Fuji Electric

FCX-AIV series

# GAUGE AND ABSOLUTE PRESSURE TRANSMITTER WITH REMOTE SEAL

DATA SHEET

FKP, FKH ···6

The FKP and FKH models of FCX-AIV series of pressure transmitters accurately measure a gauge and absolute pressure and transmit a proportional 4-20 mA output signal.

The transmitter uses 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.

FCX-AIV series of pressure transmitters comply with Safety Integrity Level 2 or 3 according to IEC 61508 and IEC 61511 standards.

## FEATURES

**1. High accuracy**

The Fuji Electric's micro-capacitive sensor provides in standard ±0.1% and ± 0.2% accuracies for gauge and absolute pressure respectively, for all elevated or suppressed calibration ranges without additional adjustments.

**2. Minimum inventory and design**

Electronic parts and transmitter housing are interchageable among all FCX-AIV transmitters. Gauge and absolute pressure transmitters with remote seals are based on a full welded design with 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 7 communication protocol**

FCX-AIV series of pressure transmitters can communicate using the universal HART communication protocol. By the use of the HART Device Description files, HART compatible devices can communicate with any FCX-AIV 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
- 5 digits local display with engineering units
- Stainless steel electronics housing
- Wide selection of wetted part materials

**6. Programmable output Linearization Function**

The output signal can be linearized using up to 14 pair-points.

**7. Burnout current flexibility**

The burnout current value can be adjusted in the ranges of [3.4; 4.0] and [20.8 ; 22.5] mA and can be compliant with NAMUR NE43 recommandations.

**8. Contacless local adjustment**

An optional LCD unit with 3 push-buttons and magnetic switches allows to configure the transmitter without opening the indicator cover (flameproof approvals for hazardous locations). A magnetic pen is required to enable the 3 magnetic switches (please refer to the “Accessories” section).

## FUNCTIONAL SPECIFICATIONS

**Type:**

FKP or FKH : Smart, 4-20 mA + HART communication protocol

**Service:**

Liquid, gas, or vapour

**Span, range and overrange limit:**

| Model | Span limit kPa {bar} | | Rangelimits (bar) | Overrange limit (bar) |
|---|---|---|---|---|
| | Min. | Max. | | |
| | FKP | | | |
| FKP□01 | 0.08125 | 1.3 | -1 to +1,3 | 10 |
| FKP□02 | 0.3125 | 5 | -1 to +5 | 15 |
| FKP□03 | 1.875 | 30 | -1 to +30 | 90 |
| FKP□04 | 6.25 | 100 | -1 to +100 | 150 |
| | FKH | | (bar abs) | (bar abs) |
| FKH□02 | 0.08125 | 1,3 | 0 to +1.3 | 5 |
| FKH□03 | 0.3125 | 5 | 0 to +5 | 15 |
| FKH□04 | 1.875 | 30 | 0 to +30 | 90 |

Note: Span higher than 1/10 of the URL is recommended for optimal accuracy.

**Output signal:**

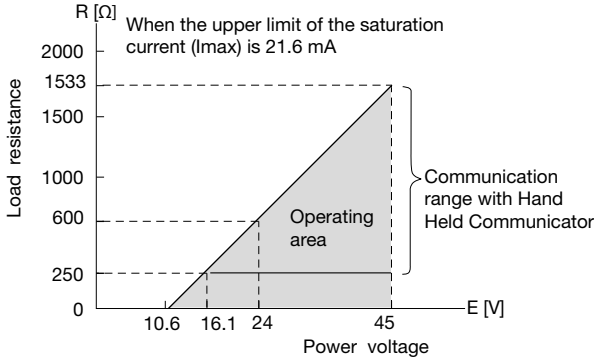
4-20 mA with HART communication protocol.

**Power supply :**

10.5 to 45 V DC at transmitter terminals.
10.5 to 32 V DC with the optional arrester4

Refer to hazardous location table for specific limitations

**Load limitations :** see figure below




Note 1 : The load resistance varies with the upper limit of the saturation current [I max]

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

Note 2 : For communication with a HART device, a minimum load of 250 Ω is required.

**Hazardous locations:** (Approval pending)

| Marking (Digit 10 =) | | Protection type |
|---|---|---|
| **ATEX** | | Intrinsic Safety "i": |
| | | Ex II 1G/D |
| | | Ex ia IIC T4 Ga (-40°C ≤ Ta ≤ +60°C) |
| | | Ex ia IIC T5 Ga (-40°C ≤ Ta ≤ +50°C) |
| | (K) | Ex ia IIIC $T_{200}$135°C Da (-40°C ≤ Ta ≤ +60°C) |
| | | Ex ia IIIC $T_{200}$100°C Da (-40°C ≤ Ta ≤ +50°C) |
| | | IP 66/67 |
| | | Ui ≤ 28Vdc, Ii ≤ 110mA, Pi ≤ 0.77W |
| | | Ci = 14.9nF$_{(1)}$/26.0nF$_{(2)}$ Li = 0.18mH |
| | | Flameproof Enclosure "d": |
| | | Ex II 2G/D |
| | | Ex d IIC T5 Gb (-40°C ≤ Ta ≤ +85°C) |
| | (X) | Ex d IIC T6 Gb (-40°C ≤ Ta ≤ +65°C) |
| | | Ex tb IIIC $T_{200}$100°C Db (-40°C ≤ Ta ≤ +85°C) |
| | | Ex tb IIIC $T_{200}$85°C Db (-40°C ≤ Ta ≤ +65°C) |
| | | 45 Vdc max |
| | (M) | Combination (K) + (X) |
| **IECEx** | | Intrinsic Safety "i": |
| | | Ex ia IIC T4 Ga (-40°C ≤ Ta ≤ +60°C) |
| | | Ex ia IIC T5 Ga (-40°C ≤ Ta ≤ +50°C) |
| | (T) | Ex ia IIIC $T_{200}$135°C Da (-40°C ≤ Ta ≤ +60°C) |
| | | Ex ia IIIC $T_{200}$100°C Da (-40°C ≤ Ta ≤ +50°C) |
| | | IP 66/67 |
| | | Ui ≤ 28Vdc, Ii ≤ 110mA, Pi ≤ 0.77W |
| | | Ci = 14.9nF$_{(1)}$/26.0nF$_{(2)}$ Li = 0.18mH |
| | | Flameproof Enclosure "d": |
| | | Ex d IIC T5 Gb (-40°C ≤ Ta ≤ +85°C) |
| | (R) | Ex d IIC T6 Gb (-40°C ≤ Ta ≤ +65°C) |
| | | Ex tb IIIC $T_{200}$100°C Db (-40°C ≤ Ta ≤ +85°C) |
| | | Ex tb IIIC $T_{200}$85°C Db (-40°C ≤ Ta ≤ +65°C) |
| | | 45 Vdc max |
| | (N) | Combination (T) + (R) |
| **cCSAus** | | Intrinsic Safety/Non Incendive/Class 1 Division 2: |
| | | IS Class I Division 1, Groups ABCD Ex ia |
| | | Class II Groups EFG: Class III |
| | | NI Class I Division 2, Groups ABCD |
| | (J) | (Per control drawing) |
| | | Class I Division 2, Groups ABCD |
| | | T4 (-40°C ≤ Ta ≤ +60°C) |
| | | T5 (-40°C ≤ Ta ≤ +50°C) |
| | | Ui ≤ 28Vdc, Ii ≤ 110mA, Pi ≤ 0.77W |
| | | Ci = 14.9nF$_{(1)}$/26.0 nF$_{(2)}$ Li = 0.18mH |
| | | Explosion proof |
| | | XP Class I Division 1, Groups CD |
| | | Class II Groups EFG: Class III |
| | (E) | T5 (-40°C ≤ Ta ≤ +85°C) |
| | | T6 (-40°C ≤ Ta ≤ +65°C) |
| | | Vmax = 42.4Vdc |
| | (L) | Combination (J) + (E) |
| **ATEX IECEx cCSAus** | (W) | Combination (K) + (X) + (T) + (R) + (J) + (E) |

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

**Configuration:**

Configuration of the FCX-AIV series of pressure transmitters can be carried out by either using a HART device or the 3 push-buttons optional indicator.

