OIML Certification System	CMI	V 3112

OIML Member State Czech Republic	**OIML Certificate No.** R134/2006-A-CZ1-25.01

OIML CERTIFICATE ISSUED UNDER SCHEME A

OIML Issuing Authority

Name: **Czech Metrology Institute**
Address: Okružní 31
638 00 Brno
Czech Republic

Person responsible: Jan Kalandra

Applicant

Name: **TENZOVÁHY, s.r.o.**
Address: Machátova 345/3
783 01 Olomouc
Czech Republic

Manufacturer

Name: **TENZOVÁHY, s.r.o.**
Address: Machátova 345/3
783 01 Olomouc
Czech Republic

Identification of the certified type *(the detailed characteristics will be defined in the additional pages)*

Automatic instrument for weighing road vehicles in motion and measuring axle loads type PW 134

Designation of the module *(if applicable)*

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This OIML Certificate attests the conformity of the above identified type (represented by the sample(s) identified in the OIML type evaluation report) with the requirements of the following Recommendation of the International Organization of Legal Metrology (OIML):

OIML R 134 **Edition (year): 2006**

Český metrologický institut

This OIML Certificate relates only to metrological and technical characteristics of the type of measuring instrument covered by the relevant OIML Recommendation identified above.

This OIML Certificate does not bestow any form of legal international approval.

The conformity was established by the results of tests and examinations provided in the associated reports:

Test report No. 6012-PT-R0011-25 dated 2.4.2025 that includes 50 pages.
Test report No. 6012-PT-R0014-25 dated 15.7.2025 that includes 75 pages.
Test report No. 8551-PT-E0217-24 dated 30.11.2024 that includes 1+41 (Test report + annex) pages.
Test report No. 8552-PT-S0008-25 dated 27.3.2025 that includes 5+5 (Test report + annex) pages.

OIML type evaluation report 0511-ER-W103-23 dated 16.7.2025 that includes 7 pages.

The technical documentation relating to the identified type is contained in documentation file:

0511-UL-W103-23

OIML Certificate History

Revision No.	Date	Description of the modification
-	24 July 2025	Issuing of certificate

The OIML Issuing Authority
RNDr. Pavel Klenovský
Director of Certification Body

Date: 24 July 2025

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Important note: Apart from the mention of the Certificate's reference number and the name of the OIML Member State in which the Certificate is issued, partial quotation of the Certificate and of the associated OIML type evaluation report(s) is not permitted, although either may be reproduced in full.

1 INSTRUMENT NAME AND DESCRIPTION

PW 134 is a portable weighing instrument designed for determining the weight of wheels, axles, and the total weight (gross vehicle weight) of road vehicles.

1.1 Weighing instrument modules

The weighing instrument consists of the following parts (modules):

- A pair of weighing platforms, which are load receptors with integrated load cells.
- Levelling pads (usually plastic mats) for installing the portable weighing instrument on the roadway surface. Alternatively, the levelling pads can be replaced by inserting the weighing platforms into a base frame embedded in the roadway surface.
- Indication unit with legally relevant software (LRSW): WSERVER, WTERMINAL, and Firmware PSU.

2 MAIN METROLOGICAL CHARACTERISTICS

Instrument - platform type	**PW 134 - T05**	**PW 134 - T10**	**PW 134 - T15**	**PW 134 - T20**
Accuracy class for Vehicle mass	2 and higher			
Accuracy class for Axle load	E and higher			
Accuracy class for Axle group load	C and higher			
Max	5 000 kg	10 000 kg	15 000 kg	20 000 kg
Min	200 kg	200 kg	200 kg	500 kg
Scale interval d	20 kg	20 kg	20 kg	50 kg
Operating speed range	2 to 6 km/h			
Temperature range	- 20 to + 60°C			

Table 1: PW134 metrological characteristics

Min and Max, as shown in Table 1, determine the range of weight capacity *per wheel of the vehicle* (Min_{wheel}, Max_{wheel}).

For the weighing capacity range *of one axle,* the following formula applies:

$$Min_{axle} = 2 \times Min_{wheel}$$
$$Max_{axle} = 2 \times Max_{wheel}$$

The weighing range for *the total vehicle weight* (Gross vehicle weight - GVW) is determined as the product of the weighing range of one axle and the maximum number of weighable axles (A_{max}).

$$Max_{GVW} = (2 \times Max_{wheel}) * A_{max}$$

In the default configuration of PW 134 scales, the parameter $A_{max} = 16$. The value of A_{max} can be adjusted during the manufacturing process in the range $16 \leq A_{max} \leq 99$.

