



(1) EC-TYPE-EXAMINATION CERTIFICATE (Translation)

(2) Equipment and Protective Systems Intended for Use in
Potentially Explosive Atmospheres - **Directive 94/9/EC**

(3) EC-type-examination Certificate Number:

PTB 99 ATEX 2139 X



(4) Equipment: Measuring transducer type TH 02-Ex, TH 102-Ex and TH 202-Ex

(5) Manufacturer: ABB Automation Products GmbH

(6) Address: Borsigstraße 2, D-63754 Alzenau

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

(8) The Physikalisch-Technische Bundesanstalt, notified body No. 0102 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 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 confidential report PTB Ex 99-29128.

(9) Compliance with the Essential Health and Safety Requirements has been assured by compliance with:
EN 50014:1997 **EN 50020:1994**

(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.

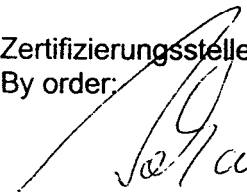
(11) This EC-type-examination Certificate relates only to the design and construction of the specified equipment in accordance with Directive 94/9/EC. Further requirements of this Directive apply to the manufacture and supply of this equipment.

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

 **II 2 G EEx [ia] ib IIC T6**

Zertifizierungsstelle Explosionsschutz
By order:

Braunschweig, October 14, 1999


Dr.-Ing. U. Johannsmeyer
Regierungsdirektor



sheet 1/5

EC-type-examination Certificates without signature and official stamp shall not be valid. The certificates may be circulated only without alteration. Extracts or alterations are subject to approval by the Physikalisch-Technische Bundesanstalt. In case of dispute, the German text shall prevail.

Physikalisch-Technische Bundesanstalt

Braunschweig und Berlin

(13) **SCHEDULE**

(14) **EC-TYPE-EXAMINATION CERTIFICATE PTB 99 ATEX 2139 X**

(15) Description of equipment

The TH-series measuring transducers in combination with sensors is used for the detection, amplification and transmission of measuring values in intrinsically safe circuits. Sensors such as resistance thermometers, thermocouples resp. other sensors with defined quantities of resistance and direct voltage may be connected to the input alternatively.

The TH-series consists of the following types:

- TH02-Ex sensor-head measuring transducer
- TH102-Ex measuring transducer in cascading rail housing, 1- and 2-channel
- TH202-Ex measuring transducer in field housing

The permissible range of the ambient temperature depending on the temperature class is shown in the following table:

temperature class	T6	T5	T4, T3, T2, T1
permissible range of ambient temperature	-40 °C...+50 °C	-40 °C...+65 °C	-40 °C...+85°C

Electrical data

Measuring transducer type TH02-Ex and TH202-Ex

Supply circuit type of protection Intrinsic Safety EEx ib IIC resp. EEx ib IIB
(terminals resp. soldering tags for connection to certified intrinsically safe circuits
„+“ and „-“) maximum input values:

$$U_i = 29.4 \text{ V}$$
$$I_i = 130 \text{ mA}$$
$$P_i = 0.8 \text{ W}$$

the effective internal capacitance is 15 nF.
the effective internal inductance is 220 µH.

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SCHEDULE TO EC-TYPE-EXAMINATION CERTIFICATE PTB 99 ATEX 2139 X

Measuring circuit type of protection Intrinsic Safety EEx ia IIC resp. EEx ia IIB
(terminals resp. soldering tags resp. EEx ib IIC resp. EEx ib IIB
1, 2, 3 and 4) with the following maximum values:

$$U_o = 5.6 \text{ V}$$
$$I_o = 145 \text{ mA}$$
$$P_o = 20 \text{ mW}$$

linear characteristic

load current for connected intrinsically safe sensors : $I \leq 1,5 \text{ mA}$

the effective internal capacitance is 50 nF.
the effective internal inductance is negligibly small.

the maximum permissible external inductance and capacitance are dependent on the connected intrinsically safe circuit as follows:

passive sensors:

type of protection	EEx ia		EEx ib	
	IIC	IIB	IIC	IIB
L_o	1 mH	1 mH	1.5 mH	100 mH
C_o	1.55 μF	9.15 μF	98.9 μF	2 mF

active sensors with the following maximum values:

$$U_o = 1.2 \text{ V}$$
$$I_o = 50 \text{ mA}$$
$$P_o = 60 \text{ mW}$$

type of protection	EEx ia /ib	
	IIC	IIB
L_o	0.5 mH	1 mH
C_o	950 nF	4.9 μF

The supply circuit is safely electrically isolated from the measuring circuit up to a peak value of the total voltage of 30 V.

