(2654) *V(2)e*

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

Certification No 2654 Revision 1

Valid Until 13 October 2012

In accordance with the provisions of section 12 of the Weights and Measures Act 1985, the Secretary of State for Innovation, Universities & Skills hereby certifies as suitable for use for trade a pattern of an automatic catchweight price computing weighing machine as described in the descriptive annex to this Certificate, and having the following characteristics:-

Maximum capacity	*Max*	≤	*15 kg*
Minimum capacity	*Min*	≥	*20 e*
Scale interval	*e*	≥	*0.001 kg*
Number of scale intervals	*n*	≤	*6000*

Under the provisions of section 12(5) of the said Act, the certificate is subject to the conditions as given in the descriptive annex.

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.

Submitted by: ***Bizerba (UK) Ltd***
Eastman Way
Hemel Hempstead
Hertfordshire
HP2 7DU
United Kingdom

Signatory: *G Glas*
for Chief Executive
National Weights & Measures Laboratory
Department for Innovation, Universities & Skills
Stanton Avenue
Teddington
Middlesex TW11 0JZ
United Kingdom

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CERTIFICATION NO 2654

Descriptive Annex

1 INTRODUCTION

This pattern of a 230 V a.c. 50 Hz mains-operated automatic catch weigher, designated GLM-I..., comprises a self-indicating and price computing weighing machine and a control system, a weigh platform incorporating a load receptor and weighing system, two additional conveyors, and a thermal label printer and applicator module.

The instrument is designed to weigh packs dynamically, with a maximum throughput of 150 packs per minute, depending upon the pack size, weight and label size. The conveyor speed is adjustable by the operator and can run at a maximum speed of 90 m/min.

The GLM-I... has PLUs which contain the price per unit weight data for each product/pack type. This is used in conjunction with the pack weight to calculate the price to pay. The required transaction and commodity data is sent to the printer where the labels are printed and automatically applied to the packs.

Unit prices of up to £9999.99 per kg by £0.01 intervals can be entered and price-to-pay amounts of up to £9999.99 by £0.01 intervals can be printed.

2 WEIGHING PARAMETERS

2.1 The system has the following weighing parameters:

Maximum capacity	≤ 15 kg
Minimum capacity	≥ 20 e (catchweight mode)
	≥ 50 g (average weight mode - see section 8)
Scale interval	≥ 1 g
Maximum number of scale intervals	≤ 6000 (single interval), or
	≤ 2 x 3000 (multi-interval)
Maximum subtractive tare	- Max
Maximum throughput	≤ 150 packs per minute
Operating temperature range	- 10 to + 40 °C

3 CONSTRUCTION

Figure 1 shows the basic construction of the GLM-I. The GLM-I comprises the following assemblies:

- transport system
- control unit
- labeller
- load receptor
- display and operating unit

3.1 Transport system

3.1.1 The transport system comprises a stand onto which are mounted the control unit and the conveyor belts. The following conveyors are provided:

- feed conveyor belt
- separating conveyor belt
- weighing conveyor belt
- labelling conveyor belt(s)
- discharge roller conveyor

3.1.2 The weighing conveyor belt is mounted on the load receptor. The powered conveyor belt is mounted on a free-standing load support and transfers the package weight on to the measuring sensor.

3.1.3 The conveyor belts are driven by means of DC motors or brushless three-phase motors. An incremental encoder detects the revolutions of the drive motor which is then used to regulate the speed and to control the position of the packs as they are transported through the system.

3.1.4 A photocell and associated reflector are mounted at the trailing edge of the separating conveyor. The photocell detects the arrival of packs at the weigh conveyor and is used to facilitate control of the weighing operation.

3.2 Control unit

3.2.1 The electronic system which controls the motors is located in the control unit (switch cabinet). The labeller(s), display and operating unit are supplied with power from the control unit and are also networked for data exchange.

3.3 Labeller

3.3.1 The labeller is set up over the transport system by a mechanically adjustable suspension fixture. The position of the label on the pack is determined by the position control system of the unit. The height of the labeller can be adjusted by a powered spindle. Powered adjustment of the horizontal position of the labeller is also provided.

