Instruction and operation manual

S305

Dew point monitor

.SUO

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.
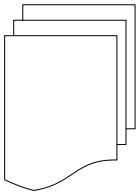
The device is destined exclusively for the described application.

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.

Table of contents

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.
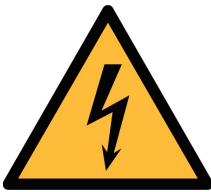
WARNING!

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.

- The sensor is calibrated ex work. The exact calibration date is printed on the certificate that is supplied with the sensor. The accuracy of the sensor is regulated by the on site conditions. Parameters such as oil, high humidity or other impurities can affect the calibration and furthermore the accuracy. We recommend to calibrate the instrument at least once per year. The calibration is excluded from the instruments warranty. For this please contact the manufacturer.

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. 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 monitor is mainly used in compressed air systems in industrial environment. It is not developed to be used in explosive areas.

3. Features

- 2 models: -50 ... +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 24 VDC

- Wall or panel mountable

- Accuracy of ±2°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

4. Technical Data

4.1 General

CE	
Measuring range (model depending)	Dew point: -50 ... +20°C Td -20 ... +50°C Td
Dew point sensor	Polymer
Temperature sensor	NTC
Ambient temperature	-10°C ... +40°C
Operating pressure	0.3 ... 1.5 MPa
Medium temperature	-30°C ... +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

4.2 Electrical Data

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

4.3 Input-Signals

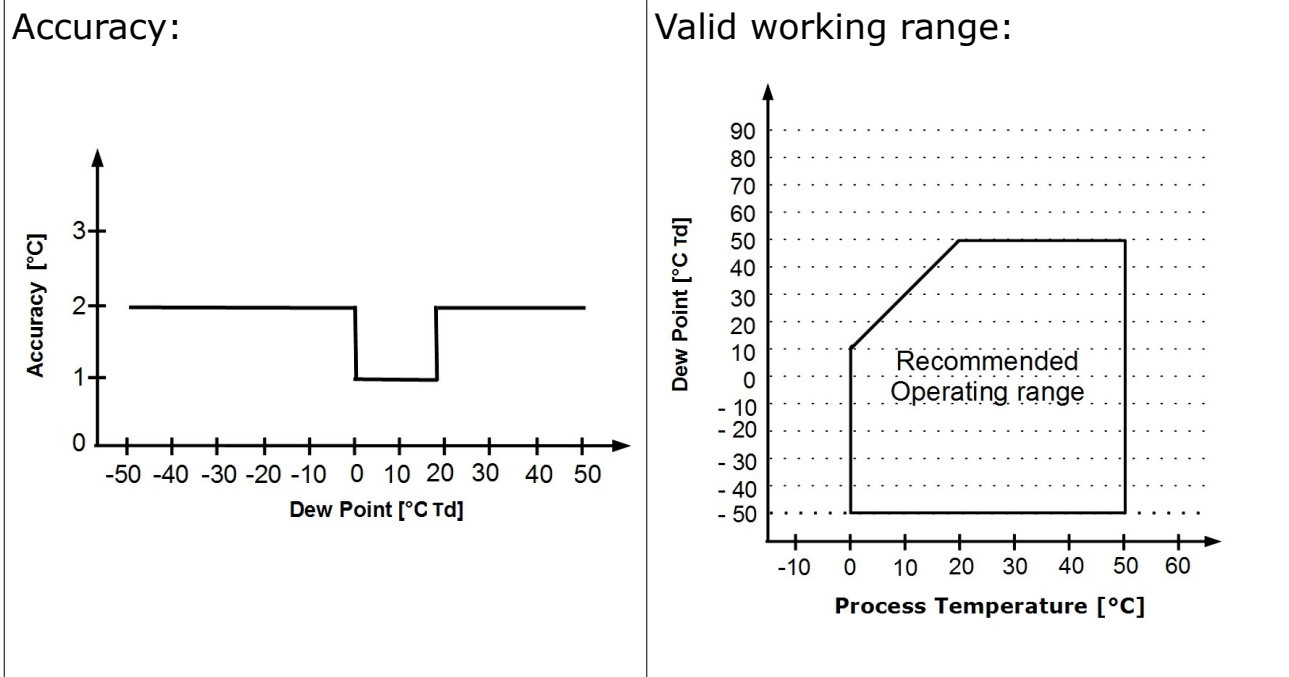| Digital input	1 x SDI for dew point
Analog input	0 ... 20 mA / 4 ... 20 mA, 0 ... 10 V