3 WEIGHING INSTRUMENT DESIGN

3.1 Mechanical design of the load receptor

The weighing platforms, which are the load receptors of the PW 134 weighing instrument, are sandwich structures consisting of a base plate fitted with strain gauge load cells and a bottom cover plate with supports for the load sensors.

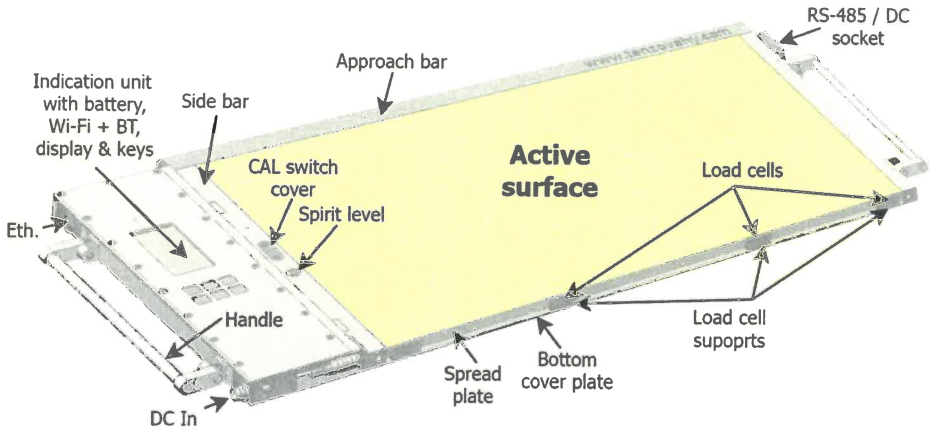


Figure 1: Cross-section of the weighing platform with indication unit module connected on the left side

A PSU module (Platform Scale Unit) with an integrated A/D, temperature sensor and a platform tilt sensor are inbuilt into the weighing platform as shown in the following Figure:

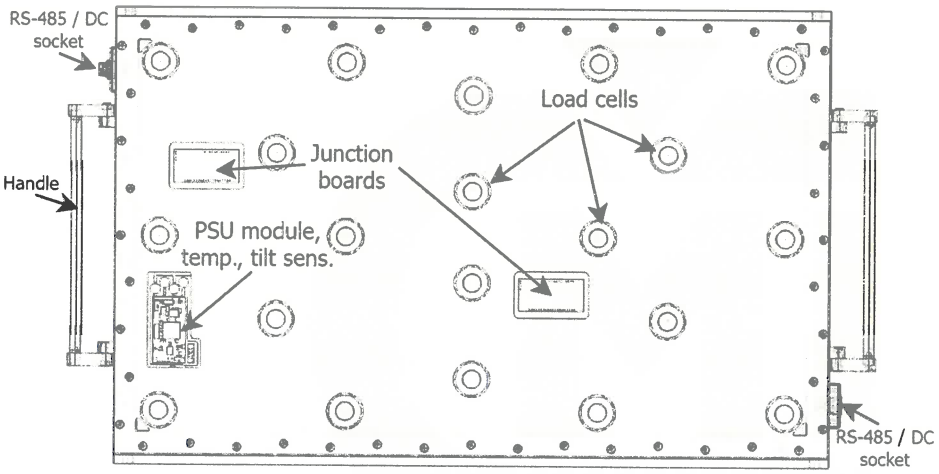


Figure 2: Load cell board and electronics inside weighing platform

3.2 Electronics

The weighing instrument electronics consist of three hardware modules:

Board	Description	Location	LRSW
PSU	**Platform Scales Unit** Data acquisition module from load, temperature and tilt sensors	Weighing platform	Firmware PSU
CBU	**Communication Battery Unit** Battery charging and wireless communication module	Communication unit Indication unit	---
Indicator	**Indication Unit** with display and keyboard	Indication unit	WSERVER, WTERMINAL

Table 2: Hardware modules

3.2.1 Detachable electronic units

A Communication unit for wireless data transmission or an Indication unit can be connected to the weighing platform. Both units contain a rechargeable battery power source.

