

# Certificate

## Pursuant to section 12 of the Weights and Measures Act 1985

*Certification No 2937*

*Valid Until 19 December 2022*

*In accordance with the provisions of section 12 of the Weights and Measures Act 1985, the Secretary of State for Business, Innovation and Skills hereby certifies as suitable for use for trade a pattern of an automatic road-weighbridge, for measuring the gross weight of road vehicles in-motion as described in the descriptive annex to this Certificate, and having the following characteristics:-*

*A weighbridge, fitted with a minimum of four strain gauge load cells, connected to an indicating device. The manufacturer's designation for the system is "Rideweigh".*

<i>Maximum capacity</i>	<i>Max</i>	<i>≤</i>	<i>60,000 kg</i>
<i>Minimum load</i>	<i>Min</i>	<i>=</i>	<i>400 kg</i>
<i>Verification scale interval</i>	<i>e</i>	<i>≥</i>	<i>5 kg</i>
<i>Maximum number of scale intervals</i>	<i>n</i>	<i>≤</i>	<i>10,000</i>

*Note: This certificate relates to the suitability of the equipment for use for trade only in respect of its metrological characteristics. It does not constitute or imply any guarantee as to the safety of the equipment in use for trade or otherwise.*

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Reference No: T1138/0015  
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# Descriptive Annex

## 1 INTRODUCTION

This pattern of an automatic (in-motion) road-weighbridge comprises any of the following indicating devices: 3590E, CPWE, DFW or DGT, a printer, a remote display and a load receptor having aprons on both sides. The system is for gross vehicle weighing only for vehicles having a maximum of 20 axles. The system has a maximum capacity of up to 60,000 kg with a minimum scale interval (e) of 5 kg, depending upon configuration. A schematic diagram is shown in Figure 1. This instrument is a mains powered 240 V / 50 Hz digital weight-indicating device

## 2 CONSTRUCTION

### 2.1 Mechanical

#### 2.1.1 Weigh zone

The weigh zone comprises of the load receptor with aprons on both sides.

#### 2.1.2 Load receptor

##### 2.1.3.1 Fixed system (RWS)

The load receptor comprises of two flush mounted weigh platforms, each fitted with four or more load cells. The maximum capacity of each weigh platform is dependent upon the number of load cells multiplied by the maximum capacity of the load cells. The RWS platforms are embedded in the ground using a concrete foundation and having the following technical characteristics.

Platform Model	Maximum capacity of single platform (kg)	Dimensions (mm)
RWS – Permanently fixed system	25,000	3000 x 720

##### 2.1.3.2 Portable system (WWS)

The load receptor, comprising of a portable weigh platform fitted with four or more load cells. The maximum capacity of each weigh platform is dependent upon the number of load cells multiplied by the maximum capacity of the load cells. The WWS platforms are securely fixed to a concrete base with bolts that can be removed when not in use. The portable system can either be used with one or two WWS platforms together with levelling mats either side of the weigh platforms having the following technical characteristics.

Platform Model	Maximum capacity of single platform (kg)	Dimensions (mm)
WWSD – Portable system	20,000	900 x 500
WWSE– Portable system	12,500	700 x 450
WWSF– Portable system	30,000	900 x 700

## 2.1.4 Aprons

Each apron either side of the load receptor are level to within +/- 1 mm. Irregularities of up to +/- 3 mm may be tolerated provided they are confined in areas of less than 150 mm in diameter and do not lie at right angles to the direction of travel. A line or marker is used to indicate the start of the approach apron.

### 2.1.4.1 Levelling mats

The WWS portable system has levelling mats fitted before and after the weigh platforms. The table below details the levelling mats available with their technical characteristics;

Apron Model	Apron weight (kg)	Dimensions (mm)
WWSELM	28	1200 x 700 x 52
WWSGLM	28	1200 x 700 x 52
WWSFLM	40	1200 x 900 x 71

## 2.1.5 Vehicle guide device

Traffic Management (for instance barriers, kerbing, signage or traffic lights) shall be put in place to ensure the axles pass completely over the platform and to restrict the direction if the instrument is for single direction use.

## 2.2 Electrical/electronic

### 2.2.1 Weight indicator

#### 2.2.1.1 3590-E, CPWE, DFW and DGT models

The 3590-E, CPWE, DFW and DGT digital indicators are fully described in Test Certificate. №. GB-1461.

