



TEST CERTIFICATE

Number E-10.02.C03

LOAD CELL TYPE 460

Issued by: Secretaria d'Indústria i Empresa - Generalitat de Catalunya
(Notified Body number 0315)
Avinguda de la Diagonal, 405 bis
E-08008 BARCELONA SPAIN

In accordance with: Paragraph 8.1 of the European Standard "Metrological aspects of non-automatic weighing instruments" EN 45501:1992(+AC:1993). The applied error fraction p_i with reference to paragraphs 3.5.4 and 4.12 of this standard is 0,7. Following paragraph 4.12 of this standard, the tests have been performed according to the OIML International Recommendation, OIML R 60 (2000).

Issued to: TÉCNICAS DE ELECTRÓNICA Y AUTOMATISMOS, S.A.
Carrer Espronceda, núm.176-180
E-08018 BARCELONA SPAIN

In respect of: The model of a **load cell**, tested as part of a non-automatic weighing instrument.
Manufacturer: TÉCNICAS DE ELECTRÓNICA Y AUTOMATISMOS, S.A..
Type: 460.

Characteristics:

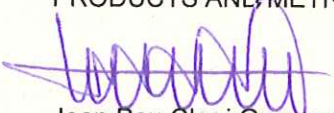
Classification	C3↓		--
Maximum number of LC verification intervals n_{LC}	3000		--
Maximum capacity E_{max}	5000 to 25000		kg
Ratio minimum LC verification interval $Y = E_{max}/V_{min}$	10000		--
additional marking	temperature limits	rated output	impedance input
--	-10°C/+40°C	C = 2 mV/V	$R_{LC} = 800 \Omega$
			minimum dead load
			$E_{min} = 0 \text{ kg}$
			safe overload
			$E_{lim}/E_{max} = 200\%$

The main characteristics are shown in the descriptive annex, which is an integral part of the test certificate and consists of 7 pages.

The type is described in the submitted technical documentation, identified with number 13/10.

The summary of tests involved can be found in the descriptive annex.

For delegation
of Secretari d'Indústria i Empresa
THE HEAD OF THE SERVICE OF AUTOMOBILES,
PRODUCTS AND METROLOGY


Joan Pau Clar i Guevara

Barcelona, 21 April 2010



Generalitat de Catalunya
Departament d'Innovació,
Universitats i Empresa
Secretaria d'Indústria i Empresa
Subdirecció General de Seguretat Industrial
Servei d'Automòbils, Productes i Metrologia

This document shall not be reproduced except in full, with the annex.
This test certificate refers only to metrological requirements.
This test certificate cannot be used without applicant's authorization.



Descriptive annex to test certificate number E-10.02.C03

0.- Index.

1.- Name and type of the instrument.	2
2.- Functional description.	2
3.- Technical characteristics.	2
3.1.- Metrological characteristics.	2
3.2.- Additional characteristics.	3
4.- Connections.	3
5.- Location of the indications.	3
6.- Conditions for use.	3
7.- Tests performed.	3
8.- Drawings.	4
Figure 1.- Drawing HM-0313.	5
Figure 2.- Drawing HM-0317.	6
Figure 3.- Drawing HM-0316.	7





Descriptive annex to test certificate number E-10.02.C03

1.- Name and type of the instrument.

Load cell type 460.

Manufactured by:

TÉCNICAS DE ELECTRÓNICA Y AUTOMATISMOS, S.A.
Carrer Espronceda, 176-180
E-08018 BARCELONA SPAIN

It does not use any concrete trade name.

2.- Functional description.

The load cell type 460 is a double shearing load cell. The principle of measurement is that of strain gauges, as a full bridge, in an elastic element.

Load cell type 460 has only one version.

Reference is made to Figure 1 (drawing HM-0313) of this descriptive annex.

3.- Technical characteristics.

3.1.- Metrological characteristics.

