

# Instruction and Operation Manual

# S320

## Display



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 cancelled and the manufacturer is exempt from liability.

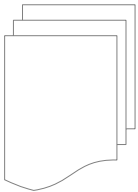
The device is destined exclusively for the described application.

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.

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## 1 Safety Instructions



**Please check if this instruction manual accords to the product type.**

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

This instruction manual has to be available at the operation site of the display at any time. In case of any obscurities or questions, regarding this manual or the product, please contact the manufacturer.

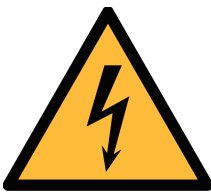


**WARNING!**

**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 product should be maintained and calibrated frequently, at least annually.

**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.



**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 display is between -30 ... +70°C.
- For transportation it is recommended to use the packaging which comes with the display.
- Please make sure that the storage temperature of the display is between 0 ... +40°C.

- Avoid direct UV and solar radiation during storage.
- For the storage the humidity has to be <90%, no condensation.

## 2 Application

The S320 display can display all relevant parameters (flow, dew point, pressure, temperature, power consumption, compressor status etc.) in a compressed air system.

The S320 display and data logger is not developed to be used in explosive areas. For the use in explosive areas please contact the manufacturer.

The S320 display and data logger is mainly used in compressed air systems in industrial environment.

## 3 Features

- Graphic display for easy user interface.
- Flexible power supply: 100 V ... 240 VAC / 50 ... 60 Hz or 18 ... 30 VDC.
- 1 input for SUTO SDI sensors.
- 1 input for analog sensors: 0 ... 20 mA, 4 ... 20 mA, 0 ... 10 V.
- 2 relay outputs for alarm.
- USB interface for configuration with S4C software.
- Wall or panel mountable casing.
- Optional alarm on display.

## 4 Technical Data

### 4.1 General

<b>CE</b>	
Operating temperature	0 ... 50°C
Housing material	ABS
Protection class	IP65
Dimensions	See dimensional drawing on the next page
Display	Graphic display, 220 x 140 pixels with back light
Interface	USB to PC
Keyboard	4 keys
Weight	0.52 kg

### 4.2 Electrical Data

Power supply	100 ... 240 VAC, 15 VA (option A1640) 18 ... 30 VDC, 15 VA (option A1641)
Sensor supply	24 V, 10 W

