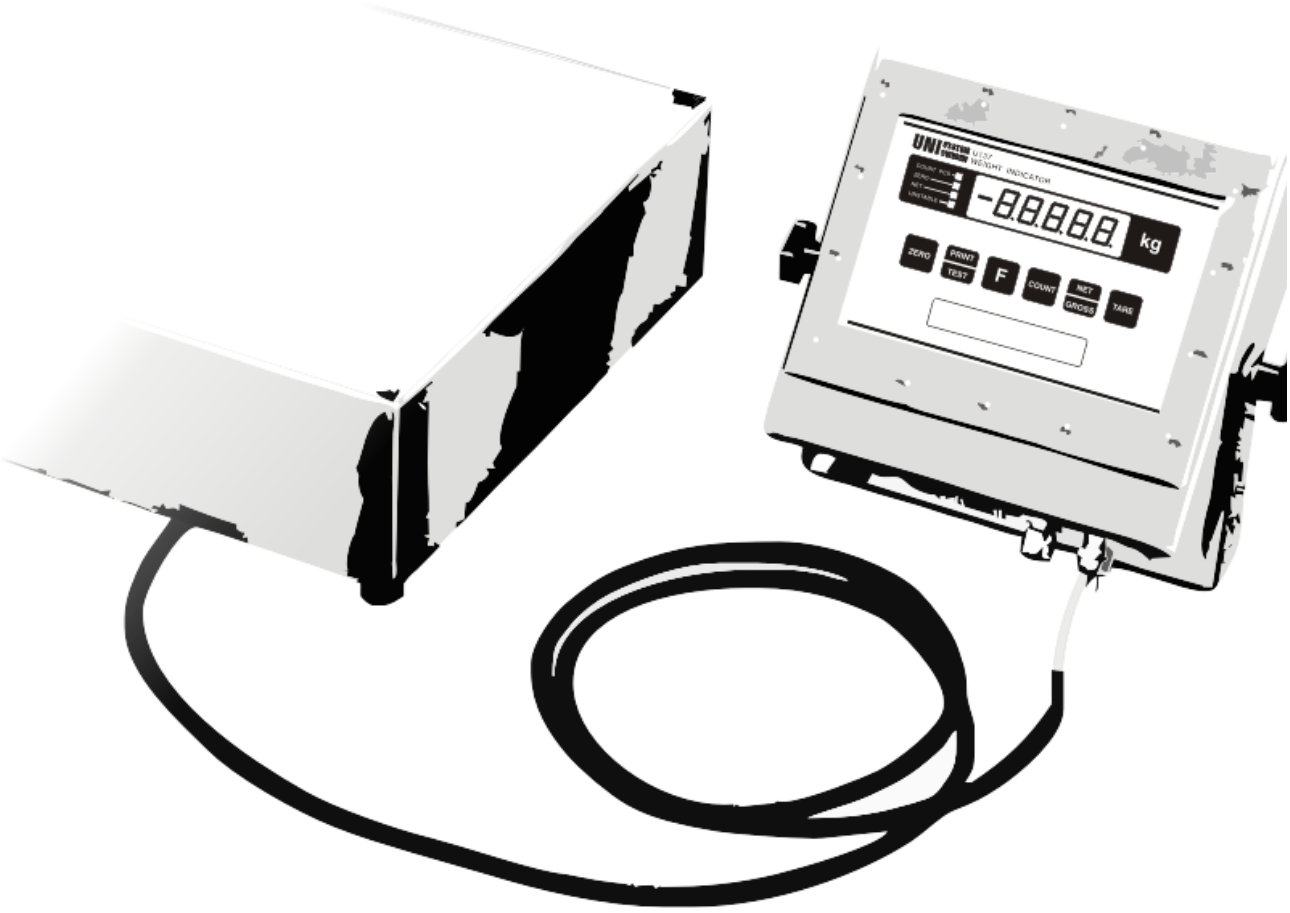
UNI SYSTEM SWEDEN

# Marine Scale U1451/U8551

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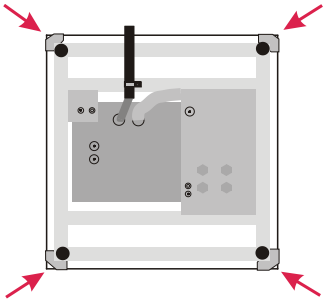
## Contents

# 1 Introduction



## 1.1 Before using the scale

Remove the four transport protection devices.

