



7E.173-E
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SMART differential pressure transmitter Series LD357B for use in intrinsically safe area

Description

LD357B series SMART differential pressure transmitters are microprocessor-based instruments that combine the analog signal advantages (4-20mA) together with the flexibility of digital communication using HART® protocol. They can be remotely configured by a universal hand held terminal (HHT) or by a PC with a dedicated interface.

Moreover, it is possible to locally configure the instruments (zero and span) by means of 4 pushbuttons and to display the data on the wide LCD display.

The LD357B transmitters measure differential pressure with span from 1,2 to 10000 mbar with a static pressure up to 200 bar.

The pressure measuring element is a piezoresistive sensor. It is possible to choose a variety of sensors to satisfy all process conditions.

The Spirax Sarco measuring cell contains the sensor and transmits pressure to the electronics. Thermal drift is compensated using the temperature signal generated by a PTC thermistor integrated in the sensor itself. Based on these readings the microprocessor generates the 4-20 mA analog output two wires system and displays the pressure measurement on the LCD.

Some of the main characteristics of this microprocessor-based transmitter, are:

- Wide rangeability.
- Automatic temperature compensation.
- Digital communication using HART® protocol.

Functional data

With reference to the following, please note these definitions:

Nominal range: (referred to the sensor mounted in the instrument) the measured pressure range for which the sensor has been designed. Defined as a minimum and maximum value.

Measuring range: the minimum and maximum range values for which the transmitter is to be calibrated.

Measuring span: the interval between minimum and maximum values of the measuring range.

Input scale initial value or zero input: minimum pressure value within in the measuring range.

Input full scale value: maximum pressure value within in the measuring range.

Measuring range and span limits

Ref.	Nominal range mbar	SPAN min/max mbar	Range limits min/max mbar
B	0/18	1,2/18	-18/+18
C	0/50	3,3/50	-50/+50
D	0/350	23/350	-350/+350
E	0/1000	67/1000	-1000/+1000
F	0/2500	167/2500	-2500/+2500
G	0/5000	333/5000	-5000/+5000
H	0/10000	667/10000	-10000/+10000



Transmitter parameters

The parameters that are available for display and setting are:

Measuring span: possibility to change from 3,3% to 100% of the nominal span.

Zero adjustment: digital calibration $\pm 15\%$.

Low/upper range values: they can be set within the nominal range provided that the span greater than minimum span.

Damping: digitally adjustable from 0 to 60 sec. (minimum response time $\sim 0,1$ sec.).

Reverse output: automatically obtained via software.

Transfer function: linear/square root via software.

Self-test: in case of malfunction the analog output is forced to the fail-safe state 3,85 mA or 21 mA.

Measuring units: 18 different pressure units or % of the measuring span, selectable via software.

Physical characteristics

Power supply: 12,5-30 Vdc

Output signal:

Analog 4-20 mA, 2 wires. Digital using HART® protocol.

Response time: <256ms (std Hart)

Measured value update frequency: Output 4-20 mA + Hart®: ~ 1s

Polling time: output 4-20 mA + Hart®: ~800 ms

Nominal range: 18-50 mbar.

Max static pressure: 50 bar.

Overpressure limits: 50 bar on either side.

Nominal range: 350-10000 mbar.

Max static pressure: 100 bar.

Overpressure limits: 100 bar on either side.

Ambient conditions

Temperature

Process fluid: -40 ÷ +80°C

Housing: -40 ÷ +80°C

Handling and storage: -40 ÷ +90°C

Relative Humidity: 0 to 100% R.H.

LCD display reading: -10 ÷ +65°C

Power supply condition:

For Ta < 60°C

Ui=30V, li = 100 mA; Pi= 0,75 W; Ci= 10nF; Li=0 mH

For 60<Ta< 80°C

Ui=25.2V, li = 100 mA; Pi= 0,62 W; Ci= 10nF; Li=0 mH

Performances

Accuracy comprehensive of non-linearity, repeatability and hysteresis: <0.1% FS

Dead band: negligible.

Display resolution: 0.1

Influence of operating conditions

Thermal drift: It is referred to -10 ÷ +80°C range.

Zero: ± 0,1%/10°C. **Span:** ± 0,1%/10°C at nominal range.

Static pressure effect

Nominal range 18-50 mbar:

Zero: ± 0,4% / 10 bar. **Span:** 0,4% / 10 bar.

Nominal range 350-2500 mbar:

Zero: ± 0,1% / 10 bar. **Span:** 0,1% / 10 bar.

Nominal range 5000-10000 mbar:

Zero: ± 0,2% / 10 bar. **Span:** 0,2% / 10 bar.

Over range effect

Nominal range 18-50 mbar:

Zero: on either side ± 1% at 50 bar.

Nominal range 350-2500 mbar:

Zero: on either side ± 0.1% at 100 bar.

