

User manual

AGRETO three-point scale with B300 weighing indicator

27 January 2014



ATTENTION! Read the operating instructions in this user manual before operating the equipment for the first time, in order to prevent damage to your scale or implement!

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1 Introduction

Thank you very much for choosing the AGRETO three-point scale. You have just purchased a robust tool for everyday use.

The AGRETO three-point scale can only be employed as a checkweigher for internal use. It's not allowed to be used for legal transactions.

Please read this manual carefully before putting the scale to use.

As in common parlance, the word 'load' is used instead of 'mass' in this user manual.

2 Scope of delivery

Standard scope of delivery

- Steel construction with built-in load cells
- 2 top link brackets with 160 mm hole spacing
- 2 top link brackets with 130 mm hole spacing
- 1 top link and 2 lower link pins with linchpins
- Weighing indicator with connecting cables
- This user manual

Optional accessories:

- Lower link hook (instead of ball ends/connection eyes)
- 3, 5 or 10 m extension cable for the weighing signal
- Two-line B400 weighing indicator with distance sensor (instead of the standard single-line B300 weighing indicator)
- Connecting cable to the signal socket for the speed signal (only in combination with the B400 weighing indicator)

3 Intended use

The AGRETO three-point scale is a scale for weighing three-point implements and/or their loads. It's mounted at the three-point linkage between tractor and implement.

Tractors with Category II and III top links and lower links are suitable, but only Category II implements can be attached.

Only implements with a total weight of 6,000 kg can be attached.

The scale must be set to the exact same mounting height as the attached implement.

The implement can only be connected to the scale via the two lower link pins and the top link pins.

No significant push/pull forces must be transferred, which means that soil tillage implements can be attached. Seed drills with normal sowing coulters are acceptable.

The weighing procedure can be performed during standstill or whilst driving.

Three-point scales aren't officially calibratable and therefore not authorized to determine weights for legal transactions. The scale is meant exclusively as a checkweigher for internal use.

4 Safety

4.1 Safety guidelines for the purchaser



IMPORTANT!

Make sure that every person who works with the AGRETO three-point scale for the first time, has read and understood this user manual.

4.2 Safety guidelines for operating and assembling personnel



Appropriate equipment must be used when employing lifting machinery for transport.



Persons who are involved with mounting, removing or setting up the three-point scale, must wear safety shoes.



Persons who are involved with mounting, removing or setting up the three-point scale, must wear safety gloves.

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During transport the scale or pallet can slip on the vehicle. Transport and loading personnel must be instructed to securely attach loads.



Be aware of the risk of crushing between the three-point scale's moving parts during mounting, removing and setting up.



The scale must not be stored or used in a potentially explosive environment.



Be careful not to trip over parts or tools that could be lying around you.

5 Specifications

Scale construction

- Steel construction with tubes and laser-cut parts
- Internal load cells
- Roller supported mounting for implement attachment
- Designed for implements with a total weight of 6,000 kg
- Lower link attachment to the tractor: Pins Ø28 mm, 64 mm inner width, for lower link with CAT II ball end, CAT II hook and ball, or CAT III hook and CAT II reduction balls
- Lower link attachment to the implement: Ball joint Ø28.4mm, 51 mm width or a CAT II Walterscheid quick coupling-hook
- Lower link distance: CAT II, standard 87.5 cm, can be adjusted infinitely between 85 and 90 cm with set screws, can be adjusted manually up to 105 cm for attachment to a rigid axle
- Top link attachment to the tractor: Pins Ø25.4 mm, 64 mm inner width, for top links with CAT II ball joint, or CAT II hook and ball
- Top link attachment to the implement: CAT II mounting brackets Ø26 mm
- Distance lower link-top link on the attachment: infinitely adjustable between 48 and 68 cm
- Horizontal distance lower link pins-implement pins (lower link shifted backwards): 160 mm (200 mm for hooks)
- Horizontal distance top link pins-implement pins (top link shifted backwards): 130 mm or 160 mm depending on the mounting brackets
- Net weight approx. 80 kg including pins
- Dimensions: 104x84x20 cm (LxWxH, lying down)