## 1.2 General description

U13702 and U23712-series Marine Scales are designed to withstand the harsh environment at sea. The mechanical parts are made of stainless steel and the weight measuring part is compensating for both movement and inclination, which makes the scale independent of the gravity, the tilt of the vessel and the motion of the sea. This is accomplished by using a reference weight which the weight on the platform is compared to.

## 1.3 Placement of the scale

Place the scale on a flat, stable surface. The scale is manufactured and tested to IP67 standards, which makes it possible to use the scale outdoors, but to make the scale properly compensate when the ship rolls, the scale should be placed as far down in the ship as possible - below the centre of mass. If the scale is used outdoors, please make sure that the scale platform is protected against strong wind, as this could have negative influence on the accuracy.

## 1.4 Handling of the scale

The scale is equipped with a sturdy overload protection so that the measuring parts of the scale are not damaged if there is too much weight on the platform. The internal reference-weight parts in the platform are also protected with an overload protection, but as these parts are sensitive to motion, they should not be exposed to shock. In order for the scale to keep its waterproof protection the lids of the connectors (RS232 and charge) must be closed when not in use.

## 1.5 Cleaning the scale

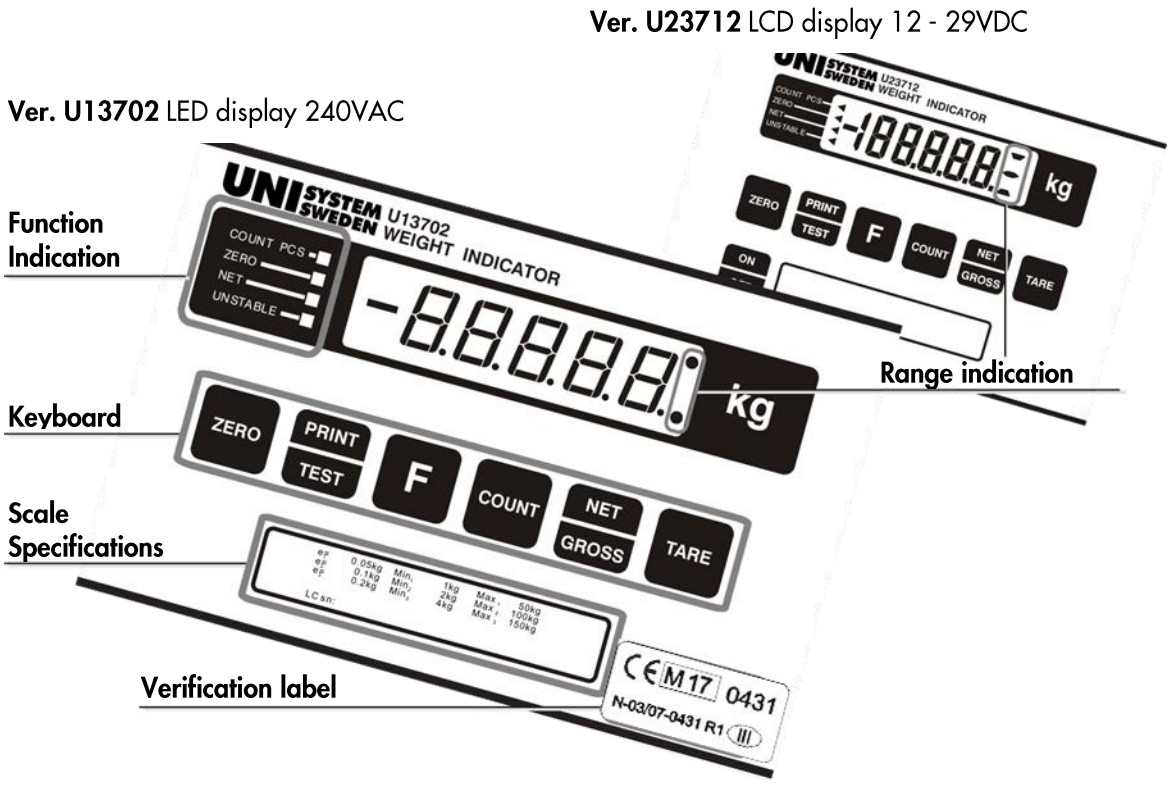
Before cleaning, break the power to the scale.

Use a soft cloth to clean the exterior of the indicator (the display part of the scale). Be careful when washing the front panel and do not use any strong detergents. Do not use any high-pressure washing appliance directly on the platform. If the cover of the platform needs high-pressure washing, then remove the cover and wash it away from the rest of the scale. The electrical parts of the platform shall not be exposed to any high-pressure washing.