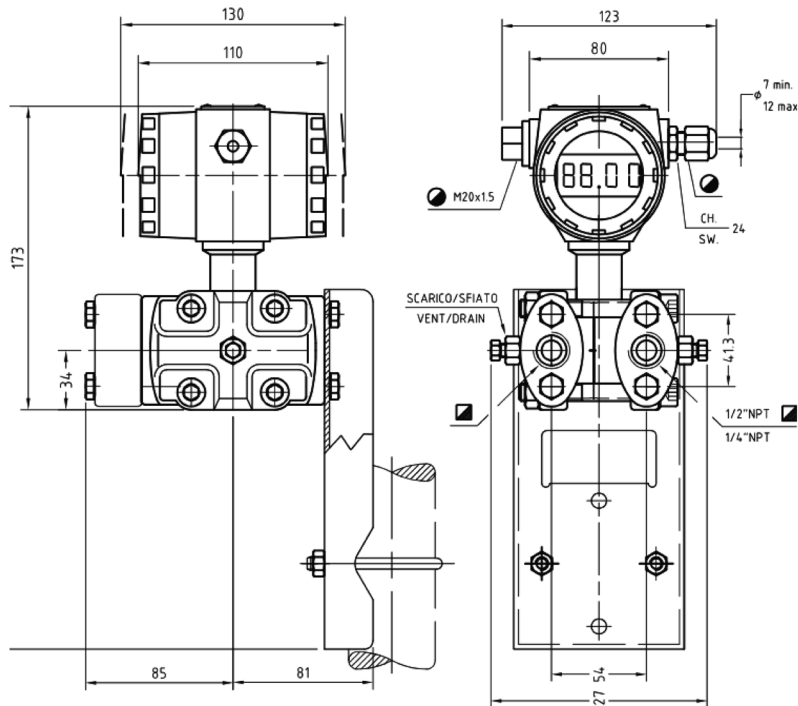
Nominal range 5000-10000 mbar:

Zero: on either side ± 1% at 100 bar.

Power supply effect:

Negligible between 12,5 and 30 Vdc.

Dimensions (mm)



Physical specifications

Housing: die cast aluminium alloy EN AB-44100 finished with epoxy resin (RAL 5010). It is dust and sand tight and protected against sea wave effects as defined by IEC IP66. Suitable for tropical climate operation as defined by DIN 50015

Covers O-ring: EPDM

Filling fluid: silicone oil.

Nameplate: stainless steel, fixed on housing.

Bracket: For 2 inch pipe mounting.

Process connections: 1/4" NPT F on process chambers, 1/2" NPT F on the adapters.

Electrical connections: two entries on electronic housing, M201,5 and cable gland PG 13,5 for 7 to 12mm diameter cable.

Terminal board: 2 terminals for signal wiring up to 1,5 mm² (14AWG). Connection for ground and cable shield.

Mounting position: any position.

Net weight: 5 kg approx.

Calibration

Standard: at nominal range, direct action, linear

Optional: at the conditions specified with the order.

Process wetted parts

Body and connections: AISI 316.

Diaphragm: see ordering information table.

Options

Static pressure: 200 bar

Degreasing for oxygen service

Housing: AISI 316

Directive 2014/68/EU (PED)

Pressure equipment until category III, for fluids (gases, liquids and vapours) in Group 1.

Directive 2014/34/EU (ATEX)

Equipment for explosive atmospheres Group II Category 1G suitable for zones 0,1 and 2.

Intrinsically safe: Ex ia IIC T6 Ga (-40°C ≥ Tamb ≥ +40 °C)

Ex ia IIC T5 Ga (-40°C ≥ Tamb ≥ +55 °C)

Ex ia IIC T4 Ga (-40°C ≥ Tamb ≥ +80 °C)

Directive 2014/30/EU (EMC)

Equipment with an adequate level of electromagnetic compatibility.

ORDERING INFORMATION		Example: LD357B-H-2-B-2-3-0-2-1									
Code number	LD357B	H	2	B	2	3	0	2	1		
HART Differential Pressure Transmitter		H									
External parts:											
Stainless steel			1								
Stainless steel suitable for oxygen service			2								
Stainless steel + diaph. in Hastelloy C			3								
Nominal range	Measuring range min.	Measuring range max									
0/18 mbar	0+1.2 mbar	0+18 mbar		B							
0/50 mbar	0+3.3 mbar	0+50 mbar		C							
0/350 mbar	0+23 mbar	0+350 mbar		D							
0/1000 mbar	0+67 mbar	0+1000 mbar		E							
0/2500 mbar	0+167 mbar	0+2500 mbar		F							
0/5000 mbar	0+333 mbar	0+5000 mbar		G							
0/10000 mbar	0+667 mbar	0+10000 mbar		H							
Speciale				9							
Calibration											
Optional					2						
Options											
Without						0					
Static pressure 200 bar (*)						1					
Housing: AISI 316 SS						2					
Application of diaphragm seals (**)						3					
Special						9					
Options											
Without							0				
Static pressure 200 bar (*)							1				
Housing: AISI 316 SS							2				
Application of diaphragm seals (**)							3				
Special							9				
Process connections											
Standard ¼ NPT F								0			
Stainless steel adapters ½ NPT F								2			
Explosion protection											
Exia intrinsic safety										1	

(*) Only for ranges D-E-F-G-H
 (**) External diaphragm seal required