



# Instruction manual

## SX SERIES PRESSURE TRANSMITTER



### 1. General information

The following instructions contain important information about the correct use of the instrument. Read this instruction manual carefully before installing and commissioning the instrument. Keep it in a safe place accessible to users at any time.

The operators in charge of the instrument selection, installation and maintenance should be able to recognise what conditions may be negative affect the instrument's functioning and that may lead to premature damage or failure. Therefore, the staff should be technically qualified and adequately trained and perform the procedures established by the plant regulations.

Any improper use may damage the instrument, cause failures, and harm the operators and the plant.

To choose the constructive and operating characteristics of the instruments we recommend that you consult the most updated version of the related data sheets available online at <http://www.nuovafima.com>

The user is fully responsible for the installation and maintenance of the instrument.

The product cannot be modified in any way unless it is explicitly declared in this manual.

The producer reserves the right to modify the technical data without notice.

### 2. Intended use

The pressure transmitter SX series is an intrinsic safety measuring instrument used to monitor liquid or gaseous fluids in areas that might be potentially explosive. Its function is to transform an input pressure into a standardised output electrical signal 4...20 mA.

A sensor measures the pressure through the deformation of a membrane. The sensor, when adequately powered, converts the deformation into an electrical signal proportional to the pressure which is applied.

### 3. Safety instructions

The instrument's safety derives from a careful choice of the model and installation in the system, as well as from compliance with the maintenance procedures established by the manufacturer.

Do not use the transmitter in the immediate proximity of motors, pumps, valves, heating sources or any other potential sources that may interfere with it. Excessive vibrations, shocks or pressure spikes outside the instrument's specifications may alter the measuring values and destroy the pressure transmitter. The non-observance may bring severe lesions and material damages caused by the material leakage.

Remove the transmitter only after the plant has been depressurised. The process fluid residues of the removed instruments may harm people, the environment, and the plant. It is highly recommended that adequate precautions are taken.

Do not interfere or modify the pressure transmitter in any way that is different from what is described in this instruction manual for use and safety.

Repairs must be performed by the producer exclusively.

### 4. CE conformity

The pressure transmitters SX series are complying with the following Directives:

**ATEX 2014/34/UE - EMC 2014/30/UE - RoHS 2011/65/U - PED 2014/68/UE**

The pressure transmitters SX series are complying with the following harmonised Standards:

**EN IEC 60079-0:2018 - EN 60079-11:2012 - EN 61326-1:2013 - EN 61326-2-3:2013**

### 5. Marking



**II 1G Ex ia IIC T6...T4 Ga**

**II 1D Ex ia IIIC T<sub>200</sub>85°C...T<sub>200</sub>135°C Da**

**II 1/2G Ex ia IIC T6...T4 Ga/Gb**

**II 1/2D Ex ia IIIC T<sub>200</sub>85°C...T<sub>200</sub>135°C Da/Db**

### 6. Funcional characteristics


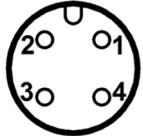
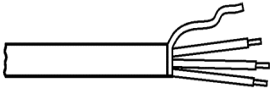





#### 6.1 Electrical values

Voltage	Ui	≤ 30 VDC (10...30 VDC)
Current	Ii	≤ 100 mA
Power	Pi	≤ 1 W
Maximum internal capacitor values + cable	Ci	= 19 nF + 0,2 nF/m
Maximum internal inductance values + cable	Li	= 0 μH + 2 μH/m

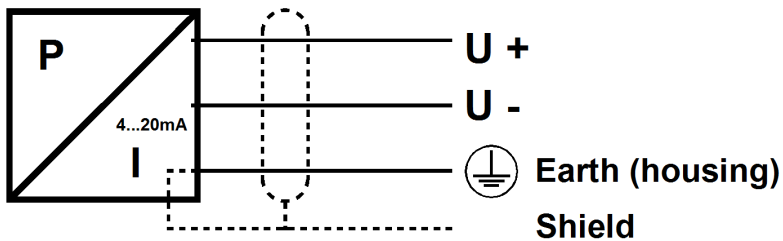
**6.2 Table of correlation: electrical connection, category, protection level (EPL), group, ambient temperature/process, class temperature/surface temperature.**

