

# ABSOLUTE AND GAUGE PRESSURE TRANSMITTER FOR REMOTE SEAL

**DATASHEET**
**FKP, FKH...F**

The FCX-All pressure transmitter accurately measures gauge pressure and level and transmits proportional 4 to 20mA signal.

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

## FEATURES

### 1- Outstanding accuracy

0,1 % accuracy is the standard feature for all gauge pressure models. 0,2% accuracy for all absolute pressure.

The micro-capacitance silicon sensor assures this feature for all elevated or suppressed calibration ranges without additional adjustment.

### 2- Minimum inventory and design

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

### 3- Fuji/HART® bilingual communication protocol

FCX-All series transmitter offers bilingual communication to speak both Fuji proprietary protocol and HART®.

Any HART® compatible devices can communicate with FCX-All.

### 4- Application flexibility

Example of options that render the FCX-All series suitable for almost any process applications includes :

- 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.
- Stainless steel electronics housing.
- Wide selection of materials.
- High temperature and high vacuum seals.

### 6- Programmable output Linearization Function

In addition to linear and square root, output signal is freely programmable.

### 7- Burnout current flexibility (Under Scale : 3,2 to 4,0mA, Over scale : 20,8 to 22,5mA)

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), reliability of dry calibration without reference pressure is at equal level as wet calibration.



## SPECIFICATIONS

### Functional specifications

#### Type :

Absolute and gauge pressure transmitter with remote seal :

- FKH or FKP : Smart, 4-20mA DC + Fuji/Hart® digital signal

#### Service :

Liquid, gas or vapour.

#### Span, range and overrange limits :

Model	Span limits (bar)		Range limits (bar)	Overrange limits (bar)
	Minimum	Maximum		
	FKP			
F□P□01	0,08125	1,3	-1 à +1,3	10
F□P□02	0,3125	5	-1 à +5	15
F□P□03	1,875	30	-1 à +30	90
F□P□04	6,25	100	-1 à +100	150
	FKH (barabs)		(barabs)	(barabs)
F□H□02	0,08125	1,3	0 à +1,3	5
F□H□03	0,3125	5	0 à +5	15
F□H□04	1,875	30	0 à +30	90

Note: to minimise environmental influence, span should be greater than 1/10 of the max. span in most applications.

**Output signal :**

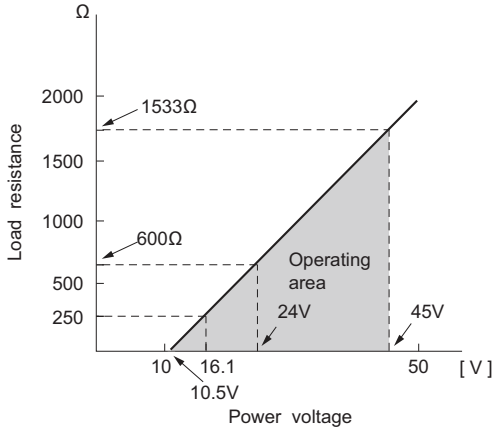
4-20 mA DC with digital signal superimposed on the 4/20 mA signal.

**Power supply :**

Transmitter operates on 10,5 to 45V DC at transmitter terminals

10,5 to 32V DC for the units with optional arrester.

**Load limitations :**



Note : digital communication with FXW/HART™ requires min 250Ω load resistance.

**Hazardous locations :**

Authority (Digit 10 = )	Intrinsic safety																					
ATEX (K)	Ex II 1 G 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, li ≤ 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																					
Factory Mutual (H)	Class I II III Div.1 Groups A, B, C, D, E, F, G T4 Entity Type 4X <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> Entity Parameters: Vmax=42.4V, Imax=113mA, Pi=1W, Ci=35.98nF, Li=0.694mH	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 (J)	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 Li = 0.7 mH/0.6 mH for models with/without Analog Indicator																					
IECEX (T)	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, li ≤ 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 (X)	Ex II 2 GD Ex d IIC T6 (-40°C ≤ Ta ≤ +65 °C) Ex d IIC T5 (-40°C ≤ Ta ≤ +85 °C) Ex tD A21 IP66/67 T 85°C Ex tD A21 IP66/67 T 100°C Electrical ratings Model Without arrester: Ui ≤ 45 Vdc, 4-20 mA loop powered, Pi ≤ 1.0125 W Model With arrester: Ui ≤ 32 Vdc, 4-20 mA loop powered, Pi ≤ 1.0125 W
Factory Mutual (D)	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 (E)	Class I, Groups C and D; Class II, Groups E, F and G ; Class III Maximum ambient temperature 85°C Maximum working pressure 50 Mpa Electrical ratings Model Without arrester: Ui ≤ 45 Vdc, 4-20 mA Model With arrester: Ui ≤ 32 Vdc, 4-20 mA Note: "Seal not required"
IECEX (R)	Ex d IIC T6 (-40°C ≤ Ta ≤ +65 °C) Ex d IIC T5 (-40°C ≤ Ta ≤ +85 °C) DIP A21 IP66/67 T 85°C DIP A21 IP66/67 T 100°C Electrical ratings Model Without arrester: Ui ≤ 45 Vdc, 4-20 mA loop powered, Pi ≤ 1.0125 W Model With arrester: Ui ≤ 32 Vdc, 4-20 mA loop powered, Pi ≤ 1.0125 W

