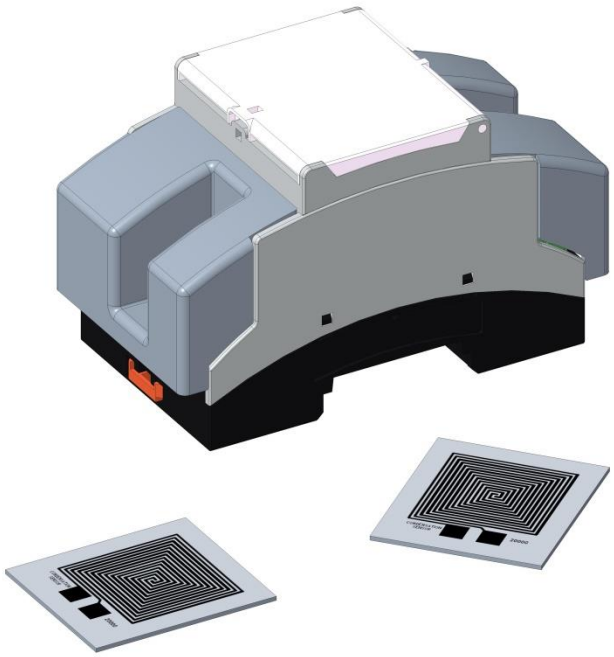
User Manual and Installation Guide

EN

Condensation Detector

ConSensy



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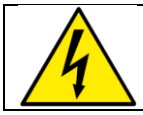
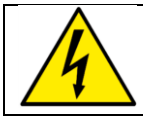
Sommario

1. SAFETY INFORMATION



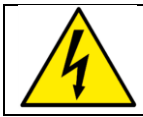
ATTENTION

Before connecting this device, carefully read this User and Installation Manual.



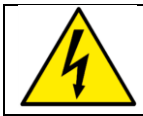
ATTENTION

This product must be installed only by qualified personnel to avoid the risk of fire and electric shock.



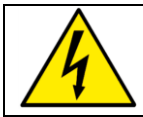
ATTENTION

The IP20 protection level of the Interface Module is guaranteed only if the wires are correctly inserted into the terminals and the plastic covers are assembled correctly.



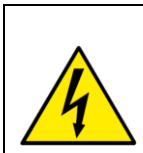
ATTENTION

Any tampering with the Interface Module is prohibited as it may pose a fire and electric shock hazard.



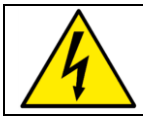
ATTENTION

It is forbidden to open or remove the transparent upper cover panel of the Interface Module as it may pose a fire and electric shock hazard.



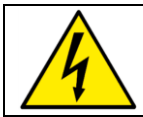
ATTENTION

The Interface Module and the Condensation Sensor can only be cleaned when the Interface Module is turned off and de-energized on all terminals.
Use a dry cloth or a cloth soaked in a soap solution.
Do not use caustic or solvent-containing substances.



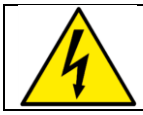
ATTENTION

The *ConSensy* condensation detector cannot be used as a safety device but only as a signaling device.



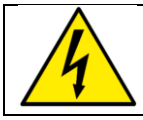
ATTENTION

The insulation and safety of the power supply voltage are the responsibility of the customer's power supply. The insulation of +24V/+15V/+12V/+5V must be SELV type.



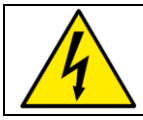
ATTENTION

The Condensation Sensor must not be applied to live parts.



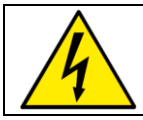
ATTENTION

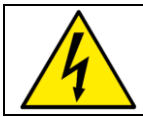
The Condensation Sensor must be applied to parts without dangerous voltage (SELV) even in the presence of condensation.