A third party HART device can be used in combination with Fuji Electric FCX-AIV HART Device Description files. (https://fieldcommgroup.org).

| Functions | | HART Protocol | | 3 push buttons optional indicator | |
|---|---|---|---|---|---|
| | | Display | Set | Display | Set |
| Tag Nb | | *v* | *v* | *v* | *v* |
| Model Nb | | *v* | *v* | *v* | *v* |
| Serial Nb & Software revision | | *v* | — | *v* | — |
| Engineering units | | *v* | *v* | *v* | *v* |
| Upper Range Value | | *v* | — | *v* | — |
| Measuring Range | | *v* | *v* | *v* | *v* |
| Damping | | *v* | *v* | *v* | *v* |
| Output signal type | Linear | *v* | *v* | *v* | *v* |
| | Square Root | *v* | *v* | *v* | *v* |
| Burnout current | | *v* | *v* | *v* | *v* |
| Calibration | | *v* | *v* | *v* | *v* |
| Output Adjust | | — | *v* | — | *v* |
| Measuring Value | | *v* | — | *v* | — |
| Self Diagnosis | | *v* | — | *v* | — |
| External Adj Screw Lock | | *v* | *v* | *v* | *v* |
| Transmitter Display | | *v* | *v* | *v* | *v* |
| Linearization | | *v* | *v* | *v* | *v* |
| Rerange | | *v* | *v* | *v* | *v* |
| Saturation Current | | *v* | *v* | *v* | *v* |
| Write Protect | | *v* | *v* | *v* | *v* |
| History<br>- Calibration History<br>- Ambient T° History | | <br>*v*<br>*v* | <br>*v*<br>— | <br>*v*<br>*v* | <br>*v*<br>— |

**Zero and span adjustment:**

Zero and span are remotly adjustable by a HART device or locally by the three pusch-buttons LCD unit or the external adjustment screw.

**Damping:**

The damping time constant can be adjusted within the range of [0.04 to 32] seconds.

**Zero elevation/suppression:**

Zero can be adjusted within the range of -1 bar to 100% of the URL of the sensor.

**Normal/reverse action:**

Selectable by range setting

**Local indicator:**

Optional 5-digits LCD unit with 3 push-buttons and magnetic switches. A magnetic pen is required to enable this feature (please refer to the "Accessories" section).

**Saturation currents:**

Lower limit: 3.6 to 4.0mA, Default value: 3.8mA
Upper limit: 20.0 to 21.6mA, Default value: 20.8mA

**Burnout direction and output current:**

In 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 latest value just before the failure happens.

When "Output Overscale":

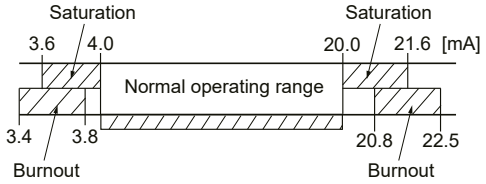
The output signal is set within the range of [20.8 to 22.5] mA, Default value: 21.6mA

When "Output Underscale":

The output signal is set within the range of [3.4 to 3.8] mA, Default value: 3.6mA

**IEC 61511 considerations:**

For safety applications, the “Output Hold’’ MUST NOT be used. Only “Output Overscale” and “Output Underscale” must be used to clearly notify a “failure’’ state.




**Loop-check / fixed output current:**

The transmitter can be configured to provide a constant output signal from 3.4 up to 22.5 mA.

**Temperature limit:**

Ambient

-40 to +85°C

-20 to +80°C (with the optional LCD unit)

-40 to +60°C (with the optional arrester)

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

Process: Please refer to the remote seal section and type of filling fluids.

Storage: -40 to +90°C

**Humidity limit:**

0 to 100% RH (Relative Humidity)

# PERFORMANCE SPECIFICATIONS

Reference conditions, silicone oil filling, SS 316L isolating diaphragms, 4-20 mA analog output in linear mode

**Accuracy rating:**

(including linearity, hysteresis, and repeatability)

For span > 1/10 of URL:

±0.1 % of calibrated span (FKP)

±0.2 % of calibrated span (FKH)

For span > 1/10 of URL:

$$\pm \left( 0.05+0.005 \ \frac{URL}{Span} \right) \% \text{ of span (FKP)}$$

$$\pm \left( 0.1+0.01 \ \frac{URL}{Span} \right) \% \text{ of span (FKH)}$$

**Stability:**

±0.2% of URL for 10 years

**Temperature effect:**

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

**Model FKP:**

Zero shift: $\pm(0.4+0.1\frac{URL}{Span})\%$ / 28°C

Total effect: $\pm(0.475+0.1\frac{URL}{Span})\%$ / 28°C

**Model FKH:**

Zero shift: $\pm(0.4+0.2\frac{URL}{Span})\%$ / 28°C

Total effect: $\pm(0.475+0.2\frac{URL}{Span})\%$ / 28°C

**Overrange effect:**

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

**Supply voltage effect:**

< 0.005% of calibrated span per 1 V.

**Update rate:** 40 msec

**Turn on time:** 6 sec

**Response time:**

(at 63.3% of output signal without electrical damping)

Time constant: 0.08 sec at 23°C

Dead time: about 0.06 sec

Response time = time constant + dead time

**Electromagnetic compatibility:**

FCX-AIV transmitters are in accordance with the following harmonized standards:

**EN 61326-1**

**EN 61326-2-3**

**EN 61326-3-1**

**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).

**Mounting position effect:**

Zero shift:

Less than 0.1kPa (1mbar) for a 10° tilt in any position. This error can be corrected by adjusting zero. (Double the effect for fluorinated fill sensors.) No effect on span

**Vibration effect:**

< ±0.25% of spans for spans greater than 1/10 of URL. Frequency 10 to 150 Hz, acceleration 29.4 m/sec$^2$

**Dielectric strength:**

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

**Insulation resistance:**

More than 100 MΩ at 500 V DC.

**Internal resistance for external field indicator:**

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

**Pressure equipment directive (PED) 2014/68/EU:**

According to Article 4.3

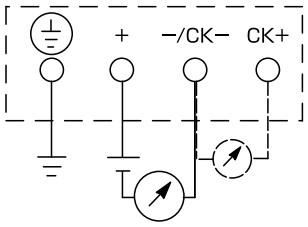
## PHYSICAL SPECIFICATIONS

**Electrical conduit connection:**
1/2-14 NPT, M20 × 1.5 or Pg13.5
**Non wetted parts material:**
Electronic housing:
Low copper die-cast aluminum alloy with polyester coating (standard) or SS 316L (option)
Mounting bracket: SS 316L
**Environmental protection:**
IP66, IP67 and Type 4X
**Mounting:**
Direct mounting (rigid assembly)
With the optional mounting bracket for 50 mm (2") pipe
**Weight:**
Refer to the page 9 and 10
**Diaphragm seal(s) :**
Please refer to the remote seal section for detailled specifications.

