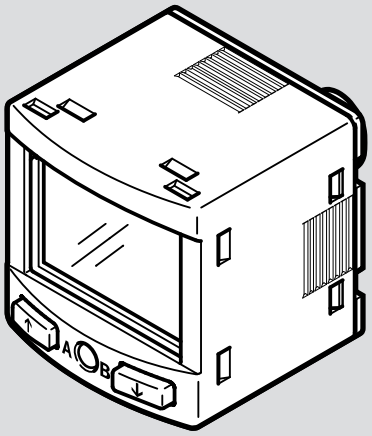
SPAN
Pressure sensor



FESTO

Operating instruction

8225842

8225842
2025-05b
[8225844]

Original instructions

Table of contents

1 Applicable documents

All available documents for the product ➔ www.festo.com/sp.

2 Safety

2.1 Safety instructions

- Only use the product in its original condition without unauthorised modifications.
- Only use the product if it is in perfect technical condition.
- Observe the identifications on the product.
- Before working on the product, switch off the compressed air supply and lock it to prevent it from being switched on again.
- Only use media in accordance with the specifications.

2.2 Intended use

The sensor monitors the pressure of compressed air and inert gases in the piping system.

2.3 Training of qualified personnel

Work on the product may only be carried out by qualified personnel who can evaluate the work and detect dangers.
The qualified personnel have skills and experience in dealing with electropneumatic (open-loop) control technology.

2.4 UL/CSA certification

In combination with the UL inspection mark on the product, the information in this section must also be observed in order to comply with the certification conditions of Underwriters Laboratories Inc. (UL) for USA and Canada.

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

Tab. 1: UL/CSA certification information

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

2.5 Cyber security measures

The product has a protected service interface that uses the existing connection cables.
Accidental or improper execution of functions on the product can lead to failure or malfunction of the product and thus the entire connected system.
In addition, unauthorised access to information stored on the product may be

possible. The system operator must therefore take appropriate measures to prevent accidental or improper access to the product. Cyber security information ➔ www.festo.com/psirt.

3 Additional information

- Contact the regional Festo contact if you have technical problems ➔ www.festo.com.
- Accessories and spare parts ➔ www.festo.com/catalogue.

4 Product overview

4.1 Product design

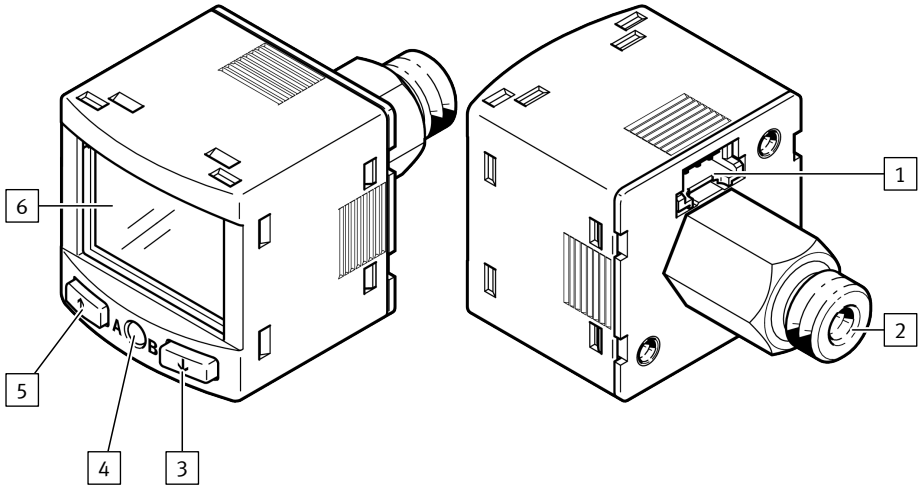
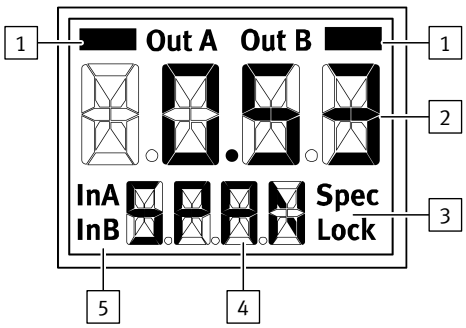


Fig. 1: Product design

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

4.2 Display components



1 Output display
2 Main display
3 Status information
4 Secondary display
5 Signal indicator

Fig. 2: Display

Example for display	Meaning
Output display	
'OutA'	Switching output OutA selected, flashes with active IO-Link
'OutA'	Switching output OutA set
'OutB'	Switching output OutB selected
'OutB'	Switching output OutB set

Example for display	Meaning
Status information/signal indicator	
‘Lock’	Security code activated
‘Spec’	Special menu selected
‘InA’	Pressure signal InA or analogue signal selected
IIIIIIII	Graphic bar graph in the ‘Sub.d’ alternating display

