

# General Specifications

## Model EJX430A Gauge Pressure Transmitter



GS 01C25E01-01E

The high performance gauge pressure transmitter model EJX430A features single crystal silicon resonant sensor and is suitable to measure liquid, gas, or steam pressure. It outputs a 4 to 20 mA DC signal corresponding to the measured pressure. Model EJX430A also features remote setup and monitoring via communications with the BRAIN terminal or HART communicator.

### STANDARD SPECIFICATIONS

#### SPAN AND RANGE LIMITS

Measurement Span/Range	MPa	psi (D1)	bar/(D3)	kgf/cm <sup>2</sup> /(D4)
H	Span 3.5 to 700 kPa	14 to 2800 inH <sub>2</sub> O	0.035 to 7	0.035 to 7
	Range -100 to 700 kPa	-400 to 2800 inH <sub>2</sub> O	-1 to 7	-1 to 7
A	Span 0.0175 to 3.5	2.5 to 500	0.175 to 35	0.175 to 35
	Range -0.1 to 3.5	- 15 to 500	-1 to 35	-1 to 35
B	Span 0.08 to 16	12 to 2300	0.8 to 160	0.8 to 160
	Range -0.1 to 16	-14.7 to 2300	-1 to 160	-1 to 160

T01E.EPS

#### PERFORMANCE SPECIFICATIONS

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

#### Specification Conformance

EJX series ensures specification conformance to at least  $\pm 3\sigma$ .

#### Reference Accuracy of Calibrated Span

(includes the effects of terminal-based linearity, hysteresis, and repeatability)

Measurement span		H	A	B
Reference accuracy	X ≤ Pressure	±0.04% of Span		
	X > Pressure	±(0.005+0.0035 URL/Span)% of Span		
X		70 kPa (10 psi)	0.35 MPa (50 psi)	1.6 MPa (230 psi)
URL (the upper range limit)		700 kPa (100 psi)	3.5 MPa (500 psi)	16 MPa (2300 psi)

T02E.EPS

#### Ambient Temperature Effects per 28°C (50°F) Change

±(0.04% of Span + 0.009% of URL)

#### Stability (All normal operating condition)

±0.1% of URL per 10 years

#### Power Supply Effects

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

#### Vibration Effects

Less than 0.1% of URL when tested per the requirements of IEC60770-1 field or pipeline with high vibration level (10-60 Hz, 0.21 mm peak to peak displacement/60-2000 Hz 3g)



#### Mounting Position Effects

Rotation in diaphragm plane has no effect. Tilting up to 90 degree will cause zero shift up to 0.4 kPa (1.6 inH<sub>2</sub>O) which can be corrected by the zero adjustment.

#### Response Time (All capsules)

95 ms

When amplifier damping is set to zero and including dead time of 45 ms (nominal)

#### FUNCTIONAL SPECIFICATIONS

##### Output

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

Output range: 3.6 mA to 21.6 mA

Output limits conform to NAMUR NE43 can be pre-set by option C2 or C3.

##### 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 or less  
Note: Applicable for Output signal code D and E

##### Damping Time Constant (1st order)

Amplifier damping time constant is adjustable from 0 to 100.00 seconds and added to response time.

Note: For BRAIN protocol type, when amplifier damping is set to 0.5 s or less, communication may occasionally be unavailable during the operation, especially while output changes dynamically. The default setting of damping ensures stable communication.

##### Update Period

Pressure: 45 ms

##### 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 0.005% incremental resolution of span. Re-range can be done locally using the digital indicator with range-setting switch.

**Integral Indicator (LCD display)**

5-digit Numerical Display, 6-digit Unit Display and Bar graph.

The indicator is configurable to display one or up to three of the following variables periodically.; Pressure in %, Scaled pressure, Pressure in Engineering unit.  
See "Setting When Shipped" for factory setting.

**Burst Pressure Limits**

69 MPa (10000 psi)

**NORMAL OPERATING CONDITION**

(Optional features or approval codes may affect limits.)

