

# ABSOLUTE PRESSURE TRANSMITTER

## DATA SHEET

**FKH...5**

The FCX-All absolute pressure transmitter (direct mount type) accurately measures absolute pressure and transmits proportional 4 to 20 mA signal.

The transmitter utilizes the unique micromachined capacitive silicon sensor with state-of-the-art microprocessor technology to provide exceptional performance and functionality.

## FEATURES

### 1. High accuracy

0.2% accuracy for all calibrated spans is the standard feature. Fuji's micro-capacitance silicon sensor assures this feature for all suppressed calibration ranges without additional adjustment.

### 2. Minimum inventory

Electronics unit, communication module, local indicators and electronics housing are interchangeable among all FCX-All models.

### 3. 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..

### 4. Fuji/HART® bilingual communications protocol

FCX-All series transmitter offers bilingual communications to speak both Fuji proprietary protocol and HART®. Any HART® compatible devices can communicate with FCX-All

### 5. Application flexibility

Various options that render the FCX-All suitable for almost any process applications include.

- Analog indicator at either the electronics side or terminal side
- 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

### 6. Burnout current flexibility (Under Scale: 3.2 to 4.0 mA, Over Scale: 20.0 to 22.5 mA)

Burnout signal level is adjustable using Model FXW or Hand Held Communicator (HHC) to comply with NAMUR NE43.

### 7. 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

#### Type:

**FKH:** Smart, 4 to 20 mA DC + Fuji / Hart® digital signal

#### Service:

Liquid, gas, or vapour

#### Span, range, and overrange limit:

| Type   | Span limit kPa abs {bar abs} |              | Range limit kPa abs {bar abs} | Overrange limit MPa {bar} |
|--------|------------------------------|--------------|-------------------------------|---------------------------|
|        | Min.                         | Max.         |                               |                           |
| FKH□02 | 8.125<br>{0.08125}           | 130<br>{1.3} | 0 to 130<br>{0 to 1.3}        | 0.5<br>{5}                |
| FKH□03 | 31.25<br>{0.3125}            | 500<br>{5}   | 0 to 500<br>{0 to 5}          | 1.5<br>{15}               |
| FKH□04 | 187.5<br>{1.875}             | 3000<br>{30} | 0 to 3000<br>{0 to 30}        | 9<br>{90}                 |

#### Output signal:

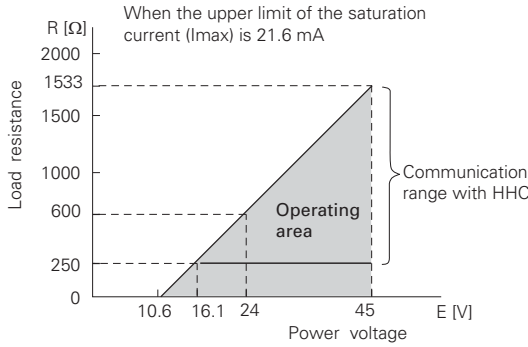
4 to 20 mA DC with digital signal superimposed on the analogic signal

#### Power supply:

Transmitter operates on 10.5 V to 45 V DC at transmitter terminals.

10.5 V to 32 V DC for the units with optional arrester

Load limitations: see figure below



Note) The load resistance varies with the upper limit of the saturation current [I max]

