accordance with IEC 61557-8 in unearthed IT AC systems, IT AC systems with galvanically connected DC circuits, or IT DC systems.
The devices are able to monitor control circuits (single-phase) and main circuits (3-phase).

Ordering details

Rated control supply voltage	Nominal voltage U_n of the distribution system to be monitored	System leakage capacitance, max.	Adjustment range of the specified response value R_{an} (threshold)	Type	Order code	Price 1 pc	Weight (1 pc) kg (lb)
24-240 V AC/DC	0-250 V AC / 0-300 V DC	10 µF	1-100 kΩ	CM-IWS.1S	1SVR730660R0100		0.148 (0.326)
				CM-IWS.1P	1SVR740660R0100		0.137 (0.302)
	0-400 V AC			CM-IWS.2S	1SVR730670R0200		0.141 (0.311)
				CM-IWS.2P	1SVR740670R0200		0.130 (0.287)
	0-400 V AC / 0-600 V DC	20 µF	1-100 kΩ 2-200 kΩ	CM-IWN.1S	1SVR750660R0200		0.241 (0.531)
				CM-IWN.1P	1SVR760660R0200		0.217 (0.478)

CM-IWN.1

CM-IWM.x



CM-IVN

Description

The CM-IWM.x provides best and up to date insulation monitoring of modern IT supply systems in an optimum and state of the art way according to IEC 61558-8 including annex C.
The device can be used in the most flexible way for AC, DC and AC/DC systems even with a large leakage capacity to earth (PE) and under adverse conditions.

Ordering details

Rated control supply voltage	Nominal voltage U_n of the distribution system to be monitored	System leakage capacitance, max.	Adjustment range of the specified response value R_{an} (threshold)	Type	Order code	Price 1 pc	Weight (1 pc) kg (lb)
24 V DC	0-690 V AC/DC [1]	1000 µF	1-250 kΩ 20 kΩ-2 MΩ	CM-IWM.10	1SVR470670R1000		0.500 (1.1)
	0-1000 V AC/DC [2]	3000 µF		CM-IWM.11	1SVR470670R1100		

1) Allowed voltage range of the supervised network: 0-760 V AC / 0-1000 V DC
2) Allowed voltage range of the supervised network: 0-1100 V AC / 0-1500 V DC

Ordering details - Coupling unit

Rated control supply voltage = measuring voltage	Nominal voltage U_n of the distribution system to be monitored	Type	Order code	Price 1 pc	Weight (1 pc) kg (lb)
Passive device, no control supply voltage needed	0-690 V AC / 0-1000 V DC	CM-IVN.S	1SVR750669R9400		0.179 (0.395)
		CM-IVN.P	1SVR760669R9400		0.165 (0.364)

S: screw connection
P: push-in connection

Insulation monitoring relays for unearthed supply systems
Technical data - CM-IWx

