



1 **EU TYPE-EXAMINATION CERTIFICATE**

2 Equipment intended for use in Potentially Explosive Atmospheres Directive 2014/34/EU
3 Certificate Number: **CSANe 20ATEX1078X** Issue: **0**
4 Equipment: **TRICOR TCMQ– System consisting of TCMQ**** – Sensor and TCD9x00-a-bcde-fgh–iii – Transmitter**
5 Applicant: **KEM Kueppers Elektromechnik GmbH**
6 Address: **Liebigstraße 5
85757 Karlsfeld
Germany**

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

8 CSA Group Netherlands B.V., notified body number 2813 in accordance with Articles 17 and 21 of Directive 2014/34/EU of the European Parliament and of the Council, dated 26 February 2014, 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 confidential reports listed in Section 14.2.

9 Compliance with the Essential Health and Safety Requirements, with the exception of those listed in the schedule to this certificate, has been assured by compliance with the following documents:

EN IEC 60079-0:2018	EN 60079-1:2014	EN 60079-7:2015/A1:2018
EN 60079-11:2012	EN 60079-31:2014	

10 If the sign 'X' is placed after the certificate number, it indicates that the equipment is subject to specific conditions of use specified in the schedule to this certificate.

11 This EU 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 shall include the following:



II 1/2 (1) G
II 2 (1) D
Ex db eb ia [ia Ga] IIC T* Ga/Gb Ta = -40°C to +*°C
Ex tb [ia Da] IIIC T*°C Db

* the temperature class and the maximum surface temperature for hazardous dusts are dependent on the maximum ambient temperature and the maximum process temperature as detailed in the Specific Conditions of Use and Conditions of Manufacture

Project Number 80040208

Signed: J A May

Title: Director of Operations

CSA Group Netherlands B.V.
Utrechtseweg 310, Building B42,
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13 DESCRIPTION OF EQUIPMENT

The TRICOR TCMQ is a two chamber (Electronics and Terminal) flameproof 'Ex d' and increased safety 'Ex e' transmitter enclosure mounted on top of a flameproof 'Ex d' sensor enclosure. The TRICOR TCMQ**** Sensor is powered directly by the TRICOR TCD9x00-a-bcde-fgh-iii Transmitter via a glass to metal bushing fitted within the interconnecting pedestal. The transmitter electronics flameproof chamber is fitted with various electronics modules and has a display and window fitted to one end. The transmitter terminal increased safety chamber is fitted with user terminals that allow for direct connection of an external power supply and intrinsically safe field circuits. These field connections are electrically routed to the electronics chamber via a single internal flameproof bushing.

The TRICOR TCD9x00-a-bcde-fgh-iii Transmitter is intended to be powered via an 20 Vdc to 90 Vdc (11 W) or 250 Vac (30 VA) power supply connected to the following terminals:

Power Supply Terminals: L (1) and N (2)	Um = 264 V
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The TRICOR TCD9x00-a-bcde-fgh-iii Transmitter is intended for direct connection to the TRICOR TCMQ Sensor via a 4-pin flameproof connection or flameproof cable gland and cable. The four-wire connection to the remote TRICOR TCMQ Sensor with DSL from the TRICOR TCMQ TCD9200-a-bcde-fgh-iii Transmitter is intrinsically safe [Ex ia Ga] and provides both power and serial communications. This four-wire connection has the following safety description:

SSL Interface	Circuit type	Active IIC	Active IIB
M12 Connector - Pins 1 to 4	Uo	17.42 V	
	Io	459 mA	
	Po	2.0 W	
	Ci	840 pF	
	Co	338 nF	1.96 µF
	Li	4 µH	
	Lo	134 µH	675 µH
	Lo /Ro	17.8 µH/Ω	

The TRICOR TCD9x00-a-bcde-fgh-iii transmits the measurements taken by the TRICOR TCMQ Sensor back to the safe area via the following intrinsically field connections:

HART (Active)	Circuit type	Active IIC	Active IIB
Terminal: Ca+ (4) and C (5)	Uo	28 V	
	Io	85 mA	
	Po	0.584 W	
	Co	72 nF	639 nF
	Lo	1.64 mH	16.4 mH

HART (Passive)	Circuit type	Passive IIC	Passive IIB
Terminals: C (5) and Cp- (6)	Ui	30 V	N/A
	Ii	100 mA	N/A
	Pi	1 W	N/A
	Ci	15.8 nF	N/A
	Li	36 µH	N/A



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IO (Channel 2) Active Terminal: IO2+ (8) and IO2 (9) Passive Terminal: IO2 (9) and IO2-(10)	Circuit type	Active IIC	Passive IIC	Active IIB	Passive IIB
	Uo	28 V	N/A	N/A	
	Io	87 mA	N/A	N/A	
	Po	0.601 W	N/A	N/A	
	Co	78 nF	61 nF	645 nF	
	Lo	1.46 mH	3.6 mH	15.7 mH	
	Ui	N/A	30 V		
	Ii	N/A	100 mA		
	Pi	N/A	1 W		
	Ci	N/A	7.3 nF		
	Li	N/A	36 μH		

