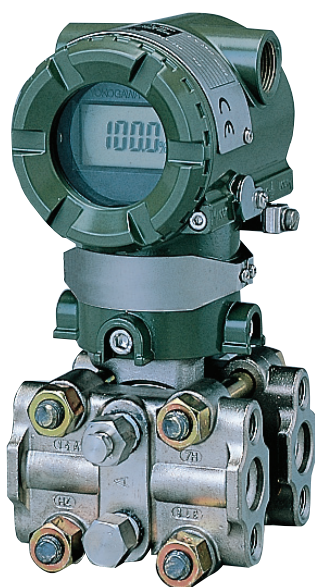


EJA Series Differential Pressure and Pressure Transmitters Installation Manual

CD-ROM included

IM 01C22A01-01E

vigilantplant®



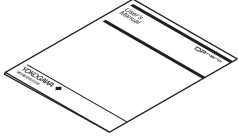
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1. Introduction

Thank you for purchasing the DPharp electronic pressure transmitter.

This manual provides the basic guidelines for installation and wiring procedures of the DPharp EJA Series with BRAIN and HART protocols. It does not provide the product specific functional specifications and explanations, maintenance, troubleshooting, and fieldbus communication operating procedures, both FOUNDATION Fieldbus™ and PROFIBUS PA. For the items which are not covered in this manual, see the applicable user's manuals in the CD-ROM attached to this manual as listed in Table 1.1.

● **Installation manual (this document)**
EJA series common manual

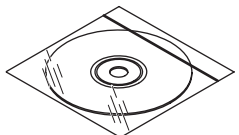


<Contents>

- Installation
- Impulse piping installation
- Wiring
- Zeroing

● **Attached CD-ROM includes PDF manuals for:**

- **Product specific manuals, 7 PDFs by model code**
- **HART operation manual, 1 PDF**
- **Fieldbus communication manuals, 2 PDFs**



<Contents of product specific manuals>

- Installation
- Impulse piping installation
- Wiring
- Zeroing
- BT200 operation
- Maintenance
- Specifications
- Parts list

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Table 1.1 PDF Manual List and Applicable Style Code

Models	Document No.	Style
EJA110A, EJA120A, and EJA130A	IM 01C21B01-01E	S1
EJA210A and EJA220A	IM 01C21C01-01E	S1
EJA310A, EJA430A, and EJA440A	IM 01C21D01-01E	S1
EJA510A and EJA530A	IM 01C21F01-01E	S2
EJA118W, EJA118N, and EJA118Y	IM 01C22H01-01E	S2
EJA438W and EJA438N	IM 01C22J01-01E	S2
EJA115	IM 01C22K01-01E	S3
EJA Series HART Protocol	IM 01C22T01-01E	—
EJA Series FOUNDATION Fieldbus Communication Type	IM 01C22T02-01E	—
EJA Series PROFIBUS PA Communication Type	IM 01C22T03-00E	—

› Regarding This Manual

- This manual should be passed on to the end user.
- The contents of this manual are subject to change without prior notice.
- All rights reserved. No part of this manual may be reproduced in any form without Yokogawa's written permission.
- Yokogawa makes no warranty of any kind with regard to this manual, including, but not limited to, implied warranty of merchantability and fitness for a particular purpose.
- If any question arises or errors are found, or if any information is missing from this manual, please inform the nearest Yokogawa sales office.
- The specifications covered by this manual are limited to those for the standard type under the specified model number break-down and do not cover custom-made instruments.
- Please note that changes in the specifications, construction, or component parts of the instrument may not immediately be reflected in this manual at the time of change, provided that postponement of revisions will not cause difficulty to the user from a functional or performance standpoint.
- Yokogawa assumes no responsibilities for this product except as stated in the warranty.
- If the customer or any third party is harmed by the use of this product, Yokogawa assumes no responsibility for any such harm owing to any defects in the product which were not predictable, or for any indirect damages.



NOTE

For FOUNDATION Fieldbus, PROFIBUS PA and HART protocol versions, please refer to manuals in the attached CD-ROM, in addition to this manual.

- The following safety symbol marks are used in this manual:



WARNING

Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

**CAUTION**

Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.

**IMPORTANT**

Indicates that operating the hardware or software in this manner may damage it or lead to system failure.

**NOTE**

Draws attention to information essential for understanding the operation and features.

--- Direct current

1.1 For Safe Use of Product

For the protection and safety of the operator and the instrument or the system including the instrument, please be sure to follow the instructions on safety described in this manual when handling this instrument. In case the instrument is handled in contradiction to these instructions, Yokogawa does not guarantee safety. Please give your attention to the followings.

(a) Installation

- The instrument must be installed by an expert engineer or a skilled personnel. The procedures described about INSTALLATION are not permitted for operators.
- In case of high process temperature, care should be taken not to burn yourself because the surface of body and case reaches a high temperature.
- The instrument installed in the process is under pressure. Never loosen the process connector bolts to avoid the dangerous spouting of process fluid.
- During draining condensate from the pressure detector section, take appropriate care to avoid contact with the skin, eyes or body, or inhalation of vapors, if the accumulated process fluid may be toxic or otherwise harmful.
- When removing the instrument from hazardous processes, avoid contact with the fluid and the interior of the meter.
- All installation shall comply with local installation requirement and local electrical code.

(b) Wiring

- The instrument must be installed by an expert engineer or a skilled personnel. The procedures described about WIRING are not permitted for operators.
- Please confirm that voltages between the power supply and the instrument before connecting the power cables and that the cables are not powered before connecting.

(c) Operation

- Wait 10 min. after power is turned off, before opening the covers.

(d) Maintenance

- Please do not carry out except being written to maintenance descriptions. When these procedures are needed, please contact nearest YOKOGAWA office.
- Care should be taken to prevent the build up of drift, dust or other material on the display glass and name plate. In case of its maintenance, soft and dry cloth is used.

(e) Explosion Protected Type Instrument

- Users of explosion proof instruments should refer first to section 2.4 (Installation of an Explosion Protected Instrument) of this manual.
- The use of this instrument is restricted to those who have received appropriate training in the device.
- Take care not to create sparks when accessing the instrument or peripheral devices in a hazardous location.

(f) Modification

- Yokogawa will not be liable for malfunctions or damage resulting from any modification made to this instrument by the customer.

1.2 Warranty

- The warranty shall cover the period noted on the quotation presented to the purchaser at the time of purchase. Problems occurred during the warranty period shall basically be repaired free of charge.
- In case of problems, the customer should contact the Yokogawa representative from which the instrument was purchased, or the nearest Yokogawa office.
- If a problem arises with this instrument, please inform us of the nature of the problem and the circumstances under which it developed, including the model specification and serial number. Any diagrams, data and other information you can include in your communication will also be helpful.

- Responsible party for repair cost for the problems shall be determined by Yokogawa based on our investigation.
- The Purchaser shall bear the responsibility for repair costs, even during the warranty period, if the malfunction is due to:
 - Improper and/or inadequate maintenance by the purchaser.
 - Failure or damage due to improper handling, use or storage which is out of design conditions.
 - Use of the product in question in a location not conforming to the standards specified by Yokogawa, or due to improper maintenance of the installation location.
 - Failure or damage due to modification or repair by any party except Yokogawa or an approved representative of Yokogawa.
 - Malfunction or damage from improper relocation of the product in question after delivery.
 - Reason of force majeure such as fires, earthquakes, storms/floods, thunder/lightening, or other natural disasters, or disturbances, riots, warfare, or radioactive contamination.

