

CERTIFICATE

(1) EU-Type Examination

(2) **Equipment or protective systems intended for use in potentially explosive atmospheres - Directive 2014/34/EU**

(3) EU-Type Examination Certificate Number: **DEKRA 16ATEX0047 X** Issue Number: **4**

(4) Product: **2-wire TC Temperature Transmitter, type 5434D... , 2-wire universal Temperature Transmitter, type 5431D... and 6431D... , 2-wire HART Temperature Transmitter, type 5435D..., 5437D..., 5437B... and type 6437D....**

(5) Manufacturer: **PRelectronics A/S**

(6) Address: **Lerbakken 10, 8410 Rønede, Denmark**

(7) This product and any acceptable variation thereto is specified in the schedule to this certificate and the documents therein referred to.

(8) DEKRA Certification B.V., Notified Body number 0344 in accordance with Article 17 of Directive 2014/34/EU of the European Parliament and of the Council, dated 26 February 2014, certifies that this product has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of products intended for use in potentially explosive atmospheres given in Annex II to the Directive.

The examination and test results are recorded in confidential test report number NL/DEK/ExTR16.0035/05.

(9) Compliance with the Essential Health and Safety Requirements has been assured by compliance with:

EN IEC 60079-0 : 2018

EN 60079-11 : 2012

except in respect of those requirements listed at item 18 of the Schedule.

(10) If the sign "X" is placed after the certificate number, it indicates that the product is subject to the Specific Conditions of Use specified in the schedule to this certificate.

(11) This EU-Type Examination Certificate relates only to the design and construction of the specified product. Further requirements of the Directive apply to the manufacturing process and supply of this product. These are not covered by this certificate.

(12) The marking of the product shall include the following:



**II 1 G Ex ia IIC T6 ...T4 Ga
II 2(1) G Ex ib [ia Ga] IIC T6...T4 Gb
II 2 D Ex ia IIIC Db
I M1 Ex ia I Ma**

Date of certification: 30 June 2021

DEKRA Certification B.V.



R. Schuller
Certification Manager



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(13) **SCHEDULE**

(14) **to EU-Type Examination Certificate DEKRA 16ATEX0047 X**

Issue No. 4

(15) **Description**

Temperature Transmitters, type 543D...., type 5437B... and type 643D...., are used to convert temperature measurement signals from one or two temperature sensors or mV signals, into a 4 ... 20 mA current signal with digital communication (HART).

Model 5437B... is identical to 5437D... but with ATEX marking only.

An extra connection 'TEST' enables connection of an external intrinsically safe current meter, to measure the 4..20 mA supply current signal.

The dedicated extension port (8-pin-header hidden under a small plastic lid on the 543D..... and the front connectors on the 643D.....) is meant to connect future extension modules of PRelectronics A/S in series with the 4..20mA loop supply.

The transmitters, type 543....., are suitable for mounting in an enclosure form B according to DIN 43729 or equivalent.

The transmitters, type 643D....., are suitable for rail mounting.

Nomenclature

5434abd - 2-wire TC temperature transmitter
5431abd - 2-wire universal temperature transmitter
5435abcd - 2-wire HART® temperature transmitter
5437abcd - 2-wire HART® temperature transmitter
6431abcd - 2-wire universal temperature transmitter
6437abcd - 2-wire HART® temperature transmitter

a: A = Zone 2 / Zone 22 approved
B, D = Zone 0 / Zone 20 approved

b: 1 = single input (4Wire)
2 = dual input (7Wire)
3 = two channel

c: S = SIL approved
" " = Not SIL approval

d: M = Marine approved
" " = Not marine approved

(13) **SCHEDULE**

(14) **to EU-Type Examination Certificate DEKRA 16ATEX0047 X**

Issue No. 4

Thermal and electrical data

Supply / output circuit (for type 543.....: terminals 1 and 2, inclusive the 'Test' connection, for type 643D.....: terminals 11...14):

in type of protection intrinsic safety Ex ia IIC, Ex ib IIC, Ex ia IIIC and Ex ia I, only for connection to a certified intrinsically safe circuit, with the following maximum values:

$U_i = 30 \text{ V}$; $I_i = 120 \text{ mA}$; $C_i = 1 \text{ nF}$; $L_i = 0 \text{ }\mu\text{H}$. For P_i , see the below table.

