Data sheet

Coupling unit CM-IVN

For expansion of the insulation monitoring relay CM-IWN.x measuring range up to U_n = 690 V AC and 1000 V DC

The CM-IVN serves to extend the measuring range of the insulation monitoring relay CM-IWN.x for monitoring the insulation resistance up to 690 V AC and 1000 V DC in accordance with IEC 61557-8.

The CM-IVN is available with two different terminal versions. You can choose between the proven screw connection technology (double-chamber cage connection terminals) and the completely tool-free Easy Connect Technology (push-in terminals).



2CDC 251 027 V0012

Characteristics

- Expansion of the nominal voltage range of the insulation monitoring relay CM-IWN.x for monitoring the insulation resistance of unearthed IT systems up to 690 V AC and 1000 V DC
- According to IEC/EN 61557-8 “Electrical safety in low voltage distribution systems up to 1000 V a.c. and 1500 V d.c. – Equipment for testing, measuring or monitoring of protective measures – Part 8: Insulation monitoring devices for IT systems"
- Passive device, no supply voltage needed
- Screw connection technology or Easy Connect Technology available
- Housing material for highest fire protection classification UL 94 V-0
- Tool-free mounting on DIN rail as well as demounting
- 45 mm (1.77 in) width

Approvals

UL 508, CAN/CSA C22.2 No.14
GL
IEC/EN 60947-5-1, CB scheme
GB14048.5 - 2001, CCC
GOST

Marks

CE
C-Tick

Order data

Coupling unit

Type	Nominal voltage U_n of the distribution system to be monitored	Rated control supply voltage	Connection technology	Order code
CM-IVN.P	0-690 V AC / 0-1000 V DC	Passive device, no control supply voltage needed	Push-in terminals	1SVR 760 669 R9400
CM-IVN.S			Screw type terminals	1SVR 750 669 R9400

Accessories

Type	Description	Order code
ADP.02	Adapter for screw mounting	1SVR 440 029 R0100
MAR.01	Marker label	1SVR 366 017 R0100
COV.12	Sealable transparent cover	1SVR 750 005 R0100

Functions

Application / monitoring function

The coupling unit CM-IVN is designed to extend the nominal voltage range of the insulation monitoring relay CM-IWN.x up to 690 V AC and 1000 V DC. The coupling unit can be connected to the system to be monitored by means of the terminals VL+ and VL-. The terminal V⏚ has to be connected to the earth potential. The terminals L+, V1+, L-, V1-, VS and VE have to be connected to the CM-IWN.x as shown in the connection diagrams below.

Supply systems with voltages U_n = 0-690 V AC (15-400 Hz) or 0-1000 V DC can be connected.

Measuring principle

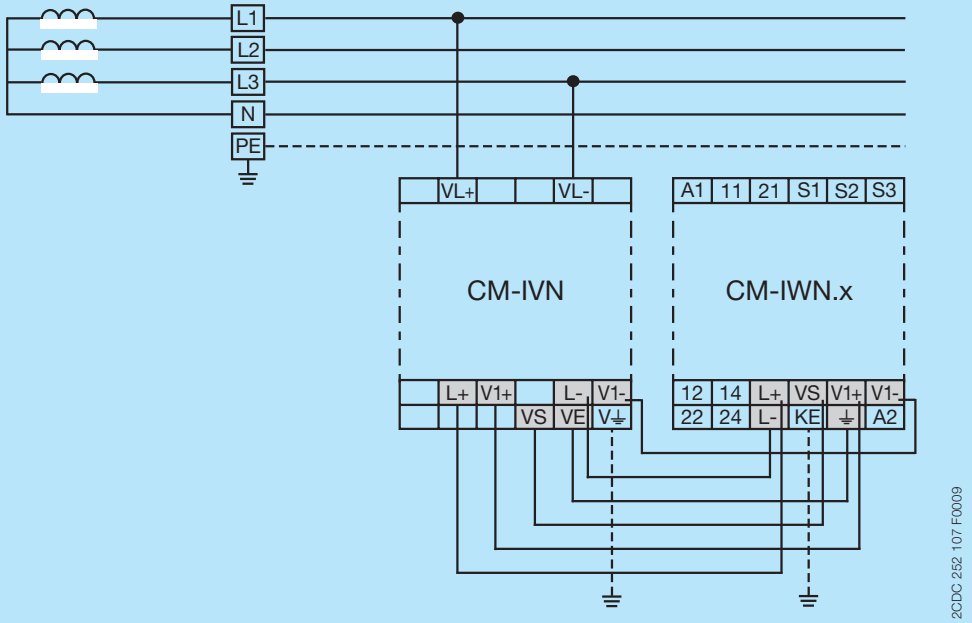
With CM-IWN.x a pulsating measuring signal is fed into the system to be monitored and the insulation resistance calculated.

This pulsating measuring signal alters its form depending on the insulation resistance and system leakage capacitance. From this altered form the change in the insulation resistance is forecast.

