



1 **EU-TYPE EXAMINATION CERTIFICATE**

2 Equipment intended for use in Potentially Explosive Atmospheres Directive 2014/34/EU

3 Certificate Number: **CSANe 23ATEX1126X** Issue: **0**

4 Equipment: **M400 2-Wire G2 Series Multi-parameter Transmitter**

5 Applicant: **METTLER-TOLEDO GmbH**

6 Address: **Process Analytics
Im Hackacker 15
8902 Urdorf
Switzerland**

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 60079-11:2012

10 If the sign 'X' is placed after the certificate number, it indicates that the equipment is subject to Specific Conditions of Use identified 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 1G
II 2D
II 2(1)G
II 2(1)D
Ex ia IIC T4 Ga
Ex ia IIIC T80°C Db
Ex ib [ia Ga] IIC T4 Gb
Ex ib [ia Da] IIIC T80°C Db
Ta = -20°C to 60°C
IP66

Signed:

M Halliwell
Title: Director of Operations



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SCHEDULE

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Issue 0

13 DESCRIPTION OF EQUIPMENT

Intrinsically safe M400 2-Wire G2 Series Multi-parameter Transmitter (hereinafter, transmitter) is used in hazardous areas, collecting physical signals such as pH, electrical conductivity (resistivity), dissolved oxygen, process temperature etc., it converts those signals into a standard 4 - 20mA HART electrical signal. The transmitter is suitable for Zone 0, Zone 1 and Zone 21.

The transmitter is powered by 2-wire and can be connected to an analog sensor or digital sensor to deliver 4-20mA HART (including main and auxiliary 4-20mA) output signal, representing pH, conductivity (resistivity), dissolved oxygen and process temperature etc.. There are optional 0/4-20mA input, digital input signals, digital output signals for alarm and control.

The transmitter consists of aluminum alloy housing (back cover and front cover), with three PCBs installed inside and are protected by an additional plastic cover. On the front cover, there is one LCD display and four membrane buttons. 35 terminals are designed for external connection.

The transmitter has been tested in accordance with the test of enclosure section of EN IEC 60079-0:2018 and meets the requirements of IP66.

The M400 is available in different versions. Model designations of the "M400 2aH Type b c d" are as follows:

a = none: model for Zone 2 and Class I, Division 2

a = X: model for Zone 0 or 1 and Zone 21, Class I/II/III, Division 1

b = 2, 3 or any numbers: indicating firmware differences only for different sensors

c = none: supporting both analog and digital (ISM) sensors

c = ISM: supporting digital (ISM) sensors only

d = any alphanumeric code and strings that is only with adjustment on firmware compared with the above models

The entity parameters are listed in Table 1:

Table 1 Entity parameters of terminals

Terminal No.	Function	Entity parameters				
1, 2, 3, 4	ES485 Easy clean	$U_i=7.2V$	$I_i=20mA$	$P_i=0.15W$	$L_i=0$	$C_i=0.3\mu F$
5, 6	Digital Input 1	$U_i=30V$	$I_i=100mA$	$P_i=0.8W$	$L_i=0$	$C_i=0$
7, 8	Digital Input 2	$U_i=30V$	$I_i=100mA$	$P_i=0.8W$	$L_i=0$	$C_i=0$
9, 10	OC1 Output	$U_i=30V$	$I_i=100mA$	$P_i=0.8W$	$L_i=0$	$C_i=0$
11, 12	OC2 Output	$U_i=30V$	$I_i=100mA$	$P_i=0.8W$	$L_i=0$	$C_i=0$
13, 14	Aout1 (HART)	$U_i=30V$	$I_i=100mA$	$P_i=0.8W$	$L_i=0$	$C_i=15nF$
15, 16	Aout2	$U_i=30V$	$I_i=100mA$	$P_i=0.8W$	$L_i=0$	$C_i=15nF$
P, Q	Analog Input	$U_i=30V$	$I_i=100mA$	$P_i=0.8W$	$L_i=0$	$C_i=15nF$
N, O	RS485 Sensor	$U_o=5.88V$ $U_i=10V$	$I_o=13.5mA$ $I_i=100mA$	$P_o=19.9mW$ $P_i=500mW$	$L_o=1mH$ $L_i=0mH$	$C_o=3.3\mu F$ $C_i=0\mu F$
L, M	One-wire Sensor	$U_o=5.88V$	$I_o=21.3mA$	$P_o=31.3mW$	$L_o=1mH$	$C_o=2.8\mu F$
J, K wrt I	Temperature Sensor	$U_o=5.88V$	$I_o=5.4mA$	$P_o=8.0mW$	$L_o=5mH$	$C_o=2\mu F$
B, C, D, H	Dissolved Oxygen Sensor	$U_o=11.24V$	$I_o=2.3mA$	$P_o=6.3mW$	$L_o=1mH$	$C_o=0.84\mu F$
A, B, E wrt G	Conductivity Sensor	$U_o=5.88V$	$I_o=25.7mA$	$P_o=37.8mW$	$L_o=1mH$	$C_o=2.5\mu F$
A, E wrt G	pH Sensor	$U_o=5.88V$	$I_o=1.3mA$	$P_o=1.9mW$	$L_o=5mH$	$C_o=2.1\mu F$

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Note: Parameters for terminal "A" to "K" are for analog sensors, thus they are not applicable for product models named "M400 2aH Type b ISM d".

14 DESCRIPTIVE DOCUMENTS

14.1 Drawings

Refer to Certificate Annexe.

14.2 Associated Reports and Certificate History

Issue	Date	Report number	Comment
0	23 June 2023	R80119115A	The release of the prime certificate.

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

15.1 Install only as per installation instruction.

15.2 Under certain extreme circumstances, the non-metallic parts incorporated in the enclosure of this equipment may generate an ignition-capable level of electrostatic charge. Therefore, the equipment shall not be installed in a location where the external conditions are conducive to the build-up of electrostatic charge on such surfaces. In addition, the equipment shall only be cleaned with a damp cloth.

15.3 All cable entry holes shall be fitted with either certified cable glands or blanking elements with degree of protection IP66 in compliance with the test of enclosure section of EN IEC 60079-0.

15.4 The display has not been tested for resistance to ultraviolet light. The display shall be protected from direct light (e.g. from sunlight or luminaires).

15.5 Resistance to impact was tested corresponding to the low risk of mechanical danger. The equipment has to be protected against strong impacts.

15.6 The enclosure is manufactured from aluminium alloy. In rare cases, ignition sources due to impact and friction sparks could occur. This shall be considered when the transmitter is being installed in Zone 0 locations for Group II level of protection Ga.

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 Group Netherlands B.V. 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.

17.3 At the conclusion of manufacture, each complete sample of transformer shall be subjected to a routine dielectric strength test for a minimum of 60 s in accordance with EN 60079-11:2012 clause 11.2 as follows:

- 500 Vac shall be applied between primary to secondary winding
- 500 Vac shall be applied between all windings and the core

Alternatively, 1.2 times the test voltage shall be applied for a minimum of 1 s. The maximum current shall not exceed 5 mA and there shall be no evidence of insulation breakdown.

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- 17.4 The product incorporates previously certified Ex components listed as below. It is therefore the responsibility of Mettler-Toledo to continually monitor the status of the certifications associated with these devices. Mettler-Toledo shall inform CSA of any modifications to the device that may impinge upon the explosion safety design of the product.

Item	Manufacturers and Model Number	ATEX Certificate
Digital isolators	Texas Instrument, Inc ISO7021FDR	CSANe 20ATEX2090U Issue 0
Digital isolators	Texas Instrument, Inc ISO7041FDBQR	CSANe 20ATEX2003U Issue 0

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