1.3 ATEX Documentation

This is only applicable to the countries in European Union.

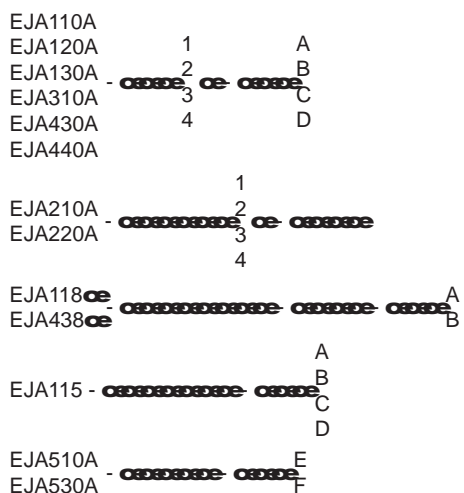
<p>GB All instruction manuals for ATEX Ex related products are available in English, German and French. Should you require Ex related instructions in your local language, you are to contact your nearest Yokogawa office or representative.</p>	<p>SK Všetky návody na obsluhu pre prístroje s ATEX Ex sú k dispozícii v jazyku anglickom, nemeckom a francúzskom. V prípade potreby návodu pre Ex-prístroje vo Vašom národnom jazyku, skontaktujte prosím miestnu kanceláriu firmy Yokogawa.</p>
<p>DK Alle brugervejledninger for produkter relateret til ATEX Ex er tilgængelige på engelsk, tysk og fransk. Skulle De ønske yderligere oplysninger om håndtering af Ex produkter på eget sprog, kan De rette henvendelse herom til den nærmeste Yokogawa afdeling eller forhandler.</p>	<p>CZ Všechny uživatelské příručky pro výrobky, na něž se vztahuje nevybušné schválení ATEX Ex, jsou dostupné v angličtině, němčině a francouzštině. Požadujete-li pokyny týkající se výrobků s nevybušným schválením ve vašem lokálním jazyku, kontaktujte prosím vaši nejbližší reprezentační kancelář Yokogawa.</p>
<p>I Tutti i manuali operativi di prodotti ATEX contrassegnati con Ex sono disponibili in inglese, tedesco e francese. Se si desidera ricevere i manuali operativi di prodotti Ex in lingua locale, mettersi in contatto con l'ufficio Yokogawa più vicino o con un rappresentante.</p>	<p>LT Visos gaminiø ATEX Ex kategorijos Eksploatavimo instrukcijos teikiami anglø, vokietieø ir prancøzø kalbomis. Norëdami gauti prietaisø Ex dokumentacijà kitomis kalbomis susisiekite su artimiausiu bendrovës "Yokogawa" biuru arba atstovu.</p>
<p>E Todos los manuales de instrucciones para los productos antiexplosivos de ATEX están disponibles en inglés, alemán y francés. Si desea solicitar las instrucciones de estos artículos antiexplosivos en su idioma local, deberá ponerse en contacto con la oficina o el representante de Yokogawa más cercano.</p>	<p>LV Visas ATEX Ex kategorijas izstrãdãjumu Lietošanas instrukcijas tiek piegãdãtas angļu, vãcu un franøu valodãs. Ja vølaties saøemt Ex ierøu dokumentãciju citã valodã, Jums ir jãsasinaš ar firmas Jokogava (Yokogawa) tuvãko ofisu vai pãrstãvi.</p>
<p>NL Alle handleidingen voor producten die te maken hebben met ATEX explosiebeveiliging (Ex) zijn verkrijgbaar in het Engels, Duits en Frans. Neem, indien u aanwijzingen op het gebied van explosiebeveiliging nodig hebt in uw eigen taal, contact op met de dichtstbijzijnde vestiging van Yokogawa of met een vertegenwoordiger.</p>	<p>EST Kõik ATEX Ex toodete kasutamisujuhendid on esitatud inglise, saksa ja prantsuse keeles. Ex seadmete muukeelse dokumentatsiooni saamiseks pöörduge lähima lokagava (Yokogawa) kontori või esindaja poole.</p>
<p>SF Kaikkien ATEX -tyyppisten tuotteiden käyttöohjeet ovat saatavilla englannin-, saksan- ja ranskankielisinä. Mikäli tarvitsette Ex -tyyppisten tuotteiden ohjeita omalla paikallisella kielellänne, ottakaa yhteyttä lähimpään Yokogawa-toimistoon tai -edustajaan.</p>	<p>PL Wszystkie instrukcje obsługi dla urządzeń w wykonaniu przeciwwybuchowym Ex, zgodnych z wymaganiami ATEX, dostępne są w języku angielskim, niemieckim i francuskim. Jeżeli wymagana jest instrukcja obsługi w Państwa lokalnym języku, prosimy o kontakt z najbliższym biurem Yokogawy.</p>
<p>P Todos os manuais de instruções referentes aos produtos Ex da ATEX estão disponíveis em Inglês, Alemão e Francês. Se necessitar de instruções na sua língua relacionadas com produtos Ex, deverá entrar em contacto com a delegação mais próxima ou com um representante da Yokogawa.</p>	<p>SLO Vsi predpisi in navodila za ATEX Ex sorodni pridelki so pri roki v angleščini, nemščini ter francoščini. Èe so Ex sorodna navodila potrebna v vašem tukejnem jeziku, kontaktirajte vaš najbliži Yokogawa office ili predstavnika.</p>
<p>F Tous les manuels d'instruction des produits ATEX Ex sont disponibles en langue anglaise, allemande et française. Si vous nécessitez des instructions relatives aux produits Ex dans votre langue, veuillez bien contacter votre représentant Yokogawa le plus proche.</p>	<p>H Az ATEX Ex mûszerek gépkönyveit angol, német és francia nyelven adjuk ki. Amennyiben helyi nyelven kéri az Ex eszközök leírásait, kérjük keressék fel a legközelebbi Yokogawa irodát, vagy képviselőtet.</p>
<p>D Alle Betriebsanleitungen für ATEX Ex bezogene Produkte stehen in den Sprachen Englisch, Deutsch und Französisch zur Verfügung. Sollten Sie die Betriebsanleitungen für Ex-Produkte in Ihrer Landessprache benötigen, setzen Sie sich bitte mit Ihrem örtlichen Yokogawa-Vertreter in Verbindung.</p>	<p>BG Всички упътвания за продукти от серията ATEX Ex се предлагат на английски, немски и френски език. Ако се нуждаете от упътвания за продукти от серията Ex на родния ви език, се свържете с най-близкия офис или представителство на фирма Yokogawa.</p>
<p>S Alla instruktionsböcker för ATEX Ex (explosionssäkra) produkter är tillgängliga på engelska, tyska och franska. Om Ni behöver instruktioner för dessa explosionssäkra produkter på annat språk, skall Ni kontakta närmaste Yokogawakontor eller representant.</p>	<p>RO Toate manualele de instructiuni pentru produsele ATEX Ex sunt in limba engleza, germana si franceza. In cazul in care doriti instructiunile in limba locala, trebuie sa contactati cel mai apropiat birou sau reprezentant Yokogawa.</p>
<p>GR Όλα τα εγχειρίδια λειτουργίας των προϊόντων με ATEX Ex διατίθενται στα Αγγλικά, Γερμανικά και Γαλλικά. Σε περίπτωση που χρειάζεστε οδηγίες σχετικά με Ex στην τοπική γλώσσα παρακαλούμε επικοινωνήστε με το πλησιέστερο γραφείο της Yokogawa ή αντιπρόσωπο της.</p>	<p>M Il-manwali kollha ta' l-istruzzjonijiet għal prodotti marbuta ma' ATEX Ex huma disponibbli bl-Ingliż, bil-Germaniż u bil-Franċiż. Jekk tkun tehtieg struzzjonijiet marbuta ma' Ex fil-lingwa lokali tiegħek, għandek tikkuntattja lill-eqreb rappreżentant jew uffičju ta' Yokogawa.</p>