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SCHEDULE TO EC-TYPE-EXAMINATION CERTIFICATE PTB 99 ATEX 2139 X

Measuring transducer type TH 102-Ex

Supply circuit/-s..... type of protection Intrinsic Safety EEx ib IIC resp. EEx ib IIB
 type/variant Pt100 3L:

(channel 1: terminals 31+, 32-) only for connection to certified intrinsically safe
 (channel 2: terminals 41+, 42-) circuits

maximum input values:

type/variant Pt100 4L: $U_i = 29.4 \text{ V}$
 (single channel: terminals 31+, 32-) $I_i = 130 \text{ mA}$
 $P_i = 0.8 \text{ W}$

the effective internal capacitance is 15 nF.

the effective internal inductance is 220 µH.

Measuring circuits type of protection Intrinsic Safety EEx ia IIC resp. EEx ia IIB
 type/variant Pt100 3L: resp. EEx ib IIC resp. EEx ib IIB

(channel 1: terminals 11, 12 and 13)

(channel 2: terminals 21, 22 and 23) with the following maximum values per circuit:

type/variant Pt100 4L $U_o = 5.6 \text{ V}$
 (single channel: $I_o = 145 \text{ mA}$
 $P_o = 20 \text{ mW}$

terminals 11, 12, 13 and 14) linear characteristic

load current for connected intrinsically safe
 sensors : $I \leq 1.5 \text{ mA}$

the effective internal capacitance is 50 nF.
 the effective internal inductance is negligibly small.

the maximum permissible external inductance and
 capacitance are dependent on the connected intrinsically
 safe circuit as follows:

passive sensors:

type of protection	EEx ia		EEx ib	
	IIC	IIB	IIC	IIB
L_o	1 mH	1 mH	1.5 mH	100 mH
C_o	1.55 µF	9.15 µF	98.9 µF	2 mF

active sensors with the following maximum values:

$U_o = 1.2 \text{ V}$
 $I_o = 50 \text{ mA}$
 $P_o = 60 \text{ mW}$

type of protection	EEx ia /ib	
	IIC	IIB
L_o	0.5 mH	1 mH
C_o	950 nF	4.9 µF

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The supply circuits are safely electrically isolated from the respective measuring circuits up to a peak value of the total voltage of 30 V.

With the variant Pt100 3L the channels of the measuring transducer TH 102-Ex are safely electrically isolated from each other up to a peak value of the total voltage of 60 V.

(16) Test report PTB Ex 99-29128

(17) Special conditions for safe use

1. The connection facilities of the measuring transducer type TH 02-Ex have to be installed as such that at least a degree of protection of IP 20 according to IEC-publication 60529:1989 is met.
2. The lowest permissible ambient temperature for the measuring transducer type TH 02-Ex is -40 °C.
3. The lowest permissible ambient temperature for the measuring transducer type TH 102-Ex is -20 °C.
4. The avoidance of inadmissible charging of the plastic housing of the measuring transducer type TH 102-Ex must be taken into consideration and indicated by a warning label on the equipment.

(18) Essential health and safety requirements

Met by the standards mentioned above.