$$R [\Omega] = \frac{E [V] - 10.5}{(I \text{ max [mA]} + 0.9) \times 10^{-3}}$$

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

**Hazardous locations:**

| Authority (Digit 10 = ) | Intrinsic safety   |                |  |      |           |            |  |           |       |                |             |       |                |             |       |                |           |       |                |   |       |                |
|-------------------------|--|----------------|--|------|-----------|------------|--|-----------|-------|----------------|-------------|-------|----------------|-------------|-------|----------------|-----------|-------|----------------|---|-------|----------------|
| ATEX<br>(K)             | Ex II 1 G<br>Ex ia IIC T5 (-40°C ≤ Ta ≤ +50 °C)<br>Ex ia IIC T4 (-40°C ≤ Ta ≤ +70 °C)<br>IP66/67<br>Entity Parameters:<br>Ui ≤ 28 Vdc, Ii ≤ 94.3 mA, Pi ≤ 0.66 W<br>Ci = 36 nF/26 nF for models with/without Arrester<br>Li = 0.7 mH/0.6 mH for models with/without Analog Indicator   |                |  |      |           |            |  |           |       |                |             |       |                |             |       |                |           |       |                |   |       |                |
| Factory Mutual<br>(H)   | Class I II III<br>Div.1 Groups A, B, C, D, E, F, G<br>T4 Entity Type 4X<br><table border="1"> <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,C,D,J</td> <td>Y,G,N</td> <td>-40°C to +85°C</td> </tr> <tr> <td>L,P,M,1,2,3</td> <td>Y,G,N</td> <td>-20°C to +80°C</td> </tr> <tr> <td>Q,S,N,4,5,6</td> <td>Y,G,N</td> <td>-20°C to +60°C</td> </tr> <tr> <td>E,F,G,H,K</td> <td>Y,G,N</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> <p>Entity Parameters:<br/>Vmax=42.4V, Imax=113mA, Pi=1W,<br/>Ci=35.98nF, Li=0.694mH</p> | Model code     |  | Tamb | 9th digit | 13th digit |  | A,B,C,D,J | Y,G,N | -40°C to +85°C | L,P,M,1,2,3 | Y,G,N | -20°C to +80°C | Q,S,N,4,5,6 | Y,G,N | -20°C to +60°C | E,F,G,H,K | Y,G,N | -40°C to +60°C | - | W,A,D | -10°C to +60°C |
| Model code              |  | Tamb           |  |      |           |            |  |           |       |                |             |       |                |             |       |                |           |       |                |   |       |                |
| 9th digit               | 13th digit   |                |  |      |           |            |  |           |       |                |             |       |                |             |       |                |           |       |                |   |       |                |
| A,B,C,D,J               | Y,G,N  | -40°C to +85°C |  |      |           |            |  |           |       |                |             |       |                |             |       |                |           |       |                |   |       |                |
| L,P,M,1,2,3             | Y,G,N  | -20°C to +80°C |  |      |           |            |  |           |       |                |             |       |                |             |       |                |           |       |                |   |       |                |
| Q,S,N,4,5,6             | Y,G,N  | -20°C to +60°C |  |      |           |            |  |           |       |                |             |       |                |             |       |                |           |       |                |   |       |                |
| E,F,G,H,K               | Y,G,N  | -40°C to +60°C |  |      |           |            |  |           |       |                |             |       |                |             |       |                |           |       |                |   |       |                |
| -                       | W,A,D  | -10°C to +60°C |  |      |           |            |  |           |       |                |             |       |                |             |       |                |           |       |                |   |       |                |
| CSA<br>(J)              | Ex ia Class I, Groups A, B, C and D;<br>Class II, Groups E,F and G; Class III<br>Per drawing TC 522873<br>Temp. code T5 for Tamb max = +50°C<br>Temp. code T4 for Tamb max = +70°C<br>Entity Parameters:<br>Vmax = 28 Vdc, Imax = 94.3 mA, Pmax = 0.66 W<br>Ci = 36 nF/25 nF for models with/without Arrester<br>Li = 0.7 mH/0.6 mH for models with/without Analog Indicator   |                |  |      |           |            |  |           |       |                |             |       |                |             |       |                |           |       |                |   |       |                |
| IECEX<br>(T)            | Ex ia IIC T5 (-40°C ≤ Ta ≤ +50 °C)<br>Ex ia IIC T4 (-40°C ≤ Ta ≤ +70 °C)<br>IP66/67<br>Entity Parameters:<br>Ui ≤ 28 Vdc, Ii ≤ 94.3 mA, Pi ≤ 0.66 W<br>Ci = 36 nF/26 nF for models with/without Arrester<br>Li = 0.7 mH/0.6 mH for models with/without Analog Indicator  |                |  |      |           |            |  |           |       |                |             |       |                |             |       |                |           |       |                |   |       |                |