Sensor circuit (for type 543.....: terminals 3...9, for type 643D.....: terminals 41...44 and 51...54): in type of protection intrinsic safety Ex ia IIC, Ex ia IIIC and Ex ia I, with the following maximum values:

$U_o = 7,2 \text{ V}$; $I_o = 12,9 \text{ mA}$; $P_o = 23,3 \text{ mW}$; $C_o = 13,5 \text{ }\mu\text{F}$; $L_o = 200 \text{ mH}$.

or

Sensor circuit (CH1 terminals 3 to 4,5,6 or CH2 terminals 3 to 7,8,9) for 543... and (CH1 terminals 41...44 or CH2 terminals 51...54) for 643... and (CH1 terminals 5...8 or CH2 terminals 9...12) for 5825-3... in type of protection intrinsic safet Ex ia IIC, Ex ia IIIC and Ex ia I, with the following maximum values:

$U_o = 7,2 \text{ V}$; $I_o = 7,3 \text{ mA}$; $P_o = 13,2 \text{ mW}$; $C_o = 13,5 \text{ }\mu\text{F}$; $L_o = 667 \text{ mH}$.

The relation between P_i , temperature class, model type and maximum ambient temperature is as follows:

P_i per channel	Temperature class	Maximum ambient temperature	
		Single and dual input	Two channel
900 mW	T6	+50 °C	+45 °C
	T5	+65 °C	+60 °C
	T4	+85 °C	+85 °C
750 mW	T6	+55 °C	+50 °C
	T5	+70 °C	+65 °C
	T4	+85 °C	+85 °C
610 mW	T6	+60 °C	+55 °C
	T5	+75 °C	+70 °C
	T4	+85 °C	+85 °C

The minimum ambient temperature is -50 °C.

For EPL Db:

The surface temperature of the outer enclosure is +20 K above the ambient temperature, determined without a dust layer.

The sensor circuit is infallibly isolated from the supply / output circuit.

The two channels of model type 643D3.. are infallibly isolated from each other.

(16) **Report Number**

No. NL/DEK/ExTR16.0035/05.

(13) **SCHEDULE**

(14) **to EU-Type Examination Certificate DEKRA 16ATEX0047 X**

Issue No. 4

(17) **Specific conditions of use**

For ambient temperature range see (15).

If the enclosure is made of non-metallic plastic materials, electrostatic charges on the transmitter enclosure shall be avoided.

If the transmitter is installed in an explosive atmosphere requiring the use of equipment protection level Ga or Ma, and if the enclosure is made of aluminium, it must be installed such, that ignition sources due to impact and friction sparks are excluded.

If the transmitter is installed in an explosive atmosphere requiring the use of equipment protection level Ga, the transmitter shall be mounted in enclosure that provides a degree of protection of at least IP20 according to IEC 60529, and that is suitable for the application and correctly installed.

If the transmitter is installed in an explosive atmosphere requiring the use of equipment protection level Db, the transmitter shall be mounted in enclosure that provides a degree of protection of at least IP5X according to IEC 60079-0, and that is suitable for the application and correctly installed.

If the transmitter is installed in an explosive atmosphere requiring the use of equipment protection level Ma, the transmitter shall be mounted in enclosure that provides a degree of protection of at least IP54 according to IEC 60529, and that is suitable for the application and correctly installed.

(18) **Essential Health and Safety Requirements**

Covered by the standards listed at item (9).

(19) **Test documentation**

As listed in Report No. NL/DEK/ExTR16.0035/05.

(20) **Certificate history**

Issue 0 -	219200600	initial certificate
Issue 1 -	222530100	addition of type 643.....
Issue 2 -	223223600	minor constructional change 643..... addition of type 643D3.. and 5437B...
issue 3 -	223223600	minor change to electronic circuit addition to entity parameters
Issue 4 -	224097400	assessed per EN IEC 60079-0: 2018

**Annex 1 to: Certificate of Conformity IECEx DEK 16.0029X
Report NL/DEK/ExTR16.0035/05**

Description

The 2-Wire Temperature Transmitters, type 543..... and type 643....., are used to convert temperature measurement signals from one or two temperature sensors or mV signals, into a 4 ... 20 mA current signal with digital communication (HART).

The 2-Wire Temperature Transmitters, type 643... and type 5825-3.... are the DIN Rail mounted versions. They have the same electronics, same thermal and electrical data and the same safety instructions. The transmitter, type 5825-3..., is just a 'dummy' version, meant to support a second license certificate for Siemens.

Note that type 543.A... and 543.D..., respectively type 5825-3.A... , 5825-3.D...and type 5825-3.N... are identical, only the label differs.