The technical data for the weight indicators is as follows:

Power supply	3590 Series: 6-12 V DC External/Internal 110-240 V AC 50/60 Hz
	CPW Series: 8-24 V DC
	DGT Series: 12-24 V DC External/Internal 110-240 V AC 50/60 Hz
	DFW Series: 12 V DC External/Internal 110-240 V AC
Maximum number of scale intervals	10000
Load cell excitation voltage	5 V DC
Minimum load cell impedance	20 Ω
Maximum load cell impedance	10 kΩ
Minimum input voltage per verification scale interval	0.3 μV/Div
Measuring range minimum voltage	3 mV
Measuring range maximum voltage	30 mV
Fraction of maximum permissible error	0.5
Operating temperature range	-10 / + 40 °C
Load cell connection	4 or 6 wire
Load cell cable length (junction box to indicator)	50 m

## **2.2.2 Devices**

The Dini Argeo family of indicators can comprise of the following devices:

- Semi-automatic zero setting ( $\leq 4\%$  Max)
- Zero tracking ( $\leq 4\%$  Max)
- Semi-automatic subtractive tare weighing
- Pre-set tare
- Recall of Gross indication when tare is active
- Determination of stability of equilibrium
- Indication of stability of equilibrium
- Multi-range and multi-division function
- Checking of display
- Printing
- Alibi storage device
- Gravity compensation
- Real time clock
- Accumulation
- Battery level indicator
- Remote control
- LCD or LED
- Peak Hold
- Gross, Net, Tare, Preset tare, Print, Zero, Motion, Accumulation, Over/Under weight and Network indicators

## **2.3 Load cell**

**2.3.1** Any load cell(s) may be used for instruments under this Type-Approval Certificate provided the following conditions are met:

- There is a respective OIML Certificate of Conformity (R60) or a Test Certificate (EN: 45501) issued for the load cell by a Notified Body responsible for type examination under Directive 2009/23/EC.
  - The certificate contains the load cell types and the necessary load cell data required for the manufacturer's declaration of compatibility of modules (WELMEC Guide 2, Issue 5, 2009, section 11), and any particular installation requirements. A load cell marked NH is allowed only if humidity testing to EN: 45501 has been conducted on this load cell.
  - The compatibility of load cells and indicator is established by the manufacturer by means of the compatibility of modules form, contained in the above WELMEC Guide 2 document, at the time of verification.
  - The load transmission must conform to one of the examples shown in WELMEC Guide 2.4, "Guide for load cells".

## **2.4 Printer**

**2.4.1** Any simple recipient printer may be used if:

- it bears the CE marking for conformity to the EMC Directive;
- it is not capable of transmitting any data or instruction into the indicator other than to release a printout, checking for correct data transmission;
- it prints weighing results and other data as received from the indicator without any modification or further processing; and
- it complies with the applicable requirements of EN45501, i.e. 4.2, 4.4, 4.6 and 4.7.

**2.4.2** The printer is connected to the indicator via a protected interface. Upon completion of a weighing cycle, information is sent from the indicator weight processor via a serial link to the printer. An example printout is shown in figure 3.

The printout shall include, as a minimum, the following information:

- Total vehicle mass with unit
- Date and time
- Operating speed or warning message if applicable (FAST)
- “Axle Weights and Wheel Weights Not Permitted to be used for Trade Purposes” or similar wording if these weight values are printed

**2.4.3** The printer may be used as a tally roll printer when the indicator is connected to a computer. It shall not be possible to initiate a second printout for the same weighing operation, except where the second ticket is clearly a duplicate of the first ticket e.g. multi-leaf with different colours / headings, or marked duplicate. One copy shall be retained as a tally record for a period of not less than 90 days.

## **2.5 Remote display**

**2.5.1** A remote display model designated DGT60; incorporating a six digit LCD with 60 mm high characters may be fitted to the indicator unit via a protected interface listed in Section 2.8.2.

Alternatively, the following LCD displays may be connected:

- DGT100

## **2.6 Legends and markings**

The manufacturer’s name is located on the front cover of the indicating device. The following inscriptions are on a data plate which cannot be removed without being destroyed:

Manufacturer	Dini Argeo S.r.l.
Certificate number:	UK 2937
Accuracy Class:	2, 5, or 10 (whichever is applicable)
Serial number:	To be completed before verification
Minimum capacity:	400 kg
Maximum capacity:	XX,XXX kg (up to 60,000 kg)
Maximum operating speed:	X km/h (up to 5 km/h)
Maximum number of axles:	X axles (up to 20 axles)
Scale interval (e):	≥ 5 kg

The maximum operating speed depends upon the accuracy class:

Speed (km/h)	Platform Model	Accuracy class	Direction of travel	Vehicle type
0 – 5	RWS – Permanently fixed system	2, 5, and 10	Dual	Steel leaf & Pneumatic suspension
	WWSD – Portable system	5, and 10	Dual	
	WWSE – Portable system	5, and 10	Dual	
	WWSF– Portable system	2, 5, and 10	Dual	

## 2.7 Sealing and stamping

**2.7.1** The data plate is secured, either by sealing or by being of a form such that it is destroyed when removed.

**2.7.2** Components that may not be dismantled or adjusted by the user must be secured. Common serial numbers, a wire and seal solution or a suitable mark may be used. The securing mark may be either:

- a mark of the manufacturer and/or manufacturer’s representative, or
- an official mark of a verification officer.