4.4 Output-Signals

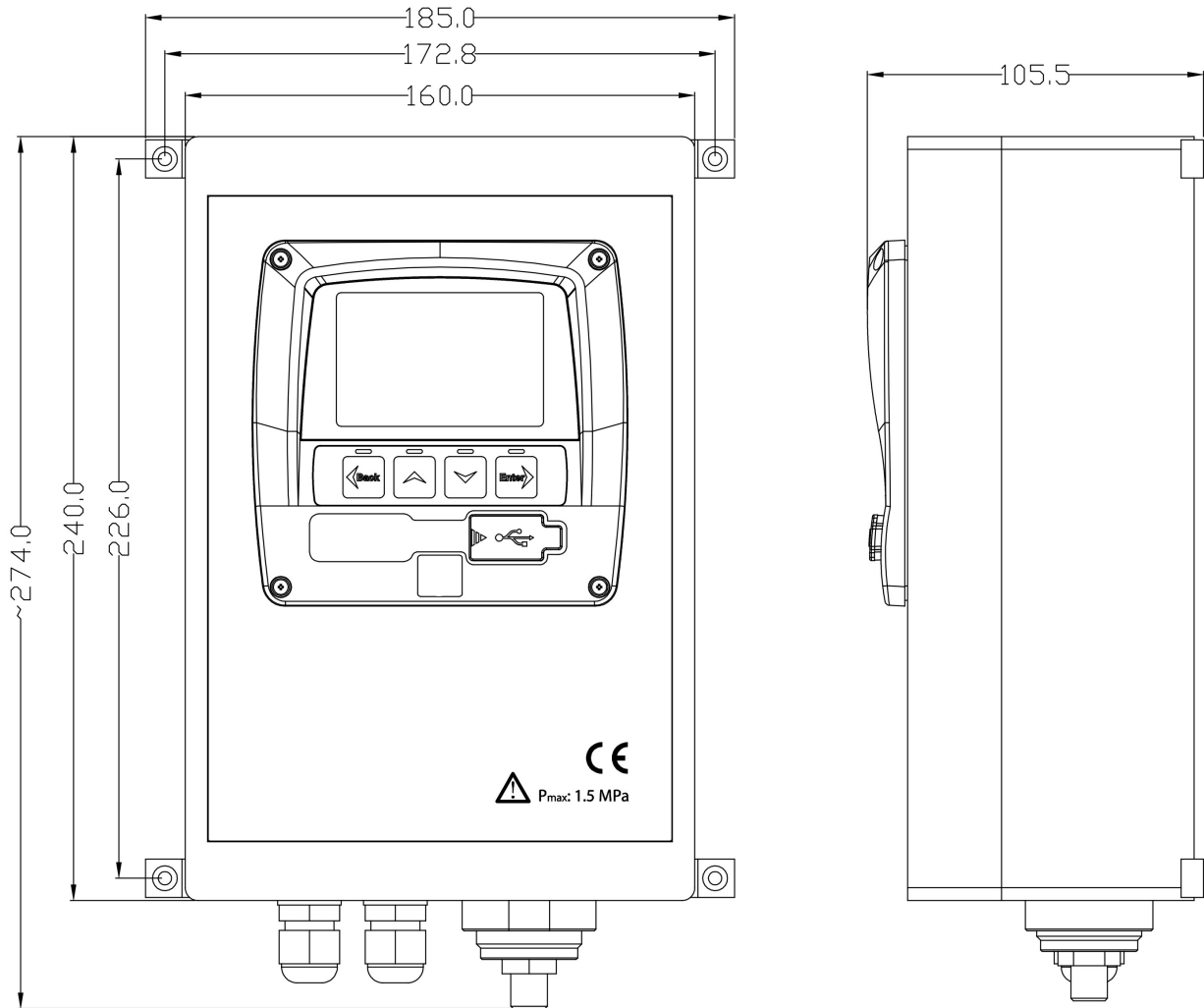| Analog output	4 ... 20 mA for forwarding the analog signal to customer systems

