

ABSOLUTE, DIFFERENTIAL AND GAUGE PRESSURE TRANSMITTER FOR REMOTE SEAL(S)

DATA SHEET

FKB, FKD and FKM models of FCX-All V5 series of pressure transmitters accurately measure a gauge, differential or absolute pressure and transmit a proportional 4-20 mA output signal. The transmitters use an unique micro-capacitive silicon sensor in combination with a state-of-the-art digital signal processing to provide exceptional performances in terms of accuracy and stability.

FEATURES

1. High accuracy

The Fuji Electric's micro-capacitive sillicon sensor provides in standard $\pm 0.065\%$ accuracy for differential and gauge transmitter models and $\pm 0.2\%$ accuracy for the absolute transmitter model, for all elavated or supressed calibration ranges without additional adjustments.

2. Minimum inventory and design

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

Fuji Electric remote seals design are based on a welded conception that provides a reduced and optimized volume flange to guarantee a perfect vaccum tightness and high pressure services.

3. Minimum environmental influence

The Advanced Floating Cell technology provides a high immunity against temperature variations and overpressure commonly found in the process industry and substantially reduces the overall measurement error.

4. HART/Fuji Electric communication protocols

FCX-All V5 series of pressure transmitters can communicate using either the universal HART or the proprietary and faster Fuji Electric communication protocol.

By the use of Device Description files, HART compatible devices can communicate with any FCX-All V5 transmitter.

5. Application flexibility

Various options are available to address most of the process industry applications, including :

- Full range of hazardous area approvals
- Built-in RFI filter and lightning arrester
- Analog or 5 digits local indicator with engineering unit
- Stainless steel electronics housing
- Wide selection of materials
- High temperature, high vacuum seals

6. Programmable output Linearization Function

The output signal can be linearized using up to 14 pairpoints.

7. Burnout current flexibility

The burnout current value can be adjusted in the ranges of [3.2 ; 4.0] and [20.0 ; 22.5] mA and can be compliant with NAMUR NE43 recommandations.

FKB, FKD, FKM...F



FUNCTIONAL SPECIFICATIONS

Type:

- FKD : differential pressure transmitter with remote seal(s)
- FKB : gauge pressure transmitter with remote seal
- FKM : absolute pressure transmitter with remote seal Service :

Liquid, gas, or vapour

Span, range, and overrange limit :

-	-		
	Spar	n limits	Range limits
Model	Minimum	Maximum	
	F		
	(mbar)	(mbar)	(mbar)
F_D_3	3.2	320	± 320
F_D5	13	1300	± 1300
F_D6	50	5000	± 5000
F_D_ 8	300	30000	± 30000
F_D9*	2000	200000	±200000
	F	KB	
	(bar)	(bar)	(bar)
F🗆 B🗆 🗆 1	0.013	1,3	-1 to + 1,3
F_B_ 2	0.05	5	-1 to + 5
F_B_ 3	0.3	30	-1 to + 30
F_B_ 4	1	100	-1 to + 100
F🗆 B🗆 🗆 5	5	500	-1 to + 500
	F	КM	
	(bar abs)	(bar abs)	(bar abs)
F□M□ □1	0.016	0.16	0 to +0,16
F□M□ □2	0.013	1,3	0 to +1,3
FM3	0.05	5	0 to +5
F□M□ □4	0,3	30	0 to +30
FM5	1	100	0 to +100

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

Important : For FKD#49, maximum possible overload pressure on LP side must be ≤ 100 bar. The accuracy is not guaranteed when used at negative DP.

Fuji Electric France S.A.S.

EDSF6-050
Date May, 2019

FKB, FKD, FKM...F

Output signal :

4-20 mA with digital signal superimposed on the analog signal.

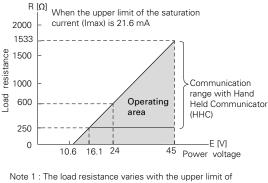
Power supply :

10.5 to 45 V DC at transmitter terminals.

10.5 to 32 V DC with the optional arrester.

Refer to hazardous location table for specific limitations.

Load limitations : see figure below



the saturation current [I max] $R [\Omega] = \frac{E [V] - 10.5}{(I max [mA]+0.9)x10^3}$

Note 2 : For communication with HHC (FXW model), a minimum load of 250 Ω is required.

Hazardous locations :

Marking (D	igit 10 =)	Protection type
ATEX		Intrinsic Safety "i" :
		Ex II 1G/D
		Ex ia IIC T4 Ga (-40°C \leq Ta \leq +70°C)
		Ex ia IIC T5 Ga (-40°C \leq Ta \leq +50°C)
		Ex ia IIIC T135°C Da (-40°C \leq Ta \leq +70°C)
	(K)	Ex ia IIIC T100°C Da (-40°C \leq Ta \leq +50°C)
		IP 66/67
		Electrical Parameters :
		Ui \leq 28 Vdc, li \leq 94.3 mA, Pi \leq 0.66 W
		$Ci = 26 \text{ nF}_{(1)}/36 \text{ nF}_{(2)}$, $Li = 0.6 \text{ mH}_{(3)}/0.7 \text{ mH}_{(4)}$
		Flameproof Enclosure "d":
		Ex II 2G/D
		Ex II 20/D Ex d IIC T5 Gb (-40°C ≤ Ta ≤ +85°C)
	(X)	Ex d IIC 15 Gb (-40 C \leq 1a \leq +65 C) Ex d IIC T6 Gb (-40°C \leq Ta \leq +65°C)
	(^)	Ex th IIIC T100°C Db (-40°C \leq Ta \leq +85°C)
		Ex tb IIIC T85°C Db (-40°C \leq Ta \leq +65°C)
		45 Vdc max
		Increased Safety "e" :
		Ex II 3G/D
	(P)	Ex ec IIC T5 Gc (-40°C \leq Ta \leq +70°C)
		Ex tc IIIC T100°C Dc (-40°C \leq Ta \leq +70°C)
	(1.4)	45 Vdc max
1505	(M)	Combination (K) + (X)
IECEx		Intrinsic Safety "i":
		Ex ia IIC T4 Ga (-40°C \leq Ta \leq +70°C)
		Ex ia IIC T5 Ga (-40°C ≤ Ta ≤ +50°C)
	(=)	Ex ia IIIC T135°C Da (-40°C \leq Ta \leq +70°C)
	(T)	Ex ia IIIC T100°C Da (-40°C ≤ Ta ≤ +50°C)
		IP 66/67
		Electrical Parameters :
		Ui ≤ 28 Vdc, li ≤ 94.3 mA, Pi ≤ 0.66 W
		$Ci = 26 nF_{(1)} / 36 nF_{(2)}, Li = 0.6 mH_{(3)} / 0.7 mH_{(4)}$
		Flameproof Enclosure "d":
		Ex d IIC T5 Gb (-40°C \leq Ta \leq +85°C)
	(R)	Ex d IIC T6 Gb (-40°C ≤ Ta ≤ +65°C)
		Ex tb IIIC T100°C Db (-40°C \leq Ta \leq +85°C)
		Ex tb IIIC T85°C Db (-40°C ≤ Ta ≤ +65°C)
		45 Vdc max
		Increased Safety "e" :
	(Q)	Ex ec IIC T5 Gc (-40°C ≤ Ta ≤ +70°C)
		Ex tc IIIC T100°C Dc (-40°C \leq Ta \leq +70°C)
		45 Vdc max
	(N)	Combination (T) + (R)
ATEX		
IECEx	(VV)	Combination $(K) + (X) + (T) + (R) + (J) + (E)$
cCSAus		
000Au3		

cCSAus		Intrinsic safety / Non Incendive / Class 1 Division 2 :					
		IS Class I Division 1, Groups ABCD Ex ia					
		Class II Groups EFG; Class III					
		NI Class I Division 2, Groups ABCD					
	(J)	(Per control drawing TC522873)					
	(3)	Class I Division 2, Groups ABCD					
		T4 (-40°C ≤ Ta ≤ +70°C)					
		T5 (-40°C ≤ Ta ≤ +50°C)					
		Ui ≤ 28 Vdc, li ≤ 94.3 mA, Pi ≤ 0.66 W					
		$Ci = 26nF_{(1)}/36 nF_{(2)}, Li = 0.6 mH_{(3)}/0.7 mH_{(4)}$					
		Explosion proof					
		XP Class I Division 1, Groups CD					
	(E)	Class II Groups EFG; Class III					
	(⊏)	T5 (-40°C ≤ Ta ≤ +85°C)					
		T6 (-40°C ≤ Ta ≤ +65°C)					
		Vmax = 42.4 Vdc					
	(L)	Combination (J) + (E)					

(1) Without optional arrester(2) With optional arrester

(3) Without analog indicator(4) With analog indicator

Configuration :

Configuration of the FCX-All V5 series of pressure transmitters can be carried out by either using a Hand Held Terminal (ie. Fuji Electric FXW or third party HART terminal) or the 3 push-buttons optional indicator.

A third party HART hand held communicator can be used in combination with Fuji Electric FCX-AII V5 HART Device Description files (https://fieldcommgroup.org).

Functions		Fuji El FX		Third p HART		3 push b optional ir	
		Display	Set	Display	Set	Display	Set
Tag Nb		V	V	v	v	v	V
Model Nb		v	v	v	v	v	V
Serial Nb 8 vision	Software re-	v		v	-	v	
Engineering	g units	v	v	v	v	v	V
Upper Rang	ge Value	v	—	v	—	v	—
Measuring	Range	v	v	v	v	v	v
Damping		v	v	v	v	v	V
Output sig-	Linear	v	v	v	v	v	V
nal type	Square Root	v	v	v	v	v	V
Burnout cur	rent	v	v	v	v	v	V
Calibration		v	v	v	v	v	V
Output Adju	ist	—	v	—	v	-	V
Measuring	Value	v	—	v	—	v	—
Self Diagno	sis	v	_	v	_	v	_
Printer (opti	ion)	v	—	—	—	-	_
External Ad	j Screw Lock	v	v	v	v	v	V
Transmitter	Display	v	v	v	v	v	v
Linearizatio	n	—	—	v	v	v	V
Rerange		v	v	v	v	v	V
Saturation (Current	V	V	v	v	v	v
Write Prote	ct	v	V	v	v	v	v
History							
 Calibratio Ambient 1 		v v	<u>v</u>	v v	<u>v</u>	v v	<i>v</i>

Note 1 : The FXW firmware revision must be higher than 7.0 in order to address FCX-AII V5 "Saturation current", "Write protect" and "History" functions.

