

ISOM K-40 / K-40h

IMDs in an IT system



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1. DOCUMENTATION



All documentation relating to ISOM K-40 and its sensors is available on the SOCOMEC website at the following address: www.socomec.fr

2. HAZARDS AND WARNINGS

The term "device" used in this document covers both the ISOM K-40 and K-40h.

The assembly, use, servicing and maintenance of this equipment must only be carried out by trained, qualified professionals. SOCOMEC shall not be held responsible for failure to comply with the instructions in this manual.

2.1. Risk of electrocution, burns or explosion

	Caution: risk of electric shock	Ref. ISO 7000-0434B (2004-01)
	Caution: refer to the accompanying documentation each time this symbol is shown	Ref. ISO 7000-0434B (2004-01)

- This device must only be installed and serviced (cleaning with a dry cloth) by qualified personnel who have in-depth knowledge of installing, commissioning and operating the device and who have had appropriate training. He or she should have read and understood the various safety measures and warnings stated in the instructions.
- Be aware of protection devices (insulation monitoring system), annual preventive maintenance should be carried out to test the system's basic functions (manually activate the test function).
- Use connection cables compatible with the voltage and connection terminals of the devices.
- If, for usage reasons, the device is connected by terminals L1, L2 to a powered IT network, the terminals EARTH and KE should not be separated from the protective conductor (PE).
- Prior to any work on or in the unit, disconnect all power sources (voltage inputs, the unit's auxiliary power supply and dry contact supplies).
- The isolation options must be:
 - within the electrical installation itself
 - located somewhere convenient and easily accessible
 - labelled as the unit's power switching device
- These devices are designed to be integrated; they must be installed in an additional enclosure providing protection against electric shocks and fire.
- Always use an appropriate voltage detection device to confirm the absence of voltage.
- Replace all devices, doors and covers before turning on power to this equipment.
- Always power the device with the correct rated voltage.
- Install the device following the recommended installation instructions and in a suitable electrical cabinet
- Always connect the TE and TR current sensors using the recommended connection cables and observing the maximum prescribed currents.
- For safety reasons, only use accessories that conform to the manufacturer's specifications.
- During installation, the safety of any system integrating the device is the responsibility of the system installer.



Do NOT clamp or pull out NON-INSULATED conductors carrying DANGEROUS VOLTAGE which could cause an electric shock, burn or arc flash.

Ref. IEC 61010-2-032

Failure to take these precautions could cause death or serious injuries.

If there is a problem, please contact

SOCOMEK, 1 rue de Westhouse, 67235 BENFELD, FRANCE

Tel. +33 3 88 57 41 41

info.scp.isd@socomec.com

2.2. Risk of damaging the unit

To ensure that the unit operates correctly, make sure that:

- The unit is correctly installed.
- The voltage of the auxiliary power supply.
- The frequency of the network shown on the device.
- There is a maximum voltage at the voltage input terminals of 480 VAC phase/phase or 277 VAC phase/neutral or 240 VDC.
- Always connect the TE or TR current sensors using the recommended connection cables and observing the maximum prescribed currents.
- Only use SOCOMEC RJ45 cables.
- During specific checks, disconnect the devices from the network before attempting to insulate or carry out dielectric testing.
- The devices are designed for indoor use.
- If the ambient temperature exceeds +50°C, the minimum temperature of the copper conductors to connect to terminals should be +85°C.

Failure to respect these precautions could cause damage to the unit or cause an electrical shock.

2.3. Responsibility

- Assembly, connection and use must be carried out in accordance with the installation standards currently in force.
- The unit must be installed in accordance with the rules given in this manual.
- Failure to observe the rules for installing this unit may compromise the device's intrinsic safety.
- The unit must be positioned within an installation which complies with the standards currently in force.
- Any cable which needs to be replaced may only be replaced with a cable with the correct rating.

3. BEFORE YOU START

To ensure the safety of personnel and the product, please carefully read the contents of these instructions before installation.

Check the following points as soon as you receive the package containing the unit:

- The packaging is in good condition
- The unit has not been damaged during transportation
- The device reference number conforms to your order
- The packaging includes the unit fitted with removable terminal blocks and a Quick Start guide.

4. PRESENTATION

4.1. Introduction to ISOM K-40 / K-40h

ISOM K-40 / K-40h monitors the insulation of the IT system (IMD* function).

ISOM K-40h is specifically intended for insulation monitoring in IT systems in medical buildings. It can be linked to a special signalisation reporting system ISOM D-15h.

ISOM K-40 / K-40h allows you to monitor the insulation of IT systems, by delivering alerts if the insulation level drops below the thresholds set by the operator.

ISOM K-40 / K-40h offers a number of options including measuring the insulation, leakage capacity, voltage network, load current (AC only), and monitoring the temperature.

The ISOM K-40 / K-40h is configured from the display or via the Easy Config software.

* IMD: Insulation monitoring device (product standard IEC 61557-8)

4.1.1. Range

Insulation monitoring device (IMD)



Insulation monitoring device for disrupted IT networks

ISOM K-40 AC

Auxiliary power supply $U_s=110-230 \text{ VAC} / 120-240 \text{ VDC}$

Ref. 4725 0120

Insulation monitoring device for disrupted IT networks

ISOM K-40 DC

Auxiliary power supply $U_s=24 \text{ VDC}^*$

Ref. 4725 0121

Insulation monitoring device for medical IT networks

ISOM K-40h

Auxiliary power supply $U_s=230 \text{ VAC}$

Ref. 4725 0122

Alert notifications for operating theatres (with ISOM K-40h)



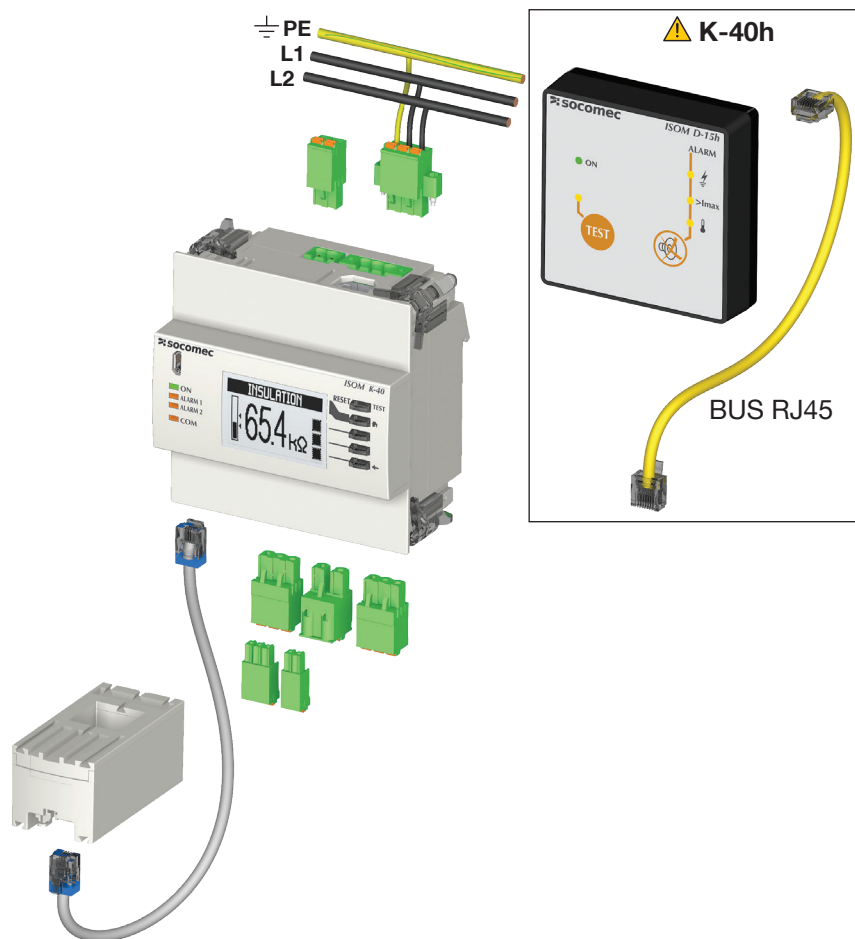
ISOM D-15h

Auxiliary power supply $U_s=$ powered by K-40h

Ref. 4729 0200

(*)**WARNING:** DC auxiliary supply must be galvanically separated from monitored network.

4.1.2. Principle



4.1.3. Functions

ISOM K-40 / K-40h ISOM Digiware offers a number of options, including:

Insulation monitoring

- Rf, Ce measurements

Temperature monitoring

External TEST/RESET function

General measurements

- Current measurements

Data-logging

- Recording and timestamping measurement alarms (insulation, overloads, overheating) + system alarm (no network connection, network disturbances...)

Current inputs

- Measuring the single-phase or three-phase balanced load current
- Current inputs with quick connection and automatic recognition of the current sensors
- Connection of solid-core and split-core sensors

Communication

- Modbus RTU communication protocol, via RS485

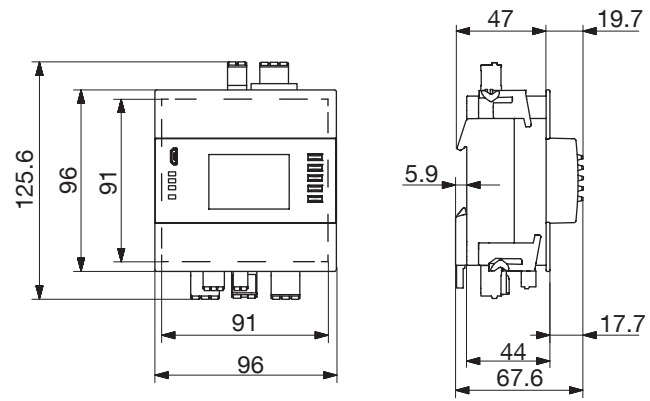
4.1.4. Electrical readings

	D-15h
Function	
Single-device alarm reporting	•
Clearer display with LED	•
Power supply	
Self-supplied	•
Communication	
Manufacturer bus	•
Format	
Width / number of modules / installation	Mounted on the outside of the enclosure D67mm P40 mm
Reference	4729 0200

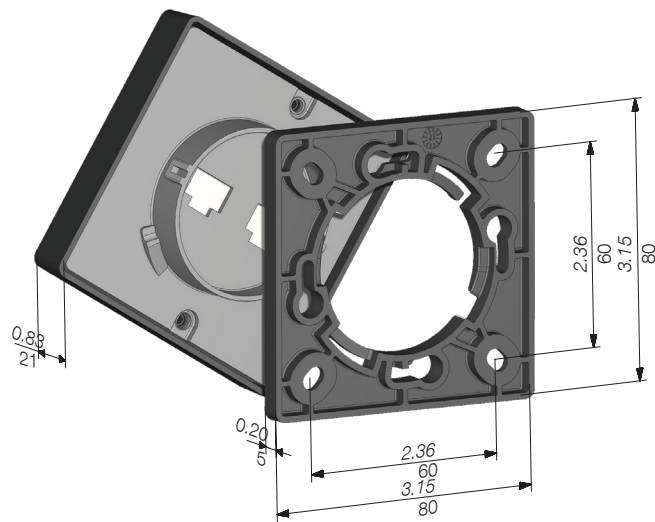
	solution		
	K-40 AC	K-40 DC	K-40h
Multi-measurement			
R_F, C_e	•	•	•
I on mains 1AC	•	•	•
Alarms			
On adjustable thresholds (R_F, I), on fixed threshold ($T^{\circ}C$)	•	•	•
Format			
Width/Number of modules	96 mm / 5.5	96 mm / 5.5	96 mm / 5.5
Reference	4725 0120	4725 0121	4725 0122

4.1.5. Dimensions

ISOM K-40 / K-40h



ISOM D-15h



4.2. Presentation of associated current sensors

Various types of current sensors can be connected to ISOM K-40 / K-40h:

Current sensors for measuring load currents

- Solid-core TE (does not apply to TE-90)
- Split-core (TR).