Alarm output	2 relays, 230 VAC, 3A , change over contact

4.5 Accuracy

Accuracy	±2°C Td（see picture below）
Repeatability	±0.5°C

Accuracy:	Valid working range:

5. Dimensional drawing

6. Installation

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

| Qty	Description	Item No.
1	S305 Panel with ordered options and if ordered with casing	D699 3050 D699 3051 D699 3052 D699 3053
1	USB cable, USB 2.0, A-male to A-male, 1.5 m	A554 0015
1	Instruction manual	No P/N

6.1 Installation Requirements

The instrument can either be mounted into a panel or if ordered with the optional wall casing on a wall. Please observe the drawings in chapter 5 for details. The housing of the S305 must be fixed on the wall using suitable dowels and screws.

6.2.Installation Procedure

The instrument is mounted on a wall. Please 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.
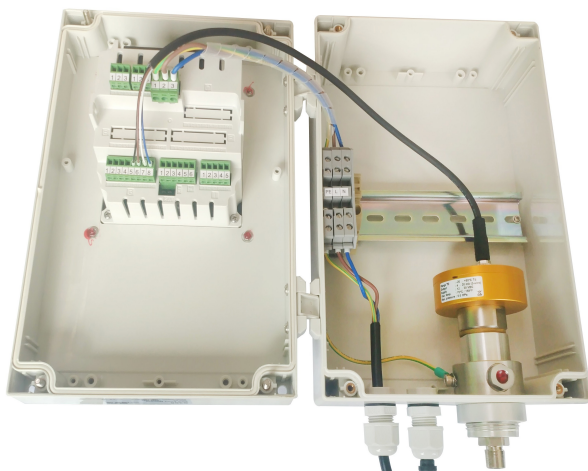
2. Connect the power supply cable as described in section 6.4 Electrical connection .
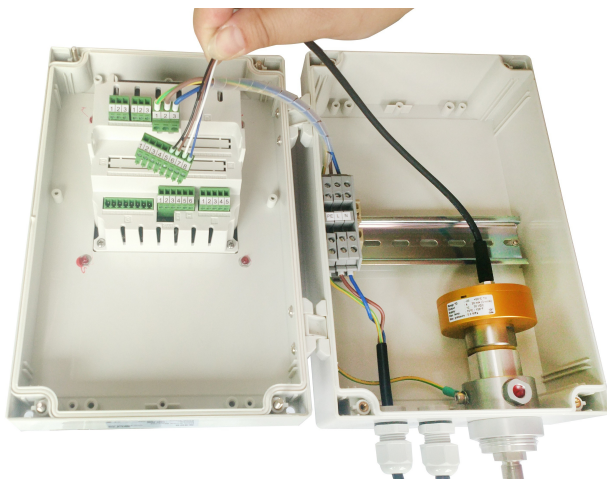
3. Use the covers to close the screw openings.

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.

6.3 Sensor change

The sensor unit may need to be changed in service cases.

1. Open the S305 case and remove the sensor cable connected at the display terminal first. See the left picture.

ATTENTION!