3.3.2 Thermal printer

3.3.2.1 The labeller is equipped with a thermal printer which comprises the mechanical printing unit, the print head, the tape winder and various mechanical fixtures to accommodate the label supply roll and the label backing paper.

3.3.3 Applicator

3.3.3.1 After being printed the label is held in position in front of the print head until the transport system has delivered the package to be labelled into the labelling position. The label is then applied to the package by a blast of air.

3.4 Weighing system

3.4.1 The forces acting on the load receptor are transferred to the weighing system by a load support which comprises a powered conveyor belt with the relevant mechanics and rollers. The weighing system comprises the DMS (strain gauge) weighing system type WS10, with or without mechanical pre-load compensation (additional identifier ... VK), installed in load receptor type 10A or 10B.

3.4.2 Load cell with pre-load compensation

3.4.2.1 To compensate for large pre-loads on the load receptor, a pre-load compensation can be provided on the load cell. It consists of an extension arm above the load cell which stretches in parallel from the part of the load cell fixed to the housing to the part which is responsible for the transfer of forces. For compensation, a spring is provided which is configured as a tension spring.

3.5 Display and operating unit (Figure 2)

3.5.1 The labeller(s) and the transport system can be operated using the display and operating unit type GT-... (graphics capable) which is mounted above the transport system on a stand.

3.6 The system is provided with a levelling device. For instruments that are permanently installed, the levelling device may be omitted.

4 ELECTRICAL

The weigh-price labeller is designed according to a modular concept. The individual modules are networked using a bus system which are networked by CAN bus connections within the modules. Modules such as the display and operating unit, additional labellers and load receptors are connected by means of separate interfaces. An overview of components:

- transport control
- labeller
- load cell electronic system (via its own serial interface)
- display and operating unit type GT-...

4.1 Transport control

4.1.1 All the connected devices such as labellers and the GT-... unit are networked in the transport control system (switch cabinet). The individual components are supplied with power from the switch cabinet. The transport control system is made up of the following components.

4.1.2 Transport control CPU and counter card for motor increments.

4.1.2.1 This is responsible for package tracing and co-ordination of the drive system. Package relevant data is exchanged between the individual components and the control system during the labelling process.

4.1.3 Motor control

4.1.3.1 The motors used for the powered conveyor belts are controlled by means of electronic motor control cards in the transport control switch cabinet.

4.1.4 Supply voltage

4.1.4.1 The labelling unit is configured for mains operation. The integrated power supply unit provides the voltage supply for the internal assemblies and also supplies external components such as additional labellers, the load cell electronics and the external display and operating unit type GT ... with the necessary operating voltage. The mains power to the unit is 230 V ac, 50 - 60 Hz.

4.2 Labeller

4.2.1 The labeller comprises the electronic assemblies for control of the unit, for the print set-up, labelling set-up and processing the weight information supplied from the load cell electronics.

4.3 Load cell electronics

4.3.1 The electronic circuit belonging to the load cell system encompasses all of the components required to supply the load sensor and to measure the load. The electronic system also encompasses the analogue to digital converter and a microcomputer for sequential control and digital pre-processing of the measured data. The electrical structure comprises the load sensor, strain gauge bridge, temperature sensor and electronic system. The data from the load cell is transmitted via a serial interface to the scale electronics.