| Authority               | Flameproof  |                |  |      |           |            |  |           |       |                |             |       |                |             |       |                |           |       |                |   |       |                |
|-------------------------|---|----------------|--|------|-----------|------------|--|-----------|-------|----------------|-------------|-------|----------------|-------------|-------|----------------|-----------|-------|----------------|---|-------|----------------|
| ATEX<br>(X)             | Ex II 2 GD<br>Ex d IIC T6 (-40°C ≤ Ta ≤ +65 °C)<br>Ex d IIC T5 (-40°C ≤ Ta ≤ +85 °C)<br>Ex tD A21 IP66/67 T 85°C<br>Ex tD A21 IP66/67 T 100°C<br>Electrical ratings<br>Model Without arrester:<br>Ui ≤ 45 Vdc, 4-20 mA loop powered, Pi ≤ 1.0125 W<br>Model With arrester:<br>Ui ≤ 32 Vdc, 4-20 mA loop powered, Pi ≤ 1.0125 W  |                |  |      |           |            |  |           |       |                |             |       |                |             |       |                |           |       |                |   |       |                |
| Factory Mutual<br>(D)   | Class I<br>Div.1 Groups B, C, D<br>T6 Type 4X<br>Class II III<br>Div.1 Groups E, F, G<br>T6 Type 4X<br>Tamb max = +60°C   |                |  |      |           |            |  |           |       |                |             |       |                |             |       |                |           |       |                |   |       |                |
| CSA<br>(E)              | Class I, Groups C and D;<br>Class II, Groups E,F and G ; Class III<br>Maximum ambient temperature 85°C<br>Maximum working pressure 50 Mpa<br>Electrical ratings<br>Model Without arrester:<br>Ui ≤ 45 Vdc, 4-20 mA<br>Model With arrester:<br>Ui ≤ 32 Vdc, 4-20 mA<br>Note: "Seal not required"   |                |  |      |           |            |  |           |       |                |             |       |                |             |       |                |           |       |                |   |       |                |
| IECEX<br>(R)            | Ex d IIC T6 (-40°C ≤ Ta ≤ +65 °C)<br>Ex d IIC T5 (-40°C ≤ Ta ≤ +85 °C)<br>DIP A21 IP66/67 T 85°C<br>DIP A21 IP66/67 T 100°C<br>Electrical ratings<br>Model Without arrester:<br>Ui ≤ 45 Vdc, 4-20 mA loop powered, Pi ≤ 1.0125 W<br>Model With arrester:<br>Ui ≤ 32 Vdc, 4-20 mA loop powered, Pi ≤ 1.0125 W  |                |  |      |           |            |  |           |       |                |             |       |                |             |       |                |           |       |                |   |       |                |
| Authority (Digit 10 = ) | Type n Nonincendive   |                |  |      |           |            |  |           |       |                |             |       |                |             |       |                |           |       |                |   |       |                |
| ATEX<br>(P)             | Ex II 3 G<br>Ex nA II T5 (-40°C ≤ Ta ≤ +70 °C)<br>IP66/67<br>Electrical ratings<br>Model Without arrester:<br>Ui ≤ 45 Vdc, 4-20 mA loop powered, Pi ≤ 1.0125 W<br>Model With arrester:<br>Ui ≤ 32 Vdc, 4-20 mA loop powered, Pi ≤ 1.0125 W<br>Optional Analog indicator is not available for type "n"   |                |  |      |           |            |  |           |       |                |             |       |                |             |       |                |           |       |                |   |       |                |
| Factory Mutual<br>(H)   | Class I II III<br>Div.2 Groups A, B, C, D, F, G<br>T4 Entity Type 4X<br><table border="1"> <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,C,D,J</td> <td>Y,G,N</td> <td>-40°C to +85°C</td> </tr> <tr> <td>L,P,M,1,2,3</td> <td>Y,G,N</td> <td>-20°C to +80°C</td> </tr> <tr> <td>Q,S,N,4,5,6</td> <td>Y,G,N</td> <td>-20°C to +60°C</td> </tr> <tr> <td>E,F,G,H,K</td> <td>Y,G,N</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,C,D,J | Y,G,N | -40°C to +85°C | L,P,M,1,2,3 | Y,G,N | -20°C to +80°C | Q,S,N,4,5,6 | Y,G,N | -20°C to +60°C | E,F,G,H,K | Y,G,N | -40°C to +60°C | - | W,A,D | -10°C to +60°C |
| Model code              |   | Tamb           |  |      |           |            |  |           |       |                |             |       |                |             |       |                |           |       |                |   |       |                |
| 9th digit               | 13th digit  |                |  |      |           |            |  |           |       |                |             |       |                |             |       |                |           |       |                |   |       |                |
| A,B,C,D,J               | Y,G,N   | -40°C to +85°C |  |      |           |            |  |           |       |                |             |       |                |             |       |                |           |       |                |   |       |                |
| L,P,M,1,2,3             | Y,G,N   | -20°C to +80°C |  |      |           |            |  |           |       |                |             |       |                |             |       |                |           |       |                |   |       |                |
| Q,S,N,4,5,6             | Y,G,N   | -20°C to +60°C |  |      |           |            |  |           |       |                |             |       |                |             |       |                |           |       |                |   |       |                |
| E,F,G,H,K               | Y,G,N   | -40°C to +60°C |  |      |           |            |  |           |       |                |             |       |                |             |       |                |           |       |                |   |       |                |
| -                       | W,A,D   | -10°C to +60°C |  |      |           |            |  |           |       |                |             |       |                |             |       |                |           |       |                |   |       |                |
| CSA<br>(J)              | Class I<br>Div.2 Groups A, B, C, D<br>Class II<br>Div.2 Groups E, F, G<br>Class III<br>Div.2<br>Temp Code T5 Tamb max = +50°C<br>Temp Code T4 Tamb max = +70°C<br>Entity Parameters:<br>Vmax = 28 Vdc, Imax = 94.3 mA, Pmax = 0.66 W<br>Ci = 36 nF/25 nF for models with/without Arrester<br>Li = 0.7 mH/0.6 mH for models with/without Analog Indicator  |                |  |      |           |            |  |           |       |                |             |       |                |             |       |                |           |       |                |   |       |                |
| IECEX<br>(Q)            | Ex nA II T5 (-40°C ≤ Ta ≤ +70 °C)<br>IP66/67<br>Electrical ratings<br>Model Without arrester:<br>Ui ≤ 45 Vdc, 4-20 mA loop powered, Pi ≤ 1.0125 W<br>Model With arrester:<br>Ui ≤ 32 Vdc, 4-20 mA loop powered, Pi ≤ 1.0125 W<br>Optional Analog indicator is not available for type "n"  |                |  |      |           |            |  |           |       |                |             |       |                |             |       |                |           |       |                |   |       |                |

**Zero/span adjustment:**

Zero and span are adjustable either from the HHC<sup>(1)</sup> in Hart® or Fuji protocol. Zero is also adjustable externally from the adjustable screw.

**Damping:**

Adjustable from HHC<sup>(1)</sup> or local adjustment unit with LCD display.

The time constant is adjustable between 0.06 to 32 sec

**Zero elevation/suppression:**

0 kPa abs to +100% of URL

**Normal/reverse action:**

Selectable from HHC<sup>(1)</sup>.

**Indication:**

Analog indicator or 5 digit LCD meter, as specified.

An analog display may be mounted at the location of one or the other of the housing.

**Burnout direction:** Selectable from HHC<sup>(1)</sup>

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

**"Output Hold":**

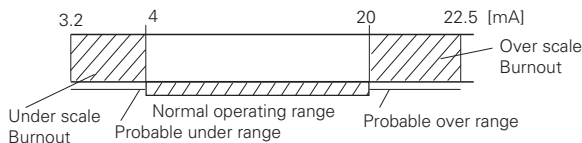
Output signal is hold as the value just before failure happens.

**"Output Overscale":**

Adjustable within the range 20.0 mA to 22.5 mA from HHC<sup>(1)</sup>

**"Output Underscale":**

Adjustable within the range 3.2 mA to 4.0 mA from HHC<sup>(1)</sup>



Output limits conforming to NAMUR NE43 by order.

**Loop-check output:**

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

**Temperature limit:**

Ambient: -40 to +85°C  
 (-20 to +80°C for LCD indicator)  
 (-40 to +60°C for arrester option)

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

Process: -40 to +85°C for silicone fill sensor

Storage: -40 to +90°C

**Humidity limit:**

0 to 100% RH (Relative humidity)

**Communication:**

With HHC<sup>(1)</sup> (model FXW, consult DS N°EDS8-47), following items can be remotely displayed or configured.

