

High Performance Smart Gauge/ Absolute Pressure Transmitter RP1002/ 3



High Stability Silicon Sensor



Reference Accuracy up to 0.035%



Reverse Polarity & Surge Protection



HART7 & ATEX, CE, SIL Certified

**Product
Datasheet**

ROCKSENSOR AT A GLANCE (ABOUT US)

Rocksensor is one of the global leaders specializing in process Instrumentation, Research and Development and Designing of Industrial Automation Equipment. We provide highly precise pressure sensors and transmitters, flow metres, level transmitters & temperature transmitters with a prime focus to help our clients efficiently, safely and economically run complex industrial processes.

Rocksensor headquartered in Germany (originated in Switzerland), has its footprint in various geographical regions such as the US, Russia, South Korea, Italy, Germany, Singapore, Malaysia, China, Taiwan, Australia, UAE, Brazil, and India. Our clients come from some of the major industries such as Oil and Gas, Petrochemicals, Pharmaceuticals, FMCG, Automobiles, Water, Cement, Metal & Mining and mainly from the Power Industry like Nuclear, Thermal, Hydro and Solar.

Rocksensor deals in a wide range of highly accurate industrial automation instruments ensuring that even the complex industrial processes happen efficiently.

To fulfill the needs of our clients we make sure that our instruments work in even the harsh environmental conditions offering accurate recordings and communication.

We, at Rocksensor, believe in creating bonds that last a lifetime and create a success story for each and every client. Rocksensor aims to achieve a perfect fit in global market landscape and establish our footprints across the globe.



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KEY APPLICATION INDUSTRIES

- Oil and Gas sector
 - Cement
 - Metal
 - Pulp and Paper
 - Agriculture
 - Textiles
- Chemicals
 - Power
 - Water
 - Pharmaceutical
 - Fertilizer
 - Plastics and HVAC

1. Salient Features

- High Stability Silicon Sensor
- Reference Accuracy up to 0.035%
- Excellent Performance for Overload
- Packaged Temperature Sensor inside
- Inbuilt Reverse Polarity Protection
- Inbuilt Surge Protection
- IP67 Grade Protection
- Integrated Push-button
- HART
- ATEX, CE, SIL Certified

2. Technical Specifications

Parameter	Details
Medium	Gas, Steam, Liquid
Measurement Range	0-600Pa ~60MPa
Reference Accuracy	0.035%/ 0.06%/ 0.1%
Ambient Temp. Effects	(-)25 ~ 65°C: $\pm(0.075\%*TD + 0.025\%) \times \text{Span}$
Over Range Effects	$\pm 0.05\% \times \text{Span}$
Stability	$\pm 0.15\%$ / 10 years
Power Supply Effects	$\pm 0.001\%$ / 10 V (12-36 VDC)
Zero Setting	Zero Point and range can be adjusted to any value within the measure range in the form as long as: Calibrating Span $\geq$ Maximum Range
Span & Range	Randomly adjusted between Upper Range and Lower Range
Mounting Position Effects	Tilting up to 90°, Zero shift <0.15 kPa. (This can be adjusted)
Output Options	2 Wire, 4-20 mA HART 7 (std.)
Output Signal Limit	$I_{\min} = 3.9\text{mA}$, $I_{\max} = 21\text{mA}$
Failure Alarm	NAMUR NE43 Compliant/ Low Mode: 3.6 mA/ High Mode: 21 mA
Response Time	Up to 100 ms; Amplifier damping time constant is adjustable from 0.1 to 60 sec
Turn ON time	<5s
T_{Ambient}	(-)40°C ~ 85°C
	(-)20°C ~ 65°C (With LCD, Fluorine O-ring)
T_{Process}	(-)30°C ~ 120°C (std.), Upto 180°C (code 9), Upto 600°C- Option available in Remote seal PT
$T_{\text{Storage/ Transportation}}$	(-)50°C ~ 85°C
	(-)25°C ~ 85°C (With LCD Display)
Pressure Limit	Vacuum to Upper Range Limit
Turn Down Ratio	Min. 10:1/ Max. 100:1
EMC	Compliant to IEC61326-1
Power Supply	24 VDC (9-36 VDC)
Load	$R \leq (U_s - 12V)/I_{\max} \text{ k}\Omega$, $I_{\max} = 23\text{mA}$
Overload Range for Digital Communication	230 ~ 600 Ω
Electrical Connection	M20X1.5 or NPT1/2 (F) thread, Standard for M20X1.5 nylon cable sealing clasp. The screw Terminals are suitable for wire cross-sections up to 0.5 - 2.5 mm ²
Process Connection & MOC	Standard 1/2"NPT F Thread; other options available/ SS316 Material
Isolating Diaphragm MOC	SS316L/ Hastelloy C/ Gold Plated on SS316L/ Tantalum
Filling Fluid	Silicone Oil/ Fluorinated Oil

