

REFSCALE-S

4688867

EN

INSTRUCTION MANUAL

Electronic Charging Scale

DE

BEDIENUNGSANLEITUNG

Elektronische Füllwage

FR

MODE D'EMPLOI

Balance électronique

IT

ISTRUZIONE PER L'USO

Bilancia elettrica

ES

MANUAL DE INSTRUCCIONES

Báscula eléctrica



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1.0 Introduction

Congratulations on your purchase of this device. The REFCO REFSCALE-S is equipped with a weight sensor with a strain gauge, providing you with the capability to connect to the REFCO REFMesh App and/or the REFCO REFmate.

The latest manual can be downloaded from www.refco.ch

2.0 General information

Before you start working with the REFSCALE-S, please read the operating instructions carefully. They contain important information for the successful operation, maintenance and disposal of the electronic charging scale.

Conformity

	This device complies with the relevant European directives. The Declaration of Conformity is available from the specified contact details or on the REFCO website.
	This device complies with Part 15 of the FCC Rules. It should be operated under the following conditions: (1) This device may not cause harmful interference, and (2) This device must be able to withstand interference, including interference that may result in errors during operation. FCC ID: XPYNINAB1
	This device complies with Industry Canada's license-exempt RSS standards. It should be operated under the following conditions: (1) This device may not cause harmful interference, and

	(2) This device must be able to withstand interference, including interference that may result in errors during operation. IC ID: 8595A-NINAB1
	RCM: Regulatory Compliance Mark This device complies with the requirements of the RCM regulations.
RoHS	RoHS: Restriction of Hazardous Substances This device meets the requirements of the RoHS EU directive. RoHS 2011/65/EU including 2015/863/EU The device does not contain any prohibited substances above the maximum permissible values.
REACH	In accordance with Article 33 of REACH Regulation 1907/2006, we confirm that this device and its packaging complies with Article 57 of REACH Regulation 1907/2006. This device and its packaging do not contain any of the SVHC specified in the current candidate list (Article 59) at concentrations above 0.1%.

Important Safety Instructions

Read all safety instructions thoroughly and comply with them.

	Warning!	
	The symbol <i>Warning!</i> indicates a potentially dangerous situation that can lead to serious injury if not avoided.	
	Danger!	
	...indicates an electrical hazard. Failure to observe the safety instructions may result in serious or fatal injury.	
Safety instructions:		
	Do not expose the electronic charging scale to rain.	
	Always wear protective goggles and gloves when working with the electronic charging scale	
		
	REFCO products are specifically designed and manufactured to be handled by trained refrigeration technicians. Due to the high pressures and gases used in refrigeration systems, REFCO declines all responsibility and liability for accidents, injuries and death. Contact with refrigerant on the scales should be avoided.	
	REFCO expressly states that the products must only be used by professionally trained experts. No use by children or unqualified persons.	
	The electronic charging scale must not be used in EX zones.	



If the electronic charging scale falls, it must be calibrated.

Intended Use

The electronic charging scale has been developed for measuring weights in mobile and stationary refrigeration systems. Only trained refrigeration technicians are permitted to use this REFCO product. Observe the operating conditions from the specifications (data sheet).

The weight measurement should only begin when a stable condition is fulfilled, or the symbol "Stable Measured Value" is displayed (see Chapter 8.0). To achieve the most accurate measurement result possible, the weight must be placed in the middle.

Humidity can cause surface changes to the aluminium housing, which is harmless. To prevent this, the device must be dried when damp.

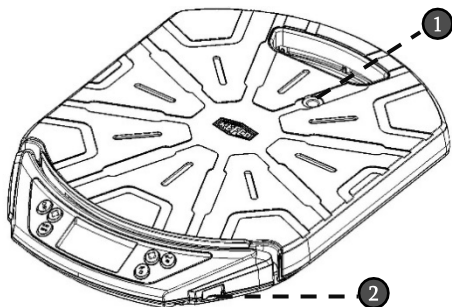
The scale must not be exposed to the sun for long periods of time, as this can cause damage and discoloration to the plastic housing, the rubber mat or the display.

