Translation

(1) # EC-Type Examination Certificate

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

(3) ## DMT 02 ATEX E 068 X

(4) **Equipment:** **Temperature-Transmitter Typ TF 02-Ex, TF 102-Ex, TF 202-Ex und TF 202-Ex M**

(5) **Manufacturer:** **ABB Automation Products GmbH**

(6) **Address:** **D - 63754 Alzenau**

(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 Deutsche Montan Technologie 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 02.2040 EG.

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

EN 50014:1997 + A1 - A2	General requirements
EN 50020:1994	Intrinsic safety
EN 50284:1999	Equipment Group II Category 1G
EN 50303:2000	Equipment Group I Category M1

(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:

Ex **II 1G** or Ex **I M1** (details see 15.1)

Deutsche Montan Technologie GmbH
Essen, dated 25. April 2002

Signed: Dr. Jockers — DMT-Certification body

Signed: Dr.-Eickhoff — Head of special services unit

Am Technologiepark 1, 45307 Essen, Telefon (0201)172-1416, Telefax (0201)172-1716

(13) Appendix to

(14) # EC-Type Examination Certificate

DMT 02 ATEX E 068 X

(15) 15.1 Subject and type

Temperature-Transmitter

Type TF 02-Ex	Sensor-head transmitter	Ex II 1G EEx ia IIC T6 or	Ex I M1 EEx ia I
Type TF 102-Ex	Sensor-head transmitter in series-rail housing	Ex II 1G EEx ia IIC T6 or	Ex I M1 EEx ia I
Type TF 202-Ex	Sensor-head transmitter in field housing	Ex II 1G EEx ia IIC T6	
Type TF 202-Ex M	Sensor-head transmitter in stainless steel field housing	Ex I M1 EEx ia I	

15.2 Description

The Temperature-Transmitters are used as measured value sensors to detect, amplify and transfer measured values in intrinsically safe circuits. Supply and communication of the values are effected via an intrinsically safe fieldbus.

15.3 Parameters

15.3.1 Supply/communications circuit in the type of protection EEx ia IIC or EEx ia IIB
Connection for type TF 02-Ex via terminals or solder terminals (+) and (-)
Connection for type TF 202-Ex and TF 202-Ex M via terminals (+) and (-)
Connection for type TF 102-Ex via terminals 31 and 32 (Circuit 1) and
Terminals 41 and 42 (Circuit 2)

For connection to intrinsically safe circuits with the following maximum values in accordance with the FISCO/ENTITY-concept:

			IIC	
Maximum input voltage	U_i	DC	24	V
Maximum input current	I_i		360	mA
Maximum input power	P_i		2,52	W

			IIB	
Maximum Input voltage	U_i	DC	24	V
Maximum Input current	I_i		380	mA
Maximum Input power	P_i		5,32	W

Maximum internal capacitance	C_i	5	nF
Maximum internal inductance	L_i	10	µH

Am Technologiepark 1, 45307 Essen, Telefon (0201)172-1416, Telefax (0201)172-1716

DMT

15.3.2 Measurement circuit in the type of protection EEx ia IIC or EEx ia IIB
Connection for type TF 02-Ex via terminals or solder terminals 1, 2, 3 and 4
Connection for type TF 202-Ex and TF 202-Ex M via terminals 1, 2, 3 and 4
Connection for type TF 102-Ex via terminals 11, 12, 13 and 14 (circuit 1) and terminals 21, 22, 23 and 24 (circuit 2)

Maximum output voltage	U_o	DC	5,5	V
Maximum output current	I_o		25	mA
Maximum output power	P_o		35	mW
Characteristic: linear				
Maximum internal capacitance	C_i		60	nF
Maximum internal inductance	L_i		negligible	

For the connection of passive sensors, refer to the following table for the maximum permitted values for C_o and L_o:

	IIC	IIB
L_o in mH	C_o in µF	C_o in µF
2	2.6	15
1	2.9	17
0.5	3.6	21
0.2	4.5	27

For the connection of active sensors with the maximum values $U_o \leq 1{,}2$ V, $I_o \leq 50$ mA, $P_o \leq 60$ mW, C_i and L_i negligible small, refer to the following table for the maximum permitted values for C_o and L_o:

	IIC	IIB
L_o in mH	C_o in µF	C_o in µF
2	1.6	9.8
1	1.9	12
0.	2.3	14
0.2	3.0	19

15.3.3 Display/Service interface in the type of protection EEx ia IIC or EEx ia IIB, only for type TF 02-Ex, TF 202-Ex and type TF 202-Ex M; connection via 6-pin edge connector

Maximum Output voltage	U_o	DC	8,7	V
Maximum Output current	I_o		55	mA
Maximum Output power	P_o		74	mW
Characteristic: linear				

Refer to the following table for the maximum permitted values for Co and Lo:

	IIC	IIB
L_o in mH	C_o in µF	C_o in µF
2	0.8	2
1	0.8	3
0.5	0.8	3
0.2	1	4

Am Technologiepark 1, 45307 Essen, Telefon (0201)172-1416, Telefax (0201)172-1716

DMT

15.3.4 Ambient temperatures or temperatures at the installation site

Equipment Group II, for use in zones of category 1 (Zone 0)	
Temperature class T1 ... T5	- 20 °C to + 60 °C
Temperature class T6	- 20 °C to + 50 °C
Equipment Group II, for use in zones of category 2 (Zone 1)	
Temperature class T1 ... T4	- 40 °C to + 85 °C
Temperature class T5	- 40 °C to + 65 °C
Temperature class T6	- 40 °C to + 50 °C
Equipment Group I, for use in zones of categories M1 and M2	- 20 °C to + 60 °C

(16) Test and assessment report
BVS PP 02.2040 EG as of 25.04.02

(17) Special conditions for safe use

17.1 The Temperature-Transmitter Type TF 02-Ex and TF 102-Ex have to be installed in a housing which guarantee a minimum type of protection IP20 in accordance with EN 60529.

17.2 When using the Temperature-Transmitter Type TF 02-Ex, TF 102-Ex and TF 202-Ex M in underground mines which are endangered by mine gas and/or inflammable dust (Equipment Group I, Categories M1 and M2), interconnections with other intrinsically safe circuits have to be separated tested and certificated.
In addition, the incorporation of the Temperature-Transmitter Types TF 02-Ex and TF 102-Ex into suitable housings (IP54) have to be separated tested and certificated.

17.3 The Temperature-Transmitters are suitable for the following ambient temperatures or installation site temperatures:

Equipment Group II, for use in zones of category 1 (Zone 0)	
Temperature class T1 ... T5	- 20 °C to + 60 °C
Temperature class T6	- 20 °C to + 50 °C
Equipment Group II, for use in zones of category 2 (Zone 1)	
Temperature class T1 ... T4	- 40 °C to + 85 °C
Temperature class T5	- 40 °C to + 65 °C
Temperature class T6	- 40 °C to + 50 °C
Equipment Group I, for use in zones of categories M1 and M2	- 20 °C to + 60 °C

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.

45307 Essen, 04.09.2002
BVS-Rip/Mi E 1470/02

Deutsche Montan Technologie GmbH

DMT-Certification body

Head of special services unit

Am Technologiepark 1, 45307 Essen, Telefon (0201)172-1416, Telefax (0201)172-1716

EXAM
BBG Prüf- und Zertifizier GmbH

Fachstelle für Sicherheit elektrischer Betriebsmittel - BVS

Carl-Beyling-Haus
Dinnendahlstraße 9
44809 Bochum

Telefon 02 01 - 17 2-39 23
Telefax 02 01 - 17 2-39 24

DAR-Reg.-Nr.:
ZLS-P-359-2/01

Änderungsinformation – Revision Report

Prüfprotokoll – Test and Assessment Report
BVS PP 02.2040 EG

Die mit folgender Dokumentation festgelegte Änderung hat keinen Einfluss auf die in o.g. Prüfprotokoll getroffenen Festlegungen.

