

High Performance Smart Gauge/ Absolute Pressure Transmitter RP1002/ 1003



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 and temperature transmitters with a prime focus to help our clients efficiently, safely and economically run complex industrial processes.

Rocksensor, headquartered in Switzerland, has its footprint in various geographical regions such as the US, Russia, South Korea, Italy, Germany, Singapore, Malaysia, Morocco, 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 the 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®, Foundation Fieldbus & Profibus Communication
- ATEX, CE, SIL Certified

2. Technical Specifications

Parameter	Details
Medium	Gas, Steam, Liquid
Measurement Range	0 - 600 Pa ~ 60 MPa
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	$\pm 0.15\% / 10 \text{ years}$
Power Supply Effects	$\pm 0.001\% / 10 \text{ V (12-36 VDC)}$
Zero Setting	Zero Point can be adjusted to any value within measuring 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/ Profibus PA/ Foundation Fieldbus
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; depends upon range & TD Ratio
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; Up to 600°C available as an option
$T_{\text{Storage/ Transportation}}$	(-)50°C ~ 85°C
	(-)25°C ~ 85°C (With LCD, Fluorine O-ring)
Pressure Limit	Vacuum to Upper Range Limit
Overload Limit	Up to 900 bar
Turn Down Ratio	Min. 10:1/ Max. 100:1
EMC	Compliant to IEC61326-1
Explosion Proof	ATEX/ IECEx – Intrinsic Safety/ Flameproof
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 ~ 600Ω
Electrical Connection	M20x1.5, suitable for wire cross-section up to 2.5 sq. mm
Process Connection	Standard 1/2" NPT Female Thread; Other options available*
Isolating Diaphragm MOC	SS316L/ Hastelloy C/ Gold Plated/ Tantalum
Process Connection & MOC	Flange with thread 7/16 UNF . NPT Female Thread on both sides/ SS316L
Filling Fluid	Silicone Oil/ Fluorine Oil

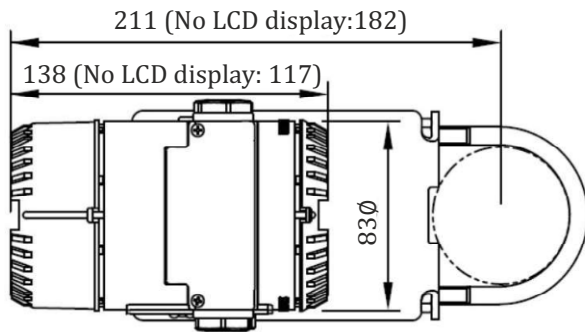
*Vacuum connection DIN 28403 KF16 / ISO 2861 applies only to the ranges less than 2.5 bar

Housing	Die Cast Aluminium with Epoxy Resin Coat
	Stainless Steel Housing available as an option
Housing Gasket	Perbunan (NBR)/ FKM/ PTFE
Nameplate	SS304
Ingress Protection	IP67
Mounting Bracket	Stainless Steel/ Galvanized Carbon Steel
Surge Protection	Available
Display	5½ Digit LCD, Backlit Display, OLED
Sensor	Piezoresistive
Reverse Polarity Protection	Yes
Configuration	Though in-built Push-button/ Handheld HART Communicator/ Rocksensor Software
Safety Integrity	SIL3 Certified
Certification	CE certified
Weight	~1.6kg (excluding accessories such as mounting bracket, etc.)

