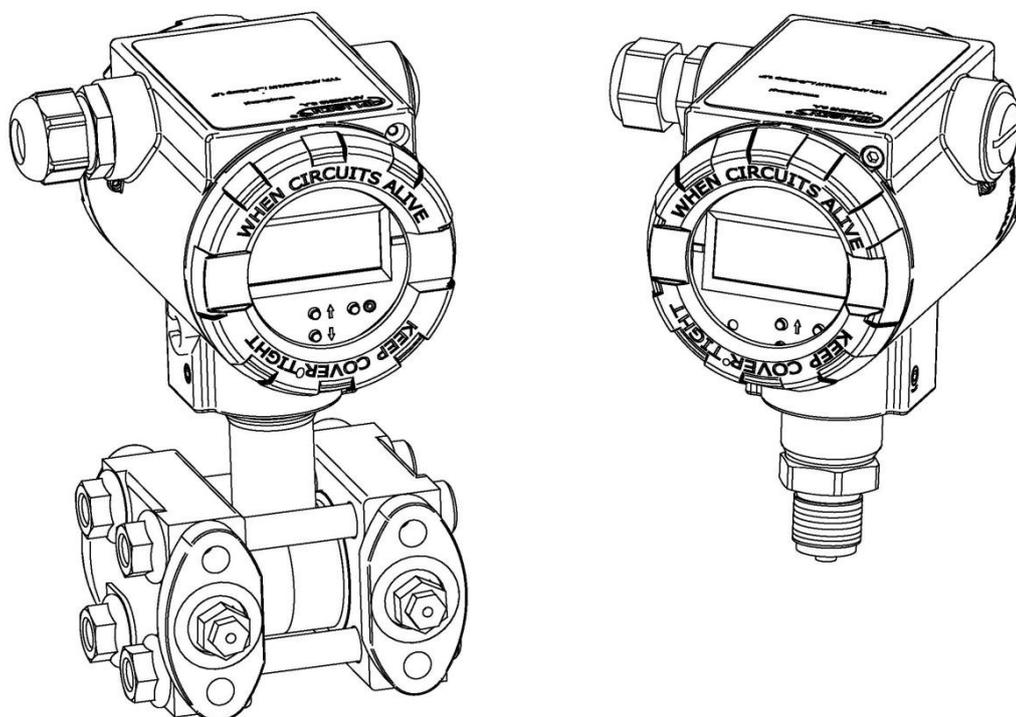


## HAZARDOUS AREA INSTALLATION MANUAL

SMART PRESSURE TRANSMITTERS  
**APC-2000ALW, APC-2000ALW SAFETY**  
SMART PRESSURE DIFFERENTIAL TRANSMITTERS  
**APR-2000ALW, APR-2000ALW SAFETY**

(Intrinsic Safety, Explosinproof, Flameproof, Dust-Ignitionproof,  
Fiber+Flying Protection, Protection by Enclosure)



## Symbols used

Symbol	Description
	Warning about the necessity follow strictly the information provided in the documentation in order to ensure safety and full functionality of the device.
	Information particularly useful for device installation and operation.
	Information particularly useful for Ex device installation and operation.
	Waste of electrical and electronic equipment disposal information.

## BASIC REQUIREMENTS AND OPERATION SAFETY



- The manufacturer shall not be liable for any damage resulting from incorrect installation, failure to maintain the device in proper condition, or device use other than intended.
- Installation should be carried out by qualified staff having the required authorization to install electrical and I&C equipment. The fitter is responsible for performing the installation in accordance with this manual and with the electromagnetic compatibility and safety regulations and standards applicable to the type of installation.
- If leakage in systems with I&C equipment occurs, pressurized medium poses a threat to the personnel. All safety and protection requirements must be observed during transmitter installation, operation and inspections.
- If a malfunction occurs, the device should be removed and sent for repair to the manufacturer or a facility authorized by the manufacturer.



In order to minimize the risk of malfunction and associated risks to staff, do not install or use the device in particularly adverse conditions, where the following hazards occur:

- Possible mechanical impacts, excessive shocks and vibration;
- Excessive temperature fluctuation;
- Water condensation, dust, icing.



Explosion-proof installations should be made with special care and in accordance with standards and regulations applicable to this type of installations.

Changes can be made in the manufacturing before the paper version of user documentation is updated. Up-to-date user manuals are available on the manufacturer's website: [www.aplisens.com](http://www.aplisens.com).

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## 1. INTRODUCTION

The Manual is applicable to the APC-2000ALW, APC-2000ALW Safety & APR-2000ALW, APR-2000ALW Safety pressure transmitters which are made in Intrinsically Safe (IS) or group in version protected by enclosure (XP, Exd, DIP and Ext). To the XP, Exd, DIP and Ext group secured by housing are qualified Flameproof, Dust-Ignitionproof, Fiber+Flying Protection and Protection by Enclosure versions. The transmitters are made in one of three versions: IS, group version (XP, Exd, DIP and Ext), or in both versions, with the option of choosing, as required, the appropriate IS or XP, Exd, DIP, Ext destination. For transmitters made for both versions, the choice of IS or XP, Exd, DIP, Ext destination, with a making of a permanent marking on the name plates, can be made only once, before the first installation – see Fig. 1,

The transmitter type and versions are identified with Model ID on the labels/nameplates according to the specification in 4 section.

If the transmitters are installing, refer to this Manual and also:

- EN.IO.APC.APR.ALW.SFT Manual for APC-2000ALW Safety, APR-2000ALW Safety series transmitters,
- EN.IO.APC.APR.ALW Manual for APC-2000ALW and APR-2000ALW, series transmitters.