The modification as defined in the following documentation does not influence the details of the aforementioned test and assessment report.

Dokumentation – Descriptive Documents

Beschreibung (2 Bl.) – Description (2 pages), unterschrieben am –signed 08.09.03

Zeichnung Nr. – Drawing no.	vom - dated	unterschrieben am - signed
TF02 B X	22.01.02/01.09.03	08.09.03
04820-01MOP-213428A	26.08.03	08.09.03
04820-01EBL-213428A	26.08.03	08.09.03
04820-01BPB-213428A	26.08.03	08.09.03
04820-01SLB-213428A	26.08.03	08.09.03
04820-01FRP-213428A	26.08.03	08.09.03
0216061 P1 (2)	09.03.01/08.09.03	08.09.03

44809 Bochum, den 25.09.2003
BVS-Rip/Mi A 20030723

EXAM BBG Prüf- und Zertifizier GmbH
Fachstelle für Sicherheit elektrischer Betriebsmittel - BVS

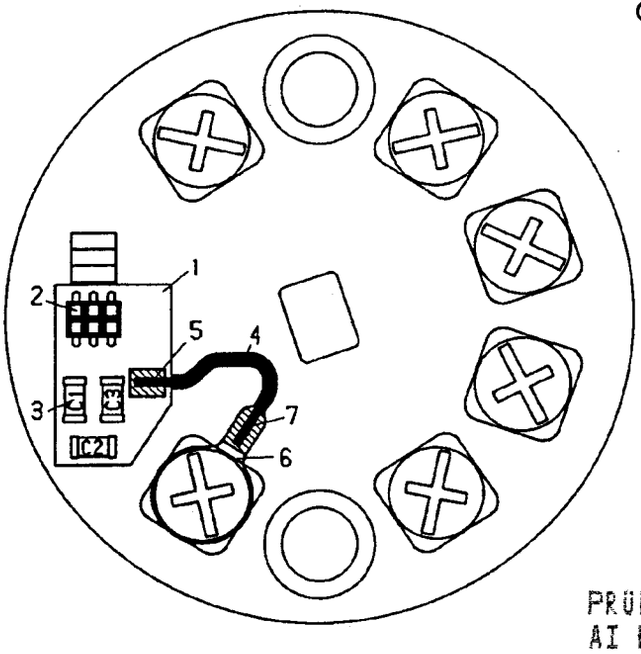
Der Sachverständige - The Testing Officer

Dinnendahlstrasse 9 44809 Bochum Telefon-Phone 0201/172-3923 Telefax-Fax 0201/172-3924
(bis 31.05. 2003: Deutsche Montan Technologie GmbH Dinnendahlstrasse 9 44809 Bochum)

Montageplan

ABB Automation Products GmbH
Borsigstraße 2
D-63755 Alzenau

08. 09. 03



PRÜFUNGSUNTERLAGE ZU
AI BVS PP 02.2040 EG
VOM 25.09.2003
EXAM - BVS BOCHUM

1 = Platine
2 = Buchse, 2x3-Pin, SMD, Platinenunterseite
3 = C1,C2,C3 : ≤3,3nF ±10%, Form 1206, Platinenunterseite
4 = Verbindungsdraht
5 = Lötpad für Verbindungsdraht, Platinenunterseite
6 = Kabelöse M3
7 = Löt- bzw. Krimpstelle

Maßstab 2:1

CAD-File: TFEMVP1L.PIC				V1-1	26.08.03		Zeichnungs Nr.: 04820-01MOP-213428A
				2003	Datum	Name	Benennung : TF02 Filter-Modul
				Zeichn.	26.08.03	A. Wolf	
				Bearb.			
				Gepr.	26.08.03	Deckmann	
				Norm			
							Prod.Nr.: 83010-4820
				ABB Automation Products GmbH 63755 Alzenau Borsigstrasse 2			Sach-Nr.: 213428-TFE-A
01							
Zust	Aenderung	Datum	Name	ges. Blatt 8	Blatt: 1		Ers. fuer: ..... Teilekl.: .....