

# (1) EU-TYPE EXAMINATION CERTIFICATE



- (2) Equipment and Protective Systems intended for use in Potentially Explosive Atmosphere - **Directive 2014/34/EU**
- (3) EU-Type Examination Certificate Number

**TÜV 20 ATEX 8510 X**

Issue: 00

- (4) Equipment: **Calibrator and Recorder**  
**Model name: Additel226Ex, Additel227Ex, Additel227Ex-HART, Additel260Ex and Additel273Ex**
- (5) Manufacturer: **Additel Corporation.**
- (6) Address: **2900 Saturn Street #B Brea, CA 92821, USA**

- (7) This product and any acceptable variation thereto are specified in the schedule to this certificate and the documents therein referred to.
- (8) The TÜV Rheinland Zertifizierungsstelle für Explosionsschutz of TÜV Rheinland Industrie Service GmbH, Notified Body No. 0035 in accordance with Article 21 of the Council Directive 2014/34/EU of 26<sup>th</sup> February 2014, certifies this product which has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment and protective systems intended for use in potentially explosive atmosphere, given in Annex II to the Directive.

The examination and test results are recorded in the confidential report GC/Ex8510.00/20

- (9) Compliance with the Essential Health and Safety Requirements, with the exception of those listed in the schedule of this certificate, has been assessed by reference to:

**EN IEC 60079-0:2018      EN 60079-11:2012**

- (10) If the sign "X" is placed after the certificate number, it indicates that the equipment is subject to special conditions for safe use specified in the schedule to this certificate.
- (11) This EU-Type Examination Certificate relates only to the design and specification for construction of the equipment or protective system. It does not cover the process for actual manufacture or supply of the equipment or protective system, for which further requirements of the directive are applicable.
- (12) The marking of the equipment shall include the following:



**II 1 G      Ex ia IIC T4 Ga**

TÜV Rheinland, Zertifizierungsstelle für Explosionsschutz

Cologne, 2021-11-25

Dipl.-Ing. Klauspeter Graffi



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(13) Annex

(14) **EU Type Examination Certificate**  
**TÜV 20 ATEX 8510 X** Issue: 00

(15) Description of equipment

15.1 Equipment and type:

Calibrator and Recorder

Model name: Additel226Ex, Additel227Ex, Additel227Ex-HART, Additel260Ex and Additel273Ex

Detailed naming for different models:

Multifunction Documenting Process Calibrator(Model Additel227Ex and Additel227Ex-HART)

Multifunction Process Calibrator(Model Additel226Ex)

Handheld Pressure Calibrator(Model Additel273Ex)

Handheld Multichannel Reference Recorder(Model Additel260Ex)

Note:

Model Additel226Ex, Additel227Ex-HART and Additel227Ex has total same hardware design but software.

15.2 Description / Details of Change

General Description:

Model Additel226Ex, Additel227Ex, Additel227Ex-HART, Additel260Ex and Additel273Ex is the multifunction documenting process calibrator and recorder provided by Additel.

With the documenting test task inside, it can significantly improve the efficiency of the test and calibration in the explosive gas atmosphere field application. It combines plenty of functions in a single device, such as gauge measurement, signal source, loop power, pressure indicator, HART communicator and thermal calculator. Users can perform field calibration, troubleshooting and maintenance by carrying only one calibrator, so that greatly improved the efficiency of the field engineers.

The calibrator can be used to calibrate pressure, loop, temperature and flow equipment.

The calibrator and recorder is designed and constructed with type of protection "ia" and intended to use in the explosive gas atmosphere of group IIC.

There are several fasteners used to fix the plastic enclosure, these fasteners are protected silicone rubber protective shell completely, no any chances access to them. There is a hook rack on the surface of plastic enclosure, which is used to fix the flexible rope.

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01-Main Housing:

The enclosure of equipment is made from non-metallic material TPU-E70S,RTP 2500(lower shell) and Cycoloy FR Resins C6600(Face cover which is protected by TPU-E70S completely),and these materials with a surface resistance lower than 1GΩ.

02-Marking Plate:

The labels of Nameplate, Battery, Warning, Lower casing and Measuring units are made of PC PW-SC11AS with a surface resistance less than 1GΩ.