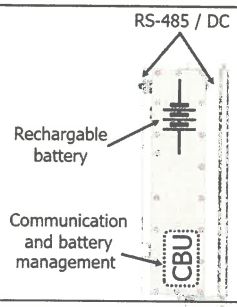
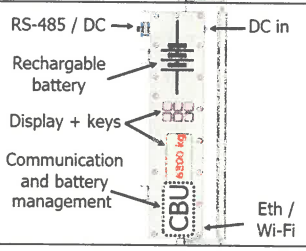
Module		Communication with platforms	Communication with external clients
Communication unit		Cable (RS-485) Wireless (Bluetooth)	- - -
Indication unit (incl. also communication circuits)		Cable (RS-485) Wireless (Bluetooth)	Ethernet or Wi-Fi

Table 3: Detachable electronic units

3.3 Principle of operation

Low-level signals from the load sensors are routed through junction boards to a single output with a load cell bridge function. This is connected to the input of the PSU module, converted to digital signal and transmitted via secured protocol to the Indication unit over the RS-485 bus.
Each weighing platform can be connected to:

- another weighing platform (multiple platforms can be chained in this way),
- or a Communication unit with a CBU module,
- or an Indication unit, which contains both a CBU module and an indicator.

3.4 Wired or wireless communication

EIA-485 bus is used for chain connection of weighing platforms leading to the Indication unit. Connection is established by cable or wirelessly by Bluetooth, as shown in the following diagrams:

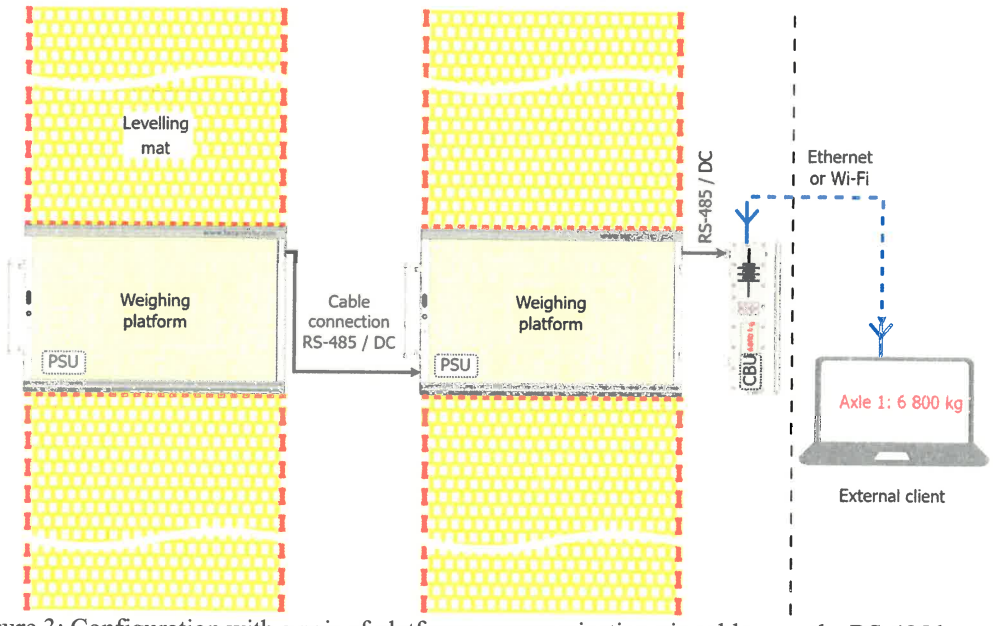


Figure 3: Configuration with a pair of platforms communicating via cable over the RS-485 bus with the Indication unit. The Indication unit may communicate further with external SW clients via Ethernet or Wi-Fi interface.

