Translation

(1) # EC-Type Examination Certificate

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

(3) # BVS 09 ATEX E 158 X

(4) **Equipment:** **Alarm Indicator System type AGS 1**

(5) **Manufacturer:** **WOELKE Industrieelektronik GmbH**

(6) **Address:** **45239 Essen, Germany**

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

(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 10.1008 EG.

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

EN 50394-1:2004 Intrinsically safe systems Group I

(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:

I (M1) M2 SYST EEx ib / ia I

DEKRA EXAM GmbH
Bochum, dated 05. February 2010

Signed:Hans Christian Simanski
Certification body

Signed: Dr. Franz Eickhoff
Special services unit

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(13) Appendix to

(14) # EC-Type Examination Certificate

BVS 09 ATEX E 158 X

(15) 15.1 Subject and type

Alarm Indicator System type AGS 1

15.2 Description

The intrinsically safe system 'Alarm Indicator System type AGS 1' comprises the following equipment:

No.	Designation	Type	Certificate number
1	Power Supply Unit	USV 4.2	DMT 01 ATEX E 062
1	Gas- / Temperature Measuring Gauge	MONIMET GMM **.**.***	DMT 03 ATEX E 065 X
	or		
	Gas- / Temperature Measuring Gauge	ANNOVEX GMA **.**.***	DMT 03 ATEX E 065 X
up to 4 each)[1]	Audio- / Opto-Alarm	AVS 4 / AVS 4.1	BVS 08 ATEX E 024 X

- Assemblies according to the local installation rules
- floating contacts and floating opto-isolator- inputs / outputs intended to be connected to IS circuits

)[1] output- (supply-) circuit terminals no. 2 - or no. 3 respectively - of the Power Supply Unit type USV 4.2; output- (supply-) circuit terminals no. 1 are used to supply the Gas- / Temperature Measuring Gauge type MONIMET GMM **.**.*** / ANNOVEX GMA **.**.***.

The interconnection of the equipment of the Alarm Indicator System type AGS 1 is visible in the schematic drawings 406.07.01 and 406.09.01, signed Nov. 18, 2009.

The Gas- / Temperature Measuring Gauge type MONIMET GMM **.**.*** / ANNOVEX GMA **.**.*** is used as control and measuring device.

An IS circuit of a certified electrical IS system may be interconnected to the floating opto-isolator-circuits 'Alarm' and 'Mains power alive' of the Power Supply Unit type USV 4.2.

An IS circuit of a certified electrical IS system may be interconnected to the floating opto-isolator-circuits 'ALARM 1' and 'ALARM 2' of the Audio- / Opto-Alarm type AVS 4 / AVS 4.1.

Floating relay-contacts or floating opto-isolator-inputs / outputs may be interconnected to the non-floating opto-isolator-circuits 'ALARM 1' and 'ALARM 2' of the Audio- / Opto-Alarm type AVS 4 / AVS 4.1.

Audio- / Opto-Alarms type AVS 4 / AVS 4.1 providing floating or non-floating opto-isolator-circuits have different terminal allocation (see tables in clause 15.3.* 'parameters).

After de-energizing of the non IS mains power connection of the Power Supply Unit type USV 4.2 the marking 'I M1 Ex ia I' applies to the Power Supply Unit and the following devices interconnected thereto:
- Gas- / Temperature Measuring Gauge type MONIMET GMM **.**.*** / ANNOVEX GMA **.**.***
- Audio- / Opto-Alarm type AVS 4 / AVS 4.1.

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15.3. Parameters

15.3.1 Power Supply Unit type USV 4.2

15.3.1.1 Non IS supply circuit
(Mains connection)

Voltage (U_m = 250 V_{AC})		230 V / 50 Hz
Voltage (U_m = 110 V_{AC})		100 V / 50 Hz
Voltage (U_m = 50 V_{AC})		42 V / 50 Hz

15.3.1.2 Intrinsically safe circuits

15.3.1.2.1 Output-(supply-) circuit terminals no. 1
(for application requiring level of protection 'ia' and 'ib')

Voltage	U_o	16.2 V
Current	I_o	170 mA

15.3.1.2.2 Output-(supply-) circuit terminals no. 2 or no. 3 respectively
(for application requiring level of protection 'ia')

Voltage	U_o	15.5 V
Current	I_o	3.3 A

15.3.1.2.3 Output-(supply-) circuit terminals no. 2 or no. 3 respectively
(for application requiring level of protection 'ib')

Voltage	U_o	15.5 V
Current	I_o	600 mA

15.3.1.2.4 Terminals 'Alarm', intended to be connected to an IS circuit
(floating transistor output of an opto-isolators)

Voltage	U_i	24 V
Power dissipation	P_i	100mW (25 °C)
Power dissipation	P_i	70mW (40 °C)
Inductance	L_i	negligible
Capacitance	C_i	negligible

15.3.1.2.5 Terminals 'Mains power alive', intended to be connected to an IS circuit
(floating transistor output of an opto-isolators)

