



TECHNICAL GUIDANCE

FCX-AIII Series

FKE...5

LEVEL TRANSMITTER

OUTLINE

The FCX-AIII level transmitter accurately measures liquid level and transmits a proportional 4 to 20mA signal. The transmitter utilizes a unique micromachined capacitance silicon sensor with state-of-the-art microprocessor technology to provide exceptional performance and functionality.

FEATURES

- High accuracy**
0.2% accuracy for all calibrated spans is a standard feature for all models covering 0.32kPa {3.2mbar} range to 500kPa {5bar} high differential pressure range. 0.1% accuracy is available as option.
- Minimum environmental influence**
The "Advanced Floating Cell" design which protects the pressure sensor against changes in temperature, static pressure, and overpressure substantially reduces total measurement error in actual field applications.
- HART® bilingual communications protocol**
FCX-AIII series transmitter offers bilingual communications to speak both proprietary protocol and HART®. Any HART® compatible devices can communicate with FCX-AIII.
- Application flexibility**
Various options that render the FCX-AIII suitable for almost any process applications include:
 - Full range of hazardous area approvals
 - Built-in RFI filter and lightning arrester
 - 5-digit LCD meter with engineering unit
 - Stainless steel electronics housing
 - Wide selection of materials
 - High temperature, high vacuum service.
- Programmable output Linearization Function**
Output signal can be freely programmable. (Up to 14 compensated points at approximation.)
- Burnout current flexibility (Under Scale: 3.2 to 4.0mA, Over Scale: 20.0 to 22.5mA)**
Burnout signal level is adjustable using Model FXW Hand Held Communicator (HHC) to comply with NAMUR NE43.
- Dry calibration without reference pressure**
Thanks to the best combination of unique construction of mechanical parts (Sensor unit) and high performance electronics circuit (Electronics unit), reliability of dry calibration without reference pressure is at equal level as wet calibration.



SPECIFICATIONS

Functional specifications

Service: Liquid, gas, or vapor
Static pressure, span, and range limit:

| Type | Static pressure | Span limit [kPa] {m bar} | | Range limit [kPa] {m bar} |
|--------|---------------------|--------------------------|--------|---------------------------|
| | | Min. | Max. | |
| FKE□□3 | Up to flange rating | 0.32 (3.2) | 32 | +/- 32 |
| FKE□□5 | | {3.2(3.2)} | {320} | { +/- 320} |
| FKE□□6 | | 1.3 (13) | 130 | +/- 130 |
| | | {13(130)} | {1300} | { +/- 1300} |
| | | 5 (50) | 500 | +/- 500 |
| | | {50(500)} | {5000} | { +/- 5000} |

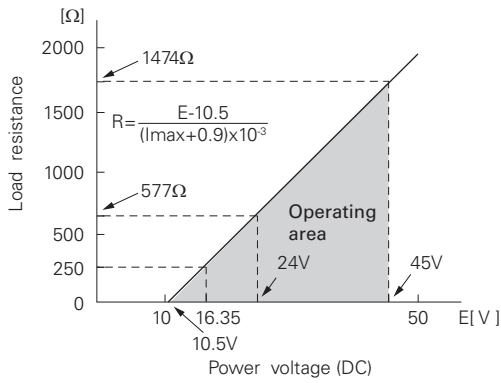
Remark: To minimize environmental influence, span should be greater than 1/40 of the max. span in most applications.

Note: Minimum span for flange whose diameter is 50A/2B/2 inch or smaller are shown in parentheses.

- Lower limit of static pressure (vacuum limit) ;
Silicone fill sensor: See Fig.1
Fluorinated fill sensor: 66kPa abs (500mmHg abs) at temperature below 60 °C.
- The maximum span of each sensor can be converted to different units using factors as below.
1MPa=10³kPa=10bar=10.19716kgf/cm²=145.0377psi
1kPa=10mbar=101.9716mmH₂O=4.01463inH₂O

Overrange limit: To maximum static pressure limit
Output signal: 4 to 20mA DC with digital signal superimposed on the 4 to 20mA signal
Power supply: Transmitter operates on 10.5V to 45V DC at transmitter terminals.
10.5V to 32V DC for the units with optional arrester.

Load limitations: see figure below



Note: For communication with HHC⁽¹⁾ (Model: FXW), min. of 250Ω required.

Hazardous locations: See TABLE 2

Zero/span adjustment:

Zero and span are adjustable from the HHC⁽¹⁾. Zero and span are also adjustable externally from the adjustment screw.

Damping:

Adjustable from HHC or local configurator unit with LCD display. The time constant is adjustable between 0.06 to 32 seconds.

Zero elevation/suppression:

-100% to + 100% of URL

Normal/reverse action:

Selectable from HHC⁽¹⁾

Indication:

Analog indicator or 5-digit LCD meter, as specified.

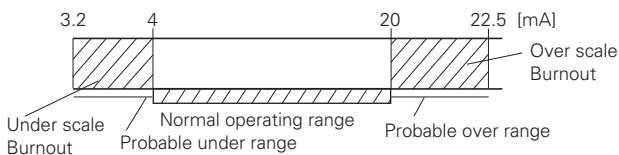
Burnout direction: Selectable from HHC⁽¹⁾

If self-diagnostic detect transmitter failure, the analog signal will be driven to either "Output Hold", "Output Overscale" or "Output Underscale" modes.

"Output Hold": Output signal is hold as the value just before failure happens.

"Output Overscale": Adjustable within the range 20.0mA to 22.5mA from HHC⁽¹⁾

"Output Underscale": Adjustable within the range 3.2mA to 4.0mA from HHC⁽¹⁾



Output Limits conforming the NAMUR NE43 by order.

Loop-check output:

Transmitter can be configured to provide constant signal 3.2mA through 22.5mA by HHC⁽¹⁾.

Temperature limit:

Ambient: -40 to + 85°C

(-20 to + 80°C for LCD indicator)

(-40 to + 60°C for arrester option)

(-10 to + 60°C for fluorinated oil fill transmitter)

For explosionproof units (flameproof or intrinsic safety), ambient temperature must be within the limits specified in each standard.

Process:

| | Code in the 13th digit of "Code symbols" | Process temperature | Lower limit of static press |
|-----------------|--|---------------------|-----------------------------|
| Fluorinated oil | W, A and D | -20 to 120°C | Atmospheric pressure |
| Silicone oil | U | -15 to 250°C | |
| | X | 20 to 300°C | |
| | Y and G | -40 to 120°C | 2.7kPa abs (20.3mmHg abs) |

Low pressure side contact liquid temperature on transmitter of Code H, J is 120°C or lower.