This range of sensors can be adapted to any type of installation. They all use a specific RJ-12 link. This link provides a quick connection, with no cabling errors. ISOM K-40 / K-40h recognises the sensor size and type.



Important:

To connect current sensors, only use straight through, unshielded, twisted-pair, 600 V -10 / +70 °C RJ12 cables from SOCOMEC. We recommended that all the current sensors are installed in the same direction.

Connection cables for current sensors:

RJ12 connection cables	Cable length (m)								
	0.1	0.2	0.3	0.5	1	2	5	10	50 m reel + 100 connectors*
Number of cables	Reference	Reference	Reference	Reference	Reference	Reference	Reference	Reference	Reference
1	-	-	-	-	-	-	4829 0602	4829 0603	4829 0601
3	4829 0580	4829 0581	4829 0582	4829 0595	4829 0583	4829 0584	-	-	-
4				4829 0596	4829 0588	4829 0589	-	-	-
6	4829 0590	4829 0591	4829 0592	4829 0597	4829 0593	4829 0594	-	-	-



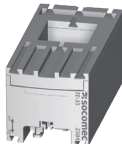
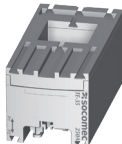
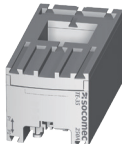
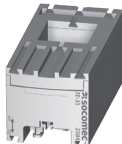
* When producing cables, do not exceed a maximum length of 10 metres.

4.2.1. TE solid-core current sensors

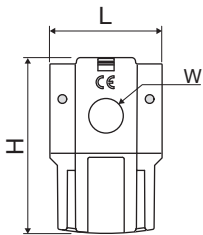
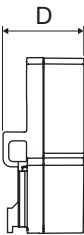
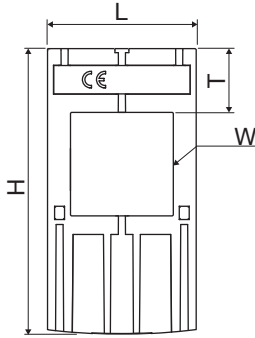
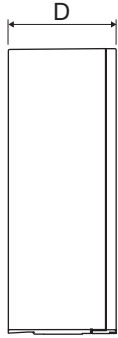
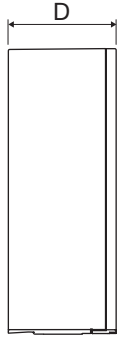
The TE solid-core current sensors are used to set up measurement points in a new or existing installation. They are easy to integrate as they are compact and respect the pitch of the circuit breakers. A wide range of accessories are also available for direct fitting on all type of cabling (cable, flexible or rigid busbar) or on a DIN rail support or plate.

With a specific link, they are detected by the ISOM K-40.

4.2.1.1. Range

						
	TE-18	TE-18	TE-25	TE-35	TE-45	TE-55
Pitch	18 mm	18 mm	25 mm	35 mm	45 mm	55 mm
Nominal current range I _n	5 to 20 A	25 to 63 A	40 to 160 A	63 to 250 A	160 to 630 A	400 to 1000 A
I _{max}	24 A	75.6 A	192 A	300 A	756 A	1200 A
Reference	4829 0500	4829 0501	4750 6052	4829 0503	4829 0504	4829 0505

4.2.1.2. Dimensions

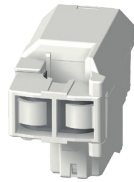
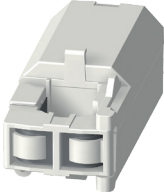
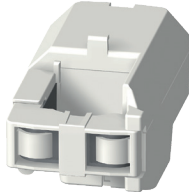
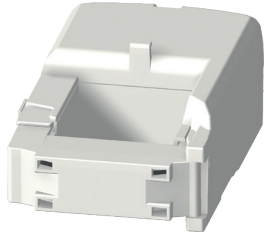
					
Dimensions mm	TE-18	TE-25	TE-35	TE-45	TE-55
Pitch	18	25	35	45	55
LxHxD	28 x 45 x 20	25 x 65 x 32.5	35 x 71 x 32.5	45 x 86 x 32.5	55 x 100 x 32.5
Ø W	ø 8.4	-	-	-	-
□ W	-	13.5 x 13.5	21 x 21	31 x 31	41 x 41
(T)	-	17.5	17.5	19.5	21.5

4.2.2. TR split-core current sensors

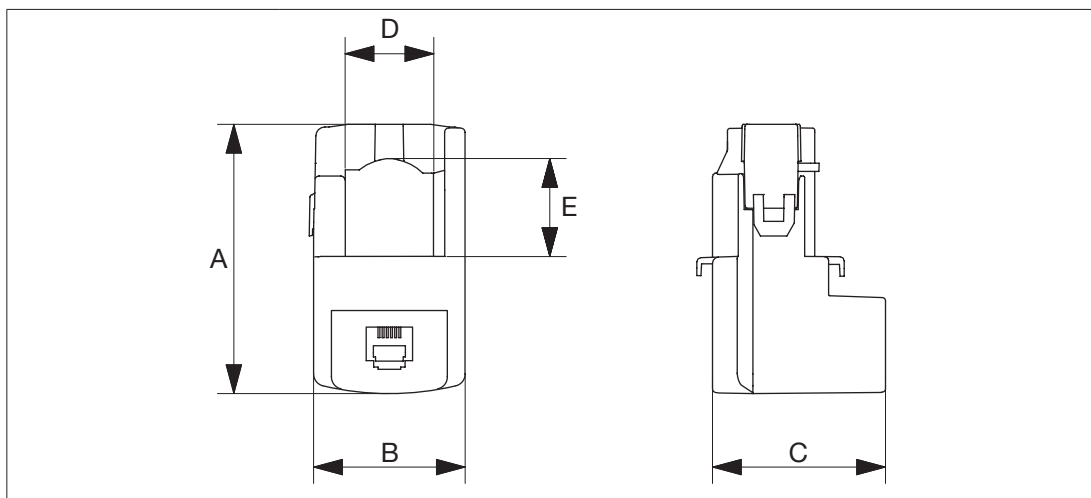
The TR split-core current sensors are used to set up measurement points in a new or existing installation without interfering with its cabling. Thanks to the specific link, they are recognised by the ISOM K-40 and the overall accuracy of the measurement chain is guaranteed.

4.2.2.1. Range

Four models are available from 25A to 600A to analyse several types of loads.

				
	TR-10 / iTR-10	TR-14 / iTR-14	TR-21 / iTR-21	TR-32 / iTR-32
Cable passage diameter	Ø 10 mm	Ø 14 mm	Ø 21 mm	Ø 32 mm
Nominal current range I _n	25 - 63 A	40 - 160 A	63 - 250 A	160 - 600 A
Recommended cable section	6 mm ² (iTR-10)	10 mm ² (iTR-14)	50 mm ² (iTR-21)	50 mm ² (iTR-32)
Maximum I	75.6 A	192 A	300 A	720 A
Part number	4829 0555 / 4829 0655	4829 0556 / 4829 0656	4829 0557 / 4829 0657	4829 0558 / 4829 0658

4.2.2.2. Dimensions

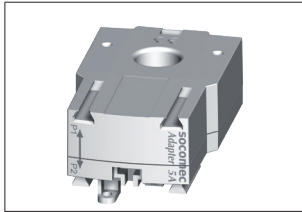


Dimensions in/mm	TR-10 / i TR-10	TR-14 / i TR-14	TR-21 / iTR-21	TR-32 / iTR-32
A	1.74 44	2.63 67	2.56 65	3.38 86
B	1.02 26	1.14 29	1.45 37	2.08 53
C	1.10 28	1.10 28	1.69 43	1.85 47
D	-	0.55 14	0.82 21	1.26 32
E	-	0.59 15	0.90 23	1.30 33
Diameter	0.39 10	0.55 14	0.82 21	1.26 32

4.2.3. Adapters for 5A sensors

An adaptor can be utilized with standard 5 A or 1 A sensors to the secondary sensor with 10000 A / 5 A (max) or 2000 A / 1 A (max).

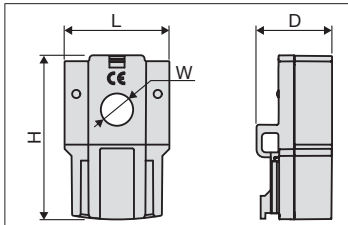
4.2.3.1. Range



5A adapter

I name.	5 A
I max.	6 A
Reference	4829 0599

4.2.3.2. Dimensions



Dimensions in/mm

5A adapter

LxHxD	28 x 20 x 45
Aperture (W)	∅ 8.4

5. INSTALLATION

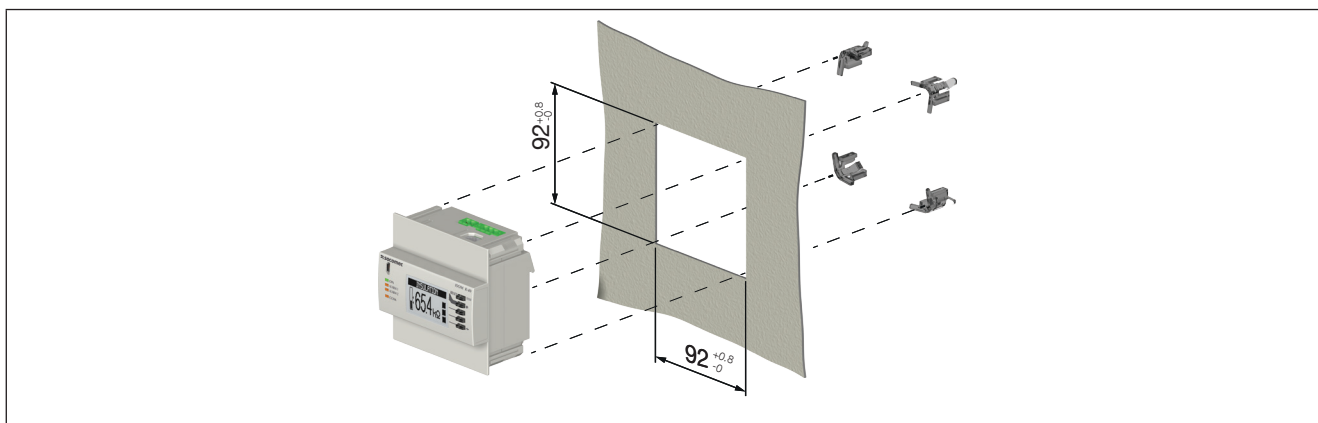
The following paragraphs describe how to install the ISOM K-40 / K-40h and its sensors.