*Vacuum connection DIN 28403 KF16 / ISO 2861 applies only to the ranges less than 2.5 bar

Housing	Die Cast Aluminium with Epoxy Resin Coating
	Stainless Steel Housing available as an option
Sealing/Housing Gasket-Perbunan	Perbunan (NBR)
Tag Plate	SS304/ SS316 (optional)
Ingress Protection	IP67
Mounting Bracket	Galvanised Carbon steel (Std.)/ SS304 (optional)/ SS316 (optional)
Surge Protection	Available
Display	5 ^{1/2} Digit LCD Backlit Display (Std.)/ OLED
Sensor	Piezoresistive
Reverse Polarity Protection	Yes
Configuration	Though in-built Push-button/ Handheld HART Communicator/ Rocksensor Software
Safety Integrity	SIL 2 Certified
Certification	CE certified
Weight	~1.6kg (excluding accessories such as mounting bracket, etc.)
Explosion Proof	Intrinsic safety-II 2 G Ex ia IIC T4/T5/T6 Ga,
	Explosion Proof-II 2 G Ex db IIC T4/T5/T6 Gb,
	Dust Explosion Proof-II 2 D Ex tb IIIC T80°/T90°/T130° Db
Corrosion Protection	As per ISO 12944 catogory CX
Minimum Voltage for LCD/OLED display	13.5VDC

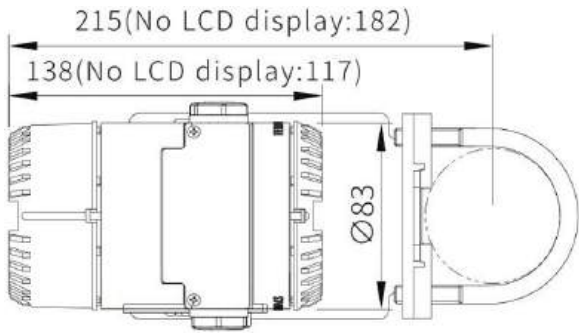
Span & Range

Span/Range		kPa	inH₂O	mbar	mmH₂O
B	Span	0.2 ~ 6	0.8 ~ 24	2 ~ 60	20 ~ 600
	Range	(-)6 ~ 6	(-)24 ~ 24	(-)60 ~ 60	(-)600 ~ 600
C	Span	0.4 ~ 40	1.6 ~ 160	4 ~ 400	40 ~ 4000
	Range	(-)40 ~ 40	(-)160 ~ 160	(-)400 ~ 400	(-)4000 ~ 4000
D	Span	2.5 ~ 250	10 ~ 1000	25 ~ 2500	0.25 ~ 25mH ₂ O
	Range	(-)250 ~ 250	(-)1000 ~ 1000	(-)2500 ~ 2500	(-)25 ~ 25mH ₂ O
F	Span	30 ~ 3000	120 ~ 12000	0.3 ~ 30 bar	3 ~ 300mH ₂ O
	Range	(-)500 ~ 3000	(-)2000 ~ 12000	(-)50 ~ 30bar	(-)50 ~ 300mH ₂ O