2. Handling Cautions

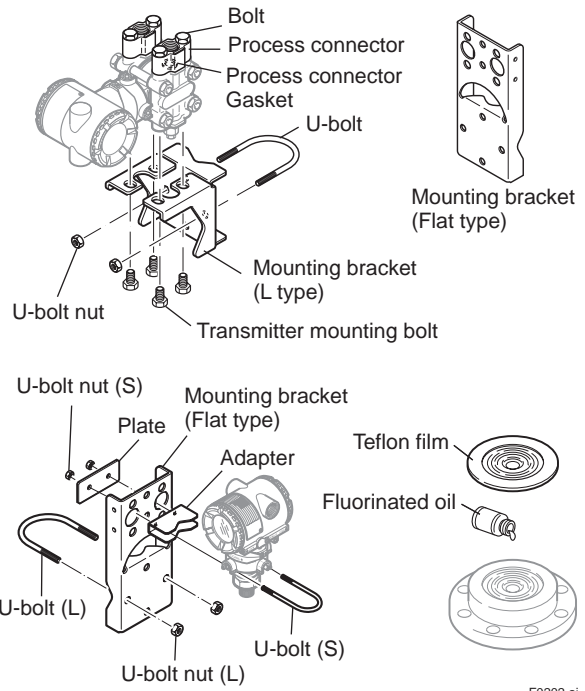
When the transmitter is delivered, visually check them to make sure that no damage occurred during shipment. Also check that all transmitter mounting hardware shown in Figure 2.1 is included. If the transmitter was ordered without the mounting bracket or without the process connector, the transmitter mounting hardware is not included.

Table 2.1 Applicable Model Code for Mounting Hardware

Applicable model	Suffix code	Part name	Qty
EJA110A EJA120A EJA130A	Process connections 1, 2, 3, and 4	Process connector bolt	4
		Process connector	2
		Process connector gasket	2
EJA210A EJA220A EJA310A EJA430A EJA440A	Process connections 1, 2, 3, and 4	Process connector bolt	2
		Process connector	1
		Process connector gasket	1
EJA110A EJA120A EJA130A EJA310A EJA430A EJA440A EJA118 EJA438 EJA115	Mounting bracket A, B, C, and D	U-bolt	1
		U-bolt nut	2
		Mounting bracket (L or flat type)	1
		Transmitter mounting bolt	4
EJA510A EJA530A	Mounting bracket E and F	U-bolt and nut (L)	1
		U-bolt and nut (S)	1
		Mounting bracket (L or flat type)	1
		Plate	1
		Adapter	1
EJA210A EJA438W	Option code /T	Teflon film	1
		Fluorinated oil	1
EJA118W	Option code /T	Teflon film	2
		Fluorinated oil	2



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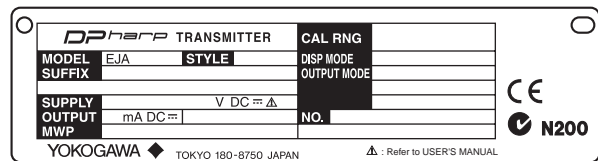


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Figure 2.1 Transmitter Mounting Hardware

2.1 Model and Specifications Check

The model name and specifications are indicated on the name plate attached to the case.



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Figure 2.2 Name Plate

2.2 Selecting the Installation Location

The transmitter is designed to withstand severe environmental conditions. However, to ensure stable and accurate operation for years, observe the following precautions when selecting an installation location.

- (a) Ambient Temperature
 - Avoid locations subject to wide temperature variations or a significant temperature gradient. If the location is exposed to radiant heat from plant equipments, provide adequate thermal insulation and/or ventilation.

- (b) Ambient Atmosphere
Avoid installing the transmitter in a corrosive atmosphere. If the transmitter must be installed in a corrosive atmosphere, there must be adequate ventilation as well as measures to prevent intrusion or stagnation of rain water in conduits.
- (c) Shock and Vibration
Select an installation site suffering minimum shock and vibration (although the transmitter is designed to be relatively resistant to shock and vibration).
- (d) Installation of Explosion-protected Transmitters
Explosion-protected transmitters can be installed in hazardous areas according to the types of gases for which they are certified. See Subsection 2.4 "Installation of Explosion Protected Type Transmitters."

2.3 Pressure Connection

WARNING

- Instrument installed in the process is under pressure. Never loosen the process connector bolts to avoid the dangerous spouting of process fluid.
- During draining condensate from the pressure detector section, take appropriate care to avoid contact with the skin, eyes or body, or inhalation of vapors, if the accumulated process fluid may be toxic or otherwise harmful.

The following precautions must be observed in order to safely operate the transmitter under pressure.

- (a) Make sure that the process connector bolts are tightened firmly.
- (b) Make sure that there are no leaks in the impulse piping.
- (c) Never apply a pressure higher than the specified maximum working pressure.

CAUTION

Maximum working pressure of the model EJA120A differential pressure transmitter is 50 kPa {0.5 kgf/cm²}.
Should the pressure exceed 50 kPa {0.5 kgf/cm²}, it is possible to break the sensor. Proceed with caution when applying pressure.

2.4 Installation of Explosion Protected Type

In this section, further requirements and differences and for explosionproof type instrument are described.

For explosionproof type instrument, the description in this chapter is prior to other description in this users manual.

For the intrinsically safe equipment and explosionproof equipment, in case the instrument is not restored to its original condition after any repair or modification undertaken by the customer, intrinsically safe construction or explosionproof construction is damaged and may cause dangerous condition. Please contact Yokogawa for any repair or modification required to the instrument.

NOTE

For FOUNDATION Fieldbus and PROFIBUS PA explosion protected type, please refer to manuals in the attached CD-ROM.

CAUTION

This instrument is tested and certified as intrinsically safe type or explosionproof type. Please note that the construction of the instrument, installation, external wiring, maintenance or repair is strictly restricted, and non-observance or negligence of this restriction would result in dangerous condition.

WARNING

To preserve the safety of explosionproof equipment requires great care during mounting, wiring, and piping. Safety requirements also place restrictions on maintenance and repair activities. Please read the following sections very carefully.

