rexroth
A Bosch Company

Operating instructions

Electronic pressure switch with two switching outputs

Type HEDE10-3X

CE UKCA

c UL US LISTED

RoHS

RE 30277-01-B Edition: 2022-11

Content

The data specified only serve to describe the product. If information on the use of the product is given, it is only to be regarded as application examples and recommendations.
Catalog specifications do not constitute assured characteristics. The information given does not release the user from the obligation of own judgment and verification. It must be remembered that our products are subject to a natural process of wear and aging.

The cover shows an example configuration. The product delivered may differ from the image on the cover.

Translation of the original operating instructions. The original operating instructions were prepared in German language.

Bosch Rexroth AG

1 About this documentation

1.1 VALIDITY OF THE DOCUMENTATION

This documentation applies to the following products:

- R901425452 HEDE10-30/100/2/-Gi-K35-0
- R901425453 HEDE10-30/250/2/-Gi-K35-0
- R901425454 HEDE10-30/400/2/-Gi-K35-0
- R901425455 HEDE10-30/600/2/-Gi-K35-0

- R901433081 HEDE10-30/100/2/-Ga-K35-V
- R901433087 HEDE10-30/250/2/-Ga-K35-V
- R901433088 HEDE10-30/400/2/-Ga-K35-V
- R901433089 HEDE10-30/600/2/-Ga-K35-V

This documentation is intended for fitters, operators, service technicians, system operators and plant/machine manufacturers.

This documentation contains important information on the safe and proper mounting, transport, commissioning, operation, use, maintenance, demounting and simple troubleshooting of the product.

▶ Read this documentation thoroughly, especially Chapter 2 “Safety instructions“ and Chapter 3 “General notes on damage to property and damage to the product“, before working with the pressure switch.

1.2 REQUIRED AND SUPPLEMENTARY DOCUMENTATION

- Only commission the product once you have been provided with the documentation marked with the book symbol 📖 and you have understood and observed it.

Tabelle 1: Required and supplementary documentation

	Title	Document no.	Document type
📖	Electronic pressure switch type HEDE10	RE 30277	Data sheet
	Electronic pressure switch type HEDE10	RE 30277-PA	Parameter description

1.3 REPRESENTATION OF INFORMATION

In order that this documentation allows you to work directly and safely with your product, standardized safety notes, symbols, terms, and abbreviations are used. For a better understanding, they are explained in the following sections.

1.1.1 Safety instructions

This documentation contains safety notes in chapter 2.6 “Product-specific safety instructions“ and chapter 3 “General notes on damage to material and the product“ as well as before a sequence of activities or instructions for action, which involve the risk of personal injury or damage to equipment. Observe the hazard avoidance measures described.

Safety instructions are structured as follows:

⚠ SIGNAL WORD

Type and source of danger!

Consequences in case of non-compliance

- ▶ Hazard avoidance measures
- ▶ <Enumeration>

- **Warning symbol:** draws attention to a hazard
- **Signal word:** identifies the degree of hazard
- **Type and source of danger:** Specifies the type and source of hazard
- **Consequences:** describes the consequences in case of non-observance
- **Precaution:** specifies how the hazardous situation can be prevented

Tabelle 2: Hazard classifications according to ANSI Z535.6-2011

Warning sign, signal word	Meaning
⚠ DANGER	Indicates a hazardous situation which, if not avoided, will certainly result in death or serious injury.
⚠ WARN-ING	Indicates a hazardous situation which, if not avoided, could result in death or serious injury.

Warning sign, signal word	Meaning
CAUTION	Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.
NOTICE	Damage to property: The product or the environment could be damaged.

1.1.2 Symbols

The following symbols indicate notices which are not safety-relevant but increase the comprehensibility of the documentation.

Tabelle 3: Meaning of the symbols

Symbol	Meaning
	If this information is disregarded, the product cannot be used or operated in an optimum manner.
▶	Individual, independent action
1.	Numbered instruction: The numbers indicate that the actions must be carried out one after the other.
[...]	Designation of keys, buttons or indications

1.1.3 Designations

The following designations are used in this documentation:

Tabelle 4: Designations

Designation	Meaning
HEDE10-3X	Electronic pressure switch with two separately settable switching outputs

1.1.4 Abbreviations

The following abbreviations are used in this documentation:

Tabelle 5: Abbreviations

Abbreviation	Meaning
IODD	IO Device Description
UMRL	Upper Measuring Range Limit
PELV	Protective Extra Low Voltage
SELV	Safety Extra Low Voltage

2 Safety instructions

2.1 ABOUT THIS CHAPTER

The product has been manufactured according to the generally accepted codes of practice. However, there is still a risk of personal injury and damage to property if you do not observe this chapter and the safety instructions in this documentation.

- Read this documentation completely and thoroughly before working with the product.
- Keep this documentation in a location where it is accessible to all users at all times.

▶ Always include the required documentation when passing the product on to third parties.

2.2 INTENDED USE

The product is an electronic component. These pressure switches comply with the Pressure Equipment Directive and are designed and manufactured for group 2 fluids in accordance with sound engineering practice. You may use the product as follows:

- For acquiring the system pressure in hydraulic systems.
- While adhering to the operating and ambient conditions and specified performance limits according to the data sheet.
- In the original condition, without damage.
- Only in applications for which they are suitable without any restrictions.
- Only within the pressure limits provided in the operating range.

The product is intended exclusively for professional use and not for private usage. Operation according to the intended use also implies that you have read and understood this documentation completely, especially chapter 2 “Safety instructions“.

2.3 IMPROPER USE

Any use other than described in the section “Intended use” is considered as improper and is therefore not permitted. Improper use of the pressure switch includes:

- Use in potentially explosive atmospheres
- Improper storing

- Incorrect transport
- Lack of cleanliness during storage and mounting
- Faulty installation
- Use of unsuitable/non-approved media
- Exceeding of the specified overload pressures.
- Operation outside the permissible temperature range

Bosch Rexroth AG does not assume any liability for damage caused by improper use. The user assumes all risks involved with improper use.

2.4 PERSONNEL QUALIFICATIONS

The activities described in this documentation require basic knowledge of mechanics, electrics and hydraulics as well as knowledge of the appropriate technical terms. In order to ensure safe use, these activities may only be carried out by an expert in the respective field or an instructed person under the direction and supervision of an expert.
Experts are those who are able to recognize potential hazards and apply the appropriate safety measures due to their professional training, knowledge and experience, as well as their understanding of the relevant requirements pertaining to the work to be undertaken. An expert must observe the relevant specific professional rules and have the necessary expert knowledge.

With regard to hydraulic products, expertise means, for example:

- Reading and completely understanding hydraulic circuit diagrams,

- in particular, completely understanding the correlations regarding safety equipment and
- knowledge of the function and structure of hydraulic components.

Bosch Rexroth offers training courses that support your qualification in specific fields. An overview of the training contents can be found on the Internet at:
`http://www.boschrexroth.com`

2.5 GENERAL SAFETY INSTRUCTIONS

- Observe the valid regulations on accident prevention and environmental protection.
- Observe the safety regulations and provisions of the country in which the product is used/applied.
- Only use Rexroth products in technically perfect condition.
- Observe all information on the product.
- Persons assembling, operating, disassembling or maintaining Rexroth products may not be under the influence of alcohol, other drugs or medication influencing the ability to react.
- Only use genuine Rexroth accessories and spare parts in order to exclude any hazard to persons due to unsuitable spare parts.
- Comply with the technical data and ambient conditions specified in the product documentation.
- The installation or use of inappropriate products in safety-relevant applications could result in unintended operating states in the application which in turn could cause personal injuries and/or damage to property. Therefore, only use a product for

safety-relevant applications if this use is expressly specified and permitted in the documentation of the product, e.g. in explosion protection zones or in safety-related parts of control systems (functional safety).