Authority (Digit 10 = )	Type n Nonincendive																					
ATEX (P)	Ex II 3 G Ex nA II T5 (-40°C ≤ Ta ≤ +70 °C) IP66/67 Electrical ratings Model Without arrester: Ui ≤ 45 Vdc, 4-20 mA loop powered, Pi ≤ 1.0125 W Model With arrester: Ui ≤ 32 Vdc, 4-20 mA loop powered, Pi ≤ 1.0125 W Optional Analog indicator is not available for type "n"																					
Factory Mutual (H)	Class I II III Div.2 Groups A, B, C, D, F, G T4 Entity Type 4X <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 (J)	Class I Div.2 Groups A, B, C, D Class II Div.2 Groups E, F, G Class III Div.2 Temp Code T5 Tamb max = +50°C Temp Code T4 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 Li = 0.7 mH/0.6 mH for models with/without Analog Indicator																					
IECEX (Q)	Ex nA II T5 (-40°C ≤ Ta ≤ +70 °C) IP66/67 Electrical ratings Model Without arrester: Ui ≤ 45 Vdc, 4-20 mA loop powered, Pi ≤ 1.0125 W 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 by hand held communicator in Hart® or Fuji protocol. Local adjustment of zero and span are possible from outside screw on the electronic housing.

**Damping:**

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

The time constant is adjustable between 0 to 32 seconds.

**Zero elevation/suppression:**

Zero can be elevated or suppressed within the specified range limit of each sensor model.

**Normal/reverse action:**

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

**Indication:**

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

**Burnout direction:** selected from the HHC

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

**"Output Hold" :**

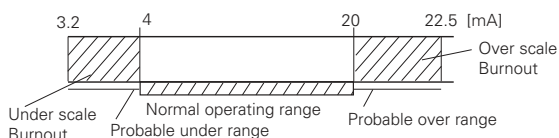
Output signal is hold as the value just before the failure happens.

**"Output Overscale" :**

Adjustable within the range 20,0 mA to 22,5 mA from the hand held communicator (HHC).

**"Output Underscale" :**

Adjustable within the range 3,2 mA to 4,0 mA from the HHC<sup>(1)</sup>



**Loop check output :**

Transmitter can be configured via HHC to provide constant signal between 3,2 and 22,5 mA.

**Temperature limit :**

Ambient :

- 40 to + 85°C
- 20 to + 80°C (LCD indicator)
- 40 to + 60°C (arrestor option)
- 20 to + 80°C (fluorinated oil filling of the cell)

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

Process :

Check in the seal datasheet with the specific temperature conditions

Storage :

- 40 to + 90°C

**Humidity :**

0 to 100% RH

**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 FCX-All for supporting these items : "Saturate current", "Write protect", and "History".

Items	Fuji Protocol with FXW		Hart® Protocol	
	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	✓	—	✓	—

(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**

(under reference conditions).

**Accuracy rating :**

(Including linearity, hysteresis & repeatability)

For span greater than 1/10 of URL :

±0,1 % of calibrated span (FKP)

±0,2 % of calibrated span (FKH)

For span smaller than 1/10 of URL :

±(0,05 + 0,05 x 0,1 x URL/span) % of span (FKP)

±(0,1 + 0,1 x 0,1 x URL/span) % of span (FKH)

**Stability :**

±0,2% of upper range (URL) for 10 years

**Temperature effect :**

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

**Model FKP :**

Zero shift :

±(0,4 + 0,1 x URL/span) %/28°C

Total effect :

±(0,475 + 0,1 x URL/span) %/28°C

**Model FKH :**

Zero shift :

±(0,4 + 0,2 x URL/span) %/28°C

Total effect :

±(0,475 + 0,2 x URL/span) %/28°C

**Overrange effect :**

Zero shift :

±0,3% of URL for any overrange pressures (limited to the max. overrange pressure)

**Supply voltage effect :**

< 0,05% of calibrated span per 10V.

**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 :** (at 63,2% of output signal)

Time constant : 200 msec  
 Dead time : about 300 msec  
 Response time = time constant + dead time  
 Note : faster response time is available as option - Consult Fuji Electric

**Mounting position effect :**

Zero shift : <10mm WC for 10° incline in any position. This shift can be corrected with the zero adjustment.  
 The effect is doubled for fluorinated oil filling.  
 No influence on span adjustment.

**Vibration effect:**

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

**Material fatigue:**

Please consult Fuji Electric.

**Dielectric strength :**

500 V AC 50/60Hz during 1 minute between circuit and earth.

**Insulation resistance :**

> 100 MΩ at 500 Vdc.