2.4.1 FM Approval

a. FM Intrinsically Safe Type

- Caution for FM intrinsically safe type. (Following contents refer "DOC. No. IFM012-A12 P.1 and 2.")
- Note 1. Model EJA Series pressure transmitters with optional code /FS1 are applicable for use in hazardous locations.
- Applicable Standard: FM3600, FM3610, FM3611, FM3810, ANSI/NEMA250

- 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.
- Outdoor hazardous locations, NEMA 4X.
- Temperature Class: T4
- Ambient temperature: -40 to 60°C

Note 2. Entity Parameters

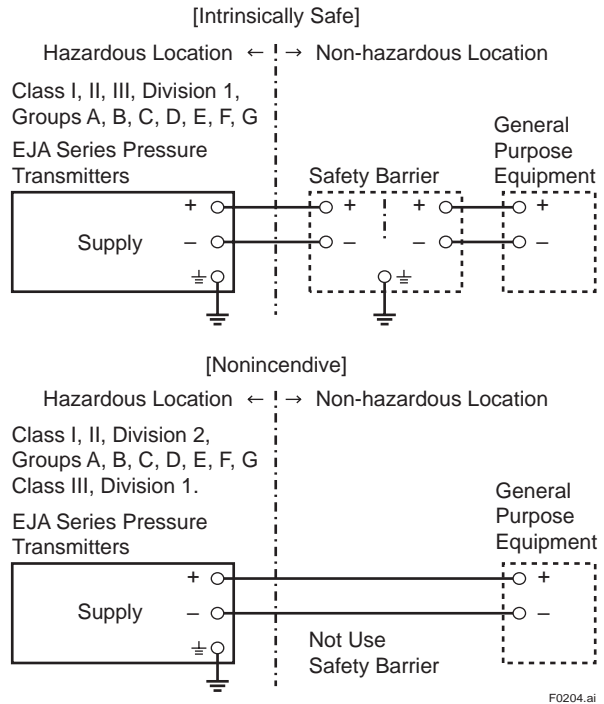
- Intrinsically Safe Apparatus Parameters [Groups A, B, C, D, E, F and G]
 $V_{max} = 30\text{ V}$, $C_i = 22.5\text{ nF}$, $I_{max} = 165\text{ mA}$,
 $L_i = 730\text{ }\mu\text{H}$, $P_{max} = 0.9\text{ W}$
- * Associated Apparatus Parameters (FM approved barriers)
 $V_{oc} = 30\text{ V}$, $C_a > 22.5\text{ nF}$, $I_{sc} = 165\text{ mA}$, $L_a > 730\text{ }\mu\text{H}$,
 $P_{max} = 0.9\text{ W}$
- Intrinsically Safe Apparatus Parameters [Groups C, D, E, F and G]
 $V_{max} = 30\text{ V}$, $C_i = 22.5\text{ nF}$, $I_{max} = 225\text{ mA}$,
 $L_i = 730\text{ }\mu\text{H}$, $P_{max} = 0.9\text{ W}$
- * Associated Apparatus Parameters (FM approved barriers)
 $V_{oc} = 30\text{ V}$, $C_a > 22.5\text{ nF}$, $I_{sc} = 225\text{ mA}$,
 $L_a > 730\text{ }\mu\text{H}$, $P_{max} = 0.9\text{ W}$
- Entity Installation Requirements
 $V_{max} = V_{oc}$ or V_t , $I_{max} = I_{sc}$ or I_t ,
 P_{max} (IS Apparatus) P_{max} (Barrier),
 $C_a = C_i + C_{cable}$, $L_a = L_i + L_{cable}$

Note 3. Installation

- Barrier must be installed in an enclosure that meets the requirements of ANSI/ISA S82.01.
- Control equipment connected to barrier must not use or generate more than 250 V rms or V dc.
- Installation should be in accordance with ANSI/ISA RP12.6 "Installation of Intrinsically Safe Systems for Hazardous (Classified) Locations" and the National Electric Code (ANSI/NFPA 70).
- The configuration of associated apparatus must be FMRC Approved.
- Dust-tight conduit seal must be used when installed in a Class II, III, Group E, F and G environments.
- Associated apparatus manufacturer's installation drawing must be followed when installing this apparatus.
- The maximum power delivered from the barrier must not exceed 0.9 W.
- Note a warning label worded "SUBSTITUTION OF COMPONENTS MAY IMPAIR INTRINSIC SAFETY," and "INSTALL IN ACCORDANCE WITH DOC. No. IFM012-A12 P.1 and 2."

Note 4. Maintenance and Repair

- The instrument modification or parts replacement by other than authorized representative of Yokogawa Electric Corporation is prohibited and will void Factory Mutual Intrinsically safe and Nonincendive Approval.



b. FM Explosionproof Type

Caution for FM explosionproof type.

Note 1. Model EJA Series differential, gauge, and absolute pressure transmitters with optional code /FF1 are applicable for use in hazardous locations.

- Applicable Standard: FM3600, FM3615, FM3810, ANSI/NEMA250
- Explosionproof for Class I, Division 1, Groups B, C and D.
- Dust-ignitionproof for Class II/III, Division 1, Groups E, F and G.
- Outdoor hazardous locations, NEMA 4X.
- Temperature Class: T6
- Ambient Temperature: -40 to 60°C
- Supply Voltage: 42 V dc max.
- Output signal: 4 to 20 mA

Note 2. Wiring

- All wiring shall comply with National Electrical Code ANSI/NEPA70 and Local Electrical Codes.
- When installed in Division 1, "FACTORY SEALED, CONDUIT SEAL NOT REQUIRED."

Note 3. Operation

- Keep the "CAUTION" nameplate attached to the transmitter.
CAUTION: OPEN CIRCUIT BEFORE REMOVING COVER. FACTORY SEALED, CONDUIT SEAL NOT REQUIRED. INSTALL IN ACCORDANCE WITH THE INSTRUCTION MANUAL IM 1C22.
- Take care not to generate mechanical sparking when accessing to the instrument and peripheral devices in a hazardous location.

Note 4. Maintenance and Repair

- The instrument modification or parts replacement by other than authorized representative of Yokogawa Electric Corporation is prohibited and will void Factory Mutual Explosionproof Approval.

c. FM Intrinsically Safe Type/FM Explosionproof Type

Model EJA Series pressure transmitters with optional code /FU1 can be selected the type of protection (FM Intrinsically Safe or FM Explosionproof) for use in hazardous locations.

Note 1. For the installation of this transmitter, once a particular type of protection is selected, any other type of protection cannot be used. The installation must be in accordance with the description about the type of protection in this instruction manual.

Note 2. In order to avoid confusion, unnecessary marking is crossed out on the label other than the selected type of protection when the transmitter is installed.

2.4.2 CSA Certification

a. CSA Intrinsically Safe Type

Caution for CSA Intrinsically safe type. (Following contents refer to "DOC No. ICS003-A12 P.1-1 and P.1-2.")

