IECEx Certificate of Conformity

INTERNATIONAL ELECTROTECHNICAL COMMISSION
IEC Certification Scheme for Explosive Atmospheres

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

Certificate No.: IECEx LOM 18.0002X

Issue No: 0

Certificate history:
Issue No. 0 (2018-07-04)

Status: **Current**

Date of Issue: **2018-07-04**

Applicant: **Técnicas de Electrónica y Automatismos, S.A.**
C/ Espronceda, 180 – 176. 08018. Barcelona
Spain

Equipment: **Load Cells Types 190i, 300, 340, 350, 420, 450, 460, 650, 740 and 750.**

Optional accessory:

Type of Protection: **Intrinsic safety "ia", Protection by enclosures "ta"**

Marking:

Ex ia IIC T4...T6 Ga

Ex ia I Ma

Ex ia IIIC T85°C Da

Ex ta IIIC T85°C Da

Approved for issue on behalf of the IECEx Certification Body: Carlos Fernández Ramón

Position: Head of Certification

Signature:
(for printed version)

Date:

1. This certificate and schedule may only be reproduced in full.
2. This certificate is not transferable and remains the property of the issuing body.
3. The Status and authenticity of this certificate may be verified by visiting the Official IECEx Website.

Certificate issued by:

Laboratorio Oficial J.M. Madariaga (LOM)
TECNOGETAFE
C/ Eric Kandel, 1
28906 Getafe (Madrid)
Spain

IECEx Certificate of Conformity

Certificate No:	IECEx LOM 18.0002X	Issue No: 0
Date of Issue:	**2018-07-04**	Page 2 of 3
Manufacturer:	**Técnicas de Electrónica y Automatismos, S.A.** C/ Espronceda, 180 – 176. 08018. Barcelona **Spain**	

Additional Manufacturing location(s):

Macomtex, SARL
Ilot, 79 C-1 / 79 C-10 Hangars NO 79 C5 ET C6
Tangier Free Zone Morocco.
Morocco

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 apparatus 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 : 2011 Edition:6.0	Explosive atmospheres - Part 0: General requirements
IEC 60079-11 : 2011 Edition:6.0	Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i"
IEC 60079-31 : 2013 Edition:2	Explosive atmospheres - Part 31: Equipment dust ignition protection by enclosure "t"

*This Certificate **does not** indicate compliance with electrical 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:

ES/LOM/ExTR17.0011/00

Quality Assessment Report:

ES/LOM/QAR16.0003/02

IECEx Certificate of Conformity

Certificate No: IECEx LOM 18.0002X Issue No: 0

Date of Issue: **2018-07-04**

Schedule

EQUIPMENT:

Equipment and systems covered by this certificate are as follows:

Series of load cells based on strain gauges realized in steel or stainless steel in a watertight body with permanent cable assembled in factory with connection to 4 or 6 wires.

They have different formats and sizes sharing the basic electrical scheme. They have different modes of operation for the measurement of the load or force. Variants 190i, 300, 340 and 420 are flexion type; variants 350, 450, 460, 650 and 750 are shear type; variant 740 is compression type.

SPECIFIC CONDITIONS OF USE: YES as shown below:

When the load cells are used with type of protection "Ex ta" cable and the cells themselves must be protected mechanically. Also the supply to the load cells must be fitted with a protective device with a maximum current of 0.1A and a breaking capacity of 10kA.

Annex:

IECEx LOM 18.0002X_Annex.pdf

IECEx Certificate of Conformity

Certificate No: IECEx LOM 18.0002X

Issue No: 0

Annex: IECEx LOM 18.0002X_Annex

Series of load cells based on strain gauges realized in steel or stainless steel in a watertight body with permanent cable assembled in factory with connection to 4 or 6 wires. The enclosure is made of steel or stainless steel and with common internal circuits. It offers a degree of protection IP68 (at 1 m dept. 100 hours).

The permanent cables used have a specific capacity of up to 144 nF/km and a specific inductance up to 0.8 mH/km. These values are considered as distributed parameters for calculating the permissible values in the installation of intrinsically safe circuits.

The load cells are intended for use in intrinsically safe circuits in environments with flammable gases or dust, or alternatively with type of protection by enclosure for environment protection of combustible dust.

These cells are made in different constructive variants and sizes.

