General Specifications

Model EJA430A
Gauge Pressure Transmitter

DPharp

GS 1C21E1-E

The high performance gauge pressure transmitter model EJA430A can be used to measure liquid, gas, or steam pressure. It outputs a 4 to 20 mA DC signal corresponding to the measured gauge pressure. Model EJA430A also features remote setup and monitoring through communications with the BRAIN™ terminal and CENTUM CS™ or µXL™ or HART® 275 host.

■ STANDARD SPECIFICATIONS

Refer to GS 1C22T2-E for Fieldbus communication type marked with "◇."

□ 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)

±0.075 % of Span

For spans below X,

$$\pm[0.025 + 0.05 \frac{X}{Span}] \text{ \% of Span}$$

where X equals:

Capsule	X MPa {psi}
A	0.3 {43}
B	1.4 {200}

Ambient Temperature Effects

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

±[0.084 % Span + 0.017 % URL]

Stability

±0.1 % of URL per 60 months

Power Supply Effects "◇"

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

□ FUNCTIONAL SPECIFICATIONS

Span & Range Limits

Measurement Span and Range		MPa	psi (/D1)	bar (/D3)	kgf/cm²(/D4)
A	Span	0.03 to 3	4.3 to 430	0.3 to 30	0.3 to 30
	Range	-0.1 to 3	-15 to 430	-1 to 30	-1 to 30
B	Span	0.14 to 14	20 to 2000	1.4 to 140	1.4 to 140
	Range	-0.1 to 14	-15 to 2000	-1 to 140	-1 to 140

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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 0.4 kPa {1.6 inH$_2$O} 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
Time Constant (approx. sec)	0.2	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

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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	Pressure
A	4.5 MPa {645 psig}
B	21 MPa {3000 psig}

Working Pressure Limits (Silicone Oil)

Maximum Pressure Limit

Capsule	Pressure
A	3 MPa {430 psig}
B	14 MPa {2000 psig}

Minimum Pressure Limit
See graph below

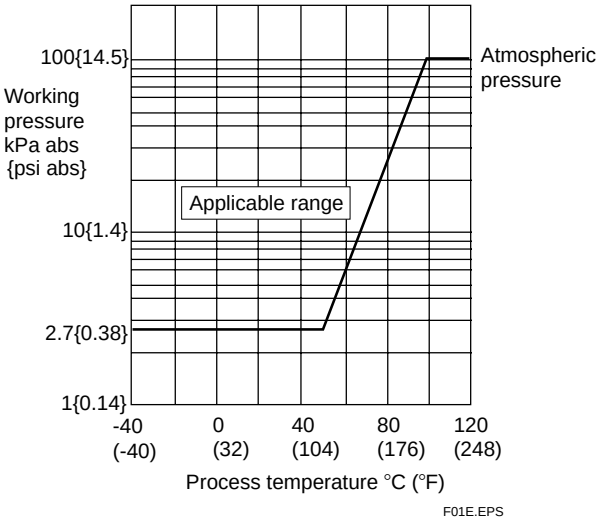

Figure 1. Working Pressure and Process Temperature

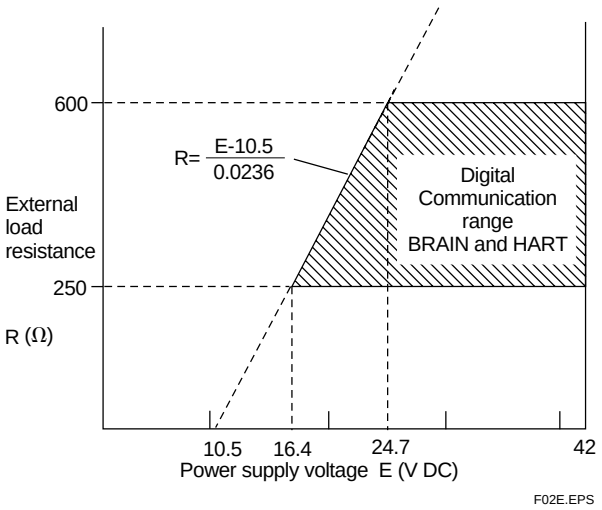

Figure 2. Relationship Between Power Supply Voltage and External Load Resistance

Supply & Load Requirements
(Safety approvals can affect electrical requirements)
With 24 V DC supply, up to a 570 Ω load can be used. See Figure 2.