Note 1. Model EJA Series differential, gauge, and absolute pressure transmitters with optional code /CS1 are applicable for use in hazardous locations

Certificate: 1053843

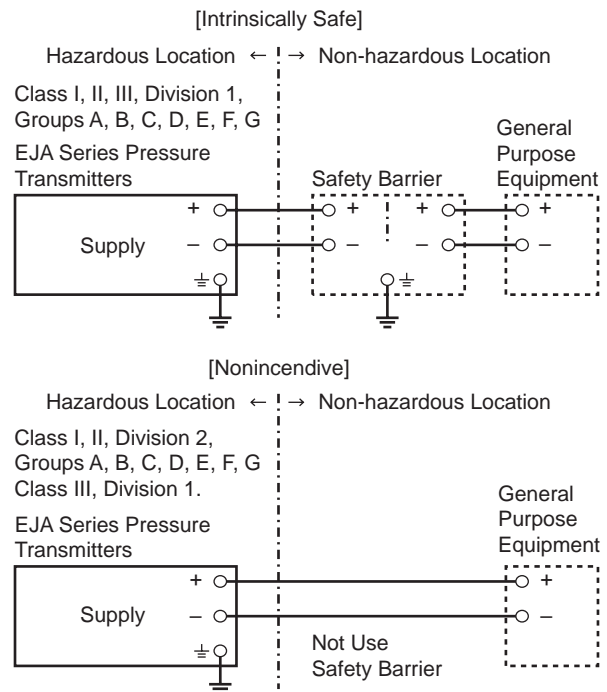
- Applicable Standard: C22.2 No.0, No.0.4, No.25, No.30, No.94, No.142, No.157, No.213
- Intrinsically Safe for Class I, Division 1, Groups A, B, C & D. Class II, Division 1, Groups E, F & G and Class III, Division 1 Hazardous Locations.
- Nonincendive for Class I, Division 2, Groups A, B, C & D, Class II, Division 2, Groups F & G, and Class III, Hazardous Locations. (not use Safety Barrier)
- Encl. "Type 4X"
- Temperature Class: T4
- Ambient temperature: -40 to 60°C
- Process Temperature: 120°C max.

Note 2 Entity Parameters

- Intrinsically safe ratings are as follows:
Maximum Input Voltage (Vmax) = 30 V
Maximum Input Current (Imax) = 165 mA
Maximum Input Power (Pmax) = 0.9 W
Maximum Internal Capacitance (Ci) = 22.5 nF
Maximum Internal Inductance (Li) = 730 µH
- * Associated apparatus (CSA certified barriers)
Maximum output voltage (Voc) 30 V
Maximum output current (Isc) 165 mA
Maximum output power (Pmax) 0.9 W

Note 3. Installation

- All wiring shall comply with Canadian Electrical Code Part I and Local Electrical Codes.
- The instrument modification or parts replacement by other than authorized representative of Yokogawa Electric Corporation and Yokogawa Corporation of America is prohibited and will void Canadian Standards Intrinsically safe and nonincendive Certification.



b. CSA Explosionproof Type

Caution for CSA explosionproof type.

Note 1. Model EJA Series differential, gauge, and absolute pressure transmitters with optional code /CF1 are applicable for use in hazardous locations:

Certificate: 1089598

- Applicable Standard: C22.2 No.0, No.0.4, No.25, No.30, No.94, No.142
- Explosionproof for Class I, Division 1, Groups B, C and D.
- Dust-ignitionproof for Class II/III, Division 1, Groups E, F and G.
- Encl "Type 4X"

- Temperature Class: T6, T5, and T4
- Process Temperature: 85°C (T6), 100°C (T5), and 120°C (T4)
- Ambient Temperature: -40 to 80°C
- Supply Voltage: 42 V dc max.
- Output Signal: 4 to 20 mA

Note 2. Wiring

- All wiring shall comply with Canadian Electrical Code Part I and Local Electrical Codes.
- In hazardous location, wiring shall be in conduit as shown in the figure.

CAUTION: SEAL ALL CONDUITS WITHIN 50 cm OF THE ENCLOSURE.

UN SCÉLLEMENT DOIT ÊTRE INSTALLÉ À MOINS DE 50 cm DU BÂTIER.

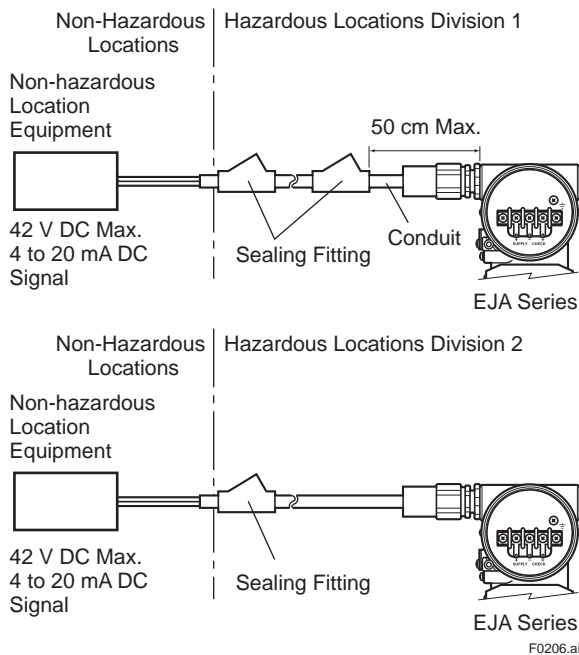
- When installed in Division 2, "SEALS NOT REQUIRED."

Note 3. Operation

- Keep the "CAUTION" label attached to the transmitter.
CAUTION: OPEN CIRCUIT BEFORE REMOVING COVER.
OUVRIR LE CIRCUIT AVANT D'NLEVER LE COUVERCLE.
- Take care not to generate mechanical sparking when accessing to the instrument and peripheral devices in a hazardous location.

Note 4. Maintenance and Repair

- The instrument modification or parts replacement by other than authorized representative of Yokogawa Electric Corporation and Yokogawa Corporation of America is prohibited and will void Canadian Standards Explosionproof Certification.



c. CSA Intrinsically Safe Type/CSA Explosionproof Type

Model EJA Series pressure transmitters with optional code /CU1 can be selected the type of protection (CSA Intrinsically Safe or CSA Explosionproof) for use in hazardous locations.

Note 1. For the installation of this transmitter, once a particular type of protection is selected, any other type of protection cannot be used. The installation must be in accordance with the description about the type of protection in this instruction manual.

Note 2. In order to avoid confusion, unnecessary marking is crossed out on the label other than the selected type of protection when the transmitter is installed.

2.4.3 IECEx Certification

Model EJA Series differential, gauge, and absolute pressure transmitters with optional code /SU2 can be selected the type of protection (IECEx Intrinsically Safe/type n or flameproof) for use in hazardous locations.

Note 1. For the installation of this transmitter, once a particular type of protection is selected, any other type of protection cannot be used. The installation must be in accordance with the description about the type of protection in this instruction manual.

Note 2. In order to avoid confusion, unnecessary marking is crossed out on the label other than the selected type of protection when the transmitter is installed.

a. IECEx Intrinsically Safe Type / type n

Caution for IECEx Intrinsically safe and type n.

Note 1. Model EJA Series differential, gauge, and absolute pressure transmitters with optional code /SU2 are applicable for use in hazardous locations.

