

Operating manual

AMAZONE

AMACO

Hectare meter



MG3730
BAG0028.0 04.06
Printed in Germany



Please read this operating
manual before first
commissioning.
Keep it in a safe place
for future use!

en



Reading the instruction

Manual and following it should seem to be inconvenient and superfluous as it is not enough to hear from others and to realize that a machine is good, to buy it and to believe that now everything should work by itself. The person in question would not only harm himself but also make the mistake of blaming the machine for possible failures instead of himself. In order to ensure success one should enter the mind of a thing, make himself familiar with every part of the machine and get acquainted with how it's handled. Only in this way could you be satisfied both with the machine and with yourself. This goal is the purpose of this instruction manual.

Leipzig-Plagwitz 1872. Rud. Sark.

Identification data

Enter the machine identification data here. You will find the identification data on the type plate.

Type:

AMACO

Year of manufacture:

Manufacturer's address

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Online spare parts' catalogue: www.amazone.de
When ordering spare parts, always specify the (ten-digit) machine identification number.

Formalities of the operating manual

Document number: MG3730

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Foreword

Foreword

Dear Customer,

You have chosen one of the quality products from the wide product range of AMAZONEN-WERKE, H. DREYER GmbH & Co. KG. We thank you for your confidence in our products.

On receiving the machine, check to see if it was damaged during transport or if parts are missing. Using the delivery note, check that the machine was delivered in full including the ordered special equipment. Damage can only be rectified if problems are signalled immediately!

Before first commissioning, read and understand this operating manual, and particularly the safety information. Only after careful reading will you be able to benefit from the full scope of your newly purchased machine.

Please ensure that all the machine operators have read this operating manual before commissioning the machine.

Should you have problems or queries, please consult this operating manual or give us a call.

Regular maintenance and timely replacement of worn or damaged parts increases the lifespan of your machine.

User evaluation

Dear Reader,

We update our operating manuals regularly. Your suggestions for improvement help us to create ever more user-friendly manuals. Send us your suggestions by fax.

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1 User Information

The User Information chapter supplies information on handling the operating manual.

1.1 Purpose of the document

This operating manual

- Describes the operation and maintenance of the machine.
- Provides important information on safe and efficient handling of the machine.
- Is a component part of the machine and should always be kept with the machine or the traction vehicle.
- Keep it in a safe place for future use.

1.2 Locations in the operating manual

All the directions specified in the operating manual are always seen from the direction of travel.

1.3 Diagrams used

Handling instructions and reactions

Activities to be carried out by the user are given as numbered instructions. Always keep to the order of the handling instructions. The reaction to the handling instructions is given by an arrow.

Example:

1. Handling instruction 1
- Machine reaction to handling instruction 1
2. Handling instruction 2

Lists

Lists without an essential order are shown as a list with bullets.

Example:

- Point 1
- Point 2

Number items in diagrams

Numbers in round bracket refer to items in diagrams. The first number refers to the diagram and the second number to the item in the figure.

Example: (Fig. 3/6)

- Figure 3
- Item 6

2 General Safety Instructions

This chapter contains important information on safe operation of the machine.

2.1 Obligations and liability

Comply with the instructions in the operating manual

Knowledge of the basic safety information and safety regulations is a basic requirement for safe handling and fault-free machine operation.

Obligations of the user

Before starting work, anyone charged with working with/on the machine is obliged

- To comply with the basic workplace safety instructions and accident prevention regulations.
- To read and understand the chapter "General safety information" of this operating manual.
- To read the chapters of this operating manual, important for carrying out your work.

If the user discovers that a function is not working properly, then they must eliminate this fault immediately. If this is not the task of the user or if the user does not possess the appropriate technical knowledge, then they should report this fault to their superior (operator).

Risks in handling the machine

The machine has been constructed to the state-of-the art and the recognised rules of safety. However, there may be risks and restrictions which occur when operating the machine

- For the health and safety of the user or third persons,
- For the machine,
- For other goods.

Only use the machine

- For the purpose for which it was intended.
- In a perfect state of repair.

Eliminate any faults immediately, which could impair safety.

Guarantee and liability

Our "General conditions of sales and business" are always applicable. These shall be available to the operator, at the latest on the completion of the contract. Guarantee and liability claims for damage to people or goods will be excluded if they can be traced back to one or more of the following causes:

- Improper use of the machine.
- Improper installation, commissioning, operation and maintenance of the machine.
- Operation of the machine with defective safety equipment or improperly attached or non-functioning safety equipment.
- Non-compliance with the instructions in the operating manual regarding commissioning, operation and maintenance.
- Independently-executed construction changes to the machine.
- Insufficient monitoring of machine parts, which are subject to wear.
- Improperly executed repairs.
- Disasters through the impact of foreign bodies and acts of God.