Note: HHC's version must be higher than 7.0 (or FXW □□□□1-□4), for FC-All for supporting these items: "Saturate current", "Write protect", and "History".

| Items                         | Fuji Protocol with FXW |     | Hart® Protocol |     | By local configurator (with 3 push button), (LCD indicator) |     |
|-------------------------------|------------------------|-----|----------------|-----|---|-----|
|                               | Display                | Set | Display        | Set | Display   | Set |
| Tag No.                       | √                      | √   | √              | √   | √   | √   |
| Model No.                     | √                      | √   | √              | √   | √   | √   |
| Serial No. & Software Version | √                      | —   | √              | —   | √   | —   |
| Engineering unit              | √                      | √   | √              | √   | √   | √   |
| Range limit                   | √                      | —   | √              | —   | √   | —   |
| Measuring range               | √                      | √   | √              | √   | √   | √   |
| Damping                       | √                      | √   | √              | √   | √   | √   |

|  |             |   |   |   |   |   |   |
|--|-------------|---|---|---|---|---|---|
| Output mode                                  | Linear      | √ | √ | √ | √ | √ | √ |
|  | Square root | √ | √ | √ | √ | √ | √ |
| 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                |             | √ | — | √ | — | √ | — |

(Note) (1) HHC: Hand Held Communicator

**Local configurator with LCD display (option):**

Local configurator with 3 push button and LCD display can support all items (Fuji Protocol list) except "Linearize" function.

**Programmable output linearization function:**

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

**Performance specifications**

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

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

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

For spans below 1/10 of URL:

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

**Stability:**

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

(In case of 6th digit code "3", "4")

**Temperature effect:**

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

$$\text{Zero shift: } \pm (0.4 + 0.2 \frac{\text{URL}}{\text{span}}) \% / 28^\circ\text{C}$$

$$\text{Total effect: } \pm (0.475 + 0.2 \frac{\text{URL}}{\text{span}}) \% / 28^\circ\text{C}$$

**Overrange effect:**

Zero shift, 0.3% of URL for any overrange to maximum limit

**Supply voltage effect :**

Less than 0.05% of calibrated span per 10 V

**Update rate:**

60 msec

**RFI effect :**

< 0,2% of URL for the frequencies of 20 to 1000 MHz and field strength of 10 V/m when electronic housing covers are on (Classification : 2-abc : 0,2% of span according SAMA PMC 33.1)

**Response time:** (63,3% of output signal without damping)

Time constant. 0.08 seconds (at 23°C)

Dead time: about 0.12 seconds

Response time = time constant + dead time

**Mounting position effect:**

Zero shift, less than 0.1 kPa for a 10° tilt in any plane.

This error can be corrected by adjusting Zero.

No effect on span. .

**Vibration effect:**

< ±0,25% Of spans for spans greater than 1/10 of URL.  
Frequency 10 to 150 Hz, acceleration 39,2 m/sec<sup>2</sup>

**Material fatigue:**

Please consult Fuji Electric.

**Dielectric strength:**

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

**Insulation resistance:**

More than 100 MΩ at 500 V DC.

**Internal resistance for external field indicator:**

12Ω Max (connected to test terminal CK+ and CK-)

**Pressure equipment directive (PED) 97/23/EC**

According to Article 3.3

**Physical specifications****Electrical connections:**

1/2-14 NPT, Pg13.5, or M20 x 1.5

**Process connections:**

1/2-14 NPT, 1/4-18 NPT, Rc 1/2, G1/2 A manometer fitting, M20 x 1,5.

**Process-wetted parts material:**

| Material code<br>(7th digit<br>in "Code<br>symbols") | Process cover | Diaphragm              | Wetted<br>sensor body | Vent/drain |
|--|---------------|------------------------|-----------------------|------------|
| J  | SS 316L       | SS 316L + gold<br>coat | SS 316L               | SS 316L    |
| V  | SS 316L       | SS 316L                | SS 316L               | SS 316L    |

**Non-wetted parts material:**

Electronics housing:

Low copper die cast aluminum alloy finished with polyester coating (standard), or SS 316(L) as option.

Fill fluid:

Silicone oil

Mounting bracket:

SS 304L

**Environmental protection:**

IEC IP66/IP67 and NEMA 4X

**Mounting:**

Without mounting bracket : direct mounting on manifold (optional)

With optional mounting bracket : for 50 mm (2") pipe or direct wall mounting

**Mass{weight}:**

Transmitter approximately 1,7 kg without options.

Add : 0.3 kg for indicator

0.5 kg for mounting bracket

2 kg for stainless steel housing (option)

**Optional features****Indicator:**

A plug-in analog indicator (2.5% accuracy) can be housed in the electronics compartment or in the terminal box of the housing.

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 communication with HHC.

**Arrester:**

A built-in arrester protects the electronics from lightning surges.

Lightning surge immunity: 4 KV (1.2x50 μs)

**Degreasing:**

Process-wetted parts are cleaned, but the fill fluid is standard silicone oil. Not for use for oxygen or chlorine measurement.

**NACE specification:**

Metallic materials for all pressure boundary parts comply with NACE MR 0175 / ISO 15156.

SS 660 or SS 660/660 bolts and nuts comply with NACE MR 0175 / ISO 15156.

**Customer tag:**

A stainless steel tag for customer tag data is wired to the transmitter.