Supply Voltage "◇"
10.5 to 42 V DC for operation(10.5 to 30 V DC for Intrinsically safe type)
16.4 to 42 V DC for digital communications(16.4 to 30 V DC for Intrinsically safe type)
9.0 to 32 V DC for digital communication, FOUNDATION Fieldbus protocol

Load (Output signal code D and E)
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 μF or less (see note)

Load Inductance
3.3 mH or less (see note)

Input Impedance of communicating device
10 kΩ 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

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☐ PHYSICAL SPECIFICATIONS

Wetted Parts Materials

Diaphragm, Cover flange, Process connector, and Vent/Drain Plug
Refer to 'MODEL AND SUFFIX CODE.'

Capsule Gasket
For wetted parts material code S, Teflon-coated SUS316L.
For wetted parts material code other than S, PTFE(Teflon).

Process Connector Gasket
PTFE Teflon

Non-wetted Parts Materials

Bolting
SCM435 or SUS630

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

Name plate and tag
SUS304

Fill Fluid
Silicone, Fluorinated oil (option)

Weight
3.9 kg (8.6 lbs.) without integral indicator, mounting bracket, and process connector.

Connections
Refer to the model code to specify the process and electrical connection type.

< Settings When Shipped > "◇"

Tag Number	As specified in order *1
Output Mode	'Linear'
Display Mode	'Linear'
Operation Mode	'Normal' unless otherwise specified in order
Damping Time Constant	'2 sec.'
Calibration Range Lower Range Value	As specified in order
Calibration Range Higher Range Value	As specified in order
Calibration Range Units	Selected from mmH_2O, mmAq, mmWG, mmHg, kPa, MPa, mbar, bar, gf/cm^2, kgf/cm^2, inH_2O, inHg, ftH_2O, or psi. (Only one unit can be specified)

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

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■ MODEL AND SUFFIX CODES

Model	Suffix Codes	Description		
EJA430A	·····	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)		
	-F ·····	Digital communication (FOUNDATION Fieldbus protocol, refer to GS 1C22T2-E)		
Measurement span(capsule)	**A** ·····	0.03 to 3 MPa{0.3 to 30 kgf/cm^2}		
	B ·····	0.14 to 14 MPa{1.4 to 140 kgf/cm^2}		
Wetted parts material		[Body]*1	[Capsule]	[Vent plug]
	S ·····	SCS14A	SUS316L *2	SUS316
	H ·····	SCS14A	Hastelloy C-276 *3	SUS316
	M ·····	SCS14A	Monel*3	SUS316
	T ·····	SCS14A	Tantalum *3	SUS316
	A ·····	Hastelloy C-276 equivalent*4	Hastelloy C-276 *3	Hastelloy C-276
	D ·····	Hastelloy C-276 equivalent*4	Tantalum *3	Hastelloy C-276
	B ·····	Monel equivalent*5	Monel*3	Monel
Process connection	**0** ·····	without process connector (Rc1/4 female on the cover flanges)		
	1 ·····	with Rc1/4 female process connector		
	2 ·····	with Rc1/2 female process connector		
	3 ·····	with 1/4 NPT female process connector		
	4 ·····	with 1/2 NPT female process connector		
	5 ·····	without process connector (1/4 NPT female on the cover flanges)		
Bolts and nuts material			[Maximum working pressure]	
			(A capsule)	(B capsule)
☆	**■** ·····	◇SCM435	3 MPa {30 kgf/cm^2}	14 MPa {140 kgf/cm^2}
	B ·····	SUS630	3 MPa {30 kgf/cm^2}	14 MPa {140 kgf/cm^2}
	C ·····	SUH660	3 MPa {30 kgf/cm^2}	14 MPa {140 kgf/cm^2}
Installation	**-2** ·····	Vertical impulse piping type, right side high pressure, process connector upside*6		
	-3 ·····	Vertical impulse piping type, right side high pressure, process connector downside*6		
	-6 ·····	Vertical impulse piping type, left side high pressure, process connector upside*6		
	-7 ·····	Vertical impulse piping type, left side high pressure, process connector downside*6		
	-8 ·····	Horizontal impulse piping type, right side high pressure*7		
	-9 ·····	Horizontal impulse piping type, left side high pressure*7		
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	**A** ·····	SECC Carbon steel	2-inch pipe mounting (flat type)	
	B ·····	SUS304	2-inch pipe mounting (flat type)	
	C ·····	SECC Carbon steel	2-inch pipe mounting (L type)	
	D ·····	SUS304	2-inch pipe mounting (L type)	
	N ·····	(None)		
Optional codes		/□ Optional specification		