2.2 Representation of safety symbols

Safety instructions are indicated by the triangular safety symbol and the highlighted signal word. The signal word (DANGER, WARNING, CAUTION) describes the gravity of the risk and has the following significance:



DANGER

Indicates an immediate high risk, which will result in death or serious physical injury (loss of body parts or long term damage) if not avoided.

If the instructions are not followed, then this will result in immediate death or serious physical injury.



WARNING

Indicates a medium risk, which could result in death or (serious) physical injury if not avoided.

If the instructions are not followed, then this may result in death or serious physical injury.



CAUTION

Indicates a low risk, which could incur minor or medium level physical injury or damage to property if not avoided.



IMPORTANT

Indicates an obligation to special behaviour or an activity required for proper machine handling.

Non-compliance with these instructions can cause faults on the machine or in the environment.



NOTE

Indicates handling tips and particularly useful information.

These instructions will help you to use all the functions of your machine to the optimum.

2.3 Organisational measures



The operation manual

- Must always be kept at the place at which the machine is operated.
- Must always be easily accessible for the user and maintenance personnel.

Check all the available safety equipment regularly.

2.4 Safety information for users

2.4.1 Electrical system

- When working on the electrical system, always disconnect the battery (negative terminal).
- Only use the prescribed fuses. Using unsuitable fuses will destroy the electrical system - risk of fire.
- Ensure that the battery is connected correctly - firstly connect the positive terminal and then connect the negative terminal. When disconnecting the battery, disconnect the negative terminal first, followed by the positive terminal.
- Always place the appropriate cover over the positive battery terminal. Accidental grounding poses the risk of an explosion.
- Risk of explosion – Avoid spark formation and naked flames in the area of the battery!
- The machine can be equipped with electronic components, the function of which may be influenced by electromagnetic interference from other units. Such interference can pose risks to people, if the following safety information is not followed.
 - o In the case of retrofitting of electrical units and/or components on the machine, with a connection to the on-board power supply, the user must check whether the installation might cause faults on the vehicle electronics or other components.
 - o Ensure that the retrofitted electrical and electronic components comply with the EMC directive 2006/42/EEC in the appropriate version and carry the CE label.

3 Product description

This chapter:

- Provides a comprehensive overview of the **AMACO** structure.
- Provides the names of the individual modules and controls.

3.1 Overview

- Scope of delivery and spare part numbers

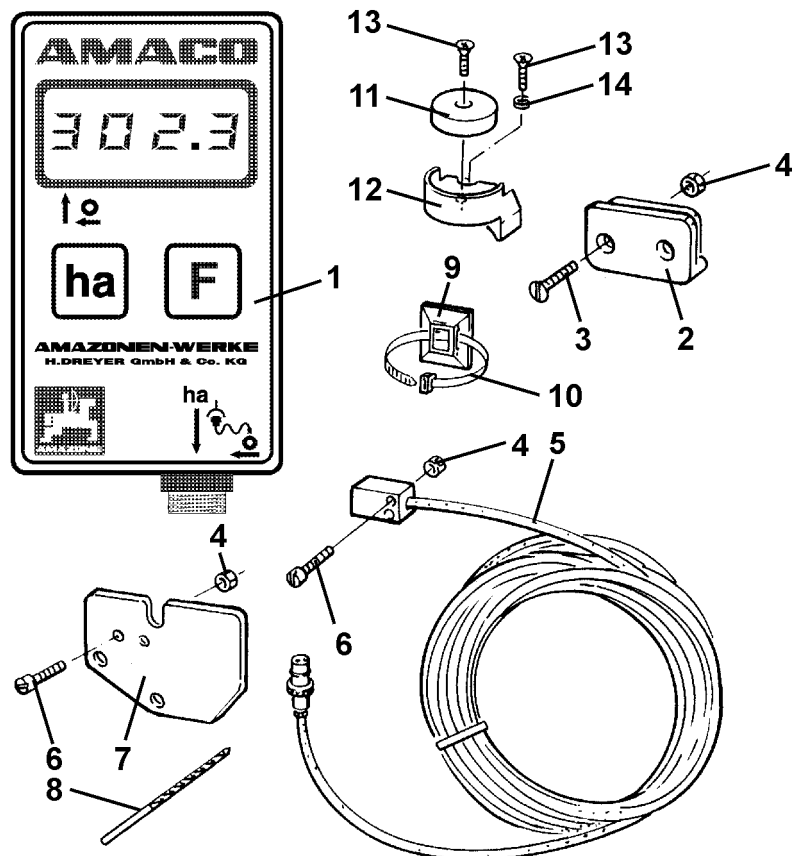


Fig. 1

Description:		Part-No.	Quantity:
1	Electronic hectare meter (including. Pos. 2-14)	954671	1
2	Mounting bracket for computer		2
3	Hex. bolt M4x25		4
4	Self locking nut M4		6
5	Sensor with 7 m cable and plug	NE253	1
6	Cylindrical screw M4x20		2
7	Sensor mounting plate for two range gearbox	951857	1

