

General Specifications

Model EJA510A and EJA530A Absolute and Gauge Pressure Transmitter

DP *harp*

GS 1C21F1-E

The absolute and gauge pressure transmitter model EJA510A and EJA530A can be used to measure liquid, gas, or steam pressure. Both output a 4 to 20 mA DC signal corresponding to the measured pressure, and also feature remote setup and monitoring through communications with the BRAIN™ terminal and CENTUM CS™ or μXL™ or HART® 275 host.

■ STANDARD SPECIFICATIONS

□ PERFORMANCE SPECIFICATIONS

Zero-based calibrated span, linear output, wetted parts material code 'S' and silicone oil.

Reference Accuracy of Calibrated Span

(including the effects of zero-based linearity, hysteresis, and repeatability, values are in absolute for EJA510A)

±0.2 % of Span

For spans below X,

$$\pm[0.05+0.15 \frac{X}{\text{Span}}] \% \text{ of Span}$$

Where X equals:

Capsule	X MPa {psi}
A	20 kPa {2.9}
B	0.2 {29}
C	1 {145}
D	8 {1160}

Ambient Temperature Effects

Total Effects per 28 °C (50 °F) Change

±[0.25% Span + 0.25% URL]

Stability

±0.1% of URL per 12 months

Vibration Effects

±0.1 % of URL

(5 to 15Hz; 4mm peak-to-peak constant displacement, 15 to 150Hz; 2g, 150 to 2000Hz; 1g)

Power Supply Effects

±0.005 % per Volt (from 21.6 to 32 V DC, 350 Ω)



□ FUNCTIONAL SPECIFICATIONS

Span & Range Limits

(Values are in absolute for EJA510A)

Measurement Span and Range	MPa	psi (/D1)	bar (/D3)	kgf/cm ² (/D4)	
A	Span	10 to 200 kPa	1.45 to 29	0.1 to 2	0.1 to 2
	Range	0 to 200 kPa	0 to 29	0 to 2	0 to 2
B	Span	0.1 to 2	14.5 to 290	1 to 20	1 to 20
	Range	0 to 2	0 to 290	0 to 20	0 to 20
C	Span	0.5 to 10	72.5 to 1450	5 to 100	5 to 100
	Range	0 to 10	0 to 1450	0 to 100	0 to 100
D	Span	5 to 50	720 to 7200	50 to 500	50 to 500
	Range	0 to 50	0 to 7200	0 to 500	0 to 500

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URL is defined as the Upper Range Limit from the table above.

Zero Adjustment Limits

Zero can be fully elevated or suppressed, within the Lower and Upper Range Limits of the capsule.

External Zero Adjustment

External zero is continuously adjustable with 0.01 % incremental resolution of span. Span may be adjusted locally using the digital indicator with range switch.

Mounting Position Effect

Rotation in diaphragm plane has no effect. Tilting up to 90° will cause zero shift up to 0.2 kPa {0.8 inH₂O} which can be corrected by the zero adjustment.

Output

Two wire 4 to 20 mA DC output with digital communications. BRAIN or HART FSK protocol are superimposed on the 4 to 20 mA signal.

Failure Alarm:

Output status at CPU failure and hardware error;
 Up-scale: 110%, 21.6 mA DC or more(standard)
 Down-scale: -5%, 3.2 mA DC
 Note: Applicable for Output signal code D and E

Damping Time Constant (1st order)

The sum of the amplifier and capsule damping time constant must be used for the overall time constant. Amp damping time constant is adjustable from 0.2 to 64 seconds.