Tab. 2: Display functions

Example for main display	Example for sub-display	Meaning
Measured value indicator and unit in RUN mode		
‘– 0.53’	‘bar’	Measured value indicator and unit
Menu for the switching outputs OutA and OutB		
‘Edit’	‘bin’	Edit menu for the switching outputs (binary)
	‘Fctn’	Threshold value comparator
	‘Fctn’	Window comparator
‘d’ 	‘Fctn’	Auto difference monitor
‘1.80’	‘SP’	Value of switching point with threshold value comparator
‘2.45’	‘SP.Lo’	Value of lower switching point
‘6.45’	‘SP.Hi’	Value of upper switching point
‘0.50’	‘HY’	Hysteresis value
‘18’	‘t.obS’/‘MSEC’	Time interval for determination of an average, which is used to determine the pressure change and establish the reference value.
‘0.25’	‘d.SP’	Threshold value of the differential pressure with auto difference monitoring
‘NO’	‘LOGC’	Switching response: ‘N/O’ = normally open contact, ‘N/C’ = normally closed contact
‘bLUE’	‘COLR’	Display colour: ‘bLUE’ = blue, colour change function deactivated ‘R.ON’ = red when switching output set ‘R.OFF’ = red when switching output not set The red colour change appears with some malfunctions regardless of the ‘COLR’ settings.
Extreme values, SHOW mode only		
‘1.64’	‘MIN’	Minimum measured pressure since switch-on or the last Reset
‘8.50’	‘MAX’	Maximum measured pressure since switch-on or the last Reset
Menu of the pressure signal (InA)		
‘Edit’	‘ANLG’	Edit menu for the analogue output
‘1 _ 5’	‘Out’/‘V’	Output function of the analogue output
‘93’	‘In.Hi’/‘%’	Scaling of the analogue output in percent of the final value of the pressure measuring range
‘3’	‘In.Lo’/‘%’	Scaling of the analogue output in percent of the initial value of the pressure measuring range
Menu for device settings (Spec)		
‘Edit’	‘MENU’	Edit menu for additional settings
‘16’	‘Filt’/‘MSEC’	Value of the filter time constant for the pressure measurement signal
‘bar’	‘Unit’	Unit for the pressure indicator

Example for main display	Example for sub-display	Meaning
‘OFF’	‘Z.AdJ’	‘OFF’ = zero point synchronisation deactivated ‘ON’ = offset correction for measured value indicator, switching points and analogue output possible
‘Unit’	‘Sub.d’	Settings of the lower display in RUN mode: selected unit or switching point of OutA or bar graph
‘40’	‘Eco’/‘SEC’	Economy mode: period after which the display background lighting is switched off
‘PNP’	‘bin’/‘Out’	Shift of the switching outputs (binary) between PNP and NPN
‘bin’	‘Pin3’/‘Out’	Shift between switching output (binary) and analogue output (InA) at pin 3
‘OFF’	‘Code’	Activation and specification of the security code
‘OFF’	‘MASt’	Activation of the IO-Link master function for replication of parameters

Tab. 3: Display functions

4.3 Function

4.3.1 Functional principle

The sensor converts pneumatic pressure values (relative pressure) to electrical signals that can be used for control or regulation functions. Measurements are carried out using a piezoresistive sensor element with a downstream electronic evaluation unit. The connection to the higher-level system is by 1 or 2 switching outputs, an optional analogue output and an optional IO-Link interface.
The switching outputs can be configured for monitoring a threshold value, a pressure range or a change in the pressure. The outputs can be configured as PNP or NPN and N/O contact (NO) or N/C contact (NC). The process values can be read out and parameters changed and transmitted to additional devices through the IO-Link interface.

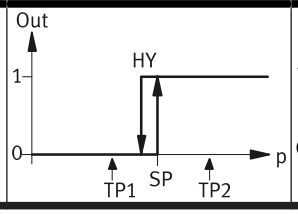
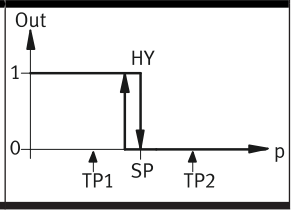
4.3.2 Operating statuses

Operating status	Function
RUN mode	– Basic status after the operating voltage is switched on – 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

Tab. 4: Operating statuses

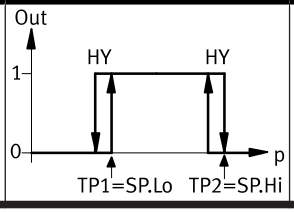
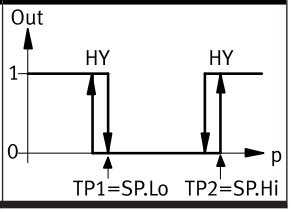
4.3.3 Switching functions

Threshold value comparator for monitoring a pressure threshold _I¯

Function	N/O contact (NO)	N/C contact (NC)
Switching function: – 1 switching point (SP) TEACH mode: – 2 teach-in points (TP1, TP2) – SP = ½ (TP1 + TP2)		

Tab. 5: Threshold value comparator for monitoring a pressure threshold _I¯

Window comparator for monitoring a pressure range _I¯I_

Function	N/O contact (NO)	N/C contact (NC)
Switching function: – 2 switching points (SP.Lo, SP.Hi) TEACH mode[1]: – 2 teach-in points (TP1, TP2) – TP1 = SP.Lo, TP2 = SP.Hi		

1) SP.Lo = lower pressure/vacuum value, SP.Hi = higher pressure/vacuum value, regardless of the teach-in sequence

Tab. 6: Window comparator for monitoring a pressure range _I¯I_

Auto difference monitoring d_I¯I_

This function permits monitoring of a pressure value for consistence. If the applied pressure is constant in the range between [SP.Lo] and [SP.Hi], the reference pressure PRef is automatically specified. The result is a switching operation at the output. The signal change signals the start of pressure monitoring.
If the pressure remains in the monitoring range [d.SP] at PRef, the pressure is stable. If the pressure moves outside the monitoring range (e.g. as the result of a leakage in the system), the output switches back.