Data at T_a = 25 °C and rated values, unless otherwise indicated

			CM-IWS.2	CM-IWS.1	CM-IWN.1
Input circuit - Supply circuit			A1 - A2		
Rated control supply voltage U_s			24-240 V AC/DC		
Rated control supply voltage tolerance			-15...+10 %		
Typical current / power consumption		24 V DC	30 mA / 0.7 VA	35 mA / 0.9 VA	55 mA / 1.3 VA
		115 V AC	12 mA / 1.4 VA	17 mA / 2.0 VA	20 mA / 2.3 VA
		230 V AC	12 mA / 2.8 VA	14 mA / 3.2 VA	15 mA / 3.5 VA
Rated frequency f_s			DC or 15-400 Hz		
Frequency range AC			13.5-440 Hz		
Power failure buffering time		min.	20 ms		
Input circuit - Measuring circuit			L, ⏚	L+, L-, ⏚, KE	L+, L-, ⏚, KE
Monitoring function			insulation resistance monitoring of IT systems		
Measuring principle			superimposed DC voltage	prognostic measuring principle with superimposed square wave signal	
Nominal voltage U_n of the distribution system to be monitored			0-400 V AC	0-250 V AC / 0-300 V DC	0-400 V AC / 0-600 V DC
Voltage range of the distribution system to be monitored			0-460 V AC (tolerance +15 %)	0-287.5 V AC / 0-345 V DC (tolerance +15 %)	0-460 V AC / 0-690 V DC (tolerance +15 %)
Rated frequency f_N of the distribution system to be monitored			50-60 Hz	DC or 15-400 Hz	DC or 15-400 Hz
System leakage capacitance C_e		max.	10 µF		20 µF
Tolerance of the rated frequency f_N			45-65 Hz	13.5-440 Hz	13.5-440 Hz
Extraneous DC voltage U_{fg} (when connected to an AC system)		max.	none	290 V DC	460 V DC
Number of possible response / threshold values			1		2
Adjustment range of the specified response value R_{an} (threshold)		min.-max.	1-100 Ω		–
		min.-max. R1	–		1-100 kΩ
		min.-max. R2	–		2-200 kΩ (activated / de-activated by DIP-switch)
Adjustment resolution			1 kΩ		
		R1	1 kΩ		1 kΩ
		R2	–		2 kΩ
Tolerance of the adjusted threshold value / Relative percentage uncertainty A at -5...+45 °C, U_n = 0-115 %, U_s = 85-110 %, f_N, f_s, C_e = 1µF		at 1-10 kΩ R_F (yellow marked scale)	≥ 15 %, max. ± 0.5 kΩ		≥ 15 %, max. ± 1 kΩ, with CM-IVN ± 1.5 kΩ
		at 10-100 kΩ R_F	± 6 %		–
		at 10-15 kΩ R_F	–		± 1 kΩ, with CM-IVN ± 1.5 kΩ
		at 15-200 kΩ R_F	–		± 8 %
Hysteresis related to the threshold value			25 %; min. 2 kΩ		
Internal impedance Z_i		at 50 Hz	135 kΩ	100 kΩ	155 kΩ
Internal DC resistance R_i			185 kΩ	115 kΩ	185 kΩ
Measuring voltage U_m			15 V	22 V	24 V
Tolerance of measuring voltage U_m			+10 %		
Measuring current I_m		max.	0.1 mA	0.3 mA	0.15 mA
Response time t_{an}					
	pure AC system	0.5 x R_{an} and C_e = 1 µF	max. 10 s		
	DC system or AC system with connected rectifiers		–	max. 15 s	
Repeat accuracy (constant parameters)			< 0.1 % of full scale		
Accuracy of R_a (measured value) within the rated control supply voltage tolerance			< 0.05 % of full scale		
Accuracy of R_a (measured value) within the operation temperature range		at 1-10 kΩ R_F	5 Ω / K		
		at 10-100 kΩ R_F	0.05 % / K		–
		at 10-200 kΩ R_F	–		0.05 % / K
Transient overvoltage protection (⏚ - terminal)			Z-diode	avalanche diode	
Input circuit - Control circuits			S1 - S2 - S3		
Control inputs - volt free		S1-S3	remote test		
		S2-S3	remote reset		
Maximum switching current in the control circuit			1 mA		
Maximum cable length to the control inputs			50 m - 100 pF/m		
Minimum control pulse length			150 ms		
No-load voltage at the control input			≤ 24 V ± 5 %	≤ 24 V DC	

Insulation monitoring relays for unearthed supply systems
Technical data - CM-IWx

		CM-IWS.2	CM-IWS.1	CM-IWN.1
Indication of operational states				
Control supply voltage		LED U (green)		
Fault message		LED F (red)		
Relay status		LED R (yellow)		
Output circuits				
Kind of output		relay, 1 c/o (SPDT) contact		2 x 1 or 1 x 2 c/o (SPDT) contacts configurable
Operating principle		closed-circuit principle [1]		open- or closed circuit principle [1] configurable
Contact material		AgNi alloy, Cd free		
Rated voltage		250 V AC / 300 V DC		
Min. switching voltage / Min. switching current		24 V / 10 mA		
Max. switching voltage / Max. switching current		see data sheet		
Rated operational current I_e	AC-12 (resistive) at 230 V	4 A		
	AC-15 (inductive) at 230 V	3 A		
	DC-12 (resistive) at 24 V	4 A		
	DC-13 (inductive) at 24 V	2 A		
AC rating (UL 508)	utilization category (Control Circuit Rating Code)	B 300 pilot duty; general purpose 250 V, 4 A, cos φ 0.75		
	max. rated operational voltage	250 V AC		
	max. continuous thermal current at B 300	4 A		
	max. making/breaking apparent power at B 300	3600/360 VA		
Mechanical lifetime		30 x 10^6 switching cycles		
Electrical lifetime (AC-12, 230 V, 4 A)		0.1 x 10^6 switching cycles		
Max. fuse rating to achieve short-circuit protection	n/c contact	6 A fast-acting		
	n/o contact	10 A fast-acting		
Conventional thermal current I_{th}		4 A		
General data				
Duty time		100 %		
Dimensions		see 'Dimensional drawings'		
Mounting		DIN rail (IEC/EN 60715), snap-on mounting without any tool		
Mounting position		any		
Minimum distance to other units	vertical	not necessary		
	horizontal	10 mm (0.39 in) at U_n > 240 V	not necessary	10 mm (0.39 in) at U_n > 400 V
Material of housing		UL 94 V-0		
Degree of protection	housing / terminal	IP50 / IP20		