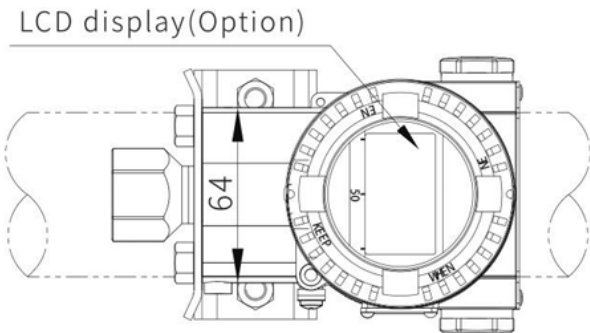
Overload Limit

Span	6kPa		40kPa	250kPa
	(B)		(C/L)	(D/M)
Overload Limit	0.2MPa		1MPa	4MPa
Span	3MPa	10MPa	21MPa	40MPa
	(F/O)	(G)	(H)	(I)
Overload Limit	15MPa	20MPa	50MPa	50MPa

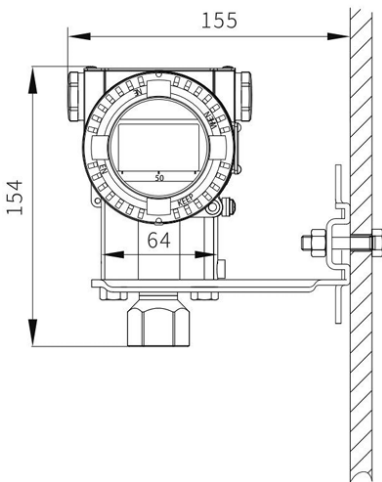
3. Dimensions (mm) & Installations



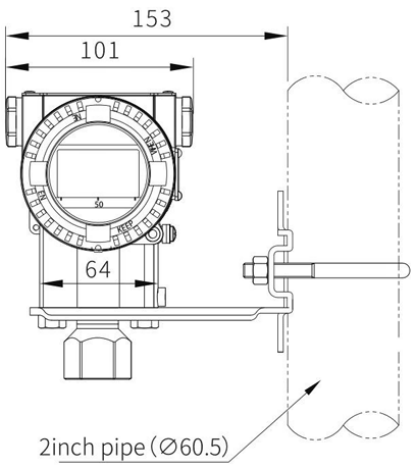
Horizontal Piping Connection Type (Side)



Horizontal Piping Connection (Front)