## 1.6 Transportation of the scale

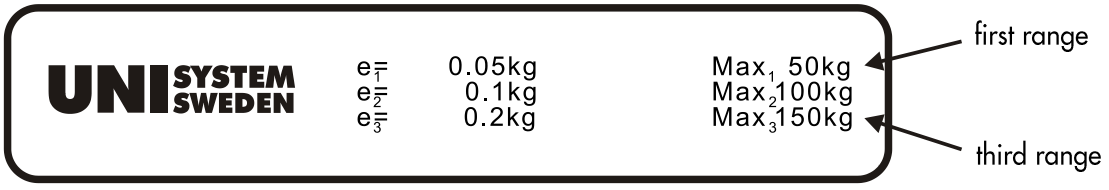
If the scale is to be transported, it should be placed with the platform upside-down on a pallet and use the transport protection devices. Avoid sending the scale in a loose package as there is a risk of shock during the transport.

## 1.7 Display and text panel overview




## 1.8 Marking - Scale specifications

The specifications for the scale are presented in the little window below the keyboard. To make use of as much as possible of the scale precision, there are multiple ranges of measurement, with higher resolution the lower weight on the scale. The resolution, or the scale interval, of the scale is the smallest steps the display is able to show. E.g.:




The label indicates that the display reading will be in steps of 5g (0,005kg) between 0kg and 5kg ($e_1$ and $Max_1$ indicates that this is range 1). I.e. the display is able to show for instance 4.995kg.

In the next range, 5kg to 10kg, the display can show the weight in steps of 10g. This means that the display reading can be 9.990kg but not 9.995kg, the display will then switch to 10.000kg.

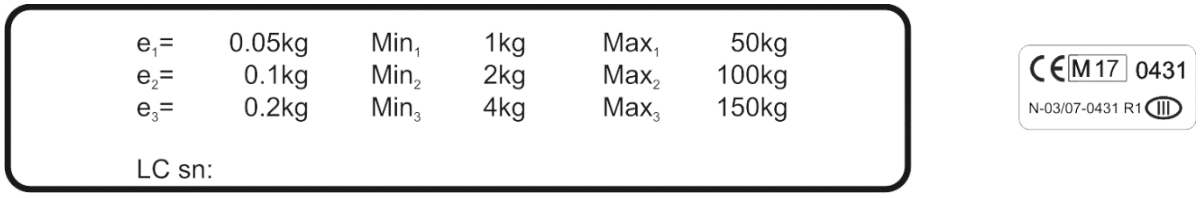
In rage 3 (10kg - 20kg), the display reading will be in steps of 20g and in range 4 (20kg - 30kg), the reading will be in steps of 50g.

## *Verified scales*

For verified scales - scales approved according to EU directive 90/384/EEG, there are strict regulations for the precision, and the error should be almost negligible even at extreme conditions.

For these scales, there is also a min-value for each range of measurement (Min). According to the regulations the weight on the scale must exceed the Min-value for the error to be accepted within the limits specified in the directive. The resolution and maximum weights are the same as for the standard scale above, but according to regulations, when the scale has been loaded it needs to be unloaded to 0kg before the display shifts to show at a higher resolution again.

Below is an example of labels for a verified scale:




Every verified scale is accompanied with a Declaration of Conformity, where the serial number of the scale is stated. The verified scale has a Type-/Model-number: U13702 or U23712 depending on version. U13702 has 240VAC power supply and U23712 is DC-powered.

Both U13702 and U23712 are included in the Certificate of EC type-approval: No N-03/07.

# 1.9 Example of Declaration of Conformity

Konformitätserklärung. Declaration of Conformity. Date:020828 B02161
Déclaration de conformité. Försäkran om typöverensstämmelse.

Kennummer der benannte Stelle, die die EG-Überwachung nach der EG-Richtlinie 2009/23/EC durchgeführt hat
Identification number of the notified body that has carried out the EC – surveillance referred to the Council Directive 2009/23/EC
Numéro d'identification de l'organisme notifié, qui a effectué la surveillance CE en conformié avec la directive 2009/23/EC.
Identifieringsnummer för det anmälda organ, som utför EG kontroll enligt rådets direktiv 2009/23/EC

**0431**

CE **Konformitätserklärung.**
**Declaration of Conformity.**
**Déclaration de conformité.**
**Försäkran om typöverensstämmelse.**

Die nichtselbsttätigen Waage
The non- automatic weighing instrument
L'instrument de pseage á fonctionnne ment non automatique
Icke-automatisk våg