5.1. Recommendations and safety

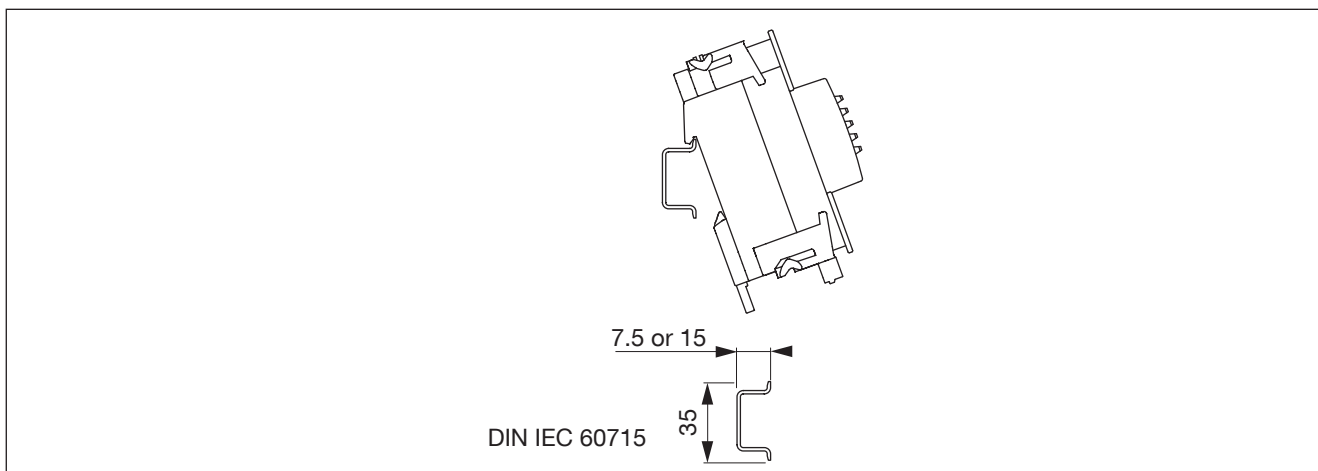
Refer to the safety instructions (section "2. Hazards and Warnings", page 5)

5.2. Installing ISOM K-40 / K-40h

5.2.1. Door mounted







5.2.2. DIN rail mounted



5.3. Installing TE solid-core sensors

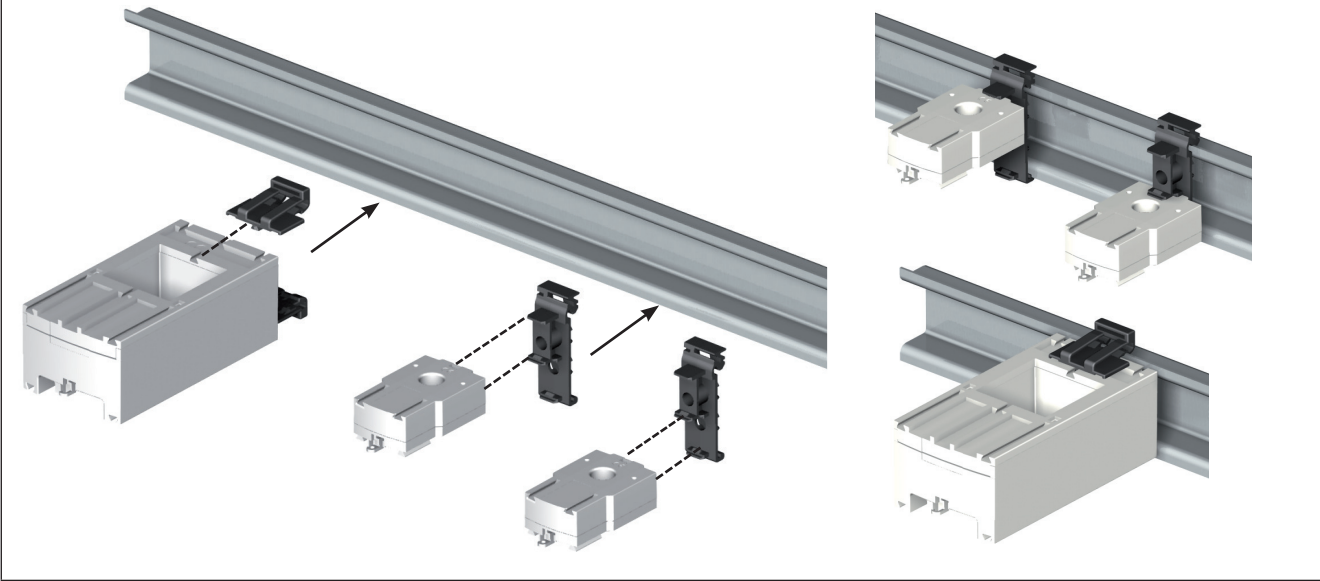
5.3.1. Mounting accessories

The mounting accessories supplied with the sensors are listed below:

Reference		Pitch				
			DIN rail and plate mounting	DIN rail mounting	Plate mounting	Busbar mounting
4829 0500 4829 0501	TE-18	18 mm	x1			
4829 0502	TE-25	25 mm		x2	x4	
4829 0503	TE-35	35 mm		x2	x4	x2
4829 0504	TE-45	45 mm		x2	x4	x2
4829 0505	TE-55	55 mm		x2	x4	x2
4829 0506	TE-90	90 mm	x2		x6	