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Load cells

- 2 high resolution shear force load cells, each at 5,000 kg, 3mV/V, 350 Ohm
- Total nominal load: 10,000 kg
- 150% overload, 300% breaking load
- Protection class IP68 (dust- and waterproof)
- Operating temperature: -35 up to +65 °C
- Temperature compensated: -10 up to +40 °C

Weighing indicator

- 6-digit LED-backlit LCD display with 20 mm high digits
- 12 to 24 Volt power supply
- Operating temperature: -10 up to +50 °C
- Real-time clock
- Tare through the push of a button (zeroing the empty implement)
- Shockproof and spraywaterproof
- Stabilized indicator for reading while driving
- OPTIONAL: Two-line weighing indicator with 30 / 20 mm high digits and special programming to display the spread rate per hectare

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Cabling

- Internal load cell connection with waterproof box (IP67)
- 3.5 m long weighing signal cable with special sheathing, from the outlet on the front of the right frame part to the indicator
- Waterproof, threaded plug connector (IP68)
- 2 m power supply cable with a flexible universal plug (for cigarette lighter and standard sockets according to DIN EN ISO 4165), with integrated and replaceable fuse

Accuracy

- +/- 0.02% load cell accuracy
- +/- 1 to 2% accuracy when operated properly in everyday conditions
- 5 kg weighing indicator resolution
- Readability during standstill or smooth ride: very good
- Readability during bumpy ride: sufficient
- Deviation when load shifts (front, back, left, right): none when operated properly
- Deviation on slopes: hardly noticeable up to 5%
- Deviation when inclined sideways: hardly noticeable up to 5%
- Deviation when not attached vertically: hardly noticeable up to 5%, can be compensated through calibration

6 Getting started

6.1 Setting lower link distance

- Measure the necessary horizontal distance between both lower link mounting points on your implement (for instance a fertilizer spreader). The standard dimension for Category II is 87 cm, but in practice it's between 86 and 88 cm.
- Set the required distance on your three-point scale with the adjustment screws. Use the exterior nuts of the adjustment screws on both sides of the three-point scale to keep the construction symmetrical.
- Set the scale's width in such a way that there's a little space left between scale and implement, so that the scale isn't under tension.
- When your implement has a rigid mounting axle, you must completely remove the adjustment nuts on one side of the three-point scale, pull the scale apart during mounting and push it back together again.

6.2 Setting mounting height



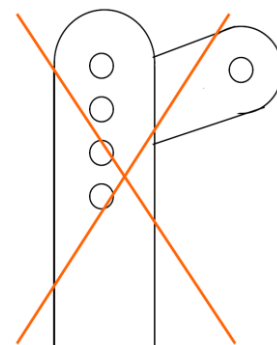
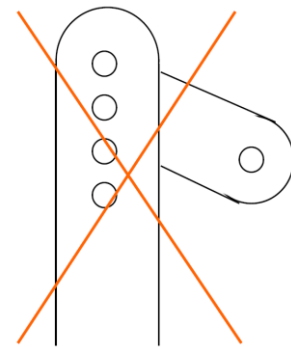
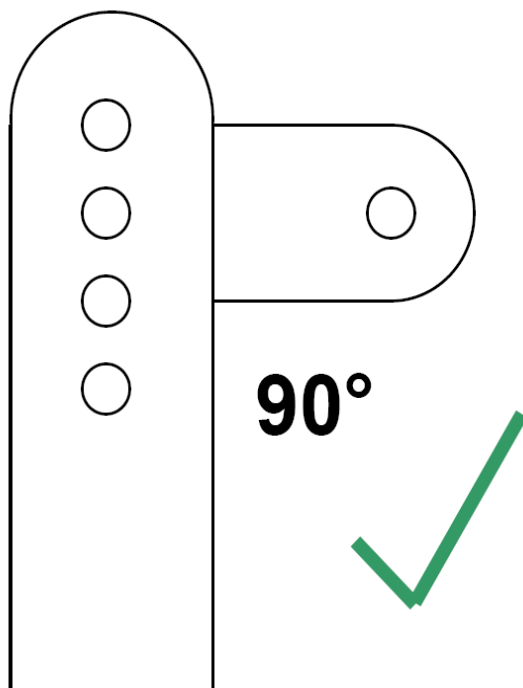
A correct setting of the mounting height is of paramount importance for your scale's accuracy.