III

| | |
|---|---|
| Hersteller:<br>Manufacturer:<br>Fabricant:<br>Tillverkare: | UNISYSTEM AB |
| Typ/Modell:<br>Type/Model:<br>Type/ modèle:<br>Typ/modell: | U13702<br>..... |
| Herstellungsnummer:<br>Serial number:<br>Numéro de série:<br>Serienummer: | Platform Indicator<br>XXXXX XXXXX<br>..... |
| Nr. der EG-Bauartzulassung (gegebenen falls):<br>No of EC type-approval certificate (where applicable):<br>N° du certifiacat d'approbation CE de type (le cas écheant):<br>Nr för EG typgodkännande (i tillämpliga fall) | N-03/07-0431<br>..... |

entspricht dem in der Bescheinigung über die Bauartzulassung beschriebenen Baumuster, sowie den Anforderungen der EG-Richtlinie 2009/23/EC in der jeweils geltenden Fassung.
Die Übereinstimmung wurde durch eine Prüfung nach EN 45 501 Nr.8.2 festgestellt.
corresponds to the production model described in the EC type-approval certificate and to the requirements of the Council Directive 2009/23/EC as amended.
The c onformity was established by tests referred to in EN 45 501 - 8.2.
correspond au modèle décrit dans le certificat d'approbation CE de type, aux exigences de la directive 2009/23/EC modifiée.
La conformité été constatée par une vérification en conformité avec la norme européen ne EN 45 501 - 8.2.
motsvarar det utförande, som beskrivs i EG typgodkännandecertifikatet samt uppfyller gällande krav i rådets direktiv 2009/23/EC.
Överensstämmelsen är kontrollerad genom provning enligt standarden EN 45 501 -8.2.

| | | |
|---|---|---|
| Unterschrift | UNISYSTEM AB | Datum XX-XX-20XX |
| Signature ..... | Tone Westbye-Karlsson | Date ..... |

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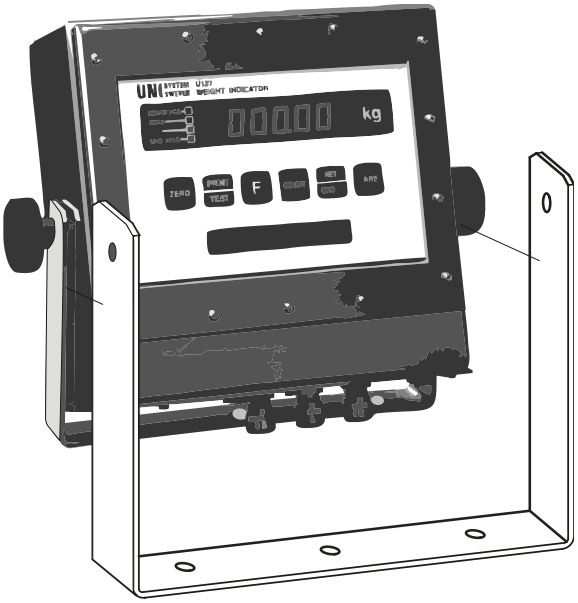
# 2 Installation

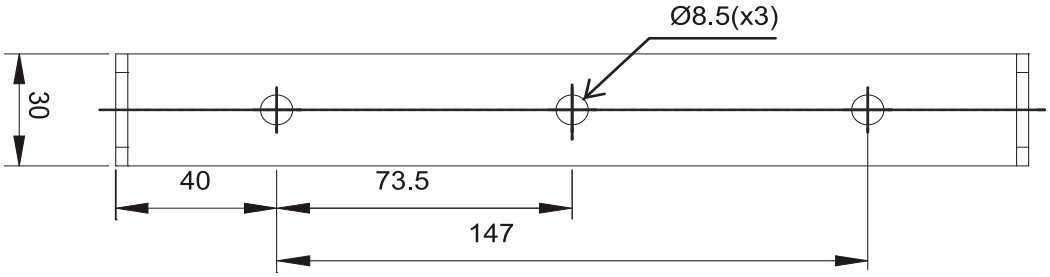
## 2.1 Mechanical installation

The display part of the scale (the indicator), is supplied with a mounting angel. Use 3 pieces of stainless steel screw (not included in the scale) to fasten the indicator.



Put the platform on a solid surface and adjust the rubber feet so that the platform is stable.

As an option, there is stand with a mounting for the indicator, which is fastened in the platform.