**Ambient Temperature Limits**

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

**Process Temperature Limits**

-40 to 120°C (-40 to 248°F)

**Ambient Humidity Limits**

0 to 100% RH

**Maximum Over Pressure**

Capsule	Pressure
H and A	16 MPa (2300 psi)
B	25 MPa (3600 psi)

**Working Pressure Limits (Silicone oil)**

**Maximum Pressure Limits**

Capsule	Pressure
H	700 kPa (2800 inH <sub>2</sub> O)
A	3.5 MPa (500 psi)
B	16 MPa (2300 psi)

**Minimum Pressure Limit**

See graph below

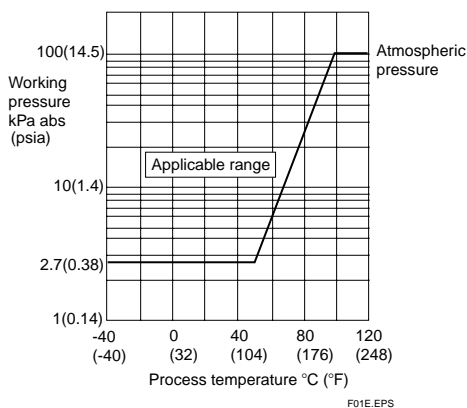


Figure 1. Working Pressure and Process Temperature

**Supply & Load Requirements**

(Optional features or safety approvals may affect electrical requirements.)

With 24 V DC supply, up to a 570 Ω load can be used. See graph below.

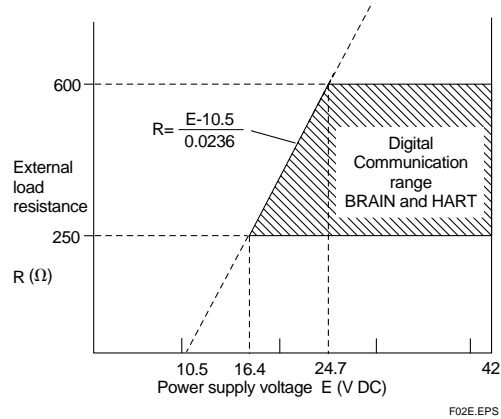


Figure 2. Relationship Between Power Supply Voltage and External Load Resistance

**Supply Voltage**

10.5 to 42 V DC for general use and flameproof type.  
10.5 to 32 V DC for lightning protector (Option code /A).  
10.5 to 30 V DC for intrinsically safe, type n, non-incendive or non-sparking type.  
Minimum voltage limited at 16.4 V DC for digital communications, BRAIN and HART

**Load (Output signal code D and E)**

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

**Communication Requirements**

(Safety approvals may affect electrical 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

**Load Inductance**

3.3 mH or less

**Input Impedance of communicating device**

10 kΩ or more at 2.4 kHz.

**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  $\Omega$  (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

**EMC Conformity Standards** **CE** , **N200**

EN 61326, AS/NZS 2064

**□ PHYSICAL SPECIFICATIONS**

**Wetted Parts Materials**

**Diaphragm, Cover Flange, Process Connector,  
Capsule Gasket, and Vent/Drain Plug**  
Refer to "MODEL AND SUFFIX CODE."

**Process Connector Gasket**

PTFE Teflon

Fluorinated rubber for Option code /N2 and /N3

**Non-wetted Parts Materials**

**Bolting**

ASTM-B7M carbon steel, 316SST(ISO A4-70)  
stainless steel, or ASTM grade 660 stainless steel

**Housing**

Low copper cast aluminum alloy with polyurethane,  
mint-green paint (Munsell 5.6BG 3.3/2.9 or its  
equivalent)

**Degrees of Protection**

IP67, NEMA4X, JIS C0920

**Cover O-rings**

Buna-N

**Name plate and tag**

304SST

**Fill Fluid**

Silicone, Fluorinated oil (option)

**Weight**

[Installation code 7, 8 and 9]

2.6 kg(5.7 lbs) without integral indicator, mounting  
bracket, and process connector.

**Connections**

Refer to "MODEL AND SUFFIX CODE."

**< Related Instruments >**

Power Distributor: Refer to GS 01B04T01-02E or  
GS 01B04T02-00E

BRAIN TERMINAL: Refer to GS 01C00A11-00E

**< 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.

Other company names and product names used in this  
material are registered trademarks or trademarks of  
their respective owners.