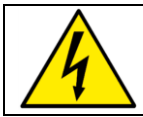


ATTENTION

The Condensation Sensor must be protected from any surrounding live parts against accidental contacts or faults, for example, through segregation or separators.

	**ATTENTION** **Before carrying out the installation, make sure that the wires to be connected to the device are free of voltage.**

	**ATTENTION** **After making the electrical connections, refit the plastic protections of the X0, X1 and X2 terminal blocks before powering up the device.**

	**ATTENTION** **The sensors can never be touched unless the ConSensy device and the equipment where the sensors are applied have been completely turned off.**

	**WARNING - Safety** ***ConSensy* is not suitable for use in explosion and fire risk areas and in areas excluded by the EN61010-1 Part 1 standard.**

	**WARNING - Safety** **Check the compliance of the nominal voltage before putting the device into service (see the product data plate). Check that the connection cables are not damaged and that they are not energized during device wiring.**

	**WARNING** ***ConSensy* is not intended for use in safety-critical applications.** **The use of *ConSensy* in safety-critical applications is not safe.**

	**NOTE** **To prevent condensation formation in the Interface Module, leave the device at room temperature for about half an hour before connecting.**

	**MAINTENANCE** **These devices are maintenance-free.** **If damaged during transport or storage, the user must not make repairs.**

	**GUARANTEE** **Opening the Interface Module and any other tampering voids the warranty.**

1.1. Symbols used on the equipment labels and plates

	**General warning – General safety information**

	**Risk of electric shock and/or arc flash hazard: life-threatening voltages may be present with risk of arc flash in the event of an inadvertent short circuit.**

2. GENERAL INFORMATION

The ConSensy Condensation Detector detects the state of condensation on a surface.
It consists of an Interface Module and sensors that are connected to the module itself.
The sensors must be applied to the surfaces on which you want to monitor the state of condensation.
The Interface Module provides a dry contact for signalling the presence of condensation on the monitored surface.

Main applications

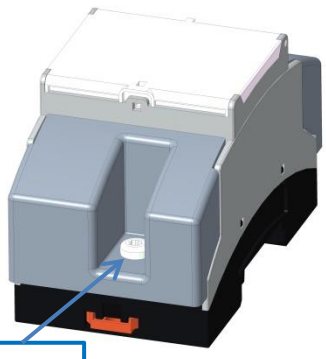
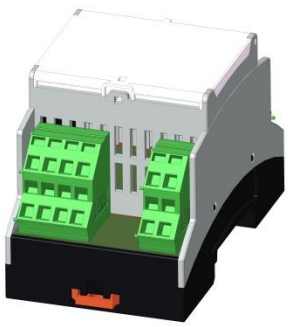
- Climatic tests on electrical and electronic equipment.
- Climatic tests on equipment and materials in general.
- Monitoring condensation on components of outdoor electrical and electronic equipment.
- Monitoring condensation on air conditioning system pipes.
- Monitoring condensation on surfaces through IoT systems.
- Detection of surfaces that could get wet due to faults in technological systems (hydraulic, thermal, air conditioning, etc.).
- Rain detection.

3. CONNECTIONS

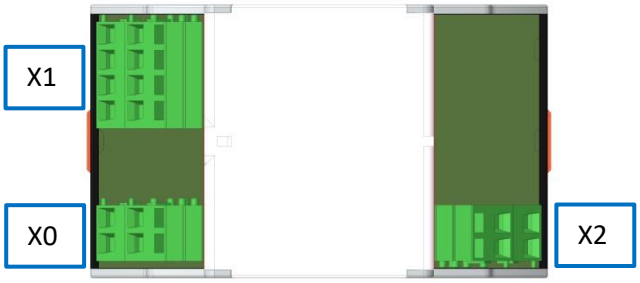
The terminals are of the "spring" type.
The stripped part of the wire must be 7 mm, and it must be fully inserted into the terminal so that it is not possible to come into contact with the stripped part itself.
The maximum wire section is 1.5 mm²; 1.0 mm² if pin terminals are used.