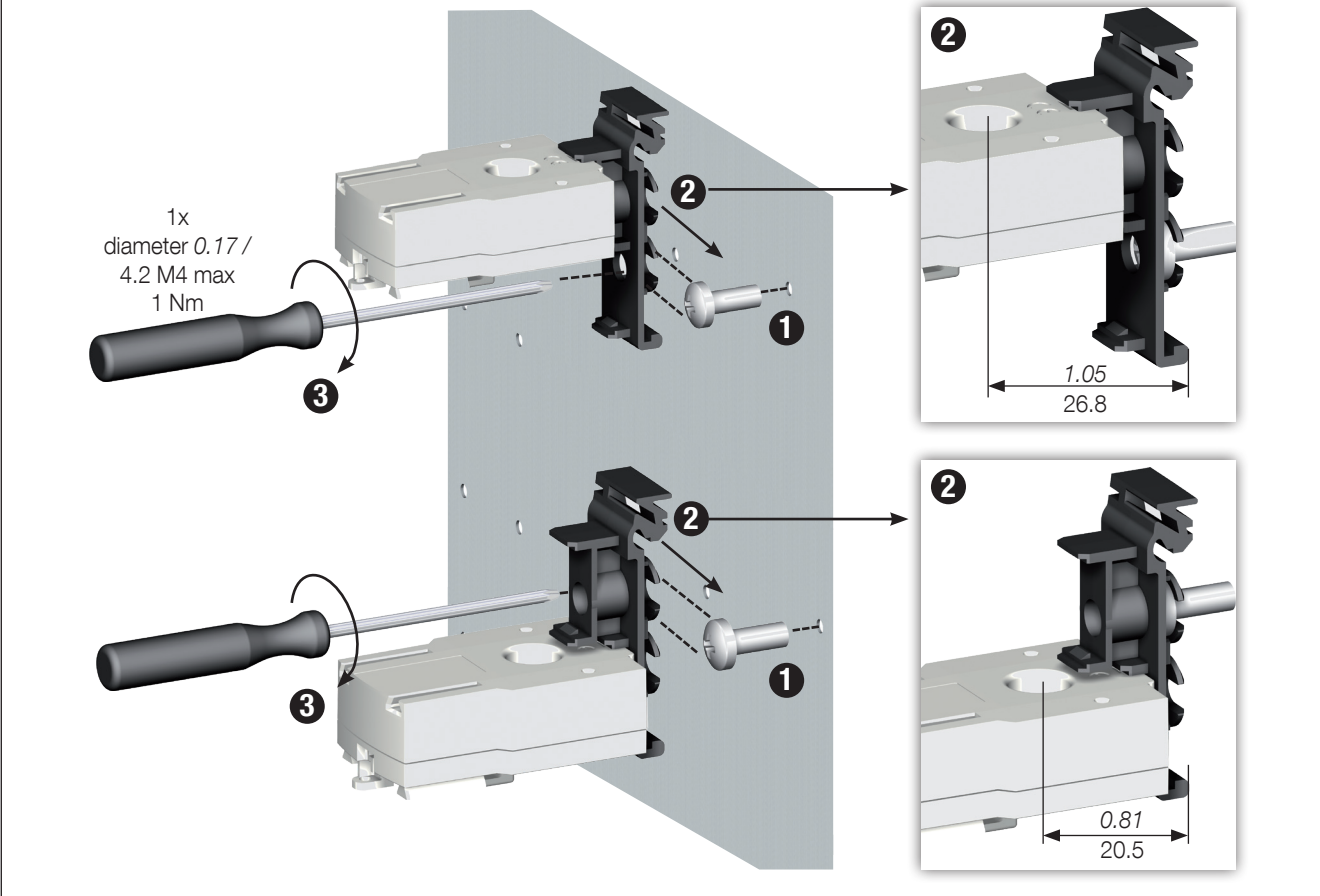
5.3.2. DIN rail mounted

TE-18 -> TE-55

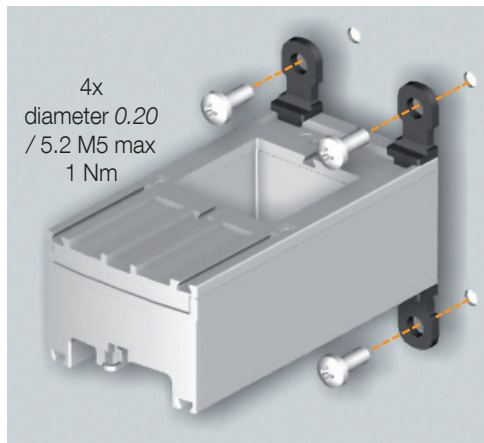


5.3.3. Plate mounting

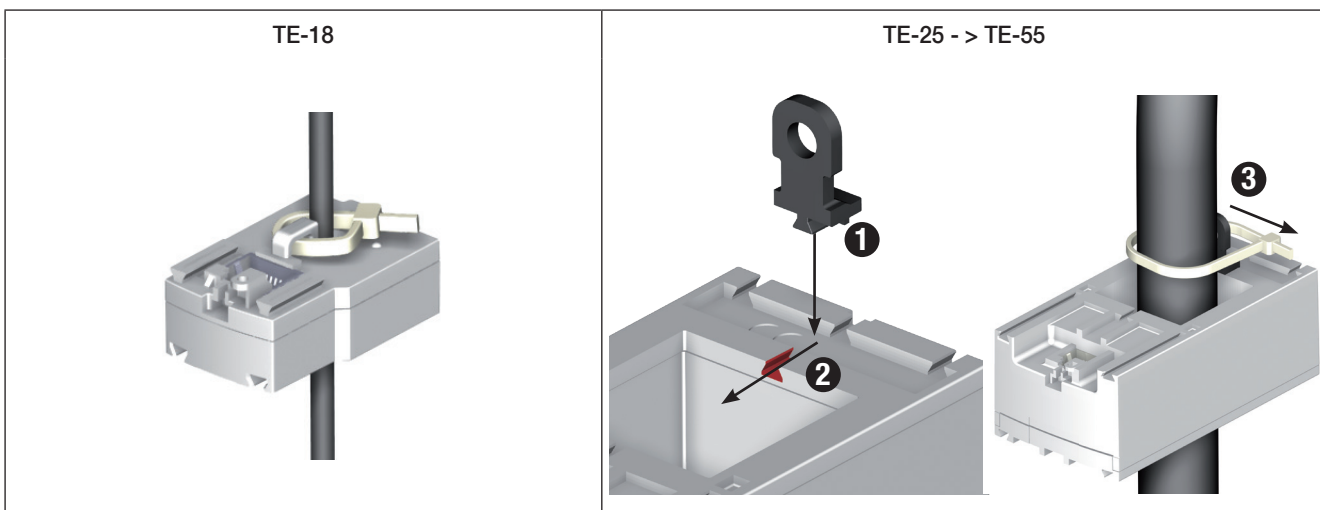
TE-18



TE-25 - > TE-55

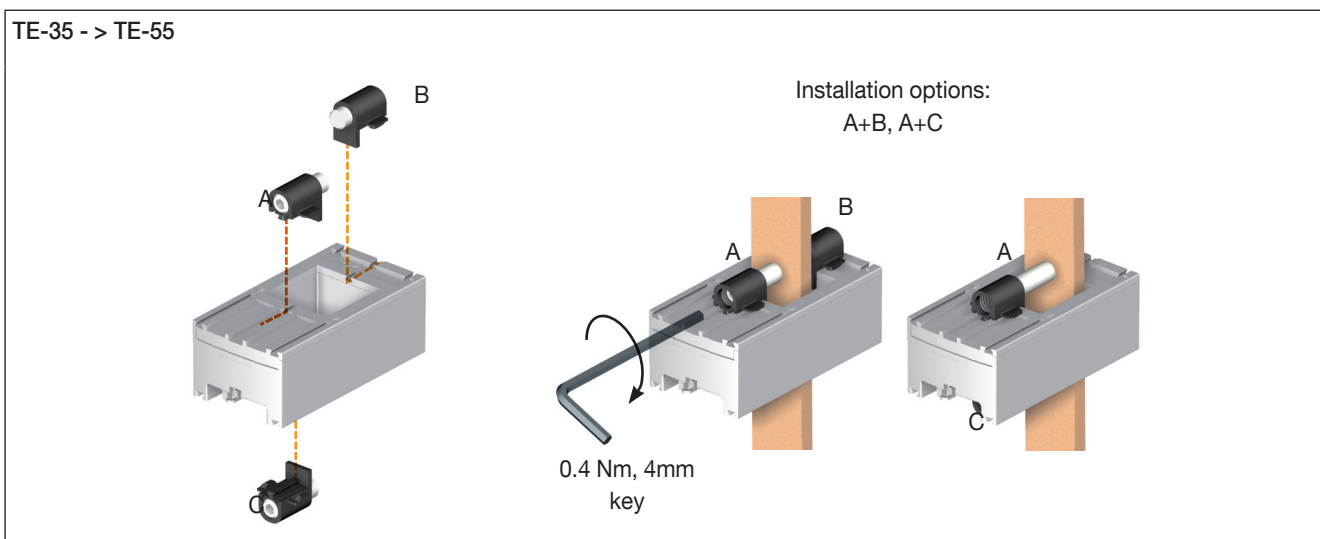


5.3.4. Installing on a cable with clamping collar



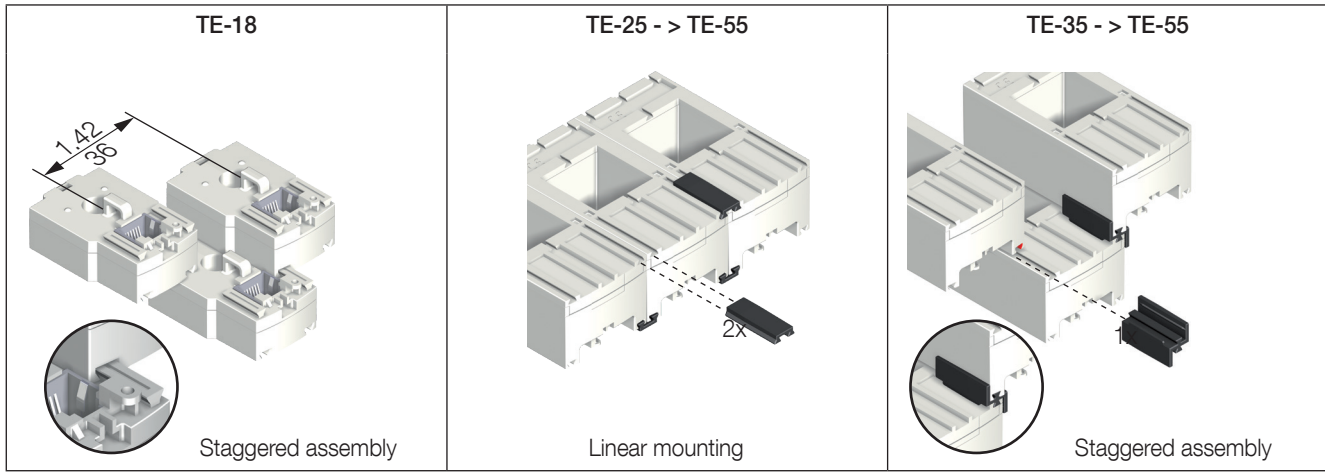
Do NOT clamp or pull out NON-INSULATED conductors carrying DANGEROUS VOLTAGE which could cause an electric shock, burn or arc flash. Ref. IEC 61010-2-032.

5.3.5. Bar mounting

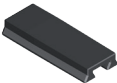
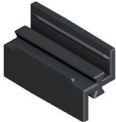


Do NOT clamp or pull out NON-INSULATED conductors carrying DANGEROUS VOLTAGE which could cause an electric shock, burn or arc flash. Ref. IEC 61010-2-032.

5.3.6. Sensors assembly

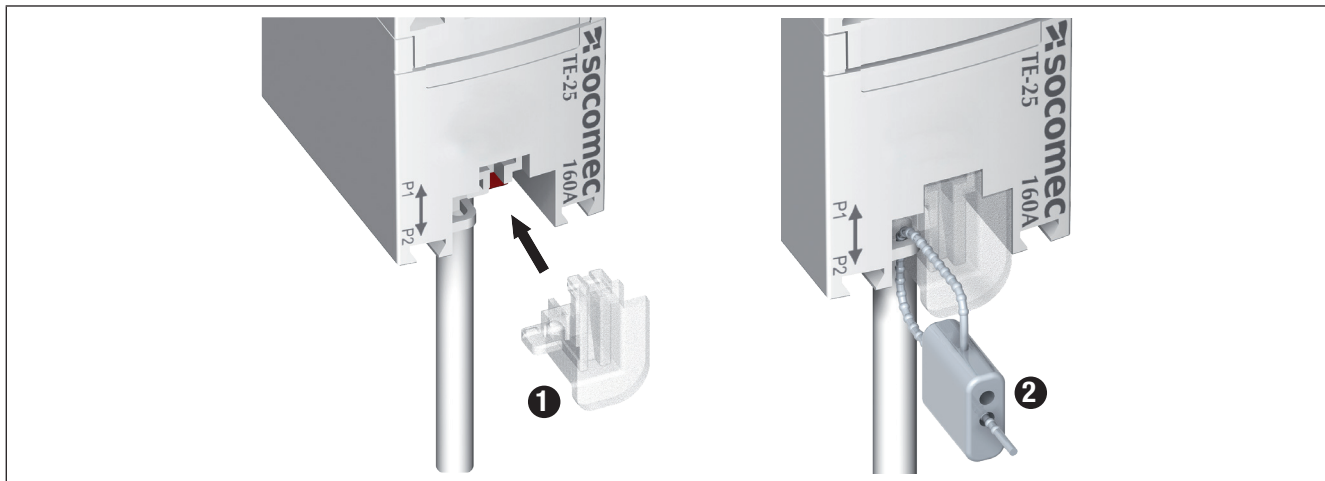


Mounting accessories for combining sensors:

		
Reference	Linear assembly	Staggered assembly
4829 0598	x30	

These accessories must be ordered separately.

5.3.7. Sealing accessories for sensors



Reference	Sealing case for terminal
4829 0600	x20

These accessories must be ordered separately.

5.4. Installing TR split-core sensors

5.4.1. Cable mounting

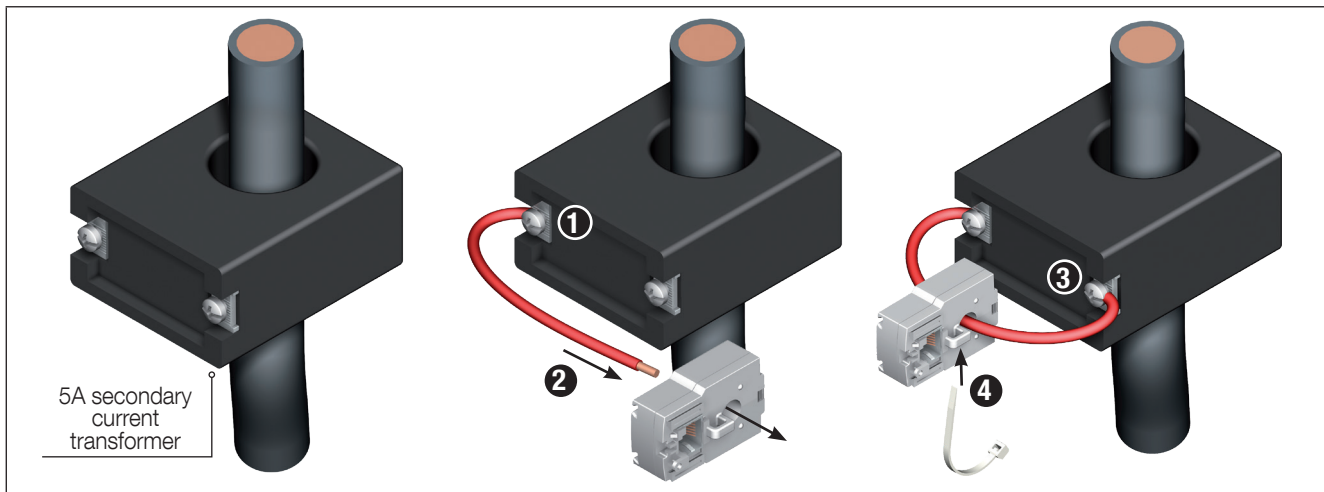



Do NOT clamp or pull out NON-INSULATED conductors carrying DANGEROUS VOLTAGE which could cause an electric shock, burn or arc flash. Ref. IEC 61010-2-032



Before closing the TR /iTR sensor, check that the air gap is clean (no contamination or corrosion).