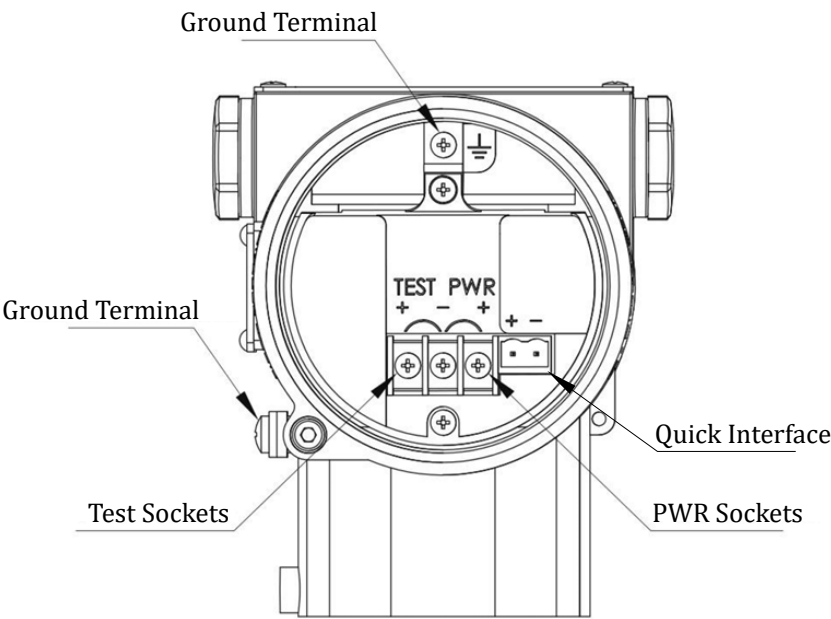


Wall Mounting Connection Type



Vertical Piping Connection Type

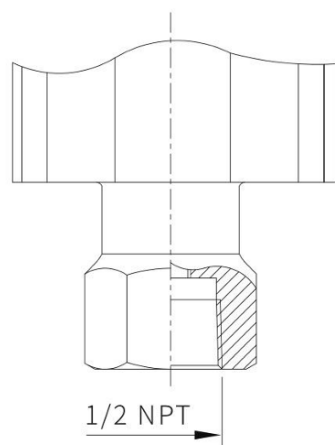
4. Terminal Configuration



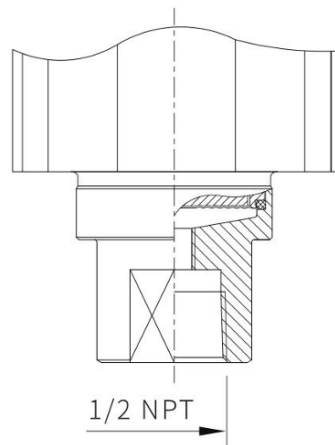
Note: The quick interface function is equivalent to the signal terminal.

5. Process Connection Descriptions

a. Default Process Connections

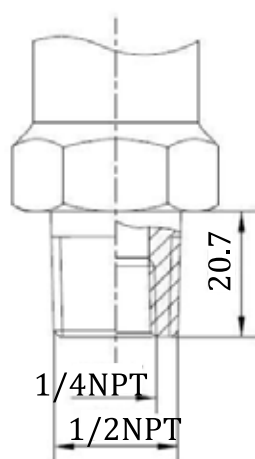


F/G/H/I/O Span

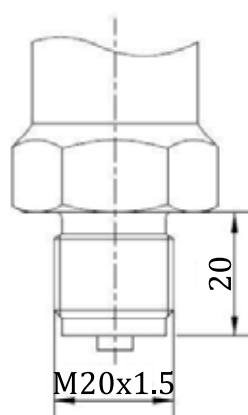


C/D/M Span

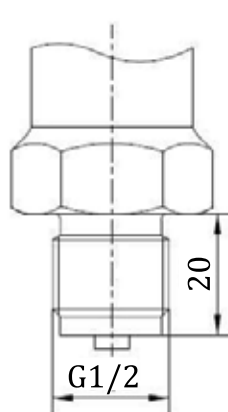
b. Other forms of Process Connectors



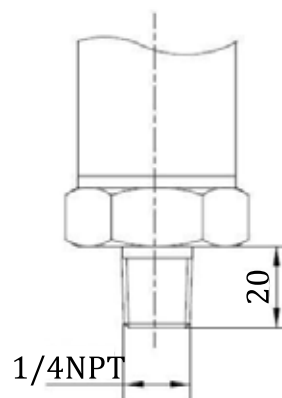
1/2" NPT Male Thread (Code 2)



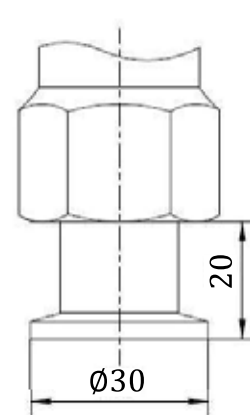
M20*1.5 Male Thread (Code 3)



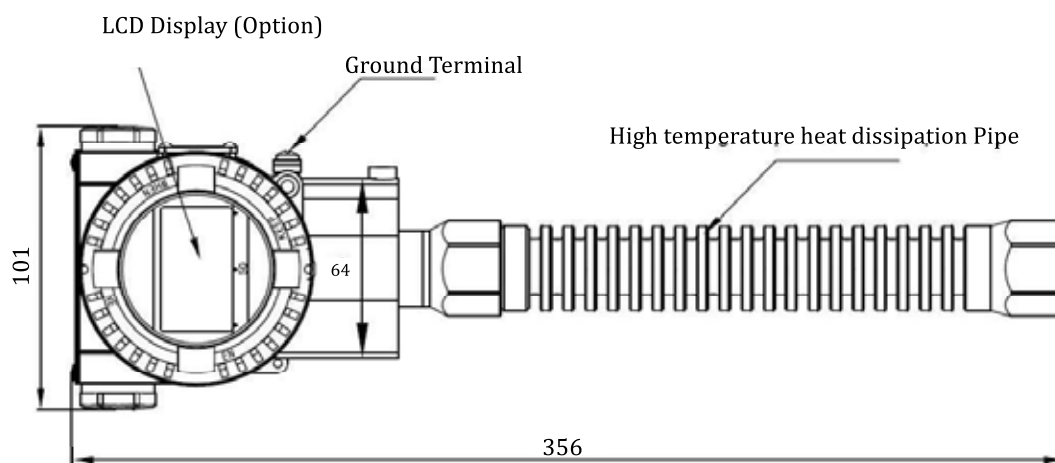
G1/2 Male Thread (Code 4)