Product description

8	Hole drill (Ø 3.6mm)		1
9	Adhesive plate 29x29		15
10	Cable ties		10
11	Magnet cpl. (incl. Pos. 12,13,14)		1
12	Retainer for magnet		1
13	Self thread cutting screw M4x10		2
14	Spring washer		1

3.2 Intended use

AMACO is exclusively designed to function as display- and metering- and monitoring device for agricultural machinery.

The intended use also includes:

- Compliance with all the instructions in this operating manual.
- Execution of inspection and maintenance work.
- Exclusive use of original **AMAZONE** spare parts.

Other uses to those specified above are forbidden and shall be considered as improper.

Any damage resulting from improper use means that:

- The operator carries the sole responsibility,
- AMAZONEN-WERKE assumes no liability.

3.3 Technical data

Model:	AMACO
Display capacity:	4 digits with floating-comma display
Display:	Liquid crystal (L C D)
Power source:	2x 1.5 Volt-AAA-batteries
Ambient temperature:	0°C – 45°C
Dimensions of the computer (H x B x T) mm:	120 x 69 x 39
Weight (basic execution) kg:	0.75
Sensor:	Max. 167 Impulses /sec.
Hectare meter:	Max 360 ha/h = 0.1 ha/sec.

3.4 Conformity

The **AMACO** fulfils the:

Directives / standards

- Machines directive 2006/42/EC
- EMC directive 2004/108/EEC

4 Structure and function

The following chapter provides information on the **AMACO** structure and the functions of the individual components.

4.1 Method of operation

The **AMACO** is an electronic hectare meter displaying the worked area.

4.2 Structure

- **Display (Fig. 2/1).**

Lower bar (Fig. 2/1) flicks during operation:
Computer receives impulses from sensor.

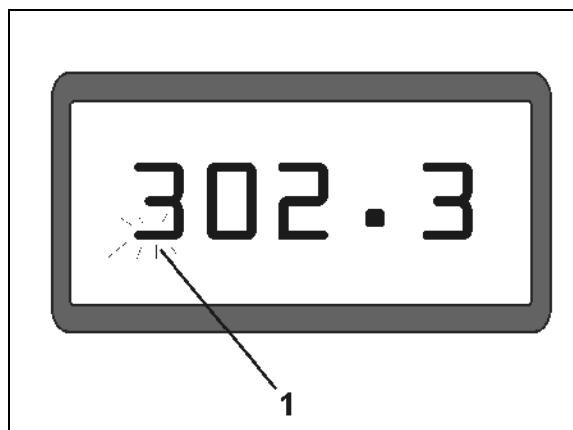


Fig. 2

- **Keys**

Key **ha** (Fig. 3/1).

- o Switching on
- o Marking figures to be changed
- o Switching off at simultaneous pressing

key **F**.

Key **F** (Fig. 3/2)

- o Switching on
- o Marking figures to be changed
- o Switching off at simultaneous pressing

key **ha**.

- **Connection Sensor (Fig. 3/3).**

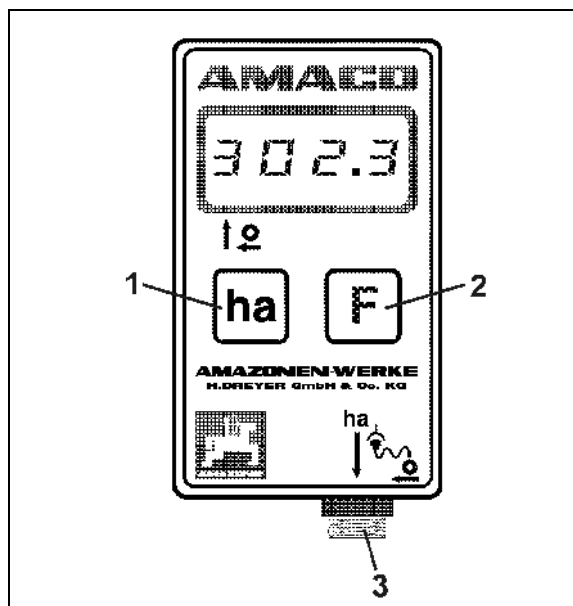


Fig. 3

Seed drills with Vario gearbox

Fig. 4 shows the mounting points of the sensor "ha".

1. sensor "ha"

The Vario gearbox housing is equipped as standard with a magnet for the sensor.