Storage: -40 to + 90°C

Humidity limit: 0 to 100% RH

Communication: With HHC⁽¹⁾ (Model FXW), following items can be remotely displayed or configured.

Note: HHC's version must be higher than 7.0 (or FXW □□□□1-□4), for FCX-AIII.

Local configurator with LCD display (option):

Local configurator with 3 push button and LCD display can support following items.

| Items | By communication with FXW | | By local configurator (with 3 push button) | |
|--|---------------------------|-----|--|-----|
| | Display | Set | Display | Set |
| Tag No. | ✓ | ✓ | ✓ | ✓ |
| Model No. | ✓ | ✓ | ✓ | ✓ |
| Serial No. & Software Version | ✓ | — | ✓ | — |
| Engineering unit | ✓ | ✓ | ✓ | ✓ |
| Range limit | ✓ | — | ✓ | — |
| Measuring range | ✓ | ✓ | ✓ | ✓ |
| Damping | ✓ | ✓ | ✓ | ✓ |
| Output mode | ✓ | — | ✓ | — |
| Burnout direction | ✓ | ✓ | ✓ | ✓ |
| Calibration | ✓ | ✓ | ✓ | ✓ |
| Output adjust | — | ✓ | — | ✓ |
| Data | ✓ | — | ✓ | — |
| Self diagnoses | ✓ | — | ✓ | — |
| Printer (In case of FXW with printer option) | ✓ | — | — | — |
| External switch lock | ✓ | ✓ | ✓ | ✓ |
| Transmitter display | ✓ | ✓ | ✓ | ✓ |
| Linearize | ✓ | ✓ | — | — |
| Rerange | ✓ | ✓ | ✓ | ✓ |
| Saturate current | ✓ | ✓ | ✓ | ✓ |
| Write protect | ✓ | ✓ | ✓ | ✓ |
| History | | | | |
| - Calibration history | ✓ | ✓ | ✓ | ✓ |
| - Ambient temperature history | ✓ | — | ✓ | — |

Programmable output linearization function:

Output signal can be characterized with "14 points linear approximation function" from HHC⁽¹⁾.

(Note) (1) HHC: Hand Held Communicator

Performance specifications

Reference conditions, silicone oil fill, 316SS isolating diaphragms, 4-20 mA analog output in linear mode.

Accuracy rating: (including linearity, hysteresis, and repeatability)

(Standard)

For spans greater than 1/10 of URL: ±0.2% of span

For spans below 1/10 of URL:

$$\pm \left(0.1 + 0.1 \frac{0.1 \times \text{URL}}{\text{Span}} \right) \% \text{ of span}$$

(Option) (Code: 21th digit H, K)

For span greater than 1/10 of URL: 0.1% of span

For span below 1/10 of URL:

$$\pm \left(0.05 + 0.05 \frac{0.1 \times \text{URL}}{\text{Span}} \right) \% \text{ of span}$$

Stability: ±0.2% of upper range limit (URL) for 10 years.

Temperature effect:

Effects per 28°C change between the limits of -40°C and +85°C

(Standard) Zero shift: $\pm \left(0.35 \frac{\text{URL}}{X} \right) \%$

Total effect: $\pm \left(0.5 \frac{\text{URL}}{X} \right) \%$

(Option) (Code: 21th digit J, K)

Zero shift: ±0.3% (X>1/4URL)

$\pm \left(0.1 + 0.2 \frac{0.25 \times \text{URL}}{X} \right) \% (x < 1/4 \text{URL})$

Total effect: ±0.4% (X>1/4URL)

$\pm \left(0.2 + 0.2 \frac{0.25 \times \text{URL}}{X} \right) \% (x < 1/4 \text{URL})$

Static pressure effect:

Zero shift: ±0.2% of URL / 1MPa

Span shift: -0.2% of calibrated span / 1MPa

Overrange effect: Zero shift; ±0.1% of URL for flange rating pressure

Supply voltage effect:

Less than 0.005% of calibrated span per 1V

Update rate: 60 msec

Step response: (without electrical damping)

| Range code | Time constant (at 23°C) | Dead time |
|-------------|-------------------------|-----------|
| "3" | 0.55 s | 0.12 s |
| "5" and "6" | 0.3 s | |

Mounting position effect:

Zero shift, less than 0.3kPa {3m bar} for a 10° tilt in any plane. (No extension)

No effect on span.

This error can be corrected by adjusting zero.

Dielectric strength:

500V AC, 50/60Hz 1 min., between circuit and earth.

Insulation resistance:

More than 100MΩ at 500V DC.

Internal resistance for external field indicator:

12Ω or less

Physical specifications

Electrical connections:

G1/2, 1/2-14 NPT, Pg13.5, or M20 x 1.5 conduit, as specified.

Process connections:

LP side: 1/4-18 NPT or Rc1/4.

HP side: ANSI, DIN, or JIS raised face flange. See OUTLINE DIAGRAM for detailed dimensions.

Refer to "Code symbols"

Process-wetted parts material:

| Material (7th code) | HP side (mounting flange side) | | LP side | |
|---------------------|-----------------------------------|----------------------|----------------------|---------------------|
| | Diaphragm | Flange face | Diaphragm | Wetted sensor body |
| V | 316L stainless steel | 316L stainless steel | 316L stainless steel | 316 stainless steel |
| B | 316L stainless steel + Au coating | 316L stainless steel | 316L stainless steel | 316 stainless steel |
| W | Hastelloy-C | 316L stainless steel | 316L stainless steel | 316 stainless steel |
| C | Hastelloy-C | Hastelloy-C | 316L stainless steel | 316 stainless steel |
| D | Monel | Monel | 316L stainless steel | 316 stainless steel |
| E | Tantalum | Tantalum | 316L stainless steel | 316 stainless steel |
| H | Hastelloy-C | Hastelloy-C | Hastelloy-C | Hastelloy-C |
| M | Monel | Monel | Monel | Monel |
| T | Tantalum | Tantalum | Tantalum | Tantalum |
| P | Titanium | Titanium | 316L stainless steel | 316 stainless steel |
| R | Zirconium | Zirconium | 316L stainless steel | 316 stainless steel |

Process cover: 316 stainless steel

Non-wetted parts material:

Electronics housing:

Low copper die-cast aluminum alloy finished with polyester coating (standard), or 316 stainless steel, as specified.

Bolts and nuts:

Cr-Mo alloy (standard) or 304 stainless steel

Fill fluid:

Silicone oil (standard) or fluorinated oil

Mounting flange:

316L stainless steel

Environmental protection:

IEC IP67 and NEMA 6 / 6P

Flange mounting: See drawings

Mass {weight}: Transmitter approximately 10.2 to 19.2kg without options.