Electrical connection	ATEX	EPL	Group	Ambient temperature / medium temperature (°C)	Temperature class / surface temperature
Angular connector DIN175301-803 A DIN175301-803 C	1/2G	Ga/Gb	IIC	-20 ≤ Ta ≤ +60 -20 ≤ Ta ≤ +80 -20 ≤ Ta ≤ +100	T6 T5 T4
	1/2D	Da/Db	IIIC	-20 ≤ Ta ≤ +40 -20 ≤ Ta ≤ +55 -20 ≤ Ta ≤ +90	T <sub>200</sub> 85 °C T <sub>200</sub> 100 °C T <sub>200</sub> 135 °C
Circular connector M12x1	1/2G	Ga/Gb	IIC	-20 ≤ Ta ≤ +60 -20 ≤ Ta ≤ +80 -20 ≤ Ta ≤ +100	T6 T5 T4
	1/2D	Da/Db	IIIC	-20 ≤ Ta ≤ +40 -20 ≤ Ta ≤ +55 -20 ≤ Ta ≤ +90	T <sub>200</sub> 85 °C T <sub>200</sub> 100 °C T <sub>200</sub> 135 °C
Cable outlet IP68	1G	Ga	IIC	-20 ≤ Ta ≤ +60 -20 ≤ Ta ≤ +80 -20 ≤ Ta ≤ +80	T6 T5 T4
	1D	Da	IIIC	-20 ≤ Ta ≤ +40 -20 ≤ Ta ≤ +55 -20 ≤ Ta ≤ +80	T <sub>200</sub> 85 °C T <sub>200</sub> 100 °C T <sub>200</sub> 135 °C
Cable outlet IP65	1/2G	Ga/Gb	IIC	-20 ≤ Ta ≤ +60 -20 ≤ Ta ≤ +80 -20 ≤ Ta ≤ +80	T6 T5 T4
	1/2D	Da/Db	IIIC	-20 ≤ Ta ≤ +40 -20 ≤ Ta ≤ +55 -20 ≤ Ta ≤ +80	T <sub>200</sub> 85 °C T <sub>200</sub> 100 °C T <sub>200</sub> 135 °C
Field case	1/2G	Ga/Gb	IIC	-20 ≤ Ta ≤ +60 -20 ≤ Ta ≤ +80 -20 ≤ Ta ≤ +100	T6 T5 T4
	1/2D	Da/Db	IIIC	-20 ≤ Ta ≤ +40 -20 ≤ Ta ≤ +55 -20 ≤ Ta ≤ +90	T <sub>200</sub> 85 °C T <sub>200</sub> 100 °C T <sub>200</sub> 135 °C

## 7. Electrical connection

Electrical outlet	Angular connector EN175301-803-A/C (DIN43650-A/C)	Circular connector M12x1 (4 poles)	Cable PUR	Cable PVC	Field Case
					
Outlet connection	U + = 1 U - = 2 GND = 	U + = 1 U - = 3  = 2	U + = brown U - = white  = shield	U + = 1 U - = 2  = 4	
Protection IP (IEC/EN 60529)	IP65	IP65	IP68	IP65	IP65

U + = Positive supply  
U - = Negative supply



The transmitter metal case must always be connected to the ground using the process connector thread (case) to protect it against fluctuations due to electromagnetic fields and electrostatic charges. If this is impossible, you can connect the transmitter to the ground using the connector and the cable shield.

The case connection and the cable shielding to the ground cannot be performed simultaneously as this is permitted only under the requirements and installation guidelines specified in the IEC/EN 60079-14 standard.

## 8. Installation and commissioning

Before installing or commissioning intrinsic safety electrical equipment, it is strongly recommended that the user ensures that the correct instrument has been installed and that the measuring range, overpressure capacity, and specific measuring conditions of the equipment align with the original project data. Failure to comply can result in the loss of explosion protection, with the potential for severe injuries, property damage, and lifethreatening hazards.

The transmitter must be installed by qualified personnel only according to the requirements of the installation standard IEC/EN 60079-14 and the related national rules.

Install the transmitter on non-pressurised plants only respecting the mounting torque of 50Nm. The correct torque depends on the process connection and the gasket being used which can vary based on their shape and material.

Before installation make sure that the pressure connection is clean and undamaged.

In flush diaphragm transmitters, the protection cap must be removed just before installation to prevent damage to the diaphragm, which is an essential safety component. The liquid leakage is an indication of damage to the diaphragm. If the diaphragm is damaged, protection against explosion is no longer guaranteed.

In transmitters with electric connectors, the IP protection class is guaranteed only if the cable and the connector are assembled correctly. It is advised to use a cable suitable to the application and ensure its diameter matches the connector's cable gland.

In relative pressure transmitters with electric connectors, the pressure compensation placed in the connector must be ensured.

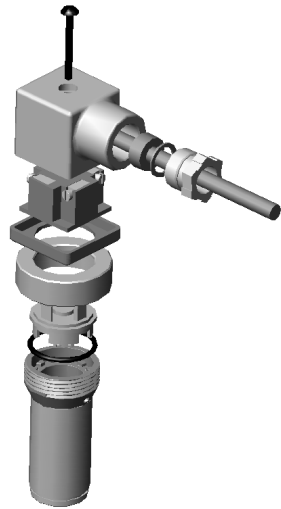
In transmitters with cable outlet any damage to the cable sheath must be prevented.

The pressure transmitter must be used only if it is in perfect safety conditions.

