

## TEST CERTIFICATE

Number E-18.02.C04

### LOAD CELL TYPE TCC

Issued by: LGAI TECHNOLOGICAL CENTER S.A.  
Campus de la U.A.B.  
Ronda de la Font del Carme, s/n.  
E-08193 BELLATERRA SPAIN  
Notified Body Number 0370.

In accordance with Paragraph 3.10 of the European Standard "Metrological aspects of non-automatic weighing instruments" EN 45501:2015. The applied error fraction  $p_i$  with reference to paragraph 3.10.2.1 of this standard is 0,7. Following paragraph F.2 of Anexo F of this standard, the tests have been performed according to the OIML International Recommendation, OIML·R60 (2000).

Issued to: TRANSDUTEC, S.A.  
Calle Industria, 1 – B1 (P. I. Les Pedreres).  
E-08390 MONTGAT ESPAÑA.

In respect of: The type of a load cell, tested as part of a non-automatic weighing instrument.  
Manufacturer: TRANSDUTEC, S.A.  
Type: TCC.

#### Characteristics:

Classification		C3 ↓	---
Maximum number of LC verification intervals	$n_{LC}$	3000	---
Maximum capacity	$E_{max}$	300 kg up to and including 10000 kg	---
Ratio minimum LC verification interval	$Y = E_{max}/V_{min}$	10000	---
additional marking	temperature limits	nominal sensitivity	input impedance
--	-10°C/+40°C	C=2 mV/V	$R_{LC} = 383 \Omega / 1100 \Omega$
			minimum dead load
			$E_{min} = 0 \text{ kg}$
			safe overload
			$E_{lim}/E_{max} = 1250\%$

The main characteristics are shown in the descriptive annex, which is an integral part of the test certificate and consists of 23 pages.

The type is described in the submitted technical documentation, identified with number 07/18 (18/34552400 -D).

Managing Director  
Product Conformity B.U.

Xavier Ruiz Peña  
Bellaterra, 19 october 2018.

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-18.02.C04**

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**1.- Name and type of the instrument.**

Load cell type TCC.

Manufactured by:

TRANSDUTECH, S.A.  
Calle Industria, 1 – B1 (P. I. Les Pedreres).  
E-08390 MONTGAT ESPAÑA.

The company will be using its own mark.

**2.- Functional description.**

Load cell type TCC is a beam (shear) load cell. The principle of measurement is that of strain gauges, as a full bridge, in an elastic element.

Load cell type TCC has two versions, the TCC-4 version and the TCC-5 version.

The TCC-4 and TCC-5 versions have an alphabetic code to identify the different options and are defined as follows:

**TCC-4XyY-Z**

- "X"** (Concerning the manufacturing material)
  - Where "i" corresponds to Stainless Steel.
  - Where "s" corresponds to Steel.
- "y"** (Concerning the mechanical fastening system)
  - Where "C" corresponds at drawing TCC-4a.1.
  - Where "S" corresponds at drawing TCC-4a.2
- "Y"** (Concerning load transmission device)
  - Where "S" corresponds at drawing TCC-4a.1
  - Where "M" corresponds at drawing TCC-4b.1
  - Where "T" corresponds at drawing TCC-4c.1
  - Where "H" corresponds at drawing TCC-4d.1
- "Z"** (Concerning the output resistance)
  - Where "350" corresponds to an output resistance of 350 Ω.
  - Where "1000" corresponds to an output resistance of 1000 Ω.

**TCC-5XyY-Z**

- "X"** (Concerning the manufacturing material)
  - Where "i" corresponds to Stainless Steel.
  - Where "s" corresponds to Steel.
- "y"** (Concerning the mechanical fastening system)
  - Where "C" corresponds at drawing TCC-5a.1
  - Where "S" corresponds at drawing TCC-5a.2
- "Y"** (Concerning load transmission device)
  - Where "S" corresponds at drawing TCC-5a.1
  - Where "M" corresponds at drawing TCC-5b.1
  - Where "H" corresponds at drawing TCC-5c.1
  - Where "T" corresponds at drawing TCC-5d.1
- "Z"** (Concerning the output resistance)
  - Where "350" corresponds to an output resistance of 350 Ω.
  - Where "1000" corresponds to an output resistance of 1000 Ω.

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Load cell type TCC is clamped on the lower part with two possible machining:

Load cell type TCC can have different systems of mechanical connection for the application of the load.

The load cell type TCC can be done in steel or stainless steel and output resistances of 350 Ω o 1000 Ω.

Reference is made to Figure 1 (General view load cell TCC) , of this descriptive annex.

- Reference is made to Figure 2 (Drawing TCC-4.pos); Figure 8 (Drawing TCC-5.pos) concerning the location of the components of the load cell type TCC, of this descriptive annex.
- Reference is made to Figure 3 (Drawing TCC-4a.1); Figure 4 (Drawing TCC-4a.2), Figure 9 (Drawing TCC-5a.1) and Figure 10 (Drawing TCC-5a.2) concerning to the load cell mechanical fastening systems of the load cell type TCC, of this descriptive annex.
- Reference is made to Figure 5 (Drawing TCC-4b.1); Figure 6 (Drawing TCC-4c.1); Figure 7 (Drawing TCC-4d.1); Figure 11 (Drawing TCC-5b.1); Figure 12 (Drawing TCC-5c.1) and Figure 13 (Drawing TCC-5d.1) concerning to the load transmission device of the load cell type TCC, of this descriptive annex.

**3.- Technical characteristics.**

**3.1.- Metrological characteristics.**

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

Type	TCC		--
Version	TCC-4	TCC-5	--
Maximum capacity $E_{max}$	300-500-550-750-1000-1100-1500-1760-2000-2500-3000	2000-3000-4000-5000-6000-7500-10000	kg
Additional marking	--		--
Classification symbol	C3 ↓		--
Maximum number of LC verification intervals $n_{LC}$	3000		--
Minimum dead load, relative $E_{min}/E_{max}$	0		%
Ratio of minimum LC verification interval $Y=E_{max}/V_{min}$	18000		--
Minimum dead load output return $Z=E_{max}/2DR$	10000		--
Nominal sensitivity $C$	2		mV/V
Maximum power supply	18 V		--
Input impedance $R_{LC}$	383 Ω ó 1100 Ω		--
Lower limit of temperature range $T_{min}$	-10		°C
Upper limit of temperature range $T_{max}$	40		°C
Safe overload $E_{lim}/E_{max}$	125		%
Fraction maximum permissible error $\rho_{LC}$	0,7		--

Load cell type TCC can have other maximum capacities from 300 kg to 10000 kg, respecting always its metrological and constructive characteristics, according to OIML R60.

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**3.2.- Additional characteristics.**

Load cell type TCC has the following additional characteristics :

Transducer material	Stainless steel or Stainless	--
Tolerance of the input impedance	$\pm 2$	%
Output impedance	350 $\Omega$ ó 1000 $\Omega$	--
Tolerance of the output impedance	$\pm 3$	%
Reference excitation voltage	10 V	--
Excitation voltage limits	5 V to 15 V	--

**4.- Connections.**

The connection is four-wires or six-wires, with a nominal section of 0,22 mm<sup>2</sup>. The cable is shielded, with the shielding not connected to the load cell, and with remote sense.

The connection code is the following:

System	Four-wires	Six-wires	--
Positive input	Red	Red	--
Negative input	Black	Black	--
Positive output	Green	Green	--
Negative output	White	White	--
Positive sense	--	Yellow	--
Negative sense	--	Blue	--
Length	5 meters	20 meters	--

Reference is made to Figure 18 (drawing TCC-4.ec) of this descriptive annex.

**5.- Location of the indications.**

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

Location of the *characteristics labels* is shown in Figure 14 (drawing TCC-4.eti) for TCC-4 version and Figure 16 (drawing TCC-5.eti) for TCC-5 version, of this descriptive annex.

The indications required according to point 4.6 of OIML R 60 of *characteristics label* is shown in Figure 15 (drawing TCC-4.eti2) for TCC-4 version and Figure 17.( drawing TCC-5.eti2) for TCC-5 version, 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.