Add; 0.5kg for mounting bracket

4.5kg for stainless steel housing option

1.0kg per 50mm extension of diaphragm

Optional features

- Indicator:** A plug-in analog indicator (2.5% accuracy).
An optional 5-digit LCD meter with engineering unit is also available.
- Local configurator with LCD display:**
An optional 5 digits LCD meter with 3 push buttons can support items as using communication with FXW.
- Arrester:** A built-in arrester protects the electronics from lightning surges.
Lightning surge immunity:
4kV (1.2 × 50μs)
- Oxygen service:** Special cleaning procedures are followed throughout the process to maintain all process wetted parts oil-free.
The fill fluid is fluorinated oil.
- Chlorine service:** Oil-free procedures as above. Includes fluorinated oil for fill.
- Degreasing:** Process-wetted parts are cleaned, but the fill fluid is standard silicone oil. Not for use on oxygen or chlorine measurement.
- Vacuum service:** Special silicone oil and filling procedure are applied. See Fig.1
- Optional tag plate:**
An extra stainless steel tag with customer tag data is wired to the transmitter.

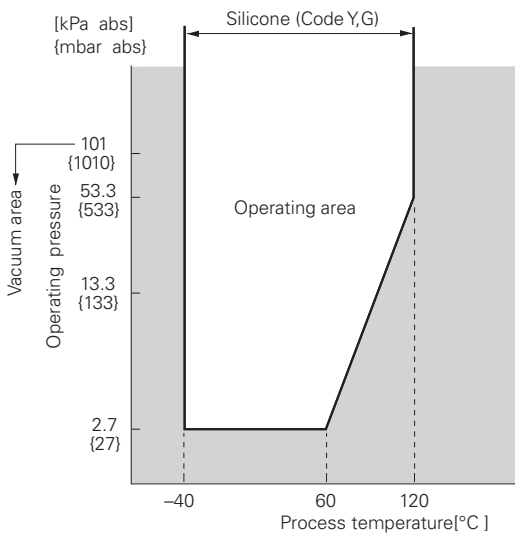


Fig. 1 Relation between process temperature and operating pressure

ACCESSORIES

Oval flanges: Model FFP
Converts process connection to 1/2-14 NPT or to Rc1/2; in carbon steel or in 316 stainless steel.

Hand held communicator:
Model FXW

ORDERING INFORMATION

When ordering this instrument, specify:

1. CODE SYMBOLS
2. Measuring range
3. Output orientation (burnout direction) when abnormality is occurred in the transmitter.
Hold / Overscale / Underscale.
Unless otherwise specified, output hold function is supplied.
4. Indication method (indicated value and unit) in case of the actual scale (code D, H, P, S, 2, 5 on 9th digit).
5. TAG No. (up to 14 alphanumerical characters), if required.

CODE SYMBOLS

| Digit | Description | Note | Digit No. of code | | | | | | | | | | | | | |
|--|---|------------------------|----------------------|------------------|---|---|---|---|---|---|---|----|----|----|----|----|
| | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
| 4 | <Low pressure Connections> | | F | K | E | | | | | | | | | | | |
| | <Process cover> | <AMP case> | | | | | | | | | | | | | | |
| | <Process connection> | <Oval flange screw> | <Conduit connection> | <Case shape> | | | | | | | | | | | | |
| | Rc1/4 | 7/16-20UNF | G1/2 | T shape | | | | | | | | | | | | |
| | 1/4-18NPT | 7/16-20UNF | 1/2-14NPT | T shape | | | | | | | | | | | | |
| | 1/4-18NPT | M10 | Pg 13.5 | T shape | | | | | | | | | | | | |
| | 1/4-18NPT | M10 | M20 | T shape | | | | | | | | | | | | |
| | 1/4-18NPT | 7/16-20UNF | Pg 13.5 | T shape | | | | | | | | | | | | |
| | Rc1/4 | 7/16-20UNF | G1/2 | L shape | | | | | | | | | | | | |
| | 1/4-18NPT | 7/16-20UNF | 1/2-14NPT | L shape | | | | | | | | | | | | |
| | 1/4-18NPT | M10 | Pg 13.5 | L shape | | | | | | | | | | | | |
| | 1/4-18NPT | M10 | M20 | L shape | | | | | | | | | | | | |
| 1/4-18NPT | 7/16-20UNF | Pg 13.5 | L shape | | | | | | | | | | | | | |
| 5 | <Flange size and rating> | <Flange material> | | | | | | | | | | | | | | |
| | JIS 10K 40A | | 316L SS | | | | | | | | | | | | | |
| | JIS 20K 40A | | 316L SS | | | | | | | | | | | | | |
| | JIS 30K 40A | | 316L SS | | | | | | | | | | | | | |
| | JIS 10K 50A | | 316L SS | | | | | | | | | | | | | |
| | JIS 20K 50A | | 316L SS | | | | | | | | | | | | | |
| | JIS 30K 50A | | 316L SS | | | | | | | | | | | | | |
| | JIS 10K 80A | | 316L SS | | | | | | | | | | | | | |
| | JIS 20K 80A | | 316L SS | | | | | | | | | | | | | |
| | JIS 30K 80A | | 316L SS | | | | | | | | | | | | | |
| | JIS 10K 100A | | 316L SS | | | | | | | | | | | | | |
| | JIS 20K 100A | | 316L SS | | | | | | | | | | | | | |
| | JIS 30K 100A | | 316L SS | | | | | | | | | | | | | |
| | ANSI/JPI 150LB 1.5" | | 316L SS | | | | | | | | | | | | | |
| | ANSI/JPI 300LB 1.5" | | 316L SS | | | | | | | | | | | | | |
| | ANSI/JPI 150LB 2" | | 316L SS | | | | | | | | | | | | | |
| | ANSI/JPI 300LB 2" | | 316L SS | | | | | | | | | | | | | |
| | ANSI/JP1 150LB 3B | | 316L SS | | | | | | | | | | | | | |
| ANSI/JP1 300LB 3B | | 316L SS | | | | | | | | | | | | | | |
| ANSI/JP1 150LB 4B | | 316L SS | | | | | | | | | | | | | | |
| ANSI/JP1 300LB 4B | | 316L SS | | | | | | | | | | | | | | |
| DIN PN40 DN80 | | 316L SS | | | | | | | | | | | | | | |
| DIN PN16 DN100 | | 316L SS | | | | | | | | | | | | | | |
| 6 | | Note 1 | | | | | | | | | | | | | | |
| | [0.32 32] (For flange size 50A/2B or smaller: [3.2 32]) | | | | | | | | | | | | | | | |
| | {3.2 320} (For flange size 50A/2B or smaller: {32 320}) | | | | | | | | | | | | | | | |
| | [1.3 130] (For flange size 50A/2B or smaller: [13 130]) | | | | | | | | | | | | | | | |
| | {13 1300} (For flange size 50A/2B or smaller: {130 1300}) | Note 2 | | | | | | | | | | | | | | |
| [5 500] (For flange size 50A/2B or smaller: [50 500]) (*2) | | | | | | | | | | | | | | | | |
| {50 5000} (For flange size 50A/2B or smaller: {500 5000}) (*2) | | | | | | | | | | | | | | | | |
| 7 | <Material> | | | | | | | | | | | | | | | |
| | HP side | | LP side | | | | | | | | | | | | | |
| | Diaphragm | Flange face | Diaphragm | Wetted cell body | | | | | | | | | | | | |
| | 316L SS | 316L SS | 316L SS | 316 SS | | | | | | | | | | | | |
| | 316L SS + Au coating | 316L SS | 316L SS | 316 SS | | | | | | | | | | | | |
| | Hastelloy-C | 316L SS | 316L SS | 316 SS | | | | | | | | | | | | |
| | Hastelloy-C | Hastelloy-C | 316L SS | 316 SS | | | | | | | | | | | | |
| | Monel | Monel | 316L SS | 316 SS | | | | | | | | | | | | |
| | Tatalum | Tatalum | 316L SS | 316 SS | | | | | | | | | | | | |
| | Hastelloy-C | Hastelloy-C | Hastelloy-C | Hastelloy-C | | | | | | | | | | | | |
| Monel | Monel | Monel | Monel | | | | | | | | | | | | | |
| Tatalum | Tatalum | Tatalum | Tatalum | | | | | | | | | | | | | |
| Titanium | Titanium | 316L SS | 316 SS | Note 3 | | | | | | | | | | | | |
| Zirconium | Zirconium | 316L SS | 316 SS | Note 3 | | | | | | | | | | | | |
| 9 | <Indicator> | <Scale> | <Arrester> | | | | | | | | | | | | | |
| | None | --- | None | | | | | | | | | | | | | |
| | Analog | 0 to 100% linear scale | None | | | | | | | | | | | | | |
| | Analog | Custom scale | None | | | | | | | | | | | | | |
| | None | --- | Yes | | | | | | | | | | | | | |
| | Analog | 0 to 100% linear scale | Yes | | | | | | | | | | | | | |
| | Analog | Custom scale | Yes | | | | | | | | | | | | | |
| | Digital | 0 to 100% linear scale | None | | | | | | | | | | | | | |
| | Digital | Custom scale | None | | | | | | | | | | | | | |
| | Digital | 0 to 100% linear scale | Yes | | | | | | | | | | | | | |
| | Digital | Custom scale | Yes | | | | | | | | | | | | | |
| | Digital (Local configurator unit with LCD) | 0 to 100% linear scale | None | | | | | | | | | | | | | |
| Digital (Local configurator unit with LCD) | Custom scale | None | | | | | | | | | | | | | | |
| Digital (Local configurator unit with LCD) | 0 to 100% linear scale | Yes | | | | | | | | | | | | | | |
| Digital (Local configurator unit with LCD) | Custom scale | Yes | | | | | | | | | | | | | | |

