



# PRESSURE TRANSMITTER (DIRECT MOUNT TYPE)

DATA SHEET

FKP...5

The FCX-AII pressure transmitter accurately measures gauge 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.



### 1. High accuracy ±0.1%

0.1% accuracy is a standard feature. Fuji's micro-capacitance silicon sensor assures this accuracy for all elevated or suppressed calibration ranges without additional adjustment.

## 2. Minimum inventory and design

Electronics unit, local indicators and electronics housing are interchageable among all FCX-All transmitters.

#### 3. Minimum environmental influence

The "Advance Floating Cell" design which protects the pressure sensor against changes in temperature, 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-AII

## 5. Application flexibility

Various options that render the FCX-AII 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. Programmable output Linearization Function

Output signal can be freely programmable.

(Up to 14 compensated points at approximation)

# 7. 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.

#### 8. 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:

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

Service:

Liquid, gas, or vapour

Span, range and overrange limit:

Type	Span limit	kPa {b	ar}	Range limit	Overrange limit		
	Min.	Ма	ax.	kPa {bar}	MPa {bar}		
FKP□01	8.125	130		-100 to +130	1		
	{0.08125}		{1.3}	{-1 to +1.3}		{10}	
FKP□02	31.25	500		-100 to +500	1.5		
	{0.3125}		{5}	{-1 to +5}		{15}	
FKP□03	187.5	3000		-100 to +3000	9		
	{1.875}		{30}	{-1 to +30}		{90}	
FKP□04	625	10000	. ,	-100 to +10000	15	. ,	
	{6.25}		{100}	{-1 to +100}		{150}	

Lower range limit (vacuum limit) is:

Silicone fill sensor: See Fig. 1

Fluorinated fill sensor: 66 kPa abs (500mmHg abs) at below  $60^{\circ}\text{C}$ 

#### **Output signal:**

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

#### Power supply:

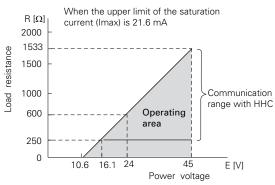
Transmitter operates on 10.5 to 45 V DC at transmitter terminals.

10.5 to 32 V DC for the units with optional arrester

Fuji Electric France S.A.S..

EDSF5-98i
Date October, 2015

## Load limitations: see figure below



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

R [
$$\Omega$$
] =  $\frac{\text{E [V] -10.5}}{(\text{I max [mA]+0.9})\times10^{-3}}$ 

Note: For communication with HHC  $^{\text{(1)}}$  (model: FXW), min. of 250  $\Omega$  required.

## **Hazardous locations:**

Authority (Digit 10 = )		Intrinsic safety						
ATEX (K)	Ex II 1 G Ex ia IIC T5 (- $40$ °C $\leq$ Ta $\leq$ + $50$ °C) Ex ia IIC T4 (- $40$ °C $\leq$ Ta $\leq$ + $70$ °C) IP66/67 Entity Parameters: Ui $\leq$ 28 Vdc, Ii $\leq$ 94.3 mA, Pi $\leq$ 0.66 W Ci = 36 nF/26 nF for models with/without Arrester Li = 0.7 mH/0.6 mH for models with/without Analog Indicator							
Factory Mutual	Class I II III Div.1 Groups A, B, C T4 Entity Type 4X	C, D, E, F, G						
(H)	9th digit A,B,C,D,J L,P,M,1,2,3 Q,S,N,4,5,6 E,F,G,H,K - Entity Parameters:	A,B,C,D,J Y,G,N L,P,M,1,2,3 Y,G,N Q,S,N,4,5,6 Y,G,N E,F,G,H,K Y,G,N - W,A,D  Entity Parameters: Vmax=42.4V, Imax=113mA, Pi=1W,						
CSA (J)	Class II, Groups E,F Per drawing TC 5228 Temp. code T5 for Ta Temp. code T4 for Ta Entity Parameters: Vmax = 28 Vdc, Ima: Ci = 36 nF/25 nF for	Ex ia Class I, Groups A, B, C and D; Class II, Groups E,F and G; Class III Per drawing TC 522873 Temp. code T5 for Tamb max = +50°C Temp. code T4 for Tamb max = +70°C Entity Parameters: Vmax = 28 Vdc, Imax = 94.3 mA, Pmax = 0.66 W Ci = 36 nF/25 nF for models with/without Arrester						
IECEx (T)	Li = 0.7 mH/0.6 mH for models with/without Analog Indicator  Ex ia IIC T5 (-40°C ≤ Ta ≤+50 °C)  Ex ia IIC T4 (-40°C ≤ Ta ≤+70 °C)  IP66/67  Entity Parameters:  Ui ≤ 28 Vdc, Ii ≤ 94.3 mA, Pi ≤ 0.66 W  Ci = 36 nF/26 nF for models with/without Arrester  Li = 0.7 mH/0.6 mH for models with/without Analog Indicator							