Capsule (Silicone Oil)	A, B, C, and D
Time Constant (approx. sec)	0.2

Ambient Temperature Limits (approval codes may affect limits)

-40 to 85 °C (-40 to 185 °F)
 -30 to 80 °C (-22 to 176 °F) with LCD Display

Process Temperature Limits (approval codes may affect limits)

-40 to 120 °C (-40 to 248 °F)

Ambient Humidity Limits
 5 to 100 % RH @ 40 °C (104 °F)

Maximum Overpressure

Capsule	Capsule	
	EJA510A	EJA530A
A	400 kPa abs{58 psia}	400 kPa {58 psig}
B	4 MPa abs{580 psia}	4 MPa {580 psig}
C	20 MPa abs{2900 psia}	20 MPa {2900 psig}
D	60 MPa abs{8500 psia}	60 MPa {8500 psig}

Working Pressure Limits (Silicone Oil)
Maximum Pressure Limit

Capsule	Capsule	
	EJA510A	EJA530A
A	200 kPa abs{29 psia}	200 kPa {29 psig}
B	2 MPa abs{290 psia}	2 MPa {290 psig}
C	10 MPa abs{1450 psia}	10 MPa {1450 psig}
D	50 MPa abs{7200 psia}	50 MPa {7200 psig}

Minimum Pressure Limit
 See graph below.

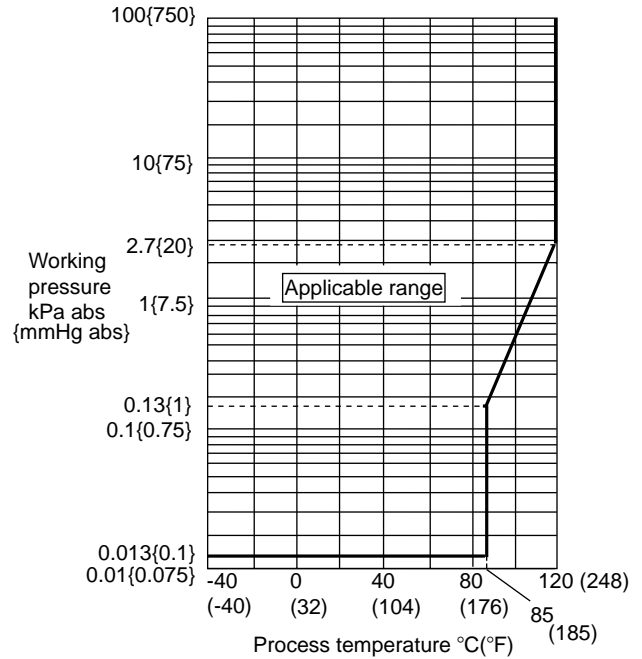


Figure 1. Working Pressure and Process Temperature [For model EJA510A]

Supply & Load Requirements

(Safety approvals can affect electrical requirements, see graph below)
 With 24 V DC supply, up to a 570 Ω load can be used.

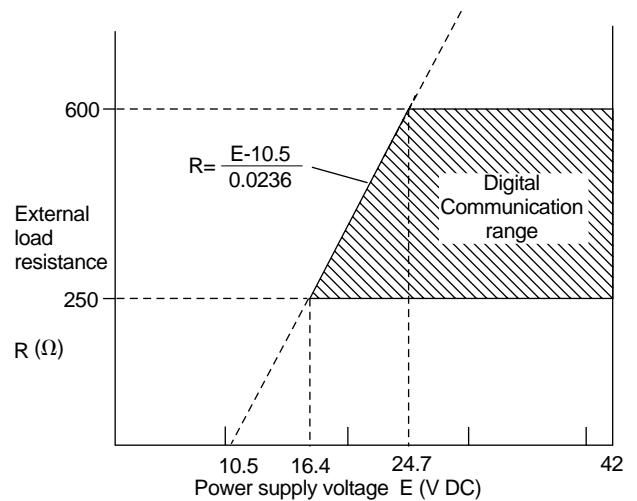


Figure 2. Relationship Between Power Supply Voltage and External Load Resistance

Supply Voltage

10.5 to 42 V DC for operation
 16.4 to 42 V DC for digital communications
 (16.4 to 30 V DC for Intrinsically safe type)

Load

0 to 1335 Ω for operation
 250 to 600 Ω for digital communication

EMC Conformity Standards: CE , N200

For EMI (Emission): EN55011, AS/NZS 2064 1/2
 For EMS (Immunity): EN50082-2

Communication Requirements**BRAIN****Communication Distance**

Up to 2 km (1.25 miles) when using CEV polyethylene-insulated PVC-sheathed cables. Communication distance varies depending on type of cable used.