Zertifizierungsstelle Explosionsschutz
By order:

Braunschweig, October 14, 1999

Dr.-Ing. U. Johannsmeyer
Regierungsdirektor

1st SUPPLEMENT
according to Directive 94/9/EC Annex III.6
to EC-TYPE-EXAMINATION CERTIFICATE PTB 99 ATEX 2139 X
(Translation)

Equipment: Measuring transducer, types TH 02-Ex, TH 102-Ex and TH 202-Ex

Marking:  **II 2 G EEx [ia] ib IIC T6**

Manufacturer: ABB Automation Products GmbH

Address: Borsigstraße 2
63754 Alzenau, Germany

Description of supplements and modifications

The measuring transducers TH 102-Ex and TH 202-Ex have been modified and may in future also be manufactured and operated as specified in the test documents for test report PTB Ex 02-20193.

The marking for measuring transducers TH 02-Ex, TH 102-Ex and TH 202-Ex will in future be as follows:

 **II 2 (1) G EEx [ia] ib IIC T6**

The modifications for measuring transducer TH 102-Ex concern the internal configuration as well as the cascading rail housing.

Measuring transducer TH 202-Ex (measuring transducer TH 02-Ex in the field housing) was expanded to additionally include type TH 202-Ex with indicator.

For measuring transducer TH 202-Ex with indicator the modifications concern the internal configuration, the "electrical data" as well as the marking.

For measuring transducer TH 202-Ex with indicator the marking is as follows:

 **II 2 (1) G EEx [ia] ib IIC T4**

The "electrical data" for measuring transducer TH 02-Ex, TH 102-Ex, and TH 202-Ex will in future for clarity's sake be shown in a different way.

Electrical data

Measuring transducer, types TH 02-Ex and TH 202-Ex

Supply circuit type of protection Intrinsic Safety EEx ib IIC or EEx ib IIB
 (terminals or solder terminations for connection to certified intrinsically safe circuits
 “+“ and “-“) Maximum input values:

$$U_i = 29.4 \text{ V}$$

$$I_i = 130 \text{ mA}$$

$$P_i = 0.8 \text{ W}$$

The effective internal capacitance is 15 nF.
 The effective internal inductance is 220 µH.

Measuring circuit..... type of protection Intrinsic Safety EEx ia IIC or EEx ia IIB
 (terminals or solder terminations or EEx ib IIC or EEx ib IIB
 1, 2, 3 & 4) with the following maximum values:

$$U_o = 5.6 \text{ V}$$

$$I_o = 1.5 \text{ mA (load current for transmitter)}$$

$$P_o = 20 \text{ mW}$$

Linear characteristic

$$I_{dyn} = 145 \text{ mA (dynamic short-circuit current)}$$

The effective internal capacitance is 50 nF.
 The effective internal inductance is negligibly low.

The max. permissible external inductance and capacitance depend on the connected intrinsically safe circuit as follows:

Passive transmitters:

Type of protection	EEx ia		EEx ib	
	IIC	IIB	IIC	IIB
L_o	1 mH	1 mH	1.5 mH	100 mH
C_o	1.55 µF	9.15 µF	98.9 µF	2 mF

(The tabulated values are based on the dynamic short-circuit current of $I_{dyn} = 145 \text{ mA}$)

Active transmitters with the following maximum values:

$$U_o = 1.2 \text{ V}$$

$$I_o = 50 \text{ mA}$$

$$P_o = 60 \text{ mW}$$

Type of protection	EEx ia /ib	
	IIC	IIB
L_o	0.5 mH	1 mH
C_o	950 nF	4.9 μ F

(The tabulated values are based on the dynamic short-circuit current of $I_{dyn} = 145$ mA)

The supply circuit is safely electrically isolated from the measuring circuit up to a peak value of the total voltages of 30 V.

Measuring transducer, type TH 102-Ex

Supply circuit/stype of protection Intrinsic Safety EEx ib IIC/IIB

(channel 1: terminals 31+, 32-)
(channel 2: terminals 41+, 42-)

only for connection to certified intrinsically safe circuits

Maximum input values:

$$U_i = 29.4 \text{ V}$$

$$I_i = 130 \text{ mA}$$

$$P_i = 0.8 \text{ W}$$

The effective internal capacitance is 15 nF.
The effective internal inductance is 220 μ H.