The Logo master is made of material Acrylic(PMMA) which a thickness of 1mm.

Model Designation:

Model Additel226Ex, Additel227Ex, Additel227Ex-HART, Additel260Ex and Additel273E are named according to different measuring modules are selected for final assembly as listed in Table 2 as below. No differences on circuit design and mechanical construction between these models(Only software differences on model Additel226Ex, Additel227Ex-HART and Additel227Ex).

Electrical Circuits:

The electrical parts of calibrator are comprised of following modules,

- 01- BAT-Li-Connect;
- 02- BAT-Li-Protect(1\*Rechargeable secondary battery);
- 03- BAT-3AA(3\*AA size primary batteries);
- 04- Main board;
- 05- EM module;
- 06- ES module;
- 07- TM module;
- 08- DRTD module;
- 10- CDPX module;
- 11- Key&LCD module;
- 12- ATM-PCB(BMP388);
- 13- INTCDP-FPC;
- 14- DC&USB-FPC;
- 15- EXPLUG;
- 16- MODULE-CONNECT;
- 17- TC(TM Module)-FPC;
- 20- MAIN-TO-KEY-FPC;
- 21- HC-TO-CDPX;
- 22- CDPX-TO-SENSOR;
- 23- ATM-FPC;
- 26- CDPX-TO-Senstronics 85 89 NPI-15C SENSOR;
- 27- CDPX-TO-86 87 13 17 SENSOR;
- 28- CDPX-TO-ALL SENSOR;
- 30- USB-EX Cable;
- 31- Adapter-EX Cable;

Note:

Module 09,18,19,24 and 25 only used on Non-Ex calibrator and recorder.

Power Sources:

The equipment is powered by one secondary Lithium-ion battery or three AA size primary batteries connected in series as specified in the Table as below.

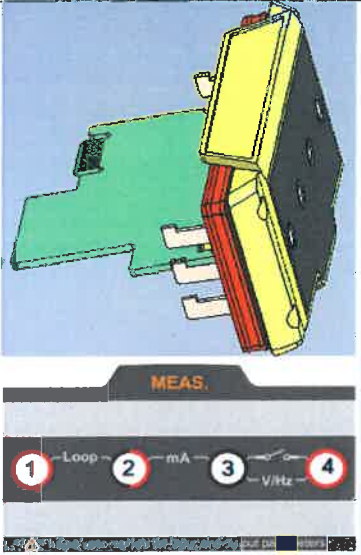
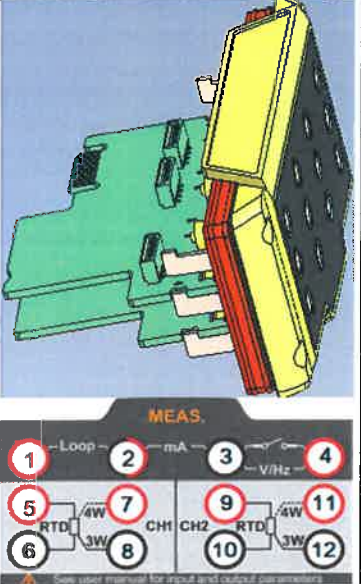
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Brand	Model	Description	Max. Uov*	Max Isc*	Tmax	Ex Approval
<b>Secondary Battery:</b>						
SAFT	MP 174565	Rechargeable Li-ion cell, 3.65V,4.0Ah, Ta: -40°C~85°C	4.18V	291.8A	114°C@ Ta=60°C No electrolyte leakage	Test report no. INERIS 154516/15 -DM30145 (2016.06.16~2015 .06.17)-IEC 60079-11: 2011  Cell safety approval: UL1642 and IEC 62133 Ed.2  Type of battery: Hermetically sealed with pressure relief device
<b>Primary Batteries:</b>						
ENERGIZE R	E91(LR6)	Non-rechargeable 1.5V Alkaline Zinc-Manganese(Zn/MnO <sub>2</sub> ), Ta: -18°C~55°C	1.65V	Not used	112.8°C @Ta=50 °C No electrolyte leakage	Safety approval: IEC 60086-1/-2-5 ANSI C18.4  Type of battery:Gas tight
MAXELL	LR6	Non-rechargeable 1.5V Mercury Free Alkaline Manganese Battery,2.1Ah Ta: -20°C~60°C	1.65V	Not used	128°C@ Ta=50°C No electrolyte leakage	Safety approval: IEC 60086-1 and IEC 60086-2  Type of battery:Gas tight
Panasonic	LR6	Non-rechargeable 1.5V Potassium Hydroxide battery, Ta: -20°C~54°C	1.65V	Not used	119.1°C@ Ta=50°C No electrolyte leakage	Safety approval: IEC 60086-1/-2-5  Type of battery:Gas tight