- You may only commission the product when it has been established that the final product (for example, a machine or system), in which the Rexroth products have been installed, complies with national regulations, safety regulations and standards relevant to the application.

2.6 PRODUCT-SPECIFIC SAFETY INSTRUCTIONS

WARNING

System parts under pressure and ejecting hydraulic fluid!

When working on hydraulic systems with stored energy (accumulator or cylinder operating under gravity) hydraulic components may still be under pressure even after the pressure supply was switched off. During installation and demounting, the pressure switch or parts may be hurled around and cause personal injuries and/or damage to property. There is moreover the risk of serious injury caused by a powerful, ejecting hydraulic fluid jet.

- ▶ Before working on the hydraulic product ensure that the hydraulic system is depressurized and the electrical control de-energized.
- ▶ Completely depressurize machines and systems before working on hydraulic products.

WARNING

Faulty fastening!

Improper mounting can cause the pressure switch to loosen and to fall down. Consequently, hydraulic fluid may leak and lead to personal injuries and/or damage to property.

- ▶ Install the pressure switch thoroughly according to the mounting instructions by means of suitable mounting aids.
- ▶ Adhere to the specified tightening torques.

Easily inflammable hydraulic fluid!

In connection with fire or other sources of heat, leaking hydraulic fluid mist, which results from defective or incompletely mounted pressure switches and their connections, may lead to fire or explosions.

- ▶ Do not use hydraulic components in areas with open fire and only at a sufficient distance to sources of heat.

CAUTION

Exceeding of maximum temperatures!

When the pressure switch is operated outside the specified temperatures, malfunction or failures, e.g. overheating, may occur and thus pose a risk of injury.

- ▶ Operate the pressure switches only within the ambient and fluid temperatures provided for them.

- Before commissioning the pressure switch, read this document and make sure that the product is suitable for your application without any restrictions.
- Check the compatibility of the product materials with the media to be measured in all applications.
- Correct condition of the pressure switch during operation can only be guaranteed if it is only used with media, to which the wetted materials are sufficiently resistant.
- The pressure switch may only be operated within the specified measuring range.
- The maximum pressure resistance specified must not be exceeded. Even brief exceeding of the maximum pressure resistance can lead to the destruction of the pressure switch.
- Notes on pressure limits, product materials and materials in contact with the media as well as further information can be found in the technical data (see data sheet).

2.7 OBLIGATIONS OF THE MACHINE END-USER

The operation of installations, systems and machines basically requires the implementation of a holistic IT security concept which is state-of-the-art in terms of technology. Accordingly, Bosch Rexroth products and their properties have to be considered as components of installations, systems and machines for their holistic IT security concept.

Unless otherwise documented, Bosch Rexroth products are designed for operation in local, physically and logically secured networks with access restrictions for authorized persons, and they are not classified according to IEC 62443-4-2.

3 General notes on damage to property and damage to the product

The warranty only applies to the delivered configuration.

- The claim to warranty expires if the product is assembled, commissioned and operated incorrectly, not used as intended and/or handled improperly.

NOTICE

Impermissible mechanical loading!

Impact or similar forces on the pressure switch may damage or even destroy it.

▶ Never use pressure switches as a handle or step. Do not place/put any objects on top of it.

Dirt and foreign particles in hydraulic components!

Penetrating dirt and foreign particles lead to wear and malfunctions. Safe functioning of the hydraulic components is no longer ensured.

▶ During installation, ensure utmost cleanliness in order to prevent foreign particles such as welding beads or metal chips from getting into the hydraulic lines.

▶ Do not use linty cloth for cleaning.

▶ Ensure that no cleaning agents are able to penetrate the hydraulic system.

NOTICE

Contaminated hydraulic fluid!

Contamination in the hydraulic fluid can lead to malfunction, e.g. jamming or clogging of the pressure switch.

- ▶ Ensure sufficient cleanliness of the hydraulic fluid over the entire operating range.

Environmentally harmful hydraulic fluid!

Leaking hydraulic fluid leads to environmental pollution.

- ▶ Remove any leakage immediately.
- ▶ Dispose of the hydraulic fluid in accordance with the currently applicable national regulations in your country.

4 Scope of delivery

- 1 pressure switch
- 1 documentation

5 About this product

The device measures and monitors the system pressure of machines and installations.

5.1 OPERATING RANGE

WARNING

Overpressure!

Risk of injury and risk of destruction of the pressure switch, even if the bursting pressure is exceeded only briefly.

- ▶ Avoid static and dynamic overpressure exceeding the specified pressure resistance.

Tabelle 6: Operating range of HED10-3X

Ordering code	Measuring range **	Pressure resistance *	Bursting pressure
Pressure switch with female thread			
HEDE10-30/100/2/-Gi-K35-0	0...100 bar	300 bar	400 bar
HEDE10-30/250/2/-Gi-K35-0	0...250 bar	500 bar	1000 bar
HEDE10-30/400/2/-Gi-K35-0	0...400 bar	800 bar	1600 bar
HEDE10-30/600/2/-Gi-K35-0	0...600 bar	800 bar	2500 bar
Pressure switch with male thread			
HEDE10-30/100/2/-Ga-K35-V	0...100 bar	300 bar	400 bar
HEDE10-30/250/2/-Ga-K35-V	0...250 bar	500 bar	1000 bar
HEDE10-30/400/2/-Ga-K35-V	0...400 bar	800 bar	1600 bar
HEDE10-30/600/2/-Ga-K35-V	0...600 bar	800 bar	2500 bar

*) With static overload pressure

) **The pressure switch may only be operated within the specified measuring range.

Restrictor in process connection:
In hydraulic systems, highly dynamic effects such as pressure peaks, cavitation, etc. may occur depending on the relevant operating state. To reduce these effects on the measuring element of the sensor, a restrictor element is integrated in the process connection.

High viscosities can delay the response by some milliseconds. Severe soiling may impair the function.

The units are vacuum-resistant.

5.2 FUNCTION

The pressure switch displays the current system pressure. It generates output signals according to the operating mode and the parameter setting.

It moreover provides the process data via IO-Link. The pressure switch is designed for full bidirectional communication. So, the following options are provided:

- Remote display: Reading and displaying the current system pressure
- Remote parameter setting: Reading and changing current parameter settings
- OI-Link parameter setting

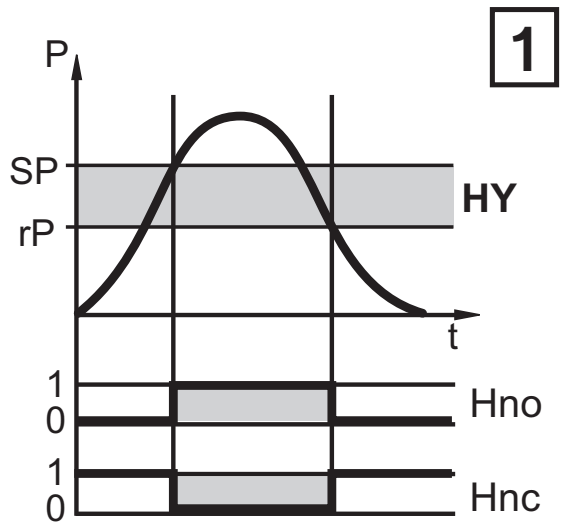
OUT1 (Pin 4) Switching signal for system pressure limit value
Communication via IO-Link

OUT2 (Pin 2) Switching signal for system pressure limit value

1.1.5 Switching function

OUTx changes its switching state if it is above or below the set switching limits (SPx, rPx). The following switching functions can be selected:

- Hysteresis function / normally open: [**ou1**] / [**ou2**] = [**Hno**] (see Fig. 1).
- Hysteresis function / normally closed: [**ou1**] / [**ou2**] = [**Hnc**] (see Fig. 1).
- First the set point (SPx) is to be determined, then the reset point (rPx). The hysteresis thus defined remains, even if SPx is changed again.
- Window function / normally open: [**ou1**] / [**ou2**] = [**Fno**] (see Fig. 2).
- Window function / normally closed: [**ou1**] / [**ou2**] = [**Fnc**] (see Fig. 2).
- The width of the window can be set by means of the difference between FHx and Flx. FHx = upper value, FLx = lower value.