4.4 Display and operating unit

4.4.1 The operator interface is provided by the separately mounted display and operating unit type GT-... which encompasses the following assemblies. Depending upon the GT type, several of these can be accommodated on one card:

- CPU card
- display control
- display with backlighting
- keypad with control/touch screen
- power supply

4.5 Devices

4.5.1 The instrument is provided with the following devices:

- zero point display
- initial zero-setting device
- automatic zero-setting after ≤ 30 minutes
- semi-automatic zero-setting device, by means of soft-key “Scale 0”
- zero-tracking device
- static and dynamic adjustment (not accessible to the user)

- setting of conveyor belt speed
- detection of stable equilibrium
- display of software version number in the form “e: xxx”
- display test on start-up
- price calculation
- semi-automatic tare
- preset tare device
- tare per PLU, tare memory

4.6 Interfaces

4.6.1 The instrument is provided with the following interfaces.

4.6.1.1 Internal:

- system bus
- scale connector
- CAN bus

4.6.1.2 External:

- ethernet
- EDP - TTY or RS-232
- wireless LAN for optional equipment not subject to legal control
- I/O connector
- memory card connector to store article data or configuration data
- printer port for multiple labellers as master-slave printers

5 VERIFICATION MARKS (Figure 3)

5.1 Descriptive markings

5.1.1 The following legends are durably and legibly marked on a rating plate fixed to the front of the load receptor:

Manufacturers name:	Bizerba
Model Type:	GLM-I...
Serial Number:	#####
Certification No:	2654
Voltage:	230 V a.c.
Frequency:	50 Hz
Accuracy classification:	III
Max:	*
Min:	*
e:	*
T-:	*

* = assigned at initial verification

5.1.2 For average weight mode (checkweigher), as described in section 8, the appropriate Min and Max shall also be marked or displayed.

5.1.3 The following legends are shown on the operator display:

Max:
Min:
e:
"Not to be used for direct trade with the public"

5.1.4 The following legends are durably and legibly marked on a rating plate fixed to the labeller:

Manufacturers name:	Bizerba
Model Type:	GLM-I...
Serial Number:	#####
Certification No:	2654

5.1.5 The following legends are durably and legibly marked on a rating plate fixed to the operating and display unit:

Manufacturers name:	Bizerba
Model Type:	GT...
Serial Number:	#####
Certification No:	2654

5.2 Stamping

5.2.1 A stamping plate is securely fixed to the main rating plate on the front of the load receptor.

5.3 Sealing

5.3.1 The load receptor is secured by a protective hood made of stainless steel. The protective hood is secured against removal by an angular plate, which also secures the calibration switch. The fixing screw of the plate is either secured by a wire and lead seal or by a 'tamper-evident' label applied over the screw. 'Tamper-evident' labels or wire and lead seals are used to secure all adjusting devices. Data subject to metrological control is secured.

6 SOFTWARE

6.1 Software structure

6.1.1 The software is structured in layers (layer model). It comprises the "base software" BOS (Bizerba Operating System) and the application software (unit specific software). The basic software comprises the first three layers.

6.1.2 Basic software

6.1.2.1 The first layer contains the device drivers, the second layer comprises the device managers, and the third layer comprises the application managers.

6.1.3 Application software

6.1.3.1 The upper layer contains the actual device software featuring the functions of the relevant devices. This layer is further subdivided into a general part and a device-specific part.

7 OPERATION

7.1 Switching on

7.1.1 After powering-up the instrument using the main switch, the individual scale components are initialised. An internal test routine then follows automatically.

7.1.2 After power-up, certain test routines are run through in the load cell electronic circuit. After this the CPU is tested in the main program to ensure that the zero-setting criteria are fulfilled. If the initial zero-setting range is exceeded, a message "unload scale" appears in the display. As soon as this has been fulfilled and the scale is at equilibrium, zero-setting takes place. The instrument is then ready for operation.

7.2 Weight labelling mode (Figure 4)

7.2.1 The instrument operates under the control of the PLUs. The PLUs are programmed with information to allow the calculation of the price of the pack and to print the required label, containing the transaction and commodity data, and apply it to the pack in the correct location. Information contained within the PLU is used by the system, in association with the signal from the pack photosensor, to generate the timing signals for control of the weighing and labelling operations.