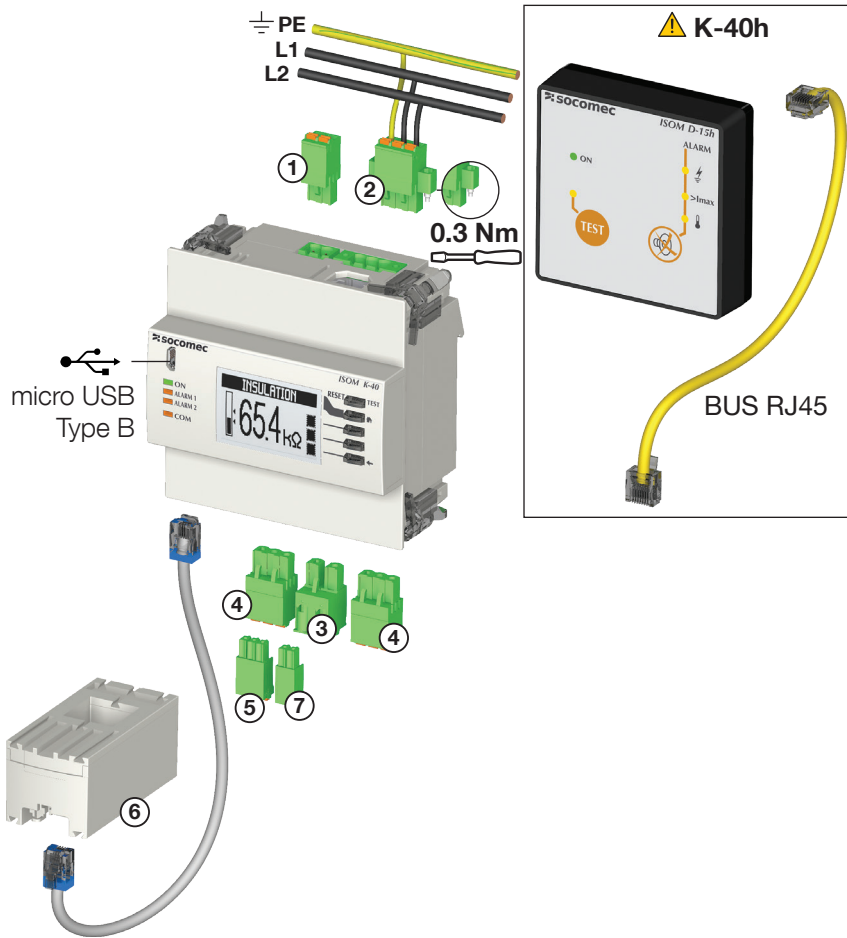
5.5. Installing the 5A adapter



 Do NOT clamp or pull out NON-INSULATED conductors carrying DANGEROUS VOLTAGE which could cause an electric shock, burn or arc flash. Ref. IEC 61010-2-032.

6. CONNECTION

6.1. Connection ISOM K-40 / K-40h



①	AUXILIARY POWER SUPPLY For AC version: 110-230 VAC 50/60Hz, 120-240 VDC For DC version: 24VDC ±10%* (*) WARNING: DC auxiliary supply must be galvanically separated from monitored network.	x= 10 mm 0.2 to 1.5 mm ² rigid 0.2 to 2.5 mm ² flexible
②	CONNECTION U / PE (L1 - L2 - KE) 24-277VAC L/N 24-480VAC L/L' 24-240VDC +/-	
③	FE (\perp)	
④	2x OUTPUT RELAYS 230 VAC 3 A max	
⑤	RS485 MODBUS	x= 7 mm 0.14 mm ² - 1.5 mm ²
⑥	TE SENSORS	RJ12 SOCOMEC cables
⑦	1 x INPUT PTC (T°C) / 4729 0560 or TEST (>3s) / RESET (<1s) or CPI INHIBIT max. length < 3m	x= 7 mm 0.14 mm ² - 1.5 mm ²

The inputs/outputs above are defined as SELV (safety extra-low voltage): 1 (for DC model), 3, 5, 6, 7.



IMPORTANT:

- Only use Digiware bus RJ45 cables (UTP RJ45 straight, twisted pair, unshielded, AWG24, 600V CAT 5, -10 / +70°C in accordance with IEC 61010-1 version 3.0) between all the Digiware bus modules.
- When connecting, make sure you separate the low voltage (LV) section and the very low voltage (SELV) section to prevent any risk of electric shock.
- Conductors should be clamped to the closest terminals to avoid them detaching themselves and reducing the insulation distances.
- DC auxiliary supply must be galvanically separated from monitored network.
- The 24VDC auxiliary power supply must be galvanically separated from the network to be monitored.
- Proper operation of the D-15h display with K-40h requires launching an auto-detection (see "9.2.2. Screen menu structure", page 35).

Description of the terminals

AUXILIARY POWER SUPPLY ①

ISOM K-40 AC (4725 0120)

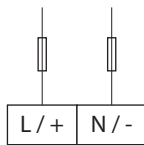
ISOM K-40h (4725 0122)

110-230 VAC 50/60Hz,

120-240 VDC

ISOM K-40 DC (4725 0121)

24 Vdc ±10% galvanically separated from monitored network.



CONNECTION U / PE ②

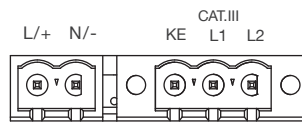
L1 - L2 - KE

24-277 VAC L/N

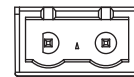
24-480 VAC L/L'

24-240 VDC +/-

24-250VAC L/N or L/L' (h version)

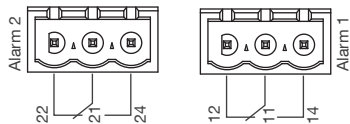


FE (±) ③

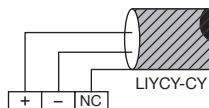


1A gG / BS 88 1 A gG / T1AH300VDC

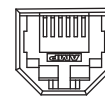
2x OUTPUT RELAYS ④



**COMMUNICATION ⑤
RS485 MODBUS**



**SENSORS ⑥
TE / TR sensors
I >**



The relay's dry contacts should be protected with a 2A gG fuse => use up to 2A with resistive load. Or T3AH250V => use up to 3A with resistive load. It is not permitted for use on a 230VAC/30 VDC relay or a SELV signal.

You can use different phases on the 2 output relays, but they must be from the same three-phase network.

PTC (T°C) ⑦

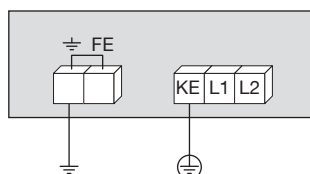
θ >



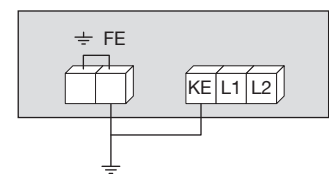
or
TEST / RESET
or
CPI INHIBIT

For dry contact
max length : 3 m

⚠ K40 CONNECTION



⚠ Not Allowed



Authorised

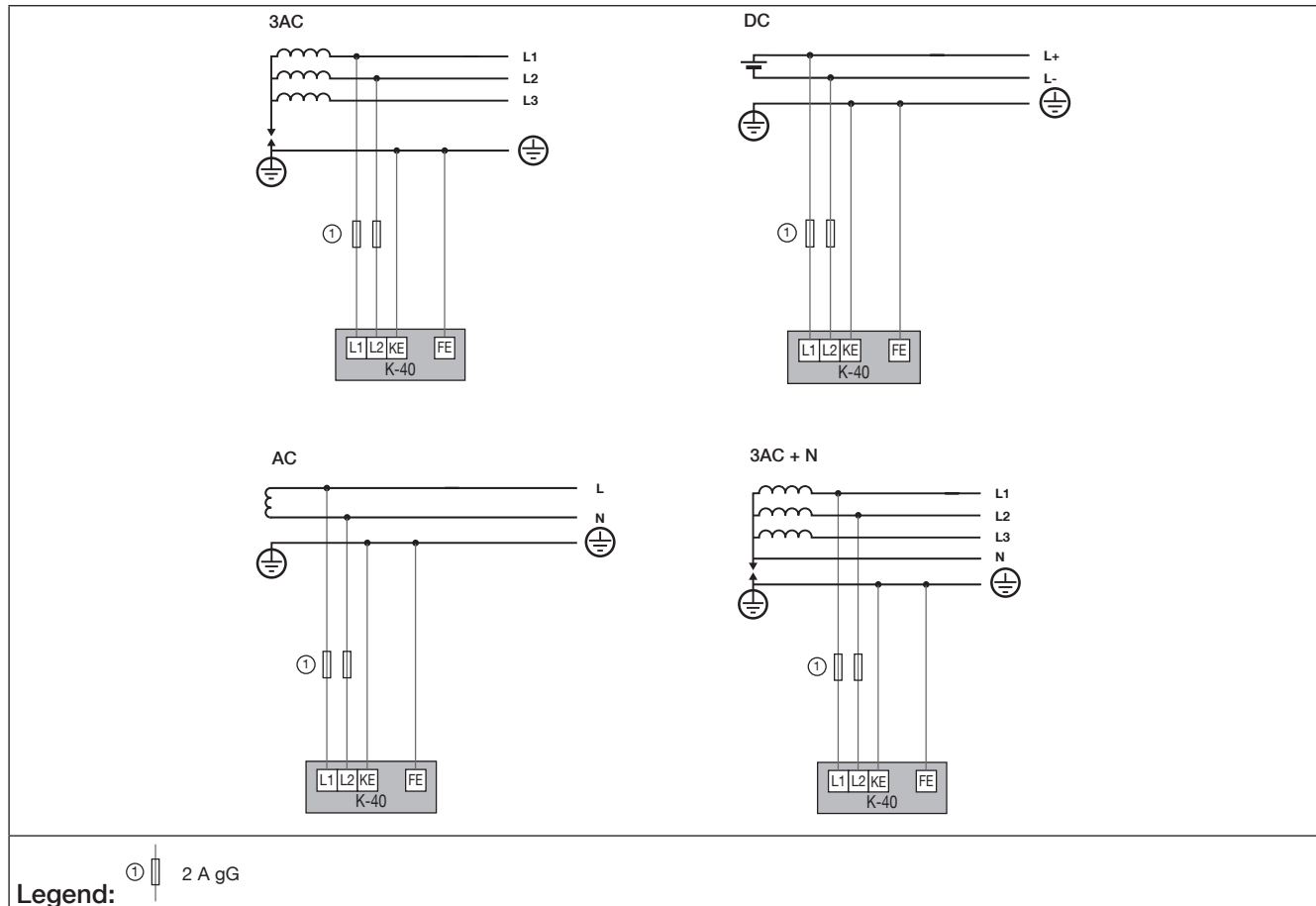
6.2. Connecting to the electrical network and circuits

The insulation monitoring system ISOM K-40 is suitable for single-phase, two-phase, three-phase and continuous networks.