Load Capacitance

0.22 μ F or less (see note)

Load Inductance

3.3 mH or less (see note)

Input Impedance of communicating device

10 k Ω or more at 2.4 kHz.

Note : For general-use and Flameproof type.
 For Intrinsically safe type, please refer to
 'OPTIONAL SPECIFICATIONS.'

HART**Communication Distance**

Up to 1.5 km (1 mile) when using multiple twisted pair cables. Communication distance varies depending on type of cable used.

Use the following formula to determine cable length for specific applications:

$$L = \frac{65 \times 10^6}{(R \times C)} - \frac{(C_f + 10,000)}{C}$$

Where:

L = length in meters or feet
 R = resistance in Ω (including barrier resistance)
 C = cable capacitance in pF/m or pF/ft
 C_f = maximum shunt capacitance of receiving devices in pF/m or pF/ft

□ PHYSICAL SPECIFICATIONS**Wetted Parts Materials:****Diaphragm and Process connector**

Refer to 'MODEL AND SUFFIX CODE.'

Non-wetted Parts Materials:**Housing**

Low copper cast-aluminum alloy with polyurethane paint (Munsell 0.6GY3.1/2.0)

Enclosure Classification

JIS C0920 immersion proof
 (equivalent to NEMA 4X and IEC IP67)

Cover O-rings

Buna-N

Data plate and tag

SUS304

Fill Fluid

Silicone, Fluorinated oil (option)

Weight

1.6 kg (3.5 lb) without integral indicator, mounting bracket.

Connections

Refer to the model code to specify the electrical connection type.

MODEL AND SUFFIX CODES

Model EJA510A and EJA530A

Model	Suffix Codes	Description
EJA510A EJA530A	Absolute pressure transmitter Gauge pressure transmitter
Output Signal	-D	4 to 20 mA DC with digital communication (BRAIN protocol)
	-E	4 to 20 mA DC with digital communication (HART protocol, refer to GS 1C22T1-E)
Measurement span (capsule)	A	10 to 200 kPa{0.1 to 2 kgf/cm ² }
	B	0.1 to 2 MPa{1 to 20 kgf/cm ² }
	C	0.5 to 10 MPa{5 to 100 kgf/cm ² }
	D	5 to 50 MPa{50 to 500 kgf/cm ² }
Wetted parts material	S	[Process Connection] SUS316L [Diaphragm] Hastelloy C-276
	H	Hastelloy C-276 Hastelloy C-276
Process connection	4	1/2 NPT female
	7	1/2 NPT male
	8	G 1/2 DIN 16 288 male
	9	M20×1.5 DIN 16 288 male
—	N	Always N
—	-0	Always 0
Electrical connection	0	G1/2 female, one electrical connection
	2	1/2 NPT female, two electrical connections without blind plug
	3	Pg 13.5 female, two electrical connections without blind plug
	4	M20 female, two electrical connections without blind plug
	5	G1/2 female, two electrical connections and a blind plug
	7	1/2 NPT female, two electrical connections and a blind plug
	8	Pg 13.5 female, two electrical connections and a blind plug
	9	M20 female, two electrical connections and a blind plug
Integral indicator	D ...	Digital indicator
	E ...	Digital indicator with the range setting switch
	N ...	(None)
Mounting bracket	E ..	SECC Carbon steel 2-inch pipe mounting
	F ..	SUS304 2-inch pipe mounting
	N ..	(None)
Optional codes		/□ Optional specification

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The '☆' marks indicate the most typical selection for each specification. Example: EJA530A-DAS4N-02NN/□

OPTIONAL SPECIFICATIONS (For Explosion Protected types)

