

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 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 :

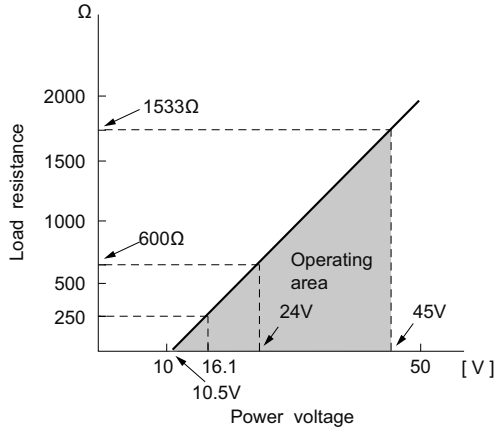
4-20 mA DC with digital signal superimposed on the 4/20 mA signal.

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, 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																					
Factory Mutual (pending) (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
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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																					
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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 (pending) (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"																					
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CSA (pending) (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⁽¹⁾ 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⁽¹⁾.

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" :

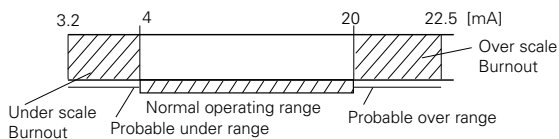
Output signal is hold as the value just before the failure happens.

"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⁽¹⁾



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⁽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-AII 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⁽¹⁾.

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)

±0,1 % 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 :

±0,25 % /28°C at (1 to 1/2,5) x URL

±(0,25 x 0,4 x URL/span) %/28°C for span below 1/2,5 of URL

Total effect :

±0,25 % /28°C at (1 to 1/2,5) x URL

±(0,25 + 0,25 x 0,4 x URL/span) %/28°C for span below 1/2,5 of URL

Model FKH :

Zero shift :

±(0,25% x URL/span) %/28°C

Total effect :

±(0,25 + 0,25 x URL/span) %/28°C

Overrange effect :

Zero shift :

$\pm 0,3\%$ 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:

> $\pm 0,25\%$ of span for spans greater than 1/10 of URL.

Frequency 10 to 150Hz, acceleration 39,2m/sec².

Material fatigue:

Please consult Fuji Electric.

Dielectric strength :

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

Insulation resistance :

> 100 M Ω at 500 Vdc.

Turn on time :

4 seconds

Internal resistance for external field indicator :

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

Optional features**Indicator :**

A plug-in turnable analog indicator (1,5% accuracy) 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 :

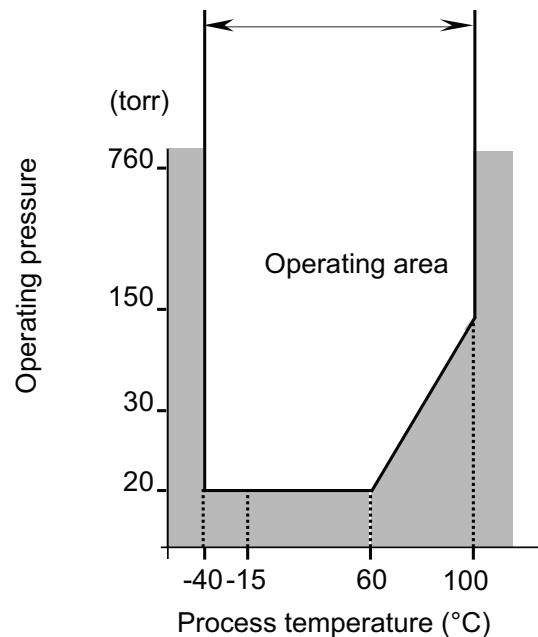
A built-in arrester protects the electronics from lightning surges.

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.

Physical specifications**Electrical connections :**

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

Non wetted parts material :

Electronics housing :

Standard :

Low copper die cast aluminium alloy finished with epoxy/polyurethane double coating

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.