## 2.2 Electrical installation

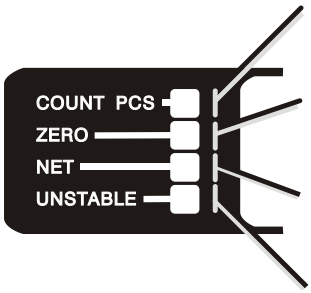
The power supply to the scale depends on the version. The scale can be delivered for 230VAC (200 - 260VAC), 12 - 29VDC or a version with an internal 12V battery. The electrical installation of the scale shall be set up according to local safety regulations.

When the electrical installation is finished the power should preferably always be left on(with exception to the instance below), as continuous power supply to electronics and transducers prevents moisture condensation in the units.

As an option the scale can be delivered with a detachable contact between the indicator and the platform. In this case, it is important to turn the power off before the contact is connected or disconnected. If the contact is handled with the power on, there is a risk of damaging the measuring part of the scale, which then needs to be sent in for repair.

# 3 Display and keyboard

## 3.1 Function indicators



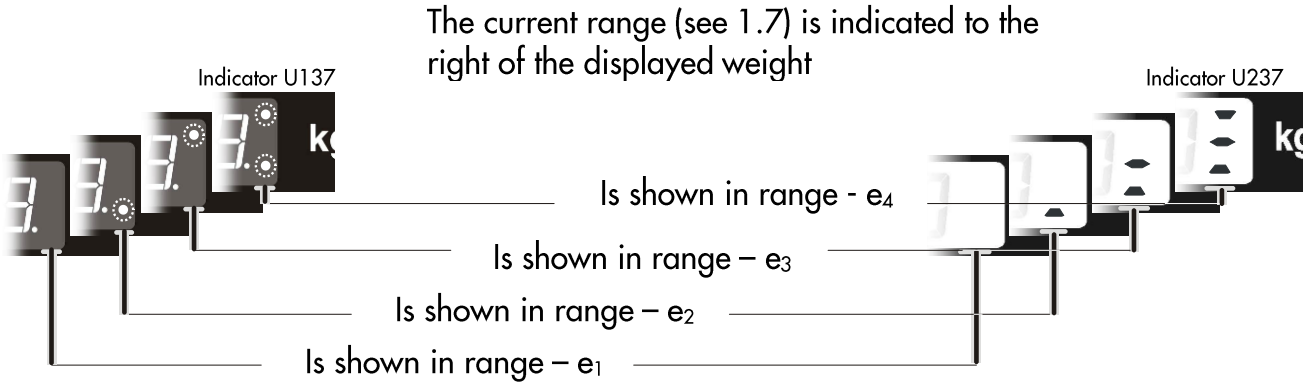

Indicates counting scale mode. The number of units are displayed. See 5.1

Is lit when the weight is ±1/4 of a scale interval from zero. See 4.1

Is lit when the indicator is tared and net weight is displayed. See 4.2

Indicates that the weight result is unstable.

## 3.2 Range indicators (only verified versions)




## 3.3 Keyboard

| | |
|---|---|
| ZERO | Is used in order to set the scale to zero, when the weight on the platform is within the zero range. See 4.1<br>The zero range is -0.8 to 3.1% of the max weight of the scale. |
| PRINT TEST | Is used for printing.<br>If the button is kept pressed, a display test is performed. See 6.1. |
| F | Is used for special functions. See 5. |
| COUNT | Is used to enter counting scale function. See 5.1. |
| NET GROSS | Is used in order to switch the displayed weight between net weight and gross weight. |
| TARE | Is used in order to set the displayed value to zero with a container on the weighing platform. For differences in using Zero or Tare when zeroing the display, see 4.1 and 4.2. |
| ON OFF | Is used in order to switch the scale on or off. (Only valid for version with indicator U2372). See 5.3.1. |

# 4 Weighing

### *Switching on the Scale*

Switch on the scale by connecting the power cable to a power supply. Depending on different versions, the scale can be connected to 230VAC (200 - 260VAC), 11 - 29VDC. There is also a version with an internal 12V battery, which is switched on by pressing [ON/OFF].

The power should preferably always be left on, as this prevents moisture condensation in the units.

### *Initial sequence*

At start-up, a test/start-up sequence is displayed. The program number and date is displayed, followed by a display test where all display segments are switched on/off five times. Next the weight is displayed and the scale is ready to use.

If the scale is unloaded at start-up, an automatic zero setting is done. If there is weight on the platform, the scale uses the calibrated zero value. In this case, unload the platform and check that the scale I set to zero before use.

### *Zero tracking*

When the scale is left unloaded (the zero indicator is lit), it automatically adjusts for small changes in the zero point, to compensate for e.g. dust on the platform.