## 2. SAFETY

- Read the Manual carefully before the transmitter installing, commissioning and operating.
- Installation and maintenance should be carried out by qualified staff having the required authorization to install electrical and measuring devices.
- The transmitter should be used as intended within permissible parameters.
- Power source must be disconnected before the transmitter installing or removing.
- No repairs or alterations to the transducer electronic system are permitted. Only the manufacturer or an authorized by the manufacturer facility may assess damages and repair the device (if possible)
- Using damaged instruments is not allowed, the device must be disconnected.
- For the equipment using in zones and/or divisions, the technical requirements specified in this Manual and applicable local (national) regulations should be followed.
- **WARNING** - potential static hazard. Clean the transmitter only with a water wetted cloth.
- **ATTENTION** - risque d'électricité statique potentiel. L'émetteur nettoyer seulement avec un linge imbibé d'eau.
- **CAUTION** - do not open covers when explosive atmosphere is present.
- **ATTENTION** - ne pas ouvrir couvre en présence d'une atmosphère explosive.
- **WARNING** - use cable rated at least 100°C.
- **CAUTION** - for division installations seal not required.
- **CAUTION** - for zone installations, seal within 50mm.
- **ATTENTION** - pour les zones, un scellement doit être installé à moins de 50 mm du boîtier.



### 3. COMPLETE DELIVERY CHECKLIST

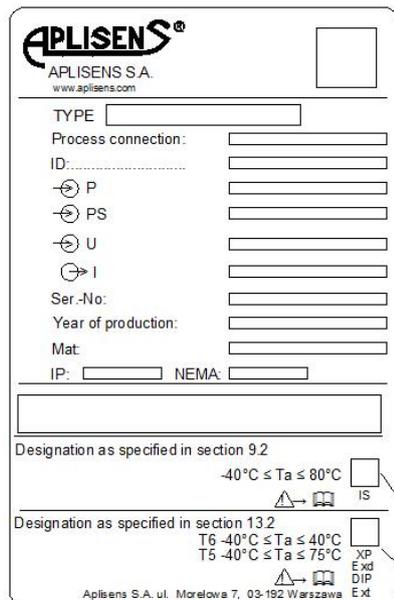
The following specifications are included to the transmitters delivery:

- a) Product Certificate, which also constitutes a warranty card.
  - b) Copy of Type Approval Certificates (on request).
  - c) EN.FM.APC.APR.ALW hazardous area installation manual.
  - d) EN.IO.APC.APR.ALW.SFT user manual or EN.IO.APC.APR.ALW user manual
- b), c), d) items are available at [www.aplisens.com](http://www.aplisens.com).

### 4. IDENTIFICATION MARKS.

Transmitters designed to explosive hazardous area are described a nameplates which contains data specified in 5.2 section, EN.IO.APC.APR.ALW.SFT or EN.IO.APC.APR.ALW and also the following:

- a) Designation of explosion-proof design type with the certificate number.
- b) Parameter values, e.g. Ui, li, Ci, Li for IS transmitters.
- c) Manufacture year.
- d) SA Version inscription, for the IS transmitters with overvoltage protection. See p.11.



One of two boxes, the intended indicating: (IS) or (XP, Exd, DIP, Ext) protection should be permanently marked before transmitter installation.

**Figure 1.** Transmitter nameplate sample with common: IS & XP, Exd, DIP, Ext designation

### 5. TRANSMITTER DESIGN

The basic transmitter components are: measuring head where a pressure signal is converted to an electrical signal in 316 (1.4401) stainless steel enclosure, and IC module converting the signal from the measuring head to a standardized output signal in an enclosure made of painted aluminum, or of stainless steel. The measuring head, in its wettable parts is made of materials, resistant to the measuring media as Hastelloy, tantalum or various stainless steel kinds.

## 6. ELECTROSTATIC HAZARDS

The painted aluminum enclosure, plastic nameplate and coated with PTFE diaphragm seals, for some applications, are a non-conducting layers applied on a conducting metal base. Transmitters with this design in a dust-explosion zones should be installed in a places where electrostatic charging is impossible; in particular should be avoided these surfaces contacts with electrically charged falling off dust or blown from devices in the vicinity.

## 7. SPECIAL CONDITIONS OF USE

- a) The user shall ensure that any source of external heating does not result in the transmitter exceeding the maximum marked ambient temperature.
- b) The flameproof joints are not intended to be repaired. Contact manufacturer for information related to the repair of flameproof joints.
- c) In hazardous zones of dust explosion, transmitters with painted aluminum enclosures, as well as transmitters equipped with plastic marking plates and diaphragm separator elements covered with a teflon layer, shall be installed in a way that prevents electrostatic charging, specified in accordance with point 6.
- d) The diaphragm separator containing titanium elements shall be protected against mechanical impacts.
- e) An IS transmitter versions with surge arrester marked on plate "Version SA", do not meet the requirements of dielectric strength tests 500Vrms between terminal connections and transmitter housing. The device should be installed in accordance with point 11.
- f) When the manufacturer of the equipment has not identified the type of protection on the label, the user shall, on installation, mark the label with the type of protection used. Once the type of protection has been marked it shall not be changed.
- g) The enclosure made of aluminum alloy and given a protective polyurethane paint finish; care should be taken to protect it from impact or abrasion of located in Zone 0.
- h) For a double destination transmitters with a nameplate for both IS and XP, Exd, DIP, Ext destines, the applied protection type must be permanently marked on the transmitter nameplate before transmitters installation (see Figure 1).
- i) In the device version including the flameproof enclosure, the diaphragm shall not be subject on damage during installation and exploitation of the transmitter. The transmitter diaphragm is made of stainless steel, Hastelloy alloy or tantalum and shall not be exposed to medium that could cause its damage.

