

**Translation**

(1) **EC-Type Examination Certificate**

(2) **- Directive 94/9/EC -**  
**Equipment and protective systems intended for use**  
**in potentially explosive atmospheres**

(3) **BVS 06 ATEX F 002 X**

(4) **Equipment:** Thermal cut-out type eB\*6\*\*\*

(5) **Manufacturer:** ELMESS-Thermosystemtechnik GmbH & Co. KG

(6) **Address:** Nordallee 1, D-29525 Uelzen

(7) The design and construction of this equipment and any acceptable variation thereto are specified in the schedule to this type examination certificate.

(8) The certification body of EXAM BBG Prüf- und Zertifizier GmbH, notified body no. 0158 in accordance with Article 9 of the Directive 94/9/EC of the European Parliament and the Council 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 and protective systems intended for use in potentially explosive atmospheres, given in Annex II to the Directive.

The examination and test results are recorded in the test and assessment report BVS PP 06.2018 EG.


(9) The Essential Health and Safety Requirements are assured by compliance with:

EN 954-1:1996	Safety of machinery – Safety-related parts of control systems, Part 1
DIN EN 61508-1:2002	Functional safety of electrical/ electronic/ programmable electronic safety-related systems, Part 1
EN 50019:2000	Electrical apparatus for potentially explosive atmospheres, Increased safety ,e’
prEN 62086-1:2004	Electrical apparatus for explosive gas atmospheres – Electrical resistance trace heating, Part 1
EN 50014:1997+A1-A2	Electrical apparatus for potentially explosive atmospheres, General requirements
EN 50020:2002	Electrical apparatus for potentially explosive atmospheres, Intrinsic safety “i”
EN 50281-1-1:1998+A1	Electrical apparatus for use in the presence of combustible dust – Part 1-1: Electrical apparatus protected by enclosures
prIEC 61241-11:2001	Electrical apparatus for use in the presence of combustible dust – Part 11: Protection by intrinsic safety “iD”

(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 EC-Type Examination Certificate relates only to the design, examination and tests of the specified equipment in accordance to Directive 94/9/EC.  
Further requirements of the Directive apply to the manufacturing process and supply of this equipment. These are not covered by this certificate

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

- II (2) GD bzw.
-  II (2) GD [EEx ib] IIC bzw.
- II (2) GD [EEx ib] IIB bzw. [Ex ibD]

**EXAM BBG Prüf- und Zertifizier GmbH**

Bochum, dated 17. February 2006

Signed: Dr. Eickhoff

Signed: Dr. Wittler

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Certification body

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Special services unit

(13)

Appendix to

(14)

## EC-Type Examination Certificate

### BVS 06 ATEX F 002 X

(15) 15.1 Subject and type

Thermal cut-out type eB\*6\*\*\*

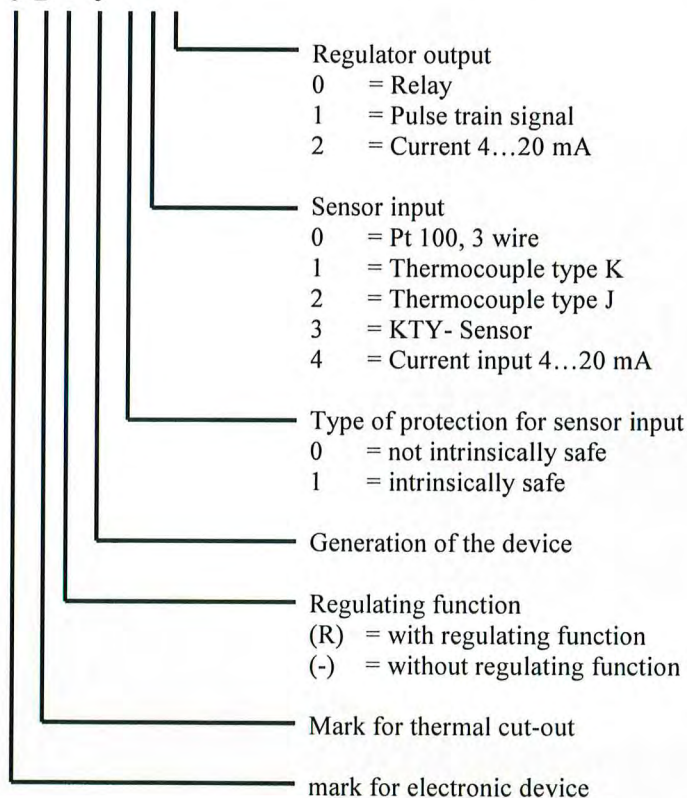
#### 15.2 Description

The thermal cut-out type eB\*6\*\*\* is a safety-related device according to the directive 94/9/EC, which can be used as a measure for direct temperature control of electrical equipment (e.g. for heatings in potentially explosive atmospheres).