It ensures the insulation of a complete powered IT system is monitored.

ISOM K-40 can also measure the single-phase and three-phase balanced AC current and monitors the temperature.

6.2.1. Description of the main network and circuit combinations

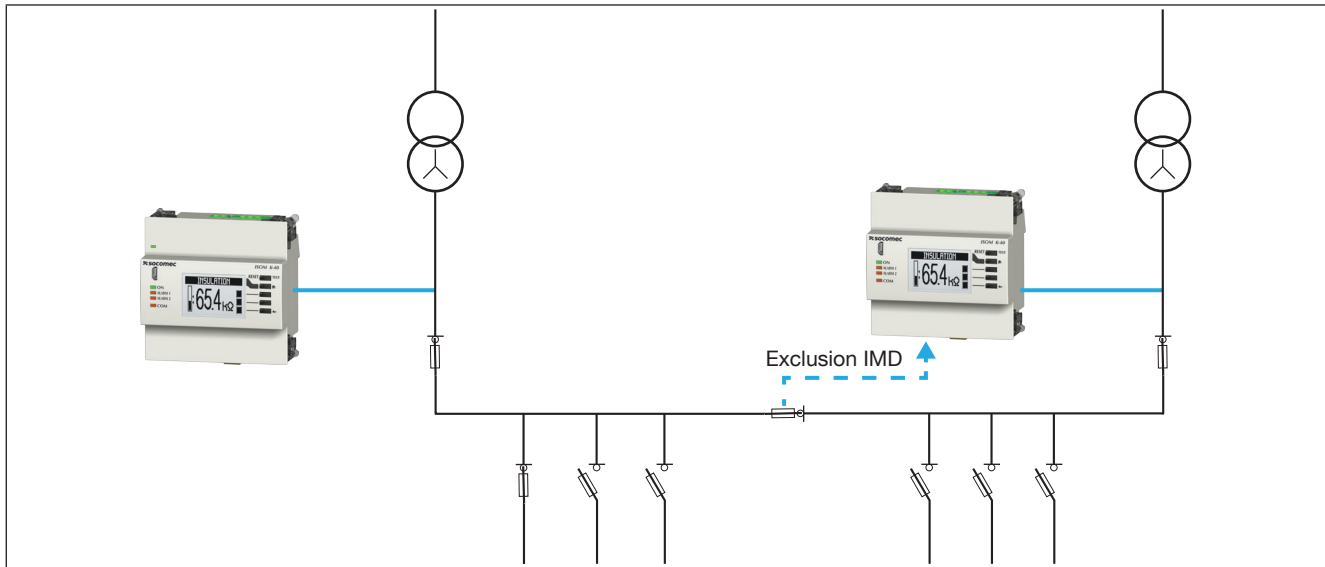


6.2.2. Coupled networks

6.2.2.1. Simple coupled networks without fault-locating options

In the case of coupled networks, you must ensure that only one IMD is active. You can do this by setting and using the specific input of the ISOM K-40 (see section "9.1.2.4. Paramétrage de l'exclusion CPI", page 34 on how to configure the input in "CPI inhibit" mode).

Principle diagram:



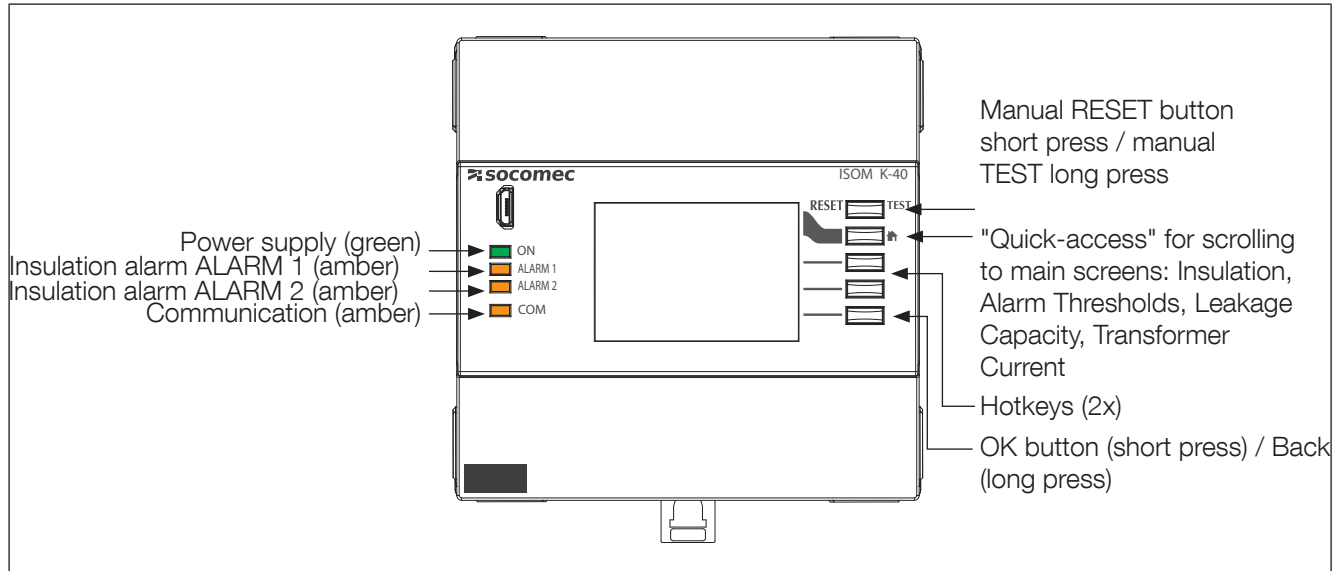
i Note: Some applications may require you to manage the positions of general cut-off devices of the 2 transformers, as part of excluding the IMD.

7. STATUS LEDS, BUTTONS AND AUTO-ADDRESSING

7.1. Status LEDs and buttons

These LEDs can be used to find out the status of the product at any time. Use specific buttons to go straight to the devices' main functions.

7.1.1. K-40



LED state	Fixed	Blinking	Pulse
ON	In operation		1 second to start-up
ALARM 1	Presence of an alarm related to exceeding the low threshold ALARM1 (K-40) Presence of an alarm due to overheating or overloading of the medical IT transformer (K-40h)	System alarm (e.g. network connection error)	
ALARM 2	Presence of an alarm related to exceeding the low threshold ALARM2	System alarm (e.g. network connection error)	
COM	Addressing problem.	Address OK	1 second to start-up and when a frame received is processed

Autotest

In order to ensure a high degree of safety when measuring the insulation and in operation, ISOM K-40 / K-40h offers advanced autotesting functions.

After powering on the devices, all their internal measurement functions as well as the data memories and connections to the network and the PE protection conductor are tested.

You can follow the progress of the autotest option onscreen (TEST message).

You can also start the autotest at any time during use by pressing the TEST button.

The ALARM 1 and ALARM 2 signalling relay can be configured to switch if the auto-test fails (see section 11.1.4).

8. COMMUNICATION

8.1. General information

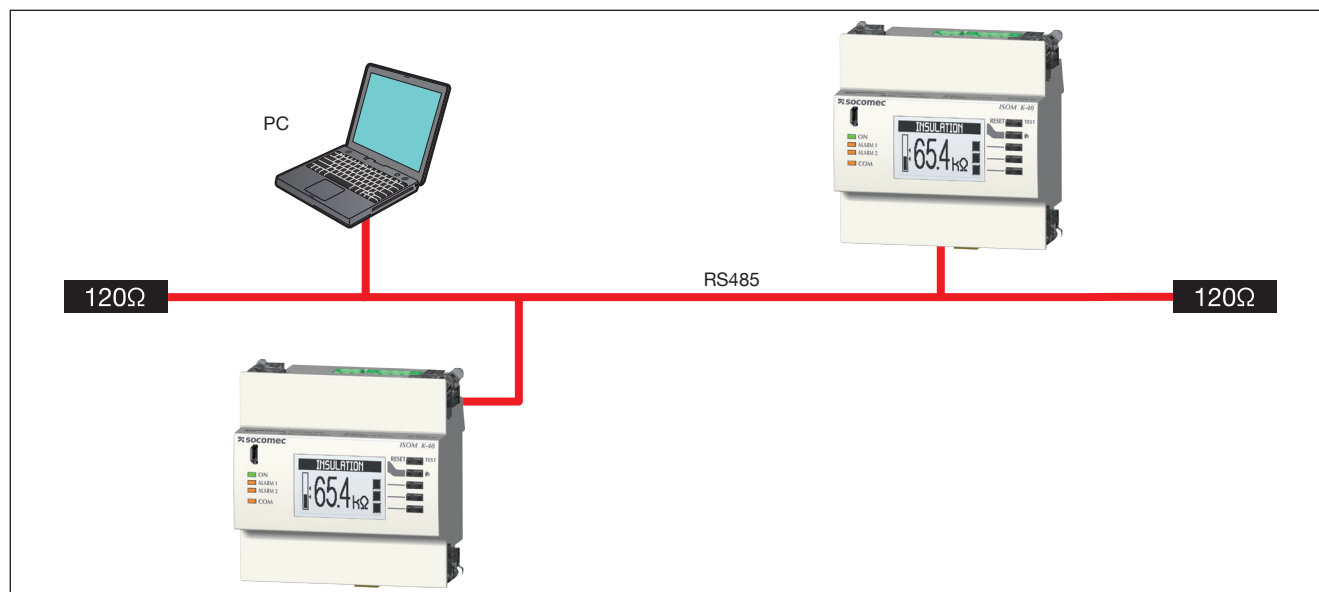
ISOM K-40 / K-40h communicates via RS485 using the Modbus protocol.

It takes place via an RS485 serial link (2- or 3-wire) in accordance with the Modbus RTU protocol.

With the RS485 link, ISOM K-40 / K-40h can be connected directly to a PC to retrieve the data.

The Modbus protocol requires a dialogue with a master/slave structure. The mode of communication is the RTU (Remote Terminal Unit). In a standard setup, an RS485 link enables the interconnection of 32 RS485 devices (ISOM K-40 / K-40h counting as one device), to a PC or a PLC etc. over a distance of 1,200 metres.