Table 1

Two different battery container used for both SAFT rechargeable Li-ion battery and 3\*AA size primary batteries respectively.IP20 enclosure for calibrator and recorder are totally same whatever which kind of batteries used.

**Model Designation and Equipment Configuration:**

Equipment Name	Optional Module Name						Silkscreen on the Top view of Equipment and Module Configuration
	EM	ES	TM	DRTD	CDPX (Internal)	CDPX (External)	
Model Additel273 Ex	•	X	X	X	•	•	
Model Additel260 Ex	•	X	X	•	•	•	

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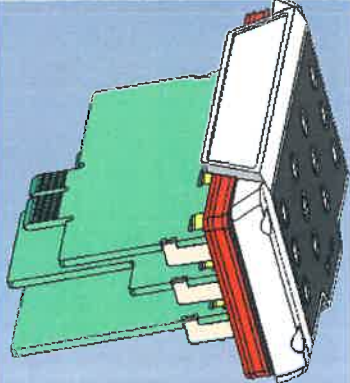




Model Additel227 Ex-HART& Additel227 Ex and Additel226 Ex	•	•	•	X	X	•	
							

Table 2

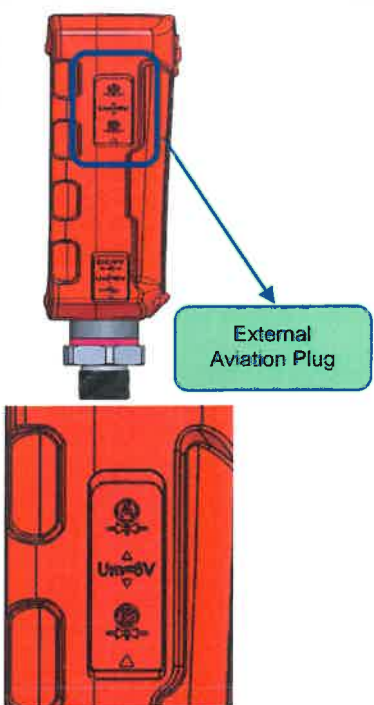
•\* - Selected

X\* - Not Selected

**Working Parameters for Intended used of Equipment(Intrinsically safe Parameters):**

Model Name	Input/Output Module	Port Symbol	Input/ Output Parameters	Remarks
Additel 273Ex	EM		Refer to Table 3.1 & Table 3.2	J1=JACK1 J2=JACK2 J3=JACK4 J4=JACK3
Additel 260Ex	EM and DRTD		Refer to Table 3.3 & Table 3.4	EM Module: J1=JACK1 J2=JACK2 J3=JACK4 J4=JACK3  DRTD Module: J5=JACK1 J6=JACK4 J7=JACK2 J8=JACK3 J9=JACK5 J10=JACK8 J11=JACK6 J12=JACK7
Additel 227Ex-HART, Additel 227Ex, Additel 226Ex	EM,ES and TM		Refer to Table 3.5 & Table 3.6	TM Module: J1=JACK1 J2=JACK2 J3=JACK3 J4=JACK4 J5=TC-MES J6=TC-OUT

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			<p>EM Module: J7=JACK1 J8=JACK2 J9=JACK4 J10=JACK3</p> <p>ES Module: J11=JACK1 J12=JACK2 J13=JACK4 J14=JACK3</p>
All models	External Aviation Plug (Two)		-

