Pressure sensor SPAN

FESTO
Festo AG & Co. KG
Postfach
73726 Esslingen
Germany
+49 711 347-0
www.festo.com

Operating instructions
8049275
1607
[8049280]

Original: de

Pressure sensor SPAN ...........................................

1 Product description

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

1.1 Overview

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

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/sp.

1.2 Characteristics

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td>SPAN</td>
<td>Pressure sensor</td>
</tr>
<tr>
<td>Pressure measuring range</td>
<td>B2, B11, P02S, P05, P1, P2, P6, P10, P12, P16, V025, V05, V1</td>
<td>Technical data</td>
</tr>
<tr>
<td>Supply port</td>
<td>R</td>
<td>Relative pressure</td>
</tr>
<tr>
<td>Pneumatic port</td>
<td>G1/8, R1/8, N1/8, M5, QAu</td>
<td>Push-in connector 4 mm</td>
</tr>
<tr>
<td>Thread type</td>
<td>M</td>
<td>None</td>
</tr>
<tr>
<td>F</td>
<td>Male thread</td>
<td></td>
</tr>
<tr>
<td>Female thread</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Electrical output 1</td>
<td>PNLK</td>
<td>Switching output PNP / NPN / IO-Link</td>
</tr>
<tr>
<td>Electrical output 2</td>
<td>PNVB</td>
<td>PNP / NPN / 0...10 V / 1...5 V / 4...20 mA</td>
</tr>
<tr>
<td>Electrical connection</td>
<td>L1</td>
<td>Plug connector, design L1</td>
</tr>
<tr>
<td>Certificate</td>
<td>+T</td>
<td>Without</td>
</tr>
<tr>
<td></td>
<td></td>
<td>With inspection report</td>
</tr>
</tbody>
</table>

2 Safety

Intended use

The pressure sensor SPAN is intended for monitoring pressure of compressed air and inert gases in the piping.

General safety information

- Only use the product in its original status, without any unauthorised modifications.
- Only use the product if it is in an excellent technical status.
- 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).
- Observe the specifications on the rating plate.
- Comply with all applicable national and international regulations.

Disposal

- Observe the local specifications for environmentally friendly disposal.

3 Function and application

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 optional analogue output and an optional IO-Link interface. The switching outputs can be configured for monitoring of a threshold value, a pressure range or a differential pressure. The outputs can be set as PNP or NPN and normally open (NO) or normally closed (NC). Via the IO-Link interface, process values can be read out and parameters changed and transmitted to additional devices.

3.1 Operating statuses

<table>
<thead>
<tr>
<th>Operating status</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>RUN mode</td>
<td>Basic status after the operating voltage is switched on</td>
</tr>
<tr>
<td></td>
<td>- Display of the current measured value</td>
</tr>
<tr>
<td>SHOW mode</td>
<td>- Display of the current settings</td>
</tr>
<tr>
<td>EDIT mode</td>
<td>- Setting or modification of parameters</td>
</tr>
<tr>
<td>TEACH mode</td>
<td>- Acceptance of the current measured value to determine switching points</td>
</tr>
</tbody>
</table>

3.2 Switching functions

Threshold value comparator for monitoring of a pressure threshold

Function

<table>
<thead>
<tr>
<th>Switching function:</th>
<th>NO (normally open)</th>
<th>NC (normally closed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Switching point (SP)</td>
<td>Out</td>
<td>HY</td>
</tr>
<tr>
<td>2 teach-in points (TP1, TP2)</td>
<td>TP1=SP.Lo, TP2=SP.Hi</td>
<td></td>
</tr>
<tr>
<td>1 switching point (SP)</td>
<td>TP1, TP2</td>
<td></td>
</tr>
<tr>
<td>2 Switching points (SP.Lo, SP.Hi)</td>
<td>TP1, TP2</td>
<td></td>
</tr>
<tr>
<td>3 Switching points (SP.L0, SP.Hi)</td>
<td>TP1, TP2</td>
<td></td>
</tr>
<tr>
<td>4 Switching points (SP.L0, SP.Hi)</td>
<td>TP1, TP2</td>
<td></td>
</tr>
</tbody>
</table>

Window comparator for monitoring of a pressure range

Function

<table>
<thead>
<tr>
<th>Switching function:</th>
<th>NO (normally open)</th>
<th>NC (normally closed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Switching points (SP.L0, SP.Hi)</td>
<td>Out</td>
<td>HY</td>
</tr>
<tr>
<td>2 Switching points (SP.L0, SP.Hi)</td>
<td>TP1=SP.L0, TP2=SP.Hi</td>
<td></td>
</tr>
<tr>
<td>3 Switching points (SP.L0, SP.Hi)</td>
<td>TP1, TP2</td>
<td></td>
</tr>
</tbody>
</table>