Note 2 : The "Linearization" function is not accessible throught the 3 puh-buttons optional indicator.

Damping :

The damping time constant can be adjusted within the range of [0.06 to 32] seconds.

Zero and span adjustment :

Zero and span are ajustable remotly with a Hand Held Communicator or locally with the external adjustment screw. Zero elevation/suppression :

±100 % of the URL for FKD models

-1 bar to +100 % of the URL for FKB models 0 kPa abs to +100 % of the URL for FKM models

Normal/reverse action :

Selectable from a Hand Held Communicator.

Burnout and saturation currets :

If the self-diagnostic functions detect a transmitter failure, the burnout function will drive the output signal to either "Output Hold", "Output Overscale" or "Output Underscale" modes.

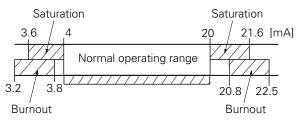
When "Output Hold" :

The output signal is held as the last value just before the failure happens.

When "Output Overscale" :

The output signal is set within the range of [20.0 to 22.5] mA When "Output Underscale" :

The output signal is set within the range of [3.2 to 4.0] mA Both burnout and saturation current can be adjusted within the range of [3.2; 4.0] and [20.0; 22.5] mA



Loop-check / fixed output currents :

The transmitter can be configured to provide a constant output signal from 3.2 up to 22.5 mA.

Temperature limit :

Ambient :

-40 to +85°C

- -20 to +80°C (for LCD indicator)
- -40 to +60°C (for arrester option)
- -20 to +60°C (for fluorinated oil)

Please refer to the hazardous locations table for ambient temperature limitations according to the standard and type of protection.

Process :

Refer to the seal specifications and the specific temperature conditions.

Storage :

- 40 to +90°C Humidity limit :

PERFORMANCE SPECIFICATIONS

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

Accuracy rating : (including linearity, hysteresis, and repeatability) For span > 1/10 of URL :

- ± 0.065% of calibrated span (FKB & FKD models)
- ± 0.1% of calibrated span for FKB
- ± 0,2% of calibrated span for FKM model
- For span < 1/10 of URL :
- ± (0.015 + 0.005 x URL/span) % of span (FKB & FKD model)
- ± (0.1+ 0.01 x URL/span) % of span (FKM model)

Stability :

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

Linearity :

0.05% of calibrated span (FKB & FKD models)

0.1% of calibrated span (FKM model)

Temperature effect :

Effect per 28°C change within the range of -40°C and +85°C

- FKM model :
- Zero shift :
 - ±(0.125 + 0.1 x URL/span) % of URL
- Total effect :
 - ±(0.15 + 0.1 x URL/span) % f URL

FKB & FKD models :

Zero shift :

±(0.075 + 0.0125% URL/span) % of URL

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Total effect :
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±(0.095 + 0.0125 URL/span) % of URL

Static pressure effect (FKD model) :

Zero shift :

± 0.035% of URL for 100 bar

Overrange effect (FKB & FKM models) :

Zero shift :

0.2% of URL, for any overrange pressures (limited to the max. overrange pressure)

Overrange effect (FKD model) :

Zero shift : ± 0.15% of URL / 160 bar limit

Supply voltage effect :

Less than 0.005% of calibrated span per 1 V

RFI effect :

< 0,2% of the URL for the frequencies from 20 up to 1000 MHz with an electrical field strength of 10 V/m and housing covers in place. (Classification : 2-abc : 0.2% of span according SAMA PMC 33.1)

Update rate :

60 msec

- **Response time :** (At 63.3% of output signal without damping)
 - Time constant :
 - 300 msec (FKD span code "3")
 - Time constant :
 - 200 msec (others spans and FKB, FKM)
 - Dead time :

300 msec

Response time = time constant + dead time

Mounting position effect :

Zero shift :

< 12 mm CE for 10° incline in any position.

- This shift can be corrected with the zero adjustment.
- This 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 150 Hz, acceleration 39.2 m/sec². These informations are available only for capillary mounting.

Material fatigue :

Please consult Fuji Electric

Dielectric strength :

500 V AC, 50/60 Hz 1 min., between circuit and earth (except with the optional arrester).

Insulation resistance :

More than 100 MQ / 500 V DC.

Internal resistance for external field indicator :

12 Ωmaxi (connected to test terminal CK+ and CK-)

Pressure equipment directive (PED) 2014/68/EU

FKD : According to Article 4.3

- FKB : Digit 6 code 1, 2, 3, 4 according to Article 4.3 Digit 6 code 5 : Category III model H1
- FKM : According to Article 4.3

⁰ to 100% RH (Relative Humidity)

PHYSICAL SPECIFICATIONS

Conduit connections : 1/2"-14 NPT, Pg13.5 or M20x1.5 Process-wetted parts material : Diaphragm : SS 316L, Hastelloy-C, Monel, Tantalum, Titanium or Zirconium Flange face : SS 316L, Hastelloy-C, Monel, Tantalum, Titanium or Zirconium Extension : SS 316L, Hastelloy-C (refer to "Model code") Non-wetted parts material : Electronics housing : Low copper die-cast aluminum alloy finished with polyester coating (standard), or SS 316 (option). Bolts and nuts : Standard : Cr-Mo alloy Option : SS 316 (L) for pressure ≤ 100 bar or SS 660 for pressure > 100 bar Filling fluid : Standard : Silicone oil Option : Fluorinated oil Mounting bracket : SS 304L or SS 316L **Environmental protection :** IEC IP66/IP67 and Type 4X Mounting bracket: Without : direct mounting With (option) : On 50 mm (2") pipe or direct wall mounting Mass {weight} : Refer to outline dimensions page 12 to 17. Diaphragm seal(s) :

A comprehensive selection of seals can be chosen in accordance with the specific seal (see datasheet).

OPTIONAL FEATURES

Local indicator :

A plug-in analog indicator (2.5% accuracy) can be mounted into the electronics compartment or the terminal box of the housing. An optional 5 digit indicator with engineering units is also available. Local configuration with the 3 push-buttons indicator : A local configuration can be carried out with the optional 3 push-buttons 5-digits indicator. Arrester : A built-in arrester protects the electronics from lightning surges. Lightning surge immunity : ±4 kV (1.2 × 50 µs) **NACE** specification : Metallic materials for all pressure boundary parts comply with NACE MR 0175/ISO 15156.

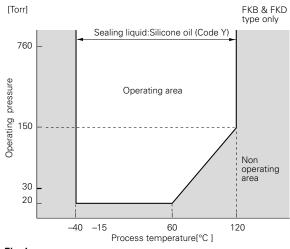
SS 660 bolts and nuts comply with NACE MR 0175/ISO 15156.

Optional tag plate :

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

Vacuum service : See Fig.1

Special silicone oil and filling procedure are applied.



Fia. 1

Relation between process temperature and operating pressure

ACCESSORIES

Hand held communicator :