Load cell type 460 has the following metrological characteristics and information for compatibility of modules:

Classification		C3↓	--
Additional marking		---	--
Maximum number of LC verification intervals	n_{LC}	3000	--
Maximum capacity	E_{max}	5000 to 25000	kg
Minimum dead load, relative	E_{min}/E_{max}	0	%
Ratio of minimum LC verification interval	$Y = E_{max}/V_{min}$	10000	--
Minimum dead load output return	$Z = E_{max}/2DR$	3000	--
Maximum rated output	C	2	mV/V
Maximum excitation voltage		15	V
Input impedance	R_{LC}	800	Ω
Minimum limit temperature rating	T_{min}	-10	°C
Maximum limit temperature rating	T_{max}	+40	°C
Safe overload	E_{lin}/E_{max}	200	%
Fraction maximum permissible error	p_{LC}	0,7	--

Load cell type 460 can have other maximum capacities from 5000 kg to 25000 kg, respecting always its metrological and constructive characteristics, according to OIML R60.





Descriptive annex to test certificate number E-10.02.C03

3.2.- Additional characteristics.

Load cell type 460 has the following additional characteristics:

Constructive material	Stainless steel	--
Reference excitation voltage	10	V
Excitation voltage limits	5 a 15	V
Output impedance R_{LC}	700	Ω
Tolerance of input impedance	± 30	Ω
Tolerance of output impedance	± 3	Ω

4.- Connections.

The connection is a four-wire system or a six-wire system. The cable is shielded, with the shielding not connected to the load cell, and with remote sense.

	Four-wire system	Six-wire system
Nominal section	0,22 mm ²	0,22 mm ²
Maximum nominal length	12 m	--

The connection code is variable and it is shown in label of Figure 2 (drawing HM-0317) of this descriptive annex.

Reference is made to Figure 3 (drawing HM-0316) of this descriptive annex.

5.- Location of the indications.

The indications required according to point 4.6 of OIML R 60 (2000) are in a label named *characteristics label*.

Serial number of this load cell is in a label named *characteristics label*.

Reference is made to Figure 2 (drawing HM-0317) of this descriptive annex.

6.- Conditions for use.

No property of this instrument, whether described or not, may be in conflict with the standard and international recommendation mentioned in the test certificate.

7.- Tests performed.

Tests have been performed with load cells with the following identification and characteristics:





Descriptive annex to test certificate number E-10.02.C03

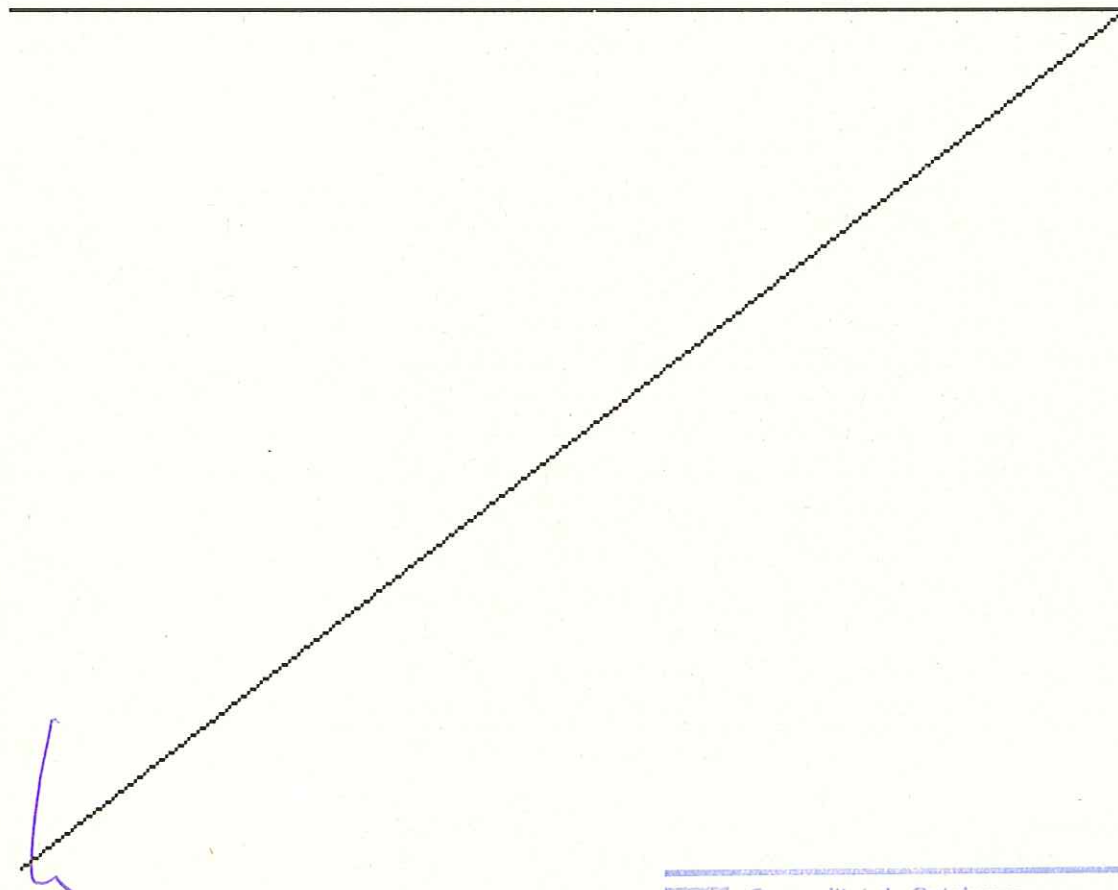
Type	Serial number	E_{max}	$Y = E_{max} / v_{min}$	$Z = E_{max} / 2DR$	n_{LC}
460	798354(10)	5000 kg	10000	3000	3000