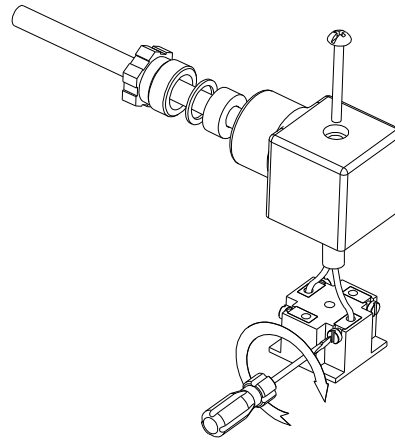
The transmitter must be powered by a EX ia certified combined equipment (as a safety Barrier with diodes or a galvanic Isolator) capable of ensuring the maximum voltage characteristics ( $U_i$ ) maximum current ( $I_i$ ), and maximum power ( $P_i$ ) as indicated on the product's label or use instruction manual.

The technical specifications provided by the manufacturer for using a pressure transmitter with aggressive or corrosive fluids must be strictly followed, and precautions should be taken to prevent any mechanical shocks.

Dismount the connector as shown in figure 1 and connect the cable as shown in figure 2.  
Remount the connector and fasten it on the transmitter.



**Figure 1 – Connector exploded view**



**Figure 2 – Wire connection**

## 9. Maintenance and recalibration

The SX series pressure transmitters do not typically require maintenance.

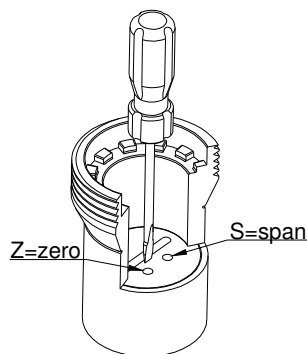
The recalibration procedure depends on the application conditions.

Suggested recalibration interval: 1 year.

For recalibration send the transmitter to the manufacturer Nuova Fima s.r.l.

Maintenance operations must be entrusted to qualified personnel who are trained in the specific characteristics of the equipment, in full compliance with the requirements of the European standard IEC/EN 60079-17.

Only in the available versions, it is possible to adjust the zero (Z) and the full scale range (S) by dismounting the connector (figure 1) and adjusting them with an appropriate tool (figure 3).



**Figure 3 – Adjustment**



## DICHIARAZIONE UE DI CONFORMITÀ EU DECLARATION OF CONFORMITY

NUOVA FIMA s.r.l. dichiara sotto la propria responsabilità che i seguenti strumenti  
*NUOVA FIMA s.r.l. declare on its sole responsibility that the following instruments*

### Trasmittitori di Pressione - serie SX *Pressure Transmitters - SX series*

sono conformi ai requisiti delle Direttive e sono marcati **CE**

*fulfill the requirements of the Directives and they are marked with the symbol CE*

2014/68/UE (PED)<sup>(1)</sup>

2014/34/UE (ATEX)<sup>(2)</sup>

2014/30/UE (EMC)<sup>(3)</sup>

2011/65/UE (RoHS)

<sup>(1)</sup> Gli strumenti con sovrappressione applicabile  $PS \leq 200$  bar sono progettati e fabbricati secondo criteri di buona prassi costruttiva, in accordo con l'articolo 4, par.3 della Direttiva.

Gli strumenti con sovrappressione applicabile  $PS > 200$  bar sono classificati in CATEGORIA I e sottoposti a valutazione della conformità secondo il Modulo A – Controllo di fabbricazione interno.

*Instruments with allowable overpressure value  $PS \leq 200$  bar are designed and manufactured in accordance with sound engineering practice, according to article 4, par. 3 of the Directive.*

*Instruments with allowable overpressure value  $PS > 200$  bar are classified in CATEGORY I and subjected to the conformity assessment procedure according to Module A - Internal production control.*

<sup>(2)</sup> Gli strumenti sono marcati - *Instruments are marked as follows:*



**II 1G Ex ia IIC T6...T4 Ga**

**II 1D Ex ia IIIC T<sub>200</sub>85°C... T<sub>200</sub>135°C Da**

**II 1/2G Ex ia IIC T6...T4 Ga/Gb**

**II 1/2D Ex ia IIIC T<sub>200</sub>85°C... T<sub>200</sub>135°C Da/Db**

e sono conformi alle norme – *and they comply with standards*

EN IEC 60079-0:2018

EN 60079-11:2012

Hanno la certificazione di tipo **0425 ATEX 2635-01** relativa al Fascicolo Tecnico TF 4 rev.3, e la sorveglianza sulla produzione ha la certificazione N° 1591 rilasciate dall'Organismo Notificato ICIM S.p.A. N° 0425.

*Instruments are certified with certification type **0425 ATEX 2635-01** related to the Technical File TF 4 rev.3, and the surveillance of production is certified with certification N° 1591 issued by the Notified Body ICIM S.p.A. N° 0425.*

<sup>(3)</sup> Gli strumenti sono conformi alla norma – *Instruments comply with standard*

EN 61326-1:2013

EN 61326-2-3:2013

Il controllo interno degli strumenti è assicurato dal Sistema Qualità secondo ISO 9001 operante in azienda e certificato da ICIM SpA.

*The control of the instruments internal manufacturing is guaranteed by the Quality System according to ISO 9001 of the factory, certified by ICIM SpA.*

Invorio 16 - 10 - 2023

Responsabile ATEX + DG  
Federico Zaveri

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