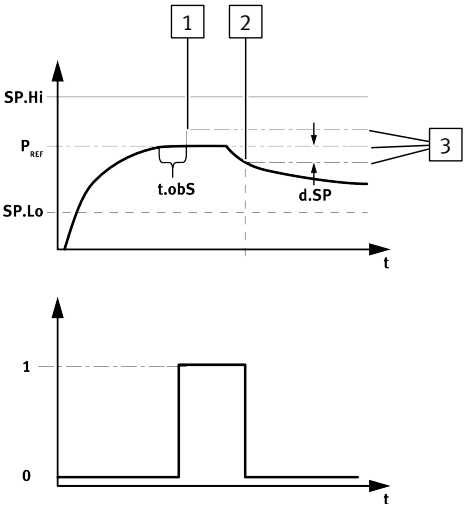
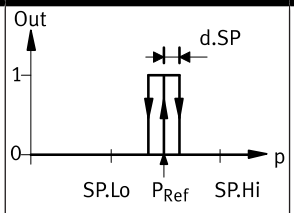
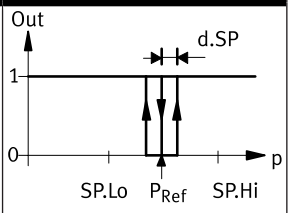


Fig. 3: Auto difference monitor

1 Reference value is determined
2 Measured value deviates by [d.SP] from the reference value
3 Monitoring range

The user can configure the [SP.Lo], [SP.Hi], [t.obS] and [d.SP] parameters. The greater [t.obS] is set, the more constant the pressure signal must be to establish the PRef reference value.

Function	N/O contact (NO)	N/C contact (NC)
Switching function: – 2 switching points (SP.Lo, SP.Hi) for setting the valid working range – 1 switching point (d.SP) to define the monitoring range TEACH mode[1]: – 2 teach-in points (TP1, TP2) – TP1 = SP.Lo, TP2 = SP.Hi		

1) SP.Lo = lower pressure value, SP.Hi = higher pressure value, regardless of the teach-in sequence

Tab. 7: Auto difference monitoring d_I¯I_

5 Mounting

5.1 Assembly information

NOTICE

Accumulation of condensate in the product can impair its functionality.

- Install the product in such a way that condensate from the compressed air lines cannot collect in the product.

NOTICE

Accumulation of heat results from cramped installation situation.

Material damage or malfunction.

- Mount the product with sufficient space for heat dissipation.

NOTICE

Material damage due to incorrect mounting

Force applied to the connection between the pneumatic port and housing can destroy the sensor.

- When mounting or removing the pneumatic port always use the specified spanner flat for counter holding, not the housing.

5.2 Direct mounting of sensor

– Product variants: SPAN-...-G18M, SPAN-...-R18M, SPAN-...-N18M

- Seal the connection thread.

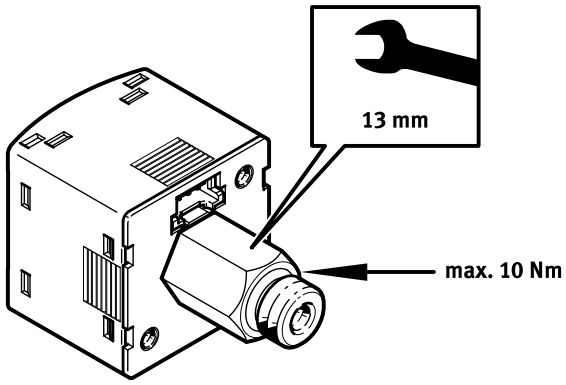


Fig. 4: Example with SPAN-...-G18M

5.3 Mounting sensor on mounting bracket

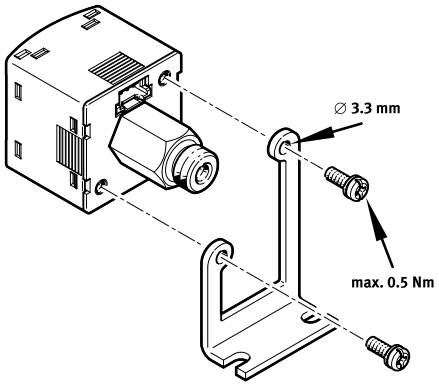


Fig. 5: Example with SAMH-PU-A. Mounting SAMH-PN-W correspondingly

5.4 Mounting sensor with panel frame

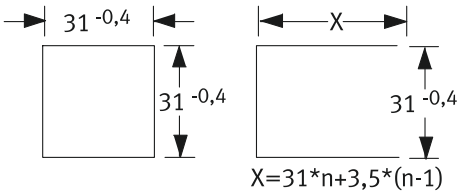
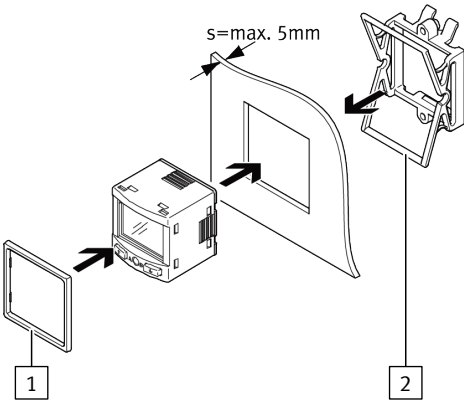


