

## ■ DATA SHEET

The ProcessX pressure transmitter accurately measures gauge pressure and transmits proportional 4 to 20mA signal.

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

## ■ FEATURES

### 1. High accuracy $\pm 0.1\%$

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

### 2. Minimum environmental influence

The "Advance Floating Cell" design which protects the pressure sensor against changes in temperature, and overpressure substantially reduces total measurement error in actual field applications.

### 3. GEORGIN//HART™ bilingual communication protocol

ProcessX series transmitter offers bilingual communications to speak both Georgin proprietary protocol and HART®.

Any HART® compatible devices can communicate with ProcessX series transmitters.

### 4. Application flexibility

Example features that render the ProcessX suitable for almost any process applications includes:

- Full range of hazardous location approvals.
- Built-in RFI filter and lightning arrester.
- 5-digits LCD meter with engineering unit.

### 5. Burnout current flexibility (Under Scale: 3.2 to 4.0mA, Over Scale: 20.0 to 22.5mA)

Burnout signal level is adjustable using Model ProcessX or Hand Held Communicator (HHC) to comply with NAMUR NE43.

### 6. Dry calibration without reference pressure

Thanks to the best combination of unique construction of mechanical parts (Sensor unit) and high performance electronics circuit (Electronics unit), reliability of dry calibration without reference pressure is at equal level as wet calibration.



## ■ CARACTÉRISTIQUE FONCTIONNELLES

### Type:

FKP: Smart, 4-20mA DC + Georgin/Hart® digital signal

### Service:

Liquid, gas or vapour

### Span, range and overrange limit:

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

### Lower range limit (vacuum limit) is:

Silicone fill sensor: See Fig. 1

Fluorinated fill sensor: 66kPa abs (500mmHg abs) at below 60°C

### Output signal:

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

### Power supply :

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

10.5V to 32V DC for the units with optional arrester

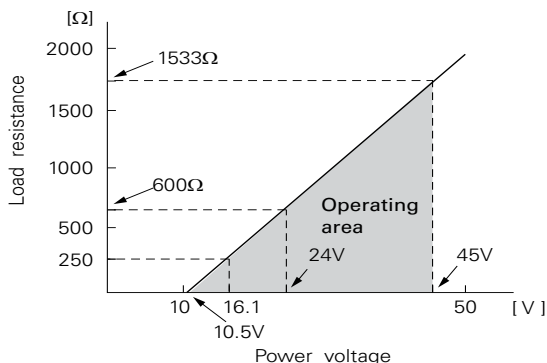


# FKP...5 Pressure transmitter (Direct mount type)



Safety for Industrial Processes

LOAD LIMITATIONS: see figure below



Note: for communication with HHC <sup>(1)</sup> min. of 250W required.

HAZARDOUS LOCATION:

Authority (Digit 10 = )	Intrinsic safety																					
ATEX (K)	Ex II 1 G Ex ia IIC T5 (-40°C ≤ Ta ≤ +50 °C) Ex ia IIC T4 (-40°C ≤ Ta ≤ +70 °C) IP66/67 Entity Parameters: Ui ≤ 28 Vdc, Ii ≤ 94.3 mA, Pi ≤ 0.66 W Ci = 36 nF/26 nF for models with/without Arrester Li = 0.7 mH/0.6 mH for models with/without Analog Indicator																					
Factory Mutual (H)	Class I II III Div.1 Groups A, B, C, D, E, F, G T4 Entity Type 4X <table border="1"> <thead> <tr> <th colspan="2">Model code</th> <th>Tamb</th> </tr> <tr> <th>9th digit</th> <th>13th digit</th> <th></th> </tr> </thead> <tbody> <tr> <td>A,B,C,D,J</td> <td>Y,G,N</td> <td>-40°C to +85°C</td> </tr> <tr> <td>L,P,M,1,2,3</td> <td>Y,G,N</td> <td>-20°C to +80°C</td> </tr> <tr> <td>Q,S,N,4,5,6</td> <td>Y,G,N</td> <td>-20°C to +60°C</td> </tr> <tr> <td>E,F,G,H,K</td> <td>Y,G,N</td> <td>-40°C to +60°C</td> </tr> <tr> <td>-</td> <td>W,A,D</td> <td>-10°C to +60°C</td> </tr> </tbody> </table> Entity Parameters: Vmax=42.4V, Imax=113mA, Pi=1W, Ci=35.98nF, Li=0.694mH	Model code		Tamb	9th digit	13th digit		A,B,C,D,J	Y,G,N	-40°C to +85°C	L,P,M,1,2,3	Y,G,N	-20°C to +80°C	Q,S,N,4,5,6	Y,G,N	-20°C to +60°C	E,F,G,H,K	Y,G,N	-40°C to +60°C	-	W,A,D	-10°C to +60°C
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CSA (J)	Ex ia Class I, Groups A, B, C and D; Class II, Groups E, F and G; Class III Per drawing TC 522873 Temp. code T5 for Tamb max = +50°C Temp. code T4 for Tamb max = +70°C Entity Parameters: Vmax = 28 Vdc, Imax = 94.3 mA, Pmax = 0.66 W Ci = 36 nF/25 nF for models with/without Arrester Li = 0.7 mH/0.6 mH for models with/without Analog Indicator																					
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Authority	Flameproof																					
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CSA (E)	Class I, Groups C and D; Class II, Groups E, F and G ; Class III Maximum ambient temperature 85°C Maximum working pressure 50 Mpa Electrical ratings Model Without arrester: Ui ≤ 45 Vdc, 4-20 mA Model With arrester: Ui ≤ 32 Vdc, 4-20 mA Note: "Seal not required"																					
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IECEX (Q)	Ex nA II T5 (-40°C ≤ Ta ≤ +70 °C) IP66/67 Electrical ratings Model Without arrester: Ui ≤ 45 Vdc, 4-20 mA loop powered, Pi ≤ 1.0125 W Model With arrester: Ui ≤ 32 Vdc, 4-20 mA loop powered, Pi ≤ 1.0125 W Optional Analog indicator is not available for type "n"																					

■ **ZERO/SPAN ADJUSTMENT:**

Zero and span are adjustable from the HHC<sup>(1)</sup>. Zero and span are also adjustable externally from the adjustment screw (span adjustment not available with 9th digit code "L, P, Q, S").

■ **DAMPING:**

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

The time constant is adjustable between 0 to 32 seconds.

■ **ZERO ELEVATION/SUPPRESSION:**

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

■ **NORMAL/REVERSE ACTION:**

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

■ **INDICATION :**

Analog Indicator or 5-digit LCD meter as specified.

■ **BURNOUT DIRECTION:** Selectable from HHC<sup>(1)</sup>

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

**"Output Hold" :**

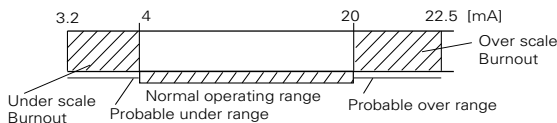
Output signal is hold as the value just before failure happens.

**"Output Overscale" :**

Adjustable within the range 20.0mA to 22.5mA from HHC<sup>(1)</sup>.

**"Output Underscale" :**

Adjustable within the range 3.2mA to 4.0mA from HHC<sup>(1)</sup>:



Output limits conforming to NAMUR NE43 by order

■ **LOOP-CHECK OUTPUT:**

Transmitter can be configured to provide constant signal 3.2mA through 22.5mA by HHC<sup>(1)</sup>.

■ **TEMPERATURE LIMIT:**

Ambient : - 40 to +85°C

-20 to +80°C (for LCD indicator)

-40 to +60°C (for arrester option)

-10 to +60°C (for fluorinated oil fill transmitter)

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

Process: - 40 to +100°C (for silicone fill sensor)

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

Storage : -40 to +90°C

■ **HUMIDITY:**

0 to 100% RH

■ **COMMUNICATION:**

With HHC<sup>(1)</sup>, following items can be remotely displayed or configured

Note:

HHC's version must be higher than 7.0, for ProcessX for supporting these items: "Saturate current", "Write protect", and "History".

