

Electronic pressure switch for hydraulic applications

Type HEDE12-1X

Installation instructions
RE 30340-MON/08.2019

English



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 information does not constitute warranted properties. The information given does not release the user from the obligation of own judgment and verification. Our products are subject to a natural process of wear and aging.

© This document, as well as the data, specifications and other information set forth in it, are the exclusive property of Bosch Rexroth AG. It may not be reproduced or given to third parties without its consent.

The original operating instructions were prepared in German.

Content

1	About this documentation	4
1.1	Validity of the documentation	4
1.2	Required and supplementary documentation	4
1.3	Representation of information	4
1.3.1	Safety instructions	4
1.3.2	Symbols	6
1.3.3	Abbreviations	6
2	Safety instructions	7
2.1	About this chapter	7
2.2	Intended use	7
2.3	Improper use	7
2.4	Qualification of personnel	8
2.5	General safety instructions	8
2.6	Product-specific safety instructions	9
3	General notes on damage to material and the product	10
4	Scope of delivery	11
5	About this product	11
5.1	Operating range	12
5.2	Function	13
5.3	Communication, parameterization, evaluation	13
5.3.1	Switching function	13
5.3.2	IO-Link	14
6	Installation	15
6.1	Electrical connection	15
7	Parameterization	18
7.1	List of parameters	19
7.2	Customized switching points	19
8	Factory setting	20
9	Maintenance and repair	21
9.1	Repair	21
10	Demounting and replacement	21
11	Disposal	21
11.1	Environmental protection	21
12	List of addresses	22

1 About this documentation

1.1 Validity of the documentation

This documentation is valid for all HEDE12-1X products.

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

This documentation contains important information on the safe and appropriate installation and commissioning of the product.

- Read this documentation completely and thoroughly before working with the pressure switch.

1.2 Required and supplementary documentation

Tabelle 1: Required and supplementary documentation

Title	Document no.	Document type
 Electronic pressure switch for hydraulic applications	RE 30340	Data sheet
 Electronic pressure switch for hydraulic applications	RE 30340-PA	Parameter description

1.3 Representation of information

Uniform safety instructions, symbols, terms and abbreviations are used to ensure quick and safe working with the product using this documentation. For a better understanding, they are explained in the following sections.

1.3.1 Safety instructions

In this documentation, safety instructions are provided whenever there is a risk of personal injury or damage to equipment. The hazard avoidance measures described must be observed.

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.
 WARNING	Indicates a hazardous situation which, if not avoided, could result in death or serious injury.
 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.

1.3.2 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.
1.	Numbered instruction:
2.	The numbers indicate that the actions must be carried out one after the other.
3.	
▶	Individual, independent action

1.3.3 Abbreviations

The following abbreviations are used in this documentation:

Tabelle 4: 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

- ▶ 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 you pass the product on to third parties.

2.2 Intended use

The product is an electronic component. You may use the product as follows:

- For acquiring the system pressure of hydraulic systems
- In the original condition, without damage
- Only in applications for which it is suitable without any restrictions
- Only in conjunction with media to which the wetted materials are sufficiently resistant
- Only within the pressure limits provided in the operating range

The product is intended exclusively for professional use and not for private usage.

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
- Use in safety-related applications
- Lack of cleanliness during storage and mounting
- Faulty installation
- Outside the operating limits according to data sheet RE 30340

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 Qualification of personnel

The activities described in this documentation require basic knowledge of mechanics and electrics. 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.

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.
- Exclusively use Rexroth products in technically perfect condition.
- Observe all notices on the product.
- Persons who install, operate, demount or maintain Rexroth products must not consume any alcohol, drugs or pharmaceuticals that may affect their ability to respond.
- 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).
- Before commissioning the pressure switch, read this document and make sure that the product is suitable for your application without any restrictions.

- 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).

2.6 Product-specific safety instructions



WARNING

System parts under pressure, ejecting hydraulic fluid!