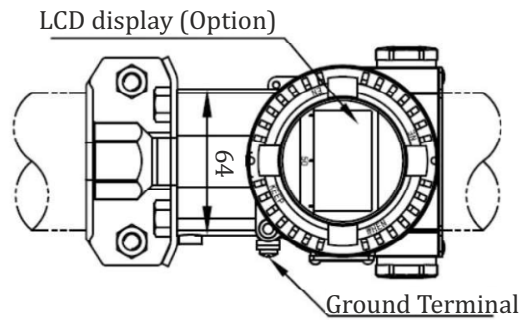
Span & Range

Span/Range		kPa	inH ₂ O	mbar	mmH ₂ O
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

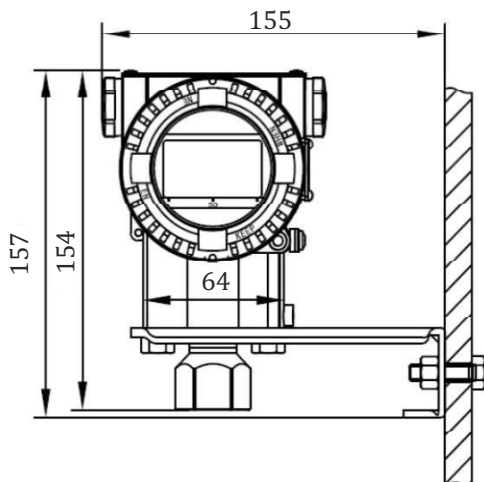
3. Dimensions (mm) & Installations



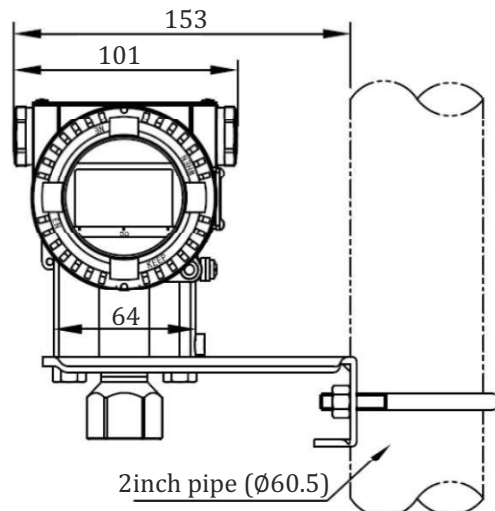
Horizontal Piping Connection Type (Side)



Horizontal Piping Connection (Front)