When the forecast insulation resistance corresponds to the insulation resistance calculated in the next measurement cycle and is smaller than the set threshold value, the output relays are activated or deactivated, depending on the device configuration. This measuring principle is also suitable for the detection of symmetrical insulation faults.

Connection and wiring

Connection diagram

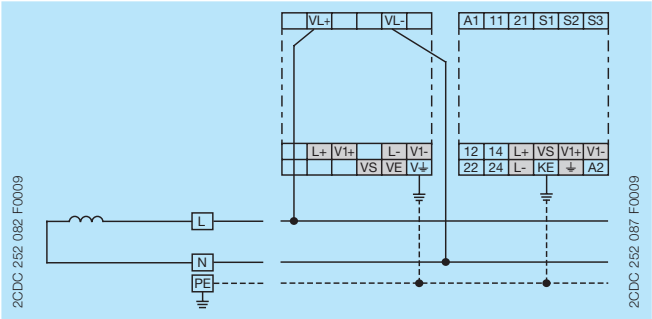


VE	Connection to CM-IWN.x - ⏚
VS	Connection to CM-IWN.x - VS
L+	Connection to CM-IWN.x - L+
V1+	Connection to CM-IWN.x - V1+
L-	Connection to CM-IWN.x - L-
V1-	Connection to CM-IWN.x - V1-
VL+, VL-	Measuring circuit / Measuring input Connection to the system
V⏚	Measuring circuit / Measuring input Connection to earth

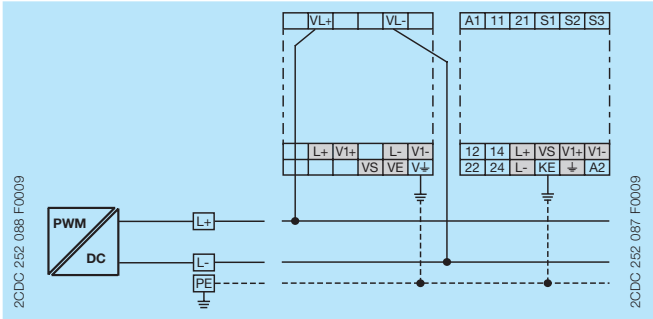
Wiring diagrams

Always connect L+ and L- to different conductors. L+ and L- can be connected to any of the conductors.

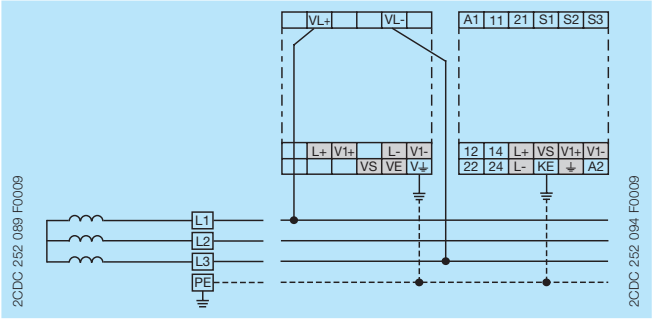
$U_n \leq 690$ V AC; 1000 V DC



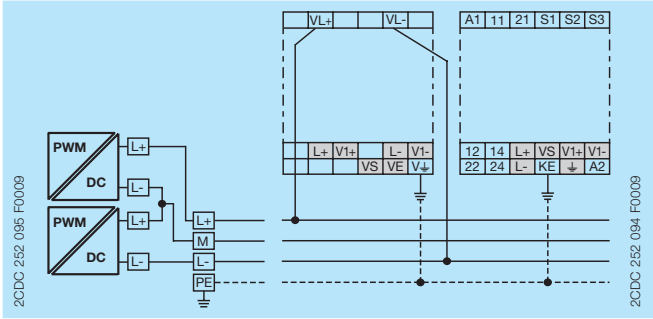
2-wire AC system



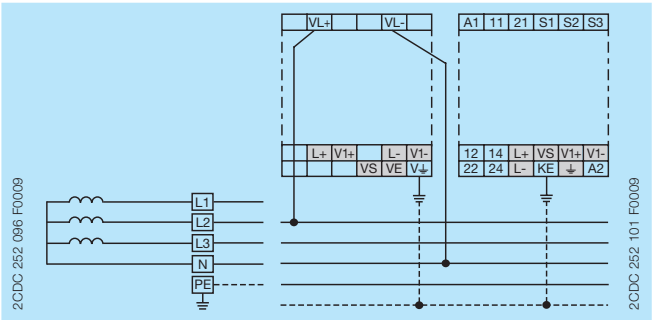
2-wire DC system



3-wire AC system



3-wire DC system



4-wire AC system

Technical data

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

Input circuits

Input circuit - Measuring circuit		**VL+, VL-, V⏚**
Function		expansion of the nominal voltage range of the insulation monitoring relay CM-IWN.x to 690 V AC or 1000 V DC, max. length of connection cable 40 cm
Measuring principle		see CM-IWN.x
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 = 1µF	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 (W x H x D)		45 x 78 x 100 mm (1.78 x 3.07 x 3.94 in)	
		Screw connection technology	**Easy Connect Technology (push-in)**
Weight	net weight	0.179 kg (0.395 lb)	0.165 kg (0.364 lb)
	gross weight	0.203 kg (0.448 lb)	0.189 kg (0.417 lb)
Mounting		DIN rail (IEC/EN 60715), snap-on mounting without any tool	
Mounting position		any	
Minimum distance to other units		not necessary	
		10 mm (0.39 in) at U_n > 400 V	
Degree of protection	housing / terminal	IP50 / IP20	