Fig. 6: Size of the front panel cut-out in mm



1 Panel frame
2 Clamping element

Fig. 7: SAMH-PN-F front panel mounting

1. Mount the panel frame on the sensor.
2. Insert the sensor into the cut-out on the front panel from the front.
3. Insert the clamping element and press until the clamping element clicks into place.

6 Installation, electrical

⚠ WARNING

Risk of injury due to electric shock.

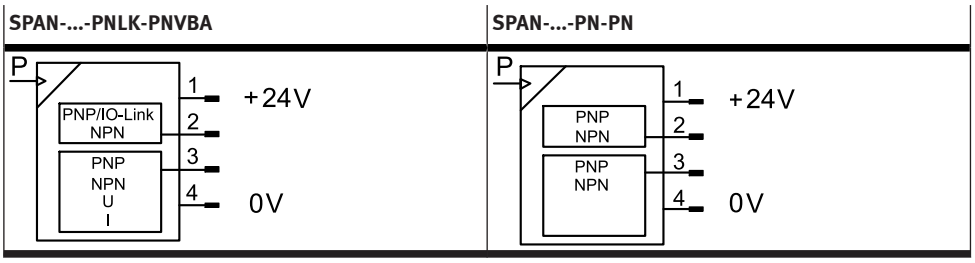
- For the electric power supply, use only PELV circuits that ensure a reliable electric disconnection from the mains network.
- Observe IEC 60204-1/EN 60204-1.

- Connect the sensor.
  – Note the maximum allowable line length: 30 m, 20 m with IO-Link.

Plug L1	Pin	Wire colour[1)]	Allocation
1 2 3 4	1	Brown (BN)	Operating voltage +24 V DC
	2	Black (BK)	Switching output OutA or IO-Link (C/Q line)
	3	White (WH)	Switching output OutB or analogue output (pressure signal InA)
	4	Blue (BU)	0 V

1) Colours are applicable for connecting cables NEBS-L1... or electrical adapters SASC-P4... with NEBA-M8...

Tab. 8: Pin allocation



Tab. 9: Circuit diagrams

7 Commissioning

7.1 Switching on the sensor in RUN mode

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

The basic status can be reached from other modes by:

– Press and hold the [Edit] key for 3 seconds
– After a monitoring time has elapsed (Timeout)

7.2 Displaying parameters in SHOW mode

Switching output OutA

Requirement: the sensor is ready for operation and is in RUN mode.

1. Press the [A] key.
   ⇨ The first set parameter is displayed. ‘Fctn’ flashes.
2. The following parameter is displayed by pressing the [A] key again.

Switching output OutB or analogue output for InA pressure signal

Requirement: the sensor is ready for operation and is in RUN mode.

1. Press the [B] key.
   ⇨ The first set parameter is displayed. With OutB ‘Fctn’ flashes, with InA ‘Out’ flashes.
2. The following parameter is by pressing the [A] key again.