The safety function of the safety related device is the direct temperature control of the monitored equipment and the cut off of the relay contact in the output of the thermal cut-out in the case of the transgression of a threshold value. The thermal cut-out and the optional regulator operate independent of each other. The relay output of the thermal cut out and the optional relay output of the regulator operate independent of each other too.

Key code:

e B \* 6 \* \* \*





### 15.3 Parameters

15.3.1 Degree of protection according EN 60529: IP 20

#### **15.3.2 Power supply:**

Voltage supply: 115 V / 230 V  $\pm$  10 %, 48...63 Hz  
resp. 24 V AC / DC  $\pm$  10 %  
Power consumption: 4 VA

#### **Power supply for the intrinsically version eB\*61\*\***

Clamp E1...E3  
Max. effective value of the AC voltage  $U_m = 253 \text{ VAC}$

Clamp G3, G4  
Max. effective value of the AC voltage  $U_m = 26,4 \text{ VAC}$

Max. value of the DC voltage  $U_m = 37,5 \text{ VDC}$

15.3.3 Permissible ambient temperature range +5...+45 °C

#### 15.3.4 Parameters of the input variations:

Variation Pt100:  
Sensor: Pt100 in 3-wire circuit  
Measuring range: - 200 ... + 850 °C

Variation thermocouple (type K and type J):  
Sensor: Thermocouple (type K or type J)  
Measuring range: - 200 ... + 1200 °C

Variation KTY sensor:  
Sensor: KTY sensor  
Measuring range: - 30 ... + 125 °C

Variation 4...20 mA:  
Sensor: Current input 4...20 mA  
Impedance: < 23 Ohm

For the type eB\*61\*\* with intrinsically input-/measurement circuits in the type of protection EEx ib IIC/IIB or Ex ibD

Sensorinput 4...20 mA clamps H1...H4:

Supply from a circuit in the type of protection EEx ib IIC/IIB or Ex ibD with the following maximal values:

Max. output voltage	$U_o = 15,4 \text{ V}$
Max. output current	$I_o = 114 \text{ mA}$
Max. output power	$P_o = 555 \text{ mW}$
Max. internal capacitance	$C_i$ negligible
Max. internal inductance	$L_i$ negligible

Sensorinput Pt100 clamps H1...H4:

Supply from a circuit in the type of protection EEx ib IIC/IIB or Ex ibD with the following maximal values:

Max. output voltage	$U_o = 13,2 \text{ V}$
Max. output current	$I_o = 22 \text{ mA}$
Max. output power	$P_o = 210 \text{ mW}$
Max. internal capacitance	$C_i$ negligible
Max. internal inductance	$L_i$ negligible

Sensorinput thermocouple clamps H1...H4:

Supply from a circuit in the type of protection EEx ib IIC/IIB or Ex ibD with the following maximal values:

Max. output voltage	$U_o = 13,2 \text{ V}$
Max. output current	$I_o = 15 \text{ mA}$
Max. output power	$P_o = 160 \text{ mW}$
Max. internal capacitance	$C_i < 40 \text{ nF}$
Max. internal inductance	Li negligible

Sensorinput 10 mV/ °C clamps H1...H4:

Supply from a circuit in the type of protection EEx ib IIC/IIB or Ex ibD with the following maximal values:

Max. input voltage	$U_i = 10 \text{ V}_{\text{eff}}$ or 15 VDC
Max. short circuit current	$I_k = 1 \text{ mA}$
Max. internal capacitance	$C_i$ negligible
Max. internal inductance	$L_i$ negligible
Max. output voltage	$U_o = 15,4 \text{ VDC}$

