

Instruction and Operation Manual

S305

Dew Point Monitor



Dear Customer,

Thank you for choosing our product.

The operating instructions must be read in full and carefully observed before starting up the device. The manufacturer cannot be held liable for any damage which occurs as a result of non-observance or non-compliance with this manual.

Should the device be tampered with in any manner other than a procedure which is described and specified in the manual, the warranty is void and the manufacturer is exempt from liability.

The device is destined exclusively for the described application.

SUTO offers no guarantee for the suitability for any other purpose. SUTO is also not liable for consequential damage resulting from the delivery, capability or use of this device.

Revision: 2025-3

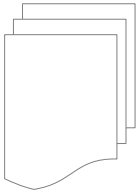


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1 Safety Instructions



Please check if this instruction manual matches to the product type.

Please observe all notes and instructions indicated in this manual. It contains essential information which must be observed before and during installation, operation and maintenance. Therefore this instruction manual must be read carefully by the technician as well as by the responsible user / qualified personnel.

This instruction manual must be available at the operation site of the dew point monitor at any time. In case of any obscurities or questions, regarding this manual or the product, please contact the manufacturer.



WARNING!

Compressed air!

Any contact with quickly escaping air or bursting parts of the compressed air system can lead to serious injuries or even death!

- Only use pressure tight installation material.
- Avoid that persons get hit escaping air or bursting parts of the instrument.
- The system must be pressureless during maintenance work.



WARNING!

Voltage used for supply!

Any contact with energized parts of the product, may lead to a electrical shock which can lead to serious injuries or even death!

- Consider all regulations for electrical installations.
- The system must be disconnected from any power supply during maintenance work.
- Any electrical work on the system is only allowed by authorized qualified personal.

**ATTENTION!****Permitted operating parameters!**

Observe the permitted operating parameters, any operation exceeding this parameters can lead to malfunctions and may lead to damage on the instrument or the system.

- Do not exceed the permitted operating parameters.
- Make sure the product is operated in its permitted limitations.
- Do not exceed or undercut the permitted storage and operation temperature and pressure.

General safety instructions

- It is not allowed to use the product in explosive areas.
- Please observe the national regulations before/during installation and operation.

Remarks

- It is not allowed to disassemble the product.
- Always use suitable tools that are in proper working order.

**ATTENTION!****Measurement values can be affected by malfunction!**

The product must be installed properly and frequently maintained, otherwise it may lead to wrong measurement values, which can lead to wrong results.

Storage and transportation

- Make sure that the transportation temperature of the monitor is between -30 ... +70°C.
- For transportation it is recommended to use the packaging which comes with the monitor.
- Please make sure that the storage temperature of the monitor is between 0 ... +40°C.
- Avoid direct UV and solar radiation during storage.
- For the storage the humidity must be <90%, no condensation.

2 Registered Trademarks

SUTO®

Registered trademark of SUTO ITEC

MODBUS®

Registered trademark of the Modbus Organization, Hopkinton, USA

3 Application

The S305 is an all-in-one Dew Point Monitor that integrates the S217 dew point meter and a display in a rugged housing (IP65).

The S305 is mainly used in the compressed air systems in an industrial environment. It is not developed to be used in explosive areas.

4 Features

- 2 models: -60 ... +20°C Td and -20 ... +50°C Td
- Plug & Play (complete solution)
- Compressed air supply through 6 mm quick-connector
- Power supply: 100 ... 240 VAC or 18 ... 30 VDC
- Easy wall mounting
- Accuracy of $\pm 2^{\circ}\text{C}$ Td
- IP65 casing for robust protection in rough industrial environment
- 4 ... 20 mA output to PLC or SCADA system
- Pre- and Main-Alarm programmable:
 - Optical: red blinking display
 - Two relay outputs