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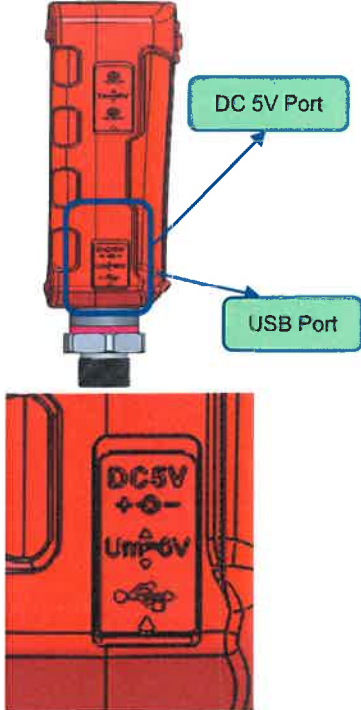
All models	Type-C USB + DC Plug		$U_i=5V$ (limited by external overvoltage protection circuit)  $U_m=250V$	Used in Non-hazardous area only.
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Table 3

### Technical Data

#### Electrical data

Table 3.1- Additel273Ex

Terminal	Function	$U_i/V$	$I_i/mA$	$P_i/mW$	$C_i/nF$	$L_i/mH$
J1 and J3	HART(External Power and Resistance)	30	100	750	10	0
J2 and J3	Current Measuring	30	100	750	1	0
J4 and J3	Voltage,Frequency and Switch Measuring	30	100	750	1	0
J1and J2	Loop Circuit Transmitter Current Measuring HART(Internal Power and Resistance)	30	100	750	10	0

Table 3.2- Additel273Ex

Terminal	Function	$U_o/V$	$I_o/mA$	$P_o/mW$	$C_o/nF$	$L_o/mH$
J1 and J3	HART(External Power and Resistance)	25.2	79.16	499	107	9
J2 and J3	Current Measuring	5.0	0.85	1.1	87	100
J4 and J3	Voltage,Frequency and Switch Measuring	5.0	0.85	1.1	87	100
J1and J2	Loop Circuit Transmitter Current Measuring HART(Internal Power and Resistance)	25.2	79.16	499	107	9

Table 3.3- Additel260Ex

Terminal	Function	$U_i/V$	$I_i/mA$	$P_i/mW$	$C_i/nF$	$L_i/mH$
J1 and J3	HART(External Power and Resistance)	30	100	750	10	0
J2 and J3	Current Measuring	30	100	750	1	0
J4 and J3	Voltage,Frequency and Switch	30	100	750	1	0

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	Measuring					
J1 and J2	Loop Circuit Transmitter Current Measuring HART(Internal Power and Resistance)	30	100	750	10	0
J5 and J8 J9 and J12	Resistor Measuring	30	100	750	20	0

Table 3.4- Additel260Ex

Terminal	Function	Uo/V	Io/mA	Po/mW	Co/nF	Lo/mH
J1 and J3	HART(External Power and Resistance)	25.2	79.16	499	107	9
J2 and J3	Current Measuring	5.0	0.85	1.1	87	100
J4 and J3	Voltage,Frequency and Switch Measuring	5.0	0.85	1.1	87	100
J1 and J2	Loop Circuit Transmitter Current Measuring HART(Internal Power and Resistance)	25.2	79.16	499	107	9
J5 and J8 J9 and J12	Resistor Measuring	5.0	21	26.3	85	30

Table 3.5- Additel227Ex-HART,Additel227Ex and Additel226Ex

Terminal	Function	Ui/V	Ii/mA	Pi/mW	Ci/nF	Li/mH
J1~J4	Thermal Resistance Measuring,Thermal Couple and Analog Output	30	100	750	23	0
J5~J6	Thermocouple Measuring and Analog Output	30	100	750	23	0
J7 and J9	HART(External Power and Resistance)	30	100	750	10	0
J8 and J9	Current Measuring	30	100	750	1	0
J10 and J9	Voltage,Frequency and Switch Measuring	30	100	750	1	0
J7 and J8	Loop Circuit Transmitter Current Measuring HART(Internal Power and Resistance)	30	100	750	10	0
J11 and J12	Current Source Output	30	100	750	30	0
J12 and J13	Current Sink Output	30	100	750	30	0
J14 and J13	Voltage and Frequency Output	30	100	750	30	0