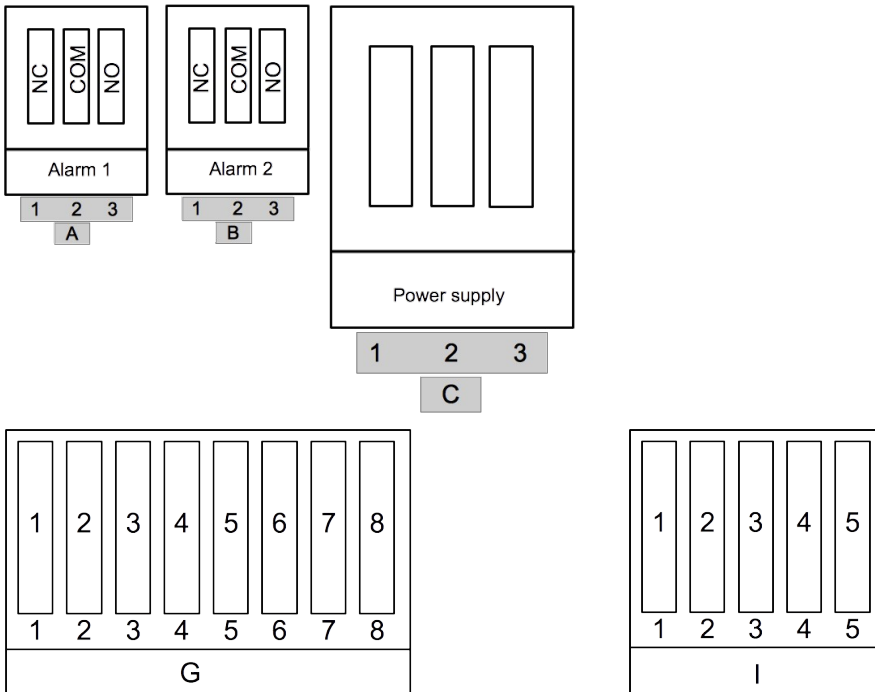**Please ensure that the power supply is switched off before opening the casing!**

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.
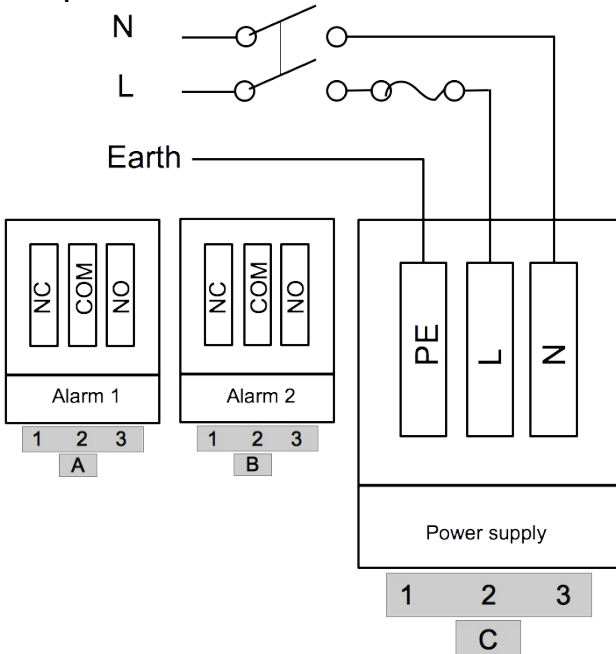
6.4 Electrical connection

6.4.1 Layout of terminal blocks

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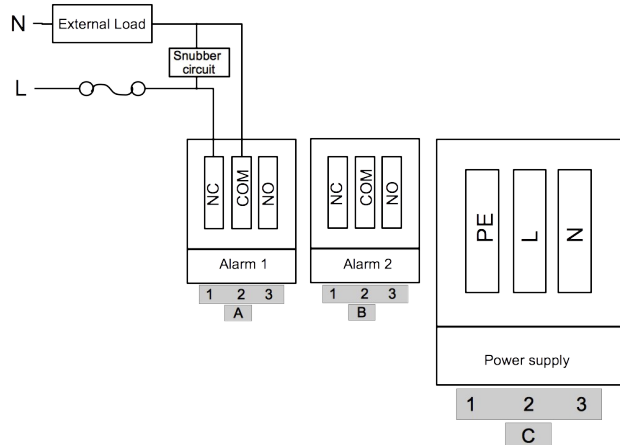

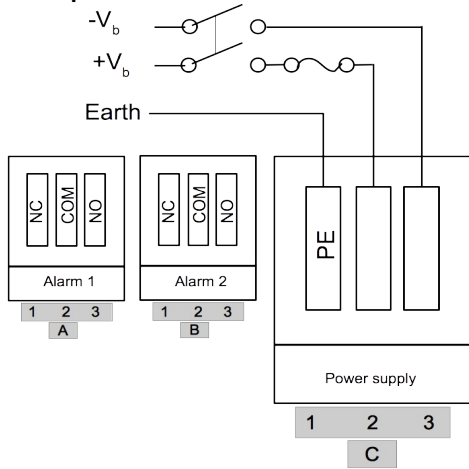## 6.4.2 AC Power supply and alarm connection

