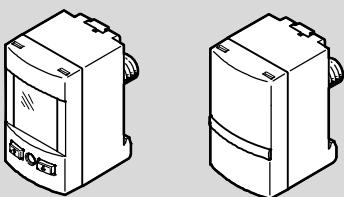


# Pressure sensor SPAU



**FESTO**

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Operating instructions  
8001199  
1410NH  
[8041211]

Original: de



**Pressure sensor SPAU ..... English**

## 1 Product description

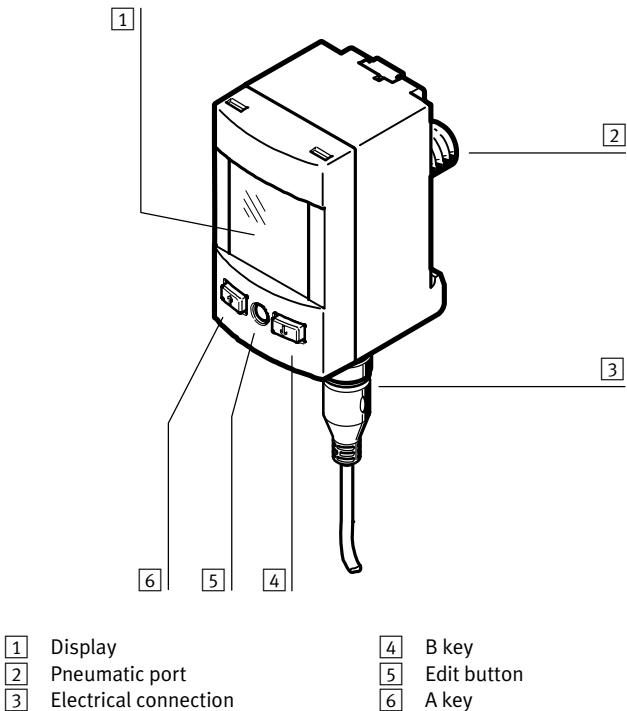
The operating instructions describe the entire function range. The function range is limited, depending on the product variant.

### → Note

You can find detailed specifications for the product, the device description file (IODD) with a description of the IO-Link parameters and the declaration of conformity at: → [www.festo.com](http://www.festo.com).

## 1.1 Overview

### Display variant without front panel mounting<sup>1)</sup>



- [1] Display
- [2] Pneumatic port
- [3] Electrical connection
- [4] B key
- [5] Edit button
- [6] A key

<sup>1)</sup> Representation of other variants can deviate from this.

Fig. 1

## 1.2 Characteristics

Characteristic	Code	Specification
Type	SPAU	Pressure sensor
Pressure measuring range	-B2, -B11, -P025, -P05, -P1, -P2, -P6, -P10, -P12, -P16, -V025, -V05, -V1	→ Technical data
Supply port	R	Relative pressure
Type of mounting	-T -H -W -A -F	Threaded mounting H-rail mounting Wall mounting Mounting bracket Front panel mounting

Characteristic	Code	Specification
Pneumatic port	-G18, -R18, N18, -R14, -M5, -M7 -Q4, -Q6, -T532	Thread G 1/8, R 1/8, NPT 1/8, R 1/4, M 5, M 7 Plug connector 4 mm, 6 mm, 5/32
Thread type	M F	None Male thread Female thread
Outlet direction	D	Rear Underneath
Display	-L	None LCD, backlit
Electrical output 1	-PNLK -LK	Switching output PNP / NPN / IO-Link IO-Link
Electrical output 2	-PNVBA -V -B -A	PNP / NPN / 0...10 V / 1...5 V / 4...20 mA 0...10 V 1...5 V 4...20 mA
Electrical connection	-M8 -M12	M8 plug Plug M12, A-coded
Electrical outlet direction	D U	Rear Underneath On top
Electrical accessories	+2.5A +2.5S +5A +5S	None Angled socket, 2.5 m cable Straight socket, 2.5 m cable Angled socket, 5 m cable Straight socket, 5 m cable
Protective devices	G	None Safety guard
Certificate	T	None Test report

Fig. 2

## 2 Function and application

The pressure sensor SPAU is intended for monitoring pressure in the piping. The sensor converts pneumatic pressure values (relative pressure) into electrical signals, which can be used for control or regulating functions. Measurements are carried out using a piezoresistive sensor element with a following electronic evaluation unit. Interfacing to the higher-level system is provided by 1 or 2 switching outputs, an analogue output and/or an IO-Link interface. The switching outputs can be configured for monitoring of a threshold value, a pressure range or a differential pressure. For each output, PNP or NPN and normally open (NO) or normally closed (NC) can optionally be set. Via the IO-Link interface, process values can be read out and parameters changed and transmitted to additional devices.