FXW model, refer to datasheet No.EDS 8-47

MODEL CODE SYMBOLS - FKB

1 2 3		5	6	7	8		<u>م</u>	0 11	12	12						
1 2 3 F K B	4 8	Ĵ		v	8 F	- Г		0 11	12	Y					DESCRIPTION	
													Туре			
													Gauge pressure transmi	tter with remote seal - S	Smart, 4-20 mA + HA	RT/Fuji Electric comr
													Conduit connection	Enclosure type		
	T	-				+	-	-	_	-			1/2 - 14 NPT Pg13.5	"L" shape		
	w	1				+							M20 x 1.5	E onopo		
	5												G 1/2			
	6	_				_	_	_	_				1/2 - 14 NPT	"T" shape		
	7 8	+		-		+	+	+		-			Pg13.5 M20 x 1.5			
		1				+		+				(*3)	Diaphragm seal rating			
	2	2				+		+				. ,	PN 25			
	4	4											PN 20 - 150 lbs			
	e	6											PN 50 - 300 lbs			
	8	- F							_				PN 40			
	9	- F				_	_	_	_				PN 16			
		м				+	-	-	-	-			PN 100 - 600 lbs PN 150 - 900 lbs			
	N	- F				-							PN 250 - 1500 lbs			
		P				+	+	+					PN 420 - 2500 lbs			
												(*1)	Measuring range			
			1									(*2)	0.013 to 1.3 bar			
			2									(*2)	0.05 to 5 bar			
			3		\vdash	_	-	_	-	-		\vdash	0.3 to 30 bar			
			4 5		\vdash	+	-	+	+	-		(*3)	1 to 100 bar			
		L	э					+	+		-	(3)	5 to 500 bar Indicator		Arrester	
				v	F		↓	+	+				None			
				v			в					(*5)	Analog, 0-100% linear s	cale	None	
				v	F	-						(*5)	Analog, Custom scale			
				v	•		ıГ					(*5)				
				V	F		=	_					None			
				V	F		F –	_	_			(*5)		cale	Yes	
				v	F		<u>'</u> -	+	-	-		(*5)	-		-	
				v	F		< _	-		-		(*5)				
				v	F	-		-					Digital, 0-100% Digital, Custom scale		None	
				v	F			+					Digital, 0-100%			
				v	F		s	+					Digital, Custom scale		Yes	
				v	F		1						Digital, 0-100% with pus	sh button		
				v	F	-	2						Digital, Custom scale w	ith push button	None	
				v	F	-	4						Digital, 0-100% with pus	sh button	Yes	
				V	F	-	5		_				Digital, Custom scale w			
								. –					Hazardous location ap	provals		
								`	_			(*7)	None ATEX - Flameproof			
								λ–	-			(1)	ATEX - Intrinsic Safety			
								;					ATEX - Increased Safet	v		
								и —				(*7)	ATEX - Combination Fla	, ,	Safety	
												(*7)	cCSAus - Explosion pro	of	-	
							.	, —					cCSAus - Intrinsic Safet	y and Non Incendive		
										1		1	cCSAus -Combination E	- xplosion proof. Intrinsi		
														- p ,	ic Safety and Non In	cendive
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								R F Q W B L M G S				(*7) (*7) (*7) (*10) (*10) (*10) (*10) (*10) (*10) (*10)	IECEx - Intrinsic Safety IECEx - Increased Safet IECEx - Combination FI IECEx - ATEX - cCSAus Mounting (Capilla Rigid - Long de Rigid - Long de Rigid - Short d	ty ameproof and Intrinsic - Explosion/Flamepro design ry sign (in line) esign (90°) ry sign (in line) esign (90°)	Safety of, Intrinsic Safety ar Ambiant temper Transmitter and diap Trans Tran Stainless : Tag plate	nd Non Incendive ature correction hragm seal assembly smitter
								R F Q W B L M G S	1	Y		(*7) (*7) (*7) (*10) (*10) (*10) (*10) (*10) (*6)	IECEx - Intrinsic Safety IECEx - Increased Safe IECEx - Combination FI IECEx - ATEX - cCSAus Mounting (Capilla Rigid - Long de Rigid - Short d Capilla Rigid - Long de Rigid - Short d Cell flange Operating pressure	ty ameproof and Intrinsic s - Explosion/Flamepro design ry sign (in line) esign (90°) ry sign (in line) esign (90°) design Bolts/nuts	Safety of, Intrinsic Safety an Ambiant temper Transmitter and diapl Tran Tran Stainless Tag plate None	nd Non Incendive ature correction hragm seal assembly smitter steel parts
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Notes* : 1- Turn down ratio of 100 is possible but	Subar w	100	tor +i	han 1	/40 of	he *		R T Q N W B L M G S T	1 2	Y		(*7) (*7) (*7) (*10) (*10) (*10) (*10) (*10) (*10) (*10) (*10)	IECEx - Intrinsic Safety IECEx - Increased Safe IECEx - Combination FI IECEx - ATEX - cCSAus Mounting (Capilla Rigid - Long de Rigid - Short d Capilla Rigid - Long de Rigid - Short d Cell flange Operating pressure	ty ameproof and Intrinsic s - Explosion/Flamepro design ry sign (in line) esign (90°) ry sign (in line) esign (90°) design Bolts/nuts	Safety of, Intrinsic Safety an Ambiant temper Transmitter and diapl Trans Tran Stainless Tag plate None Yes	nd Non Incendive ature correction hragm seal assembly smitter steel parts Housing
Notes* : 1- Turn down ratio of 100 is possible but recommended for better performances.	span gr	reat	ter tl	han 1,	/40 of 1	he tl		R T Q N W B L M G S T	1 2 3 4 Y	Y Y Y Y		(*7) (*7) (*7) (*4) (*10) (*10) (*10) (*10) (*10) (*10) (*10) (*10)	IECEx - Intrinsic Safety IECEx - Increased Safe IECEx - Combination FI IECEx - ATEX - cCSAus Mounting (Capilla Rigid - Long de Rigid - Short d Capilla Rigid - Long de Rigid - Short d Cell flange Operating pressure	ty ameproof and Intrinsic s - Explosion/Flamepro design ry sign (in line) esign (90°) ry sign (in line) esign (90°) design Bolts/nuts	Safety of, Intrinsic Safety an Ambiant temper Transmitter and diapl Trans Tran Stainless : Tag plate None Yes None	nd Non Incendive ature correction hragm seal assembly smitter steel parts Housing None Yes
 Turn down ratio of 100 is possible but recommended for better performances. For DN<50, please consult Fuji Electric replacement 	garding t	the p	proce	ess co	nditions		ne UF	R G S L L is	1 2 3 4 Y B	Y Y Y Y		(*7) (*7) (*4) (*10) (*10) (*10) (*10) (*10) (*10) (*10) (*10) (*10)	IECEx - Intrinsic Safety IECEx - Increased Safe IECEx - Combination FI IECEx - ATEX - cCSAus Mounting (Capilla Rigid - Long de Rigid - Short d Capilla Rigid - Long de Rigid - Short d Cell flange Operating pressure	ty ameproof and Intrinsic s - Explosion/Flamepro design ry sign (in line) esign (90°) ry sign (in line) esign (90°) design Bolts/nuts	Safety of, Intrinsic Safety an Ambiant temper Transmitter and diapi Transmitter and diapi Tran Stainless Tag plate None Yes None Yes None Yes	nd Non Incendive ature correction hragm seal assembly smitter steel parts Housing None
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 Turn down ratio of 100 is possible but recommended for better performances. For DN<50, please consult Fuji Electric re; The flange rating is according to the Ma please consult Fuji Electric 	garding t ximum V	the p Worl	proce king	ess co Press	nditions ure. For	PN :	ne UR	R F Q W B L M G S S T	1 2 3 4 Y B C E	Y Y Y Y Y Y		(*7) (*7) (*4) (*10) (*10) (*10) (*10) (*10) (*10) (*10) (*10) (*10)	IECEx - Intrinsic Safety IECEx - Increased Safe IECEx - Combination FI IECEx - ATEX - cCSAus Mounting (Capilla Rigid - Long de Rigid - Short d Capilla Rigid - Short d Capilla Rigid - Short d Cell flange Operating pressure p ≤ 50 bar	ty ameproof and Intrinsic s - Explosion/Flamepro design ry sign (in line) esign (90°) ry sign (in line) esign (90°) • design Bolts/nuts None	Safety of, Intrinsic Safety an Ambiant temper Transmitter and diapl Transmitter and diap	nd Non Incendive ature correction hragm seal assembly smitter steel parts Housing None Yes None
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 Turn down ratio of 100 is possible but recommended for better performances. For DN<50, please consult Fuji Electric re; The flange rating is according to the Ma please consult Fuji Electric 	garding t ximum V	the p Worl	proce king	ess co Press	nditions ure. For	PN :	ne UR	R F Q W B L M G S S T	1 2 3 4 Y B C E A D	Y Y Y Y Y Y Y		(*7) (*7) (*10) (*	IECEx - Intrinsic Safety IECEx - Increased Safe IECEx - Combination FI IECEx - ATEX - cCSAus Mounting (Capilla Rigid - Long de Rigid - Short d Capilla Rigid - Short d Cell flange Operating pressure p ≤ 50 bar	ty ameproof and Intrinsic s - Explosion/Flamepro design ry sign (in line) esign (90°) ry sign (in line) esign (90°) • design Bolts/nuts None	Safety of, Intrinsic Safety an Ambiant temper Transmitter and diapl Transmitter and diapl Tran Stainless : Tag plate None Yes None Yes None Yes None Yes None Yes None Yes	nd Non Incendive ature correction hragm seal assembly smitter steel parts Housing None Yes None Yes None Yes None
 Turn down ratio of 100 is possible but recommended for better performances. For DN<50, please consult Fuji Electric regions The flange rating is according to the Maplease consult Fuji Electric For capillary version, the standard mount with rigid mounting version. Except digit 10 = "P", "0" Standard cell filling fluid = silicone oil. Oti 	garding t ximum V ing brack	the p Worl ket i	proce king is pro	ess co Press ovided	nditions ure. For 1. No mo	PN :	ne UR	R F Q W B L M G S S T	1 2 3 4 Y B C E A	Y Y Y Y Y Y		(*7) (*7) (*7) (*4) (*10) (*10) (*10) (*10) (*10) (*10) (*10) (*10) (*10) (*10) (*10) (*10) (*10) (*10) (*10) (*10) (*7) (*7) (*7)	IECEx - Intrinsic Safety IECEx - Increased Safet IECEx - Combination FI IECEx - ATEX - cCSAus Mounting - Capilla Rigid - Long de Rigid - Short d Capilla Rigid - Long de Rigid - Short d Cell flange Operating pressure p ≤ 50 bar	ty ameproof and Intrinsic s - Explosion/Flamepro Idesign ry sign (in line) esign (90°) ry sign (in line) esign (90°) idesign Bolts/nuts None Carbon steel	Safety of, Intrinsic Safety an Ambiant temper Transmitter and diapi Transmitter and diapi Tran Stainless : Tag plate None Yes None Yes None Yes None Yes None Yes None	nd Non Incendive ature correction rragm seal assembly smitter steel parts Housing None Yes None Yes None Yes
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 Turn down ratio of 100 is possible but recommended for better performances. For DN<50, please consult Fuji Electric re The flange rating is according to the Ma please consult Fuji Electric. For capillary version, the standard mount with rigid mounting version. Except digit 10 = "P", "Q" Standard cell filling fluid = silicone oil. Ott Only with digit 4 = "T", "W", "6", "8" SS 660 bolts/nuts are in conformity with 	garding t ximum V ing brack ner filling NACE MI	the p Worl ket i g flu R01	proce king is pro ids u 75/IS	ess co Press ovided ipon ri	nditions ure. For I. No mo equest.	PN :	ne UR	R F Q W B L M G S S T	1 2 3 4 Y B C E A D F G	Y Y Y Y Y Y Y Y		(*7) (*7) (*7) (*4) (*10	IECEx - Intrinsic Safety IECEx - Increased Safe IECEx - Combination FI IECEx - ATEX - cCSAus Mounting (Capilla Rigid - Long de Rigid - Short d Capilla Rigid - Long de Rigid - Short d Capilla Rigid - Short d Cell flange Operating pressure p ≤ 50 bar	ty ameproof and Intrinsic s - Explosion/Flamepro design ry sign (in line) esign (90°) ry sign (in line) esign (90°) design Bolts/nuts None Carbon steel SS 316L	Safety of, Intrinsic Safety an Ambiant temper Transmitter and diapi Transmitter and diapi Tran Stainless Tag plate None Yes None Yes None Yes None Yes None Yes None Yes None Yes	nd Non Incendive ature correction hragm seal assembly smitter steel parts Housing None Yes None Yes None Yes None
 Turn down ratio of 100 is possible but recommended for better performances. For DN<50, please consult Fuji Electric re The flange rating is according to the Ma please consult Fuji Electric For capillary version, the standard mount with rigid mounting version. Except digit 10 = "P", "0" Standard cell filling fluid = silicone oil. Ott Only with digit 4 = "T", "W", "6", "8" 	garding t ximum V ing brack ner filling NACE Mi nape vers	the p Worl ket i g flu R01 sion	proce king is pro ids u 75/IS	ess co Press ovided Ipon ri SO 15	nditions ure. For I. No mo equest. 156	PN :	ne UR	R T Q N W B L M G S T T L is bar, cket	1 2 3 4 Y B C E A D F G H	Y Y Y Y Y Y Y Y Y Y Y Y	(*9)	(*7) (*7) (*10) (*	IECEx - Intrinsic Safety IECEx - Increased Safet IECEx - Combination FI IECEx - ATEX - cCSAus Mounting - Capilla Rigid - Long de Rigid - Short d Capilla Rigid - Long de Rigid - Short d Cell flange Operating pressure p ≤ 50 bar	ty ameproof and Intrinsic s - Explosion/Flamepro Idesign ry sign (in line) esign (90°) ry sign (in line) esign (90°) idesign Bolts/nuts None Carbon steel	Safety of, Intrinsic Safety an Ambiant temper Transmitter and diapi Transmitter and diapi Tran Stainless Tag plate None Yes None Yes None Yes None Yes None Yes None Yes None Yes None Yes None Yes None	nd Non Incendive ature correction ature correction mragm seal assembly smitter steel parts Housing None Yes None
 Turn down ratio of 100 is possible but recommended for better performances. For DN-50, please consult Fuji Electric re The flange rating is according to the Ma please consult Fuji Electric. For capillary version, the standard mount with rigid mounting version. Except digit 10 = "P", "O" Standard cell filling fluid = silicone oil. Ot Only with digit 4 = "T", "W", "6", "8" SS 660 bolts/nuts are in conformity with SS 316L enclosure not available for "T" sl 	garding t ximum V ing brack ner filling NACE Mi nape vers	the p Worl ket i g flu R01 sion	proce king is pro ids u 75/IS	ess co Press ovided Ipon ri SO 15	nditions ure. For I. No mo equest. 156	PN :	ne UR	R T Q N W B L M G S T T	1 2 3 4 Y B C E A D F G H J	Y Y Y Y Y Y Y Y Y	(*9)	(*7) (*7) (*4) (*10) (*1	IECEx - Intrinsic Safety IECEx - Increased Safe IECEx - Combination FI IECEx - ATEX - cCSAus Mounting (Capilla Rigid - Long de Rigid - Short d Capilla Rigid - Long de Rigid - Short d Capilla Rigid - Short d Cell flange Operating pressure p ≤ 50 bar	ty ameproof and Intrinsic s - Explosion/Flamepro design ry sign (in line) esign (90°) ry sign (in line) esign (90°) design Bolts/nuts None Carbon steel SS 316L	Safety of, Intrinsic Safety an Ambiant temper Transmitter and diapi Transmitter and diapi Tran Stainless : Tag plate None Yes None Yes None Yes None Yes None Yes None Yes None Yes None Yes None Yes None Yes	nd Non Incendive ature correction hragm seal assembly smitter steel parts Housing None Yes None Yes None Yes None