## 8. HAZARDOUS AREAS CLASSES AND PROTECTION TYPES

Intrinsic Safety protection means that the transmitter can be installed in Class I, II, III, Division 1 and Zone 0 ,1, 20 or 21 for US and Canada.

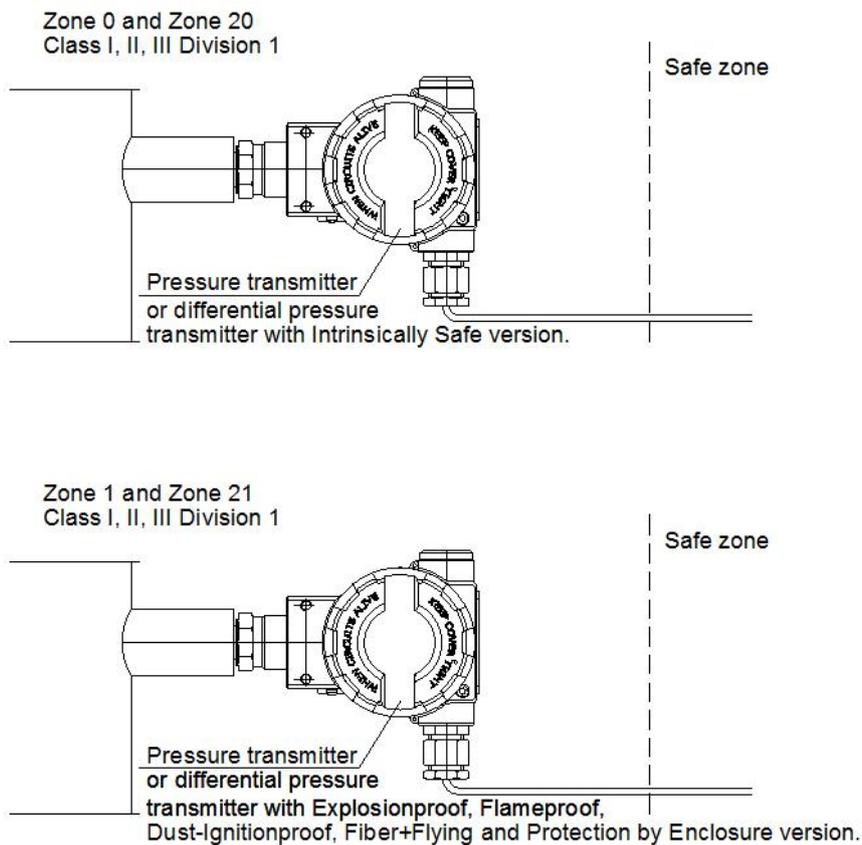
Explosionproof protection means that the transmitter can be installed in Class I, Division 1 for US and Canada.

Flameproof protection means that the transmitter can be installed in Zone 1 for US and Canada.

Dust-Ignitionproof protection means that the transmitter can be installed in Class II, Division 1 for US and Canada.

Fiber+Flying protection means that the transmitter can be installed in Class III, Division 1 or Division 2 for US and Canada.

Protection by Enclosure means that the transmitter can be installed in Zone 21 or 22 for US and Canada



**Figure 2.** Transmitter installation in potentially explosive areas.



Intrinsically safe transmitters should be installed accordance with FM control drawing APC2000-A544-TA sheet 1B.



Installations are to be in accordance with the National Electrical Code (for US) and Canadian Electrical Code (for Canada).

## 9. INTRINSICALLY-SAFE TRANSMITTERS ACCORDED WITH FM APPROVALS

### 9.1. Standards used for assessment

9.1.1. The transmitters for US are manufactured in compliance with the following standards: FM Class 3600:2018, FM Class 3610:2018, FM Class 3810:2018, ANSI/UL 61010-1:2012, ANSI/UL 60079-0:2019, ANSI/ISA 60079-11:2014, ANSI/IEC 60529:2020, UL 50E:2015.

9.1.2. The transmitters for Canada are manufactured in compliance with the following standards: CAN/CSA-C22.2 No. 60079-0:2019, CAN-CSA C22.2 No. 60079-11:2014, CAN-CSA C22.2 No. 60529:2016, CSA-C22.2 No. 94:2011, CAN-CSA C22.2 No. 61010-1:2012.

### 9.2. IS transmitters designations accorded with FM Approvals.

- 9.2.1 US Intrinsic Safety (IS):
- IS Class I, Div 1, Groups A, B, C, D T4**
  - IS Class II, Div 1, Groups E, F, G T5**
  - IS Class III, Div 1, T5**
  - Zone 0 AEx ia IIC T4 Ga**
  - Zone 20 AEx ia IIIC T105°C Da**
  - FM20US0156X**

ID marking applied only for an intrinsically safe (IS) transmitters marked with the type and model:

APC-2000ALW Safety	ID 0001 0004 0002 0000 0000 0001 0001 39
	ID 0001 0004 0002 0000 0000 0005 0001 37
APR-2000ALW Safety	ID 0002 0004 0002 0000 0000 0001 0001 36
	ID 0002 0004 0002 0000 0000 0005 0001 34
APC-2000ALW	ID 0005 0004 0006 0000 0000 0010 0001 68
	ID 0005 0004 0006 0000 0000 0014 0001 66
APR-2000ALW	ID 0006 0004 0006 0000 0000 0010 0001 65
	ID 0006 0004 0006 0000 0000 0014 0001 63



Transmitters with double IS and XP, Exd, DIP, Ext designation become IS transmitters after durable marked IS field on the nameplates.