Auto difference monitoring \( d, f \)

This function permits monitoring of a pressure value for constancy. If the applied pressure is constant in the range between \( SP.L0 \) and \( SP.Hi \), the reference pressure \( P_{Ref} \) is automatically determined. 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 \( d(SP) \) around \( P_{Ref} \), the pressure is stable. When the monitoring range is left (e.g. caused by a leakage in the system), the output switches back.
Reference value is determined
Measured value deviates by \(d.SP\) from the reference value
Monitoring area
Fig. 6

The parameters \([SP.Lo], [SP.Hi], [t.Obs]\) and \([d.SP]\) can be configured by the user.
The greater \([t.Obs]\) is set, the more constant the pressure signal must be to establish the reference value \(P_{Ref}\).

<table>
<thead>
<tr>
<th>Function</th>
<th>NO (normally open)</th>
<th>NC (normally closed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Switching function:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1) switching points ((SP.Lo, SP.Hi)) for setting the valid work range</td>
<td>(SP.Lo)</td>
<td>(SP.Hi)</td>
</tr>
<tr>
<td>2) switching point ((d.SP)) for determination of the monitoring area</td>
<td>(P_{Ref})</td>
<td>(P_{Ref})</td>
</tr>
<tr>
<td>TEACH mode1):</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1) teach-in points ((TP1, TP2))</td>
<td>(SL.Po)</td>
<td>(SL.Hi)</td>
</tr>
<tr>
<td>TP1 = (SP.Lo), TP2 = (SP.Hi)</td>
<td>(d.SP)</td>
<td>(d.SP)</td>
</tr>
</tbody>
</table>

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

4.2 Electrical

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.

- Connect sensor.
  - Consider the maximum permissible line length: 30 m (20 m for IO-Link).

<table>
<thead>
<tr>
<th>Pin</th>
<th>Colour1)</th>
<th>Allocation</th>
<th>Plug L1</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Brown (BN)</td>
<td>Operating voltage +24 V DC</td>
<td>1 2 3 4</td>
</tr>
<tr>
<td>2</td>
<td>Black (BK)</td>
<td>Switching output OutA or IO-Link (C/Q line)</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>White (WH)</td>
<td>Switching output OutB or analogue output (pressure signal InA)</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Blue (BU)</td>
<td>0 V</td>
<td></td>
</tr>
</tbody>
</table>

1) Colours apply for connecting cables NEBS-L1... or electrical adapter SASC-P4... with NEBU-M8...

4.3 Installation

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

- Remove all transport packaging. The material used in the packaging has been specifically chosen for its recyclability.

4.4 Mechanical and pneumatic

- An unfavourable mounting position can impair the function of the product.
- Mount the sensor so that no condensate 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).

Front panel use SAMH-PN-F
- Size of the front panel cut-out in mm ➔ Fig. 10.
- Fasten panel frame to the sensor.
- Guide sensor from the front into the cut-out on the front panel.
- Attach the clamping element and press until it catches.

Fig. 10

4.2 Electrical

- Consider the maximum permissible line length: 30 m (20 m for IO-Link).

<table>
<thead>
<tr>
<th>Pin</th>
<th>Colour1)</th>
<th>Allocation</th>
<th>Plug L1</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Brown (BN)</td>
<td>Operating voltage +24 V DC</td>
<td>1 2 3 4</td>
</tr>
<tr>
<td>2</td>
<td>Black (BK)</td>
<td>Switching output OutA or IO-Link (C/Q line)</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>White (WH)</td>
<td>Switching output OutB or analogue output (pressure signal InA)</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Blue (BU)</td>
<td>0 V</td>
<td></td>
</tr>
</tbody>
</table>

1) Colours apply for connecting cables NEBS-L1... or electrical adapter SASC-P4... with NEBU-M8...