**ACCESSORIES****Hand held communicator:**

Model FXW, refer to datasheet (EDS8-47)

**Two valve Manifold:**

Available in SS 316 and pressure rating 10 MPa (100bar).

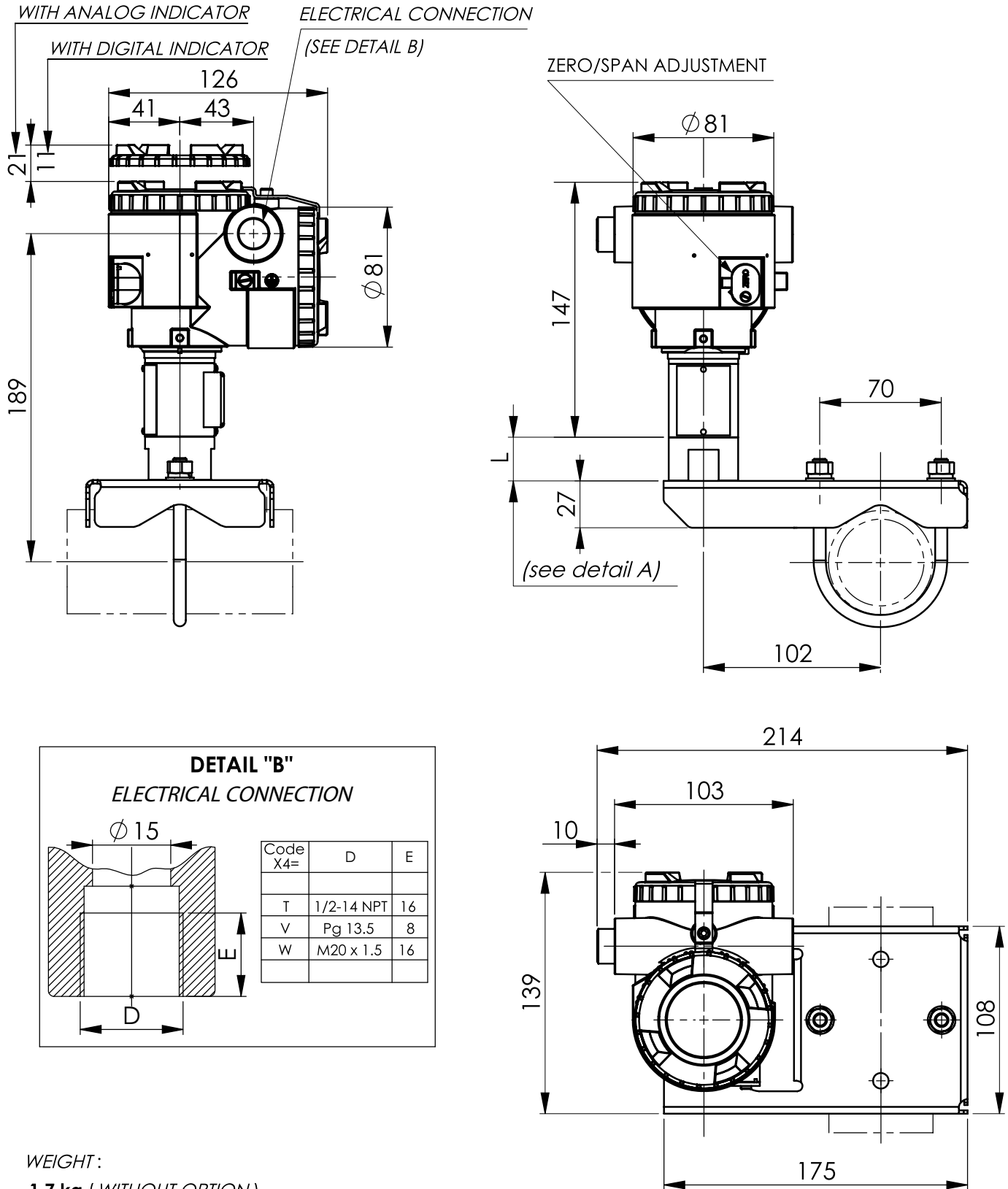
# CODE SYMBOLS

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | DESCRIPTION   |
|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|---|
| F | K | H |   | 0 |   |   | 5 |   |    |    |    |    | 0  |    |   |
|   |   |   |   |   |   |   |   |   |    |    |    |    |    |    | <b>Type</b>   |
|   |   |   |   |   |   |   |   |   |    |    |    |    |    |    | Smart, 4-20 mA dc + Fuji/Hart® digital signal   |
|   |   |   |   |   |   |   |   |   |    |    |    |    |    |    | <b>Connections</b>  |
|   |   |   |   |   |   |   |   |   |    |    |    |    |    |    | Process connection  |
|   |   |   |   |   |   |   |   |   |    |    |    |    |    |    | Electrical connection   |
|   |   |   |   |   |   |   |   |   |    |    |    |    |    |    | See digit 15  |
|   |   |   |   |   |   |   |   |   |    |    |    |    |    |    | 1/2-14 NPT  |
|   |   |   |   |   |   |   |   |   |    |    |    |    |    |    | See digit 15  |
|   |   |   |   |   |   |   |   |   |    |    |    |    |    |    | Pg 13,5   |
|   |   |   |   |   |   |   |   |   |    |    |    |    |    |    | See digit 15  |
|   |   |   |   |   |   |   |   |   |    |    |    |    |    |    | M 20 x 1,5  |
|   |   |   |   |   |   |   |   |   |    |    |    |    |    |    | <b>Range &amp; wetted parts material</b>  |
|   |   |   |   |   |   |   |   |   |    |    |    |    |    |    | Span (bar abs)  |
|   |   |   |   |   |   |   |   |   |    |    |    |    |    |    | Diaphragm material  |
|   |   |   |   |   |   |   |   |   |    |    |    |    |    |    | Wetted parts  |
|   |   |   |   |   |   |   |   |   |    |    |    |    |    |    | 0,08125/1,3   |
|   |   |   |   |   |   |   |   |   |    |    |    |    |    |    | SS 316L   |
|   |   |   |   |   |   |   |   |   |    |    |    |    |    |    | SS 316L   |
|   |   |   |   |   |   |   |   |   |    |    |    |    |    |    | 0,08125/1,3   |
|   |   |   |   |   |   |   |   |   |    |    |    |    |    |    | SS 316L / gold coat   |
|   |   |   |   |   |   |   |   |   |    |    |    |    |    |    | SS 316L   |
|   |   |   |   |   |   |   |   |   |    |    |    |    |    |    | 0,3125/5  |
|   |   |   |   |   |   |   |   |   |    |    |    |    |    |    | SS 316L   |
|   |   |   |   |   |   |   |   |   |    |    |    |    |    |    | 0,3125/5  |
|   |   |   |   |   |   |   |   |   |    |    |    |    |    |    | SS 316L / gold coat   |
|   |   |   |   |   |   |   |   |   |    |    |    |    |    |    | SS 316L   |
|   |   |   |   |   |   |   |   |   |    |    |    |    |    |    | 1,875/30  |
|   |   |   |   |   |   |   |   |   |    |    |    |    |    |    | SS 316L   |
|   |   |   |   |   |   |   |   |   |    |    |    |    |    |    | 1,875/30  |
|   |   |   |   |   |   |   |   |   |    |    |    |    |    |    | SS 316L / gold coat   |
|   |   |   |   |   |   |   |   |   |    |    |    |    |    |    | SS 316L   |
|   |   |   |   |   |   |   |   |   |    |    |    |    |    |    | <b>Indicator &amp; Arrestor</b>   |
|   |   |   |   |   |   |   |   |   |    |    |    |    |    |    | Indicator   |
|   |   |   |   |   |   |   |   |   |    |    |    |    |    |    | Arrestor  |
|   |   |   |   |   |   |   |   |   |    |    |    |    |    |    | Initial setting   |
|   |   |   |   |   |   |   |   |   |    |    |    |    |    |    | None  |
|   |   |   |   |   |   |   |   |   |    |    |    |    |    |    | None  |
