

[1] **EC-TYPE EXAMINATION CERTIFICATE**

according to Directive 94/9/EC, Annex III



(Translation)

- [2] Equipment and Protective Systems intended for use in Potentially Explosive Atmospheres, Directive 94/9/EC
- [3] EC-Type Examination Certificate Number: **IBExU04ATEX1165 X**
- [4] Equipment: Control device for electrical heating
Type ex-box XXX and ex-control
- [5] Manufacturer: eltherm Elektrowärmetechnik GmbH
- [6] Address: Ernst-Heinkel-Straße 8 – 10
57299 Burbach, Germany
- [7] This equipment mentioned in [4] and any acceptable variation thereto are specified in the schedule to this EC-Type Examination Certificate.
- [8] IBExU Institut für Sicherheitstechnik GmbH, NOTIFIED BODY number 0637 in accordance with article 9 of the Council Directive 94/9/EC of 23 March 1994, certifies that this equipment has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment intended for use in potentially explosive atmospheres given in Annex II to the Directive.
The examination and test results are recorded in the test report IB-03-3-890 of 16 February 2005.
- [9] Compliance with the Essential Health and Safety Requirements has been assured by compliance with EN 50014:1997+A1 +A2, EN 50019:2000, EN 50020:2002, EN 50028:1987 and EN 50281-1-1:1998.
- [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 under [17] in the schedule to this EC-Type Examination Certificate.
- [11] This EC-Type Examination Certificate relates only to the design and construction of the specified equipment. If applicable, further requirements of this directive apply to the manufacture and supply of this equipment.
- [12] The marking of the equipment mentioned in [4] shall include the following:

Control device ex-box XXX:

II 2G EEx em [ib] IIC T4

II 2D IP 65 T 100 °C

-32 °C ≤ T_a ≤ +60 °C

external Operator panel, ex-control:

II 2G EEx ib IIC T4

II 2D IP 65 T 100 °C

-32 °C ≤ T_a ≤ +60 °C

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Authorised for certifications Explosion protection

By order

(Dr. Lösch)



- Seal-
(ID no. 0637)

Freiberg, 17 February 2005

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Schedule

[13]

Schedule

[14]

to the EC-TYPE EXAMINATION CERTIFICATE IBExU04ATEX1165 X

[15]

Description of equipment

The temperature control device type ex-box XXX will be installed in Ex-area and is provided for control electrical heating, which also can be installed in Ex-area. The control device is encapsulated and makes available intrinsically safe connection for an external connected Pt100, a external intrinsically safe operator panel (ex-control) and data communication.

Technical dataDevice versions

ex-box DIS

Control device with internal display, full version

ex-box LED

Control device with internal LED, small version

ex-box LIM

Limiter without control function (only relays)

ex-control

external Operator panel, for connection on ex-box LED

Power supply circuit

clip 1.5 and clip 1.3

 $U_m = 265 \text{ V AC}$ Intrinsically safe Pt100-circuit:

Uo1: clip 3.1, 3.2 and gnd

 $U_o = 8.7 \text{ V DC}$ $I_o = 112 \text{ mA}$ $P_o = 0.54 \text{ W}$

max. internal capacitance

 $C_i = \text{negligible}$

max. internal inductance

 $L_i = \text{negligible}$ Intrinsically safe supply circuit:

Uo2:X1, pin1 and gnd

 $U_o = 8.7 \text{ V DC}$ $I_o = 223 \text{ mA}$ $P_o = 1.0 \text{ W}$

max. internal capacitance

 $C_i = \text{negligible}$

max. internal inductance

 $L_i = \text{negligible}$

Permitted peak values on mixed reactances:

	IIC	IIC
C_o	1.5 μF	1.0 μF
L_o	100 μH	400 μH

Intrinsically safe supply circuit CL-interface:

Uo3:X1, pin7, 13 and gnd

 $U_o = 7.9 \text{ V DC}$ $I_o = 112 \text{ mA}$ $P_o = 0.5 \text{ W}$

max. internal capacitance

 $C_i = \text{negligible}$

max. internal inductance

 $L_i = \text{negligible}$

The intrinsically safe circuits are connected with each other equalpotentially.

Intrinsically safe supply circuit operator panel:

clip 1 and clip 2

 $U_i = 9 \text{ V DC}$ $I_i = 300 \text{ mA}$ $P_i = 1.2 \text{ W}$

max. internal capacitance
max. internal inductance

C_i = negligible
 L_i = negligible

Ambient temperature range
Degree of protection:

from -32 °C to +60 °C
IP 65

[16] **Test report**

The test results are recorded in detail in the test report IB-03-3-890. The inspection documents are component of the test report and they are listed there.