MODEL CODE SYMBOLS - FKD

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	FKD	╅╉	+	V	F	• –	+	+	\vdash	Y	└ ┡─-	Туре		DESCRIPTION		
												Differential pressure trans		eals - Smart, 4-20 m/	A + HART/Fuji Elec	tric communication protoc
								_					Enclosure type	-		
		V -	-	_			-	_				1/2 - 14 NPT Pg13.5	"L" shape			
		Ŵ	+	+	\square	-	+	+	-			M20 x 1.5	- snape			
		5										G 1/2		İ		
		6			\square		$-\Gamma$					1/2 - 14 NPT	"T" shape			
		7	-	+	\square		+	-	-	-		Pg13.5 M20 x 1.5				
		Ч	+	+	\square	+	+	+	+		(*11)	Diaphragm seal rating		1		
			2									PN 25				
			4	+	\square		+	+	+			PN 20 - 150 lbs				
			6 8	+	$\left \right $		+	+	-	-		PN 50 - 300 lbs PN 40				
			9						L			PN 40 PN 16				
			L _	_								PN 100 - 600 lbs				
			м N			-	-	-			(*9)	PN 150 - 900 lbs PN 250 - 1500 lbs				
			Р —								(*9)	PN 420 - 2500 lbs				
		-	Τ	T							(*1)					
						_	_	_			(*2)	3,2 to 320 mbar				
			6		\square		+	+	-	-	(*2)	0,013 to 1,3 bar 0,05 to 5 bar				
			8			+	+	+		-		0,3 to 30 bar				
			ę									2 to 200 bar		i		
				1.	-		. –	_	-			Indicator		Arrester	-	
					F		а в	+	-	-	(*4)	None Analog, 0-100% linear s	cale	-		
				v v	F			+	-		(*4)	Analog, 0-100% intear s Analog, 0-100% √		None		
				v	F		٥L		L		(*4)	Analog, Custom scale		1		
				V	F	-	٦Ľ				(*4)	Analog, double scale]		
				V	F		Ē	+	-	-	(*4)	None Analog, 0-100% linear s	cale	-		
					F F		F G	-	-	-	(*4)	Analog, 0-100% intear s		Yes		
				1 v	F		нĽ				(*4)	Analog, Custom scale		1		
				v	F		κ匚				(*4)	Analog, double scale				
				V	F		ᄓᄃ	+				Digital, 0-100%		None		
				V	F		M⊢	+	-	-		Digital, 0-100% √ Digital, Custom scale		-		
					F			+				Digital, 0-100%				
				Ň	F		йĽ					Digital, 0-100% √		Yes		
				V	F		s					Digital, Custom scale				
					F		1 2	+	-	-		Digital, 0-100% with pus		None		
				V V	F		3	+	+	-		Digital, Custom scale w Digital, 0-100% √ with p		NOTE		
				v	F		4					Digital, 0-100% with pus			1	
				V	F	-	5					Digital, Custom scale w	ith push buttons	Yes		
				V	F	-	6	+	-			Digital, 0-100% √ with p				
							A	\vdash	-			Hazardous location ap None	provais			
							×		1		(*7)	ATEX - Flameproof				
							к					ATEX - Intrinsic Safety				
							P					ATEX - Increased Safe				
							N				(*7)	ATEX - Combination FI		nsic Safety		
							E				(*7)	cCSAus - Explosion pro				
							J	\vdash	-	-	(*7)	cCSAus - Intrinsic Safe cCSAus -Combination			on Incendive	
							R	\vdash	+	-	(*7)	IECEx - Flameproof		amore Garety and N	on incentive	
							Т		+			IECEx - Intrinsic Safety	,			—
							c					IECEx - Increased Safe				
							N				(*7)	IECEx - Combination F				
							v	4	-		(*7)	IECEx - ATEX - cCSAu Mounting				
								в		-	(*3) (*6)	Mounting Capillary on		Ampiant tem	perature correct	
								С				Capillary on HF	% LP side	Transmitter and d	iaphragm seal as	sembly
								E	<u> </u>		(*12)	Rigid short design on HP, Capillary on				
								G H		-		Capillary on Capillary on HF		. Tra	ansmitter	
								1		_		Cell flange o		Stainless stee		
								<u> </u>			(*5)			Stanness stee	-	
												Operating pressure	Bolts/nuts	Tag plate	el parts Housing	
Notes* : 1- Turo dow	ration of 100 is presible but open creat	or than 1	/40 -4	the +		is roo	Ommo		1	Y	(*12)	Operating pressure		Tag plate None	-	1
1- Turn dow	ration of 100 is possible but span greate performances.	er than 1	/40 ot	the th	ne URL	is rec	omme		2	Y	(*12)	Operating pressure p ≤ 50 bar		Tag plate None Yes	Housing	
1- Turn down for better	ration of 100 is possible but span greate performances. , please consult Fuji Electric regarding the				ne URL	is rec	omme		2 3	Y Y	(*12) (*12) (*10)(*12)		Bolts/nuts	Tag plate None Yes None	Housing	
 Turn down for better For DN<5 For capilla 	performances. I, please consult Fuji Electric regarding the ry version, the standard mounting bracket	e process	s condi	tions				nded	2	Y	(*12)		Bolts/nuts	Tag plate None Yes	Housing None Yes	
 Turn down for better For DN<5 For capilla mounting 	performances. , please consult Fuji Electric regarding the ry version, the standard mounting bracket version.	e process	s condi	tions				nded	2 3 4 Y B	Y Y Y	(*12) (*12) (*10)(*12) (*10)(*12)	p ≤ 50 bar	Bolts/nuts	Tag plate None Yes None Yes	Housing None	
 Turn down for better For DN<5 For capilla mounting Except Di 	performances. I, please consult Fuji Electric regarding the ry version, the standard mounting bracket	e process t is provi	s condi ded. N	tions lo mou				nded	2 3 4 Y B C	Y Y Y Y Y	(*12) (*12) (*10)(*12) (*10)(*12) (*10)		Bolts/nuts None	Tag plate None Yes None Yes None Yes None	Housing None Yes	
 Turn down for better For DN<5 For capilla mounting Except Di Standard Temperati 	performances. , please consult Fuji Electric regarding the ry version, the standard mounting bracker version. it 10 = "P", "O" ell filling fluid = silicone oil. Other filling fl re correction must be done when diaphra	e process t is provi luids upo	s condi ded. N on requ	tions lo mou lest.	Inting	oracke	t with	nded rigid	2 3 4 Y B C E	Y Y Y Y Y Y	(*12) (*12) (*10)(*12) (*10)(*12)	p ≤ 50 bar	Bolts/nuts None	Tag plate None Yes None Yes None Yes None Yes	Housing None Yes None Yes	
 Turn down for better For DN<5 For capilla mounting Except Di Standard Temperative 	performances. , please consult Fuji Electric regarding the ry version. it 10 = "P", "Q" ell filling fluid = silicone oil. Other filling fl re correction must be done when diaphra IP and LP	e process t is provi luids upo	s condi ded. N on requ	tions lo mou est.	Inting	oracke	t with	nded rigid	2 3 4 Y B C E A	Y Y Y Y Y Y Y	(*12) (*12) (*10)(*12) (*10)(*12) (*10)	p ≤ 50 bar 50 bar < p ≤ 420 bar	Bolts/nuts None Carbon steel	Tag plate None Yes None Yes None Yes None Yes None	Housing None Yes None	
 Turn dow for better For DN<5 For capilla mounting Except Di Standard Temperat between Only with 	performances. , please consult Fuji Electric regarding the ry version, the standard mounting bracker version. it 10 = "P", "Q" vell filling fluid = silicone oil. Other filling fl re correction must be done when diaphra IP and LP Digit 4 = "T", "W", "6", "8"	e process t is provi luids upo agm seal	s condi ded. N on requ Is or c	tions lo mou est. apillar	Inting	oracke	t with	nded rigid	2 3 4 Y B C E	Y Y Y Y Y Y	(*12) (*12) (*10)(*12) (*10)(*12) (*10)	p ≤ 50 bar	Bolts/nuts None	Tag plate None Yes None Yes None Yes None Yes	Housing None Yes None Yes None	
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SEAL DIAPHRAGMS

Fuji Electric seal diaphragms are dedicated to accurately measure level and density on open and closed tanks, flow and line pressure in pipes in heavy process conditions. The use of remote seal diaphragms avoids the measuring cell to be directly in contact with the process conditions. The various diaphragm architectures and the welded seal construction provide to the Fuji Electric remote seal diaphragm offer an excellent reliability in harsh processing conditions such as high static pressure, temperature or corrosiveness as weel as viscous, crystallizable or abrasive process.