- No. IECEx KEM 06.0007X
- Applicable Standard: IEC 60079-0:2004, IEC 60079-11:1999, IEC 60079-15:2005, IEC 60079-26:2004
- Type of Protection and Marking Code: Ex ia IIC T4, Ex nL IIC T4
- Ambient Temperature : -40 to 60°C
- Max. Process Temp.: 120°C
- Enclosure: IP67

Note 2. Entity Parameters

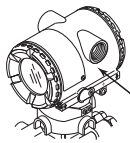
- Intrinsically safe ratings are as follows:
Maximum Input Voltage (Ui) = 30 V
Maximum Input Current (Ii) = 165 mA
Maximum Input Power (Pi) = 0.9 W
Maximum Internal Capacitance (Ci) = 22.5 nF
Maximum Internal Inductance (Li) = 730 µH

- Type "n" ratings are as follows:
 - Maximum Input Voltage (U_i) = 30 V
 - Maximum Internal Capacitance (C_i) = 22.5 nF
 - Maximum Internal Inductance (L_i) = 730 μH
- Installation Requirements
 - U_o U_i, I_o I_i, P_o P_i, C_o C_i + C_{cable},
 - L_o L_i + L_{cable}, U_o, I_o, P_o, C_o, and
 - L_o are parameters of barrier.

Note 3. Installation

- In any safety barrier used output current must be limited by a resistor 'R' such that I_o=U_o/R.
- The safety barrier must be IECEx certified.
- Input voltage of the safety barrier must be less than 250 V_{rms}/V_{dc}.
- The instrument modification or parts replacement by other than authorized representative of Yokogawa Electric Corporation and will void IECEx Intrinsic safe and type n certification.
- The cable entry devices and blanking elements for type n shall be of a certified type providing a level of ingress protection of at least IP54, suitable for the conditions of use and correctly installed.
- Electrical Connection:
The type of electrical connection is stamped near the electrical connection port according to the following marking.

Screw Size	Marking
ISO M20 x 1.5 female	△ M
ANSI 1/2 NPT female	△ A



Location of the marking

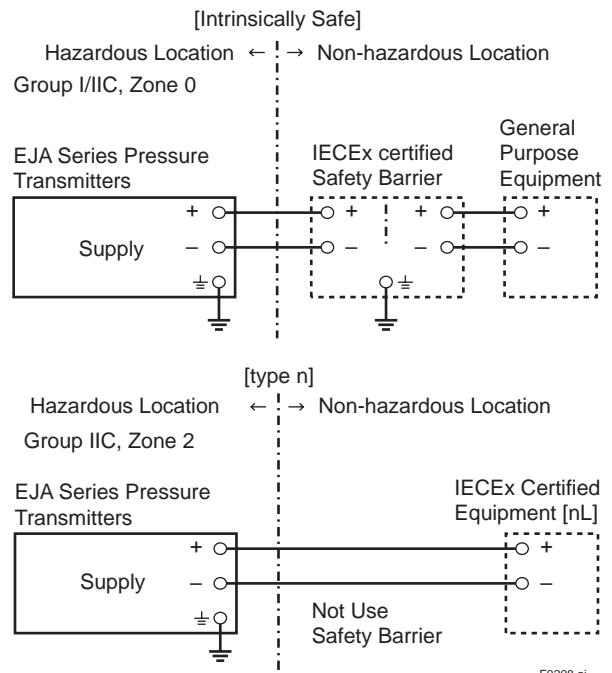
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Note 4. Operation

- WARNING:
WHEN AMBIENT TEMPERATURE 55°C,
USE THE HEAT-RESISTING CABLES 90°C.

Note 5. Special Conditions for Safe Use

- WARNING:
IN THE CASE WHERE THE ENCLOSURE OF THE PRESSURE TRANSMITTER IS MADE OF ALUMINUM, IF IT IS MOUNTED IN AN AREA WHERE THE USE OF ZONE 0 IS REQUIRED, IT MUST BE INSTALLED SUCH, THAT, EVEN IN THE EVENT OF RARE INCIDENTS, IGNITION SOURCES DUE TO IMPACT AND FRICTION SPARKS ARE EXCLUDED.



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b. IECEx Flameproof Type

Caution for IECEx flameproof type.

Note 1. Model EJA Series differential, gauge, and absolute pressure transmitters with optional code /SU2 are applicable for use in hazardous locations:

- No. IECEx KEM 06.0005
- Applicable Standard: IEC60079-0:2004, IEC60079-1:2003
- Type of Protection and Marking Code: Ex d IIC T6...T4
- Enclosure: IP67
- Maximum Process Temperature: 120°C (T4), 100°C (T5), 85°C (T6)
- Ambient Temperature: -40 to 75°C (T4), -40 to 80°C (T5), -40 to 75°C (T6)
- Supply Voltage: 42 V dc max.
- Output Signal: 4 to 20 mA dc

Note 2. Wiring

- In hazardous locations, the cable entry devices shall be of a certified flameproof type, suitable for the conditions of use and correctly installed.
- Unused apertures shall be closed with suitable flameproof certified blanking elements. (The plug attached is certificated as the flame proof IP67 as a part of this apparatus.)
- In case of ANSI 1/2 NPT plug, ANSI hexagonal wrench should be applied to screw in.

Note 3. Operation

- WARNING:
AFTER DE-ENERGIZING, DELAY 10 MINUTES BEFORE OPENING.
- WARNING:
WHEN AMBIENT TEMPERATURE 70°C,
USE THE HEAT-RESISTING CABLES 90°C.
- Take care not to generate mechanical sparking when accessing to the instrument and peripheral devices in a hazardous location.

Note 4. Maintenance and Repair

- The instrument modification or parts replacement by other than authorized representative of Yokogawa Electric Corporation is prohibited and will void IECEx Certification.

2.4.4 CENELEC ATEX (KEMA) Certification

(1) Technical Data

a. CENELEC ATEX (KEMA) Intrinsically Safe Type

Caution for CENELEC ATEX (KEMA) Intrinsically safe type.

Note 1. Model EJA Series differential, gauge, and absolute pressure transmitters with optional code /KS2 for potentially explosive atmospheres:

- No. KEMA 02ATEX1030 X
- Applicable Standard: EN50014:1997, EN50020:1994, EN50284:1999
- Type of Protection and Marking code: EEx ia IIC T4
- Temperature Class: T4
- Enclosure: IP67
- Process Temperature: 120°C max.
- Ambient Temperature: -40 to 60°C

Note 2. Electrical Data

- In type of explosion protection intrinsic safety EEx ia IIC only for connection to a certified intrinsically safe circuit with following maximum values:

$U_i = 30\text{ V}$
 $I_i = 165\text{ mA}$
 $P_i = 0.9\text{ W}$
 Effective internal capacitance; $C_i = 22.5\text{ nF}$
 Effective internal inductance; $L_i = 730\text{ }\mu\text{H}$

Note 3. Installation

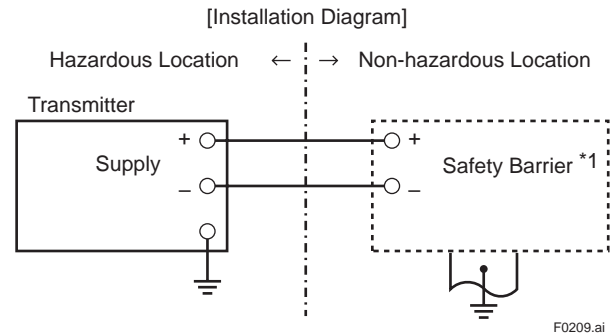
- All wiring shall comply with local installation requirements. (Refer to the installation diagram)

Note 4. Maintenance and Repair

- The instrument modification or parts replacement by other than authorized representative of Yokogawa Electric Corporation is prohibited and will void KEMA Intrinsically safe Certification.