Items	Georgin protocol with HHC <sup>(1)</sup>		Hart protocol	
	Display	Set	Display	Set
Tag No.	v	v	v	v
Model No.	v	v	—	—
Serial No. & Software Version	v	—	v	—
Engineering unit	v	v	v	v
Range limit	v	—	v	—
Measuring range	v	v	v	v
Damping	v	v	v	v
Output mode	v	—	v	—
Burnout direction	v	v	v	v
Calibration	v	v	v	v
Output adjust	—	v	—	v
Data	v	—	v	—
Self diagnoses	v	—	v	—
Printer (as option)	v	—	—	—
External switch lock	v	v	v	v
Transmitter display	v	v	v	v
Linearize*	v	v	—	—
Rerange	v	v	v	v
Saturate current	v	v	v	v
Write protect	v	v	v	v
History				
– Calibration history	v	v	v	v
– Ambient temperature history	v	—	v	—

(Note) (1) HHC: Hand Held Communicator

■ **\*LOCAL CONFIGURATOR WITH LCD DISPLAY (OPTION) :**

Local configurator with 3 push button and LCD display can support all items (Georgin Protocol list) except "Linearize" function.

■ **PROGRAMMABLE OUTPUT LINEARIZATION FUNCTION:**

Output signal can be characterized with "14 points linear approximation function" from HHC<sup>(1)</sup>.



# FKP...5 Pressure transmitter (Direct mount type)



Safety for Industrial Processes

## ■ PERFORMANCE SPECIFICATIONS

- **ACCURACY RATING:**  
(including linearity, hysteresis, and repeatability)  
For spans > than 1/10 of URL:  
 $\pm 0.1\%$  of span  
For spans < than 1/10 of URL:  
 $\pm (0.05 + 0.05 \frac{0.1 \times \text{URL}}{\text{span}}) \%$  of span
- **STABILITY:**  
 $\pm 0.2\%$  of upper range limit (URL) for 10 years (in case of 6th digit code "2", "3", "4").
- **TEMPERATURE EFFECT:**  
Effects per 28°C change between the limits of - 40°C and +85°C  
Zero shift:  
 $\pm (0.4 + 0.1 \frac{\text{URL}}{\text{span}}) \%/28^\circ\text{C}$   
Total effect:  
 $\pm (0.475 + 0.1 \frac{\text{URL}}{\text{span}}) \%/28^\circ\text{C}$
- **OVERRANGE EFFECT:**  
Zero shift, 0.3% of URL for any overrange to maximum limit
- **SUPPLY VOLTAGE EFFECT:**  
Less than 0.05% fo calibrated span per 10V
- **UPDATE RATE:**  
60 msec
- **RESPONSE TIME:** (without electrical damping)  
Time constant: 0.08 s (at 23°C)  
Dead time: about 0.12 s  
Response time = time constant + dead time
- **MOUNTING POSITION EFFECT:**  
Zero shift, less than 0.1kPa {1mbar} for a 10° tilt in any plane.  
No effect on span.  
This error can be corrected by adjusting zero.  
(Double the effect for fluorinated fill sensors)
- **VIBRATION EFFECT:**  
<  $\pm 0.25\%$  of span for spans greater than 1/10 of URL.  
Frequency 10 to 150Hz, acceleration 39.2m/sec<sup>2</sup>
- **MATERIAL FATIGUE:**  
Consult GeorGIN.
- **DIELECTRIC STRENGTH:**  
500 V AC 50/60Hz min., between circuit and earth.
- **INSULATION RESISTANCE:**  
More than 100 MΩ at 500 V DC.
- **INTERNAL RESISTANCE FOR EXTERNAL FIELD INDICATOR:**  
12 Ω max..

## ■ PHYSICAL SPECIFICATIONS

- **ELECTRICAL CONNECTIONS:**  
G1/2", 1/2"-14 NPT, Pg13.5, or M20×1.5 conduit, as specified.
- **PROCESS CONNECTIONS:**  
1/2"-14 NPT, Rc1/2", Rc1/4" or 1/4"-18 NPT, as specified.

