IECEx Certificate of Conformity

INTERNATIONAL ELECTROTECHNICAL COMMISSION
IEC Certification System for Explosive Atmospheres

for rules and details of the IECEx Scheme visit www.iecex.com

Certificate No.: **IECEx IMQ 24.0006X**

Certificate history:

Status: **Current**

Issue No: 0

Date of Issue: 2024-06-03

Applicant: **ELSI S.r.l.**
Via Milano, 11
Lainate (MI) 20045
Italy

Equipment: **Thermometric assembly, series Q1 and S2**

Optional accessory:

Type of Protection: **Flameproof enclosures Ex db; Dust tight Ex tb**

Marking: **For Series Q1**

Ex db IIC T6…T1 Gb

Ex tb IIIC T80°C…T440°C Db

For Series S2

Ex db IIC T6…T1 Ga/Gb

Ex tb IIIC T80°C…T440°C Da/Db

Approved for issue on behalf of the IECEx Certification Body: **Mr. Mauro CASARI**

Position: **IMQ ExCB Manager**

Signature:
(for printed version)

Date:
(for printed version)

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Certificate issued by:

Istituto Italiano del Marchio di Qualità S.p.A
Via Quintiliano 43
20138 Milano
Italy

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Date of issue: 2024-06-03 Issue No: 0

Manufacturer: **ELSI S.r.l.**
Via Milano, 11
Lainate (MI) 20045
Italy

Manufacturing locations:

This certificate is issued as verification that a sample(s), representative of production, was assessed and tested and found to comply with the IEC Standard list below and that the manufacturer's quality system, relating to the Ex products covered by this certificate, was assessed and found to comply with the IECEx Quality system requirements.This certificate is granted subject to the conditions as set out in IECEx Scheme Rules, IECEx 02 and Operational Documents as amended

STANDARDS :
The equipment and any acceptable variations to it specified in the schedule of this certificate and the identified documents, was found to comply with the following standards

IEC 60079-0:2017 Explosive atmospheres - Part 0: Equipment - General requirements
Edition:7.0

IEC 60079-1:2014 Explosive atmospheres - Part 1: Equipment protection by flameproof enclosures "d"
Edition:7.0

IEC 60079-26:2021 Explosive atmospheres - Part 26: Equipment with Separation Elements or combined Levels of Protection
Edition:4.0

IEC 60079-26:2014 Explosive atmospheres – Part 26: Equipment with Equipment Protection Level (EPL) Ga
Edition:3.0

IEC 60079-31:2022 Explosive atmospheres – Part 31: Equipment dust ignition protection by enclosure "t"
Edition:3.0

IEC 60079-31:2013 Explosive atmospheres - Part 31: Equipment dust ignition protection by enclosure "t"
Edition:2

This Certificate **does not** indicate compliance with safety and performance requirements other than those expressly included in the Standards listed above.

TEST & ASSESSMENT REPORTS:
A sample(s) of the equipment listed has successfully met the examination and test requirements as recorded in:

Test Report:

IT/IMQ/ExTR24.0006/00

Quality Assessment Report:

IT/IMQ/QAR24.0002/00

IECEx Certificate of Conformity

EQUIPMENT:
Equipment and systems covered by this Certificate are as follows:

Thermometric assemblies, Series Q1 and S2, are used to measure (by means of a resistive sensor, RTD, or thermocouple, T/C) the temperature of solids, liquids or gases.
They are suitable to be used in presence of gas (Group IIC) and/or dust (Group IIIC).
Series Q1 can be installed in Zone 1 and/or Zone 21, while Series S2 can be installed on the boundary wall between Zone 0 (or Zone 20) and Zone 1 (or Zone 21) with the terminal enclosure placed in the Zone 1 (or Zone 21).

Full details in Annex.