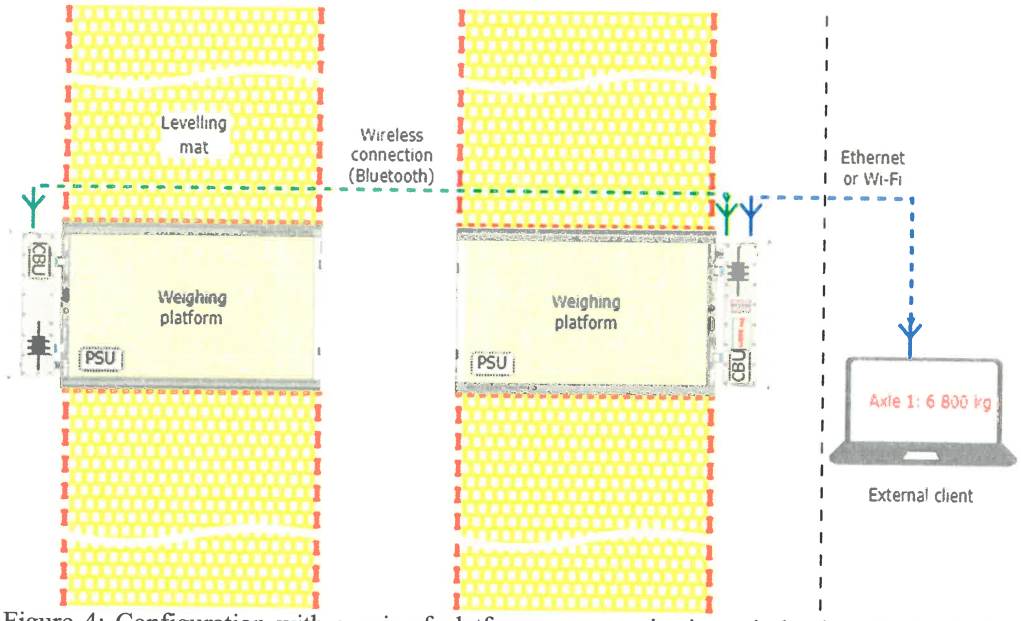


Figure 4: Configuration with a pair of platforms communicating wirelessly with the Indication unit via Bluetooth technology. The Indication unit may communicate further with external SW clients via Ethernet or Wi-Fi interface.

3.5 Controlled weighing area

Weighing instrument installation instructions are based on OIML R 134:2006 Annex B clause and are further specified in manufacturer's User manual.

3.5.1 Weighing zone with weighing platforms laid on the roadway surface

When the weighing platforms are placed on the road surface, the levelling of the weighing platforms is ensured by a set of levelling pads or levelling mats placed in front of and behind the weighing platforms. The length of the levelling mats shall be sufficient to ensure that all the wheels of the individual vehicles in the vehicle combination remains at the same level during weighing - as shown in the Figure 5a,b:

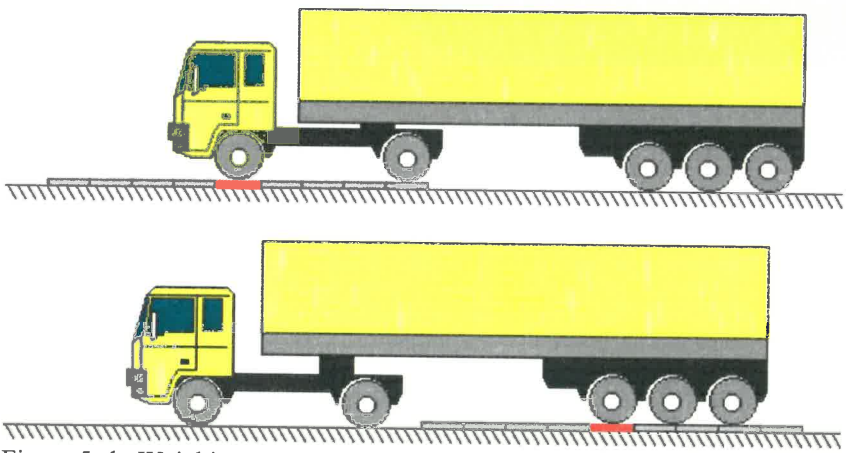


Figure 5a,b: Weighing zone consisting of weighing platforms and levelling pads (levelling mats)

3.5.2 Weighing zone with weighing platforms in the level of road surface

The base frame lined with a steel angle is used to place the weighing platforms at the level of the road surface of the weighing zone. The bottom of the foundation must provide support for the weighing platforms over the entire surface of the bottom plate. Frame is levelled to a plane in both longitudinal and transversal directions. The minimum length of the weighing zone, in the centre of which the base frame with weighing platforms is placed, is determined by the longest wheelbase of the vehicle being weighed.