## ACCESSORIES

**Magnet pen:**
To be used with the 3 push-buttons optional indicators.
Order number = ZZP*TQ507742C1

## CONNECTION DIAGRAM




## OPTIONAL FEATURES

**Local indicator:**
An optional 5 digit indicator with engineering units is available.
A local configuration can be carried out using the 3 push-buttons version with magnetic switches.
A separately ordered magnet pen is required for adjustment using the 3 magnetic switches (please refer to the “Accessories” section).
**Arrester:**
A built-in arrester protects the electronics from lightning surges.
Lightning surge immunity: ±4 kV (1.2 × 50 µs)
**Optional tag plate:**
An extra stainless steel tag plate with customer tag data is wired to the transmitter to the transmitter.

# MODEL CODE SYMBOLS FKP...F

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | - | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | Note | DESCRIPTION | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| F | K | P | | | | | 6 | | | | | | Y | 0 | L | 0 | | **Type** | | |
| | | | | | | | | | | | | | | | | | | Gauge pressure with remote seal - Smart, 4-20 mA+ HART communication protocol | | |
| | | | | | | | | | | | | | | | | | | **Conduit connection** | **Enclosure type** | |
| | | | T | | | | | | | | | | | | | | | 1/2 - 14 NPT | "L" shape | |
| | | | V | | | | | | | | | | | | | | | Pg 13,5 | | |
| | | | W | | | | | | | | | | | | | | | M20 x 1,5 | | |
| | | | 6 | | | | | | | | | | | | | | | 1/2 -14 NPT | "T" shape | |
| | | | 7 | | | | | | | | | | | | | | | Pg13,5 | | |
| | | | 8 | | | | | | | | | | | | | | | M20 x 1,5 | | |
| | | | | | | | | | | | | | | | | | (1) | **Diaphragm seal rating** | | |
| | | | | 2 | | | | | | | | | | | | | | PN 25 | | |
| | | | | 4 | | | | | | | | | | | | | | PN 20 - 150 lbs | | |
| | | | | 6 | | | | | | | | | | | | | | PN 50 - 300 lbs | | |
| | | | | 8 | | | | | | | | | | | | | | PN 40 | | |
| | | | | 9 | | | | | | | | | | | | | | PN 16 | | |
| | | | | L | | | | | | | | | | | | | | PN 100 - 600 lbs | | |
| | | | | | | | | | | | | | | | | | (2) | **Measuring range 0…min to max** | | |
| | | | | | 1 | | | | | | | | | | | | (3) | 0...81.25 to 1300 mbarg / 0...8.125 to 130 kPag / 0...1.18 to 18.86 psig | | |
| | | | | | 2 | | | | | | | | | | | | | 0...312.5 to 5000 mbarg / 0...31.25 to 500 kPag / 0...4.53 to 72.52 psig | | |
| | | | | | 3 | | | | | | | | | | | | | 0...1.875 to 30 barg / 0...187.5 to 3000 kPag / 0...27.20 to 435.11 psig | | |
| | | | | | 4 | | | | | | | | | | | | | 0...6.25 to 100 barg / 0...0.625 to 10 MPag / 0...90.65 to 1450.38 psig | | |
| | | | | | | V | | | | | | | | | | | | | | |
| | | | | | | | 6 | | | | | | | | | | | **Design revision number** | | |
| | | | | | | | | | A | | | | | | | | | **Indicator** | **Arrester** | |
| | | | | | | | | | E | | | | | | | | | None | none | |
| | | | | | | | | | L | | | | | | | | | None | yes | |
| | | | | | | | | | P | | | | | | | | | Digital, 0-100% | none | |
| | | | | | | | | | Q | | | | | | | | | Digital, Custom scale | | |
| | | | | | | | | | S | | | | | | | | | Digital, 0-100% | yes | |
| | | | | | | | | | 1 | | | | | | | | | Digital, Custom scale | | |
| | | | | | | | | | 2 | | | | | | | | | Digital, 0-100% with push button | none | |
| | | | | | | | | | 4 | | | | | | | | | Digital, Custom scale with push button | | |
| | | | | | | | | | 5 | | | | | | | | | Digital, 0-100% with push button | yes | |
| | | | | | | | | | | | | | | | | | | Digital, Custom scale with push button | | |
| | | | | | | | | | | A | | | | | | | | **Hazardous location approvals** | | |
| | | | | | | | | | | X | | | | | | | (4) | None | | |
| | | | | | | | | | | K | | | | | | | | ATEX - Flameproof | | |
| | | | | | | | | | | M | | | | | | | (4) | ATEX - Intrinsic Safety | | |
| | | | | | | | | | | E | | | | | | | (4) | ATEX - Combination Flameproof and Intrinsic Safety | | |
| | | | | | | | | | | J | | | | | | | | cCSAus - Explosion proof | | |
| | | | | | | | | | | L | | | | | | | (4) | cCSAus - Intrinsic Safety and Non Incendive | | |
| | | | | | | | | | | R | | | | | | | (4) | cCSAus -Combination Explosion proof, Intrinsic Safety and Non Incendive | | |
| | | | | | | | | | | T | | | | | | | | IECEx - Flameproof | | |
| | | | | | | | | | | N | | | | | | | (4) | IECEx - Intrinsic Safety | | |
| | | | | | | | | | | W | | | | | | | (4) | IECEx - Combination Flameproof and Intrinsic Safety | | |
| | | | | | | | | | | | | | | | | | (4) | IECEx - ATEX - cCSAus - Explosion/flameproof, Intrinsic Safety and Non Incendive | | |
| | | | | | | | | | | | B | | | | | | (5) | **Assembling design** | | |
| | | | | | | | | | | | L | | | | | | | Capillary | | |
| | | | | | | | | | | | | | | | | | | Rigid | | |
| | | | | | | | | | | | | | | | | | | **Stainless steel parts** | | |
| | | | | | | | | | | | | | | | | | | **Tag plate** | **Housing** | |
| | | | | | | | | | | | | Y | Y | | | | | None | None | |
| | | | | | | | | | | | | B | Y | | | | | Yes | | |
| | | | | | | | | | | | | C | Y | | | | | None | Yes | |
| | | | | | | | | | | | | E | Y | | | | | Yes | | |
| | | | | | | | | | | | | | | 0 | | | | | | |
| | | | | | | | | | | | | | | | | | | **Special options** | | |
| | | | | | | | | | | | | | | | L | | | None | | |
| | | | | | | | | | | | | | | | | (*) | (6) | Special, no code available | | |

Notes:

1- The flange rating is according to the Maximum Working Pressure

2- A turn down ratio ≤ 10is recommended for optimal performances

3- For DN ≤ 50, please consult Fuji Electric regarding process conditions

4- Only with Digit 4 = "T", "W",“6”, “8”

5- For capillary version, a mounting bracket is provided. No mounting bracket with the rigid assembly design.

6- When no code can be found in the current definition, place a “*” in the corresponding digit code as well as in the 16th digit.