Tests performed with load cell:

Tests	R60 Ref.	Approved
Temperature test and repeatability (at 20, 40, -10 and 20°C)	5.1.1, 5.4; A.4.1	+
Temperature effect on minimum dead load output (at 20, 40, -10 and 20°C)	5.5.1.3; A.4.1	+
Creep test (at 20, 40 and -10°C)	5.3.1; A.4.2	+
Minimum dead load output return (at 20, 40 and -10°C)	5.3.2; A.4.3	+
Barometric pressure effects at room temperature	5.5.2; A.4.4	+
Humidity test, cyclic: CH-marked (or without marked)	5.5.3.1; A.4.5	+
Humidity test, static: SH-marked	5.5.3.2; A.4.6	-

8.- Drawings.

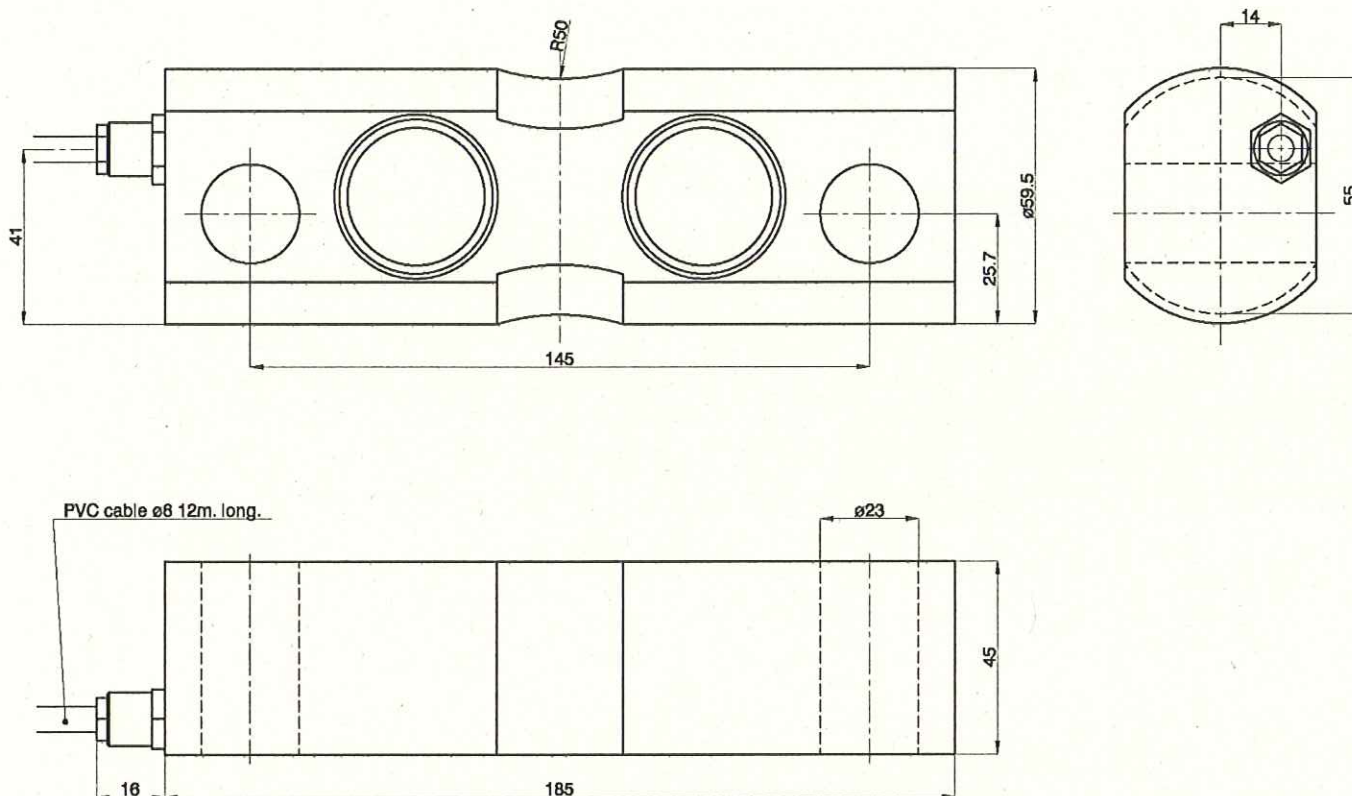
Dimensions indicate in this drawings are given in millimetres.





Descriptive annex to test certificate number E-10.02.C03

Figure 1.- Drawing HM-0313.