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■ SELECTION GUIDE

Application	Type	Model	Capsule	Measurement Span		Maximum Working Pressure	
				kPa	inH_2O	MPa	psi
Differential Pressure	Traditional-Mounting*1	EJA110A	L M H V	0.5 to 10 1 to 100 5 to 500 0.14 to 14MPa	2 to 40 4 to 400 20 to 2000 20 to 2000 psi	3.5 14 14 14	500 2000 2000 2000
Flow	Integral Orifice	EJA115	L M H	1 to 10 2 to 100 20 to 210	4 to 40 8 to 400 80 to 830	3.5 14 14	500 2000 2000
Differential Pressure & Liquid Level with Remote Seals	Extended Flush Combination	EJA118N EJA118W EJA118Y	M H	2.5 to 100 25 to 500	10 to 400 100 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 H	1 to 100 5 to 500	4 to 400 20 to 2000	32 32	4500 4500
Liquid Level, Closed or Open Tank	Flush Extended	EJA210A EJA220A	M H	1 to 100 5 to 500	4 to 400 20 to 2000	Based on Flange Rating	
Absolute (vacuum) Pressure	Traditional-Mounting*1	EJA310A	L M A	0.67 to 10*2 1.3 to 130*2 0.03 to 3 MPa*2	2.67 to 40*2 0.38 to 38 inHg*2 4.3 to 430 psi*2	10 kPa*2 130 kPa*2 3000 kPa*2	40 in H_2O*2 18.65*2 430*2
Gauge Pressure	Traditional-Mounting*1	EJA430A	A B	0.03 to 3 MPa 0.14 to 14	4.3 to 430 psi 20 to 2000 psi	3 14	430 2000
Gauge Pressure with Remote Seal	Extended	EJA438N	A B	0.06 to 3 MPa 0.46 to 7	9 to 430 psi 66 to 1000 psi	Based on Flange Rating	
Gauge Pressure with Remote Seal	Flush	EJA438W	A B	0.06 to 3 MPa 0.46 to 7	8 to 430 psi 66 to 2000 psi	Based on Flange Rating	
High Gauge	Traditional-Mounting*1	EJA440A	C D	5 to 32 MPa 5 to 50 MPa	720 to 4500 psi 720 to 7200 psi	32 50	4500 7200
Absolute & Gauge Pressure*3	Direct-Mounting	EJA510A EJA530A	A B C D	10 to 200 0.1 to 2 MPa 0.5 to 10 MPa 5 to 50 MPa	1.45 to 29 psi 14.5 to 290 psi 72.5 to 1450 psi 720 to 7200 psi	200 kPa 2 10 50	29 290 1450 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. Monel; Trademark of Inco Alloys International, Inc.
4. HART; Trademark of the HART Communication Foundation.
5. FOUNDATION; Trademark of Fieldbus 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 EJA430A maintains a specification conformance to at least 3 σ.

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