**MODEL AND SUFFIX CODES**

Model	Suffix Codes	Description
<b>EJX430A</b>	.....	Gauge pressure transmitter
Output Signal	<b>-D</b> .....	4 to 20 mA DC with digital communication (BRAIN protocol)
	<b>-E</b> .....	4 to 20 mA DC with digital communication (HART protocol)
Measurement span (capsule)	<b>H</b> .....	3.5 to 700 KPa (14 to 2800 inH <sub>2</sub> O)
	<b>A</b> .....	0.0175 to 5.5 MPa (2.5 to 500 psi)
	<b>B</b> .....	0.08 to 16 MPa (12 to 2300 psi)
Wetted parts material	<b>S</b> .....	Refer to "Wetted Parts Material" Table below.
	-.....	
	-.....	
	-.....	
	-.....	
	-.....	
Process connections	<b>0</b> .....	without process connector (Rc1/4 female on the cover flanges)
	<b>1</b> .....	with Rc1/4 female process connector
	<b>2</b> .....	with Rc1/2 female process connector
	<b>3</b> .....	with 1/4 NPT female process connector
	<b>4</b> .....	with 1/2 NPT female process connector
	☆ <b>5</b> .....	without process connector (1/4 NPT female on the cover flanges)
Bolts and nuts material	☆ <b>J</b> .....	ASTM-B7M carbon steel
	☆ <b>G</b> .....	316SST(ISO A4-70) stainless steel
	☆ <b>C</b> .....	ASTM grade 660 stainless steel
Installation	☆ <b>-7</b> .....	Vertical piping, left side high pressure, and process connection downside
	☆ <b>-8</b> .....	Horizontal piping and right side high pressure
	☆ <b>-9</b> .....	Horizontal piping and left side high pressure
Amplifier housing	<b>1</b> .....	Cast aluminum alloy
Electrical connection	☆ <b>0</b> .....	G1/2 female, one electrical connection without blind plugs
	☆ <b>2</b> .....	1/2 NPT female, one electrical connection without blind plugs
	☆ <b>4</b> .....	M20 female, one electrical connection without blind plugs
	☆ <b>5</b> .....	G1/2 female, two electrical connections and a blind plug
	☆ <b>7</b> .....	1/2 NPT female, two electrical connections and a blind plug
	☆ <b>9</b> .....	M20 female, two electrical connections and a blind plug
Integral indicator	☆ <b>D</b> .....	Digital indicator
	☆ <b>E</b> .....	Digital indicator with the range setting switch
	☆ <b>N</b> .....	None
Mounting bracket	☆ <b>B</b> .....	304 SST 2-inch pipe mounting (flat type)
	☆ <b>D</b> .....	304 SST 2-inch pipe mounting (L type)
	☆ <b>N</b> .....	None

T04E.EPS

Contact Yokogawa representative for the codes indicated as '-'.  
 The "☆" marks indicate the most typical selection for each specification.  
 \*1: Cast version of 316SST. Equivalent to SCS14A.

**Table. Wetted Parts Materials**

Wetted parts material code	Cover flange and process connector	Capsule	Capsule gasket	Drain/Vent plug
S #	ASTM CF-8M	Hastelloy C-276 (Diaphragm) 316L SST (Others)	Teflon-coated 316L SST	316 SST
- #	ASTM CF-8M	Hastelloy C-276	PTFE (Teflon)	316 SST
-	ASTM CF-8M	Monel	PTFE (Teflon)	316 SST
-	ASTM CF-8M	Tantalum	PTFE (Teflon)	316 SST
- #	Hastelloy C-276 equivalent	Hastelloy C-276	PTFE (Teflon)	Hastelloy C-276
-	Hastelloy C-276 equivalent	Tantalum	PTFE (Teflon)	Hastelloy C-276
-	Monel equivalent	Monel	PTFE (Teflon)	Monel

M04E.EPS

The '#' marks indicate the construction materials conform to NACE material recommendations per MR01-75. For the use of 316 SST material, there may be certain limitations for pressure and temperature. Please refer to NACE standards for details.