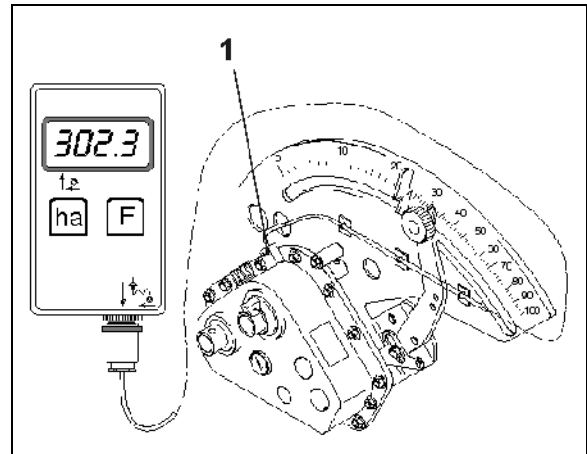


Fig. 4

Seed drills with two-range setting gearbox

Fig. 5 shows the mounting points of the sensor "ha" and of the magnet to the gearbox shaft.

1. sensor "ha"
2. magnet
3. gearbox shaft

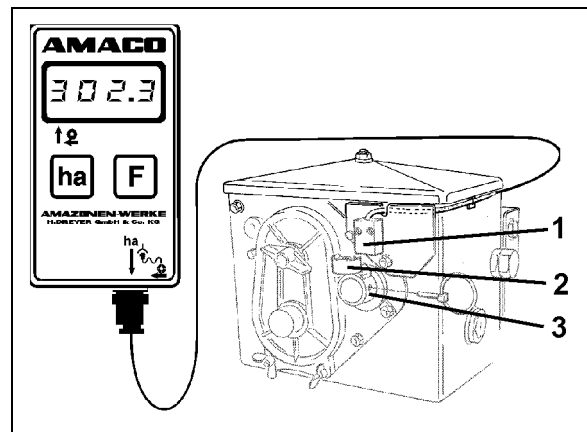


Fig. 5

Precision seeders ED

Fig. 6 shows the mounting points of the sensor "ha" and of the magnet to the gearbox shaft.

1. sensor "ha"
2. magnet
3. gearbox shaft

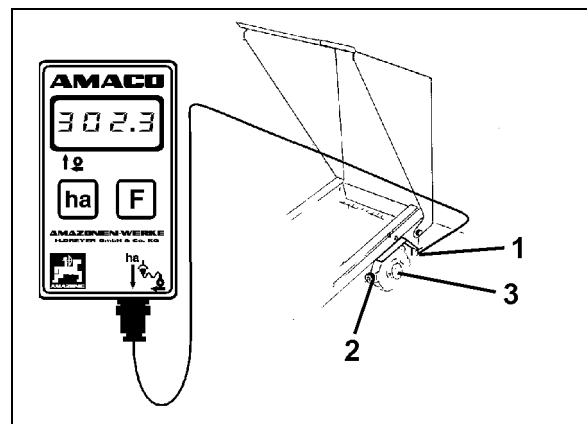


Fig. 6

5 Fitting instruction

5.1 Inserting batteries

The scope of delivery of the computer includes two 1.5 Volt Mignon AAA batteries. The battery compartment is located at the back of the computer.

How to insert batteries:

1. Slide open the battery compartment.
2. Drop batteries between the clamps. Please ensure correct poling (+/-)!
3. Close battery compartment.

5.2 Fitting the calculator

1. Fix the mounting bracket (Fig. 7) of the calculator inside the tractor cab.



Protect calculator from heavy sunshine and frost.

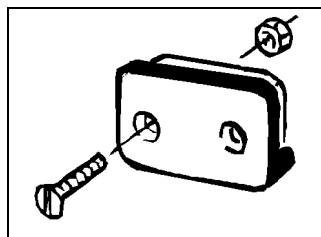


Fig. 7

2. Slide the calculator onto the mounting bracket.
3. Finally, after all parts have been fitted and the seed drill has also been mounted to the tractor, plug the plug of the sensor into the calculator socket and secure by firmly tighten the plug nut.

5.3 Fitting sensor "ha" to the Vario gearbox

1. Bolt sensor (Fig. 8/1) on to the Vario gearbox
2. Fix magnet cable to the seed drill with adhesive plates and with cable ties. The sticking areas must be clean and free of grease/oil.



CAUTION

Place sensor cable in such a way that the cable will not be damaged during operation.