	Variant									
	190i	300	340	350	420	450	460	650	740	750
Working principle	bending	bending	bending	shearing	bending	shearing	shearing	shearing	compression	shearing
Input resistance (Ω)	400±20 to 1150±60	400±20 to 1150±60	400±20 to 1150±60	400±20 to 1150±60	800±100	800±100	800±100	400±20 to 1150±60	800±100	800±100
Output resistance (Ω)	350±3 to 1000±9	350±3 to 1000±9	350±3 to 1000±9	350±3 to 1000±9	700±10	700±10	700±10	350±3 to 1000±9	700±10	700±10
Nominal load	15 to 400 kg	5 to 500 kg	15 to 1500 kg	300 to 10000 kg	1 to 100 t	2 to 20 t	5 to 100 t	250 to 7500 kg	10 to 1000 t	7.5 to 30 t

Rated supply voltage range: 2 to 22 V

Specific parameters of the intrinsically safe type of protection

Pi	190i	300	340	350	420	450	460	650	740	750
T4 Ta ≤ 40°C	2.5 W	2.5 W	2.5 W	1.3 W	1.3 W	1.3 W	1.3 W	1.3 W	1.3 W	1.3 W
T5 Ta ≤ 40°C	1.7 W	1.7 W	1.7 W	0.8 W	0.6 W	0.6 W	0.6 W	0.8 W	0.6 W	0.6 W
T6 Ta ≤ 40°C	0.56 W	0.56 W	0.56 W	0.53 W	0.4 W	0.4 W	0.4 W	0.53 W	0.4 W	0.4 W
T4 Ta ≤ 60°C	2.1 W	2.1 W	2.1 W	1.2 W	1.2 W	1.2 W	1.2 W	1.2 W	1.2 W	1.2W

Annex: IECEx LOM 18.0002X_Annex

Group I Ta ≤ 40°C	3.3 W
Group I Ta ≤ 60°C	3.15 W

Specific parameters for the "ta" type of protection
Imax: 0.1 A Umax: 15 V

IECEx Certificate of Conformity

INTERNATIONAL ELECTROTECHNICAL COMMISSION
IEC Certification Scheme for Explosive Atmospheres

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

Certificate No.: IECEx LOM 18.0003 Issue No: 0

Certificate history:
Issue No. 0 (2018-07-04)

Status: **Current**

Date of Issue: **2018-07-04**

Applicant: **Técnicas de Electrónica y Automatismos, S.A.**
C/ Espronceda, 180 - 176.
08018, Barcelona
Spain

Equipment: **Load Cells Types 190i, 300, 340, 350, 420, 450, 460, 650, 740 and 750.**

Optional accessory:

Type of Protection: **Non sparking "nA", Protection by enclosures "tc"**

Marking:

Ex nA IIC T6 Gc

Ex tc IIIC T85°C Dc

Approved for issue on behalf of the IECEx Certification Body: Carlos Fernández Ramón

Position: Head of Certification

Signature:
(for printed version)

Date:

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Certificate issued by:

Laboratorio Oficial J.M. Madariaga (LOM)
TECNOGETAFE
C/ Eric Kandel, 1
28906 Getafe (Madrid)
Spain

IECEx Certificate of Conformity

Certificate No:	IECEx LOM 18.0003	Issue No: 0
Date of Issue:	**2018-07-04**	Page 2 of 3
Manufacturer:	**Técnicas de Electrónica y Automatismos, S.A.** C/ Espronceda, 180 - 176. 08018, Barcelona. **Spain**	

Additional Manufacturing location(s):

Macomtex, SARL
Ilot, 79 C-1 / 79 C-10 Hangars NO 79 C5 ET C6.
Tangier Free Zone Morocco.
Morocco

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 apparatus 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 : 2011 Edition:6.0	Explosive atmospheres - Part 0: General requirements
IEC 60079-15 : 2010 Edition:4	Explosive atmospheres - Part 15: Equipment protection by type of protection "n"
IEC 60079-31 : 2013 Edition:2	Explosive atmospheres - Part 31: Equipment dust ignition protection by enclosure "t"

*This Certificate **does not** indicate compliance with electrical 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:

ES/LOM/ExTR17.0011/00

Quality Assessment Report:

ES/LOM/QAR16.0003/02

IECEx Certificate of Conformity

Certificate No:	IECEx LOM 18.0003	Issue No: 0
Date of Issue:	**2018-07-04**	Page 3 of 3

Schedule

EQUIPMENT:

Equipment and systems covered by this certificate are as follows:

Series of load cells based on strain gauges realized in steel or stainless steel in a watertight body with permanent cable assembled in factory with connection to 4 or 6 wires.