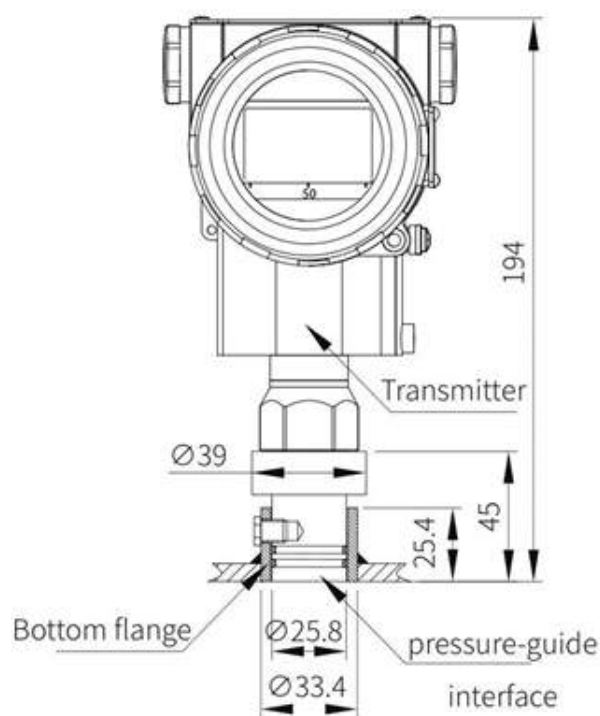
1/4"NPT Male Thread (Code 6)



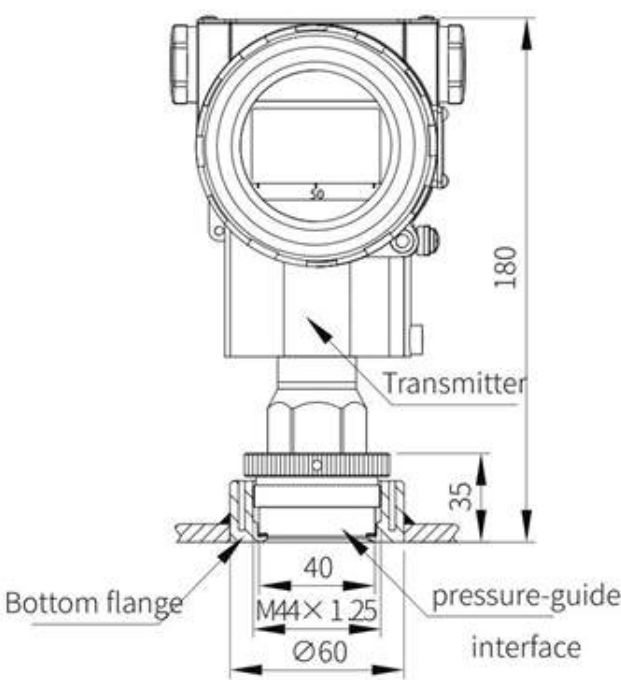
**Vacuum connector
DIN 28403 KF16
/ISO 2861 (Code 5)**