For all the types of sensors the connected capacity and inductivity must be lower as the following values:

for the group IIC  $L_o < 0,4 \text{ mH}$  and/or  $C_o < 0,4 \text{ uF}$

for the group IIB  $L_o < 2 \text{ mH}$  and/or  $C_o < 2 \text{ uF}$

#### 15.3.5 Relay output of the thermal cut-out:

Relay with changeover contact

Power rating:

Contact:

NC: max. 4 A at 250 V AC1  
resp. 0,5 A at 24 V

Contact:

NO: max. 0,5 A at 250 V AC1  
resp. 0,5 A bei/ at 24 V

In the intrinsically version eB\*61\*\*

Power rating: max. switching capacity 50 W resp. 100 VA

15.3.6 Backspace value of the temperature limiting: Threshold value – ca. 20 K

15.3.7 Safety integrity level of the thermal cut-out according to DIN EN 61508

The thermal cut-out type eB\*6\*\*\* fulfils the requirements for the usage in safety functions up to a safety integrity level of SIL 2.

This applies to the low demand mode of operation; the calculation of the safety integrity level used a proof-test interval of the safety function of one year.

15.3.8 Category of the thermal cut-out according to EN 954-1

The thermal cut-out type eB\*6\*\*\* fulfils the requirements for a category 2 according to EN 954-1.

(16) Test and assessment report

BVS PP 06.2018 EG as of 17. February 2006

(17) Special conditions for safe use

The adjustment of the thermal cut-out type eB\*6\*\*\* shall be locked and sealed and shall not be capable of being subsequently altered when in service.

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We confirm the correctness of the translation from the German original.  
In the case of arbitration only the German wording shall be valid and binding.

44809 Bochum, 17. February 2006  
BVS-/Wil/Ha/Mi A 20050461

**EXAM BBG Prüf- und Zertifizier GmbH**



Certification body



Special services unit



## Translation

# (1) 1<sup>st</sup> Supplement to the EC-Type Examination Certificate

- (2) Equipment and protective systems intended for use in potentially explosive atmospheres - Directive 94/9/EC Supplement accordant with Annex III number 6
- (3) No. of EC-Type Examination Certificate: **BVS 06 ATEX F 002 X**
- (4) Equipment: **Thermal cut-out type eB\*6\*\*\***
- (5) Manufacturer: **ELMESS-Thermosystemtechnik GmbH & Co. KG**
- (6) Address: **Nordallee 1, D-29525 Uelzen, Germany**
- (7) The design and construction of this equipment and any acceptable variation thereto are specified in the appendix to this supplement.
- (8) The certification body of DEKRA EXAM GmbH, notified body no. 0158 in accordance with Article 9 of the Directive 94/9/EC of the European Parliament and the Council 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 and protective systems intended for use in potentially explosive atmospheres, given in Annex II to the Directive. The examination and test results are recorded in the test and assessment report BVS PP 06.2018 EG.
- (9) The Essential Health and Safety Requirements are assured by compliance with:

<b>EN 13463-6:2005</b>	<b>Non-electrical Equipment for Use in Potentially Explosive Atmospheres – Part 6: Protection by control of ignition sources ‘b’</b>
<b>EN 50495:2010</b>	<b>Safety Devices Required for the Safe Functioning of Equipment with Respect to Explosion Risks</b>
<b>EN 60079-0:2009</b>	<b>General Requirements</b>
<b>EN 60079-11:2007</b>	<b>Intrinsic Safety ‘i’</b>
<b>EN 60079-30-1:2007</b>	<b>Electrical Resistance Trace Heating: General requirements and testing requirements</b>
<b>EN 61241-11:2006</b>	<b>Protection by Intrinsic Safety ‘iD’</b>

- (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 appendix to this certificate.
- (11) This EC-Type Examination Certificate relates only to the design, examination and tests of the specified equipment in accordance to Directive 94/9/EC. Further requirements of the Directive apply to the manufacturing process and supply of this equipment. These are not covered by this certificate.
- (12) The marking of the equipment shall include the following:

<b>II (2) G (b1)</b>	Type eB*60**
<b>II (2) D (b1)</b>	
<b>II (2) G [Ex ib Gb] IIC/IIB (b1)</b>	Type eB*61**
<b>II (2) D [Ex ib Db] IIIC (b1)</b>	

DEKRA EXAM GmbH  
Bochum, 24<sup>th</sup> October 2012

Signed: Simanski

Certification body

Signed: Dr. Wittler

Special services unit



- (13) Appendix to
- (14) **1<sup>st</sup> Supplement to the EC-Type Examination Certificate  
BVS 06 ATEX F 002 X**
- (15) 15.1 Subject and type

Thermal cut-out type eB\*6\*\*\*

15.2 Description

The thermal cut-out type eB\*6\*\*\* is a safety-related device according to Directive 94/9/EC which can be used as a measure for direct temperature control of electrical equipment (e.g. for heaters in potentially explosive atmospheres).