## 4.1 Zero setting

ZERO

Setting the display to zero with the [ZERO]-button is used when weighing without container, directly on the platform. This zero setting will result in an adjustment of the zero point of the scale. The advantage of this compared to using [TARE] is that the zero tracking is retained when using [ZERO].

Since zeroing using [ZERO] is for adjusting the “empty-weight” of the platform, only small weights can be set to zero, about 3% of the max weight for the scale. The max weight of the scale is counted from last zero point, which means that the max weight is retained when using [ZERO], contrary to using [TARE] where max weight is reduced. See 4.2 .

| **Action** | **Comment** |
|---|---|
| See to that the platform is empty | |
| Press ZERO | The display will show:   |

## 4.2 Tare

TARE Taring - zeroing using [TARE] is used when the display is set to zero with a container or packing on the platform. The display value is set to zero, but the zero point remains. Using [NET/GROSS], the display reading shifts between net weight - the contents in the container, and the gross weight - the total weight including the container weight (the tare weight).

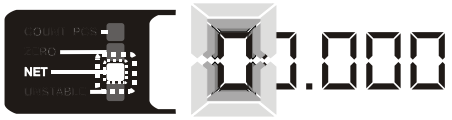
Setting the display to zero with [TARE] can be used for the whole range of measurement.

The scale can be auto-tared (see below) or a tare weight can be entered manually.

### 4.2.1 Auto tare - eliminating container weight on scale

| Action | Comment |
|---|---|
| Place the container/packing on the platform | |
| Press TARE | The display will show  |

### 4.2.2 Manual input of tare weight

| Action | Comment |
|---|---|
| Press F followed by TARE | NET and the leftmost digit is flashing  |
| **Entering the tare weight:** | |
| If for instance a container with the weight 2,55kg shall be tared: | COUNT increases the value of the chosen (flashing) digit<br>shifts NET GROSS to the next digit |
| Press NET GROSS | The second leftmost digit is now chosen and is flashing  |
| Press COUNT x2 followed by NET GROSS | 02.000 is displayed and the 3rd digit is flashing  |
| Press COUNT x5 followed by NET GROSS | 02.500 is displayed and the 4th digit is flashing  |

| | |
|---|---|
| Enter all digits in the same manner | |
| When all digits in the tare value has been entered: |   |
| Press TARE | The scale is tared with the entered value. NET is lit and the display is showing the weight on the platform minus the entered tare value.<br>If the platform is empty, the display will show the entered tare value preceded by a minus sign, since the scale now will show zero with the container/packing on the platform.<br>   |

Since using [TARE], only sets the displayed value to zero and not adjusts the zero point of the scale, the zero tracking will not be active for this zero value. Moreover, the max value the display can show will decrease with the tare value. For example, if a 10kg container is tared on a 70kg scale, the display will only be able to show contents of a weight up to 60kg.

# 5 Functions

## 5.1 Counting Scale

COUNT The scale has a built-in function which allows the display to show the number of pieces put on the scale. You can for instance have the scale count the number of screws in a box. Consequently, this function is called counting scale function.

The scale uses the average weight of the pieces to do the count, so for this function to work properly, the weight of the pieces counted, need to be the same. The more the pieces deviate in weight the less accurate the count will be. The accuracy can then be improved if more pieces are used for the sample weighing, as the average weight then should get more precise.

First a small number of items are put on the platform, the number of pieces is selected and the average weight is calculated. Then the scale will enter counting mode and display will show the number of items on the scale.

| Action | Comment |
|---|---|
| **Sampling the piece weight:** | |
| Set the display to zero using [ZERO] or [TARE]. See 4.1 and 4.2 | |
| Put sample items on the scale | The scale will accept 1, 2, 5 10, 20, 50 or 100 sample pieces. The more sample pieces used, the more accurate the calculated average piece weight will be. If the variation in piece weight is known to be low, less sample items can be used. |
| Press and hold COUNT | The display will start by showing 0 and then 1 followed by 2 etc. Let go of the count button when the number of samples items on the scale are shown.<br>  <br>Count pcs is lit and the display will show the number of sampled pieces.<br>  <br>Now the average piece weight is calculated and the display has switched to counting mode. |
| **Counting items:** | |
| If the items are in a container, then the container weight needs to be tared. See 4.2 | The zero setting functions works in the same way as in weighing-mode, pressing [TARE] or [ZERO] will set the display to zero, but a point to the right will indicate that this is number of pieces and not weight. |
| Put the items on the scale | The display will show the total number of items on the scale. |
| **Switching back to weight:** | |
| Press COUNT | The display will leave counting mode and again display the weight on the scale. |
| **Re-entering counting mode:** | |
| | If you want to re-enter counting mode to go back and check the last items again (or re-use the last average piece weight). |

| | |
|---|---|
| Press COUNT | Letting go of the count button when 0 is displayed will enter counting mode using the last calculated piece weight. |

## 5.2 Peak value

The peak value is a function that needs to be activated before it can be used. This can be done at delivery or your distributor can assist you in activating the function. When the function is active, the counting scale function is deactivated, so only one of these functions can be used.