Note 1: (*1) 100: 1 turn down is possible, but should be used at a span greater than 1/40 of the maximum span for better performance.

Note 2: (*2) Not available for 7th digit code "R".

Note 3: (*3) 5th digit code "0, 2, 4, 6, 8, T" are available.

| Digit | Description | Note | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | ← Digit No. of code |
|-------|--|---|---|--------|---|---|---|---|---|---|---|----|----|----|----|----|----|---------------------|
| 10 | <Approvals for hazardous location> None (for ordinary location) TIIS Flameproof (Cabel grand seal) (*4) TIIS Intrinsic safety FM Flameproof (or explosionproof) (*5) FM Intrinsic safety FM Combined of flameproof and intrinsic safety (*5) ATEX Flameproof (*6) ATEX Intrinsic safety ATEX Type n ATEX Combined of flameproof and intrinsic safety (*6) IECEX scheme, Flameproof (*6) IECEX scheme, Intrinsic safety CSA Flameproof (or explosionproof) (*5) CSA Intrinsic safety and nonincentive | Note 4 Note 5 Note 5 Note 6 Note 6 Note 6 Note 6 Note 5 | F | K | E | | | | | 5 | - | | | | | | | |
| 11 | <Diaphragm extension [mm]> <Extension [mm]> 0 mm 50 mm 100 mm 150 mm 200 mm <Applicable material code (7th code)> Any "V" only "V" only "V" only "V" only | | | | | | | | | | | | | | | | | |
| 12 | <Option> <Extra SS tag plate> None Yes None Yes <SS electric housing> None None Yes Yes | Note 7 Note 8 Note 8 | | | | | | | | | | | | | | | | |
| 13 | <Treatment> Standard Standard Degreasing Oxygen service Chlorine service High temp. High temp. | <Fill fluid> Silicone oil Fluorinated oil Silicone oil Fluorinated oil (7th code "V" only) Fluorinated oil (7th code "H", "T", "C", and "E") Silicone oil High temp. 250°C Silicone oil High temp. 300°C | | | | | | | | | | | | | | | | |
| 14 | <Vent/drain plug type> Standard Standard A-type long vent A-type long vent | <O-ring/Gasket> PTFE PTFE PTFE PTFE | <Bolt for LP side> (*9) Carbone steel (Cr-Mo alloy hexagon socket head cap bolt / nut) 316 SS bolt / 316 SS nut Carbone steel (Cr-Mo alloy hexagon socket head cap bolt / nut) 316 SS bolt / 316 SS nut | Note 9 | | | | | | | | | | | | | | |
| 15 | <Fixed code> (*10) | Note 10 | | | | | | | | | | | | | | | | * |

- Note 4 : (*4) Available for 4th digit code "S".
- Note 5 : (*5) Available for 4th digit code "6", "T".
- Note 6 : (*6) Available for 4th digit code "6", "8", "T", "W".
- Note 7 : (*7) Customer tag number can be engraved on standard stainless steel name plate. If extra tag plate is required, select "Yes".
- Note 8 : (*8) Not available for 4th digit code "5" to "9", and 10th digit code "C".
- Note 9 : (*9) For use in tropics, select stainless bolts and nuts.
- Note 10 : (*10) In case of hazardous location type, tagplate is made by Fuji Electric Co., Ltd.