7.2.2 A pack is supplied on to the infeed conveyor which runs at a slower speed than the separator conveyor, to provide separation of packs. The pack is transported across the infeed and separator conveyors to the weighing conveyor. The pack breaks the photosensor located at the trailing edge of the separator conveyor which initiates the dynamic weighing process. The pack passes along the weighing conveyor and is weighed dynamically. If a stable weight value is not achieved the system indicates an error and the pack is not labelled. Provided a stable weight value is achieved, it is used to calculate the Total Price to the nearest 1 p (0.5 rounded up) and the transaction is sent to the printer. The label is then printed and applied to the pack.

7.2.3 The photosensor at the trailing edge of the separator conveyor is used to ensure that there is only one pack on the weighing conveyor while the weighing operation is in progress. If a second pack arrives at the photosensor while the weighing operation is in progress, the infeed and separator conveyors stop. When the weighing operation is complete the conveyors start again and the pack is transported onto the weighing conveyor.

7.2.4 The speed of the conveyors can be changed while in weight labelling mode. The separator, weighing and labelling conveyors all run at the same selected speed, with the infeed conveyor always running at a slower speed.

7.3 Non-weighed items operation

The availability of these modes is protected to management level with entry requiring positive acceptance by the operator.

7.3.1 Fixed price

7.3.1.1 A fixed price mode of operation is provided, and is accessed by selecting a PLU which has been programmed with a fixed price. The Unit Price field includes the text "Fixed Price". The scale display is inactive, i.e. the weight and tare fields are blanked out with the text "Non-weighed" displayed. The softkey functions and print formats for the labels are changed in accordance with the labelling mode. Packs are labelled with the price but not with the weight in this mode of operation.

7.3.1.2 The scale functions "Scale 0" and "Tare" are no longer accessible in this labelling mode. However, if the scale is connected these functions remain activated in the background (also with automatic zero correction) so that the scale supplies the correct value immediately when switched back into weight labelling mode.

7.3.2 Fixed weight labelling

7.3.2.1 As per fixed price labelling the weighing function is disabled although the scale remains active in the background. The softkey functions and print formats for the labels are changed according to the labelling mode. The weight value display includes the text "Fixed Weight" to clearly differentiate from weight labelling, with the text "Non-weighed" also displayed.

7.3.2.2 Using the function key "Fixed Weight", a weight value can be entered and displayed. The fixed weight value can also be stored per PLU and automatically be activated when changing PLUs. When a unit price has been entered, it is also possible for the price to pay to be calculated and printed. If the unit price is zero, only the fixed weight value is printed and unambiguously identified as such.

7.3.3 Fixed value labelling

7.3.3.1 Fixed value labelling is a combination of fixed price and fixed weight. With this labelling mode, the fixed price and fixed weight are entered, or automatically changed with a change of PLU. All fixed values are unambiguously identified as such both on the display and also on the printed label. The text "Fixed Price" and "Fixed Weight" are shown in the appropriate fields, with the text "Non-weighed" also displayed.

7.4 Display functions

7.4.1 The display and operating unit is equipped with a high-resolution LCD graphic module. In the operating mode "Weight labelling", the metrological data (unit price, weight and tare) is indicated in the upper area of the display. The various operating modes of the instrument, i.e. weight labelling, fixed weight, etc. are clearly identified. Unambiguous assignment of the entered values and their units of measurement ensures that there is no confusion for the operator.

8 AVERAGE WEIGHT MODE (CHECKWEIGHER)

8.1 The instrument has an operating mode which includes an average weight facility. The availability of the average weight facility is protected to management level. Entry into this mode requires positive acceptance by the operator. All packs which comply with the conditions for the average weight system are labelled with the nominal weight, e.g. if the nominal weight is 500 g, all packs which fall within the tolerances for the average weight system will be labelled with 500 g. An "e" symbol is either printed on the label or pre-printed labels are used. Any packs which do not meet the conditions of the average weight system are labelled with the catchweight or are not labelled at all. A statistical program is provided for providing the necessary records.