**Turn on time :**

4 seconds

**Internal resistance for external field indicator :**

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

**Physical specifications**

**Electrical connections :**

1/2"-14 NPT, Pg13,5 or M20x1,5

**Non wetted parts material :**

Electronics housing :  
 Low copper die cast aluminium alloy finished with polyester coating (standard), or 316 SS as specified.

**Filling fluid :**

Standard : silicone oil  
 Upon request : fluorinated oil

**Environmental protection :**

IP66/IP67

**Weight :**

Transmitter alone : about 1,9 kg  
 Add : 0,5 kg for mounting bracket  
 0,8 kg for indicator option

**Diaphragm seal(s) :**

For seal selection, please refer to enclosed datasheet for diaphragm seals.

**Optional features**

**Indicator :**

A plug-in turnable analog indicator can be housed in the electronics compartment or in the terminal box of the housing.

An optional 5 digits LCD meter, which can be fitted on the electronic side is also available.

**Arrester :**

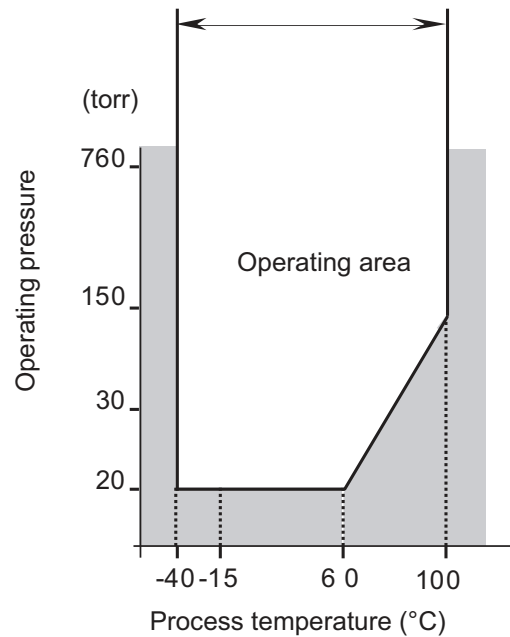
A built-in arrester protects the electronics from lightning surges.

**NACE specifications :**

Metallic materials for all pressure boundary parts comply with NACE MR 01-75.

**Vacuum service :**

Silicone oil (code : Y, G, N)



**Relation between max.temperature an operating pressure for transmitter only**

**Custom tag :**

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

**ACCESSORIES**

**Hand Held Communicator :** (refer to the FXW datasheet)





# DIAPHRAGM SEALS

S

Diaphragm seals are used to measure accurately hydrostatic level liquid on open tanks or pressure measurement in line. The use of the diaphragm seal avoids that the measuring cell is directly in contact with the process. The welded seal construction assures excellent reliability in high temperature and vacuum applications. The seals can be used for high corrosive, viscous, sticking, crystallizable and abrasive process conditions.

## FEATURES

### 1- Construction

The diaphragm seals are mounted on gauge and absolute pressure transmitters of FCX-All series. The seal is rigid, (direct) mounted on the transmitter. For capillary mounting design, please consult Fuji Electric.

The construction is an all welded design without any gasket between the seal and the transmitter diaphragm and is filled with the suitable oil for your application.

### 2- Operating principle

The measuring pressure is applied on the diaphragm seal and transferred by the filling to the measuring cell of the pressure transmitter.

### 3- Parts materials

Wetted parts materials (diaphragm and gasket face) are in Stainless Steel, Tantalum, Hastelloy, Monel, Titanium, Zirconium, Nickel depending on the application requirements.

Other parts are in stainless steel : reduced volume flange, diaphragm seal body, direct mounting connection parts.

Standard filling fluid is silicone oil. Fluorinated oil, sanitary oil, high temperature oil and vacuum service filling are available through model code selection.

### 4- Diaphragm seal types

According to the mounting and operating conditions different seal types can be useful :

- Flush mounting design for DN40 to DN 125.
- Seals with extensions (50 to 200 mm).
- Seals for sanitary applications according DIN, SMS, Tri-Clamp standards.
- Screwed, flush mounted connections G 1"1/2 and G 2".

## SPECIFICATIONS

### 1- Diaphragm seal application :

The seal can be mounted direct or rigid on the transmitter (for example for liquid level measurement at the bottom of a tank).

### 2- Temperature limit :

Ambient temperature : -40 to 85°C for transmitter

Process temperature : -40 to 150°C

and according the filling fluid limitations

Please consult Fuji for higher process temperature

### 3- Pressure limits :

Working pressure :

Working pressure of the transmitter or nominal flange rating of the diaphragm seal (PN). (please take the smallest of both)

Vacuum limit : depending of the limit of the transmitter and the filling fluid of the seal.

The lowest vacuum is 20 Torr or 27mbar abs for gauge pressure transmitters.



## Performance specifications

To calculate the total performance, both the transmitter and the diaphragm seals performances have to be considered.