5 Technical Data

5.1 General

CE	
Measuring range (model depending)	Dew point: -60 ... +20°C Td -20 ... +50°C Td
Dew point sensor	Polymer
Temperature sensor	NTC
Ambient temperature	-10 ... +40°C
Ambient humidity	0 ... 100% rH
Operating pressure	0.3 ... 1.6 MPa
Temperature of the measured medium	-30 ... +70°C
Housing material	Electrical connection: Screw terminals Process connection: 6 mm quick connector Casing: ABS, Aluminium alloy
Classification	IP65
Dimensions	See dimensional drawing on page 9
Display	Graphic display, 220 x 140 pixels with back light
Interface	USB to PC
Keyboard	4 keys
Weight	520 g

5.2 Electrical Data

Power supply	100 ... 240 VAC, 15 VA (D699 3050 / 3052) 18 ... 30 VDC, 20 W (D699 3051 / 3053)
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5.3 Input Signals

Digital input	1 x SDI for dew point
Analog input	0 ... 20 mA / 4 ... 20 mA, 0 ... 10 V

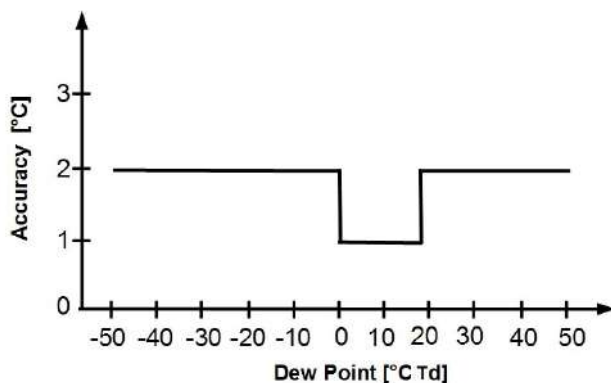
5.4 Output Signals

Analog output	4 ... 20 mA for forwarding the analog signal to customer systems
Alarm output	2 relays, 230 VAC, 3A , change over contact

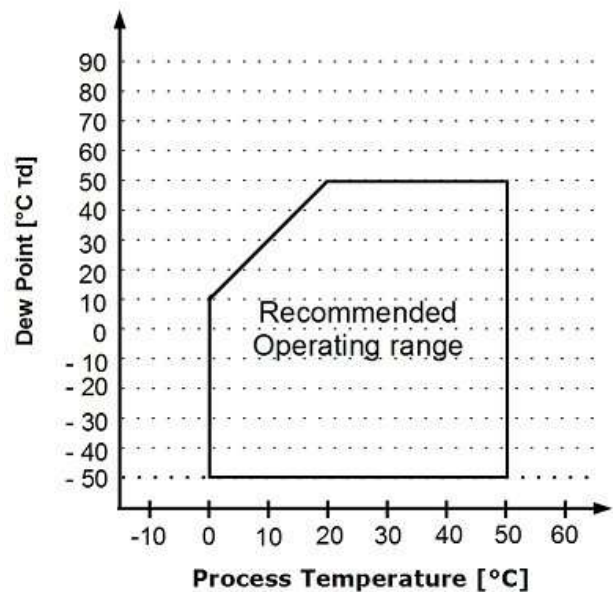
5.5 Accuracy

Accuracy	$\pm 2^{\circ}\text{C Td}$ (see picture below)
Repeatability	$\pm 0.5^{\circ}\text{C}$
Stated accuracy at	Ambient/process temperature $23^{\circ}\text{C} \pm 3^{\circ}\text{C}$ Ambient/process humidity $< 95\% \text{ rH}$, no condensation Airflow $> 2 \text{ l/min}$ at sensor tip