SPECIFIC CONDITIONS OF USE: YES as shown below:

- The equipment shall be installed in compliance with manufacturer's safety instruction document.
- The installer has to space out the terminal box enclosure from the process in order to guarantee that the temperature on its surface does not exceed the maximum ambient temperature specified (when the equipment is switched off).
- User has to periodically clean the enclosure in order to avoid the creation of a dust layer higher than 5 mm.
- Flameproof joints are not intended to be repaired.
- Potential electrostatic charging hazard – Painted equipment shall be cleaned only with a damp cloth or antistatic products.

In addition, for series S2 equipment:

- The user has to apply the safety requirements of relevant industrial standard in order to ensure that the partition wall can sustain the specified process pressure, temperature or mechanical loads.
- The user has to ensure that the process connection will result in a sufficient tight joint (IP66 or IP67 according to IEC 60529) for the specified process condition.
- Graphite tape type shall be applied to the process thread (only when it complies to ISO 228)

Annex:

IECEx IECEx IMQ 24.0006X issue No. 0 Annex.pdf

General description

Thermometric assemblies, Series Q1 and S2, are used to measure (by means of a resistive sensor, RTD, or thermocouple, T/C) the temperature of solids, liquids or gases.

They are suitable to be used in presence of gas (Group IIC) and/or dust (Group IIIC).

Series Q1 can be installed in Zone 1 and/or Zone 21, while Series S2 can be installed on the boundary wall between Zone 0 (or Zone 20) and Zone 1 (or Zone 21) with the terminal enclosure placed in the Zone 1 (or Zone 21).

The equipment are made of metallic material and they are composed of an enclosure (which contains the terminals and/or the conversion/supply electronic circuit) and a stainless steel thermowell (for Series S2) which contains the probe or a threaded fitting (for Series Q1) for connection to the process made of stainless steel.

The probe can be made of AISI 316, AISI 321 or INCONEL 600 (with a minimum diameter of 3 mm and minimum thickness of 0.45 mm), the cable has magnesium oxide insulation and its end is closed with an epoxy resin.

For Series Q1, the terminal enclosure is connected to the probe through a threaded fitting which is welded to it and, when it is supplied with, a threaded fitting for process connection.

This threaded fitting for process connection is fixed to the probe by welding or through a sliding threaded compression fitting (which is part of this certification) which allows the user to choose where to position the thermowell on the probe.
The thermowell is connected to the process through a threaded joint.

For Series S2, the terminal enclosure is connected to the thermowell through a stainless steel nipple (which is part of this certification), a galvanized steel three pieces joint (already ATEX and IECEx certified) and another galvanized steel nipple (already ATEX and IECEx certified). The thermowell is connected to the process through a joint (threaded, flanged or welded).

The probe (which includes up to three sensors) is included in the thermowell and kept in position through the use of two elastic ring and a spring.

The thermowell can be made of AISI (304, 304L, 310, 316, 316L, 321, 321H, 347, 446), INCOLOY 800 (or 825), INCONEL 600 (or 601), INCOLOY 625, MONEL or HASTELLOY.

In order to be suitable for EPL Ga (or Da) a thermowell with thickness greater than 1 mm is used in conjunction to two addition “flameproof joints” (one between the nipple and the probe and one realized by the three-piece joint) and a “dust tight joint” before the partition wall.

Ratings

Rated voltage: from 10 to 30 Vdc

Rated current: from 4 to 20 mA; or
1 mA (for RTD)

Maximum process temperature: 400°C

Degree of protection:

- IP 66 (according to IEC 60079-0 and IEC 60529)
- IP 66/67 (declared by the manufacturer for identification codes “Q1.2”, “Q1.3”, “S2.2”, “S2.3”);

Warning

- See instruction document
- After de-energizing, delay 15 minutes before opening

List of IECEx certified equipment or component that can be part of the thermometric assembly

The equipment is partially composed of the following equipment or components:

#	Manufacturer	Description	Ex mode of protection	IEC Ex Certificate *ATEX Certificate*	*Standard*	*Gap analysis review (ExTAG DS 2014-001)*
1	Cortem S.p.a.	Empty box Series SWS (aluminium)	Ex d IIC Gb Ex tb IIIC Db	IECEx CES 15.0012U_i0 CESI 03 ATEX 059U_i2	IEC 60079-0: 2011 Ed. 6.0 IEC 60079-1:2014 Ed. 7.0 IEC 60079-31:2013 Ed. 2	From IEC 60079-0 Ed.6 to Ed.7: No additional technical options or technical requirements in addition or applicable for the enclosure. From IEC 60079-31 Ed.2 to Ed.3: No additional technical options or technical requirements in addition or applicable for the enclosure. Any additional requirement has already been taken into account in this ExTR
2	F.L.P. Elettroceramica industriale S.r.l.	Empty enclosure Series TTE100 (aluminium)	Ex db IIC Gb Ex tb IIIC Db	IECEx CES 14.0005U_i1 CESI 00 ATEX 008 U_i4	IEC 60079-0: Ed. 7.0 IEC 60079-1 Ed. 7.0 IEC 60079-31 Ed. 2	From IEC 60079-31 Ed.2 to Ed.3: No additional technical options or technical requirements in addition or applicable for the enclosure. Any additional requirement has already been taken into account in this ExTR
3	BARTEC FN	Nipple Type NP1 (Galvanized steel)	Ex db IIC Gb Ex tb IIIC Db	IECEx INE 16.0014X_i2 INERIS 16 ATEX 0007X_i1	IEC 60079-0 Ed. 6.0 IEC 60079-1 Ed. 7.0 IEC 60079-31 Ed. 2	From IEC 60079-0 Ed.6 to Ed.7: No additional technical options or technical requirements in addition or applicable for the equipment. From IEC 60079-31 Ed.2 to Ed.3: No additional technical options or technical requirements in addition or applicable for the equipment. Any additional requirement has already been taken into account in this ExTR
4	EL.FIT S.p.a.	Three pieces fitting Series RFF1G (Galvanized steel)	Ex d IIC Gb Ex tb IIIC Db	IECEx CES 10.0002U_i1 CESI 99 ATEX 034 U_i4	IEC 60079-0 Ed. 6.0 IEC 60079-1 Ed. 6.0 IEC 60079-31 Ed. 1	From IEC 60079-0 Ed.6 to Ed.7: No additional technical options or technical requirements in addition or applicable for the component. From IEC 60079-1 Ed.6 to Ed.7: No additional technical options or technical requirements in addition or applicable for the component. From IEC 60079-31 Ed.1 to Ed.2: No additional technical options or technical requirements in addition or applicable for the component. From IEC 60079-31 Ed.2 to Ed.3: No additional technical options or technical requirements in addition or applicable for the component. Any additional requirement has already been taken into account in this ExTR

Identification

XX. XXX - XXX - XXXX – XXX / A

Type of probe (Q1, S2)

Head type FPL (TTE100), CORTEM (SWS)

Type	Electrical connection	ID
FPL (TTE100)	terminal block	X
FPL (TTE100)	transmitter	U
CORTEM (SWS)	terminal block	2
CORTEM (SWS)	transmitter	3

Insert diameter * Ø min 3 mm – max 8 mm

Value element type in ohms *

probe	ID
THERMORESISTANCE	= P
THERMOCOUPLE	≠ P

Number of elements and tolerance *

Type of thermoelement *

Insert material *
AISI 316, AISI 321, INCONEL 600

Immersion* length
Q1 minimum 50 mm and 10000 mm maximum
S2 minimum 50 mm and 2000 mm maximum

Process thread type

Thread type	ID	Thread type	ID
1/8" GAS	E	1/8" NPT	M
1/4" GAS	F	1/4" NPT	N
3/8" GAS	H	3/8" NPT	P
1/2" GAS	I	1/2" NPT	Q
3/4" GAS	J	3/4" NPT	R
1" GAS	L	1" NPT	T
None	S	None	S

***Extension length* ***
Q1 minimum 0 and 500 mm maximum
S2 minimum 100 and 200 mm maximum

Thermometric complex with ATEX & IECEx certification

* Parameters that do not affect the mode of protection

Note: The identification code shows the letter 'S' when the Q1 equipment is supplied with the sliding threaded compression fitting.