IO (Channel 3) Active Terminal: IO3 + (11) and IO3 (12) Passive Terminal: IO3 (12) and IO3 – (13) Relay Terminal: NC (11), C (12) and NO (13)	Circuit type	Active IIC	Passive IIC	Relay	Active IIB	Passive IIB
	Uo	28 V	N/A	N/A		
	Io	87 mA	N/A	N/A		
	Po	0.61 W				
	Co	78 nF	61 nF	59 nF	645 nF	
	Lo	1.46 mH	3.6 mH	3.4 mH	15.7 mH	
	Ui	N/A	30V	30 V		
	Ii	N/A	100 mA	100 mA		
	Pi	N/A	1 W	1W		
	Ci	4.2 nF	7.3 nF	7.3 nF		
	Li	34 μH	36 μH	36 μH		

IO (Channel 4) Active Terminal: IO4+(14) and IO4 (15) Passive Terminal: IO4 (15) and IO4- (16) Relay Terminal: NC (14), C (15) and NO (16)	Circuit type	Active IIC	Passive IIC	Relay	Active IIB	Passive IIB
	Uo	28 V	N/A	N/A		
	Io	87 mA	N/A	N/A		
	Po	0.61 W	N/A	N/A		
	Co	78 nF	61 nF	59 nF	645 nF	
	Lo	1.46 mH	3.6 mH	3.4 mH	15.7 mH	
	Ui	N/A	30V	30 V		
	Ii	N/A	100 mA	100 mA		
	Pi	N/A	1 W	1W		
	Ci	4.2 nF	7.3 nF	7.3 nF		
	Li	34 μH	36 μH	36 μH		

Modbus Terminal (4) and (5)	Modbus input, ia IIC	Modbus output, ia IIC	Modbus output, ia IIB
	Ui = 4.2V	Uo = 4.2 V	Uo = 4.2 V
	Ii = 149 mA	Io = 117.8 mA	Io = 117.8 mA
	Pi = 156 mW	Po = 124 mW	Po = 124 mW
	Ci < 500 pF	Co = 420 μF	Co = 1000 μF
Li < 50 μH	Lo = 2.56 mH	Lo = 10.198 mH	

14 DESCRIPTIVE DOCUMENTS

14.1 Drawings

Refer to Certificate Annexe.



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14.2 Associated Reports and Certificate History

Issue	Date	Report number	Comment
0	18 March 2021	R80040208A	The release of prime certificate.

14.3 Certificate number SIRA 12ATEX1102X Issue 8

15 SPECIFIC CONDITIONS OF USE (denoted by X after the certificate number)

15.1 The TRICOR TCMQ TCD9x00-a-bcde-fgh-iii shall only be electrically powered / connected to an overvoltage category II or better circuit as defined in IEC 60664-1 and required by Annex F of IEC 60079-11.

15.2 The quoted entity parameters of Co and Lo are applicable for the distributed capacitance and inductance in cables. Where there is circuit capacitance or inductance in the connected equipment (represented by Ci and Li) that both total more than 1% of quoted Co and Lo then the Co and Lo of the connected equipment shall not exceed 50% of the quoted Co and Lo values.

15.3 The maximum dust layer shall be no greater than 5 mm (T₅ 85°C).

15.4 The apparatus housing shall be connected to the potential equalising conductor in the hazardous area.

15.5 The maximum allowable process fluid temperatures with respect to the marked temperature class and maximum surface temperature for the device in the following maximum ambient temperatures are:

Ta / °C	Maximum Process Temperature / °C			
	T6	T5	T4	T3
60	80	80	80	80
55	85	100	110	110
50	85	100	135	140
45	85	100	135	170
40	85	100	135	200
35	85	100	135	200
30	85	100	135	200

If T_{process} ≤ 85°C, maximum surface temperature = 85°C.
If T_{process} > 85°C, maximum surface temperature = process temperature

15.6 The maximum pressure associated with the process medium in the internal pipes shall be limited to 160 bar.

15.7 If the Sensor is mounted remotely from the Adapter, the wiring shall be given protection against torsional and tensile stresses (e.g. by the use of conduit).

15.8 The EPL marking Gb/Ga indicates that the equipment is for use in zone 1, but the sensor interfaces with the process fluid, which may be zone 0 inside the process pipe.

16 ESSENTIAL HEALTH AND SAFETY REQUIREMENTS OF ANNEX II (EHSRs)

The relevant EHSRs that are not addressed by the standards listed in this certificate have been identified and individually assessed in the reports listed in Section 14.2.

17 CONDITIONS OF MANUFACTURE

17.1 The use of this certificate is subject to the Regulations Applicable to Holders of CSA Certificates.

17.2 Holders of EU-Type Examination Certificates are required to comply with the conformity to type requirements defined in Article 13 of Directive 2014/34/EU.

Certificate Annexe



Certificate Number: CSANe 20ATEX1078X

Equipment: TRICOR TCMQ– System consisting of
TCMQ**** – Sensor and TCD9x00-a-bcde-
fgh–iii – Transmitter

Applicant: KEM Kueppers Elektromechanik GmbH

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Drawing	Sheets	Rev	Date (Stamp)	Title
TCMQ-ATEX-MRK-LBL-MTR-MNT-2	1 of 2	RO1	21 Jan 21	Display Compact Mounting, ALU for TCMQ series
TCMQ-ATEX-MRK-LBL-RMT-MNT-1	1 of 2	RO1	21 Jan 21	TCD-9200-R/L-xxxx-xx for TCMQ-series

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