Fig. 10
5 Commissioning

5.1 LCD display

Fig. 15

Example for LCD display

Output display

- (OutA): Switching output OutA selected (flashes with active IO-Link)
- (OutB): Switching output OutB selected

Status information / signal indicator

- [Lock]: Security code activated
- [Spec]: Special menu selected
- [InA]: Pressure signal InA or analogue signal is selected
- [MIN]: Value of lower switching point (window comparator)
- [MAX]: Value of upper switching point (window comparator)
- [SP]: Value of lower limit of the work space (auto difference monitoring)
- [d.SP]: Value of upper limit of the work space (auto difference monitoring)
- [HY]: Value of hysteresis (not for auto difference monitoring)
- [R.OFF]: Red, if switching output not set
- [R.ON]: Red, if switching output set
- [bLUE]: Blue, colour change function deactivated
- [NO]: Normally open, [NC]: Normally closed

Lower display

- [Unit]: Measured value indicator (RUN mode)
- [OutA or OutB]: Output display
- [Spec]: Signal indicator

Menu for the switching outputs (OutA and OutB)

- [Edit]: 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
- [SP]: Value of switching point (only for threshold value comparator)
- [SP.Lo]: Value of lower limit of the work space (auto difference monitoring)
- [SP.Hi]: Value of upper limit of the work space (auto difference monitoring)
- [HY]: Value of hysteresis (not for auto difference monitoring)
- [t.obs]: Time interval for determination of a mean value, which is used to determine the pressure change and establish the reference value.
- [d.SP]: Threshold value of the differential pressure with auto difference monitoring
- [NO]: Switching characteristics of the switching outputs: [NO] = normally open, [NC] = normally closed
- [bLUE]: Display colour: [NUE] = Blue, colour change function deactivated
- [R.ON]: Red, if switching output set
- [R.OFF]: Red, if switching output not set

Extreme values (only SHOW mode)

- [MIN]: Minimum measured pressure since switch-on or the last reset
- [MAX]: Maximum measured pressure since switch-on or the last reset

Menu of the pressure signal (InA)

- [Edit]: Edit menu for the analogue input
- [Out]: Output function of the analogue output
- [%]: Scaling of the analogue output in percent of the initial value of the pressure measuring range
- [Offset]: Scaling of the analogue output in percent of the offset value of the pressure measuring range

Menu for device settings (Spec)

- [Edit]: Edit menu for additional settings
- [Unit]: Unit for the pressure indicator

Fig. 16

Example for LCD display

Main display

- [OutA]: Switching output OutA selected
- [OutB]: Switching output OutB selected
- [Spec]: Signal indicator

Lower display

- [Sub.d]: Lower display (e.g. unit)
- [Meaning]: Measured value indicator and unit in the RUN mode

Menu for the switching outputs (OutA and OutB)

- (OutA): Switching output OutA selected (flashes with active IO-Link)
- (OutB): Switching output OutB selected

5.2 Switch on sensor (RUN mode)

- Switch on the operating voltage.

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.

Switching output OutB or analogue output for pressure signal InA

- Press B-key.

The subsequent parameters can be displayed by repeatedly pressing the A key (Fig. 18).

At the end, the min. and max. values are displayed. This can be reset with the Edit key.

Switching output OutB or analogue output for pressure signal InA

The subsequent parameters can be displayed by repeatedly pressing the B-key (Fig. 18).

Fig. 17

[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] Settings of the lower display in RUN mode: selected unit or switching point of OutA or bar graph

[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 Pin3

[OFF] [Code]: Activation and determination of the security code

[OFF] [MASI]: Activation of the IO-Link master function for replication of parameters

Fig. 18

Measured value indicator (RUN mode)

Measured value indicator (RUN mode)
5.4 Enter the security code (EDIT mode)

Requirement: The sensor is ready for operation (RUN mode).
1. Press the Edit button.
   → The EDIT mode is active. If the security code is activated, the parameter entry option is blocked: [Lock] flashes.
2. Enter security code set with A or B key.
3. Press the Edit button briefly.
   → [OutA] flashes. The parameter entry option is unblocked.

5.5 Configuring switching output (EDIT mode)

**Note**
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

1. Press the Edit button briefly.
2. Press the Edit button briefly.
   → [Fctn] flashes.
3. With A or B key, select _I_ or _I_ or d._I_.
4. Press the Edit button briefly.
   → The set value is saved.
5. The next adjustable parameter is shown.
6. Set parameters with A- or B-key.
7. Press the Edit button.
   → Switch to the RUN mode.

5.6 Change device settings (EDIT mode)

Requirement: The sensor is ready for operation (RUN mode).
1. Press the Edit button briefly.
2. With A or B key, select special menu [Spec].
   → [Spec] flashes.
3. Press the Edit button briefly.
   → [Filt] flashes.
4. Set parameters with A- or B-key.
5. Press the Edit button briefly.
   → The set value is saved.
6. The next adjustable parameter is displayed.
7. Repeat points 4 and 5 until all parameters are set.