The safety function of the safety-related device includes both the direct temperature control of the monitored equipment and the cut-off of the relay contact in the output of the thermal cut-out in case the threshold value is exceeded.

The input connection of the device can be done by means of the following variants:

- Input for Pt100 sensors
- Input for thermo-couples (types K or J)
- Input for KTY-sensors
- Input for current signals of 4...20 mA

The device has the following output features:

- Control of sensor and sensor cables for short-circuit and power interruption
- Reset hysteresis (approx. 20 K)
- Reset only by means of tool
- Preventing permanent resetting
- Remain disconnected in case of voltage failure and if power supply returns.

Variant type eB\*61\*\* has it that the thermal cut-out is erected outside the potentially explosive atmosphere in a suitable housing that meets at least the degrees of protection IP 43; only the circuits lead into the potentially explosive atmosphere.

This supplement does not only cover the revised and updated standards applicable, but also minor technical modifications and it is hereby determined that device variants featuring an Ex i sensor input of type eB\*61\*\* will be provided with an Ex i adapter for connection of art. no. 10122701.

The intrinsically safe circuits of type eB\*61\*\* are safely separated from all other circuits up to a voltage peak value of 375 VAC.

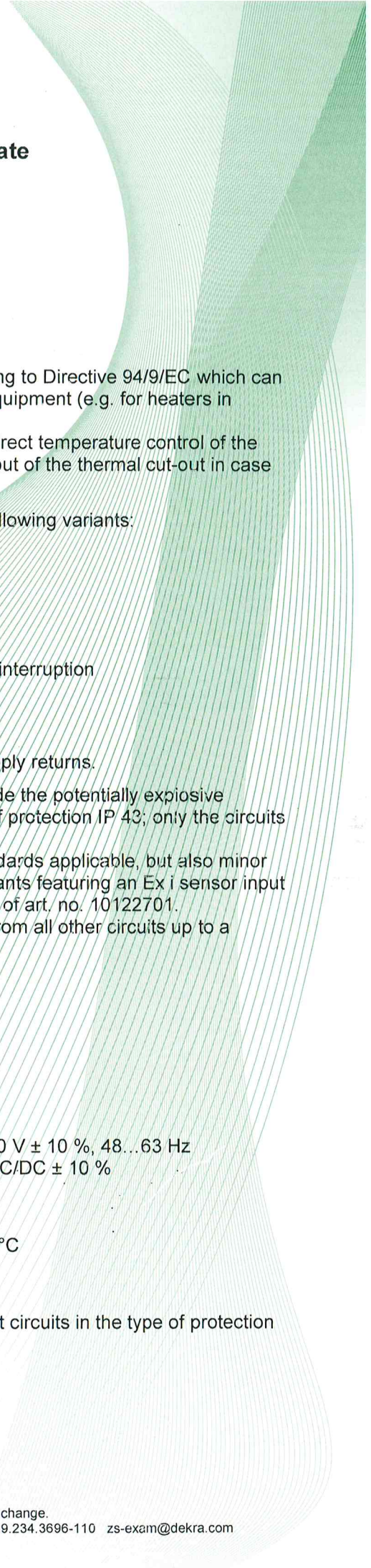
15.3 Parameters

- 15.3.1 Degree of protection according EN 60529: IP 20
- 15.3.2 Power supply:
- Voltage supply: 115 V/230 V ± 10 %, 48...63 Hz  
or 24 V AC/DC ± 10 %
- Power consumption: 4 VA
- 15.3.3 Permissible ambient temperature range +5...+45 °C
- 15.3.4 Parameters of the input variants of type eB\*61\*\*
- For type eB\*61\*\* with intrinsically safe input/measurement circuits in the type of protection EEx ib IIC/IIB or Ex ibD:

Sensor input 4...20 mA

Two-wire variant transducer clamps H2(+) and H3

Transducer with external supply clamps H1 and H3(+)





Supply from a circuit in the type of protection EEx ib IIC/IIB or Ex ibD with the following maximum values:

- Max. output voltage  $U_o = 15.4 \text{ V}$
- Max. output current  $I_o = 114 \text{ mA}$
- Max. output power  $P_o = 555 \text{ mW}$
- Max. internal capacitance  $C_i$  negligible
- Max. internal inductance  $L_i$  negligible

Sensor input Pt100 clamps H1, H2 and H3

There is a bridge between H1 and H3 if the two-wire variant is used.

Supply from a circuit in the type of protection EEx ib IIC/IIB or Ex ibD with the following maximum values:

- Max. output voltage  $U_o = 13.2 \text{ V}$
- Max. output current  $I_o = 26 \text{ mA}$
- Max. output power  $P_o = 240 \text{ mW}$
- Max. internal capacitance  $C_i$  negligible
- Max. internal inductance  $L_i$  negligible

Sensor input thermo-couples clamps H2 and H3

Supply from a circuit in the type of protection EEx ib IIC/IIB or Ex ibD with the following maximum values:

- Max. output voltage  $U_o = 13.2 \text{ V}$
- Max. output current  $I_o = 15 \text{ mA}$
- Max. output power  $P_o = 160 \text{ mW}$
- Max. internal capacitance  $C_i < 40 \text{ nF}$
- Max. internal inductance  $L_i$  negligible

Sensor input  $10 \text{ mV}/^\circ\text{C}$  clamps H1 and H3(+)

Supply from a circuit in the type of protection EEx ib IIC/IIB or Ex ibD with the following maximum values:

- Max. input voltage  $U_i = 10 V_{\text{eff}}$  or  $15 \text{ VDC}$
- Max. short circuit current  $I_k = 1 \text{ mA}$
- Max. internal capacitance  $C_i$  negligible
- Max. internal inductance  $L_i$  negligible
- Max. output voltage  $U_o = 15.4 \text{ VDC}$

For all types of sensors the connected capacity and inductivity must together be lower than the following values:

- for group IIC  $L_o < 0.4 \text{ mH}$  and/or  $C_o < 0.4 \text{ uF}$
- for group IIB  $L_o < 2 \text{ mH}$  and/or  $C_o < 2 \text{ uF}$

### 15.3.5 Relay output of the thermal cut-out:

Relay with changeover contact

- Power rating:
- Contact NO:  $\text{max. } 4 \text{ A at } 250 \text{ V AC1}$   
 $\text{or } 0.5 \text{ A at } 24 \text{ V}$
- Contact NC:  $\text{max. } 0.5 \text{ A at } 250 \text{ V AC1}$   
 $\text{or } 0.5 \text{ A at } 24 \text{ V}$

In the intrinsically safe version eB\*61\*\*

- Max. switching capacity  $50 \text{ W}$  or  $100 \text{ VA}$

### 15.3.6 Reset value of the temperature limiting:

- Threshold value  $\text{approx. } 20 \text{ K}$

### 15.3.7 Safety integrity level of the thermal cut-out according to DIN EN 61508

The thermal cut-out type eB\*6\*\*\* meets the requirements for the usage in safety functions up to a safety integrity level of SIL 2.

This applies to the low demand mode of operation; the calculation of the safety integrity level was done using a proof-test interval of the safety function of one year.



15.3.8 Ignition Prevention Level IPL according to EN 13463-6:2005:  
The device meets the requirements of IPL 1.

15.3.9 Performance Level (PL) according to EN ISO 13849-1:2007:  
The device meets the requirements of PL c.

(16) Test and assessment report

BVS PP 06.2018 EG, as of 24.10.2012

(17) Special conditions for safe use

The adjustment of the thermal cut-out type eB\*6\*\*\* shall be locked and sealed and shall not be capable of being subsequently altered when in service.

Using the supply variant with 24 VDC the power supplying source must be safely galvanically separated.

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We confirm the correctness of the translation from the German original.  
In the case of arbitration only the German wording shall be valid and binding.

DEKRA EXAM GmbH  
44809 Bochum, 21.01.2013  
BVS-Eick/Ar E 2195/13



Certification body



Special services unit