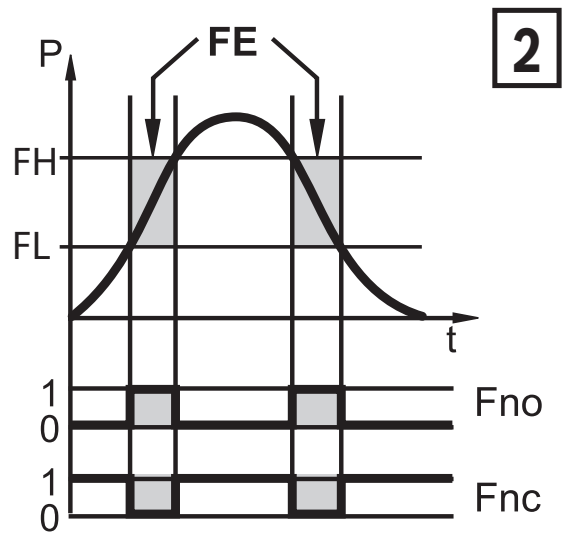


Fig. 1 Normally open Fig. 2 Normally closed

P = system pressure, **HY** = hysteresis, **FE** = window

When set to the window function, the set and reset points have a fixed hysteresis of 0.25 % of the measuring span.

1.1.6 IO-Link

General information

The pressure switch is provided with an IO-Link communication interface, which requires an IO-Link-capable module (IO-Link master) for operation.

The IO-Link interface enables direct access to the process and diagnostic data and provides the possibility of setting parameters of the pressure switch during operation.

In addition, communication is possible via a point-to-point connection with a USB adapter cable.

You can find the IODDs necessary for the configuration of the device, detailed information about process data structure, diagnostic information and parameter addresses as well as the required information on the necessary IO-Link hardware and software at `www.boschrexroth.com/hede10-3x`

6 Transport and storage

Rexroth components are delivered in an unobjectionable state.

When transporting and storing the product, strictly adhere to the ambient conditions specified in the data sheet. Improper storage can be detrimental to the product.

6.1 STORING THE PRESSURE SWITCH

Pressure switches are suitable for storage for up to 12 months under the following conditions:

- Do not store the assemblies outdoors but in a well-ventilated room.
- Provide for 100 % UV protection.
- Ensure a storage temperature between -40 °C and +100 °C.
- Protect the hydraulic component against humidity, particularly ground humidity. Store the hydraulic component in the shelf or on a pallet. The relative air humidity must not exceed 65 % and there must not be any condensation.
- Ensure that no ozone formation takes place near the storage location.
- Store the hydraulic component in packaging in order to protect it from dust and dirt.

7 Installation

CAUTION

Pressure!

Risk of injury due to pressurized or improperly installed component.

- ▶ Before installing and removing the pressure switch, make sure that the system is depressurized.
- ▶ Check the process connection for compatibility.
- ▶ Observe the recommended tightening torques.

- ▶ Insert the pressure switch in a G¼ process connection.
- ▶ Tighten firmly. Recommended tightening torque:

Upper measuring range limit value in bar	Tightening torque in Nm
100, 250, 400 bar	25...35 Nm
600 bar	30...50 Nm
Dependent on lubrication, seal and pressure load!	

The sensor housing can be rotated by 345° with regard to the process connection. Do not rotate past the end stop!

7.1 ELECTRICAL CONNECTION

CAUTION

Voltage!

Hazard caused by connection to supply outside the protective or safety extra low voltage.

- The sensor may exclusively be installed by a qualified electrical worker.
- Observe national and international regulations for the erection of electrotechnical systems.
- Observe voltage supply according to EN 50178, SELV, PELV.

With regard to cULus:
The device shall be supplied from an isolating transformer having a secondary Listed fuse rated either

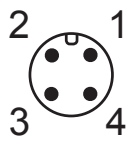
a) max 5 amps for voltages 0...20 Vrms (0...28.3 Vp) or

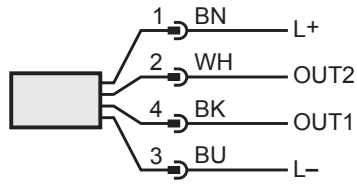
b) 100/Vp for voltages of 20...30 Vrms (28.3...42.4 Vp).

The device shall be connected only by using any Listed (CYJV/7) or R/C (CYJV2/8) cord in respect of Condition of Acceptability, having suitable ratings. (See ML File No. E223220).

1. Disconnect the system from the power supply.
2. Connect the sensor as follows:

Wire color	
BK	Black
BN	Brown
BU	Blue
WH	White



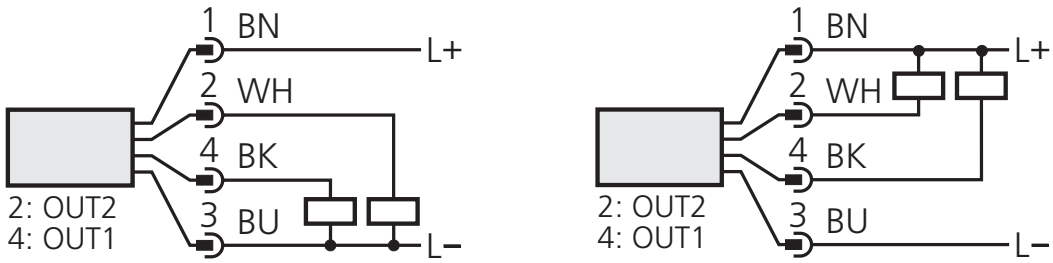


OUT1 Switching output or IO-Link
OUT2 Switching output

Color coding according to DIN EN 60947-5-2

Example circuits	
2 x positive switching	2 x negative switching

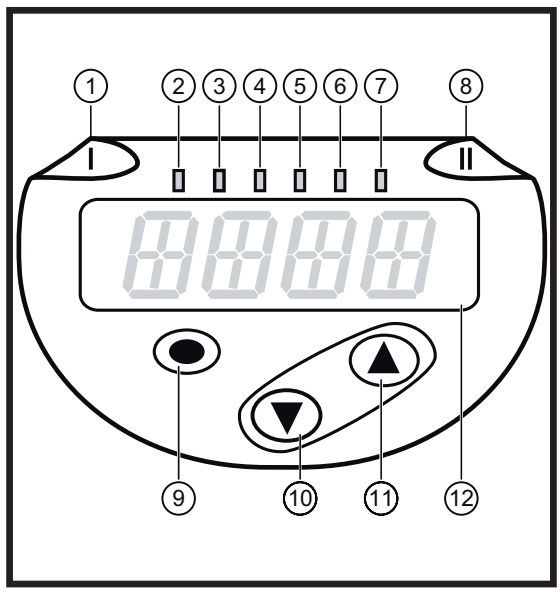
Example circuits



8 Commissioning

You can set and commission your pressure switch using the operating and display elements described here.