5.7 Set analogue output (EDIT mode)

Requirement: The sensor is ready for operation (RUN mode).
1. Press the Edit button briefly.
2. Select [InA] with the A-key or B-key.
   → [Edit] appears. [InA] flashes.
3. Press the Edit button briefly.
4. Set parameters with A- or B-key.
5. Press the Edit button briefly.
   → The set value is saved.
6. The next adjustable parameter is shown.
7. Repeat points 4 and 5 until all parameters are set.
8. Press the Edit button.
   → Switch to the RUN mode.

5.8 Replicating parameters (EDIT mode)

Requirement:
– The pre-configured sensor (master sensor) is ready for operation (RUN mode).
– Master sensor and device sensor have the same design regarding the parameters (same device ID).
– The master sensor is connected with the device sensor (Fig. 19).
– 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).

Power supply

Master sensor

Device sensor

Fig. 19

1. Select special menu [Spec] at the master sensor via device settings.
2. Press the Edit button briefly until [MASt] appears.
3. With A or B key, select [ON].
4. Press the Edit button
5. Press A- or B-key.
   → The parameters are transmitted to the device sensor.
6. Repeat point 5 if an error occurs, an error message appears (Fig. 21).
7. Repeat point 5 if an additional sensor should be parameterised.
8. Press the Edit button briefly.
   → Switch to the RUN mode.
5.9 Menu structure

<table>
<thead>
<tr>
<th>Measured value indicator (RUN mode)</th>
</tr>
</thead>
<tbody>
<tr>
<td>[ ] OutA Edit bin</td>
</tr>
<tr>
<td>[ ] J fctn</td>
</tr>
<tr>
<td>[ ] OutB Edit bin</td>
</tr>
<tr>
<td>[ ] J_L fctn</td>
</tr>
<tr>
<td>[ ] d_J_L fctn</td>
</tr>
<tr>
<td>[ ] InA Edit ANLG</td>
</tr>
<tr>
<td>[ ] Fctn</td>
</tr>
<tr>
<td>[ ] d_Fctn</td>
</tr>
<tr>
<td>[ ] Out</td>
</tr>
<tr>
<td>[ ] 0...10 V</td>
</tr>
<tr>
<td>[ ] 1...5 V</td>
</tr>
<tr>
<td>[ ] 4...20 mA</td>
</tr>
<tr>
<td>[ ] Spec Edit MENU</td>
</tr>
<tr>
<td>[ ] Filt</td>
</tr>
<tr>
<td>[ ] OFF, Z, 4, 8, ..., 1024 ms</td>
</tr>
</tbody>
</table>

Fig. 20

5.10 Zero point synchronisation (zero adjust)

Requirement:
- The sensor is ready for operation (RUN mode).
- [Z.AdJ] [ON] is set (Chap. 5.6).
- 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.

5.11 Teach switching points (TEACH mode)

Note
The process for teaching the switching outputs for OutA (A-key) and OutB (B-key) is the same. In the following, the process is described using the switching output OutA.

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

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).
- The current pressure value will then be adopted as the first teach point (TP1).
- [t-IN] flashes.
- The current pressure value is adopted as the second teach point (TP2).
- Switch to the RUN mode.

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. 20).

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

<table>
<thead>
<tr>
<th>Malfunction</th>
<th>Possible cause</th>
<th>Remedy</th>
</tr>
</thead>
<tbody>
<tr>
<td>No display</td>
<td>No operating voltage or permissible operating voltage</td>
<td>Apply permissible operating voltage</td>
</tr>
<tr>
<td></td>
<td>Electrical connections swapped</td>
<td>Connect the device in accordance with the circuit diagram</td>
</tr>
<tr>
<td></td>
<td>Device defective</td>
<td>Replace device</td>
</tr>
<tr>
<td>Display or switching output does not react in accordance with the settings</td>
<td>Short circuit or overload at the output</td>
<td>Eliminate short circuit or overload</td>
</tr>
<tr>
<td></td>
<td>Incorrect switching point taught (e.g. at 0 bar)</td>
<td>Repeat teaching procedure</td>
</tr>
<tr>
<td></td>
<td>Device defective</td>
<td>Replace device</td>
</tr>
<tr>
<td></td>
<td>Parameter incorrect</td>
<td>Reset to factory settings</td>
</tr>
<tr>
<td></td>
<td>OutA in switched active</td>
<td>Check device settings</td>
</tr>
<tr>
<td></td>
<td>Device ID error, replication function failed</td>
<td>When replicating, use sensors with the same type (same device ID)</td>
</tr>
<tr>
<td></td>
<td>IO-Link communication error</td>
<td>Check the C/Q line</td>
</tr>
</tbody>
</table>