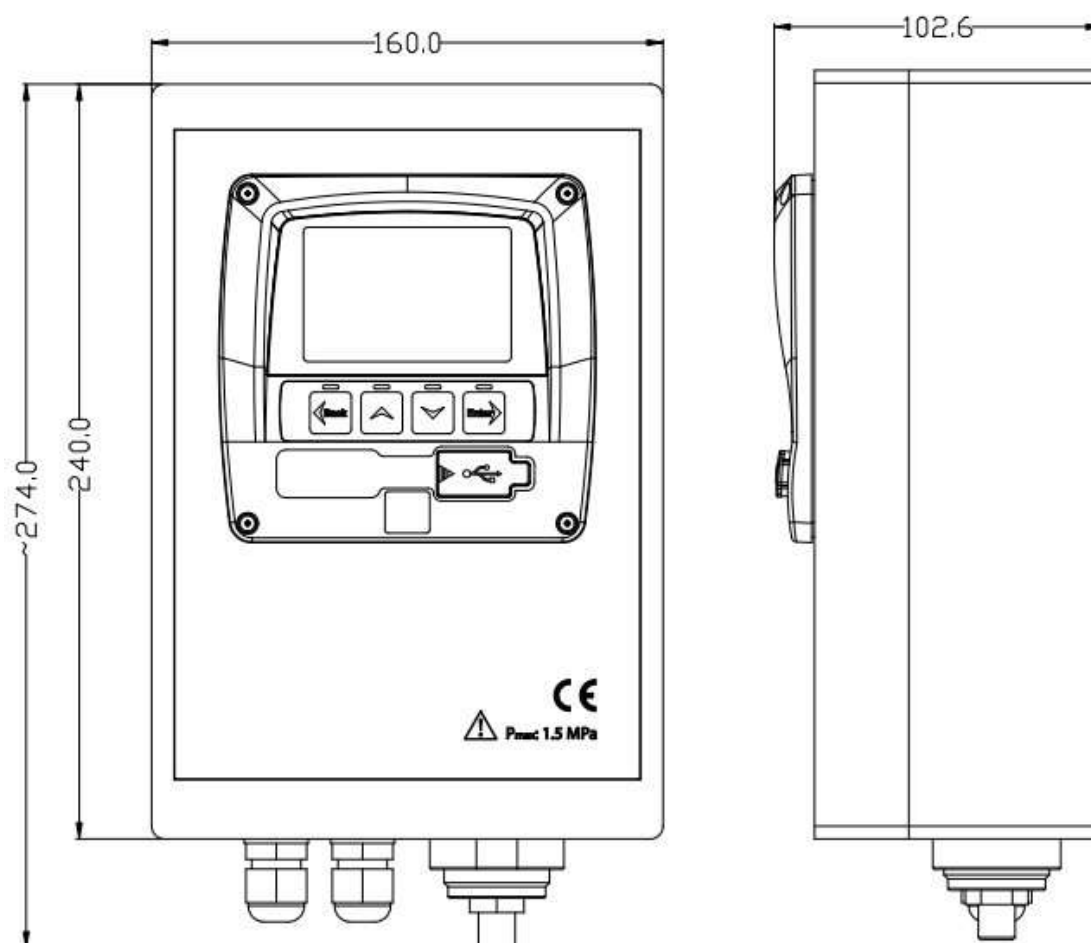
Accuracy:



Valid working range:



6 Dimensional Drawing



7 Installation

Please make sure that all components listed below are included in your package.

Qty	Description	Item No.
1	S305 Dew Point Monitor in wall-mounted housing	D699 3050 D699 3051 D699 3052 D699 3053
1	Instruction manual	No P/N

The descriptions of order numbers of the S305 are as follows:

Order No.	Description
D699 3050	S305 Dew Point Monitor, -20 ... +50 °C Td, 6 mm quick connector, 15 bar, 1 x 4 ... 20 mA, 100 ... 240 VAC, 2 relay outputs
D699 3051	S305 Dew Point Monitor, -20 ... +50 °C Td, 6 mm quick connector, 15 bar, 1 x 4 ... 20 mA, 24 VDC, 2 relay outputs
D699 3052	S305 Dew Point Monitor, -60 ... +20 °C Td, 6 mm quick connector, 15 bar, 1 x 4 ... 20 mA, 100 ... 240 VAC, 2 relay outputs
D699 3053	S305 Dew Point Monitor, -60 ... +20 °C Td, 6 mm quick connector, 15 bar, 1 x 4 ... 20 mA, 24 VDC, 2 relay outputs