8.1 OPERATING AND DISPLAY ELEMENTS



1 to 8: Indicator LEDs	
LED 1	Switching status OUT1 (is on when output 1 is connected through).

LED 8	Switching status OUT2 (is on when output 2 is connected through).
LED 2 - 7	System pressure in the given unit of measurement.

9: Enter button [●]

Selection of the parameters and acknowledgement of the parameter values.

10 to 11: Arrow keys up [▲] and down [▼]

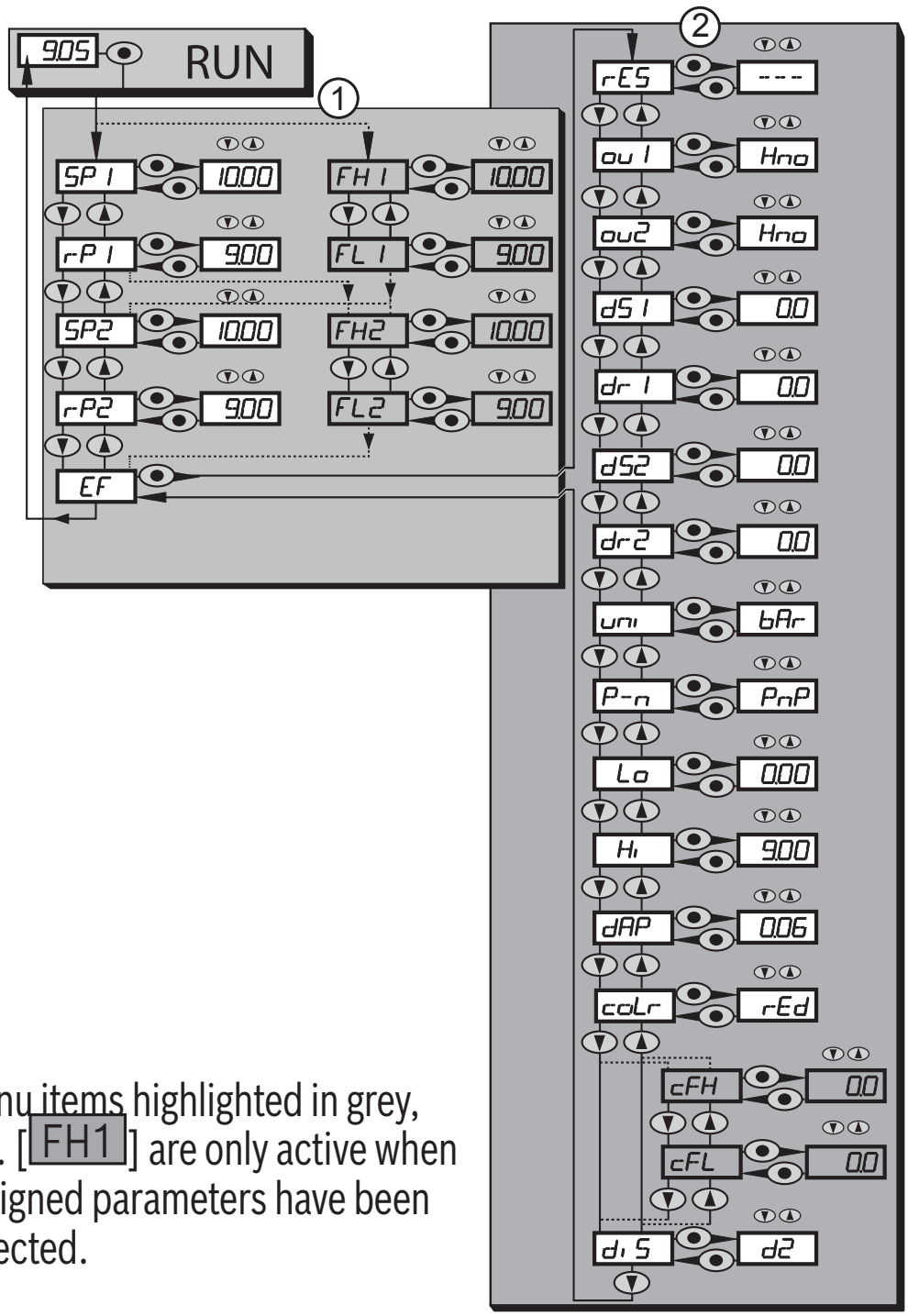
Setting of the parameter values (scrolling by holding pressed; incremental by pressing once).

12: Alphanumeric display, 4 digits

- Display of the current system pressure.
- Indication of the parameters and parameter values.

8.2 MENU

1.1.7 Menu structure: Main menu



Menu items highlighted in grey, e.g. [FH1] are only active when assigned parameters have been selected.

1.1.8 Explanation of menu level 1

SPx/rPx	Upper/lower limit value for system pressure, at which OUTx switches with hysteresis setting. Prerequisite: OUTx setting is [Hno] or [Hnc]
FHx/FLx	Upper/lower limit value for system pressure, at which OUTx switches with window setting. Prerequisite: OUTx setting is [Fno] or [Fnc]
EF	Extended functions / opening of menu level 2.

1.1.9 Explanation of menu level 2

rES	Restore factory setting.
ou1	Output function for OUT1: Switching signal for the pressure limit values: Hysteresis function [H ..] or window function [F ..], either normally open [. no] or normally closed [. nc]
ou2	Output function for OUT2: Switching signal for the pressure limit values: Hysteresis function [H ..] or window function [F ..], either normally open [. no] or normally closed [. nc]
dS1 / dS2	Set delay for OUT1 / OUT2
dr1 / dr2	Reset delay for OUT1 / OUT2
uni	Standard unit of measurement for system pressure (display): [bAr] / [PSI] / [MPA]
P-n	Switching logic of outputs: pnp / npn

Lo	Minimum value memory for system pressure
Hi	Maximum value memory for system pressure
dAP	Damping of the switching point
coLr	Assignment of display colors “red” and “green” within the measuring range
cFL / cFH	Lower / upper value for color change Parameter only active after selection of a freely definable color window in the coLr parameter: [r-cF] or [G-cF]
diS	Update rate and orientation of the display

8.3 PARAMETER SETTING

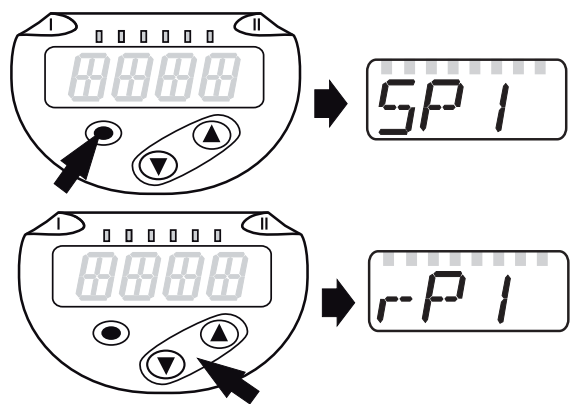
During parameter setting the unit remains in operation. It continues to execute its monitoring functions with the existing parameters until the parameter setting is completed.

1.1.10 Parameter setting in general

3 steps have to be taken for each parameter setting:

1 **Select parameter**
Press [●] to get to the menu.

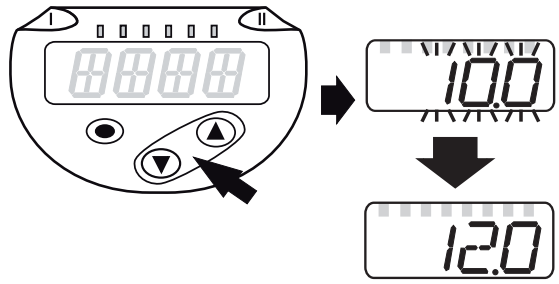
Press [▲] or [▼] until the requested parameter is displayed.