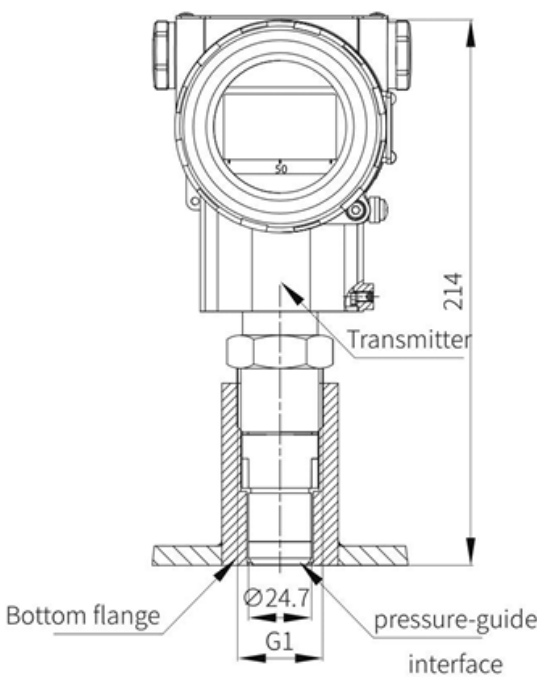
High-temperature heat sink interface (Code 9)



**$\phi 25.8$ inserted connection
Pulp joint (code S)**



**M44x1.25 thread connection
Pulp joint (code M)**



**G1 thread connection
Pulp joint (code L)**

6. Model Selection Table

RP1002		Gauge Pressure Transmitter														
RP1003		Absolute Pressure Transmitter														
Code		1	2	3	4	5	6	7	8	9	10	11		15		
Accuracy																
±0.035% of span	A															
±0.06% of span	B															
±0.1% of span	C															
Sensor Type																
Piezo-resistive Silicon Sensor	1															
Output																
4-20mA with HART7	B															
Span																
Gauge Pressure RP1002																
0-0.6kPa~6kPa/ (0-60~600 mmH ₂ O)/ (0-6~ 60mbar)	B															
0-2kPa~40kPa/(0-200~4000mmH2O) / (0-20~400mbar)	C															
0-2.5kPa ~ 250kPa/ (0-0.25 ~ 25 mH ₂ O)/ (0-25 ~ 2500mbar)	D															
0-30kPa ~ 3MPa/ (0-3 ~ 300mH ₂ O) / (0-0.3 ~ 30bar)	F															
0-0.1Mpa ~ 10MPa/ (0-1 ~ 100bar)	G															
0-0.21Mpa~21MPa/ (0-2.1~210 bar)	H															
0-0.4Mpa ~ 40MPa/ (0-4 ~ 400 bar)	I															
0-0.6Mpa ~ 60MPa/ (0-6 ~ 600 bar)	J															
Absolute Pressure RP1003																
0-10kPa~ 40kPa/ (0-1000 ~ 4000 mmH ₂ O)/ (0-20 ~ 400mbar)	L															
0-2.5kPa~250kPa/ (0-25~2500mbar)	M															
0-30kPa~3MPa / (0-0.3~30bar)	O															
Diaphragm Material																
SS316L	S															
Hastelloy C	H															
Gold plated on SS316L	G															
Tantalum, (Silicone oil)	T															
Filling Fluid																
Silicone oil	S															
Fluorine oil	F															
Integral Indicator																
N	None															
2	Backlit LCD Display															
Mounting Bracket																
N	None															
1	SS304 Bracket															
2	Carbon steel galvanized															
3	SS316 Bracket															
Special Function																
N	None															
O	Degrease cleansing treatment (Oxygen measurement must be with fluorinated oil filled capsule, Viton (FKM) gasket, <6MPa, <60°C															
P	Anti-lightning Function															
Gaskets (Sealing Material)																
N	Perbunan (NBR)															
Process Connections																
1	1/2-NPT Female Thread (Std.)															
2	1/2-NPT Male Thread (Containing 1/4-NPT Female Thread)															
3	M20x1.5 Male Thread															
4	G1/2 Male Thread															
A	M20x1.5 Male thread															
B	G1/2 Male thread															
5	Vacuum Connection DIN 28403 KF16 / ISO 2861															
6	1/4-NPT Male Thread															
7	1/4-NPT Female Thread															
9	High temperature heat sink connection,1/2"NPT Female Thread															
L	G1 Threaded pulp connection seal															
M	M44*1.25 pulp connection seal device															
S	ø25.8 Inserted pulp connection seal device															
R	Remote Seal															