### 2.1 Operating statuses

Operating status	Function
RUN mode	– Initial status after switching on the operating voltage – Display of the current measured value
SHOW mode	– Display of the current settings
EDIT mode	– Setting or modification of parameters
TEACH mode	– Acceptance of the current measured value to determine switching points

Fig. 3

### 2.2 Switching functions

#### Threshold value comparator for monitoring of a pressure threshold

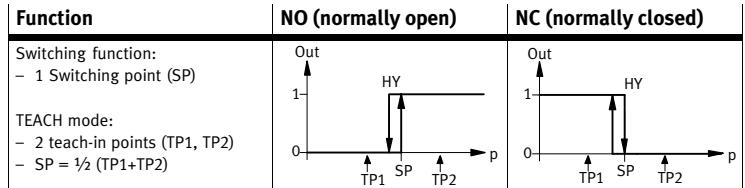
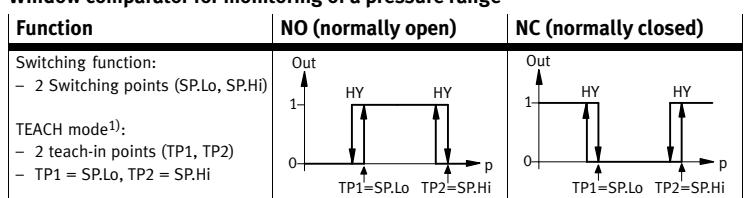


Fig. 4

#### Window comparator for monitoring of a pressure range



<sup>1)</sup> SP.Lo = smaller pressure/vacuum value, SP.Hi = larger pressure/vacuum value, dependent on the Teach sequence

Fig. 5

## Auto difference monitoring

With the auto difference monitoring function, a change in pressure from a reference value is detected. As a result, a maximum permissible pressure drop can be monitored, for example.

If the input variable is in the work range between [SP.Hi] and [SP.Lo] and is constant, its value is set automatically as the reference value  $P_{Ref}$ . The output switches.

A constant input variable is present if the signal change is less than 0.2 % FS during the set observation time [ $t_{obs}$ ].

The parameter [d.SP] establishes the permissible deviation of pressure from the reference value and thus the monitoring range. If pressure exceeds or falls below [d.SP], the output switches back.

Function	NO (normally open)	NC (normally closed)
Switching function: – 2 switching points (SP.Lo, SP.Hi) for setting the valid work range		
TEACH mode <sup>1)</sup> : – 2 teach-in points (TP1, TP2) – TP1 = SP.Lo, TP2 = SP.Hi		

1) SP.Lo = smaller pressure value, SP.Hi = larger pressure value, independent of the Teach sequence

Fig. 6

## 3 Requirements for product use

- Only use the product in original status, without any unauthorised modifications.
- The product is intended for use in industrial environments. Measures may need to be implemented in residential areas for radio interference suppression.
- Take into consideration the ambient conditions at the location of use.
- Operate the product only with compressed air of the specified air quality class (→ Technical data).
- Remove all transport packaging. The material used in the packaging has been specifically chosen for its recyclability.
- Accessories → [www.festo.com/catalogue](http://www.festo.com/catalogue).

## Range of applications and certifications

In combination with the UL mark on the product, the information included in this section is also applicable for compliance with the certification requirements of Underwriters Laboratories Inc. (UL) for USA and Canada. Observe the following English-language remarks from UL:

### UL approval information

Product category code	QUYX, QUYX7
File number	E322346
Considered standards	UL 61010-1, CAN/CSA-C22.2 No. 61010-1
UL mark	

Fig. 7

Only for connection to an NEC/CEC Class 2 supply.

Raccorder uniquement à un circuit NEC/CEC Classe 2.

### Electrical and environmental ratings

Input voltage	max. 30 V DC, Class 2
Input current	max. 0.24 A
Power	max. 7.2 W
Pressure differential	max. 1.6 MPa
Ambient temperature	max. 50 °C / 122 °F
Pollution degree	3
Humidity range	93 %
Only for indoor use.	
Altitude up to 2000 m. Altitude up to 2000 m or above 2000 m if specified by the manufacturer.	

Fig. 8

### Warning

Unit shall be supplied by a power source which complies with the requirements of a limited-energy circuit in accordance with IEC/EN/UL/CSA 61010-1 or a Limited Power Source (LPS) in accordance with IEC/EN/UL/CSA 60950-1 or IEC/EN/UL/CSA 62368-1 or a Class 2 circuit in accordance with NEC or CEC.

## 4 Installation

### Note

Installation and commissioning are to be carried out only by qualified personnel in accordance with the operating instructions.

### 4.1 Mechanical and pneumatic

### Note

An unfavourable mounting position can impair the function of the product.

- Mount the sensor so that no condensation from the compressed air lines can gather in the device.
- Install the sensor so that it cannot be heated above the maximum permissible operating temperature (plan for convection possibilities).

### SPAU-...-T

- Seal connecting thread.