### Accuracy : (at reference conditions)

The assembling of a diaphragm seal on a transmitter increases the accuracy error at reference conditions of 0,1% of the span.

### Ambient temperature effect :

- Effect when transmitter alone is corrected

Seal	Effect (mbar/10°C)
DN50/2" (ss diaphragm)	2,03
DN80/3" (ss diaphragm)	0,11
DN80/3" (other diaph. mater.)	0,22
DN100/4" (ss diaphragm)	0,04
Adaptor (ss diaphragm)	0,11
Clamp 2"	2,06
DN 50 or 2" (SMS or DIN 11851)	2,85
No dead volume	5,16
G 1" 1/2	5,16
G 2"	2,03

Note : the indicated values are in mbar/10°C

- Effect when transmitter and the seal assembly is corrected  
**The zero drift due to ambient temperature changes are improved (between 2 and 5 times) by an additional temperature correction operation of the complete transmitter unit (transmitter and seal).**

(See code L digit 11 of the codification FKP)

### Process temperature effect :

Seal	Effect (mbar/10°C)
DN50/2" (ss diaphragm)	1,24
DN80/3" (ss diaphragm)	0,17
DN80/3" (other diaph.mater.)	0,73
DN100/4" (ss diaphragm)	0,08
Adaptor (ss diaphragm)	0,17
Clamp 2"	2,61
DN 50 or 2" (SMS or DIN 11851)	4,22
No dead volume	5,16
G 1" 1/2	1,42
G 2"	1,24

Note : the indicated values are in mbar/10°C

### Filling fluid of the diaphragm seals :

Code digit 7	Designation	Temperature resistance (°C)		Density (25°C)
		P abs ≥ 1bar	P abs < 1bar	
Y	Silicone oil	-40 to +150	-40 to +120	0,934
W	Fluorinated oil	-20 to +100	-20 to +80	1,84
F	Sanitary fill fluid	-10 to +150	-10 to +120	0,92
V	Silicone oil	20 to +200		1,09
T	Silicone oil	20 to +350	20 to +200	1,09

These values and limits are indicated for the most common applications (standard filling fluids).

Please ask Fuji Electric for special applications indicating your temperature, pressure and vacuum conditions (vacuum and temperature can occur together); other filling fluids can be used for your applications.

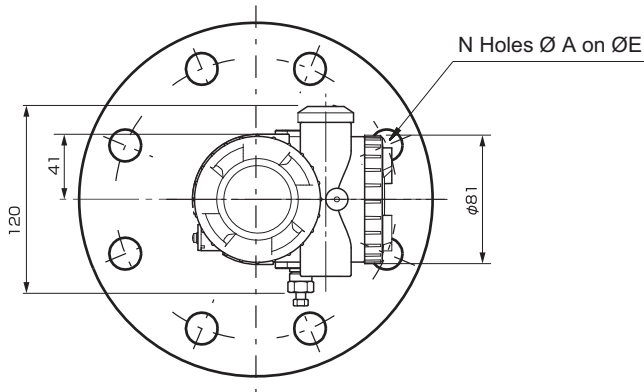
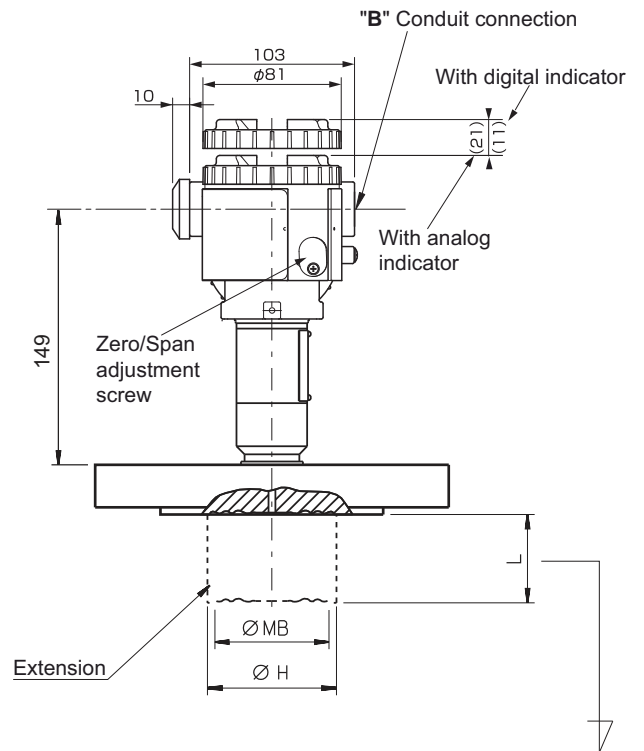
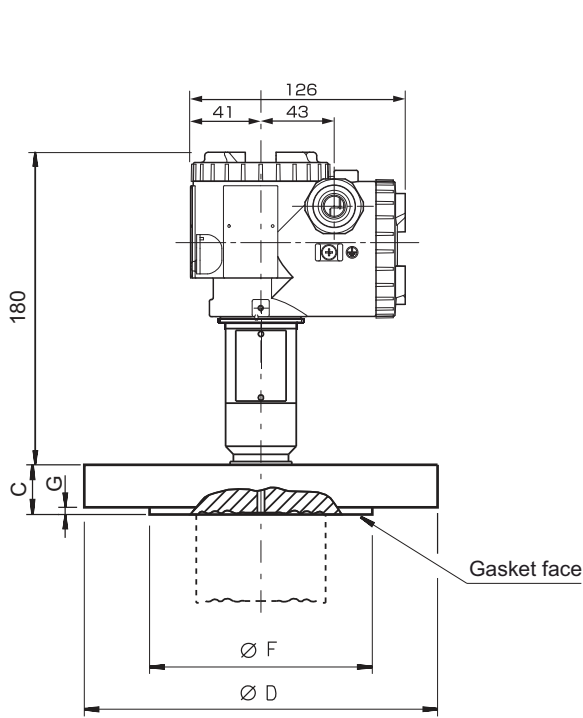
CODE SYMBOLS - S