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FEATURES

1- Construction

Connection of the remote seal to the measuring cell diaphragms can be done either by a rigid (direct) or capillary architectures. The full welded Fuji Electric design allows a free of gasket path between the remote seal and the differential, gauge or absolute measuring cell of the FCX-AII V5 pressure transmitters. Depending the nature of the process, specific filling fluids are available to ensure the optimal transmission of the process pressure to the measuring cell.

2- Operating principle

The pressure is applied on the remote seal and transferred by the filling fluid through the capillary path to the measuring cell of the pressure transmitter.

3- Wide variety of materials selection

Depending the process conditions, wetted or non-wetted parts and filling fluids can be selected thanks to the model code definition. Wetted parts :

AISI 316L, Tantalum, Hastelloy, Monel, Titanum, Zirconium, AISI 316L with Gold or PFA coating.

Non wetted parts :

AISI 316L

Filling fluids :

Standard silicone, fluorinated, alimentary, high temperature, and vacuum specific oils.

For specific process conditions, please consult Fuji Electric.

4- Diaphragm seal types

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

Flush mounting design from DN40 to DN100.

Seals with extensions (50 to 200 mm).

Flanged, screwed or welded neck adapters

Seals for sanitary applications according DIN, SMS or Tri-Clamp standards.

For specifics seals, please consult Fuji Electric.

FUNCTIONAL SPECIFICATIONS

Remote seal diaphragm assembling :

The remote seal can be assembled on the transmiter either by a direct (rigid) connection (as for level measurement at the bottom of a tank) or by capillary (distant measuring point, high temperature process).

The rigid assembling can be either "long design" (in line) or "short design" (90°) as shown in the outline dimension drawings.

	Rigid mounting	Capillary mounting
FKB	short or long design	HP side
FKM	short or long design	HP side
FKD	Refer to FKR level	HP and LP side
	transmitter technical	HP side
	datasheet	LP side

Capillary tube specifications :

Standard capillary lengthes :

1.5 / 3 / 6 m (other upon request)

Inside diameter :

1 mm standard

2 mm for vacuum service, high process temperature applications, short response time requirements Smallest bending radius of the capillary : 100 mm

Capillary tube shealding possibilities :

Temperature limit :

PVC sleeve :

-10 to 80°C

Stainless steel sheald :

-40 to 350°C

Process connection possibilities :

The remote seal diaphragms can be :

- For flush mounting
- With extension

- With mounting adapters mounting (flanged, screwed or welded neck).

The mounting adapter is dedicated to either adapt the remote seal to a specific process connection or increase the sensibility of the transmitter with special process conditions.

Temperature limits :

Ambiant temperature :

-40 to 85°C for transmitter

Process temperature :

-40 to 150°C for rigid mounting, 0 to 350°C for capillary design, and high temperature filling fluid.

Pressure limits :

Working pressure :

Limited by by the smallest value between the nominal flange rating of the seal diaphragm and the maximum working pressure of the transmitter.

Vacuum limit :

Depends on the limit of the measuring cell and the filling fluid of the remote seal. For the differential or gauge pressure transmitter, the vacuum limit is 20 Torr or 27 mbar abs.

Only the absolute pressure transmitter can be used till absolute zero (FKM).

For process pressure < 20 Torr, please consult Fuji Electric.

PERFORMANCE SPECIFICATIONS

To evaluate the global performances, both the transmitter and the remote seal diaphragm performances must be considered under the reference conditions : standard silicone oil filling, SS 316L seal diaphragm, 4-20 mA output in linear mode.

Accuracy :

Assembling 1 or 2 remote seal diaphragms on a transmitter increases the accuracy error at reference conditions by 0,1% of the span.

Ambiant temperature effect :

Effect when only transmitter is corrected. (See digit 11 code G, S, T of the FKB and FKM model codes and code G, H of the FKD model code).

Transmitters	Effe	ect (mbar/10	°C)	
	FKB/FKM	Capillary	FKD	Capillary
Seals	Gauge / Abs.	(m)	Differential	(m)
	pressure		pressure	
DN 50 / 2" -	2.03	1.5	0.48	0.32
SS 316L diaphragm				
DN 80 / 3" -	0.11	0.08	0.04	0.03
SS 316L diaphragm				
DN80 / 3" - other	0.22	0.2	0.05	0.07
diaphragm materials				
DN100 / 4" -	0.04	0.03	0.02	0.01
SS 316L diaphragm				
Adaptor -	0.11	0.08	0.04	0.03
SS 316L diaphragm				

Note : the indicated values are in mbar/10°C for capillary length of 1m and internal capillary tube ø of 1 mm

Effect when both the transmitter and the seal assembly are corrected. (See codes B,C,L,M digit 11 of the FKB, FKD and FKM model codes).

The correction of the zero drift can be done at factory level on the complete system (transmitter and remote seals) by an additional temperature correction operation..

A thermal isolation or a heating of the capillaries minimises the ambient temperature effect.

Process temperature effect :

Transmitters	Effect (mba	ar/10°C)
Seals	FKB/FKM Gauge/absolute pressure	FKD differential pressure
Jeals	Cauge/absolute pressure	
DN50 / 2" SS 316L diaphragm	1.24	0.5
DN80 / 3" SS 316L diaphragm	0.17	0.09
DN80 / 3" other diaphragm materials	0.73	0.22
DN100 / 4" SS 316L diaphragm	0.08	0.05
Adaptor SS 316L diaphragm	0.17	0.09

Static pressure effect for ∆P transmitter with stainless steel diaphragms (FKD transmitter with DN80 and DN100 seals) : Zero shift :

± 0,2% of URL for flange rating, up to 40 bar or 300 lbs **Response time :** (mean values)

Oil filling	Code	Response time				
	digit 7	0 to	0 to			
		320 mbar	1.3 bar			
Std silicone oil	Y, G	0.15	0.037			
Fluorinated oil	W,A,D	0.17	0.04			
Oil for vaccum or	U, X	0.25	0.065			
high temperature						

The indicated values are in seconds per meter of capillary length with internal tube diameter \emptyset 1 mm.

The indicated response time is based on a pressure change of 0 to 100% of the calibrated span at reference temperature of 20°C.

The indicated values do not include the response time of the transmitter.

Filling fluid of the diaphragm seals :

Code	Designation	Temperature r	Density	
digit 7		P abs ≥ 1 bar	P abs < 1 bar	(25°C)
Y	Silicone oil	-40 to 180	-40 to 120	0.95
W	Fluorinated oil	-20 to 200	-20 to 120	1.84
F	Sanitary fill fluide	-10 to 250	-10 to 120	0.94
V	Silicone oil		20 to 200	1.07
U	Silicone oil	0 to 300	20 to 200	1.07
Х	Silicone oil	-10 to 350	20 to 200	1.09

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

Please consult Fuji Electric for special applications indicating your temperature, pressure and vacuum conditions (vacuum and temperature can occure together).

Other filling fluids can be used for your applications.

s	3	4	5	6	ŕ	 _	_	Г				DESCRIP	TION		
			_							Remote seal diaphrage	ns	LOONF			
										Flange / Capillary conn					
A										Axial					
R									_	Radial - Not possible with	h rigid assembli	ng design (dig	it 6 = "R")		
w										Wafer type - Not possible		mbling design	(digit 6 ="R")	
								((*1)	Flanges RF (flange size					
	4									ANSI-150 Lbs 3" / ISO P	N20 DN80				
	5				-					ANSI-150 Lbs 4" / ISO P					
	6									ANSI-300 ILbs 3" / ISO F	PN50 DN80				
	7							_		ANSI-300 Lbs 4" / ISO P	N50 DN100				
	8							_		DIN PN40 DN80					
	9									DIN PN16 DN100					
	H									ANSI-150 lbs 2" / ISO PI					
	J									ANSI-300 lbs 2" / ISO PI	N50 DN50				
	G K									DIN PN40 DN50 G 2" screwed seal					
	L							· ·	,	G 1 1/2" screwed seal					
	U							-	,	PN25 DN50 - coupling n	ute	n	IN 11851	Digit 4 = "V" only	
	v									PN40 DN50 - coupling n				Digit 4 = "V" only	
	ŵ							-		PN40 DN50 - seal only	uts			Digit 4 = "V" only	
	x							-		No dead volume				Digit 4 = "V" only	
	A								*3)	Flange adapter PN40 DN			annary	Digit 4 = "V" only - ot	
	в									Flange adapter ISO PN2		ANSI)		Digit 4 = "V" only - ot	
	с									Flange adapter ISO PN5				Digit 4 = "V" only - of	
	D									Flange adapter PN40 DN		,		Digit 4 = "V" only - of	
	Е									Flange adapter ISO PN2		150 ANSI)		Digit 4 = "V" only - of	· · ·
	F									Flange adapter ISO PN5				Digit 4 = "V" only - of	
	s									Screwed 1/2 NPTE				Digit 4 = "V" only - of	
	т									To be welded (2"1/2 pipe	e)			Digit 4 = "V" only - ot	
-										S	eal diaphragm	design			
										Diaphragm	Seal lan	d surface	Flange	4	
		v						((*4)	SS 316L	SS	316L			
		н						T	_	Hastelloy-C	Hast	elloy-C	1		
		в						T		Monel	M	onel	1		
		т								Tantalum	Tan	talum	SS 316L		
		Ρ			<u> </u>				(*9)	Titanium	Tita	nium	-		
		R			<u> </u>			((*9)	Zirconium	Ziro	onium	-		
		С			-					SS 316L + gold coating	g SS	316L	-		
		F			<u> </u>		\square	((*5)	SS 316L + PFA lining		PFA lining	<u> </u>		
					L			_		Seal diaphragm design	1		1		
			Y	<u> </u>	-		\mid	_	***	Flush mounting					
			A	—	-		\vdash			Diaphragm extension 50		git 4 = "V"	4		
			В		-		\vdash			Diaphragm extension 10		git 4 = "V"	1		
			C D		-		\vdash		. ,	Diaphragm extension 15		git 4 = "V"	1		
			D		-		\vdash			Diaphragm extension 20 Diaphragm extension 50		git 4 = "V" git 4 = "H"	-		
			F		-		\vdash			Diaphragm extension 50 Diaphragm extension 10		git 4 = "H" git 4 = "H"	1		
			G	-						Diaphragm extension 15		git 4 = "H"	1		
			н							Diaphragm extension 20		git 4 = "H"	1		
			J							Diaphragm extension 50		git 4 = "B"	1		
			ĸ							Diaphragm extension 10		git 4 = "B"	1		
			L							Diaphragm extension 15		git 4 = "B"	1		
			м							Diaphragm extension 20		git 4 = "B"]		
			Р					((*6)	Diaphragm extension 50		git 4 = "T"			
			R							Diaphragm extension 10		git 4 = "T"]		
			s					((*6)	Diaphragm extension 15	0 mm Di	git 4 = "T"	1		
			т					((*6)	Diaphragm extension 20	0 mm Di	git 4 = "T"			
							ΙĪ			Remote seal assemblin					
										Mounting assembly	Length	Protection	4		
				А	L						1,5 m	4			
				в							3 m	PVC			
				С	L						6 m	sleeve			
				D	<u> </u>					Capillary .	Upon request	.			
				G					(*7)		1,5 m	Stainless			
nishing (r	rener	29		н	<u> </u>				(*7)		3 m	steel			
		, o,		ĸ	<u> </u>		\vdash		(*7) (*7)		6 m Upon request	sleeve			
				L	<u> </u>			((1)	Divid as a with of the first				A//	1
garding th	he pr	ocess		R R	<u> </u>		$\mid \mid$	_	_	Rigid assembly for FKB, F					
				.``			\vdash		_	Rigid assembly for FKP &				axinnum process tempe	eralure: 150 °C
ossible										Specific applications a	na miing fluids	1			1
						<u> </u>	\vdash		_	Treatment		+ '	Filling fluids	,	
		1.1			Y W	-	\vdash		_	None (standard)		-	Silicone oil		
sion and					F		\vdash		_	None (standard)			luorinated oi		
her remo	JLE SE	5d1 0N			F D		\vdash		_	None (standard) Chlorine service		1	anitary fill flui luorinated oi		
	v dia	meter	r		G	<u> </u>	\vdash		_				Silicone oil	·	
canillan	, aid				A	<u> </u>	\vdash			Degreasing Oxygen service		Fluorinated	d oil - Digit 4	= "V" only	
capillary					N	-	\vdash		_	NACE MR 0175 / ISO 15	5156	i nuor mateo	Silicone oil	v only	
capillary	mum	pres-			1.1		. 1						Surgerie Oil		
	mum	pres-			v			1	*81				Silicone oil		
ons (minir					V U				(*8)	Vacuum service - maxim	um T° 200°C	vacuum	Silicone oil		
					v u x			((*8) (*8)		num T° 200°C D to 300°C) - No		Silicone oil		