8.2 In this mode of operation the minimum capacity is as specified below.

$$\text{Min} \geq 50 \text{ g}$$

9 CERTIFICATION NUMBER

9.1 The system bears the Certification No 2654.

10 RECOMMENDED TESTS

In addition to the tests specified in The Weighing Equipment (Non-automatic Weighing Machines) Regulations 2000, the following additional tests should be carried out:

10.1 Dynamic testing of the instrument is to be performed using the type of items or articles which are intended to be weighed. Test loads shall be applied at maximum, minimum and mid-point speeds of operation, as follows:

(i) Test load values close to Min and Max.

(ii) Test loads at critical points in between Min and Max e.g. at 500 e.

The number of test weighings shall be a minimum of 10 for each load.

The mass of all test loads shall be determined on a control instrument to an accuracy at least five times higher (three times higher if the control instrument is verified immediately prior to the automatic test) than the appropriate error allowance for the load.

11 AUTHORISED ALTERNATIVES

11.1 Having the instrument configured for start/stop operation such that the pack is weighed statically on the weigh conveyor. A label will only be printed if stable equilibrium is achieved.

11.2 Having multiple labellers connected to the instrument.

11.3 Having the labeller(s) mounted at the side of, or below, the labelling conveyor.

11.4 Having the instrument configured for the determination of postal tariffs, in which case the minimum capacity shall be as specified below:

$$Min \geq 5\ e$$

11.5 Having the air blast label applicator mechanism replaced by either a rotating applicator or a plunger applicator.

11.6 Having a 120 V ac 50/60 Hz mains power supply.

11.7 Having a modified instrument with the following technical characteristics:

Mode of operation	Start-Stop operation or operation in motion	
Scale module (with lever work)	Type 30K/60K	
Accuracy class	Y(a), Y(b) [1]	X(x), x ≥ 1 [1]
Maximum belt speed v_{max} in independence of the load L	≤ 0.67 m/s (0 kg < L < 5 kg) ≤ 1.00 m/s (5 kg< L < 60 kg)	
Power supply voltage	230 VAC – 50/60 Hz	
Temperature range	0 ˚C / +40 ˚C	
Number n of verification scale intervals	≤ 2 x 3000 [2] ≤ 6000 [3]	
Ratio between verification scale intervals	$e_{i+1} / e_i \leq 3$	
Verification scale intervals e	≥ 10 g	
Maximum load Max	≤ 60 kg	
Minimum load Min	≥ 3 kg [4]	

[1] For weighing instruments of the accuracy classes X(x) with x ≥ 2 and Y(b), the number of verification scale intervals is limited to $n_i \leq 1000$.

[2] This applies only to multi-interval instruments.

[3] This applies only to single-interval instruments.

[4] The minimum loads for accuracy classes X(x) (here only for Start-Stop operation) and Y(y) are as follows:

- Min ≥ 20 e_1 for weighing instruments of the accuracy classes Y(a) and X(x) with x ≤ 1,
- Min ≥ 10 e_1 for weighing instruments of the accuracy classes Y(a) and X(x) with x ≥ 2,
- Min ≥ 5 e_1 for postal scales

Greater minimum loads may also result from the metrological test of the verification inspection.

12 NOTES AND CONDITIONS

Note 1: Approval under this certificate only covers the use of the pattern as an automatic catchweight weighing machine.

Note 2: Features (as described at Section 7.3 and 8), not forming part of the conventional use of an automatic catchweight weighing machine, have been allowed in this pattern under the following condition.

In accordance with section 12(5) of the Weights and Measures Act 1985 these features shall not be used in a manner that compromises the pattern when used as an automatic catchweight weighing machine.

Note 3: Use of these features for weighing and pricing may be covered by requirements in other legislation outside the scope of this approval.

12.1 When more than one labeller is provided on a system, when more than one label is applied to the same pack, the primary indications of weight, unit price and price-to-pay shall be grouped together clearly and unambiguously on the same label.

CERTIFICATE HISTORY

ISSUE NO.	DATE	DESCRIPTION
Cert 2654	14 October 2002	Type approval first issued.
Cert 2654 revision 1	14 July 2008	Consolidation of the certificate (Amendment 1 included). Addition of authorised alternative 11.7.