Authority		Flameproof						
ATEX	Ex II 2 GD	·						
	Ex d IIC T6 (-40°C ≤							
(X)	Ex d IIC T5 (-40°C ≤ Ta ≤ +85 °C) Ex tD A21 IP66/67 T 85°C							
	Ex tD A21 IP66/67 T Electrical ratings	100°C						
	Model Without arrest							
	Ui ≤ 45 Vdc, 4-20 m/ Model With arrester:	A loop powered, F	Pi ≤ 1.0125 W					
	Ui ≤ 32 Vdc, 4-20 m/	A loop powered, F	Pi ≤ 1.0125 W					
Factory Mutual	Class I							
Muluai	Div.1 Groups B, C, D T6 Type 4X							
	Class II III Div.1 Groups E, F, G							
(D)	T6 Type 4X							
004	Tamb max = +60°C	10						
CSA	Class I, Groups C an Class II, Groups E,F							
(E)	Maximum ambient te Maximum working pr							
(=)	Electrical ratings	·						
	Model Without arrest Ui ≤ 45 Vdc, 4-20 m/							
	Model With arrester: Ui ≤ 32 Vdc, 4-20 m/							
	Note: "Seal not requi							
IECEx	Ex d IIC T6 (-40°C ≤	Ta ≤ +65 °C)						
	Ex d IIC T5 (-40°C ≤ DIP A21 IP66/67 T 8							
(D)	DIP A21 IP66/67 T 1							
(R)	Electrical ratings  Model Without arrest	er:						
	Ui ≤ 45 Vdc, 4-20 m/ Model With arrester:	A loop powered, F	Pi ≤ 1.0125 W					
	Ui ≤ 32 Vdc, 4-20 m/	A loop powered, F	Pi ≤ 1.0125 W					
Authority		Type n						
(Digit 10 = )		Nonincendive						
ATEX	Ex II 3 G							
		Ta ≤+70 °C)						
	Ex nA II T5 (-40°C ≤ 1P66/67	Ta ≤+70 °C)						
(P)	Ex nA II T5 (-40°C ≤ IP66/67 Electrical ratings Model Without arrest	er:						
(P)	Ex nA II T5 (-40°C ≤ IP66/67 Electrical ratings Model Without arrest Ui ≤ 45 Vdc, 4-20 mA	er:	Pi ≤ 1.0125 W					
(P)	Ex nA II T5 (-40°C ≤ IP66/67 Electrical ratings Model Without arrest Ui ≤ 45 Vdc, 4-20 mA Model With arrester: Ui ≤ 32 Vdc, 4-20 mA	er: A loop powered, F A loop powered, F	Pi ≤ 1.0125 W					
(P)	Ex nA II T5 (-40°C ≤ IP66/67 Electrical ratings Model Without arrest Ui ≤ 45 Vdc, 4-20 mA Model With arrester:	er: A loop powered, F A loop powered, F	Pi ≤ 1.0125 W					
Factory	Ex nA II T5 (-40°C ≤ IP66/67 Electrical ratings Model Without arrest Ui ≤ 45 Vdc, 4-20 m/ Model With arrester: Ui ≤ 32 Vdc, 4-20 m/ Optional Analog indic	er: A loop powered, F A loop powered, F eator is not availa	Pi ≤ 1.0125 W					
	Ex nA II T5 (-40°C ≤ IP66/67 Electrical ratings Model Without arrest Ui ≤ 45 Vdc, 4-20 mA Model With arrester: Ui ≤ 32 Vdc, 4-20 mA Optional Analog indic	er: A loop powered, F A loop powered, F eator is not availa	Pi ≤ 1.0125 W					
Factory	Ex nA II T5 (-40°C ≤ IP66/67 Electrical ratings Model Without arrest Ui ≤ 45 Vdc, 4-20 m/ Model With arrester: Ui ≤ 32 Vdc, 4-20 m/ Optional Analog indic Class I II III Div.2 Groups A, B, C T4 Entity Type 4X	er: A loop powered, F A loop powered, F cator is not availa C, D, F, G	Pi ≤ 1.0125 W					
Factory	Ex nA II T5 (-40°C ≤ IP66/67 Electrical ratings Model Without arrest Ui ≤ 45 Vdc, 4-20 m/ Model With arrester: Ui ≤ 32 Vdc, 4-20 m/ Optional Analog indic  Class I II III Div.2 Groups A, B, C T4 Entity Type 4X  Model code 9th digit A,B,C,D,J	er: A loop powered, F cator is not availa  C, D, F, G  13th digit Y,G,N	Pi ≤ 1.0125 W ble for type "n"  Tamb  -40°C to +85°C					