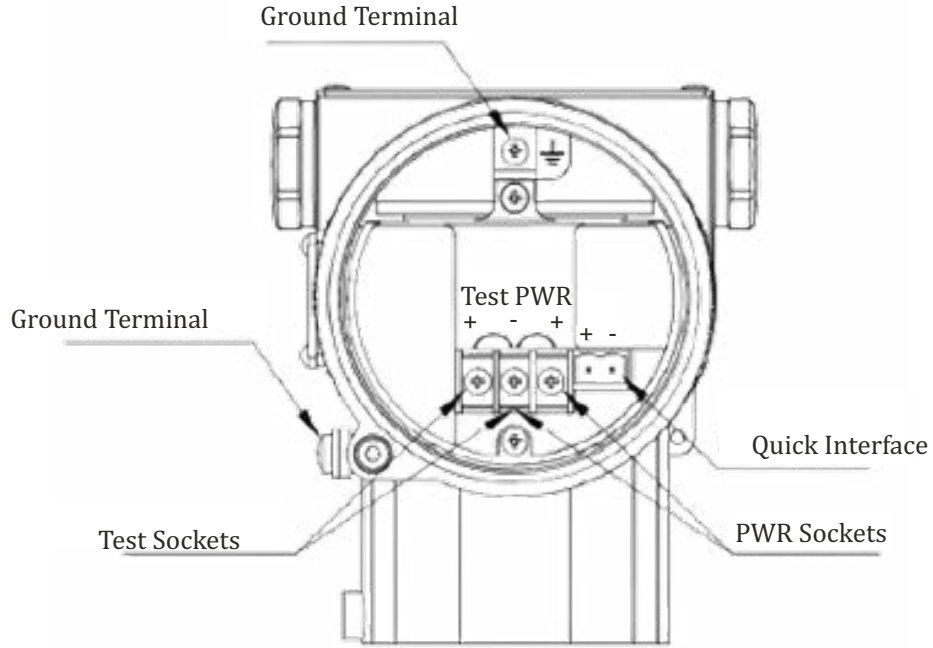


Wall Mounting Connection Type



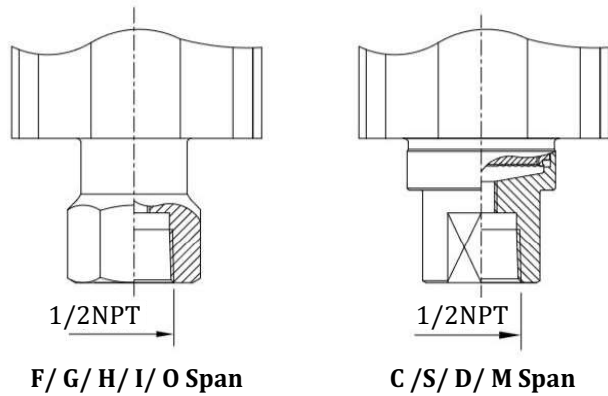
Vertical Piping Connection Type

4. Terminal Configuration

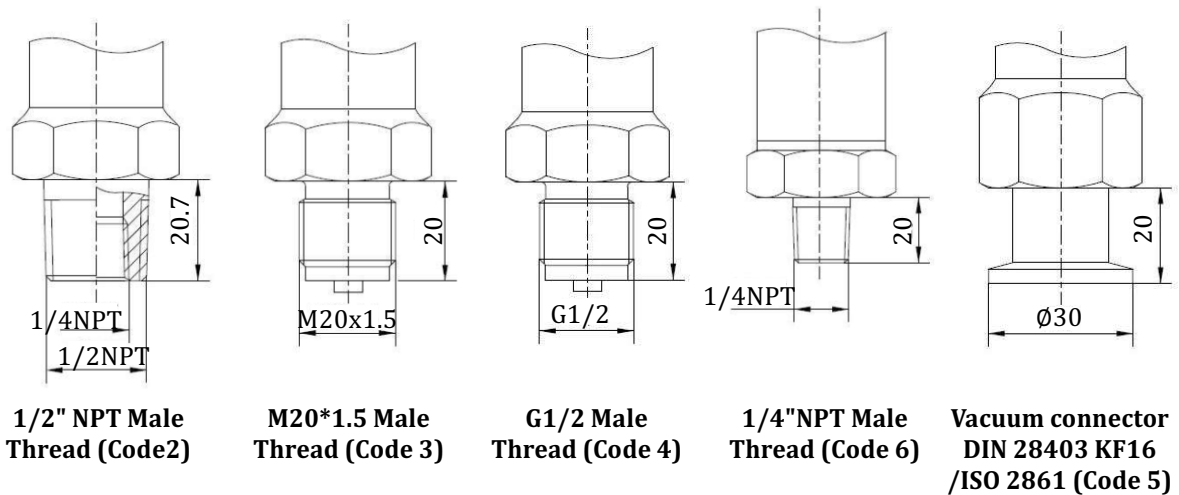


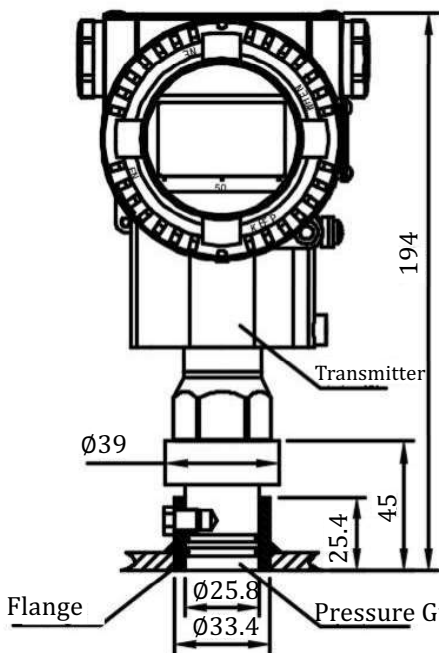