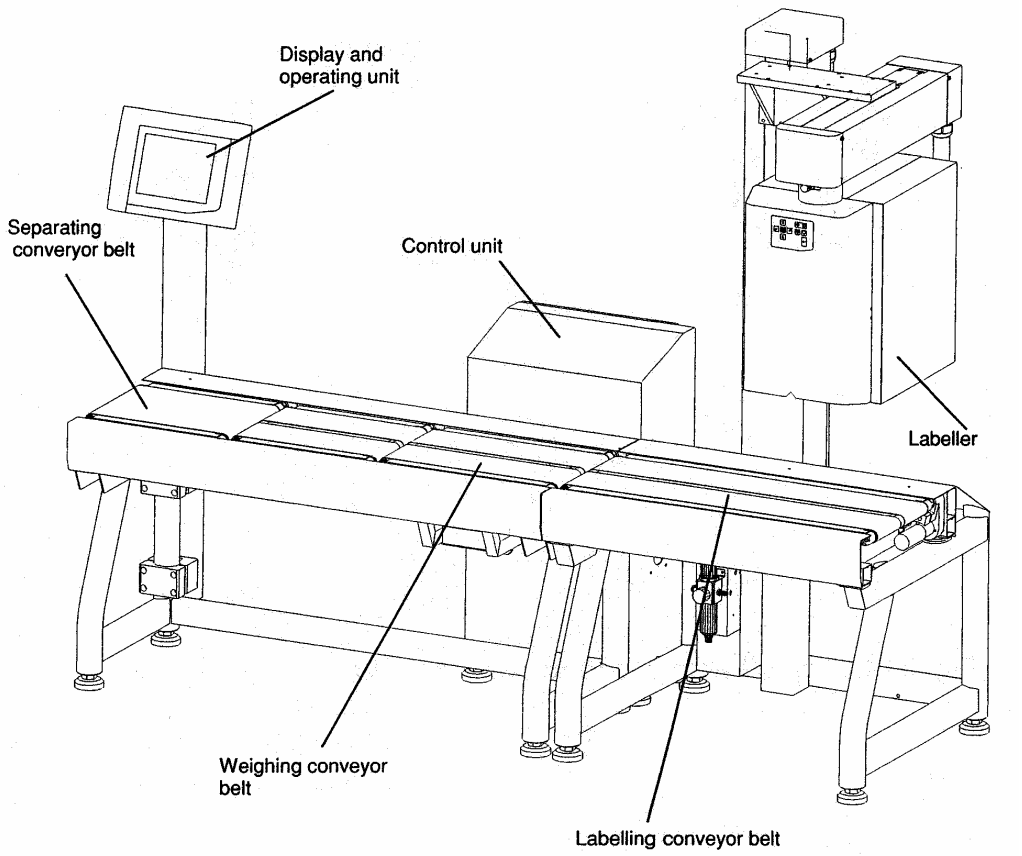

Figure 1 Schematic of GLM-I system

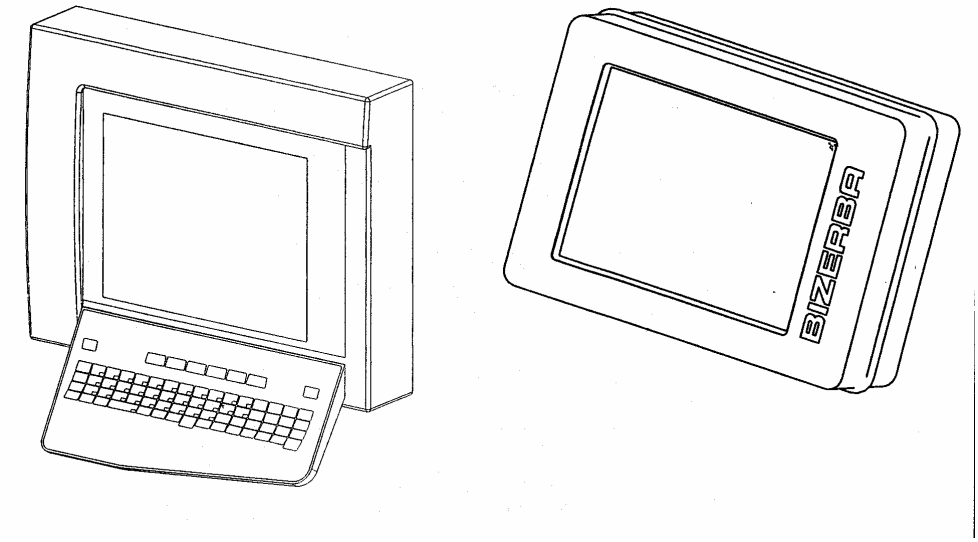