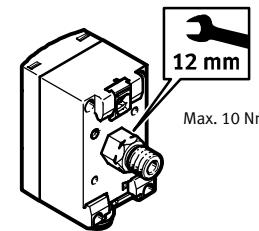


Fig. 9

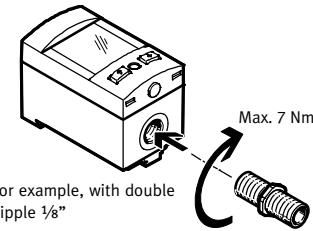


Fig. 10

### SPAU-...-H

### SPAU-...-A

- Mounting bracket hole pattern → Fig. 29

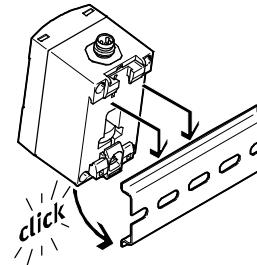


Fig. 11

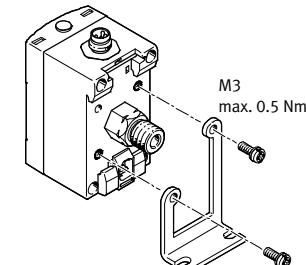
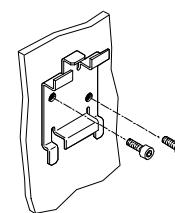


Fig. 12

### SPAU-...-W

- Wall mounting hole pattern → Fig. 30

1.



2.

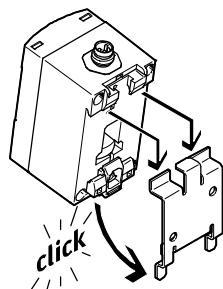


Fig. 13

### SPAU-...-F

- Size of the front panel cut-out in mm → Fig. 14
- Guide sensor from the front into the cut-out on the front panel.
- Attach the clamping plate and press until the fastening slide clips in.

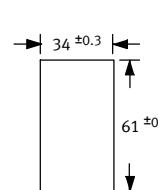


Fig. 14

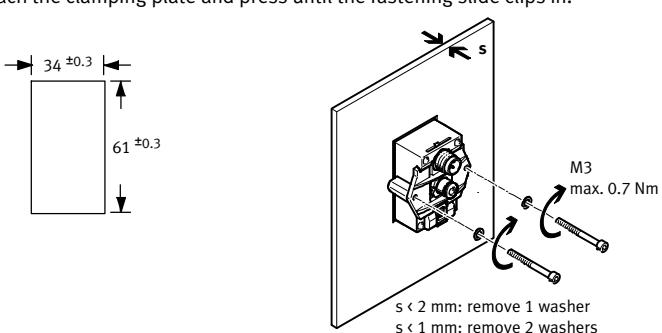


Fig. 15

## 4.2 Electric



### Warning

Use only power sources which guarantee reliable electrical isolation of the operating voltage in accordance with IEC/EN 60204-1. Consider also the general requirements for PELV circuits in accordance with IEC/EN 60204-1.

- Connecting the sensor.
- Consider the maximum permissible line length: 30 m (20 m for IO-Link).
- Maximum tightening torque of plug connector: M8 = 0.3 Nm, M12 = 0.5 Nm

Pin	Allocation	Plug connector
1	Operating voltage +24 V	M8 x 1
2	Switching output OutB or analogue output OutD	
3	0 V	
4	Switching output OutA or IO-Link (C/Q line)	M12A x 1 

Fig. 16

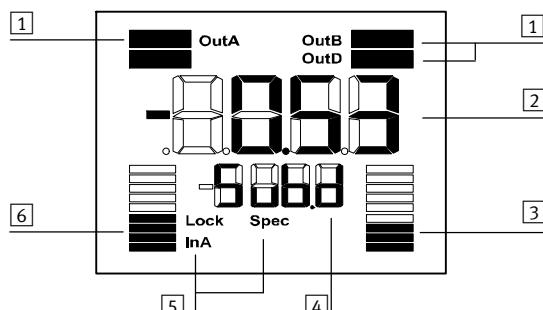
### Circuit diagrams

SPAU-...-L-...	SPAU-...-LK-V-.../SPAU-...-LK-B-...	SPAU-...-LK-A-...
With display	Without display, analogue voltage output on pin 2	Without display, analogue current output on pin 2

Fig. 17

## 5 Commissioning

### 5.1 LCD display



- |     |   |
|-----|---|
| [1] | Output display  |
| [2] | Measured value indicator / menu   |
| [3] | Bar graph for analogue output (only visible for scaled analogue output) |
| [4] | Unit (default) / submenu / threshold value                              |
| [5] | Information / input display   |
| [6] | Bar graph for input signal  |