### 10 Accessories

Accessories: [www.festo.com/catalogue](http://www.festo.com/catalogue)

### 11 Technical data

#### SPAN-

**General**
- Approval certificate: RCM
- 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

**Output, general**

<table>
<thead>
<tr>
<th>Accuracy</th>
<th>[% FS]</th>
<th>±2 at room temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>B2, B11, V1, P1, P2, P6, P10, P20, P5, V20, V5, V12, P12, P16</td>
<td>[% FS]</td>
<td>±1.5 at room temperature</td>
</tr>
<tr>
<td>B2, B11, V1, P1, P2, P6, P10</td>
<td>[% FS]</td>
<td>±3 in the entire temperature range</td>
</tr>
<tr>
<td>- P20, P5, V20, V5, P12, P16</td>
<td>[% FS]</td>
<td>±4 in the entire temperature range</td>
</tr>
</tbody>
</table>

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

**Switching output**
- Switching output: 2x PNP or 2x NPN switchable
- Switching function: Threshold value comparator
- Switch-on/switch-off time [ms]: typ. 0.2, max. 4 with FILT = OFF
- Max. output current [mA]: 100
- Capacitive load maximum DC [µF]: 100
- Voltage drop [V]: Max. 2
- Pull-down / pull-up resistor: PNP: integrated, NPN: not integrated

**Inductive protective circuit**
- Present

**Analogue output**
- Output characteristic curve initial value … end value [V]: 0 … 10
- Pull-up resistor [V]: 1 … 5
- Pull-down resistor [mA]: 4 … 20
- Max. load resistance of current output [Ω]: 500
- Min. load resistance of voltage output [kΩ]: 20
- Output, additional data:
  - Short circuit protection: Yes
  - Overload protection: Present

**Electronics**
- Max. current consumption [mA]: 230
- Nominal operating voltage DC [V]: 24
- Operating voltage range DC [V]: 230 … 30
- No-load supply current [mA]: Max. 30

**Ready-state delay [ms]**
- typ. B0
- Protection against polarity reversal: All connections against each other

**Mechanical system**
- Mounting position: Any, avoid condensation gathering in the sensor
- Housing material: PA reinforced
- Keyboad material: TPE-

**Display**
- Display: No operating voltage or
- Operating medium: Compressed air in accordance with ISO 8573-1:2010[7:4:4]; inert gases, operation with lubricated medium possible
- Switching function: Threshold value comparator
- Switch-on/switch-off time [ms]: typ. 80

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

**Accessories:**
- 10 Accessories
- 2) Display illuminated red

**Fig. 21**

**Fig. 22**

**Fig. 23**

**Fig. 24**

**Fig. 25**

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

**SPAN-**

<table>
<thead>
<tr>
<th>B2</th>
<th>B11</th>
<th>V025</th>
<th>V05</th>
<th>V1</th>
<th>-P025</th>
<th>-P05</th>
</tr>
</thead>
<tbody>
<tr>
<td>-1</td>
<td>-0.1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Pressure measuring range [bar] Start value**
- [MPa]: 0

**Pressure measuring range End value**
- Start value [bar] [MPa]: 0.1
- End value [bar] [MPa]: 10

**Overload range**
- Start value [bar] [MPa]: 0.5
- End value [bar] [MPa]: 6

**Fig. 23**

**SPAN-**

<table>
<thead>
<tr>
<th>-P1</th>
<th>-P2</th>
<th>-P6</th>
<th>-P10</th>
<th>-P12</th>
<th>-P16</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

**Pressure measuring range**
- [bar]: Start value
- [MPa]: End value

**Overload range**
- Start value [bar] [MPa]: 5
- End value [bar] [MPa]: 6

**Fig. 25**

**IO-Link1) Protocol version**
- Device V1.1
- Profiles: Smart sensor profile

**Function classes**
- Binary data channel (BDC)
- Process data variable (PDV)
- Identification
- Diagnostics
- Teach channel

**Communication mode**
- COM2 (38.4 kbaud)

**Part class**
- A

**Process data width IN**
- 2 byte

**Process data content IN**
- 2 bit BDC (pressure monitoring)
- 14 bit PDV (pressure reading)

1) Only SPAN-...PNLX-PNVA

**Fig. 25**