Electrical connection

		Screw connection technology	**Easy Connect Technology (push-in)**
Wire size	fine-strand with(out) wire end ferrule	1 x 0.5-2.5 mm² (1 x 20-14 AWG), 2 x 0.5-1.5 mm² (2 x 20-16 AWG)	2 x 0.5-1.5 mm² (2 x 20-16 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)	-
Max. length of connection cable to CM-IWN.x		40 cm	

Environmental data

Ambient temperature ranges	operation	-25...+60 °C
	storage	-40...+85 °C
	transport	-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} (IEC/EN 60947-1, IEC/EN 60664-1)	input circuit / PE	8 kV
Pollution degree (IEC/EN 60664-1)		3
Overvoltage category (IEC/EN 60664-1)		III
Rated insulation voltage U_i (IEC/EN 60947-1, IEC/EN 60664-1)	input circuit / PE	1000 V
Test voltage, routine test (IEC/EN 60255-5, IEC/EN 61010-1)	input circuit / PE	3.3 kV, 50 Hz, 1 s

Standards

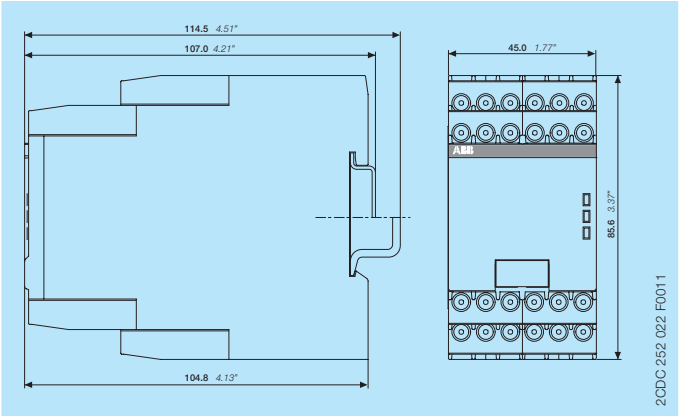
Product standard	IEC/EN 61557-8, IEC/EN 60255-6
Other standards	EN 50178
Low Voltage Directive	2006/95/EC
EMC Directive	2004/108/EC
RoHS Directive	2002/95/EC

Electromagnetic compatibility

Interference immunity to		IEC/EN 61000-6-1, 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 emission		IEC/EN 61000-6-3, IEC/EN 61000-6-4
high-frequency radiated	IEC/CISPR 22, EN 55022	Class B
high-frequency conducted	IEC/CISPR 22, EN 55022	Class B

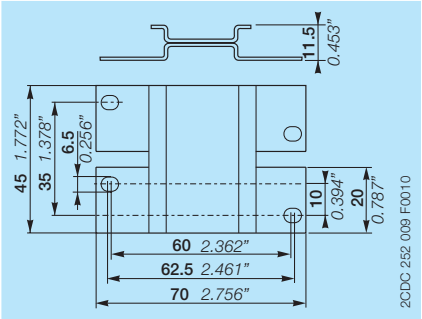
Dimensions

in **mm** and *inches*

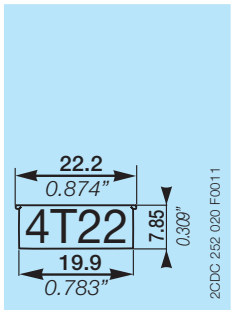


Accessories

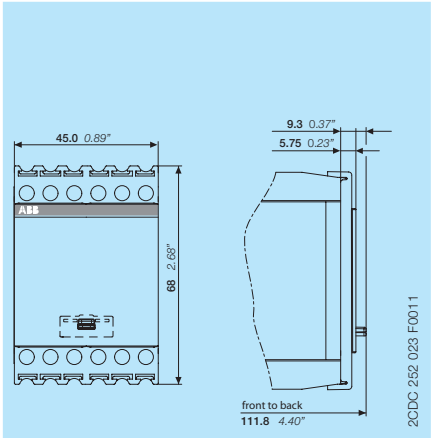
in **mm** and *inches*



ADP.02 - Adapter for screw mounting



MAR.12 - Marker label for devices with DIP switches



COV.12 - Sealable transparent cover

Further documentation

Document title	Document type	Document number
Electronic products and relays	Catalog	2CDC 110 004 C020x
CM-IWN.1, CM-IWN.4, CM-IWN.5, CM-IWN.6	Instruction sheet	1SVC 750 020 M0000

You can find the documentation on the internet at www.abb.com/lowvoltage -> Control Products -> Electronic Relays and Controls -> Insulation Monitors.

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