ACCESSORIES

Hand Held Communicator : (refer to the FXW)

CODE SYMBOLS FKP...F

1	2	3	4	5	6	7	8	9	10	11	12	13	DESCRIPTION	
F	K	P					F							Type
														Smart, 4-20 mAdc + Fuji/Hart® digital signal
			T											Conduit connection
			V											1/2-14 NPT
			W											Pg 13.5
														M 20 x 1,5
				2										Diaphragm seal rating
				4										PN 25
				6										PN 20 - 150 Lbs
				8										PN 50 - 300 Lbs
				9										PN 40
				L										PN 16
														PN 100 - 600Lbs
														Span
			1	V										0,08125/1,3 bar
			2	V										0,3125/5 bar
			3	V										1,875/30 bar
			4	V										6,25/100 bar
														Indicator & Arrester
														Indicator
														Arrester
														Initial setting
			F	-	A									None
			F	-	B									Analog, 0-100% linear scale
			F	-	D									Analog, Custom scale
			F	-	J									Analog, double scale
			F	-	E									None
			F	-	F									Analog, 0-100% linear scale
			F	-	H									Analog, Custom scale
			F	-	K									Analog, double scale
			F	-	1									Digital, 0-100%
			F	-	2									Digital, Custom scale
			F	-	4									Digital, 0-100%
			F	-	5									Digital, Custom scale
														Approvals for hazardous locations (consult FUJI for availability)
														None (Standard)
														ATEX - Flameproof enclosures (digit 4 = "R, T" & "W" only)
														ATEX - Intrinsic Safety
														(*1) 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 & 6 only)
														IECEX - Type "n" (digit 9 = A, E, 1, 2, 3, 4, 5 & 6 only)
														IECEX - Flameproof enclosures (digit 4 = "R, T" & "W" only)
														IECEX - Intrinsic Safety
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														FM - Explosion-Proof & Intrinsic Safety combined approval (digit 4 = "T" only)
														Mounting design
														Ambiant temperature correction
			B											Capillary
			G											Transmitter and diaphragm seal assembly
			L											Capillary
			S											Transmitter
														Rigid
														Transmitter and diaphragm seal assembly
														Rigid
														Transmitter
														SS parts
														SS tag plate
														SS housing
			Y	Y										None
			B	Y										None
			C	Y										None
			E	Y										Yes
														Yes

*Notes :

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

CODE SYMBOLS FKH...F

1	2	3	4	5	6	7	8	9	10	11	12	13	DESCRIPTION																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
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*Notes :
1- Code "D" FM approval only possible with electrical connection 1/2" NPT.

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 F#P)

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	-10 to +150		1,07
T	Silicone oil	-20 to +150	-10 to +150	1,07