Terminal	Function	Uo/V	Io/mA	Po/mW	Co/nF	Lo/mH
J1~J4	Thermal Resistance Measuring,Thermal Couple and Analog Output	5.0	10.1	13	82	300
J5~J6	Thermocouple Measuring and Analog Output	5.0	10	13	82	300
J7 and J9	HART(External Power and Resistance)	25.2	79.16	499	107	9
J8 and J9	Current Measuring	5.0	0.85	1.1	87	100
J10 and J9	Voltage,Frequency and Switch Measuring	5.0	0.85	1.1	87	100
J7 and J8	Loop Circuit Transmitter Current Measuring HART(Internal Power and Resistance)	25.2	79.16	499	107	9
J11 and J12	Current Source Output	21	55	289	165	30
J12 and J13	Current Sink Output	21	55	289	165	30
J14 and J13	Voltage and Frequency Output	21	55	289	165	30

Table 3.6- Additel227Ex-HART,Additel227Ex and Additel226Ex

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**Environmental data**

Optional ambient temperature:

Battery brand	Battery model	Tamb
SAFT	MP 174565	-20°C~50°C
ENERGIZER	E91(LR6)	-18°C~45°C
MAXELL	LR6(GD)	-20°C~50°C
Panasonic	LR6XWA	-20°C~45°C

IP Rating: IP20

(16) Test-Report No. GC/Ex8510.00/20

(17) Special Conditions for safe use

1. WARNING – DO NOT OPEN WHEN AN EXPLOSIVE ATMOSPHERE IS PRESENT
2. WARNING – DO NOT CHARGE THE BATTERY IN HAZARDOUS LOCATION
3. WARNING – USE ONLY the approved BATTERIES,see Ex instruction
4. The Measuring instrument needs to protected from impacts with high impact energy.
5. Do not touch the non-metallic enclosure or touch with the insulating materials only.
6. The batteries used in the equipment with same manufacturer,same models and same electrochemical system.
7. The conformal coating is applied to PCB boards was declared meet the requirements of IEC 60664-1 and IEC 60664-3 by manufacturer.
8. Suitable ambient temperature to be applied depend on the different batteries used,see Ex instruction.
9. No additional input energy limitation are required for Type-C USB port and DC charging port when Um does not exceed 250V(internal OVP/OCP are designed in line with IEC 60079-11).
10. USB port only to be used in Non-hazardous area.
11. PX connect with pressure measuring module CDPX-EX only,the connected cables and flexible hose used for the external pressure modules are made of insulation materials,so end user should consider the risk of electrostatic discharge during material selection and installation process.
12. Metallic parts(only fasteners) presented a maximum capacitance of total 110pF,end user should considered this risk for suitable application.
13. Do not remove the silicone rubber protective sleeve from the enclosure of equipment in Hazardous area.
14. IS parameters must be observed for different external measuring ports on the different models in accordance with Ex instruction strictly and completely.
15. Intrinsically safe electrical system between IS apparatus and Associated apparatus or other IS apparatus:

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Item	Calibrator	External input to Calibrator	System
Equipment group	II C	II C	II C
Level of protection	ia	ia	ia
Temperature class	T4	T4	
Ambient temperature	-10°C~+50°C	-10°C~+50°C	
Parameter connections			
Voltage	U <sub>o</sub>	U <sub>i</sub> (30V)	
Current	I <sub>o</sub>	I <sub>i</sub> (100mA)	
Power	P <sub>o</sub>	P <sub>i</sub> (0.75W)	
Cable parameters			
Capacitance	C <sub>o</sub>	C <sub>i</sub>	C <sub>c</sub>
Inductance	L <sub>o</sub>	L <sub>i</sub>	L <sub>c</sub>
L/R ratio	/	/	/
Earthing	isolated	isolated	isolated

$U_o \leq U_i$   
 $I_o \leq I_i$   
 $P_o \leq P_i$   
 $C_o \geq C_i + C_c$   
 $L_o \geq L_i + L_c$

(18) Basic Safety and Health Requirements

Covered by afore mentioned standard

TÜV Rheinland Zertifizierungsstelle für Explosionsschutz

Cologne, 2021-11-25

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