

High Precision Pressure Transmitters analog outputs + RS485 / Modbus Accuracy 0.05% F.S series ERS.306

All st. steel housing of wetted parts
The RS485 interface communicates
using the Modbus® protocol
with various analog output signals

General features

- Piezosistive Silicon Pressure Transmitters applied
- High Precision, accuracy $\leq \pm 0.05\%$
- Pressure range from 0...2.5 to 0...1000 bar
- Ingress protection IP67
- Housing parts of stainless steel
- RS485 communication using the Modbus RTU

Application area

- Laboratory use
- Test benches
- Gauge standard
- Precision measurement
- Industrial applications

General specification

Pressure ranges

0...2.5 bar to 0...1000 bar

Accuracy

$\leq \pm 0.05\%$ FS @ RT (20...25°C)

including nonlinearity (best fitted straight line BFSL)
pressure hysteresis, non-repeatability, zero point deviation
and amplification deviation

- In case of negative pressure range: typically, 0.1% F.S
- It can be provided pressure ≥ 2.5 bar. Lower than 2.5 bar it will be supported normally accuracy 0.1%

Overpressure 1.3 X pressure range

Communication

Digital Interface: RS485 (Half-duplex)
Communication protocols: Modbus RTU

Analog output types

Current, 2-wire system: 4...20mA
Voltage, 3-wire system: 0...10V
0...5V
1...5V

Power supply

Reference power: DC 24V
Available power: 9...30 VDC (RL < 25Ω @ 9VDC)
12...30 VDC (RL > 25Ω)

Response time > 5ms

Isolation > 100MΩ at 100 VDC

Materials

Wetted parts: st. steel 316L
Sensor sealing: FKM
Body: st. steel 304



Pressure Transmitter series ERS.306

Temperature range of

Compensation: -10...80°C
Operating: -20...100°C
-40...+125 °C [option]
Ambient: -20...100°C
Storage: -40...125°C

Performance

Digital nonlinearity $\leq \pm 0.02\%$ FS
Best fitted straight line (BFSL)
Compensated temp. range: 10...40°C
-10...80°C

Total error band

Total error band (10...40°C): $\leq \pm 0.1\%$ FS
Max. deviation within the compensated pressure range.
Total error band (-10...80°C): $\leq \pm 0.15\%$ FS
Max. deviation within the compensated pressure and temperature range.
Outside the compensated temperature range, the total error band in the ambient temperature range is expanded by 0.1 %FS.

Analog interface additional deviation

$\leq \pm 0.05\%$ FS
Based on accuracy @ RT and the total error band.

Electrical connection & protection

M12 Plug IP67

Pressure connection

G 1/4", DIN 3852-E with sealing by DIN 3869 ring seals
G 3/8", G 1/2"
R 1/4", R 3/8", R 1/2"

Weight

Approx. 140g

Technical specifications

Input pressure range

Nominal pressure:

from 0...2.5 bar to 0...1000 bar

- The span value, lower than 2 bar, it is not possible to get the accuracy 0.05% due to span volume of pressure transducers.

Permissible static pressure:

1.3 x pressure range, max.1100 bar

Output signal / Supply

Modbus protocol via RS485 interface

Baud rates : 9,600 and 115,200 bps

Data type : Float32

Unit of Pressure : bar, kPa, MPa, kgf/cm², psi, mmH₂O, mmHg

Unit of Temperature : °C

Supply : 9...30 VDC

Output signal / Supply

Current:

2-wire 4...20mA Vs = 9...30 VDC
(RL < 25 Ω @9VDC)
Vs = 12...30 VDC
(RL > 25 Ω)

Voltage:

3-wire 0...10V Vs=12...30 VDC
0...5 V
1...5 V

Performance

¹Accuracy @ RT (20...25 °C) : ≤ ±0.05%FSO @ 25 °C

¹ including nonlinearity (best fitted straight line BFS), pressure hysteresis, non-repeatability, zero point deviation and amplification deviation

Digital nonlinearity: ≤ ±0.02 %FS

Best fitted straight line (BFS)

Influence effects:

Longterm stability: Typ. ±0.05 %FS
Max. ±0.10 %FS / year

Response time: > 5ms

Sampling rate : < 5ms

Thermal effects (Offset and Span)

/ Permissible temperatures

FS thermal error: ±0.75%FS @ 25 °C, typical

Zero thermal error: ±0.75%FS @ 25 °C, typical

Operating temperature: -20...100°C

-40...+125 °C [option]

Compensated temperature: 10...40°C
-10...80°C

Electrical protection

Electromagnetic compatibility:

Emission and immunity according to

EN 61326-2-3:20B CCISPR II Group 1, Class A

EN IEC 61000-3-2:2019

Insulation: the transmitter is grounded via the process connection

Weather protection grade

■ Ingress protection: IP67

IP rating depends on the electrical connection and mating connector used.

Materials

Pressure port: stainless steel 316L

Housing / body: stainless steel 304

Sensor diaphragm: stainless steel 316L

Wetted parts: stainless steel 316L

EMC Test report for CE conformance

■ EN 61326-2-3:2013 / Class A

■ EN 61326-2-3: 2013 / IEC 61326-1:2012

Mechanical stability

Vibration: No change at 10 g RMS (20...2000) Hz

Shock: 0.1 g (1m/s) Max.