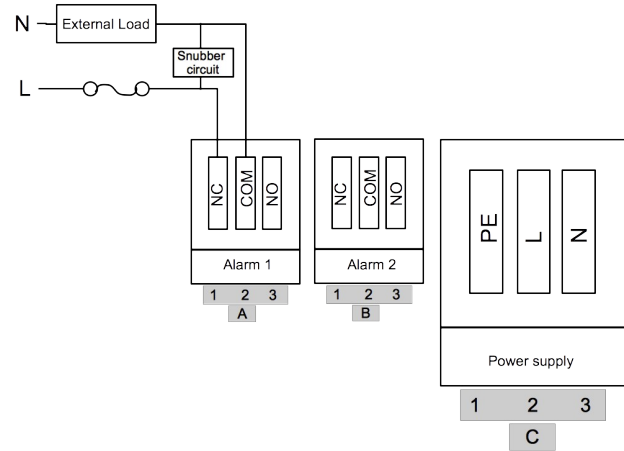AC power connection:

AC alarm connection:

6.4.3 DC Power supply and alarm connection

DC power connection:

DC alarm connection:

6.4.4 Signals of the 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	SGND	Signal ground (internally connected to $-V_b$)
	1	+10 V	Positive voltage input

Remark:

• Analog sensors can be connected to terminal I.

6.4.5 Pin wiring for the internal S217

This following table lists the pin wirings for S305 with its internal S217, and for the S217 with an external PLC if you want to loop the 4 ... 20 mA signal of the S217 to the 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

6.4.6 Analog sensor powered by S305

A. voltage input 0 … 1 V dc / 0 … 10 V DC   **B.** current input, 3/4 wire 0 / 4 … 20 mA DC   **C.** Current input, 2 wire 4… 20 mA DC
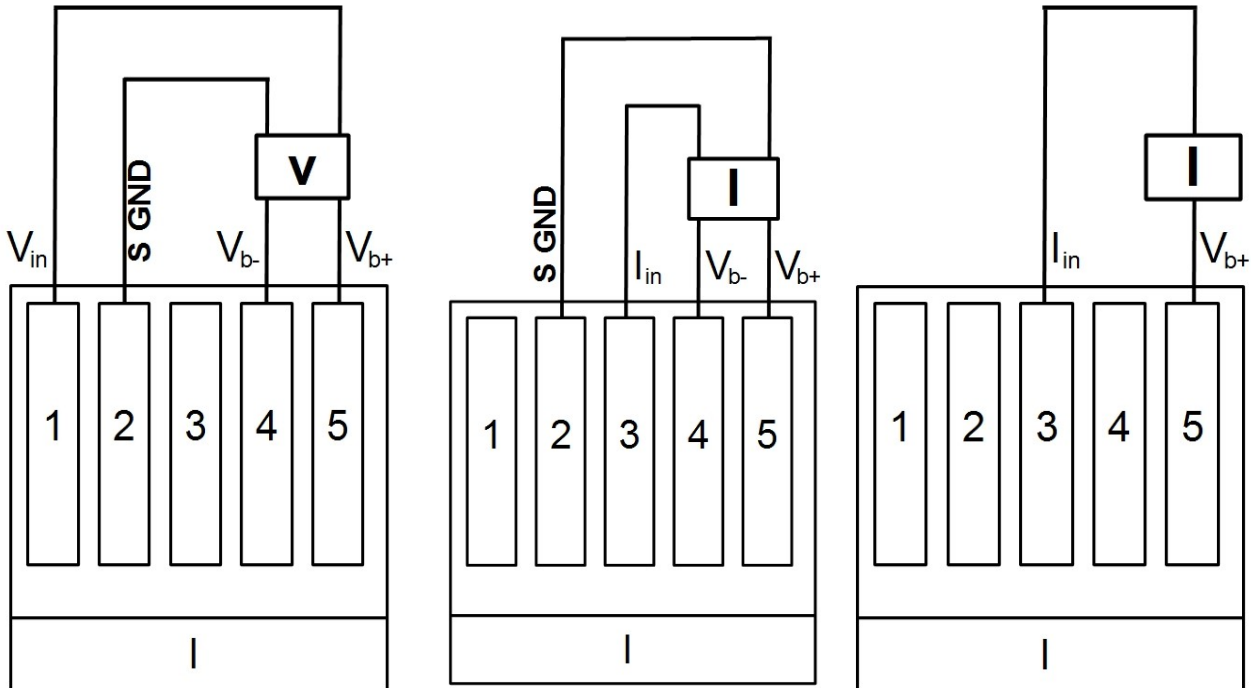
7. Configuration