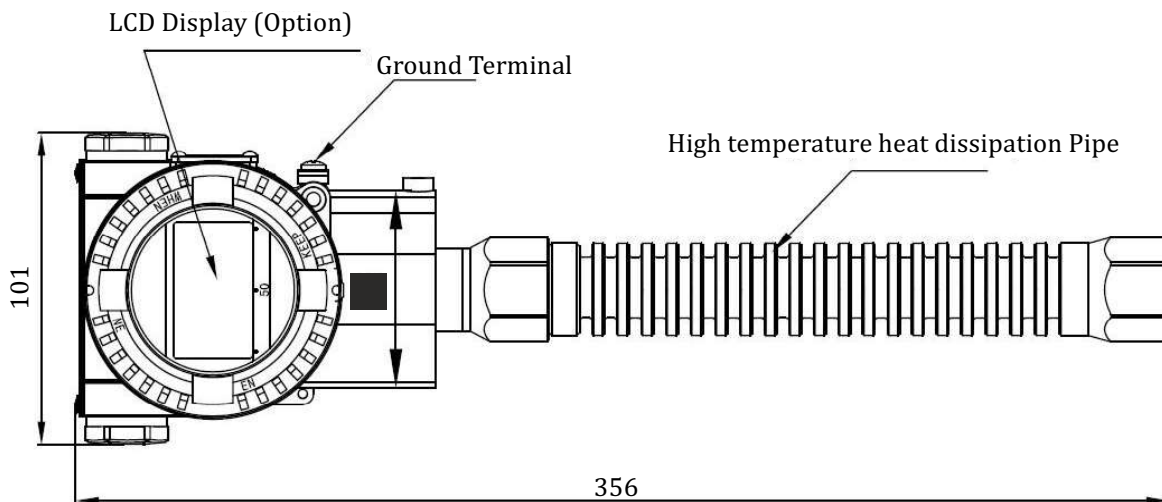
5. Process Connection Descriptions

a. Default Process Connections

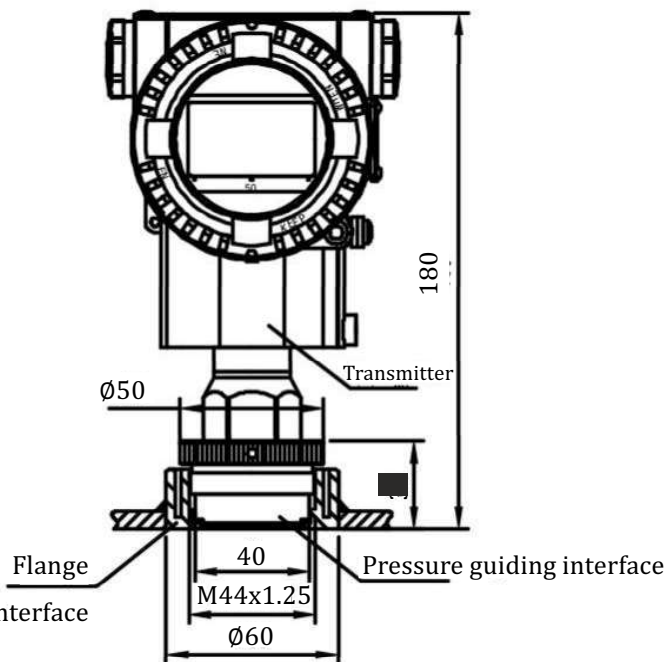


b. Other forms of Process Connectors

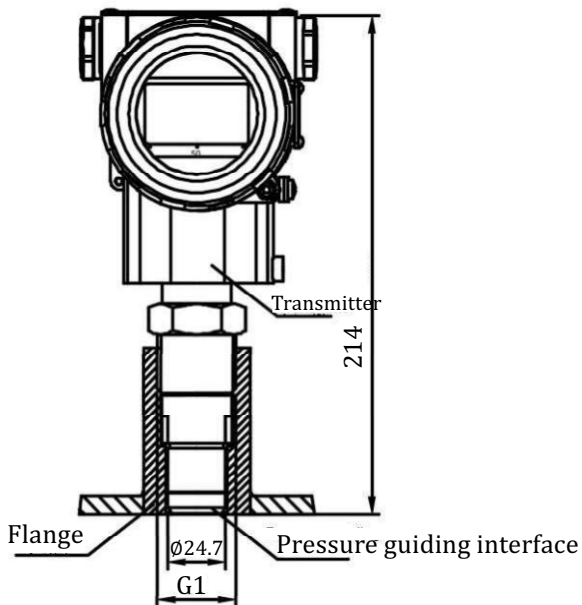




$\text{Ø}25.8$ insert pulp connector (Code S)