When working on hydraulic systems with stored energy 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 carrying out any work, ensure that the hydraulic system is depressurized and the electrical control de-energized.
- ▶ Completely unload the pressure of machines and systems before working on hydraulic products.

Faulty fastening!

Improper mounting can cause the pressure switch to loosen, which can lead to fluid flowing out. The loosened pressure switch can cause injuries and 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.



WARNING

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

High surface temperatures!

Caution touching the pressure switch during operation. Surface temperature may exceed permissible temperatures according to DIN EN 563. This can result in burns.

- ▶ Let the pressure switch cool down before touching it or wear protective gloves.
- ▶ Protect the housing against contact with flammable substances and against accidental touching.

3 General notes on damage to material and the product

- Warranty claims will be rejected in the case of improper installation, commissioning and operation as well as in the case of use not in accordance with the intended purpose and/or improper handling.

NOTICE

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.

Environmentally harmful hydraulic fluid!

Leaking hydraulic fluid leads to environmental pollution.

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

4 Scope of delivery

- 1 x pressure switch
- 1 x documentation in German and English

5 About this product

The device senses the hydraulic pressure and issues pressure-related switching signals and data at the output.

5.1 Operating range



WARNING

Excessive pressure!

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

- Take appropriate measures to avoid static and dynamic overpressures that exceed the indicated pressure resistance.

Tabelle 5: Operating range HEDE12-1X - pressure type: relative pressure

Types	Measuring range		Overload pressure		Burst pressure	
	bar	psi	bar	psi	bar	psi
HEDE12-1x/100-...	0...100	0...1450.5	200	2900	400	5802
HEDE12-1x/250-...	0...250	0...3626	500	7250	1000	14500
HEDE12-1x/400-...	0...400	0...5802	800	11600	1600	23205
HEDE12-1x/630-...	0...630	0...9137	1000	14504	2520	36550

MPa = bar ÷ 10 / kPa = bar × 100



The units are vacuum-resistant.

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. The specifically designed thread pitch at the restrictor element has the effect of a 0.3 mm bore.



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

5.2 Function

The device generates output signals according to the operating mode and the parameter setting. It moreover provides the process data, switching states and diagnostic messages via IO-Link.

5.3 Communication, parameterization, evaluation

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

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

5.3.1 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.

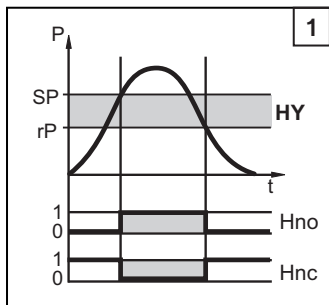


Fig. 1

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.

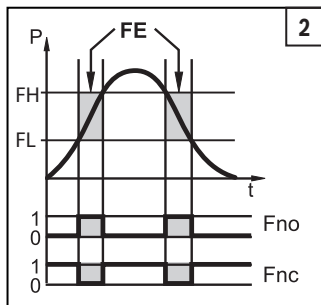


Fig. 2

5.3.2 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 (see chapter “Parameterization”).

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 at

www.boschrexroth.com/hede12-1x

6 Installation

1. Before installing the pressure switch, make sure that the system is depressurized.
2. Check the process connection for compatibility.
3. Insert the pressure switch in a G $\frac{1}{4}$ process connection.
4. Tighten firmly. Recommended tightening torque:

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

6.1 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 5017, 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.