* Notes :

1- Standard seal land surface finishing (stock finish). Other finis groove...): please consult Fuji Electric.

For material codes H, B, T, P, R, F : smooth finishing 2- Only available for P > 1 bar. Please consult Fuji Electric regar

- conditions

 Only for axial seal diaphragm connection - No extension pos
 S3 316 for DNS0, 80, 100 and flange adapter
 Not possible with digit 7 = "V", "U" and "X"
 All wetted parts in the same material (diaphragm, extension) surface). Available for digit 3 = 4, 5, 6, 7, 8, 9, H, J, G - Othe demand

7- Vacuum service and high temperature > 120 $^{\circ}\text{C}$: internal ca = 2 mm

8- Please consult Fuji Electric regarding the process conditions sure, maximum temperature)

- 9- Maximum process temperature : 150°C
- 10- When no code can be found in the current model code, plac responding digit code as well as in the 16th digit

11- Only for FKP, FKH and rigid assembly. $\ensuremath{\mathsf{P}}\xspace > 1.3$ bar

ELECTROMAGNETIC COMPATIBILITY

All FCX-All series of pressure transmitters are in conformity with the provision of the EMC Directive 2014/30/EU on the harmonization of the laws of the Members States relating to electromagnetic compatibility.

All these models of pressure transmitters are in accordance with the following harmonized standards :

- EN 61326-1 (Electrical equipment for measurement, control and laboratory use EMC requirements -
- Part 1: General requirements).

• EN 61326-2-3 (Particular requirements - Test configuration, operational conditions and performance criteria for tranducers with integrated or remote signal conditioning).

Emission limits (according to EN 55011 / CISPR 11, Group 1 Class A)

Frequency range (MHz)	Limits	Result
30 to 230	40 dB (μ V/m) quasi peack, measured at 10 m distance	Passed
230 to 1000	47 dB (μ V/m) quasi peack, measured at 10 m distance	

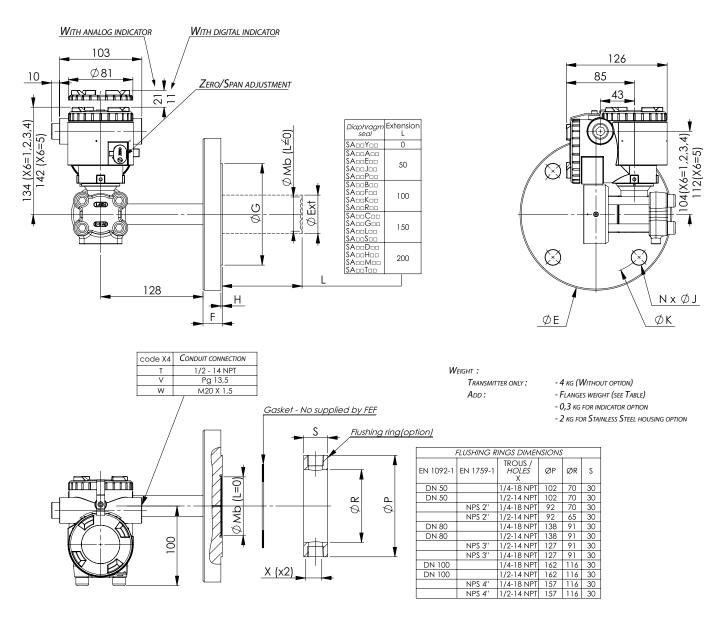
Immunity

Phenomenon	Test value	Standard	Required	Result
			Performance criteria	of criteria
Electrostatic Discharge	±4 kV (Contact)	EN/IEC 61000-4-2	В	Α
	±8 kV (Air)			
Radiated, Electromagnetic	10 V/m (0.08 to 1.0 GHz)	EN/IEC 61000-4-3	Α	Α
Field	3 V/m (1.4 to 2.0 GHz)			
	1 V/m (2.0 to 2.7 GHz)			
Fast transients (burst)	2 kV (5/50 ns, 5 kHz	EN/IEC 61000-4-4	В	Α
Surge Transients	1 kV Line to line	EN/IEC 61000-4-5	В	Α
	2 kV Line to ground			
Conducted RF Disturbances	3 Vrms (150 kHz to 80 MHz)	EN/IEC 61000-4-6	Α	Α
	80% AM @ 1 kHz			
Power Frequency Magnetic Field	30 A/m (50 Hz, 60 Hz)	EN/IEC 61000-4-8	A	Α

Performance criteria (A & B): according to IEC 61326

OUTLINE DIMENSIONS FOR RIGID MOUNTED DIAPHRAGM SEAL ON A GAUGE OR AN ABSOLUTE PRESSURE TRANSMITTER (units : mm) - Dimensions of seals - Refer to page 18 and 19

Short mounting design

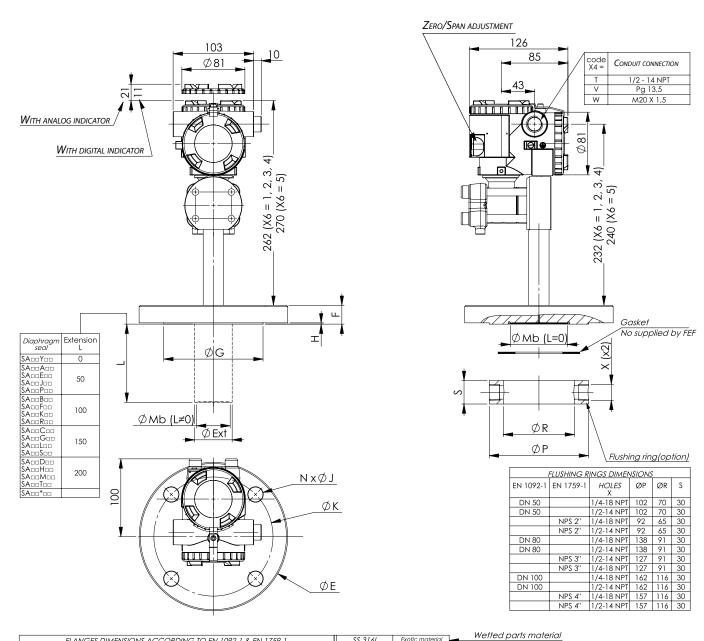


ØMb = Ø diaphragm ØExt = extension Wetted parts material

											WEITER	a pu	is muteric
ŀ	LANGES DIME	NSIONS ACCO	RDIN	G TO E	N 109	2-1 &	EN 1759	P_1		3	SS 316L	Exofic material	
diaphragm seal	EN 1092-1	EN 1759-1	ØE	F min	ØG	н	N x ØJ	ØK	<i>Weight</i> (kg)	L=0 ØMb	L≠0 ØExt=ØMb	L=0 ØMb	L≠0 ØExt(ØMb)
SAGDDDD	DN50 PN40		165	20	102	2	4 x 18	125	3.3	59	48	59	48,3 (47)
SAHDDDD	21.00111.00	2" CLASS 150	152	21	92	1,6	4 x 19	120,6	2,7	59	48	59	48,3 (47)
SAJDDDD		2" CLASS 300	165	22,5	92	1,6	8 x 19	127	3.7	59	48	59	48,3 (47)
SA80000	DN80 PN40		200	24	138	2	8 x 18	160	5,8	73	73	89	76 (72)
SA40000		3" CLASS 150	190	24	127	1,6	4 x 19	152,4	5,3	73	73	89	76 (72)
SA6DDDD		3" CLASS 300	210	28,5	127	1,6	8 x 22,2	168,3	7,8	73	73	89	76 (72)
SA9000	DN100 PN16		220	22	158	2	8 x 18	180	5,9	96	96	89	94 (89)
SA50000		4" CLASS 150	229	24	157	1,6	8 x 19	190,5	7,7	96	96	89	94 (89)
SA7DDDD		4" CLASS 300	254	32	157	1,6	8 x 22,2	200	12,7	96	96	89	94 (89)