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.
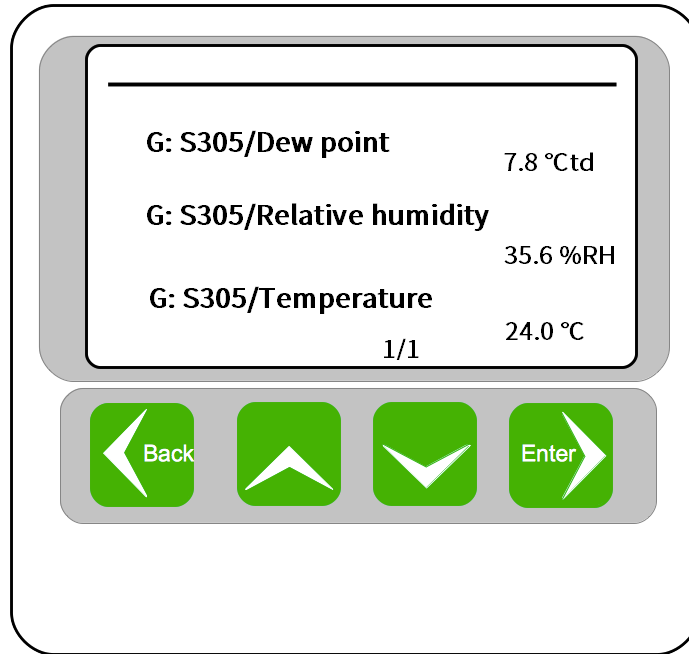
To configure settings using the S4C-Display:

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.

8. Operation

8.1 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.

8.2 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.

8.3 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".

8.4 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.

8.5 Service setting

To view and change contact information of the service company.

9. Signal inputs

9.1 Digital input

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

9.2 Analog input

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

10. Signal outputs

10.1 Analog output

A 4 … 20 mA output signal of the internal S217 sensor. It can be looped to an external PLC. See section <u>6.4.5 Pin wiring for the internal S217</u>.

10.2 Alarm output

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

11. 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 (unit is using the relay outputs of S305 to trigger the alarm).

12. Maintenance

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

ATTENTION!

Do not use isopropyl alcohol to clean the display!

13. Disposal or waste

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

14. Warranty

SUTO provides a warranty for this product of 24 months covering the material and workmanship under the stated operating conditions from the date of delivery. Please report any findings immediately and within the warranty time. If faults occur during the warranty time SUTO will repair or replace the defective unit, without charge for labour and material costs but there is a charge for other service such as transport and packing costs.
Excluded from this warranty is:

- Damage caused by:

    ◦ Improper use and non-adherence to the instruction manual.

    ◦ Use of unsuitable accessories.

    ◦ External influences (e.g. damage caused by vibration, damage during transportation, excess heat or moisture).

The warranty is void:

- If the user opens the measurement instrument without a direct request written in this instruction manual.

- If repairs or modifications are undertaken by third parties or unauthorised persons.

- If the serial number has been changed, damaged or removed.

Other claims, especially those for damage occurring outside the instrument are not included unless responsibility is legally binding.

Warranty repairs do not extend the period of warranty.

⚠️ **ATTENTION!**

Batteries have a reduced warranty time of 12 months.

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