SHOW mode menu structure

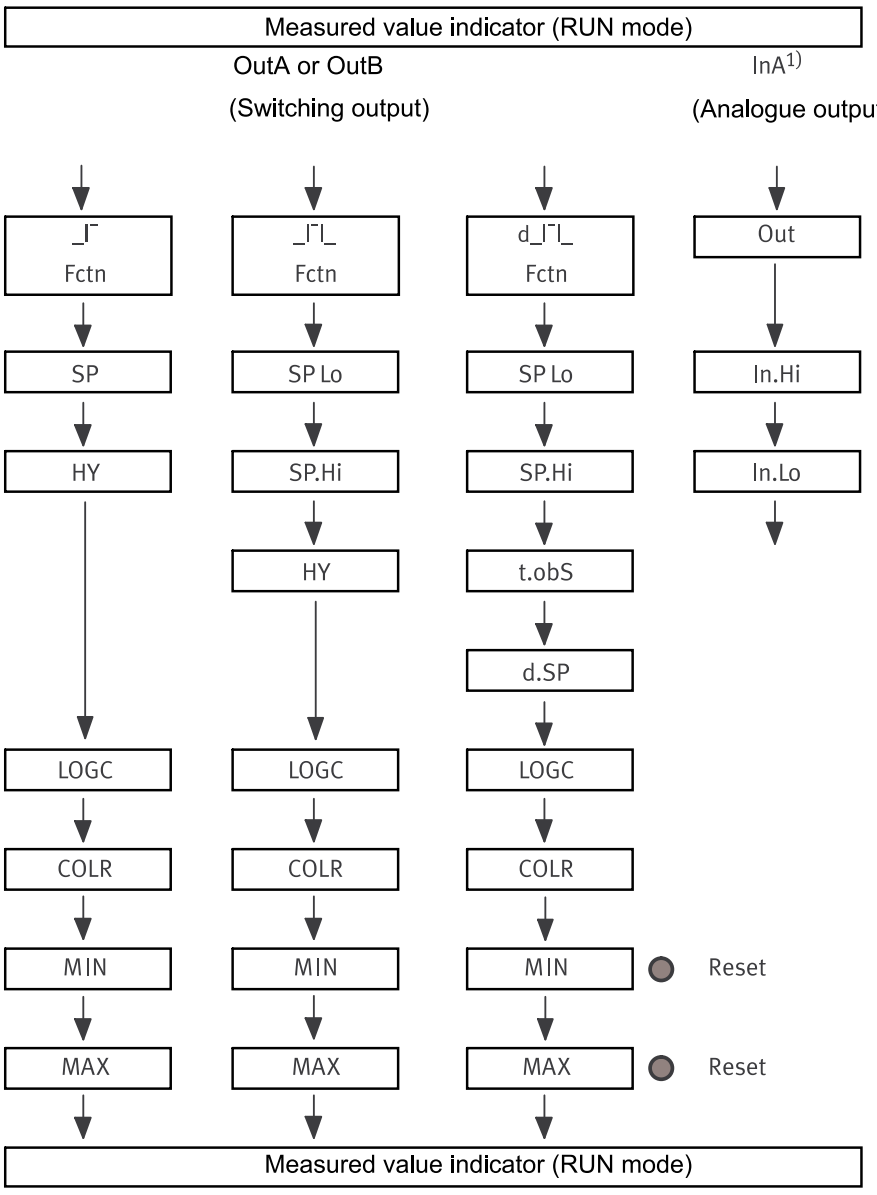


Fig. 8: SHOW mode menu structure

7.3 Input security code in the EDIT mode

Requirement: the sensor is ready for operation and is in RUN mode.

1. Press the [Edit] key.
   ⇨ The EDIT mode is active. If the security code is activated, the parameter entry option is blocked: ‘Lock’ flashes.
2. Enter the security code with the [A] key or the [B] key.
3. Press the [Edit] key briefly.
   ⇨ ‘OutA’ flashes. The parameter entry option is unblocked.

7.4 EDIT mode menu structure

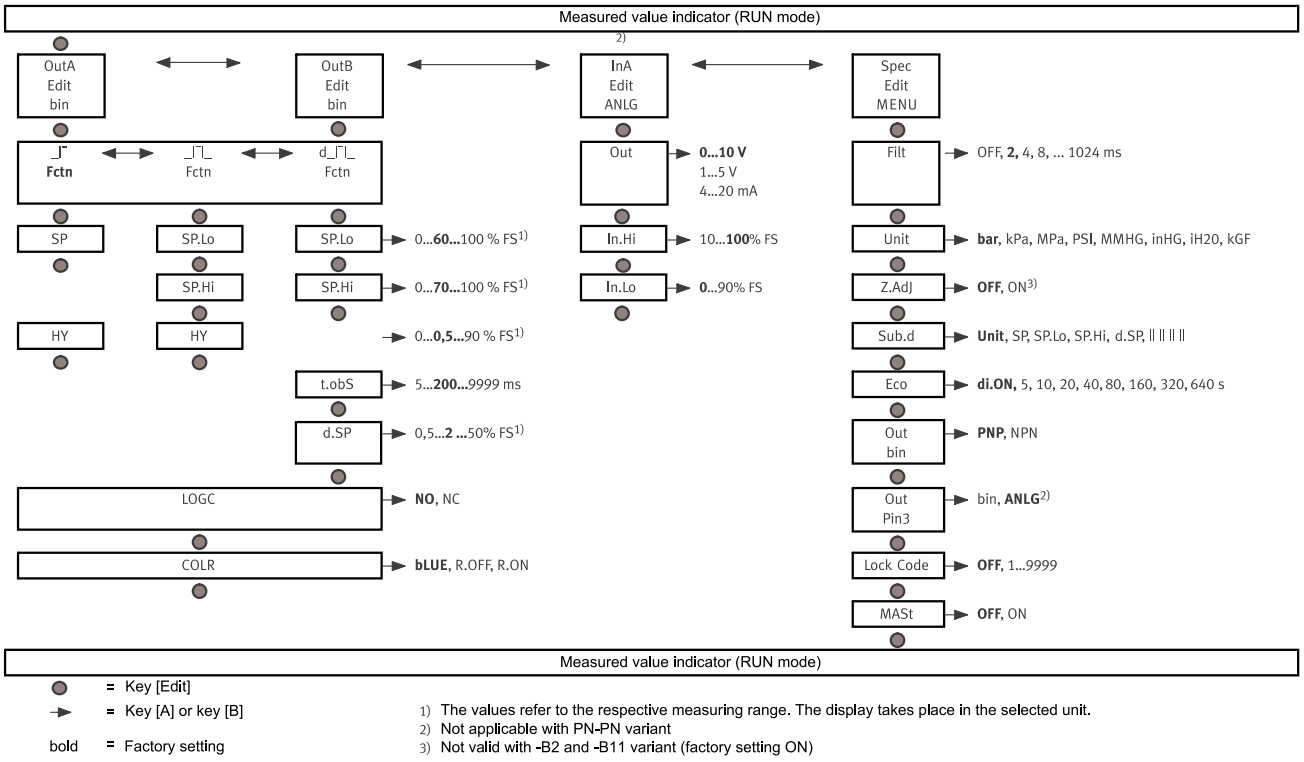


Fig. 9: EDIT mode menu structure

7.5 Configuring switching output in the EDIT mode

The process for configuring the switching outputs for OutA and OutB is the same. The process is described below with the OutA switching output.