Factory Mutual	Ex nA II T5 (-40°C ≤ IP66/67 Electrical ratings Model Without arrest Ui ≤ 45 Vdc, 4-20 m/ Model With arrester: Ui ≤ 32 Vdc, 4-20 m/ Optional Analog indic  Class I II III Div.2 Groups A, B, C T4 Entity Type 4X  Model code 9th digit A,B,C,D,J L,P,M,1,2,3	er: A loop powered, F ator is not availa C, D, F, G  13th digit Y,G,N  Y,G,N	Pi ≤ 1.0125 W ble for type "n"  Tamb  -40°C to +85°C  -20°C to +80°C					
Factory Mutual	Ex nA II T5 (-40°C ≤ IP66/67 Electrical ratings Model Without arrest Ui ≤ 45 Vdc, 4-20 m/ Model With arrester: Ui ≤ 32 Vdc, 4-20 m/ Optional Analog indic  Class I II III Div.2 Groups A, B, C T4 Entity Type 4X  Model code 9th digit A,B,C,D,J	er: A loop powered, F ator is not availa C, D, F, G  13th digit Y,G,N Y,G,N Y,G,N Y,G,N	Pi ≤ 1.0125 W ble for type "n"  Tamb  -40°C to +85°C  -20°C to +80°C  -20°C to +60°C  -40°C to +60°C					
Factory Mutual (H)	Ex nA II T5 (-40°C ≤ IP66/67 Electrical ratings Model Without arrest Ui ≤ 45 Vdc, 4-20 m/ Model With arrester: Ui ≤ 32 Vdc, 4-20 m/ Optional Analog indic  Class I II III Div.2 Groups A, B, C T4 Entity Type 4X  Model code 9th digit A,B,C,D,J L,P,M,1,2,3 Q,S,N,4,5,6 E,F,G,H,K	er: A loop powered, F ator is not availa C, D, F, G  13th digit Y,G,N Y,G,N	Pi ≤ 1.0125 W ble for type "n"  Tamb  -40°C to +85°C  -20°C to +80°C  -20°C to +60°C					
Factory Mutual	Ex nA II T5 (-40°C ≤ IP66/67 Electrical ratings Model Without arrest Ui ≤ 45 Vdc, 4-20 m/ Model With arrester: Ui ≤ 32 Vdc, 4-20 m/ Optional Analog indic Class I II III Div.2 Groups A, B, C T4 Entity Type 4X  Model code 9th digit A,B,C,D,J L,P,M,1,2,3 Q,S,N,4,5,6 E,F,G,H,K - Class I	er: A loop powered, F cator is not availa  C, D, F, G  13th digit Y,G,N Y,G,N Y,G,N Y,G,N W,A,D	Pi ≤ 1.0125 W ble for type "n"  Tamb  -40°C to +85°C  -20°C to +80°C  -20°C to +60°C  -40°C to +60°C					
Factory Mutual (H)	Ex nA II T5 (-40°C ≤ IP66/67 Electrical ratings Model Without arrest Ui ≤ 45 Vdc, 4-20 m/ Model With arrester: Ui ≤ 32 Vdc, 4-20 m/ Optional Analog indic Class I II III Div.2 Groups A, B, C T4 Entity Type 4X  Model code 9th digit A,B,C,D,J L,P,M,1,2,3 Q,S,N,4,5,6 E,F,G,H,K  Class I Div.2 Groups A, B, C Class II	er: A loop powered, F cator is not availa  C, D, F, G  13th digit Y,G,N Y,G,N Y,G,N Y,G,N W,A,D	Pi ≤ 1.0125 W ble for type "n"  Tamb  -40°C to +85°C  -20°C to +80°C  -20°C to +60°C  -40°C to +60°C					
Factory Mutual (H)	Ex nA II T5 (-40°C ≤ IP66/67 Electrical ratings Model Without arrest Ui ≤ 45 Vdc, 4-20 m/ Model With arrester: Ui ≤ 32 Vdc, 4-20 m/ Optional Analog indic Class I II III Div.2 Groups A, B, C T4 Entity Type 4X	er: A loop powered, F cator is not availa  C, D, F, G  13th digit Y,G,N Y,G,N Y,G,N Y,G,N W,A,D	Pi ≤ 1.0125 W ble for type "n"  Tamb  -40°C to +85°C  -20°C to +80°C  -20°C to +60°C  -40°C to +60°C					