2 Set parameter value

▶ Press [●] to edit the selected parameter.

Press [▲] or [▼] for min. 1 s.
After 1 s: Set value is changed:
Incrementally by pressing the button once or continuously by keeping the button pressed.

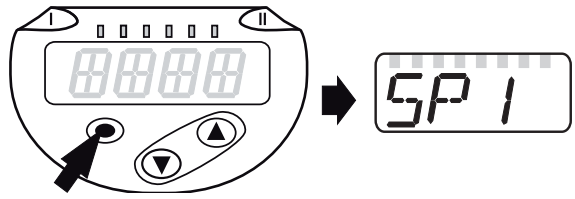


Numerical values are continuously incremented with [▲] or decremented with [▼].

3 Confirm parameter value

▶ Briefly press [●].

The parameter is displayed again. The new setting value is saved.



Setting other parameters

▶ Press [▲] or [▼] until the requested parameter is displayed.

Finish parameter setting

▶ Press [▲] or [▼] repeatedly until the current measured value is displayed, or wait for 30 s.

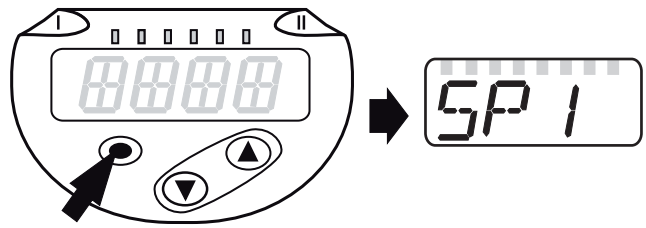
The unit returns to the process value display.

If [C.Loc] is displayed when an attempt is made to modify a parameter value, a parameter setting process is active via IO-Link communication (temporary locking).

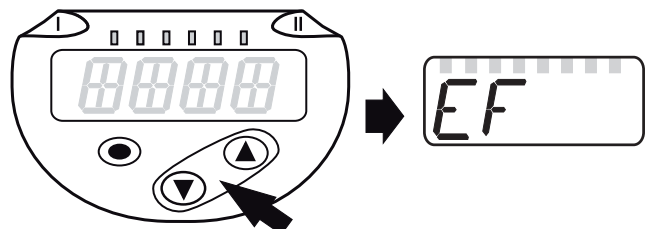
If [S.Loc] is displayed, the sensor is permanently software-locked. This lock can only be removed using a parameter setting software.

Change from menu level 1 to menu level 2:

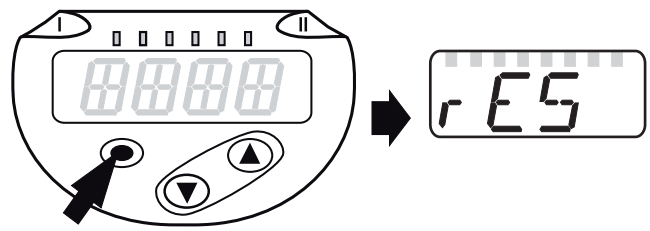
- Press [●] to get to the menu.



- Press [▲] or [▼] until [EF] is displayed.

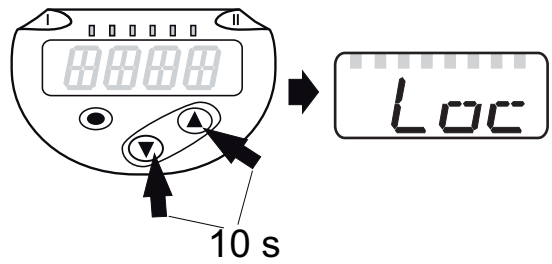


- Press [●].
  The first parameter of the submenu is displayed (here: [rES]).



Locking / unlocking

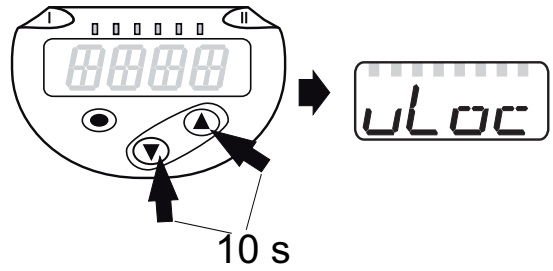
The unit can be locked electronically to prevent unintentional settings.



- ▶ Make sure that the unit is in the normal operating mode.
- ▶ Press [▲] + [▼] simultaneously for 10 s.
  [Loc] is displayed.

During operation: [**Loc**] is briefly displayed if you try to change parameter values.

For unlocking:

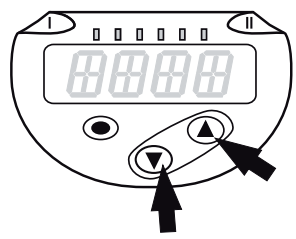


- ▶ Press [▲] + [▼] simultaneously for 10 s.
  [uLoc] is displayed.

Factory setting: Not locked

- Timeout:
  If no button is pressed for 30 s during parameter setting, the unit returns to the operating mode with unchanged values.
- Exiting a parameter without adopting the settings:

For unlocking:



- ▶ Press [▲] + [▼] simultaneously.
  The longer [▲] and [▼] are held down, the further you jump back in the menu until you reach the display.

8.4 CONFIGURING THE DISPLAY (OPTIONAL)

- Select [uni] and set the unit of measurement:

  - [bAr], [PSI] or [MPA]

The selectable units of measurement depend on the respective unit.

- Select [diS] and set the update rate and orientation of the display:

  - [d1]: Update of the measured values every 50 ms
  - [d2]: Update of the measured values every 200 ms
  - [d3]: Update of the measured values every 600 ms
  - [rd1], [rd2], [rd3]: Display as for d1, d2, d3; rotated by 180°
  - [OFF] = The display is switched off in the operating mode. When one of the buttons is pressed, the current measured value is displayed for 30 s. The LEDs remain active even if the display is deactivated.

Even with unsteady pressure characteristics, [d1] provides optimum readability; the corresponding algorithms are stored!

8.5 SETTING THE OUTPUT SIGNALS

1.1.11 Setting the output functions

- ▶ Select [ou1] and set the switching function:
  - – [Hno] = hysteresis function/NO
  - – [Hnc] = hysteresis function/NC
  - – [Fno] = window function/NO
  - – [Fnc] = window function/NC

- ▶ Select [ou2] and set the function:
  - – [Hno] = hysteresis function/NO
  - – [Hnc] = hysteresis function/NC
  - – [Fno] = window function/NO
  - – [Fnc] = window function/NC

1.1.12 Determining the switching limits for the hysteresis function

- ▶ [ou1] / [ou2] has to be set as [Hno] or [Hnc].
- ▶ Select [SPx] and set the value at which the output is set.
- ▶ Select [rPx] and set the value at which the output is reset.

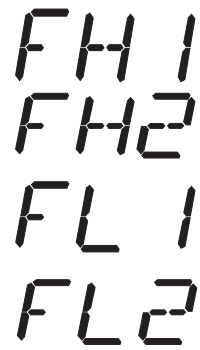
rPx is always smaller than SPx. The unit only accepts values which are smaller than the value for SPx.

1.1.13 Determining the switching limits for the

window function

- ▶ [ou1] / [ou2] has to be set as [Fno] or [Fnc].
- ▶ Select [FHx] and set the upper limit value.
- ▶ Select [FLx] and set the lower limit value.

FLx is always smaller than FHx. The unit only accepts values which are smaller than the value for FHx.