They have different formats and sizes sharing the basic electrical scheme. They have different modes of operation for the measurement of the load or force. Variants 190i, 300, 340 and 420 are flexion type; variants 350, 450, 460, 650 and 750 are shear type; variant 740 is compression type.

SPECIFIC CONDITIONS OF USE: NO

Annex:

IECEx LOM 18.0003_Annex.pdf

IECEx Certificate of Conformity

Certificate No: IECEx LOM 18.0003

Issue No: 0

Annex: IECEx LOM 18.0003_Annex

Series of load cells based on strain gauges realized in steel or stainless steel in a watertight body with permanent cable assembled in factory with connection to 4 or 6 wires. The enclosure is made of steel or stainless steel and with common internal circuits. It offers a degree of protection IP68 (at 1 m depth 100 hours).

These cells are made in different constructive variants and sizes.

	Variant									
	190i	300	340	350	420	450	460	650	740	750
Working principle	bending	bending	bending	shear	bending	shear	shear	shear	compression	shear
Input resistance (Ω)	400±20 to 1150±60	400±20 to 1150±60	400±20 to 1150±60	400±20 to 1150±60	800±100	800±100	800±100	400±20 to 1150±60	800±100	800±100
Output resistance (Ω)	350±3 to 1000±9	350±3 to 1000±9	350±3 to 1000±9	350±3 to 1000±9	700±10	700±10	700±10	350±3 to 1000±9	700±10	700±10
Nominal load	15 to 400 kg	5 to 500 kg	15 to 1500 kg	300 to 10000 kg	1 to 100 t	2 to 20 t	5 to 100 t	250 to 7500 kg	10 to 1000 t	7.5 to 30 t

Rated supply voltage range: 2 to 22 V

SUPLEMENTO DE CERTIFICADO DE EXAMEN UE DE TIPO

2 Equipos y sistemas de protección destinados a ser utilizados en atmósferas potencialmente explosivas
Directiva 2014/34/UE

3 Suplemento del Certificado de Examen UE de Tipo **LOM 17ATEX1003X /1** edición **0**

4	Producto	Células de carga Tipos 190i, 300, 340, 350, 420, 450, 460, 650, 740, 750
5	Fabricante	Técnicas de Electrónica y Automatismos S.A.
6	Dirección	Espronceda, 180-176 080018 Barcelona ESPAÑA

7 Este Suplemento de Certificado amplia el Certificado de Examen UE de Tipo nº LOM 17ATEX1003X para aplicar a los productos diseñados y construidos de acuerdo con las especificaciones indicadas en el anexo del mencionado certificado, pero que incorporan variaciones como se especifican en el anexo del presente certificado y en los documentos que se referencian.

8 El Laboratorio Oficial J.M. Madariaga (LOM), Organismo Notificado bajo la referencia nº 0163, conforme al Artículo 17 de la Directiva 2014/34/UE del Parlamento Europeo y del Consejo del 26 de febrero de 2014, certifica que este producto es conforme a los Requisitos Esenciales de Seguridad y Salud relativos al diseño y construcción de productos destinados a ser utilizados en atmósferas potencialmente explosivas indicados en el Anexo II de la Directiva.

Getafe,

FERNANDEZ RAMON
CARLOS - 05870499W
2018.07.20 10:47:47 +02'00'

Responsable del Comité de Certificación

RCPCER 25.18/3

ENAC CERTIFICACIÓN Nº OC-P227
UNIVERSIDAD POLITÉCNICA DE MADRID
ENSAYOS E INVESTIGACIONES DE MATERIALES Y EQUIPOS PARA ATMÓSFERAS EXPLOSIVAS Y MINERÍA
(Real Decreto 334/1992 de 3 de Abril - BOE 1992-04-29)
Eric Kandel, 1 – 28906 GETAFE (MADRID) • (34) 91 4421366 • (34) 91 4419933 • lom@lom.upm.es

13 ANEXO

14 Suplemento del Certificado de Examen UE de Tipo **LOM 17ATEX1003X /1**

15 Descripción de las variaciones en el producto

Se incluye marcado para grupo I

II 1G	Ex ia IIC T4..T6 Ga
II 1D	Ex ia IIIC T85°C Da
II 1D	Ex ta IIIC T85°C Da
I M1	Ex ia I Ma