OUTLINE DIAGRAM (Unit:mm)

AMP. case: L type

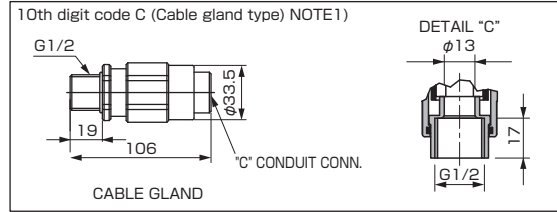
| 4th digit of the code symbols | conduit conn. | | | Press. Conn. | Oval flange screw |
|-------------------------------|---------------|------|-----|--------------|-------------------|
| | J | K | M | | |
| S | G1/2 | 18 | 2 | Rs 1/4 | 7/16-20UNF |
| T | 1/2-14NPT | 16 | 4 | 1/4-18NPT | 7/16-20UNF |
| V | Pg13.5 | 10.5 | 4.5 | 1/4-18NPT | M10 |
| W | M20x1.5 | 16 | 4 | 1/4-18NPT | M10 |
| X | Pg13.5 | 10.5 | 4.5 | 1/4-18NPT | 7/16-20UNF |

TABLE 1

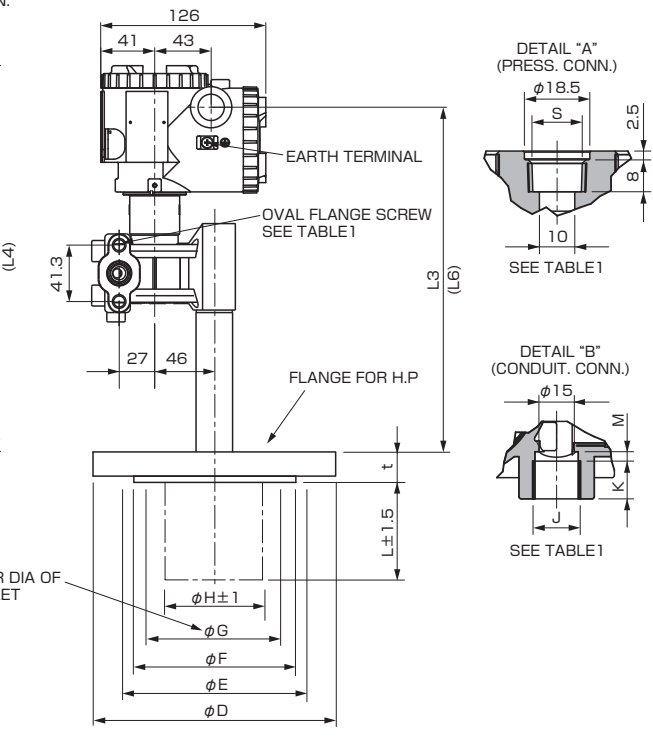
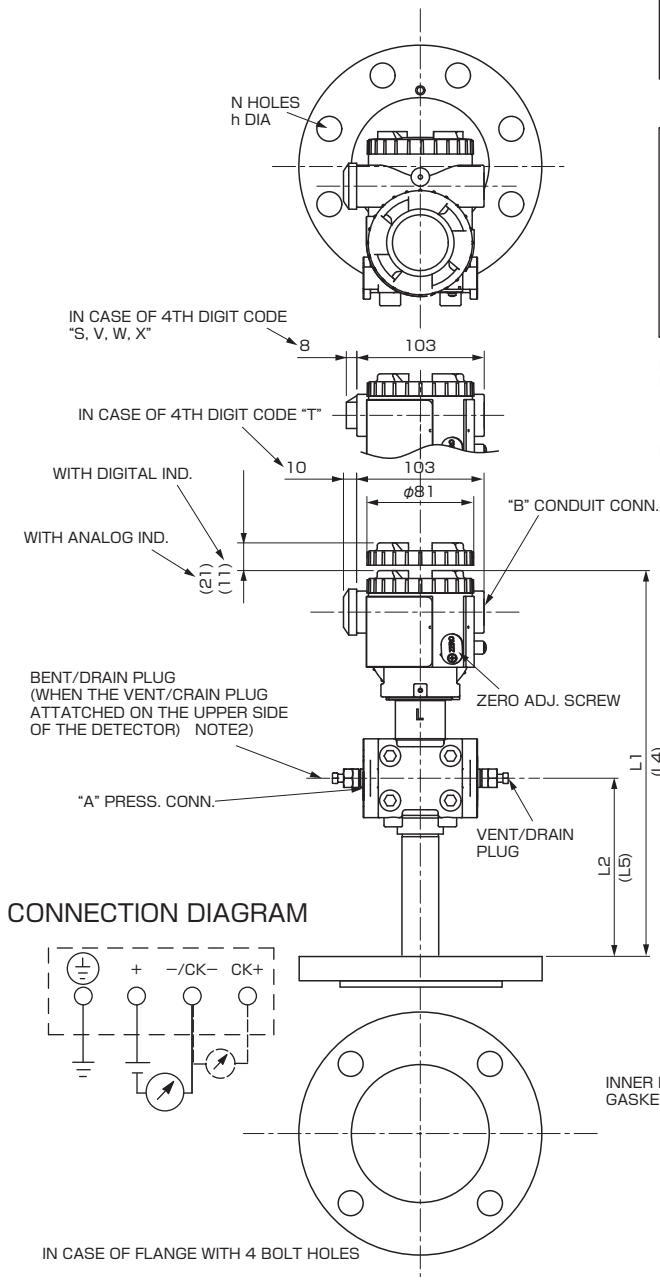
| 11th digit of the code symbols | L±1.5 | MASS APPROX. (kg) | L1 | L2 | L3 | NOTE3) | | |
|--------------------------------|-------|-------------------|-----|-----|-----|--------|-----|-----|
| | | | | | | L4 | L5 | L6 |
| Y | 0 | 10.2 ~ 13.7 | 285 | 128 | 255 | 290 | 130 | 257 |
| A | 50 | 10.7 ~ 17.7 | | | | | | |
| B | 100 | 11.2 ~ 18.2 | | | | | | |
| C | 150 | 11.7 ~ 18.7 | | | | | | |
| D | 200 | 12.2 ~ 19.2 | | | | | | |