8.6 USER SETTINGS (OPTIONAL)

1.1.14 Setting the delay for the switching outputs

[dSx] = set delay for OUT1 / OUT2
[drx] = reset delay for OUT1 / OUT2

- ▶ Select [dS1], [dS2], [dr1] or [dr2] and set a value between 0 and 50 s (with 0 the delay time is not active).

For this unit, the parameters [dSx] and [drx] for the set and reset points are executed strictly according to the VDMA guideline!

1.1.15 Setting the logic for the switching outputs

- ▶ Select [P-n] and set [PnP] or [nPn].

1.1.16 Setting damping for the switching signal

- ▶ Select [dAP] and set the damping constant in seconds
  (T value: 63 %); setting range 0.000...4.000 s.

Damping [dAP] has an influence on the switching point/process data flow (IO-Link communication) and the display.

1.1.17 Reading the min/max values for the system pressure

- ▶ Select [Hi] or [Lo] and briefly press [●].

[Hi] = maximum value, [Lo] = minimum value.
Clear memory:

- ▶ Select [Hi] or [Lo].
- ▶ Press and hold [▲] or [▼] until [----] is displayed.
- ▶ Briefly press [●].

1.1.18 Resetting all parameters to factory setting

- ▶ Select [rES].
- ▶ Press [●].
- ▶ Press and hold [▲] or [▼] until [----] is displayed.
- ▶ Briefly press [●].

We recommend noting down your own settings before carrying out a reset (→ 14.3 Factory setting).

1.1.19 Set color change of the display color

- ▶ Select [coLr] and set the function:
  - – [rEd] = display color red (independent of measured value)
  - – [GrEn] = display color green (irrespective of measured value)
  - – [r1ou] = display color red when OUT1 switches
  - – [G1ou] = display color green when OUT1 switches
  - – [r2ou] = display color red when OUT2 switches
  - – [G2ou] = display color green when OUT2 switches
  - – [r-12] = display color red when the measured value is between the limit values of OUT1 and OUT2
  - – [G-12] = display color green when the measured value is between the limit values of OUT1 and OUT2
  - – [r-cF] = display color red when the measured value is between the freely definable limit values [cFL]*) and [cFH]*)

– [G-cF] = display color green when the measured value is between the freely definable limit values [cFL]*) and [cFH]*)

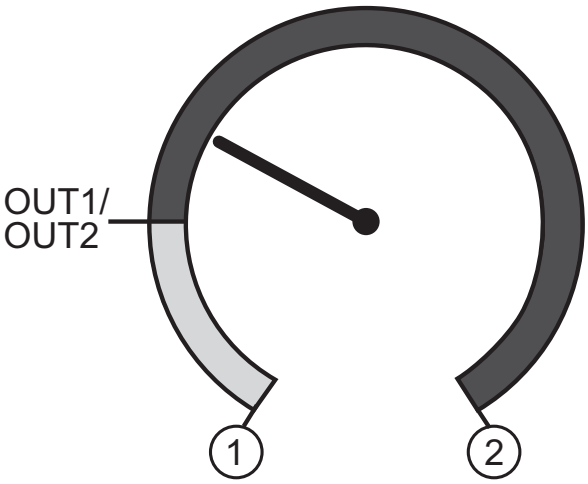
*) The parameters [cFL] and [cFH] can only be selected in the menu tree when [r-cF] or [G-cF] was activated.

- Select [cFH] and set upper limit value (only possible when [r-cF] or [G-cF] was activated).
  The setting range corresponds to the measuring range and its minimum limit is [cFL].

- Select [cFL] and set lower limit value (only possible when [r-cF] or [G-cF] was activated).
  The setting range corresponds to the measuring range and its maximum limit is [cFH].

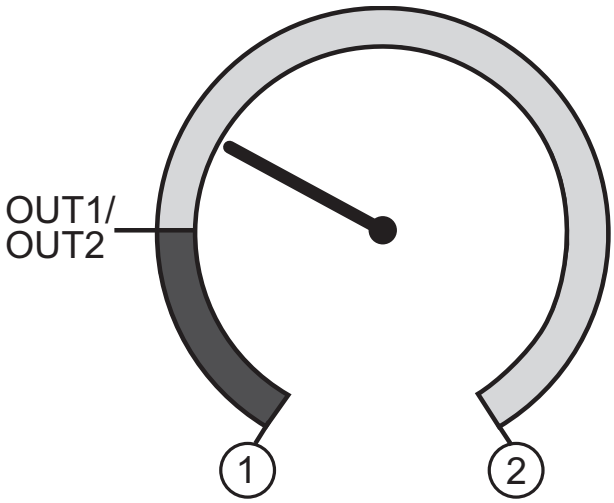
1.1.20 Graphical depiction of the color change of the display

Display color change for the parameters **[r1ou]** / **[r2ou]**, mode **hysteresis function**



Measured value > switching point OUT1/OUT2; display = red

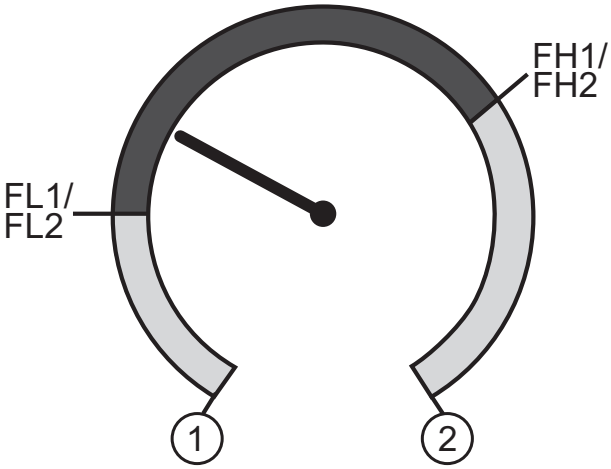
Display color change for the parameters **[G1ou]** / **[G2ou]**, mode **hysteresis function**



Measured value > switching point OUT1/OUT2; display = green

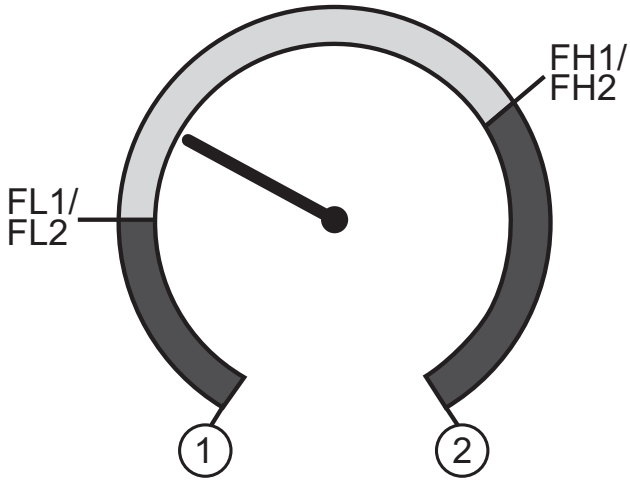
	Color change display green
	Color change display red
1	Lower measuring range limit
2	Upper Measuring Range Limit

Display color change for the parameters **[r1ou]** / **[r2ou]**, mode **window function**



Measured value between FL1/FL2 and FH1/FH2; display = red

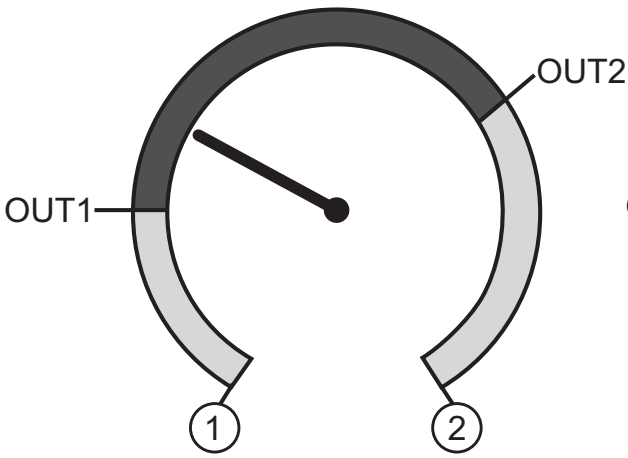
Display color change for the parameters **[G1ou]** / **[G2ou]**, mode **window function**