Measuring circuits.....type of protection Intrinsic Safety EEx ia IIC/IIB or EEx ib IIC/IIB

(channel 1: terminals 11, 12, 13 & 14)
(channel 2: terminals 21, 22, 23 & 24)

with the following maximum values for each circuit:

$$U_o = 5.6 \text{ V}$$

$$I_o = 1.5 \text{ mA (load current for transmitter)}$$

$$P_o = 20 \text{ mW}$$

Linear characteristic

$$I_{dyn} = 145 \text{ mA (dynamic short-circuit current)}$$

The effective internal capacitance is 50 nF.
The effective internal inductance is negligibly low.

The maximum permissible external inductance and capacitance depend on the connected intrinsically safe circuit as follows:

Passive transmitters:

Type of protection	EEx ia		EEx ib	
	IIC	IIB	IIC	IIB
L_o	1 mH	1 mH	1.5 mH	100 mH
C_o	1.55 μ F	9.15 μ F	98.9 μ F	2 mF

(The tabulated values are based on the dynamic short-circuit current of $I_{dyn} = 145$ mA)

Active transmitters with the following maximum values:

$U_o = 1.2$ V
 $I_o = 50$ mA
 $P_o = 60$ mW

Type of protection	EEx ia /ib	
	IIC	IIB
L_o	0.5 mH	1 mH
C_o	950 nF	4.9 μ F

(The tabulated values are based on the dynamic short-circuit current of $I_{dyn} = 145$ mA)

The supply circuits are safely electrically isolated from the respective measuring circuits up to a peak value of the total voltages of 30 V.

The two channels of measuring transducer TH 102-Ex are safely electrically isolated from each other up to a peak value of the total voltages of 60 V.

Measuring transducer, type TH 202-Ex, with indicator

Supply circuit type of protection Intrinsic Safety EEx ib IIC or EEx ib IIB
 (terminals or solder terminations for connection to certified intrinsically safe circuits
 “+“ and “-“) maximum input values:

$U_i = 29.4$ V
 $I_i = 130$ mA
 $P_i = 0.8$ W

The effective internal capacitance is 28 nF.
 The effective internal inductance is 440 μ H.

Measuring circuit..... type of protection Intrinsic Safety EEx ia IIC or EEx ia IIB
 (terminals or solder terminations or EEx ib IIC or EEx ib IIB
 1, 2, 3 & 4) with the following maximum values:

$U_o = 5.6$ V
 $I_o = 1.5$ mA (load current for transmitter)
 $P_o = 20$ mW

Linear characteristic

$I_{dyn} = 145 \text{ mA}$ (dynamic short-circuit current)

The effective internal capacitance is 50 nF.

The effective internal inductance is negligibly low.

The maximum permissible external inductance and capacitance depend on the connected intrinsically safe circuit as follows:

Passive transmitters:

Type of protection	EEx ia		EEx ib	
	IIC	IIB	IIC	IIB
L_o	1 mH	1 mH	1.5 mH	100 mH
C_o	1.55 μF	9.15 μF	98.9 μF	2 mF

(The tabulated values are based on the dynamic short-circuit current of $I_{dyn} = 145 \text{ mA}$)

Active transmitters with the following max. values:

$U_o = 1.2 \text{ V}$

$I_o = 50 \text{ mA}$

$P_o = 60 \text{ mW}$

Type of protection	EEx ia /ib	
	IIC	IIB
L_o	0.5 mH	1 mH
C_o	950 nF	4.9 μF

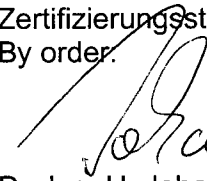
(The tabulated values are based on the dynamic short-circuit current of $I_{dyn} = 145 \text{ mA}$)

The supply circuit is electrically isolated from the measuring circuit up to a peak value of the total voltages of 30 V.