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**7.- Test performed.**

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

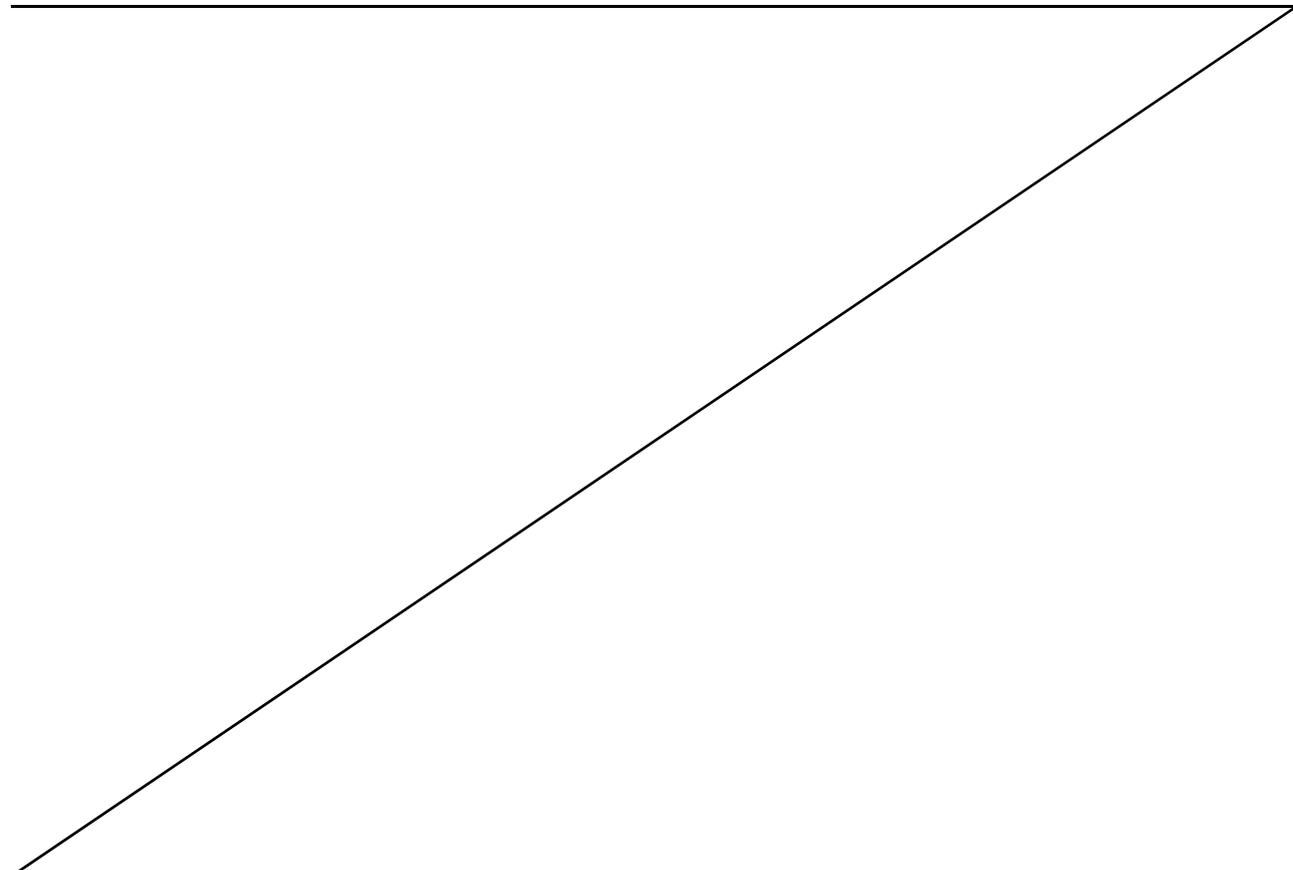
Type	Serial number	E <sub>max</sub>	Y= E <sub>max</sub> /v <sub>min</sub>	Z = E <sub>max</sub> /2DR	n <sub>LC</sub>
TCC-4	282558	300 kg	10000	3000	3000
TCC-5	282559	2000 kg	10000	3000	3000

Tests performed with load cell:

Test	R60 No.	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.



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Figure 1.- General view load cell TCC.

**VISTA TCC-4**

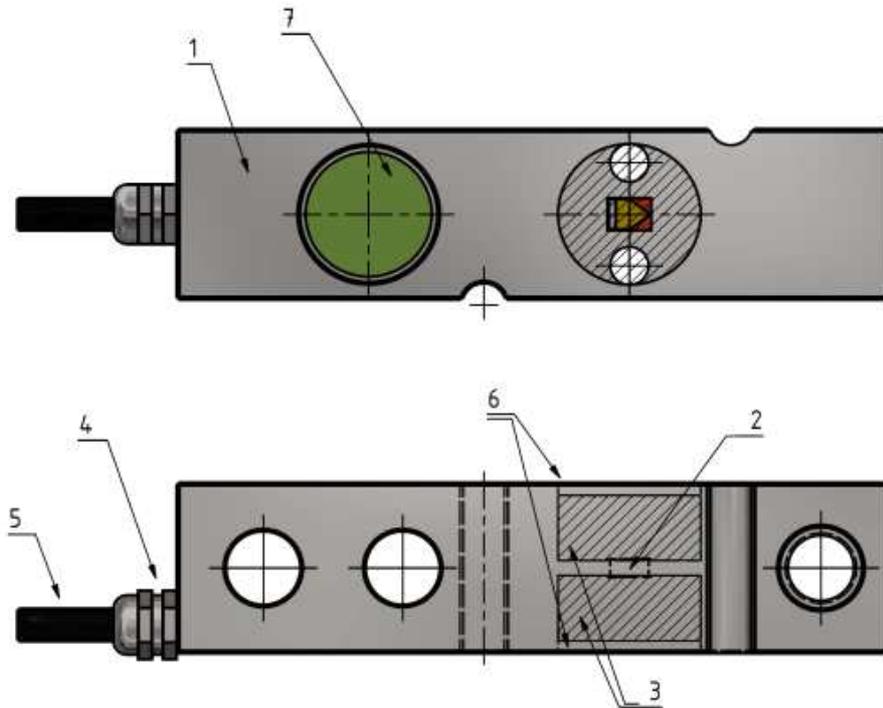


**VISTA TCC-5**



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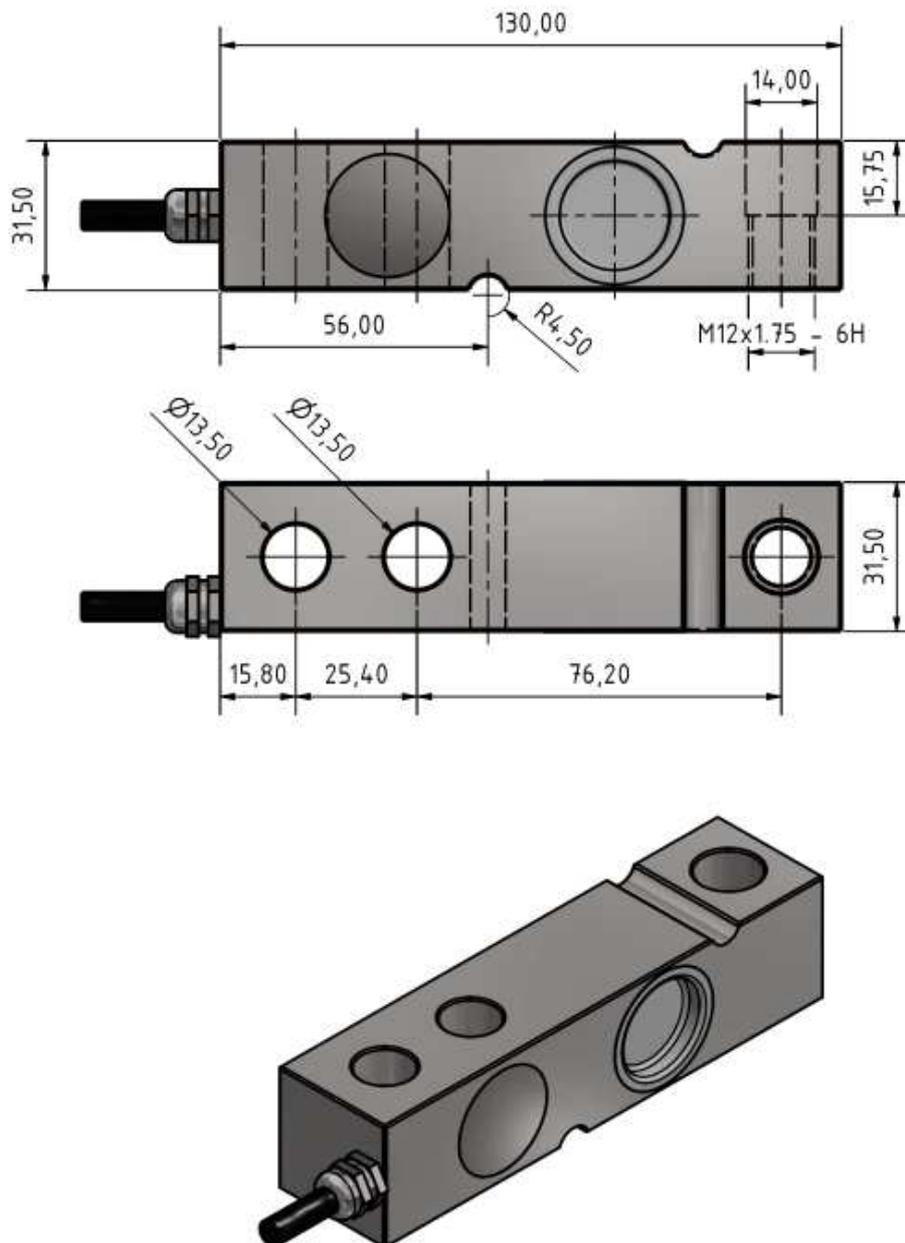
**Figure 2.- Drawing TCC-4.pos. Components load cell TCC-4.**