**OPTIONAL SPECIFICATIONS (For Explosion Protected type)**

Item	Description	Code
Factory Mutual (FM)	FM Explosionproof Approval *1 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)	-
	FM Intrinsically safe Approval *1 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.	-
	Combined FF1 and FS1 *1	-
ATEX	ATEX (KEMA) Flameproof Approval *1 II 2G EExd IIC T4, T5, T6	-
	ATEX (KEMA) Intrinsically safe Approval *1 II 1G EEx ia IIC T4	-
	Combined KF2, KS2 and Type n *1 Type n: II 3G EEx nL IIC T4	-
Canadian Standards Association (CSA)	CSA Explosionproof Approval *1 Explosionproof for Class I, Division 1, Groups B, C and D Dustignitionproof for Class II/III, Division 1, Groups E, F and G	-
	CSA Intrinsically safe Approval *1 Class I, Groups A, B, C and D Class II and III, Groups E, F and G Encl Type 4x	-
	Combined CF1 and CS1 *1	-

T05E.EPS

Contact Yokogawa representative for the codes indicated as '-'.  
\*1: Applicable for Electrical connection code 2, 3, 7, and 9.

**OPTIONAL SPECIFICATION**

Item		Description	Code	
Painting	Color change	Terminal cover only	P□	
		Both sides of amplifier covers, Munsell 7.5 R4/14	PR	
	Coating change	Anti-corrosion coating	X2	
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 Applicable Standards: IEC 61000-4-4, IEC 61000-4-5		A	
Oil-prohibited use*1	Degrease cleansing treatment		K1	
	Degrease cleansing treatment and with fluorinated oilfilled capsule. Operating temperature -20 to 80°C (-4 to 176°F)		K2	
Oil-prohibited use with dehydrating treatment*1	Degrease cleansing treatment and dehydrating treatment		K5	
	Degrease cleansing treatment and dehydrating treatment with fluorinated oilfilled capsule. Operating temperature -20 to 80°C (-4 to 176°F)		K6	
Capsule fill fluid	Flourinated oil filled in capsule		K3	
Calibration units*2	P calibration (psi unit)		(See Table for Span and Range Limits.) D1	
	bar calibration (bar unit)			D3
	M calibration (kgf/cm <sup>2</sup> unit)			D4
Long vent*3	Total length: 119 mm (standard: 34 mm); Total length when combining with Optional code K1, K2, K5, and K6: 130 mm. Material: 316SST.		U	
Output limits and failure operation*4	Output status at CPU failure and hardware error. When combining with Optional code F1, output signal is -5%, 3.2 mA DC or less.		C1	
	NAMUR NE43 Compliant Output signal limits : 3.8mA to 20.5 mA	Failure alarm down-scale : Output status at CPU failure and hardware error is -5%, 3.2mA DC or less.	C2	
		Failure alarm up-scale : Output status at CPU failure and hardware error is -110%, 21.6 mA or more.	C3	
Body option*5	Without drain and vent plugs		N1	
	N1 and Process connection, based on IEC61518 with female thread on both sides of cover flange, with blind kidney flanges on back		N2	
	N1, N2, and Material certificate for cover flange, diaphragm, capsule body, and blind kidney flange		N3	
Stainless steel tag plate	304SST stainless steel tag plate wired onto transmitter		N4	
Data Configuration at factory*6	Data configuration for HART communication type	Amplifier damping, Descriptor, Memo	CA	
	Data configuration for BRAIN communication type	Amplifier damping	CB	
Material Certificate *7	Cover flange *8		M01	
	Cover flange, Process connector *9		M11	
Pressure test/ Leak test Certificate	Test Pressure: 700 kPa(2800 inH <sub>2</sub> O)*10	Nitrogen(N <sub>2</sub> ) Gas*13 Retention time: one minute	T11	
	Test Pressure: 3.5 MPa(500 psi)*11		T01	
	Test Pressure: 16 MPa(2300 psi)*12		T12	