1	2	3	4	5	6	7	8	DESCRIPTION
S								Flanged axial diaphragm seal connection
A								Flanged radial diaphragm seal connection - Not possible with rigid mounting design digit 6 : code R
R								Wafer type - Not possible with rigid mounting design digit 6 : code R
W								
								(*1) <b>Flanges RF (Flange size and rating)</b>
4								ANSI-150LB 3"-ISO PN 20 DN 80
5								ANSI-150LB 4"-ISO PN 20 DN 100
6								ANSI-300LB 3"-ISO PN 50 DN 80
7								ANSI-300LB 4"-ISO PN 50 DN 100
8								DIN PN40 DN80
9								DIN PN16 DN100
H								(*2) ANSI-150LB 2"-ISO PN 20 DN 50
J								(*2) ANSI-300LB 2"-ISO PN 50 DN 50
G								(*2) DIN PN40 DN50
K								(*9) G 2" screwed seal
L								(*9) G 1 1/2" screwed seal
U								PN 25 / DN 50 - coupling nut      DIN 11851 design      material code "V" only
V								PN 40 / DN 50 - coupling nut      SMS      material code "V" only
W								PN 40 / DN 50      Clamp      material code "V" only
X								No dead volume      Sanitary      material code "V" only
A								(*3) Flange adaptor PN 40 DN 25      material code "V" - others UR
B								(*3) Flange adaptor ISO PN 20 DN 25 (1"-150 ANSI)      material code "V" - others UR
C								(*3) Flange adaptor ISO PN 50 DN 25 (1"- 300 ANSI)      material code "V" - others UR
D								(*3) Flange adaptor PN 40 DN 40      material code "V" - others UR
E								(*3) Flange adaptor ISO PN 20 DN 40 (1"1/2 - 150 ANSI)      material code "V" - others UR
F								(*3) Flange adaptor ISO PN 50 DN 40 (1"1/2 - 300 ANSI)      material code "V" - others UR
S								(*3) Screwed 1/2 NPTE      material code "V" - others UR
T								(*3) To be welded (pipe 2"1/2)      material code "V" - others UR
								<b>Diaphragm seal material</b>
								Diaphragm      Flange raised face      Flange
V								SS 316 L      SS 316 L      SS 316 L
H								Hastelloy-C      Hastelloy-C      SS 316 L
B								Monel      Monel      SS 316 L
T								Tantalum      Tantalum      SS 316 L
P								Titanium      Titanium      SS 316 L
R								Zirconium      Zirconium      SS 316 L
C								SS 316 L + gold coat      SS 316 L      SS 316 L
F								SS 316L + FEP lining      SS 316 L + FEP lining      SS 316 L
								<b>Diaphragm seal design</b>
Y								Flush mounting
A								(*5) Diaphragm extension 50 mm
B								(*5) Diaphragm extension 100 mm      material code "V" - digit 4
C								(*5) Diaphragm extension 150 mm
D								(*5) Diaphragm extension 200 mm
E								(*5) Diaphragm extension 50 mm
F								(*5) Diaphragm extension 100 mm      material code "H" - digit 4
G								(*5) Diaphragm extension 150 mm
H								(*5) Diaphragm extension 200 mm
J								(*5) Diaphragm extension 50 mm
K								(*5) Diaphragm extension 100 mm      material code "B" - digit 4
L								(*5) Diaphragm extension 150 mm
M								(*5) Diaphragm extension 200 mm
P								(*5) Diaphragm extension 50 mm
R								(*5) Diaphragm extension 100 mm      material code "T" - digit 4
S								(*5) Diaphragm extension 150 mm
T								(*5) Diaphragm extension 200 mm
								<b>Transmission diaphragm seal to measuring cell</b>
								Mounting design      Capillary length      Capillary design
A								Capillary      1,5 m      PVC protection
B								Capillary      3 m      PVC protection
C								Capillary      6 m      PVC protection
D								Capillary      Upon request      PVC protection
G								(*6) Capillary      1,5 m      SS sheald (*8)
H								(*6) Capillary      3 m      SS sheald (*8)
K								(*6) Capillary      6 m      SS sheald (*8)
L								(*6) Capillary      Upon request      SS sheald (*8)
S								Rigid design - not possible with digit 2 = R, W ; max. process temperature : 150°C
								<b>Special applications and fill fluid for the diaphragm seal only</b>
								Treatment      Fill fluid
Y								None (standard)      Silicone oil
W								None (standard)      Fluorinated oil
F								None (standard)      Sanitary fill fluid
D								Chlorine service      Fluorinated oil
G								Degreasing      Silicone oil
A								Oxygen service      Fluorinated oil
								material code "V" only
N								NACE      Silicone oil
V								Vacuum      Silicone oil
T								(*7) Very high temperature (20 to 350°C)      Silicone oil