ELEMENTOS PRINCIPALES			
POS.	DESCRIPCION	CANTIDAD	MATERIAL
1	Cuerpo célula	1	INOX / ACERO
2	Bandas Extensiométricas	2	-
3	Protección	1	Silicona
4	Prensaestopas	1	Latón
5	Conductor	5m	PVC
6	Chapas soldadas	2	AISI304
7	Circuito	1	Fibra

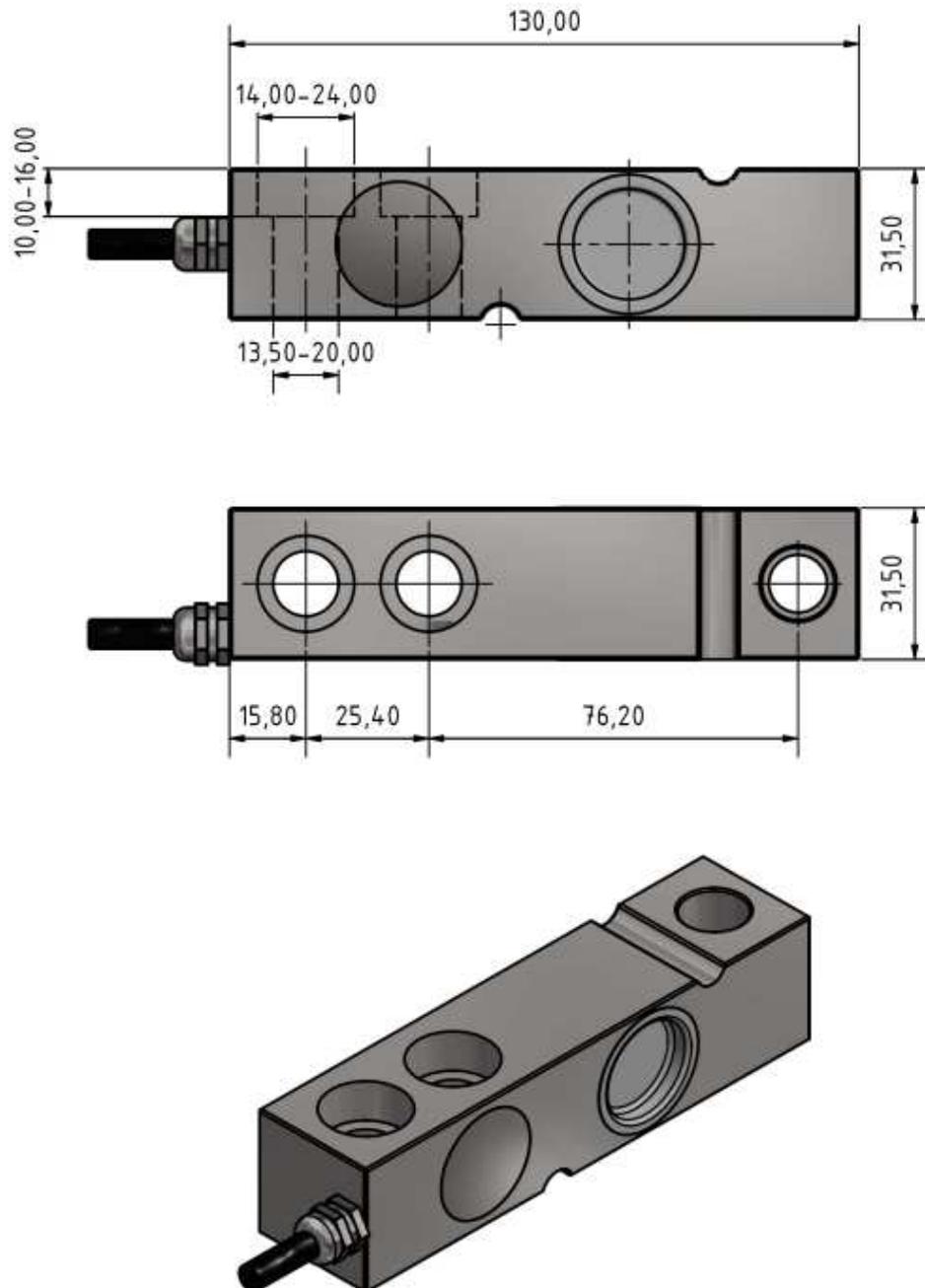
Descriptive annex to test certificate number E-18.02.C04

Figure 3.- Drawing TCC-4a.1. Mechanical fastening system. Load cell TCC-4 (Option 1).



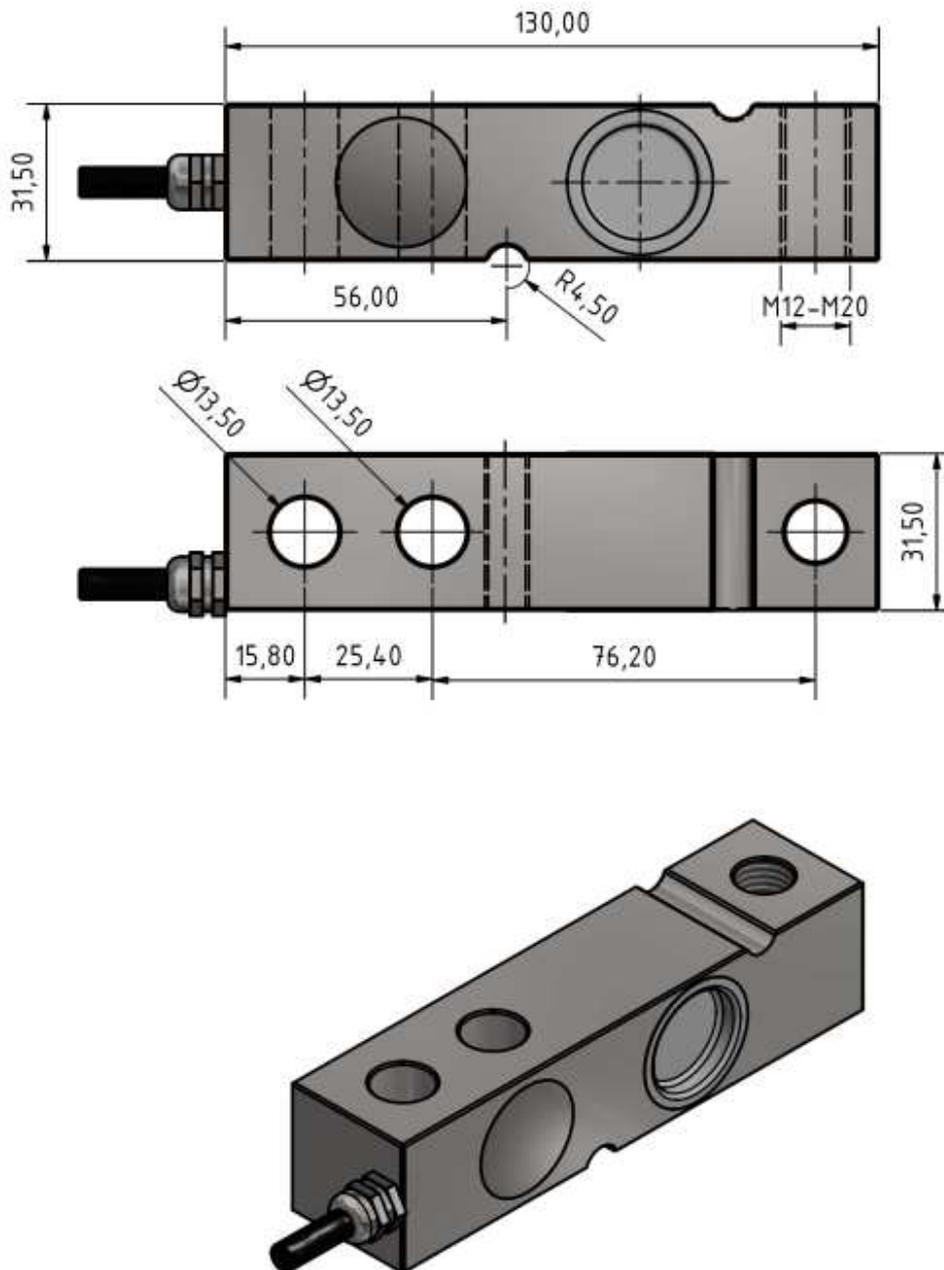
Descriptive annex to test certificate number E-18.02.C04

Figure 4.- Drawing TCC-4a.2. Mechanical fastening system. Load cell TCC-4 (Option 2).