Test report: PTB Ex 02-20193

Zertifizierungsstelle Explosionsschutz

By order:


Dr.-Ing. U. Johannsmeyer
Regierungsdirektor



Braunschweig, February 28, 2002


2. SUPPLEMENT

according to Directive 94/9/EC Annex III.6

to EC-TYPE-EXAMINATION CERTIFICATE PTB 99 ATEX 2139 X

(Translation)

Equipment: Measuring transducer, type TH 02-Ex, TH 102-Ex, TH 202-Ex and TH 202-Ex with indicator

Marking:  II 2 (1) G EEx [ia] ib IIC T6

Manufacturer: ABB Automation Products GmbH

Address: Borsigstraße 2, 63754 Alzenau, Germany

Description of supplements and modifications

The measuring transducers of type series TH *02-Ex have been revised. The modifications concern the internal construction, a further type differentiation (HW-versions), the application as category-1 equipment for specific types of the TH 02-Ex-series provided with hardware version HW 2.xx, the marking, the "Electrical data", the permissible ranges of the ambient temperature as well as the "Special conditions".

The TH *01-Ex-series comprises the following types:

- TH 02-Ex HW 1.xx, sensor-head measuring transducer
- TH 02-Ex HW 2.xx, sensor-head measuring transducer
- TH 102-Ex HW 1.xx, measuring transducer in rail-terminal housing, 1-and 2-channel
- TH 102-Ex HW 2.xx, measuring transducer in rail-terminal housing, 1-and 2-channel
- TH 202-Ex HW 1.xx, measuring transducer in field housing without indicator
- TH 202-Ex HW 2.xx, measuring transducer in field housing without indicator
- TH 202-Ex HW 1.xx, measuring transducer in field housing with indicator
- TH 202-Ex HW 2.xx, measuring transducer in field housing with indicator

The marking for the measuring transducers of types TH 02-Ex HW 2.xx and TH 202-Ex HW 2.xx without indicator is:

 II 1 G EEx ia IIC T6

The marking for the measuring transducers of types TH 202-Ex HW 2.xx with indicator is:

 II 1 G EEx ia IIC T4

2. SUPPLEMENT TO EC-TYPE-EXAMINATION CERTIFICATE PTB 99 ATEX 2139 X

For permissible range of the ambient temperature depending on temperature class and type of measuring transducer, reference is made to the table below:

temperature class		T6	T5	T4, T3, T2, T1
permissible range of the ambient temperature for measuring transducer, type ... for application as category-2 equipment	TH 202-Ex HW 1.xx with indicator	---	---	-20 °C...+85 °C
	TH 202-Ex HW 2.xx with indicator			
permissible range of the ambient temperature for measuring transducer, type ... for application as category-1 equipment	TH 02-Ex HW 1.xx	-40 °C*...+50 °C	-40 °C*...+65 °C	-40 °C*...+85 °C
	TH 02-Ex HW 2.xx			
	TH 102-Ex HW 1.xx			
	TH 102-Ex HW 2.xx			
permissible range of the ambient temperature for measuring transducer, type ... for application as category-2 equipment	TH 202-Ex HW 1.xx w/o indicator	---	---	-20 °C...+60 °C
	TH 202-Ex HW 2.xx w/o indicator			
permissible range of the ambient temperature for measuring transducer, type ... for application as category-1 equipment	TH 202-Ex HW 2.xx with indicator	-20 °C...+38 °C	-20 °C...+50 °C	-20 °C...+60 °C
	TH 02-Ex HW 2.xx with indicator			
	TH 202-Ex HW 2.xx w/o indicator			

* optional -50 °C

Electrical data

Measuring transducer, type TH 02-Ex HW 1.xx and TH 202-Ex HW 1.xx without indicator

Supply circuit type of protection EEx ib IIC/IIB
 (terminals „+“ and „-“) for connection to certified intrinsically circuits

maximum input values:

U_i = 29.6 V
 I_i = 130 mA
 P_i = 0.8 W

The effective internal capacitance is 15 nF.
 The effective internal inductance is 220 µH.

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Measuring circuittype of protection EEx ia IIC or EEx ia IIB
(terminals 1, 2, 3 and 4) or EEx ib IIC or EEx ib IIB

with the following maximum values:

$$U_o = 5.6 \text{ V}$$

$$I_o = 1.5 \text{ mA (load current for sensor)}$$

$$P_o = 3 \text{ mW}$$

linear characteristic

$$I_{dyn} = 145 \text{ mA (dynamic short-circuit current)}$$

The effective internal capacitance is 50 nF.