Fig. 18

Example for LCD display	Significance
<b>Output display</b>	
[OutA]	Switching output OutA selected
[OutA]	Switching output OutA set
[OutB]	Switching output OutB selected
[OutB]	Switching output OutB set
[OutD]	Analogue output OutD selected
<b>Information / input display</b>	
[InA]	Input signal InA: Graphic display of the current measured value related to the maximum measured value of the measuring range
	Analogue output OutD with activated scaling
[Lock]	Security code activated
[Spec]	Special menu activated

Fig. 19

Example for LCD display	Significance
<b>Measured value indicator and unit in the RUN mode</b>	
[−0.53]	[bar] Measured value indicator (here negative value) and unit
<b>Menu and submenu for the switching outputs (OutA and OutB)</b>	
[Edit]	[bin] Edit menu for the switching outputs (binary)
	[Fctn] Determination of the switching function: threshold value comparator
	[Fctn] Determination of the switching function: window comparator
	[Fctn] Determination of the switching function: auto difference monitoring
[0010]	[SP] Value of switching point (only for threshold value comparator)
[0010]	[SP.Lo] Value of lower switching point (only for window comparator and auto difference monitoring)
[0100]	[SP.Hi] Value of upper switching point (only for window comparator and auto difference monitoring)
[0010]	[HY] Value of hysteresis (not for auto difference monitoring)
[18]	[t.obs] Time interval for determination of the reference value with auto difference monitoring
[0008]	[d.SP] Threshold value of the differential pressure with auto difference monitoring
[NO]	[logic] Switching characteristics of the switching outputs: [NO] = normally open, [NC] = normally closed
	[COLR] Display colour: [bLUE] = Blue, colour change function deactivated [R.ON] = Red, if switching output set [R.OFF] = Red, if switching output not set Note: Independent of the settings [COLR], the red colour change appears with some malfunctions.
[0010]	[MIN] Minimum measured pressure since switch-on or the last reset
[0100]	[MAX] Maximum measured pressure since switch-on or the last reset
<b>Menu and submenu for the analogue output (OutD)</b>	
[Edit]	[ANLG] Edit menu for the analogue output
[93]	[In.Hi] [%] Scaling of the analogue output in percent of the final value of the pressure measuring range (FS - full scale)
[3]	[In.Lo] [%] Scaling of the analogue output in percent of the initial value of the pressure measuring range (offset)
[1_5]	[Out] [V] Output function of the analogue output, can be switched between [0_10 V], [1_5 V], [4_20 MA]
<b>Menu and submenu for the special menu (Spec)</b>	
[Edit]	[MENU] Edit menu for additional settings
[20]	[Filt] / [MSEC] Value of the filter time constant for the measurement signal InA
[bar]	[Unit] Unit for the pressure indicator
[OFF]	[Z.Adj] [OFF] = zero point synchronisation (zero adjust) deactivated [ON] = offset correction for measured value indicator, switching points and analogue output possible
[Unit]	[Sub.d] Display of the submenu (sub-display) in the RUN mode: selected unit or switching point from OutA
[50]	[Eco] Economy mode: period after which the display background lighting is switched off
[PNP]	[Out] / [bin] Shift of the switching outputs (binary) between PNP and NPN
[bin]	[Pin2] / [Out] Shift between switching output (binary) and analogue output at Pin2
[OFF]	[Code] Activation and determination of the security code
[OFF]	[MASt] Activation of the IO-Link master function for replication of parameters

Fig. 20



### Note

For device variants without LCD display:

- LED illuminated green: normal operation
- LED illuminated or flashes red: malfunction

### 5.2 Switch on sensor (RUN mode)

- Switch on the operating voltage.  
→ Current measured value is displayed. The sensor is in the basic status (RUN mode).

The basic status can be reached from other modes by:

- pressing edit button for 3 seconds
- expiration of a monitoring time (Timeout)

### 5.3 Displaying parameters (SHOW mode)

Requirement: The sensor is ready for operation (RUN mode).

### Switching output OutA

- Press A key.  
→ The first parameter set is displayed. [Fctn] flashes.
- The subsequent parameters can be displayed by repeatedly pressing the A key (→ Fig. 21).

#### **Switching output OutB or analogue output OutD**

- Press B key.  
→ The first parameter set is displayed. [Fctn] at OutB or [In.Hi] at OutD flashes.

The subsequent parameters can be displayed by repeatedly pressing the B key (→ Fig. 21).