Example of the architecture of an ISOM Digiware K-40 screen:



8.2. RS485 and ISOM Digiware bus rule

The following rules must be observed:

- A 120 Ω resistor must be added at the start of the RS485 link
- A 120 Ω resistor must be added at the end of the RS485 link

8.3. Communication tables

The communication tables and associated explanations can be found on the documentations page for ISOM K-40 / K-40h on the SOCOMEC website: www.socomec.com/en/isom-K-40

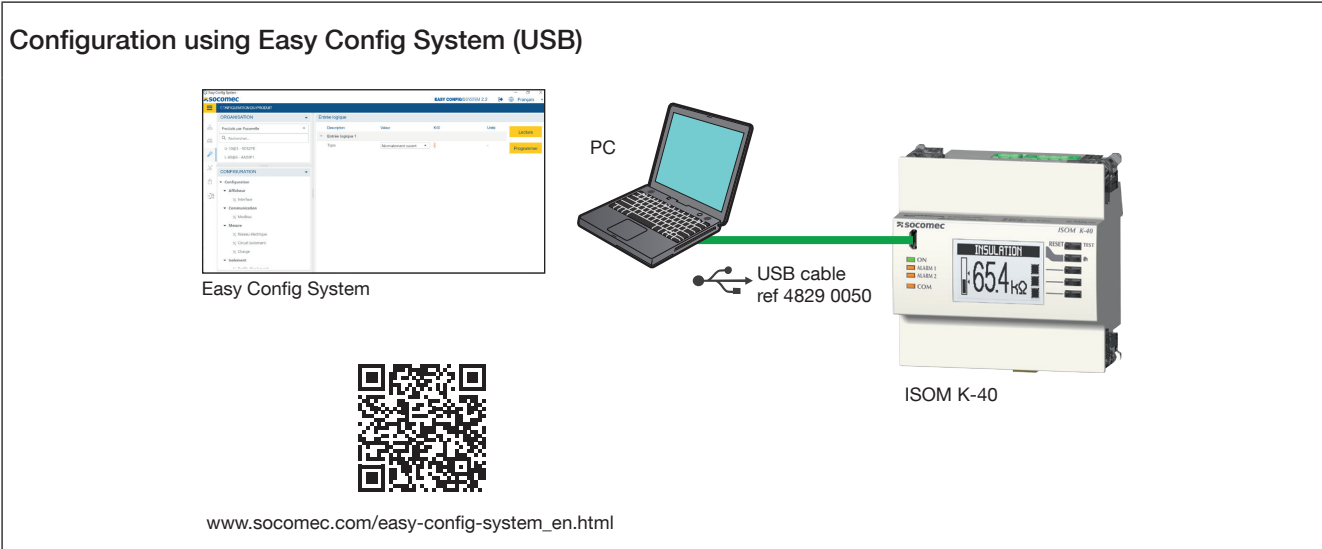
9. CONFIGURATION

Configuration can be carried out using the Easy Config System software. Use the Easy Config System software to configure ISOM K-40 / K-40h via RS485 or USB. Easy Config System must be installed before using the USB connection.

9.1. Configuration using Easy Config System

9.1.1. Connection modes

Configuration using Easy Config System (USB)



The diagram illustrates the USB configuration setup. On the left, a laptop labeled 'PC' is connected to an ISOM K-40 device on the right via a green USB cable labeled 'USB cable ref 4829 0050'. The PC screen shows the 'Easy Config System' software interface with various configuration options. Below the PC, a QR code is shown, and the URL www.socomec.com/easy-config-system_en.html is provided. The ISOM K-40 device has a digital display showing '654 HΩ' and several ports labeled 'CON', 'RESEZ 1', 'RESEZ 2', and 'COM'.

9.1.2. Using Easy Config System

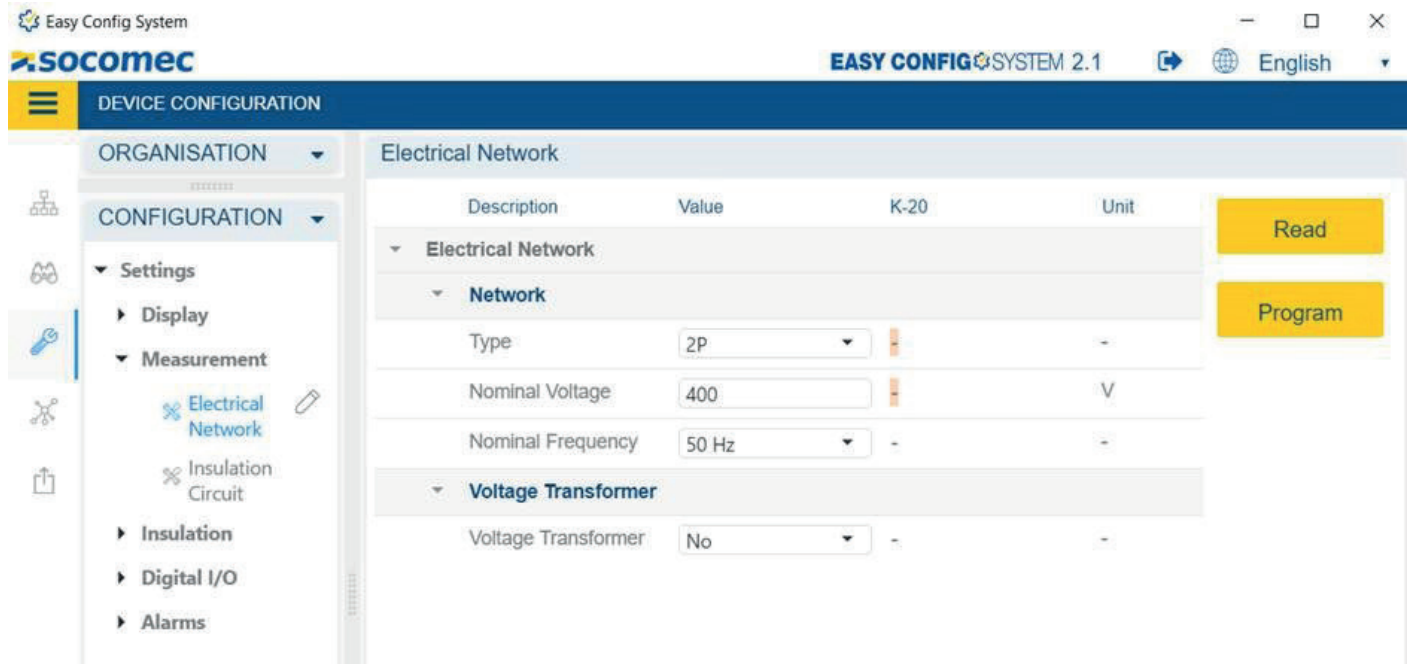
Easy Config System is a configuration software used to set device parameters easily and quickly.

9.1.2.1. Configuring the electrical network

In the electrical network configuration menu, the user selects the type of network (three-phase, single-phase, etc.), the nominal voltage, the network frequency.

Configuration can also be done locally from the ISOM K-40

Example: three-phase network 400VAC:



The screenshot shows the 'Easy Config System' interface for 'EASY CONFIG SYSTEM 2.1'. The main window is titled 'DEVICE CONFIGURATION' and 'Electrical Network'. A table with columns 'Description', 'Value', 'K-20', and 'Unit' is displayed. The table contains the following data:

Description	Value	K-20	Unit
Electrical Network			
Network			
Type	2P	-	-
Nominal Voltage	400	-	V
Nominal Frequency	50 Hz	-	-
Voltage Transformer			
Voltage Transformer	No	-	-

On the right side of the table, there are two yellow buttons: 'Read' and 'Program'. The sidebar on the left shows a 'CONFIGURATION' menu with options for Settings, Display, Measurement (including 'Electrical Network'), Insulation Circuit, Insulation, Digital I/O, and Alarms.

On this screen you can configure the type of IMD connection:

Three-phase or two-phase → «2P»

Single-phase → «1P+N»

Continuous → «DC»

The voltage value, as well as the rated frequency of the network (50Hz, DC...)

9.1.2.2. Insulation

The screenshot shows the 'Easy Config System' interface for 'EASY CONFIG SYSTEM 2.1'. The main menu on the left is titled 'DEVICE CONFIGURATION' and includes sections for 'ORGANISATION', 'CONFIGURATION', and 'Settings'. Under 'Settings', there are sub-sections for 'Display', 'Measurement', 'Insulation', 'Digital I/O', and 'Alarms'. The 'Insulation' section is expanded, showing options for 'Insulation Profiles', 'Injection', 'Manual Test', 'High Resistance Grounding System', and 'Digital I/O'. The 'Insulation Profiles' screen is active, displaying a table with columns for 'Description', 'Value', 'K-20', and 'Unit'. The table lists four rows: 'Insulation Profiles' (expanded), 'Installation Profile' (set to 'Distribution'), 'IMD Max Injection Voltag' (set to '75 V'), 'Max Cf' (set to '30'), and 'Filtering' (set to 'High'). To the right of the table are two yellow buttons: 'Read' and 'Program'.

Description	Value	K-20	Unit
Insulation Profiles			
Installation Profile	Distribution	-	-
IMD Max Injection Voltag	75 V	-	-
Max Cf	30	-	μF
Filtering	High	-	-

The «Insulation Profiles» screen defines the general settings of the device:

Choosing the profile is an easy way to support the measurement algorithm on the intended application, with improved filtering/measurement times.

You can choose between 3 profiles:

- Custom
- Distribution
- Control/command

9.1.2.3. Configuring alarms

Insulation alert:

The screenshot shows the 'Easy Config System' interface for configuring an 'Insulation Alarm'. The left sidebar contains a 'CONFIGURATION' menu with 'Alarms' expanded to show 'Insulation Alarm' selected. The main panel displays the configuration for 'Insulation Alarm 1' in a table format:

Description	Value	K-20	Unit
Insulation Alarm 1			
Common			
Alarm Activation	Enabled	-	-
Type			
Type	Rf Alarm 1	-	-
Information			
Criticality	Not Critical	-	-
Acknowledgement			
Acknowledgement Method	Auto	-	-
Threshold			
Rf Low Threshold	50000	-	ohm
Hysteresis	0	-	%
Delay			
Startup Delay	0	-	x500 ms
Dropout Delay	0	-	x500 ms
Relay			
Startup Delay of Relay	0	-	x500 ms

Buttons for 'Read' and 'Program' are located on the right side of the configuration table.

In this screen, you can set key information linked to the thresholds Alarm1 and Alarm2.