# MODELS CODE SYMBOLS FKH...F

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | - | 9 | 10 | 11 | 12 | 13 | - | 14 | 15 | - | 16 | Note | DESCRIPTION |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| F | K | H | | | | | 6 | - | | | | | Y | - | 0 | L | - | | | **Type** |
| | | | | | | | | | | | | | | | | | | | | Absolute pressure with remote seal - Smart, 4-20 mA+ HART communication protocol |
| | | | T | | | | | | | | | | | | | | | | | **Conduit connection** / **Enclosure type**: 1/2 - 14 NPT / "L" shape |
| | | | V | | | | | | | | | | | | | | | | | Pg 13,5 / "L" shape |
| | | | W | | | | | | | | | | | | | | | | | M20 x 1,5 / "L" shape |
| | | | 6 | | | | | | | | | | | | | | | | | 1/2 -14 NPT / "T" shape |
| | | | 7 | | | | | | | | | | | | | | | | | Pg13,5 / "T" shape |
| | | | 8 | | | | | | | | | | | | | | | | | M20 x 1,5 / "T" shape |
| | | | | 2 | | | | | | | | | | | | | | | (1) | **Diaphragm seal rating** |
| | | | | 4 | | | | | | | | | | | | | | | | PN 25 |
| | | | | 6 | | | | | | | | | | | | | | | | PN 20 - 150 lbs |
| | | | | 8 | | | | | | | | | | | | | | | | PN 50 - 300 lbs |
| | | | | 9 | | | | | | | | | | | | | | | | PN 40 |
| | | | | L | | | | | | | | | | | | | | | | PN 16 |
| | | | | | | | | | | | | | | | | | | | | PN 100 - 600 lbs |
| | | | | | 2 | | | | | | | | | | | | | | (2) | **Measuring range 0…min to max** |
| | | | | | 3 | | | | | | | | | | | | | | (3) | 0...81.25 to 1300 mbar abs / 0...8.125 to 130 kPa abs / 0...1.18 to 18.86 psi abs |
| | | | | | 4 | | | | | | | | | | | | | | | 0...312.5 to 5000 mbar abs / 0...31.25 to 500 kPa abs / 0...4.53 to 72.52 psi abs |
| | | | | | | V | | | | | | | | | | | | | | 0...1.875 to 30 bar abs / 0...187.5 to 3000 kPa abs / 0...27.20 to 435.11 psi abs |
| | | | | | | | 6 | | | | | | | | | | | | | **Design revision number** |
| | | | | | | | | | A | | | | | | | | | | | **Indicator**: None / **Arrester**: none |
| | | | | | | | | | E | | | | | | | | | | | None / yes |
| | | | | | | | | | L | | | | | | | | | | | Digital, 0-100% / none |
| | | | | | | | | | P | | | | | | | | | | | Digital, Custom scale / none |
| | | | | | | | | | Q | | | | | | | | | | | Digital, 0-100% / yes |
| | | | | | | | | | S | | | | | | | | | | | Digital, Custom scale / yes |
| | | | | | | | | | 1 | | | | | | | | | | | Digital, 0-100% with push button / none |
| | | | | | | | | | 2 | | | | | | | | | | | Digital, Custom scale with push button / none |
| | | | | | | | | | 4 | | | | | | | | | | | Digital, 0-100% with push button / yes |
| | | | | | | | | | 5 | | | | | | | | | | | Digital, Custom scale with push button / yes |
| | | | | | | | | | | A | | | | | | | | | | **Hazardous location approvals** |
| | | | | | | | | | | A | | | | | | | | | | None |
| | | | | | | | | | | X | | | | | | | | | (4) | ATEX - Flameproof |
| | | | | | | | | | | K | | | | | | | | | | ATEX - Intrinsic Safety |
| | | | | | | | | | | M | | | | | | | | | (4) | ATEX - Combination Flameproof and Intrinsic Safety |
| | | | | | | | | | | E | | | | | | | | | (4) | cCSAus - Explosion proof |
| | | | | | | | | | | J | | | | | | | | | | cCSAus - Intrinsic Safety and Non Incendive |
| | | | | | | | | | | L | | | | | | | | | (4) | cCSAus -Combination Explosion proof, Intrinsic Safety and Non Incendive |
| | | | | | | | | | | R | | | | | | | | | (4) | IECEx - Flameproof |
| | | | | | | | | | | T | | | | | | | | | | IECEx - Intrinsic Safety |
| | | | | | | | | | | N | | | | | | | | | (4) | IECEx - Combination Flameproof and Intrinsic Safety |
| | | | | | | | | | | W | | | | | | | | | (4) | IECEx - ATEX - cCSAus - Explosion/flameproof, Intrinsic Safety and Non Incendive |
| | | | | | | | | | | | B | | | | | | | | (5) | **Assembling design** |
| | | | | | | | | | | | L | | | | | | | | | Capillary |
| | | | | | | | | | | | | | | | | | | | | Rigid |
| | | | | | | | | | | | | | | | | | | | | **Stainless steel parts** |
| | | | | | | | | | | | | Y | Y | | | | | | | **Tag plate** / **Housing**: None / None |
| | | | | | | | | | | | | B | Y | | | | | | | Yes / None |
| | | | | | | | | | | | | C | Y | | | | | | | None / Yes |
| | | | | | | | | | | | | E | Y | | | | | | | Yes / Yes |
| | | | | | | | | | | | | | | | 0 | | | | | |
| | | | | | | | | | | | | | | | | | | | | **Special options** |
| | | | | | | | | | | | | | | | | Y | | | | None |
| | | | | | | | | | | | | | | | | | | * | (6) | Special, no code available |

Notes:

1- The flange rating is according to the Maximum Working Pressure

2- A turn down ratio ≤ 10is recommended for optimal performances

3- For DN ≤ 50, please consult Fuji Electric regarding process conditions

4- Only with Digit 4 = "T", "W","6", "8"

5- For capillary version, a mounting bracket is provided. No mounting bracket with the rigid assembly design.

6- When no code can be found in the current definition, place a "*" in the corresponding digit code as well as in the 16th digit.

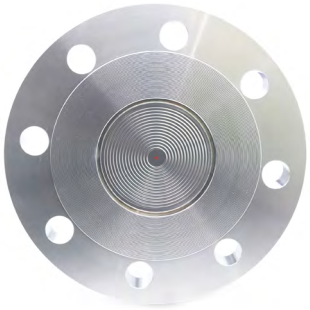
# SEAL DIAPHRAGMS

DATA SHEET S

Fuji Electric remote seal diaphragms are dedicated to accurately measure level, density, flow and line pressure in heavy process conditions.

The use of remote seal diaphragms avoids the measuring cell of the transmitter to be directly in contact with the process conditions

The various architectures and the full welded construction provide to the Fuji Electric remote seal diaphragm product offer an excellent reliability in harsh processing conditions such as high static pressure, temperature and corrosiveness as well as viscous, clogging or abrasive processes..



## 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 or gauge measuring cell of the FCX-A IV 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:

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

Non wetted parts:

SS 316L

Filling fluids:

Standard silicone, fluorinated, sanitary, high temperature and vacuum specific oils. For specific process conditions, please consult Fuji Electric.

**4. Diaphragm seal types**

According to the connection type and operating conditions different seal types can be defined:

- 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 needs, please consult Fuji Electric.

## FUNCTIONAL SPECIFICATIONS

**Remote seal diapfragm assembly:**

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 with high temperature process).

**Capillary 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 protection sheath:**

PVC (-10 °C to +80 °C)

Stainless steel sheald (-40 °C to +350 °C)

**Type of process connections:**

- Flush mounting
- With diaphragm extension
- With adapter (flanged, screwed or welded).

The adapter is dedicated either to adapt the process connection or to increase the diameter of the membrane and the sensitivity of the measurement

**Temperature limits:**

Ambiant temperature:

- 40 to 85 °C for transmitters without fuorinated oil
- 10 to +60 °C for transmitters with fluorinated oil

Process temperature:

Rigid assembly: -40 to 150°C (P ≥ 1 atm)

Capillary assembly: Refer to the ‘’Filling fluids and temperatures’’ section

**Pressure limits:**

Working pressure:

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

Vacuum limit :

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.