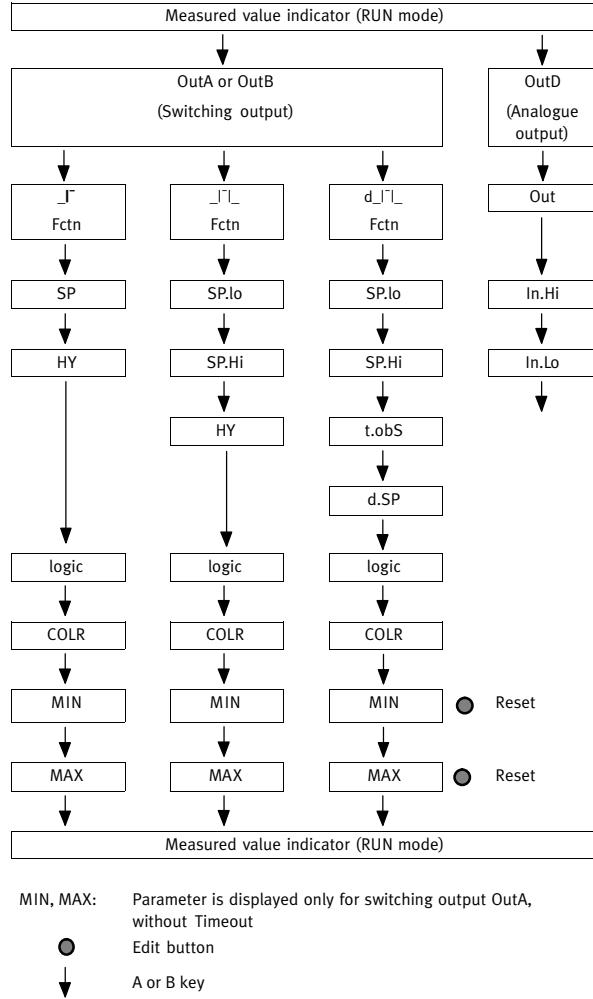


Fig. 21

#### **5.4 Configuring switching output (EDIT mode)**

The process is the same for configuring the switching outputs for OutA and OutB. In the following, the process is described using the switching output OutA. Menu structure → Fig. 23

Requirement: The sensor is ready for operation (RUN mode).

## Enter the security code

If the security code is activated, the parameter entry option is blocked: [Lock flashes].

- Enter security code set with A or B key.
  - Press the Edit button briefly.  
→ The parameter entry option is unblocked

Set threshold value comparator  $\lceil$  or window comparator  $\lceil$

1. Press the Edit button briefly.  
→ [Edit] appears. [OutA] flashes.
  2. Press the Edit button briefly.  
→ [Fctn] flashes.
  3. With A or B key, select  $\underline{\underline{I}}$  or  $\underline{\underline{I'}}$ .
  4. Press the Edit button briefly.  
→ The next adjustable parameter flashes.
  5. With A or B key, select the parameter or value.
  6. Repeat points 4 and 5 until all parameters are set.

## **Set auto difference monitoring d\_ITI**

1. Press the Edit button briefly.  
→ [Edit] appears. [OutA] flashes.
  2. Press the Edit button briefly.  
→ [Fctn] flashes.
  1. With A or B key, select d\_I^-I\_.  
2. Press the Edit button briefly.  
→ [SP.Lo] flashes.
  3. Set the value for the switching point with A or B key.
  4. Press the Edit button briefly.  
→ [SP.Hi] flashes.
  5. Set the value for the switching point with A or B key.
  6. Press the Edit button briefly.  
→ [t.obS] flashes.
  7. With A or B key, select the time interval.
  8. Press the Edit button briefly.  
→ [d.SP] flashes.
  9. With A or B key, select the differential pressure.
  10. Press the Edit button briefly.  
→ [logic] flashes.
  11. Additional settings → Fig. 23.

## 5.5 Change device settings (EDIT mode)

Requirement: The sensor is ready for operation (RUN mode).

If the security code is activated, the parameter entry option is blocked: [Lock] flashes.

- Enter the security code (→ Chap. 5.4)

1. Press the Edit button briefly.  
→ [Edit] appears. [OutA] flashes.
  2. With A or B key, select special menu [Spec].  
→ [Spec] flashes.
  3. Press the Edit button briefly.  
→ [Filt] flashes.
  4. With A or B key, select the parameter or value.
  5. Press the Edit button briefly.  
→ The set value is saved  
→ The next adjustable parameter flashes.
  6. Repeat points 4 and 5 until all parameters are set.

## 5.6 Replicating parameters (EDIT mode)

## Requirement

- The pre-configured sensor (master sensor) is ready for operation (RUN mode).
  - The master sensor is connected with the device sensor (→ Fig. 22).
  - Parameterisation of the device sensor must not be blocked via IO-Link.
  - The device sensor is in an unswitched status (switching output PNP, display OutA off).