With this function it is possible to switch the display between showing max weight on the scale, min weight or normal weighing.

| **Action** | **Comment** |
|---|---|
| **Displaying the max weight:** | |
| Press COUNT | The display will switch to show the highest value there has been on the scale, since last reset (see below).<br>The count pcs indicator flashes slowly.<br>  |
| **Displaying the min weight:** | |
| After displaying the max weight | |
| Press COUNT | The display will switch to show the lowest value the scale has registered, since last reset (see below).<br>The count pcs indicator is lit.<br>  |
| **Return to normal weighing:** | |
| After displaying the min weight | |
| Press COUNT | The display will switch back to show normal weight.<br>The count pcs indicator turned off.<br>  |
| **Resetting the min or the max value:** | |
| Set the display reading to the value you want to reset: max or min, according to above. | |
| Press ZERO | The selected value, max or the min, is reset and the current value will be the new max or min value. |

## 5.3 Optional functions

There is some optional functionality that the scale can be equipped with. Only a short description of these is given here, as these functions often are delivered with some customization. At delivery a separate description with any optional functions will accompany the scale.

### 5.3.1 On/off-Timer

The scale can be equipped with an internal lead battery. This version has an [ON/OFF]-button, which also work along an internal switch-off timer. The settings for how long time of inactivity before the scale is turned off, is configurable, and the timer function can also be turned off. This can be done at delivery, or your distributor can assist you in configuring the timer.

### 5.3.2 Printouts

The scale is internally equipped with a RS232 interface for connection to a computer or a printer. Different outputs can be configured and some small customization of the output is possible. Such as a company or vessel name can be printed along with the weight. Printing/outputs are performed continuously or when pressing [PRINT/TEST].

### 5.3.3 RS232 Pin-out


1.0VD
2.RD
3.TD
Ground

Use Amphenhol
Part number:C016 20D003 110 10

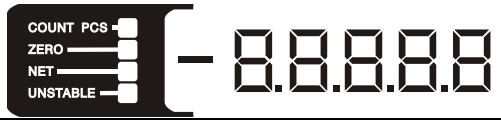
### 5.3.4 Output signals

There are a number of optional functions that the scale can be equipped with, such as control signals, set points and more. These functions are described in separate documentation that accompanies the scale.

# 6 Test / troubleshooting

## 6.1 Test functions

There are some tests to determine the status of the scale.

| Action | Comment |
|---|---|
| **Testing the display:** | |
| Press and hold PRINT TEST for a couple of seconds | The display should set all the digits and indicator on and off. |
| |  |
| **Testing the zero drift:** | |
| Press and hold ZERO for a couple of seconds | The display will show how much the current zero point deviates from the initial (calibrated) zero point. |

## 6.2 Error indication and troubleshooting

There are some indications in the display that could help you find out what is wrong with the scale.

| Error indication | Description |
|---|---|
|  | Indicates *underload*.<br>Check to see if anything is pushing the cover of the platform upwards or sideways.<br>If this is not the case, please see 6.3 Wrong zero setting |
|  | Indicates *overload*.<br>Check to see if the maximum weight is exceeded. |
|  | Indicates wrong input signal<br>Check to see if any cables are damaged. |

## 6.3 Wrong zero setting

The scale has a build in function that will automatically adjust the zero setting of the scale. The function will correct drift in the zero setting that will occur under normal conditions, such as waste that get stuck on the platform. If the zero point will drift outside the auto zero setting boundary the zero point can nevertheless be corrected by pressing the [ZERO] button, under the condition that the value is within the adjustable zero range.

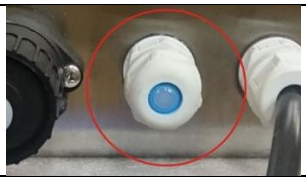
### 6.3.1 Zero adjustment outside the zero range

If the zero point of the scale is outside the adjustable zero range, then the scale cannot be set to zero by pressing the [ZERO]-button. If this will occur, then this can lead to that the *underload* error indication is shown:  and/or that the scale reading is unstable at rough sea. The cause of this can be a number of things, such as overloading or that the platform has been exposed to

sideways shock. Corrosion in the load sensor can also lead to this as well as moisture soaked into the load sensor, sensor cable or indicator housing.