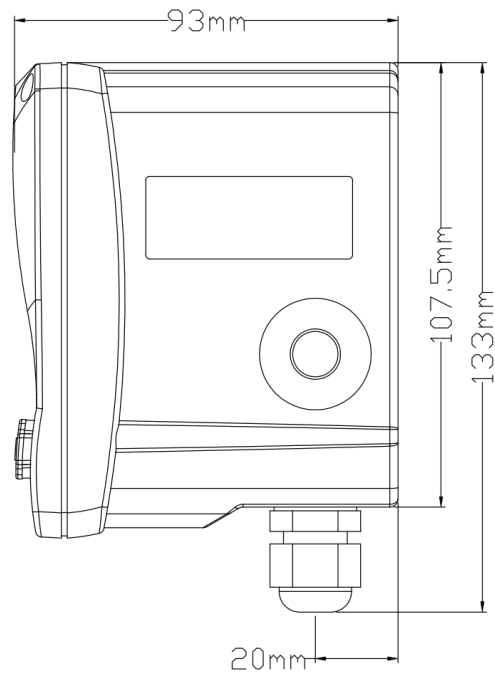
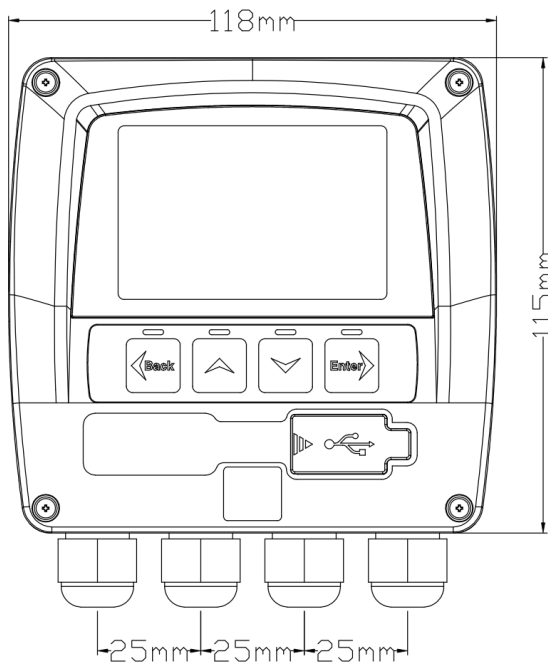
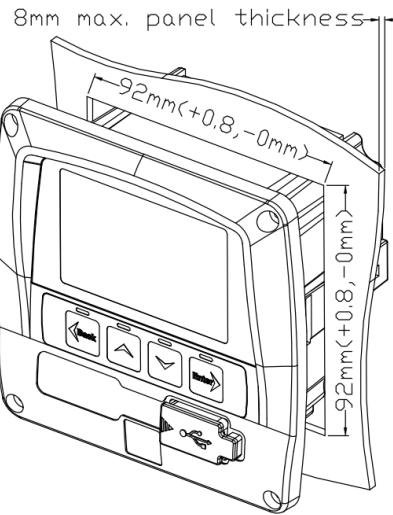
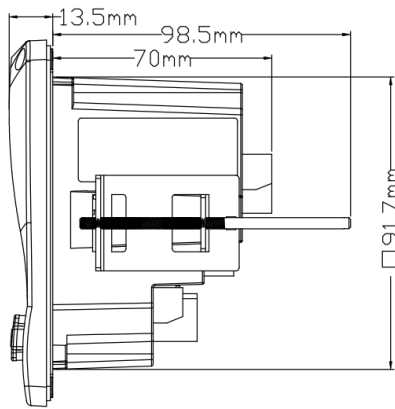
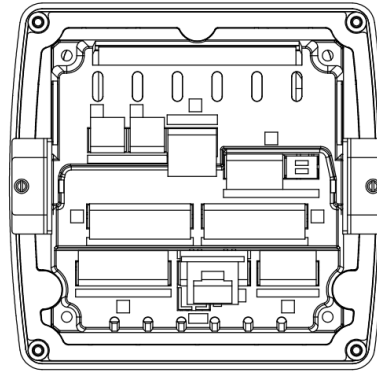
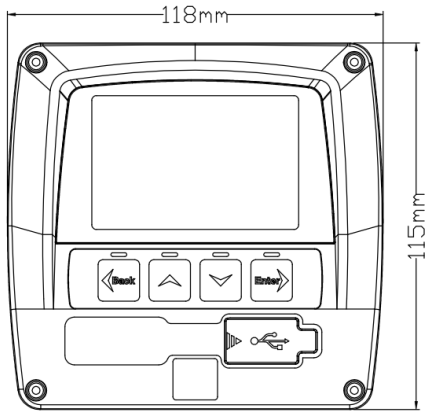
### 4.3 Input-Signals

Digital input	1 x SDI for SDI input for SUTO sensors
Analog input	1 x 0 ... 20 mA or 1 x 4 ... 20 mA or 1 x 0 ... 10 V

### 4.4 Output-Signals

Alarm output	2 relays, 230 VAC, 3 A
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## 5 Dimensional Drawing





## 6 Installation

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

Qty	Description	Item No.
1	S320 Panel with ordered options and if ordered with casing	D500 0320
1	Instruction manual	No P/N