Factory Mutual (H)	Ex nA II T5 (-40°C ≤ IP66/67 Electrical ratings Model Without arrest Ui ≤ 45 Vdc, 4-20 m/ Model With arrester: Ui ≤ 32 Vdc, 4-20 m/ Optional Analog indic Class I II III Div.2 Groups A, B, C T4 Entity Type 4X  Model code 9th digit A,B,C,D,J L,P,M,1,2,3 Q,S,N,4,5,6 E,F,G,H,K -  Class I Div.2 Groups A, B, C Class II Div.2 Groups E, F, G Class III Div.2	er: A loop powered, F cator is not availa  C, D, F, G  13th digit Y,G,N Y,G,N Y,G,N Y,G,N W,A,D	Pi ≤ 1.0125 W ble for type "n"  Tamb  -40°C to +85°C  -20°C to +80°C  -20°C to +60°C  -40°C to +60°C					
Factory Mutual (H)	Ex nA II T5 (-40°C ≤ IP66/67 Electrical ratings Model Without arrest Ui ≤ 45 Vdc, 4-20 m/ Model With arrester: Ui ≤ 32 Vdc, 4-20 m/ Optional Analog indic Class I II III Div.2 Groups A, B, C T4 Entity Type 4X	er: A loop powered, F cator is not availa  C, D, F, G  13th digit Y,G,N Y,G,N Y,G,N Y,G,N W,A,D	Tamb  -40°C to +85°C  -20°C to +80°C  -20°C to +60°C  -40°C to +60°C  -10°C to +60°C					
Factory Mutual (H)	Ex nA II T5 (-40°C ≤ IP66/67 Electrical ratings Model Without arrest Ui ≤ 45 Vdc, 4-20 m/ Model With arrester: Ui ≤ 32 Vdc, 4-20 m/ Optional Analog indic Class I II III Div.2 Groups A, B, C T4 Entity Type 4X  Model code 9th digit A,B,C,D,J L,P,M,1,2,3 Q,S,N,4,5,6 E,F,G,H,K   Class I Div.2 Groups A, B, C Class II Div.2 Groups A, B, C Class II Div.2 Groups E, F, G Class III Div.2 Temp Code T5 Tat Entity Parameters:	er: A loop powered, F A loop powered, F A loop powered, F C D, F, G  13th digit Y,G,N Y,G,N Y,G,N W,A,D  mb max = +50°C mb max = +70°C	Pi ≤ 1.0125 W ble for type "n"  Tamb  -40°C to +85°C  -20°C to +80°C  -20°C to +60°C  -40°C to +60°C  -10°C to +60°C					
Factory Mutual (H)	Ex nA II T5 (-40°C ≤ IP66/67 Electrical ratings Model Without arrest Ui ≤ 45 Vdc, 4-20 m/ Model With arrester: Ui ≤ 32 Vdc, 4-20 m/ Optional Analog indic Class I II III Div.2 Groups A, B, C T4 Entity Type 4X  Model code 9th digit  A,B,C,D,J  L,P,M,1,2,3  Q,S,N,4,5,6  E,F,G,H,K  -  Class I Div.2 Groups A, B, C Class II Div.2 Groups E, F, G Class III Div.2 Groups E, F, G	er: A loop powered, F ator is not availa  C, D, F, G  13th digit Y,G,N Y,G,N Y,G,N Y,G,N W,A,D  mb max = +50°C mb max = +70°C x = 94.3 mA, Pma models with/with	Pi ≤ 1.0125 W ble for type "n"  Tamb  -40°C to +85°C  -20°C to +80°C  -20°C to +60°C  -40°C to +60°C  -10°C to +60°C					
Factory Mutual (H)	Ex nA II T5 (-40°C ≤ IP66/67 Electrical ratings Model Without arrest Ui ≤ 45 Vdc, 4-20 m/ Model With arrester: Ui ≤ 32 Vdc, 4-20 m/ Optional Analog indic Class I II III Div.2 Groups A, B, C T4 Entity Type 4X  Model code 9th digit A,B,C,D,J L,P,M,1,2,3 Q,S,N,4,5,6 E,F,G,H,K   Class I Div.2 Groups A, B, C Class II Div.2 Groups E, F, G Class III Div.2 Groups E, F, G Class III Div.2 Temp Code T5 Tan Temp Code T4 Tan Entity Parameters: Vmax = 28 Vdc, Imax Ci = 36 nF/25 nF for Li = 0.7 mH/0.6 mH f	er: A loop powered, F ator is not availa  C, D, F, G  13th digit Y,G,N Y,G,N Y,G,N Y,G,N W,A,D  mb max = +50°C mb max = +70°C at = 94.3 mA, Pm: models with/with/w	Pi ≤ 1.0125 W ble for type "n"  Tamb  -40°C to +85°C  -20°C to +80°C  -20°C to +60°C  -40°C to +60°C  -10°C to +60°C					