Item	Description	Code
Factory Mutual (FM)	FM Explosionproof Approval Explosionproof for Class I, Division 1, Groups B, C and D Dust-ignitionproof for Class II/III, Division 1, Groups E, F and G Hazardous(classified) locations, indoors and outdoors(NEMA 4X) Temperature class: T6 Amb. Temp.: -40 to 60°C(-40 to 140°F) Electrical connection: 1/2 NPT female *1	FF11
	FM Intrinsically safe Approval *3 Intrinsically Safe for Class I, Division 1, Groups A, B, C & D, Class II, Division 1, Groups E, F & G and Class III, Division 1 Hazardous Locations. Nonincendive for Class I, Division 2, Groups A, B, C & D, Class II, Division. 2, Groups E, F & G, and Class III, Division 1 Hazardous Locations. Enclosure: "NEMA 4X," Temp. Class: T4, Amb. Temp.: -40 to 60°C(-40 to 140°F) Intrinsically Safe Apparatus Parameters [Groups A, B, C, D, E, F and G] Vmax=30 V, Imax=165 mA, Pmax=0.9 W, Ci=22.5 nF, Li=730 μH [Groups C, D, E, F and G] Vmax=30 V, Imax=225 mA, Pmax=0.9 W, Ci=22.5 nF, Li=730 μH Electrical connection: 1/2 NPT female *1	FS11
	Combined FF11 and FS11 *3 Electrical connection: 1/2 NPT female *1	FU11
CENELEC (KEMA)	CENELEC(KEMA) Flameproof Approval EExd IIC T4, T5, T6, Amb. Temp.: T6; -40 to 75°C(-40 to 167°F), T4 and T5; -40 to 80 °C(-40 to 176 °F) Max. process Temp.: T4; 120°C(248°F), T5; 100°C(212°F), T6; 85°C(185°F) Electrical connection: 1/2 NPT female, Pg 13.5 female and M20 female *2	KF11
	CENELEC(KEMA) Intrinsically safe Approval *3 EEx ia IIC T4, Amb. Temp.: -40 to 60 °C(-40 to 140 °F) Ui=30 V, li=165 mA, Pi=0.9 W, Ci=22.5 nF, Li=730 μH Electrical connection: 1/2 NPT female, Pg 13.5 female and M20 female *2	KS11
	Combined KF11, KS11 and Type n Approval *3 KEMA Type n Approval Ex nA IIC T4, Amb. Temp.: -40 to 60°C(-40 to 140°F) U=30 V, I=165 mA Electrical connection: 1/2 NPT female, Pg 13.5 female and M20 female *2	KU11
Canadian Standards Association (CSA)	CSA Explosionproof Approval Explosionproof for Class I, Division 1, Groups B, C and D Dustignitionproof for Class II/III, Division 1, Groups E, F and G Division2 'SEALS NOT REQUIRED,' Temp. Class: T4, T5, T6 Encl Type 4x Max. Process Temp.: T4; 120°C(248°F), T5; 100°C(212°F), T6; 85°C(185°F) Amb. Temp.: -40 to 80°C(-40 to 176°F) Electrical connection: 1/2 NPT female *1	CF11
	CSA Intrinsically safe Approval *3 Class I, Groups A, B, C and D Class II and III, Groups E, F and G Encl Type 4x, Temp. Class: T4, Amb. Temp.: -40 to 60°C(-40 to 140°F) Vmax=30 V, Imax=165 mA, Pmax=0.9 W, Ci=22.5 nF, Li=730 μH Electrical connection: 1/2 NPT female *1	CS11
	Combined CF11 and CS11 *3 Electrical connection: 1/2 NPT female *1	CU11
Standards Association of Australia (SAA)	SAA Flameproof, Intrinsically safe and Non-sparking Approval *3 Ex d IIC T4/T5/T6, IP67 class I, Zone 1, Amb. Temp. : -40 to 80°C(-40 to 176°F) Max. Process Temp.: T4; 120°C(248°F), T5; 100°C(212°F), T6; 85°C 185°F) Ex ia IIC T4, IP67 class I, Zone 0 Ex n IIC T4, IP67 class I, Zone 2 Ui=30 V DC, li=165 mA DC, Wi=0.9 W, Amb. Temp.: -40 to 60°C(-40 to 140°F) Electrical connection: 1/2 NPT female, Pg 13.5 female and M20 female *2	SU11

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*1: Applicable for Electrical connection code 2.