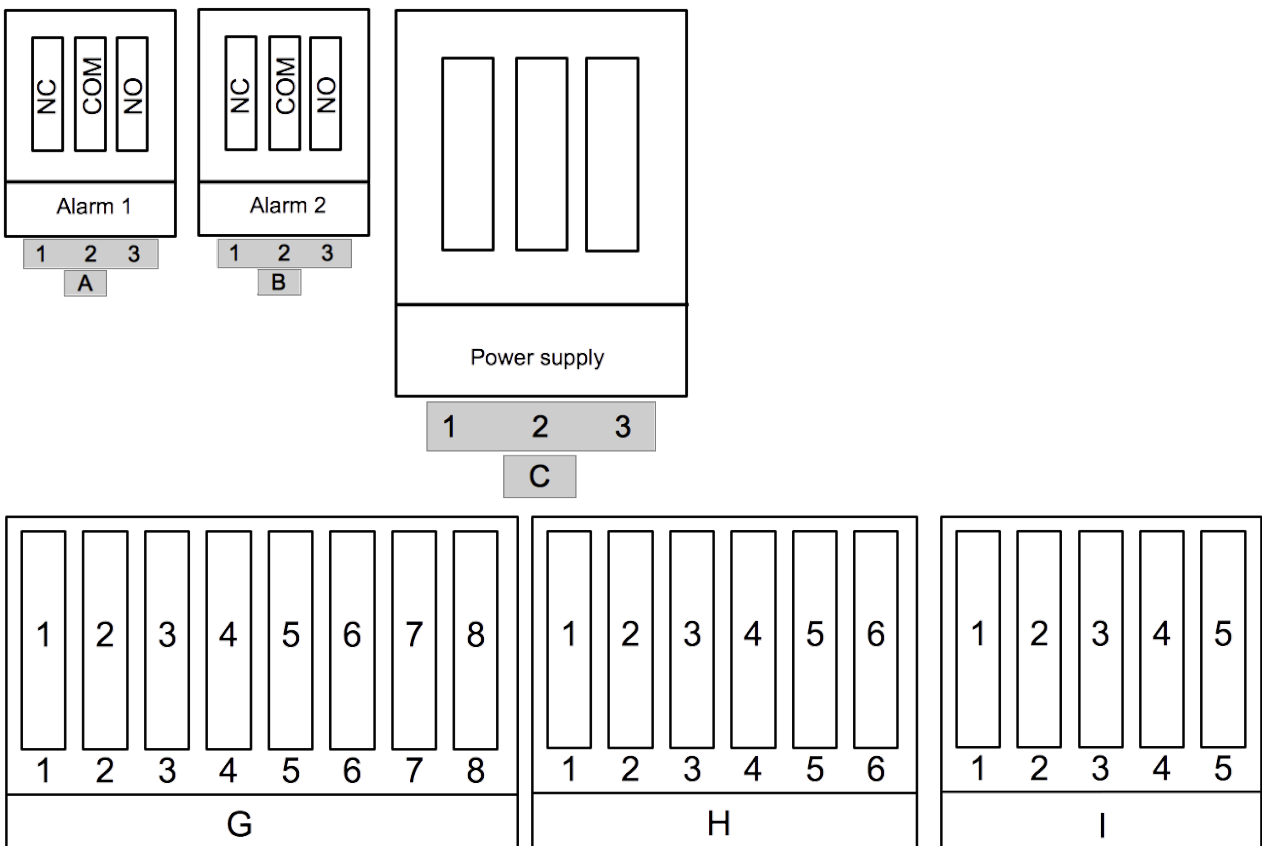
### 6.1 Installation Requirements

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 S320 must be fixed on the wall using suitable dowels and screws.

### 6.2 Electrical Connection

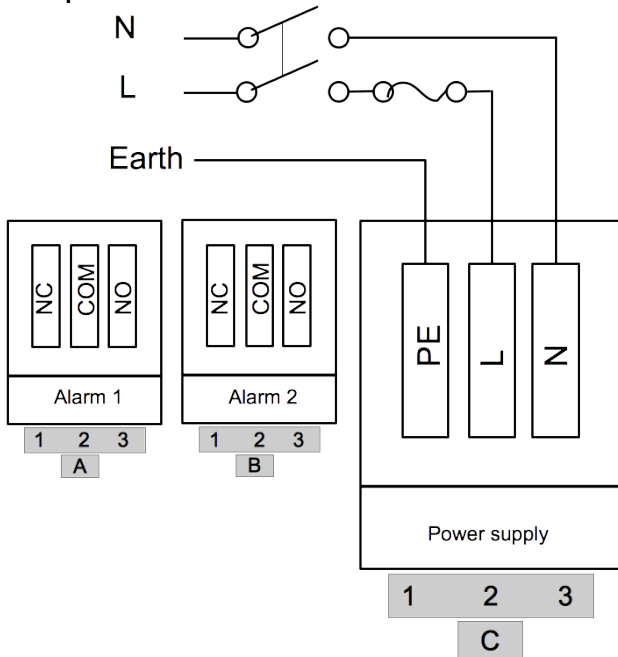
#### Terminal block layout at back side

The following diagram is the terminal block layout at S320 back side.