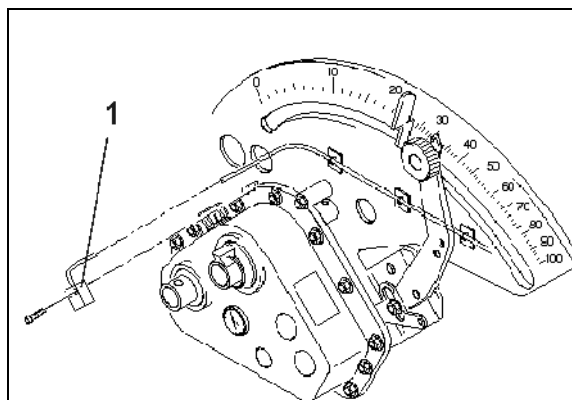


Fig. 8

5.4 Fitting magnet and sensor "ha" to the two range gearbox

1. Remove clip pin (Fig. 9/1, which connects agitator shaft with drive).
2. Bolt magnet mounting bracket (Fig. 9/2) with self thread cutting bolt M4 x 10 (Fig. 9/3) and spring washer to the gearbox hollow shaft (Fig. 9/4)..

When having older seed drills which do not have a fixing hole in the gearbox hollow shaft:

3. a hole has to be drilled ($\varnothing 3.6$ mm) into the hollow shaft (Fig. 10/1).
 - o The hole should be drilled at an angle of 90° towards the existing hole provided for the clip pin.

The distance **A** (see Fig. 10) from the edge of the hollow shaft towards the centre of the hole is 5 mm. Before drilling a hole, mark the centre by a punch.
4. Bolt the magnet (Fig. 9/5) with a self thread cutting bolt M4 x 10 to the magnet mounting bracket..
5. Bolt sensor (Fig. 9/6) on to the sensor bracket (Fig. 9/7).
6. Bolt sensor bracket (Fig. 9/7) with two housing nuts (Fig. 9/8) on to the gearbox.
7. Place sensor cable (Fig. 9/9) towards the tractor cab..

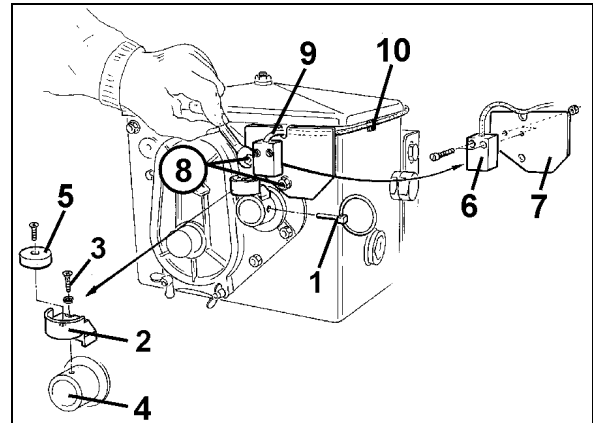


Fig. 9

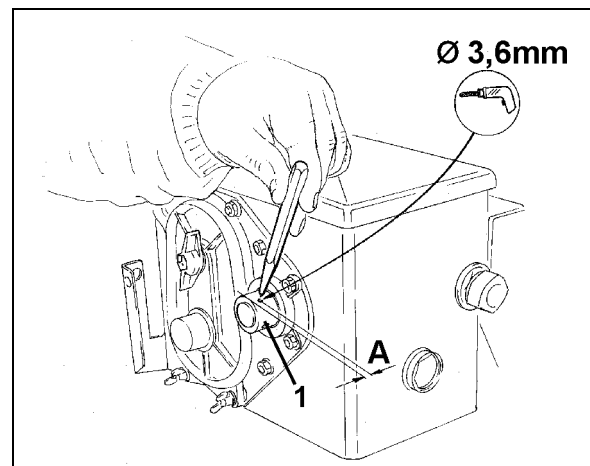


Fig. 10



CAUTION

Place sensor cable in such a way that the cable will not be damaged during operation.

8. Fix magnet cable to the seed drill with adhesive plates (Fig. 9/10) and with cable ties. The sticking areas must be clean and free of grease/oil.
9. Reinsert clip pin (Fig. 9/1) into the gearbox hollow shaft.

5.5 Fitting and magnet and sensor "ha" for precision airseeder/planter ED

Mount sensor and magnet on **ED 1** (Fig. 11) to the input of the sprocket wheel setting gearbox:

1. Bolt magnet (Fig. 11/1) with self thread cutting bolt M4 x 10 to the impulse disc of the gearbox input shaft.
2. For fixing the sensor slacken impulse carrier (Fig. 11/3) and retighten afterwards.
3. Bolt sensor (Fig. 11/2) to the impulse carrier (Fig. 11/3).
4. Place sensor cable to tractor cab. Fix cable to the seed drill with adhesive plates and cable ties. The sticking areas for the adhesive plates must be clean and free of oil/grease.