Measured value between FL1/FL2 and FH1/FH2; display = green

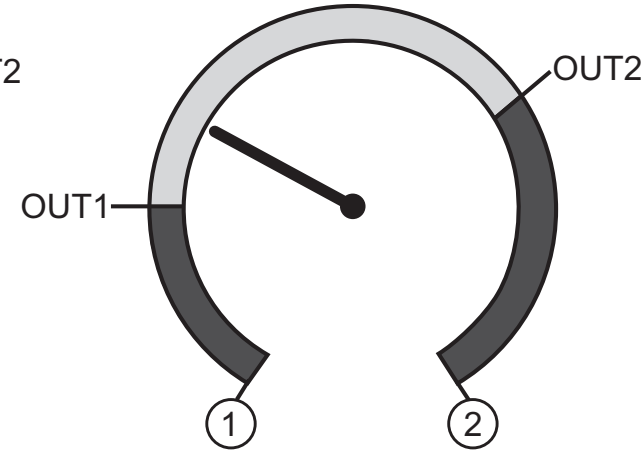
	Color change display green
	Color change display red
1	Lower measuring range limit
2	Upper measuring range limit
FL1/FL2	Lower limit value, window function output OUT1 / OUT2
FH1/FH2	Upper limit value, window function output OUT1 / OUT2

Display color change for the parameter **[r-12],** mode **hysteresis function**



Measured value between OUT1 and OUT2; display = red

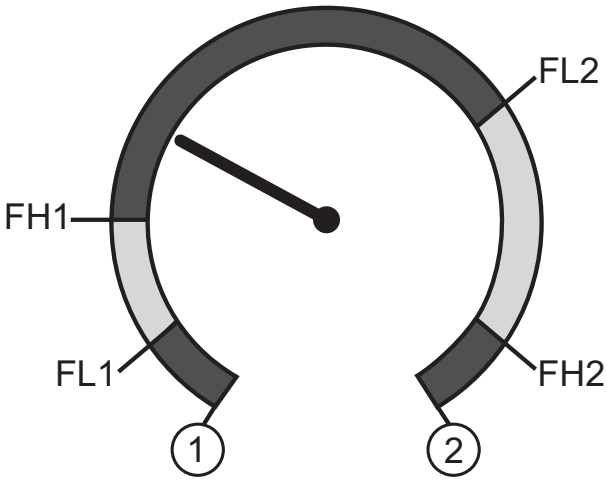
Display color change for the parameter **[G-12]**, mode **hysteresis function**



Measured value between OUT1 and OUT2; display = green

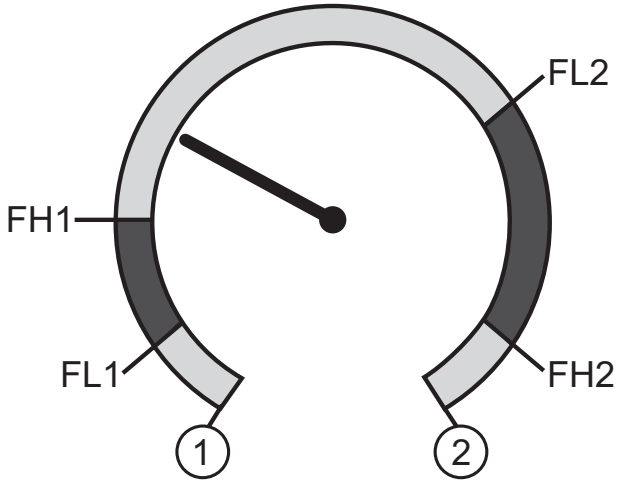
	Color change display green
	Color change display red
1	Lower measuring range limit
2	Upper measuring range limit

Display color change for the parameter **[r-12]**, mode **window function**



Measured value outside FL1...FH1 and FL2...FH2; display = red

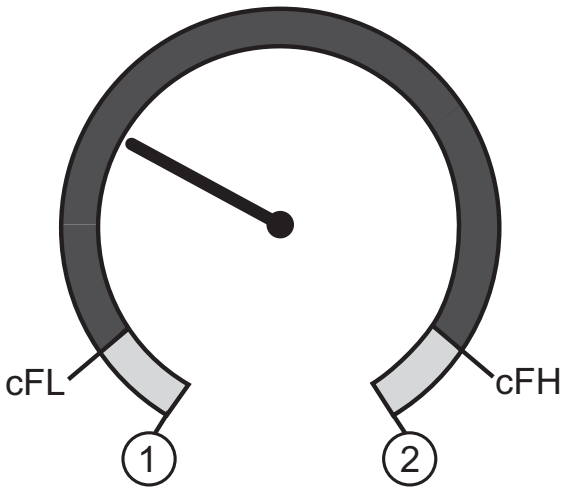
Display color change for the parameter **[G-12],** mode **window function**



Measured value outside FL1...FH1 and FL2...FH2; display = green

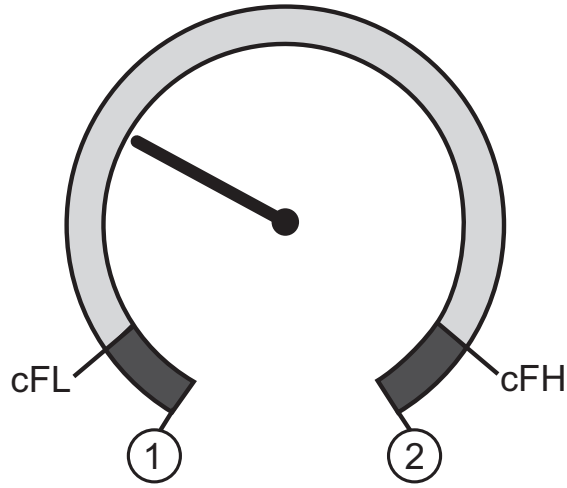
	Color change display green
	Color change display red
1	Lower measuring range limit
2	Upper measuring range limit
FL1/FL2	Lower limit value, window function output OUT1 / OUT2
FH1/FH2	Upper limit value, window function output OUT1 / OUT2

Display color change for the parameter **[r-cF]** independently of OUT1 / OUT2.



Measured value between cFL and cFH; display = red

Display color change for the parameter **[G-cF]** independently of OUT1 / OUT2



Measured value between cFL and cFH; display = green

	Color change display green
	Color change display red
1	Lower measuring range limit
2	Upper measuring range limit
cFL	Lower limit value (independent of the output function)
cFH	Upper limit value (independent of the output function)

9 Operation

After power ON, the unit is in the run mode (normal operating mode). It carries out measurement and evaluation functions and provides output signals according to the set parameters. Operating displays → 8.1 Operating and display elements.

9.1 READING THE PARAMETER SETTINGS

- ▶ Press [●].
- ▶ Press [▲] or [▼] until the requested parameter is displayed.
- ▶ Briefly press [●].

The unit displays the corresponding parameter value for approx. 30 s and then changes to the process value display.

10 Maintenance and repair

Rexroth pressure switches are usually maintenance-free.
The seals of pressure switches are subject to a natural process of wear and aging. It is therefore recommended that they are changed at reasonable intervals. The time intervals are mainly determined by the operating conditions and cleanliness of the hydraulic fluid.