3.0 Specification

Property	Value
Capacity	0 - 110 kg / 243 lb
Resolution	2 g
Accuracy	0.05 % or 10 g
Units	kg / lb / oz / lb&oz
Power supply	4 x 1.5 V AA Battery or USB Micro Type B
App	REFMESH
Wireless range	100 m 330 ft
Permissible humidity during operation	0 – 90 %
Operating temperature	-20 °C – 50 °C -4 °F – 122°F
Storage temperature	-40 °C – 60 °C -40 °F – 140 °F
Dimensions	36.5 cm x 26.1 cm x 3.9cm 14.4" x 10.3" x 1.5"
Weight	3.2 kg / 7 lb
Battery runtime	50 h

4.0 Product and part description

4.1 Product



- 1 M10 thread for attaching the 10612-REF valve for refrigerant bottles.
- 2 USB-connection micro type B.

4.2 Buttons and navigation

operation	
 On/Off and Backlight Button <i>Press for 2 seconds:</i> Device on <i>Press briefly:</i> Backlight On/Off <i>Press long and hold:</i> Device off	 Tara and Zero Button <i>Press briefly:</i> Tare <i>Press and hold:</i> Zero
 Enter and Menu Button <i>Press and hold:</i> Enter/exit the menu <i>Press briefly:</i> In menu mode: Enter / confirm. In work mode: save current data	 Hold and Alarm Button <i>Press briefly:</i> Hold function / hold current value <i>Press and hold:</i> Alarm on / off
 Navigation Button left / top Navigate through the screens and settings	 Navigation Button right / bottom Navigate through the screens and settings

4.3 Display

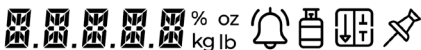


4.3.1 Primary Display



Display of the measured value with the corresponding units and tare display.

4.3.2 Secondary Display with Functional status



Display of an auxiliary value

% oz
kg lb

Auxiliary display unit



Alarm function is switched on



Alarm triggered



Tank Capacity function is switched on



Valve function: valve open



Valve function: valve closed



Hold function is active

Status bar symbols



Stable measured value is displayed when the measured value is stable.



Wireless enabled
(connection to REFMesh or REFmate)



Valve enabled
(connection to the external valve)



Error is displayed when a function cannot be executed successfully.



USB is displayed when power is supplied via USB.



Battery indicates the battery charge level

Menu symbols



Menu indicates that the scale is in menu mode.



Alarm indicates that the scale is in the configuration for the alarm function.



Tank capacity indicates that the scale is in the configuration for the tank capacity function. Parameters: 100%, 0%, On/Off



Wireless configuration indicates that the scale is in the configuration for the radio connection. Parameters: BLE On/OFF/APP/LE



Unit of measurement indicates that the scale is in the configuration for unit of measurement.



Calibration or gravity indicates that the scale is in the configuration for calibration or gravity.



Valve indicates that the scale is in the configuration for valve control.



Memory indicates that the scale is in memory mode.



Information indicates that the scale is in information mode.

5.0 Transport, packaging and storage

5.1 Transport, packaging

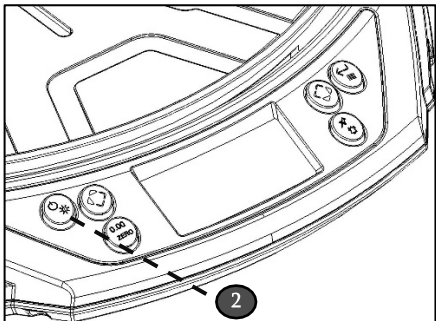
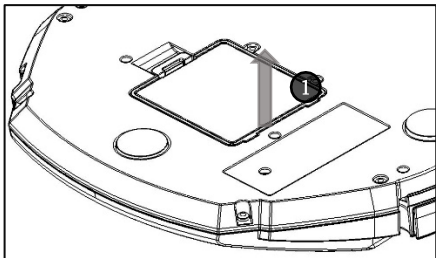
Transport, packaging

Storage conditions must be adhered to during transport. During transport, the REFSCALE-S must be placed in the corresponding case.

5.2 Storage

The storage temperatures (chapter 3) must be adhered to. If the REFSCALE-S will not be used for a long period of time, the batteries must be removed from the battery compartment.

6.0 Commissioning



- 1 Remove the battery cover and pull out the contact break.
- 2 Press button for 2 seconds and wait until the display symbols appear.

6.1 Functions

On / Off / Lighting

	Press and hold for 2 seconds to switch on the device.
	Long press to switch the device off.
	The backlight can be turned on or off by pressing briefly.

Set Tare

Tare / 0.00

Resets the scale to zero, regardless of the weight. This function is used, for example, to subtract the empty cylinder weight.

Net

When taring the scale with a weight on the platform, "Net" appears on the display.