An extra connection 'TEST', next to terminal 1 of the 543.... resp. on terminal 1 and 2 of the 5825-3....., resp. on terminals 13, 14 and 23, 24 of type 643..., enables connection of an external intrinsically safe current meter, to measure the supply current. Intrinsic safety parameters of the supply circuit also apply for the 'TEST' connection.

The dedicated extension port 'EXT' (8-pin-header hidden under a small plastic lid on the 543..... and the front connector and contact pads on the 643.....) may only be connected to equipment that is predefined by PRelectronics A/S.

The transmitters type 543..... are suitable for mounting in an enclosure form B according to DIN 43729 or equivalent.

The transmitters type 643....., are suitable for rail mounting.

Nomenclature

For the head mounted transmitters, type 543...

5434abd - 2-wire TC temperature transmitter
5431abd - 2-wire universal temperature transmitter
5435abcd - 2-wire HART® temperature transmitter
5437abcd - 2-wire HART® temperature transmitter

- a: A = Zone 2 / Div2 approved
D = Zone 0 / Div 1 approved
- b: 1 = single input (4Wire)
2 = dual input (7Wire)
- c: S = SIL approved
" " = Not SIL approval
- d: M = Marine approved
" " = Not marine approved

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Type	Ex Approvals	Input	SIL Approvals	Marine Approvals
5434	A: Zone 2 / Div 2 D: Zone 0 / Div 1	1: single input (4W)		M: Marine -: None
5431	A: Zone 2 / Div 2 D: Zone 0 / Div 1	1: single input (4W) 2: dual input (7W)		M: Marine -: None
5435	A: Zone 2 / Div 2 D: Zone 0 / Div 1	1: single input (4W)	S: SIL -: No SIL	M: Marine -: None
5437	A: Zone 2 / Div 2 D: Zone 0 / Div 1	1: single input (4W) 2: dual input (7W)	S: SIL -: No SIL	M: Marine -: None

For the rail mounted version, type 643... :

6431abcd - 2-wire universal temperature transmitter

6437abcd - 2-wire HART® temperature transmitter

- a: A = Zone 2 / Div2 approved
D = Zone 0 / Div 1 approved
- b: 1 = single input
2 = dual input
3 = two channel
- c: S = SIL approved
“ “ = Not SIL approval
- d: M = Marine approved
“ “ = Not marine approved

Type	Ex Approvals	Input	SIL Approvals	Marine Approvals
6431	A: Zone 2 / Div 2 D: Zone 0 / Div 1	1: single input 2: dual input 3: two channel	S: SIL -: No SIL	M: Marine -: None
6437	A: Zone 2 / Div 2 D: Zone 0 / Div 1	1: single input 2: dual input 3: two channel	S: SIL -: No SIL	M: Marine -: None

For the rail mounted version, type 5825-3....

Enclosure	Name	Type no	Approvals	Input Wires
Rail mount	2-wire programmable transmitter	5825-34	A: Zone 2 / Div 2 D: Zone 0 / Div 1 N: Zone 2 / Div 2 and Zone 0 / Div 1	1: single input (4Wire)
Rail mount	2-wire programmable transmitter	5825-31	A: Zone 2 / Div 2 D: Zone 0 / Div 1 N: Zone 2 / Div 2	1: single input (4Wire) 2: dual input (7Wire)

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			and Zone 0 / Div 1	
Rail mount	2-wire HART transmitter	5825-35	A: Zone 2 / Div 2 D: Zone 0 / Div 1 N: Zone 2 / Div 2 and Zone 0 / Div 1	1: single input (4Wire)
Rail mount	2-wire HART transmitter	5825-37	A: Zone 2 / Div 2 D: Zone 0 / Div 1 N: Zone 2 / Div 2 and Zone 0 / Div 1	1: single input (4Wire) 2: dual input (7Wire)

Example: 5825-34D1xy where x=" " or "S" and Y=" " or "M"

S= SIL approval and M=Marine approval

Thermal and electrical data

For type of protection Ex ia and Ex ib

Supply / output circuit (for type 543.... terminals 1, 2; for type 5825-3.... terminals 3, 4, and for type 643... terminals 11, 12 and 21, 22):

in type of protection intrinsic safety Ex ia IIC, Ex ib IIC, Ex ia IIIC and Ex ia I, only for connection to a certified intrinsically safe circuit, with the following maximum values:

$U_i = 30 \text{ V}$; $I_i = 120 \text{ mA}$; $C_i = 1 \text{ nF}$; $L_i = 0 \text{ }\mu\text{H}$. For P_i , see the below table.