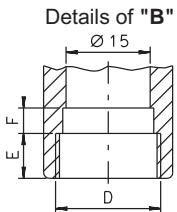
- Notes :
- 1\* Standard flange machining = stock finish ; Different flange machinings (recess, groove, ...) upon request- For material code H, B, T, P, R, F = smooth finish
  - 2\* Only available with span higher than 1 bar - Ask FUJI with operating conditions
  - 3\* Axial diaphragm seal connection - no extension possible
  - 4\* Not possible with digit 7 : V, H, T
  - 5\* All wetted parts in the same material (diaphragm, extension, flange gasket area) - other flange designs are available  
- Only available with flange size digit 3 code 4, 5, 6, 7, 8, 9, H, J, G
  - 6\* Recommended for Vacuum or High Temperature applications T > 120°C - (Capillary internal diameter = 2mm)
  - 7\* Consult FUJI for your application with the specific operating conditions
  - 8\* Max process temperature 150 °C
  - 9\* Only for rigid mounted design on transmitter



# Outline dimensions for rigid mounted diaphragm seal on a gauge pressure transmitter (units : mm)



Diaphragm seal		L
SA □ □	Y	0
	AEJP	50
	BFKR	100
	CGLS	150
	DHMT	200
	S □	

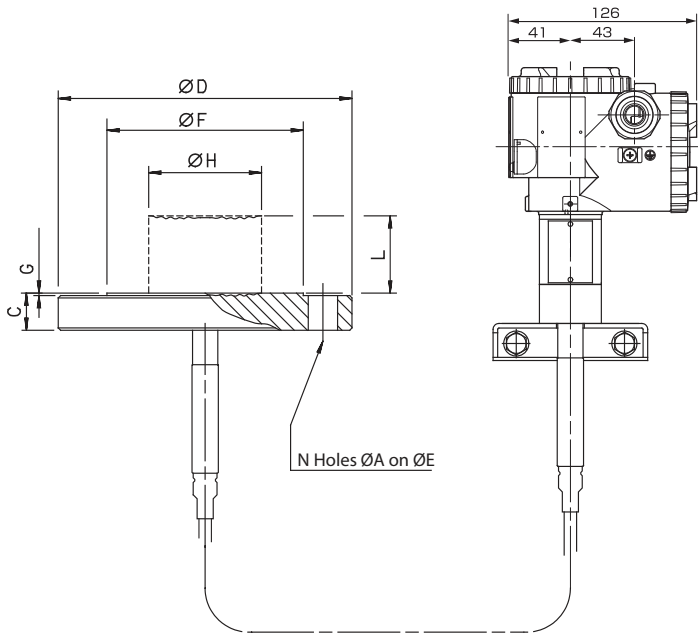


CODE	CONDUIT CONN.		
	D	E	F
T	1/2-14NPT	16	5
V	Pg 13.5	8	4.5
W	M20x1.5	16	5

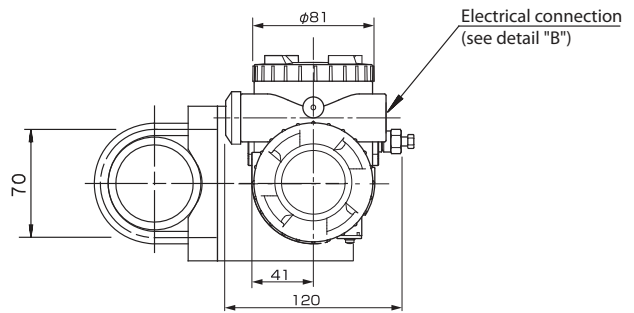
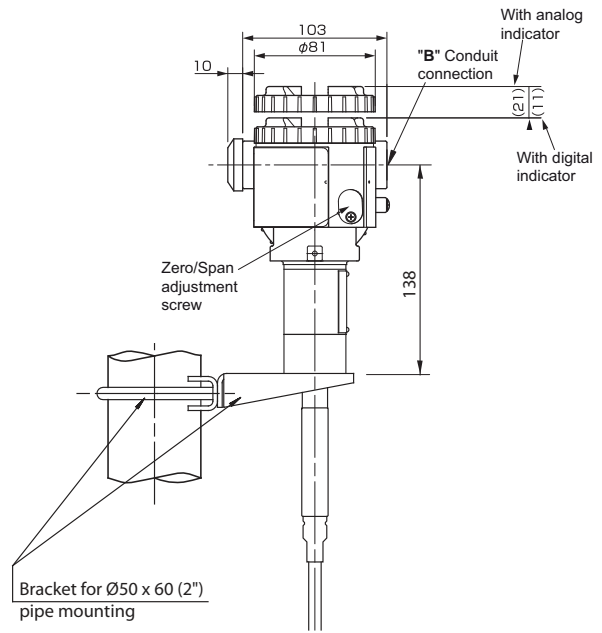
ø EXTENSION / DIAPHRAGM			
SA □ $\begin{matrix} V \\ C \end{matrix}$ Y S □ (L=0)	SA □ $\begin{matrix} V \\ C \end{matrix}$ ≠ Y S □ (L>0)	SA □ $\begin{matrix} H \\ B \\ T \\ P \\ R \\ F \end{matrix}$ Y S □ (L=0)	SA □ $\begin{matrix} H \\ B \\ T \\ P \\ R \\ F \end{matrix}$ ≠ Y S □ (L>0)
øMB	øH = øMB	øMB	øH (øMB)
73	73	89	76 (72)
96	96	89	94 (89)