Factory Mutual (H)	Ex nA II T5 (-40°C ≤ IP66/67 Electrical ratings Model Without arrest Ui ≤ 45 Vdc, 4-20 m/ Model With arrester: Ui ≤ 32 Vdc, 4-20 m/ Optional Analog indic Class I II III Div.2 Groups A, B, C T4 Entity Type 4X  Model code 9th digit A,B,C,D,J L,P,M,1,2,3 Q,S,N,4,5,6 E,F,G,H,K   Class I Div.2 Groups A, B, C Class II Div.2 Groups A, B, C Class II Div.2 Groups A, B, C Class III Div.2 Temp Code T5 Tai Temp Code T4 Tai Entity Parameters: Vmax = 28 Vdc, Ima: Ci = 36 nF/25 nF for Li = 0.7 mH/0.6 mH f  Ex nA II T5 (-40°C ≤	er: A loop powered, F ator is not availa  C, D, F, G  13th digit Y,G,N Y,G,N Y,G,N Y,G,N W,A,D  mb max = +50°C mb max = +70°C at = 94.3 mA, Pm: models with/with/w	Pi ≤ 1.0125 W ble for type "n"  Tamb  -40°C to +85°C  -20°C to +80°C  -20°C to +60°C  -40°C to +60°C  -10°C to +60°C					
Factory Mutual (H)	Ex nA II T5 (-40°C ≤ IP66/67 Electrical ratings Model Without arrest Ui ≤ 45 Vdc, 4-20 m/ Model With arrester: Ui ≤ 32 Vdc, 4-20 m/ Optional Analog indic Class I II III Div.2 Groups A, B, C T4 Entity Type 4X  Model code 9th digit A,B,C,D,J L,P,M,1,2,3 Q,S,N,4,5,6 E,F,G,H,K   Class I Div.2 Groups A, B, C Class II Div.2 Groups E, F, G Class III Div.2 Groups E, F, G Class III Div.2 Temp Code T5 Tan Temp Code T4 Tan Entity Parameters: Vmax = 28 Vdc, Imax Ci = 36 nF/25 nF for Li = 0.7 mH/0.6 mH f	er: A loop powered, F ator is not availa  C, D, F, G  13th digit Y,G,N Y,G,N Y,G,N Y,G,N W,A,D  mb max = +50°C mb max = +70°C x = 94.3 mA, Pm: models with/with or models with/w Ta ≤+70°C)	Pi ≤ 1.0125 W ble for type "n"  Tamb  -40°C to +85°C  -20°C to +80°C  -20°C to +60°C  -40°C to +60°C  -10°C to +60°C					
Factory Mutual (H)	Ex nA II T5 (-40°C ≤ IP66/67 Electrical ratings Model Without arrest Ui ≤ 45 Vdc, 4-20 m/ Model With arrester: Ui ≤ 32 Vdc, 4-20 m/ Optional Analog indic Class I II III Div.2 Groups A, B, C T4 Entity Type 4X  Model code 9th digit  A,B,C,D,J  L,P,M,1,2,3  Q,S,N,4,5,6  E,F,G,H,K  -  Class I Div.2 Groups A, B, C Class II Div.2 Groups E, F, G Class III Div.2 Groups E, F, G Class III Div.2 Temp Code T5 Tar Temp Code T4 Tar Entity Parameters: Vmax = 28 Vdc, Imax Ci = 36 nF/25 nF for Li = 0.7 mH/0.6 mH f  Ex nA II T5 (-40°C ≤ IP66/67 Electrical ratings	er: A loop powered, F ator is not availa  C, D, F, G  13th digit Y,G,N Y,G,N Y,G,N Y,G,N W,A,D  mb max = +50°C mb max = +70°C x = 94.3 mA, Pm: models with/with or models with/w Ta ≤+70°C)	Pi ≤ 1.0125 W ble for type "n"  Tamb  -40°C to +85°C  -20°C to +80°C  -40°C to +60°C  -40°C to +60°C  -10°C to +60°C					