### ■ PROCESS-WETTED PARTS MATERIAL:

Code (7th digit)	Process cover	Diaphragm	Wetted sensor body
J	316L SS	316L SS+ gold coating	316L SS
V	316L SS	316L SS	316L SS

### ■ NON-WETTED PARTS MATERIAL:

#### Electronics housing:

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

Fill fluid: Silicone oil (standard) or fluorinated oil (Daifloil)

Mounting bracket: 304 stainless steel

- **ENVIRONMENTAL PROTECTION:**  
IEC IP67 and NEMA 6/6P
- **MOUNTING :**  
On 60.5mm pipe using mounting bracket, direct wall mounting, or direct process mounting.
- **MASS {WEIGHT} :**  
Transmitter approximately 2.2kg without options.  
Add 0.5kg for mounting bracket.

## OPTIONAL FEATURES

- **INDICATOR:**  
A plug-in turnable analog indicator  
An optional 5digits LCD meter with engineering unit is also available
- **LOCAL CONFIGURATOR WITH LCD DISPLAY:**  
An optional 5 digits LCD meter with 3 push buttons can support items as using communication with HHC.
- **ARRESTER:**  
A built-in arrester protects the electronics from lightning surges.  
Lightning surge immunity: 4KV (1.2×50μs).
- **OXYGEN SERVICE:**  
Special cleaning procedures are followed throughout the process to maintain all process wetted parts oil-free.  
The fill fluid is fluorinated oil.
- **DEGREASING:**  
Process-wetted parts are cleaned, but the fill fluid is standard silicone oil. Not for use for oxygen or chlorine measurement.
- **NACE SPECIFICATION:**  
Metallic materials for all pressure boundary parts comply with NACE MR-01-75.
- **OPTIONAL TAG PLATE:**  
An extra stainless steel tag for customer tag data is wired to the transmitter.