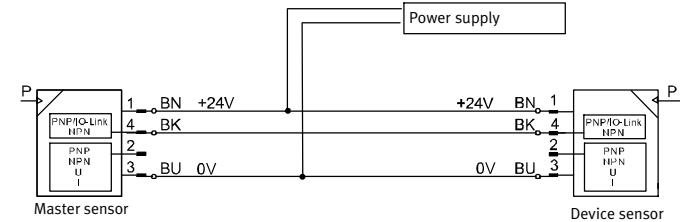
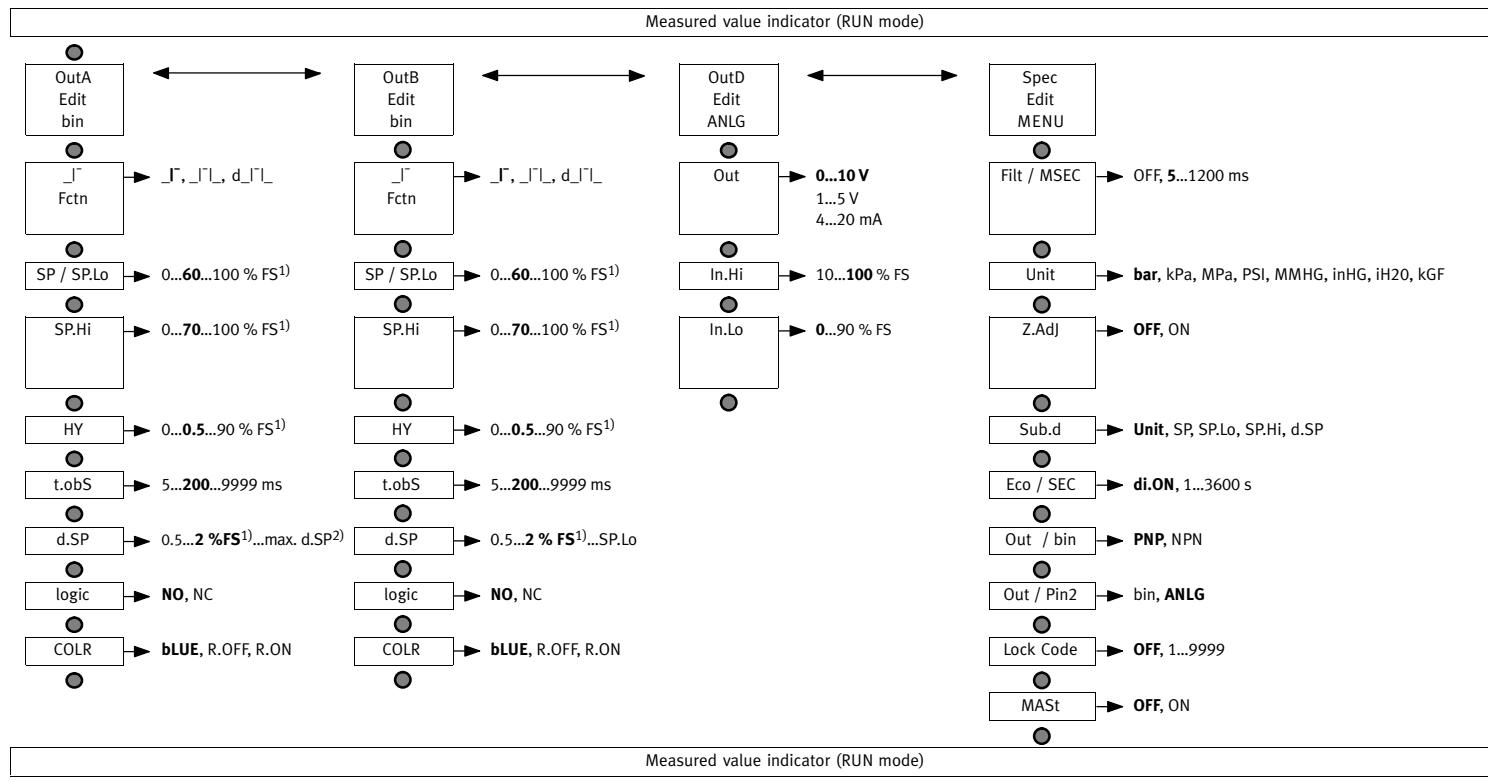


Fig. 22

1. Select special menu [Spec] at the master sensor.
  2. Press the Edit button briefly until [MASt] appears.
  3. With A or B key, select [ON].  
→ [REPL] / [RedY] appears.
  4. Press A or B key.
    - [REPL] / [RUN] appears briefly.
    - The parameters are transmitted to the device sensor.
    - [REPL] / [RedY] appears.If an error occurs, an error message appears (→ Fig. 24).
  5. Repeat point 4 if an additional sensor should be parameterised.
  6. Press the Edit button briefly.  
→ Switch to the RUN mode.

## 5.7 Menu structure

Fig. 23 shows the complete menu structure. Some menu options or setting values are not applicable, depending on the selected switching function.



- = Edit button
- = A or B key
- bold** = factory setting

1) The values refer to the respective measuring range. The display takes place in the selected unit.  
2) The maximum value depends on SP.Lo and SP.Hi.