Figure 2 Operating and display unit

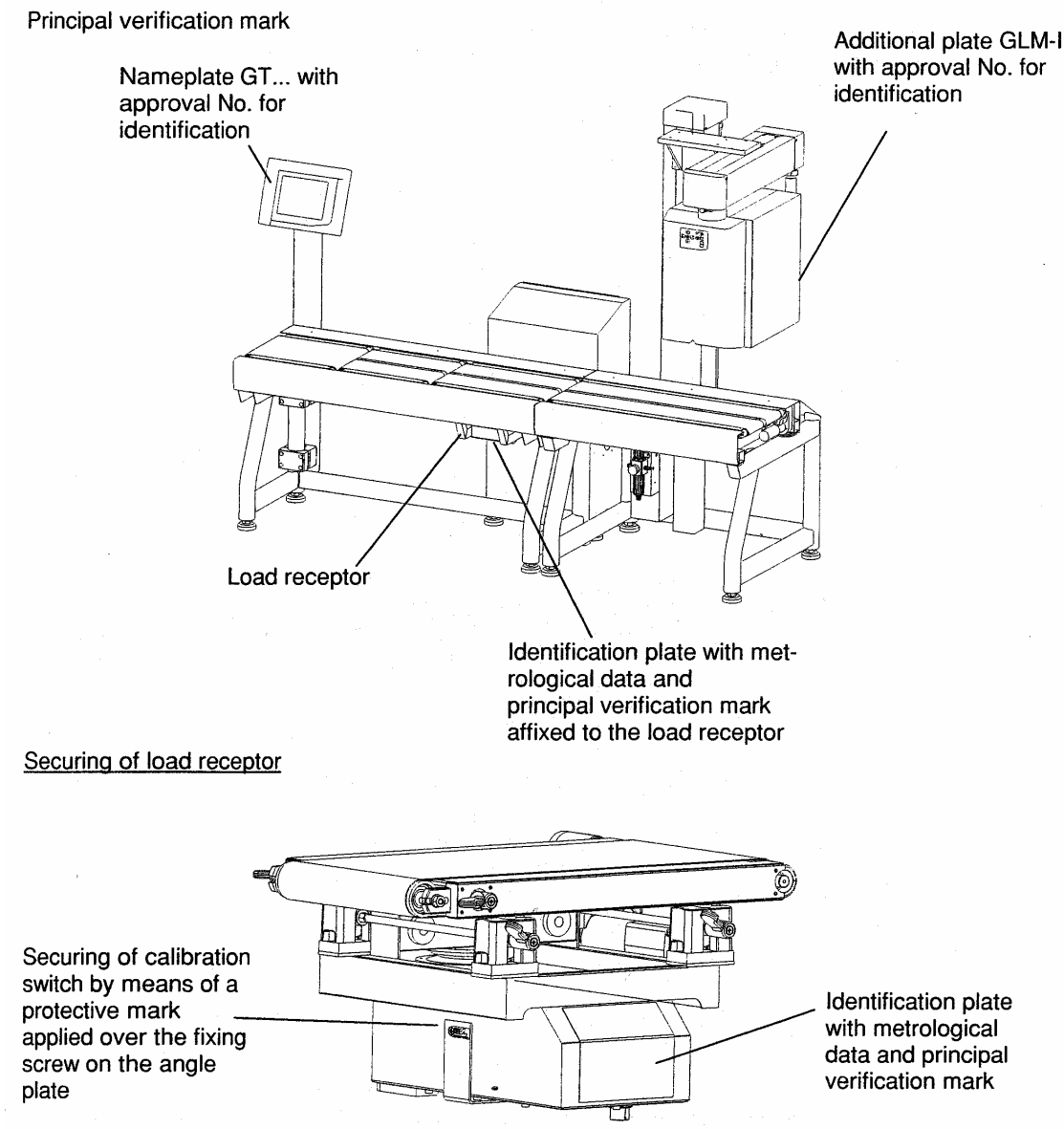