Se revisan los parámetros específicos de los modos de protección

		Pi									
		190i	300	340	350	420	450	460	650	740	750
Ta ≤ 40 °C	Ex ia IIC T4 Ex ia IIIC	2,5 W	2,5 W	2,5 W	1,3 W	1,3 W	1,3 W	1,3 W	1,3 W	1,3 W	1,3 W
	Ex ia IIC T5	1,7 W	1,7 W	1,7 W	0,8 W	0,6 W	0,6 W	0,6 W	0,8 W	0,6 W	0,6 W
	Ex ia IIC T6	0,56 W	0,56 W	0,56 W	0,53 W	0,4 W	0,4 W	0,4 W	0,53 W	0,4 W	0,4 W
Ta ≤ 60 °C	Ex ia IIC T4	2,1 W	2,1 W	2,1 W	1,2 W	1,2 W	1,2 W	1,2 W	1,2 W	1,2 W	1,2 W
Ta ≤ 40 °C	Ex ia I	3,3 W									
Ta ≤ 60 °C	Ex ia I	3,15 W									

Parámetros específicos del modo de protección "Ex ta": *Umax*: 15 V, *Imax*: 0,1 A

Evaluación según las normas EN 60079-0:2012+A11:2013, EN 60079-11:2012 y EN 60079-31:2014

16 Protocolo de ensayos nº **18.522K**

17 Condiciones específicas de uso

- Cuando las células de carga se utilicen con un modo de protección por envolvente "Ex ta" el cable y las mismas células deberán estar protegidos mecánicamente. La alimentación de las células de carga deberá ir provista de un fusible de hasta 0,1 A conforme con un poder de corte no inferior a 10 kA.

18 Requisitos esenciales de seguridad y salud

Sin cambios

19 Documentos y planos

Número	Hojas	Edición	Fecha	Descripción
MH-16-07-18	8	0	2018-07-16	Memoria técnica

1 SUPLEMENTO DE CERTIFICADO DE EXAMEN DE TIPO

2 Equipos y sistemas de protección destinados a ser utilizados en atmósferas potencialmente explosivas
Directiva 2014/34/UE

3 Suplemento del Certificado de Examen UE de Tipo **LOM 17ATEX4004 /1** edición **0**

4	Producto	Células de carga Tipos 190i, 300, 340, 350, 420, 450, 460, 650, 740, 750
5	Fabricante	Técnicas de Electrónica y Automatismos S.A.
6	Dirección	Espronceda, 180-176 080018 Barcelona ESPAÑA

7 Este Suplemento de Certificado amplia el Certificado de Examen de Tipo nº LOM 17ATEX4004 para aplicar a los productos diseñados y construidos de acuerdo con las especificaciones indicadas en el anexo del mencionado certificado, pero que incorporan variaciones como se especifican en el anexo del presente certificado y en los documentos que se referencian.

8 El Laboratorio Oficial J.M. Madariaga (LOM) certifica que este producto es conforme a los Requisitos Esenciales de Seguridad y Salud relativos al diseño y construcción de productos destinados a ser utilizados en atmósferas potencialmente explosivas indicados en el Anexo II de la Directiva 2014/34/UE del Parlamento Europeo y del Consejo del 26 de febrero de 2014.

Getafe,

FERNANDEZ RAMON
CARLOS - 05870499W
2018.07.20 10:45:42 +02'00'

Responsable del Comité de Certificación

RCPCER 25.19/2

UNIVERSIDAD POLITÉCNICA DE MADRID
ENSAYOS E INVESTIGACIONES DE MATERIALES Y EQUIPOS PARA ATMÓSFERAS EXPLOSIVAS Y MINERÍA
(Real Decreto 334/1992 de 3 de Abril - BOE 1992-04-29)
Eric Kandel, 1 - 28906 GETAFE (MADRID) • ☎ (34) 91 4421366 • 🖷 (34) 91 4419933 • 🖳 lom@lom.upm.es

13 ANEXO

14 Suplemento del Certificado de Examen UE de Tipo **LOM 17ATEX4004 /1**

15 Descripción de las variaciones en el producto

Se revisan las características y parámetros de los modos de protección. No hay cambios en el marcado
Para "Ex nA" y "Ex tc": *Umax*: 22 V

Temperatura ambiente -20 ºC ≤ Ta ≤ +60 ºC

Evaluación según las normas EN 60079-0:2012+A11:2013, EN 60079-15:2010 y EN 60079-31:2014

16 Protocolo de ensayos nº **18.522K**

17 Condiciones específicas de uso

Sin cambios

18 Requisitos esenciales de seguridad y salud

Sin cambios

19 Documentos y planos

Número	Hojas	Edición	Fecha	Descripción
MH-16-07-18	8	0	2018-07-16	Memoria técnica