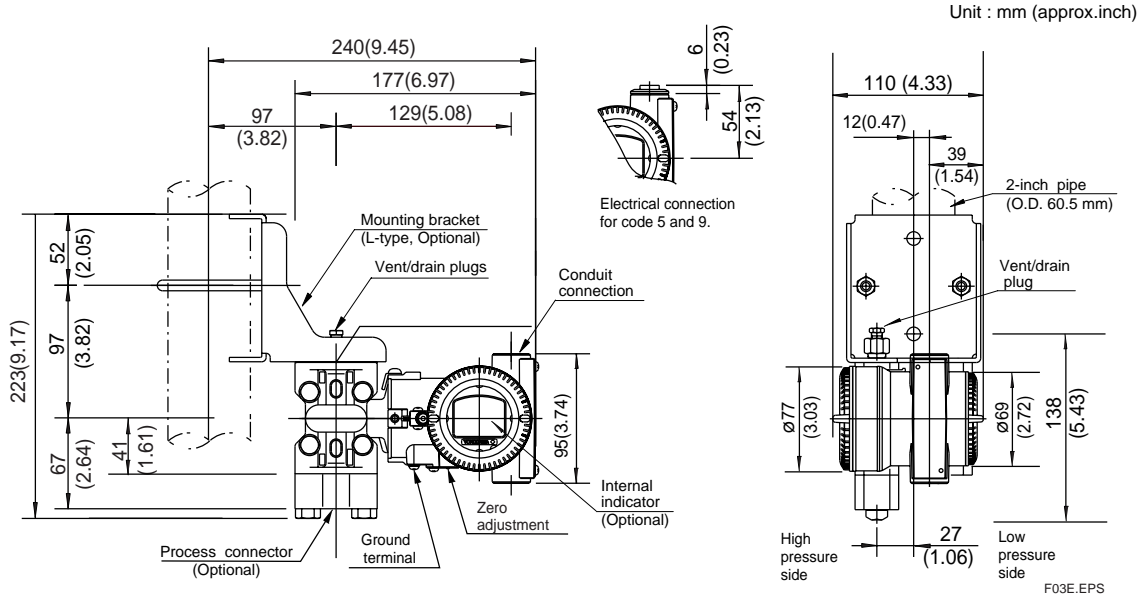
T06E.EPS

- \*1: Applicable for Wetted parts material code S.
- \*2: 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.
- \*3: Applicable for vertical impulse piping type (Installation code 7) and Wetted parts material code S.
- \*4: Applicable for Output signal code D and E. The hardware error indicates faulty amplifier or capsule.
- \*5: Applicable for Wetted parts material code S; Process connection code 3, 4, and 5; Installation code 9; and Mounting bracket code N. Process connection faces on the other side of zero adjustment screw.
- \*6: Also see 'Ordering Instructions'.
- \*7: Applicable for Process connections code 0 and 5.
- \*8: Applicable for Process connections code 1, 2, 3, and 4.
- \*9: Applicable for Capsule code H.
- \*10: Applicable for Capsule code A.
- \*10: Applicable for Capsule code B.
- \*11: Pure nitrogen gas is used for oil-prohibited use (Optional code K1, K2, K5, and K6).