Before starting connections to the device, make sure that the wires are free of voltage.
To make the connections to the terminal blocks X0, X1 and X2, the plastic protections that protect the terminal blocks themselves must be removed by removing the fixing screws.
After making the connections to the terminal blocks, before energizing, the protections must be reassembled using the same screws.

<u>The IP20 protection level is guaranteed only if the wires are correctly inserted into the terminals and the plastic covers are correctly assembled.</u>

View with protections	View without protections
	

View of the terminal blocks from above – Identification of the terminal blocks



3.1. Power supply

Connect the power supply to terminal block X0 as indicated on the label.

+Vdc	GND
+Vdc	GND
X0	

It is sufficient to connect only one +Vdc terminal and one GND terminal.
Characteristics that the power supply upstream of ConSensy must have:

- Power: > 2W
- Input voltage: depends on the mains voltage
- Output voltage: depends on the chosen model (see chapter 8)
- Isolation between input and output: SELV (Reinforced)
- Protections: self-protected against the output short circuit

The power supply input of the Interface Module is protected with an internal fuse. In case an external fuse or switch is installed, it must have a minimum rating of 400 mA.
The power supply input of the Interface Module is protected against reverse polarity.
In the case of reverse connection, the device does not turn on; correct the reverse polarity.

3.2. Sensors

Connect the sensors to terminal block X1 as indicated on the label.

S3	S3	S4	S4
S1	S1	S2	S2
X1			

The sensor wires are already adequately stripped (7 mm stripping).
One to four sensors can be connected, starting from position S1 to S4.
The sensors are not polarized.
The first sensor should be connected between terminals S1-S1.
The second sensor, if present, should be connected between terminals S2-S2.
The third sensor, if present, should be connected between terminals S3-S3.
The fourth sensor, if present, should be connected between terminals S4-S4.

3.3. Output

Connect the signaling to terminal block X2 as indicated on the label.

NO	C
	NC
X2	

The signalling output is provided by a dry contact of an internal relay.

C: Common
NO: Normally Open Contact
NC: Normally Closed Contact

Contact operation

Sensor state	Relay state	Contact C-NO	Contact C-NC
Without condensation	De-energized	Open	Closed
With condensation	Energized	Closed	Open

The contact is not protected against overcurrent, so an external protection (fuse or circuit breaker) **must be installed.**

The protection must not exceed the current indicated in the table

Maximum current of protection (fuse or circuit breaker)	8 A @ 300 Vac 1 A @ 24 Vdc 0.15 A @ 300 Vdc

The dry contact can be used for various purpose, for example:

- Turning on fans
- Turning on heaters
- Turning on signal lamps
- Giving consent to electrical machines
- Being an input to measurement and monitoring systems

4. INSTALLATION

4.1. Installation of *ConSensy* Condensation Sensor

1. Identify the area where to apply the sensor.

   The Condensation Sensor must be applied to parts without dangerous voltage (SELV) even in the presence of condensation.

   The Condensation Sensor must be protected from surrounding live parts against accidental contacts or faults, for example, through segregation or separators.

   The surface on which the Condensation Sensor is intended to be applied can be flat or rounded. If the surface is rounded, the diameter of the circle must not be less than 20 mm.

2. Clean the area where to apply the sensor.
   Carefully remove dirt and dust.
3. Remove the protective film from the adhesive part of the sensor
4. Apply the sensor to the previously cleaned area.
   Apply pressure on the sensor with your fingers, using a sheet of paper or a cloth, to optimize the grip of the sensor on the surface of the material to be monitored.
5. Connect the sensor wires to the X1 connector of the Interface Module, making sure that the entire stripped part of the wires is inserted into the terminals.
   The wires are already adequately stripped (7 mm stripping).
6. In case of use in a marine environment, periodic cleaning of the sensor may be necessary.

4.2. Installation of Interface Module

The Interface Module can be used either on a table or inserted into a case.