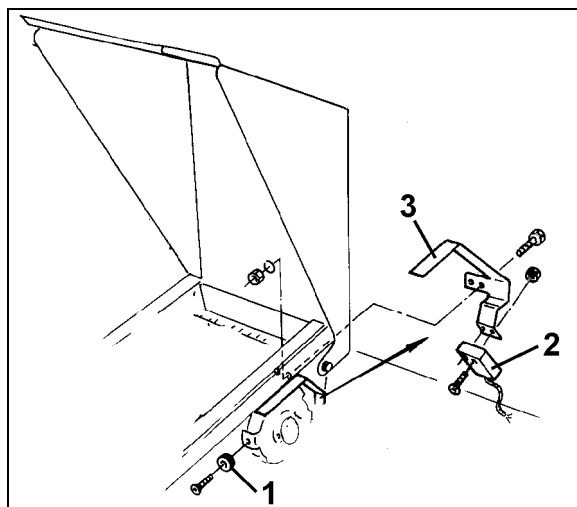


Fig. 11



Place sensor cable in such a way that it cannot be damaged during operation.

5.6 Fitting magnet and sensor "ha" to seed drills without two range gear-boxes

If it is not possible to fit sensor and magnet to the two range gearbox as described in para.5.4, the magnets (Fig. 12/1) should be attached to the drive shaft of your seed drill and the sensor (Fig. 12/2) be fitted to a suitable place at a distance of max. 12 mm (see Fig. 12). If required you may order an additional sensor bracket (Fig. 12/3, Order No. 950725

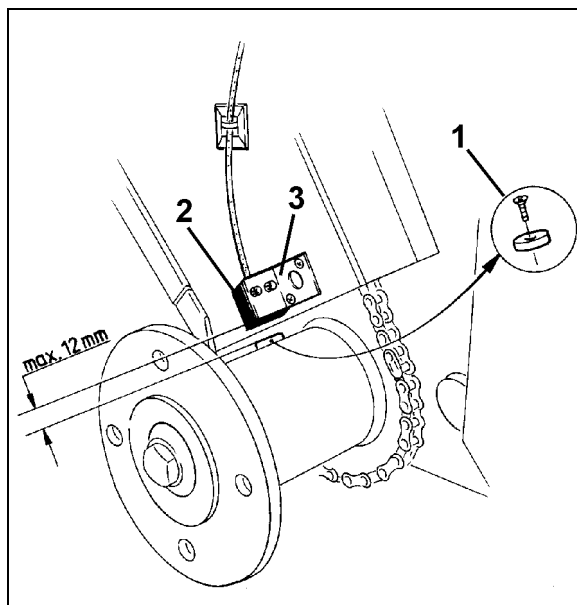


Fig. 12



In any case, at this kind of fitting the factor should be calculated according to see on page 23 and be programmed together with the working width according to see on page 24.

6 Commissioning

After the seed drill has been attached to the tractor, plug the plug of the sensor into the calculator socket and tighten securing nut.

Switching on computer

Press **F** - key or **ha** - key.

- Display (briefly):
Number of calculator version e.g. "HA. X.X"
- Automatic checking the battery voltage.
If voltage too low: display: [-bl-].
- Display:
The latest programmed implement-No., e.g. **F.4**



If the display shows [-bl-] switch off calculator (see on page 25) and exchange batteries (see on page 16).



For the AMACO to correctly measure the worked area, the following must be entered according to the machine:

- **a factor and the working width** or
- **a code**

Entering machine code (see on page 20)



- Inform the calculator of the description of the seed drill by entering the code (e. g. **F.13**). The code indicates to the calculator the required information regarding the working width of the seed drill and the relation between the number of magnet turns to the travelling distance.

Entering machine factor and working width (see on page 23)



- Note the number of crank turns at the wheel next to the code in the tables. If you conduct a calibration test with another number of wheel turns than shown in the tables or when the sensor for the magnet is fitted to your seed drill in another way than shown in para. 5, calculate the data of your seed drill and programme these data as follows:
- **For AMAZONE D9, AD-P, AD03.**

6.1 Entering machine code

To every implement a code number (e. g. **F.13**) has been determined which you may take from the tables (below).

For the pack top seed drills equipped with star wheel **AD 2** and **AD-P 2** with 3 m working width the code number "F.13" refers.