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

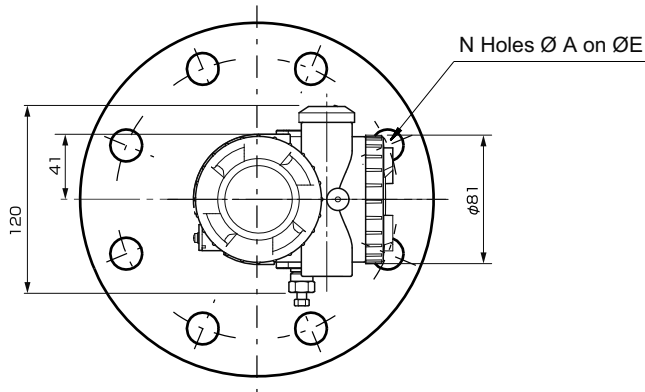
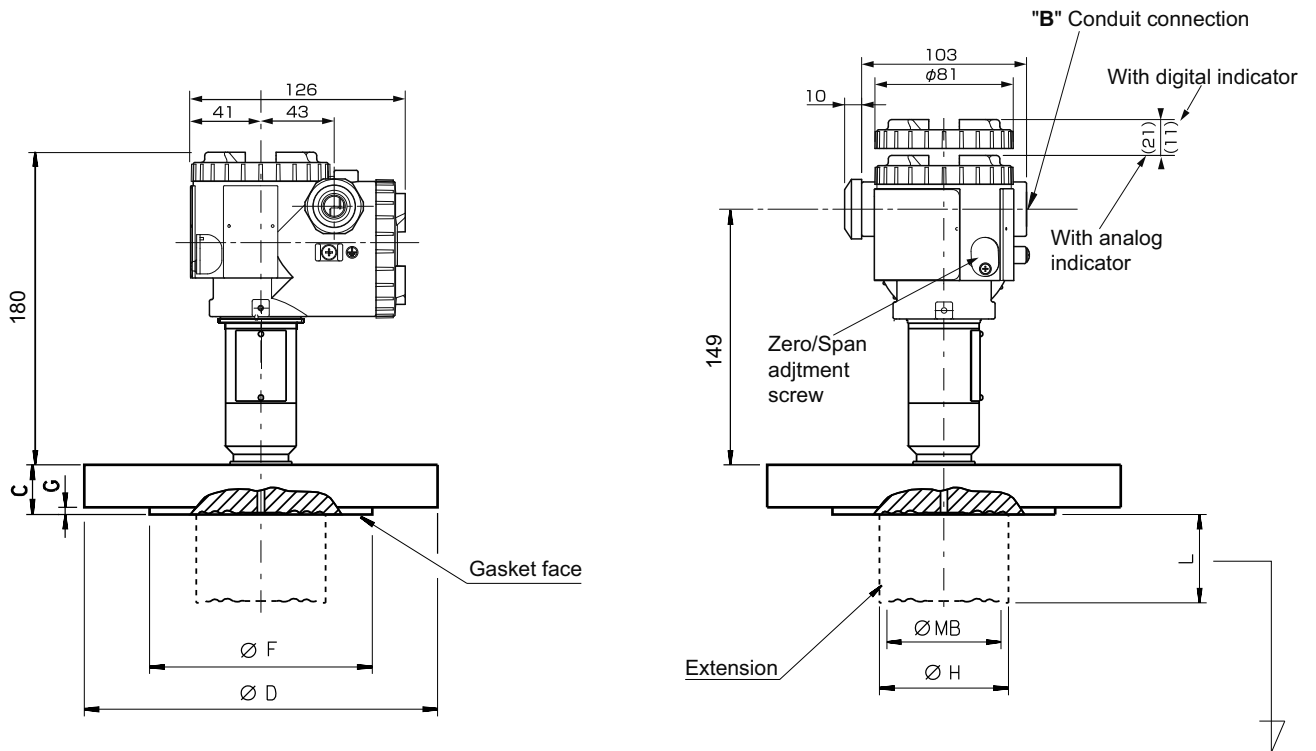
Please ask Fuji Electric for special applications indicating your temperature, pressure and vacuum conditions (vacuum and temperature can occur together); other filling fluids can be used for your applications.

CODE SYMBOLS - S

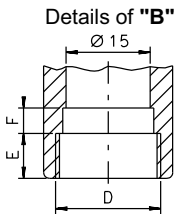
1	2	3	4	5	6	7	8	DESCRIPTION
S								Flanged axial diaphragm seal connection
A								Flanged radial diaphragm seal connection - Not possible with rigid mounting design digit 6 : code R
R								Wafer type - Not possible with rigid mounting design digit 6 : code R
W								
								(*1) Flanges RF (Flange size and rating)
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
								Diaphragm seal material
								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
								Diaphragm seal design
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
								Transmission diaphragm seal to measuring cell
								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 : 130°C
								Special applications and fill fluid for the diaphragm seal only
								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								(*7) Vacuum Silicone oil
T								(*7) Very high temp (- 20 to 400°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
Y		0
AEJP		50
SA □ □ BFKR	S □	100
CGLS		150
DHMT		200