| 5th digit of the code symbols | φD | φE | φF | φG | φH±1 | t | N-φh | FLANGE |
|-------------------------------|-----|-------|-----|-----|------|------|------|---------------------|
| A | 140 | 105 | 81 | 49 | — | 16 | 4-19 | JIS 10K 40A |
| B | 140 | 105 | 81 | 49 | — | 18 | 4-19 | JIS 20K 40A |
| C | 160 | 120 | 90 | 49 | — | 22 | 4-23 | JIS 30K 40A |
| D | 155 | 120 | 96 | 49 | 48 | 16 | 4-19 | JIS 10K 50A |
| E | 155 | 120 | 96 | 49 | 48 | 18 | 8-19 | JIS 20K 50A |
| F | 165 | 130 | 105 | 49 | 48 | 22 | 8-19 | JIS 30K 50A |
| O | 185 | 150 | 126 | 100 | 73 | 18 | 8-19 | JIS 10K 80A |
| T | 200 | 160 | 132 | 100 | 73 | 22 | 8-23 | JIS 20K 80A |
| 2 | 210 | 170 | 140 | 100 | 73 | 28 | 8-23 | JIS 30K 80A |
| 1 | 210 | 175 | 151 | 103 | 96 | 18 | 8-19 | JIS 10K 100A |
| U | 225 | 185 | 160 | 103 | 96 | 24 | 8-23 | JIS 20K 100A |
| 3 | 240 | 195 | 160 | 103 | 96 | 32 | 8-25 | JIS 30K 100A |
| G | 127 | 98.4 | 73 | 49 | 48 | 17.5 | 4-16 | ANSI/JPI 150LB 1.5B |
| H | 156 | 114.3 | 73 | 49 | 48 | 20.6 | 4-23 | ANSI/JPI 300LB 1.5B |
| J | 150 | 120.6 | 92 | 49 | 48 | 20 | 4-20 | ANSI/JPI 150LB 2B |
| K | 165 | 127 | 92 | 49 | 48 | 22.5 | 8-20 | ANSI/JPI 300LB 2B |
| 4 | 190 | 152.5 | 127 | 100 | 73 | 24 | 4-20 | ANSI/JPI 150LB 3B |
| 6 | 210 | 168 | 127 | 100 | 73 | 29 | 8-23 | ANSI/JPI 300LB 3B |
| 5 | 230 | 190.5 | 158 | 103 | 96 | 24 | 8-20 | ANSI/JPI 150LB 4B |
| 7 | 255 | 200 | 158 | 103 | 96 | 32 | 8-23 | ANSI/JPI 300LB 4B |

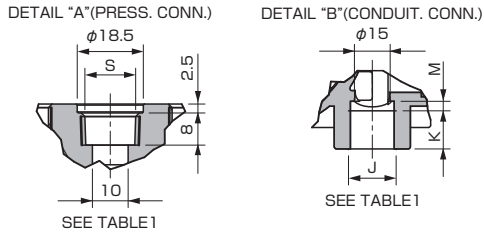
OPTION PARTS FOR FLAMEPROOF OF THIS (JAPAN)



NOTE1) IN CASE OF 10TH CODE "C", φ11 CABLE IS SUITBLE.
 NOTE2) THE PRESSURE CONNECTOR IS LOCATED ON THE DOWN SIDE SURFACE OF THE DETECTOR, WHEN THE VENT/DRAINPLUG IS ATTACHED ON THE UPPER SIDE OF THE DETECTOR
 (WHEN THE 15TH DIGIT OF THE CODE SYMBOLS : C,E,D,P,Q,R).
 NOTE3) WHEN THE 7TH DIGIT OF THE CODE SYMBOLS "H,M,T"



AMP. case: T type



| 4th digit of the code symbols | conduit conn. | | | Press. Conn. | Oval flange screw |
|-------------------------------|---------------|------|-----|--------------|-------------------|
| | J | K | M | S | |
| 5 | G1/2 | 18 | 2 | Rc 1/4 | 7/16-20UNF |
| 6 | 1/2-14NPT | 16 | 4 | 1/4-18NPT | 7/16-20UNF |
| 7 | Pg13.5 | 10.5 | 4.5 | 1/4-18NPT | M10 |
| 8 | M20x1.5 | 16 | 4 | 1/4-18NPT | M10 |
| 9 | Pg13.5 | 10.5 | 4.5 | 1/4-18NPT | 7/16-20UNF |

TABLE 1

| 5th digit of the code symbols | φD | φE | φF | φG | φH±1 | t | N-φh | FLANGE |
|-------------------------------|-----|-------|-----|-----|------|------|------|---------------------|
| A | 140 | 105 | 81 | 49 | 48 | 16 | 4-19 | JIS 10K 40A |
| B | 140 | 105 | 81 | 49 | 48 | 18 | 4-19 | JIS 20K 40A |
| C | 160 | 120 | 90 | 49 | 48 | 22 | 4-23 | JIS 30K 40A |
| D | 155 | 120 | 96 | 49 | 48 | 16 | 4-19 | JIS 10K 50A |
| E | 155 | 120 | 96 | 49 | 48 | 18 | 8-19 | JIS 20K 50A |
| F | 165 | 130 | 105 | 49 | 48 | 22 | 8-19 | JIS 30K 50A |
| 0 | 185 | 150 | 126 | 100 | 73 | 18 | 8-19 | JIS 10K 80A |
| T | 200 | 160 | 132 | 100 | 73 | 22 | 8-23 | JIS 20K 80A |
| 2 | 210 | 170 | 140 | 100 | 73 | 28 | 8-23 | JIS 30K 80A |
| 1 | 210 | 175 | 151 | 103 | 96 | 18 | 8-19 | JIS 10K 100A |
| U | 225 | 185 | 160 | 103 | 96 | 24 | 8-23 | JIS 20K 100A |
| 3 | 240 | 195 | 160 | 103 | 96 | 32 | 8-25 | JIS 30K 100A |
| G | 127 | 98.4 | 73 | 49 | 48 | 17.5 | 4-16 | ANSI/JPI 150LB 1.5B |
| H | 156 | 114.3 | 73 | 49 | 48 | 20.6 | 4-23 | ANSI/JPI 300LB 1.5B |
| J | 150 | 120.6 | 92 | 49 | 48 | 20 | 4-20 | ANSI/JPI 150LB 2B |
| K | 165 | 127 | 92 | 49 | 48 | 22.5 | 8-20 | ANSI/JPI 300LB 2B |
| 4 | 190 | 152.5 | 127 | 100 | 48 | 24 | 4-20 | ANSI/JPI 150LB 3B |
| 6 | 210 | 168 | 127 | 100 | 96 | 29 | 8-23 | ANSI/JPI 300LB 3B |
| 5 | 230 | 190.5 | 158 | 103 | 96 | 24 | 8-20 | ANSI/JPI 150LB 4B |
| 7 | 255 | 200 | 158 | 103 | 96 | 32 | 8-23 | ANSI/JPI 300LB 4B |

| 11th digit of the code symbols | L±1.5 | MASS APPROX. (kg) | L1 | L2 | L3 | NOTE3) | | |
|--------------------------------|-------|-------------------|-----|-----|-----|--------|-----|-----|
| | | | | | | L4 | L5 | L6 |
| Y | 0 | 10.2 ~ 13.7 | | | | | | |
| A | 50 | 10.7 ~ 17.7 | | | | | | |
| B | 100 | 11.2 ~ 18.2 | 298 | 128 | 282 | 303 | 130 | 284 |
| C | 150 | 11.7 ~ 18.7 | | | | | | |
| D | 200 | 12.2 ~ 19.2 | | | | | | |