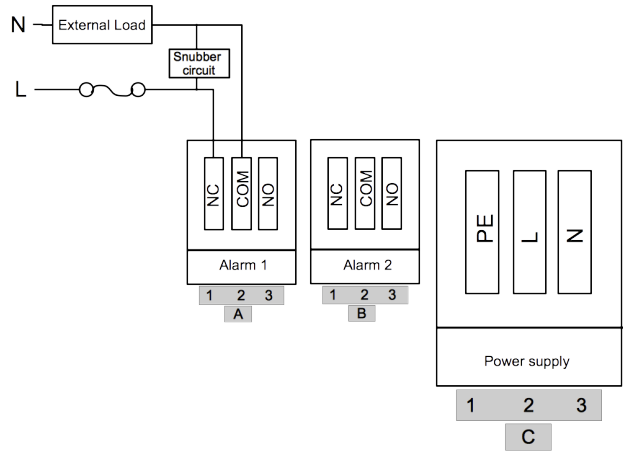


### 6.2.1 AC Power Supply and Alarm Connection (A1640)

AC power connection:

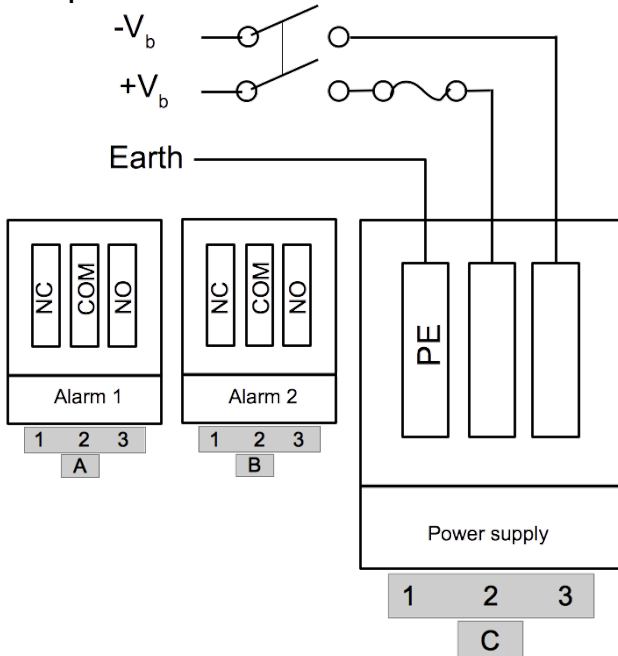


AC alarm connection:

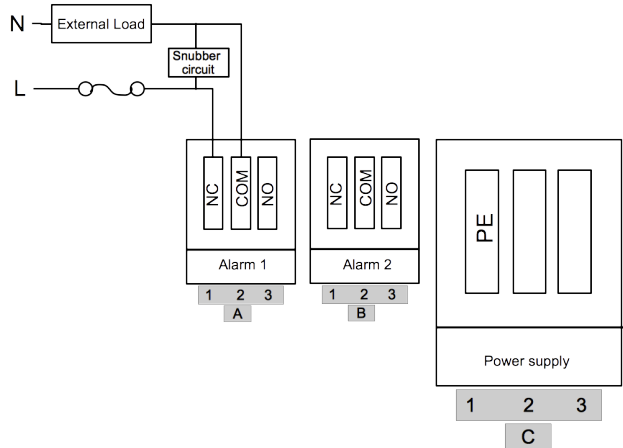


### 6.2.2 DC Power Supply and Alarm Connection (A1641)

DC power connection:



DC alarm connection:



### 6.2.3 Signals at Back Terminals

Terminal	Pin	Signal	Description
G	8	+V <sub>b</sub>	Positive sensor supply
	7	-V <sub>b</sub>	Negative sensor supply
	6	SDI	Digital communication signal from sensors
	5	Iin	4 ... 20 mA signal from sensor
	4	+P	Active pulse signal from flow sensor
	3	-V <sub>b</sub>	Negative signal connection to PLC
	2	Iout	4 ... 20 mA signal to PLC
	1	-V <sub>b</sub>	Negative signal connection to PLC
H	6	-V <sub>b</sub>	Negative signal connection to PLC
	2	-V <sub>b</sub>	Negative signal connection to PLC
	4	-V <sub>b</sub>	Negative signal connection to PLC
	3	-V <sub>b</sub>	Negative signal connection to PLC
	2	Piso	Isolated pulse output pin 2, NO
	1	Piso	Isolated pulse output pin 1, NO
I	5	+V <sub>b</sub>	Positive analog sensor supply
	4	-V <sub>b</sub>	Negative analog sensor supply
	3	+20 mA	Positive current input
	2	SGND	Signal ground (internally connected to -V <sub>b</sub> of terminal I)
	1	+10 V	Positive voltage input

#### Remarks

- In order to use the isolated pulse output at terminal H its required to have the active pulse output of the flow sensor connected to terminal G, pin 4.
- 4 ... 20 mA signals from flow sensor or dew point sensors can be looped through the G terminal pin 5 + 2. The external device (PLC or mA-meter) negative signal is connected to pin 1.
- Analog sensors are connectable to terminal I.

## 6.2.4 Connection of SUTO Sensors

### Connection via digital SDI input

S320		S401/ S421	S450/ S452	S430	S211*/S215 */S220*	S120/S130 /S132	Cable	
Terminal G	Pin	Signal	Pin	Pin	Pin	Pin	Color	
	1	-V <sub>b</sub>						
	2	I <sub>out</sub>						
	3	-V <sub>b</sub>						
	4	N/A						
	5	N/A						
	6	SDI	A.1	4	A.1	3	A.1	brown
	7	-V <sub>b</sub>	A.2	3	A.2	2	A.2	white
8	+V <sub>b</sub>	A.3	2	A.3	1	A.3	blue	

\* The dew point sensor type must be equipped with SDI: S699 1xxx or S699 2xxx.

### Connection via analog 4...20 mA input

S320		S401 / S421	S450/ S452	S430	S211*/S215* /S220*	S120/S130 / S132	S415/ S418	
Terminal I	Pin	Signal	Pin	Pin	Pin	Pin	Pin	
	1	V <sub>in</sub>						
	2	GND						
	3	I <sub>in</sub>	B.4	10	B.4	4	B.4	A.4
	4	-V <sub>b</sub>	B.5+A. 2* <sup>2</sup>	9+3* <sup>2</sup>	B.5+A. .2* <sup>2</sup>	2	B.5+B.2* <sup>2</sup>	A.1+A.2 * <sup>2</sup>
	5	+V <sub>b</sub>	A.3	2	A.3	3	B.3	A.3

\* The dew point sensor type must be 3-wire type: S699 2xxx.

\*<sup>2</sup> By connecting it like this, the isolated analog output becomes non-isolated, you have to bridge -V<sub>b</sub> and I- to connect it as 3-wire sensor.

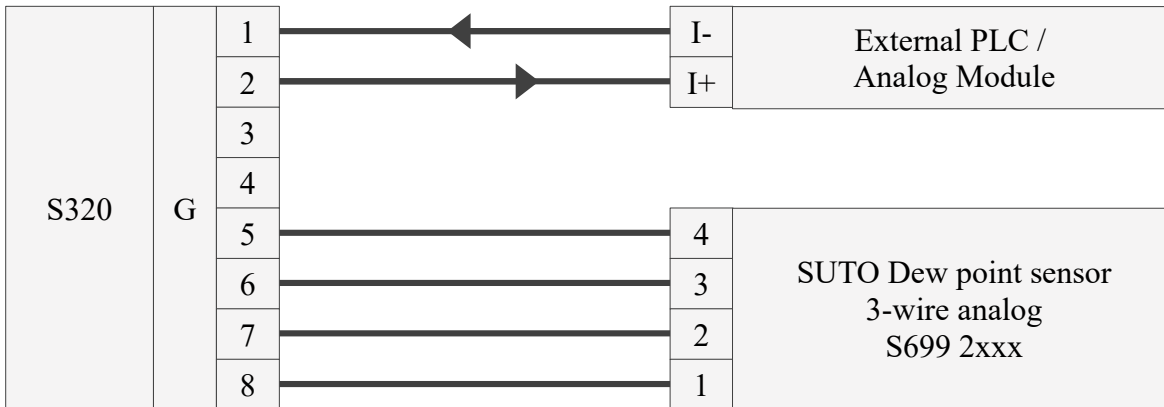
### Looping the analog output of SUTO dew point sensors to a PLC