**2.7.3** When software sealing is used, the CONFIG and CAL counters’ values shall be written on a tamper-evident label on or near the rating plate.

## 2.8 Peripheral devices and interfaces

### 2.8.1 Peripherals

**2.8.1.1** The weighing system may be connected, via a protected interface listed in Section 2.8.2, to any non-intelligent recipient peripheral which is technically compatible; has a Test Certificate issued by a Notified Body for EC Type Examination to the Directive 2009/23/EC in any member state or bears the CE marking of conformity to the relevant directives.

### 2.8.2 Interfaces

**2.8.2.1** The instrument may be fitted with the following protected interfaces:

- 4 or 6-wire load cell connection
- DC voltage input
- RS-232
- RS-485
- Control inputs/outputs
- USB
- Ethernet
- Bluetooth
- Optoisolated inputs
- Photomosfet outputs
- SENOR (Digital in)
- RF (radio frequency)
- WiFi

### **3 OPERATION**

**3.1** All weighing operations shall be started with the vehicle stationary at a minimum distance of 4 m in front of the load receptor. A suitable forward gear shall be selected to ensure the vehicle crosses the load receptor in a smooth manner. Weighing operations are not permitted using reverse gear.

**3.2** If the bridge has no weight on it and any previous weigh cycle has been completed, the display will read zero. Automatic zero-tracking will occur if selected. This means that any weight which appears on the weighbridge below 1 scale interval will be zeroed out. The “zero” button may be operated to balance the bridge for loads over 1 scale interval.

**3.3** The vehicle identification number can be entered via the keyboard, either before or after the vehicle has crossed the weighbridge, or by using any other automatic Dini Argeo identification system.

**3.4** When the first axle is driven over the weighbridge, the display will indicate the axle weight and an internal timer (internally adjustable) will be started. If another axle is detected before the timer has elapsed, the timer will reset and the weight of the new axle displayed. This sequence continues for up to a maximum of 20 axles.

**3.5** As an axle passes over the bridge a number of weighings are taken to determine the axle weight. If an insufficient number of weighings have been made (internally adjustable) “Fail” will be displayed and recordings discontinued. “Overspeed” will be printed on the ticket (no other printing will be possible). The maximum speed is 5 km/h.

**3.6** If a weight greater than the maximum capacity + 9e is recorded, a fault code is displayed and recordings discontinued. “OVER” will be indicated on display and not print at all. If a weight less than the minimum capacity (400 kg) is recorded, a fault code is displayed, and printing will not be possible.

**3.7** When no further axles have been detected and the timer has elapsed, a data entry timer is started. The vehicle identification number should be entered if not done at the start of the weighing operation. The printout will display the gross vehicle weight up to a maximum of 999.99 t. A new weighing cycle may be started when the printer has printed the ticket.

**3.8** The measurement data is stored on the alibi storage device, and shall include the information listed in section 2.4.2. The requirement of section 2.4.2 also applies to data stored on an external PC complying with section 2.8.1.1 when no printer is connected to the instrument.

### **4 SECURITY**

**4.1** The software is held on the Flash Memory and cannot be modified by the user. The calibration and legally relevant parameters are protected via physical or software means.

A jumper located on the main board prevents all access to the legally relevant parameters.



Alternatively, software sealing may be used to protect the calibration and legally relevant parameters. Two non-editable counters, designated CAL and CONFIG, are incremented each time the calibration and legally relevant parameters respectively are modified, with access to these parameters being password-protected. The counters' values and designations must be written on a tamper-evident label on or near the rating plate.

## 4.2 Verification information

### 4.2.1 Software identification

When the indicator is first turned on a 10-digit code will appear on the display indicating: the type of instrument, the software version subject to legal restrictions and the software programme version which does not involve variations with the essential requirements of the EN45501.

The displayed abbreviation is made up of: ***prefix/version/suffix***

The ***prefix*** shows the instrument model and may be made up of alphanumeric or numeric characters of variable length.