The horizontal and vertical top link mounting brackets must be in a perfect right angle relative to each other. This will make sure that the load's position doesn't influence weighing accuracy.

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Proceed as follows:

- Measure the necessary vertical distance on your implement between lower link pins and top link pins. If there are several positions for your top link and/or lower link, choose a combination where the distance is between 50 and 65 cm.
- Determine which of the 4 holes on the three-point scale's vertical top link brackets must be used for the distance you measured. Loosen the 4 interior nuts of the adjustment screws, set the measured distance, and tighten the nuts again.
- The distance can still be readjusted after the implement is attached, but first relieve any load from the scale. Slightly loosen the nuts and use a rubber hammer to shift the brackets.



ATTENTION: The exact setting of mounting height is not only a prerequisite for accurate weighings. When the angle is not exactly right, the three-point scale and/or your implement could get damaged or deformed.

6.3 Mounting the three-point scale

- You can choose whether you first want to mount the three-point scale to the tractor or the implement. When your implement has a rigid axle, you must first mount the scale to the implement. Of course, the scale can be left mounted on the implement if it is only used for that implement.
- Try to use the three-point scale in a position that is as vertical as possible. Either use the brackets with 130 mm hole spacing, or the brackets with 160 mm hole spacing. If vertical mounting isn't possible, the scale must be calibrated to obtain correct results. Deviations are hardly noticeable when under 5 degrees in comparison to the vertical position.

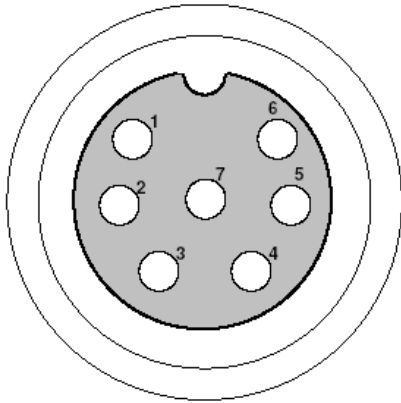
6.4 Connecting the weighing indicator

- Position the weighing indicator in a suitable spot in the vehicle.
- Connect the power supply cable. Either use the provided cable or connect the indicator directly to the electric system. The indicator can be run on a voltage between 12 and 24 Volt. If during operation the power supply to the indicator is interrupted, it will remember the scale's zero point, but not a tare point that might have been set.
- Connect the weighing signal cable to the plug on the three-point scale. You could run the cable along the hydraulic tubes to prevent damage.

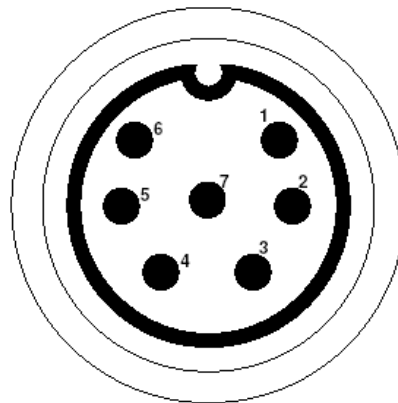
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The weighing signal cable is assigned as follows:

Front view cable socket
on the scale



Front view cable plug
on the connecting cable



Number	Description	Function
1	EX -	Supply -
2	EX +	Supply +
3	SI -	Signal -
4	SI +	Signal +
5		
6		
7		

7 Weighing indicator

7.1 Switching on the weighing indicator

Switch the weighing indicator on with the button on the far left. The indicator shows a start-up sequence, followed by the scale's actual load, based on the most recently set zero point.