Fig. 23

## 5.8 Zero point synchronisation (zero adjust)

Requirement:

- The sensor is ready for operation (RUN mode).
- [Z.Adj][ON] is set (→ Chap. 5.5).
- The measured value lies in the range 0 bar ± 3 % FS.

- Press the A and B key and Edit button simultaneously.
- [OK] appears. The zero point synchronisation was successful.
- [FAIL] appears. The zero point synchronisation was not successful. Check requirements.

### Note

If [Z.Adj][OFF] is set for a later time, the device takes over the factory setting calibration values.

## 5.9 Teach switching points (Teach mode)

### Note

The process for teaching is the same for configuring the switching outputs for OutA and OutB. In the following, the process is described using the switching output OutA.

Requirement: The sensor is ready for operation (RUN mode).

If the security code is activated, the parameter entry option is blocked: [Lock] flashes.

- Enter the security code (→ Chap. 5.4).

1. Establish switching function in the EDIT mode (→ Chap. 5.4).
2. Create pressure value 1.
3. Press the A key and Edit button.
  - The current pressure value will then be adopted as the first teach point (TP1).
  - [t-IN] flashes.
4. Create pressure value 2.
5. Press the A key and Edit button.
  - The current pressure value is adopted as the second teach point (TP2).
  - Switch to the RUN mode.

There is no Timeout in the TEACH mode. The sensor changes to the RUN mode only after the entire teach process is ended.

## 6 Operation



### Caution

Property damage due to high temperatures.

Extreme pneumatic conditions (high cycle rate with large pressure amplitude) can heat the product above 80 °C.

- Select the operating conditions (in particular the ambient temperature, pressure amplitude, cycle rate, current consumption) such that the product does not heat up above the maximum permitted operating temperature.

### Restoring factory settings (restore)

### Note

By resetting to factory settings, the current settings are lost.

1. Switch off the operating voltage.
2. Keep the A and B keys pressed down simultaneously.
3. Switch on the operating voltage.
4. Additionally press the Edit button.
  - [Rsto PARM] appears. All parameters are reset to the factory settings (→ Fig. 23).

## 7 Maintenance and care

1. Switch off the energy sources (operating voltage, compressed air).
2. Clean sensor with non-abrasive cleaning agents.

## 8 Disassembly

1. Switch off the energy sources (operating voltage, compressed air).
2. Separate connections from the sensor.
3. Loosen the mountings.

## 9 Fault clearance

Malfunction	Possible cause	Remedy
No display	No operating voltage or impermissible operating voltage	• Apply permissible operating voltage
	Electrical connections swapped	• Connect the device in accordance with the circuit diagram
	Device defective	• Replace device
Display or switching output does not react in accordance with the settings	Short circuit or overload at the output	• Eliminate short circuit or overload
	Incorrect switching point taught (e.g. at 0 bar)	• Repeat teaching procedure
	Device defective	• Replace device
<b>Device variants with LCD display</b>		
[Er_1] / [FAIL] <sup>1)</sup>	Device error	• Replace device
[Er_2] / [ASIC] <sup>1)</sup>	Device error	• Replace device
[Er10] / [OVER] <sup>2)</sup>	Measuring range exceeded	• Comply with the measuring range
[Er17] / [SUPL] <sup>2)</sup>	Undervoltage	• Apply permissible operating voltage
[Er20] / [TEMP] <sup>2)</sup>	Temperature error	• Check operating conditions • Replace device
[Er21] / [SHRT] <sup>2)</sup>	Short circuit at OutA	• Eliminate short circuit
[Er22] / [SHRT] <sup>2)</sup>	Short circuit at OutB	• Eliminate short circuit
[Err] / [BUSY]	C/Q busy	• Check device settings
[Err] / [ID]	Device ID error, replication function failed	• When replicating, use sensors with the same pressure range (same device ID)
[Err] / [COMM]	IO-Link communication error	• Check the C/Q line
<b>Device variants without LCD display</b>		
LED flashes red	Device error	• Replace device
LED illuminated red	Temperature error, undervoltage, measuring range exceeded, short circuit	• Check operating conditions

1) Display flashes red

2) Display illuminated red

Fig. 24

## 10 Technical data

### SPAU-

#### General

Certification	RCM Mark, c UL us – Listed (OL)
CE marking (→ Declaration of conformity)	In accordance with EU EMC directive
Note on materials	RoHS-compliant

#### Input signal / measuring element

Operating medium	Compressed air in accordance with ISO 8573-1:2010 [7:4:4]; inert gases, operation with lubricated medium possible
------------------	---

Temperature of medium [°C]	0 ... +50
----------------------------	-----------

Ambient temperature [°C]	0 ... +50
--------------------------	-----------

Max. permissible relative air humidity [%RH]	93
--	----

Max. current consumption [mA]	240
-------------------------------	-----

#### Output, general

Accuracy	
– P16 [% FS]	±2 at room temperature
– B2, B11, V1, P1, P2, P6, P10, P025, P05, V025, V05, P12 [% FS]	±1.5 at room temperature
– B2, B11, V1, P1, P2, P6, P10 [% FS]	±3 in the entire temperature range
– P025, P05, V025, V05, P12, P16 [% FS]	±4 in the entire temperature range