The effective internal inductance is negligibly low.

The maximum permissible external inductance and capacitance depend on the connected intrinsically safe circuit as follows:

passive sensors:

type of protection	EEx ia /ib	
	IIC	IIB
L_o	1 mH	1 mH
C_o	2.3 μF	14.9 μF

(the tabulated values are based on the dynamic short-circuit current $I_{dyn} = 145 \text{ mA}$)

aktive sensors with the following maximum values:

$$U_o = 1.2 \text{ V}$$

$$I_o = 50 \text{ mA}$$

$$P_o = 60 \text{ mW}$$

type of protection	EEx ia /ib	
	IIC	IIB
L_o	0.5 mH	1 mH
C_o	2 μF	10.9 μF

(the tabulated values are based on the dynamic short-circuit current $I_{dyn} = 145 \text{ mA}$)

The supply circuit is safely electrically isolated from the measuring circuit up to a peak value of the total voltage of 30 V.

Measuring transducer, type TH 102-Ex HW 1.xx

Supply circuit(s) type of protection EEx ib IIC/IIB
 (channel 1: terminals 31+, 32-) for connection to certified intrinsically circuits
 (channel 2: terminals 41+, 42-)

maximum input values:

$$U_i = 29.6 \text{ V}$$

$$I_i = 130 \text{ mA}$$

$$P_i = 0.8 \text{ W}$$

The effective internal capacitance is 15 nF.
 The effective internal inductance is 220 µH.

Measuring circuits type of protection EEx ia IIC/IIB
 Type/variant Pt100 3L or EEx ib IIC/IIB
 (channel 1: terminals 11, 12, 13, 14) with the following maximum values per circuit:
 (channel 2: terminals 21, 22, 23, 24)

$$U_o = 5.6 \text{ V}$$

$$I_o = 1.5 \text{ mA (load current for sensor)}$$

$$P_o = 3 \text{ mW}$$

linear characteristic

$$I_{dyn} = 145 \text{ mA (dynamic short-circuit current)}$$

The effective internal capacitance is 50 nF.
 The effective internal inductance is negligibly low.

The maximum permissible external inductance and capacitance depend on the connected intrinsically safe circuit as follows:

passive sensors:

type of protection	EEx ia /ib	
	IIC	IIB
L_o	1 mH	1 mH
C_o	2.3 µF	14.9 µF

(the tabulated values are based on the dynamic short-circuit current $I_{dyn} = 145 \text{ mA}$)

active sensors with the following maximum values:

$$U_o = 1.2 \text{ V}$$

$$I_o = 50 \text{ mA}$$

$$P_o = 60 \text{ mW}$$

type of protection	EEx ia /ib	
	IIC	IIB
L _o	0.5 mH	1 mH
C _o	2 µF	10.9 µF

(the tabulated values are based on the dynamic short-circuit current $I_{dyn} = 145 \text{ mA}$)

The supply circuits are safely electrically isolated from the respective measuring circuits up to a peak value of the total voltage of 30 V.

Both channels of the measuring transducer TH 101-Ex are safely electrically isolated from each other up to a peak value of the total voltage of 60 V.

Measuring transducer, type TH 202-Ex HW 1.xx with indicator

Supply circuit type of protection EEx ib IIC/IIB
(terminals „+“ and „-“)

for connection to certified intrinsically circuits

maximum input values:
 $U_i = 29.6 \text{ V}$
 $I_i = 130 \text{ mA}$
 $P_i = 0.8 \text{ W}$

The effective internal capacitance is 28 nF.
 The effective internal inductance is 440 µH.

Measuring circuit type of protection EEx ia IIC/IIB
(terminals 1, 2, 3 and 4) or EEx ib IIC/IIB

with the following maximum values:

$U_o = 5.6 \text{ V}$
 $I_o = 1.5 \text{ mA}$ (load current for sensor)
 $P_o = 3 \text{ mW}$
 linear characteristic
 $I_{dyn} = 145 \text{ mA}$ (dynamic short-circuit current)

The effective internal capacitance is 50 nF.
 The effective internal inductance is negligibly low.