The ***version*** shows the software version legally constrained and made up of two numeric characters.

The ***suffix*** shows the software programme version and is made up of 6 numeric characters in the *xx.yy.zz* format.

Model	EPROM version code
3590E series	<i>01.01 xx.yy.zz</i>
CPWE series	<i>01.01 xx.yy.zz</i>
DFW series	<i>02.01 xx.yy.zz</i>
DGT series	<i>09.01 xx.yy.zz</i>

Prefix 0X: indicates the model.

Version 01: indicates the legal software version

Suffix *xx.yy.zz*: indicates the software programme version which may be modified.

### 4.2.2 Indication of code

An indication of the code appears automatically and temporarily on the main display of the indicator each time it is turned on with the "ON" key before the scale predisposes itself normally at zero. Since the code is longer than the digits available, it is displayed in two parts. First of all the prefix and version are displayed and after a few seconds these are substituted by a suffix.

### 4.2.3 Calibration and programming

The programming and calibration of the instrument may be done through the keyboard of the indicator module if a specific jumper inside the indicator on the CPU board has been activated. Once the function has been enabled one accesses the general set-up menu where steps are shown on the display to help guide the operator. The calibration data is stored in a non-volatile manner in the FLASH memory and is protected by a checksum which ascertain the integrity; in case of error the instrument's functioning is blocked. If an indicator repeater is remotely connected, the programming and calibration function is only possible on the main indicator.

## **5 AUTHORISED ALTERNATIVES**

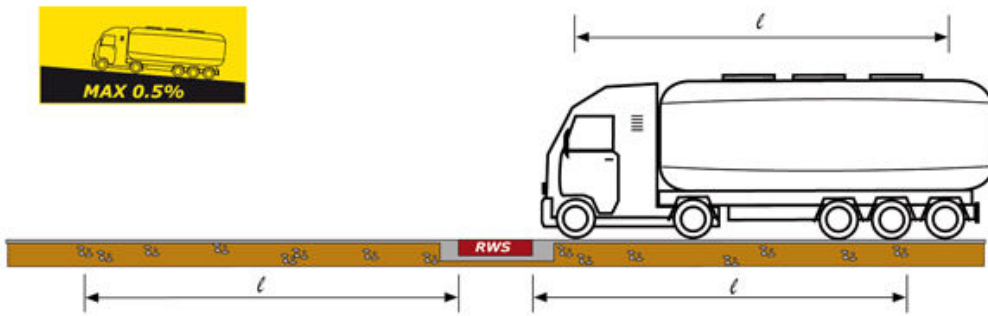
There are no current authorised alternatives.

## **6 ILLUSTRATIONS**

- Figure 1 Schematic diagram of weighing system
- Figure 2 The 3590E indicator
- Figure 3 Typical ticket printout
- Figure 4 RWS cabling
- Figure 5 Ground installation of RWS

## **7 CERTIFICATE HISTORY**

<b>Issue No.</b>	<b>Date</b>	<b>Description</b>
2437	20 December 2012	Certificate first issued.



**Figure 1** Schematic diagram of weighing system



**Figure 2** The 3590E indicator

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Via della Fisica 20  
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Modena, Italy