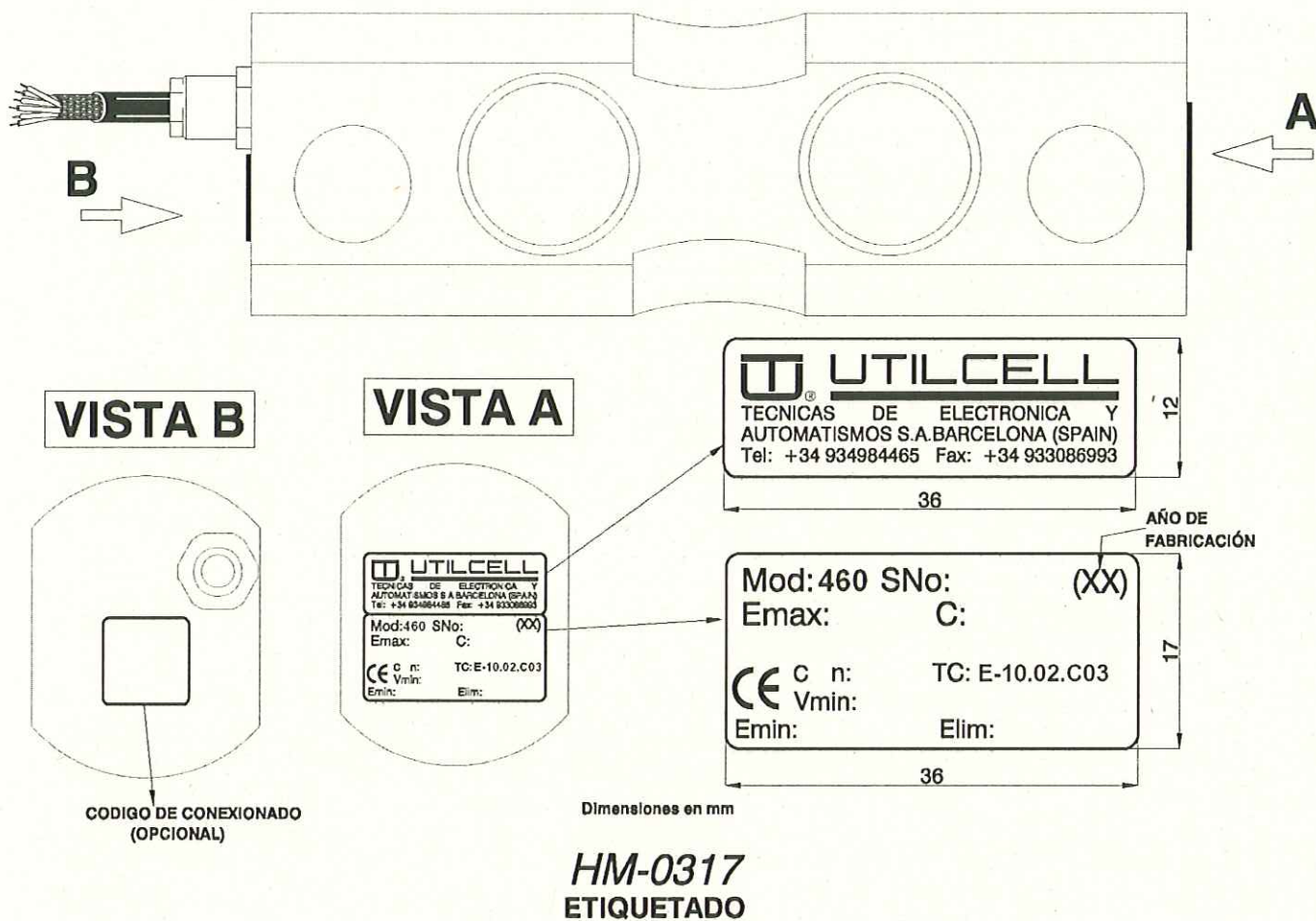
HM-0313
DIMENSIONES EXT. MOD.460 5-25t





Descriptive annex to test certificate number E-10.02.C03

Figure 2.- Drawing HM-0317.



HM-0317
ETIQUETADO

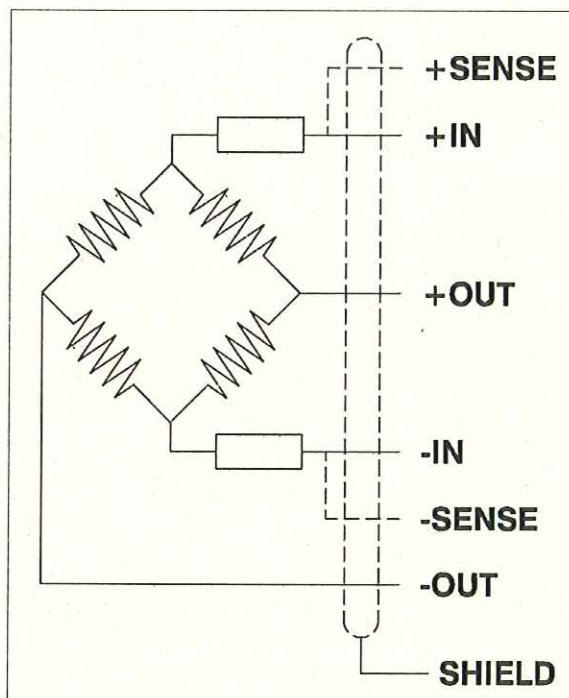


Generalitat de Catalunya
Departament d'Innovació,
Universitats i Empresa
Secretaria d'Indústria i Empresa
Subdirecció General de Seguretat Industrial
Servei d'Automòbils, Productes i Metrologia



Descriptive annex to test certificate number E-10.02.C03

Figure 3.- Drawing HM-0316.



**EL SISTEMA DE CONEXIÓN PUEDE SER
DE 4 ó 6 HILOS.
EL CODIGO DE COLORES PUEDE VARIAR
Y SE INDICA MEDIANTE UNA ETIQUETA
EN LA CELULA O MANUAL ADJUNTO.**

**HM-0316
CONEXIÓN ELÉCTRICA 6 HILOS**