1. Disconnect the system from the power supply.

2. Connect the sensor as follows:

Wire color

BK Black

BN Brown

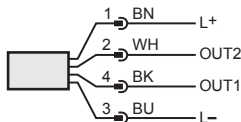
BU Blue

WH White

OUT1 Switching output or IO-Link

OUT2 Switching output

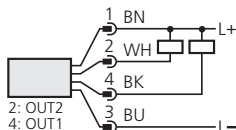
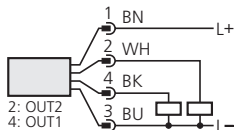
Color coding according to DIN EN 60947-5-2



Example circuits

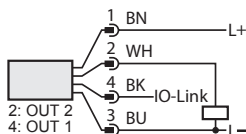
2 x positive switching

2 x negative switching

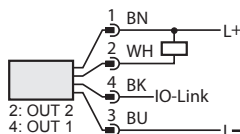


Example circuits

1 x p-switching, 1 x IO-Link



1 x n-switching, 1 x IO-Link



To ensure electromagnetic compatibility (surge resistance) the max. cable length for a non-shielded supply cable is 30 m. Beyond this length only shielded supply cables are permitted, and the cable shield has to be connected at both ends.

7 Parameterization

NOTICE

Changed operation of the system!

Changing parameters during operation can influence the operation of the system and cause damage.

- Make sure that no malfunction can occur in the system.



The device can only be parameterized by means of the IO-Link function.

1. Prepare the IO-Link hardware and software for parameter setting.
2. Connect the device e.g., with the IO-Link master.
3. Set the parameters.
4. Commission the device.

The parameters can be set before the device is installed and commissioned or during operation.

7.1 List of parameters

Parameter	Function
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]
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	Default unit for system pressure: [bAr] / [MPa] / [PSI]
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 switching point
coF	Zero point calibration
HIPS	Configuration of overload counter threshold
HIPC	Number of overload events

7.2 Customized switching points

At the customer's request the switching points can be factory-set specifically according to the individual requirements.

Further information can be found in the IODD description (see www.boschrexroth.com/hede12-1x) or the context-specific parameter descriptions.

8 Factory setting

	Factory setting	Custom setting
SP1	25 % of UMRL*	
rP1	23 % of UMRL*	
ou1	Hno	
ou2	Hno	
SP2	75 % of UMRL*	
rP2	73 % of UMRL*	
dS1	0.0 s	
dr1	0.0 s	
dS2	0.0 s	
dr2	0.0 s	
P-n	PnP	
dAP	0.06 s	
uni	bAr	
coF	0 bar	
HIPS	UMRL	
HIPC	0	

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

NOTE: In the case of custom settings of the switching points these values differ from the above factory setting!

9 Maintenance and repair

Rexroth pressure switches require no maintenance. Seals 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.

9.1 Repair

Rexroth pressure switches may only be replaced as a complete unit.

10 Demounting and replacement

1. Disconnect your system from the power supply and depressurize it.
2. Unload hydraulic accumulators, if provided.
3. Make sure that the surroundings are clean for demounting.
4. Collect escaping hydraulic fluid in the provided container and dispose of it properly.
5. Loosen the pressure switch exclusively by means of a suitable tool.

11 Disposal

11.1 Environmental protection

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

- ▶ Dispose of the product in accordance with the currently applicable national provisions in your country.
- ▶ Dispose of hydraulic fluid residues according to the applicable safety data sheets for these hydraulic fluids.

12 List of addresses

Contact for damage in transit and spare parts

Bosch Rexroth AG
Service Industriehydraulik
Bürgermeister-Dr.-Nebel-Straße 8
97816 Lohr am Main
Germany
Phone +49 (0) 93 52 / 40 50 60

E-mail: service@boschrexroth.de

<http://www.boschrexroth.com/service>

Ordering address for pressure switches

Headquarters:
Bosch Rexroth AG
Zum Eisengießer 1
97816 Lohr am Main
Germany
Phone +49 (0) 93 52 / 40 30 20

E-mail: my.support@boschrexroth.de

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

Bosch Rexroth AG

Industrial Hydraulics

Zum Eisengießer 1

97816 Lohr a. Main, Germany

Phone +49 (0) 93 52 / 40 30 20

my.support@boschrexroth.de

www.boschrexroth.com

Subject to revision

Printed in Germany

RE 30340-MON/08.2019