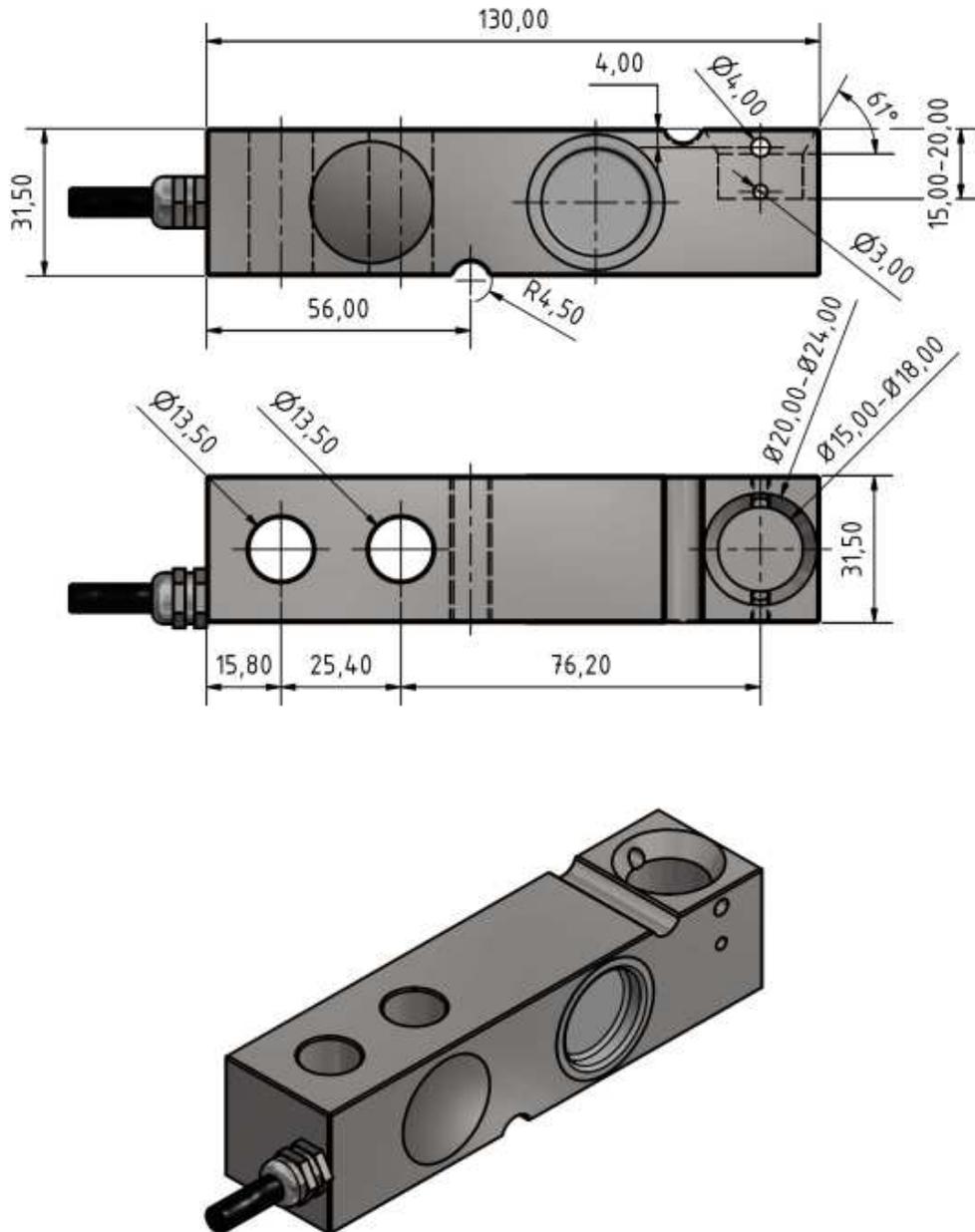
Descriptive annex to test certificate number E-18.02.C04

Figure 5.- Drawing TCC-4b.1. Load transmission system. Load cell TCC-4 (Option 1).



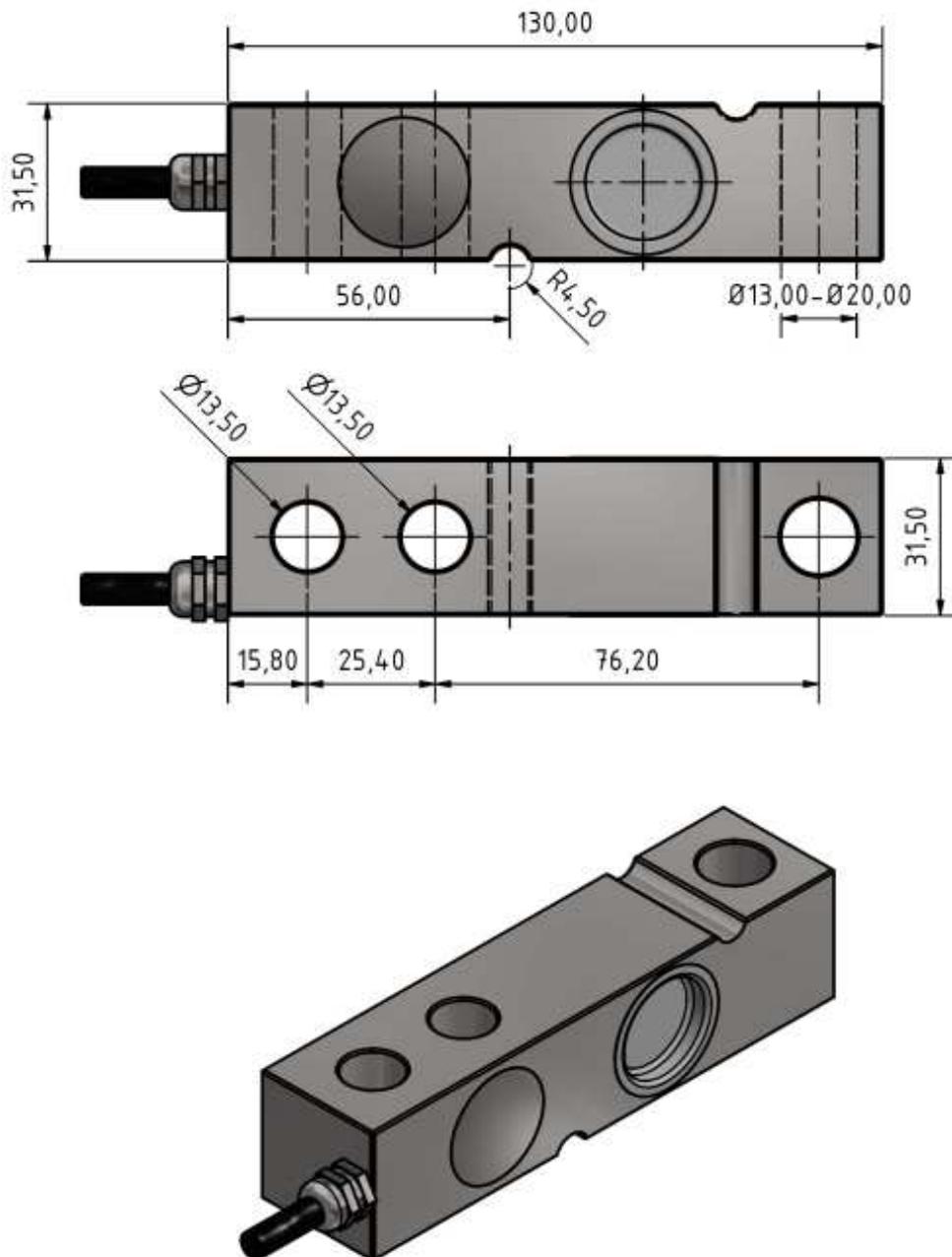
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Figure 6.- Drawing TCC-4c.1. Load transmission device. Load cell TCC-4 (Option 2).



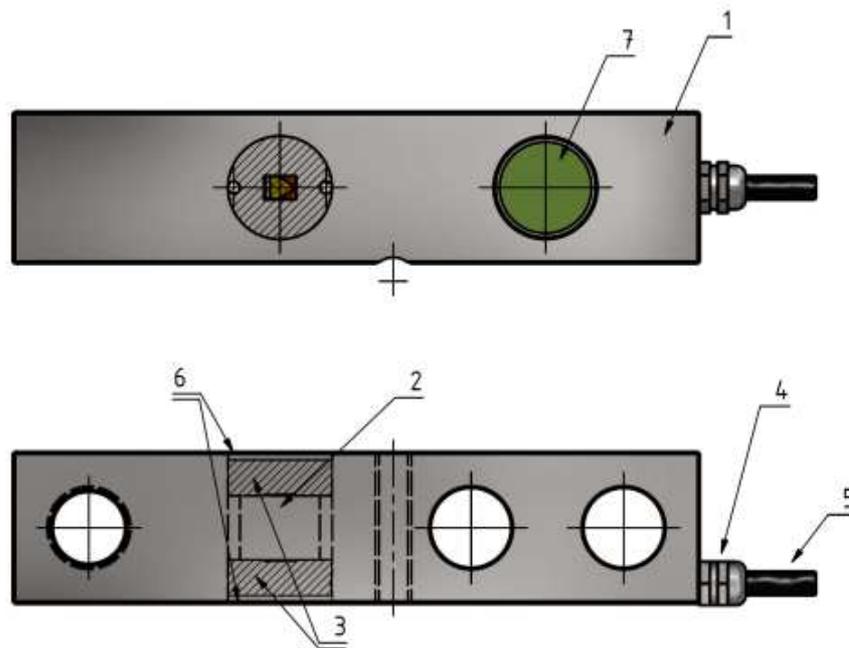
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Figure 7.- Drawing TCC-4d.1. Load transmission device. Load cell TCC-4 (Option 3)