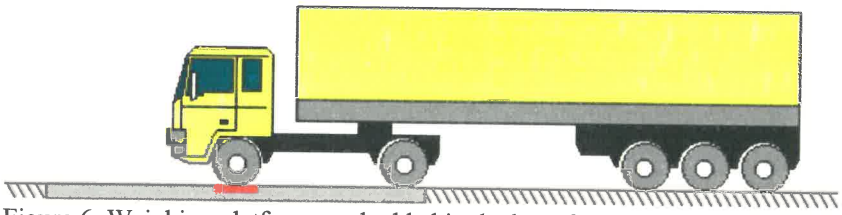


Figure 6: Weighing platforms embedded in the base frame at weighing zone level

4 SOFTWARE

The legally relevant software of the scales and its security meet the requirements of the WELMEC 7.2:2023 software guide. The software of the Indication unit is based on a client-server architecture. WSERVER application acts as the server, to which external client applications can connect. The structure of the legally relevant software - LRSW and the software of external clients is shown below:

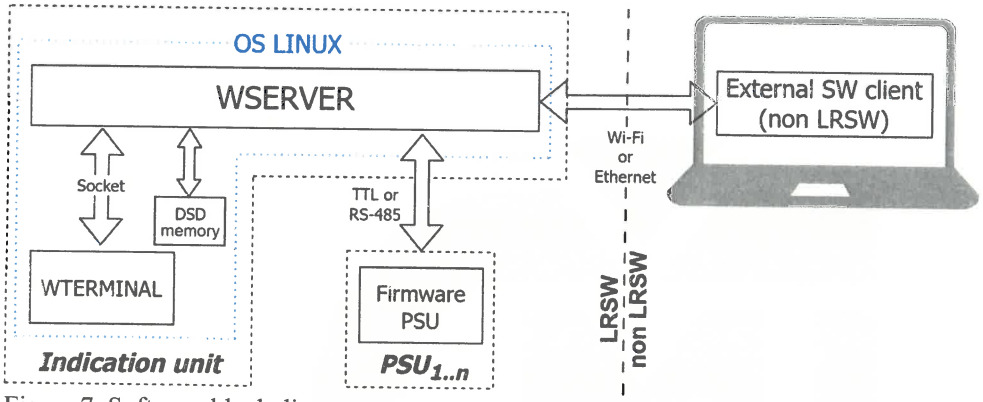


Figure 7: Software block diagram

4.1 Software modules and their functions

4.1.1 PSU Firmware

The PSU firmware is stored in the integrated secured EEPROM memory of the PSU module.
PSU modules are paired with a specific indication unit during the manufacturing process by a unique key that allows the paired PSU module to communicate only with that specific indication unit.

4.1.2 OS Linux - Debian distribution with LinuxRT extension

The single chip computer (SoC) of the indication unit runs the closed Linux Debian operating system with the LinuxRT extension. Access to the operating system functions and interfaces of the SoC computer beyond selected functions of the weighing device is prohibited at the operating system level.

4.1.3 WSERVER

The WSERVER application establishes and controls communication with paired PSU modules via the UART interface (TTL or EIA-485). The indicator unit with LRSW WSERVER acts as the Master device on the bus.

4.1.3.1 WSERVER LEGALLY RELEVANT FUNCTIONS

- Weighing in automated mode - WSERVER control the process of weighing-in-motion and performs data collection from paired PSU units.
- Storing weighing records in the internal integrated DSD memory.
- Selecting LRD from DSD memory and displaying them on the indicator unit display. The WTERMINAL application provides the display's graphical interface and keyboard commands.
- During calibration and verification process, WSERVER controls saving of LRF parameters created by the Service client WSERVICE as described in article 4.5.

4.1.4 WTERMINAL

WTERMINAL is LRSW serving HID devices – it ensures the display of LRD provided by the WSERVER application on the indicator unit display, menu navigation, and operation of the indicator unit keyboard.