7.2 Zeroing

The [ZERO] button resets the indicator's zero point. Use this function for zeroing the scale with an attached and raised implement. This puts the zero point on the implement's empty weight, after which a load's weight can be read directly.

7.3 Standard weighing procedure

Load and unload the implement, or use your implement as usual, and the load's actual weight will be displayed immediately on the weighing indicator. The indicator is stabilized, which allows you to read the weight while driving.

7.4 Weighing with tare function

If you would like to weigh goods in containers or packages, the weight of these containers or packages can be automatically subtracted using the tare function, without changing the scale's zero point.

- Make sure that the indicator reads zero.
- Put the container or package on the scale.
- Wait until the weighing indicator displays a stable value.
- Press the [TARE] button. The weighing indicator reads zero again and displays the NET symbol. Now the weighing indicator will only show the additional load (net weight).
- Put the goods in the container.
- Wait until the weighing indicator displays a stable value.
- Read the weight. This is the net weight without container.
- If you want to weigh several goods in the same container, you can put them on the scale one after the other. As long as the NET symbol is displayed, the previously calculated tare weight is subtracted and only the net weight is shown.
- To switch from gross to net, press the [GROSS/NET] button.
- End the tare function by taking the load from the scale and press the [TARE] button again.

7.5 Switching off the weighing indicator

Keep the button on the far left pressed until the weighing indicator switches off.

7.6 Settings

The weighing indicator contains several adjustable parameters that influence the system's functioning. Normally these parameters have been pre-set correctly and only need to be changed in the case of specific requirements.

The parameters are described in the enclosed quick reference guide.

For use with the AGRETO three-point scale, the weighing indicator's following parameters differ from default settings:

BUILD CABLE 4	(load cell connection with 4 cables)
BUILD CAP 6000	(maximum load of the scale)
BUILD RES 5	(weighing indicator resolution)
OPTION FILTER 4	(maximum attenuation)
OPTION Z.RANGE FULL	(enable zeroing up to maximum load)
CAL SPAN 2667	(calibration value at 0.8 mV)

7.7 Calibration

When the AGRETO three-point scale is operated vertically or with a slight slant forward or backward, the factory-set calibration is correct and the scale is ready for direct use. If this isn't possible, the weighing indicator must be calibrated, depending on how the scale is employed.

A calibration determines the scale's accuracy. Perform the following steps only when necessary and with the greatest care!

Every new calibration replaces the previous calibration. Proceed in the following manner:

- Place your vehicle on an even surface and put the empty implement in the operating position.
- Keep the weighing indicator's buttons on the far left and right pressed simultaneously, until the calibration sequence starts.
- Wait until the word BUILD appears on the display.

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- Press the [ZERO] button twice. The word CAL appears on the display.
- Press the [TARE] button. ZERO appears on the display.
- Press the [GROSS/NET] button. The actual weight appears on the display.
- Press the [GROSS/NET] button. Z.inP appears on the display. The zero point is determined, confirmed by a sound. 0 appears on the display.
- Press the [TARE] button. ZERO appears on the display.
- Press the [TARE] button. SPAN appears on the display.
- Press the [GROSS/NET] button twice. The actual weight appears on the display.
- Now load the scale with something of which you know the weight, or fill your implement with a known amount of materials. The weight should be as large as possible, completely filling your implement would be best.
- To prevent tensions in the implement and scale from influencing the calibration, drive forwards and backwards again.
- Press the [GROSS/NET] button. The most recently set calibration weight appears on the display.
- Change the displayed number to the actual weight used for the calibration. The number can be changed digit by digit, which will flash. Switch digits by using the [GROSS/NET] button. After the digit on the far right, the digit on the left starts flashing again. Change the flashing digit's number by pressing the [PRINT] button.
- Press the [TARE] button. S.inP appears on the display. The calibration is now carried out, and confirmed with a sound. The weight you entered, is now flashing on the display.
- Press the [TARE] button to end the calibration function.
- To save the settings, simultaneously press the [Ein/Aus] and [ZERO] buttons, until the indicator restarts.
- To interrupt the calibration process at any point, simply turn off the indicator.