Voltage	U_i	24 V
Power dissipation	P_i	100mW (25 °C)
Power dissipation	P_i	70mW (40 °C)
Inductance	L_i	negligible
Capacitance	C_i	negligible

15.3.1.3 Ambient temperature range -20 °C ≤ T_a ≤ +40 °C

15.3.2 Gas- / Temperature Measuring Gauge type MONIMET GMM **.**.*** / ANNOVEX GMA **.**.***
Connector X1 or 12-pole terminal block

15.3.2.1 Supply circuit
Connector pins no. 1 (GND) und 2 (+) or marked terminals

Voltage	U_i	DC	16.2	V
Effective internal capacitance	C_i	≤	110	nF
Effective internal inductance	L_i	≤	5	µH

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15.3.2.2 Alarm-signal circuits providing relays
Alarm 1: connector pins no. 7(-) und 15(+) or marked terminals
Alarm 2: connector pins no. 9(-) und 10(+) or marked terminals

Voltage	U_i	DC	30	V
Current	I_i		1	A
Power	P_i		30	W
Effective internal capacitance	C_i		negligible	
Effective internal inductance	L_i		negligible	

15.3.2.3 Alarm-signal circuits providing opto-isolatorn (alternative to 15.3.2.2)
Alarm 1: connector pins no. 7(-) and 15(+) or marked terminals
Alarm 2: connector pins no. 9(-) and 10(+) or marked terminals

Voltage	U_i	DC	30	V
Current	Ii_i		100	mA
Power	P_i		100	mW
Effective internal capacitance	C_i		negligible	
Effective internal inductance	L_i		negligible	

15.3.2.4 Ambient temperature range: $-20°C \leq T_a \leq +60°C$
$-20°C \leq T_a \leq +50°C$ (electro-chemical sensors)

15.3.3 Audio- / Opto-Alarm type AVS 4 / type AVS 4.1

15.3.3.1 Terminal allocation 'floating opto-isolator-input ALARM 1 and ALARM 2'

Parameter	Supply circuit	Remote circuits)[1]	
		ALARM 1	ALARM 2
Level of protection	Ex ia I	Ex ia I	Ex ia I
Voltage U_i	DC 16 V	DC 24 V	DC 24 V
Current I_i	2 A	N / A	N / A
Power P_i	N / A	N / A	N / A
Effective internal capacitance C_i	110 nF	negligible	negligible
Effective internal inductance L_i	negligible	negligible	negligible
Terminals	X1 (+), X2 (-)	X6 (+), X7 (-)	X9 (+), X10 (-)
Remark:)[1] galvanically separated from each other and from the supply circuit N / A = not applicable			

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15.3.3.2 Terminal allocation 'non-floating opto-isolator-inputs ALARM 1 and ALARM 2' intended to be connected to relay contacts or opto-isolator-outputs providing 'active open' characteristic

Parameter	Supply circuit	Remote circits	
		ALARM 1	ALARM 2
Level of protection	Ex ia I	Ex ia I	Ex ia I
Voltage U_i	DC 16 V	N / A	N / A
Current I_i	2 A	N / A	N / A
Power P_i	N / A	N / A	N / A
Effective internal capacitance C_i	110 nF	negligible	negligible
Effective internal inductance L_i	negligible	negligible	negligible
Voltage U_o	N / A	DC 16 V)[3]	DC 16 V)[3]
Current I_o	N / A	5 mA	5 mA
Power P_o	N / A	20 mW	20 mW
max. external capacitance C_o	N / A	13 µF	13 µF
max. external inductance L_i	N / A	18.66 H	18.66 H
max. inductance- / resistance ratio $L_o(R_o$	N / A	24.93 mH/Ω	24.93 mH/Ω
Characteristics	N / A	linear	linear
Terminals)[1]	X1 (+), X2 (-)	X5 (+), X6 (-)	X8 (+), X9 (-)
Interconnection between)[1]	N / A	X7 -X11	X10-X11
Terminals)[2]	X1 (+), X2 (-)	X6 (+), X7 (-)	X9 (+), X10 (-)
Interconnection between)[2]	N / A	X5 -X6, X7-X11	X8 -X9, X10-X11
Remarks:)[1] intended to be connected to floating relay contacts or opto-isolator-outputs providing 'active open' characteristic)[2] intended to be connected to floating relay contacts or opto-isolator-outputs providing 'active closed' characteristic)[3] identical with U_i in the supply circuit N / A = not applicable			

15.3.3.3 Ambient temperature range: $-20\ °C \leq T_a \leq +60\ °C$

(16) Test and assessment report

BVS PP 10.1008 EG as of 05.02.2010

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(17) Special conditions for safe use

Installation of the 6-wire interconnection cable between Power Supply Unit type USV 4.2 and the Audio- / Opto-Alarms type AVS 4 / type AVS 4.1 shall provide protection against mechanical impact.

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, 05.02.2010
BVS-Hk/Her A 20090658

DEKRA EXAM GmbH

Certification body

Special services unit

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