Summary of the Test Result:

The electronic heating control device fulfils the requirements of the type of protection Increased Safety, Encapsulation and Intrinsic Safety for an electrical apparatus for the Group II, Explosion Group IIC, level of protection ib in Category 2G as well as requirements of Dust Explosion Protection.

[17] **Special conditions**

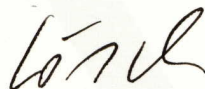
In the supply line to the electronic heating control device ex-box XXX has to be installed a VDE standard fuse max. 16 A, sluggish (also again one switchable) in the safe area respectively in an explosion-proof design. Cables, heat-resistant up to 100 °C, have to be used.

[18] **Essential Health and Safety Requirements**

Confirmed by norms (see [9]).

By order

Freiberg, 17 February 2005



(Dr. Lösch)

- [1] **1st Addition to**
EC-TYPE EXAMINATION CERTIFICATE IBExU04ATEX1165 X
according to Directive 94/9/EC, Annex III



- Translation -

- [2] **Equipment:** Control device for electrical heating
Type ex-box XXX and ex-control
- [3] **Manufacturer:** eltherm Elektrowärmetechnik GmbH
- [4] **Address:** Ernst-Heinkel-Straße 8 – 10
57299 Burbach, Germany

[5] **Modification/addition**

The equipment mentioned in [2] will be extended about the PC-adapter type ex-connect with followings technical data:

Power supply circuit: 230 VAC $\pm 10\%$ / 50...60 Hz
I $\leq$ 100 mA
P $\leq$ 10 VA

Intrinsically safe communication circuits: in type of protection intrinsically safety EEx ib IIC

(Pin 1/5 and Pin 2, Pin 4)

U_0	$\leq$	7.9 V DC
I_0	$\leq$	244 mA DC (each channel)
P_0	$\leq$	1.12 W
max. external capacitance	C_0	$\leq$ 1.0 μ F
max. external inductance	L_0	$\leq$ 400 μ H

Ambient temperature range -20 °C ... +40 °C

[6] **Test result**

The proof of explosion protection for the addition is recorded in test report IB-05-3-193 of 21st July 2005. The documents are listed there. The equipment fulfils the requirements of the type of protection "intrinsically safety" for an associated apparatus of the group II and the category 2G in accordance with EN 50014:1997+A1-A2 and EN 50020:2002. The marking for the additionally PC-adapter type ex-connect is:

II (2) GD [EEx ib] IIC

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- Explosion protection -

By order

(Dr. Lösch)



(Identification No. 0637)

Freiberg, 22nd July 2005

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[1] **2nd Addition to
EC-TYPE EXAMINATION CERTIFICATE IBExU04ATEX1165 X
- Translation -**

- [2] Equipment: Control device for electrical heating
Type ex-box XXX, ex-control and ex-connect
- [3] Manufacturer: eltherm Elektrowärmetechnik GmbH
- [4] Address: Ernst-Heinkel-Straße 8 - 10
57299 Burbach
Germany

[5] **Addition / Alteration**

The additions / alterations of the equipment stated under [2] compared to the equipment already certified comprise in particular:

- a) The equipment meet the requests of the standardizing rows of EN 60079 and EN 61241.
b) The Ex marking was revised standardizing justly.

Device versions

ex-box DIS	Control device with internal display, full version
ex-box LED	Control device with internal LED, small version
ex-box LIM	Limiter without control function (only relays)
ex-control	external Operator panel, for connection on ex-box LED
ex-connect	external PC-Adapter, associated apparatus

Technical Data for Control device and Limiter ex-box

Ambient temperature range	from -32 °C to +60 °C
Measurement (LxBxH):	140x140x150 mm
Weight:	3.0 kg (without mount)
Degree of protection:	IP 65
<u>Power supply circuit</u>	
Operating voltage (Cl. 4 and Cl. 5):	230 V ± 10 %
Nominal current: max.	100 mA
max. load current:	16 A (resistive)
Alarm exit(Cl. 1 and Cl. 2):	optically separate jailer 100mA (max. 60V DC voltage)

Intrinsically safe Pt100-circuit in Ex ib IIC

Uo1: (Cl. 9, Cl. 10 and Cl. 11)	U _o = 8.7 V DC
	I _o = 112 mA
	P _o = 0.5 W
max. internal capacitance	C _i = negligible
max. internal inductance	L _i = negligible