Installation conditions

The equipment is foreseen to be installed in locations where there are environmental conditions as clearly specified at clause 1, par. 2 of IEC 60079-0.

Installation and use in atmospheric and environmental conditions that are out of above mentioned intervals require special considerations and additional measures.

It is not a requirement of the applicable standards listed in first page that the certification body confirm suitability for these special considerations and additional measures.

Installation of equipment shall be done according to IEC 60079-14 Standard requirements.

The user has to connect the free extremity of cable either in non-explosive atmosphere or in an enclosure protected by a recognized type of protection.

The cable that is connected to the equipment must be at least 3 meters long (otherwise a “barrier” cable gland must be used).

Entry cable devices have to be selected according to Table 10 of IEC 60079-14 and they shall be compliant with the following:

- They shall be IECEx certified according to current edition of IEC 60079-0, IEC 60079-1 and IEC 60079-31, with EPLs Gb and Db, and installed according IEC 60079-14;
- They shall guarantee the declared protection degree of the equipment and shall have operating temperature suitable for a range from -20°C to +85°C;
- They shall be of type:
  - ½” NPT (for identification codes “Q1.X”, “Q1.U”, “S2.X”, “S2.U”);or
  - ¾” NPT (for identification codes ““Q1.2”, “Q1.3”, “S2.2”, “S2.3”);

Specific conditions of use (X)

- The equipment shall be installed in compliance with manufacturer’s safety instruction document.
- The installer has to space out the terminal box enclosure from the process in order to guarantee that the temperature on its surface does not exceed the maximum ambient temperature specified (when the equipment is switched off).
- User has to periodically clean the enclosure in order to avoid the creation of a dust layer higher than 5 mm.
- Flameproof joints are not intended to be repaired.
- Potential electrostatic charging hazard – Painted equipment shall be cleaned only with a damp cloth or antistatic products.

In addition, for series S2 equipment:

- The user has to apply the safety requirements of relevant industrial standard in order to ensure that the partition wall can sustain the specified process pressure, temperature or mechanical loads.
- The user has to ensure that the process connection will result in a sufficient tight joint (IP66 or IP67 according to IEC 60529) for the specified process condition.
- Graphite tape type shall be applied to the process thread (only when it complies to ISO 228)

Routine tests

- The manufacturer shall carry out the routine test prescribed at clauses 27 of the IEC 60079-0.

- The manufacturer has to verify the integrity of the welded construction by means of routine overpressure testing (in compliance with clause 15.2.3.2 of IEC 60079-1) at a pressure of:

- 11.3 bar for identification codes “Q1.X”, “Q1.U”, “S2.X”, “S2.U; or
- 13.3 bar for identification codes “Q1.2”, “Q1.3”, “S2.2”, “S2.3”.

As an alternative, when this test is impractical, the integrity of the welds may be verified by the following methods:

- Liquid penetrant weld inspection; or
- Radiographic weld inspection.

In addition, for series S2 equipment, the manufacturer has to verify that the partition wall can sustain the specified maximum operational parameters (pressure and temperature) by means of routine overpressure testing for 60s without leakage at the maximum rated operational temperature and operational pressure applied from the process side.

Temperature class and Maximum surface temperature:

The Temperature Class of the equipment T6...T1 depends on the process temperature according to the following table.

The maximum surface temperature T85°C...T440°C is selected as the highest temperature value for the corresponding Tclass.

Process temperature ‘Tp’ up to / °C	Temperature class for GAS	Maximum surface temperature for DUST
Tp ≤ 80	T6	T85°C
95	T5	T100°C
130	T4	T135°C
195	T3	T200°C
290	T2	T300°C
400	T1	T440°C