|   |   |   |   |   |   |   |   |   |    |    |    |    |    |    | Analog, 0-100% linear scale   |
|   |   |   |   |   |   |   |   |   |    |    |    |    |    |    | None  |
|   |   |   |   |   |   |   |   |   |    |    |    |    |    |    | Analog, Custom scale  |
|   |   |   |   |   |   |   |   |   |    |    |    |    |    |    | None  |
|   |   |   |   |   |   |   |   |   |    |    |    |    |    |    | Analog, double scale  |
|   |   |   |   |   |   |   |   |   |    |    |    |    |    |    | None  |
|   |   |   |   |   |   |   |   |   |    |    |    |    |    |    | Yes   |
|   |   |   |   |   |   |   |   |   |    |    |    |    |    |    | 4-20 mA DC  |
|   |   |   |   |   |   |   |   |   |    |    |    |    |    |    | Yes   |
|   |   |   |   |   |   |   |   |   |    |    |    |    |    |    | Analog, 0-100% linear scale   |
|   |   |   |   |   |   |   |   |   |    |    |    |    |    |    | Yes   |
|   |   |   |   |   |   |   |   |   |    |    |    |    |    |    | Analog, Custom scale  |
|   |   |   |   |   |   |   |   |   |    |    |    |    |    |    | Yes   |
|   |   |   |   |   |   |   |   |   |    |    |    |    |    |    | Analog, double scale  |
|   |   |   |   |   |   |   |   |   |    |    |    |    |    |    | Yes   |
|   |   |   |   |   |   |   |   |   |    |    |    |    |    |    | Digital, 0-100%   |
|   |   |   |   |   |   |   |   |   |    |    |    |    |    |    | None  |
|   |   |   |   |   |   |   |   |   |    |    |    |    |    |    | Digital, Custom scale   |
|   |   |   |   |   |   |   |   |   |    |    |    |    |    |    | None  |
|   |   |   |   |   |   |   |   |   |    |    |    |    |    |    | Digital, Custom scale   |
|   |   |   |   |   |   |   |   |   |    |    |    |    |    |    | Yes   |
|   |   |   |   |   |   |   |   |   |    |    |    |    |    |    | Digital, 0-100% with push button  |
|   |   |   |   |   |   |   |   |   |    |    |    |    |    |    | None  |
|   |   |   |   |   |   |   |   |   |    |    |    |    |    |    | Digital, Custom scale with push button  |
|   |   |   |   |   |   |   |   |   |    |    |    |    |    |    | None  |
|   |   |   |   |   |   |   |   |   |    |    |    |    |    |    | Digital, 0-100% with push button  |
|   |   |   |   |   |   |   |   |   |    |    |    |    |    |    | Yes   |
|   |   |   |   |   |   |   |   |   |    |    |    |    |    |    | Digital, Custom scale with push button  |
|   |   |   |   |   |   |   |   |   |    |    |    |    |    |    | Yes   |
|   |   |   |   |   |   |   |   |   |    |    |    |    |    |    | Digital, Custom scale with push button  |
|   |   |   |   |   |   |   |   |   |    |    |    |    |    |    | Yes   |
|   |   |   |   |   |   |   |   |   |    |    |    |    |    |    | <b>Approvals for hazardous locations (consult FUJI for availability)</b>                      |
|   |   |   |   |   |   |   |   |   |    |    |    |    |    |    | None (Standard)   |
|   |   |   |   |   |   |   |   |   |    |    |    |    |    |    | ATEX - Flameproof enclosures (digit 4 = "T" & "W" only)                                       |
|   |   |   |   |   |   |   |   |   |    |    |    |    |    |    | ATEX - Intrinsic Safety   |
|   |   |   |   |   |   |   |   |   |    |    |    |    |    |    | FM - Explosion-Proof (digit 4 = "T" only)   |
|   |   |   |   |   |   |   |   |   |    |    |    |    |    |    | CSA - Explosion-Proof (digit 4 = "T" only)  |
|   |   |   |   |   |   |   |   |   |    |    |    |    |    |    | FM - Intrinsic Safety and Non Incendive   |
|   |   |   |   |   |   |   |   |   |    |    |    |    |    |    | CSA - Intrinsic Safety  |