High Performance Smart Gauge/ Absolute Pressure Transmitter RP1002/3

RP1002	Gauge Pressure Transmitter					
RP1003	Absolute Pressure Transmitter					
Code	1	...	12	13	14	15

Explosion-Proof Option	
None	N
Intrinsic Safety (Exia) - ATEX	I1
Intrinsic Safety (Exia)- IECEx	I2
Isolated Explosion/ Flameproof(Exd) - ATEX	D1
Isolated Explosion/ Flameproof(Exd) - IECEx	D2
Intrinsically Safe & Flameproof - ATEX	E1
Intrinsically Safe & Flameproof - IECEx	E2

Additional Options	
N	None
A	Exd Cable Entry (Ex-Proof Cable Gland)
E	Hanging Stainless Steel Tag Plate

Enclosure Material	
A1	Die Cast Aluminum
S2	SS316

Electrical Connection	
M	M20*1.5
N	1/2" NPT

Example: RP1002-A1BFSS1N12E1AA1A

A - Accuracy: $\pm 0.035\%$ of span

1 – Sensor Type: Piezo-resistive Silicon Sensor

B – Output: 4-20mA with HART7

F - Span: 0-30KPa ~ 3 MPa/ (0-3 ~ 300mH₂O)/ (0-0.3 ~ 30bar

S - Diaphragm Material: SS316L

S - Filling Fluid: Silicone Oil

1 – Process Connections: 1/2-NPT Female Thread (Std.)

N - Gaskets (Sealing Material): Perbunan (NBR)

N – Special Function: None

1 - Mounting Bracket: SS304 Bracket

2 – Integral Indicator: Backlit LCD Display

E1 –Explosion-Proof Option - Intrinsically Safe & Flameproof- ATEX

M – Electrical Connection: M20*1.5

A1 – Enclosure Material: Die Cast Aluminium

A – Additional Options: Exd Cable Entry (Ex-Proof Cable Gland)

*For any customisation, contact our sales team

7. Electromagnetic Compatibility (EMC)

No.	Test Items	Basic Standard	Test Conditions	Performance Level
1	Radiated Interference (Housing)	IEC61000-4-20, EN61326-1	30MHz ~ 1000MHz	Qualified
2	Conducted Interference (DC power port)	CISPR:11:2009+A1, EN61326-1	0.15MHz ~ 30MHz	Qualified
3	Electrostatic Discharge (ESD) Immunity	IEC61000-4-2, EN61326-1	4kV(Line), 8kV(Air)	B
4	RF Electromagnetic Field Immunity	IEC61000-4-3, EN61326-1	10V/m (80MHz ~ 1GHz)	A
5	Frequency Magnetic Field Immunity	IEC61000-4-8, EN61326-1	30A/m	A
6	Electrical Fast Transient Burst Immunity	IEC61000-4-4, EN61326-1	2kV (5/50ns, 5kHz)	B
7	Surge Immunity	IEC61000-4-5, EN61326-1	500V (line to line 1kV (line to ground, 1.2us/50us)	B
8	Conducted Interference Immunity induced by RF field	IEC61000-4-20, EN61326-1	3V (150KHz ~ 80MHz)	A

Note:

A: No degradation of performance or loss of function is allowed below a minimum performance level specified by the manufacturer (or what the user may reasonably expect) when the equipment is used as intended.

B: No degradation of performance or loss of function is allowed, after the application of the phenomena below a performance level specified by the manufacturer (or what the user may reasonably expect) when the equipment is used as intended.