# 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.

**Accuracy:**

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

**Ambiant temperature effect:**

| Transmitters / Diaphragm seal | Effect (mbar/10°C) | |
|---|---|---|
| | Gauge / Absolute pressure | Capillary (/m) |
| DN 50/2" - SS 316L | 2.03 | 1.5 |
| DN 80/3" - SS 316L | 0.11 | 0.08 |
| DN80/3" Other diaphragm materials | 0.22 | 0.2 |
| DN100/4" - SS 316L | 0.04 | 0.03 |
| Adaptor - SS 316L | 0.11 | 0.08 |

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

The correction of the zero drift is done at factory level on the complete system (transmitter and remote seals) by an additional temperature correction operation. A thermal insulation or the heating of the capillaries may be necessary to minimize the ambient temperature effect.

**Process temperature effect:**

| Transmitters / Diaphragm seal | Effect (mbar/10°C) |
|---|---|
| | Gauge and absolute pressure |
| DN 50/2" - SS 316L | 1.24 |
| DN 80/3" - SS 316L | 0.17 |
| DN80/3" Other diaphragm materials | 0.73 |
| DN100/4" - SS 316L | 0.08 |
| Adaptor - SS 316L | 0.17 |

**Response time: (mean values)**

| Filling fluid | 7th model code | Response time constant (sec) |
|---|---|---|
| | | 0 to 1.3 bar |
| Std silicone oil | Y, G, N | 0.037 |
| Fluorinated oil | W, A, D | 0.04 |
| Vaccum or high temperature | V, U, X | 0.065 |

The indicated values are in seconds per meter of capillary length with internal diameter Ø1 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 fluids and temperatures:**

| 7th model code | Designation | Temperature resistance (°C) | | Density (25°) |
|---|---|---|---|---|
| | | P abs ≥ 1 bar | P abs < 1 bar | |
| Y, G, N | Silicone oil | -40 to 180 | -40 to 120 | 0.95 |
| W, D, A | Fluorinated oil | -20 to 250 | -20 to 120 | 1.84 |
| F | Sanitary oil | -10 to 250 | -10 to 120 | 0.94 |
| V | Silicone oil | NA | 0 to 200 | 1.07 |
| U | Silicone oil | 0 to 300 | NA | 1.07 |
| X | Silicone oil | 20 to 350 | NA | 1.09 |

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

Please consult Fuji Electric for special applications regarding the process conditions (temperature, pressure and vacuum conditions).

# MODELS CODE SYMBOLS FKH...F

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | | 8 | Notes | DESCRIPTION | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **S** | | | | | | | - | | | **Remote seal diaphragms** | | |
| | | | | | | | | | | **Flange / Capillary connection** | | |
| | A | | | | | | | | | Axial | | |
| | R | | | | | | | | | Radial - Not possible with rigid assembling design (digit 6 = "R") | | |
| | W | | | | | | | | | Wafer type - Not possible with rigid assembling design (digit 6 ="R") | | |
| | | | | | | | | | (1) | **Flanges RF (flange size and rating)** | | |
| | | 4 | | | | | | | | ANSI-150 Lbs 3" / ISO PN20 DN80 | | |
| | | 5 | | | | | | | | ANSI-150 Lbs 4" / ISO PN20 DN100 | | |
| | | 6 | | | | | | | | ANSI-300 lLbs 3" / ISO PN50 DN80 | | |
| | | 7 | | | | | | | | ANSI-300 Lbs 4" / ISO PN50 DN100 | | |
| | | 8 | | | | | | | | DIN PN40 DN80 | | |
| | | 9 | | | | | | | | DIN PN16 DN100 | | |
| | | H | | | | | | | (2) | ANSI - 150 lbs 2" / ISO PN20 DN50 | | |
| | | J | | | | | | | (2) | ANSI - 300 lbs 2" / ISO PN50 DN50 | | |
| | | G | | | | | | | (2) | DIN PN40 DN50 | | |
| | | K | | | | | | | | G 2" screwed seal | | |
| | | L | | | | | | | | G 1 1/2" screwed seal | | |
| | | U | | | | | | | | PN25 DN50 - coupling nuts | DIN 11851 | Digit 4 = "V" only |
| | | V | | | | | | | | PN40 DN50 - coupling nuts | SMS | Digit 4 = "V" only |
| | | W | | | | | | | | PN40 DN50 - seal only | Clamp | Digit 4 = "V" only |
| | | X | | | | | | | | No dead volume | Sanitary | Digit 4 = "V" only |
| | | A | | | | | | | (3) | Flange adapter PN40 DN25 | | Digit 4 = "V" only - others upon request |
| | | B | | | | | | | (3) | Flange adapter ISO PN20 DN25 (1"-150 ANSI) | | Digit 4 = "V" only - others upon request |
| | | C | | | | | | | (3) | Flange adapter ISO PN50 DN25 (1"- 300 ANSI) | | Digit 4 = "V" only - others upon request |
| | | D | | | | | | | (3) | Flange adapter PN40 DN40 | | Digit 4 = "V" only - others upon request |
| | | E | | | | | | | (3) | Flange adapter ISO PN20 DN40 (1"1/2 - 150 ANSI) | | Digit 4 = "V" only - others upon request |
| | | F | | | | | | | (3) | Flange adapter ISO PN50 DN40 (1"1/2 - 300 ANSI) | | Digit 4 = "V" only - others upon request |
| | | S | | | | | | | (3) | Screwed 1/2 NPT (M) | | Digit 4 = "V" only - others upon request |
| | | T | | | | | | | (3) | To be welded (2"1/2 pipe) | | Digit 4 = "V" only - others upon request |
| | | | V | | | | | | | **Seal diaphragm design** | | |
| | | | | | | | | | | **Diaphragm** | **Gasket surface** | **Flange** |
| | | | V | | | | | | | SS 316L | SS 316L | SS 316L |
| | | | H | | | | | | | Alloy C276 | Alloy C276 | |
| | | | B | | | | | | | Alloy 400 | Alloy 400 | |
| | | | T | | | | | | | Tantalum | Tantalum | |
| | | | P | | | | | | (4) | Titanium | Titanium | |
| | | | R | | | | | | (4) | Zirconium | Zirconium | |
| | | | C | | | | | | | SS 316L + gold coating | SS 316L | |
| | | | F | | | | | | (5) | SS 316L + PFA lining | SS 316L + PFA lining | |

# MODELS CODE SYMBOLS FKH...F

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | | 8 | Notes | DESCRIPTION |
|---|---|---|---|---|---|---|---|---|---|---|
| S | | | | | | | - | | | |
| | | | | | | | | | (6) | **Diaphragm extension** |

| | Extension length (mm) | 4th digit material |
|---|---|---|
| Y | | |
| A | 50 | Code "V" |
| B | 100 | |
| C | 150 | |
| D | 200 | |
| E | 50 | Code "H" |
| F | 100 | |
| G | 150 | |
| H | 200 | |
| J | 50 | Code "B" |
| K | 100 | |
| L | 150 | |
| M | 200 | |
| P | 50 | Code "T" |
| R | 100 | |
| S | 150 | |
| T | 200 | |

**Remote seal assembling characteristics**

| | Mounting assembly | Length | Protection |
|---|---|---|---|
| A | Capillary | 1,5 m | PVC sheath |
| B | | 3 m | |
| C | | 6 m | |
| D | | Upon request | |
| G | | 1,5 m | Stainless steel sheath |
| H | | 3 m | |
| K | | 6 m | |
| L | | Upon request | |

S — Rigid assembly - Not possible with digit 2 = "R", "W" - Maximum process temperature: 150 °C