When first switching on the calculator (see also on page 19) by press-

ing the **F**-key or the **ha**-key automatically the code **F.13** appears:

	D8 SPECIAL	Tyres 5.00-16	
Code	Working width	Number of crank turns at the wheel	
		1/40 ha	1/10 ha
F. 1	2.5 m	49.5	197.0
F. 2	3.0 m	41.0	164.0

	D8 SPECIAL D8 SUPER MD 8	Tyres 6.00-16	
Code	Working width	Number of crank turns at the wheel	
		1/40 ha	1/10 ha
F. 3	2.5 m	46.0	185.0
F. 4	3.0 m	38.5	154.0

	D8 SUPER MD 8	Tyres 10.0/75-15	
Code	Working width	Number of crank turns at the wheel	
		1/40 ha	1/10 ha
F. 5	3.0 m	37.0	149.0
F. 6	4.0 m	28.0	112.0

	D8 SUPER, MD 8	Tyres 31x15,50-15	
Code	Working width	Number of crank turns at the wheel	
		1/40 ha	1/10 ha
F. 7	3.0 m	36.0	144.0
F. 8	4.0 m	27.0	108.0
F. 9	6.0 m	18.0	72.0


	D8 SUPER	Tyres 11.5/80-15	
Code	Working width	Number of crank turns at the wheel	
		1/40 ha	1/10 ha
F. 10	4.5 m	22.0	88.0
F. 11	6.0 m	16.5	66.0




	AD 2 AD-P 2	Pack Top Seed Drill with star wheel ø 1.18m	
Code	Working width	Number of crank turns at the wheel	
		1/40 ha	1/10 ha
F. 12	2.5 m	27.0	108.0
F. 13	3.0 m	22.5	90.0
F. 14	4.0 m	17.0	67.5
F. 15	4.5 m	15.0	60.0


	RP-AD 2 RP-AD-P 2	Tyre Packer- Pack Top Seed Drill	
Code	Working width	Number of crank turns at the wheel	
		1/40 ha	1/10 ha
F. 16	2.5 m	59.0	235.0
F. 17	3.0 m	49.0	196.0
F. 18	4.0 m	37.0	147.0
F. 19	4.5 m	33.0	130.5
F. 20	6.0 m	24.5	98.0

	Precision Seeder ED
Code	Working width
F. 21	2.7 m
F. 22	3.0 m
F. 23	3.2 m
F. 24	3.6 m
F. 25	4.0 m
F. 26	4.2 m
F. 27	4.5 m
F. 28	4.8 m
F. 29	5.4 m
F. 30	6.0 m
F. 31	6.4 m

6.1.1 Entering code

When confirming the -key the actual code is shown in the display. If you want to change this code:

1. Press -key for 2 seconds.
Display: Code flicks.
2. Press -key as follows until the correct code appears::
At every pressing of the ha-key on the display the next following code in uprising order appears.
If the ha-key is pressed and the key is kept pressed the codes appear on the display in downward order.
3. Press -key for 2 seconds, as soon as in the display the desired code is shown. The code then has been entered (programmed).

If you **do not** press the -key the displayed (flicking) code will be programmed automatically after 10 seconds.

6.2 Entering machine factor and working width

6.2.1 Factor for different machines

Machine	Drive	Factor
AD-P Special	star wheel	113.5
AD-P Super	star wheel	101.4
AD03	Star wheel w/ sprocket wheel 26	399.2
AD03 Variant	Star wheel w/ sprocket wheel 26	259.5
AD03	Tyre packer roller RP	238.3
C-Drill	star wheel	306,5

Machine	Tyres	Factor
D9	6.00 – 16	216.3
D9	10.0 / 75-15	225.0
D9	31x15,5-15	231.4
C-Drill		

6.2.2 Calculating the factor

If you conduct a calibration test with another number of wheel turns than shown in the tables (on page 20) or when the sensor for the magnet is fitted to your seed drill in another way than shown in para. 5, calculate the data of your seed drill and programme these data as follows:

1. Drive with your seed drill a calibration distance (**L**) of at least 100 m.
2. Hereby count the number of turns (**z**) of the magnet on the gear-box shaft.
3. Calculate the factor from the values determined:

$$\text{factor} = \frac{\text{L (m)} \times 100}{z}$$

Example: **L = 100 m**
 z = 59.5

$$\text{factor} = \frac{100 \text{ (m)} \times 100}{59.5}$$

$$\text{factor} = 168.1$$

6.2.3 Programming (entering) factor and working width

Programme the factor determined and the working width of your seed drill as follows:

1. Press **F** - key for 2 seconds. Display: flicking code number
2. Press **ha** -key until the code number "F.0" (flicking) appears.
3. Press **F** -key until the symbol [o] appears Display: The factor of the code "F.0", which you may change as follows:
 - 3.1 Press **ha** -key until the comma is in the right place.
 - 3.2 **F** Display: 1st figure flicks
 - 3.3 Press **ha** -key , until 1st figure is correct..
 - 3.4 Press **F** -key. Display: 2nd figure flicks
 - 3.5 Press **ha** -key until 2nd figure is correct.

Continue this way until the factor (e.g. **[168.1]**) is set.