- 9.2.2 US and Canada Intrinsic Safety (IS):
  - IS Class I, Div 1, Groups A, B, C, D T4**
  - IS Class II, Div 1, Groups E, F, G T5**
  - IS Class III, Div 1, T5**
  - Zone 0 AEx/Ex ia IIC T4 Ga**
  - Zone 20 AEx/Ex ia IIIC T105°C Da**
  - FM20US0156X and FM20CA0079X**

ID marking applied only for an intrinsically safe (IS) transmitters marked with the type and model:

APC-2000ALW Safety	ID 0001 0004 0002 0000 0000 0001 0001 39
	ID 0001 0004 0002 0000 0000 0003 0001 38
APR-2000ALW Safety	ID 0002 0004 0002 0000 0000 0001 0001 36
	ID 0002 0004 0002 0000 0000 0003 0001 35
APC-2000ALW	ID 0005 0004 0006 0000 0000 0010 0001 68
	ID 0005 0004 0006 0000 0000 0012 0001 67
APR-2000ALW	ID 0006 0004 0006 0000 0000 0010 0001 65
	ID 0006 0004 0006 0000 0000 0012 0001 64



Transmitters with double IS and XP, Exd, DIP, Ext designation become IS transmitters after durable marked IS field on the nameplates.

### 9.3. Minimum supply voltage

**Table 1.** Minimum supply voltage for IS transmitter

Minimum supply voltage for transmitters without display backlighting	Minimum supply voltage for transmitters with display backlighting *)
11.5V	14.5V
*)On request backlighting is turned on at transmitter manufacturing stage only.	

## 10. TRANSMITTERS PERMISSIBLE PARAMETERS

**Table 2.** IS transmitters permissible input parameters

Linear power supply	Orthogonal power supply		Trapezoidal power supply
U <sub>i</sub> = 30V	U <sub>i</sub> = 24V	U <sub>i</sub> = 24V	U <sub>i</sub> = 24V, U <sub>Q</sub> =48V
I <sub>i</sub> = 0.1A	I <sub>i</sub> = 0.025A	I <sub>i</sub> = 0.05A	I <sub>i</sub> = 0.05A
P <sub>i</sub> = 0.75W	P <sub>i</sub> = 0.6W	P <sub>i</sub> = 1.2W	P <sub>i</sub> = 0.7W
C <sub>i</sub> = 2.5nF			
L <sub>i</sub> = 18µH			
-40°C ≤ T <sub>a</sub> ≤ +80°C (T4)			



Power supply to transmitters should be connected from supply and measurement devices with applicable IS certificates, whose outputs parameters to a hazard zone should not exceed the transmitters permissible power supply parameters specified above.

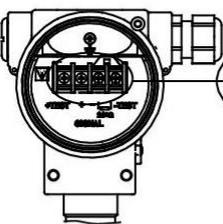
# 11. INTRINSICALLY SAFE TRANSMITTERS CONNECTING

CHANGE No.	DATE	NAME
1	09.2020	D.lzdebski
1	12.2020	D.lzdebski

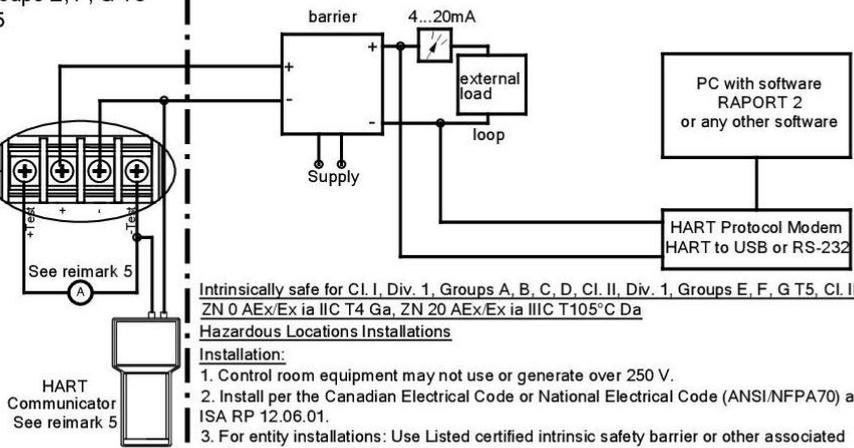
## INTRINSICALLY SAFE INSTALLATIONS

**HAZARDOUS (CLASSIFIED) LOCATIONS**

LOCATIONS:  
 CLASS I, Division 1, Groups A, B, C & D T4  
 CLASS II, Division 1, Groups E, F, G T5  
 CLASS III, Division 1, T5  
 Zone 0, Zone 20



**NON HAZARDOUS LOCATION**



See remark 5

HART Communicator See remark 5

PC with software RAPORT 2 or any other software

HART Protocol Modem HART to USB or RS-232

**Intrinsically safe for Cl. I, Div. 1, Groups A, B, C, D, Cl. II, Div. 1, Groups E, F, G T5, Cl. III, Div. 1 T5  
 ZN 0 AEx/Ex ia IIC T4 Ga, ZN 20 AEx/Ex ia IIIC T105°C Da  
 Hazardous Locations Installations**