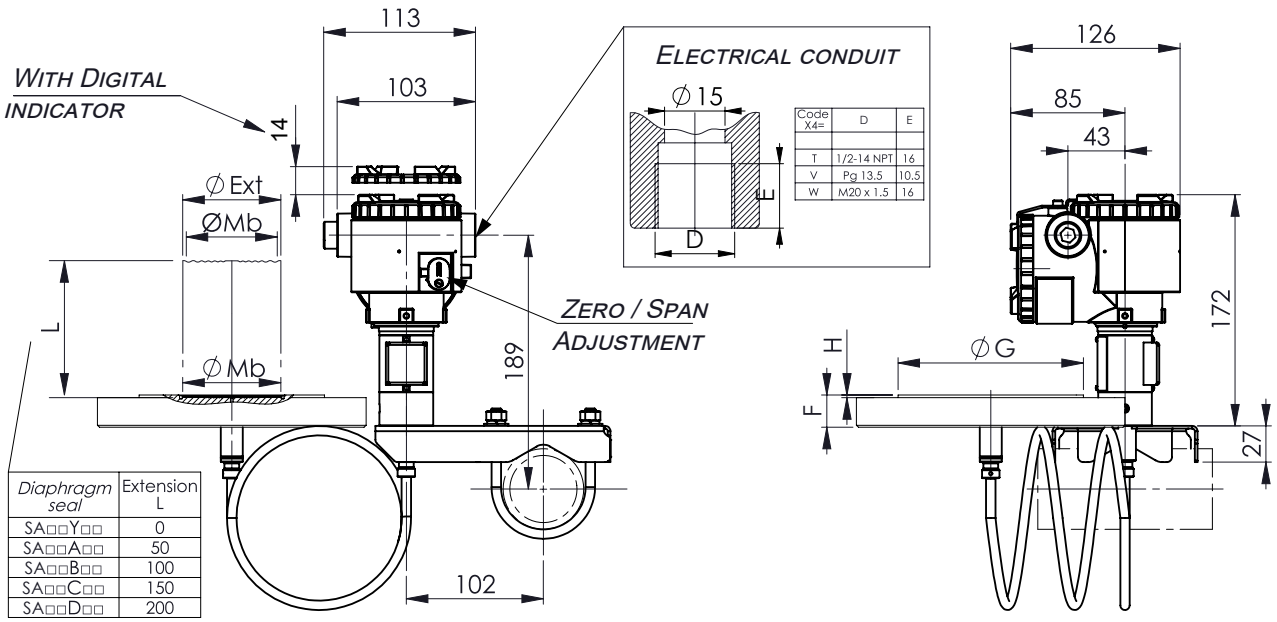
**Specific applications and filling fluids for the remote seal**

| | Treatment | Filling fluids |
|---|---|---|
| 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 - Digit 4 = "V" only |
| N | NACE MR 0175 / ISO 15156 | Silicone oil |
| V | Vacuum service - maximum T° 200°C | |
| U | Very high temperature (0 to 300°C) - No vacuum | |
| X | Very high temperature (20 to 350°C) - No vacuum | |

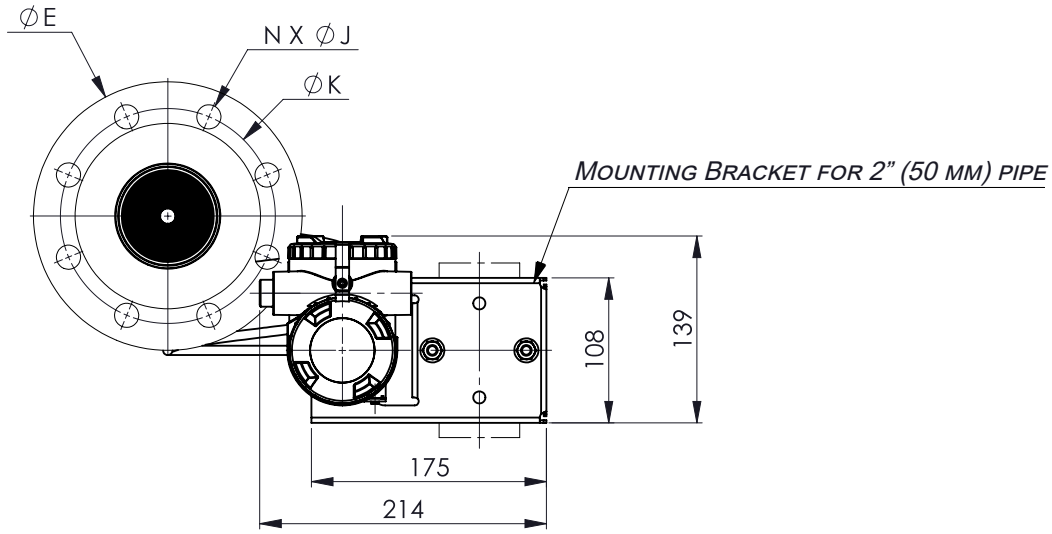
| - | * | (7) | **Special options** |
|---|---|---|---|
| | | | Special, no code available |

Notes:
1- Standard : Raising Face, stock finish (6.3 µm < Ra < 12.5 µm). Other types of flange and surface finish upon request.
2- For DN ≤ 50, please consult Fuji Electric regarding process conditions
3- Only for axial diaphragm seal (2nd digit = "A") - No extension possible
4- Maximum process temperature = 150 °C
5- Maximum process temperature = 250 °C
6- Extension available for Digit 3 = 4, 5, 6, 7, 8, 9, H, J, G
All wetted parts in the same material (diaphragm, extension and gasket surface) for Digit 4 = V, H, B, T
7- When no code can be found in the current definition, place a “*” in the corresponding digit code as well as in the 16th digit.

# OUTLINE DIMENSIONS FOR CAPILLARY ASSEMBLY (UNITS : MM)




| Diaphragm seal | Extension L |
|---|---|
| SA□□Y□□ | 0 |
| SA□□A□□ | 50 |
| SA□□B□□ | 100 |
| SA□□C□□ | 150 |
| SA□□D□□ | 200 |




| FLANGES DIMENSIONS ACCORDING TO EN 1092-1 & EN 1759-1 | | | | | | | | | | SS 316L | | Exotic material | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| diaphragm seal | EN 1092-1 | EN 1759-1 | ØE | F min | ØG | H | N x ØJ | ØK | Weight (kg) | L=0 ØMb | L≠0 ØExt=ØMb | L=0 ØMb | L≠0 ØExt(ØMb) |
| SAG□□□□ | DN50 PN40 | | 165 | 20 | 102 | 2 | 4 x 18 | 125 | 3,3 | 59 | 48 | 59 | 48,3 (47) |
| SAH□□□□ | | 2" CLASS 150 | 152 | 21 | 92 | 1,6 | 4 x 19 | 120,6 | 2,7 | 59 | 48 | 59 | 48,3 (47) |
| SAJ□□□□ | | 2" CLASS 300 | 165 | 22,5 | 92 | 1,6 | 8 x 19 | 127 | 3.7 | 59 | 48 | 59 | 48,3 (47) |
| SA8□□□□ | DN80 PN40 | | 200 | 24 | 138 | 2 | 8 x 18 | 160 | 5,8 | 73 | 73 | 89 | 76 (72) |
| SA4□□□□ | | 3" CLASS 150 | 190 | 24 | 127 | 1,6 | 4 x 19 | 152,4 | 5,3 | 73 | 73 | 89 | 76 (72) |
| SA6□□□□ | | 3" CLASS 300 | 210 | 28,5 | 127 | 1,6 | 8 x 22,2 | 168,3 | 7,8 | 73 | 73 | 89 | 76 (72) |
| SA9□□□□ | DN100 PN16 | | 220 | 22 | 158 | 2 | 8 x 18 | 180 | 5,9 | 96 | 96 | 89 | 94 (89) |
| SA5□□□□ | | 4" CLASS 150 | 229 | 24 | 157 | 1,6 | 8 x 19 | 190,5 | 7,7 | 96 | 96 | 89 | 94 (89) |
| SA7□□□□ | | 4" CLASS 300 | 254 | 32 | 157 | 1,6 | 8 x 22,2 | 200 | 12,7 | 96 | 96 | 89 | 94 (89) |