Electrical connection		**Screw connection technology**	**Easy Connect Technology (Push-in)**
Connecting capacity	fine-strand with(out) wire end ferrule	1 x 0.5-2.5 mm² (1 x 18-14 AWG) 2 x 0.5-1.5 mm² (2 x 18-16 AWG)	2 x 0.5-1.5 mm² (2 x 18-16 AWG)
	rigid	1 x 0.5-4 mm² (1 x 20-12 AWG) 2 x 0.5-2.5 mm² (2 x 20-14 AWG)	2 x 0.5-1.5 mm² (2 x 20-16 AWG)
Stripping length		8 mm (0.32 in)	
Tightening torque		0.6-0.8 Nm (5.31-7.08 lb.in)	

Environmental data		
Ambient temperature ranges	operation / storage / transport	-25...+60 °C/-40...+85 °C/-40...+85 °C
Climatic class	IEC/EN 60721-3-3	3K5 (no condensation, no ice formation)
Damp heat, cyclic	IEC/EN 60068-2-30	6 x 24 h cycle, 55 °C, 95 % RH
Vibration, sinusoidal		25 Hz: 2.5 g

[1] Closed-circuit principle: Output relay(s) de-energize(s) if a fault is occuring
Open-circuit principle: Output relay(s) energize(s) if a fault is occuring

Insulation monitoring relays for unearthed supply systems
Technical data - CM-IWx

		CM-IWS.2	CM-IWS.1	CM-IWN.1
Isolation data				
Rated impulse withstand voltage U_{imp}	supply / measuring circuit	6 kV		
	supply / output circuit	6 kV		
	measuring / output circuit	6 kV		
	output 1 / output circuit 2			4 kV
Rated insulation voltage U_i	supply / measuring circuit	400 V	300 V	600 V
	supply / output circuit	300 V		
	supply / measuring circuit	400 V	300 V	600 V
	output 1 / output circuit 2	-	-	300 V
Basic insulation	supply / measuring circuit	400 V AC / 300 V DC	250 V AC / 300 V DC	400 V AC / 600 V DC
	supply / output circuit	250 V AC / 300 V DC		
	measuring / output circuit	400 V AC / 300 V DC	250 V AC / 300 V DC	400 V AC / 600 V DC
	output 1 / output 2	250 V AC / 300 V DC		
Protective separation (IEC/EN 61140, EN 50178)	supply / output circuit	250 V AC / 250 V DC		
	supply / measuring circuit	250 V AC / 250 V DC		
	measuring / output circuit	250 V AC / 250 V DC		
Pollution degree		3		
Overvoltage category		III		
Standards / Directives				
Standards		IEC/EN 60947-5-1, IEC/EN 61557-1, IEC/EN 61557-8		
Low Voltage Directive		2014/35/EU		
EMC Directive		2014/30/EU		
RoHS Directive		2011/65/EU		
Electromagnetic compability				
Interference immunity to		IEC/EN 61000-6-2, IEC/EN 61326-2-4		
electrostatic discharge	IEC/EN 61000-4-2	level 3, 6 kV / 8 kV		
radiated, radio-frequency, electromagnetic field	IEC/EN 61000-4-3	level 3, 10 V/m (1 GHz) / 3 V/m (2 GHz) / 1 V/m (2.7 GHz)		
electrical fast transient/burst	IEC/EN 61000-4-4	level 3, 2 kV / 5 kHz		
surge	IEC/EN 61000-4-5	level 3, installation class 3, supply circuit and measuring circuit 1 kV L-L, 2 kV L-earth		
conducted disturbances, induced by radio-frequency fields	IEC/EN 61000-4-6	level 3, 10 V		
voltage dips, short interruptions and voltage variations	IEC/EN 61000-4-11	class 3		
harmonics and interharmonics	IEC/EN 61000-4-13	class 3		
Interference emissions		IEC/EN 61000-6-3		
high-frequency radiated	IEC/CISPR 22, EN 55022	class B		
high-frequency conducted	IEC/CISPR 22, EN 55022	class B		

Insulation monitoring relays for unearthed supply systems
Technical data - CM-IVN