7.1 Installation Requirements

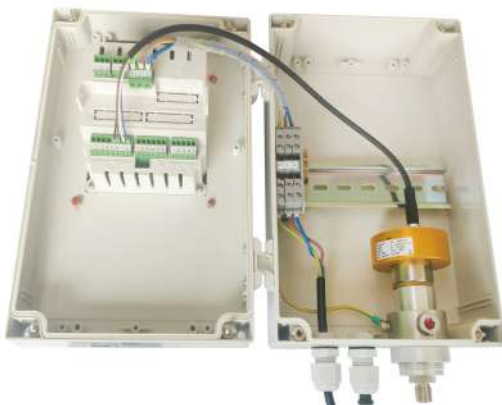
The device can be mounted on a wall. Please observe the drawings in chapter 6 for details. The housing of the S305 must be fixed on the wall using suitable dowels and screws.

7.2 Installation Procedure

The instrument is mounted on a wall. Follow the installation steps described below.



1. For the wall mounting, mount the brackets to the bottom of the casing as indicated in the picture.



2. Connect the power supply cable as described in section 7.4 [Electrical Connection](#).



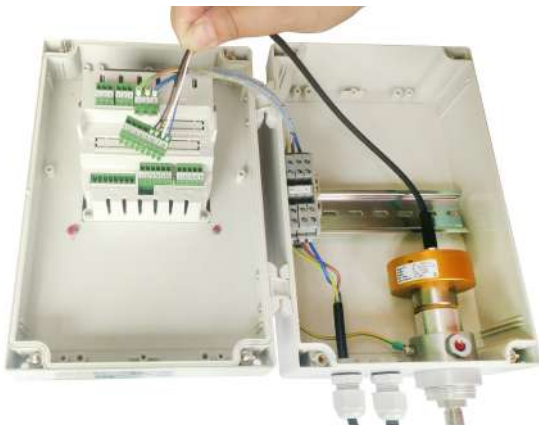
3. Use the covers to close the screw openings.



4. Connect the compressed air. The S305 will produce a small compressed air bleeding of about 2 l/min. This is required to have a good response time.

7.3 Sensor Change

For service or calibration, the sensor unit may have to be replaced.



1. Open the S305 case and remove the sensor cable connected at the display terminal first. See the left picture. To do this, disconnect the entire plug.



ATTENTION!

Please ensure that the power supply is switched off before opening the casing!

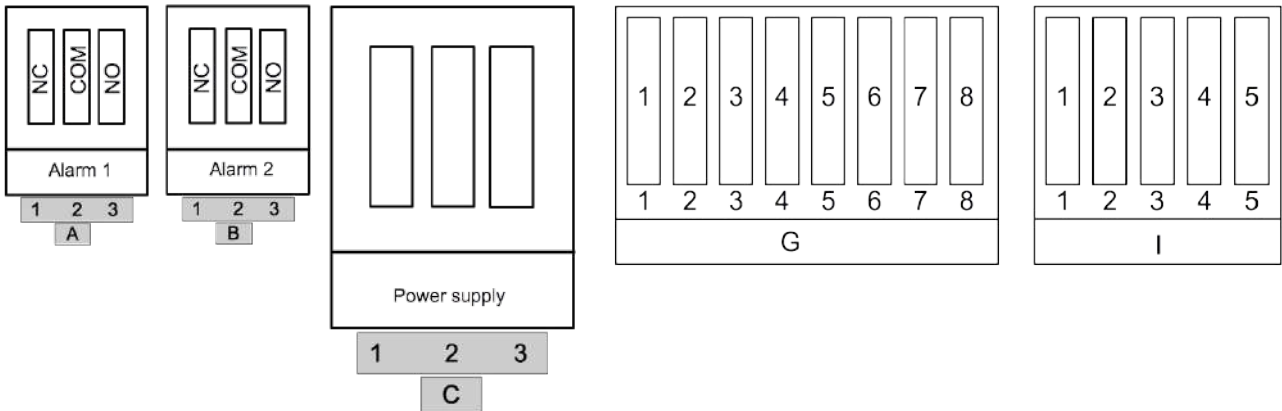


2. Screw the sensor unit out of the measuring chamber.
3. Remove the green terminal connector from the old sensor and connect it to the new sensor.