Model With arrester:

Ui ≤ 32 Vdc, 4-20 mA loop powered, Pi ≤ 1.0125 W Optional Analog indicator is not available for type "n"

### 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(1) or local adjustment unit with LCD

The time constant is adjustable between 0,06 to 32 sec.

## 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<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.

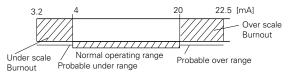
"Output Hold":

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

"Output Overscale":

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

Adjustable within the range 3.2 to 4.0 mA from HHC(1)



Output limits conforming to NAMUR NE43 by order.

#### Loop-check output:

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

## 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 by each standard.

#### Process:

-40 to +100°C for silicone oil fill sensor

-20 to +80°C for fluorinated oil fill sensor

Storage: -40 to +90°C

## **Humidity limit:**

0 to 100% RH (Relative Humidity)

## Communication:

With HHC(1) (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 FCX-All for supporting these items: "Saturate current", "Write protect", and "History".

Items		Fuji Pro with F		Hart® Pro	otocol	By local configu- rator (with 3 push button), (LCD in- dicator)		
		Display	Set	Display	Set	Display	Set	
Tag No.		v	V	v	V	v	V	
Model No.		v	V	v	V	v	v	
Serial No. Version	& Software	v	_	V	_	v	_	
Engineerin	g unit	v	V	v	V	v	v	
Range limi	t	v		V		V		
Measuring	range	v	V	v	v	V	V	
Damping		v	V	v	V	V	V	
Output	Linear	V	V	V	V	V	V	
mode	Square root	V	V	V	V	V	V	

Burnout direction	V	v	v	v	v	v
Calibration	V	v	V	v	v	v
Output adjust	_	V	_	v	_	V
Data	V	_	v	_	v	_
Self diagnoses	V	_	v	_	v	_
Printer (In case of FXW with printer option)	V	-	_	_	_	_
External switch lock	V	v	v	v	v	v
Transmitter display	V	v	v	v	v	v
Linearize*	V	v	_	_	_	_
Rerange	V	v	v	v	v	V
Saturate current	V	v	v	v	v	V
Write protect	V	V	v	v	v	V
History  - Calibration history  - Ambient temperature history	v v	<u>v</u>	v v	<u>v</u>	v v	<u>v</u>

(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(1).

## 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:

±0.1% of span

For spans below 1/10 of URL:

$$\pm (0.05 + 0.05 \frac{0.1 \text{ x URL}}{\text{span}}) \% \text{ of span}$$

## Stability:

±0.2% of upper range limit (URL) for 10 years (In case of 6th digit code "2", "3", "4")

## Temperature effect:

Effects per 55°C change between the limits of - 40°C and +85°C

Zero shift:

$$\pm (0.4 + 0.1 \frac{URL}{span})\% / 28^{\circ}C$$

Total effect:

## Overrange effect:

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

## Supply voltage effect:

Less than 0.05% fo calibrated span per 10 V

#### Update rate:

60 msec

## RFI effect:

< 0,2% of URL for the frequences 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: (without electrical 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 {1mbar} for a 10° tilt in any plane

This error can be corrected by adjusting zero.

(Double the effect for fluorinated fill sensors).

No effect on span.

#### Vibration effect:

<  $\pm 0.25\%$  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 M $\Omega$  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 M20×1.5

#### **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:

## Non-wetted parts material:

pa. 10a.10	nou parto matorian									
Material code (7th digit in Code symbols)	Process cover	Diaphragm	Wetted sensor body							
J	SS 316L	SS 316L + Gold coating	SS 316L							
V	SS 316L	SS 316L	SS 316L							

## Electronics housing:

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

Fill fluid:

Silicone oil (standard) or fluorinated oil (option)

Mounting bracket:

SS 304L

SS 316L (option)

#### **Environmental protection:**

IEC IP66/IP67 and NEMA4X

## 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; 0.5 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 without using communication with HHC.

#### Arrester:

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

Lightning surge immunity: 4 kV (1.2 x 50 μs)

#### Oxygen service:

Special cleaning procedures are followed throughout the process to maintain all process wetted parts oil-free.