It is possible to connect a SUTO dew point sensor via SDI to the S320 and at the same time use the analog output of the SUTO sensor to be connected to an external PLC or analog input card.

See the below connection table.

S320		S211*/S215*/S220*	External PLC / Analog Module	Cable	
Terminal G	Pin	Signal	Pin	Color	
	1	-V <sub>b</sub>		to I-/I <sub>out</sub> of PLC	
	2	I <sub>out</sub>		to I+/I <sub>in</sub> of PLC	
	3	-V <sub>b</sub>			
	4	N/A			
	5	I <sub>in</sub>	4		black
	6	SDI	3		brown
	7	-V <sub>b</sub>	2		white
	8	+V <sub>b</sub>	1		blue

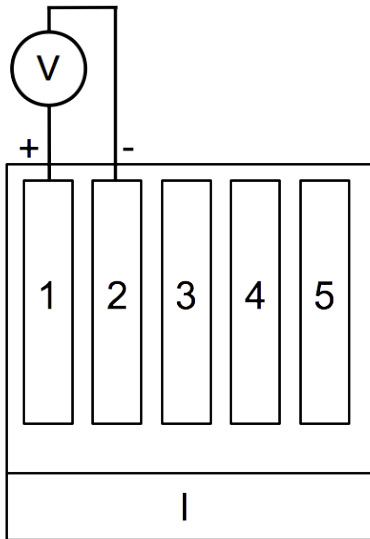
Connection Scheme



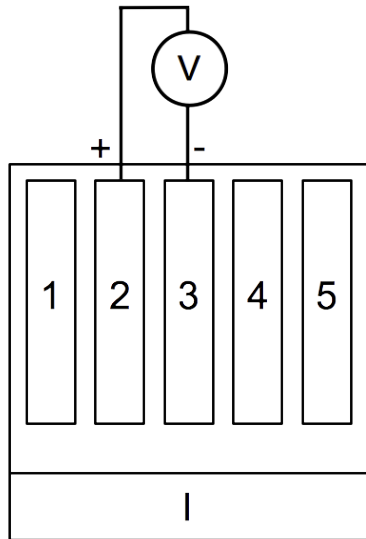
6.2.5 Connection of Third-Party Analog Sensors

S320		External analog sensor	
Terminal I	Pin	Signal	
	1	V <sub>in</sub>	Process signal Voltage (0... 1 V / 0... 10 V)
	2	GND	Signal ground (internally connected to I.4 -V <sub>b</sub> )
	3	I <sub>in</sub>	Current (0... 20 mA / 4... 20 mA)
	4	-V <sub>b</sub>	Negative Power supply connection
	5	+V <sub>b</sub>	Positive Power supply connection (24 VDC)

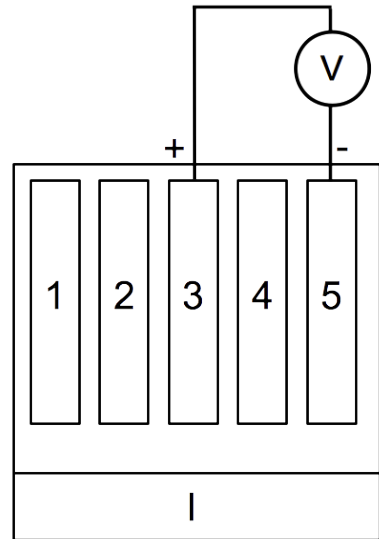
**A. Process voltage**  
input 0 ... 1 V or 0 ... 10 V



**B. Process current**  
input 0 ... 20 mA or 4 ... 20 mA



**C. loop powered 4 ... 20 mA sensor with supply from S320**



## 7 Configuration

The S320 is delivered with specific customer settings according to the order.