**Installation:**

- Control room equipment may not use or generate over 250 V.
- Install per the Canadian Electrical Code or National Electrical Code (ANSI/NFPA70) and ISA RP 12.06.01.
- For entity installations: Use Listed certified intrinsic safety barrier or other associated equipment that satisfy the following conditions:  $V_{oc} < V_{max}$ ,  $I_{sc} < I_{max}$ ,  $C_{a2} < C_{cable}$ ,  $L_{a2} < L_{cable}$ .  
 Transmitter entity parameters are as follows:
  - a) Supply from a power source with linear output characteristic:
    - $U_i / V_{max} = 30 \text{ VDC}$
    - $I_i / I_{max} = 100 \text{ mA}$
    - $P_i / P_{max} = 0.75 \text{ W}$
    - $C_i = 2.5 \text{ nF}$
    - $L_i = 18 \text{ } \mu\text{H}$
  - b) Supply from a power source with trapezoidal output characteristic:
    - $U_i / V_{max} = 24 \text{ VDC}$
    - $I_i / I_{max} = 50 \text{ mA}$
    - $P_i / P_{max} = 0.7 \text{ W}$
    - $C_i = 2.5 \text{ nF}$
    - $L_i = 18 \text{ } \mu\text{H}$
  - c) Supply from a power source with rectangular output characteristic:
 

$U_i / V_{max} = 24 \text{ VDC}$	$U_i / V_{max} = 24 \text{ VDC}$
$I_i / I_{max} = 25 \text{ mA}$	$I_i / I_{max} = 50 \text{ mA}$
$P_i / P_{max} = 0.6 \text{ W}$	$P_i / P_{max} = 1.2 \text{ W}$
$C_i = 2.5 \text{ nF}$	$C_i = 2.5 \text{ nF}$
$L_i = 18 \text{ } \mu\text{H}$	$L_i = 18 \text{ } \mu\text{H}$
- Use Listed certified safety barriers with entity parametrs meeting the requirements of note 3.
- Hazardous (classified) location equipment may be simple apparatus or FM Approved equipment with entity parametrs meeting the requirements of note 3.
- Remark: Versions with surge arrester marked on plate "Version SA", do not meet the requirements of dielectric strength tests 500Vrms between terminal connections and transmitter housing.
- Under certain extreme circumstances in Zone 20 the device with painting of aluminum enclosure and with plastic rating plate may store an ignition-capable level of electrostatic charge. The device shall not be installed in a location where the external conditions are conducive to the build-up of electrostatic charge.
- The enclosure made of aluminum alloy and given a protective polyurethane paint finish; care should be taken to protect it from impact or abrasion of located in Zone 0.
- When the transmitter with a nameplate containing various types of explosion-proof the user must permanently mark the type IS of protection chosen for the intrinsically Safe installation. Once the type of protection has been marked the IS destiny of the transmitter shall not be changed.

Table: Permissible ambient temperature and temperature code for gas hazardous are

Temperature code	Temperature ambient
T4	-40...80°C

Table: Permissible ambient temperature and temperature code for dust hazardous are

Temperature code	Temperature ambient
T5	-40...80°C
105°C	-40...80°C

Note:  
 No modification to be made without reference/approval from FM Approvals and APLISENS S.A.



Transmitter and equipment in the transmitter measurement loop must be connected in compliance with intrinsic safety and explosion proofing standards and application conditions in risk zones. If intrinsic safety rules are not followed, can occur explosion and staff/people can be exposed to danger.



The transmitter is equipped with a communication resistor  $R_D=240\Omega$  between <SIGNAL- > and <TEST- > terminals; terminals are short-circuited in factory with easily removable jumper.  $R_D$  resistor is used for transmitter local reading (from its terminals) without measuring loop opening. For transmitter reading the jumper removing from the <SIGNAL- > and <TEST- > terminals is necessary.



If the measuring medium temperature can exceed  $T_a=80^\circ\text{C}$ , separating elements, such as diaphragm seals, siphon tubes, etc., should be used. The transmitter operating temperature  $T_p$  must meet the  $T_p \leq T_a$  condition.



The electrical system for connecting transmitters should meet installation requirements of applicable standards.



No repairs or alterations to the transmitter electrical system are permitted. Only the manufacturer or a facility authorized by the manufacturer may assess damages and repair the device.



“SA Version” transmitters should be supplied from devices equipped with galvanically isolated power supply. If galvanically isolated power supply is not possible, the transmitter or metal parts connected to it should be properly grounded, for instance with an equipotential wiring or an equipotential bonding between the transmitter and the negative pole of power supply barrier.



A transmitter enclosure has two holes with M20x1.5 or 1/2 NPT thread; one for a cable gland or flexible metal conduit and other always blocked with blinding plug. Transmitter is delivered without a cable gland. The customer is obliged to install a cable gland or flexible metal conduit with at least IP66 (NEMA TYPE 4X) protection and operation temperature range suitable for the installation site. Cable glands or flexible metal conduit, installed by the customer, should be certified and should have a designation proper to zones/divisions where the transmitters will be installed.

**12. EXPLOSIONPROOF, FLAMEPROOF, DUST-IGNITIONPROOF, FIBER+FLYING AND PROTECTION BY ENCLOSURE TRANSMITTERS ACCORDED WITH FM APPROVALS.**

**12.1. Standards used for assessment**

**12.1.1.** The transmitters for US are manufactured in compliance with the following standards: FM Class 3600:2018, FM Class 3610:2018, FM Class 3810:2018, FM Class 3615:2018, FM Class 3616:2011, ANSI/UL 60079-1:2015, ANSI/UL 60079-0:2019, ANSI/ISA 60079-31:2015, ANSI/ISA 60079-11:2014, ANSI/IEC 60529:2020, UL 50E:2015.