	Seal diaphragm		SPAN	I LIMIT
$X_1 X_2 X_3 X_4 X_5 X_6 X_7 X_8 - X_9 X_{10} X_{11} X_{12} X_{13}$	$X_1 X_2 X_3 X_4 X_5 X_6 X_7$		Min.	Max.
		FKB 1	1,3 kPa (0,013 bar)	100 kPa (1,3 bar)
	S A R R	FKB 22	5 kPa (0,05 bar)	500 kPa (5 bar)
X11 = M, T		FKB 3	30 kPa (0,3 bar)	3 MPa (30 bar)
		FKB 4	100 kPa (1 bar)	10 MPa (100 bar)
		FKB 5	500 kPa (5 bar)	50 MPa (500 bar)

Long mounting design



6					V 100	210	EN 1760	1		1	SS 316L	Exo	tic material	Wetted parts materia
Г														
-11	EN 1092-1	EN 1759-1	ØE	Fmin	an	н	NXØJ	ØK	141-2-1-4	L=0	L≠0	L=0	L≠0	ØMb = Ø diaphragm
diaphragm seal	EN 1092-1	EN 1739-1			ØG	п		ØK	<i>Weight</i> (kg)	Øмb	ØExt=ØMb	Øмь	ØExt(ØMb)	ØExt = extension
SAGDDDD	DN50 PN40		165	20	102	2	4 x 18	125	3,3	59	48	59	48,3 (47)	
SAHDDDD		2" CLASS 150	152	21	92	1,6	4 x 19	120,6	2,7	59	48	59	48,3 (47)	
SAJDDDD		2" CLASS 300	165	22,5	92	1,6	8 x 19	127	3.7	59	48	59	48,3 (47)	
SA80000	DN80 PN40		200	24	138	2	8 x 18	160	5,8	73	73	89	76 (72)	
SA40000		3" CLASS 150	190	24	127	1,6	4 x 19	152,4	5,3	73	73	89	76 (72)	
SA6DDDD		3" CLASS 300	210	28,5	127	1,6	8 x 22,2	168,3	7,8	73	73	89	76 (72)	
SA90000	DN100 PN16		220	22	158	2	8 x 18	180	5,9	96	96	89	94 (89)	
SA50000		4" CLASS 150	229	24	157	1,6	8 x 19	190,5	7,7	96	96	89	94 (89)	
SA70000		4" CLASS 300	254	32	157	1,6	8 x 22,2	200	12,7	96	96	89	94 (89)]

WEIGHT :

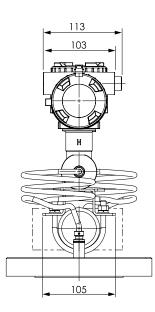
TRANSMITTER ONLY: Add:

- 4 KG (WITHOUT OPTION) - Flanges weight (see Table) - 0,3 KG FOR INDICATOR OPTION - 2 KG FOR STAINLESS STEEL HOUSING OPTION

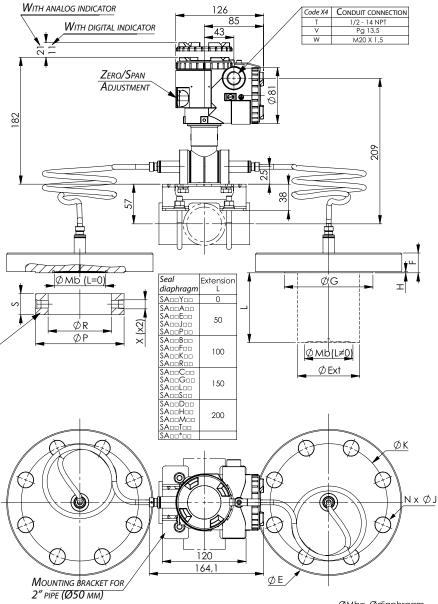
	[]		SPAN	I LIMIT
$X_1 X_2 X_3 X_4 X_5 X_6 X_7 X_8 - X_9 X_{10} X_{11} X_{12} X_{13}$	Seal diaphragm :		Min.	Max.
	$X_1 X_2 X_3 X_4 X_5 X_6 X_7$	FKB 11	1,3 kPa (0,013 bar)	100 kPa (1,3 bar)
		FKB□□2	5 kPa (0,05 bar)	500 kPa (5 bar)
$X_{11} = L, S$	S A L	FKB 3	30 kPa (0,3 bar)	3 MPa (30 bar)
		FKB 4	100 kPa (1 bar)	10 MPa (100 bar)
		FKB🗆 🗆 5	500 kPa (5 bar)	50 MPa (500 bar)

OUTLINE DIMENSIONS FOR CAPILLARY MOUNTED DIAPHRAGM SEAL(S) ON A DIFFERENTIAL PRESSURE TRANSMITTER (units : mm) - Dimensions of seals - Refer to page 18 and 19

For PN ≤ 50bar : reduced volume flanges are welded on the measuring cell



	FLUSHING	RINGS DIME	INSION	IS	
EN 1092-1	EN 1759-1	HOLES X	ØP	ØR	s
DN 50		1/4-18 NPT	102	70	30
DN 50		1/2-14 NPT	102	70	30
	NPS 2"	1/4-18 NPT	92	65	30
	NPS 2"	1/2-14 NPT	92	65	30
DN 80		1/4-18 NPT	138	91	30
DN 80		1/2-14 NPT	138	91	30
	NPS 3"	1/4-18 NPT	127	91	30
	NPS 3"	1/2-14 NPT	127	91	30
DN 100		1/4-18 NPT	162	116	30
DN 100		1/2-14 NPT	162	116	30
	NPS 4"	1/4-18 NPT	157	116	30
	NPS 4"	1/2-14 NPT	157	116	30



WFIGHT :

TRANSMITTER ONLY : ADD:

- 3.5 KG (WITHOUT OPTION)
- FLANGES WEIGHT (SEE TABLE)
- 1 KG PER 50 MM EXTENSION - 0.3 KG FOR INDICATOR OPTION

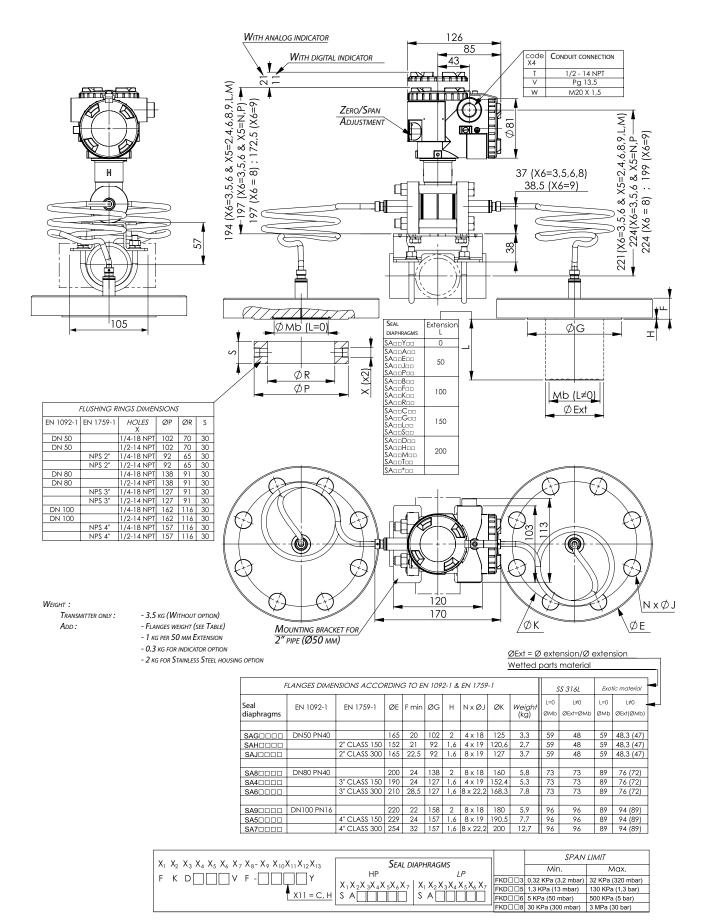
- 2 KG FOR STAINLESS STEEL HOUSING OPTION

Ø	E>	۱b t)= =	ç	Ø Ø	dia e>	ap de	hro ns	a ic	gm >n	

Wetted parts material

F	FLANGES DIMEI	NSIONS ACCO	RDING	G TO EI	N 109.	2-1 &	EN 1759	-1		3	SS 316L	Exo	tic material
Seal diaphragms	EN 1092-1	EN 1759-1	ØE	F min	ØG	Н	NרJ	ØK	<i>Weight</i> (kg)	L=0 ØMb	L≠0 ØExt=ØMb	L=0 ØMb	L≠0 ØExt(ØMb)
SAGDDDD	DN50 PN40		165	20	102	2	4 x 18	125	3,3	59	48	59	48,3 (47)
SAHDDDD		2" CLASS 150	152	21	92	1,6	4 x 19	120,6	2,7	59	48	59	48,3 (47)
SAJDDDD		2" CLASS 300	165	22,5	92	1,6	8 x 19	127	3.7	59	48	59	48,3 (47)
SA80000	DN80 PN40		200	24	138	2	8 x 18	160	5,8	73	73	89	76 (72)
SA40000		3" CLASS 150	190	24	127	1,6	4 x 19	152,4	5,3	73	73	89	76 (72)
SA60000		3" CLASS 300	210	28,5	127	1,6	8 x 22,2	168,3	7,8	73	73	89	76 (72)
SA9000	DN100 PN16		220	22	158	2	8 x 18	180	5,9	96	96	89	94 (89)
SA50000		4" CLASS 150	229	24	157	1,6	8 x 19	190,5	7,7	96	96	89	94 (89)
SA7DDDD		4" CLASS 300	254	32	157	1,6	8 x 22,2	200	12,7	96	96	89	94 (89)