Input circuit - Measuring circuit		VL+, VL-, V⏚
Function		expansion of the nominal voltage range of the insulation monitoring relay CM-IWN to 690 V AC or 1000 V DC, max. length of connection cable 40 cm
Measuring principle		see CM-IWN
Nominal voltage U_n of the distribution system to be monitored		0-690 V AC / 0-1000 V DC
Voltage range of the distribution system to be monitored		0-793.5 V AC / 0-1150 V DC (tolerance +15 %)
Rated frequency f_N of the distribution system to be monitored		DC or 15-400 Hz
Tolerance of the rated frequency f_N		13.5-440 Hz
System leakage capacitance C_e	max.	identical to that of the insulation monitoring relay used
Extraneous DC voltage U_{fg} (when connected to an AC system)	max.	793.5 V DC
Tolerance of the adjusted threshold value / Relative percentage uncertainty A at -5...+ 45 °C, U_n = 0-115 %, U_s = 85-110 %, f_N, f_s, C_e = 1 µF	at 1-15 kΩ R_F	±1.5 kΩ
	at 15-200 kΩ R_F	±8 %
Internal impedance Z_i	at 50 Hz	195 kΩ
Internal DC resistance R_i		200 kΩ
Measuring voltage U_m		24 V
Tolerance of measuring voltage U_m		+10 %
Measuring current I_m		0.15 mA
General data		
MTBF		on request
Duty time		100 %
Dimensions		see 'Dimensional drawings'
Mounting		DIN rail (IEC/EN 60715), snap-on mounting without any tool
Mounting position		any
Minimum distance to other units	vertical	not necessary
	horizontal	10 mm (0.39 in) at U_n > 600 V
Degree of protection		IP50 / IP20
Electrical connection		
Connecting capacity	fine-strand with(out) wire end ferrule	2 x 0.75-2.5 mm² (2 x 18-14 AWG)
	rigid	2 x 0.5-4 mm² (2 x 20-12 AWG)
Stripping length		7 mm (0.28 in)
Tightening torque		0.6-0.8 Nm (5.31-7.08 lb.in)
Max. length of connection cable to CM-IWN		40 cm
Environmental data		
Ambient temperature ranges	operation / storage / transport	-25...+60 °C / -40...+85 °C / -40...+85 °C
Climatic category	IEC/EN 60721-3-3	3K5 (no condensation, no ice formation)
Damp heat, cyclic	IEC/EN 60068-2-30	6 x 24 h cycle, 55 °C, 95 % RH
Vibration, sinusoidal	IEC/EN 60255-21-1	Class 2
Shock, half-sine	IEC/EN 60255-21-2	Class 2
Isolation data		
Rated impulse withstand voltage U_{imp}	input circuit / PE	8 kV
Rated insulation voltage U_i	input circuit / PE	1000 V
Pollution degree		3
Overvoltage category		III
Standards / Directives		
Standards		IEC/EN 60947-5-1, IEC/EN 61557-1, IEC/EN 61557-8
Low Voltage Directive		2014/35/EU
EMC Directive		2014/30/EU
RoHS Directive		2011/65/EU
Electromagnetic compability		
Interference immunity to		IEC/EN 61000-6-2, IEC/EN 61326-2-4
electrostatic discharge	IEC/EN 61000-4-2	level 3, 6 kV / 8 kV
radiated, radio-frequency, electromagnetic field	IEC/EN 61000-4-3	level 3, 10 V/m (1 GHz) / 3 V/m (2 GHz) / 1 V/m (2.7 GHz)
electrical fast transient/burst	IEC/EN 61000-4-4	level 3, 2 kV / 5 kHz
surge	IEC/EN 61000-4-5	level 3, installation class 3, supply circuit and measuring circuit 1 kV L-L, 2 kV L-earth
conducted disturbances, induced by radio-frequency fields	IEC/EN 61000-4-6	level 3, 10 V
voltage dips, short interruptions and voltage variations	IEC/EN 61000-4-11	level 3
harmonics and interharmonics	IEC/EN 61000-4-13	Level 3
Interference emission		IEC/EN 61000-6-3
high-frequency radiated	IEC/CISPR 22, EN 50022	class B
high-frequency conducted	IEC/CISPR 22, EN 50022	class B

Insulation monitoring relays for unearthed supply systems
Technical data - CM-IWM