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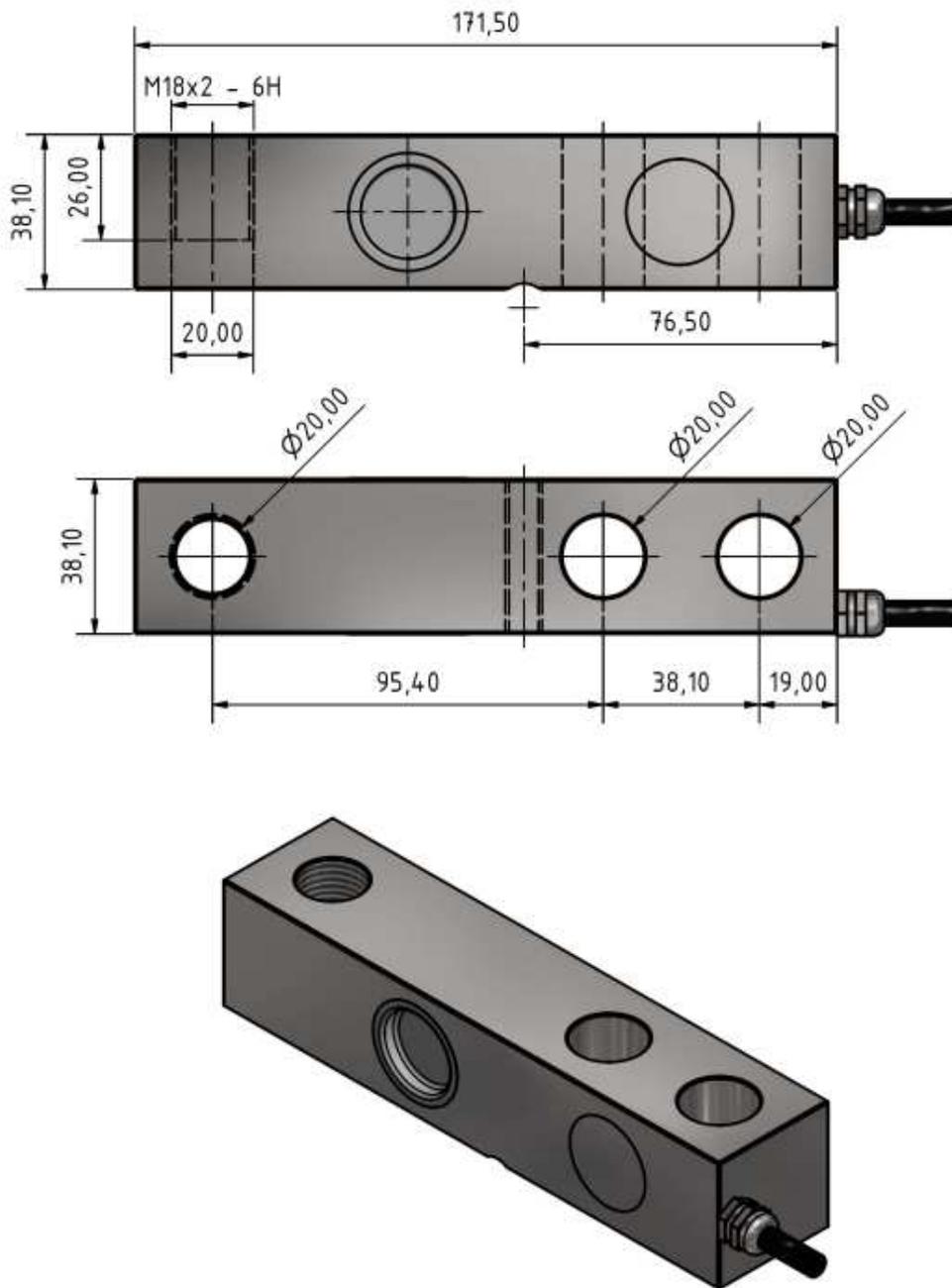
Figure 8.- Drawing TCC-5.pos. Components load cell TCC-5.



ELEMENTOS PRINCIPALES			
POS.	DESCRIPCION	CANTIDAD	MATERIAL
1	Cuerpo célula	1	INOX / ACERO
2	Bandas Extensiométricas	2	-
3	Protección	1	Silicona
4	Prensaestopas	1	Latón
5	Conductor	5m	PVC
6	Chapas soldadas	2	AISI304
7	Circuito	1	Fibra

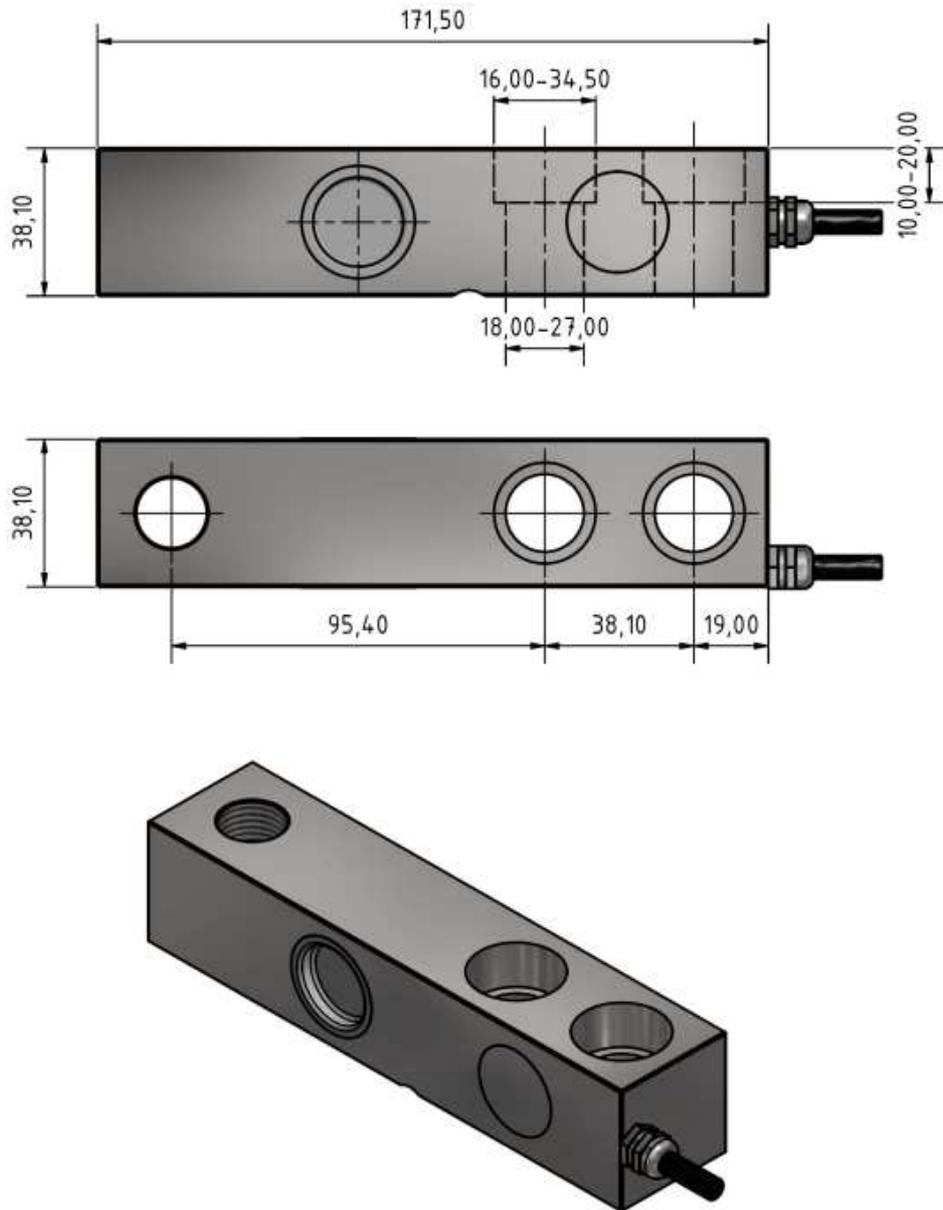
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Figure 9.- Drawing TCC-5a.1. Mechanical fastening system. Load cell TCC-5 (Option 1).