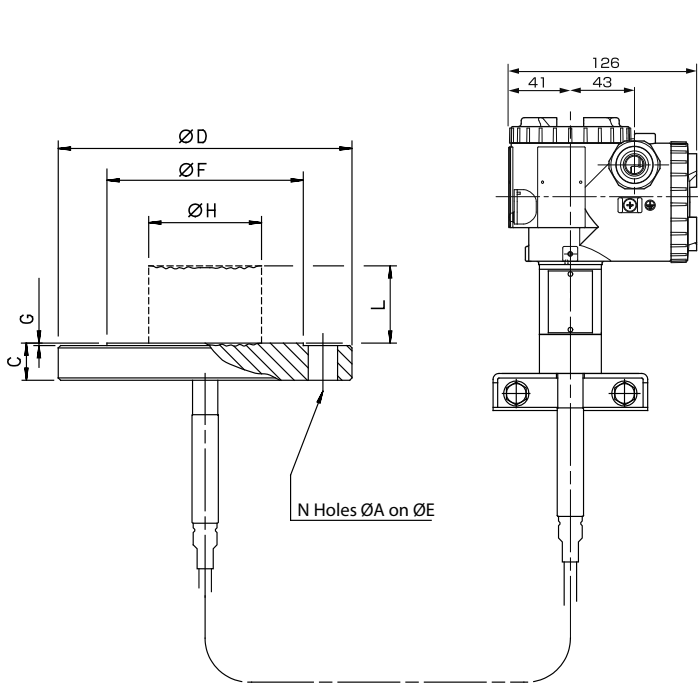


CODE	CONDUIT CONN.		
	D	E	F
T	1/2-14NPT	16	5
V	Pg 13.5	8	4.5
W	M20x1.5	16	5

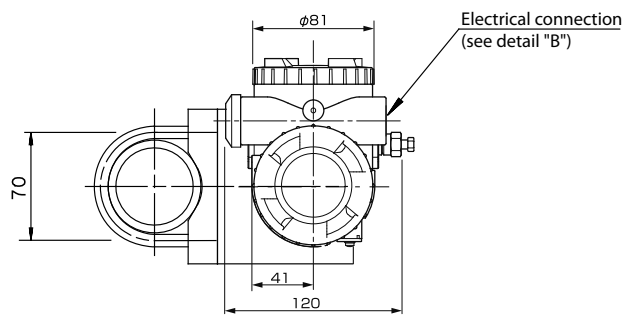
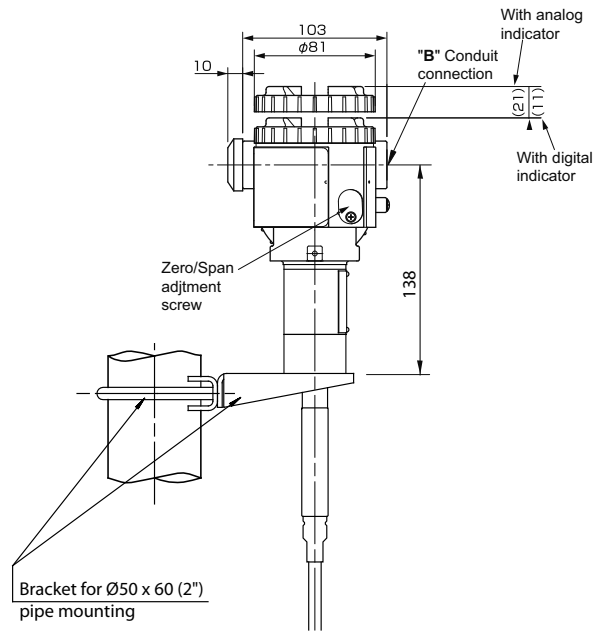
ø EXTENSION / DIAPHRAGM			
SA □ $\begin{matrix} V \\ C \end{matrix}$ Y S □ (L=0)	SA □ $\begin{matrix} V \\ C \end{matrix}$ ≠ Y S □ (L>0)	SA □ $\begin{matrix} H \\ B \\ T \\ P \\ R \\ F \end{matrix}$ Y S □ (L=0)	SA □ $\begin{matrix} H \\ B \\ T \\ P \\ R \\ F \end{matrix}$ ≠ Y S □ (L>0)
øMB	øH = øMB	øMB	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

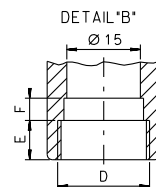
Outline dimensions for capillary mounted diaphragm seal on a gauge or absolute pressure transmitter (units : mm)



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.		
x4=	D	E	F
T	1/2-14NPT	16	5
V	Pg 13.5	8	4.5
W	M20x1.5	16	5

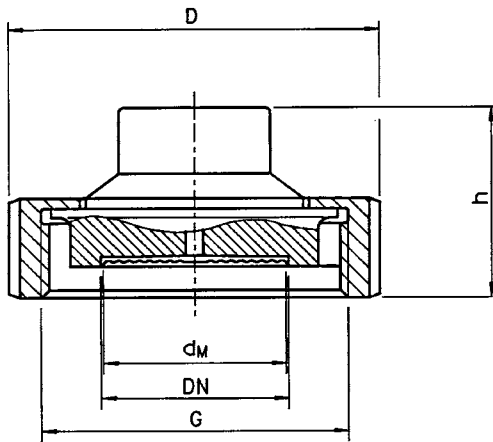
Outline dimensions of sanitary diaphragm seals (units : mm)

