HYDAC INTERNATIONAL

Pressure Switch

HPS 2400

IO-Link interface

Relative pressure	Device temperature	Display

IO-Link

Features

- IO-Link interface
- Parameterisation and cyclic transmission of process and service data
- Simplification of installation and commissioning
- With rotatable display
- Any installation position possible
- Colour display
- Device temperature monitoring

Description

The HPS 2400 with IO-Link communication interface is a compact electronic pressure switch with integrated digital display for the measurement of relative pressures in the low and high-pressure range.
The device has an IO-Link or a switching output and one additional output which can be configured as switching or analogue output (4 .. 20 mA or 0 .. 10 V scalable).

IO-Link is a communication interface technology used between the sensor / actuator (IO-Link device) and an IO-Link master based on a point-to-point interface.
Process data, parameters and diagnostic information from the pressure switch can be transmitted via the standard cable (SDCI Mode). The integrated LED display provides information on the operating mode and on the switching statuses.

If IO-Link is not used, the sensor works as a pressure switch with two switching outputs or with one switching output and one analogue output (SIO mode), depending on the settings.
In order to create customised small series or to generate system wide duplications of sensor settings, the sensor can also be adjusted very conveniently outside of the system to suit the application using the HYDAC programming adapter ZBE P1-000 or via the portable measurement unit HMG 4000.

Fields of application

Typical application fields of the HPS 2400 IO-Link are in machine tools, handling and mounting automation, intra-logistics or in packaging industry. The bi-directional communication with sensors and actuators on the lowest field level via IO-Link enables services, such as remote diagnostics, remote maintenance and condition-based predictive maintenance.

Technical data

Input data														
Measurement ranges	bar	-1..1	2.5	6	10	16	25	40	100	160	250	400	600	1000
Overload pressures	bar	5	5	12	20	32	50	80	200	320	500	800	1000	1200
Burst pressure	bar	100	100	100	100	100	125	200	500	800	1250	2000	2000	3000
Mechanical connection					G1/4 A ISO 1179-2 with orifice									
Tightening torque, recommended					20 Nm									
Parts in contact with fluid					Mech. connector: Stainless steel Seal: FKM									
Output data														
Output signal					Output 1: Switching output Output 2: configurable as switching output or analogue output									
Switching outputs					PNP, NPN and Push-Pull transistor switching outputs (switchable) Switching current: SP1: max. 0.25 A / SP2: max. 0.25 A switching cycles: > 100 million									
Analogue output, permitted load resistance					Selectable, scalable: 4 .. 20 mA 0 .. 10 V					Load: max. 500 Ω Load: min. 2 kΩ				
Accuracy acc. to DIN 16086, Terminal based					≤ ± 0.5 % FS typ. ≤ ± 1.0 % FS max.									
Temperature compensation offset					≤ ± 0.015 % FS / °C typ. ≤ ± 0.025 % FS / °C max.									
Temperature compensation span					≤ ± 0.015 % FS / °C typ. ≤ ± 0.025 % FS / °C max.									
Repeatability					≤ ± 0.25 % FS max.									
Response time					< 10 ms									
Long-term drift					≤ ± 0.3 % FS typ. / year									
Environmental conditions / Approvals / Tests														
Compensated temperature range					-10 .. +70 °C									
Operating temperature range					-25 .. +80 °C (-25 .. +60 °C for UL specifications *see below)*									
Storage temperature range					-40 .. +80 °C									
Fluid temperature range					-25 .. +80 °C									
EMC					EN 61000-6-1 / 2 / 3 / 4									
Vibration resistance					DIN EN 60068-2-6					≤ 10 g (10 .. 500 Hz)				
Shock resistance					DIN EN 60068-2-27					≤ 50 g / 11 ms				
Protection type acc. to [1]					DIN EN 60529					IP 67				
CE conformity					Available									
UKCA Conformity					Available									
cULus approval [2]					*(in preparation)*									
IO-Link specific data														
IO-Link revision					V1.1									
Transmission Rate, Baudrate [3]					38.4 kbit/s (COM2)									
Minimum Cycle Time					3 ms									
Process data width					32 bit									
SIO Mode supported					Yes									
Sensor profile					DMSS (Profile-ID 0x0010)									
M-Sequence capability					PREOPERATE = TYPE_1_V with 8 octets on-request data OPERATE = TYPE_2_V with 1 octet on-request data ISDU supported									
Download of the IO Device Description (IODD) at:					https://ioddfinder.io-link.com/#/									
Other data														
Supply voltage when applied acc. to UL specifications *(see above)*					9 .. 35 V DC, if PIN 2 = SP2 18 .. 35 V DC, if PIN 2 = Analogue output (each 18 .. 30 V DC for communication operation) - limited energy – acc. to 9.3 UL 61010; Class 2 UL 1310/1585; LPS UL 60950									
Residual ripple of supply voltage					≤ 5 %									
Current consumption					≤ 60 mA without switching point and analogue output currents									
Display					4 digits, LED, 7 segment, red / green (switchable), height of characters 8.4 mm									
Weight					~ 220 g									