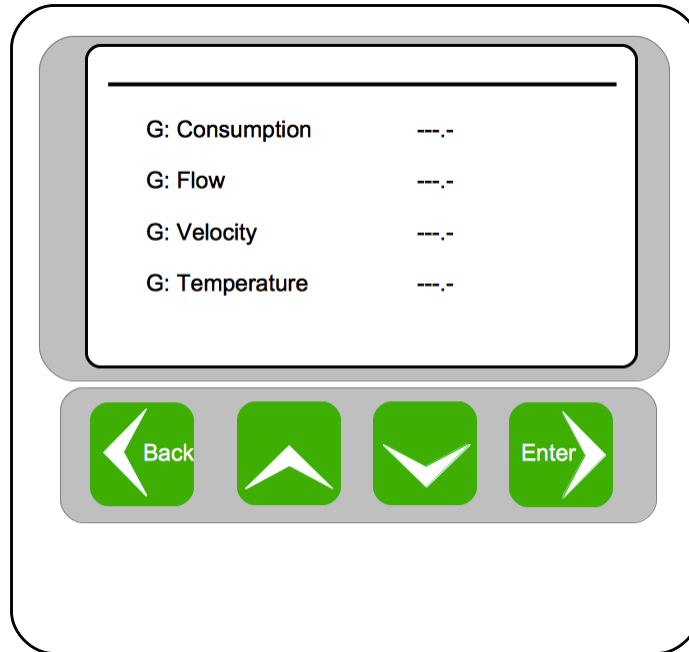
In order to simplify the user interface not all settings but most of it are accessible via the user interface, instead a PC software can be used. This software is called S4C which can be downloaded from the company web page.

To change certain or all settings by the user, S320 can be connected to the PC via the USB interface. After starting S4C all device settings are accessible.





All settings are stored permanently inside of the S320 and do not need to be entered again, unless the user wants some changes. Some setting for the dew point and flow sensor can also be done at the user interfacer of S320.

## 8 Operation

### 8.1 Description of Display Icons



The display can illustrate different measurement values like shown in the graphic. Please use the buttons for changing settings.

	<ul style="list-style-type: none"> <li>• Use this key to exit the current menu level.</li> <li>• Use it to leave all setting state without saving the change.</li> </ul>
 	<ul style="list-style-type: none"> <li>• Use this keys to browse and select different items in menu and scroll through different pages of measurement value display.</li> <li>• Use this key to alter or adjust the setting option or numbering.</li> </ul>
	<ul style="list-style-type: none"> <li>• Use this key to enter to submenu or next menu level of the current selected menu item.</li> <li>• To confirm the setting change or enable an option in all setting state.</li> </ul>

After pressing the enter button, different submenus can be selected. The particular submenus will be explained in the next chapters.

## 8.2 Sensor Setting

After selecting "Sensors" the next screen will show which kind of sensors are programmed at which terminal. Changes can be done individually for each sensor, by selecting the terminal where the sensor is connected to.

## 8.3 Alarm Setting

The S320 has two alarm relay outputs. It is possible to set the value and the direction of the value for "Alarm 1" and "Alarm 2".

## 8.4 System Status and Settings

Please press the "System" button for the following submenus:

**Device Info** It will show different system information like device type, device serial number, firmware version, hardware version etc.

**LCD Contrast** Contrast of the display can be changed.

**Reset** In case sensors have been changed its recommended to use this function in order to update system settings.

**Language** Please choose the desired language.

## 8.5 Service Setting

Contact information of service company can be set in this submenu.

# 9 Signal Input

## 9.1 Digital Input

The display has one sensor input for SUTO flow / dew point sensor.

## 9.2 Analog Input

The display has one analog input for SUTO pressure / temperature sensor or further sensors (0 ... 20 mA / 4 ... 20 mA / 0 ... 10 V).



## 10 Signal Outputs

### 10.1 Alarm Output

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

## 11 Optional Extra Accessories

The following extra accessories are optional:

- Sensor cable 5 m with M12 connector, open wire.
- Sensor cable 10 m with M12 connector, open wire.
- Power cable with mains plug, 1.8 m.

## 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.





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