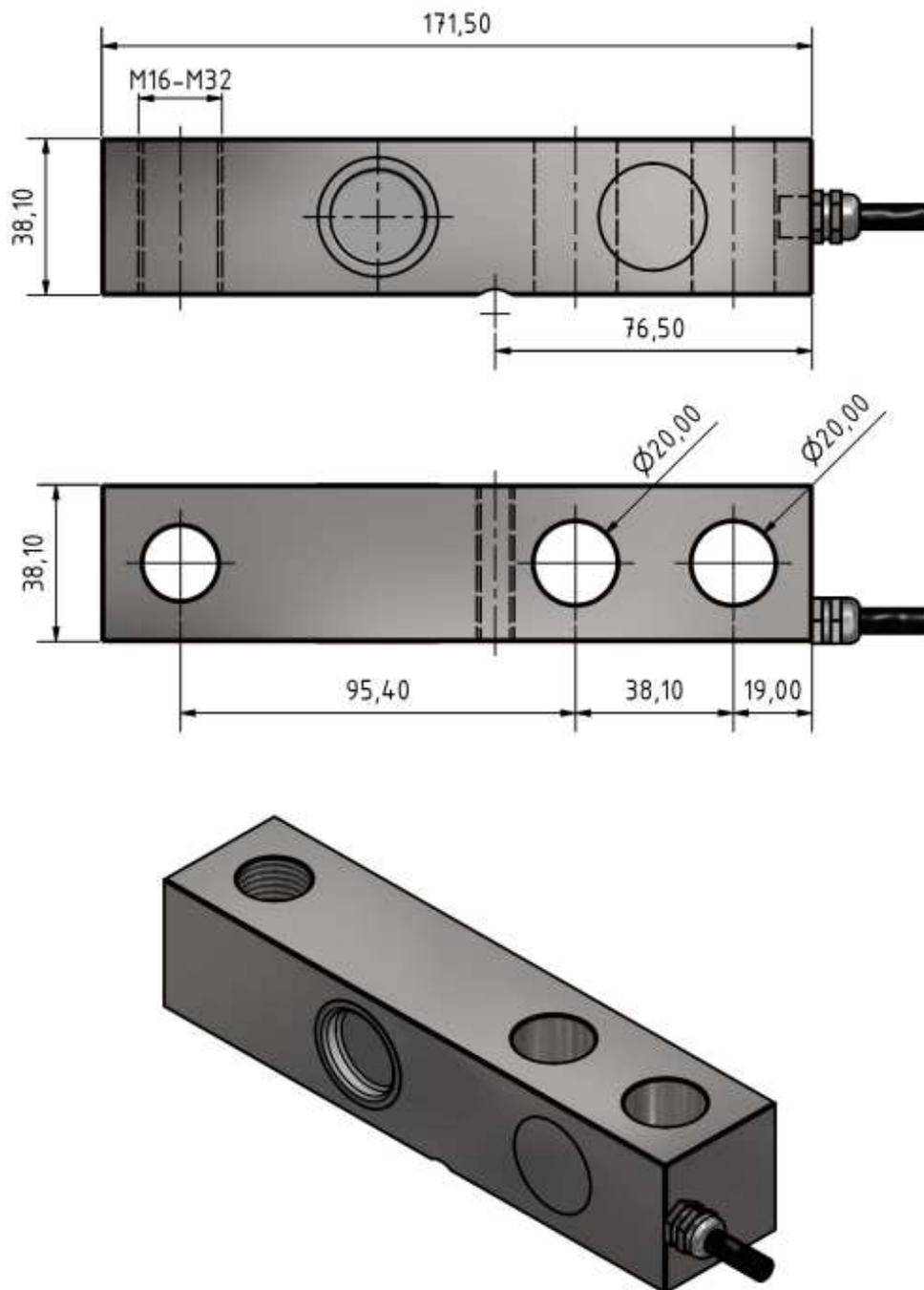
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Figure 10.- Drawing TCC-5a.2. Mechanical fastening system. Load cell TCC-5 (Option 2).



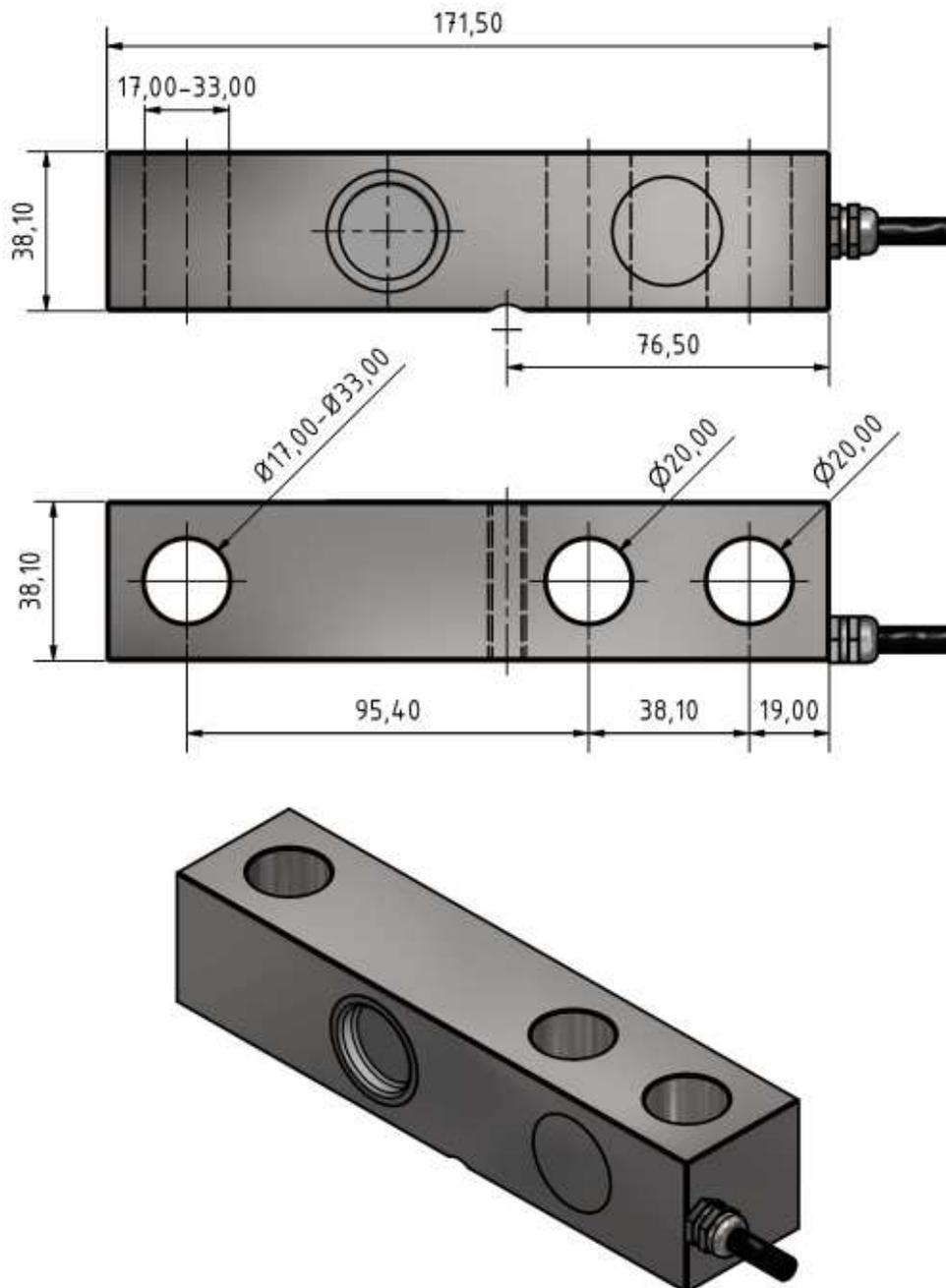
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Figure 11.- Drawing TCC-5b.1. Load transmission system. Load cell TCC-5 (Option 1).