*2: Applicable for Electrical connection code 2, 3, or 4.

*3: Use the safety barrier certified by the testing laboratories(BARD-400 is not applicable).

Item		Description	Code	
Painting	Color change	Amplifier cover only	P□	
	Coating change	Epoxy resin-baked coating	X1	
Lightning protector		Transmitter power supply voltage: 10.5 to 32 V DC (10.5 to 30 V DC for intrinsically safe type, 9 to 32 V DC for Fieldbus communication type.) Allowable current: Max. 6000 A (1×40 μs), Repeating 1000 A (1×40 μs) 100 times	A	
Oil-prohibited use		Degrease cleansing treatment	K1	
		Degrease cleansing treatment and with fluorinated oil filled capsule. Operating temperature -20 to 80 °C	K2	
Calibration units *1		P calibration (psi unit)	(See Table for Span and Range Limits.)	D1
		bar calibration (bar unit)		D3
		M calibration (kgf/cm ² unit)		D4
Fast response *9		Update time: 0.125 sec or less Response time (with min. damping time constant): max. 0.3 sec	C1	
Failure alarm down-scale *2		Output status at CPU failure and hardware error. When combining with Optional code F1, output signal is -2.5%, 3.6 mA DC or less.	C1	
Stainless steel amplifier housing *3		Amplifier housing material; SCS14A stainless steel (equivalent to SUS316 cast stainless steel or ASTM CF-8M)	E1	
Mill Certificate		Process connector	M15	
Pressure test/ Leak test Certificate		Test Pressure: 200 kPa (2 kgf/cm ²) *4	Nitrogen (N ₂) Gas *8 Retention time: 10 minutes	T05
		Test Pressure: 2 MPa (20 kgf/cm ²) *5		T06
		Test Pressure: 10 MPa (100 kgf/cm ²) *6		T07
		Test Pressure: 50 MPa (500 kgf/cm ²) *7		T08

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- *1: The unit of MWP (Max. working pressure) on the name plate of a housing is the same unit as specified by Optional code D1, D3 and D4.
- *2: The hardware error indicates faulty amplifier or capsule.
- *3: Applicable for Electrical connection code 2, 3, 4, 7, 8, or 9. Not applicable for Optional code P□ and X1.
- *4: Applicable for Capsule code A.
- *5: Applicable for Capsule code B.
- *6: Applicable for Capsule code C.
- *7: Applicable for Capsule code D.
- *8: Pure nitrogen gas is used for oil-prohibited use (Optional code K1 and K2)
- *9: Applicable for Output signal code D and E. Consult Yokogawa when combining with Optional code for explosion protected type.

< Settings When Shipped >

Tag Number	As specified in order *1	Calibration Range Lower Range Value	As specified in order
Output Mode	'Linear'	Calibration Range Higher Range Value	As specified in order
Display Mode	'Linear'	Calibration Range Units	Selected from mmH ₂ O, mmAq, mmWG, mmHg, Torr, Pa, hPa, kPa, MPa, mbar, bar, gf/cm ² , kgf/cm ² , inH ₂ O, inHg, ftH ₂ O, psi, or atm.(Only one unit can be specified)
Operation Mode	'Normal' unless otherwise specified in order		
Damping Time Constant	'2 sec.'		