1. Secure the Interface Module on the DIN43880 guide, if present.
2. Remove the two plastic protections from the terminals.
3. Connect the +Vdc/GND power supply to the X0 connector.
   The power supply voltage depends on the code of the Interface Module as per the table:

Interface Module code	Supply voltage
0504230.00	5 Vdc ± 10%
1204230.00	12 Vdc ± 10%
1504230.00	15 Vdc ± 10%
2404230.00	24 Vdc ± 10%

4. Connect the Condensation Sensors to the X1 connector
5. Connect the output circuit to the X2 connector.
6. Reassemble the two plastic protections of the terminals.

4.3. "AC Power Supply" option

The "AC Power Supply" option consists of a plug-in power supply suitable for directly powering the Interface Module with code 0504230.00 (5V dc power supply).
The technical specifications are in chapter 8.

5. MAINTENANCE

The ConSensy Condensation Detector, if used in an appropriate environment (pollution degree 2), does not require any maintenance.

In case the Condensation Sensor is installed in a very dusty environment, to keep it fully efficient, it must be cleaned periodically.
Cleaning of the Condensation Sensor must be done by qualified personnel, with the Interface Module turned off and de-energized.
Use a dry cloth or a cloth soaked in a soap solution.
Do not use caustic or solvent-containing substances.
It is always prohibited to tamper with, disassemble, or open the Interface Module.