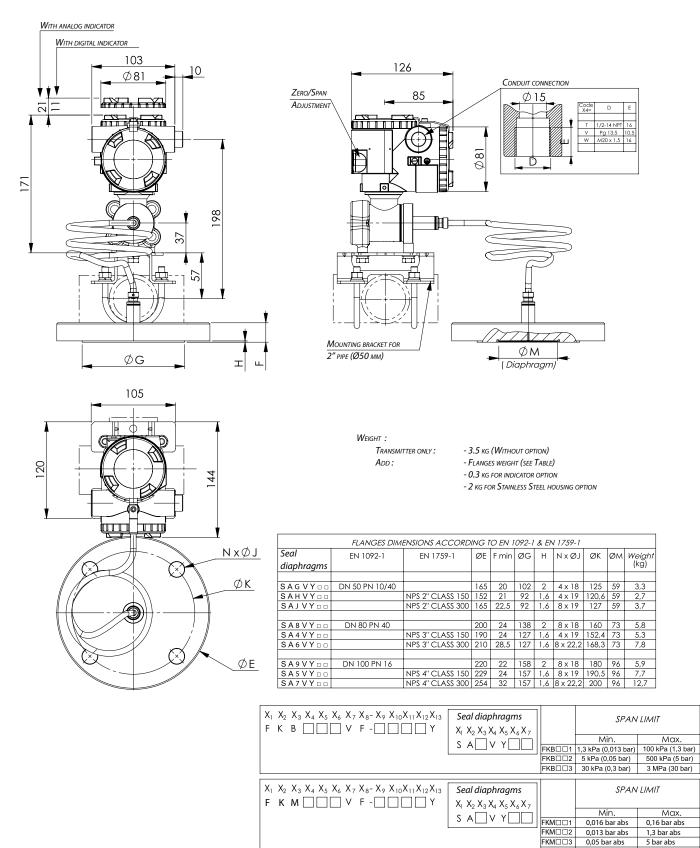
$X_1 X_2 X_3 X_4 X_5 X_6 X_7 X_8 - X_9 X_{10} X_{11} X_{12} X_{13}$	Seal DIAPHRAGMS		SPAN	LIMIT
	HP I LP		Min.	Max.
				32 KPa (320 mbar)
		FKD 5	1,3 KPa (13 mbar)	130 KPa (1,3 bar)
X5 = 2, 4, 6, 8, 9 $X11 = C, H$		FKD 🗆 🗆 6	5 KPa (50 mbar)	500 KPa (5 bar)



For PN > 50bar : reduced volume flanges are welded and bolted on the measuring cell

OUTLINE DIMENSIONS FOR CAPILLARY MOUNTED DIAPHRAGM SEAL(S) ON A GAUGE OR AN ABSO-LUTE PRESSURE TRANSMITTER (units : mm) - Dimensions of seals - Refer to page 18 and 19

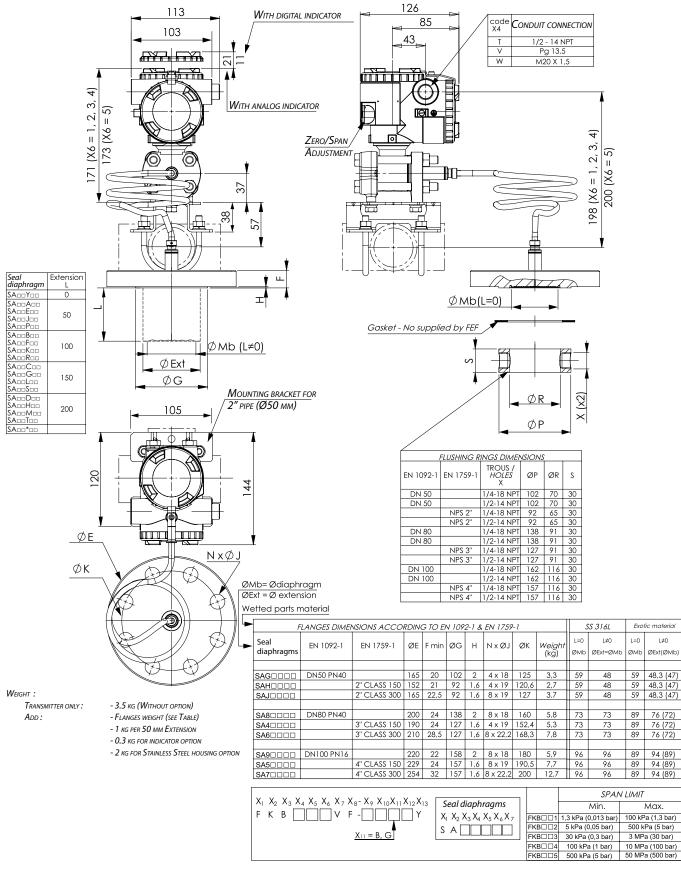




FKM□□4

0.3 bar abs

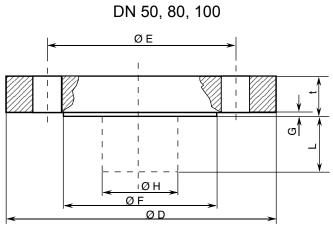
30 bar abs



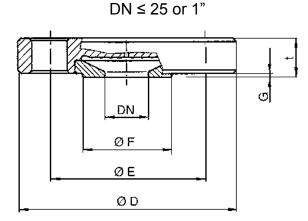
For PN > 50bar : reduced volume flanges are welded and bolted on the measuring cell

$X_1 X_2 X_3 X_4 X_5 X_6 X_7 X_8 - X_9 X_{10} X_{11} X_{12} X_{13}$	Dianhranna ag al t		SPA	N LIMIT
	Diaphragm seal :		Min.	Max.
	$X_1 X_2 X_3 X_4 X_5 X_6 X_7$	FKM□□1	0,016 bar abs	0,16 bar abs
	ς αΠν ΥΠΠ	FKM□□2	0,013 bar abs	1,3 bar abs
		FKM□□3	0,05 bar abs	5 bar abs
		FKM□□4	0,3 bar abs	30 bar abs
		FKM□□5	1 bar abs	100 bar abs

OUTLINE DIMENSIONS OF THE STANDARD DIAPHRAGM SEALS - FLUSH / EXTENSION (units : mm)

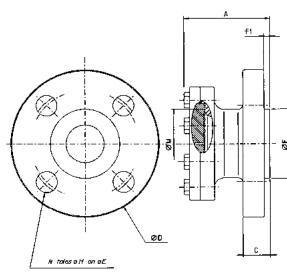




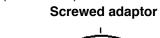


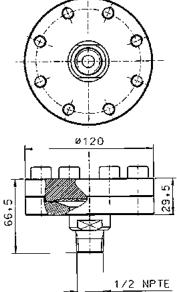
FLANGE DIMENSIONS ACCORDING DIN 2501 ET B16.5										
DIN/ISO ANSI										
ΡN	DN	NP	NW	ØD	ØE	ØF	G	ØН	t	N x Øh
40	15			95	65	45	2		22	4 x 14
40	20			105	75	58	2		22	4 x 14
40	25			115	85	68	2		22	4 x 14
40	50			165	125	102	3	48	20	4 x 18
40	80			200	160	138	3	73	20	8 x 18
16	100			220	180	158	3	96	20	8 x 18
20	15	150 lbs	1/2"	95	60,5	35	2		22	4 x 16
20	20	150 lbs	3/4"	100	70	43	2		22	4 x 16
20	25	150 lbs	1″	110	79,5	51	2		22	4 x 16
50	15	300 lbs	1/2″	95	66,5	35	2		22	4 x 16
50	20	300 lbs	3/4"	120	82,5	43	2		22	4 x 20
50	25	300 lbs	1″	125	89	51	2		22	4 x 20
20	50	150 lbs	2″	150	120,5	92	1,6	48	20	4 x 20
20	80	150 lbs	3″	190	152,5	127	1,6	73	24	4 x 20
20	100	150 lbs	4″	230	190,5	158	1,6	96	24	8 x 20
50	50	300 lbs	2″	165	127	92	1,6	48	22,5	8 x 20
50	80	300 lbs	3″	210	168,5	127	1,6	73	29	8 x 22
50	100	300 lbs	4″	255	200	158	1,6	96	32	8 x 22

OUTLINE DIMENSIONS OF DIAPHRAGM SEALS WITH ADAPTORS (units : mm) Flange adaptor Scree



F	FLANGES DIMENSIONS											
DIN		AINSI		ØD	ØE			ØF	Cmin	f1	А	ØМ
ΡN	DN	Pe	DN	-		Ν	ØН					
40	25			115	85	4	14	68	18	2	83	72,2
20	25	150	1"	108	79,5	4	15,8	50,8	16	1,6	81	72,2
50	25	300	1"	124	89	4	19	50,8	17,5	1,6	86	72,2
40	40			150	110	4	18	88	18	3	85	72,2
20	40	150	1 1/2"	127	98,4	4	15,8	73	18	16	85	72,2
50	40	300	11/2"	156	114,3	4	22,2	73	21	1,6	91	72,2



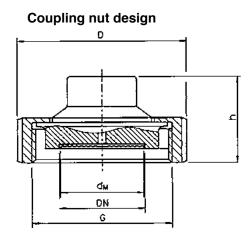


OUTLINE DIMENSIONS OF SANITARY DIAPHRAGM (units : mm)

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

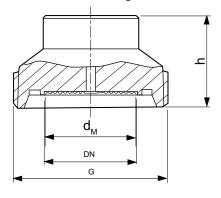
Seals according DIN 11851 and SMS standard

2 different designs exist for DIN 11851 and SMS : (d_M = diaphragm actif diameter)



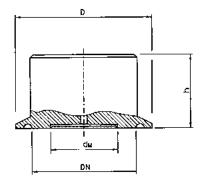
DIN	DIN 11851									
DN	PN (Max)	D	h	d _M	G					
25	40	63	36	25	Rd 52 x 1/6					
32	40	70	36	32	Rd 58 x 1/6					
40	40	78	36	40	Rd 65 x 1/6					
50	40	112	36	52	Rd 78 x 1/6					
65	40	112	36	65	Rd 95 x 1/6					
80	40	127	36	76	Rd110 x 1/4					

Male thread design



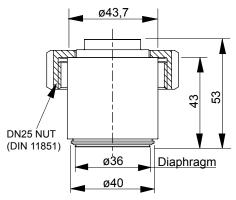
SMS DN PN (Max) D h d_{M} G 25 Rd 40 x 1/6 40 51 38 25 32 40 60 38 Rd 48 x 1/6 32 38 40 74 Rd 60 x 1/6 38 40 51 40 84 38 52 Rd 70 x 1/6 63.5 40 100 Rd 85 x 1/6 38 65 76 40 114 38 76 Rd 98 x 1/4

Tri Clamp design

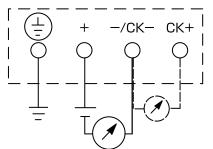


DN PN (Max) D h d_M 1"1/2 40 50,5 35 32 2" 40 40 64 35 2"1/2 40 77,5 35 50 3" 40 91 35 65

Dead volume seal



CONNECTION DIAGRAM





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