By increasing the number of filled/emptied cylinders, while using the Hold function, the Net display also increases. This is possible up to Net 9. Then it starts again with Net 1.

ZERO

Resets the scale to zero if the weight display deviates from zero by a maximum of 100 grams. This function is used if a small deviation is displayed when the scale is switched on.

Hold function



A special function of the REFSCALE-S allows you to freeze the value. This function can be used, for example, when filling or emptying the system when the gas cylinder is empty or full.

The function is activated by briefly pressing  and the symbol  appears on the display.

To deactivate the function, press again .

Alarm



With the REFSCALE-S a programmable alarm value can be set. The alarm will sound when the required value (either positive for increasing weight, or negative for decreasing weight) is reached.

After 90% of the programmed value, an approaching alarm brings to your attention, with an alternating tone, that the required amount is nearly reached. When reaching 100%, a continuous tone sounds.

1.  press , enter the menu
2.  press , navigate to alarm
3.  press , confirm
4.  press , «SET» is displayed
5.  press , confirm «SET»
6.  press , define the value at which the alarm should be triggered
7.  press , confirm value



The alarm value can only be entered as a positive value, but it counts in positive and negative direction.



If the unit is changed, the programmed value must be reset.

To activate or deactivate a programmed alarm, press and hold



for 3 seconds.

Deactivate / activate Alarm sound

In the Alarm mode, the acoustic sound can be deactivated and only a visual message is triggered on the display.

1.  press , to enter the menu
2.  press , navigate to alarm
3.  press , confirm
4.  press , navigate to  (sound deactivated)
5.  press , confirm «sound deactivated»

The following symbol appears on the display, when the alarm is triggered: 

To reactivate the audible alarm/tone:

1.  press , to enter the menu
2.  press , navigate to alarm
3.  press , confirm

4.  press , navigate to  ;   (sound activated)
5.  press , confirm «sound activated»

Tank Capacity

It is often convenient to know the relative amount of gas remaining in a gas cylinder (tank). The REFSCALE-S Tank Capacity Mode allows a continuous display of the percentage of gas remaining in a tank. In order to compute the percentage accurately, the REFSCALE-S must be trained with the weights of an empty and full tank. To train the REFSCALE-S Tank Capacity Mode, perform the following steps:

1.  press , to enter the menu
2.  press , navigate to Tank Capacity
3.  press , confirm
4.  press , navigate to «SET»
5.  press , confirm
6. The display shows 0%, indicating that the weight of an empty container needs to be registered.
Place an empty gas cylinder (or a load equal to the weight of an empty gas cylinder) on the platform. Wait 5 seconds for the load to stabilize.
7.  press , confirm
8. The display shows 100%, indicating that the weight of a full cylinder needs to be registered.
Place a full gas cylinder (or a load equal to the weight of a full gas cylinder) on the platform. Wait 5 seconds for the load to stabilize.

9.  press , confirm
10. The training process is now completed and the 100% display goes out.

Tank Capacity Display

After 90% of the programmed value, an approaching alarm brings to your attention, with an alternating tone, that the required amount is nearly reached. The following symbol appears on the display, with the top horizontal bar starting to



flash:

While reaching 100%, a continuous tone sounds and the symbol stops flashing.



Between 10% and 90% the following symbol is displayed:

While approaching 10%, an approaching alarm brings to your attention, with an alternating tone, that the required amount is nearly reached. The following symbol appears on the display,



with the lowest horizontal bar starting to flash:

While reaching 0%, the lowest horizontal bar from the symbol no longer visible.

Deactivate / activate Tank Capacity sound

In the Tank Capacity mode, the acoustic sound can be deactivated and only the visual message is triggered on the display.

1.  press , to enter the menu
2.  press , navigate to Tank Capacity
3.  press , confirm
4.  press , navigate to  (sound deactivated)
5.  press , confirm «sound deactivated»

To reactivate the audible alarm/tone:

6.  press , to enter the menu
7.  press , navigate to Tank Capacity
8.  press , confirm
9.  press , navigate to  ;  ;   (sound activated)
10.  press , confirm «sound activated»

Activate Tank Capacity



1. press , to enter the menu
2. press , navigate to Tank Capacity
3. press , confirm
4. press , navigate to «On»
5. press , confirm

From this point on, the numeric display shows the percentage of material remaining in the gas cylinder from 0% to 100%.