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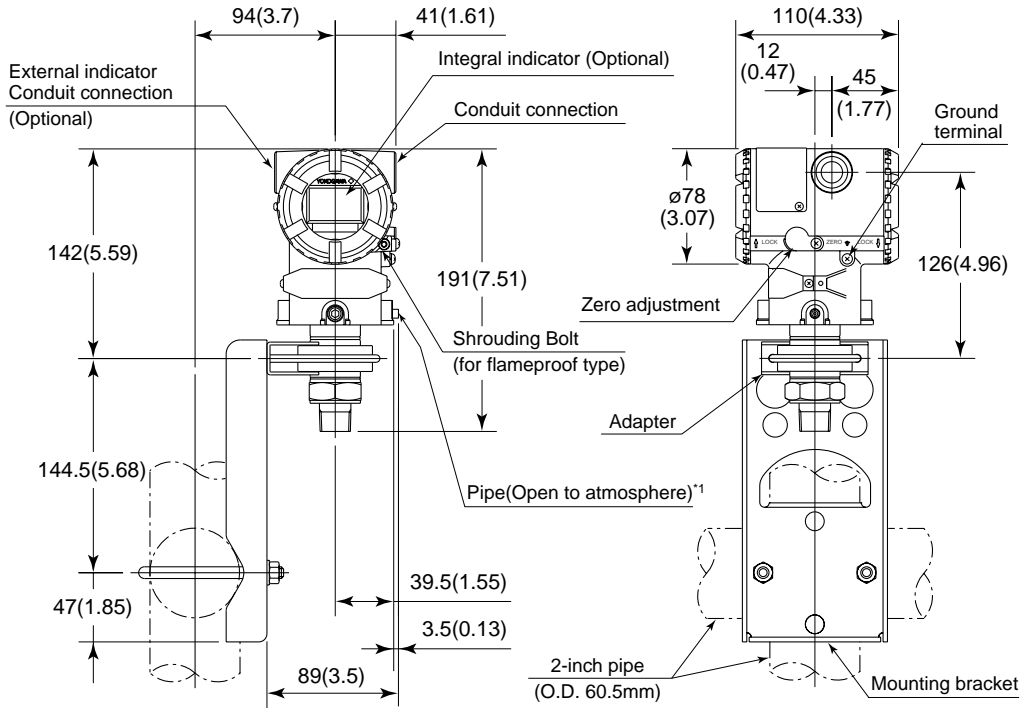
- *1: Up to 16 alphanumeric characters (including - and .) will be entered in the amplifier memory.

DIMENSIONS

Model EJA510A and EJA530A

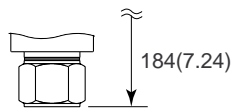
◆ With Process Connection code 7

Unit: mm(Approx. inch)

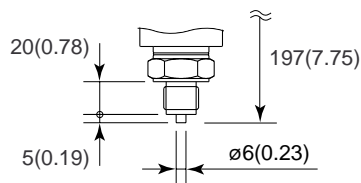


*1: Applied to Model EJA530A with Measurement span code A, B, and C.

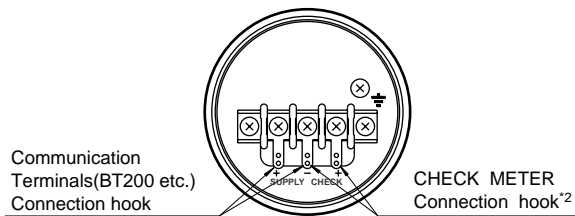
◆ For Process Connection code 4



◆ For Process Connection code 8 and 9



Terminal Configuration



Terminal Wiring

SUPPLY $\begin{matrix} + \\ - \end{matrix}$	Power supply and output terminal
CHECK $\begin{matrix} + \\ - \end{matrix}$	External indicator(ammeter) terminal*2
$\text{---} \perp$	Ground terminal

*2: When using an external indicator or a check meter, the internal resistance must be 10 Ω or less.