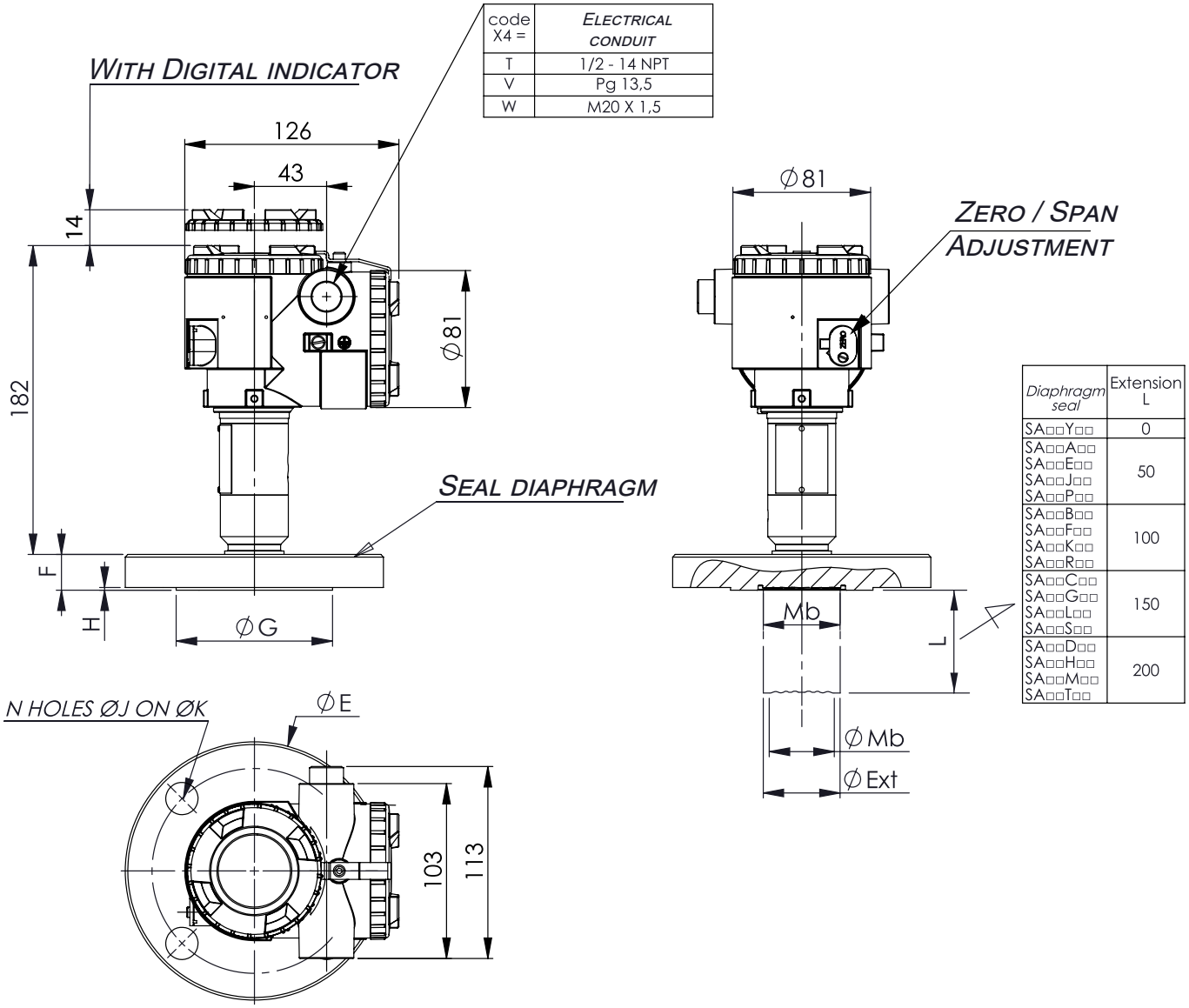
ØMb = Ø *diaphragm*
ØExt = extension

*Wetted parts material*

Weight :
- 2.2 kg (without option)
- flanges' weight (see table)
- 1 kg per 50 mm extension
- 0,2 kg for indicator option
- 2 kg for stainless steel housing

| | SPAN LIMIT | |
|---|---|---|
| | Min. | Max. |
| FKP□□1 | 8.125 kpag (81.25 mbarg) | 130 kpag (1300 mbarg) |
| FKP□□2 | 31.25 kpag (0.3125 barg) | 500 kpag (5 barg) |
| FKP□□3 | 187.5 kpag (1.875 barg) | 3000 kpag (30 barg) |
| FKP□□4 | 625 kpag (1.875 barg) | 10000 kpag (100 barg) |
| FKH□□1 | 8.125 kpa abs (81.25 mbar abs) | 130 kpa abs (1300 mbar abs) |
| FKH□□2 | 31.25 kpa abs (0.3125 bar abs) | 500 kpa abs (5 bar abs) |
| FKH□□3 | 187.5 kpa abs (1.875 bar abs) | 3000 kpa abs (30 bar abs) |

# OUTLINE DIMENSIONS FOR RIGID ASSEMBLY (UNITS : MM)




| code X4 = | ELECTRICAL CONDUIT |
|---|---|
| T | 1/2 - 14 NPT |
| V | Pg 13,5 |
| W | M20 X 1,5 |

| *Diaphragm seal* | Extension L |
|---|---|
| SA□□Y□□ | 0 |
| SA□□A□□<br>SA□□E□□<br>SA□□J□□<br>SA□□P□□ | 50 |
| SA□□B□□<br>SA□□F□□<br>SA□□K□□<br>SA□□R□□ | 100 |
| SA□□C□□<br>SA□□G□□<br>SA□□L□□<br>SA□□S□□ | 150 |
| SA□□D□□<br>SA□□H□□<br>SA□□M□□<br>SA□□T□□ | 200 |