|   |   |   |   |   |   |   |   |   |    |    |    |    |    |    | ATEX - Type "n" (digit 9 = A, E, 1, 2, 3, 4 & 5 only)   |
|   |   |   |   |   |   |   |   |   |    |    |    |    |    |    | IECEX - Type "n" (digit 9 = A, E, 1, 2, 3, 4 & 5 only)  |
|   |   |   |   |   |   |   |   |   |    |    |    |    |    |    | IECEX - Flameproof enclosures (digit 4 = "T" & "W" only)                                      |
|   |   |   |   |   |   |   |   |   |    |    |    |    |    |    | IECEX - Intrinsic Safety  |
|   |   |   |   |   |   |   |   |   |    |    |    |    |    |    | CSA - Explosion-Proof & Intrinsic Safety combined approval (digit 4 = "T" only)               |
|   |   |   |   |   |   |   |   |   |    |    |    |    |    |    | ATEX - Flameproof enclosures & Intrinsic Safety combined approval (digit 4 = "T" & "W" only)  |
|   |   |   |   |   |   |   |   |   |    |    |    |    |    |    | IECEX - Flameproof enclosures & Intrinsic Safety combined approval (digit 4 = "T" & "W" only) |
|   |   |   |   |   |   |   |   |   |    |    |    |    |    |    | FM - Explosion-Proof & Intrinsic Safety combined approval (digit 4 = "T" only)                |
|   |   |   |   |   |   |   |   |   |    |    |    |    |    |    | <b>Mounting bracket (stainless steel)</b>   |
|   |   |   |   |   |   |   |   |   |    |    |    |    |    |    | None  |
|   |   |   |   |   |   |   |   |   |    |    |    |    |    |    | Yes   |
|   |   |   |   |   |   |   |   |   |    |    |    |    |    |    | <b>Stainless steel parts</b>  |
|   |   |   |   |   |   |   |   |   |    |    |    |    |    |    | SS tag plate  |
|   |   |   |   |   |   |   |   |   |    |    |    |    |    |    | SS housing  |
|   |   |   |   |   |   |   |   |   |    |    |    |    |    |    | None  |
|   |   |   |   |   |   |   |   |   |    |    |    |    |    |    | None  |
|   |   |   |   |   |   |   |   |   |    |    |    |    |    |    | Yes   |
|   |   |   |   |   |   |   |   |   |    |    |    |    |    |    | None  |
|   |   |   |   |   |   |   |   |   |    |    |    |    |    |    | Yes   |
|   |   |   |   |   |   |   |   |   |    |    |    |    |    |    | Yes   |
|   |   |   |   |   |   |   |   |   |    |    |    |    |    |    | <b>Special applications &amp; fill fluid</b>  |
|   |   |   |   |   |   |   |   |   |    |    |    |    |    |    | Treatment   |
|   |   |   |   |   |   |   |   |   |    |    |    |    |    |    | Fill fluid  |
|   |   |   |   |   |   |   |   |   |    |    |    |    |    |    | None (std)  |
|   |   |   |   |   |   |   |   |   |    |    |    |    |    |    | Silicone oil  |
|   |   |   |   |   |   |   |   |   |    |    |    |    |    |    | Degreasing  |
|   |   |   |   |   |   |   |   |   |    |    |    |    |    |    | Silicone oil  |
|   |   |   |   |   |   |   |   |   |    |    |    |    |    |    | NACE  |
|   |   |   |   |   |   |   |   |   |    |    |    |    |    |    | Silicone oil  |
|   |   |   |   |   |   |   |   |   |    |    |    |    |    |    | <b>Processconnection (welded) adaptor - all stainless steel parts</b>                         |
|   |   |   |   |   |   |   |   |   |    |    |    |    |    |    | 1/2 - 14 NPTI   |
|   |   |   |   |   |   |   |   |   |    |    |    |    |    |    | Rc 1/2 I  |
|   |   |   |   |   |   |   |   |   |    |    |    |    |    |    | 1/4 - 18 NPTI   |
|   |   |   |   |   |   |   |   |   |    |    |    |    |    |    | 1/2 - 14 NPTE   |
|   |   |   |   |   |   |   |   |   |    |    |    |    |    |    | G 1/2"A manometer fitting   |
|   |   |   |   |   |   |   |   |   |    |    |    |    |    |    | M20 x 1,5   |