7.8 Operation error messages

Error	Description	Action
(U - - - -)	Underload	Increase load or switch the scale off and back on again
(O - - - -)	Overload	Reduce load
(TARE) (ERROR)	Taring attempt outside of the permitted range	Reduce tare
(ZERO) (ERROR)	Zeroing attempt outside of the permitted range	Reduce load
(STABLE) (ERROR)	A [ZERO] or [TARE] command can't be executed because the scale is unstable	Try again when the scale is stable

7.9 Setup error messages

Error	Description
(ENTRY) (DENIED)	There was an attempt to set a setting in SAFE-Setup that can only be set in FULL-Setup
(LIN.PT (LO)	There was an attempt to linearize to below the zero point
PT.TOO) (CLOSE)	Adjustments points are too close to each other (<2%); Adjustment cannot be performed; Use other (usually higher) loads
(RES) (LO)	Too little calibration values (<100) were set
RES) (HIGH)	Too many calibration values were set

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(SPAN) (LO)	Load cell signal is too weak for this setting
(SPAN) (HIGH)	Load cell signal is too strong for this setting
(ZERO) (LO)	Zero point is below -2mV/V
(ZERO) (HIGH)	Zero point is above +2mV/V

7.10 Diagnosis error messages

Error	Description	Solution
E0001	Supply voltage too low	Check
E0002	Supply voltage too high	Check
E0010	Temperature too high/low (-10 to +50 °C ambient)	Check site
E0020	Incorrect scale division (should be between 100 and 30000 parts)	Change value
E0100	Settings have been lost	Repeat settings
E0200	Scale calibration has been lost	New calibration
E0300	All settings and scale calibration have been lost	Repeat settings and calibration
E0400	Factory parameters have been lost (FATAL)	Service
E0800	EEPROM malfunction (FATAL)	Service
E2000	Load cells are supplied incorrectly	Check load cell cable
E4000	Battery buffered memory has been lost	Repeat settings
E8000	FLASH memory malfunction (FATAL)	Service

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Error messages that start with E can be added together. For instance:

E0012 (E0010+E0002) means that supply voltage as well as temperature are too high.

E0C00 (E0800+E0400) means that factory parameters have been lost and that EEPROM is malfunctioning.

8 Maintenance and cleaning

- Clean the AGRETO three-point scale together with your implement. High-pressure cleaning must be done from a distance of at least 0.5 m.
- Store the machine in a dry and safe place.
- When you don't use the machine for a longer period, treat it with a suitable anticorrosive agent.

9 Troubleshooting

Proceed as follows when you have reason to believe the displayed weights are incorrect:

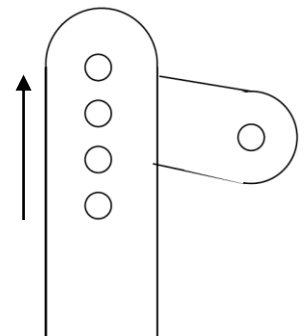
- Make sure that there is no transfer of forces because a part of your implement touches the scale. The implement can only be in contact with the scale through 3 attachment pins.
- Make sure that the scale isn't attached too tightly on the side to your implement. Check if there is still some space on both sides of the lower attachment points. Consult chapter 6 of this manual.
- Check whether the angle between scale and mounting brackets is exactly right. The factory-set calibration is only correct under an exact right angle, and the position of the load doesn't influence the weighing result. Consult chapter 6 of this manual.
- Try to use the scale in a position that is as vertical as possible. Use the top link brackets with either 130 mm or 160 mm hole spacing. If this isn't possible, the weighing indicator must be calibrated for the application. A small deviation of a few degrees doesn't matter that much.
- Calibrate the scale. Follow the instructions in this manual (chapter 7.7).
- Unsatisfactory weighing results can be caused by tensions in the scale's suspension. The 3 attachment pins aren't supported by ball bearings, and even when balls and/or hooks are used, tensions build up in the system due to load changes. These tensions dissipate while driving or moving. This is the reason why the scale and implement must be moved twice during the calibration process. It also explains why the scale weighs more accurately during movement than during standstill.
- During static weighings (for instance: slowly filling a fertilizer spreader) the displayed weight is usually lower than the true weight of the load, because of tensions in the system. Under higher loads the scale might not react smoothly to changes in weight. When you have enough experience with your system, you can add the missing weight. If not, you have to stop filling a bit earlier and clear the tensions in the system by moving, after which the correct weight will be displayed.
- Check without attached implement whether the scale displays the same weight on both sides. Stand on the left and then the right side of the