Type			CM-IWM.10	CM-IWM.11
Input circuit				
Rated control supply voltage U_S			24 V DC	
Voltage range			20-30 V DC	
Typical power consumption			max. 5 W	
Measuring circuit			L(+) / L(-) to PE / KE	
Nominal voltage U_N			0-690 V AC/DC	0-1000 V AC/DC
Allowed voltage range of the supervised network			0-760 V AC / 0-1000 V DC	0-1100 V AC / 0-1500 V DC
Frequency range			DC or 16-1000 Hz	DC or 16-1000 Hz
Max. system leakage capacitance C_e			1000 µF	3000 µF
Internal resistance (AC/DC)			> 280 kΩ	
Measuring voltage			approx. ± 95 V	
Max. measured current (R_E = 0)			< 0.35 mA	
Response values R_E each adjustable via rotary switches		pre-warning ("VW")	warning ("AL")	
		20 kΩ	1 kΩ	
		30 kΩ	3 kΩ	
		50 kΩ	10 kΩ	
		70 kΩ	20 kΩ	
		100 kΩ	30 kΩ	
		150 kΩ	50 kΩ	
		250 kΩ	70 kΩ	
		500 kΩ	100 kΩ	
		1000 kΩ	150 kΩ	
		2000 kΩ	250 kΩ	
Response inaccuracy		IEC/EN 61557-8	± 15 % + 1.5 kΩ	
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	
Control input			between T, R and G	between HM, T, R and G
Current flow			approx. 3 mA	
No-load voltage to ground			approx. 12 V	
Permissible wire length			< 50 m	
Min. activation time			0.5 s	
Output				
Contacts			2 x 1 c/o contacts for VW and AL	
Thermal current I_{th}			4 A	
Switching capacity to AC-15		n/o contact	3 A / AC 230 V acc. to IEC/EN 60947-5-1	
		n/c contact	1 A / AC 230 V acc. to 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 gL acc. to IEC/EN 60947-5-1	
Mechanical life			10 x 10^6 switching cycles	
General Data				
Operating mode			continuous operation	
Temperature range		operation	- 25 ... + 60 °C	- 25 ... + 60 °C (device mounted away from heat generation components) -25 ... +45 °C (device mounted without distance to other devices)
		storage	- 40 ... + 70 °C	
Relative air humidity			93 % at 40 °C	
Atmospheric pressure			860-1600 mbar (86-106 kPa)	
Altitude	IEC/EN 60664-1		< 4000 m	
Clearance and creepage distances				
Rated impulse voltage / pollution degree			IEC/EN 60664-1	
Measuring ciruit L(+) / L(-) to	auxiliary voltage DC and relay contacts VW, AL		8 kV / 2	
	auxiliary voltage DC to relay contacts VW, AL		8 kV / 2	
	relay contacts VW to relay contact AL		4 kV / 2	
Insulation test voltage, routine test			AC 5 kV; 1 s AC 2.5 kV; 1 s	

Insulation monitoring relays for unearthed supply systems
Technical data CM-IWM

Technical data		
EMC		
Electrostatic discharge (ESD)	IEC/EN 61000-4-2	8 kV (air)
HF irradiation	IEC/EN 61000-4-3	80 MHz-2.7 GHz: 10 V/m
Fast transients	IEC/EN 61000-4-4	4 kV
Surge voltages	IEC/EN 61000-4-5	between A1 - A2: 1 kV L(+) - L(-): 2 kV A1, A2 - PE: 4 kV L(+), L(-) - PE: 4 kV control line: 0.5 kV control line and earth: 1 kV
HF-wire guided	IEC/EN 61000-4-6	10 V
Interference suppression	EN 55011	limit value class A 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	IEC/EN 60529	IP 40
Terminals	IEC/EN 60529	IP 20
Housing		thermpolastic with V0 behaviour according to UL subject 94
Vibration resistance	IEC/EN 60068-2-6	10-55 Hz: 0.35 mm 2-13.2 Hz: ± 1 mm 13.2-100 Hz: ± 7 g
Shock resistance	IEC/EN 60068-2-27	10 g / 11 ms, 3 pulses
Climate resistance	IEC/EN 60068-1	25 / 060 / 04
Terminal designation		EN 50005
Connecting capacity		1 x 4 mm^2 solid 1 x 2.5 mm^2 stranded ferruled (isolated) 2 x 1.5 mm^2 stranded ferruled (isolated) DIN 46228-1/-2/-3-4 2 x 2.5 mm^2 stranded ferruled (isolated) DIN 46228-1/-2/-3
Stripping length		8 mm
Tightening torque		0.8 Nm
Wire fixing		plus-minus terminal scews M3,5 terminal with wire protection
Mounting	IEC/EN 60715	DIN rail
Dimensions	width x height x depth	90 x 90 x 121 mm