Setting threshold value comparator _I¯, window comparator _I¯I_, auto difference monitoring d_I¯I_

Requirement: the sensor is ready for operation and is in RUN mode.

1. Press the [Edit] key briefly.
   ⇨ ‘Edit’ appears. ‘OutA’ flashes.
2. Press the [Edit] key briefly.
   ⇨ ‘Fctn’ flashes.
3. Use the [A] key or the [B] key to select ‘_I¯’ or ‘_I¯I_’ or ‘d_I¯I_’.
4. Press the [Edit] key briefly.
   ⇨ The set value is saved and the next adjustable parameter is displayed.
5. Set the parameter with the [A] key or the [B] key.
6. Repeat points 4 and 5 until all parameters have been set.
7. Press the [Edit] key.
   ⇨ Switch to the RUN mode.

7.6 Changing device settings in the EDIT mode

Requirement: the sensor is ready for operation and is in RUN mode.

1. Press the [Edit] key briefly.
   ⇨ ‘Edit’ appears. ‘OutA’ flashes.
2. Use the [A] key or the [B] key to select the ‘Spec’ special menu.
   ⇨ ‘Spec’ flashes.
3. Press the [Edit] key briefly.
   ⇨ ‘Filt’ flashes.
4. Set the parameter with the [A] key or the [B] key.

5. Press the [Edit] key briefly.
   ⇨ The set value is saved and the next adjustable parameter is displayed.
6. Repeat points 4 and 5 until all parameters have been set.

7.7 Setting analogue output in the EDIT mode

Requirement: the sensor is ready for operation and is in RUN mode.

1. Press the [Edit] key briefly.
   ⇨ ‘Edit’ appears. ‘OutA’ flashes.
2. Use the [A] key or [B] key to select the ‘InA’ special menu.
   ⇨ ‘Edit’ appears. ‘InA’ flashes.
3. Press the [Edit] key briefly.
   ⇨ ‘Out’ flashes.
4. Set the parameter with the [A] key or the [B] key.
5. Press the [Edit] key briefly.
   ⇨ The set value is saved and the next adjustable parameter is displayed.
6. Repeat points 4 and 5 until all parameters have been set.
7. Press the [Edit] key.
   ⇨ Switch to the RUN mode.

7.8 Replicating parameters in the EDIT mode

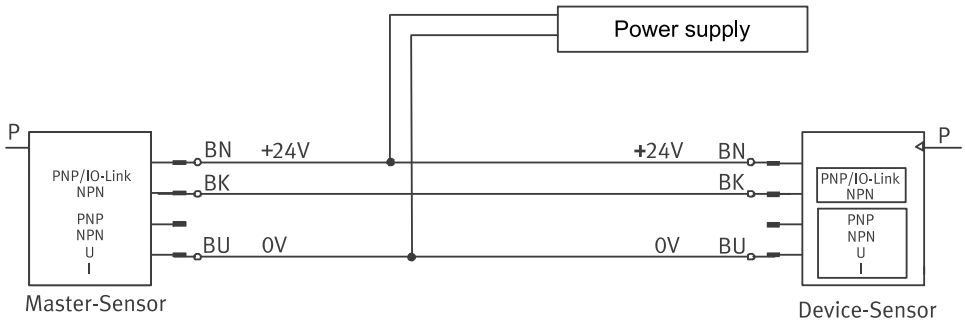


Fig. 10: Replicating parameters

Requirement:
- The pre-configured sensor (master sensor) is ready for operation (RUN mode).
- Master sensor and device sensor are identical with reference to the parameters (same Device-ID).
- The master sensor is connected with the device sensor, ➔ Fig. 10.
- 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).

1. Press the [Edit] key briefly.
   ⇨ ‘Edit’ appears. ‘OutA’ flashes.
2. Use the [A] key or the [B] key to select the ‘Spec’ special menu.
   ⇨ ‘Spec’ flashes.
3. Press the [Edit] key repeatedly until ‘MASt’ appears.
4. Use the [A] key or the [B] key to select ‘ON’.
5. Press the [Edit] key
   ⇨ ‘REPL’/‘RedY’ appears.
6. Press the [A] key or the [B] key.
   ⇨ ‘REPL’/‘RUN’ appears briefly. The transfer of the parameters starts.

7. When ‘REPL’/‘RedY’ appears, the transfer is complete. An error message appears in the event of an error, ➔ 9 Fault clearance.
8. Repeat point 5 if an additional sensor is to be parameterised.
9. Press the [Edit] key.
   ⇨ Switch to the RUN mode.

7.9 Running zero point synchronisation

Requirement:
– The sensor is ready for operation and is in RUN mode.
– ‘Z.AdJ’ ‘ON’ is set.
– The measured value is in the range 0 bar ± 3 % FS.