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SELECTION GUIDE

Application	Type	Model	Capsule	Measurement Span		Maximum Working Pressure	
				kPa	inH ₂ O	MPa	psi
Differential Pressure	Traditional-Mounting*1	EJA110A	L	0.5 to 10	2 to 40	3.5	500
			M	1 to 100	4 to 400	14	2000
			H	5 to 500	20 to 2000	14	2000
			V	0.14 to 14 MPa	20 to 2000 psi	14	2000
Flow	Integral Orifice	EJA115	L	1 to 10	4 to 40	3.5	500
			M	2 to 100	8 to 400	14	2000
Differential Pressure & Liquid Level with Remote Seals	Extended Flush Combination	EJA118N EJA118W EJA118Y	M	2.5 to 100	10 to 400	Based on Flange Rating	
			H	25 to 500	100 to 2000	Based on Flange Rating	
Draft Range	Traditional-Mounting*1	EJA120A	E	0.1 to 1	0.4 to 4	50 kPa	7.25
Differential Pressure & Liquid Level	Traditional-Mounting*1	EJA130A	M	1 to 100	4 to 400	32	4500
			H	5 to 500	20 to 2000	32	4500
Liquid Level, Closed or Open Tank	Flush Extended	EJA210A EJA220A	M	1 to 100	4 to 400	Based on Flange Rating	
			H	5 to 500	20 to 2000	Based on Flange Rating	
Absolute (vacuum) Pressure*2	Traditional-Mounting*1	EJA310A	L	0.67 to 10	2.67 to 40	10 kPa	40 in H ₂ O
			M	1.3 to 130	0.38 to 38 inHg	130 kPa	18.65
			A	0.03 to 3 MPa	4.3 to 430 psi	3000 kPa	430
Gauge Pressure	Traditional-Mounting*1	EJA430A	A	0.03 to 3 MPa	4.3 to 430 psi	3	430
			B	0.14 to 14	20 to 2000 psi	14	2000
Gauge Pressure with Remote Seal	Extended	EJA438N	A	0.06 to 3 MPa	9 to 430 psi	Based on Flange Rating	
Gauge Pressure with Remote Seal	Flush	EJA438W	B	0.46 to 7	66 to 1000 psi	Based on Flange Rating	
			A	0.06 to 3 MPa	8 to 430 psi	Based on Flange Rating	
High Gauge	Traditional-Mounting*1	EJA440A	A	5 to 32 MPa	720 to 4500 psi	32	4500
			D	5 to 50 MPa	720 to 7200 psi	50	7200
Absolute & Gauge Pressure*3	Direct Mounting	EJA510A EJA530A	A	10 to 200	1.45 to 29 psi	200 kPa	29
			B	0.1 to 2 MPa	14.5 to 290 psi	2	290
			C	0.5 to 10 MPa	72.5 to 1450 psi	10	1450
			D	5 to 50 MPa	720 to 7200 psi	50	7200

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- *1: Traditional-mounting is 1/4 - 18 NPTF process connections (1/2 - 14 NPTF with process adapters) on 2-1/8" centers.
- *2: Measurement values in absolute.
- *3: Measurement values in absolute for EJA510A.

< Ordering Information >

Specify the following when ordering

1. Model, suffix codes, and optional codes
2. Calibration range and units:
 - 1) Calibration range can be specified with range value specifications up to 5 digits (excluding any decimal point) for low or high range limits within the range of -32000 to 32000.
 - 2) Specify only one unit from the table, 'Settings when shipped.'
3. Select linear or square root for output mode and display mode.

Note: If not specified, the instrument is shipped set for linear mode.
4. Select normal or reverse for operation mode

Note: If not specified, the instrument is shipped in normal operation mode.
5. Display scale and units (for transmitters equipped with integral indicator only)

Specify either 0 to 100 % or engineering unit scale and 'Range and Unit' for engineering units scale: Scale range can be specified with range limit specifications up to 5 digits (excluding any decimal point) for low or high range limits within the range of -19999 to 19999.
6. Tag Number (if required)

< Related Instruments >

Power Distributor: Refer to GS 1B4T1-E, 1B4T2-E.
 3-Value Manifold: Refer to GS 22B1C1-E
 BRAIN TERMINAL: Refer to GS 1C0A11-E

< Reference >

1. Teflon; Trademark of E.I. DuPont de Nemours & Co.
2. Hastelloy; Trademark of Haynes International Inc.
3. HART; Trademark of the HART Communication Foundation.

Material Cross Reference Table

SUS316L	AISI 316L
SUS316	AISI 316
SUS304	AISI 304
S25C	AISI 1025
SCM435	AISI 4137
SUS630	ASTM630
SCS14A	ASTM CF-8M

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< Specification Conformance >

The model EJA510A and EJA530A maintain a specification conformance to at least 3 σ .