The fill fluid is fluorinated oil.

#### 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.

#### Optional tag plate:

An extra stainless steel tag with customer tag data is wired to the transmitter.

#### Vacuum service :

Special silicone oil and filling procedure are applied.

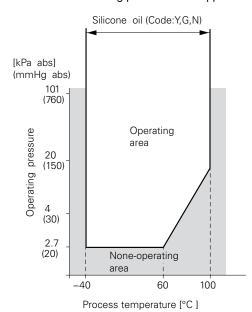


Fig.1 Relation between process temperature and operating pressure

## **ACCESSORIES**

## Hand-held communicator:

(Model FXW, refer to DSt n° EDS8-47)

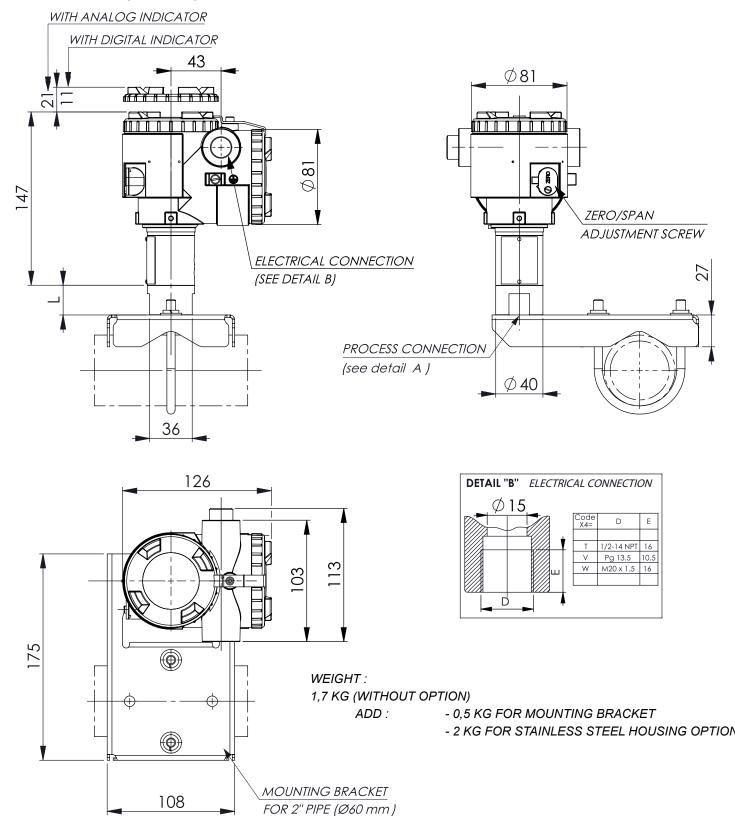
# **CODE SYMBOLS**

1 2 3	4	5	6	7	8		9	10	11	12	13		14	15							
F K P	F K P 0 5 - 0 DESCRIPTION																				
		_	_													Type	5/1 t= -4/0 -10. ** * * * * *				
	Н		_					_								Smart, 4-20 mAdc + Fuji	i/Hart® digital signal				
																Connections Process	Electrical	1			
																I I	connection				
	Т																1/2-14 NPT				
	V															1 1	Pg 13,5				
	W		_	_				_									M 20 x 1,5				
																Range & wetted parts n Span	Diaphragm material		Wetted parts		
		0	1	v													SS 316L		SS 316L		
		0	1	J												1 1	SS 316L / gold coat		SS 316L		
		0	2	٧												1	SS 316L		SS 316L		
		0	2 3	J V												1 1	SS 316L / gold coat SS 316L		SS 316L		
		0	3	J												1	SS 316L / gold coat		SS 316L SS 316L		
		0	4	٧													SS 316L		SS 316L		
	L	0	4	J												6,25/100 bar	SS 316L / gold coat		SS 316L		
																Indicator & Arrester					-
					5	_	۸	_	-		_					Indicator None			Arrester	Initial setting	-
					5 5	-	A B									Analog, 0-100% linear so	cale		None None		
					5	-	D									Analog, Custom scale			None		
					5	-	J									Analog, double scale			None		
					5	-	E	<u> </u>			_					None			Yes	4-20 mA DC	
					5 5	-	F H	-								Analog, 0-100% linear so Analog, Custom scale	cale		Yes Yes	+	
					5	-	K									Analog, double scale			Yes	·	
					5	-	L									Digital, 0-100%			None	Hart® /Fuji	
					5	-	Р									Digital, Custom scale			None	digital signal	
					5	-	Q									Digital, 0-100%			Yes	"SMART"	
					5	-	S 1									Digital, Custom scale	h huittan		Yes None		
					5 5	-	2	_								Digital, 0-100% with pusl Digital, Custom scale wit			None		
					5	-	4									Digital, 0-100% with pusl			Yes		
					5	-	5									Digital, Custom scale wit	th push button		Yes		
								Ι.								Approvals for hazardo	us locations (consult F	FUJI for availa	bility)		
								A X								None (Standard)					
								l ^	-							ATEX - Flameproof encl	osures (digit 4 = "T" & "\	N" only)			
								D	<u> </u>						(*1)	ATEX - Intrinsic Safety FM - Explosion-Proof (di	igit 4 = "T" only)				
								Е							. ,	CSA - Explosion-Proof (					
								Н								FM - Intrinsic Safety and					