Note: Reverse polarity protection of the supply voltage, excess voltage, override and short circuit protection are provided.

FS (**F**ull **S**cale) = relative to complete measuring range

[1] With mounted mating connector in corresponding protection type

[2] Environmental conditions acc. to 1.4.2 UL 61010-1; C22.2 no. 61010-1

[3] Connection with unscreened standard sensor line possible up to a max line length of 20 m.

Setting options

All the terms and symbols used for setting the HPS 2400 as well as menu structure comply with the specifications of the German Engineering Federation Standard (VDMA 24574-1) for pressure switches.

Setting ranges for the switching outputs

Measurement range in bar	Lower limit of RP / FL in bar	Upper limit of SP / FH in bar	Minimum distance betw. RP and SP, betw. FL and FH	Increment [1] in bar
-1 .. 1	-0.98	1.00	0.02	0.01
0 .. 2.5	0.025	2.500	0.025	0.005
0 .. 6	0.06	6.00	0.06	0.01
0 .. 10	0.10	10.00	0.10	0.02
0 .. 16	0.20	16.00	0.20	0.05
0 .. 25	0.25	25.00	0.25	0.05
0 .. 40	0.4	40.0	0.4	0.1
0 .. 100	1.0	100.0	1.0	0.2
0 .. 160	2.0	160.0	2.0	0.5
0 .. 250	2.5	250.0	2.5	0.5
0 .. 400	4	400	4	1
0 .. 600	6	600	6	1
0 .. 1000	10	1000	10	2