**12.1.2.** The transmitters for Canada are manufactured in compliance with the following standards: CSA-C22.2 No. 0.4:R2013, CSA-C22.2 No. 0.5:R2012, CSA-C22.2 No. 25: R2009, CSA-C22.2 No. 30:2020, CAN/CSA-C22.2 No. 60079-0:2019, CAN/CSA-C22.2 No. 60079-1:2016, CAN-CSA C22.2 No. 60079-11:2014, CAN CSA C22.2 No. 60079-31:2015, CAN-CSA C22.2 No. 60529:R2016, CSA-C22.2 No. 94:R2011 and CAN-CSA C22.2 No. 61010-1:2012.

**12.2. Explosinproof, flameproof, dust-ignitionproof, fiber+flying and protection by enclosure designations transmitters accorded with FM APPROVALS.**

12.2.1. US explosionproof (XP), flameproof, dust-ignitionproof, fiber+flying and protection by enclosure:

- XP Class I, Div 1, Groups A, B, C, D T5**
- DIP Class II, Div 1, Groups E, F, G T5**
- DIP Class III, Div 1, T5**
- Zone1 AEx db ia IIC T5 Gb**
- Zone21 AEx ia tb IIIC T105°C Db**
- FM20US0156X**

ID marking applied only for XP, Exd, DIP, Ext transmitters marked with the type and model:

APC-2000ALW Safety	ID 0001 0004 0002 0000 0000 0004 0001 86
	ID 0001 0004 0002 0000 0000 0005 0001 37
APR-2000ALW Safety	ID 0002 0004 0002 0000 0000 0004 0001 83
	ID 0002 0004 0002 0000 0000 0005 0001 34
APC-2000ALW	ID 0005 0008 0006 0000 0000 0013 0001 88
	ID 0005 0004 0006 0000 0000 0014 0001 66
APR-2000ALW	ID 0006 0008 0006 0000 0000 0013 0001 85
	ID 0006 0004 0006 0000 0000 0014 0001 63



Transmitters with double IS and XP, Exd, DIP, Ext designation become explosionproof, flameproof, dust-ignitionproof, fiber+flying and protection by enclosure transmitters after durable marked XP, Exd, DIP, Ext field on their nameplates.

12.2.2 US and Canada explosionproof (XP), flameproof, dust-ignitionproof, fiber+flying and protection by enclosure:

- XP Class I, Div 1, Groups B, C, D T5**
- DIP Class II, Div 1, Groups E, F, G T5**
- DIP Class III, Div 1, T5**
- Zone1 AEx/Ex db ia IIC T5 Gb**
- Zone21 AEx/Ex ia tb IIIC T105°C Db**
- FM20US0156X and FM20CA0079X**

ID marking applied only for XP, Exd, DIP, Ext transmitters marked with the type and model:

APC-2000ALW Safety	ID 0001 0004 0002 0000 0000 0002 0001 87
	ID 0001 0004 0002 0000 0000 0003 0001 38
APR-2000ALW Safety	ID 0002 0004 0002 0000 0000 0002 0001 84
	ID 0002 0004 0002 0000 0000 0003 0001 35
APC-2000ALW	ID 0005 0008 0006 0000 0000 0011 0001 89
	ID 0005 0004 0006 0000 0000 0012 0001 67
APR-2000ALW	ID 0006 0008 0006 0000 0000 0011 0001 86
	ID 0006 0004 0006 0000 0000 0012 0001 64



Transmitters with double IS and XP, Exd, DIP, Ext designation become explosionproof, flameproof, dust-ignitionproof, fiber+flying and protection by enclosure transmitters after durable marked XP, Exd, DIP, Ext field on their nameplates.

### 13. TRANSMITTERS PERMISSIBLE PARAMETERS

#### 13.1. Ambient temperature range and temperature classes

**Table 3.** Ambient temperature range and temperature classes for XP, Exd, DIP, Ext transmitters

Operating temperature range		Temperature class and maximum surface temperature
Ambient temperature	Process temperature	
$-40^{\circ}\text{C} \leq T_a \leq 75^{\circ}\text{C}$	$-40^{\circ}\text{C} \div 75^{\circ}\text{C}$	T5/T105°C



If during work the measuring medium temperature can exceed  $T_{a_{max}}$ , separating elements, such as diaphragm seals, siphon tubes, etc., should be used to installation. The transmitter operating temperature  $T_p$  should meet the  $T_p \leq T_{a_{max}}$  condition.