## ACCESSOIRES

- **HAND HELD COMMUNICATOR (HHC):**

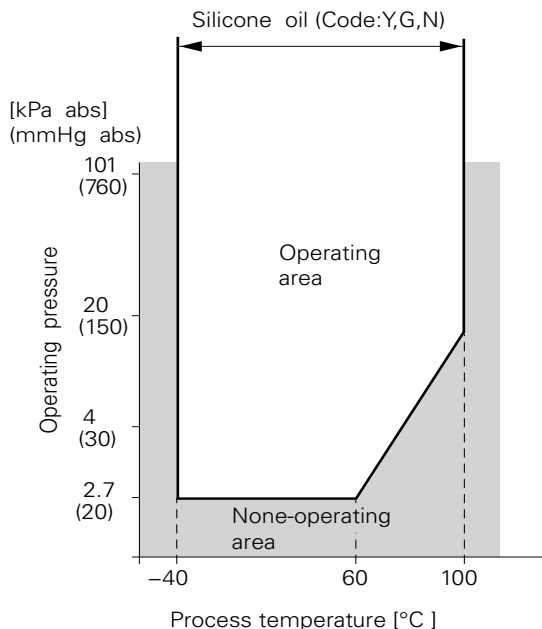


Fig.1 : Relation between process temperature and operating pressure



# FKP...5 Pressure transmitter (Direct mount type)



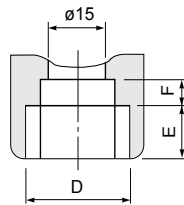
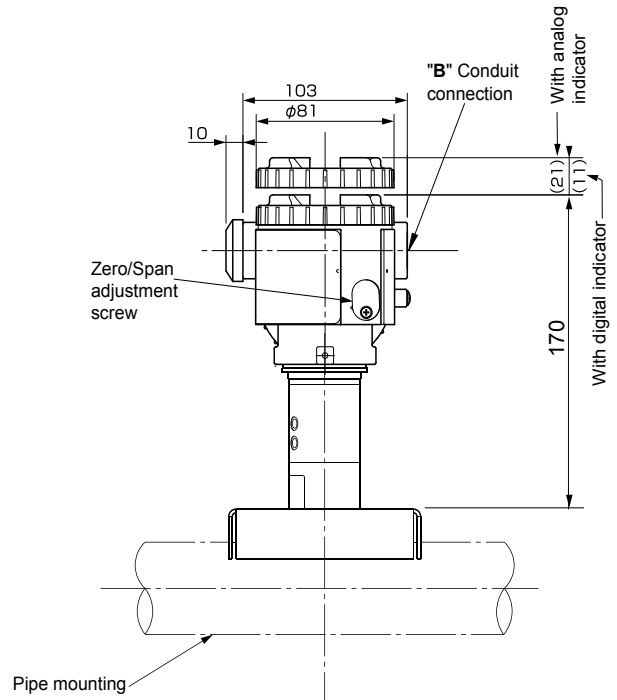
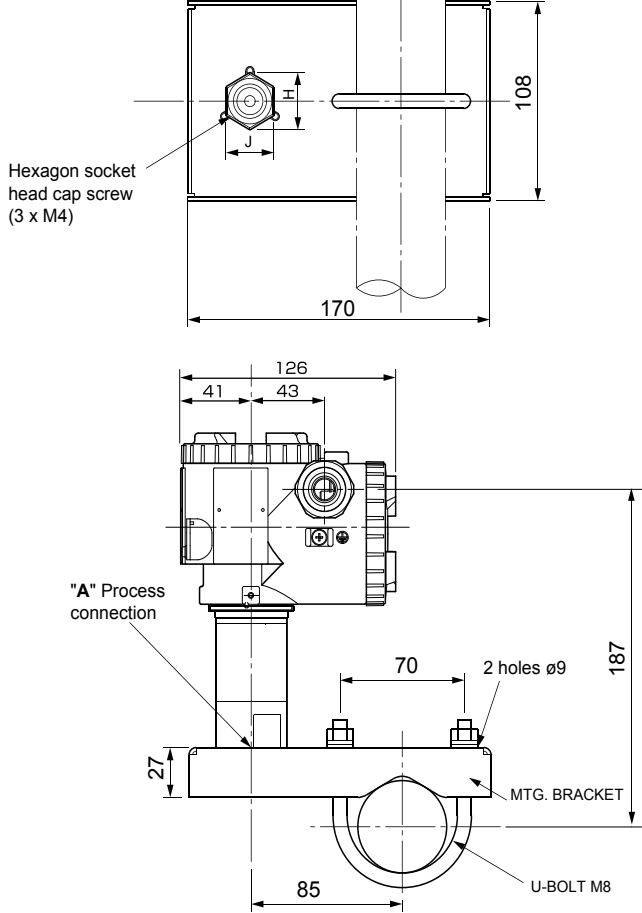
## CODE SYMBOLS

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	DESCRIPTION																																							
F	K	P		0			5						0		<b>Type</b> Smart, 4-20 mA dc + Georjin/Hart® digital signal																																							
T	V	W													<b>Connections</b> <table border="1"> <tr> <th>Process connection</th><th>Electrical connection</th></tr> <tr> <td>See digit 15</td><td>1/2-14 NPT</td></tr> <tr> <td>See digit 15</td><td>Pg 13,5</td></tr> <tr> <td>See digit 15</td><td>M 20 x 1,5</td></tr> </table>	Process connection	Electrical connection	See digit 15	1/2-14 NPT	See digit 15	Pg 13,5	See digit 15	M 20 x 1,5																															
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Digital, 0-100%	Yes																																																					
Digital, Custom scale	Yes																																																					
															<b>Approvals for hazardous locations (consult Georjin for availability)</b> None (Standard) ATEX - Flameproof enclosures (digit 4 = "M, P, R, T" & "W" only) ATEX - Intrinsic Safety (*1) FM - Explosion-Proof (digit 4 = "P" & "T" only) CSA - Explosion-Proof (digit 4 = "P" & "T" only) FM - Intrinsic Safety and Non Incendive CSA - Intrinsic Safety ATEX - Type "n" (digit 9 = A, E, 1, 2, 3, 4, 5 & 6 only) IECEx - Type "n" (digit 9 = A, E, 1, 2, 3, 4, 5 & 6 only) IECEx - Flameproof enclosures (digit 4 = "M, P, R, T" & "W" only) IECEx - Intrinsic Safety CSA - Explosion-Proof & Intrinsic Safety combined approval (digit 4 = "P" & "T" only) ATEX - Flameproof enclosures & Intrinsic Safety combined approval (digit 4 = "M, P, R, T" & "W" only) IECEx - Flameproof enclosures & Intrinsic Safety combined approval (digit 4 = "M, P, R, T" & "W" only) FM - Explosion-Proof & Intrinsic Safety combined approval (digit 4 = "P" & "T" only)																																							
															<b>Mounting bracket</b> None Yes (SS)																																							
															<b>SS parts</b> <table border="1"> <thead> <tr> <th>SS tag plate</th><th>SS housing</th></tr> </thead> <tbody> <tr><td>None</td><td>None</td></tr> <tr><td>Yes</td><td>None</td></tr> <tr><td>None</td><td>Yes</td></tr> <tr><td>Yes</td><td>Yes</td></tr> </tbody> </table>	SS tag plate	SS housing	None	None	Yes	None	None	Yes	Yes	Yes																													
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Yes	None																																																					
None	Yes																																																					
Yes	Yes																																																					
															<b>Special applications &amp; fill fluid</b> <table border="1"> <thead> <tr> <th>Treatment</th><th>Fill fluid</th></tr> </thead> <tbody> <tr><td>None (std)</td><td>Silicone oil</td></tr> <tr><td>Degreasing</td><td>Silicone oil</td></tr> <tr><td>Oxygen service</td><td>Fluorinated oil</td></tr> <tr><td>NACE</td><td>Silicone oil</td></tr> </tbody> </table>	Treatment	Fill fluid	None (std)	Silicone oil	Degreasing	Silicone oil	Oxygen service	Fluorinated oil	NACE	Silicone oil																													
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															<b>Processconnection (welded) adaptor - all stainless steel parts</b> None - (1/2 - 14 NPTI connection) Rc 1/2 I 1/4 - 18 NPTI 1/2 - 14 NPTE G 1/2"A manometer fitting																																							