4.2 Software identification by version number and CRC checksum

LRSW applications are identified by version number and CRC checksum.
Software identification by version number:

- WSERVER: WSRV: 1.01.02
- WTERMINAL: WTRM: 1.01.03
- PSU Firmware: PSU 01-nn: 1.07.00 (where "nn" is the number of paired platforms)

The CRC checksum has 8 characters in hexadecimal format:

- WSRV: 42A43767
- WTRM: D7142A48
- PSU 01-02: 3C376769, 4E234828

When the indicator unit starts, the CRC of LRSW WSERVER, WTERMINAL, and the PSU EEPROM memory data area are calculated and then compared with the stored value. If the values do not match, an error message is displayed and weighing is disabled.
The display of LRSW version numbers and their CRCs are included in the indicator's start-up sequence. These data are also accessible during system operation from the indicator user menu.

4.3 Adjustment number mechanism

To prevent unauthorised changes to LRF parameters, the system is further protected by an adjustment number mechanism. Changes to LRF parameters always result in a new adjustment number generated by the LRSW WSERVER application, which is displayed upon start-up of the indication unit:

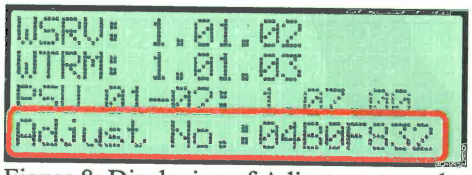


Figure 8: Displaying of Adjustment number

4.4 Storage and displaying of Legally relevant data

LRD generated during the weighing process are automatically stored in the integrated DSD memory of the indication unit upon completion of weighing. External access to the DSD memory (excluding access controlled by the LRSW WSERVER application) is disabled.
The data in the DSD memory is secured against intentional and unintentional changes by a checksum. After each write to the DSD memory, the checksum value is recalculated and stored in the LRSW WSERVER configuration.
Quantity of stored weighing records is set to 1 000 000 by default (can be changed in factory parameters).
Viewing records in the DSD memory is possible by client's query to WSERVER. WSERVER reply with data dump from the DSD to display of the Indication unit or to communication interface.

4.5 Service client WSERVICE and adjusting of LRF parameters

The WSERVICE software client provides functions for servicing and calibration of the scales, and adjusting their LRF parameters. Writing LRF parameters to the DSD memory is performed exclusively by the WSERVER.
Changes to LRF parameters can be applied only when 'CAL' switch is activated on the weighing platform.

5 TECHNICAL DATA

5.1 Weighing platforms technical data

Weighing platforms are manufactured in several types, differing in max. capacity and dimensions of active surface:

Type	Capacity [kg]	Active surface [mm]	
T05	5 000 / platform (one vehicle wheel)	Length: Width: Height:	290 (-30 +70) 390 (-20 +70) 20 (-2 +2)
T10	10 000 / platform (one vehicle wheel)	Length: Width: Height:	420 (-30 +70) 715 (-20 +70) 20 (-2 +2)
T15	15 000 / platform (one vehicle wheel)	Length: Width: Height:	420 (-30 +70) 715 (-20 +70) 20 (-2 +2)
T20	20 000 / platform (one vehicle wheel)	Length: Width: Height:	500 (-30 +70) 900 (-20 +70) 22 (-2 +2)

Table 4: Types of weighing platforms (dimensions without detachable electronic module)

Dimensional variability resulting from the customisation of mechanical parts do not affect the metrological characteristics or LRF of the scales.

The ***Length*** of the platform refers to the dimension measured in the direction of vehicle ride. The ***Width*** of the platform refers to dimension measured across the direction of vehicle ride.

5.2 Power supply

The scales are powered by direct current from an internal battery in the scale display unit or from an external adaptor (100-240 V, 50-60 Hz / 12 V DC), which also serves as a charger of the internal battery.

5.3 Interfaces and optional peripheral devices

The interfaces are described in Table 3.
PW134 weighing instrument can be equipped with optional auxiliary devices providing additional functions of the weighing instrument – i.e. printing device, external display, ANPR camera, various types of vehicle detection devices etc.
These devices are connected to and controlled by external SW client running on an external device, typically on a PC with Windows OS or a tablet with Android OS.
Peripheral devices and its data do not affect the LRD of the weighing instrument.

6 CALIBRATION, VERIFICATION AND SECURING OF THE WEIGHING INSTRUMENT

The metrological tests must be carried out according to national applicable regulations.