4. Press **F** -key until symbol [I- - - I] appears. Display: Working width of the coding "F.0", which you may change as follows.
 - 4.1 Press **F** -key until the 1st figure flicks.
 - 4.2 Press **ha** -key until the 1st figure is correct..
 - 4.3 Press **F** -key. Display: 2nd figure flicks.
 - 4.4 Press **ha** -key until 2nd figure is correct.

Continue this way until the working width (e.g. **[_3.00]** for 3 m working width) has been set.


5. Press **F** -key until the implement-No. "F.0" appears.

The factor which you have programmed and the programmed working width have been stored under the code "F 0".

7 Use of the machine

7.1 Starting to operate

If it is required to eradicate the memory contents proceed as follows:

- Press -key until (approx. 2 seconds the display shows 0.000



→ The memory has been eradicated.

As soon as the magnet starts turning, i.e. as soon as the seed drill starts operating, the calculator receives impulses from the sensor "ha" and begins to measure the worked area. The worked area can be seen at any time on the display of the calculator by briefly pressing the ha-key. The display, e. g.: 12.73, corresponds to 12.73 ha = 127300 m².

7.2 Discontinuing the use

If the calculator does not get any impulse for 1.5 hours or if during 1.5 hours no key is actuated, the calculator automatically switches off.

You may, however, switch off your calculator manually by pressing

the -key and the -key simultaneously for 5 seconds. The display then reads [STOP].

In both cases, e. g. switching off manually or automatically the calculator all data are stored.

Switching off the calculator

- switches off the display
- reduces the power consumption
- increases the life span of the batteries.

After switching off the calculator stays in waiting position,

- until it receives an impulse from the sensor "ha" or
- until a key is pressed.



Before exchanging the batteries switch off the calculator not to loose any data from the memory.

7.2.1 Disconnecting the sensor cable plug from the calculator

Before the seed drill is taken off the tractor unscrew the fixing screw, pull the plug of the sensor cable from the calculator and place the cable in a suitable moisture-free place (e.g. below the seed box on the side wall).

7.3 Protecting the calculator

Inside vehicles which park in full sunshine high temperatures occur.



Do not expose calculator to high temperatures over a longer period. The calculator can be damaged by this.
During winter, store the computer in a frost-safe room.

8 Faults

8.1 Checking the functions

If the calculator does not operate properly, it should be checked whether

- the battery voltage is too low
- the calculator or
- the sensors are defect.

8.2 Checking the battery voltage

In case the battery-voltage is too low this is displayed by the calculator by briefly showing the symbol [-bl-] on the display.


The battery voltage can also be checked as follows:

1. Switch off calculator (see on page 25)
2. Switch on calculator (see on page 25)

if the display shows [-bl-] voltage is too low.

1. Switch off the calculator and insert new batteries (see on page 16).

8.3 Checking the functions of the calculator

1. Unscrew sensor cable **ha** from the computer.
 2. Program code **F.1** and briefly press key .
 3. Bridge over poles of the connecting bush several times with a small screw driver (Fig. 13).
- The calculator processes the impulses simulated by the bridging over of the poles and shows this by adding in the display.
4. If the calculator does not process the impulses properly it must be exchanged

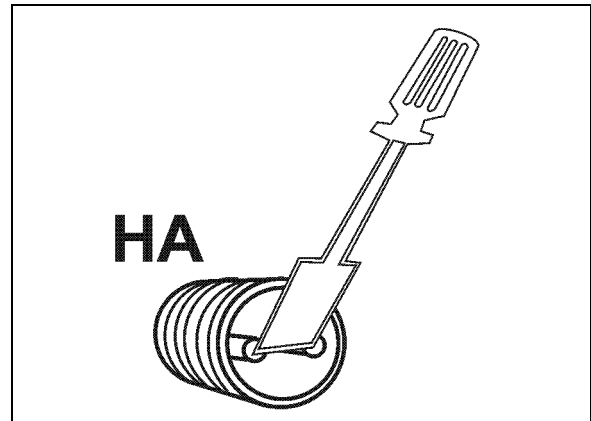


Fig. 13

8.4 Checking sensor "ha" for function

After the computer has been checked as described in para. 8.2 and 8.3 and no error could be found, a possible error can then only be caused by a wrongly fitted sensor or a defective sensor or sensor cable. Check the sensor:

1. Unbolt sensor **ha** and magnet from the seed drill.
2. Connect sensor cable **ha** to the calculator.
3. Enter code **F.1** and briefly press key **ha**.
4. Pass the magnet immediately in front of the sensor (simulation of impulses).

The calculator processes the simulated impulses and shows this by adding them in the display.

→ If the calculator does not process the impulses correctly the sensor must be exchanged.

→ If the calculator operates properly:

Reduce the gap between sensor and magnet on the seed drill.



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