Repetition accuracy [% FS]	±0.3 (short-time), with Filt = OFF
----------------------------	------------------------------------

Temperature coefficient [% FS/K]	Typically 0.05
----------------------------------	----------------

#### Switching output

Switch-on time [ms]	Max. 4.4
---------------------	----------

Switch-off time [ms]	Max. 5.3
----------------------	----------

Max. output current [mA]	100
--------------------------	-----

Capacitive load maximum DC [nF]	100
---------------------------------	-----

Voltage drop [V]	Max. 1.6
------------------	----------

Pull-down/pull-up resistor	PNP: integrated; NPN: not integrated
----------------------------	--------------------------------------

Inductive protective circuit	On hand
------------------------------	---------

#### Analogue output

Output characteristic curve initial value ... final value	
---	--

– SPAU-...V [V]	0 ... 10
-----------------	----------

– SPAU-...B [V]	1 ... 5
-----------------	---------

– SPAU-...A [mA]	4 ... 20
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Rise time [ms]	3, at [Filt] = [OFF]
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Max. load resistance of current output (SPAU-...A)	500
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Min. load resistance of voltage output (SPAU-...V, SPAU-...B)	2.5
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#### Output, additional data

Protection against short circuit	Yes
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Overload protection	On hand
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### SPAU-

#### Electronics

Operating voltage range DC [V]	20 ... 30
Idle current [mA]	Typically 35
Ready-state delay [ms]	Typically 160
Protection against incorrect polarity	All connections against each other
<b>Mechanical system</b>	

#### Mounting position

Mounting position	Any, avoid condensation gathering in the sensor
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#### Housing material

Housing material	PA reinforced
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#### Keyboard material

Keyboard material	TPE-O
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#### Plug housing material

Plug housing material	Brass (nickel-plated)
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#### Display / operation

Displayable units	bar, kPa, MPa, psi, mmHg, inchHg, inchH <sub>2</sub> O, kgf/cm <sup>2</sup>
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#### Threshold value setting range % FS

Threshold value setting range % FS	0 ... 100 (recommended range 1 ... 99)
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#### Threshold value setting range, auto difference monitoring % FS

Threshold value setting range, auto difference monitoring % FS	0.5 ... 100
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#### Hysteresis setting range % FS

Hysteresis setting range % FS	0 ... 90
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#### Immission / emission

Storage temperature [°C]	-20 ... +80
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#### Degree of protection (in accordance with EN 60529)

– SPAU-...T/H/W/A...	IP65/IP67
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#### – SPAU-...F...

– SPAU-...F...	IP65
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#### Protection class (in accordance with DIN VDE 0106-1)

Protection class (in accordance with DIN VDE 0106-1)	III
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#### Resistance to shocks (in accordance with EN 60068-2)

Resistance to shocks (in accordance with EN 60068-2)	30 g acceleration with 11 ms duration (half-sine)
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#### Vibration resistance (in accordance with EN 60068-2)

Vibration resistance (in accordance with EN 60068-2)	10 ... 60 Hz: 0.35 mm / 60 ... 150 Hz: 5 g
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SPAU-	-B2	-B11	-V025	-V05	-V1	-P025	-P05
Pressure measuring range [bar]	-1				0		
Initial value [MPa]	-0.1				0		
Pressure measuring range [bar]	1	10	-0.25	-0.5	-1	0.25	0.5
Final value [MPa]	0.1	1	-0.025	-0.05	-0.1	0.025	0.05
Overload range [bar]					-1		
Initial value [MPa]					-0.1		
Overload range [bar]	5	15	1	2	5	1	2
Final value [MPa]	0.5	1.5	0.1	0.2	0.5	0.1	0.2

SPAU-	-P1	-P2	-P6	-P10	-P12	-P16
Pressure measuring range [bar]				0		
Initial value [MPa]				0		
Pressure measuring range [bar]	1	2	6	10	12	16
Final value [MPa]	0.1	0.2	0.6	1	1.2	1.6
Overload range [bar]				-1		
Initial value [MPa]				-0.1		
Overload range [bar]	5	6		15		20
Final value [MPa]	0.5	0.6		1.5		2.0

Protocol version	Device V1.1
Profile	Smart sensor profile
Function classes:	0x8000, 0x8001, 0x8002, 0x8003, 0x8004
Communication mode	COM2 (38,4 kBaud)
Port class	A
Process data length IN	2 byte
Process data content	2 bit BDC (Pressure monitoring) 14 bit PDV (Pressure measured value)
IODD, IO-Link device description	→ www.festo.com/sp

#### IO-Link

Protocol version	Device