Note 5. Special Conditions for Safe Use

- In the case where the enclosure of the Pressure Transmitter is made of aluminium, if it is mounted in an area where the use of category 1 G apparatus is required, it must be installed such, that, even in the event of rare incidents, ignition sources due to impact and friction sparks are excluded.



*1: In any safety barriers used the output current must be limited by a resistor "R" such that $I_{maxout} < U_z/R$.

b. CENELEC ATEX (KEMA) Flameproof Type

Caution for CENELEC ATEX (KEMA) flameproof type.

Note 1. Model EJA Series differential, gauge, and absolute pressure transmitters with optional code /KF2 for potentially explosive atmospheres:

- No. KEMA 02ATEX2148
- Applicable Standard: EN50014:1997, EN50018:2000
- Type of Protection and Marking Code: EEx d IIC T6...T4
- Temperature Class: T6, T5, and T4
- Enclosure: IP67
- Maximum Process Temperature: 85°C (T6), 100°C (T5), and 120°C (T4)
- Ambient Temperature: T4 and T6; -40 to 75°C, T5; -40 to 80°C

Note 2. Electrical Data

- Supply voltage: 42 V dc max.
- Output signal: 4 to 20 mA

Note 3. Installation

- All wiring shall comply with local installation requirement.
- The cable entry devices shall be of a certified flameproof type, suitable for the conditions of use.

Note 4. Operation

- Keep the "CAUTION" label to the transmitter.
CAUTION: AFTER DE-ENERGIZING, DELAY 10 MINUTES BEFORE OPENING.
WHEN THE AMBIENT TEMP.70°C, USE HEAT-RESISTING CABLES90°C.
- Take care not to generate mechanical sparking when accessing to the instrument and peripheral devices in a hazardous location.

Note 5. Maintenance and Repair

- The instrument modification or parts replacement by other than authorized representative of Yokogawa Electric Corporation is prohibited and will void KEMA Flameproof Certification.

c. CENELEC ATEX (KEMA) Intrinsically Safe Type/CENELEC ATEX (KEMA) Flameproof Type/CENELEC ATEX Type n

Model EJA-A Series pressure transmitters with optional code /KU2 can be selected the type of protection CENELEC ATEX (KEMA) Intrinsically Safe, Flameproof or CENELEC ATEX Type n for use in hazardous locations.

Note 1. For the installation of this transmitter, once a particular type of protection is selected, any other type of protection cannot be used. The installation must be in accordance with the description about the type of protection in this user's manual.

Note 2. In order to avoid confusion, unnecessary marking is crossed out on the label other than the selected type of protection when the transmitter is installed.

● **CENELEC ATEX Type of Protection “n”**



When using a power supply not having a nonincendive circuit, please pay attention not to ignite in the surrounding flammable atmosphere. In such a case, we recommend using wiring metal conduit in order to prevent the ignition.

- Applicable Standard: EN60079-15
- Referential Standard: IEC60079-0, IEC60079-11
- Type of Protection and Marking Code: Ex nL IIC T4
- Temperature Class: T4
- Enclosure: IP67
- Process Temperature: 120°C max.
- Ambient Temperature: -40 to 60°C

Note 1. Electrical Data

U_i = 30 V
 Effective internal capacitance; C_i = 22.5 nF
 Effective internal inductance; L_i = 730 μH

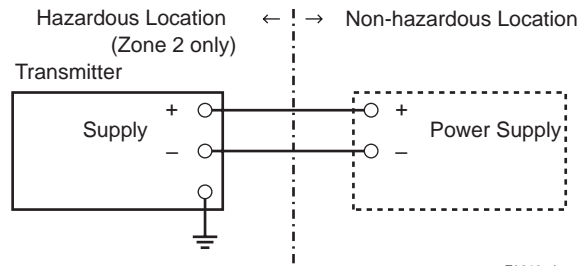
Note 2. Installation

- All wiring shall comply with local installation requirements. (refer to the installation diagram)

Note 3. Maintenance and Repair

- The instrument modification or parts replacement by other than authorized representative of Yokogawa Electric Corporation is prohibited and will void Type of Protection “n”.

[Installation Diagram]



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Ratings of the Power Supply as follows; Maximum Voltage: 30 V

● **CENELEC ATEX Type of Protection “Dust”**

- Applicable Standard: EN50281-1-1:1997
- Type of Protection and Marking Code: II 1D
- Maximum Surface Temperature: T65°C (Tamb.: 40°C), T85°C (Tamb.: 60°C), and T105°C (Tamb.: 80°C)

Note 1. Installation instructions

The cable entry devices and blanking elements shall be of a certificated type providing a level of ingress protection of at least IP6x, suitable for the conditions of use and correctly installed.

(2) Electrical Connection

The type of electrical connection is stamped near the electrical connection port according to the following marking.

Screw Size	Marking
ISO M20 × 1.5 female	⚠ M
ANSI 1/2 NPT female	⚠ A



Location of the marking

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(3) Installation



- All wiring shall comply with local installation requirement and local electrical code.
- There is no need of the conduit seal for both of Division 1 and Division 2 hazardous locations because this product is sealed at factory.
- In case of ANSI 1/2 NPT plug, ANSI hexagonal wrench should be applied to screw in.

(4) Operation



WARNING

- OPEN CIRCUIT BEFORE REMOVING COVER. INSTALL IN ACCORDANCE WITH THIS USER'S MANUAL
- Take care not to generate mechanical sparking when access to the instrument and peripheral devices in hazardous locations.

(5) Maintenance and Repair

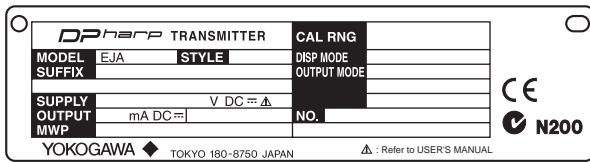


WARNING

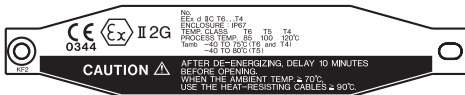
The instrument modification or parts replacement by other than authorized Representative of Yokogawa Electric Corporation is prohibited and will void the certification.

(6) Name Plate

- Name plate



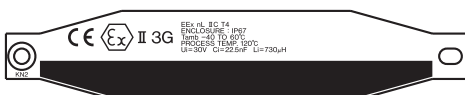
- Tag plate for flameproof type



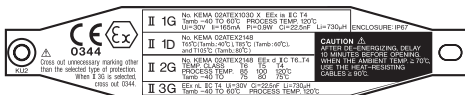
- Tag plate for intrinsically safe type



- Tag plate for type n protection



- Tag plate for flameproof, intrinsically safe type, type n protection, and Dust



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MODEL: Specified model code.
 STYLE: Style code.
 SUFFIX: Specified suffix code.
 SUPPLY: Supply voltage.
 OUTPUT: Output signal.

MWP: Maximum working pressure.
 CAL RNG: Specified calibration range.
 DISP MODE: Specified display mode.
 OUTPUT MODE: Specified output mode.
 NO.: Serial number and year of production*1.
YOKOGAWA ◆ TOKYO 180-8750 JAPAN:
 The manufacturer name and the address*2.