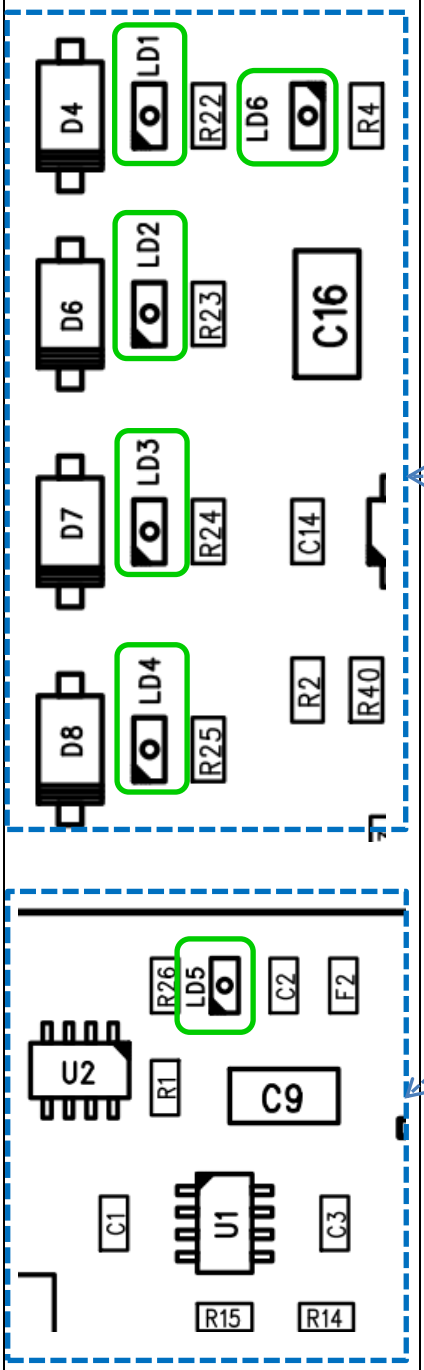
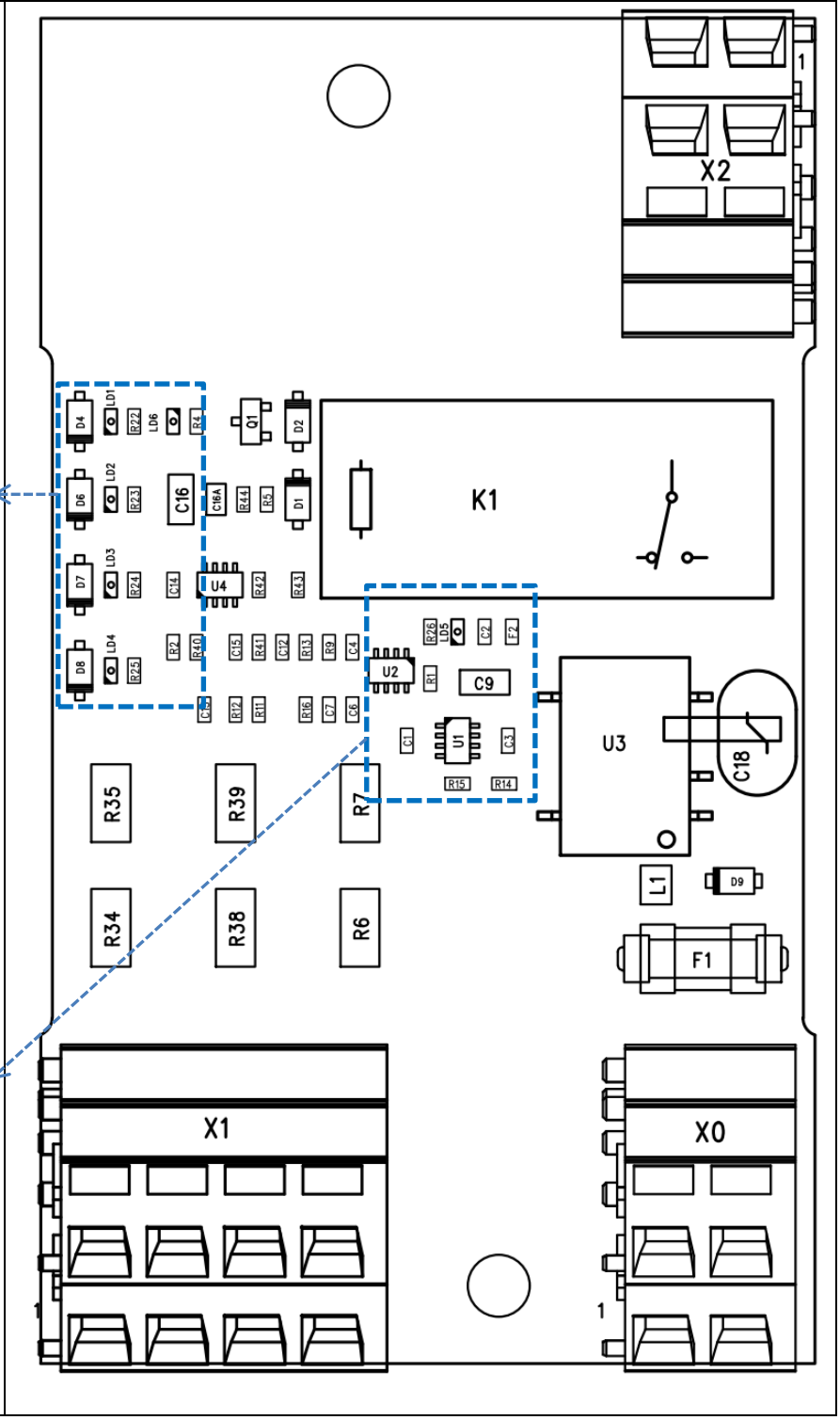
6. OPERATION

The *ConSensy* Condensation Detector detects the condensation status of a surface.
Up to 4 Condensation Sensors can be connected; this way, up to 4 different surfaces can be monitored.
The first sensor that detects condensation activates the output relay.
The state of each sensor is recognizable by an associated LED, visible through the upper transparent panel of the Interface Module.