Intrinsically safe supply circuit in Ex ib IIC

Uo2: X1, Pin1 and Gnd	U _o = 8.7 V DC
	I _o = 223 mA
	P _o = 1.0 W
max. internal capacitance	C _i = negligible
max. internal inductance	L _i = negligible

Permitted peak values on mixed reactances:

	IIC	IIC
C _o	1.5 µF	1.0 µF
L _o	100 µH	400 µH

Intrinsically safe supply circuit CL-interface in Ex ib IIC

Uo3: X1, Pin 7, 13 and Gnd	$U_o = 7.9 \text{ V DC}$
	$I_o = 112 \text{ mA}$
	$P_o = 0.5 \text{ W}$
max. internal capacitance	$C_i = \text{negligible}$
max. internal inductance	$L_i = \text{negligible}$

Intrinsically safe circuits are connected with each other equalpotentially.

Technical Data for Operator panel ex-control

Intrinsically safe supply circuit operator panel in Ex ib IIC (passiv)

Ambient temperature range	from -32 °C to $+60 \text{ °C}$
Degree of protection:	IP 65
	$U_i = 9 \text{ V DC}$
	$I_i = 300 \text{ mA}$
	$P_i = 1.2 \text{ W}$
max. internal capacitance	$C_i = \text{negligible}$
max. internal inductance	$L_i = \text{negligible}$

Technical Data for PC-Adapter ex-connect

Ambient temperature range	from -20 °C to $+40 \text{ °C}$
Measurement (LxBxH):	190x110x70 mm
Weight:	0.8 kg
Degree of protection:	IP 20

Power supply circuit

Operating voltage:	$230 \text{ V} \pm 10 \%$
Nominal current:	max. 100 mA
Interface PC:	RS-232 9-polig (Socket)

Intrinsically safe communication circuit in Ex ib IIC

(Pin 1/5 and Pin 2, Pin 4)	$U_o = 7.9 \text{ V}$
	$I_o = 224 \text{ mA}$
	$P_o = 1.12 \text{ W}$
max. external capacitance	$C_o = 1.0 \text{ µF}$
max. external inductance	$L_o = 400 \text{ µH}$

[6] **Test Report**

The proof of explosion protection of the equipment stated under [2] is documented in the Test Report IB-08-3-178 of 9th December 2008. The test documents are part of the Test Report.

[7] **Test result**

IBExU certifies, that the component stated under [2] fulfills the in Annex II of the RL 94/9/EC fixed Essential Health and Safety Requirements by accordance with EN 60079-0:2006, EN 60079-7:2007, EN 60079-11:2007, EN 60079-18:2004, EN 61241-0:2006 and EN 61241-1:2004.

The temperature control device ex-box fulfills the requirements in type of protection Increased safety "e", Encapsulation "mb" and Intrinsic safety "ib" for an electrical associated equipment Group II, Category 2G, Explosion Group IIC as well as the determinations to the dust explosion protection.

The explosion protection marking is therefore:

 **II 2G Ex emb [ib] IIC T4**
 **II 2D Ex tD A21 IP 65 T 100 °C**
 $-32 \text{ °C} \leq T_a \leq +60 \text{ °C}$

IBExU Institut für Sicherheitstechnik GmbH

An-Institut der TU Bergakademie Freiberg

The intrinsically safety operator panel ex-control fulfills the requirements in type of protection Intrinsic safety "ib" for an electrical equipment Group II, Category 2G, Explosion Group IIC as well as the determinations to the dust explosion protection.

The explosion protection marking is therefore:

 II 2G Ex ib IIC T4
 II 2D Ex tD A21 IP 65 T 100 °C
-32 °C ≤ Ta ≤ +60 °C

The PC adapter ex-connect fulfills the requirements in type of protection Intrinsic safety "ib" for an electrical associated equipment Group II, Category (2)G, Explosion Group IIC as well as the determinations to the dust explosion protection.

The explosion protection marking is therefore:

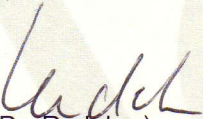
 II (2)GD [Ex ib] IIC

This addition is only valid in combination with the EC-Type Examination Certificate IBExU04ATEX1165 X of 17th February 2005 and the 1st Addition of 22nd July 2005.

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Authorized for certifications
- Explosion protection -

Freiberg, 10th December 2008


(Prof. Dr. Redeker)



- Seal -
(Identification No. 0637)

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