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LD20

High Accuracy Ex Digital Pressure Transmitter

KEY FEATURES

- **Robust industrial piezo resistive transducer**
- **Certified for use in hazardous locations**
- **Compliant to MID Welmec 8.8**
- **Smart industrial RS485 interface, free from external disturbances**
- **Ultra low power, optimised for battery powered applications**
- **Hermetically protected sensor electronics**
- **Extremely resistant to environmental influences**
- **Ultra-compact, robust housing made from stainless steel**
- **No external electronics for compensation or signal processing**
- **Extremely accurate, outstanding long-term stability, no hysteresis**
- **Pressure ranges of 1 bar to 1000 bar**

The LD20 is a precision, high accuracy, smart pressure transmitter specially designed to work with MICRO-Z familiy of volume correctors.

LD20 introduces a unique combination consisting of an exceedingly robust industrial pressure transducer and the popular industrial grade RS485 interface.

The LD20 transmitter have an unprecedented embedded digital signal processing (DSP) core for the compensation and normalization of the output values.

Technology

The LD20 is based on Chip-In-Oil (CIO) technology. It features laser welded stainless steel housing and could equally be representative for low power and low-voltage.

The housing is hermetically-sealed, oil-filled and builds a Faraday cage with feed-through capacitors around the entire electronics. The digital interface of the electronics with dual information of pressure and temperature.

Interface

High accuracy, precision, digital pressure transducer is coupled to a high performance ultra low power microcontroller which provides interface between the transducer and the external world. Complete digital structure eliminates potential error sources such as amplification, analog to digital conversion, calibration, and temperature coefficients.

A robust industrial RS-485 interface provides multi-drop digital communications. This BUS system allows connection of multiple transmitters (slaves) to the same communication lines, and long distance inter-connectability.

Electrical Connection

For transmitters that are equipped with a plug only use the corresponding counter plug and seal (both included in delivery).

Please make sure that for the EPL Ga (Zone 0), the mass ratio of the connector material consists of no more than 10% aluminium and no more than 7,5% magnesium, titanium resp. zircon. The protection of the plug version is only guaranteed with the seal mounted between the plug and the counter plug.

Installation

Run the outgoing cable from the sensor into a dry connection compartment.

Service

The LD20 is maintenance-free. The cycle for recalibration depends on the application conditions. Recommended calibration verification cycle is 2 years.

General Safety Instructions

This product must be installed by authorised personnel only. When installing and operating the pressure transmitter, attention should be paid to the corresponding national safety regulations and to the relative country regulations concerning the Ex application. Only mount the pressure transmitters onto unpressurized systems. On pressure ranges > 30 bar, the pressure connections could show residual hydraulic oil. Protect the diaphragm against damages. Also note the corresponding data sheet.

Special Conditions for Safe Use

The intrinsically safe supply and output circuits are galvanically connected. The maximum values of voltage, current and power may not be exceeded for any combination of electrical circuits connected to the transmitter. The standard dielectric resistance in relation to the metal housing is 1000 V.

If the transmitter is installed in zone 0, ensure proper lightning and surge protection. It is preferable to earth the cable shielding on one side in the safe range (see EN 60079-14). On transmitter with a cable output, the shielding is connected to the housing. By simultaneously connecting the housing and the cable shielding to earth you exclude the possibility of a potential difference between two earth connections. Refer to EN 60079-14 on this point. Do not use the transmitter with outgoing cables near strong charge generating processes.

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BASIC SPECIFICATIONS

POWER

DC input	10V...12.6V / 20mA max (when active).
Safety (terminal 4)	DC positive, Ui=12.6V, Ii=any value, Li=0mH, Ci=1µF
Safety (terminal 1)	DC negative

GENERAL

Operating ambient temperature	-30°C...+70°C
Relative humidity	95% non-condensing
Dimensions	Ø 21 mm x 62 mm (without DIN 43650 plug)
Weight	0.15 kg
Housing	Stainless steel
Electrical connection	DIN 43650 plug (3 signal tab + 1 GND tab)

CERTIFICATES AND APPROVALS

Measurement	NMI EN12405-A2, WELMEC 8.8 (TC11267)
Safety	KIWA ATEX II 1 G Ex ia IIC T4 Ga (KIWA 16ATEX0015)
	EN 60079-0 : 2012 + A11, EN 60079-11 : 2012
	IEC 61000-4-5 (Surge), IEC 61000-4-6 (Conducted)
CE	IEC 61000-4-2 (ESD), IEC 61000-4-3 (EM), IEC 61000-4-4 (EFT),
	IEC 61000-4-5 (Surge), IEC 61000-4-6 (Conducted)

INTERFACE

RS-485	Half duplex, 1/8 load, fail-safe, 38400 bps, 8 bits, 1 stop bit, no parity
Safety (terminals 1 & 2)	Uo=3.7V, Io=0.06A, Lo=20mH, Co=100µF, Po=0.055W
	Ui=5V, Ii=any value, Li=0mH, Ci=2.5µF

MEASUREMENT

Signal output	P [bar], T [°C], digital normalized data
Signal reserve	Typical ±10% FS, min. ± 5% FS
Startup time	< 1 ms
Conversion time	≤ 8 ms
Noise floor	≤ ±0,015% FS max. (temperature 4 bit)
Isolation	> 100 MΩ @ 500 VDC
Pressure connection	G 1/4", G 1/8"
Material in contact with media	Stainless Steel AISI 316L (DIN 1.4404 / 1.4435)
	O-Ring: Viton® Shore A (-20...200 °C, exchangeable)
Oil filling	Silicone oil
Pressure endurance	0...100% FS @ 25 °C: > 10 million pressure cycles with appropriate installation
Vibration endurance	20 g, 5...2000 Hz, X/Y/Z-axis
Shock	75 g sine 11 ms
Pressure ranges relative	0...1 bar, -0.5...0.5 bar, -1...3 bar, -1...10 bar, -1...30 bar
Pressure ranges absolute	
PA (zero @ 1 bara)	0...3 bara, 0...10 bara, 0...30 bara, 0...100 bara, 0...200 bara
PAA (zero @ vacuum)	0...1 bara, 0.5...1.5 bara, 0...30 bara, 0...10 bara
Accuracy	≤ ± 0.15% FS (linearity best straight line @ RT, hysteresis, repeatability)
Overpressure	4x pressure range
Stability	± 0.1 % FS typ., max. ± 0,2% FS (limited to max. ± 3 mbar)
TEB	≤ 0.5% FS (0°C...50°C)
	≤ 0.7% FS (-10°C...80°C)