Meaning of LEDs

LED symbol	Meaning
LD1	Condensation status detected by Sensor 1 (S1) ON: presence of condensation OFF: no condensation
LD2	Condensation status detected by Sensor 2 (S2) ON: presence of condensation OFF: no condensation
LD3	Condensation status detected by Sensor 3 (S3) ON: presence of condensation OFF: no condensation
LD4	Condensation status detected by Sensor 4 (S4) ON: presence of condensation OFF: no condensation
LD5	Internal power supply status ON: internal voltage OK OFF: Lack of external power supply voltage or Device fault
LD6	Relay output status ON: energized – condensation detected by at least one sensor OFF: de-energized - no condensation detected by sensors

LEDs identification

Zoom on LEDs area	Full view of the board
	

7. RECYCLING INFO

WEEE Directive 2012/19/EC on Waste Electrical and Electronic Equipment
The product should not be disposed of with other household waste. Check for the nearest authorized collection centers or authorized recyclers. Proper disposal of used equipment will help prevent potential negative consequences for the environment and human health.

8. TECHNICAL DATA

8.1. Technical data of Interface Module

Power supply				
Model	0504230.00	1204230.00	1504230.00	2404230.00
Rated voltage	5 Vdc	12 Vdc	15 Vdc	24 Vdc
Voltage range	4.5÷5.5 Vdc	10.8÷13,2 Vdc	13.5÷16.5 Vdc	21.6÷26.4 Vdc
Maximum current	220 mA	92 mA	74 mA	46 mA
Power absorbed	1.0 W max			
Protections	Polarity inversion – Input fuse			
Sensors inputs				
Number of condensation sensors	1 ÷ 4			
Sensor type	Proprietary			
strength to the SELV insulation fault	300 Vac			
Output				
Type	Relay with dry exchange contacts			
Rated voltage	250 Vac			
Maximum voltage	300 Vac / 300 Vdc			
Maximum current	8 A @ 300 Vac 1 A @ 24 Vdc 0.15 A @ 300 Vdc			
General data				
Operating temperature	0 ÷ +55 °C			
Storage temperature	-20 ÷ +70°C			
Altitude	4000 m			
Relative humidity	4 ÷ 95 % non-condensing			
Protection level	IP20			
Installation type	Indoor			
Pollution degree	2			
Over Voltage Category	II			
Weight	100 g			
Weight of condensation sensor	< 10 g			
Portable equipment	Yes			
Dew Point temperature accuracy	Typ: < 0.5°C Max: < 1.0°C			
Mechanical data				
Module	DIN43880 Guide Housing			
Dimensions	Width: 53.6 mm Deph: 102 mm Height: 63 mm			
Standards				
CEI EN 61010-1:2013+A1:2021 IEC 61010-1:2010+A1:2016 EN 61010-1:2010+A1:2019	Safety requirements for electrical equipment for measurement, control, and laboratory use Part 1: General requirements.			
EN IEC 61000-6-3:2021	Electromagnetic compatibility (EMC) Part 6-3: Generic standards - Emission standard for equipment in residential environments.			
EN IEC 61000-6-2:2019	Electromagnetic compatibility (EMC) Part 6-2: Generic standards - Immunity standard for industrial environments.			

8.2. Technical data of Condensation Sensor

Condensation sensor	
Model	20000+C
Max voltage	5 Vdc
Operating temperature	-20 °C ÷ 125°C
Storage temperature	-20 °C ÷ 70°C
Dimensions	37.5 mm x 43 mm
Minimum radius of curvature	10 mm

8.3. Technical data of "AC POWER SUPPLY" option

This option is suitable for powering the Interface Module with 5 Vdc power input, code 0504230.00

AC power supply	
Model	2301005.00
Rated input voltage	120/230 Vac 50/60 Hz
Rated input voltage range	100÷240 Vac 50/60 Hz
Power	10 W(1)
Output voltage	5.0 Vdc (SELV)
Operating temperature	0 °C ÷ 40°C
Storage temperature	0 °C ÷ 40°C
Protection	Output short circuit
Isolation	Reinforced

(1): Power may vary based on availability, but it will always be suitable for powering Interface Module code 0504230.00.

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