- Press the [A] key and the [B] key and the [Edit] key simultaneously.
  ⇨ If ‘OK’ appears: the zero point synchronisation was successful.
  ⇨ ‘FAIL’ appears: the zero point synchronisation was not successful. Check requirements.

If ‘Z.AdJ’ ‘OFF’ is set for a later time, the sensor uses the factory-set calibration values.

7.10 Teach-in switching points in TEACH mode

The teach-in process is the same for configuring the switching outputs for OutA and OutB. The process is described below with the OutA switching output.

NOTICE

In TEACH mode there is no Timeout. The sensor switches to the RUN mode only after the entire teach-in process is completed.

Requirement: the sensor is ready for operation and is in RUN mode.

1. Define the switching function in the EDIT mode, ➔ 7.5 Configuring switching output in the EDIT mode.
2. Create pressure value 1.
3. Press the [A] key and the [Edit] key.
   ⇨ The current pressure value is accepted as the first teach-in point (TP1). ‘t-IN’ flashes.
4. Create pressure value 2.
5. Press the [A] key and the [Edit] key.
   ⇨ The current pressure value will then be set as the first teach-in point (TP2). Switch to the RUN mode.

8 Operation

NOTICE

Property damage due to high temperatures.
Extreme pneumatic conditions can heat the sensor to over 80 °C.
- Select the operating conditions so the sensor does not heat above the maximum permissible operating temperature.

8.1 Reset sensor to factory setting

The current settings of the sensor will be lost if factory settings are restored.

1. Switch off the operating voltage.
2. Press and hold the [A] key, the [B] key and the [Edit] key.
3. Switch on the operating voltage.
   ⇨ The sensor is in RUN mode.

9 Fault clearance

Malfunction	Cause	Remedy
No display	No operating voltage or unreliable operating voltage	– Apply permissible operating voltage
	Electrical connections swapped	– Connect the device in accordance with the circuit diagram
	Device faulty	– Replace device
Indicator or switching output does not respond in accordance with the settings	Short circuit or overload at output	– Eliminate short circuit/overload
	Incorrect switching point taught (e.g. at 0 bar)	– Repeat teach-in
	Device faulty	– Replace device
	Parameter incorrect	– Resetting to factory settings
[Er01]/[FAIL] 1)	Device faulty	– Replace device
[Er02]/[ASIC] 1)	Device faulty	– Replace device
[Er10] / [OVER]	Measuring range exceeded	– Comply with measuring range
[Er20]/[tEMP] 2)	Temperature error	– Check operating conditions – Replace device
[Er21]/[SHRt] 2)	Short circuit at OutA	– Eliminate the short circuit
[Er22]/[SHRt] 2)	Short circuit at OutB	– Eliminate the short circuit
[Err] / [BUSY]	OutA is switched active	– Check device settings
[Err]/[ID]	Device ID error, replication function failed	– Use sensors with the same type (same device ID) for replicating
[Err]/[COMM]	IO-Link communication error	– Check OutA cable – Check settings of the device sensor

1) Display flashes red
2) Display is red

Tab. 10: Fault clearance

10 Disassembly

1. Switch off the operating voltage and the compressed air.
2. Disconnect the electrical and pneumatic connections from the sensor.
3. Release the fasteners and remove the sensor.

11 Technical data

11.1 Technical data, general

General

SPAN	
Certificates, declaration of conformity	➔ www.festo.com/sp

Tab. 11: General

Input signal and measuring element

SPAN		
Operating medium		Compressed air to ISO 8573-1:2010 [7:4:4], inert gases, lubricated operation possible
Temperature of medium	[°C]	0 ... 50
Ambient temperature	[°C]	0 ... 50

Tab. 12: Input signal and measuring element

Output, general

SPAN		
Accuracy at room temperature	[% FS]	± 1.5
Accuracy in the operating temperature range	[% FS]	± 3
Repetition accuracy	[% FS]	± 0.3 with Filt = OFF
Temperature coefficient	[% FS/K]	Typical ± 0.05

Tab. 13: Output, general

Switching output

SPAN		
Switching output		2x PNP or 2x NPN, switchable
Switching function		Threshold value comparator Window comparator Auto difference monitor
Switch-on time	[ms]	Typical 2, maximum 4 with Filt = OFF
Switch-off time	[ms]	Typical 2, maximum 4 with Filt = OFF
Max. output current	[mA]	100
Capacitive load maximum DC	[nF]	100
Voltage drop	[V]	Maximum 2
Pull-down resistor		PNP: integrated
Pull-up resistor		NPN: not integrated
Inductive protective circuit		Present

Tab. 14: Switching output

Analogue output

SPAN		-V	-B	-A
Output characteristic curve Start value ... end value	[V]	0 ... 10	1 ... 5	–
	[mA]	–		4 ... 20
Max. load resistance of current output	[Ω]	–		500
Min. load resistance of voltage output	[kΩ]	20		–

Tab. 15: Analogue output

Output, additional data

SPAN		
Short circuit current rating		Yes
Overload protection		Present

Tab. 16: Output, additional data

Electronics

SPAN		
Rated operating voltage DC	[V]	24
Operating voltage range DC	[V]	15 ... 30
No-load current	[mA]	Maximum 30

SPAN		
Ready-state delay	[ms]	Typical 80[1)]
Reverse polarity protection		All connections against one other

1) After this time, the electrical outputs take a defined, stable condition.