NOTE2) THE PRESSURE CONNECTOR IS LOCATED ON THE DOWN SIDE SURFACE OF THE DETECTOR, WHEN THE VENT/DRAINPLUG IS ATTACHED ON THE UPPER SIDE OF THE DETECTOR
 (WHEN THE 15TH DIGIT OF THE CODE SYMBOLS : G,E,D,P,Q,R).
 NOTE3) WHEN THE 7TH DIGIT OF THE CODE SYMBOLS 'H,M,T'

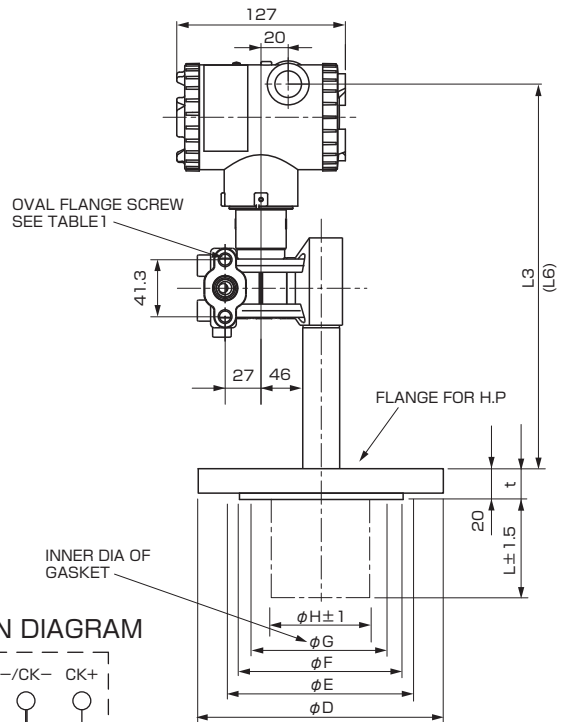
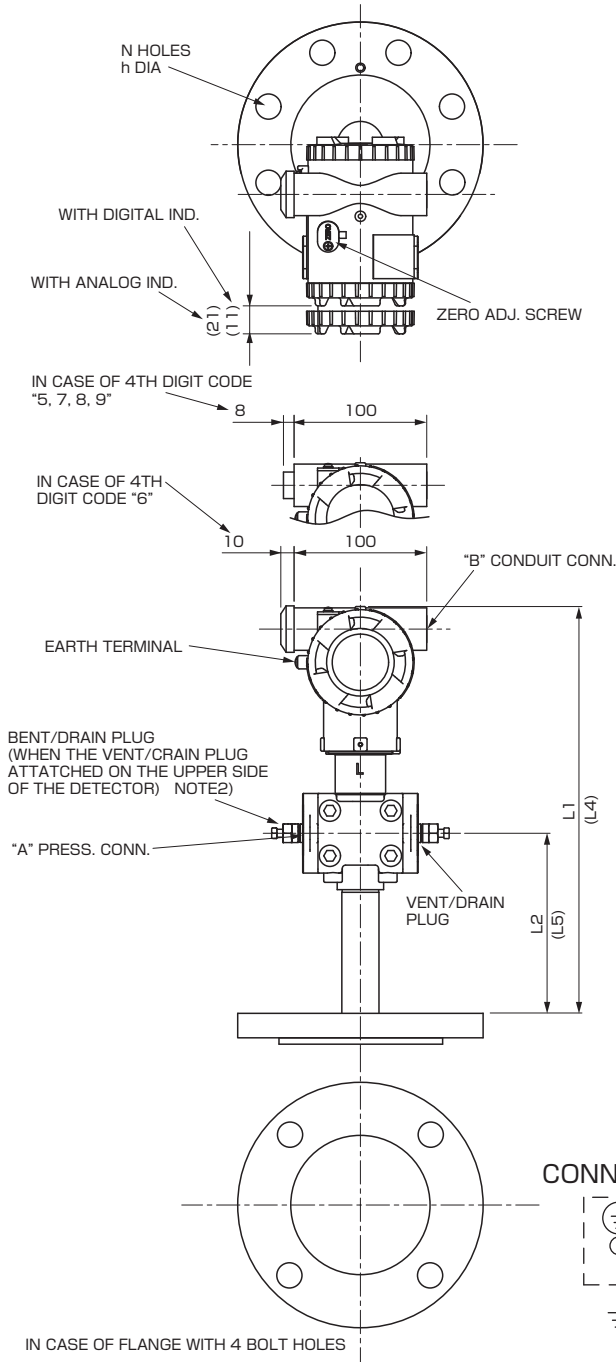