Deactivate Tank Capacity



1. press , to enter the menu
2. press , navigate to Tank Capacity
3. press , confirm
4. press , navigate to «OFF»
5. press , confirm

Wireless connection



1. press , to enter the menu
2. press , navigate to Wireless connection
3. press , confirm
4. press , to select «On / OFF»
5. press , to confirm selection

To establish a connection, the Wireless connection symbol must flash, indicating that the scale is searching for a connection. Once a connection to a device is established, the symbol lights up continuously.

The connection to the scale is made via the REFMATE or the REFMESH. While the connection to an external valve (Valve control) takes place via the scale. If the Wireless configuration is Off, incoming and outgoing connections are not possible.

Units (kg / lb / oz / lb&oz)

1. press , to enter the menu
2. press , navigate to Units
3. press , confirm
4. press , to change the units
5. press , to confirm the unit

Calibration = Cal0

The REFSCALE-S is calibrated at the factory to provide high accuracy. While recalibration should seldom, if ever, be necessary, a field calibration is performed easily without sending the product to the manufacturer for service. A known, stable calibration weight (in kilograms) is required to perform the field calibration of the scale, and can be any value between 10 kg and 100 kg. Best accuracy is obtained by using the largest weight available.

The calibration must be carried out using standardized weights. The REFSCALE-S must be placed on a firm, flat, level surface.

1. Remove all items from the platform.
2.  press , to enter the menu
3.  press , navigate to Calibration
4.  press , confirm
5.  press , navigate to «Cal0»
6.  press , confirm
7. Specify calibration weight by using , e.g. 20kg
8.  press , «Set 0kg» is displayed
9.  press , e.g. 20,000 kg is displayed
10. Put a weight of 20 kg on it. Wait 5 seconds for the load to stabilize.
11.  press , confirm
12. Display shows «SAVED»

Restoring Factory Gravitation = Call

If you make a mistake during the field calibrating with the REFSCALE-S, you can always restore the factory calibration of the scale.

To restore the factory settings, perform the following steps:

1.  press , to enter the menu
2.  press , navigate to Calibration
3.  press , confirm
4.  press , navigate to «Call»
5.  press , confirm

Gravity / GEO

Depending on the earth region where the REFSCALE-S is used, a different gravity prevails. Therefore different gravity values can be selected.

1.  press , to enter the menu
2.  press , navigate to Gravity
3.  press , confirm
4.  press , navigate to the desired gravity number / GEOx according to the table below.
5.  press , confirm

Gravity-Number	Value	City
GEO1	GEO1 = 9,80669 m/s ²	Zurich
GEO2	GEO2 = 9,81268 m/s ²	Berlin
GEO3	GEO3 = 9,80988 m/s ²	Paris
GEO4	GEO4 = 9,818349 m/s ²	Stockholm
GEO5	GEO5 = 9,81249 m/s ²	Warsaw
GEO6	GEO6 = 9,811897 m/s ²	London
GEO7	GEO7 = 9,80061 m/s ²	Washington
GEO8	GEO8 = 9,78741 m/s ²	Hong Kong
GEO9	GEO9 = 9,79652 m/s ²	Sydney

Valve control (Automatic valve under development)

1.  press , to enter the menu
2.  press , navigate to Valve control
3.  press , confirm
4.  press , navigate to On / OFF or SCAN
5.  press , to confirm the desired function

On / Off: Switching on or off the connection to the valve.
The scale automatically tries to connect to a REFCO valve.

SCAN: Search and connect to the REFCO valve via Bluetooth.

When the valve control is activated, the 'Valve Connected'

symbol  on the display blinks to establish a connection with the valve.

. It now tries to connect to a valve. When it stops flashing, the valve is connected.

If the valve is open, the valve function is displayed with an arrow



If the valve is closed, the valve function is displayed with an interruption .

Memory

In the work mode, the current displayed weight reading can be saved by pressing the Enter button . A maximum of 10 data can be saved. The data can be subsequently read from the Memory.

1.  press , to enter the menu
2.  press , navigate to Memory
3.  press , confirm
4.  press , navigate to the data
5.  press , to open the desired data
6.  press , to exit from the Memory

Information

1.  press , to enter the menu
2.  press , navigate to Information
3.  press , confirm
4.  press , to move between the information's

SW V: Current software version

HW V: Current hardware version

PAR. C: When recalibrating or changing the GEO value, the display increases.