*1: The third figure from the last shows the last one figure of the year of production. For example, the production year of the product engraved in "NO." column on the name plate as follows is 2001.

12A819857 132
 ↑
 The year 2001

*2: "180-8750" is a zip code which represents the following address.

2-9-32 Nakacho, Musashino-shi, Tokyo Japan

2.5 EMC Conformity Standards

EN61326-1 Class A, Table 2 (For use in industrial locations)

EN61326-2-3



CAUTION

This instrument is a Class A product, and it is designed for use in the industrial environment. Please use this instrument in the industrial environment only.



NOTE

YOKOGAWA recommends customer to apply the Metal Conduit Wiring or to use the twisted pair Shield Cable for signal wiring to conform the requirement of EMC Regulation, when customer installs the EJA Series Transmitters to the plant.

2.6 PED (Pressure Equipment Directive)

(1) General

- EJA series of pressure transmitters are categorized as pressure accessories under the vessel section of this directive 97/23/EC, which corresponds to Article 3, Paragraph 3 of PED, denoted as Sound Engineering Practice (SEP).
- EJA130A, EJA440A, EJA510A, and EJA530A can be used above 200 bar and therefore considered as a part of a pressure retaining vessel where category III, Module H applies. These models with option code /PE3 conform to that category.

(2) Technical Data

- Models without /PE3
Article 3, Paragraph 3 of PED, denoted as Sound Engineering Practice (SEP) .
- Models with /PE3
Module: H
Type of Equipment: Pressure Accessory - Vessel
Type of Fluid: Liquid and Gas
Group of Fluid: 1 and 2

Model	PS*1 (bar)	V(L)	PS-V (bar-L)	Category*2
EJA110A	160	0.01	1.6	Article 3, paragraph 3 (SEP)
EJA120A	0.5	0.01	0.005	Article 3, paragraph 3 (SEP)
EJA130A	420	0.01	4.2	Article 3, paragraph 3 (SEP)
EJA130A With code /PE3	420	0.01	4.2	III
EJA310A	160	0.01	1.6	Article 3, paragraph 3 (SEP)
EJA430A	160	0.01	1.6	Article 3, paragraph 3 (SEP)
EJA440A	500	0.01	50	Article 3, paragraph 3 (SEP)
EJA440A With code /PE3	500	0.01	50	III
EJA510A	500	0.01	50	Article 3, paragraph 3 (SEP)
EJA510A With code /PE3	500	0.01	50	III
EJA530A	500	0.01	50	Article 3, paragraph 3 (SEP)
EJA530A With code /PE3	500	0.01	50	III

*1: PS is maximum allowable pressure for vessel itself.
*2: Referred to Table 1 covered by ANNEX II of EC Directive on Pressure Equipment Directive 97/23/EC.

(3) Operation



- The temperature and pressure of fluid should be applied under the normal operating condition.
- The ambient temperature should be applied under the normal operating condition.
- Please pay attention to prevent the excessive pressure like water hammer, etc. When water hammer is to be occurred, please take measures to prevent the pressure from exceeding PS by setting the safety valve, etc. at the system and the like.
- When external fire is to be occurred, please take safety measures at the device or system not to influence the transmitters.

2.7 Low Voltage Directive

Applicable standard : EN61010-1

(1) Pollution Degree 2

"Pollution degree" describes the degree to which a solid, liquid, or gas which deteriorates dielectric strength or surface resistivity is adhering. " 2 " applies to normal indoor atmosphere. Normally, only non-conductive pollution occurs. Occasionally, however, temporary conductivity caused by condensation must be expected.

(2) Installation Category I

"Overvoltage category(Installation category)" describes a number which defines a transient overvoltage condition. It implies the regulation for impulse withstand voltage. " I " applies to electrical equipment which is supplied from the circuit when appropriate transient overvoltage control means (interfaces) are provided.

3.2.1 EJA210A and EJA220A

The transmitter is mounted on a process using its high pressure side flange as shown in Figure 3.5. The customer should prepare the mating flange, gasket, stud bolts and nuts.

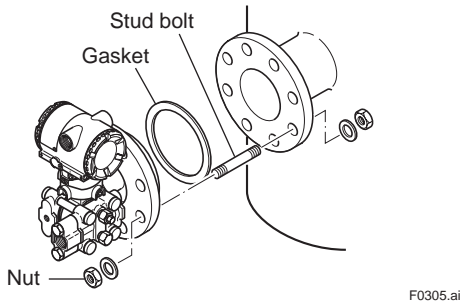


Figure 3.5 EJA210A and EJA220A Mounting

3.2.2 EJA118Y and EJA438Y

Mount the diaphragm seals using the flanges as shown in Figure 3.6. The customer should prepare the mating flange, gasket, bolts and nuts.

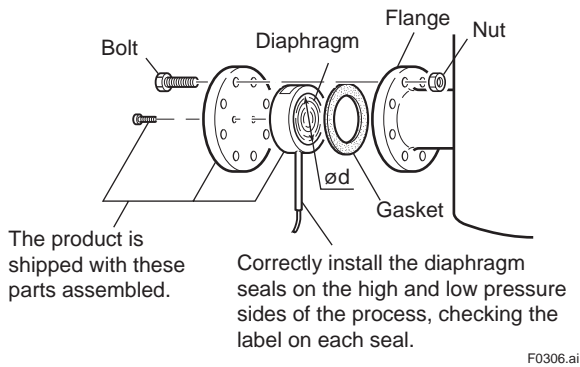


Figure 3.6 Mounting the Diaphragm Seals

3.3 Diaphragm Seals Installation Consideration



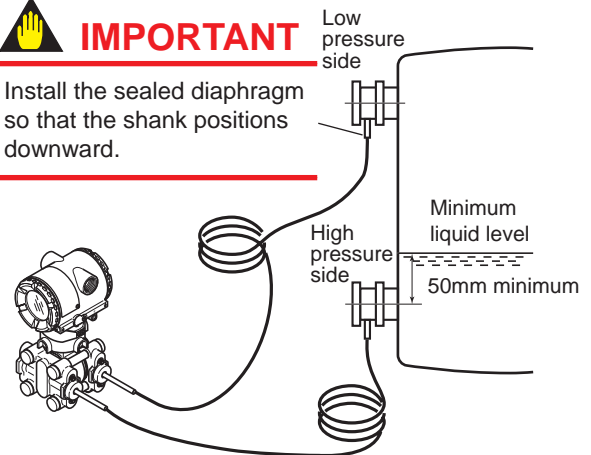
IMPORTANT

- When measuring the liquid level of the tank, the minimum liquid level (zero point) must be set to a level at least 50 mm above the center of the high pressure side diaphragm seal (see Figure 3.2.3).
- Correctly install the diaphragm seals on the high and low pressure sides of the process, checking the label on each seal.
- To avoid measuring error duets temperature difference between the two diaphragm seals, capillary tube must be bound together. The capillary tube must be securely fixed to the tank wall to prevent movement by wind or vibration. If the capillary tube is too long, loosely coil the excess and secure using suitable clamps.



IMPORTANT

Install the sealed diaphragm so that the shank positions downward.



The transmitter should be installed as low as possible below the position where the high pressure side diaphragm seal is installed.

Figure 3.7 Installing the Diaphragm Seals to a Tank