TABLE 2

| Authorities | Intrinsic safety | | | | | | | | | | | | | | | | | | | | | |
|----------------|--|----------------|--|------|-----------|------------|--|-------|---------|----------------|---------|---------|----------------|---------|---------|----------------|-------|---------|----------------|---|-------|----------------|
| ATEX | Ex II 1 G Ex ia IIC T5 Tamb = -40°C to +50°C Ex ia IIC T4 Tamb = -40°C to +70°C Entity Parameters: Ui=28V, Ii=94.3mA, Pi=0.66W, Ci=26nF (Without Arrester), Li=0.6mH (Without analog indicator), Ci=36nF (With Arrester), Li=0.7mH (With analog indicator) | | | | | | | | | | | | | | | | | | | | | |
| Factory Mutual | Class I II III Div.1 Groups A, B, C, D, E, F, G T4 Entity Type 4X <table border="1" style="margin-left: 20px;"> <thead> <tr> <th colspan="2">Model code</th> <th>Tamb</th> </tr> <tr> <th>9th digit</th> <th>13th digit</th> <th></th> </tr> </thead> <tbody> <tr> <td>A,B,D</td> <td>Y,G,H,J</td> <td>-40°C to +85°C</td> </tr> <tr> <td>L,P,1,2</td> <td>Y,G,H,J</td> <td>-20°C to +80°C</td> </tr> <tr> <td>Q,S,4,5</td> <td>Y,G,H,J</td> <td>-20°C to +60°C</td> </tr> <tr> <td>E,F,H</td> <td>Y,G,H,J</td> <td>-40°C to +60°C</td> </tr> <tr> <td>-</td> <td>W,A,D</td> <td>-10°C to +60°C</td> </tr> </tbody> </table> Entity Parameters: Vmax=28V, Imax=94.3mA, Pi=0.66W, Ci=35.98nF, Li=0.694mH | Model code | | Tamb | 9th digit | 13th digit | | A,B,D | Y,G,H,J | -40°C to +85°C | L,P,1,2 | Y,G,H,J | -20°C to +80°C | Q,S,4,5 | Y,G,H,J | -20°C to +60°C | E,F,H | Y,G,H,J | -40°C to +60°C | - | W,A,D | -10°C to +60°C |
| Model code | | Tamb | | | | | | | | | | | | | | | | | | | | |
| 9th digit | 13th digit | | | | | | | | | | | | | | | | | | | | | |
| A,B,D | Y,G,H,J | -40°C to +85°C | | | | | | | | | | | | | | | | | | | | |
| L,P,1,2 | Y,G,H,J | -20°C to +80°C | | | | | | | | | | | | | | | | | | | | |
| Q,S,4,5 | Y,G,H,J | -20°C to +60°C | | | | | | | | | | | | | | | | | | | | |
| E,F,H | Y,G,H,J | -40°C to +60°C | | | | | | | | | | | | | | | | | | | | |
| - | W,A,D | -10°C to +60°C | | | | | | | | | | | | | | | | | | | | |
| CSA | Class I Div.1 Groups A, B, C, D Class II Div.1 Groups E, F, G Class III Div.1 Temp Code T5 Tamb max = +50°C Temp Code T4 Tamb max = +70°C Entity Parameters: Vmax=28V, Imax=94.3mA, Ci=25nF (Without Arrester), Ci=36nF (With Arrester), Li=0.6mH (Without analog meter), Li=0.7mH (With analog meter) | | | | | | | | | | | | | | | | | | | | | |
| TIIS | Ex ia IIC T4 Tamb max = +60°C Entity Parameters: Ui=28V, Ii=94.3mA, Pi=0.66W, Ci=40.92nF, Li=0.694mH | | | | | | | | | | | | | | | | | | | | | |
| IECEX Scheme | Ex ia IIC T4 Tamb = -40°C to +70°C Ex ia IIC T5 Tamb = -40°C to +50°C Entity Parameters: Ui=28V, Ii=94.3mA, Pi=0.66W, Ci=26nF (Without Arrester), Li=0.6mH (Without analog indicator), Ci=36nF (With Arrester), Li=0.7mH (With analog indicator) | | | | | | | | | | | | | | | | | | | | | |

| Authorities | Flameproof | | | | | | | | | | | | | | | | | | | | | |
|----------------|--|----------------|--|------|-----------|------------|--|-------|---------|----------------|---------|---------|----------------|---------|---------|----------------|-------|---------|----------------|---|-------|----------------|
| ATEX | Ex II 2 GD Ex d IIC T6 IP66/67 T85°C Tamb = -40°C to +65°C Ex d IIC T5 IP66/67 T100°C Tamb = -40°C to +85°C | | | | | | | | | | | | | | | | | | | | | |
| Factory Mutual | Class I Div.1 Groups B, C, D T6 Type 4X Class II III Div.1 Groups E, F, G T6 Type 4X Tamb max = +60°C | | | | | | | | | | | | | | | | | | | | | |
| CSA | Class I Div.1 Groups C, D Class II Div.1 Groups E, F, G Class III Div.1 Note) "Seal Not Required" enclosure is allowed. | | | | | | | | | | | | | | | | | | | | | |
| TIIS | Ex do IIB+H ₂ T4 Tamb max = +60°C Maximum process temp. = +120°C | | | | | | | | | | | | | | | | | | | | | |
| IECEX Scheme | Ex d IIC T5 IP66/67 Tamb = -40°C to +85°C Ex d IIC T6 IP66/67 Tamb = -40°C to +65°C | | | | | | | | | | | | | | | | | | | | | |
| Authorities | Type n Nonincendive | | | | | | | | | | | | | | | | | | | | | |
| ATEX | Ex II 3 GD EEx nL IIC T5 Tamb = -40°C to +50°C EEx nL IIC T4 Tamb = -40°C to +70°C Specific Parameters: Model without arrester: Ui=42.4V, Ii=113mA, Pi=1W, Ci=25.18nF, Li=0.694mH Model with arrester: Ui=32V, Ii=113mA, Pi=1W, Ci=35.98nF, Li=0.694mH EEx nAL IIC T5 Tamb = -40°C to +50°C EEx nAL IIC T4 Tamb = -40°C to +70°C Specific Parameters: Model without arrester: Umax=42.4V, Imax=113mA, Pmax=1W Model with arrester: Umax=32V, Imax=113mA, Pmax=1W | | | | | | | | | | | | | | | | | | | | | |
| Factory Mutual | Class I II III Div.2 Groups A, B, C, D, F, G T4 Entity Type 4X <table border="1" style="margin-left: 20px;"> <thead> <tr> <th colspan="2">Model code</th> <th>Tamb</th> </tr> <tr> <th>9th digit</th> <th>13th digit</th> <th></th> </tr> </thead> <tbody> <tr> <td>A,B,D</td> <td>Y,G,H,J</td> <td>-40°C to +85°C</td> </tr> <tr> <td>L,P,1,2</td> <td>Y,G,H,J</td> <td>-20°C to +80°C</td> </tr> <tr> <td>Q,S,4,5</td> <td>Y,G,H,J</td> <td>-20°C to +60°C</td> </tr> <tr> <td>E,F,H</td> <td>Y,G,H,J</td> <td>-40°C to +60°C</td> </tr> <tr> <td>-</td> <td>W,A,D</td> <td>-10°C to +60°C</td> </tr> </tbody> </table> | Model code | | Tamb | 9th digit | 13th digit | | A,B,D | Y,G,H,J | -40°C to +85°C | L,P,1,2 | Y,G,H,J | -20°C to +80°C | Q,S,4,5 | Y,G,H,J | -20°C to +60°C | E,F,H | Y,G,H,J | -40°C to +60°C | - | W,A,D | -10°C to +60°C |
| Model code | | Tamb | | | | | | | | | | | | | | | | | | | | |
| 9th digit | 13th digit | | | | | | | | | | | | | | | | | | | | | |
| A,B,D | Y,G,H,J | -40°C to +85°C | | | | | | | | | | | | | | | | | | | | |
| L,P,1,2 | Y,G,H,J | -20°C to +80°C | | | | | | | | | | | | | | | | | | | | |
| Q,S,4,5 | Y,G,H,J | -20°C to +60°C | | | | | | | | | | | | | | | | | | | | |
| E,F,H | Y,G,H,J | -40°C to +60°C | | | | | | | | | | | | | | | | | | | | |
| - | W,A,D | -10°C to +60°C | | | | | | | | | | | | | | | | | | | | |

* Specification is subject to change without notice.

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