Vehicle AB123CD

Date/Time  
14/11/12 12:32

AXLE	1	2910kg
AXLE	2	2890kg
AXLE	3	5395kg
AXLE	4	4755kg
AXLE	5	4650kg

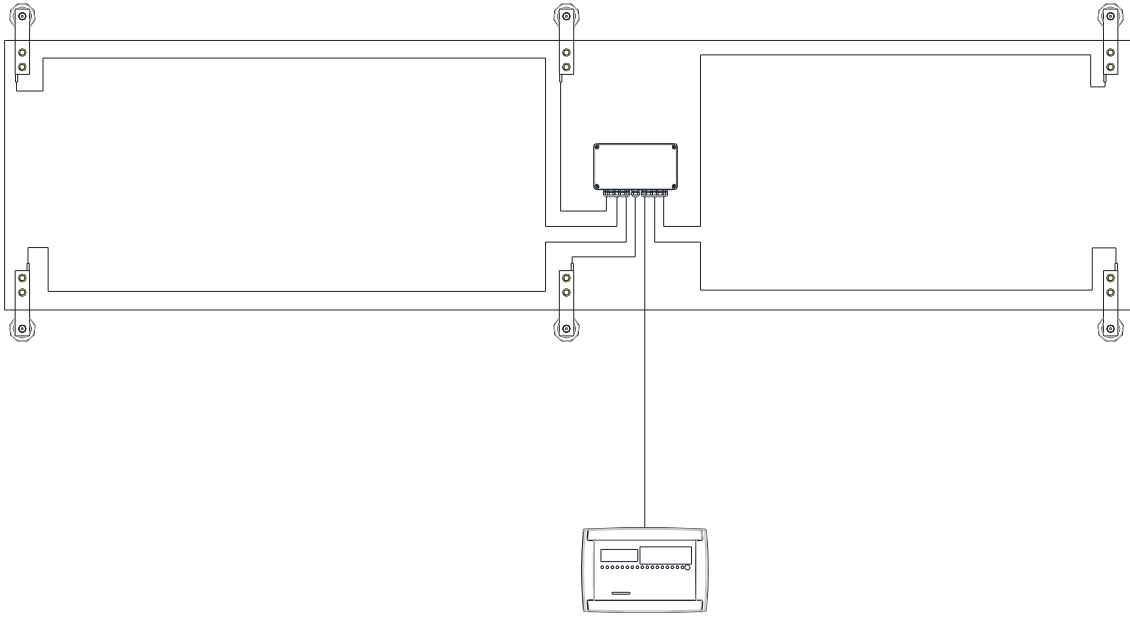
---

TOTAL 20600kg

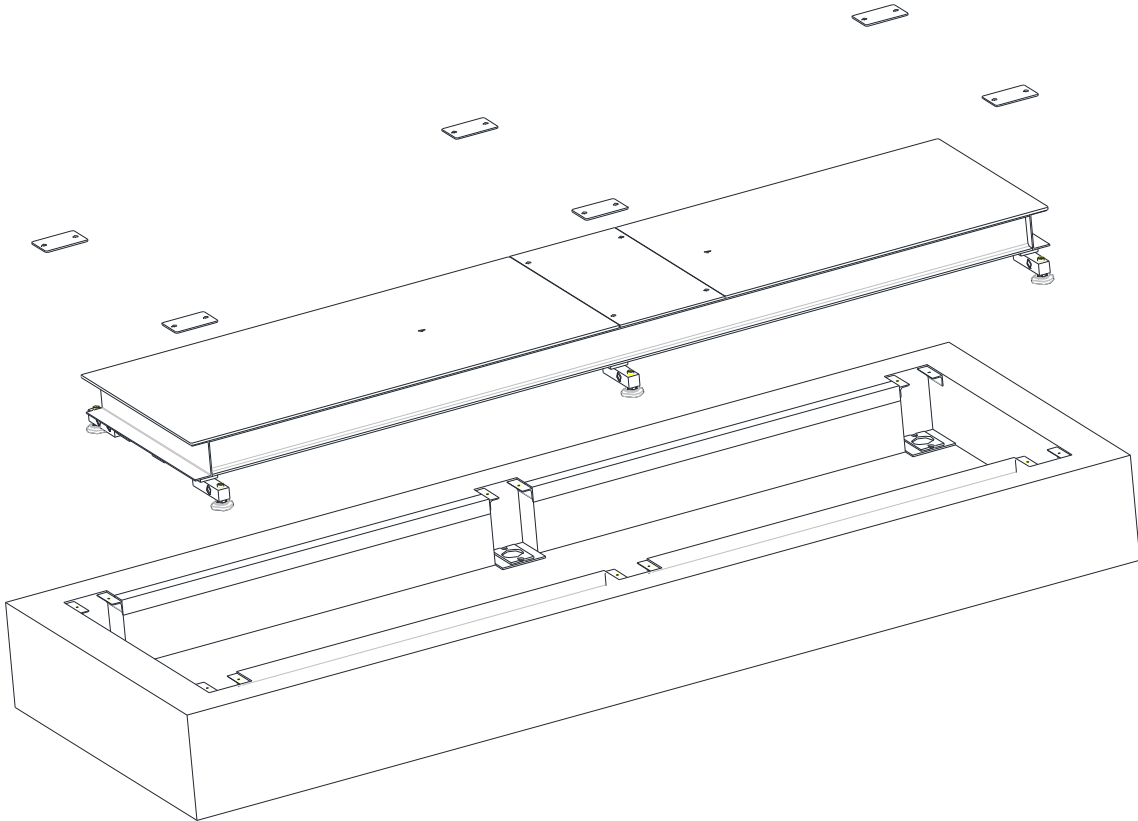
SPEED 2km/h

Axle Weights and Wheel  
Weights are not Legal  
for Trade

Figure 3 Typical ticket printout



**Figure 4 Cabling of the RWS**



**Figure 5 Ground Installation of the RWS**