8. Pressure Conversion Table

	psi	atms	"H ₂ O	mm H ₂ O	cm H ₂ O	oz/in ²	Kg/cm ²	"Hg	mmHg (Torr)	cmHg	mbar	bar	Pa (N/m ²)	kPa	MPa
psi	1	0.0681	27.71	703.8	70.38	16	0.0704	2.036	51.715	5.17	68.95	0.0689	6,895	6.895	0.0069
atms	14.7	1	407.2	10,343	1,034.3	235.1	1.033	29.92	760	76	1013	1.013	101,325	101.3	0.1013
"H ₂ O	0.0361	0.00246	1	25.4	2.54	0.5775	0.00254	0.0735	1.866	0.187	2.488	0.00249	248.8	0.249	0.00025
mm H ₂ O	0.001421	0.000097	0.0394	1	0.1	0.0227	0.0001	0.00289	0.0735	0.00735	0.098	0.000098	9.8	0.0098	0.00001
cm H ₂ O	0.01421	0.000967	0.3937	10	1	0.227	0.001	0.0289	0.735	0.0735	0.98	0.00098	98	0.098	0.0001
oz/in ²	0.0625	0.00425	1.732	43.986	4.40	1	0.0044	0.1273	3.232	0.3232	4.31	0.00431	431	0.431	0.00043
Kg/cm ²	14.22	0.968	394.1	100,010	1,001	227.6	1	28.96	735.6	73.56	980.7	0.981	98,067	98.07	0.0981
"Hg	0.4912	0.03342	13.61	345.7	34.57	7.858	0.0345	1	25.4	2.54	33.86	0.0339	3,386	3.386	0.00339
mmHg	0.01934	0.001316	0.536	13.61	1.361	0.310	0.00136	0.0394	1	0.1	1.333	0.001333	133.3	0.1333	0.000133
cmHg	0.1934	0.01316	5.358	136.1	13.61	3.10	0.0136	0.394	10	1	13.33	0.01333	1,333	1.333	0.00133
mbar	0.0145	0.000987	0.4012	10.21	1.021	0.2321	0.00102	0.0295	0.75	0.075	1	0.001	100	0.1	0.0001
bar	14.504	0.987	401.9	10,210	1021	232.1	1.02	29.53	750	75	1,000	1	100,000	100	0.1
Pa	0.000145	0.00001	0.00402	0.102	0.0102	0.00232	0.00001	0.000295	0.0075	0.00075	0.01	0.00001	1	0.001	0.000001
kPa	0.14504	0.00987	4.019	102.07	10.207	2.321	0.0102	0.295	7.5	0.75	10	0.01	1,000	1	0.001
MPa	145.04	9.869	4019	102,074	10,207	2321	10.2	295.3	7500	750	10,000	10	1,000,000	1,000	1

Field Instrumentation Range



Pressure Measurement

- Smart Differential Pressure Transmitter
- Smart Gauge Pressure Transmitter
- Smart Absolute Pressure Transmitter
- Miniature Pressure Transducer without display
- Sanitary Gauge/ Absolute Pressure Transmitter

- Submersible Pressure Transmitter
- Remote Seal Differential P.T. with capillary
- Remote Seal Differential P.T. Direct Mount
- Remote Seal Gauge/Absolute P.T. with capillary
- Remote Seal Gauge/Absolute P.T. Direct Mount



Flow Measurement

- Coriolis Mass Flowmeter
- Thermal Gas Mass Flowmeter
- Positive Displacement Flowmeter
- Electromagnetic Flowmeter
- Vortex Flowmeter

- Turbine Flowmeter
- Variable Area Flowmeter
- Clamp On Ultrasonic Flowmeter
- Inline Ultrasonic Flowmeter
- Portable Ultrasonic Flowmeter



Level Measurement

- RADAR Level Transmitter Horn Antenna
- Compact RADAR Level Transmitter
- RADAR Level Transmitter Sanitary
- RADAR Level Transmitter
- Guided Wave RADAR Level Transmitter
- Guided Wave RADAR Level Transmitter
- RADAR Level Transmitter Lens Antenna

- RADAR Level Transmitter Rod Antenna
- Ultrasonic Level Transmitter
- Microwave Barrier Level Switch
- Admittance Level Switch Series
- Vibrating Rod Level Switch Series
- Tuning Fork Level Switch Series



Temperature Measurement

- Head Mount Temperature Transmitter
- Temperature Transmitter for Sanitary Applications

- DIN Rail Temperature Transmitter
- Field Mount Temperature Transmitter

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