The Rf threshold value can be set between 1K and 1000K. You can OK a fault automatically (= «Auto») or manually with BP RESET («COM»)

System alarm:

ORGANISATION

CONFIGURATION

- Settings
 - Display
 - Measurement
 - Insulation
 - Digital I/O
 - Alarms
 - Insulation Alarm
 - System Alarm**
 - ISOM System Alarm Causes

Description	Value	K-20	Unit
System Alarm 1			
Common			
Alarm Activation	Enabled	-	-
Alarm Type	None	-	-
Information			
Criticality	Information	-	-
Acknowledgement			
Acknowledgement Mett	Auto	-	-
Delay			
Startup Delay	0	-	x0.5 s
Dropout Delay	0	-	x0.5 s
System Alarm 2			
Common			
Alarm Activation	Disabled	-	-
Alarm Type	None	-	-
System Alarm 3			
Common			

Read

Program

In this screen, you can set when to activate a startup alarm in the following cases:

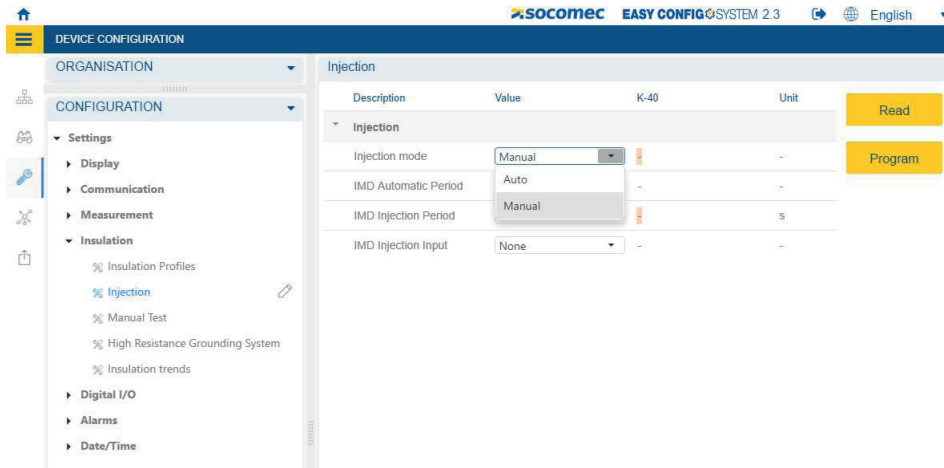
- Measuring failure
- voltage network outside specified range
- Device overheating
- The IMD measurement is outside the tolerance range and is not shown
- Internal device failure

9.1.2.4. CPI inhibit function settings

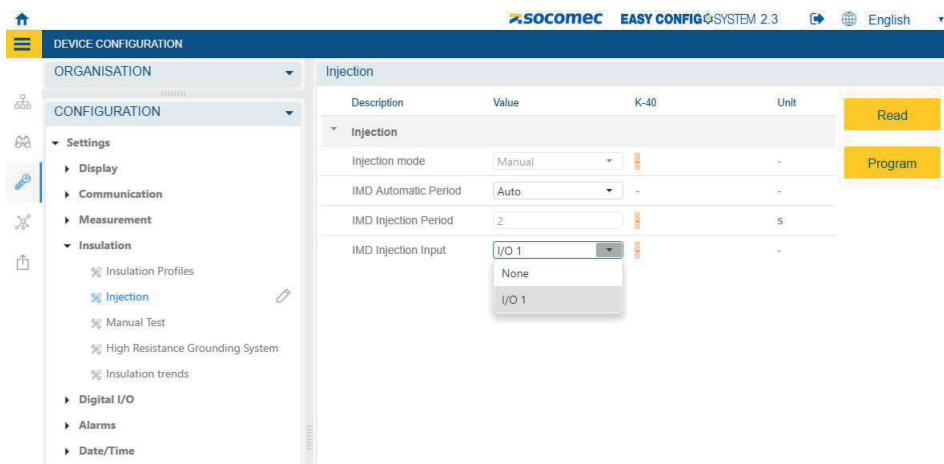
In order to configure the CPI inhibit function, it is necessary to proceed in 3 steps:

- Configure the injection in "Manual" mode
- Slave the injection of the CPI to the dedicated "I/O 1" input
- Check that the working mode of input "I/O 1" is configured as "Normally closed"

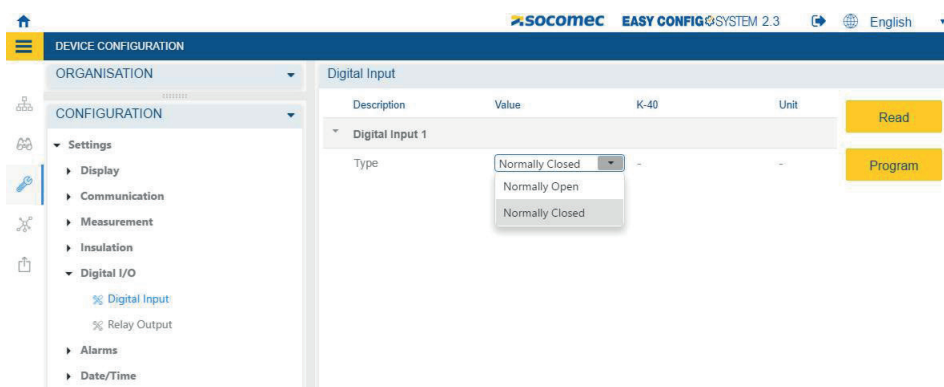
1 - Configure the injection in "Manual" mode



2 - Slave the injection of the CPI to the dedicated «I/O 1» input



3 - Check that the working mode of input "I/O 1" is configured as "Normally closed"



With these settings, the CPI ISOM K-40 performs an insulation measurement when the input is open, and switches to inhibit mode when the input is closed.

9.2. On-screen configuration



9.2.1. Navigation



9.2.2. Screen menu structure

ISOM IMD	
Rf	
Rf min	
Ran	
Ce	
Transfo	
EVENTS	
Insulation alert	
All alerts	
Histo	
SETTINGS	
Language	
Isom IMD	Measuring insulation: profile, network (Un, Fn)
	Alarm: Alarm 1, Alarm 2
	Relay: stopped
	Injection
	I/O (K-40)
Communication	RS485: Baudrate, stop, parity, address
Password	
List of devices (K-40h)	
Auto detection (K-40h)	
Add device (K-40h)	
Remove device (K-40h)	
Date / Time	
Restore factory settings	
Reboot device	
DIAG	
About	
Config screen	
State I/O	
Test	

9.2.3. Quick setup

- 1.  «QUICK-ACCESS / HOME» button: press for 3 seconds to go to settings («HOME» screen)
- 2. «HOME» menu: go to «Settings» with the hotkey «▼». Press the hotkey «OK» to confirm.
- 3. «RESTRICTED ACCESS» menu: enter the code «1 0 0» by using the hotkeys «◀» and «▲», then confirm with «OK».
- 4. «Language» submenu: change the language to desired one, then confirm with «OK».
- 5. «Isom IMD» submenu to go to the basic settings of the IMD
 - a. «Insulation measurement» submenu → make your network settings (profile, network voltage,...), press «OK» after each setting then «OK» again to exit the submenu.
 - b. «Alarms» submenu:
 - i. «Alarm 1» → «Min.» to change the threshold for ALARM 1 with hotkeys «▼» and «◀», then confirm with «OK».
 - ii. «Alarm 2» → «Min.» to change the threshold for ALARM 2 with hotkeys «▼» and «◀», then confirm with «OK».
- 6. To exit and return to the home screen, briefly press  «QUICK-ACCESS/HOME».

10. SPECIFICATIONS

10.1. Specifications ISOM K-40 / K-40h

10.1.1. Mechanical specifications

Casing type	DIN-rail mounting module and base Enclosure size DIN 96x96
Casing protection index	IP20
Front panel protection index / shockproof	IP40 on the nose in modular assembly / IK08
Material and flammability class of housing	Polycarbonate UL94-V0
Weight	400 g

10.1.2. Electrical specifications

DIRIS Digiware C-31	
Power supply K-40 AC / K-40h	AC 110-230 V 50-60 Hz / DC 120-240 V (AC preset protection: Fuses 1A gG) (recommended protection DC: Fuses T1AH300VAC)
Power supply K-40 DC	24 VDC (Preset protection: Fuses T1AH300VDC) (DC auxiliary supply must be galvanically separated from monitored network.)
Monitored IT network	
AC or combined AC/DC	K-40: ≤ 480 VAC connection L1/L2 on phases K-40h: ≤ 250 VAC +/- 10% Rated shock voltage 6 kV (IEC 60364-4-44) CAT III
AC frequency	DC, 50 to 460 Hz
Power consumption	10 VA (K-40 AC) 1.9 VA (K-40 DC)
Operating range of the voltage network	+/- 10%
Rated impulse voltage	6 kV (IEC60364-4-44)

10.1.3. Measurement characteristics

Measurement accuracy	
Accuracy	K-40 / K-40h: in accordance with IEC 61557-8
ISOM performance	
Specific response value R_{an}	K-40: ALARM 1: 1 K Ω - 1 M Ω ALARM 2: 1 K Ω - 1 M Ω K-40h: ALARM 1: 50 K Ω - 500 K Ω ALARM 2: 50 K Ω - 500 K Ω
Max. leakage capacity C_e	K-40: 150 μ F K-40h: 5 μ F
Incertitude of specific response value	+/- 10% according to profile
Response time t_{an}	For $R_F = 0.5 \times R_{an}$ and $C_e = 1 \mu$ F: typical 4s
Measurement voltage U_m	25 or 75 V depending on profile (K-40h: 25 V)
Measurement current I_m	Max 1 mA
Max. external DC voltage U_{fg}	510 V
Measurement range C_e	0-150 μ F (K-40) 0-5 μ F (K-40h)

10.1.4. Input/output specifications HMI

Type / Power supply	Insulated input, internal polarisation, dry contact (default impedance max 100 Ω) - SELV
Input functions	Temperature, IMD off
Connection	Removable spring-cage terminal block, 6 positions - 4 dedicated to outputs, 1 input polarisation, 1 common output point, stranded or solid 0.2 - 1.5 mm ² cable
Dry contact outputs	3A

10.1.5. Communication specifications

RS485	
Function	Modbus RTU
Cable type	RS485 - 3 wires
USB	
Protocol	Modbus RTU on USB
Function	Configuration ISOM K-40
Location	Front panel
Connection	Type B micro USB connector

10.1.6. Environmental specifications

Standard model	
Ambient operating temperature	-10 to +55°C (IEC 60068-2-1 / IEC 60068-2-2)
Storage temperature	-40 to +70°C (IEC 60068-2-1 / IEC 60068-2-2)
Operating humidity	55°C / 90% RH (IEC 60068-2-30)
Operating altitude	< 2000 m
Vibration	2 Hz to 13.2 Hz- amplitude \pm 1 mm (IEC 60068-2-6) 13.2 Hz to 100 Hz – acceleration \pm 0.7g (IEC 60068-2-6)

10.1.7. Standards and safety

Product	Conformity with IEC 61557-8
Safety	Conformity with Low Voltage Directive 2014/35/EU of 26 February 2014 (EN 61010-1:2010)
Insulation coordination	Installation category III, Degree of pollution 2
CEM	Directive 2014/30/EU

10.1.8. Service life

MTTF (mean time to failure)	> 100 years
-----------------------------	-------------

10.2. Display characteristics ISOM D-15h

10.2.1. Mechanical specifications

HMI models	3 LEDs - 2 keys
Front panel protection index	IP54 – marking compliant with IEC 60601-1 Resistance to ANIOS devices
Material and flammability class of housing	Polycarbonate UL94-V0
Weight	100 g

10.2.2. Electrical specifications

Power supply	
Power supply	24 VDC +/- 10%
Power consumption	D-15h: 0.2 VA ± 10%

10.2.3. Communication specifications ISOM D-15h

RJ45 Digiware	Control and power supply interface function
---------------	---

10.2.4. Environmental specifications

Operating temperature	-10°C to +55°C
Storage temperature	-40°C to +70°C
Humidity	90%RH at 55°C
Installation category, Degree of pollution	Device powered by SELV, 2

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