6.1 Securing components and verification marks

6.1.1 Securing the calibration switch on weighing platforms

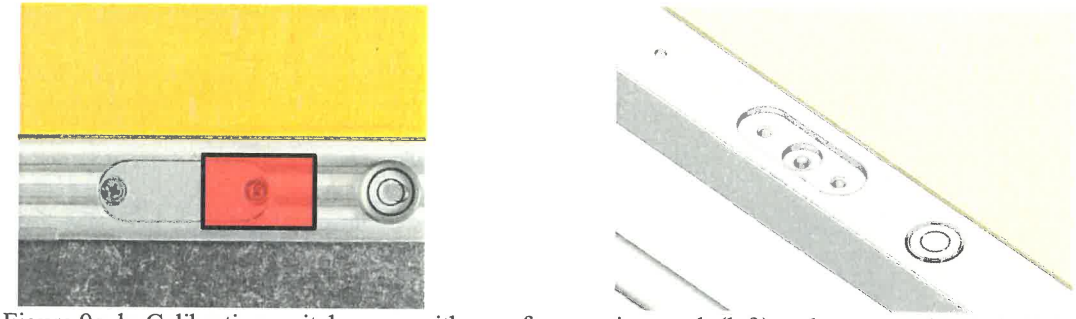


Figure 9a, b: Calibration switch cover with area for securing mark (left) and uncovered switch (right)

The calibration switch 'CAL' cover is secured with a self-adhesive verification mark placed across one of the cover screws, as shown in Figure 9 on the left.

6.1.2 Main instrument label

The main instrument label with complete descriptive markings is located on the weighing instrument's indication unit. The label complies with clause 3.9 of the international recommendation OIML R 134:2006. Following information are provided on the label:

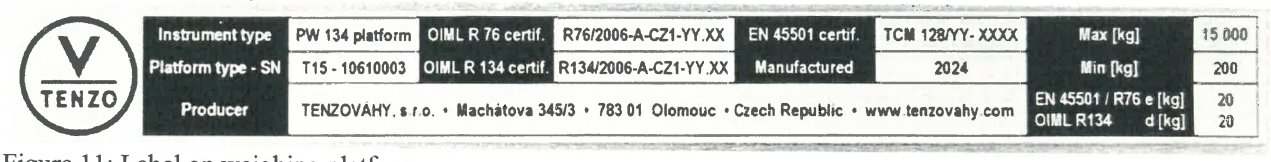
Instrument type - S/N	PW 134 - K0210002	OIML R 76 class EN 45501 class	IIII	EN 45501 / R76 e [kg] OIML R134 d [kg]	20 20	Adjustment No	04B0F832
Platform 1 type - S/N Platform 2 type - S/N	T15 - 10610003 T15 - 10610004	OIML R 134 classes Total • Axle • Group	2 E C	Oper. speed [km/h]	2 ÷ 6	WSRV version	1.01.02
OIML R 76 cetificate EN 45501 certificate	R76/2006-A-CZ1-YY.XX TCM 128/YY- XXXX	Min wheel / axle [kg]	200 / 400	Amax	16	WTRM version	1.01.03
OIML R 134 certificate	R134/2006-A-CZ1-YY.XX	Max wheel / axle [kg]	15 000 / 30 000	Temp. range [°C]	-20 ÷ +60	PSU 01-02 vers.	1.07.00
Producer	• TENZOVÁHY, s.r.o. • Machatova 345/3 • 783 01 Olomouc • • Czech Republic • www.tenzovahy.com •			Power supply	12V DC	Manufactured	2024

Figure 10: Main label of the weighing instrument

The main label is secured with a verification mark.

6.1.3 Label on weighing platforms

Each of the weighing platforms is equipped with a label containing the basic platform parameters, the platform serial number, and the serial number of the indication unit with which the platform was paired during manufacturing.



Instrument type	PW 134 platform	OIML R 76 certif.	R76/2006-A-CZ1-YY.XX	EN 45501 certif.	TCM 128/YY- XXXX	Max [kg]	15 000
Platform type - SN	T15 - 10610003	OIML R 134 certif.	R134/2006-A-CZ1-YY.XX	Manufactured	2024	Min [kg]	200
Producer	TENZOVÁHY, s.r.o. • Machatova 345/3 • 783 01 Olomouc • Czech Republic • www.tenzovahy.com					EN 45501 / R76 e [kg] OIML R134 d [kg]	20 20

Figure 11: Label on weighing platform

The label is also secured with a verification mark.