Note\*:

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

## OUTLINE DIAGRAM (UNIT:MM)



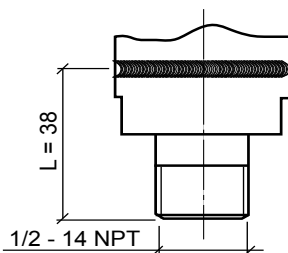
Details of "B"

4th digit of the code symbols	Conduit connections		
	D	E	F
T	1/2-14NPT	16	5
V	Pg13.5	8	4.5
W	M20x1.5	16	5

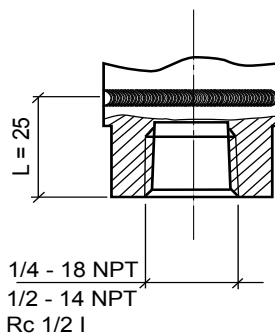
Table 1

## DETAILS "A" - PROCESS CONNECTION

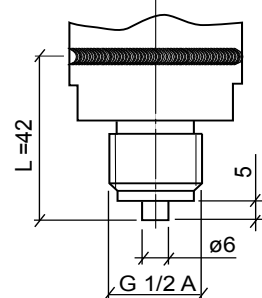
Code digit 15 = D



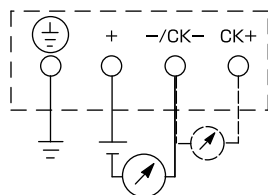
Code digit 15 = Y, B or C



Code digit 15 = E



## ■ CONNEXION ÉLECTRIQUE



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

All models of ProcessX series transmitters are in accordance with the harmonized standards :

- EN 61326-1 : 2006 (Electrical equipment for measurement, control and laboratory use - EMC requirements).
- EN 61326-2-3 : 2006 (Part 2-3 : Particular requirements - Test configuration, operational conditions and performance criteria for transducers with integrated or remote signal conditioning).

### Emission limits : EN 61326-1 : 2006

Frequency range (MHz)	Limits	Basic standard
30 to 230	40dB ( $\mu\text{V/m}$ ) quasi peak, measured at 10m distance	EN 55011 / CISPR 11 Group 1 Class A
230 to 1000	47dB ( $\mu\text{V/m}$ ) quasi peak, measured at 10m distance	

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

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

### Performance criteria:

**A** : During testing, normal performance within the specification limits.

**B** : During testing, temporary degradation or loss of function or performance which is self-recovering.