In many cases this error can be adjusted without the need to send the scale in to service. But in case of adjusting the scale as described here, it is necessary to ensure that the scale still will show the correct weight after the zero adjustment. Doing a weighing before and after the zero adjustment must be done. Checking and adjustment of the scale must be done at stable conditions and not at sea.

| Action | Comment |
|---|---|
| If the scale is showing *underload:*<br>Put some load on the weighing platform until the display is showing a value.<br>If the display is showing a value please proceed. |  <br>*Underload* indication |
| Set the scale to zero by pressing<br>TARE | The scale should now show a stable zero value. If not, contact service as the error cannot be adjusted according to the instructions shown here. |
| Put a “test load” corresponding at least 5% of the max weight of the scale.<br>The weight does not have to be an even value, but the weight displayed before and after the adjustment need to be the same. | Note the value as you will need to compare this value with the displayed weight after adjusting the zero. |
| Unload the platform to have the scale in its zero state. | |
| In the lower part of the weight indicator housing, where the cables are connected, loosen the lid of the cable gland that has no cable |  <br>Inside the lid, you can access the potentiometer P2, that is used for adjusting the zero setting. |
| Use a small screwdriver to adjust P2 until the display is showing 0kg.<br><br>If the value that the display is showing with unloaded scale is higher than zero, then P2 should be adjusted down – anti clockwise.<br>If the value shown is to low or if the display is showing underload, then P2 should be adjusted up – clockwise. |  <br>Decrease the display value<br>  <br>Increase the display value |
| When the zero setting has been adjusted with P2 and the scale is showing 0kg, put the “test load”, previously used, and check that the value displayed is the same as before the adjustment. | The value should differ maximum ± 1 unit in the last digit. If the deviation is greater or if the value shown is unstable you need to call service for assistance. |

| | |
|---|---|
| Re fit the lid of the cable gland. |  |

## 7 Specifications

| | |
|---|---|
| **Power supply*** | 200 - 250VAC<br>12 - 29VDC<br>12V (internal battery) |
| **Temperature range** | -10 to +40°C |
| **Excitation voltage** | 10VDC |
| **Display*** | LED 14mm<br>LCD 16.5mm with backlight |
| **RS232 Interface** | 300, 1200, 2400, 9600 Baud |
| **Depending on version* | |

**Notes:**

# LIMITED WARRANTY MARINE SCALES

## Warranty coverage

Unisystem products are covered by a limited warranty against faulty workmanship and defective materials through the duration of the warranty period. Warranty applies for the hardware and electronic components originally manufactured and/or installed by Unisystem. Only Unisystem and its contracted distributors are authorized to do repairs under warranty. During the warranty period any component(s) that proves to be defective will be repaired or replaced at no charge, provided that the product is returned freight prepaid.

## The warranty does not cover

This warranty does not apply if the product has been damaged by accident, improper or unusual use, by improper setup or installation, if the product is exposed to radioactive or corrosive materials, has foreign material or chemicals penetrated into the inside of the product, as a result of welding on or nearby the product, as a result of service or modification by other than Unisystem, as a result of non-factory installed electrical and/or electronic components or hardware or if the serial number have been altered or removed.
In no event shall Unisystem be liable for any indirect, incidental or consequential damages, including –but not limited to- time, wages or lost profits of any nature or kind or damages to or loss of property.

## The warranty period

The warranty period shall begin at the date of shipment to the end-user or 1 month from the date of dispatch to a contracted distributor of Unisystem, whichever occurs first.

The limited warranty period is two (2) years for marine scales. For printers, (mechanical) printing heads, batteries and computers/laptops the limited warranty period is six (6) months unless otherwise stated.

## To obtain warranty service

Return the product to your Unisystem distributor you bought the product from or to Unisystem if you bought the product from us. The purchaser agrees to cover all postal and freight expenses of the product to be repaired. If the warranty is to be continued after change of owner the product has to be inspected by Unisystem.

## Care instructions

Do not use any chemicals or salt water when cleaning the platform and indicator, use fresh water only. Avoid cleaning the marine scale with a high pressure cleaner. When moving or transporting the platform, handle with extreme care avoiding knocks and/or jolts. Also ensure you put it down gently.

UNI SYSTEM SWEDEN

ISO 9001
KVALITETS
CERTIFIERAD

SWEDAC ACKREDITERING 1450 SS-EN 45012

BMG TRADA CERTIFIERING

# Marine Scale U1451/U8551

Distributor:

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