7.4 Electrical Connection

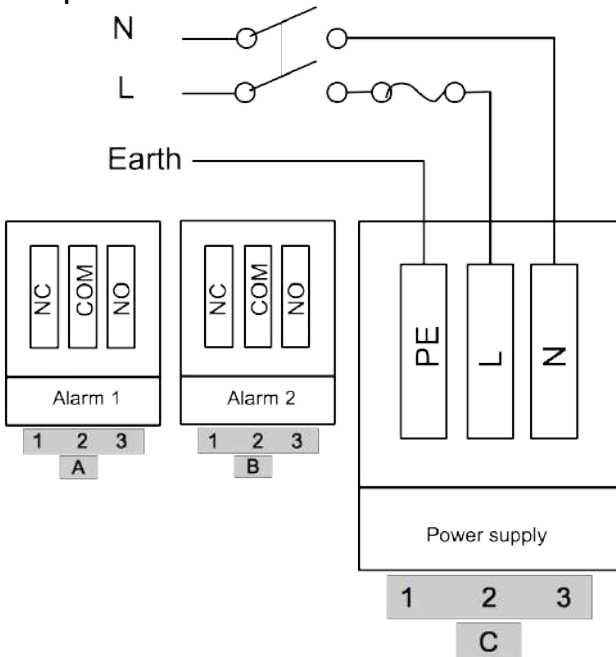
7.4.1 Layout of Terminal Blocks

The following diagram is the layout of terminal blocks at the S305 back side.

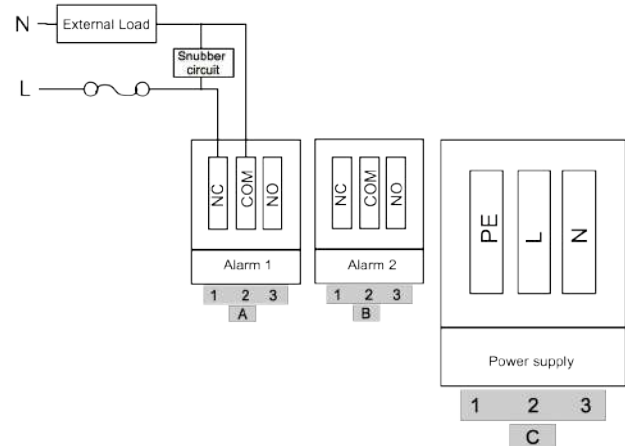


7.4.2 AC Power Supply and Alarm Connection

AC power connection:

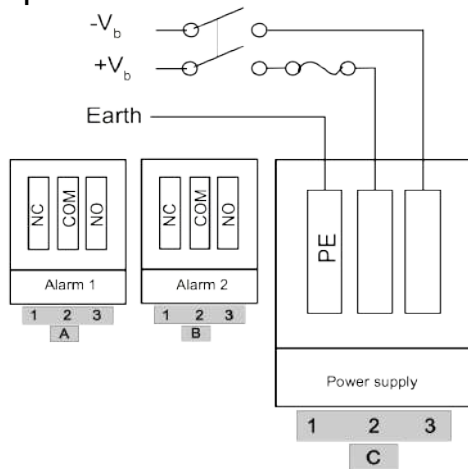


AC alarm connection:

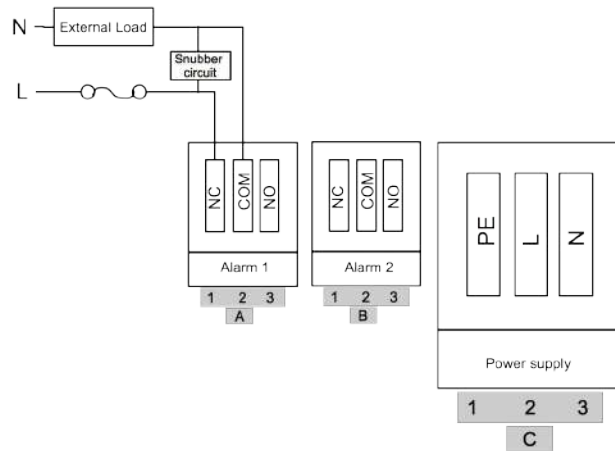


7.4.3 DC Power Supply and Alarm Connection

DC power connection:



AC alarm connection:



7.4.4 Signals of Terminals

Terminal	Pin	Signal	Description
G	8	$+V_b$	Positive sensor supply
	7	$-V_b$	Negative sensor supply
	6	SDI	Digital communication signal from sensors
	5	Iin	4 ... 20 mA signal from sensor
	4	N/A	Not available
	3	$-V_b$	Negative signal connection to PLC
	2	Iout	4 ... 20 mA signal to PLC
	1	$-V_b$	Negative signal connection to PLC
I	5	$+V_b$	Positive analog sensor supply
	4	$-V_b$	Negative analog sensor supply
	3	+20 mA	Positive current input
	2	S_{GND}	Signal ground (internally connected to $-V_b$)
	1	+10 V	Positive voltage input

Remark: Analog sensors can be connected to the terminal I.

7.4.5 Pin Assignment

This following table lists the pin wirings for S305 with its internal S217. The table also shows the current signal which can be used to connect the S305 to a PLC.

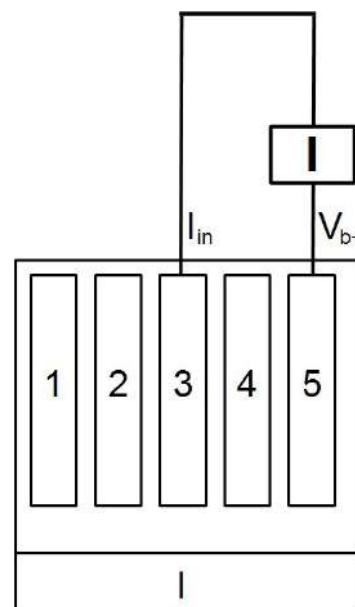
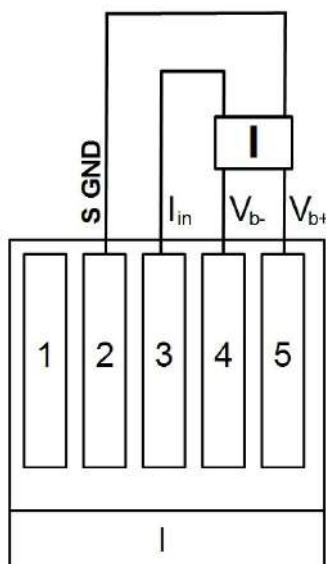
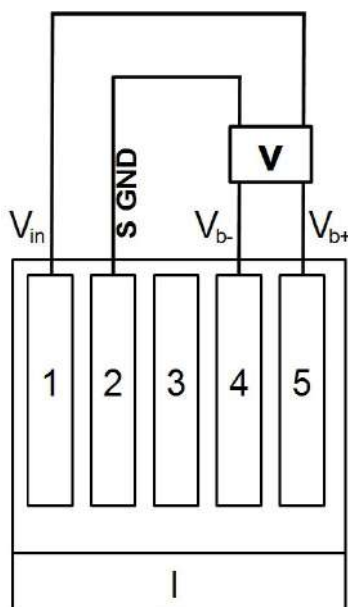
S305			S217		PLC
Terminal	Pin	Signal	Pin	Colour	
G	8	$+V_b$	3	blue	
	7	$-V_b$	2	white	
	6	SDI	1	brown	
	5	Iin	4	black	
	4	N/A			
	3	$-V_b$			
	2	Iout			+I of PLC
	1	$-V_b$			-I of PLC