Figure 3 Sealing arrangement

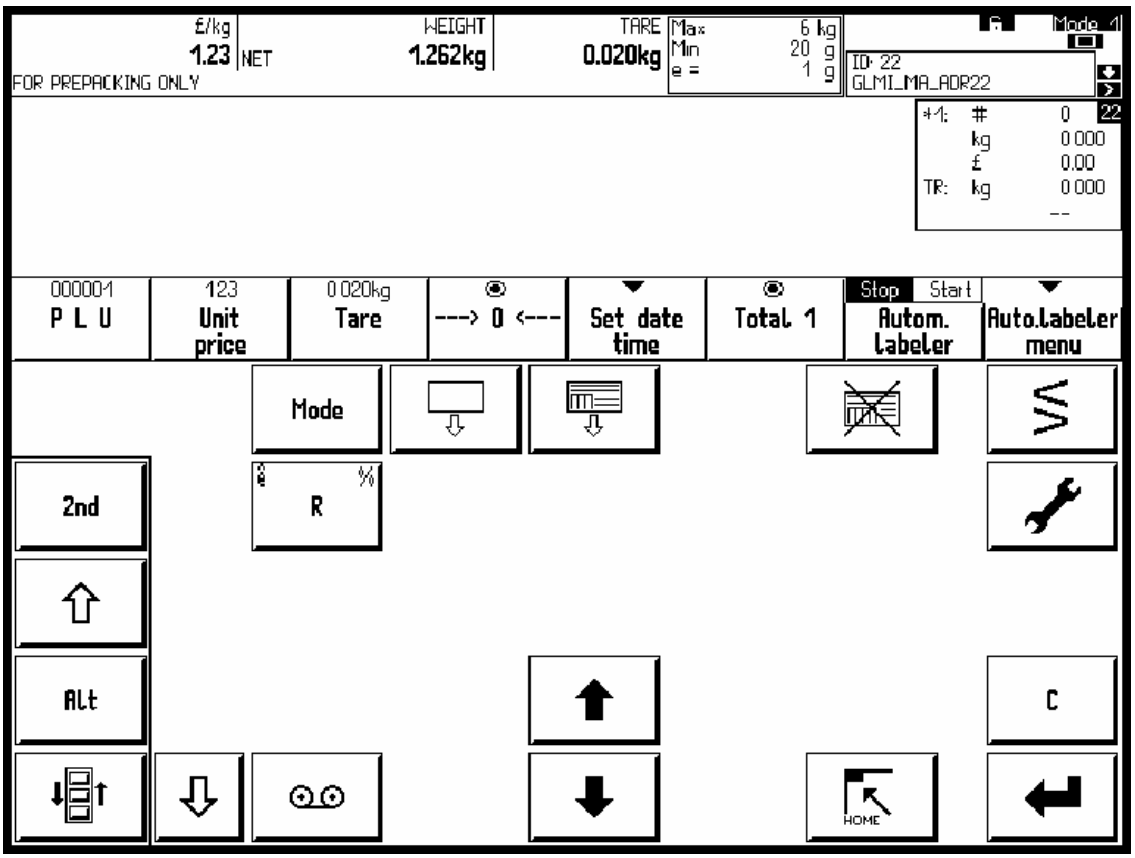

Figure 4 Weight labelling mode