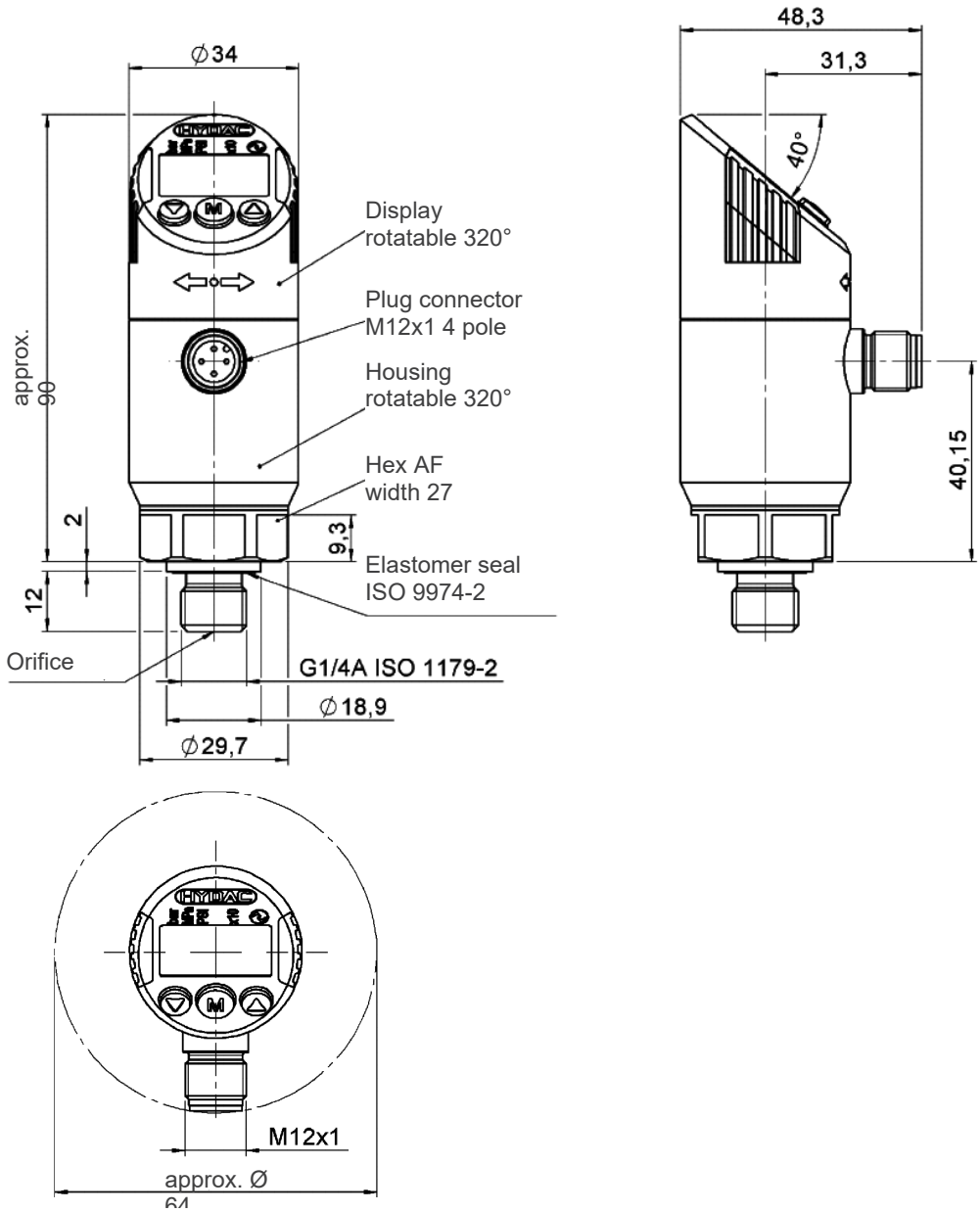
[1] All ranges listed in the table are adjustable within the grid of the increment.

SP = Switch point;
RP = Switch-back point;
FL = Pressure window lower value;
FH = Pressure window upper value

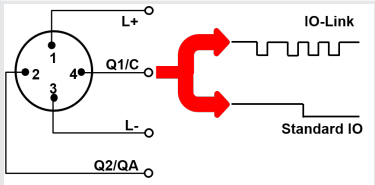
Additional functions

- Switching mode of the switching outputs adjustable (switch point function or window function)
- Switching direction of the switching outputs adjustable (N/C or N/O)
- Switch-on and switch-back delay adjustable
- Analogue output adjustable to 4 .. 20 mA or 0 .. 10 V
- Scalable analogue output
- Pressure can be displayed in the units bar, MPa, psi
- Adjustable low-pass filter for the pressure value
- Offset calibration

Dimensions



Pin connections

M12x1, 4 pole	Pin	Output signal: F31	
		Signal	Description
	1	L+	$+U_B$
	2	Q2/QA	Switching output (SP2) / analogue output
	3	L-	0 V
	4	Q1/C	Switching output (SP1) / IO-Link communication

Model code

HPS 2 4 4 6 - F31 - XXXX - 000

Mechanical connection
4 = G1/4 A ISO 1179-2 with orifice

Electrical connection
6 = Plug connector M12x1, 4 pole (without mating connector)

Output
F31 = IO-Link interface

Measuring ranges in bar
0001 (-1 .. 1); 02,5; 06.0; 0010; 0016; 0025; 0040; 0100; 0160; 0250; 0400; 0600; 1000

Modification number
000 = Standard

Accessories:
Appropriate accessories, such as mating connectors for the electrical connection and mounting clamps, can be found in the Accessories brochure.

Note

The information in this brochure relates to the operating conditions and applications described.
For applications and/or operating conditions not described please contact the relevant technical department.
Subject to technical modifications.

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