Total error band

Total error band (10...40 °C): ≤ ±0.1 %FS

Max. deviation within the compensated pressure and temperature range.

Total error band (-10...80 °C): ≤ ±0.15 %FS

Max. deviation within the compensated pressure and temperature range.

Outside the compensated temperature range, the total error band in the ambient temperature range is expanded by 0.1 %FS.

Analog interface additional deviation

Analog interface additional deviation: ≤ ±0.05 %FS

Based on accuracy @ RT and the total error band.

Position dependency

Position dependency: ≤ ±2 mbar

Calibrated in vertical installation position with pressure connection facing downwards.

Resolution

Resolution: 0.0005 %FS Digital

Signal stability

Signal stability: 0.0025 %FS

Digital noise-free

Internal measurement rate

Internal measurement rate: ≥ 1800 Hz / ≥ 6000 Hz
(3-wire + digital)

Ordering information

Model code ERS.306 · [] · [] · [] · [] · [] · B [] · option

Accuracy

A10 ≤ 0.05 % F.S

Digital communicate

O8 RS485, Modbus RTU

O10 without RS485

Communication & Analog output

O1 4...20mA

O2 0...10V

O3 0...5V

O4 1...5V

O5 0.5...4.5 V / 5V, ratio-metric

O6 0.5...4.5 V / 24V

Electrical connection

M M12 plug, Straight

MA M12 plug, 90 Angle

Process connection

G2 G 1/2" (PF 1/2")

G3 G 3/8" (PF 3/8")

G4 G 1/4" (PF 1/4")

R2 R 1/2" (BSPT 1/2")

R3 R 3/8" (BSPT 3/8")

R4 R 1/4" (BSPT 1/4")

Pressure range code, unit bar

Code Range

R01 -1...50

R02 -1...35

R05 -1...24

R07 -1...15

R09 -1...9

R11 -1...5

R19 -1...0¹⁾

R28 0...2.5

R30 0...4

R32 0...6

R33 0...10

R35 0...16

R37 0...25

R39 0...40

R41 0...60

R43 0...100

R45 0...160

R47 0...250

R50 0...400

R53 0...600

R55 0...1000

RYY Others on request

Option code

Code	Description
PAA	absolute pressure range [5...6 weeks delivery]
xL	x m cable extension (Ø: 5L = 5 m, 3L = 3 m)
T4	-40...+125 °C
AC25	Restrictor screw in socket hole
TP	St. steel tag plate, 60 x 20 x 0.5t
DMCC	Manufacture calibration certificate
KC	KOLAS Ilac-MRA calibration certificate

■ Lower than pressure 2 bar,

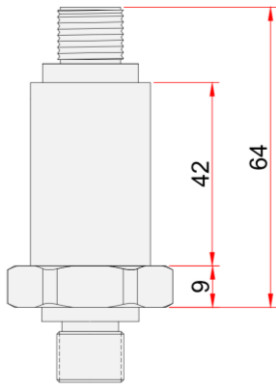
¹⁾ accuracy is typically min. 0.1% F.S

How to order

ERS.306.A10.O8.O7.M.G4.BR35

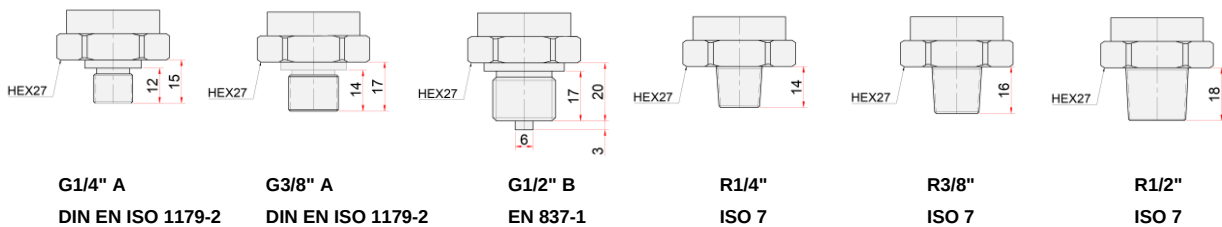
ERS.306, 0.05%, RS485, 4...20mA, M12 plug, G 1/4", 0...16 bar, DMCC

Outline drawing



M12 plug type / IP67

Process connection



Pin assignment, M12 x 1, 5-pin / male

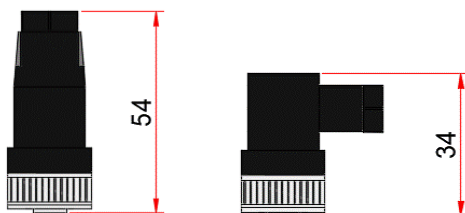
■ RS485 & 4...20mA / 2-wire system

Pin No	communication
1	OUT/GND
2	N.C.
3	+Vcc
4	A Signal RS-485
5	B Signal RS-485

■ RS485 & 0...10V, 0...5V, 1...5V / 3-wire system

Pin No	communication
1	GND
2	+OUT
3	+Vcc
4	A Signal RS-485
5	B Signal RS-485

Mating plug to M12 x 1, 5-pin



Straight type

Angle type

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