#### 13.2. Power supply, connection and operation of XP, Exd, DIP and Ext transmitters

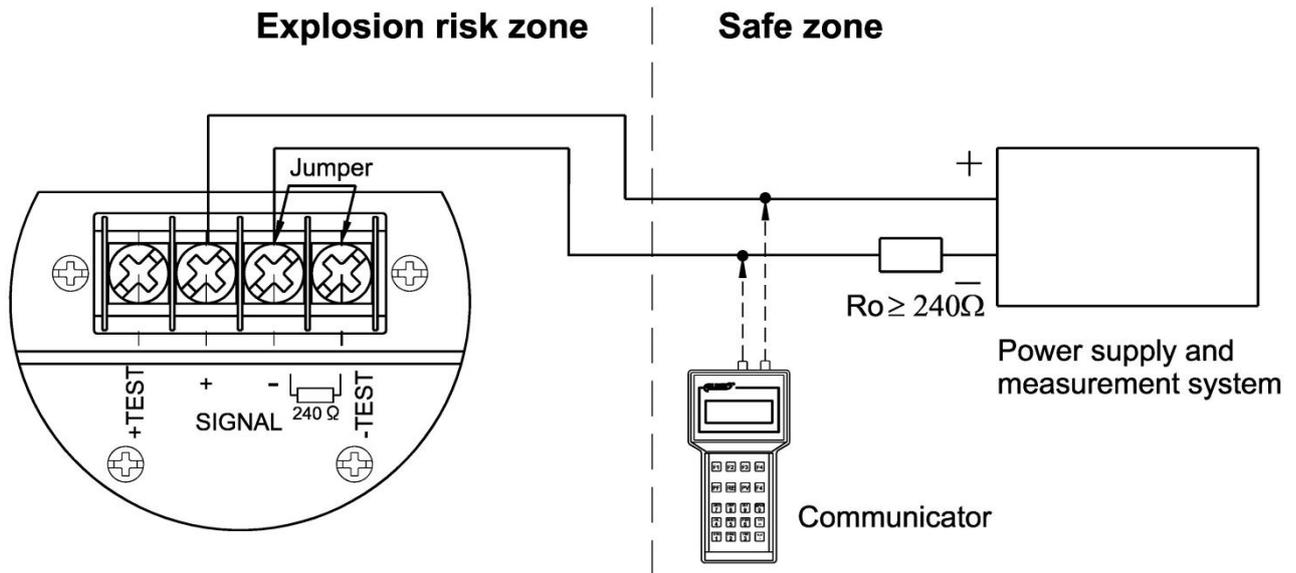
Figure 3 shown the transmitters connecting wiring diagram. The transmitters electrical connections in potentially explosive zones should be made by personnel with necessary knowledge and experience in this respect. The transmitters should be properly grounded with their grounding terminals. If transmitters are in galvanic



contacts with grounding structural elements or piping, additional transmitter groundings with a grounding terminals is not necessary.



Transmitter and equipment in the transmitter measurement loop must be connected in compliance with explosion proofing standards and application conditions in risk zones. If these rules are not followed, can occur explosion and staff/people can be exposed to danger.



**Figure 3.** XP, Exd, DIP and Ext transmitters connecting

Transmitters should be supplied with a voltage specified in the table below from transformer’s power supplies or other devices providing at least the reinforced isolation between primary and secondary winding for voltages to 250VAC. It is the user’s responsibility to provide a power supply compliant with the requirements above.



**Table 4.** Maximum supply voltage for XP, Exd, DIP and Ext transmitters

Maximum supply voltage	
APC-2000ALW Safety, APR-2000ALW Safety	APC-2000ALW, APR-2000ALW
36VDC	55VDC



In an explosion risk zone, do not remove the transmitters side covers and do not connect to the terminals, and do not change the angle position of the local indicator (display).

Outside a risk zone, for transmitter calibration or check, to its <SIGNAL+ > and <TEST+ > terminals a communicating device can be connected.



The transmitter is equipped with a communication resistor  $R_D=240\Omega$  between <SIGNAL- > and <TEST- > terminals; terminals are short-circuited in factory with easily removable jumper.  $R_D$  resistor is used for transmitter local reading (from its terminals) without measuring loop opening. For transmitter reading the jumper removing from the <SIGNAL- > and <TEST- > terminals is necessary.



Locking the side covers against unauthorized unscrewing and the sealing security option of the transmitters against foreign persons are shown in EN.IO.APC.APR.ALW.SFT or EN.IO.APC.APR.ALW user manuals.



No repairs or alterations to the transmitter enclosure elements and electrical system are permitted. Only the manufacturer or a facility authorized by the manufacturer may assess damages and repair the device.

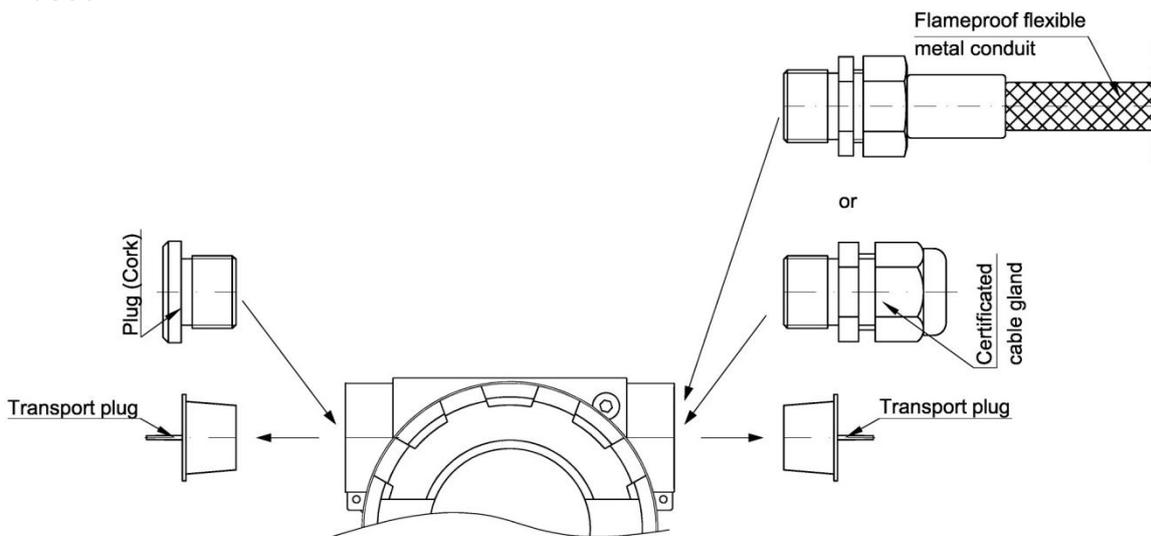


Due the kind of the material of the transmitter enclosure (light alloy with high aluminum content), the user is obliged to ensure that in the transmitter installation site its enclosure cannot be hit and, consequently, damaged.