6.2 Connections

With the REFSCALE-S it is possible to establish a connection to the REFCO REF MESH App or to the REF MATE digital manifold. To connect to REF MESH or REF MATE, the Wireless connection symbol must be flashing, which indicates that the scale is searching for a connection. As soon as a connection is established, the Wireless connection symbol lights up continuously.

Connection to REF MESH

With the REF MESH you can easily establish a connection with the REFSCALE-S via the usual "connect" window on the REF MESH. Via REF MESH it is possible to set tare, use the hold function, set an alarm and save a value which can be shown in a report.

Connection to REF MATE

When the connection LED flashes you can easily search for a device with the REF MATE. If the REFSCALE-S is within the range, you can connect the device via "Wireless Devices". When the devices are connected, you can see the REFSCALE-S values on the REF MATE. On the REF MATE you have access to the additional screen by pressing the SWITCH button.

Recommendation

A connection of the REF MESH and the REF MATE to the REFSCALE-S at the same time is not possible. You can connect the REF MATE to the REFSCALE-S and the REF MESH to the REF MATE. The current measured value is displayed in all devices.

7.0 Battery management

To increase battery life, the REFSCALE-S has two functions:

Automatic shutdown:

After 30 minutes without any button operation and without any changes of the measured value, the device switches off. This only occurs if energy supply via inserted battery is selected.

Alternative power source:

Instead of using batteries, it is possible to power the REFSCALE-S via USB Micro Type B, e.g. via a power supply or a power bank.

8.0 Stable measured value



Is displayed when the measured value is stable and no changes happens. Weight should not be put on the REFSCALE-S until this symbol is displayed.

Only in this state it is possible to calibrate the scale and to use the zero function. If this is not met, the scale must be re-aligned or restarted. The REFSCALE-S must be placed on a firm, flat surface and it must not experience any vibration.

9.0 Error



Is displayed when a function cannot be executed successfully.

The possible causes of error are:

- Missing calibration
- Zero function does not work: Exceeding the maximum permitted deviation limit of 100 grams
- No stable measurement: Scale is not placed on level or steady, the surface is not firm and flat.

9.1 Overload display

If the weight applied to the platform exceeds the maximum capacity of the REFSCALE-S (110 kg / 243 lb), the display will show "OOR", which means "Out of Range". This applies to the absolute weight measurement.



To avoid damage to the REFSCALE-S, remove the weight from the platform immediately.

9.2 Troubleshooting Guide

Failure	Troubleshooting
Device cannot be switched on	Battery inserted incorrectly. Battery contact break was not pulled out.
OOR	Weight over 110 kg. Reduce weight immediately.
Stable measured value is not met	Re-align the device. Restart the device.
Display does not change	Hold function is activated (Hold function symbol is displayed).
Wireless connection not working	A device is already connected. This can be seen when the Wireless connection symbol lights up continuously.
ZERO doesn't work	Exceeding the maximum permitted deviation limit of 100 grams.

10.0 Guarantee

Your new, state-of-the-art REFSCALE-S has been developed in accordance with the latest findings in occupational physiology and ergonomics. REFCO Manufacturing Ltd has been certified according to DIN EN ISO 9001:2015. Regular quality control checks as well as an accurate manufacturing process guarantee reliable functionality and are the basis for the REFCO guarantee, in accordance with the General Terms and Conditions of Sale and Delivery applicable on the day of delivery. Excluded from the guarantee are damage caused by obvious maltreatment and wear and tear.

It is always possible to send back the REFSCALE-S to carry out a repair or software update.

11.0 Return disposal

The REFSCALE-S has been developed for long-term use. Attention was paid to energy saving and environmental compatibility during the material procurement and production stages. REFCO embraces its responsibility towards the environment, and has therefore been certified in accordance with DIN EN ISO 14001:2015. When decommissioning the device, the user must follow local disposal regulations. The housing is made out of Thermoplastic, Aluminum and Rubber.



12.0 Spare Parts / Accessories

Spare Parts	Part no.	Designation
Battery-Cover	4688813	REFSCALE-BATTERY-COVER
Sturdy plastic case	4688963	REFSCALE-S-CASE
Accessories	Part no.	Designation
Filling adapter for refrigerant bottles	4688637	10612-REF-ACME-LH (1/2"-16G)
	4682773	10612-REF-1/4"SAE
	4677027	10612-REF
Support device for refrigerant bottles	4688316	10612-50-ACME-LH
	4682781	10612-50-1/4"SAE
	9885074	10612-50