Note\* :

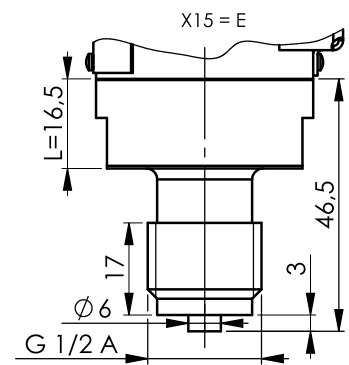
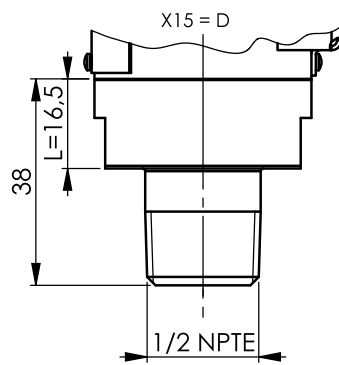
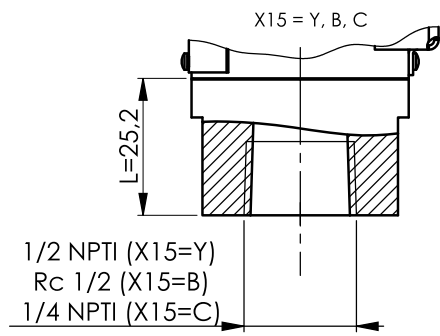
1- Code "D" & "V" FM approval only possible with electrical connection 1/2-14 NPT.

**OUTLINE DIAGRAM (unit:mm)**

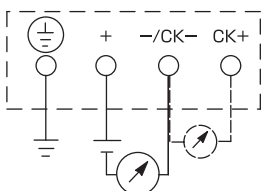


**WEIGHT:**  
**1,7 kg ( WITHOUT OPTION )**  
 ADD : - **0,4 kg** FOR MOUNTING BRACKET  
 - **1,5 kg** FOR STAINLESS STEEL HOUSING OPTION

|   |                         |                     |
|---|-------------------------|---------------------|
| X <sub>1</sub> X <sub>2</sub> X <sub>3</sub> X <sub>4</sub> X <sub>5</sub> X <sub>6</sub> X <sub>7</sub> X <sub>8</sub> - X <sub>9</sub> X <sub>10</sub> X <sub>11</sub> X <sub>12</sub> X <sub>13</sub> - X <sub>14</sub> X <sub>15</sub><br>F K H <input type="checkbox"/> 0 <input type="checkbox"/> <input type="checkbox"/> 5 - <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> - 0 <input type="checkbox"/> | <i>SPAN LIMIT</i>       |                     |
|   | Min.                    | Max.                |
| FKH□02  | 8,125 KPa (81,25 mbar)  | 130 KPa (1300 mbar) |
| FKH□03  | 31,25 KPa (0,3125 mbar) | 500 KPa (5 bar)     |
| FKH□04  | 187,5 KPa (1,875 mbar)  | 3000 KPa (30 bar)   |



## CONNECTION DIAGRAM



**EMC Directive (2004/108/EC)**

All models of **FCX** series transmitters type **FCX-All** are in accordance with :

- the harmonized standards:
  - EN 61326-1 : 2006 (Electrical equipment for measurement, control and laboratory use - EMC requirements).
  - EN 61326-2-3 : 2006 (Part 2-3 : Particular requirements - Test configuration, operational conditions and performance criteria for transducers with integrated or remote signal conditioning)

**Emission limits** : EN 61326-1 : 2006

| Frequency range (MHz) | Limits   | Basic standard                         |
|-----------------------|--|--|
| 30 to 230             | 40 dB ( $\mu\text{V/m}$ ) quasi peak, measured at 10m distance | EN 55011 / CISPR 11<br>Group 1 Class A |
| 230 to 1000           | 47 dB ( $\mu\text{V/m}$ ) quasi peak, measured at 10m distance |  |

**Immunity requirements** : EN 61326-1 : 2006 (Table 2)

| Phenomenon                              | Test value   | Basic standard                | Performance criteria |
|---|--|-------------------------------|----------------------|
| Electrostatic discharge (EDS)           | 4 kV (Contact)<br>8 kV (Air)   | EN 61000-4-2<br>IEC 61000-4-2 | <b>B</b>             |
| Electromagnetic field                   | 10V/m (80 to 1000 MHz)<br>3 V/m (1.4 to 2.0 GHz)<br>1 V/m (2.0 to 2.7 GHz) | EN 61000-4-3<br>IEC 61000-4-3 | <b>A</b>             |
| Rated power frequency<br>Magnetic field | 30 A/m   | EN 61000-4-8<br>IEC 61000-4-8 | <b>A</b>             |
| Burst                                   | 2 kV (5/50 NS, 5 kHz)  | EN 61000-4-4<br>IEC 61000-4-4 | <b>B</b>             |
| Surge                                   | 1 kV Line to line<br>2 kV Line to line                                     | EN 61000-4-5<br>IEC61000-4-5  | <b>B</b>             |
| Conducted RF                            | 3 V (150 kHz to 80 MHz)  | EN 61000-4-6<br>IEC61000-4-6  | <b>A</b>             |

Performance criteria :

**A** : During testing, normal performance within the specification limits.

**B** : During testing, temporary degradation or loss of function or performance which is self-recovering.



Fuji Electric Corp. of America  
Instrumentation & Control Division  
50 Northfield Avenue Edison, NJ 08837 USA  
Phone: 732-560-9410  
x-fea-icsales@fujielectric.com  
www.americas.fujielectric.com