7.4.6 Connect an Additional Analog Sensor to S305

A. voltage input 0 ... 1 V DC / 0 ... 10 V DC

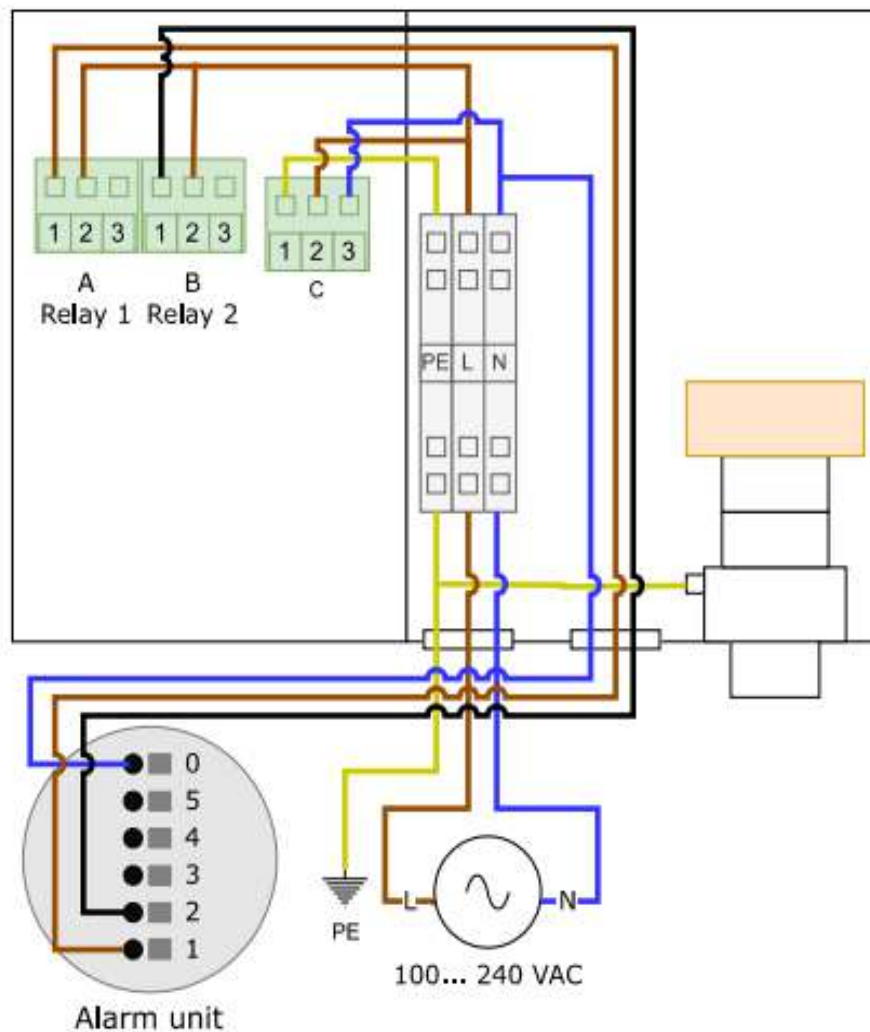
B. current input, 3/4 wire 0 / 4 ... 20 mA

C. Current input, 2 wire 4... 20 mA



7.4.7 Connect the External Alarm Unit to S305 Relays

The picture below shows the connection of the external alarm unit to the S305 utilizing the alarm relays. The pre-alarm will trigger the LED and the main-alarm will then trigger the buzzer. The alarm threshold values can be set using the on screen menu under **Alarm Settings**.



8 Configuration

The S305 is delivered with specific customer settings according to the order.

Using the S305 display and keys, you can change most settings of the S305 (including its internal S217). To change the remaining settings, you need to use the S4C-Display.

S4C-Display is free configuration software provided by SUTO and available for download at <http://www.suto-itec.com>.