73	73	89	76 (72)
96	96	89	94 (89)
73	73	89	76 (72)
96	96	89	94 (89)
59	48	59	48.3 (47)
59	48	59	48.3 (47)
59	48	59	48.3 (47)

Diaphragm seal	FLANGES DIMENSIONS										
	ISO / DIN		ANSI		C min	øD	øE	N-øA	øF	G	WEIGHT (Kg)
	PN	DN	NP	NW							
4	20	80	150 lbs	3"	24	190	152.4	4-19	127	1.6	5.3
	20	100	150 lbs	4"	24	229	190.5	8-19	157.2	1.6	7.7
6	50	80	300 lbs	3"	28.5	210	168.3	8-22.2	127	1.6	7.8
	50	100	300 lbs	4"	32	254	200	8-22.2	157.2	1.6	12.7
SA 8	40	80			24	200	160	8-18	138	3	5.8
	16	100			22	220	180	8-18	158	3	5.9
H	20	50	150 lbs	2"	21	152	120.6	4-19	92.1	1.6	2.7
	50	50	300 lbs	2"	22.4	165	127	8-19	92.1	1.6	3.7
J	40	50			20	165	125	4-18	102	3	3.3

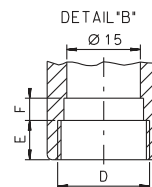
Outline dimensions for capillary mounted diaphragm seal on a gauge or absolute pressure transmitter (units : mm)



Diaphragm seal	EXTENSION L
Y	0
A	50
SA □ □ B □ □	100
C	150
D	200



FLANGES DIMENSIONS										WEIGHT (Kg)		
ISO / DIN		ANSI		C min	øD	øE	N-øA	øF	G		øH	
PN	DN	MP	MW							L=0	L>0	
20	80	150 lbs	3"	24	190	152,4	4-19	127	1,6	73	73	5,3
20	100	150 lbs	4"	24	229	190,5	8-19	157,2	1,6	96	96	7,7
50	80	300 lbs	3"	28,5	210	168,3	8-22,2	127	1,6	73	73	7,8
50	100	300 lbs	4"	32	254	200	8-22,2	157,2	1,6	96	96	12,7
40	80			24	200	160	8-18	138	3	73	73	5,8
16	100			22	220	180	8-18	158	3	96	96	5,9
20	50	150 lbs	2"	21	152	120,6	4-19	92,1	1,6	59	48	2,7
50	50	300 lbs	2"	22,4	165	127	8-19	92,1	1,6	59	48	3,7
40	50			20	165	125	4-18	102	3	59	48	3,3



CODE	CONDUIT CONN.		
	D	E	F
T	1/2-14NPT	16	5
V	Pg 13.5	8	4.5
W	M20x1.5	16	5

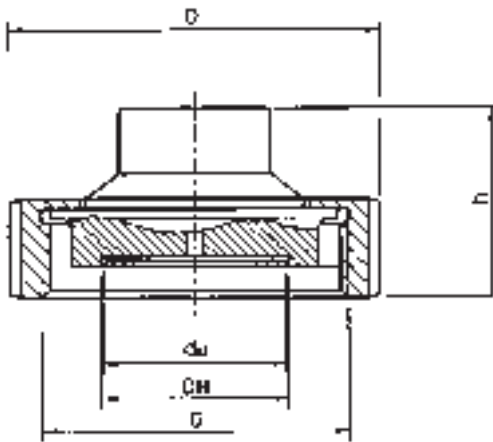
## Outline dimensions of sanitary diaphragm seals (units : mm)