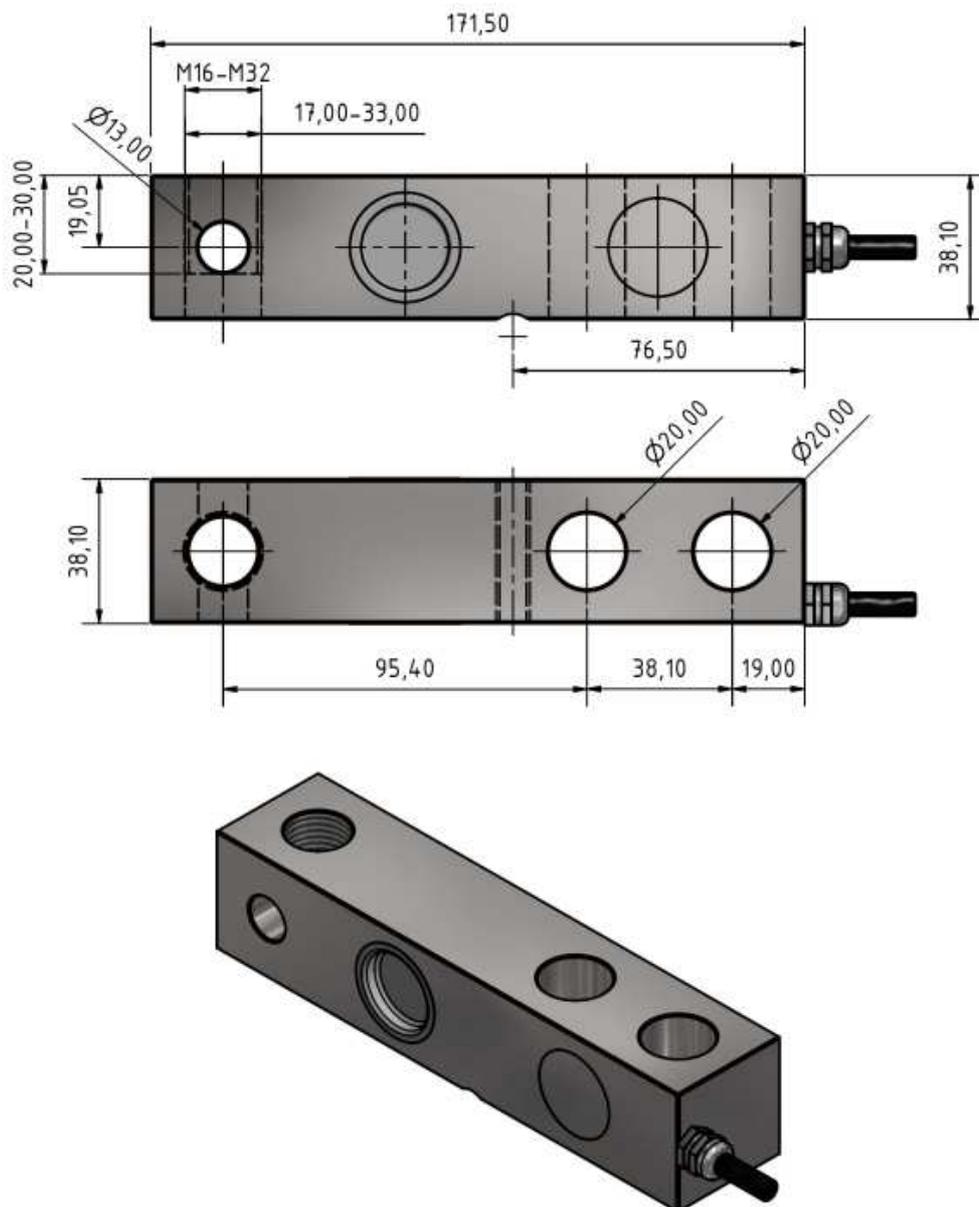
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**Figure 12.- Drawing TCC-5c.1. Load transmission system. Load cell TCC-5 (Option 2).**



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Figure 13.- Drawing TCC-5d.1. Load transmission system. Load cell TCC-5 (Option 3).

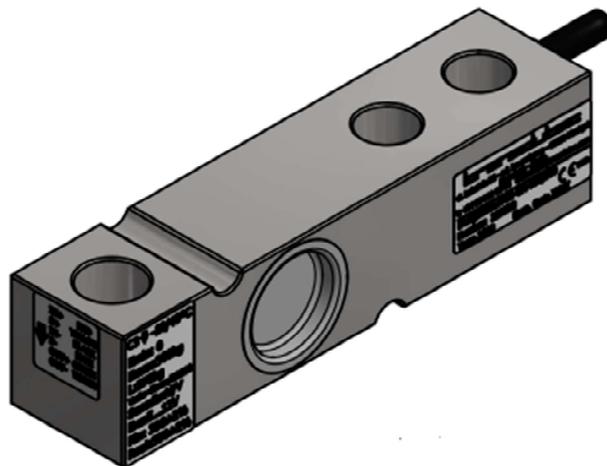
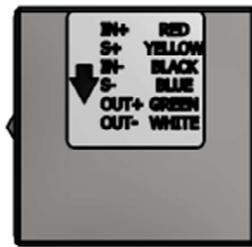


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Figure 14.- Drawing TCC-4.eti. Labels location. Load cell TCC-4.