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

Seals according DIN 11851 et SMS

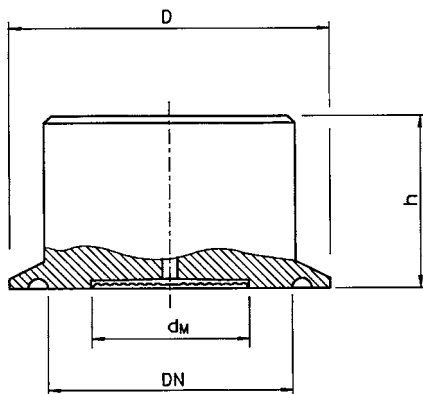
2 differents design exist for DIN 11851 and SMS :

Coupling nut design



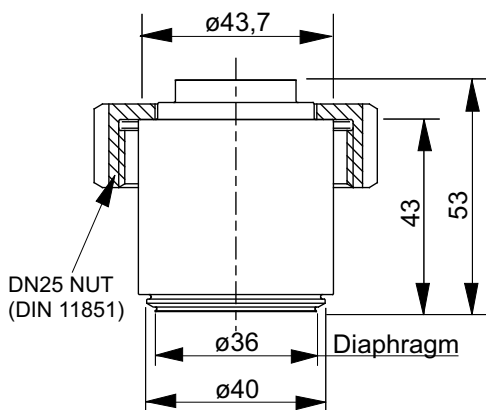
DIN 11851					
DN	PN (Max)	D	h	d _M	G
25	40	63	36	25	Rd 52 x 1/6
32	40	70	36	32	Rd 58 x 1/6
40	40	78	36	40	Rd 65 x 1/6
50	40	112	36	52	Rd 78 x 1/6
65	40	112	36	65	Rd 95 x 1/6
80	40	127	36	76	Rd 110 x 1/4
SMS					
38	40	74	38	40	Rd 48 x 1/6
51	40	84	38	52	Rd 60 x 1/6
63,5	40	100	38	65	Rd 85 x 1/6
76	40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

Tri Clamp design

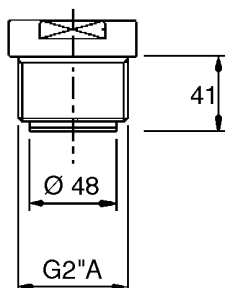


DN	PN (Max)	D	h	d _M
1"1/2	40	50	35	32
2"	40	64	35	40
2"1/2	40	77,5	35	50
3"	40	91	35	65

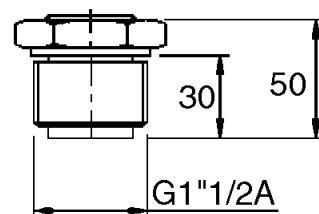
Dead volume seal



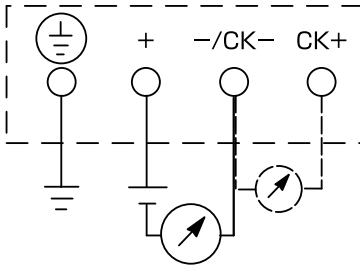
Screwed G 2" A



Screwed G 1"1/2 A



CONNECTION DIAGRAM



The product conforms to the requirements of the Electro-magnetic Compatibility Directive 89/336/EEC as detailed within the technical construction file number TN513035. The applicable standards used to demonstrate compliance are :

EMI (Emission) EN61326 : 1997

Class A (std for Industrial Location)

Frequency range MHz	Limits	Reference Standard
3 to 230	40dB ($\mu\text{V/m}$) quasi peak measured at 10m distance	CISPR16-1 and CISPR16-2
230 to 1000	47dB ($\mu\text{V/m}$) quasi peak, measured at 10m distance	

Note) Definition of 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.

EMS (Immunity) EN61326 : 1997

Annex A (std for Industrial Location)

Phenomenon	Test value	Basic Standard	Performance criteria
Electrostatic discharge	4kV (Contact) 8kV (Air)	IEC61000-4-2	B
Electromagnetic field	80 to 1000MHz 10V/m 80%AM (1kHz)	IEC61000-4-3	A
Rated power frequency magnetic field	30A/m 50Hz	IEC61000-4-8	A
Burst	2kV 5kHz	IEC61000-4-4	B
Surge	1.2 μs /50 μs 1kV (Line to line) 2kV (line to ground)	IEC61000-4-5	B
Conducted RF	0.15 to 80MHz 3V, 80%AM (1kHz)	IEC61000-4-6	A

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