2. SUPPLEMENT TO EC-TYPE-EXAMINATION CERTIFICATE PTB 99 ATEX 2139 X

The maximum permissible external inductance and capacitance depend on the connected intrinsically safe circuit as follows:

passive sensors:

type of protection	EEx ia /ib	
	IIC	IIB
L_o	1 mH	1 mH
C_o	2.3 μ F	14.9 μ F

(the tabulated values are based on the dynamic short-circuit current $I_{dyn} = 145$ mA)

active sensors with the following maximum values:

$U_o = 1.2$ V
 $I_o = 50$ mA
 $P_o = 60$ mW

type of protection	EEx ia /ib	
	IIC	IIB
L_o	0.5 mH	1 mH
C_o	2 μ F	10.9 μ F

(the tabulated values are based on the dynamic short-circuit current $I_{dyn} = 145$ mA)

The supply circuit is safely electrically isolated from the measuring circuit up to a peak value of the total voltage of 30 V.

Measuring transducer, type TH 02-Ex HW 2.xx and TH 202-Ex HW 2.xx without indicator

Supply circuittype of protection EEx ia IIC/IIB
 (terminals „+“ and „-“)
 for connection to certified intrinsically circuits

maximum input values:

$U_i = 29.6$ V
 $I_i = 130$ mA
 $P_i = 0.8$ W

The effective internal capacitance is 15 nF.
 The effective internal inductance is 220 μ H.

2. SUPPLEMENT TO EC-TYPE-EXAMINATION CERTIFICATE PTB 99 ATEX 2139 X

Measuring circuit.....type of protection EEx ia IIC/IIB
(terminals 1, 2, 3 and 4) or EEx ib IIC/IIB

with the following maximum values:

$$U_o = 5.6 \text{ V}$$

$$I_o = 1.5 \text{ mA (load current for sensor)}$$

$$P_o = 3 \text{ mW}$$

linear characteristic

$$I_{dyn} = 145 \text{ mA (dynamic short-circuit current)}$$

The effective internal capacitance is 50 nF.

The effective internal inductance is negligibly low.

The maximum permissible external inductance and capacitance depend on the connected intrinsically safe circuit as follows:

passive sensors:

type of protection	EEx ia /ib	
	IIC	IIB
L_o	1 mH	1 mH
C_o	2.3 μF	14.9 μF

(the tabulated values are based on the dynamic short-circuit current $I_{dyn} = 145 \text{ mA}$)

aktive sensors with the following maximum values:

$$U_o = 1.2 \text{ V}$$

$$I_o = 50 \text{ mA}$$

$$P_o = 60 \text{ mW}$$

type of protection	EEx ia /ib	
	IIC	IIB
L_o	0.5 mH	1 mH
C_o	2 μF	10.9 μF

(the tabulated values are based on the dynamic short-circuit current $I_{dyn} = 145 \text{ mA}$)

The supply circuit is safely electrically isolated from the measuring circuit up to a peak value of the total voltage of 30 V.

Measuring transducer, type TH 102-Ex HW 2.xx

Supply circuit(s) type of protection EEx ia IIC/IIB
 (channel 1: terminals 31+, 32-) for connection to certified intrinsically circuits
 (channel 2: terminals 41+, 42-)

maximum input values:

$$U_i = 29.6 \text{ V}$$

$$I_i = 130 \text{ mA}$$

$$P_i = 0.8 \text{ W}$$

The effective internal capacitance is 15 nF.
 The effective internal inductance is 220 µH.

Measuring circuits type of protection EEx ia IIC/IIB
 Type/variant Pt100 3L or EEx ib IIC/IIB
 (channel 1: terminals 11, 12, 13, 14) with the following maximum values per circuit
 (channel 2: terminals 21, 22, 23, 24)

$$U_o = 5.6 \text{ V}$$

$$I_o = 1.5 \text{ mA (load current for sensor)}$$

$$P_o = 3 \text{ mW}$$

linear characteristic

$$I_{dyn} = 145 \text{ mA (dynamic short-circuit current)}$$

The effective internal capacitance is 50 nF.
 The effective internal inductance is negligibly low.