| *FLANGES DIMENSIONS ACCORDING TO EN 1092-1 & EN 1759-1* | | | | | | | | | | *SS 316L* | | *Exotic material* | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *seal Diaphragm* | EN 1092-1 | EN 1759-1 | ØE | F min | ØG | H | N x ØJ | ØK | *Weight* (kg) | L=0 ØMb | L≠0 ØExt=ØMb | L=0 ØMb | L≠0 ØExt(ØMb) |
| | | | | | | | | | | | | | |
| SAG□□□□ | DN50 PN40 | | 165 | 20 | 102 | 2 | 4 x 18 | 125 | 3,3 | 59 | 48 | 59 | 48,3 (47) |
| SAH□□□□ | | 2" CLASS 150 | 152 | 21 | 92 | 1,6 | 4 x 19 | 120,6 | 2,7 | 59 | 48 | 59 | 48,3 (47) |
| SAJ□□□□ | | 2" CLASS 300 | 165 | 22,5 | 92 | 1,6 | 8 x 19 | 127 | 3.7 | 59 | 48 | 59 | 48,3 (47) |
| | | | | | | | | | | | | | |
| SA8□□□□ | DN80 PN40 | | 200 | 24 | 138 | 2 | 8 x 18 | 160 | 5,8 | 73 | 73 | 89 | 76 (72) |
| SA4□□□□ | | 3" CLASS 150 | 190 | 24 | 127 | 1,6 | 4 x 19 | 152,4 | 5,3 | 73 | 73 | 89 | 76 (72) |
| SA6□□□□ | | 3" CLASS 300 | 210 | 28,5 | 127 | 1,6 | 8 x 22,2 | 168,3 | 7,8 | 73 | 73 | 89 | 76 (72) |
| | | | | | | | | | | | | | |
| SA9□□□□ | DN100 PN16 | | 220 | 22 | 158 | 2 | 8 x 18 | 180 | 5,9 | 96 | 96 | 89 | 94 (89) |
| SA5□□□□ | | 4" CLASS 150 | 229 | 24 | 157 | 1,6 | 8 x 19 | 190,5 | 7,7 | 96 | 96 | 89 | 94 (89) |
| SA7□□□□ | | 4" CLASS 300 | 254 | 32 | 157 | 1,6 | 8 x 22,2 | 200 | 12,7 | 96 | 96 | 89 | 94 (89) |

*Wetted parts material*

ØMb = *Ø diaphragm*
ØExt = extension

Weight : - 2.2 kg (without option)
Add - flanges' weight (see table)
- 1 kg per 50 mm extension
- 0,2 kg for indicator option
- 2 kg for stainless steel housing

| | SPAN LIMIT | |
|---|---|---|
| | Min. | Max. |
| FKP□□1 | 8.125 kpag (81.25 mbarg) | 130 kpag (1300 mbarg) |
| FKP□□2 | 31.25 kpag (0.3125 barg) | 500 kpag (5 barg) |
| FKP□□3 | 187.5 kpag (1.875 barg) | 3000 kpag (30 barg) |
| FKP□□4 | 625 kpag (1.875 barg) | 10000 kpag (100 barg) |
| FKH□□1 | 8.125 kpa abs (81.25 mbar abs) | 130 kpa abs (1300 mbar abs) |
| FKH□□2 | 31.25 kpa abs (0.3125 bar abs) | 500 kpa abs (5 bar abs) |
| FKH□□3 | 187.5 kpa abs (1.875 bar abs) | 3000 kpa abs (30 bar abs) |

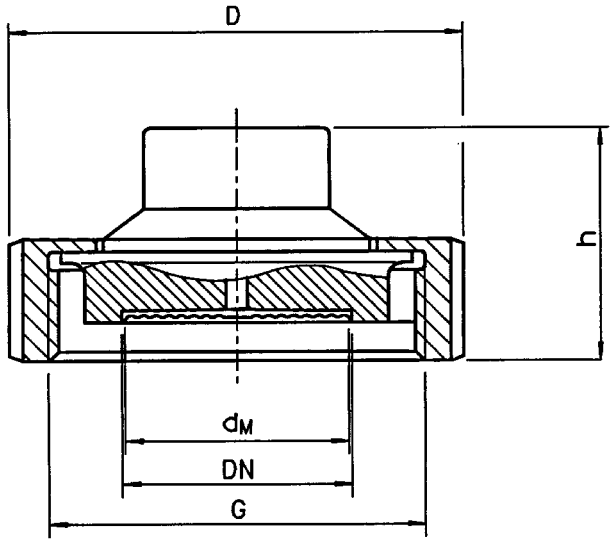
# OUTLINE DIMENSIONS OF SANITARY DIAPHRAGM SEALS (UNITS : MM)

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

**Seals according DIN 11851 et SMS**

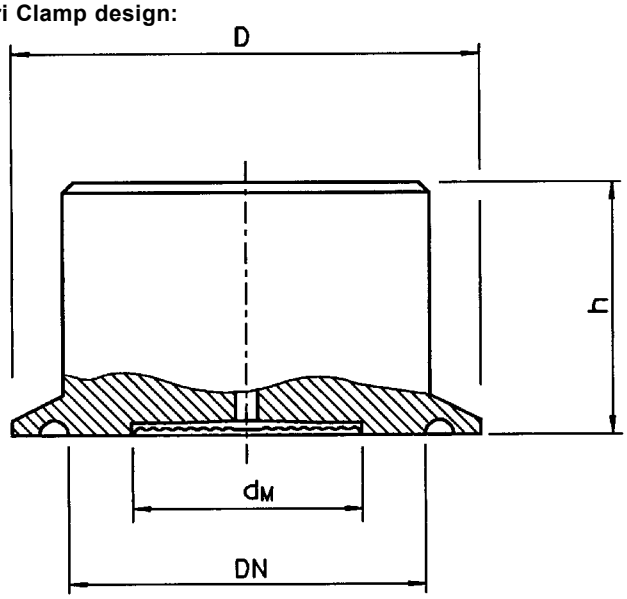
2 differents design exist for DIN 11851 and SMS :

**Coupling nut design:**



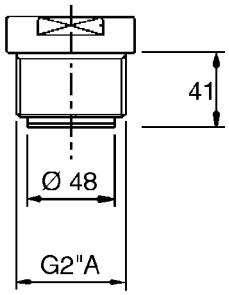

| DIN 11851 | | | | | |
|---|---|---|---|---|---|
| DN | PN (Max) | D | h | $d_M$ | G |
| 25 | 40 | 63 | 36 | 25 | Rd 52 x 1/6 |
| 32 | 40 | 70 | 36 | 32 | Rd 58 x 1/6 |
| 40 | 40 | 78 | 36 | 40 | Rd 65 x 1/6 |
| 50 | 40 | 112 | 36 | 52 | Rd 78 x 1/6 |
| 65 | 40 | 112 | 36 | 65 | Rd 95 x 1/6 |
| 80 | 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:**

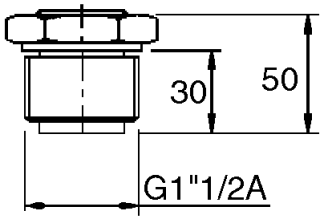



| DN | PN (Max) | D | h | $d_M$ |
|---|---|---|---|---|
| 1"1/2 | 40 | 50 | 35 | 32 |
| 2" | 40 | 64 | 35 | 40 |
| 2"1/2 | 40 | 77.5 | 35 | 50 |
| 3" | 40 | 91 | 35 | 65 |

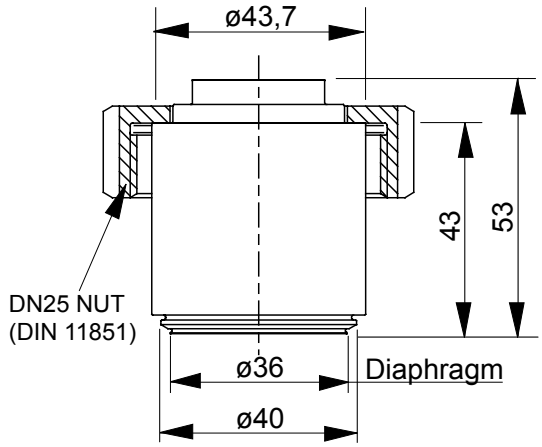
**Screwed G 2"A:**




**Screwed G 1"1/2 A:**




**No dead volume:**



Fuji Electric

**Fuji Electric France S.A.S.**
46 rue Georges Besse - ZI du brézet - 63039 Clermont ferrand
Tél : 04 73 98 26 98 - Fax : 04 73 98 26 99
Mail : sales.dpt@fujielectric.fr - web : www.fujielectric.fr