Tab. 17: Electronics

Mechanics

SPAN	
Mounting position	Any, avoid condensation accumulation in the sensor
Material of threaded connections[1)]	Stainless steel
Housing material	PA-reinforced
Inspection window material	PA
Keypad material	TPE-O
Materials in contact with the medium[1)]	PPS, FPM, NBR, PA-reinforced, high-alloy stainless steel

1) Depending on variant

Tab. 18: Mechanics

Immission and emission

SPAN		
Storage temperature	[°C]	–20 … +80
Max. permissible relative humidity	[% RH]	85
Degree of protection in accordance with EN 60529		IP40
Protection class in accordance with DIN VDE 0106-1		III
Shock resistance in accordance with EN 60068-2		30 g acceleration with 11 ms duration (half-sine)
Vibration resistance in accordance with EN 60068-2		10 … 60 Hz: 0.35 mm / 60 … 150 Hz: 5 g

Tab. 19: Immission and emission

Display and operation

SPAN		
Displayable units		bar, mbar, kPa, MPa, psi, mmHg, inchHg, inchH_2O, kgf/cm^2
Threshold value setting range	[% FS]	1 … 99
Hysteresis setting range	[% FS]	0 … 90

Tab. 20: Display and operation

Pressure measuring range and overload range

SPAN		-B02	-B2	-B11	-V025	-V05
Pressure measuring range	[MPa]	-0.01 … 0.01	-0.1 … 0.1	-0.1 … 1	0 … -0.025	0 … -0.05
	[bar]	-0.1 … 0.1	-1 … 1	-1 … 10	0 … -0.25	0 … -0.5
	[psi]	-1.45 … 1.45	-14.5 … 14.5	-14.5 … 145	0 … -3.125	0 … -7.25
Overload range	[MPa]	-0.1 … 0.1	-0.1 … 0.5	-0.1 … 1.5	-0.1 … 0.1	-0.1 … 0.2
	[bar]	-1 … 1	-1 … 5	-1 … 15	-1 … 1	-1 … 2
	[psi]	-14.5 … 14.5	-14.5 … 72.5	-14.5 … 217.5	-14.5 … 14.5	-14.5 … 29

Tab. 21: Pressure measuring range and overload range

SPAN		-V1	-P025	-P05	-P1	-P2
Pressure measuring range	[MPa]	0 … -0.1	0 … 0.025	0 … 0.05	0 … 0.1	0 … 0.2
	[bar]	0 … -1	0 … 0.25	0 … 0.5	0 … 1	0 … 2
	[psi]	0 … -14.5	0 … 3.125	0 … 7.25	0 … 14.5	0 … 29

SPAN		-V1	-P025	-P05	-P1	-P2
Overload range	[MPa]	-0.1 ... 0.5	-0.1 ... 0.1	-0.1 ... 0.2	-0.1 ... 0.5	-0.1 ... 0.6
	[bar]	-1 ... 5	-1 ... 1	-1 ... 2	-1 ... 5	-1 ... 6
	[psi]	-14.5 ... 72.5	-14.5 ... 14.5	-14.5 ... 29	-14.5 ... 72.5	-14.5 ... 87

Tab. 22: Pressure measuring range and overload range

SPAN		-P6	-P10	-P12	-P16
Pressure measuring range	[MPa]	0 ... 0.6	0 ... 1	0 ... 1.2	0 ... 1.6
	[bar]	0 ... 6	0 ... 10	0 ... 12	0 ... 16
	[psi]	0 ... 87	0 ... 145	0 ... 174	0 ... 232
Overload range	[MPa]	-0.1 ... 1.5	-0.1 ... 1.5	-0.1 ... 1.5	-0.1 ... 2
	[bar]	-1 ... 15	-1 ... 15	-1 ... 15	-1 ... 20
	[psi]	-14.5 ... 217.5	-14.5 ... 217.5	-14.5 ... 217.5	-14.5 ... 290

Tab. 23: Pressure measuring range and overload range

11.2 Technical data for UL certification

SPAN	
Input Voltage	Max. 30 V DC, class 2
Maximum input current	0.23 A
Maximum power	6.9 W
Maximum Ambient Temperature	50 °C / 122 °F
Differential pressure	Max. 1.6 MPa
Pollution degree	2
Relative humidity	Max. 85%
Installation site	for indoor use only
Maximum installation height	2000 m. Over 2000 m if approved by the manufacturer.

Tab. 24: Technical data, UL approval

11.3 Technical data, IO-Link

SPAN-...-PNLK-PNVBA only	
Protocol version	Device V1.1
Profile	Smart Sensor Profile
Function classes	BDC (binary data channel) PDV (Process Data Variable) Identification Diagnostics Teach-Channel
Communication mode	COM2 (38,4 kBaud)
Port class	A
Process data length IN	2 Byte
Process data content IN	2 bit BDC (pressure monitoring) 14 bit PDV (pressure measured value)
IODD, IO-Link device description	➔ www.festo.com/sp

Tab. 25: Technical data, IO-Link

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