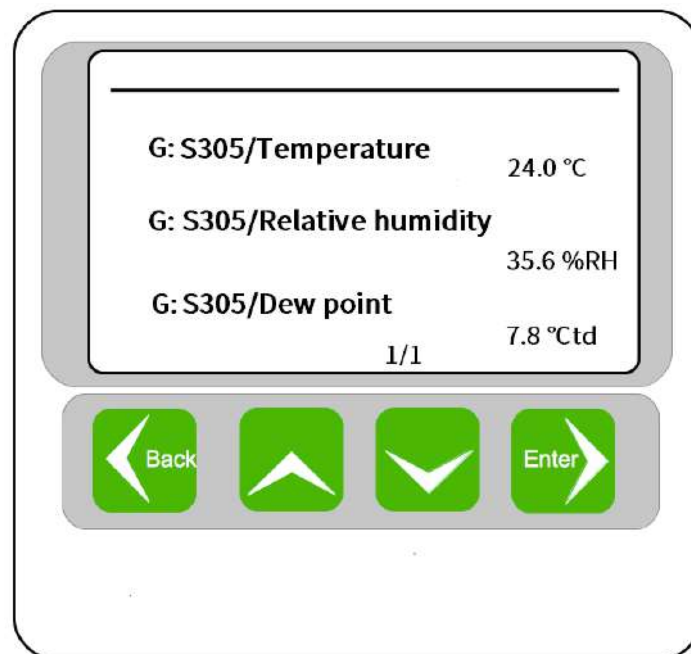
To configure settings using the S4C-Display:

1. Download and install the S4C-Display on a PC.
2. Connect the S305 to the PC via the USB interface.
3. Start the S4C-Display, and all device settings are accessible.

All settings are stored permanently in the S305.

9 Operation

9.1 Description of Keys



The display is used to show measurement values and setting items. You can use the following four keys to operate.



- To exit the current menu level.
- To leave all setting state without saving the changes.



- To browse and select different items in menu, and to scroll through pages of measurement values.



- To change or adjust the setting option or numbering.



- To enter to submenus or next menu level of the current selected menu item.
- To confirm the setting change or enable an option in all setting state.

After pressing the Enter key, you can select different submenus. The following sections describe functions of important submenus.

9.2 Sensor Settings

After selecting **Sensors**, the screen will show which kind of sensors are programmed at which terminals.

You can change setting for a sensor by selecting the terminal that the sensor is connected to.

9.3 Alarm Settings

The S305 has two alarm relay outputs. You can set the value and the direction of the value for "Alarm 1" and "Alarm 2".

9.4 System Status and Settings

The submenus of the System settings are described below.

Device Info	Shows different system information such as device type, device serial number, firmware version, hardware version etc.
LCD Contrast	To view and change contrast of the display.
Reset	To restart the S305.
Language	To choose the desired language.

9.5 Service Settings

To view and change contact information of the service company.

10 Signal Inputs

10.1 Digital Input

The S305 has one SDI input for connecting an SUTO dew point sensor.

10.2 Analog Input

The display has one input for connecting analog sensors (0 ... 20 mA / 4 ... 20 mA / 0 ... 10 V).

11 Signal Outputs

11.1 Analog Output

A 4 ... 20 mA output signal of the internal S217 sensor. It can be looped to an external PLC. See section 7.4.5 [Pin Assignment](#).

11.2 Alarm Output

S305 has two alarm relay outputs (230 VAC, 3 A).

12 Optional Accessories

The following accessories are optional:

- Alarm unit, red light and buzzer alarm, wall mountable (unit is using the relay outputs of S305 to trigger the alarm).
- Alarm unit, red light and buzzer alarm, mounted at S305 casing (The unit is using the relay outputs of S305 to trigger the alarm).

13 Calibration

The instruments is calibrated ex work. The exact calibration date is printed on the certificate which is supplied together with the instruments. The accuracy of the sensor is regulated by the on site conditions, parameters like oil, high humidity or other impurities can affect the calibration and furthermore the accuracy. However it is recommended to calibrate the instrument at least once per year. The calibration is excluded from the instruments warranty. For this please contact the manufacturer.

14 Maintenance

To clean the instruments and its accessories it is recommended to use moist cloth only.



ATTENTION!

Do not use isopropyl alcohol to clean the display!

15 Disposal of Waste



Electronic devices are recyclable material and do not belong in the household waste.

The instruments, the accessories and its packings must be disposed according to your local statutory requirements. The dispose can also be carried by the manufacturer of the product, for this please contact the manufacturer.

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