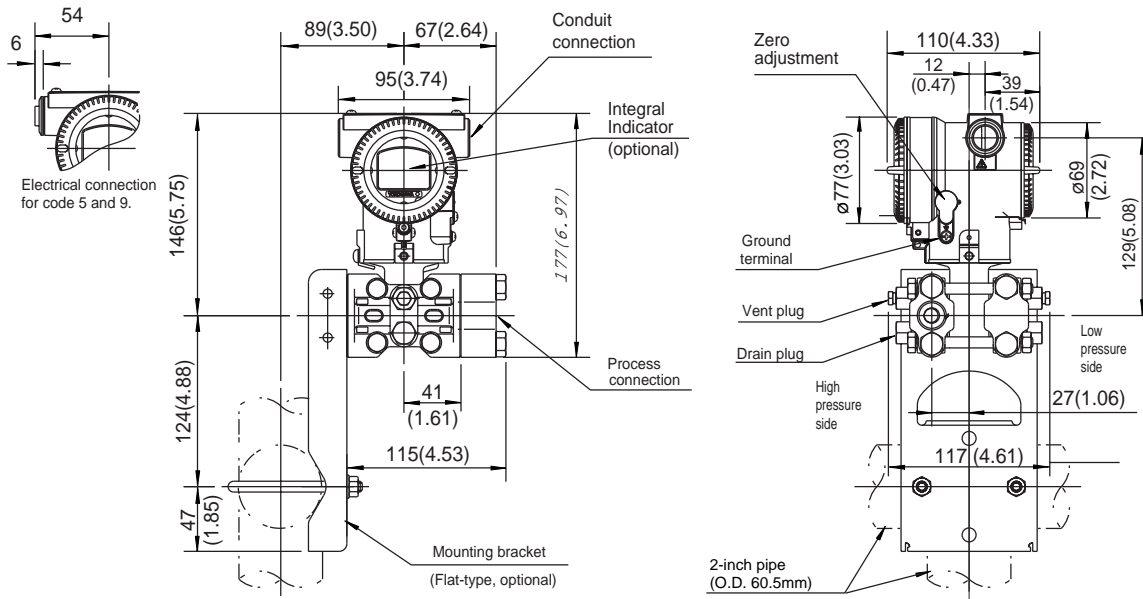
**DIMENSIONS**

● Model EJX430A

Vertical Impulse Piping Type (INSTALLATION CODE '7')

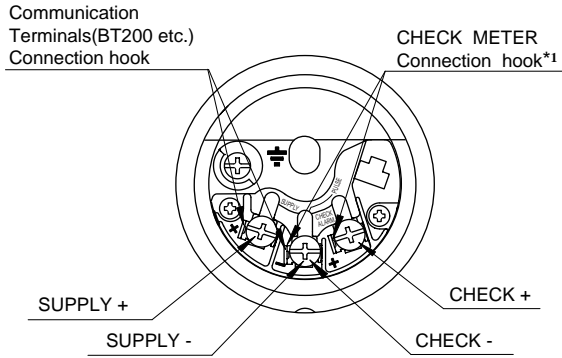


Horizontal Impulse Piping Type (INSTALLATION CODE '9') (For CODE '8', refer to the notes below.)



\* 1: When Installation code 8 is selected, high and low pressure side on above figure are reversed. (i.e. High pressure side is on the right side.)

● Terminal Configuration



● Terminal Wiring

SUPPLY $\pm$	Power supply and output terminal
CHECK $\pm$	External indicator(ammeter) terminal*1
$\equiv$	Ground terminal

\*1: When using an external indicator or a check meter, the internal resistance must be 10 Ω or less.

F05E.EPS

< 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. When reverse range is designated, specify URV as greater than LRV.
  - 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. 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 -32000 to 32000. The first 5 characters(excluding '/') of the specified scaling unit will be displayed on the unit display.
5. Tag Number (if required).
 

For BRAIN communication type, specify upto 16 letters. The specified letters will be written in the amplifier memory and engraved on the tag plate.  
For HART communication type, specify software tag (upto 8 letters) to be written on the amplifier memory and Tag number(upto 16 letters) to be engraved on the tag plate seperately.
6. Other factory configurations (if required)
 

Specifying option code /CA or /CB will allow further configuration at factory. Following are configurable items and setting range.

[/CA : For HART communication type]

  - 1) Descriptor(upto 16 characters)
  - 2) Memo (upto 32 characters)
  - 3) Amplifier damping (0.0 to 100.00 sec)

[/CB : For BRAIN communication type]

  - 1) Amplifier damping (0.0 to 100.00 sec)

< Factory Setting >

Tag Number	As specified in order
Amplifier Damping *1	'2 sec.' or as specified in order
Output Mode	'Linear' unless otherwise specified in order
Calibration Range Lower Range Value	As specified in order
Calibration Range Upper Range Value	As specified in order
Calibration Range Units	Selected from mmH <sub>2</sub> O, mmH <sub>2</sub> O(68°F), mmAq, mmWG, mmHg, Pa, hPa, kPa, MPa, mbar, bar, gf/cm <sup>2</sup> , kgf/cm <sup>2</sup> , inH <sub>2</sub> O, inH <sub>2</sub> O(68°F),inHg, ftH <sub>2</sub> O, ftH <sub>2</sub> O(68°F) or psi. (Only one unit can be specified)
Display Setting	Designated value specified in order. (%. Engineering unit or user scaled value.) Display mode is set to 'Linear' unless otherwise specified in order.

T07E.EPS

\*1: To specify these items at factory, /CA or /CB option is required.