- ▶ Inspect the product and connection faces regularly for tightness!
- ▶ Replace the seals at reasonable intervals as a precautionary measure.

Preventive maintenance (e.g. hydraulic fluid maintenance) and adherence to specified pressures and temperatures prolongs the service life of the system and the components.

10.1 CLEANING AND CARE

NOTICE

Solvents and aggressive cleaning agents!

Aggressive cleaning agents may damage the seals and the surface of hydraulic components and make the product age faster.

- Never use solvents or aggressive cleaning agents.

- Close all openings with appropriate protective caps.
- Clean the components using only a damp, non-linting cloth. Only use water and a mild detergent, if necessary, to do so.
- Remove dust and dirt accumulations on the hydraulic device at regular intervals.

10.2 SPARE PARTS

The available spare parts and seal kits are specified in the relevant data sheet. You can order spare parts from the address given in chapter 16.1 “List of addresses“ on Seite 55.

10.3 REPAIR

Rexroth pressure switches may only be replaced as a complete unit. Unauthorized modifications to devices are not permitted for safety reasons! Repairs may only be carried out by Bosch Rexroth AG. For repairs send the device to the service address given in chapter 16.1. Please return the devices to us in their original packaging. Repaired devices are returned with default settings.

In the case of parameterized devices, user-specific settings are not maintained. The operator has to transmit the relevant user parameters and programs again.

11 Demounting and replacement

WARNING

Pressurized and energized system parts.

When working on pressurized or energized system parts there is a risk of injury by discharging hydraulic fluid or electric shock.

- ▶ Before demounting any component ensure that the hydraulic system is depressurized and the electrical control de-energized.

Have sufficiently dimensioned collecting containers, non-linting cloth and medium-binding materials ready in order to collect or bind leaking hydraulic fluid.

1. Disconnect your system from the power supply and depressurize it.
2. Unload hydraulic accumulators, if provided.
3. Before carrying out any demounting work, switch your system off, disconnect it from the power supply and secure the system against restarting.
4. Make sure that the surroundings are clean for demounting.
5. Prepare a container or tray for the collection of draining hydraulic fluid and its subsequent, proper disposal.
6. Loosen the pressure switch exclusively by means of a suitable tool.

For a new installation or replacement of the hydraulic component follow the steps according to chapter 7 “Installation“ on Seite 23.

12 Disposal

12.1 ENVIRONMENTAL PROTECTION

Careless disposal of the hydraulic components and the hydraulic fluid can lead to pollution of the environment.

- Thus, dispose of the product and the hydraulic fluid in accordance with the currently applicable national regulations in your country.
- Dispose of hydraulic fluid residues according to the applicable safety data sheets for these hydraulic fluids.
- Observe the following notes for an environmentally friendly disposal of the hydraulic component.

12.2 PACKAGING

Upon request, reusable systems can be used for regular deliveries.

The materials for disposable packaging are mostly cardboard, wood, and expanded polystyrene. They can be recycled without any problems. Due to ecological reasons, disposable packaging should not be used for returning products to Bosch Rexroth.

12.3 MATERIALS USED

Hydraulic components from Bosch Rexroth do not contain any hazardous substances that could be released when used as intended. Normally, no negative effects on human beings and on the environment are to be expected.

12.4 RECYCLING

Due to the high metal share, hydraulic products can mostly be recycled. In order to achieve an ideal metal recovery, disassembly into individual assemblies is required. The metals contained in electrical and electronic assemblies can also be recovered by means of special separation procedures.

13 Extension and conversion

You must not extend or modify the pressure switches.

14 Troubleshooting

14.1 SELF-DIAGNOSIS/ERROR INDICATIONS

The unit offers comprehensive self-diagnostic options.

- It monitors itself during operation.

- Warnings and error states are signaled on the display (also when the display is deactivated) and are additionally made available via IO-Link.

Indicator lamps	Status LED OUT1	Status LED OUT2	F = fault W = warning	Type of fault	Remedy
None			F	Supply voltage too low!	Check / correct supply voltage.
SC flash-es	Flash-es	Flash-es	F	Excessive current at switching outputs OUT1 and OUT2 *)	Check switching outputs for short-circuit or excessive current; remove the fault.
SC1 flash-es	Flash-es		F	Excessive cur-rent at switch-ing output OUT1*)	Check switching output OUT1 for short-circuit or excessive current; remove the fault.
SC2 flash-es		Flash-es	F	Excessive cur-rent at switch-ing output OUT2*)	Check switching output OUT2 for short-circuit or excessive current; remove the fault.
Loc			W	Parameter set-ting locked via pushbuttons.	Unlock pushbutton lock (→ see page 29 ff.)

Indicator lamps	Status LED OUT1	Status LED OUT2	F = fault W = warning	Type of fault	Remedy
C.Loc			W	Parameter via pushbuttons is locked; parameter setting via IO-Link communication is active (→ see page 29 ff).	Wait until parameter setting via IO-Link is finished.
S.Loc			W	Setting buttons locked via parameterization software. Parameter change is rejected (→ see page 29).	Unlocking only possible via IO-Link interface / parameter setting software.
OL			W	Process value too high. (Measuring range exceeded)	Check / increase system pressure / select unit with corresponding measuring range.

Indicator lamps	Status LED OUT1	Status LED OUT2	F = fault W = warning	Type of fault	Remedy
UL			W	Process value too low (below measuring range)	Check / increase system pressure / select unit with corresponding measuring range.
Err blinking			F	Internal fault / malfunction	Contact the manufacturer

*) The affected output remains deactivated as long as the excessive current / short-circuit persists

14.2 SETTING RANGES

		SP1 / SP2		rP1 / rP2		Δp
		min	max	min	max	
R901425455 R901433089	bar	4	600	2	598	2
	PSI	40	8700	20	8680	20
	MPa	0.4	60	0.2	59.8	0.2
R901425454 R901433088	bar	4	400	2	398	2
	PSI	40	5800	20	5780	20
	MPa	0.4	40	0.2	39.8	0.2

		SP1 / SP2		rP1 / rP2		Δp
		min	max	min	max	
R901425453 R901433087	bar	2	250	1	249	1
	PSI	40	3620	20	3600	20
	MPa	0.2	25	0.1	24.9	0.1
R901425452 R901433081	bar	1	100	0.5	99.5	0.5
	PSI	10	1450	5	1445	5
	MPa	0.1	10	0.05	9.95	0.05

ΔP = step width

14.3 FACTORY SETTING

	Factory setting	User settings
SP1	25 % of UMRL*	
rP1	23 % of UMRL*	
ou1	Hno	
ou2	Hno	
SP2	75 % of UMRL*	
rP2	73 % of UMRL*	
dSx	0.0	
drx	0.0	
P-n	PnP	
dAP	0.06	
uni	bar	
coLr	rEd	
diS	d2	

* = The set value is the specified percentage of the upper measuring range limit value (UMRL) of the relevant sensor in bar.

15 Technical data

The technical data of your pressure switch can be found in data sheet 30277.

16 Annex

16.1 LIST OF ADDRESSES

Contacts for transport damage, repair and spare parts

Bosch Rexroth AG
Service Industriehydraulik
Bürgermeister-Dr.-Nebel-Strasse 8
97816 Lohr am Main
Germany

Telephone	+49 (0) 9352/40 50 60
Email	service@boschrexroth.de

Ordering address for pressure switches

Headquarters:
Bosch Rexroth AG
Zum Eisengiesser 1
97816 Lohr am Main
Germany

Telephone	+49 (0) 9352/18-0
Email	info@boschrexroth.de

The addresses of our sales and service network and sales organizations can be found at `www.boschrexroth.com`

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