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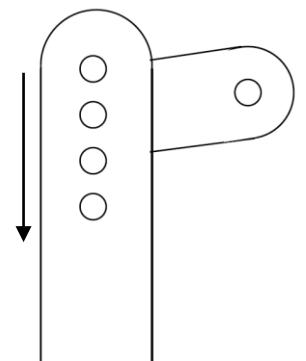
linkage. If the difference is larger than 5 kg, one of the load cells is malfunctioning or load cell suspension needs to be readjusted. If this is the case, please contact the manufacturer.

- Check with implement attached whether the scale shows the same weight when the load is in the front and then in the back of the implement. If this isn't the case, the imbalance must be offset by changing the angle of the top link mounting brackets:

If the scale displays a higher weight in the back, you must shift the two mounting parts slightly upwards. You do not have to remove the scale. Loosen the 4 internal nuts of the mounting screws and tap the bottom of the sliding mounting parts with a rubber hammer. If you can't slide them any further, you have to remove the scale and insert the upper link pin in the next hole.



If the scale displays a higher weight in the front, you must shift the two mounting parts slightly downwards. You do not have to remove the scale. Loosen the 4 internal nuts of the mounting screws and tap the top of the sliding mounting parts with a rubber hammer. If you can't slide them any further, you have to remove the scale and insert the upper link pin in the next hole.



10Warranty

- In addition to the legally required warranty, the following warranty conditions apply to the AGRETO three-point scale:
- AGRETO electronics GmbH guarantees proper functioning, and repairs or replaces all parts that exhibit material or manufacturing defects during the warranty period.
- Warranty services are provided by AGRETO electronics GmbH only.
- The decision whether warranty applies, is made exclusively by AGRETO electronics GmbH.
- The warranty period starts when the end user is billed and ends 5 years after the invoice date.
- A requirement for warranty is the presentation of the original invoice and compliance with all the points in this user manual.
- Warranty doesn't apply to wear and tear, nor to damages due to improper use, negligence or accidents.
- In case of a warranty claim transport costs are to be paid by the purchaser.

11 Disposal



When the product has reached end-of-life, dispose of the product or parts thereof in an environmentally responsible manner, with materials separated according to type (scrap metal, plastic waste, etc. - do not add to household waste)!

Detailed information can be found in Directive 2002/96/EG

12

Declaration of conformity



EC declaration of conformity

For the following product:

AGRETO three-point scale

This confirms that the product meets the essential safety requirements, as stipulated in the Council Directive on the approximation of the laws of the Member States relating to electromagnetic compatibility (2004/108/EG).

The evaluation of this product was carried out in accordance with the following standards:

EN 55022:1998
EN 60601-1-2:2007
ÖNORM ISO 2332

This declaration is made for and on behalf of the manufacturer

AGRETO electronics GmbH
Pommersdorf 11
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Submitted by:

Anton Eder
Managing director

Pommersdorf

01-27-2014



legally binding signature

13 Impressum

All information, specifications and images in this manual are correct according to the status in 2014, and subject to technical adjustments or changes in design.

Despite careful treatment and examination of the contents, no warranty is made with respect to information in this user manual. Any liability of the author is excluded.

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