The maximum permissible external inductance and capacitance depend on the connected intrinsically safe circuit as follows:

passive sensors:

type of protection	EEx ia /ib	
	IIC	IIB
L_o	1 mH	1 mH
C_o	2.3 µF	14.9 µF

(the tabulated values are based on the dynamic short-circuit current $I_{dyn} = 145 \text{ mA}$)

active sensors with the following maximum values:

$$U_o = 1.2 \text{ V}$$

$$I_o = 50 \text{ mA}$$

$$P_o = 60 \text{ mW}$$

type of protection	EEx ia /ib	
	IIC	IIB
L_o	0.5 mH	1 mH
C_o	2 μ F	10.9 μ F

(the tabulated values are based on the dynamic short-circuit current $I_{dyn} = 145$ mA)

The supply circuits are safely electrically isolated from the respective measuring circuits up to a peak value of the total voltage of 30 V.

Both channels of the measuring transducer TH 102-Ex are safely electrically isolated from each other up to a peak value of the total voltage of 60 V.

Measuring transducer, type TH 202-Ex HW 2.xx with indicator

Supply circuit type of protection EEx ia IIC/IIB
(terminals „+“ and „-“) for connection to certified intrinsically circuits

maximum input values:

$$U_i = 29.6 \text{ V}$$

$$I_i = 130 \text{ mA}$$

$$P_i = 0.8 \text{ W}$$

The effective internal capacitance is 28 nF.
The effective internal inductance is 440 μ H.

Measuring circuit..... type of protection EEx ia IIC or EEx ia IIB
(terminals 1, 2, 3 and 4) or EEx ib IIC or EEx ib IIB
with the following maximum values:

$$U_o = 5.6 \text{ V}$$

$$I_o = 1.5 \text{ mA (load current for sensor)}$$

$$P_o = 3 \text{ mW}$$

linear characteristic
 $I_{dyn} = 145 \text{ mA (dynamic short-circuit current)}$

The effective internal capacitance is 50 nF.
The effective internal inductance is negligibly low.

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The maximum permissible external inductance and capacitance depend on the connected intrinsically safe circuit as follows:

passive sensors:

type of protection	EEx ia /ib	
	IIC	IIB
L_o	1 mH	1 mH
C_o	2.3 μ F	14.9 μ F

(the tabulated values are based on the dynamic short-circuit current $I_{dyn} = 145$ mA)

aktive sensors with the following maximum values:

$$U_o = 1.2 \text{ V}$$
$$I_o = 50 \text{ mA}$$
$$P_o = 60 \text{ mW}$$

type of protection	EEx ia /ib	
	IIC	IIB
L_o	0.5 mH	1 mH
C_o	2 μ F	10.9 μ F

(the tabulated values are based on the dynamic short-circuit current $I_{dyn} = 145$ mA)

The supply circuit is safely electrically isolated from the measuring circuit up to a peak value of the total voltage of 30 V.

Special conditions for safe use

1. The connection facilities of the measuring transducer, type TH 02-Ex HW x.xx shall be installed as such, that the minimum degree of protection IP 20 in accordance with IEC-publication 60529:1989 is met.
2. Inadmissible electrostatic charge of the plastic housing of the measuring transducer, type TH 102-Ex HW x.xx shall be prevented. A warning label shall point to this danger.

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2. SUPPLEMENT TO EC-TYPE-EXAMINATION CERTIFICATE PTB 99 ATEX 2139 X

Applied standards

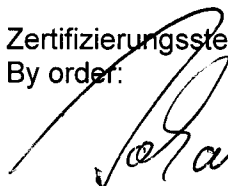
EN 50014:1997 + A1 + A2

EN 50020:2002

EN 50284:1999

Test report: PTB Ex 05-25183

Zertifizierungsstelle Explosionsschutz
By order:



Dr.-Ing. U. Johannsmeyer
Direktor und Professor



Braunschweig, December 21, 2005