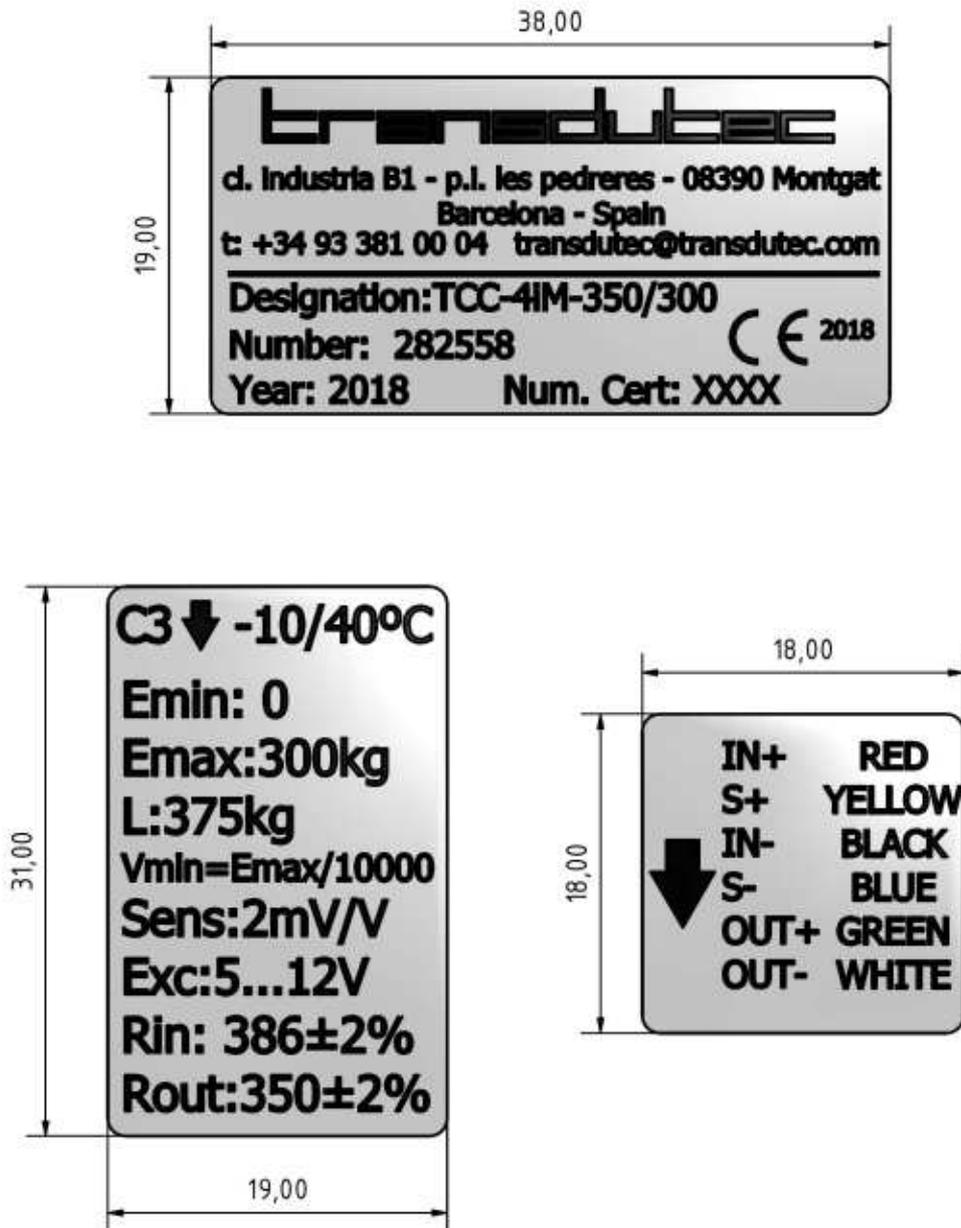


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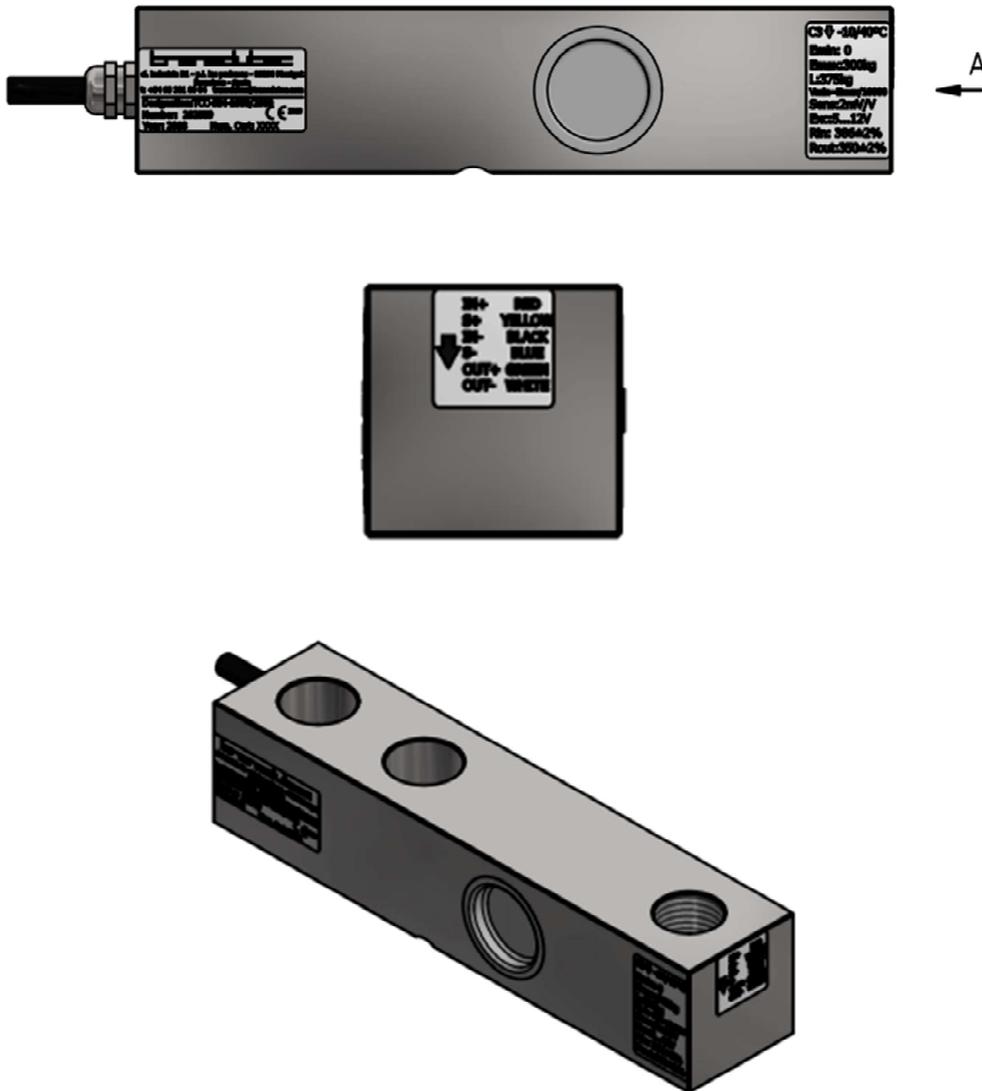
Descriptive annex to test certificate number E-18.02.C04

Figure 15.- Drawing TCC-4.eti2. Characteristics label. Load cell TCC-4.



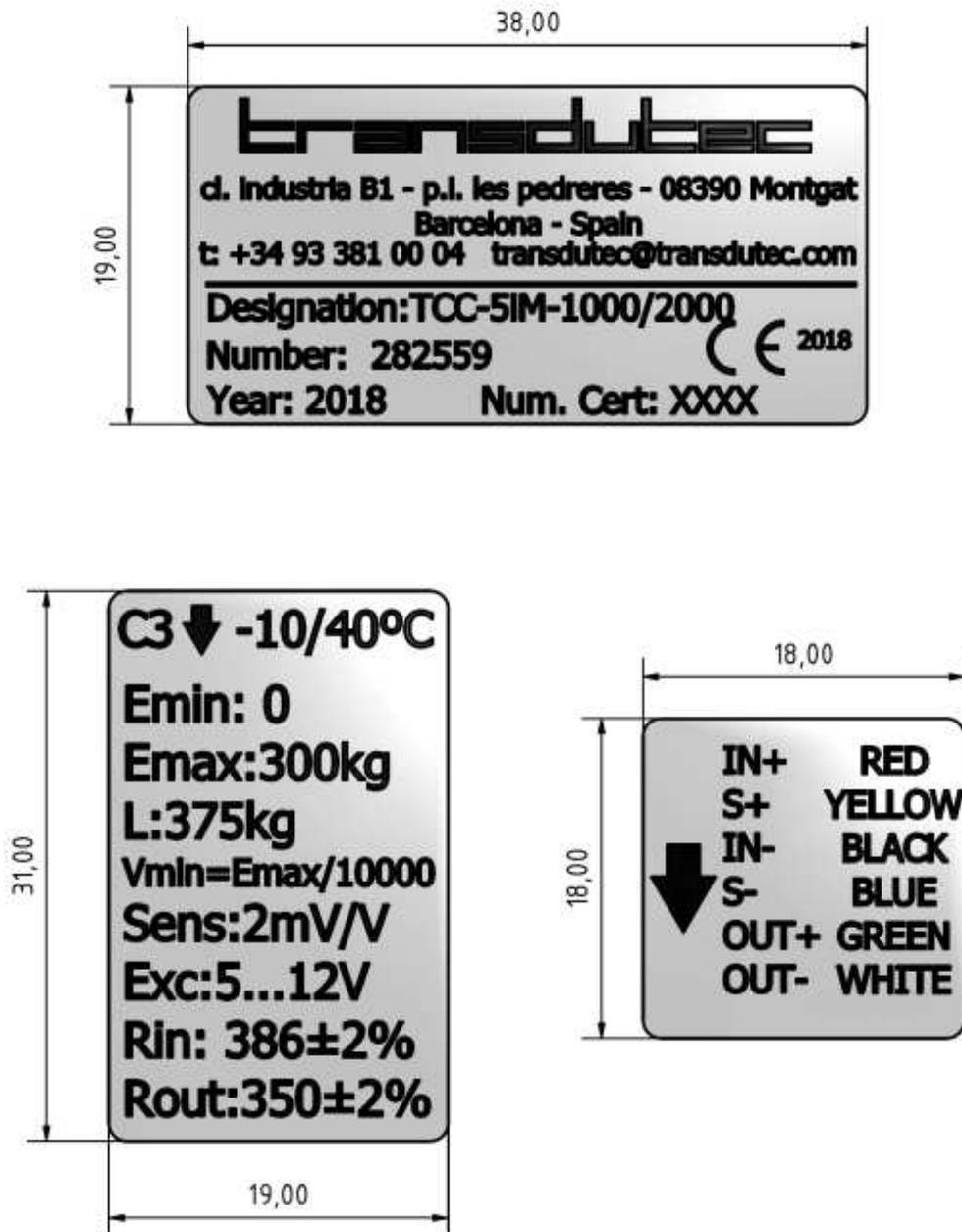
Descriptive annex to test certificate number E-18.02.C04

Figure 16.- Drawing TCC-5.eti. Labels location. Load cell TCC-5.



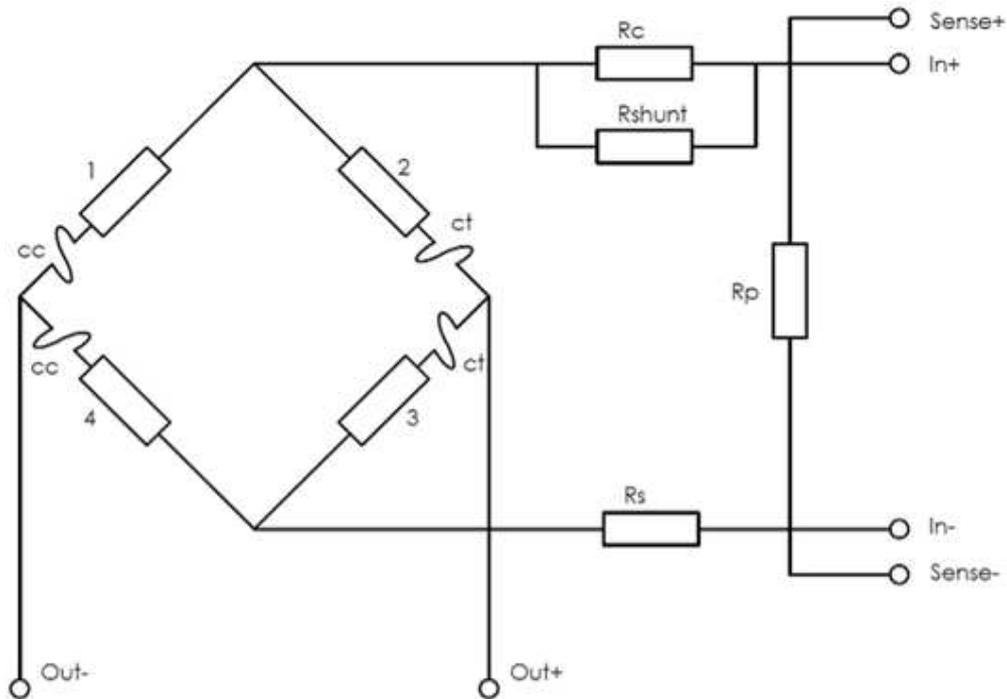
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Figure 17.- Drawing TCC-5.eti2. Characteristics label. Load cell TCC-5.



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**Figure 18.- Drawing o TCC-4.ec. Electrical connection. Load cell TCC.**



1,2,3,4	Bandas Extensiométricas
Rc	Resistencia de compensación de módulo de temperatura
Rs	Resistencia de compensación de sensibilidad
Rp	Resistencia de compensación de impedancia de entrada
cc	Compensación de la señal de salida de cero
ct	Compensación de la desviación de cero en temperatura

**Código colores conexionado**

4 hilos		6 hilos	
Rojo	In+	Rojo	In+
Negro	In-	Negro	In-
Blanco	Out-	Blanco	Out-
Verde	Out+	Verde	Out+
		Amarillo	Sense +
		Azul	Sense -