M44*1.25 thread pulp connector (Code M)



G 1 thread pulp connector (Code L)

5. 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														
Profibus-PA	C														
Foundation Fieldbus	D														
Span															
Gauge Pressure RP1002															
0-600Pa ~ 6kPa (0-20 ~ 600mmH ₂ O) / (0-2~60mbar)	B														
0-2kPa ~ 40kPa/ (0-200 ~ 4000 mmH ₂ O)/ (0-20~400mbar)	C														
0-2.5kPa ~ 250kPa/ (0-0.25 ~ 25 mmH ₂ O)/ (0-25 ~ 2500mbar)	D														
0-10kPa ~ 1Mpa/ (0-1 ~ 100mmH ₂ O) / (0-0.1 ~ 10bar)	E														
0-30kPa ~ 3MPa/ (0-3 ~ 300mmH 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															
0-2kPa ~ 40kPa/ (0-200 ~ 4000 mmH ₂ O)/ (0-20~400mbar) (not suitable for 0.035%)	L														
0-2.5kPa~250kPa/ (0-25~2500mbar)	M														
0-30kPa~3MPa / (0-0.3~30bar)	O														
Diaphragm & Filling Fluid															
316L Stainless Steel	S														
Hastelloy C	H														
Gold plated on SS316L	G														
Tantalum, (Silicone oil)	T														
Filling Fluid															
Silicone oil	S														
Fluorine oil/Inert Oil	F														
Integral Indicator															
N	None														
2	Backlit LCD Display ((-)20°C)														
3	OLED ((-)40°C)														
Mounting Bracket															
N	None														
1	304 stainless steel														
2	Carbon steel galvanized														
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)														
F	Viton (FKM)														
P	Teflon (PTFE)														
Process Connections															
1	1/2-NPT Female Thread (Std.)														
2	1/2-NPT Male Thread (Containing 1/4-NPT Female Thread)														
3	M20x1.5 Female Thread														
4	G1/2 Female Thread														
5	Vacuum Connection DIN 28403 KF16 / ISO 2861[2]														
6	1/4-NPT Male Thread														
7	1/4-NPT Female Thread														
9	High temperature heat dissipation connection,1/2"NPT Female Thread														
L	G1 Threaded pulp connection seal														
M	M44*1.25 Threaded pulp connection seal														
S	ø25.8 Insert Pulp pulp connection seal														
R	Remote Seal														

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)- ATEX/ 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)
D	Double Compression Gland
E	Hanging Stainless Steel Tag Plate

Enclosure Material	
A1	Die Cast Aluminum
S2	Stainless Steel 316

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

Example: RP1002-A1BFSS1NN12EMA1A

RP1002 – Gauge Pressure Transmitter

A - Reference Accuracy 0.035%

1 – Piezoresistive Silicon Sensor

B – 4-20 mADC HART7 Output

F – Span 0-30 bar

S – Diaphragm MOC SS316L

S – Filling Fluid Silicon Oil

1 – 1/2" NPT Female Thread Process Connection

N – Gasket Material NBR (Perbunan)

N – Special Function None

1 – SS304 Mounting Bracket

2 – Backlit LCD Display (-20 deg C)

E – Intrinsically safe and flameproof enclosure with ATEX Certificate

M – M20*1.5 Electrical Connection

A1 – Die Cast Aluminium Housing

A – Exd cable entry (Explosion proof cable glands)

6. 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.

7. 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