Sensor circuit (for type 543.... terminals 3..9, for type 5825-3... terminals 5..12, and for type 643... terminals 41..44 and 51..54):

in type of protection intrinsic safety Ex ia IIC, Ex ia IIIC and Ex ia I, with the following maximum values:

$U_o = 7.2 \text{ V}$; $I_o = 12.9 \text{ mA}$; $P_o = 23.3 \text{ mW}$; $C_o = 13.5 \text{ }\mu\text{F}$; $L_o = 200 \text{ mH}$

or

Sensor circuit (CH1 terminals 3 to 4,5,6 or CH2 terminals 3 to 7,8,9) for 543... and (CH1 terminals 41...44 or CH2 terminals 51...54) for 643... and (CH1 terminals 5...8 or CH2 terminals 9...12) for 5825-3... in type of protection intrinsic safet Ex ia IIC, Ex ia IIIC and Ex ia I, with the following maximum values:

$U_o = 7.2 \text{ V}$; $I_o = 7.3 \text{ mA}$; $P_o = 13.2 \text{ mW}$; $C_o = 13.5 \text{ }\mu\text{F}$; $L_o = 667 \text{ mH}$.

The sensor circuit is infallibly isolated from the supply / output circuit.

The two channels of model type 643.3.. are infallibly isolated from each other.

The relation between P_i , temperature class and maximum ambient temperature is as follows:

P_i per channel	Temperature class	Maximum ambient temperature	
		Single and dual input	Two channel
900 mW	T6	+50 °C	+45 °C
	T5	+65 °C	+60 °C
	T4	+85 °C	+85 °C
750 mW	T6	+55 °C	+50 °C
	T5	+70 °C	+65 °C
	T4	+85 °C	+85 °C
610 mW	T6	+60 °C	+55 °C
	T5	+75 °C	+70 °C
	T4	+85 °C	+85 °C

The minimum ambient temperature is -50 °C.

For EPL Db:

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The surface temperature of the outer enclosure is +20 K above the ambient temperature, determined without a dust layer.

For type of protection Ex nA, Ex ec or Ex ic:

Supply / output circuit (for type 543.... terminals 1, 2; for type 5825-3.... terminals 3, 4, and for type 643... terminals 11, 12 and 21, 22):

the relation between type of protection, model type, temperature class and ambient temperature range, is listed in the table below:

Supply / output circuit			Temperature class	Maximum ambient temperature	
Ex nA & Ex ec	Ex ic	Ex ic		Single and dual input	Two channel
	$L_i = 0 \mu\text{H}$, $C_i = 1 \text{ nF}$	$U_i = 48 \text{ VDC}$, $L_i = 0 \mu\text{H}$, $C_i = 1 \text{ nF}$			
$V_{\text{max}} = 37 \text{ VDC}$	$U_i = 37 \text{ VDC}$	$P_i = 851 \text{ mW}$ per channel	T4	+85 °C	+85 °C
			T5	+70 °C	+65 °C
			T6	+55 °C	+50 °C
$V_{\text{max}} = 30 \text{ VDC}$	$V_i = 30 \text{ VDC}$	$P_i = 700 \text{ mW}$ per channel	T4	+85 °C	+85 °C
			T5	+75 °C	+70 °C
			T6	+60 °C	+55 °C

The minimum ambient temperature is -50 °C.

For EPL Dc:

The surface temperature of the outer enclosure is +20 K above the ambient temperature, determined without a dust layer.

Sensor circuit (for type 543... terminals 3..9; for type 5825-3... terminals 5..12; and for type 643... terminals 41..44, 51..54) in type of protection intrinsic safety Ex ic IIC and Ex ic IIIC, with the following maximum values:

$U_o = 7.2 \text{ V}$; $I_o = 12.9 \text{ mA}$; $P_o = 23.3 \text{ mW}$; $C_o = 13.5 \mu\text{F}$; $L_o = 200 \text{ mH}$

or

Sensor circuit (CH1 terminals 3 to 4,5,6 or CH2 terminals 3 to 7,8,9) for 543... and (CH1 terminals 41...44 or CH2 terminals 51...54) for 643... and (CH1 terminals 5...8 or CH2 terminals 9...12) for 5825-3... in type of protection intrinsic safety Ex ic IIC and Ex ic IIIC, with the following maximum values:

$U_o = 7.2 \text{ V}$; $I_o = 7.3 \text{ mA}$; $P_o = 13.2 \text{ mW}$; $C_o = 13.5 \mu\text{F}$; $L_o = 667 \text{ mH}$.