The seals for the sanitary and pharmaceutical applications are available according DIN, SMS and Tri-Clamp standards

### Seals according DIN 11851 et SMS

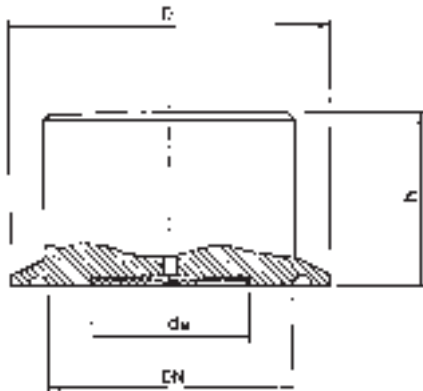
2 differents design exist for DIN 11851 and SMS :

#### Coupling nut design



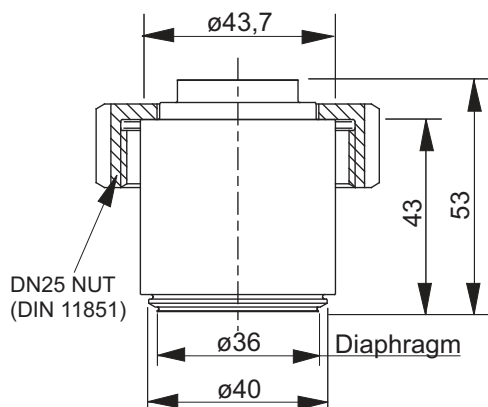
DIN 11851					
DN	PN (Max)	D	h	d <sub>M</sub>	G
25	40	63	36	25	Rd 52 x 1/6
32	40	70	36	32	Rd 58 x 1/6
40	40	78	36	40	Rd 65 x 1/6
50	40	112	36	52	Rd 78 x 1/6
65	40	112	36	65	Rd 95 x 1/6
80	40	127	36	76	Rd 110 x 1/4
SMS					
38	40	74	38	40	Rd 48 x 1/6
51	40	84	38	52	Rd 60 x 1/6
63,5	40	100	38	65	Rd 85 x 1/6
76	40	114	38	76	Rd 98 x 1/6

#### Tri Clamp design

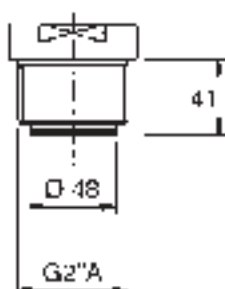


DN	PN (Max)	D	h	d <sub>M</sub>
1"1/2	40	50	35	32
2"	40	64	35	40
2"1/2	40	77,5	35	50
3"	40	91	35	65

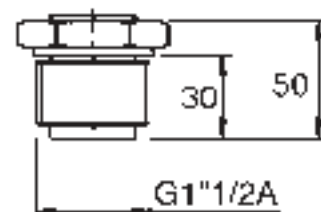
#### Dead volume seal



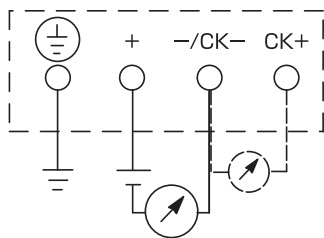
#### Screwed G 2" A



#### Screwed G 1"1/2 A



## CONNECTION DIAGRAM



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

All models of **FCX** series transmitters type **FCX-AII** 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 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)	EN 61000-4-2	<b>B</b>
	8 kV (Air)	IEC 61000-4-2	
Electromagnetic field	10V/m (80 to 1000 MHz)	EN 61000-4-3	<b>A</b>
	3 V/m (1.4 to 2.0 GHz)	IEC 61000-4-3	
	1 V/m (2.0 to 2.7 GHz)		
Rated power frequency Magnetic field	30 A/m	EN 61000-4-8 IEC 61000-4-8	<b>A</b>
Burst	2 kV (5/50 NS, 5 kHz)	EN 61000-4-4 IEC 61000-4-4	<b>B</b>
Surge	1 kV Line to line	EN 61000-4-5	<b>B</b>
	2 kV Line to line	IEC61000-4-5	
Conducted RF	3 V (150 kHz to 80 MHz)	EN 61000-4-6 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 France S.A.S.**

46 rue Georges Besse - ZI du brézet - 63039 Clermont ferrand

Tél : 04 73 98 26 98 - Fax : 04 73 98 26 99

Mail : sales.dpt@fujielectric.fr - web : www.fujielectric.fr

Fuji Electric can accept no responsibility for possible errors in catalogues, brochures and other printed material. Fuji Electric reserves the right to alter its products without notice. This also applies to products already on order provided that such alterations can be made without subsequential changes being necessary in specifications already agreed. All trademarks in this material are property of the respective companies. all rights reserved.