								J	-							CSA - Intrinsic Safety					
								P Q	-							ATEX - Type "n" (digit 9					
								R								IECEx - Type "n" (digit 9 IECEx - Flameproof enc					
								Т								IECEx - Intrinsic Safety	Josules (digit 4 – 1 &	vv orny)			
								L								CSA - Explosion-Proof 8	& Intrinsic Safety combin	ed approval (di	igit 4 = "T" only)		
								M	L							ATEX - Flameproof encl	osures & Intrinsic Safety	combined app	oroval (digit 4 = "T"	• • • • • • • • • • • • • • • • • • • •	
								N V	<u> </u>							IECEx - Flameproof end				' & "W" only)	
								L <sub>v</sub>	-							FM - Explosion-Proof &	Intrinsic Safety combine	d approval (dig	it 4 = "T" only)		
									А							Mounting bracket None					
									C	L						Yes (SS 304L)					
																Stainless Steel parts					
											<u> </u>					Tag plate	Housing				
										Y B	<del> </del>					None Yes	None None				
										С						None	Yes				
										E						Yes	Yes				
											_	_	_			Special applications &					
											Y	<u> </u>				Treatment	Fill fluid Silicone oil				
											G	$\vdash$				None (std) Degreasing	Silicone oil				
											A					Oxygen service	Fluorinated oil				
											N					NACE	Silicone oil				
														1	<u> </u>	Processconnection (we	elded) adaptor - all stai	inless steel pa	irts		
												-	0	Y	<u> </u>	1/2 - 14 NPTI					
												-	0	B	<u> </u>	Rc 1/2 I 1/4 - 18 NPTI					
												] -	0	D		1/2 - 14 NPTE					
												-	0	E		G 1/2"A manometer fittin	ıg				
													0	F		M20 x 1,5					

#### Note\*

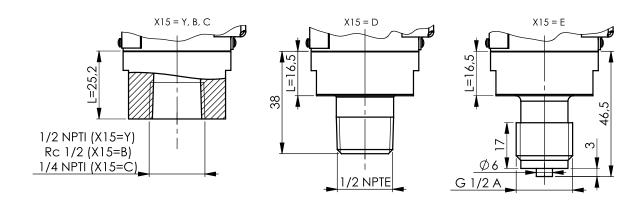
1 - Codes "D" and "V" , FM approval only possible with electrical connection 1/2"-14 NPT.

## **OUTLINE DIAGRAM (Unit:mm)**

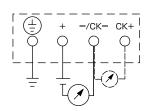


		SPAN	LIMIT
$X_1 \ X_2 \ X_3 \ X_4 \ X_5 \ X_6 \ X_7 \ X_8 - \ X_9 \ X_{10} X_{11} X_{12} X_{13} - X_{14} X_{15}$		Min.	Max.
F K P 0 V 5 - 0 - 0	FKP□01	8,125 kPa (0,08125 bar)	130 kPa (1,3 bar)
	FKP□02	31,25 kPa (0,3125 bar)	500 kPa (5 bar)
	FKP□03	187,5 kPa (1,875 bar)	3000 kPa (30 bar)
	FKP□04	625 kPa (6,25 bar)	10000 kPa (100 bar)

# **Details "A" - Process connection**



## **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 tranducers with integrated or remote signal conditioning)

Emission limits: EN 61326-1: 2006

Frequency range (MHz)	Limits	Basic standard
30 to 230	40 dB (μV/m) quasi peack, measured at 10m distance	EN 55011 / CISPR 11
230 to 1000	47 dB (μV/m) quasi peack, measured at 10m distance	Group 1 Class A

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

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

## 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.



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