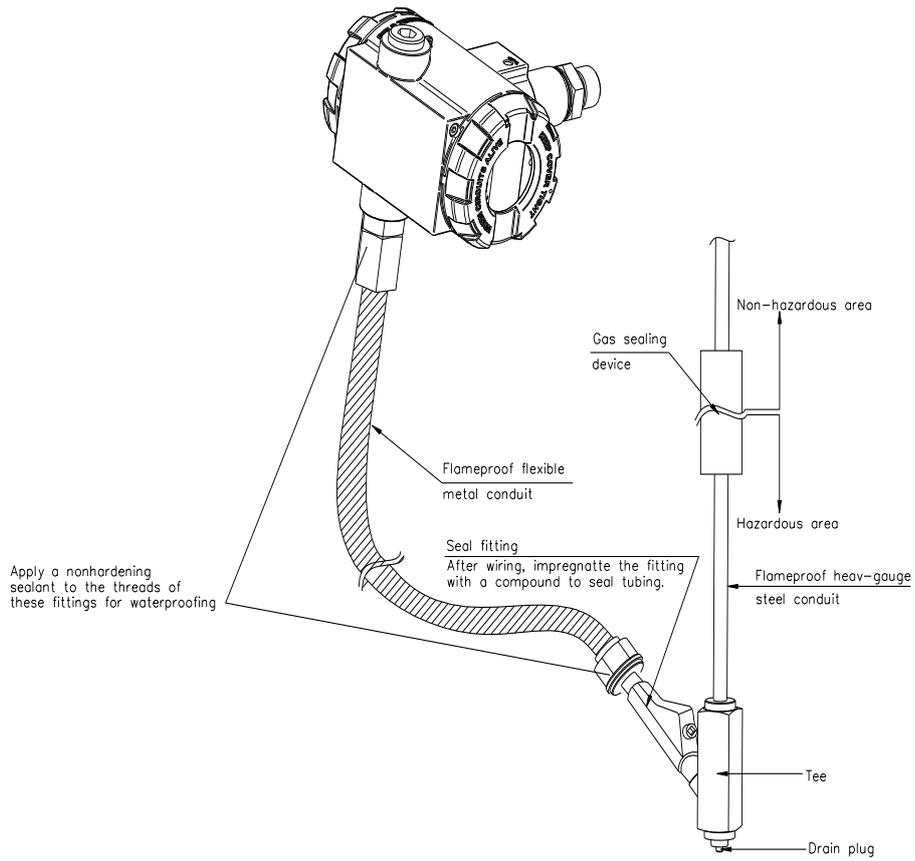
A transmitter enclosure has two holes with M20x1.5 or 1/2 NPT thread; one for a cable gland or flameproof flexible metal conduit and other always blocked with blinding plug. As standard, the transmitters are delivered without cable gland installed. In such case, in cable gland locations, a transport plug is installed. The transport plug should be removed and appropriate cable gland or flameproof flexible metal conduit (Figure 5) be installed. Cable glands or flameproof flexible metal conduit, installed by the customer, should be certified and should have a designation proper to zones/divisions where the transmitters will be installed. Transmitter's installations are to be in accordance with the National Electrical Code (for US) and Canadian Electrical Code (for Canada).

Apply LOCTITE 577 or SWAK MS-PTS-50 on the 1/2 NPT thread of cable gland before installation.

When the cable gland is using for the cable sealing, make sure that the cable type and diameter and temperature in the installation site are suitable for the cable gland used.



**Figure 4.** Installation of cable entries or flameproof metal conduit and blinding plugs



**Figure 5.** Typical Wiring using Explosion-proof Conduit



During periodic inspections the side covers tightening, cable entry and cable fixing in the cable entry should be checked. Visually check the enclosure and cable for mechanical damage, and the nameplate for legibility. If transmitter is dismounted the diaphragm in a measuring head should also be include in periodic inspections. It should be clean without signs of mechanical damage.



The diaphragms in the transmitter’s measuring heads should not be exposed to damage during the transmitters installation and operation. The measuring diaphragms are made of a thin stainless steel, Hastelloy or tantalum; they are selected to resistance with a measuring medium contact, but aren't resistant to mechanical exposures and easily damaged.



The general rules of connecting and operating a transmitter should be compliant with the rules and standards:

National Electrical Code (for US)

Canadian Electrical Code (for Canada)

**Due to possible damage, the transmitter should be protected from heating above 80°C also when explosion hazard does not occur.**

## 14. ADDITIONAL INFORMATION

### 14.1. Additional information

The manufacturer reserves the right to introduce structural and technological changes to the device, which does not deteriorate its performance.

### 14.2. History of revisions

Revision No	Document revision	Description of changes
-	01.A.001/2020.03	Initial document version. Prepared by DKD, DCF.